

# Renewable Energy Progress Reports

European Union Member State Data for 2011 and 2012



### Acknowledgement

This ECN report addresses to European energy experts and policy makers. The document and the underlying database are available as a reference for renewable energy progress in the European Union Member States. The point of departure for this work is the set of Progress Reports that were due in 2013, with renewable energy data for 2011 and 2012. For all background data the reader is referred to www.ecn.nl/nreap, where feedback on this report and the database is welcomed. The author would like to thank the Netherlands Enterprise Agency (RVO) for making it possible to carry out this work and his colleagues at ECN for their assistance and ideas, with a special word of thanks to Moises Covarrubias Perez, Francesco Dalla Longa and Ayla Uslu. For more information contact the author at nreap@ecn.nl.

#### **Abstract**

This report compiles and presents a selection of the data that were published by the 28 European Member States to comply with Article 22 from the Renewable Energy Directive (2009/28/EC): Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom, including, where possible, an aggregate of all 28 Member States. These Member State reports were due by December 2013 and present, among others, the status of renewable energy for the statistical years 2011 and 2012. The original Progress Reports are available publicly, but grabbing the data from the predefined tables is a challenge. In this report and the underlying database (both available at www.ecn.nl/nreap) all data are presented in an accessible manner. In the first part of the report the data have been grouped per country, in the second part per technology. Where possible EU-28 totals have been calculated.

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# 1

## Introduction

This work is an integrated compilation of all Progress Reports on renewable energy in the European Union (28 Member States<sup>1</sup>, data for 2011 and 2012). First, the legal documents following the European Directive and their context are being mentioned (Section 1.1), followed by a reader's guide to this work (Section 1.2). Next, the purpose of this report and the targeted audience are explained (Section 1.3). Finally, possible future work is being announced (Section 1.4).

### 1.1 Progress Reports: the context

Following the European Union Directive 2009/28/EC all European Union (EU) Member States (MS) have the obligation to inform the European Commission (EC) on:

- 1. Their estimate for Renewable Energy Sources (RES) development up to the year 2020, as defined in Article 4 of the RES Directive. These projections have all been published and are available for download at the website of the European Commission<sup>2</sup>. These reports are called 'National Renewable Energy Action Plans' (NREAPs).
- 2. Their progress regarding the implementation of RES. This needs to be done in a 'Progress Report' (PR) which is to be published every two years, as defined in Article 22 of the RES Directive. The first batch of releases of the 27 Progress Reports (with data for 2009 and 2010) were due on 31 December 2011; the data from these reports were all compiled in a database and a data report by ECN, publicly available from www.ecn.nl/nreap. The second batch of Progress Reports also covers Croatia (EU-28) and these reports were due on 31 December 2013. These reports cover the statistical years 2011 and 2012 and a selection of the data presented has been documented in this report, for which the underlying database is available from www.ecn.nl/nreap as well. All original Member State Progress Reports on renewable energy are available for download at the website of the European Commission<sup>3</sup>.

All European Union Member States have obligations on reporting in the framework of RES Directive 2009/28/EC

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<sup>1</sup> The countries included are Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. Where possible, an aggregate of all 28 Member States is presented. Note that the previous set of Progress Reports (due 2011) did not include Croatia.

<sup>2</sup> https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans (May 2015)

<sup>3</sup> https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports (May 2015)

Previously, ECN has made all RES projections up to 2020 publicly available at www.ecn.nl/nreap

ECN has compiled a database (last update November 2011) of all the energy projections towards 2020 (the NREAPs, available at www.ecn.nl/nreap). This database and the accompanying data report assist stakeholders in evaluating the ambitions of the European Union Member States. These NREAPs were all published during the years 2010-2011 and will remain valid up to 2021, when the EU RES target will be evaluated. Possibly, MS provide updates for their reports, which might be added to the ECN database<sup>4</sup> in a later stage.

This report makes all Progress Report data for the years 2011 and 2012 integrally available, along with a database. Both are available at www.ecn.nl/nreap

In December 2013 ECN published a database and a data report on the PRs from 2011, with data for 2009 and 2010. Until now the data from the most recent progress reports (which were due in 2013) weren't released in an integral and accessible manner. This has been done in the current report. A worksheet with all underlying data is available for download at www.ecn.nl/nreap. An overview of the Progress Reports and their delivery dates is presented in Table 1.

### 1.2 How to read this report?

The PDF version of this report has clickable references.

This data report and the accompanying data tables make a large amount of data available. Consequently, this report features many tables. In some cases comments have been made to the data, which mostly stem from the original progress reports but also have been added by the author for clarification. In most cases the translated versions (documents in English language) of the Progress Reports have been used as source documents.

The nomenclature of the tables in this report follows the original numbering as defined in the Template for the Progress Report<sup>5</sup>.

The report first presents an overview of renewable energy per country, starting with Austria (page 17) up to the United Kingdom (page 187). The added value of these tables is that all data are available at a glance, and can easily be compared among eachother. Moreover, the achievements in renewable electricity, in renewable heating and cooling and in renewable transport have been displayed in aggregate tables (one for 2011 and one for 2012), which allows to easily compare contribution of each of these sources to total RES by calculated shares, expressed in percentages. On page 193 an overview is presented for the European Union (28 Member States). These data have been calculated by summing the contributions from the individual Member States.

Secondly, the report presents separate tables for country contributions to each of the Progress Report table's rows. This makes it possible to see differences between countries for each reported parameter. This part runs from page 199 to 264.

Note that Member States in their Progress Reports do not consistently apply the same amount of decimals in their data tables. Naturally, for smaller countries the decimals have more importance than for large countries. For the purpose of this report it has been decided to display the original decimals without rounding, and generally to show the decimals in equal amounts within a table. This makes that the table columns align data nonconsistently.

As the report is meant as a reference book, the reader is encouraged to not print the document, but to use it in its original format, namely PDF. The digital version has additional functionality like automated cross-links (for the page numbers in the table comments) and active hyperlinks to relevant locations on the internet.

<sup>4</sup> After the closure of the ECN NREAP database in November 2011 three Member States amended their projections: the Czech Republic, Poland and Spain. This has not been covered yet in the NREAP database and data report.

<sup>5</sup> https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports (May 2015)

	Author	Date	Page
Austria	Bundesministerium Wirtschaft, Familie und Jugend	10 March 2014*	2
Belgium	CONCERE-ENOVER	20 December 2013	3
Bulgaria	Ministry of the Economy and Energy	December 2013	4
Croatia	Ministry of the Economy	January 2014	13
Cyprus	Ministry of Energy, Commerce, Industry and Tourism	25 March 2014*	5
Czech Republic	Czech Authorities	7 May 2014*	6
Denmark	Danish Authorities	December 2013	7
Estonia	Ministry of Economic Affairs and Communications	2013	8
Finland	Finnish Authorities	24 January 2014	9
France	Ministry of Ecology, Sustainable Developm., Energy	December 2013	10
Germany	German Government	29 Sept. 2014*	11
Greece	Ministry of Environment, Energy and Climate Change	2014	12
Hungary	Ministry of National Development	January 2014	14
Ireland	Irish Authorities	February 2014	15
Italy	Italian Authorities	December 2013	16
Latvia	Ministry of the Economy	24 March 2014*	17
Lithuania	Lithuanian Authorities	2013	18
Luxembourg	Grand Duchy of Luxembourg	2 April 2014*	19
Malta	Maltese Authorities	17 December 2013	20
Netherlands	Ministry of Economic Affairs	21 March 2014*	21
Poland	Ministerstwo Gospodarki	2014	22
Portugal	Direção Geral de Energia e Geologia	April 2014	23
Romania	Romanian Authorities	24 april 2014*	24
Slovakia	Ministry of the Economy of the Slovak Republic	2013	25
Slovenia	Ministry Of Infrastructure And Spatial Planning	24 March 2014	26
Spain	IDEA	27 December 2013	27
Sweden	Government Offices of Sweden	23 December 2013*	28
United Kingdom	United Kingdom Government	December 2013	29

Table 1: Overview of Progress Reports by the 28 European Union Member States. Some reports don't mention an author, some don't mention a publication date. For documents without a publication date the PDF creation date has been listed, indicated by an '\*'. The page number in the last column refers to the country chapter in this report.

#### Purpose and target audience 1.3

The intention of this work is to provide European energy experts with a reference book on renewable energy: research institutes, statistical offices, the energy industry, energy service companies, renewable energy associations, energy consultants, banks and policy makers on local, national and European level. This report focuses on the EU MS Progress Reports that were due in 2013 (with data for renewable energy for the years 2011 and 2012). In order to assist professionals in their energy system analyses the data have all been disclosed in a separately available database, see www.ecn.nl/nreap.

Energy professionals and policy makers may benefit from the work in this report

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#### Future work 1.4

Future updates of the EU MS Progress Reports are expected in 2015, 2017, 2019 and 2021 (conform Article 22 of Directive 2009/EC/28). If there is a demand for this type of data reports and databases ECN has the ambition to continue making these data integrally available to the audience. See www.ecn.nl/nreap for the latest updates.

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# Austria

	Unit	2011	2012	Comment
Renewable heating and cooling	%	45.5	45	
Renewable electricity	%	64.5	65.3	
Renewable Transport	%	6.7	7	
Overall renewable energy share	%	30.7	32.2	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 2: Austrian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Austria (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	4072	4301	
Gross final consumption of electricity from RES	ktoe	3908	4016	
Gross final consumption of energy from RES in transport	ktoe	571	586	
Gross total RES consumption	ktoe	8551	8902	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	8551	8902	

Table 3: Austrian PR Table 1a: Calculation table for the renewable energy contribution in Austria of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 4: Austrian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Austria for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	12980	38659	3324	37.9%	
Hydropower (non pumped)	7947	35043	3013	34.3%	
Hydropower <1 MW (non pumped)	368	1544	133	1.5%	
Hydropower 1 MW - 10 MW (non pumped)	795	3307	284	3.2%	
Hydropower >10 MW (non pumped)	6784	30192	2596	29.6%	4 ( 22)
Hydropower pumped storage	5033	3616	311	3.5%	1 (p.22)
Hydropower mixed (normalised) Geothermal	12980 1	38659 1	3324 0	37.9% 0.0%	
Solar	317	174	15	0.0%	
Solar photovoltaic	317	174	15	0.2%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	1080	2089	180	2.0%	
Onshore wind	1080	2089	180	2.0%	
Offshore wind	0	0	0	0.0%	
Biomass	2015	4523	389	4.4%	
Solid biomass	1628	3898	335	3.8%	
Biogas	372	625	54	0.6%	
Bioliquids	15	0	0	0.0%	
Total	16393	45446	3908	44.5%	
Total CHP	1254	2719	234	2.7%	
Book although and Coding				0/	Comment
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			20	0.2%	
Solar thermal			167	1.9%	
Biomass			3888	44.3%	
Solid biomass			3856	43.9%	
Biogas			32	0.4%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			133	1.5%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0% 0.0%	
Hydrothermal heat pumps  Total			4208	48.0%	
Total district heating			875	10.0%	
Total biomass in households			1515	17.3%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			66	0.8%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			38	0.4%	
Biodiesel			333	3.8%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			252	2.9%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			175	2.0%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			175	2.0%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			660	7.5%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	13076	39311	3380	38.5%	
Hydropower (non pumped)	7968	35462	3049	34.7%	
Hydropower <1 MW (non pumped)	391	1556	134	1.5%	
Hydropower 1 MW - 10 MW (non pumped)	793	3096	266	3.0%	
Hydropower >10 MW (non pumped)	6784	30810	2649	30.2%	
Hydropower pumped storage	5108	3849	331	3.8%	1 (p.22)
Hydropower mixed (normalised)	13076	39311	3380	38.5%	_ (p:==/
Geothermal	1	1	0	0.0%	
Solar	363	337	29	0.3%	
Solar photovoltaic	363	337	29	0.3%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	1316	2412	207	2.4%	
Onshore wind	1316	2412	207	2.4%	
Offshore wind	0	0	0	0.0%	
Biomass	2062	4642	399	4.5%	
Solid biomass	1672	4003	344	3.9%	
Biogas	377	639	55	0.6%	
Bioliquids	13	0	0	0.0%	
Total	16818	46703	4016	45.8%	
Total CHP	1259	2533	218	2.5%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			22	0.3%	
Solar thermal			173	2.0%	
Biomass			4094	46.7%	
Solid biomass			4048	46.1%	
Biogas			46	0.5%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			145	1.7%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps			0	0.0%	
Total			4434	50.5%	
Total district heating			890	10.1%	
Total biomass in households			1686	19.2%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			67	0.8%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			39	0.0%	
Biodiesel			348	4.0%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			249	2.8%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			173	2.0%	
Renewable electricity  Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			173	2.0%	
Other biofuels			0	0.0%	
Other biofuels Other biofuels Article 21.2			0	0.0%	
Total			651	7.4%	

Table 5: Austrian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Austria for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 6:** Austrian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	1620	1820	
Indirect supply of wood biomass	ktoe	1580	1530	
Energy crops	ktoe	13	14	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	2 (p.22)
Biomass from waste	ktoe	129	128	
Others	ktoe	335	335	
Total biomass for heating and electricity*	ktoe	3677	3827	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	74	431	3 (p.22)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	4 (p.22)
Total biomass for transport*	ktoe	74	431	
Total biomass for all sectors*	ktoe	3751	4258	
Biomass supply for heating and electricity	Ray	v material	imported t	from FU
Signature dapping for incutants and creatively				
Direct cumply of wood his mass from forests and other	Unit ktoe	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	Ktoe	220	240	
Indirect supply of wood biomass	ktoe	860	970	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	2 (p.22)
by-products Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	1080	1210	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	440	431	3 (p.22)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	,
Others	ktoe	n.a.	n.a.	4 (p.22)
Total biomass for transport*	ktoe	440	431	
Total biomass for all sectors*	ktoe	1520	1641	
Biomass supply for heating and electricity	Raw r	material im	ported fro	m non-EU
Biomass supply for heating and electricity	Raw r Unit	naterial im 2011	ported fro 2012	m non-EU Comment
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other				
Direct supply of wood biomass from forests and other wooded land energy generation	Unit	<b>2011</b> n.a.	2012 n.a.	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass	Unit ktoe	2011 n.a.	2012 n.a.	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops	Unit ktoe ktoe ktoe	2011 n.a. 50 n.a.	2012 n.a. 50 n.a.	Comment
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	Unit ktoe	2011 n.a.	2012 n.a.	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products	Unit ktoe ktoe ktoe	2011 n.a. 50 n.a. n.a.	2012 n.a. 50 n.a. n.a.	Comment
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	Unit ktoe ktoe ktoe	2011 n.a. 50 n.a.	2012 n.a. 50 n.a.	Comment
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	Unit ktoe ktoe ktoe ktoe ktoe	2011 n.a. 50 n.a. n.a.	2012 n.a. 50 n.a. n.a.	Comment
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	Unit ktoe ktoe ktoe ktoe ktoe ktoe	2011 n.a. 50 n.a. n.a.	2012 n.a. 50 n.a. n.a. n.a.	Comment
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe	2011 n.a. 50 n.a. n.a. n.a.	2012 n.a. 50 n.a. n.a. n.a.	2 (p.22)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	Unit ktoe ktoe ktoe ktoe ktoe Unit	2011 n.a. 50 n.a. n.a. n.a. 2011	2012 n.a. 50 n.a. n.a. n.a. 50	2 (p.22)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport Common arable crops for biofuels	Unit ktoe ktoe ktoe ktoe ktoe Unit ktoe	2011 n.a. 50 n.a. n.a. n.a. 2011 440	2012 n.a. 50 n.a. n.a. n.a. 2012 431	2 (p.22)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels	Unit ktoe ktoe ktoe ktoe ktoe unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	2011 n.a. 50 n.a. n.a. n.a. 2011 440 n.a.	2012 n.a. 50 n.a. n.a. n.a. 2012 431 n.a.	2 (p.22)  Comment 3 (p.22)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	2011 n.a. 50 n.a. n.a. n.a. 2011 440 n.a. n.a.	2012 n.a. 50 n.a. n.a. n.a. 2012 431 n.a. n.a.	2 (p.22)  Comment 3 (p.22)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	67500	67300	5 (p.22)
Land used for short rotation trees	ha	1300	1500	6 (p.22)
Land used for other energy crops such as grasses	ha	1214	1137	

Table 7: Austrian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	82.5	78.2	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	82.5	78.2	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

**Table 8:** Austrian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	29900000	30000000	7 (p.22)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	18800000	18100000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	9400000	10300000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	1700000	1600000	

**Table 9:** Austrian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	0	0	8 (p.22)
Origin/destination	0	0	8 (p.22)
Unit	ktoe	ktoe	8 (p.22)
2010	0	0	8 (p.22)
2011	0	0	8 (p.22)
2012	0	0	8 (p.22)
2013	0	0	8 (p.22)
2014	0	0	8 (p.22)
2015	0	0	8 (p.22)
2016	0	0	8 (p.22)
2017	0	0	8 (p.22)
2018	0	0	8 (p.22)
2019	0	0	8 (p.22)
2020	0	0	8 (p.22)

**Table 10:** Austrian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Austria (ktoe) (see Table 9 of the NREAP)

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#### Comments for Austria

- 1: Capacity value for 2011 possibly contains a typing error: meant is '5033\*' instead of '50338'. In this report the value '5033' is used. Comment in the Austrian Progress Report: 'Total capacity of pump storage works, output reduced to actual pumps is 1668 MW for 2011 and 1743 MW for 2012'.
- 2: Included in category 'Others'.
- 3: The report does not specify data for 'Common arable crops for biofuels' but instead reports quantities for 'biodiesel' and 'bioethanol' supply.
- 4: There are currently only research and development systems or demonstration systems in this area, which produce no quantities of note.
- 5: Data refer to net area. Net area including area factoring for combined production of protein feed (DDGS, rape cake). During biofuel production, only part of the yield is used for ethanol production (starch) or vegetable oil production (oil); a large part of the raw material is retained as valuable protein feed for farm animals and can replace imports of protein feed (e.g. soya imports from soya farms in South America). Gross area excluding combined production of valuable protein feed (95000 ha in 2011 and 94800 ha in 2012). The gross area is often used for misleading arguments about competition for land use; thus the net area is the most important.
- 6: 80% poplar 20% willow
- 7: Total estimate is a value calculated by ECN (sum of the GHG savings from RES-E/H/C/T). The data for Table 6 are taken from the publication 'Renewable Energy in Figures Development of Renewable Energy in Austria in 2012'. It also describes the calculation assumptions and factors.

http://www.lebensministerium/at/umwelt/energie-erneuerbar/ERneuerbare\_Zahlen.html

8: In order to attain the target of a share of 34% renewables in gross end energy use, no statistical transfers between Member States or participation in joint projects with other Member States and third countries are currently planned.

# 3 Belgium

	Unit	2011	2012	Comment
Renewable heating and cooling	%	4.68	6.64	
Renewable electricity	%	8.83	11.12	
Renewable Transport	%	4	4.46	
Overall renewable energy share	%	5.17	6.81	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 11: Belgian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Belgium (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	947.9	1309.8	1 (p.28)
Gross final consumption of electricity from RES	ktoe	668.2	848.2	
Gross final consumption of energy from RES in transport	ktoe	364.5	372.8	
Gross total RES consumption	ktoe	1980.6	2530.8	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	1980.6	2530.8	

Table 12: Belgian PR Table 1a: Calculation table for the renewable energy contribution in Belgium of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 13: Belgian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Belgium for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	1426	379	33	1.7%	2 (p.28)
Hydropower (non pumped)	119	296.6	26	1.3%	
Hydropower <1 MW (non pumped)	9	188	16	0.9%	
Hydropower 1 MW - 10 MW (non pumped)	55	153.7	13	0.7%	
Hydropower >10 MW (non pumped)	55	124.1	11	0.6%	
Hydropower pumped storage	1307	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	0	0	0	0.0%	3 (p.28)
Geothermal	0	0	0	0.0%	
Solar	1391	1169.6	101	5.3%	
Solar photovoltaic	1391	1169.6	101	5.3%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	1069	2055.3	177	0.0%	
Wind power Onshore wind			177	9.3%	
Offshore wind	n.a. n.a.	n.a. n.a.	n.a. n.a.	n.a. n.a.	
Biomass	911	3652.8	314	16.6%	4 (p.28)
Solid biomass	701	3125.9	269	14.2%	4 (ρ.26)
Biogas	129	526.9	45	2.4%	
Bioliquids	81	0	0	0.0%	
Total	4797	7256.685	624	33.0%	
Total CHP	308.7	1736.4	149	7.9%	
iotal Crir	300.7	1/30.4	143	7.370	
5 11 11 11 10 15				2/	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			2.6	0.1%	
Solar thermal			14.4	0.8%	T ( 20)
Biomass			865.8	45.8%	5 (p.28)
Solid biomass			820	43.4%	
Biogas			45.7	2.4% 0.0%	
Bioliquids Renewable energy from heat pumps			19	1.0%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps			0	0.0%	
Total			901.7	47.7%	
Total district heating			0	0.0%	6 (p.28)
Total biomass in households			243.9	12.9%	7 (p.28)
Total biolilass III Housellolus			243.3	12.3/0	7 (p.26)
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			48	2.5%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	8 (p.28)
Bioethanol / bio-ETBE imported			0	0.0%	9 (p.28)
Biodiesel			290.1	15.3%	3 (p.20)
Biodiesel Article 21.2			0	0.0%	10 (p.28)
Biodiesel imported			51.9	2.7%	11 (p.28)
Hydrogen from renewables			0	0.0%	(I: ==)
Renewable electricity			26.4	1.4%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			26.4	1.4%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	12 (p.28)
Total			364.5	19.3%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	1424	371.7	32	1.7%	2 (p.28)
Hydropower (non pumped)	117	314.8	27	1.4%	
Hydropower <1 MW (non pumped)	9	204	18	0.9%	
Hydropower 1 MW - 10 MW (non pumped)	53	160.2	14	0.7%	
Hydropower >10 MW (non pumped)	55	134.2	12	0.6%	
Hydropower pumped storage	1307	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	0	0	0	0.0%	3 (p.28)
Geothermal	0	0	0	0.0%	
Solar	2581	2148.3	185	9.8%	
Solar photovoltaic	2581	2148.3	185	9.8%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	1364	2602.8	224	11.8%	
Onshore wind	n.a.	n.a.	n.a.	n.a.	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	874	4348	374	19.8%	4 (p.28)
Solid biomass	678	3684.5	317	16.8%	
Biogas	141	663.5	57	3.0%	
Bioliquids	55	0	0	0.0%	
Total	6243	9470.795	814	43.1%	
Total CHP	222.4	1791	154	8.1%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			2.8	0.1%	
Solar thermal			15.3	0.8%	
Biomass			1243.9	65.8%	5 (p.28)
Solid biomass			1179.8	62.4%	
Biogas			64.2	3.4%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			23.4	1.2%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps			0	0.0%	
Total			1285.4	68.0%	
Total district heating			0	0.0%	6 (p.28)
Total biomass in households			789.1	41.7%	7 (p.28)
Total Diemass in neuscriotas			70311	421770	7 (pi20)
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			48	2.5%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	8 (p.28)
Bioethanol / bio-ETBE imported			0	0.0%	9 (p.28)
Biodiesel			298	15.8%	. (1. 1.2)
Biodiesel Article 21.2			0	0.0%	10 (p.28)
Biodiesel imported			52.7	2.8%	11 (p.28)
Hydrogen from renewables			0	0.0%	(F.20)
Renewable electricity			26.8	1.4%	
Renewable electricity road transport			0	0.0%	
Renewable electricity road transport			26.8	1.4%	
Other hiefuels			20.0	0.00/	

Other biofuels

Other biofuels Article 21.2

Table 14: Belgian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Belgium for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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0

0

0.0%

0.0%

12 (p.28)

25

**Table 15:** Belgian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	372	464	
Indirect supply of wood biomass	ktoe	678	675	
Energy crops	ktoe	49	49	
Agricultural by-products / processed residues and fishery	ktoe	87	94	
by-products Biomass from waste	leton	407	F22	
Others	ktoe ktoe	487 58	522 56	
Total biomass for heating and electricity*	ktoe	1731	1860	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	24	330	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	24	330	
Total biomass for all sectors*	ktoe	1755	2190	
Biomass supply for heating and electricity		w material		
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	194	183	
Energy crops	ktoe	1	0	
Agricultural by-products / processed residues and fishery by-products	ktoe	7	3	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	58	56	
Total biomass for heating and electricity*	ktoe	260	242	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	321	330	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	321	330	
Total biomass for all sectors*	ktoe	581	572	
Biomass supply for heating and electricity	Raw r	naterial im	ported fro	m non-EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other	ktoe	n.a.	n.a.	
wooded land energy generation	leton	205	388	
Indirect supply of wood biomass		203		
	ktoe	9	6	
Energy crops Agricultural by-products / processed residues and fishery		n.a.	n.a.	
Energy crops Agricultural by-products / processed residues and fishery by-products	ktoe		-	
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe	n.a.	n.a.	
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe	n.a.	n.a.	
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe ktoe	n.a. n.a. n.a.	n.a. n.a. n.a.	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	ktoe ktoe ktoe ktoe	n.a. n.a. n.a.	n.a. n.a. n.a.	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	ktoe ktoe ktoe ktoe unit	n.a. n.a. 214	n.a. n.a. n.a. 394	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	ktoe ktoe ktoe ktoe unit ktoe	n.a. n.a. 214 2011 321	n.a. n.a. n.a. 394 2012	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe unit ktoe ktoe	n.a. n.a. n.a. 214 2011 321 n.a.	n.a. n.a. n.a. 394 2012 330 n.a.	Comment

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	14818	16674	13 (p.28)
Land used for short rotation trees	ha	145	165	14 (p.28)
Land used for other energy crops such as grasses	ha	138	190	15 (p.28)

Table 16: Belgian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

Table 17: Belgian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	9080157	10506315	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	4993590	6102208	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	3604362	3910661	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	482205	493445	

Table 18: Belgian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	0	0	
2012	0	0	
2013	0	0	
2014	0	0	
2015	0	0	
2016	0	0	
2017	0	0	
2018	0	0	
2019	0	0	
2020	0	0	

Table 19: Belgian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Belgium (ktoe) (see Table 9 of the NREAP)

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## Comments for Belgium

- 1: Table headers mention 2009 and 2010 instead of 2011 and 2012.
- 2: Normalised in accordance with Directive 2009/28/EC and the Eurostat methodology.
- 3: In accordance with the new Eurostat methodology.
- 4: Only take into account forms of biomass that meet the sustainability criteria, see Directive 2009/28/EC, Article 5(1), final subparagraph.
- 5: Only take into account forms of biomass that meet the sustainability criteria, see Directive 2009/28/EC, Article 5(1), final subparagraph.
- 6: Share of urban heating and/or cooling in total energy consumption for heating and cooling produced from sustainable energy sources (RES-CU).
- 7: Share in total energy consumption for heating and cooling produced from sustainable energy sources.
- 8: Biofuels named in Directive 2009/28/EC, Article 21(2).
- 9: Share in the total quantity of bioethanol/bio-ETBE.
- 10: Biofuels named in Directive 2009/28/EC, Article 21(2).
- 11: Share in the total quantity of biodiesel.
- 12: Biofuels named in Directive 2009/28/EC, Article 21(2).
- 13: Of which wheat 9433 ha in 2011 and 9589 ha in 2012 and beet 1804 ha in 2011 and 2006 ha in 2012.
- 14: Of which willow 63 ha in 2011 and 68 ha in 2012.
- 15: Of which miscanthus 83 ha in 2011 and 105 ha in 2012.

# 4 Bulgaria

	Unit	2011	2012	Comment
Renewable heating and cooling	%	24.9	27.5	
Renewable electricity	%	13.6	16.7	
Renewable Transport	%	0.4	0.3	
Overall renewable energy share	%	14.6	16.4	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 20: Bulgarian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Bulgaria (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	1043.3	1122	
Gross final consumption of electricity from RES	ktoe	456	545.8	
Gross final consumption of energy from RES in transport	ktoe	5.9	5.1	
Gross total RES consumption	ktoe	1505.2	1672.9	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	0	0	

Table 21: Bulgarian PR Table 1a: Calculation table for the renewable energy contribution in Bulgaria of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 22: Bulgarian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Bulgaria for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	3108	4413	379	25.2%	
Hydropower (non pumped)	2095	3982	342	22.8%	
Hydropower <1 MW (non pumped)	47	106	9	0.6%	
Hydropower 1 MW - 10 MW (non pumped)	226	509	44	2.9%	
Hydropower >10 MW (non pumped)	1822	3367	290	19.3%	
Hydropower pumped storage	864	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	149	322	28	1.8%	
Geothermal	0	0	0	0.0%	
Solar	154	101	9	0.6%	
Solar photovoltaic	154	101	9	0.6%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	541	802	69	4.6%	
Onshore wind	541	802	69	4.6%	
Offshore wind	0	0	0	0.0%	
Biomass	11	56	5	0.3%	
Solid biomass	6	37	3	0.2%	
Biogas	5	19	2	0.1%	
Bioliquids	0	0	0	0.0%	
Total	3814	5373	462	30.7%	
Total CHP	n.a.	56	5	0.3%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			33	2.2%	
Solar thermal			14	0.9%	
Biomass			944	62.8%	
Solid biomass			943	62.7%	
Biogas			1	0.1%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			42	2.8%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps			0	0.0%	
Total			1033	68.7%	
Total district heating			0	0.0%	
Total biomass in households			747	49.7%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			0	0.0%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			8	0.5%	
Renewable electricity road transport			3.4	0.2%	
Renewable electricity non-road transport			4.6	0.3%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			8	0.5%	

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	3129	4488	386	25.7%	
Hydropower (non pumped)	2116	4241	365	24.3%	
Hydropower <1 MW (non pumped)	51	124	11	0.7%	
Hydropower 1 MW - 10 MW (non pumped)	234	567	49	3.2%	
Hydropower >10 MW (non pumped)	1831	3550	305	20.3%	
Hydropower pumped storage	864	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	149	339	29	1.9%	
Geothermal	0	0	0	0.0%	
Solar	1013	814	70	4.7%	
Solar photovoltaic	1013	814	70	4.7%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	677	1039	89	5.9%	
Onshore wind	677	1039	89	5.9%	
Offshore wind	0	0	0	0.0%	
Biomass	14	66	6	0.4%	
Solid biomass	14	65	6	0.4%	
Biogas	0	1	0	0.0%	
Bioliquids	0	0	0	0.0%	
Total	4833	6407	551	36.7%	
Total CHP	n.a.	66	6	0.4%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			33	2.2%	
Solar thermal			15	1.0%	
Biomass			1005	66.9%	
Solid biomass			1005	66.9%	
Biogas			0	0.0%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			47	3.1%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps			0	0.0%	
Total			1101	73.3%	
Total district heating			0	0.0%	
Total biomass in households			759	50.5%	
<b>R</b> enewable Transport			ktoe	%	Comment
				0.0%	Sommight
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2			0		
Bioethanol / bio-ETBE imported			0	0.0% 0.0%	
Biodiesel Biodiesel			0	0.0%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			6.1	0.4%	
Renewable electricity road transport			1.7	0.4%	
Renewable electricity road transport			4.4	0.1%	
Other biofuels			4.4	0.3%	
Other biorders Other biofuels Article 21.2			0	0.0%	
Total			6.1	0.0%	
IUtai			0.1	0.4%	

Table 23: Bulgarian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Bulgaria for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 24:** Bulgarian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	762	772	1 (p.34)
Indirect supply of wood biomass	ktoe	169	210	2 (p.34)
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	5	17	
by-products				
Biomass from waste Others	ktoe	13	21	
Total biomass for heating and electricity*	ktoe ktoe	n.a. 949	n.a. 1020	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	18	n.a.	3 (p.34)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	3 (p.34)
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	18	n.a.	
Total biomass for all sectors*	ktoe	967	1020	
Biomass supply for heating and electricity	Rav	w material	imported f	from EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	1 (p.34)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	2 (p.34)
Energy crops	ktoe	n.a.	n.a.	/
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	3 (p.34)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Raw r	material im	ported fro	m non-EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other	ktoe	n.a.	n.a.	1 (p.34)
wooded land energy generation				2 ( . 24)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	2 (p.34)
Indirect supply of wood biomass Energy crops	ktoe	n.a.	n.a.	2 (μ.54)
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery				z (p.54)
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	2 (μ.54)
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe	n.a. n.a.	n.a. n.a.	2 (μ.54)
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe	n.a. n.a.	n.a. n.a.	2 (μ.54)
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a.	
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a.	
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe ktoe unit ktoe ktoe	n.a. n.a. n.a. n.a. 2011	n.a. n.a. n.a. n.a. 2012	Comment
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe ktoe ktoe Unit ktoe ktoe ktoe	n.a. n.a. n.a. n.a. 2011	n.a. n.a. n.a. n.a. 2012	Comment
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe ktoe unit ktoe ktoe	n.a. n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. 2012 n.a.	Comment

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	3227237	3294685	4 (p.34)
Land used for short rotation trees	ha	587.9	597.1	5 (p.34)
Land used for other energy crops such as grasses	ha	0	0	

Table 25: Bulgarian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

Table 26: Bulgarian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	7540761	8316397	6 (p.34)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	3771176	4266502	6 (p.34)
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	3756538	4039878	6 (p.34)
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	13046	10018	6 (p.34)

Table 27: Bulgarian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	79	n.a.	
2011	207	n.a.	
2012	209	n.a.	
2013	202	n.a.	
2014	353	n.a.	
2015	386	n.a.	
2016	481	n.a.	
2017	420	n.a.	
2018	471	n.a.	
2019	411	n.a.	
2020	341	n.a.	

Table 28: Bulgarian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Bulgaria (ktoe) (see Table 9 of the NREAP)

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## Comments for Bulgaria

- 1: The amount of domestic raw material for direct supply of wood biomass from forests and other wooded land energy generation is expressed in stacked cubic meters (stacked m3).
- 2: The amount of domestic raw material for indirect supply of wood biomass is expressed in tonnes.
- 3: The amount of domestic raw material from common arable crops for biofuels is expressed in tonnes.
- 4: According to the Bulgarian Progress Report the value for 2011 refers to the year 2009 and value for 2012 refers to the year 2010. Source: Bulgarian Agricultural and Economic Survey (BANSIK) 2012, Final data on occupancy and usage of the territory of Bulgaria in 2012, www.mzh.government.bg/mzh/ShortLinks/SelskaPolitika/Agrostatistics/Land\_Use/Posts\_copy2/Buletini2012.asp.
- 5: According to the Bulgarian Progress Report the value for 2011 refers to the year 2009 and value for 2012 refers to the year 2010. Source: the MZH and the Executive Forest Agency.
- 6: According to the Bulgarian Progress Report the value for 2011 refers to the year 2009 and the value for 2012 refers to the year 2010.

# **5**Cyprus

	Unit	2011	2012	Comment
Renewable heating and cooling	%	18.9	21.5	
Renewable electricity	%	3.9	5.9	
Renewable Transport	%	2.1	2.4	
Overall renewable energy share	%	6.1	7	1 (p.40)
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 29: Cypriot PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Cyprus (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	83.58	81.95	
Gross final consumption of electricity from RES	ktoe	15.3	22.1	
Gross final consumption of energy from RES in transport	ktoe	16.01	17	
Gross total RES consumption	ktoe	114.892	121.055	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	114.892	121.055	

**Table 30:** Cypriot PR Table 1a: Calculation table for the renewable energy contribution in Cyprus of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 31: Cypriot PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Cyprus for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	0	0	0	0.0%	
Hydropower (non pumped)	0	0	0	0.0%	
Hydropower <1 MW (non pumped)	0	0	0	0.0%	
Hydropower 1 MW - 10 MW (non pumped)	0	0	0	0.0%	
Hydropower >10 MW (non pumped)	0	0	0	0.0%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised) Geothermal	0	0	0	0.0%	
Solar	10.6	11.89	1	0.0%	
Solar photovoltaic	10.6	11.89	1	0.9%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	133.5	113.78	10	8.5%	
Onshore wind	133.5	113.78	10	8.5%	
Offshore wind	0	0	0	0.0%	
Biomass	8.7	51.61	4	3.9%	
Solid biomass	0	0	0	0.0%	
Biogas	8.7	50.49	4	3.8%	
Bioliquids	n.a. <b>152.8</b>	1.12 <b>177.28</b>	0 15	0.1% 13.3%	
Total		-			
Total CHP	8.52	50.49	4	3.8%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			62.99	54.8%	
Biomass			19.55	17.0%	
Solid biomass			15.27	13.3%	2 (p.40)
Biogas			4.28	3.7%	
Bioliquids			1.05	0.0%	
Renewable energy from heat pumps				0.9%	
Aerothermal heat pumps Geothermal heat pumps			n.a. n.a.	n.a. n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			83.59	72.8%	
Total district heating			0	0.0%	
Total biomass in households			5.49	4.8%	3 (p.40)
					o (p. 10)
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			16.01	13.9%	
Biodiesel Article 21.2			0.1	0.1%	
Biodiesel imported			10.49	9.1%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			0	0.0%	
Renewable electricity road transport Renewable electricity non-road transport			0	0.0% 0.0%	
Other biofuels			0	0.0%	
Other bioduels Other biofuels Article 21.2			0	0.0%	
Total			16.01	13.9%	

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	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	0	0	0	0.0%	
Hydropower (non pumped)	0	0	0	0.0%	
Hydropower <1 MW (non pumped)	0	0	0	0.0%	
Hydropower 1 MW - 10 MW (non pumped)	0	0	0	0.0%	
Hydropower >10 MW (non pumped)	0	0	0	0.0%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised)		0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	17.7	21.44	2	1.6%	
Solar photovoltaic	17.7	21.44	2	1.6%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	146.7	184.61	16	13.8%	
Onshore wind	146.7	184.61	16	13.8%	
Offshore wind	0	0	0	0.0%	
Biomass	9.5	50.24	4	3.8%	
Solid biomass	0	0	0	0.0%	
Biogas	9.5	50.04	4	3.7%	
Bioliquids	n.a.	0.2	0	0.0%	
Total	173.9	256.29	22	19.2%	
Total CHP	9.32	50.04	4	3.7%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			64.47	56.1%	
Biomass			16	13.9%	
Solid biomass			11.68	10.2%	2 (p.40)
Biogas			4.32	3.8%	(1 /
Bioliquids			0	0.0%	
Renewable energy from heat pumps			1.48	1.3%	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			81.95	71.4%	
Total district heating			0	0.0%	
Total biomass in households			5.75	5.0%	3 (p.40)
					- (p. 10)
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			17	14.8%	
Biodiesel Article 21.2			0.1	0.1%	
Biodiesel imported			10.63	9.3%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			0	0.0%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			0	0.0%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Other biolides Article 21.2					

2012

Table 32: Cypriot PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Cyprus for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 33:** Cypriot PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material			
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	2.17	2.63	4 (p.40)
ndirect supply of wood biomass	ktoe	0.49	0.7	5 (p.40)
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery	ktoe	0.73	0.68	6 (p.40)
Biomass from waste	ktoe	0	0	
Others	ktoe	8.72	8.62	
Total biomass for heating and electricity*	ktoe	12.11	12.63	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	0	16.92	7 (p.40)
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	0.09	0	8 (p.40)
Total biomass for transport*	ktoe	0.09	16.92	
Total biomass for all sectors*	ktoe	12.2	29.55	
Biomass supply for heating and electricity	Ray	w material	imported i	from FU
	Unit	2011	2012	
Direct supply of wood biomass from forests and other	ktoe	0.02	0.75	4 (p.40)
wooded land energy generation				,
ndirect supply of wood biomass	ktoe	3.97	4.06	5 (p.40)
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery by-products	ktoe	0	0	6 (p.40)
Biomass from waste	ktoe	6.6	2.07	
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	10.59	6.88	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	15.93	16.92	7 (p.40)
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	0	0	8 (p.40)
Total biomass for transport*	ktoe	15.93	16.92	
Total biomass for all sectors*	ktoe	26.52	23.8	
Biomass supply for heating and electricity	Raw	naterial im	ported fro	m non-EU
,	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other	ktoe	n.a.	n.a.	4 (p.40)
wooded land energy generation ndirect supply of wood biomass	ktoe	n.a.	n.a.	5 (p.40)
	ktoe	n.a.	n.a.	- (I)
nergy crops		n.a.	n.a.	6 (p.40)
Agricultural by-products / processed residues and fishery	ktoe	11.0.		
Agricultural by-products / processed residues and fishery by-products	ktoe ktoe	n.a.	n.a.	
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others				
Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe	n.a. n.a.	n.a. n.a.	Commen
Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	ktoe ktoe	n.a. n.a. n.a.	n.a. n.a. n.a.	Commen 7 (p.40)
Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	ktoe ktoe ktoe Unit	n.a. n.a. n.a.	n.a. n.a. n.a. 2012	
Agricultural by-products / processed residues and fishery by-products Biomass from waste	ktoe ktoe ktoe Unit	n.a. n.a. n.a. 2011	n.a. n.a. n.a. 2012	
Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe Unit ktoe ktoe	n.a. n.a. n.a. 2011 15.93	n.a. n.a. n.a. 2012 16.92	7 (p.40)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	0	0	
Land used for short rotation trees	ha	0	0	
Land used for other energy crops such as grasses	ha	0	0	

Table 34: Cypriot PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0.09	0.09	9 (p.40)
Consumption - Fuel type X	ktoe	0.09	0.09	
Total production Art.21.2.biofuels	ktoe	0.09	0.09	
Total consumption Art.21.2. biofuels	ktoe	0.09	0.09	
Share of 21(2) fuels from total RES-T	%	0.53	0.5	

**Table 35:** Cypriot PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	345856	363962	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	49796	72165	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	273681	266374	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	22379	25423	

**Table 36:** Cypriot PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	-11.43	
2011	n.a.	-4.11	
2012	n.a.	-4.95	
2013	34	n.a.	
2014	46	n.a.	
2015	40	n.a.	
2016	42	n.a.	
2017	57	n.a.	
2018	34	n.a.	
2019	21	n.a.	
2020	0	n.a.	

**Table 37:** Cypriot PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Cyprus (ktoe) (see Table 9 of the NREAP)

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### **Comments for Cyprus**

- 1: Total RES share after reduction for civil aviation limit 6.51% for 2011 and 7.7% for 2012.
- 2: Table 1c in the Cypriotic Progress Report indicates that the values are percentages (%) but that is unlikely.
- 3: Table 1c in the Cypriotic Progress Report indicates for the value in 2012 that it is a percentage (%) but that is unlikely.
- 4: Wood biomass. Figure for import regards sum of EU and non-EU countries.
- 5: Figure for import regards sum of EU and non-EU countries. Data in Table 4 of the Cypriotic Progress Report provide a more detailed breakdown.
- 6: Table 4 of the Cypriotic Progress Report provides more context.
- 7: Table 4 of the Cypriotic Progress Report provides more context.
- 8: Table 4 of the Cypriotic Progress Report provides more context.
- 9: Biofuel from waste vegetable oils

### 6

### The Czech Republic

	Unit	2011	2012	Comment
Renewable heating and cooling	%	12.65	13.64	
Renewable electricity	%	10.6	11.64	
Renewable Transport	%	5.9	5.59	
Overall renewable energy share	%	10.47	11.22	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 38: Czech PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Czech Republic (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	1800	1904	
Gross final consumption of electricity from RES	ktoe	623	693	
Gross final consumption of energy from RES in transport	ktoe	307	290	
Gross total RES consumption	ktoe	2731	2888	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	2731	2888	

Table 39: Czech PR Table 1a: Calculation table for the renewable energy contribution in Czech Republic of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

Table 40: Czech PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Czech Republic for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

		20	11		
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	1050	1963	169	6.2%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	142	397	34	1.3%	
Hydropower 1 MW - 10 MW (non pumped)	155	498	43	1.6%	
Hydropower >10 MW (non pumped)	753	1069	92	3.4%	
Hydropower pumped storage	n.a. n.a.	n.a.	n.a.	n.a.	
Hydropower mixed (normalised) Geothermal	n.a. 0	n.a. 0	n.a. 0	n.a. 0.0%	
Solar	1913	2182	188	6.9%	
Solar photovoltaic	1913	2182	188	6.9%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	213	397	34	1.3%	
Onshore wind	213	397	34	1.3%	
Offshore wind	0	0	0	0.0%	
Biomass	177	2704	233	8.5%	
Solid biomass	n.a.	1775	153	5.6%	
Biogas	177	929	80	2.9%	
Bioliquids Total	n.a. <b>3353</b>	n.a. <b>7246</b>	n.a. <b>623</b>	n.a. <b>22.8</b> %	
Total CHP		1888	162		
IOTAI CHP	n.a.	1888	162	5.9%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			11	0.4%	
Biomass			1737	63.6%	
Solid biomass			n.a.	n.a.	
Biogas			n.a.	n.a.	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			52	1.9%	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps  Total			n.a. <b>1800</b>	n.a. <b>65.9</b> %	
Total district heating			79	2.9%	
Total biomass in households			1106	40.5%	
Total biomass in nousenoids			1106	40.5%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			59	2.2%	
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			241	8.8%	
Biodiesel Article 21.2			n.a.	n.a.	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			8	0.3%	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport Other biofuels			8	0.3% 0.0%	
Other biofuels Article 21.2			n.a.	0.0% n.a.	
Total			307	11.2%	

					1
		20	)12		
	Capacity		Energy		
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	1064	2129	183	6.7%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	149	391	34	1.2%	
Hydropower 1 MW - 10 MW (non pumped)	163	526	45	1.7%	
Hydropower >10 MW (non pumped)	753	1212	104	3.8%	
Hydropower pumped storage	n.a.	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	0	0	0	0.0%	
Solar	2022	2149	185	6.8%	
Solar photovoltaic	2022	2149	185	6.8%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	258	416	36	1.3%	
Onshore wind	258	416	36	1.3%	
Offshore wind	0	0	0	0.0%	
Biomass	300	3372	290	10.6%	
Solid biomass	n.a.	1904	164	6.0%	
Biogas	300	1468	126	4.6%	
Bioliquids	n.a.	n.a.	n.a.	n.a.	
Total	3644	8066	694	25.4%	
Total CHP	n.a.	2848	245	9.0%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			13	0.5%	

Table 41: Czech PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Czech Republic for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

Renewable Heating and Cooling		ktoe	%	Comment
Geothermal		0	0.0%	
Solar thermal		13	0.5%	
Biomass		1829	67.0%	
Solid biomass		1721	63.0%	
Biogas		108	4.0%	
Bioliquids		0	0.0%	
Renewable energy from heat pumps		62	2.3%	
Aerothermal heat pumps		n.a.	n.a.	
Geothermal heat pumps		n.a.	n.a.	
Hydrothermal heat pumps		n.a.	n.a.	
Total		1904	69.7%	
Total district heating		79	2.9%	
Total biomass in households		1140	41.8%	
			2/	
Renewable Transport		ktoe	%	Comment
Bioethanol / bio-ETBE		59	2.2%	
Bioethanol / bio-ETBE Article 21.2		n.a.	n.a.	
Bioethanol / bio-ETBE imported		n.a.	n.a.	
Biodiesel		221	8.1%	
Biodiesel Article 21.2		n.a.	n.a.	
Biodiesel imported		n.a.	n.a.	
Hydrogen from renewables		n.a.	n.a.	
Renewable electricity		9	0.3%	
Renewable electricity road transport		n.a.	n.a.	
Renewable electricity non-road transport		9	0.3%	
Other biofuels		0	0.0%	
Other biofuels Article 21.2		n.a.	n.a.	
Total		290	10.6%	

**Table 42:** Czech PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material			
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	1093	1133	
Indirect supply of wood biomass	ktoe	865	895	
Energy crops	ktoe	120	124	
Agricultural by-products / processed residues and fishery	ktoe	180	304	
by-products Biomass from waste	ktoe	173	178	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	2431	2634	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	174	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	0	0	
Total biomass for transport*	ktoe	174	0	
Total biomass for all sectors*	ktoe	2605	2634	
Biomass supply for heating and electricity	Pay	v material	imported	from EU
Diomass supply for fleating and electricity				
Direct supply of wood biomass from forests and other	Unit ktoe	2011 8	2012	Comment
wooded land energy generation	Kide	0	U	
Indirect supply of wood biomass	ktoe	53	78	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	61	84	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	kton	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	kton	0	0	
Others	ktoe	0	0	
Total biomass for transport*	ktoe	0	0	
Total biomass for all sectors*	ktoe	61	84	
Biomass supply for heating and electricity	Rawr	naterial im	ported fro	m non-EU
Direct supply of wood biomass from forests and other	Unit ktoe	2011	2012 4	Comment
wooded land energy generation				
Indirect supply of wood biomass	ktoe	10	8	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
by products	ktoe	n.a.	n.a.	
Biomass from waste		n.a.	n.a.	
Biomass from waste Others	ktoe			
Others	ktoe ktoe	11	12	
Others Total biomass for heating and electricity*		2011	2012	Comment
	ktoe			Comment
Others Total biomass for heating and electricity* Biomass supply for transport	ktoe Unit	2011	2012	Comment
Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	Unit kton kton ktoe	2011 n.a. 0	2012 n.a. 0	Comment
Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	Unit kton kton	2011 n.a. 0	2012 n.a. 0	Comment

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	189620	172426	1 (p.46)
Land used for short rotation trees	ha	771.91	1292.88	2 (p.46)
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 43: Czech PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	11.23	11.36	3 (p.46)
Consumption - Fuel type X	ktoe	11.23	11.36	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

Table 44: Czech PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	8319495	8766975	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	4448512	4666088	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	3402983	3624887	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	468000	476000	

Table 45: Czech PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	0	n.a.	
2012	0	n.a.	
2013	0	n.a.	
2014	n.a.	n.a.	
2015	n.a.	n.a.	
2016	n.a.	n.a.	
2017	n.a.	n.a.	
2018	n.a.	n.a.	
2019	n.a.	n.a.	
2020	n.a.	n.a.	

Table 46: Czech PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Czech Republic (ktoe) (see Table 9 of the NREAP)

### Comments for the Czech Republic

- 1: Beet and sugar beet, for 2012 also maize.
- 2: Mainly poplar, partly willow.
- 3: FAME

### Denmark

	Unit	2011	2012	Comment
Renewable heating and cooling	%	31.77	33.32	
Renewable electricity	%	35.88	38.69	
Renewable Transport	%	2.76	5.8	
Overall renewable energy share	%	23.99	25.97	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 47: Danish PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Denmark (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	2470	2571.6	
Gross final consumption of electricity from RES	ktoe	1117.9	1184.8	
Gross final consumption of energy from RES in transport	ktoe	143.2	213	
Gross total RES consumption	ktoe	3731.1	3969.4	
Transfer of RES to other Member States	ktoe	n.a.	n.a.	
Transfer of RES from other Member States and 3rd countries	ktoe	n.a.	n.a.	
RES consumption adjusted for target	ktoe	n.a.	n.a.	

Table 48: Danish PR Table 1a: Calculation table for the renewable energy contribution in Denmark of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 49: Danish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Denmark for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	9	22.1	2	0.1%	
Hydropower (non pumped)	9	22.7	2	0.1%	
Hydropower <1 MW (non pumped)	5	9.9	1	0.0%	
Hydropower 1 MW - 10 MW (non pumped)	4	12.8	1	0.0%	
Hydropower >10 MW (non pumped)	0	0	0	0.0%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	17	15	1	0.0%	
Solar photovoltaic	17	15	1	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	3952	8699.5	748	22.6%	
Onshore wind	3081	6747	580	17.5%	
Offshore wind	871	1952	168	5.1%	
Biomass	988	3426	295	8.9%	
Solid biomass	921	3077.7	265	8.0%	
Biogas	77	348.3	30	0.9%	
Bioliquids	0	0	0	0.0%	
Total	4976	12162.6	1046	31.5%	
Total CHP	988	3424.2	294	8.9%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			2	0.1%	
Solar thermal			18.8	0.6%	
Biomass			1987.2	59.9%	
Solid biomass			1941.4	58.5%	
Biogas			45.8	1.4%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			115.4	3.5%	
Aerothermal heat pumps			59.6	1.8%	
Geothermal heat pumps			55.8	1.7%	
Hydrothermal heat pumps			0	0.0%	
Total			2123.5	64.0%	
Total district heating			1185	35.7%	
Total biomass in households			856.7	25.8%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			n.a.	n.a.	1 (p.52)
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	_ (()/
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			n.a.	n.a.	2 (p.52)
Biodiesel Article 21.2			n.a.	n.a.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			13.2	0.4%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			13.2	0.4%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			147.3	4.4%	

		20	12		
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	9	22.1	2	0.1%	
Hydropower (non pumped)	9	21.5	2	0.1%	
Hydropower <1 MW (non pumped)	6	11.7	1	0.0%	
Hydropower 1 MW - 10 MW (non pumped)	3	9.8	1	0.0%	
Hydropower >10 MW (non pumped)	0	0	0	0.0%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	399	103.9	9	0.3%	
Solar photovoltaic	399	103.9	9	0.3%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	4163	9333.2	803	24.2%	
Onshore wind	3241	7270	625	18.8%	
Offshore wind	922	2062	177	5.3%	
Biomass	1236	3554	306	9.2%	
Solid biomass	1156	3175.8	273	8.2%	
	80	378.2	33	1.0%	
Biogas	0	3/8.2	0	0.0%	
Bioliquids		13013.3			
Total CHP	5807		1119 305	33.7%	
TOTAL CHP	1236	3551.5	305	9.2%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			3.4	0.1%	
Solar thermal			29.9	0.9%	
Biomass			2079.7	62.7%	
Solid biomass			2029.7	61.2%	
Biogas			50	1.5%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			116.6	3.5%	
Aerothermal heat pumps			60.7	1.8%	
Geothermal heat pumps			55.9	1.7%	
Hydrothermal heat pumps			0	0.0%	
Total			2229.7	67.2%	
Total district heating			1301	39.2%	
Total biomass in households			848.4	25.6%	
iotai biomass in nousenoids			848.4	23.6%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			n.a.	n.a.	1 (p.52)
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			n.a.	n.a.	2 (p.52)
Riodiesel Article 21 2			n a	n a	, , , , ,

Biodiesel Article 21.2

Renewable electricity

Hydrogen from renewables

Other biofuels Article 21.2

Renewable electricity road transport

Renewable electricity non-road transport

Biodiesel imported

Other biofuels

Table 50: Danish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Denmark for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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n.a.

n.a.

n.a.

18.1

0

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0.0% 0.0%

6.7%

**Table 51:** Danish PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	759	774	
Indirect supply of wood biomass	ktoe	238	274	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery	ktoe	464	418	
py-products				
Biomass from waste	ktoe	506	493	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	1967	1959	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Fotal biomass for all sectors*	ktoe	1967	1959	
Biomass supply for heating and electricity	Ray	w material	imported :	from FU
	ļ			
Direct supply of wood biomass from forests and other	Unit ktoe	2011 197	2012	Commen
wooded land energy generation	Ktoe	197	201	
Indirect supply of wood biomass	ktoe	540	568	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
py-products Biomass from waste	ktoe	na	n 2	
Others	ktoe	n.a.	n.a. n.a.	
Total biomass for heating and electricity*	ktoe	737	769	
Biomass supply for transport	Unit	2011	2012	Commen
				goe.
Common arable crops for biofuels  Energy crops and short rotation trees for biofuels	ktoe ktoe	n.a. n.a.	n.a. n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	737	769	
		701	700	
Biomass supply for heating and electricity	Rawı	material im	ported fro	m non-EU
	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other	ktoe	22	26	
wooded land energy generation ndirect supply of wood biomass	ktoe	127	189	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
py-products Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	149	215	
Biomass supply for transport	Unit	2011	2012	Commen
	ktoe			
Common arable crops for biofuels  Energy crops and short rotation trees for biofuels	ktoe	n.a. n.a.	n.a. n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
	111111111111			
Total biomass for all sectors*	ktoe	149	215	

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	70000	70000	3 (p.52)
Land used for short rotation trees	ha	4000	4000	4 (p.52)
Land used for other energy crops such as grasses	ha	50	50	5 (p.52)

Table 52: Danish PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

Table 53: Danish PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	14600000	15700000	6 (p.52)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	6900000	7300000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	7300000	7800000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	400000	600000	

**Table 54:** Danish PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	619	n.a.	
2012	939	n.a.	
2013	n.a.	n.a.	
2014	n.a.	n.a.	
2015	n.a.	n.a.	
2016	n.a.	n.a.	
2017	n.a.	n.a.	
2018	n.a.	n.a.	
2019	n.a.	n.a.	
2020	n.a.	n.a.	

**Table 55:** Danish PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Denmark (ktoe) (see Table 9 of the NREAP)

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### **Comments for Denmark**

- 1: Details cannot be given for confidentiality reasons. Total bioethanol and biodiesel in 2011 amounted to 134.1 ktoe, in 2012 203.7 ktoe.
- 2: See comment 7.
- 3: Values are approximately.
- 4: Values are approximately.
- 5: Values are maximum values.
- 6: Total estimate is a value calculated by ECN (sum of the GHG savings from RES-E/H/C/T).

## Estonia

	Unit	2011	2012	Comment
Renewable heating and cooling	%	48.4	41.4	
Renewable electricity	%	12.2	15.7	
Renewable Transport	%	0.1	0.1	
Overall renewable energy share	%	25.9	24.8	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

**Table 56:** Estonian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Estonia (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	667	655	
Gross final consumption of electricity from RES	ktoe	97	130	
Gross final consumption of energy from RES in transport	ktoe	1	1	
Gross total RES consumption	ktoe	765	789	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	765	786	1 (p.58)

Table 57: Estonian PR Table 1a: Calculation table for the renewable energy contribution in Estonia of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 58: Estonian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Estonia for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

		20	11		
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	5	13	1	0.1%	
Hydropower (non pumped)	5	13	1	0.1%	
Hydropower <1 MW (non pumped)	5	13	1	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	0	0	0	0.0%	
Hydropower >10 MW (non pumped)	0	0	0	0.0%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised) Geothermal	0	0	0	0.0%	
Solar	0	0	0	0.0%	
Solar photovoltaic	0	0	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	180	348	30	3.9%	
Onshore wind	180	348	30	3.9%	
Offshore wind	0	0	0	0.0%	
Biomass	67	781	67	8.7%	
Solid biomass	63	766	66	8.6%	
Biogas	4	15	1	0.2%	
Bioliquids	0	0	0	0.0%	
Total	252	1159	100	13.0%	
Total CHP	n.a.	454	39	5.1%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			0	0.0%	
Biomass			667	86.9%	
Solid biomass			666	86.8%	
Biogas			1	0.1%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			0	0.0%	
Aerothermal heat pumps			0	0.0% 0.0%	
Geothermal heat pumps Hydrothermal heat pumps			0	0.0%	
Total			667	86.9%	
Total district heating			302	39.3%	
Total biomass in households			365	47.6%	
iotai bioiilass ili liousellolus			303	47.0%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			0	0.0%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			0.9	0.1%	
Renewable electricity road transport			0.4	0.1%	
Renewable electricity non-road transport			0.5	0.1%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0.9	0.0%	
Total			0.9	0.1%	

Capacity   Energy   Comment						
Hydropower			20	12		
Hydropower (non pumped) Hydropower (non pumped) Hydropower (1 MW (non pumped) Hydropower 1 MW - 10 MW (non pumped) Hydropower 1 MW - 10 MW (non pumped) Hydropower 10 MW (non pumped) Hydropower > 10 MW (non pumped) Hydropower pumped storage  0 0 0 0 0.0% Hydropower mixed (normalised) Geothermal 0 0 0 0 0 0.0%  Solar 0 0 0 0 0 0.0%  Solar photovoltaic 0 0 0 0 0 0.0%  Solar photovoltaic 0 0 0 0 0 0.0%  Tidal, wave and ocean energy 0 0 0 0 0.0% Wind power 266 500 43 5.6% Onshore wind 0 0 0 0 0.0%  Wind power 266 500 43 5.6% Offshore wind 0 0 0 0 0.0%  Biogas 67 1001 86 11.2%  Solid biomass 63 985 85 11.0% Biogas 4 16 1 0.2% Bioliquids 0 0 0 0.0%  Total 341 1524 131 17.1%  Total CHP  n.a. 597 51 6.7%  Renewable Heating and Cooling  Geothermal Solar thermal 0 0.0% Solar thermal 0 0.0% Solar biomass Solar bio		Capacity		Energy		Comment
Hydropower (non pumped)   8	Renewable Electricity	MW	GWh	ktoe	%	
Hydropower < 1 MW (non pumped)		8	23	2		
Hydropower 1 MW - 10 MW (non pumped) Hydropower >10 MW (non pumped) Hydropower pumped storage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0						
Hydropower >10 MW (non pumped) Hydropower pumped storage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				_		
Hydropower pumped storage						
Hydropower mixed (normalised)						
Geothermal   0	, , , , , ,		-			
Solar         0         0         0         0.0%           Solar photovoltaic         0         0         0         0.0%           Concentrated solar power         0         0         0         0.0%           Tidal, wave and ocean energy         0         0         0         0.0%           Wind power         266         500         43         5.6%           Onshore wind         0         0         0         0.0%           Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Biogas         4         16         1         0.2%           Bioliquids         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         0.0%           Biomass         655         85.3%           Solid biomass         655         85.3%           Solid biomass         654			,			
Solar photovoltaic         0         0         0.0%           Concentrated solar power         0         0         0.0%           Tidal, wave and ocean energy         0         0         0.0%           Wind power         266         500         43         5.6%           Onshore wind         0         0         0         0.0%           Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Biogas         4         16         1         0.2%           Bioliquids         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         0.0%           Solid biomass         655         85.3%           Solid biomass         654         85.2%           Biogas         1         0.1%           Bioliquids         0         0.0%           Renewable energy from heat pumps <t< td=""><td></td><td></td><td>-</td><td></td><td></td><td></td></t<>			-			
Concentrated solar power         0         0         0         0.0%           Tidal, wave and ocean energy         0         0         0.0%           Wind power         266         500         43         5.6%           Onshore wind         0         0         0         0.0%           Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Biogas         4         16         1         0.2%           Bioliquids         0         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         Solar thermal         0         0.0%           Solid biomass         655         85.3%         Solid biomass         654         85.2%           Biogas         1         0.1%         Solid biomass         654         85.2%           Bioliquids         0         0.0%         O.0%         O.0%	Solar			0		
Tidal, wave and ocean energy         0         0         0.0%           Wind power         266         500         43         5.6%           Onshore wind         266         500         43         5.6%           Offshore wind         0         0         0         0.0%           Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Biogas         4         16         1         0.2%           Bioliquids         0         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         655         85.3%           Solid biomass         655         85.3%         654         85.2%           Biogas         1         0.1%         655         85.3%           Solid biomass         654         85.2%         654         85.2%         654         85.2%           Biogas         <	·					
Wind power         266         500         43         5.6%           Onshore wind         266         500         43         5.6%           Offshore wind         0         0         0         0.0%           Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Bioliquids         0         0         0         0.0%           Bioliquids         0         0         0         0.0%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         0.0%           Solar thermal         0         0.0%         0.0%           Biomass         655         85.3%         0.0%           Solid biomass         654         85.2%         0.0%           Biogas         1         0.1%         0.0%           Renewable energy from heat pumps         0         0.0%           Renewable energy from heat pumps         0         0.0%           Geothermal heat pumps         0         0.0%	Concentrated solar power					
Onshore wind         266         500         43         5.6%           Offshore wind         0         0         0         0.0%           Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Biogas         4         16         1         0.2%           Bioliquids         0         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         0.0%           Solar thermal         0         0.0%         0.0%           Biomass         655         85.3%         50ld biomass         655         85.3%           Solid biomass         654         85.2%         85.2%         654         85.2%           Bioliquids         0         0.0%         0.0%         0.0%         0.0%           Renewable energy from heat pumps         0         0.0%         0.0%         0.0%         0.0%						
Offshore wind         0         0         0.0%           Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Biogas         4         16         1         0.2%           Bioliquids         0         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%           Solar thermal         0         0.0%           Biomass         655         85.3%           Solid biomass         655         85.3%           Solid biomass         654         85.2%           Biogas         1         0.1%           Bioliquids         0         0.0%           Renewable energy from heat pumps         0         0.0%           Aerothermal heat pumps         0         0.0%           Hydrothermal heat pumps         0         0.0%           Hydrothermal heat pumps         0         0.0%	·					
Biomass         67         1001         86         11.2%           Solid biomass         63         985         85         11.0%           Biogas         4         16         1         0.2%           Bioliquids         0         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%           Solar thermal         0         0.0%           Biomass         655         85.3%           Solid biomass         654         85.2%           Biogas         1         0.1%           Bioliquids         0         0.0%           Renewable energy from heat pumps         0         0.0%           Renewable energy from heat pumps         0         0.0%           Geothermal heat pumps         0         0.0%           Hydrothermal heat pumps         0         0.0%           Total         655         85.3%           Total district heating         268         34.9% <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
Solid biomass       63       985       85       11.0%         Biogas       4       16       1       0.2%         Bioliquids       0       0       0       0.0%         Total       341       1524       131       17.1%         Total CHP       n.a.       597       51       6.7%         Renewable Heating and Cooling       ktoe       %       Comment         Geothermal       0       0.0%         Solar thermal       0       0.0%         Biomass       655       85.3%         Solid biomass       654       85.2%         Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Renewable energy from heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%	Offshore wind		0	0	0.071	
Biogas       4       16       1       0.2%         Bioliquids       0       0       0       0.0%         Total       341       1524       131       17.1%         Total CHP       n.a.       597       51       6.7%         Renewable Heating and Cooling       ktoe       %       Comment         Geothermal       0       0.0%         Solar thermal       0       0.0%         Biomass       655       85.3%         Solid biomass       654       85.2%         Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%		67	1001	86	11.2%	
Bioliquids         0         0         0.0%           Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%           Solar thermal         0         0.0%           Biomass         655         85.3%           Solid biomass         654         85.2%           Biogas         1         0.1%           Bioliquids         0         0.0%           Renewable energy from heat pumps         0         0.0%           Aerothermal heat pumps         0         0.0%           Geothermal heat pumps         0         0.0%           Hydrothermal heat pumps         0         0.0%           Total         655         85.3%           Total district heating         268         34.9%	Solid biomass	63	985	85	11.0%	
Total         341         1524         131         17.1%           Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         0.0%           Solar thermal         0         0.0%         55.3%         5.2%           Biomass         655         85.3%         5.2%	Biogas	4	16	1	0.2%	
Total CHP         n.a.         597         51         6.7%           Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         0.0%           Solar thermal         0         0.0%         0.0%           Biomass         655         85.3%         50ld biomass         654         85.2%         655         85.3%         654         85.2%         655         85.3%         655         85.3%         655         85.2%         655         85.2%         655         85.2%         655         85.2%         655         85.2%         655         85.2%         655         85.2%         655         85.2%         655         85.2%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3%         655         85.3% <td>Bioliquids</td> <td>0</td> <td>0</td> <td>0</td> <td>0.0%</td> <td></td>	Bioliquids	0	0	0	0.0%	
Renewable Heating and Cooling         ktoe         %         Comment           Geothermal         0         0.0%         0.0%           Solar thermal         0         0.0%         0.0%           Biomass         655         85.3%         5.2%         0.0%	Total	341	1524	131	17.1%	
Geothermal       0       0.0%         Solar thermal       0       0.0%         Biomass       655       85.3%         Solid biomass       654       85.2%         Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%	Total CHP	n.a.	597	51	6.7%	
Solar thermal       0       0.0%         Biomass       655       85.3%         Solid biomass       654       85.2%         Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%	<b>R</b> enewable Heating and Cooling			ktoe	%	Comment
Solar thermal       0       0.0%         Biomass       655       85.3%         Solid biomass       654       85.2%         Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%	Geothermal			0	0.0%	
Solid biomass       654       85.2%         Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%						
Solid biomass       654       85.2%         Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%						
Biogas       1       0.1%         Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%						
Bioliquids       0       0.0%         Renewable energy from heat pumps       0       0.0%         Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%						
Renewable energy from heat pumps         0         0.0%           Aerothermal heat pumps         0         0.0%           Geothermal heat pumps         0         0.0%           Hydrothermal heat pumps         0         0.0%           Total         655         85.3%           Total district heating         268         34.9%				_		
Aerothermal heat pumps       0       0.0%         Geothermal heat pumps       0       0.0%         Hydrothermal heat pumps       0       0.0%         Total       655       85.3%         Total district heating       268       34.9%	•					
Geothermal heat pumps         0         0.0%           Hydrothermal heat pumps         0         0.0%           Total         655         85.3%           Total district heating         268         34.9%						
Hydrothermal heat pumps   0   0.0%	· · ·					
Total         655         85.3%           Total district heating         268         34.9%	• •					
Total district heating 268 34.9%						
3 2 2 2						
	Total biomass in households			387	50.4%	

Table 59: Estonian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Estonia for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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Total Bioliuss III Householus		307	301170	
<b>R</b> enewable Transport		ktoe	%	Comment
Bioethanol / bio-ETBE		0	0.0%	
Bioethanol / bio-ETBE Article 21.2		0	0.0%	
Bioethanol / bio-ETBE imported		0	0.0%	
Biodiesel		0	0.0%	
Biodiesel Article 21.2		0	0.0%	
Biodiesel imported		0	0.0%	
Hydrogen from renewables		0	0.0%	
Renewable electricity		0.9	0.1%	
Renewable electricity road transport		0.4	0.1%	
Renewable electricity non-road transport		0.5	0.1%	
Other biofuels		0	0.0%	
Other biofuels Article 21.2		0	0.0%	
Total		0.9	0.1%	

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**Table 60:** Estonian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	652	601	2 (p.58)
Indirect supply of wood biomass	ktoe	318	273	3 (p.58)
Energy crops	ktoe	n.a.	n.a.	4 (p.58)
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	5 (p.58)
Biomass from waste	ktoe	n.a.	n.a.	6 (p.58)
Others	ktoe	n.a.	n.a.	7 (p.58)
Total biomass for heating and electricity*	ktoe	970	874	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	8 (p.58)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	9 (p.58)
Others	ktoe	n.a.	n.a.	10 (p.58)
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	970	874	
Biomass supply for heating and electricity	Ray	v material	imported t	from FII
biomass supply for meaning and electricity	<b>├</b>			
Direct cumply of wood biomacs from forests and other	Unit ktoe	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	Ktoe	n.a.	n.a.	2 (p.58)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	3 (p.58)
Energy crops	ktoe	n.a.	n.a.	4 (p.58)
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	5 (p.58)
by-products				., ,
Biomass from waste	ktoe	n.a.	n.a.	6 (p.58)
Others	ktoe	n.a.	n.a.	7 (p.58)
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	8 (p.58)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	9 (p.58)
Others	ktoe	n.a.	n.a.	10 (p.58)
Total biomass for transport*	ktoe		n.a.	
- Total Storica Control Contro	Kibe	n.a.	II.a.	
Total biomass for all sectors*	ktoe	0	0	
Total biomass for all sectors*	ktoe	0	0	
	ktoe	0 material im	0	m non-EU
Total biomass for all sectors*	ktoe	0	0	m non-EU Comment
Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other	ktoe Raw r	0 material im	0 ported fro	
Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation	Raw r Unit ktoe	0 material im 2011 n.a.	ported fro 2012 n.a.	Comment 2 (p.58)
Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass	Raw r Unit ktoe ktoe	naterial im 2011 n.a. n.a.	ported fro 2012 n.a. n.a.	Comment 2 (p.58) 3 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops	Raw r Unit ktoe ktoe ktoe	naterial im 2011 n.a. n.a.	ported fro 2012 n.a. n.a. n.a.	Comment 2 (p.58) 3 (p.58) 4 (p.58)
Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	Raw r Unit ktoe ktoe	naterial im 2011 n.a. n.a.	ported fro 2012 n.a. n.a.	Comment 2 (p.58) 3 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops	Raw r Unit ktoe ktoe ktoe	naterial im 2011 n.a. n.a.	ported fro 2012 n.a. n.a. n.a.	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58)
Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products	Raw r Unit ktoe ktoe ktoe ktoe	naterial im 2011 n.a. n.a. n.a. n.a.	ported fro 2012 n.a. n.a. n.a. n.a.	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58) 6 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	Raw r Unit ktoe ktoe ktoe ktoe ktoe	naterial im 2011 n.a. n.a. n.a. n.a. n.a.	ported fro 2012 n.a. n.a. n.a. n.a.	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	Raw r Unit ktoe ktoe ktoe ktoe ktoe ktoe	naterial im 2011 n.a. n.a. n.a. n.a. n.a.	0  ported fro  2012  n.a.  n.a.  n.a.  n.a.  n.a.	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58) 6 (p.58) 7 (p.58)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	Raw I Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	naterial im 2011 n.a. n.a. n.a. n.a. n.a. n.a.	0  ported fro 2012 n.a. n.a. n.a. n.a. n.a. n.a.	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58) 6 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport	Raw r Unit ktoe ktoe ktoe ktoe ktoe unit	0 material im	0 ported fro 2012 n.a. n.a. n.a. n.a. n.a. 2012	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58) 6 (p.58) 7 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport Common arable crops for biofuels	Raw r Unit ktoe ktoe ktoe ktoe ktoe unit ktoe	0 material im	0 ported fro 2012 n.a. n.a. n.a. n.a. 2012 n.a.	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58) 6 (p.58) 7 (p.58) Comment 8 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels	Raw r Unit ktoe ktoe ktoe ktoe unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	naterial im 2011 n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.	0 ported fro 2012 n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58) 6 (p.58) 7 (p.58)  Comment 8 (p.58) 9 (p.58)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	Raw I Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	naterial im 2011 n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.	0 ported fro 2012 n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a	Comment 2 (p.58) 3 (p.58) 4 (p.58) 5 (p.58) 6 (p.58) 7 (p.58)  Comment 8 (p.58) 9 (p.58)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	n.a.	n.a.	
Land used for short rotation trees	ha	n.a.	n.a.	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 61: Estonian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

**Table 62:** Estonian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	n.a.	n.a.	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	n.a.	n.a.	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	n.a.	n.a.	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	n.a.	n.a.	

**Table 63:** Estonian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	0	
2011	29	0	
2012	89	0	
2013	95	0	
2014	100	0	
2015	110	0	
2016	110	0	
2017	125	0	
2018	135	0	
2019	135	0	
2020	140	0	

**Table 64:** Estonian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Estonia (ktoe) (see Table 9 of the NREAP)

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#### Comments for Estonia

- 1: Table 1a from the Estonian Progress Report also spcifies gross final energy consumption 3049 ktoe in 2009 and 3215 ktoe in 2010.
- 2: The methodology of the underlying survey for preparing this report and of collection of data by the Statistics Estonia has changed, in particular with regard to timber, and therefore these data may be subject to changes in the future. At the moment, post-checking is carried out against available data, and the Commission will be notified of the updated data as soon as possible.
- 3: See comment 8.
- 4: See comment 8.
- 5: See comment 8.
- 6: See comment 8.
- 7: See comment 8.
- 8: According to the information available to the Ministry of Economic Affairs and Communications, no biofuels for transport are produced in Estonia.
- 9: See comment 8.
- 10: See comment 8.

## **9** Finland

	Unit	2011	2012	Comment
Renewable heating and cooling	%	45.9	48.2	
Renewable electricity	%	29.4	29.5	
Renewable Transport	%	6.4	7.9	
Overall renewable energy share	%	33.5	35.1	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 65: Finnish PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Finland (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	6325	6808	
Gross final consumption of electricity from RES	ktoe	2188	2209	1 (p.64)
Gross final consumption of energy from RES in transport	ktoe	213	216	
Gross total RES consumption	ktoe	8726	9234	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	8726	9234	

Table 66: Finnish PR Table 1a: Calculation table for the renewable energy contribution in Finland of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 67: Finnish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Finland for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

		20	11		
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	3196	14020	1206	14.0%	
Hydropower (non pumped)	3196	12008	1033	12.0%	
Hydropower <1 MW (non pumped)	32	110	9	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	283	843	72	0.8%	
Hydropower >10 MW (non pumped)	2881	11055	951	11.0%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised) Geothermal	0	0	0	0.0%	
Solar	8	5	0	0.0%	
Solar photovoltaic	8	5	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	199	402	35	0.4%	
Onshore wind	197	n.a.	n.a.	n.a.	
Offshore wind	2	n.a.	n.a.	n.a.	
Biomass	1910	10953	942	10.9%	
Solid biomass	1910	10819	930	10.8%	
Biogas	0	134	12	0.1%	
Bioliquids	0	0	0	0.0%	
Total	5313	25380	2182	25.3%	
Total CHP	n.a.	9068	780	9.0%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			1	0.0%	
Biomass			5962	69.0%	
Solid biomass			5904	68.4%	
Biogas			28	0.3%	
Bioliquids			30	0.3%	
Renewable energy from heat pumps			276	3.2%	
Aerothermal heat pumps Geothermal heat pumps			190 86	2.2% 1.0%	
Hydrothermal heat pumps			0	0.0%	
Total			6240	72.3%	
Total district heating			630	7.3%	
Total biomass in households			1217	14.1%	
iotai bioinass in nousenoius			1217	14.170	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			88	1.0%	
Bioethanol / bio-ETBE Article 21.2			0.5	0.0%	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			108	1.3%	
Biodiesel Article 21.2			51.5	0.6%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			0	0.0%	
Renewable electricity			17	0.2%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			17	0.2%	24.60
Other biofuels			0.1	0.0%	2 (p.64)
Other biofuels Article 21.2  Total			n.a. <b>213</b>	n.a. <b>2.5%</b>	
Iotal			213	2.3/0	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	3198	14241	1225	14.2%	
Hydropower (non pumped)	3198	13139	1130	13.1%	
Hydropower <1 MW (non pumped)	32	131	11	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	283	937	81	0.9%	
Hydropower >10 MW (non pumped)	2883	12071	1038	12.0%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	8	5	0	0.0%	
Solar photovoltaic	8	5	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	257	474	41	0.5%	
Onshore wind	255	n.a.	n.a.	n.a.	
Offshore wind	2	n.a.	n.a.	n.a.	
Biomass	1956	10846	933	10.8%	
Solid biomass	1956	10706	921	10.7%	
Biogas	0	140	12	0.1%	
Bioliquids	0	0	0	0.0%	
Total	5419	25566	2198	25.5%	
Total CHP	n.a.	9568	823	9.5%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			1	0.0%	
Biomass			6365	73.7%	
Solid biomass			6316	73.1%	
Biogas			37	0.4%	
Bioliquids			12	0.1%	
Renewable energy from heat pumps			315	3.6%	
Aerothermal heat pumps			212	2.5%	
Geothermal heat pumps			103	1.2%	
Hydrothermal heat pumps			0	0.0%	
Total			6681	77.4%	
Total district heating			759	8.8%	
Total biomass in households			1330	15.4%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			90	1.0%	
Bioethanol / bio-ETBE Article 21.2			10	0.1%	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			108	1.3%	
Diodiesei			100	1.3%	

Biodiesel Article 21.2

Renewable electricity

Hydrogen from renewables

Other biofuels Article 21.2

Renewable electricity road transport

Renewable electricity non-road transport

Biodiesel imported

Other biofuels

Table 68: Finnish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Finland for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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95

0

0

18

0.3

n.a.

n.a.

1.1%

n.a. 0.0%

0.2%

0.0%

0.2%

0.0%

n.a. **2.5**% 2 (p.64)

**Table 69:** Finnish PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass   T1   213773   217446   4 (p.64)	Biomass supply for heating and electricity	Domestic raw material			rial
wooded land energy generation indirect supply of wood biomass Energy crops  Biomass from waste		Unit	2011	2012	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others I close the stop of transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others I close the stop of the stop	• • •	TJ	102518	114861	3 (p.64)
Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Total biomass for heating and electricity*  Biomass for heating and electricity*  Itioe  Total biomass for heating and electricity*  Biomass for heating and electricity*  Itioe  Total biomass for heating and electricity*  Itioe  Biomass for transport*  Itioe  Total biomass for all sectors*  Itioe  Itio	Indirect supply of wood biomass	ΤJ	213773	217446	4 (p.64)
by-products   ktoe   n.a.   n.a.		ktoe	n.a.	n.a.	
Others  Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels  Biomass supply for heating and electricity  Biomass supply for heating and electricity  Raw material imported from EU  Unit 2011 2012 Comment  ktoe n.a. n.a.  In.a.  In.a.  In.a.  In.a.  In.a.  In.a.  In.a.  In.a.  Unit 2011 2012 Comment  In.a.  In		ktoe	n.a.	n.a.	
Rote   16791   332307     Rote   2011   2012   Comment   Common arable crops for biofuels   Rote					
Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others  Rotal biomass for transport*  Rice  Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass for biofuels Biomass from waste  Others  Total biomass for all sectors*  Raw material imported from EU  Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass  Tj 25 174 4 (p.64) Rtoe n.a. n.a. Rtoe			-		
Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others Itation and a common arable crops for biofuels Others Itation and a common arable crops for biofuels Others Itation and a common arable crops for biofuels Others Itation and a common arable crops for biofuels Itation and supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass Itation and electricity Itation and itatio	lotal biomass for heating and electricity.	ктое			
Energy crops and short rotation trees for biofuels ktoe n.a. n.a. n.a. total biomass for transport*    Raw material imported from EU					Comment
Total biomass for Inasport*   Ktoe   n.a.   n.a.	·				
Total biomass for transport*  Itotal biomass for all sectors*  Itotal biomass supply for heating and electricity  Biomass supply of wood biomass from forests and other wooded land energy generation lindirect supply of wood biomass from forests and fishery by-products from supply for heating and electricity*  Itotal biomass for all sectors*  Itotal biomass for heating and electricity  Itotal biomass for all sectors*  Itotal biomass for heating and electricity  Itotal biomass for all sectors*  Itotal biomass for all sectors tendence wooded land energy generation lindirect supply of wood biomass from forests and other wooded land energy generation lindirect supply of wood biomass for feets and fishery by-products  Itotal biomass for mass for mass for heating and electricity  Itotal biomass for mass for heating and electricity*  Itotal biomass for heating					
Biomass supply for heating and electricity    Raw material imported from EU			_	-	
Biomass supply for heating and electricity    Raw material imported from EU					
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  TJ 25 174 4 (p.64)  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Biomass for all sectors*  Biomass supply for wood biomass from forests and other wooded land energy generation  Indirect supply of wood biomass from forests and other wooded land energy generation  Indirect supply of wood biomass  Energy crops  Biomass supply for heating and electricity  Raw material imported from non-EU  Direct supply of wood biomass from forests and other wooded land energy generation  Indirect supply of wood biomass  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass for waste  Others  It 2011 2012 Comment  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  Energy crops  Ktoe n.a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  It 218 305 4 (p.64)  Energy crops  Ktoe n.a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  It 2011 2012 Comment  Unit 2	Total biomass for all sectors*	ktoe	316291	332307	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  TJ 25 174 4 (p.64)  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Biomass for all sectors*  Biomass supply for wood biomass from forests and other wooded land energy generation  Indirect supply of wood biomass from forests and other wooded land energy generation  Indirect supply of wood biomass  Energy crops  Biomass supply for heating and electricity  Raw material imported from non-EU  Direct supply of wood biomass from forests and other wooded land energy generation  Indirect supply of wood biomass  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass for waste  Others  It 2011 2012 Comment  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  Energy crops  Ktoe n.a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  It 218 305 4 (p.64)  Energy crops  Ktoe n.a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  It 2011 2012 Comment  Unit 2	Riomass sunnly for heating and electricity	Ray	w material	imported f	rom FII
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  TJ 25 174 4 (p.64)  Ktoe n.a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Biomass for all sectors*  Ktoe n.a. n.a.  Energy crops and short rotation and electricity  Raw material imported from non-EU  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass for transport*  Raw material imported from non-EU  Direct supply of wood biomass  TJ 218 305 4 (p.64)  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass for waste  Others  In a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass for heating and electricity*  Raw naterial imported from non-EU  TJ 269 359 3 (p.64)  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  In a. n.a.  It we de n.a. n.a.  It was n.a.  It we de n.a. n.a.  It was n.a.	Signal Supply for heating and electricity				
wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels  Biomass supply for heating and electricity  Raw material imported from non-EU  Unit 2011 2012 Comment  Raw material imported from non-EU  Unit 2011 2012 Comment  Raw material imported from non-EU  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Common arable crops for biofuels  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 218 305 4 (p.64)  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 218 305 4 (p.64)  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 218 305 4 (p.64)  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 218 305 4 (p.64)  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  Energy crops  TJ 218 305 4 (p.64)  Energy crops Raw material imported from non-EU  Unit 2011 2012 Comment  Energy crops  TJ 218 305 4 (p.64)  Energy crops and short rotation trees for biofuels Energy crops and short	Direct cumply of wood biomass from forests and other				
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Biomass from waste Others  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Biomass for all sectors*  Raw material imported from non-EU  Biomass supply for heating and electricity  Raw material imported from non-EU  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Tj 218 305 4 (p.64) Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Total biomass for transport  Unit 2011 2012 Comment Tj 269 359 3 (p.64)  Energy crops  Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Total biomass from transport  Unit 2011 2012 Comment Tj 269 359 3 (p.64)  Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Tj 218 305 4 (p.64)  Energy crops and short rotation trees for biofuels Energy crops and short rotation trees for b		IJ	361	330	3 (p.64)
Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Biomass for heating and electricity*  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others  Rivoe  Total biomass for transport*  Raw material imported from non-EU  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Energy crops Biomass for waste  Direct supply of wood biomass Energy crops and short rotation trees for biofuels Energy crops and short rotation trees for bi		TJ	25	174	4 (p.64)
by-products Biomass from waste Others Itoe Others Richard Street R	Energy crops	ktoe	n.a.	n.a.	
Biomass from waste	Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
Others       ktoe       0       0         Total biomass for heating and electricity*       ktoe       386       504         Biomass supply for transport       Unit       2011       2012       Comment         Common arable crops for biofuels       ktoe       n.a.       n.a.         Others       ktoe       n.a.       n.a.         Total biomass for transport*       ktoe       n.a.       n.a.         Total biomass for all sectors*       ktoe       386       504         Biomass supply for heating and electricity       Raw material imported from non-EU         Unit       2011       2012       Comment         Direct supply of wood biomass from forests and other       TJ       269       359       3 (p.64)         Wooded land energy generation       TJ       218       305       4 (p.64)         Energy crops       ktoe       n.a.       n.a.       n.a.         Agricultural by-products / processed residues and fishery       ktoe       n.a.       n.a.         by-products       ktoe       n.a.       n.a.       n.a.         Others       ktoe       n.a.       n.a.       common anable crops for biofuels         Biomass supply for transport       ktoe       n.a. <td>· ·</td> <td></td> <td></td> <td></td> <td></td>	· ·				
Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others  Total biomass for transport*  Raw material imported from non-EU  Biomass supply for heating and electricity  Raw material imported from non-EU  Unit 2011 2012 Comment  Total biomass for all sectors*  Raw material imported from non-EU  Unit 2011 2012 Comment  Total biomass from delectricity  Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  Energy crops Indirect supply of wood biomass TJ 218 305 4 (p.64) Energy crops Raicultural by-products / processed residues and fishery by-products Biomass from waste Others  Rote n.a. n.a.  Italian n.a.  Ital					
Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Cothers  Total biomass for all sectors*  Biomass supply for heating and electricity  Biomass supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Ktoe  Total biomass for heating and electricity*  Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  TJ 218 305 4 (p.64)  Energy crops  ktoe n.a. n.a.  Ray material imported from non-EU  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  TJ 218 305 4 (p.64)  Energy crops  ktoe n.a. n.a.  Ray material imported from non-EU  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  TJ 218 305 4 (p.64)  Energy crops  ktoe n.a. n.a.  Total biomass for heating and electricity*  Unit 2011 2012 Comment  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Energy	5 11.0.0		-		
Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others  Total biomass for transport*  Raw material imported from non-EU  Biomass supply for heating and electricity  Raw material imported from non-EU  Unit 2011 2012 Comment  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Ktoe n.a. n.a.  Others  ktoe n.a. n.a.  Others  ktoe 0 0  Total biomass for heating and electricity*  ktoe 487 664  Biomass supply for transport  Unit 2011 2012 Comment  Line 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2					
Energy crops and short rotation trees for biofuels Others  Total biomass for transport*  Raw material imported from non-EU  Biomass supply for heating and electricity  Raw material imported from non-EU  Unit 2011 2012 Comment  TJ 269 359 3 (p.64)  White n.a. n.a.  Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Common arable crops for transport*  Line in a. n.a.	Biomass supply for transport	Unit	2011	2012	Comment
Others ktoe n.a. n.a.  Total biomass for transport* ktoe n.a. n.a.  Total biomass for all sectors* ktoe 386 504  Biomass supply for heating and electricity Raw material imported from non-EU  Unit 2011 2012 Comment  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass TJ 218 305 4 (p.64)  Energy crops ktoe n.a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass from waste ktoe n.a. n.a.  Others ktoe 0 0  Total biomass for heating and electricity* ktoe 487 664  Biomass supply for transport Unit 2011 2012 Comment  Common arable crops for biofuels ktoe n.a. n.a.  Energy crops and short rotation trees for biofuels ktoe n.a. n.a.  Total biomass for transport* ktoe n.a. n.a.  Total biomass for transport*	·				
Total biomass for transport*  Raw material imported from non-EU  Unit 2011 2012 Comment  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops	5, 1			-	
Raw material imported from non-EU			_	_	
Biomass supply for heating and electricity    Raw material imported from non-EU					
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops ktoe n.a. n.a.  Agricultural by-products / processed residues and fishery by-products  Biomass from waste ktoe n.a. n.a.  Others ktoe 0 0  Total biomass for heating and electricity* ktoe 487 664  Biomass supply for transport Unit 2011 2012 Comment  Common arable crops for biofuels ktoe n.a. n.a.  Energy crops and short rotation trees for biofuels ktoe n.a. n.a.  Others ktoe n.a. n.a.  Total biomass for transport* ktoe n.a. n.a.	Total biomass for all sectors*	ktoe	386	504	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  Total biomass for heating and electricity*  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Cothers  Coth	Riomass supply for heating and electricity	Rawı	material im	ported fro	m non-FU
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Riomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others  Ktoe  Direct supply of wood biomass from forests and other  TJ  269 359 3 (p.64)  Riomass 4 (p.64)  Energy crops Rioe  n.a. n.a.  N.a.  Unit  218 305 4 (p.64)  Rioe  n.a. n.a.  Potal biomass from waste  Unit  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Rioe Rioe Rioe Rioe Rioe Rioe Rioe Rioe					
wooded land energy generation Indirect supply of wood biomass  Energy crops  Agricultural by-products / processed residues and fishery by-products Biomass from waste  Others  Ktoe  TJ  218  305  4 (p.64)  In.a.  n.a.  n.a.  N.a.  N.a.  Vivia in the products of transport  Whith in the products of transport  Whith in the product of the processed residues and fishery by-products  Recommon asset of transport  Whith in the product of the prod	Direct supply of wood highest from forests and other				
Indirect supply of wood biomass  Energy crops  Agricultural by-products / processed residues and fishery by-products  Biomass from waste  Others  TJ  218  305  4 (p.64)  Rice  n.a.  n.a.  n.a.  N.a.  Cothers  ktoe  0  0  Total biomass for heating and electricity*  ktoe  Unit  2011  2012  Comment  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Cothers  ktoe  n.a.  n.a.  Total biomass for transport*  ktoe  n.a.  n.a.  Total biomass for transport*  ktoe  n.a.  n.a.  N.a.		.,	203	333	3 (p.01)
Agricultural by-products / processed residues and fishery by-products Biomass from waste		TJ	218	305	4 (p.64)
by-products Biomass from waste Others Ktoe Others Common arable crops for biofuels Energy crops and short rotation trees for biofuels Cothers Ktoe N.a. N.a. Cothers Cothers Ktoe N.a. N.a. Cothers Cother	Energy crops	ktoe	n.a.	n.a.	
Biomass from waste		ktoe	n.a.	n.a.	
Total biomass for heating and electricity*  Biomass supply for transport  Unit  2011  2012  Comment  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Others  ktoe  n.a.  n.a.  Total biomass for transport*  ktoe  n.a.  n.a.  n.a.	, ·	ktoe	n.a.	n.a.	
Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Others  Ktoe  n.a.  n.a.  N.a.  Total biomass for transport*  ktoe  n.a.  n.a.  N.a.	Others	ktoe	0	0	
Common arable crops for biofuels ktoe n.a. n.a.  Energy crops and short rotation trees for biofuels ktoe n.a. n.a.  Others ktoe n.a. n.a.  Total biomass for transport* ktoe n.a. n.a.	Total biomass for heating and electricity*	ktoe	487	664	
Energy crops and short rotation trees for biofuels ktoe n.a. n.a.  Others ktoe n.a. n.a.  Total biomass for transport* ktoe n.a. n.a.	Biomass supply for transport	Unit	2011	2012	Comment
Others ktoe n.a. n.a.  Total biomass for transport* ktoe n.a. n.a.	Common arable crops for biofuels	ktoe	n.a.	n.a.	
Total biomass for transport* ktoe n.a. n.a.	Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
			n.a.	n.a.	
Total biomass for all sectors* ktoe 487 664	Total biomass for transport*	ktoe	n.a.	n.a.	
*The values indicated with '*' are calculated values and have not been mentioned in the Progress Penerts	Total biomass for all sectors*	ktoe			

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	n.a.	n.a.	
Land used for short rotation trees	ha	40	36	
Land used for other energy crops such as grasses	ha	14949	10444	

Table 70: Finnish PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	5 (p.64)
Consumption - Fuel type X	ktoe	52	105	6 (p.64)
Total production Art.21.2.biofuels	ktoe	n.a.	n.a.	
Total consumption Art.21.2. biofuels	ktoe	52	105	
Share of 21(2) fuels from total RES-T	%	24	49	

**Table 71:** Finnish PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	39300000	41000000	7 (p.64)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	16600000	16500000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	22300000	24000000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	400000	500000	

**Table 72:** Finnish PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	0	
2011	0	0	
2012	0	0	
2013	0	0	
2014	0	0	
2015	0	0	
2016	0	0	
2017	0	0	
2018	0	0	
2019	0	0	
2020	0	0	

**Table 73:** Finnish PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Finland (ktoe) (see Table 9 of the NREAP)

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#### Comments for Finland

- 1: Electricity consumption by transport is not included in the figures.
- 2: Refers to biogas.
- 3: The data were reported under 'amount' in energy units. They are now reported under 'Primary energy production' in TJ.
- 4: The data were reported under 'amount' in energy units. They are now reported under 'Primary energy production' in TJ.
- 5: No statistics are available on the production of biofuels.
- 6: Diesel component (HVO, FAME): 51.5 ktoe in 2011 and 95 ktoe in 2012. Petrol component (Ethanol, ethers, biopetrol): 0.5 ktoe in 2011 and 10 ktoe in 2012.
- 7: Total estimate is a value calculated by ECN (sum of the GHG savings from RES-E/H/C/T).

# **10**France

	Unit	2011	2012	Comment
Renewable heating and cooling	%	15.8	17.2	
Renewable electricity	%	16.4	16.7	
Renewable Transport	%	6.9	7.1	
Overall renewable energy share	%	12.7	13.7	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 74: French PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in France (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	10173	11763	
Gross final consumption of electricity from RES	ktoe	7200	7541	
Gross final consumption of energy from RES in transport	ktoe	2981	3053	
Gross total RES consumption	ktoe	19800	22021	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	19800	22021	

Table 75: French PR Table 1a: Calculation table for the renewable energy contribution in France of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 76: French PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in France for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	25617	68369	5879	28.2%	
Hydropower (non pumped)	18632	59958	5155	24.7%	1 (p.70)
Hydropower <1 MW (non pumped)	435	1542	133	0.6%	
Hydropower 1 MW - 10 MW (non pumped)	1610	5722	492	2.4%	
Hydropower >10 MW (non pumped)	16587	52723	4533	21.8%	
Hydropower pumped storage	1808	5018	431	2.1%	
Hydropower mixed (normalised)	5177	3393	292	1.4%	2 (p.70)
Geothermal	16	56	5	0.0%	
Solar	2942	2358	203	1.0%	
Solar photovoltaic	2942	2358	203	1.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	240	477	41	0.2%	
Wind power	6808	12531	1077	5.2%	
Onshore wind	6808	12531	1077	5.2%	
Offshore wind	0	0	0	0.0%	
Biomass	993	5513	474	2.3%	- 1
Solid biomass	787	4306	370	1.8%	3 (p.70)
Biogas	208	1207	104	0.5%	4 (p.70)
Bioliquids	0	0	0	0.0%	- ()
Total	36616	89304	7679	36.9%	5 (p.70)
Total CHP	592	2950	254	1.2%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			89	0.4%	
Solar thermal			121	0.4%	
Biomass			9017	43.3%	
Solid biomass			8881	42.6%	
Biogas			136	0.7%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			945	4.5%	6 (p.70)
Aerothermal heat pumps			819	3.9%	
Geothermal heat pumps			126	0.6%	7 (p.70)
Hydrothermal heat pumps			0	0.0%	8 (p.70)
Total			10173	48.8%	
Total district heating			480	2.3%	
Total biomass in households			6180	29.7%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			392	1.9%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			84	0.4%	
Biodiesel			2393	11.5%	
Biodiesel Article 21.2			358	1.7%	
Biodiesel imported			444	2.1%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			196	0.9%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			196	0.9%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			2981	14.3%	9 (p.70)

	2012					
	Capacity		Energy		Comment	
Renewable Electricity	MW	GWh	ktoe	%		
Hydropower	25654	67659	5818	27.9%		
Hydropower (non pumped)	18669	59485	5115	24.6%	1 (p.70)	
Hydropower <1 MW (non pumped)	431	1509	130	0.6%	_ ( /	
Hydropower 1 MW - 10 MW (non pumped)	1611	5592	481	2.3%		
Hydropower >10 MW (non pumped)	16627	52409	4506	21.6%		
Hydropower pumped storage	1808	4826	415	2.0%		
Hydropower mixed (normalised)	5177	3348	288	1.4%	2 (p.70)	
Geothermal	16	51	4	0.0%	_ (   /	
Solar	4056	4446	382	1.8%		
Solar photovoltaic	4056	4446	382	1.8%		
Concentrated solar power	0	0	0	0.0%		
Tidal, wave and ocean energy	240	458	39	0.2%		
Wind power	7623	14186	1220	5.9%		
Onshore wind	7623	14186	1220	5.9%		
Offshore wind	0	0	0	0.0%		
Biomass	1090	5708	491	2.4%		
Solid biomass	843	4424	380	1.8%	3 (p.70)	
Biogas	247	1284	110	0.5%	4 (p.70)	
Bioliquids	0	0	0	0.0%	4 (p.70)	
Total	38679	92508	7954	38.2%	5 (p.70)	
Total CHP	713	3248	279	1.3%	3 (þ., 0)	
Total Citr	713	3240	213	1.370		
Renewable Heating and Cooling			ktoe	%	Comment	
Geothermal			94	0.5%		
Solar thermal			133	0.6%		
Biomass			10309	49.5%		
Solid biomass			10158	48.8%		
Biogas			151	0.7%		
Bioliquids			0	0.0%		
Renewable energy from heat pumps			1227	5.9%	6 (p.70)	
Aerothermal heat pumps			1076	5.2%		
Geothermal heat pumps			151	0.7%	7 (p.70)	
Hydrothermal heat pumps			0	0.0%	8 (p.70)	
Total			11763	56.5%		
Total district heating			n.a.	n.a.		
Total biomass in households			7155	34.3%		
	_					
Renewable Transport			ktoe	%	Comment	
Bioethanol / bio-ETBE			418	2.0%		
Bioethanol / bio-ETBE Article 21.2			0	0.0%		
Bioethanol / bio-ETBE imported			77	0.4%		
Biodiesel			2424	11.6%		
Biodiesel Article 21.2			125	0.6%		
Biodiesel imported			359	1.7%		
Hydrogen from renewables			0	0.0%		
Renewable electricity			209	1.0%		
Renewable electricity road transport			1	0.0%		
Renewable electricity non-road transport			209	1.0%		
Other biofuels			0	0.0%		
Other biofuels Article 21.2			0	0.0%		
Total	T		3051	14.6%	9 (p.70)	

Table 77: French PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in France for **2012** to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 78:** French PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass in the products of the prod	Biomass supply for heating and electricity	Domestic raw material			
wooded land energy generation indirect supply of wood biomass fenergy crops in the common arable crops for biofuels indirect supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass from waste with the common arable crops for biofuels indirect supply of wood biomass from waste with the common arable crops for biofuels indirect supply of wood biomass from series with the common arable crops for biofuels indirect supply of wood biomass from waste wooded land energy generation indirect supply for transport with common arable crops for biofuels indirect supply of wood biomass from waste with common arable crops for biofuels		Unit	2011	2012	Comment
Interest supply of wood biomass   Inte	Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	6160	7155	10 (p.70)
Agricultural by-products / processed residues and fishery by-products (since supply of transport (stoe 1009) 114455 (since supply for transport (since supply for transport (stoe 1009) 114455 (since supply for transport (stoe 1898) 137 (since supply for beating and electricity (since supply for transport (since supply for beating and electricity (since supply for beating and electricity (since supply for transport (since supply for transport (since supply for beating and electricity (since supply for transport (since supply for beating and electricity (since supply for beating and electricit	Indirect supply of wood biomass	ktoe	2506	2880	11 (p.70)
by-products kide   1010   1028   14 (p.70)   12012   1201	Energy crops	ktoe	n.a.	n.a.	12 (p.70)
Riomass from waste Others Othe	Agricultural by-products / processed residues and fishery	ktoe	423	422	13 (p.70)
Signass supply for transport   Unit   2011   2012   Commen	Biomass from waste	ktoe	1010	1028	14 (p.70)
Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Entotal biomass for all sectors*  Italia biomass for all sectors*  Raw material imported from EU  Unit 2011 2012 Comment  Italia 2012 C	Others	ktoe	n.a.	n.a.	
Common arable crops for biofuels Energy crops and short rotation trees for biofuels Energy crops and short rotation trees for biofuels Chers Rice Energy crops and short rotation trees for biofuels Rice Energy crops and short rotation trees for biofuels Rice I1898 437  Total biomass for all sectors*  Raw material imported from EU  Init Energy crops Biomass supply for heating and electricity  Raw material imported from EU  Init Energy crops Agricultural by-products / processed residues and fishery Biomass from waste Others  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Direct supply of wood biomass from forests and other  In a common arable crops for biofuels Energy crops and short rotation frees for biofuels Direct supply of wood biomass from forests and other  In a common arable crops for biofuels Energy crops and short rotation trees for biofuels Direct supply of wood biomass from forests and other  In a common arable crops for biofuels Energy crops and short rotation freests and other  In a common arable crops for biofuels Energy crops and short rotation freests and other  In a common arable crops for biofuels Energy crops and short rotation freests and other  In a common arable crops for biofuels Energy crops and short rotation freests and other  In a common arable crops for biofuels Energy crops and short rotation freests or biofuels Energy crops and short rotation freests or biofuels Energy crops and short rotation freest for biofuels Energy crop	Total biomass for heating and electricity*	ktoe	10099	11485	
Energy crops and short rotation trees for biofuels	Biomass supply for transport	Unit	2011	2012	Comment
Others Total biomass for transport*  Itoe 1898 437  Total biomass for all sectors*  Raw material imported from EU  Unit 2011 2012 Commen  Biomass supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass from forests and fishery by-products / processed residues and fishery by-products   biomass from biomass from biomass from waste   ktoe   n.a.   n.a.   14 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   15 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   16 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   16 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   16 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   16 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   17 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   17 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   17 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   17 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   18 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   18 (p.70)  Common arable crops for biofuels   ktoe   n.a.   n.a.   n.a.   18 (p.70)  Common arable crops for biofuels   ktoe   0   0   10 (p.70)  Common arable crops for biofuels   ktoe   0   0   12 (p.70)  Common arable crops for biofuels   ktoe   0   0   14 (p.70)  Common arable crops for biofuels   ktoe   0   0   14 (p.70)  Common arable crops for biofuels   ktoe   0   0   14 (p.70)  Common arable crops for biofuels   ktoe   0   0   14 (p.70)  Common arable crops for biofuels   ktoe   0   0   14 (p.70)  Common arable crops for biofuels   ktoe   0   0   14 (p.70)  Common arable crops for biofuels   ktoe   0   0   14 (p.70)  Common arable crops for biofuels   ktoe   0   0   0   0   0   0   0   0   0	Common arable crops for biofuels	ktoe	1898	437	15 (p.70)
Total biomass for transport*   Row material imported from EU	Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
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	Others Total biomass for transport*  Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport Common arable crops for biofuels	ktoe ktoe  Raw r  Unit ktoe ktoe ktoe ktoe ktoe unit ktoe	n.a. 529 529 material im 2011 0 0 0 0 0 2011 529	n.a. 437 437 437  ported fro  2012 0 0 0 0 0 2012 437	10 (p.70) 11 (p.70) 12 (p.70) 13 (p.70) 14 (p.70)
Total biomass for all sectors* ktoe 529 437	Others  Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe  Raw r  Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	n.a. 529 529 material im 2011 0 0 0 0 0 2011 529 n.a.	n.a. 437 437 437  ported fro  2012 0 0 0 0 0 2012 437 n.a.	10 (p.70) 11 (p.70) 12 (p.70) 13 (p.70) 14 (p.70)
	Others Total biomass for transport*  Total biomass for all sectors*  Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe  Raw r  Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	n.a. 529 529 material im 2011 0 0 0 0 0 2011 529 n.a. n.a.	n.a. 437 437 437  ported fro 2012 0 0 0 0 2012 437 n.a. n.a.	10 (p.70) 11 (p.70) 12 (p.70) 13 (p.70) 14 (p.70)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	1107199	1230073	16 (p.70)
Land used for short rotation trees	ha	4466	4508	17 (p.70)
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 79: French PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	18 (p.71)
Consumption - Fuel type X	ktoe	362	125	
Total production Art.21.2.biofuels	ktoe	n.a.	n.a.	
Total consumption Art.21.2. biofuels	ktoe	362	125	
Share of 21(2) fuels from total RES-T	%	18.2	5.5	

**Table 80:** French PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	67300000	82400000	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	44230000	56360000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	17260000	19870000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	5810000	6160000	

**Table 81:** French PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	-41	
2011	0	-1674	
2012	0	-833	
2013	0	0	
2014	0	0	
2015	0	0	
2016	0	0	
2017	0	0	
2018	0	0	
2019	0	0	
2020	0	0	

Table 82: French PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in France (ktoe) (see Table 9 of the NREAP)

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#### **Comments for France**

- 1: By construction, total normalised production by sector is not equal to total normalised production.
- 2: In accordance with the Eurostat methodology, pumped hydro production is not considered to be renewable production hereafter. In the 'mixed' row, the figure given indicates the share of renewable hydro (i.e. non-pumped) from mixed power stations. The figure given for total hydro production is the total of renewable hydro production and non-renewable hydro production.
- 3: The powers of biomass facilities having mixed equipment have been calculated pro rata to the fuels used.
- 4: The powers of biomass facilities having mixed equipment have been calculated pro rata to the fuels used.
- 5: The 2012 data and in particular those from the electricity production survey are currently being consolidated.
- 6: Methodological work on heat pumps is under way and may mean that the figures are substantially revised, especially for aerothermal heat pumps.
- 7: Includes hydrothermal heat pumps.
- 8: Hydrothermal heat pumps are grouped with geothermal heat pumps.
- 9: Remark from the French Progress Report: Directive 2009/28/EC makes provision for concessions for second-generation biofuels and renewable energy consumed by electric vehicles in transport. They are included in Table 1d of the French Progress Report (page 7).
- 10: The method used to calculate the quantities of biomass used for energy purposes and the quantities of energy produced has changed since the National Renewable Energy Action Plan was submitted in 2010. The reason for this change is that there is no robust statistical evaluation method for or specific survey of the quantities of raw material imported for use for energy purposes and the quantities of energy produced from imported biomass. There is no change, however, to the indicative trajectory. As the lack of a survey means that no data are available, the following table is therefore partly incomplete and many data are not available. All raw material is given in the 'amount of domestic raw material' columns of Table 4 in the French Progress Report (page 27). These data come from the declarations by producers of energy from biomass (electricity and heating). The corresponding quantity of domestic biomass has been calculated using the conversion factors set out in the 2010 National Renewable Energy Action Plan.
- 11: See comment 10.
- 12: See comment 10.
- 13: See comment 10.
- 14: See comment 10.
- 15: In the case of biomass supplies for transport (common arable crops for the production of biofuels), the information collected by the customs service at the time of payment of the General Tax on Pollutant Activities sheds light on the 'consumption' in France of biofuels produced from domestic biomass and imported biomass. The French Progress Report does not provide a break-down of EU versus non-EU imports.
- 16: In 2011 the contributions were as follows: wheat/maize: 200121 ha, beet: 54198 ha, oilseed surfaces (rapeseed, sunflower): 852880 ha. In 2012 the contributions were as follows: wheat/maize: 176966 ha, beet: 47927 ha, oilseed surfaces (rapeseed, sunflower): 1005180 ha.
- 17: Main types: poplars, eucalyptus and willows felled before 20 years and rejecting stumps, excluding cones

18: Accounting methods mean that we can provide data only on consumption, and not production, in France of these types of biofuels between 2009 and 2012.

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### 11 Germany

	Unit	2011	2012	Comment
Renewable heating and cooling	%	10.8	11.1	1 (p.78)
Renewable electricity	%	20.9	23.6	
Renewable Transport	%	5.9	6.9	
Overall renewable energy share	%	11.6	12.4	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	3.4	4.2	

Table 83: German PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Germany (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	11445	12165	2 (p.78)
Gross final consumption of electricity from RES	ktoe	10646	12035	3 (p.78)
Gross final consumption of energy from RES in transport	ktoe	2986	3131	4 (p.78)
Gross total RES consumption	ktoe	25077	27331	5 (p.78)
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	25077	27331	

Table 84: German PR Table 1a: Calculation table for the renewable energy contribution in Germany of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 85: German PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Germany for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

		20	11		
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	11436	21970	1889	7.8%	
Hydropower (non pumped)	4469	21948	1887	7.8%	
Hydropower <1 MW (non pumped)	700	2687	231	1.0%	
Hydropower 1 MW - 10 MW (non pumped)	1088	4679	402	1.7%	
Hydropower >10 MW (non pumped)	2681	13830	1189	4.9%	
Hydropower pumped storage	5811 1156	751	0 65	0.0%	
Hydropower mixed (normalised) Geothermal	1156	751 19	2	0.3% 0.0%	
Solar	25039	19599	1685	7.0%	
Solar photovoltaic	25037	19599	1685	7.0%	
Concentrated solar power	2	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	29060	46746	4019	16.7%	
Onshore wind	28730	46746	4019	16.7%	
Offshore wind	330	0	0	0.0%	
Biomass	5607	32839	2824	11.7%	
Solid biomass	1966	11296	971	4.0%	
Biogas	3337	21189	1822	7.6%	
Bioliquids	304	354	30	0.1%	
Total	71150	121173	10419	43.2%	
Total CHP	n.a.	16151	1389	5.8%	6 (p.78)
Renewable Heating and Cooling			ktoe	%	Comment
					Comment
Geothermal			60	0.2%	
Solar thermal			554	2.3%	
Biomass			9460	39.3%	
Solid biomass			8269 1020	34.3% 4.2%	
Biogas Bioliquids			171	0.7%	
Renewable energy from heat pumps			613	2.5%	
Aerothermal heat pumps			263	1.1%	
Geothermal heat pumps			276	1.1%	
Hydrothermal heat pumps			73	0.3%	
Total			10687	44.4%	
Total district heating			507	2.1%	
Total biomass in households			5804	24.1%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			782	3.2%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			1989	8.3%	
Biodiesel Article 21.2			40	0.2%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			0	0.0%	
Renewable electricity			182	0.8%	7 ( -5)
Renewable electricity road transport			1	0.0%	7 (p.78)
Renewable electricity non-road transport			181	0.8%	8 (p.78)
Other biofuels Other biofuels Article 21.2			34 5	0.1% 0.0%	9 (p.78)
Total			2986	12.4%	
Total			2500	12.4/0	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	11257	21880	1881	7.8%	
Hydropower (non pumped)	4451	21862	1880	7.8%	
Hydropower <1 MW (non pumped)	713	2734	235	1.0%	
Hydropower 1 MW - 10 MW (non pumped)	1067	4582	394	1.6%	
Hydropower >10 MW (non pumped)	2671	13810	1187	4.9%	
Hydropower pumped storage	5650	0	0	0.0%	
Hydropower mixed (normalised)	1156	736	63	0.3%	
Geothermal	12	25	2	0.0%	
Solar	32643	26380	2268	9.4%	
Solar photovoltaic	32641	26380	2268	9.4%	
Concentrated solar power	2	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	31304	49335	4242	17.6%	
Onshore wind	30869	49335	4242	17.6%	
Offshore wind	435	0	0	0.0%	
Biomass	6052	39580	3403	14.1%	
Solid biomass	2034	12091	1040	4.3%	
Biogas	3764	27238	2342	9.7%	
Bioliquids	254	250	21	0.1%	
Total	81268	137200	11797	49.0%	
Total CHP	n.a.	19073	1640	6.8%	6 (p.78)
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			66	0.3%	
Solar thermal			576	2.4%	
Biomass			9997	41.5%	
Solid biomass			8742	36.3%	
Biogas			1085	4.5%	
Bioliquids			170	0.7%	
Renewable energy from heat pumps			682	2.8%	
Aerothermal heat pumps			308	1.3%	
Geothermal heat pumps			297	1.2%	
Hydrothermal heat pumps			76	0.3%	
Total			11321	47.0%	
Total district heating			641	2.7%	
Total biomass in households			6397	26.6%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			792	3.3%	
Bioethanol / bio-ETBE Article 21.2			2	0.0%	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			2034	8.4%	
Biodiesel Article 21.2			365	1.5%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			0	0.0%	
Renewable electricity			188	0.8%	
Renewable electricity road transport			1	0.0%	7 (p.78)
Renewable electricity non-road transport			187	0.8%	8 (p.78)
Other biofuels			117	0.5%	9 (p.78)
Other biofuels Article 21.2			25	0.5%	J (p.70)
Total			3131	13.0%	

Table 86: German PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Germany for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 87:** German PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	0	0	10 (p.78)
Indirect supply of wood biomass	ktoe	0	0	11 (p.78)
Energy crops	ktoe	0	0	12 (p.78)
Agricultural by-products / processed residues and fishery by-products	ktoe	0	0	13 (p.78)
Biomass from waste	ktoe	0	0	14 (p.78)
Others	ktoe	0	0	2 · (p·/ c)
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	0	0	15 (p.78)
Energy crops and short rotation trees for biofuels	ktoe	0	0	16 (p.78)
Others	ktoe	0	0	17 (p.78)
Total biomass for transport*	ktoe	0	0	17 (p.76)
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Rav	w material	imported t	from EU
	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	0	0	10 (p.78)
Indirect supply of wood biomass	ktoe	0	0	11 (p.78)
Energy crops	ktoe	0	0	12 (p.78)
Agricultural by-products / processed residues and fishery	ktoe	0	0	13 (p.78)
py-products Biomass from waste	ktoe	0	0	14 (p.78)
Others	ktoe	0	0	(I7
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	0	0	15 (p.78)
Energy crops and short rotation trees for biofuels	ktoe	0	0	16 (p.78)
Others	ktoe	0	0	17 (p.78)
Total biomass for transport*	ktoe	0	0	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Rawı	material im	ported fro	m non-EU
	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	0	0	10 (p.78)
ndirect supply of wood biomass	ktoe	0	0	11 (p.78)
Energy crops	ktoe	0	0	12 (p.78)
Agricultural by-products / processed residues and fishery	ktoe	0	0	13 (p.78)
by-products Biomass from waste	ktoe	0	0	14 (p.78)
Others	ktoe	0	0	= / (2.70)
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	0	0	15 (p.78)
	ktoe	0	0	16 (p.78)
	ALUC.		0	17 (p.78)
Energy crops and short rotation trees for biofuels	ktoe			
Energy crops and short rotation trees for biofuels Others	ktoe	0		17 (pi.70)
Energy crops and short rotation trees for biofuels	ktoe ktoe	0	0	17 ((217.5)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	2051000	2147400	18 (p.78)
Land used for short rotation trees	ha	4000	4900	
Land used for other energy crops such as grasses	ha	2000	3000	

Table 88: German PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	261	371	19 (p.78)
Total consumption Art.21.2. biofuels	ktoe	45	392	20 (p.78)
Share of 21(2) fuels from total RES-T	%	2	13	

Table 89: German PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	129000000	1.45E+08	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	89000000	1.02E+08	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	35000000	37000000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	5000000	6000000	

Table 90: German PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	21 (p.78)
Origin/destination	n.a.	n.a.	21 (p.78)
Unit	ktoe	ktoe	21 (p.78)
2010	0	0	21 (p.78)
2011	7224	0	21 (p.78)
2012	9162	0	21 (p.78)
2013	5507	0	21 (p.78)
2014	7105	0	21 (p.78)
2015	4761	0	21 (p.78)
2016	6453	0	21 (p.78)
2017	4130	0	21 (p.78)
2018	5976	0	21 (p.78)
2019	0	0	21 (p.78)
2020	3065	0	21 (p.78)

Table 91: German PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Germany (ktoe) (see Table 9 of the NREAP)

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#### **Comments for Germany**

- 1: The reported shares of renewable energy in energy supplies in Germany should also be taken as provisional, as some of the statistical data for the 2012 reporting year is provisional
- 2: Data for gross final energy consumption in heating and cooling are also provided in the German Progress Report: 106098 ktoe in 2011 and 109697 ktoe in 2012 (see Table A in the report).
- 3: Data for gross final energy consumption in electricity are also provided in the German Progress Report: 51854 ktoe in 2011 and 51816 ktoe in 2012 (see Table A in the report).
- 4: Data for gross final energy consumption in transport are also provided in the German Progress Report: 51645 ktoe in 2011 and 51283 ktoe in 2012 (see Table A in the report).
- 5: Data for total gross final energy consumption are also provided in the German Progress Report: 216666 ktoe in 2011 and 220492 ktoe in 2012 (see Table A in the report).
- 6: Electricity supplies from cogeneration reached some 14% of total gross electricity production from renewable energy in 2012. In relation to cogeneration-enabled electricity provision from biomass and geothermal energy, the proportion of cogeneration in 2012 was around 48%. Gross electricity production from cogeneration where the surplus heat is only used as 'useful heat' outside the plant pursuant to the KWKG. The electricity generation corresponding to internal heat consumption (e.g. fermenter heating in biogas plants) is not included.
- 7: The population of electric vehicles in Germany as of 1.1.2013 totalled 7114 all-electric cars, 1119 plug-in hybrid cars, 4652 electric bicycles and motorcycles and 2964 electric-powered trucks and buses.
- 8: The quantity of electricity from renewable sources used in rail transport in 2012 (187 ktoe) is slightly higher than reported in the first progress report because of the switch to an official data source. The consumption of electricity from renewable sources in rail transport for the years 2011 and 2012 is determined by the same method as in the NREAPs: it was based on the national share of renewable energy in total electricity consumption for 2009 and 2010, which was in turn calculated from the normalised wind and hydro-electric power supplies for these years.
- 9: Biomethane, vegetable oils.
- 10: See section 6.1 in the German Progress Report.
- 11: See section 6.1.1 in the German Progress Report.
- 12: See section 6.1.2 in the German Progress Report.
- 13: See section 6.1.3 in the German Progress Report.
- 14: See section 6.1.4 in the German Progress Report.
- 15: Info extracted from Section 6.2.1 regarding biodiesel. More info on bioethanol and biomethane can also be found in Section 6.2.1 in the German Progress Report.
- 16: See Section 6.2.2 in the German Progress Report.
- 17: See Section 6.2.3 in the German Progress Report.
- 18: German Progress Report provides breakdown for fuel type (land used for biodiesel, bio-ethanol and biogas).
- 19: Production data for 2011: FAME = 255 ktoe, biogas = 5 ktoe, methanol = 0 ktoe; production data for 2012: FAME = 344 ktoe, biogas = 25 ktoe, methanol = 2 ktoe.
- 20: Consumption data for 2011: FAME = 40 ktoe, biogas = 5 ktoe, methanol = 0 ktoe; consumption data for 2012: FAME = 365 ktoe, biogas = 25 ktoe, methanol = 2 ktoe. 21: n.a.

## **12**

#### Greece

	Unit	2011	2012	Comment
Renewable heating and cooling	%	20.23	24.43	1 (p.84)
Renewable electricity	%	13.82	16.48	
Renewable Transport	%	0.74	1.06	
Overall renewable energy share	%	11.03	13.83	2 (p.84)
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 92: Greek PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Greece (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	1355	1492	
Gross final consumption of electricity from RES	ktoe	739	877	3 (p.84)
Gross final consumption of energy from RES in transport	ktoe	46	51	4 (p.84)
Gross total RES consumption	ktoe	2140	2420	5 (p.84)
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	2140	2420	

Table 93: Greek PR Table 1a: Calculation table for the renewable energy contribution in Greece of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 94: Greek PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Greece for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	3224	4446	382	17.9%	6 (p.84)
Hydropower (non pumped)	2525	4106	353	16.5%	7 (p.84)
Hydropower <1 MW (non pumped)	34	108	9	0.4%	8 (p.84)
Hydropower 1 MW - 10 MW (non pumped)	172	514	44	2.1%	9 (p.84)
Hydropower >10 MW (non pumped)	2319	3484	300	14.0%	10 (p.84)
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised)	699	502	43	2.0%	11 (p.84)
Geothermal	0	0	0	0.0%	
Solar	612	610	52	2.5%	
Solar photovoltaic	612	610	52	2.5%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	1640	3356	289	13.5%	
Onshore wind	1640	3356	289	13.5%	
Offshore wind	0	0	0	0.0%	
Biomass	45	199	17	0.8%	
Solid biomass	0	0	0	0.0%	
Biogas	45	199	17	0.8%	
Bioliquids	0	0	0	0.0%	12 ( 21)
Total	5521	8611	740	34.6%	12 (p.84)
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			16	0.7%	
Solar thermal			183	8.6%	
Biomass			1093	51.1%	
Solid biomass			1078	50.4%	
Biogas			14.8	0.7%	
Bioliquids			82	0.0%	
Renewable energy from heat pumps			75	3.8% 3.5%	
Aerothermal heat pumps			75	0.3%	
Geothermal heat pumps Hydrothermal heat pumps			0	0.3%	
Total			1374	64.3%	
			0	0.0%	
Total district heating			-		
Total biomass in households			790	37.0%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			20	0.9%	
Biodiesel Article 21.2			20	0.9%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			0	0.0%	
Renewable electricity			3.3	0.2%	
Renewable electricity road transport			2.1	0.1%	
Renewable electricity non-road transport			1.3	0.1%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			23.3	1.1%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	3236	4468	384	18.0%	6 (p.84)
Hydropower (non pumped)	2537	4127	355	16.6%	7 (p.84)
Hydropower <1 MW (non pumped)	34	109	9	0.4%	8 (p.84)
Hydropower 1 MW - 10 MW (non pumped)	184	549	47	2.2%	9 (p.84)
Hydropower >10 MW (non pumped)	2319	3468	298	13.9%	10 (p.84)
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised)	699	499	43	2.0%	11 (p.84)
Geothermal	0	0	0	0.0%	
Solar	1536	1694	146	6.8%	
Solar photovoltaic	1536	1694	146	6.8%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	1753	3870	333	15.6%	
Onshore wind	1753	3870	333	15.6%	
Offshore wind	0	0	0	0.0%	
Biomass	45	197	17	0.8%	
Solid biomass	0	0	0	0.0%	
Biogas	45	197	17	0.8%	
Bioliquids	0	0	0	0.0%	
Total	6570	10229	880	41.1%	12 (p.84)
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			13	0.6%	
Solar thermal			184	8.6%	
Biomass			1193	55.8%	
Solid biomass			1178	55.1%	
Biogas			15.2	0.7%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			102	4.8%	
Aerothermal heat pumps			93	4.4%	
Geothermal heat pumps			9	0.4%	
Hydrothermal heat pumps			0	0.0%	
Total			1492	69.8%	
Total district heating			0	0.0%	
Total biomass in households			954	44.6%	
				0/	Comment
Renewable Transport			ktoe	%	Committee
					Comment
Bioethanol / bio-ETBE			0	0.0%	Comment
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2					Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported			0 0 0	0.0% 0.0% 0.0%	Comment
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported Biodiesel			0 0 0 24	0.0% 0.0% 0.0% 1.1%	
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported Biodiesel Biodiesel Article 21.2		_	0 0 0 24 24	0.0% 0.0% 0.0% 1.1%	
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported Biodiesel Biodiesel Article 21.2 Biodiesel imported			0 0 0 24 24 n.a.	0.0% 0.0% 0.0% 1.1% 1.1% n.a.	
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported Biodiesel Biodiesel Article 21.2 Biodiesel imported Hydrogen from renewables			0 0 0 24 24 n.a. 0	0.0% 0.0% 0.0% 1.1% 1.1% n.a. 0.0%	
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported Biodiesel Biodiesel Article 21.2 Biodiesel imported Hydrogen from renewables Renewable electricity			0 0 0 24 24 n.a. 0	0.0% 0.0% 0.0% 1.1% 1.1% n.a. 0.0% 0.1%	
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported Biodiesel Biodiesel Article 21.2 Biodiesel imported Hydrogen from renewables Renewable electricity Renewable electricity road transport			0 0 0 24 24 n.a. 0 3.2 2.2	0.0% 0.0% 0.0% 1.1% 1.1% n.a. 0.0% 0.1%	
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2 Bioethanol / bio-ETBE imported Biodiesel Biodiesel Article 21.2 Biodiesel imported Hydrogen from renewables Renewable electricity Renewable electricity road transport Renewable electricity non-road transport			0 0 0 24 24 n.a. 0 3.2 2.2	0.0% 0.0% 0.0% 1.1% 1.1% n.a. 0.0% 0.1% 0.1% 0.0%	

Table 95: Greek PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Greece for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 96:** Greek PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

ass supply for heating and electricity Domestic raw materia				rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	321	223	
Indirect supply of wood biomass	ktoe	48	32	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery by-products	ktoe	572	745	
Biomass from waste	ktoe	73	89	
Others	ktoe	n.a.	0	
Total biomass for heating and electricity*	ktoe	1014	1089	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	20	n.a.	13 (p.84)
Total biomass for transport*	ktoe	20	n.a.	
Total biomass for all sectors*	ktoe	1034	1089	
Biomass supply for heating and electricity	Ray	v material	imported f	from FU
0				
Direct supply of wood biomass from forests and other	Unit ktoe	<b>2011</b> 91	2012 93	Comment
wooded land energy generation	Rtoc	31	33	
Indirect supply of wood biomass	ktoe	n.a.	3	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery by-products	ktoe	0	0	
Biomass from waste	ktoe	n.a.	0	
Others	ktoe	n.a.	0	
Total biomass for heating and electricity*	ktoe	91	96	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	13 (p.84)
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	01		
	Rtoc	91	96	
				m non-EU
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other	Raw r	naterial im	ported fro	
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation	Raw r Unit ktoe	naterial im 2011 7	ported fro 2012 37	
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass	Raw r Unit ktoe	naterial im 2011 7	ported fro 2012 37	
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops	Raw r Unit ktoe ktoe	naterial im 2011 7 0 0	ported fro 2012 37 5 0	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	Raw r Unit ktoe	naterial im 2011 7	ported fro 2012 37	
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops	Raw r Unit ktoe ktoe	naterial im 2011 7 0 0	ported fro 2012 37 5 0	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products	Raw r Unit ktoe ktoe ktoe ktoe	0 0 0	ported fro 2012 37 5 0	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	Raw r Unit ktoe ktoe ktoe ktoe ktoe	0 0 0 0 n.a.	ported fro 2012 37 5 0 0	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	Raw r Unit ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 0 n.a.	ported fro 2012 37 5 0 0 0	Comment
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	Raw r Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 n.a. n.a. 7	ported fro 2012 37 5 0 0 42	Comment
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	Raw r Unit ktoe ktoe ktoe ktoe ktoe Unit	naterial im  2011 7 0 0 0 n.a. n.a. 7 2011	ported fro 2012 37 5 0 0 42 2012	Comment
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	Raw r Unit ktoe ktoe ktoe ktoe ktoe Unit ktoe	naterial im  2011 7 0 0 0 n.a. n.a. 7 2011 n.a.	ported fro 2012 37 5 0 0 42 2012 n.a.	Comment Comment 13 (p.84)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	Raw r Unit ktoe ktoe ktoe ktoe ktoe unit ktoe ktoe	naterial im  2011 7 0 0 0 n.a. n.a. 7 2011 n.a. n.a.	ported fro 2012 37 5 0 0 42 2012 n.a. n.a.	Comment

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	88975	67389	14 (p.84)
Land used for short rotation trees	ha	n.a.	n.a.	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 97: Greek PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	20	24	15 (p.84)
Consumption - Fuel type X	ktoe	20	24	16 (p.84)
Total production Art.21.2.biofuels	ktoe	20	24	17 (p.84)
Total consumption Art.21.2. biofuels	ktoe	20	24	18 (p.84)
Share of 21(2) fuels from total RES-T	%	85.84	88.24	19 (p.84)

Table 98: Greek PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	12443000	13596000	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	8264000	9278000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	3896000	3947000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	283000	371000	

Table 99: Greek PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	257	0	
2011	408	0	
2012	513	0	
2013	686	0	
2014	812	0	
2015	856	0	
2016	842	0	
2017	737	0	
2018	743	0	
2019	683	0	
2020	529	0	

Table 100: Greek PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Greece (ktoe) (see Table 9 of the NREAP)

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#### Comments for Greece

- 1: Since the oil energy statistics of 2012 are under revision, the calculated share of RES in heating and cooling as well as the overall RES share in gross final energy consumption for 2012 may need to be reassessed.
- 2: Since the oil energy statistics of 2012 are under revision, the calculated share of RES in heating and cooling as well as the overall RES share in gross final energy consumption for 2012 may need to be reassessed.
- 3: These figures refer to the normalized electricity generation from RES in 2011 and 2012, not including the renewable electricity consumed in transport. Figures referring to the actual production (not normalized for hydro and wind and not including generation from water previously pumped uphill) are: 697 ktoe for 2011 and 885 ktoe for 2012.
- 4: This figure includes renewable electricity consumed in transport as well as the respective multiplicators (i.e. double counted sustainable biofuels and road RE electricity counted 2,5 times)
- 5: According to Art.5(1)of Directive 2009/28/EC gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.
- 6: Actual electricity generation from hydropower: 4012 GWh in 2011 and 4392 GWh in 2012.
- 7: Actual electricity generation from hydropower (non pumped): 3676 GWh in 2011 and 3956 GWh in 2012.
- 8: Actual electricity generation from hydropower <1 MW (non pumped): 96 GWh in 2011 and 120 GWh in 2012.
- 9: Actual electricity generation from hydropower 1 MW 10 MW (non pumped): 485 GWh in 2011 and 549 GWh in 2012.
- 10: Actual electricity generation from hydropower >10 MW (non pumped): 3094 GWh in 2011 and 3287 GWh in 2012.
- 11: Actual electricity generation from hydropower mixed: 336 GWh in 2011 and 436 GWh in 2012.
- 12: Actual electricity generation (total): 8136 GWh in 2011 and 10133 GWh in 2012.
- 13: Breakdown for 2011: 27459 ton cotton seed, 6658 ton cotton oil and 15024 ton used cooking oils and animal fats. Breakdown for 2012: 68212 ton cotton seed, 2712 ton cotton oil and 20063 ton used cooking oils and animal fats.
- 14: Main types: sunflower seed, rapeseed, soya seed. Only oil seeds have been considered because at present it is the only type of crops used for biofuels in Greece.
- 15: Biodiesel from cottonseed oil: 8 ktoe in 2011 and 10 ktoe in 2012. Biodiesel from used cooking oils and animal fats: 12 ktoe in 2011 and 14 ktoe in 2012.
- 16: See comment 12.
- 17: See comment 12.
- 18: See comment 12.
- 19: Although for the period 2011-2012 compliance with the sustainability criteria for biodiesel was not verified, the provisions for the allocation of biodiesel and MD ?1/?/7364 (see 23 of Table 2) provide data for the raw materials used for biodiesel that was produced and consumed in Greece. The amounts reported correspond to biodiesel produced by used cooking oil, animal fat and cottonseed oil according to conversion factors set by yearly allocation decisions. Given the fact that biofuels produced from waste and residues need only to fulfill the criterion of article 17 (2) and the fact that greenhouse gas emission saving for waste vegetable oil/animal fat and cotton seed biodiesel is 88% and 80% respectively, according to the typical values in part D of Annex V and law 4062/2012, the reported amounts should be regarded as compliant with sustainability criteria.

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## **13**Croatia

	Unit	2011	2012	Comment
Renewable heating and cooling	%	12.8	13.5	
Renewable electricity	%	34.5	35.6	
Renewable Transport	%	1.4	2.2	
Overall renewable energy share	%	14.2	15.1	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 101: Croatian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Croatia (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	367.9	385.5	
Gross final consumption of electricity from RES	ktoe	541.9	552.9	
Gross final consumption of energy from RES in transport	ktoe	17	31.3	
Gross total RES consumption	ktoe	927	970	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	927	970	

Table 102: Croatian PR Table 1a: Calculation table for the renewable energy contribution in Croatia of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 103: Croatian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Croatia for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	2139.2	5969.8	513	54.6%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	0	0	0	0.0%	
Hydropower 1 MW - 10 MW (non pumped)	31.1	67.1	6	0.6%	
Hydropower >10 MW (non pumped)	2108.1	5902.7	508	54.0%	
Hydropower pumped storage Hydropower mixed (normalised)	0 n.a.	16.3 n.a.	n.a.	0.1% n.g.	
Geothermal	0	0	0	0.0%	
Solar	6	12.1	1	0.1%	
Solar photovoltaic	6	12.1	1	0.1%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	124.9	287.3	25	2.6%	
Onshore wind	124.9	287.3	25	2.6%	
Offshore wind	0	n.a.	n.a.	n.a.	
Biomass	5	33	3	0.3%	
Solid biomass	2.7	0.2	0	0.0%	
Biogas	2.2	32.8	3	0.3%	
Bioliquids Total	2275.1	n.a. <b>6302.2</b>	n.a. <b>542</b>	n.a. <b>57.6%</b>	
Total CHP	22/3.1	0.1	0	0.0%	
IOTAI CHP	2.7	0.1	U	0.0%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			6.2	0.7%	
Solar thermal			6.7	0.7%	
Biomass			337.3	35.9%	
Solid biomass			336.6	35.8%	
Biogas			0.7	0.1%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			21.4	2.3% 2.1%	
Aerothermal heat pumps Geothermal heat pumps			20 0	2.1% 0.0%	
Hydrothermal heat pumps			1.4	0.0%	
Total			371.6	39.5%	
Total district heating			28.4	3.0%	
Total biomass in households			306	32.5%	
iotal biolitass in nouscilotas			300	32.370	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			17.4	1.9%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			9.5	1.0%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			9.5	1.0%	
Other biofuels Other biofuels Article 21.2			0	0.0% 0.0%	
Total			<b>26.9</b>	0.0% <b>2.9</b> %	
TOWN			20.3	2.3/0	

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	2140.3	5962.8	513	54.5%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	0	0	0	0.0%	
Hydropower 1 MW - 10 MW (non pumped)	32.1	102.2	9	0.9%	
Hydropower >10 MW (non pumped)	2108.1	5860.6	504	53.6%	
Hydropower pumped storage	0	16.3	1	0.1%	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	n.a.	n.a.	n.a.	n.a.	
Solar	6.4	7.3	1	0.1%	
Solar photovoltaic	6.4	7.3	1	0.1%	
Concentrated solar power	n.a.	n.a.	n.a.	n.a.	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	158	347.6	30	3.2%	
Onshore wind	158	347.6	30	3.2%	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	10.8	52.9	5	0.5%	
Solid biomass	2.7	0.2	0	0.0%	
Biogas	8.1	52.7	5	0.5%	
Bioliquids	n.a.	n.a.	n.a.	n.a.	
Total	2315.5	6370.5	548	58.2%	
Total CHP	2.7	0.1	0	0.0%	
iotal Chr	2.7	0.1	U	0.0%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			7.4	0.8%	
Solar thermal			9.6	1.0%	
Biomass			349.5	37.2%	
Solid biomass			348.4	37.0%	
Biogas			1.1	0.1%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			26.4	2.8%	
Aerothermal heat pumps			24.3	2.6%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps			2.1	0.2%	
Total			392.8	41.8%	
Total district heating			31.7	3.4%	
Total biomass in households			313.8	33.4%	
iotai biomass in nousenoids			313.8	33.4%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			32.1	3.4%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			10	1.1%	
Renewable electricity road transport			0	0.0%	
D			10	3.070	

Renewable electricity non-road transport

Other biofuels

Other biofuels Article 21.2

Table 104: Croatian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Croatia for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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10

0

0

1.1%

0.0%

0.0%

4.5%

**Table 105:** Croatian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material			
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
Diamage supply for hosting and electricity	Pau	u matarial	imported	from Ell
Biomass supply for heating and electricity	<del> </del>	w material		
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Raw r	naterial im	ported fro	om non-EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other	ktoe	n.a.	n.a.	
wooded land energy generation				
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops Agricultural by-products / processed residues and fishery	ktoe ktoe	n.a. n.a.	n.a. n.a.	
by-products	NIOE	ıı.a.	ii.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
		n.a.	n.a.	
Common arable crops for biofuels	ktoe	m.a.		
Common arable crops for biofuels  Energy crops and short rotation trees for biofuels	ktoe ktoe	n.a.	n.a.	
			n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.		
Energy crops and short rotation trees for biofuels Others	ktoe ktoe	n.a. n.a.	n.a.	

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	n.a.	n.a.	
Land used for short rotation trees	ha	n.a.	n.a.	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 106: Croatian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	
Consumption - Fuel type X	ktoe	n.a.	n.a.	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	n.a.	n.a.	

Table 107: Croatian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	5768661	5885141	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	4947227	5000921	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	791838	829719	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	29596	54501	

Table 108: Croatian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	0	0	
Origin/destination	0	0	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	n.a.	n.a.	
2012	n.a.	n.a.	
2013	n.a.	n.a.	
2014	n.a.	n.a.	
2015	n.a.	n.a.	
2016	n.a.	n.a.	
2017	n.a.	n.a.	
2018	n.a.	n.a.	
2019	n.a.	n.a.	
2020	n.a.	n.a.	

Table 109: Croatian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Croatia (ktoe) (see Table 9 of the NREAP)

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#### **Comments for Croatia**

No comments for Croatia.

### 14 Hungary

	Unit	2011	2012	Comment
Renewable heating and cooling	%	12.28	13.54	
Renewable electricity	%	6.35	6.1	
Renewable Transport	%	5.05	4.49	
Overall renewable energy share	%	9.06	9.6	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 110: Hungarian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Hungary (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	1133	1115	
Gross final consumption of electricity from RES	ktoe	233	222	
Gross final consumption of energy from RES in transport	ktoe	162	137	
Gross total RES consumption	ktoe	1528	1474	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	1528	1474	

**Table 111:** Hungarian PR Table 1a: Calculation table for the renewable energy contribution in Hungary of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 112: Hungarian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Hungary for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	55	217	19	1.2%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	3.22	15	1	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	10.68	40	3	0.2%	
Hydropower >10 MW (non pumped)	40.9	161	14	0.9%	
Hydronower pumped storage	n.a.	n.a. n.a.	n.a.	n.a. n.a.	
Hydropower mixed (normalised)  Geothermal	n.a. 0	n.a. 0	n.a. 0	0.0%	
Solar	4	2	0	0.0%	
Solar photovoltaic	4	2	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	323	645	55	3.6%	
Onshore wind	323	645	55	3.6%	
Offshore wind	0	0	0	0.0%	
Biomass	392	1844	159	10.3%	
Solid biomass	343	1656	142	9.2%	
Biogas	49 0	188 0	16 0	1.0% 0.0%	
Bioliquids Total	774	2708	233	15.1%	
Total CHP	134.4	253	233	13.1%	
IOTAI CHP	154.4	253	22	1.4%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			104	6.7%	
Solar thermal Biomass			1023	0.4% 66.2%	
Solid biomass			1023	65.4%	
Biogas			1011	0.8%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			n.a.	n.a.	1 (p.98)
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			1133	73.3%	
Total district heating			75	4.9%	
Total biomass in households			724	46.8%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			46	3.0%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			46	3.0%	
Biodiesel Biodiesel Article 21.2			116 18	7.5% 1.2%	
Biodiesel imported			19	1.2%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			18	1.2%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			18	1.2%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			180	11.6%	2 (p.98)

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	55	219	19	1.2%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	3.49	20	2	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	10.68	39	3	0.2%	
Hydropower >10 MW (non pumped)	40.9	160	14	0.9%	
Hydropower pumped storage	n.a.	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal Solar	12	0	0	0.0%	
	12	8	1	0.0%	
Solar photovoltaic Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	325	701	60	3.9%	
Onshore wind	325	701	60	3.9%	
Offshore wind	0	0	0	0.0%	
Biomass	348	1656	142	9.2%	
Solid biomass	298	1421	122	7.9%	
Biogas	50	235	20	1.3%	
Bioliquids	0	0	0	0.0%	
Total	740	2584	222	14.4%	
Total CHP	138	268	23	1.5%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			107	6.9%	
Solar thermal			6	0.4%	
Biomass			1002	64.8%	
Solid biomass			985	63.7%	
Biogas			18	1.2%	
Bioliquids			0	0.0%	1 (p.98)
Renewable energy from heat pumps			n.a.	n.a.	1 (p.98)
Aerothermal heat pumps Geothermal heat pumps			n.a. n.a.	n.a. n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			1115	72.1%	
Total district heating			85	5.5%	
Total biomass in households			724	46.8%	
Total biolitass III flousefloids			724	40.8%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			34	2.2%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			34	2.2%	
Biodiesel			103	6.7%	
Biodiesel Article 21.2			17	1.1%	
Biodiesel imported			18	1.2%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			17	1.1%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			17	1.1%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			154	10.0%	2 (p.98)

Table 113: Hungarian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Hungary for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 114:** Hungarian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	715.03	660.78	3 (p.98)
Indirect supply of wood biomass	ktoe	30.42	62.2	4 (p.98)
Energy crops	ktoe	n.a.	0.77	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	5 (p.98)
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	745.45	723.75	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	6 (p.98)
Energy crops and short rotation trees for biofuels Others	ktoe ktoe	n.a.	n.a.	7 (~ 00)
Total biomass for transport*	ktoe	n.a.	n.a.	7 (p.98)
Total biomass for all sectors*	ktoe	745.45	723.75	
Biomass supply for heating and electricity	Rav	w material	imported f	rom EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other	ktoe	9.11	32.4	3 (p.98)
wooded land energy generation Indirect supply of wood biomass	ktoe	51	35.2	4 (p.98)
Energy crops	ktoe	n.a.	n.a.	1 (p.50)
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
by-products Biomass from waste	ktoe	n.a.	n.a.	5 (p.98)
Others	ktoe	n.a.	n.a.	3 (p.30)
Total biomass for heating and electricity*	ktoe	60.11	67.6	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	6 (p.98)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	7 (p.98)
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	60.11	67.6	
Biomass supply for heating and electricity	Pave	naterial im	parted fro	m non Ell
biomass supply for fleating and electricity				
Direct cumply of wood biomass from forests and other	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	13.7	16	3 (p.98)
Indirect supply of wood biomass	ktoe	4.62	29.6	4 (p.98)
Energy crops	ktoe	n.a.	n.a.	(1 7
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	5 (p.98)
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	18.32	45.6	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	6 (p.98)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	7 ( . 00)
Others	ktoe	n.a.	n.a.	7 (p.98)
Total biomass for transport*	ktoe	n.a.	n.a.	
*The values indicated with '*' are calculated values and have n	ktoe	18.32	45.6	

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	162000	197000	8 (p.98)
Land used for short rotation trees	ha	3000	n.a.	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

**Table 115:** Hungarian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	9 (p.98)
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	27	26	
Total consumption Art.21.2. biofuels	ktoe	18	17	
Share of 21(2) fuels from total RES-T	%	10	11	

**Table 116:** Hungarian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	4467773.24	4254288	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	1031204.11	921740	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	3177000.75	3112749	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	259568.37	219798.9	

**Table 117:** Hungarian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	10 (p.98)
Origin/destination	n.a.	n.a.	10 (p.98)
Unit	ktoe	ktoe	10 (p.98)
2010	147	0	10 (p.98)
2011	99	0	10 (p.98)
2012	45	0	10 (p.98)
2013	323	0	10 (p.98)
2014	267	0	10 (p.98)
2015	280	0	10 (p.98)
2016	274	0	10 (p.98)
2017	516	0	10 (p.98)
2018	464	0	10 (p.98)
2019	679	0	10 (p.98)
2020	325	0	10 (p.98)

Table 118: Hungarian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Hungary (ktoe) (see Table 9 of the NREAP)

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#### **Comments for Hungary**

- 1: Taking into account the fact that in the interest of reducing administrative burdens, the installation of heat pumps is not always subject to a licence, reliable data are not available at present for the whole volume.
- 2: In order to avoid cumulation, 'Electricity from renewable sources' was not taken into account in Table 1a (i.e. the calculation table for the renewable energy contribution in Hungary of each sector to final energy consumption).
- 3: Original table provides more detail: firewood [m3], pellets other compacted products [ton] and/or wooden briquettes [ton].
- 4: Industrial waste wood for energy purposes.
- 5: Breakdown for 'amount of domestic raw material': Biodegradable fraction of solid municipal waste\*\* 218 177 [ton] in 2011 and 194780 [ton] in 2012 (biodegradable fraction of solid municipal waste used by the Waste Recovery Facility for energy purposes (ton)), landfill gas 16711300 [m3] in 2011 and 28751300 [m3] in 2012 (these and next values based on the produced quantities reported in the HIR as part of the data supply process (ton)), biodegradable fraction of industrial waste 1160103 [ton] in 2011 and 1143955 [ton] in 2012, sewage sludge 68100 [ton] in 2011 and 78004 [ton] in 2012.
- 6: In 2011: maize 400000 tonnes, rape seed 225000 ton. In 2012: maize 700000 ton, rape seed 210000 ton.
- 7: Used frying oil.
- 8: Maize: 62000 [ha] in 2011 and 108000 [ha] in 2012, rape seed: 100000 [ha] in 2011 and 89000 [ha] in 2012.
- 9: The table entries shown for this cell state 'biodiesel'.
- 10: The figures for the period 2009 to 2012 are actual values, while the figures for the other periods were estimated in accordance with the contents of Hungary's Renewable Energy Utilisation Action Plan.

## 15 Ireland

	Unit	2011	2012	Comment
Renewable heating and cooling	%	4.7	5.2	
Renewable electricity	%	17.6	19.6	
Renewable Transport	%	3.7	3.8	
Overall renewable energy share	%	6.5	7.1	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 119: Irish PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Ireland (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	218	232	
Gross final consumption of electricity from RES	ktoe	423	468	
Gross final consumption of energy from RES in transport	ktoe	98	85	
Gross total RES consumption	ktoe	739	785	
Transfer of RES to other Member States	ktoe	n.a.	n.a.	
Transfer of RES from other Member States and 3rd countries	ktoe	n.a.	n.a.	
RES consumption adjusted for target	ktoe	739	785	

Table 120: Irish PR Table 1a: Calculation table for the renewable energy contribution in Ireland of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 121: Irish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Ireland for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	529	752	65	8.7%	
Hydropower (non pumped)	237	752	65	8.7%	
Hydropower <1 MW (non pumped)	20	63	5	0.7%	
Hydropower 1 MW - 10 MW (non pumped)	21	67	6	0.8%	
Hydropower >10 MW (non pumped)	196	622	53	7.2%	
Hydropower pumped storage	292	0	0	0.0%	1 (p.104)
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	n.a.	n.a.	n.a.	n.a.	
Solar	0.67	0.46	0	0.0%	2 (p.104)
Solar photovoltaic	0.67	0.46	0	0.0%	
Concentrated solar power	n.a.	n.a.	n.a.	n.a.	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	1631	3830	329	44.6%	
Onshore wind	1606	0	0	0.0%	
Offshore wind	25	0	0	0.0%	
Biomass	39	339	29	3.9%	
Solid biomass	5	137	12	1.6%	
Biogas	34	202	17	2.3%	
Bioliquids	0	0	0	0.0%	
Total	2200	4921	423	57.2%	
Total CHP	10.9	38	3	0.4%	3 (p.104)
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			n.a.	n.a.	
Solar thermal			8.1	1.1%	
Biomass			192.5	26.0%	4 (p.104)
Solid biomass			183	24.8%	
Biogas			9.5	1.3%	
Bioliquids			18	0.0%	
Renewable energy from heat pumps				2.4%	
Aerothermal heat pumps Geothermal heat pumps			n.a. 18	n.a. 2.4%	
• •				2.4% n.a.	
Hydrothermal heat pumps  Total			n.a. <b>218</b>	29.5%	
10.111			-		
Total district heating			n.a.	n.a.	
Total biomass in households			22	3.0%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			29	3.9%	
Bioethanol / bio-ETBE Article 21.2			29	3.9%	
Bioethanol / bio-ETBE imported			29	3.9%	
Biodiesel			68	9.2%	
Biodiesel Article 21.2			68	9.2%	
Biodiesel imported			42	5.7%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			0.53	0.1%	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport			0.53	0.1%	
Other biofuels			0.12	0.0%	
Other biofuels Article 21.2			0.12	0.0%	
Total			98	13.3%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	529	971	83	11.3%	
Hydropower (non pumped)	237	759	65	8.8%	
Hydropower <1 MW (non pumped)	20	65	6	0.8%	
Hydropower 1 MW - 10 MW (non pumped)	21	68	6	0.8%	
Hydropower >10 MW (non pumped)	196	627	54	7.3%	
Hydropower pumped storage	292	212	18	2.5%	1 (p.104)
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	_ (
Geothermal	n.a.	n.a.	n.a.	n.a.	
Solar	0.73	0.5	0	0.0%	2 (p.104)
Solar photovoltaic	0.73	0.5	0	0.0%	_ (
Concentrated solar power	n.a.	n.a.	n.a.	n.a.	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	1763	4247	365	49.4%	
Onshore wind	1738	0	0	0.0%	
Offshore wind	25	0	0	0.0%	
Biomass	60	441	38	5.1%	
Solid biomass	20	242	21	2.8%	
Biogas	40	199	17	2.3%	
Bioliquids	0	0	0	0.0%	
Total	2353	5659	487	65.8%	
Total CHP	11.3	40	3	0.5%	3 (p.104)
<b>R</b> enewable Heating and Cooling			ktoe	%	Comment
Geothermal			n.a.	n.a.	
Solar thermal			10.2	1.4%	
Biomass			203.9	27.6%	4 (p.104)
Solid biomass			195	26.4%	
Biogas			8.9	1.2%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			18	2.4%	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			18	2.4%	
Hydrothermal heat pumps			n.a.	n.a.	
Total			232	31.4%	
Total district heating			n.a.	n.a.	
Total biomass in households			27	3.7%	
iotal bioliass ili liousellolus			27	3.770	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			29	3.9%	
Bioethanol / bio-ETBE Article 21.2			29	3.9%	
Bioethanol / bio-ETBE imported			29	3.9%	
Biodiesel			56	7.6%	
Biodiesel Article 21.2			56	7.6%	
Biodiesel imported			33	4.5%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			0.58	0.1%	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport			0.58	0.1%	
Other biofuels			0.08	0.0%	
Other biofuels Article 21.2			0.08	0.0%	
Total	I		85	11.5%	

Table 122: Irish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Ireland for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 123:** Irish PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	40	38	
Indirect supply of wood biomass	ktoe	98	105	
Energy crops	ktoe	13.1	14	
Agricultural by-products / processed residues and fishery	ktoe	41	33	
by-products				
Biomass from waste Others	ktoe	68	75	
Total biomass for heating and electricity*	ktoe ktoe	260.1	265	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	Comment
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	260.1	265	
Total biolinass for all sections	Rioc	200.2	203	
Biomass supply for heating and electricity	Rav	w material	imported t	rom EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	1.8	3.27	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	1.8	3.27	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	1.8	3.27	
Biomass supply for heating and electricity	Rawı	material im	ported fro	m non-EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other	ktoe	0.08	0.03	
wooded land energy generation Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
by-products				
Biomass from waste	ktoe	n.a.	n.a.	
Others  Total biomass for heating and electricity*	ktoe ktoe	n.a. 0.08	n.a. 0.03	
Total biomass for heating and electricity*				Comment
Biomass supply for transport	Unit	2011	2012	Comment
	ktoe	n.a.	n.a.	
Common arable crops for biofuels	1.		n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.		
Energy crops and short rotation trees for biofuels Others	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels				

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	297000	315000	
Land used for short rotation trees	ha	689	839	
Land used for other energy crops such as grasses	ha	2349	2413	

**Table 124:** Irish PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	24	24.5	5 (p.104)
Consumption - Fuel type X	ktoe	97.3	84.9	6 (p.104)
Total production Art.21.2.biofuels	ktoe	24	24.5	
Total consumption Art.21.2. biofuels	ktoe	97.3	84.9	
Share of 21(2) fuels from total RES-T	%	40.6	65.5	

**Table 125:** Irish PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	3640820	3707781	7 (p.104)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	2723199	2738072	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	771409	831034	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	146212	138675	

**Table 126:** Irish PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	n.a.	n.a.	
2012	0	270	
2013	0	271	
2014	0	390	
2015	0	314	
2016	0	418	
2017	0	212	
2018	0	313	
2019	0	141	
2020	0	0	

Table 127: Irish PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Ireland (ktoe) (see Table 9 of the NREAP)

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#### **Comments for Ireland**

- 1: Pumped storage offline for all of 2011 for maintenance.
- 2: Total for 'Solar' calculated by ECN.
- 3: CHP capacity figures FOR 2011 were for solid biomass only in the last cycle. Biogas included in this cycle.
- 4: Total for 'Biomass' calculated by ECN.
- 5: Refers to production of biodiesel.
- 6: Refers to consumption of biodiesel (68.2 [ktoe] in 2011 and 56.3 [ktoe] in 2012) and bioethanol (29.1 [ktoe] in 2011 and 28.6 [ktoe] in 2012).
- 7: Total estimate is a value calculated by ECN (sum of the GHG savings from RES-E/H/C/T).

# **16**Italy

	Unit	2011	2012	Comment
Renewable heating and cooling	%	12.49	12.81	
Renewable electricity	%	23.55	27.42	
Renewable Transport	%	4.69	5.84	
Overall renewable energy share	%	12.27	13.53	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 128: Italian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Italy (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	7217.7	7387.5	
Gross final consumption of electricity from RES	ktoe	6838.1	7839.8	
Gross final consumption of energy from RES in transport	ktoe	1575.3	1551.6	
Gross total RES consumption	ktoe	15631.2	16778.9	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	15631.2	16778.9	

Table 129: Italian PR Table 1a: Calculation table for the renewable energy contribution in Italy of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 130: Italian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Italy for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	21737	44012	3784	23.9%	
Hydropower (non pumped)	14193	33283	2862	18.1%	
Hydropower <1 MW (non pumped)	548	1765	152	1.0%	
Hydropower 1 MW - 10 MW (non pumped)	2271	6351	546	3.5%	
Hydropower >10 MW (non pumped)	11374	25168	2164	13.7%	4 ( . 440)
Hydropower pumped storage	3957 3587	1934 2178	166 187	1.1% 1.2%	1 (p.110)
Hydropower mixed (normalised) Geothermal	728	5654	486	3.1%	
Solar	12773	10796	928	5.9%	
Solar photovoltaic	12773	10796	928	5.9%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	6918	10266	883	5.6%	
Onshore wind	6918	10266	883	5.6%	
Offshore wind	0	0	0	0.0%	
Biomass	2631	10832	931	5.9%	2 (p.110)
Solid biomass	421	2522	217	1.4%	
Biogas	732	3405	293	1.9%	
Bioliquids Total	736 <b>44787</b>	2698 <b>81561</b>	232 <b>7013</b>	1.5% <b>44.4%</b>	3 (p.110)
Total CHP	1084	4224	363	2.3%	3 (p.110)
IOTAI CHP	1084	4224	303	2.5%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			139	0.9%	
Solar thermal			140	0.9%	
Biomass			4481	28.4%	4 (p.110)
Solid biomass			4044	25.6%	
Biogas			330	2.1%	
Bioliquids			22	0.1%	
Renewable energy from heat pumps			2457	15.5%	
Aerothermal heat pumps Geothermal heat pumps			2400 51	15.2% 0.3%	
Hydrothermal heat pumps			6	0.5%	
Total			7218	45.7%	
Total district heating			161	1.0%	
Total biomass in households			3545	22.4%	
iotal biolitass in nouscilotas			3343	221-170	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			114	0.7%	
Bioethanol / bio-ETBE Article 21.2			7	0.0%	
Bioethanol / bio-ETBE imported			50	0.3%	
Biodiesel			1296	8.2%	
Biodiesel Article 21.2			57	0.4%	
Biodiesel imported			764	4.8%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			175	1.1%	
Renewable electricity road transport			5	0.0%	
Renewable electricity non-road transport			170	1.1%	
Other biofuels Other biofuels Article 21.2			0	0.0% 0.0%	
Total			<b>1575</b>	10.0%	5 (p.110)
Total			13/3	10.076	3 (p.110)

Renewable Electricity	Capacity	Energy			Comment
	MW	GWh	ktoe	%	
Hydropower	21880	44141	3795	24.0%	
Hydropower (non pumped)	14326	36303	3121	19.7%	
Hydropower <1 MW (non pumped)	570	1974	170	1.1%	
Hydropower 1 MW - 10 MW (non pumped)	2335	7018	603	3.8%	
Hydropower >10 MW (non pumped)	11421	27311	2348	14.9%	
Hydropower pumped storage	3957	1979	170	1.1%	1 (p.110)
Hydropower mixed (normalised)	3598	2165	186	1.2%	
Geothermal	728	5592	481	3.0%	
Solar	16420	18862	1622	10.3%	
Solar photovoltaic	16420	18862	1622	10.3%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	8102	12402	1066	6.7%	
Onshore wind	8102	12402	1066	6.7%	
Offshore wind	0	0	0	0.0%	
Biomass	3555	12342	1061	6.7%	2 (p.110)
Solid biomass	538	2582	222	1.4%	~ (b:110)
Biogas	1274	4620	397	2.5%	
Bioliquids	989	2977	256	1.6%	
Total	50685	93339	8026	50.8%	3 (p.110)
	1642		447	2.8%	3 (p.110)
Total CHP	1642	5193	447	2.8%	
<b>R</b> enewable Heating and Cooling			ktoe	%	Comment
Geothermal			134	0.8%	
Solar thermal			155	1.0%	
Biomass			4485	28.4%	4 (p.110)
Solid biomass			4210	26.6%	
Biogas			183	1.2%	
Bioliquids			21	0.1%	
Renewable energy from heat pumps			2613	16.5%	
Aerothermal heat pumps			2548	16.1%	
Geothermal heat pumps			58	0.4%	
Hydrothermal heat pumps			6	0.0%	
Total			7388	46.7%	
Total district heating			171	1.1%	
Total biomass in households			3619	22.9%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			103	0.7%	
Bioethanol / bio-ETBE Article 21.2			3	0.0%	
Bioethanol / bio-ETBE imported			45	0.3%	
Biodiesel			1262	8.0%	
Biodiesel Article 21.2			338	2.1%	
Biodiesel imported			1009	6.4%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			186	1.2%	
Renewable electricity road transport			5	0.0%	
Renewable electricity non-road transport			181	1.1%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
violacio / il tibio Elile				0.070	

Table 131: Italian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Italy for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 132:** Italian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material				
	Unit	2011	2012	Comment	
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	2679	2892	6 (p.110)	
Indirect supply of wood biomass	ktoe	772	835	7 (p.110)	
Energy crops	ktoe	610	684	8 (p.110)	
Agricultural by-products / processed residues and fishery by-products	ktoe	547	544	9 (p.110)	
Biomass from waste	ktoe	1354	1341	10 (p.110)	
Others	ktoe	n.a.	n.a.	11 (p.110)	
Total biomass for heating and electricity*	ktoe	5962	6296		
Biomass supply for transport	Unit	2011	2012	Comment	
Common arable crops for biofuels	ktoe	3	208	12 (p.110)	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.		
Others	ktoe	10	18	13 (p.110)	
Total biomass for transport*	ktoe	13	226		
Total biomass for all sectors*	ktoe	5975	6522		
Dismoss supply for hosting and electricity	Raw material imported from EU				
Biomass supply for heating and electricity					
	Unit	2011	2012	Comment	
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	480	423	6 (p.110)	
Indirect supply of wood biomass	ktoe	690	653	7 (p.110)	
Energy crops	ktoe	51	104	8 (p.110)	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	9 (p.110)	
Biomass from waste	ktoe	n.a.	n.a.	10 (p.110)	
Others	ktoe	n.a.	n.a.	11 (p.110)	
Total biomass for heating and electricity*	ktoe	1221	1180		
Biomass supply for transport	Unit	2011	2012	Comment	
Common arable crops for biofuels	ktoe	407	208	12 (p.110)	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.		
Others	ktoe	18	18	13 (p.110)	
Total biomass for transport*	ktoe	425	226		
Total biomass for all sectors*	ktoe	1646	1406		
Diamage cumply for heating and electricity	Day material imported from non CII				
Biomass supply for heating and electricity	Raw material imported from non-EU				
	Unit	2011	2012	Comment	
Direct supply of wood biomass from forests and other	ktoe	11	6	6 (p.110)	
wooded land energy generation Indirect supply of wood biomass	ktoe	54	63	7 (p.110)	
Energy crops	ktoe	437	460	8 (p.110)	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	9 (p.110)	
by-products					
Biomass from waste	ktoe	n.a.	n.a.	10 (p.110)	
Others  Total biomass for heating and electricity*	ktoe ktoe	n.a. 502	n.a. 529	11 (p.110)	
Biomass supply for transport	Unit	2011	2012	Comment	
Common arable crops for biofuels	ktoe	407	208	12 (p.110)	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.		
Others	ktoe	18	18	13 (p.110)	
Total biomass for transport*	ktoe	425	226		
Total biomass for all sectors*	ktoe	927	755		

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	3075711	3227559	14 (p.110)
Land used for short rotation trees	ha	7000	7000	15 (p.110)
Land used for other energy crops such as grasses	ha	42335	37099	16 (p.110)

**Table 133:** Italian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	44.1	44.1	17 (p.110)
Consumption - Fuel type X	ktoe	64.4	340.1	18 (p.110)
Total production Art.21.2.biofuels	ktoe	44.1	44.1	
Total consumption Art.21.2. biofuels	ktoe	64.4	340.1	
Share of 21(2) fuels from total RES-T	%	4.09	21.92	19 (p.110)

**Table 134:** Italian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	63775086	70942213	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	41518985	47759259	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	20016866	20516243	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	2239235	2666711	

**Table 135:** Italian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	5263	0	
2011	6765	0	
2012	7209	0	
2013	7384	0	
2014	6971	0	
2015	6797	0	
2016	6102	0	
2017	5796	0	
2018	4661	0	
2019	3666	0	
2020	2858	0	

Table 136: Italian PR Table 7:
Actual and estimated excess
and/or deficit (-) production of
renewable energy compared to
the indicative trajectory which
could be transferred to/from
other Member States and/or
third countries in Italy (ktoe) (see
Table 9 of the NREAP)

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### **Comments for Italy**

- 1: Instead of the entire power of hydroelectric pumping installations (considered in this version) only the share virtually attributable to natural inputs was considered.
- 2: Renewable (biodegradable) share of waste in 2011: 742 MW (2208 GWh). In 2012: 754 MW (2163 GWh). In the previous version of the Progress Report and in the NREAP the biodegradable share of waste was included in solid biomass.
- 3: In the previous version of the Progress Report and in the NREAP, the output power indicated was gross power (whereas this version shows net values).
- 4: Renewable share of waste 86 [ktoe] in 2011 and 71 [ktoe] in 2012.
- 5: Total with multiplier factors used in the numerators for the purposes of the transport objective: 1647 [ktoe] in 2011 and 1899 [ktoe] in 2012.
- 6: Data expressed in tonnes/year as is or tonnes/year volatile substance for materials intended for anaerobic digestion.
- 7: This item also includes pellets, including imported pellets, even though this is not strictly speaking a raw material. See also comment 16.
- 8: See comment 16.
- 9: See comment 16.
- 10: See comment 16.
- 11: See comment 16.
- 12: See comment 16.
- 13: See comment 16.
- 14: Data for 2011: sugar beet: 45545 [ha]; rape seed: 18759 [ha]; sunflower: 118099 [ha]; durum wheat: 1198974 [ha]; common wheat: 533606 [ha]; maize: 994773 [ha]; soy: 165955 [ha]. Data for 2012: sugar beet: 52500 [ha]; rape seed: 10301 [ha]; sunflower: 111678 [ha]; durum wheat: 1303863 [ha]; common wheat: 615751 [ha]; maize: 980473 [ha]; soy: 152993 [ha].
- 15: Regards short-rotation coppice.
- 16: Regards sorghum.
- 17: Production biodiesel: 42.8 [ktoe] in 2011 and 2012. Production ETBE: 1.3 [ktoe] in 2011 and 2012.
- 18: Consumption biodiesel: 57.3 [ktoe] in 2011 and 337.6 [ktoe] in 2012. Consumption ETBE: 7.1 [ktoe] in 2011 and 2.5 [ktoe] in 2012.
- 19: Data refer to the share of Article 21(2) biofuels on total RES-T numerator without multiplying coefficients. Progress report provied also values with multiplying coefficients.

# 17 Latvia

	Unit	2011	2012	Comment
Renewable heating and cooling	%	44.83	47	
Renewable electricity	%	44.7	44.88	
Renewable Transport	%	3.24	3.1	
Overall renewable energy share	%	33.55	35.78	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 137: Latvian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Latvia (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	1059	1188	
Gross final consumption of electricity from RES	ktoe	278	299	
Gross final consumption of energy from RES in transport	ktoe	27	24	
Gross total RES consumption	ktoe	1364	1510	
Transfer of RES to other Member States	ktoe	n.a.	n.a.	
Transfer of RES from other Member States and 3rd countries	ktoe	n.a.	n.a.	
RES consumption adjusted for target	ktoe	1364	1510	

Table 138: Latvian PR Table 1a: Calculation table for the renewable energy contribution in Latvia of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 139: Latvian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Latvia for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	1576	3097.2	266	19.5%	1 (p.116)
Hydropower (non pumped)	1576	3100.8	267	19.5%	
Hydropower <1 MW (non pumped)	25	62.6	5	0.4%	
Hydropower 1 MW - 10 MW (non pumped)	1	3.2	0	0.0%	
Hydropower >10 MW (non pumped)	1550	3035	261	19.1%	
Hydropower pumped storage	0	0	0	0.0%	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	0	0	0	0.0%	2 (p.116)
Solar photovoltaic	0	0	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	36	64.6	6	0.4%	3 (p.116)
Onshore wind	36	64.6	6	0.4%	
Offshore wind	0	0	0	0.0%	
Biomass	30	119.4	10	0.8%	
Solid biomass	5	12.8	1	0.1%	
Biogas	25	105.4	9	0.7%	
Bioliquids	0	1.2	0	0.0%	
Total	1642	3281.2	282	20.6%	
Total CHP	n.a.	116.3	10	0.7%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			n.a.	n.a.	4 (p.116)
Biomass			1059.2	77.4%	
Solid biomass			1048.7	76.7%	
Biogas			7.7	0.6%	
Bioliquids			2.8	0.2%	
Renewable energy from heat pumps			n.a.	n.a.	5 (p.116)
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			1059.2	77.4%	
Total district heating			94.8	6.9%	
Total biomass in households			624.4	45.6%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			7.7	0.6%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			11.3	0.8%	6 (p.116)
Biodiesel			16.9	1.2%	0 (p.110)
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			8.9	0.7%	7 (p.116)
Hydrogen from renewables			0.5	0.0%	, (p.220)
Renewable electricity			4.5	0.3%	
Renewable electricity road transport			2.3	0.2%	
Renewable electricity non-road transport			2.1	0.2%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			26.8	2.0%	8 (p.116)

Capacity Energy  Renewable Electricity MW GWh ktoe %	Comment
Renewable Electricity MW GWh ktoe %	
Hydropower 1576 3140.2 270 19.7%	1 (p.116)
Hydropower (non pumped) 1576 3144.1 270 19.8%	
Hydropower <1 MW (non pumped) 25 64.5 6 0.4%	
Hydropower 1 MW - 10 MW (non pumped) 1 3.6 0 0.0%	
Hydropower >10 MW (non pumped) 1550 3076 264 19.3%	
Hydropower pumped storage 0 0 0 0.0%	
Hydropower mixed (normalised) 0 0 0 0.0%	
Geothermal         0         0         0         0.0%	
Solar 0 0 0 0.0%	2 (p.116)
Solar photovoltaic 0 0 0 0.0%	
Concentrated solar power 0 0 0 0.0%	
Tidal, wave and ocean energy 0 0 0 0.0%	
Wind power         59         98.4         8         0.6%	
Onshore wind 59 98.4 8 0.6%	
Offshore wind 0 0 0 0.0%	
Biomass 66 288.6 25 1.8%	
Solid biomass 23 64.4 6 0.4%	
Biogas 43 223.4 19 1.4%	
Bioliquids 0 0.8 0 0.0%	
Total 1701 3527.3 303 22.2%	
Total CHP n.a. 282.9 24 1.8%	
Renewable Heating and Cooling ktoe %	Comment
Geothermal 0 0.0%	
Solar thermal n.a. n.a.	
Biomass 1187.5 86.8%	
Solid biomass 1167.4 <i>85.3%</i>	
Biogas 17.8 1.3%	
Bioliquids 2.3 0.2%	
Renewable energy from heat pumps n.a. n.a. n.a.	5 (p.116)
Aerothermal heat pumps n.a. n.a.	
Geothermal heat pumps n.a. n.a.	
Hydrothermal heat pumps n.a. n.a.	
Total 1187.5 86.8%	
Total district heating 120.5 8.8%	
Total biomass in households 664.6 48.6%	
Renewable Transport ktoe %	Comment
Bioethanol / bio-ETBE 6.4 0.5%	
Bioethanol / bio-ETBE Article 21.2 0 0.0% Bioethanol / bio-ETBE imported 10.7 0.8%	
Biodesel 10.7 0.8%	
Biodiesel Article 21.2 0 0.0%	
Biodiesel imported 5.1 0.4%	
Hydrogen from renewables 0 0.0%	
Renewable electricity 4.7 0.3%	
Renewable electricity road transport 2.4 0.2%	
Renewable electricity non-road transport 2.3 0.2%	
Other biofuels 0 0.0%	
Other biofuels Article 21.2 0 0.0%	
Total 23.9 1.7%	8 (p.116)

Table 140: Latvian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Latvia for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 141:** Latvian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material			
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	864	836	
Indirect supply of wood biomass	ktoe	875	1032	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
by-products	later			
Biomass from waste Others	ktoe ktoe	n.a. n.a.	n.a. n.a.	
Total biomass for heating and electricity*	ktoe	1739	1868	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	1739	1868	
Biomass supply for heating and electricity	Rav	v material	imported t	from EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	0	1	
Indirect supply of wood biomass	ktoe	2	6	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
by-products Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	2	7	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	2	7	
Biomass supply for heating and electricity	Raw r	naterial im	ported fro	m non-EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other	ktoe	0	0	
wooded land energy generation			14	
Indirect comply of wood biomass	leton		14	
	ktoe	n a	n a	
Energy crops	ktoe	n.a.	n.a. n.a.	
Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products			n.a. n.a.	
Energy crops Agricultural by-products / processed residues and fishery	ktoe	n.a.	-	
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe ktoe	n.a. n.a. n.a. n.a.	n.a. n.a.	
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	ktoe ktoe	n.a. n.a.	n.a.	
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe ktoe	n.a. n.a. n.a. n.a.	n.a. n.a.	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a.	n.a. n.a. n.a.	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe unit ktoe ktoe	n.a. n.a. n.a. 2 2011 n.a. n.a.	n.a. n.a. n.a. 14 2012 n.a. n.a.	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe ktoe ktoe unit ktoe ktoe ktoe	n.a. n.a. n.a. 2 2011 n.a. n.a.	n.a. n.a. n.a. 14 2012 n.a. n.a. n.a.	Comment
Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe unit ktoe ktoe	n.a. n.a. n.a. 2 2011 n.a. n.a.	n.a. n.a. n.a. 14 2012 n.a. n.a.	Comment

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	650874.	06693424.	3 9 (p.116)
Land used for short rotation trees	ha	209.38	321.37	10 (p.116)
Land used for other energy crops such as grasses	ha	884.94	1155.17	11 (p.116)

**Table 142:** Latvian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	12 (p.116)
Total consumption Art.21.2. biofuels	ktoe	0	0	13 (p.116)
Share of 21(2) fuels from total RES-T	%	0	0	

**Table 143:** Latvian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	4661013	4569785	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	758866	816158	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	3858153	3713545	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	43993	40082	

**Table 144:** Latvian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	0	-20	
2012	78	0	
2013	n.a.	n.a.	
2014	n.a.	n.a.	
2015	n.a.	n.a.	
2016	n.a.	n.a.	
2017	n.a.	n.a.	
2018	n.a.	n.a.	
2019	n.a.	n.a.	
2020	n.a.	n.a.	

Table 145: Latvian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Latvia (ktoe) (see Table 9 of the NREAP)

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#### Comments for Latvia

- 1: The actual amount of hydropower generated in 2012 was 3707 GWh (2887 GWh in 2011).
- 2: In 2009 the Ministry of the Economy granted rights to sell electricity under the mandatory procurement procedure to two economic operators having an aggregate installed capacity of 0.91 MW. However, the rights granted were not exercised by the due date and the decisions were therefore annulled. According to Solar Energy Association data the current solar energy capacity installed in Latvia is as follows: solar power plants connected to the grid approximately 668 kWp; autonomous solar power plants approximately 37 kWp. Given that the Solar Energy Association does not include all companies and experts operating in this area, the total capacity of solar energy for electricity and heating could be higher.
- 3: The actual amount wind power in 2012 was 114 GWh (2011: 71 GWh).
- 4: According to the Solar Energy Association data for the current solar thermal power plants (collectors) could be more than 800 kWth. Given that the Solar Energy Association does not include all companies and experts operating in this area, the total capacity of solar energy for electricity and heating could be higher.
- 5: Heat pumps are also utilised in Latvia for heating purposes; however, no accurate statistical data on the related total installed capacity and energy generation are available.
- 6: Export of bioethanol / bio-ETBE: 5.4 [ktoe] in 2011 and 5.1 [ktoe] in 2012.
- 7: Export of biodiesel: 42.0 [ktoe] in 2011 and 69.1 [ktoe] in 2012.

data).

- 8: Refers to the value according to article 3(4)(c) of Directive 2009/28/EC. Actual values: 30.3 [ktoe] in 2011 and 27.4 [ktoe] in 2012.
- 9: Only total area under the following arable crops: summer wheat, winter wheat, rye, summer barley, winter barley, oats, triticale, buckwheat, hemp, summer rape, winter rape, fibre flax, oil flax, field beans, peas, sweet lupins, mixes of the aforementioned arable crops. Source: Ministry of Agriculture
- 10: Aspen, Willow and Grey alder (see Latvian Progress Report Table 4a for detailed data).11: Reed canary grass, Switch grass (see Latvian Progress Report Table 4a for detailed
- 12: Currently, second-generation biofuels from wastes, residues, non-food cellulosic material and lingo-cellulosic material are not being produced and used in Latvia. In 2011 and 2012, cereals, rape and rapeseed oil were used for the production of biofuels.
- 13: Currently, second-generation biofuels from wastes, residues, non-food cellulosic material and lingo-cellulosic material are not being produced and used in Latvia. In 2011 and 2012, cereals, rape and rapeseed oil were used for the production of biofuels.

# 18 Lithuania

	Unit	2011	2012	Comment
Renewable heating and cooling	%	33.68	35.41	
Renewable electricity	%	9	10.9	
Renewable Transport	%	3.7	4.8	
Overall renewable energy share	%	20.23	21.72	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 146: Lithuanian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Lithuania (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	872	937	
Gross final consumption of electricity from RES	ktoe	84	103	
Gross final consumption of energy from RES in transport	ktoe	46	62	
Gross total RES consumption	ktoe	1002	1102	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	1002	1102	

Table 147: Lithuanian PR Table
1a: Calculation table for the
renewable energy contribution in
Lithuania of each sector to final
energy consumption (ktoe) (see
Table 4a of the NREAP)

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Table 148: Lithuanian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Lithuania for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from  $% \left\{ 1,2,...,n\right\}$ renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	876	425	37	3.6%	
Hydropower (non pumped)	116	419	36	3.6%	
Hydropower <1 MW (non pumped)	18	54	5	0.5%	
Hydropower 1 MW - 10 MW (non pumped)	8	20	2	0.2%	
Hydropower >10 MW (non pumped)	90	345	30	3.0%	
Hydropower pumped storage	n.a.	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal Solar	n.a.	n.a. n.a.	n.a. n.a.	n.a. n.a.	
Solar photovoltaic	n.a.	n.a.	n.a.	n.a.	
Concentrated solar power	n.a.	n.a.	n.a.	n.a.	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	202	409	35	3.5%	
Onshore wind	n.a.	n.a.	n.a.	n.a.	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	33	158	14	1.4%	
Solid biomass	18	121	10	1.0%	
Biogas	15	37	3	0.3%	
Bioliquids	n.a.	n.a.	n.a.	n.a.	
Total	1111	992	85	8.5%	
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			2	0.2%	
Solar thermal			n.a.	n.a.	
Biomass			871 867	86.8% 86.4%	
Solid biomass Biogas			4	0.4%	
Bioliquids			n.a.	n.a.	
Renewable energy from heat pumps			n.a.	n.a.	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			873	87.0%	
Total district heating			n.a.	n.a.	1 (p.122)
Total biomass in households			n.a.	n.a.	2 (p.122)
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			10	1.0%	
Bioethanol / bio-ETBE Article 21.2			10	1.0%	3 (p.122)
Bioethanol / bio-ETBE imported			6	0.6%	,
Biodiesel			35	3.5%	
Biodiesel Article 21.2			35	3.5%	
Biodiesel imported			30	3.0%	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			n.a.	n.a.	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport Other biofuels			n.a.	n.a.	
Other biofuels Article 21.2			n.a.	n.a.	
Total			n.a. <b>45</b>	n.a. <b>4.5</b> %	
			73	11370	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	876	430	37	3.7%	
Hydropower (non pumped)	116	425	37	3.6%	
Hydropower <1 MW (non pumped)	18	55	5	0.5%	
Hydropower 1 MW - 10 MW (non pumped)	8	21	2	0.2%	
Hydropower >10 MW (non pumped)	90	349	30	3.0%	
Hydropower pumped storage	n.a.	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	n.a.	n.a.	n.a.	n.a.	
Solar	7	2	0	0.0%	
Solar photovoltaic	7	2	0	0.0%	
Concentrated solar power	n.a.	n.a.	n.a.	n.a.	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	275	562	48	4.8%	
Onshore wind	n.a.	n.a.	n.a.	n.a.	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	53	218	19	1.9%	
Solid biomass	38	116	10	1.0%	
Biogas	15	42	4	0.4%	
Bioliquids	n.a.	n.a.	n.a.	n.a.	
Total	1211	1212	104	10.4%	
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			2	0.2%	
Solar thermal			n.a.	n.a.	
Biomass			935	93.2%	
Solid biomass			931	92.8%	
Biogas			4	0.4%	
Bioliquids			n.a.	n.a.	
Renewable energy from heat pumps			n.a.	n.a.	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			937	93.4%	
Total district heating			n.a.	n.a.	1 (p.122)
Total biomass in households			n.a.	n.a.	2 (p.122)
Renewable Transport			ktoe	%	Comment
			oc		
Bioethanol / bio-ETBE			9	0.9%	24 (22)
Bioethanol / bio-ETBE Article 21.2			9	0.9%	3 (p.122)
Bioethanol / bio-ETBE imported			7	0.7%	
Biodiesel			52	5.2%	
Biodiesel Article 21.2			52	5.2%	
Biodiesel imported			33	3.3%	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			n.a.	n.a.	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport Other biofuels			n.a.	n.a.	
Other biordels Other biofuels Article 21.2			n.a. n.a.	n.a. n.a.	
Other biolidels Article 21.2			n.a.	n.u.	

Table 149: Lithuanian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Lithuania for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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Total

**Table 150:** Lithuanian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass ktoe n.a. in ferring years of the supply of wood biomass in the supply of wood biomass from waste in the supply for transport with the supply for transport in the supply of wood biomass from heating and electricity with the supply for transport with the supply for heating and electricity with the supply for heating and electricity with the supply for heating and electricity with the supply for transport with the supply for heating and electricity with the supply for wood biomass from forests and other wooded land energy generation indirect supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass from forests and fishery by-products by-products / processed residues and fishery by-products with the supply for heating and electricity with the supply for heating and electricity with the supply for transport with the supply for heating and electricity with the supply for heating and ele	material
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Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for transport  Biomass supply for transport  Biomass supply for heating and electricity  Biomass supply for heating and electricity  Biomass supply for heating and electricity  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Energy crops and short rotation trees for biofuels Energy crops and short rotation trees for biofuels  Biomass supply for heating and electricity  Raw material import  Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others  Common arable crops for biofuels Energy crops Biomass from waste Others  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Energy crops Biomass from waste  Unit  2011 20 Common arable crops for biofuels Energy crops and short rotation trees for biofuels Energy crops and short rotation as from forests and other wooded land energy generation Indirect supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass from forests and other wooded land	n.a.
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Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels  Others  Total biomass for all sectors*  Raw material impo  Biomass supply for heating and electricity  Biomass from waste  Others  Total biomass for all sectors*  Indirect supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass  Energy crops  Agricultural by-products / processed residues and fishery by-products Biomass from waste  Others  It was to e. n.a. in the following th	0.4 67:422
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Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Cothers  Cothe	n.a. 6 (p.122
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Biomass from waste	n.a. 5 (p.122
Others	n.a. 6 (p.122
Fotal biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  ktoe  n.a.  r  Others  ktoe  n.a.  r	n.a.
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Energy crops and short rotation trees for biofuels ktoe n.a. r Others ktoe n.a. r	n.a. 7 (p.122
Others ktoe n.a. r	n.a. , (p.122
	n.a.
	n.a.
Total biomass for all sectors* ktoe 0	0

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	146860	177320	8 (p.122)
Land used for short rotation trees	ha	1500	2000	9 (p.122)
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

**Table 151:** Lithuanian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	
Consumption - Fuel type X	ktoe	n.a.	n.a.	
Total production Art.21.2.biofuels	ktoe	n.a.	n.a.	
Total consumption Art.21.2. biofuels	ktoe	n.a.	n.a.	
Share of 21(2) fuels from total RES-T	%	n.a.	n.a.	

**Table 152:** Lithuanian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	1427560	1624290	10 (p.122)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	861300	924200	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	400500	485050	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	165760	215040	

**Table 153:** Lithuanian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	n.a.	n.a.	
2012	n.a.	n.a.	
2013	n.a.	n.a.	
2014	n.a.	n.a.	
2015	n.a.	n.a.	
2016	n.a.	n.a.	
2017	n.a.	n.a.	
2018	n.a.	n.a.	
2019	n.a.	n.a.	
2020	n.a.	n.a.	

Table 154: Lithuanian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Lithuania (ktoe) (see Table 9 of the NREAP)

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#### Comments for Lithuania

- 1: Data are provided as a percentage: 22% in 2011 and 26% in 2012.
- 2: Data are provided as a percentage: 64% in 2011 and 60% in 2012.
- 3: ECN note: the Lithuanian Progress Report does not provide a header for this data entry (not in English nor in original Lithuanian version of the report).
- 4: Entries in 'primary energy in domestic raw material' refer to biogas (2.16 [ktoe] in 2011 and 2.3 [ktoe] in 2012) and fast-growing trees (2.14 [ktoe] in 2011 and 2.86 [ktoe] in 2012).
- 5: Entries in 'primary energy in domestic raw material' refer to straw. ECN: from the Lithianian Progress Report it is not clear whether also 'biogas from manure, waste of vegetable and animal origin and treatment facility sludge' is included.
- 6: Refers to biodegradable fraction of household solid waste, including biological waste and landfill gas.
- 7: Refers to rape (both seed and oil, 69.9 [ktoe] in 2011 and 84.39 [ktoe] in 2012) and cereals (12.06 [ktoe] in 2011 and 14.72 [ktoe] in 2012). Amount of domestic raw materials and primary energy from domestic raw material data from Ministry of Agriculture; amount of imported raw material data from main biofuel producers. UAB Kurana submitted data only for 2012, and UAB Arvi cukrus has not submitted data.
- 8: Refers to rape (125200 [ha] in 2011 and 150980 [ha] in 2012) and cereals (21660 [ha] in 2011 and 26340 [ha] in 2012).
- 9: Refers to Willow.
- 10: Preliminary data for 2012. More accurate data will be provided in the 2015 report.

## Luxembourg

	Unit	2011	2012	Comment
Renewable heating and cooling	%	4.8	4.99	
Renewable electricity	%	4.07	4.64	
Renewable Transport	%	2.05	2.22	
Overall renewable energy share	%	2.87	3.13	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 155: Luxembourg PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Luxembourg (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	49.8	53.5	
Gross final consumption of electricity from RES	ktoe	22.8	25.2	
Gross final consumption of energy from RES in transport	ktoe	47.8	49.5	
Gross total RES consumption	ktoe	120.6	128.2	
Transfer of RES to other Member States	ktoe	n.a.	n.a.	
Transfer of RES from other Member States and 3rd countries	ktoe	n.a.	n.a.	
RES consumption adjusted for target	ktoe	120.3	127.6	

Table 156: Luxembourg PR Table 1a: Calculation table for the renewable energy contribution in Luxembourg of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 157: Luxembourg PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Luxembourg for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	34	102	9	6.9%	
Hydropower (non pumped)	34	102	9	6.9%	
Hydropower <1 MW (non pumped)	2	6	1	0.4%	
Hydropower 1 MW - 10 MW (non pumped)	32	96	8	6.5%	
Hydropower >10 MW (non pumped)	0	0	0	0.0%	
Hydropower pumped storage	1134	1174	101	79.5%	1 (p.128)
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	41	26	2	1.8%	
Solar photovoltaic	41	26	2	1.8%	2 (p.128)
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	45	67	6	4.5%	
Onshore wind	45	67	6	4.5%	
Offshore wind	0	0	0	0.0%	
Biomass	20	96	8	6.5%	
Solid biomass	7	38	3	2.6%	
Biogas	10	58	5	3.9%	
Bioliquids	0	0	0	0.0%	
Total	148	291	25	19.7%	3 (p.128)
Total CHP	9	53	5	3.6%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			1	0.8%	
Biomass			51.7	40.7%	
Solid biomass			45.7	36.0%	4 (p.128)
Biogas			6	4.7%	5 (p.128)
Bioliquids			0	0.0%	
Renewable energy from heat pumps			1.2	0.9%	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			53.9	42.5%	
Total district heating			2.9	2.3%	
Total biomass in households			14.8	11.7%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			7	5.5%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			7	5.5%	
Biodiesel			39	30.7%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			39	30.7%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			2	1.6%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			2	1.6%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			48	37.8%	6 (p.128)
					, (p. 220)

	2012					
	Capacity		Energy		Comment	
Renewable Electricity	MW	GWh	ktoe	%		
Hydropower	34	103	9	7.0%		
Hydropower (non pumped)	34	103	9	7.0%		
Hydropower <1 MW (non pumped)	2	6	1	0.4%		
Hydropower 1 MW - 10 MW (non pumped)	32	97	8	6.6%		
Hydropower >10 MW (non pumped)	0	0	0	0.0%		
Hydropower pumped storage	1134	1164	100	78.9%	1 (p.128)	
Hydropower mixed (normalised)	0	0	0	0.0%		
Geothermal	0	0	0	0.0%		
Solar	75	38	3	2.6%		
Solar photovoltaic	75	38	3	2.6%	2 (p.128)	
Concentrated solar power	0	0	0	0.0%	2 (p.120)	
Tidal, wave and ocean energy	0	0	0	0.0%		
Wind power	58	74	6	5.0%		
Onshore wind	58	74	6	5.0%		
Offshore wind	0	0	0	0.0%		
	20	91	8			
Biomass Colid hismass				6.2% 2.4%		
Solid biomass	7	36	3			
Biogas	10	55	5	3.7%		
Bioliquids	0	0	0	0.0%		
Total	187	306	26	20.7%	3 (p.128)	
Total CHP	9	56	5	3.8%		
Renewable Heating and Cooling			ktoe	%	Comment	
Geothermal			0	0.0%		
Solar thermal			1.7	1.3%		
Biomass			54.5	42.9%		
Solid biomass			47.5	37.4%	4 (p.128)	
Biogas			7	5.5%	5 (p.128)	
Bioliquids			0	0.0%		
Renewable energy from heat pumps			1.2	0.9%		
Aerothermal heat pumps			n.a.	n.a.		
Geothermal heat pumps			n.a.	n.a.		
Hydrothermal heat pumps			n.a.	n.a.		
Total			57.4	45.2%		
Total district heating	1		3.1	2.4%		
	-					
Total biomass in households			17.6	13.9%		
Renewable Transport			ktoe	%	Comment	
Bioethanol / bio-ETBE			1	0.8%		
Bioethanol / bio-ETBE Article 21.2			0	0.0%		
Bioethanol / bio-ETBE imported			1	0.0%		
· · · · · ·			46			
Biodiesel Article 21.2				36.2%		
Biodiesel Article 21.2			0	0.0%		
Biodiesel imported			46	36.2%		
Hydrogen from renewables			0	0.0%		
Renewable electricity			2	1.6%		
Renewable electricity road transport			0	0.0%		
Renewable electricity non-road transport			2	1.6%		
Other biofuels			0	0.0%		
Other biofuels Article 21.2			0	0.0%		
Total			49	38.6%	6 (p.128)	

Table 158: Luxembourg PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Luxembourg for **2012** to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 159:** Luxembourg PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	2.22	2.67	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	2.22	2.67	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	2.22	2.67	
Biomass supply for heating and electricity	Rav	w material	imported f	from EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
by-products Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Rawı	naterial im	ported fro	m non-EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
by-products Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
*The values indicated with '*' are calculated values and have n				ress Reports

 $<sup>^{*}</sup>$  The values indicated with  $^{\prime*\prime}$  are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	569	581	7 (p.128)
Land used for short rotation trees	ha	n.a.	n.a.	
Land used for other energy crops such as grasses	ha	84	145	8 (p.128)

Table 160: Luxembourg PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	
Consumption - Fuel type X	ktoe	n.a.	n.a.	
Total production Art.21.2.biofuels	ktoe	n.a.	n.a.	
Total consumption Art.21.2. biofuels	ktoe	n.a.	n.a.	
Share of 21(2) fuels from total RES-T	%	n.a.	n.a.	

Table 161: Luxembourg PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	440080	452900	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	298550	305390	9 (p.128)
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	n.a.	n.a.	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	141530	147510	

Table 162: Luxembourg PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	0	
2011	0	0	
2012	0	0	
2013	0	-37.8	
2014	0	-9.8	
2015	0	-45	
2016	0	-21.6	
2017	0	-74.5	
2018	0	-39.2	
2019	0	-66.1	
2020	0	-92.9	

Table 163: Luxembourg PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Luxembourg (ktoe) (see Table 9 of the NREAP)

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### **Comments for Luxembourg**

- 1: Compared with the NREAP, these values also include non-pumped values.
- 2: Compared with the NREAP, the installed capacity for 2011 and 2012 and thus the energy output were higher for photovoltaic systems in particular. The value for installed capacity for 2012 was almost twice as high as the value assumed in the NREAP. This was due mainly to the fact that investment grants were reduced in 2013 and, above all, to the fact that the feed-in tariff will also be reduced at the beginning of each following year. Numerous plants were erected in late 2012 because of the reduction in feed-in tariffs announced for 2013. This explains the proportionally lower output despite the higher installed capacity in 2012.
- 3: Without pumped electricity. The production of renewable energy in the electricity sector was higher in 2011 and lower in 2012 than the values assumed in the NREAP. This is mainly due to the fact that the actual installed capacities of technologies with a high number of full load hours (hydro, biomass, biogas) are just below the values assumed in the
- 4: Final energy consumption in the heating and cooling sector from solid biomass is twice as high as that estimated in the NREAP (2011: 20.3 ktoe; 2012: 24.0 ktoe). This is due to the presence of several large industrial undertakings in the biomass sector (wood processing), which covers part of the heating requirement from biomass.
- 5: In the heating and cooling sector, three biogas plants were connected to the public gas network in 2011. Following completion of test phases in late 2011/early 2012, these plants fed in a total of 5.6 ktoe by the end of 2012. More detailed information on the practical implementation of the corresponding regulation is contained in the report '2012 Report Implementation of the Grand Duchy Regulation of 15 December 2011 on the production, remuneration and marketing of biogases' sent to the European Commission at the end of May 2013.
- 6: The proportion of energy from renewable sources in the transport sector in 2011 and 2012 is in part much higher than the figures quoted in the NREAP. This is due to the fact that, when the NREAP was prepared, there was uncertainty as to whether the renewable fuels fulfilled sustainability criteria. However, it transpired in practice that the mineral oil companies which import renewable fuels were able to provide the proof of compliance with sustainability criteria.
- 7: Main type: silage maize.
- 8: Main types: Miscanthus, grass sorghum, green fodder.
- 9: Value refers to the sum of GHG savings from RES-E and from RES-H/C.

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	Unit	2011	2012	Comment
Renewable heating and cooling	%	5.76	12.47	
Renewable electricity	%	0.64	90.99	
Renewable Transport	%	1.07	3.84	
Overall renewable energy share	%	1.33	2.7	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 164: Maltese PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Malta (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	3.73	7.37	
Gross final consumption of electricity from RES	ktoe	1.19	1.94	
Gross final consumption of energy from RES in transport	ktoe	1.32	3.03	
Gross total RES consumption	ktoe	6.25	12.35	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	6.25	12.35	

Table 165: Maltese PR Table 1a: Calculation table for the renewable energy contribution in Malta of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 166: Maltese PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Malta for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	n.a.	n.a.	n.a.	n.a.	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower 1 MW - 10 MW (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower >10 MW (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower pumped storage	n.a.	n.a.	n.a.	n.a.	
Hydropower mixed (normalised) Geothermal	n.a. n.a.	n.a. n.a.	n.a. n.a.	n.a. n.a.	
Solar	n.a.	n.a.	n.a.	n.a.	
Solar photovoltaic	6.65	12.392	1	16.8%	
Concentrated solar power	n.a.	n.a.	n.a.	n.a.	
Tidal, wave and ocean energy	n.a.	n.a.	n.a.	n.a.	
Wind power	n.a.	n.a.	n.a.	n.a.	
Onshore wind	n.a.	n.a.	n.a.	n.a.	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	n.a.	n.a.	n.a.	n.a.	
Solid biomass	n.a.	n.a.	n.a.	n.a.	
Biogas	n.a.	1.55	0	2.1%	
Bioliquids	n.a.	n.a.	n.a.	n.a.	
Total	n.a.	13.942	1	18.9%	
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			n.a.	n.a.	
Solar thermal			2.88	45.3%	
Biomass			n.a.	n.a.	
Solid biomass			0.65	10.2%	
Biogas			0.31	4.9%	
Bioliquids			n.a.	n.a.	
Renewable energy from heat pumps			n.a.	n.a.	
Aerothermal heat pumps			0	0.0%	1 (p.134)
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			3.84	60.4%	
Total district heating			n.a.	n.a.	
Total biomass in households			0	0.0%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			1.32	20.8%	
Biodiesel Article 21.2			1.32	20.8%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			0	0.0%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			n.a.	n.a.	
Other biofuels			n.a.	n.a.	
Other biofuels Article 21.2			n.a.	n.a.	
Total			1.32	20.8%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	n.a.	n.a.	n.a.	n.a.	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower 1 MW - 10 MW (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower >10 MW (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower pumped storage	n.a.	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	n.a.	n.a.	n.a.	n.a.	
Solar	n.a.	n.a.	n.a.	n.a.	
Solar photovoltaic	18.72	13.6	1	18.4%	
Concentrated solar power	n.a.	n.a. n.a.	n.a. n.a.	n.a. n.a.	
Tidal, wave and ocean energy Wind power	n.a.	n.a.	n.a.	n.a.	
Onshore wind	n.a.	n.a.	n.a.	n.a.	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	n.a.	n.a.	n.a.	n.a.	
Solid biomass	n.a.	n.a.	n.a.	n.a.	
Biogas	n.a.	3.03	0	4.1%	
Bioliquids	n.a.	n.a.	n.a.	n.a.	
Total	n.a.	16.63	1	22.5%	
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			n.a.	n.a.	
Solar thermal			3.88	61.0%	
Biomass			n.a.	n.a.	
Solid biomass			0.65	10.2%	
Biogas			0.41	6.4%	
Bioliquids			n.a.	n.a.	
Renewable energy from heat pumps			n.a.	n.a.	
Aerothermal heat pumps			1.76	27.7%	1 (p.134)
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			6.7	105.4%	
Total district heating			n.a.	n.a.	
Total biomass in households			0	0.0%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			0	0.0%	
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	
Bioethanol / bio-ETBE imported			11.a. 0	0.0%	
Biodiesel			3.03	47.7%	
Biodiesel Article 21.2			3.03	47.7%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			0	0.0%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			n.a.	n.a.	
Other biofuels			n.a.	n.a.	
Other biofuels Article 21.2			n.a.	n.a.	
Total			3.03	47.7%	

Table 167: Maltese PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Malta for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 168:** Maltese PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material			
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	3.97	3.97	
by-products				
Biomass from waste	ktoe	0.51	0.67	2 (p.134)
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	4.48	4.64	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	4.48	4.64	
Biomass supply for heating and electricity	Ray	v material	imported t	from EU
Direct supply of wood biomass from forests and other	Unit ktoe	2011 n.a.	2012 n.a.	Comment
wooded land energy generation	Rive	II.a.	II.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
by-products				
Biomass from waste	ktoe	n.a.	n.a.	2 (p.134)
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Raw r	naterial im	ported fro	m non-EU
	Unit	2011	2012	Comment
			n.a.	
Direct supply of wood biomass from forests and other	ktoe	n.a.		
wooded land energy generation	ktoe	n.a.		
• • •	ktoe	n.a.	n.a.	
wooded land energy generation Indirect supply of wood biomass Energy crops	ktoe ktoe			
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	ktoe	n.a.	n.a.	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products	ktoe ktoe ktoe	n.a. n.a. n.a.	n.a. n.a. n.a.	2 (n 124)
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	ktoe ktoe ktoe	n.a. n.a. n.a.	n.a. n.a. n.a.	2 (p.134)
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe ktoe	n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a.	2 (p.134)
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. n.a.	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	ktoe ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. n.a.	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	ktoe ktoe ktoe ktoe ktoe Unit	n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. n.a. 2012	2 (p.134)
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.	

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	0	0	
Land used for short rotation trees	ha	0	0	
Land used for other energy crops such as grasses	ha	0	0	

Table 169: Maltese PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0.75	0.98	3 (p.134)
Consumption - Fuel type X	ktoe	1.94	3.07	4 (p.134)
Total production Art.21.2.biofuels	ktoe	0.75	0.98	5 (p.134)
Total consumption Art.21.2. biofuels	ktoe	1.94	3.07	6 (p.134)
Share of 21(2) fuels from total RES-T	%	100	100	

Table 170: Maltese PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	45240.3	140391.9	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	16925.7	93150.6	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	24171.6	37692.1	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	4143.1	9549.3	

Table 171: Maltese PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	0	
2011	n.a.	0	
2012	2.99	0	
2013	n.a.	0	
2014	3.92	0	
2015	n.a.	0	
2016	6.42	0	
2017	n.a.	0	
2018	10.45	0	
2019	n.a.	0	
2020	2	0	

Table 172: Maltese PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Malta (ktoe) (see Table 9 of the NREAP)

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### **Comments for Malta**

- 1: Commission Decision 2013/114/EU establishing the guidelines for Member States on the calculation renewable energy from heat pumps has highlighted heating through aerothermal heat-pumps as an eligible potential which had previously been bypassed, due to unclear definition of the requirements and lack of local market information. The same equipment used for cooling (AC) run in reverse mode can generally be used for heating. Hence, space heating through aero-thermal heat-pumps is now quite common in Malta during cold winter periods, especially in commercial buildings, offices and hotels. The Malta Resources Authority has conducted a survey to identify the state of play of heat pumps in the industrial and commercial sector. Results have shown that the renewable energy generation from heat pumps in this sector is 10.6GWh. Another study conducted by the Institute for Sustainable Energy has shown that heat pumps used for heating in the domestic sector contribute 9.9GWh.
- 2: For 'Primary energy in domestic raw material' value for 2011 refers to 0.13 [ktoe] in electricty and 0.38 [ktoe] in heat. For 2012 the value refers to 0.26 [ktoe] in electricty and 0.41 [ktoe] in heat.
- 3: Refers to biodiesel.
- 4: Refers to biodiesel.
- 5: Refers to biodiesel only.
- 6: Refers to biodiesel only.

### **21**

### The Netherlands

	Unit	2011	2012	Comment
Renewable heating and cooling	%	3.3	3.4	
Renewable electricity	%	9.8	10.5	
Renewable Transport	%	4.6	5	
Overall renewable energy share	%	4.3	4.5	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 173: Dutch PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Netherlands (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	875	939	
Gross final consumption of electricity from RES	ktoe	1003	1047	
Gross final consumption of energy from RES in transport	ktoe	349	349	
Gross total RES consumption	ktoe	2228	2336	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	2228	2336	

Table 174: Dutch PR Table 1a: Calculation table for the renewable energy contribution in Netherlands of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

Table 175: Dutch PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Netherlands for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	37	100	9	0.4%	1 (p.140)
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	0	0	0	0.0%	2 (p.140)
Hydropower 1 MW - 10 MW (non pumped)	2	5	0	0.0%	3 (p.140)
Hydropower >10 MW (non pumped)	35	95	8	0.3%	4 (p.140)
Hydropower pumped storage	0	0	0	0.0%	5 (p.140)
Hydropower mixed (normalised) Geothermal	0	0	0	0.0%	
Solar	145	100	9	0.0%	
Solar photovoltaic	145	100	9	0.4%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	2316	4725	406	16.8%	6 (p.140)
Onshore wind	2088	3982	342	14.1%	
Offshore wind	228	743	64	2.6%	
Biomass	1297	7071	608	25.1%	
Solid biomass	1063	6011	517	21.3%	7 (p.140)
Biogas	217	1060	91	3.8%	8 (p.140)
Bioliquids	17	0	0	0.0%	9 (p.140)
Total	3795	11996	1031	42.6%	
Total CHP	807	4439	382	15.8%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			8	0.3%	
Solar thermal			25	1.0%	
Biomass			728	30.1%	
Solid biomass			612	25.3%	10 (p.140)
Biogas			116	4.8%	11 (p.140)
Bioliquids Renewable energy from heat pumps			n.a. 115	n.a. 4.7%	
Aerothermal heat pumps			55	2.3%	
Geothermal heat pumps			60	2.5%	12 (p.140)
Hydrothermal heat pumps			n.a.	n.a.	13 (p.140)
Total			875	36.1%	15 (p.1.15)
Total district heating			209	8.6%	14 (p.140)
Total biomass in households			299	12.3%	_ : (p :o,
Total Biomass in Households			233	12.3/0	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			149	6.2%	
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			172	7.1%	
Biodiesel Article 21.2			n.a.	n.a.	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			0	0.0%	
Renewable electricity			28	1.2%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			28	1.2%	
Other biofuels			n.a.	n.a.	
Other biofuels Article 21.2			n.a.	n.a.	
Total			516	21.3%	15 (p.140)

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	37	100	9	0.4%	1 (p.140)
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	0	0	0	0.0%	2 (p.140)
Hydropower 1 MW - 10 MW (non pumped)	2	5	0	0.0%	3 (p.140)
Hydropower >10 MW (non pumped)	35	95	8	0.3%	4 (p.140)
Hydropower pumped storage	0	0	0	0.0%	5 (p.140)
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	365	254	22	0.9%	
Solar photovoltaic	365	254	22	0.9%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	4020	0	0.0%	C (n. 140)
Wind power	2433	4939	425	17.5%	6 (p.140)
Onshore wind Offshore wind	2205 228	4156 782	357 67	14.8% 2.8%	
Biomass	1243	782 7239	622	2.8%	
Solid biomass	1007	6195	533	22.0%	7 (p.140)
Biogas	219	1043	90	3.7%	8 (p.140)
Bioliquids	17	0	0	0.0%	9 (p.140)
Total	4078	12532	1078	44.5%	J (p.140)
Total CHP	846	4752	409	16.9%	
iotal Chr	040	4/32	409	10.9%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			12	0.5%	
Solar thermal			26	1.1%	
Biomass			771	31.8%	
Solid biomass			641	26.5%	10 (p.140)
Biogas			129	5.3%	11 (p.140)
Bioliquids			n.a.	n.a.	
Renewable energy from heat pumps			131	5.4%	
Aerothermal heat pumps			63	2.6%	
Geothermal heat pumps			68	2.8%	12 (p.140)
Hydrothermal heat pumps			n.a.	n.a.	13 (p.140)
Total			939	38.8%	
Total district heating			230	9.5%	14 (p.140)
Total biomass in households			302	12.5%	
Banayahla Transnart			ktoo	0/	Commont
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			124	5.1%	
Bioethanol / bio-ETBE Article 21.2			12	0.5%	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			194	8.0%	
Biodiesel Article 21.2			182	7.5%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			0	0.0%	
Renewable electricity			30	1.2%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport Other biofuels			30	1.2%	
Other biofuels Other biofuels Article 21.2			n.a.	n.a.	
Total			n.a. <b>544</b>	n.a. <b>22.5%</b>	15 (p.140)
Total .			344	22.3/0	13 (þ.140)

Table 176: Dutch PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Netherlands for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

**Table 177:** Dutch PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	249	252	16 (p.140)
Indirect supply of wood biomass	ktoe	486	574	17 (p.140)
Energy crops	ktoe	25	25	18 (p.140)
Agricultural by-products / processed residues and fishery	ktoe	377	322	19 (p.140)
by-products Biomass from waste	ktoe	1230	1289	20 (p.140)
Others	ktoe	n.a.	n.a.	21 (p.140)
Total biomass for heating and electricity*	ktoe	2367	2462	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	22 (p.141)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	23 (p.141)
Others	ktoe	n.a.	n.a.	24 (p.141)
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	2367	2462	
Biomass supply for heating and electricity	Rav	v material	imported f	rom EU
District and of conditions of the foundation	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	16 (p.140)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	17 (p.140)
Energy crops	ktoe	n.a.	n.a.	18 (p.140)
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	19 (p.140)
Biomass from waste	ktoe	n.a.	n.a.	20 (p.140)
Others	ktoe	n.a.	n.a.	21 (p.140)
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	22 (p.141)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	23 (p.141)
Others	ktoe	n.a.	n.a.	24 (p.141)
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Raw r	naterial im	ported fro	m non-EU
Biomass supply for heating and electricity		naterial im		
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other	Raw r Unit ktoe	naterial im 2011 0	ported fro 2012 0	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	Unit ktoe	<b>2011</b> 0	2012	Comment 16 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass	Unit ktoe ktoe	2011 0	2012 0	Comment 16 (p.140) 17 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops	Unit ktoe ktoe ktoe	2011 0 0 0	2012 0 0	Comment 16 (p.140) 17 (p.140) 18 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass	Unit ktoe ktoe	2011 0	2012 0	Comment 16 (p.140) 17 (p.140) 18 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	Unit ktoe ktoe ktoe	2011 0 0 0	2012 0 0	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	Unit ktoe ktoe ktoe ktoe ktoe ktoe	2011 0 0 0 0 0	2012 0 0 0 0 0	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140) 20 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	Unit ktoe ktoe ktoe ktoe ktoe	2011 0 0 0 0	2012 0 0 0 0	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140) 20 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	Unit ktoe ktoe ktoe ktoe ktoe ktoe	2011 0 0 0 0 0	2012 0 0 0 0 0	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140) 20 (p.140) 21 (p.140)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	Unit ktoe ktoe ktoe ktoe ktoe ktoe	2011 0 0 0 0 0	2012 0 0 0 0 0	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140) 20 (p.140) 21 (p.140)  Comment
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	Unit ktoe ktoe ktoe ktoe ktoe Unit	2011 0 0 0 0 0 0 0 2011	2012 0 0 0 0 0 0 0 2012	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140) 20 (p.140) 21 (p.140)  Comment 22 (p.141) 23 (p.141)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	2011 0 0 0 0 0 0 2011 n.a. n.a.	2012 0 0 0 0 0 0 2012 n.a. n.a.	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140) 20 (p.140)  Comment 22 (p.141)
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	2011 0 0 0 0 0 0 2011 n.a. n.a.	2012 0 0 0 0 0 0 2012 n.a. n.a.	Comment 16 (p.140) 17 (p.140) 18 (p.140) 19 (p.140) 20 (p.140) 21 (p.140)  Comment 22 (p.141) 23 (p.141)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	6000	6100	25 (p.141)
Land used for short rotation trees	ha	13	6	
Land used for other energy crops such as grasses	ha	91	124	

Table 178: Dutch PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	434	1040	26 (p.141)
Consumption - Fuel type X	ktoe	321	318	27 (p.141)
Total production Art.21.2.biofuels	ktoe	n.a.	n.a.	
Total consumption Art.21.2. biofuels	ktoe	166	194	28 (p.141)
Share of 21(2) fuels from total RES-T	%	64	72	29 (p.141)

Table 179: Dutch PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	9278000	10108000	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	6957000	7648000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	1536000	1621000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	786000	839000	

Table 180: Dutch PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	0	n.a.	
Origin/destination	0	n.a.	
Unit	ktoe	ktoe	
2010	0	0	
2011	0	0	
2012	0	0	
2013	0	0	
2014	0	0	
2015	0	0	
2016	0	0	
2017	0	0	
2018	0	0	
2019	0	0	
2020	0	0	

Table 181: Dutch PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Netherlands (ktoe) (see Table 9 of the NREAP)

#### Comments for the Netherlands

- 1: Normalised in accordance with Directive 2009/28/EC.
- 2: Statistics Netherlands only provides totals. Due to data confidentiality, Statistics Netherlands cannot provide a breakdown and is bound by legal obligations in this regard. The breakdown is based on data from the NREAP.
- 3: Normalised in accordance with Directive 2009/28/EC.
- 4: Normalised in accordance with Directive 2009/28/EC.
- 5: Normalised in accordance with Directive 2009/28/EC.
- 6: In accordance with the procedure under Directive 2009/28/EC total wind energy has been normalised. The breakdown into onshore and offshore wind has been based on (non-normalised) electricity production from onshore and offshore wind.
- 7: Including renewable fraction of domestic waste.
- 8: Including electricity production from green gas.
- 9: Since 2011 only bioliquids that demonstrably meet the sustainability criteria from the Renewable Energy Directive have counted.
- 10: Including renewable fraction of domestic waste.
- 11: Including final consumption for heat from green gas.
- 12: Including a small portion of hydrothermal (heat from surface water).
- 13: Included as a small portion into geothermal heat pumps.
- 14: Defined as sold heat, therefore including steam sold to industry.
- 15: Total for biogasoline and biodiesel: 321 [ktoe] in 2011 (of which 166 [ktoe] counting double) and 319 [ktoe] in 2012 (of which 194 [ktoe] counting double).
- 16: The amount of raw materials imported for the production of biomass for electricity and heat is small and has not been recorded separately. Imported wood pellets and wood chips that are used directly for the production of heat or electricity in the Netherlands are not raw materials and have therefore not been included in the table of the Dutch Progress Report. The energy values of the raw materials have been determined on the basis of the tonnages/m3 and the calorific values of the incoming biomass streams. For biogas production this is based on the highest calorific value and for the use of solid biomass and bioliquids on the lowest calorific value. Most of the biomass used for electricity generation and heating originates from foreign waste and residue streams. It is primarily the biogenic fraction of the waste that is burned in waste incineration plants. A considerable amount of waste wood is also made available for energy purposes, both for applications in the Netherlands and other EU countries. In terms of kilograms, a large proportion of biomass originates from the agricultural industry. This mainly concerns wet waste streams (e.g. manure), which are anaerobically digested. Another important stream is the import of wood pellets for the co-firing of biomass in power stations. These have a primary energy content of approximately 20 PJ and largely originate from North America.
- 17: See comment 21. A substantial portion of the waste wood (approximately 7 PJ) is made suitable for consumption in the form of an energy carrier in the Netherlands through collection and sorting and is subsequently exported.
- 18: See comment 21.
- 19: See comment 21.
- 20: See comment 21.
- 21: See comment 21.
- 22: For 2011 and 2012 no data are available on the origin and type of raw materials used to produce biofuels for transport. There are data, however, on the origin and type of raw materials contained in the biofuels consumed in the Netherlands for transport. These data are set out in the Dutch Emissions Authority's (NEa) annual report.41 In line with the

European Renewable Energy Directive, the administrative system relating to the blending obligation focuses on identifying biofuels that are brought onto the Dutch market. For these biofuel streams information is collected on the sustainability, origin and type of the raw materials, CO2 performance, etc. Dutch factories that produce biofuels for transport do so not only for the Dutch market, but also to a large extent for foreign markets. At present the government does not collect any information on the type and origin of the raw materials for exported biofuels. Collecting such data would create an additional administrative burden. It is also doubtful that this information could be published, due to the possibility of tracing it back to individual companies.

23: See comment 21.

24: See comment 21.

25: Values 6000 (2011) and 6100 (2012) are maximum values. For energy maize: 4000 [ha] in both 2011 and 2012; for rapeseed less than 2000 [ha] in 2011 and less than 2100 [ha] in 2012. For rapeseed the total area is reported. It is not known what portion was used for energy crops. In 2012 hardly any domestically grown rapeseed or maize was used in the Netherlands for the production of biofuels for transport for the domestic market. Rapeseed is used for 1.5% of the biofuels brought onto the market in the Netherlands (FAME) and maize for 23.9% (ETOH). The main supplier of rapeseed in 2012 was Germany (72%), followed by France (27%). With regard to maize, the main supplier in 2012 was the United States (63%), followed by Hungary (12%). The area of forage maize cultivated for energy has been calculated by Statistics Netherlands using information from surveys of anaerobic digestion plant operators conducted in 2011.

26: Refers to Art. 21(2) and non-Art. 21(2) biofuels. Production of biodiesel: 434 [ktoe] in 2011 and 1040 [ktoe] in 2012. There are three major biodiesel manufacturers in the Netherlands that produce this type of biodiesel. The raw materials for the biofuels that can be double counted come from right across the European Union. Data for biogasoline are not available due to data confidentiality.

27: Refers to Art. 21(2) and non-Art. 21(2) biofuels. Biodiesel consumption in 2011: 172 [ktoe] and 194 [ktoe] in 2012. Biogasoline consumption in 2011: 149 [ktoe] and 124 [ktoe] in 2012.

28: Refers to Art. 21(2) biofuels only.

29: Share calculated on energy basis.

### 22 Poland

	Unit	2011	2012	Comment
Renewable heating and cooling	%	13.38	13.66	
Renewable electricity	%	8.15	10.68	
Renewable Transport	%	6.51	6.09	
Overall renewable energy share	%	10.42	11.04	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	1.66	2.28	

Table 182: Polish PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Poland (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	4920.7	5066.1	
Gross final consumption of electricity from RES	ktoe	1053.2	1404.4	
Gross final consumption of energy from RES in transport	ktoe	987.3	877.1	
Gross total RES consumption	ktoe	6961.2	7347.6	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	6961.2	7347.6	

**Table 183:** Polish PR Table 1a: Calculation table for the renewable energy contribution in Poland of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 184: Polish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Poland for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity	Energy			Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	940	2352.3	202	2.9%	
Hydropower (non pumped)	564	2336.8	201	2.9%	
Hydropower <1 MW (non pumped)	82	350.6	30	0.4%	1 (p.148)
Hydropower 1 MW - 10 MW (non pumped)	186	621.6	53	0.8%	2 (p.148)
Hydropower >10 MW (non pumped)	296	1364.6	117	1.7%	3 (p.148)
Hydropower pumped storage	376	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	1	0.2	0	0.0%	
Solar photovoltaic	1	0.2	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	1800	2922	251	3.6%	
Onshore wind	1800	2922	251	3.6%	
Offshore wind	0	0	0	0.0%	
Biomass	277	7599.5	653	9.3%	
Solid biomass	175	7148.4	615	8.8%	4 (p.148)
Biogas	102	451.1	39	0.6%	
Bioliquids	0	0	0	0.0%	
Total	3018	12874	1107	15.8%	
Total CHP	n.a.	7600.9	654	9.3%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			12.7	0.2%	
Solar thermal			10.4	0.2%	
Biomass			4860	69.3%	5 (p.148)
Solid biomass			4787.1	68.2%	3 (p1210)
Biogas			72.9	1.0%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			5.7	0.1%	
Aerothermal heat pumps			0.4	0.0%	
Geothermal heat pumps			3.6	0.1%	
Hydrothermal heat pumps			1.6	0.0%	
Total			4920.7	70.1%	
Total district heating			n.a.	n.a.	
Total biomass in households			2746.7	39.2%	
				05170	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			178.76	2.5%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			85.17	1.2%	
Biodiesel			535.63	7.6%	6 (p.148)
Biodiesel Article 21.2			280.85	4.0%	0 (p.148)
Biodiesel imported			280.83	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			53.73	0.8%	
Renewable electricity road transport			0.32	0.0%	
Renewable electricity non-road transport			53.41	0.8%	
Other biofuels			219.2	3.1%	7 (p.148)
Other biofuels Other biofuels Article 21.2			0	0.0%	, (b.140)
Total			987.32	14.1%	
			307.3E	± 711/0	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	945	2358.7	203	2.9%	
Hydropower (non pumped)	569	2347	202	2.9%	
Hydropower <1 MW (non pumped)	88	374.9	32	0.5%	1 (p.148)
Hydropower 1 MW - 10 MW (non pumped)	185	619.4	53	0.8%	2 (p.148)
Hydropower >10 MW (non pumped)	296	1352.7	116	1.7%	3 (p.148)
Hydropower pumped storage	376	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	1	1.1	0	0.0%	
Solar photovoltaic	1	1.1	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	2564	4510.3	388	5.5%	
Onshore wind	2564	4510.3	388	5.5%	
Offshore wind	0	0	0	0.0%	
Biomass	583	10094.1	868	12.4%	
Solid biomass	455	9528.7	819	11.7%	4 (p.148)
Biogas	128	565.4	49	0.7%	
Bioliquids	0	0	0	0.0%	
Total	4093	16964.2	1459	20.8%	
Total CHP	n.a.	10094.3	868	12.4%	
Renewable Heating and Cooling			ktoe	%	Comment
			Kloe		Comment
Geothermal			15.8	0.2%	
Solar thermal			13	0.2%	- (
Biomass			4998.5	71.3%	5 (p.148)
Solid biomass			4913.2	70.0%	
Biogas			85.3	1.2%	
Bioliquids	_		6.4	0.0%	
Renewable energy from heat pumps					
Aerothermal heat pumps			0.5 4.2	0.0% 0.1%	
Geothermal heat pumps				0.1%	
Hydrothermal heat pumps Total			1.6 <b>5066.1</b>	72.2%	
Total district heating			n.a.	n.a.	
Total biomass in households			2790.9	39.8%	
Renewable Transport			ktoe	%	Comment
·					
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2			153.93	2.2%	
Bioethanol / bio-ETBE imported			0 31.09	0.0% 0.4%	
Biodiesel			635.6	9.1%	6 (p.148)
Biodiesel Article 21.2			128.58	1.8%	0 (p.11-10)
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			54.23	0.8%	
Renewable electricity road transport			0.34	0.0%	
Renewable electricity road transport			53.89	0.8%	
nenewable electricity hon-road transport					7 (p.148)
Other hinfuels					
Other biofuels Other biofuels Article 21.2			33.37 0	0.5% 0.0%	7 (p.146)

Table 185: Polish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Poland for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 186:** Polish PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material			
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	4602	4803	8 (p.148)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	96	103	
Agricultural by-products / processed residues and fishery by-products	ktoe	442	670	
Biomass from waste	ktoe	1210	1411	
Others	ktoe	32	32	
Total biomass for heating and electricity*	ktoe	6382	7019	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	9 (p.148)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	6382	7019	
Biomass supply for heating and electricity	Rav	w material	imported t	from EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	8 (p.148)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	9 (p.148)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	,
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Rawı	naterial im	iported fro	m non-EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	8 (p.148)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	9 (p.148)
Energy crops and short rotation trees for biofuels Others	ktoe ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*  * The values indicated with ** are calculated values and have n	ktoe	0	0	

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	n.a.	n.a.	
Land used for short rotation trees	ha	7619	10344	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 187: Polish PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

**Table 188:** Polish PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	30118593	33172974	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	8730885	11642285	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	17923728	18453350	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	3463980	3077339	

**Table 189:** Polish PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	543	0	
2011	729.3	0	
2012	928.7	0	
2013	1182	0	
2014	1182	0	
2015	1074	0	
2016	1074	0	
2017	968	0	
2018	968	0	
2019	0	0	
2020	587	0	

Table 190: Polish PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Poland (ktoe) (see Table 9 of the NREAP)

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### Comments for Poland

- 1: Due to standardisation calculations, it is currently not possible to provide more detailed data concerning hydro energy.
- 2: Due to standardisation calculations, it is currently not possible to provide more detailed data concerning hydro energy.
- 3: Due to standardisation calculations, it is currently not possible to provide more detailed data concerning hydro energy.
- 4: Installed capacities for solid biomass apply only to units generating electricity with the exclusive use of biomass as fuel. This allows determination of installed capacity for each source. In Poland, in addition to electricity generation by the units dedicated solely to the incineration of biomass, there are large system installations that generate electricity through the process of biomass co-incineration with other fossil fuels, e.g. coal. In this case, in accordance with the Regulation of the Minister for the Economy of 18 October 2012 on the Detailed Scope of Obligations to Obtain Certificates of Origin and Present them for Redemption, Pay the Substitute Fee, Purchase Electricity and Heat Generated from Renewable Energy Sources and the Obligation to Confirm Data on the Amount of Electricity Generated from Renewable Energy Sources (Journal of Laws item 1229 and of 2013, item 1362), the energy produced from renewable energy sources covers the portion of electricity or heat corresponding to the share of chemical energy of biomass or biogas in the chemical energy of the fuel used to generate energy, calculated on the basis of the actual calorific values of these fuels. Since the composition of the mixture of biomass and another fuel varies with each installation and each time interval, it is impossible to calculate and determine the rated power of installed capacity for such units.
- 5: The Polish Progress Reports has an additional row in which Energy from Municipal waste has been defined (32.0 ktoe in 2011 and 32.5 ktoe in 2012). This value should be added to solid biomass and total biomass (not done here).
- 6: Amount of B100: 0 ktoe in 2011 and 0 ktoe in 2012.
- 7: Refers to B100.
- 8: Subdivision into 'direct' and 'indirect' not entirely clear: a single value is shown for both parameters.
- 9: Detailed data relating to the use of energy materials for transport purposes have been included in separate tables in the Polish Proress Report (Summary 1 and summary 2).

# 23 Portugal

	Unit	2011	2012	Comment
Renewable heating and cooling	%	35	33	
Renewable electricity	%	45.9	47.6	
Renewable Transport	%	0.4	0.4	
Overall renewable energy share	%	24.5	24.6	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 191: Portugese PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Portugal (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	2210	1905	
Gross final consumption of electricity from RES	ktoe	2144	2174	1 (p.154)
Gross final consumption of energy from RES in transport	ktoe	17	18	
Gross total RES consumption	ktoe	4371	4098	
Transfer of RES to other Member States	ktoe	n.a.	n.a.	
Transfer of RES from other Member States and 3rd countries	ktoe	n.a.	n.a.	
RES consumption adjusted for target	ktoe	4371	4098	

Table 192: Portugese PR Table 1a: Calculation table for the renewable energy contribution in Portugal of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 193: Portugese PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Portugal for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	5551	12114	1042	23.8%	2 (p.154)
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	34	88	8	0.2%	
Hydropower 1 MW - 10 MW (non pumped)	343	849	73	1.7%	
Hydropower >10 MW (non pumped) Hydropower pumped storage	5174 1029	11177 575	961 49	22.0% 1.1%	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	25	210	18	0.4%	
Solar	172	280	24	0.6%	
Solar photovoltaic	172	280	24	0.6%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	4256	9162	788	18.0%	
Onshore wind	4256	9162	788	18.0%	
Offshore wind	0	0	0	0.0%	
Solid biomass	598 554	3219 3058	277 263	6.3% 6.0%	
Biogas	44	161	14	0.3%	
Bioliquids	0	0	0	0.0%	
Total	10602	24985	2148	49.1%	
Total CHP	383	1734	149	3.4%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			1.6	0.0%	
Solar thermal			59.5	1.4%	
Biomass			2148.7	49.1%	
Solid biomass			2148.7	49.1%	
Biogas			0	0.0%	
Bioliquids Renewable energy from heat pumps			n.a.	0.0% n.a.	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			2209.7	50.5%	
Total district heating			n.a.	n.a.	
Total biomass in households			711.9	16.3%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			n.a.	n.a.	
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			4.1	0.1%	
Biodiesel Article 21.2			4.1	0.1%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables  Renewable electricity			n.a. 13.5	n.a. 0.3%	
Renewable electricity Renewable electricity road transport			0	0.3%	
Renewable electricity road transport			13.1	0.3%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			17.1	0.4%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	5717	6660	573	13.1%	2 (p.154)
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	32	73	6	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	348	553	48	1.1%	
Hydropower >10 MW (non pumped)	5337	6034	519	11.9%	
Hydropower pumped storage	1274	1038	89	2.0%	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	25	146	13	0.3%	
Solar	238	393	34	0.8%	
Solar photovoltaic	238	393	34	0.8%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0.33	0.003	0	0.0%	
Wind power	4414	10260	882	20.2%	
Onshore wind	4412	10260	882	20.2%	
Offshore wind	2	0.023	0	0.0%	
Biomass	606	3195	275	6.3%	
Solid biomass	555	2986	257	5.9%	
Biogas	51	209	18	0.4%	
Bioliquids	0	0	0	0.0%	
Total	11000	20654	1776	40.6%	
Total CHP	376	1721	148	3.4%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			1.6	0.0%	
Solar thermal			67.4	1.5%	
Biomass			1836.5	42.0%	
Solid biomass			1836.5	42.0%	
Biogas			0	0.0%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			n.a.	n.a.	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			1905.4	43.6%	
Total district heating			n.a.	n.a.	
Total biomass in households			767	17.5%	
Democrable Transport			leter	0/	Communit
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			n.a.	n.a.	
Bioethanol / bio-ETBE Article 21.2			n.a.	n.a.	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			4.2	0.1%	
Biodiesel Article 21.2			4.2	0.1%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			14.6	0.3%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			14	0.3%	
•					
Other biofuels Other biofuels Article 21.2			0	0.0% 0.0%	

Table 194: Portugese PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Portugal for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 195:** Portugese PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity	Domestic raw material			rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	61	72	
Indirect supply of wood biomass	ktoe	243	251	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery by-products	ktoe	0	0	
Biomass from waste	ktoe	1006	1039	
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	1310	1362	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	0	0	
Energy crops and short rotation trees for biofuels	ktoe	4.6	0	
Others	ktoe	4.4	0	
Total biomass for transport*	ktoe	9	0	
Total biomass for all sectors*	ktoe	1319	1362	
Biomass supply for heating and electricity	Ray	w material	imported t	from ELL
siomass-supply for fleating and electricity	ļ			
Division and of a stable way from for a facility and other	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	0	0	
Indirect supply of wood biomass	ktoe	0	0	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery by-products	ktoe	0	0	
Biomass from waste	ktoe	0	0	
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	0	0	
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	1.4	0	
Total biomass for transport*	ktoe	1.4	0	
Total biomass for all sectors*	ktoe	1.4	0	
Biomass supply for heating and electricity	Rawı	material im	ported fro	
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery by-products	ktoe	n.a.	n.a.	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	n.a.	n.a.	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	0	0	
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	1.4	0	
Total biomass for transport*	ktoe	1.4	0	
Total biomass for all sectors*	ktoe	1.4	0	
*The values indicated with '*' are calculated values and have	not heen m	entioned i	n the Drog	ross Poports

<sup>\*</sup> The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	426	4357	
Land used for short rotation trees	ha	n.a.	n.a.	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 196: Portugese PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	2.6	3.4	3 (p.154)
Consumption - Fuel type X	ktoe	2.6	3.4	
Total production Art.21.2.biofuels	ktoe	6.5	7.3	
Total consumption Art.21.2. biofuels	ktoe	6.4	72	
Share of 21(2) fuels from total RES-T	%	0.11	0.13	

Table 197: Portugese PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	7498	6907	4 (p.154)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	2874	2914	5 (p.154)
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	4593	3961	6 (p.154)
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	30	32	7 (p.154)

**Table 198:** Portugese PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	n.a.	n.a.	
2011	n.a.	n.a.	
2012	n.a.	n.a.	
2013	n.a.	n.a.	
2014	n.a.	n.a.	
2015	n.a.	n.a.	
2016	n.a.	n.a.	
2017	n.a.	n.a.	
2018	n.a.	n.a.	
2019	n.a.	n.a.	
2020	n.a.	n.a.	

**Table 199:** Portugese PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Portugal (ktoe) (see Table 9 of the NREAP)

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### **Comments for Portugal**

- 1: Electricity production from RES harmonising hydro and wind power in accordance with Directive 2009/28/EC.
- 2: For all technologies the capacity indicated regards the maximum for the corresponding years.
- 3: biodiesel
- 4: Note: the united mentioned in the Portugese Progress Report is 't CO2eq' but 'kt CO2eq' seems more appropriate.
- 5: The GN conversion factor was used rather than that recommended by the Commission (56.1 g CO2eq/MJ)
- 6: The conversion factor recommended by the Commission was used (87 g CO2eq/MJ)
- 7: The diesel conversion factor was used (74.1 g CO2eq/MJ)

### 24 Romania

	Unit	2011	2012	Comment
Renewable heating and cooling	%	24.31	25.74	
Renewable electricity	%	31.13	33.57	
Renewable Transport	%	2.05	4.15	
Overall renewable energy share	%	21.2	22.9	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 200: Romanian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Romania (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	3504.16	3687.73	
Gross final consumption of electricity from RES	ktoe	1570.74	1671.58	
Gross final consumption of energy from RES in transport	ktoe	100.85	210.41	
Gross total RES consumption	ktoe	5175.74	5569.73	1 (p.160)
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	5175.74	5569.73	

**Table 201:** Romanian PR Table 1a: Calculation table for the renewable energy contribution in Romania of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 202: Romanian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Romania for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	6483	17201	1479	28.4%	2 (p.160)
Hydropower (non pumped)	6391	11286.9	970	18.6%	
Hydropower <1 MW (non pumped)	84	76	7	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	305	415.9	36	0.7%	
Hydropower >10 MW (non pumped)	6002	10795	928	17.8%	
Hydropower pumped storage	92	202	17	0.3%	3 (p.160)
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	0	0	0	0.0%	
Solar	1	1.4	0	0.0%	
Solar photovoltaic	1	1.4	0	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	988	1299.5	112	2.1%	4 (p.160)
Onshore wind	988	1299.5	112	2.1%	
Offshore wind	0	0	0	0.0%	
Biomass	30	196.7	17	0.3%	
Solid biomass	26	188.1	16	0.3%	
Biogas	4	8.6	1	0.0%	
Bioliquids	0	0	0	0.0%	
Total	7410	18707.6	1609	30.8%	5 (p.160)
Total CHP	n.a.	111.9	10	0.2%	
<b>R</b> enewable Heating and Cooling			ktoe	%	Comment
Geothermal			22.2	0.4%	
Solar thermal			0	0.4%	
Biomass			3481.9	66.8%	
Solid biomass			3469.9	66.5%	
Biogas			12	0.2%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			0	0.0%	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			3504.2	67.2%	
Total district heating			17.8	0.3%	
Total biomass in households			3146.7	60.3%	
Total Districts in Households			52-1017	00.070	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			24.6	0.5%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			38.4	0.7%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			38.14	0.7%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			39.75	0.8%	
Renewable electricity road transport			3.2	0.1%	
Renewable electricity non-road transport			36.55	0.7%	
Other biofuels			0.02	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			102.76	2.0%	6 (p.160)

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	6548	16948.7	1457	27.9%	2 (p.160)
Hydropower (non pumped)	6456	12190.7	1048	20.1%	2 (p.100)
Hydropower <1 MW (non pumped)	90	89	8	0.1%	
Hydropower 1 MW - 10 MW (non pumped)	333	482.5	41	0.8%	
Hydropower >10 MW (non pumped)	6033	11619.1	999	19.2%	
Hydropower pumped storage	92	146	13	0.2%	3 (p.160)
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	- (p:=00)
Geothermal	0	0	0	0.0%	
Solar	41	8	1	0.0%	
Solar photovoltaic	41	8	1	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	1822	2645.1	227	4.4%	4 (p.160)
Onshore wind	1822	2645.1	227	4.4%	
Offshore wind	0	0	0	0.0%	
Biomass	35	211.7	18	0.3%	
Solid biomass	30	192.3	17	0.3%	
Biogas	5	19.4	2	0.0%	
Bioliquids	0	0	0	0.0%	
Total	8354	19813.6	1704	32.7%	5 (p.160)
Total CHP	n.a.	158.6	14	0.3%	
Renewable Heating and Cooling			ktoe	%	Comment
Netiewable fleating and Cooling			Kide	/0	Comment
Geothermal			21.6	0.4%	
Solar thermal			0.1	0.0%	
Biomass			3666	70.3%	
Solid biomass			3657.8	70.1%	
Biogas			8.2	0.2%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			0	0.0%	
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			3687.7	70.7%	
Total district heating			16	0.3%	
Total biomass in households			3283.7	63.0%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			37	0.7%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			23.58	0.5%	
Biodiesel			141.31	2.7%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			86.6	1.7%	
Hydrogen from renewables			0.00	0.0%	
Renewable electricity			34.51	0.7%	
Renewable electricity road transport			4.05	0.1%	
Renewable electricity non-road transport			30.46	0.6%	
•			0.02	0.0%	
Other biotuels					
Other biofuels Other biofuels Article 21.2			0	0.0%	

Table 203: Romanian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Romania for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 204:** Romanian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	3459	3654	7 (p.160)
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	2.6	3.2	8 (p.160)
Agricultural by-products / processed residues and fishery	ktoe	0	0	
by-products				
Biomass from waste	ktoe	0	0	
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	3461.6	3657.2	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	0	0	9 (p.160)
Energy crops and short rotation trees for biofuels	ktoe	0	0	- (17
Others	ktoe	0	0	
Total biomass for transport*	ktoe	0	0	
Total biomass for all sectors*	ktoe	3461.6	3657.2	
Biomass supply for heating and electricity	Rav	w material	imported f	rom EU
	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	0	0	7 (p.160)
ndirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	0	0	8 (p.160)
Agricultural by-products / processed residues and fishery	ktoe	0	0	0 (p.100)
py-products			-	
Biomass from waste	ktoe	0	0	
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	0	0	9 (p.160)
Energy crops and short rotation trees for biofuels	ktoe	0	0	,
Others	ktoe	0	0	
Total biomass for transport*	ktoe	0	0	
Total biomass for all sectors*	ktoe	0	0	
Total biomass for all sectors*	ktoe	0	0	
		0 material im		m non-EU
Biomass supply for heating and electricity	Rawı	naterial im	ported fro	Commen
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other	Raw ı Unit	material im	ported fro 2012	Commen
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation	Raw ı Unit	material im	ported fro 2012	Commen
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation ndirect supply of wood biomass	Raw i Unit ktoe	material im 2011 0	ported fro	7 (p.160)
Direct supply of wood biomass from forests and other wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	Raw I Unit ktoe ktoe	naterial im 2011 0 n.a.	ported fro 2012 0 n.a.	7 (p.160)
Direct supply of wood biomass from forests and other wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products	Raw I Unit ktoe ktoe ktoe ktoe	naterial im  2011  0  n.a.  0  0	2012 0 n.a. 0	7 (p.160)
Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	Raw I Unit ktoe ktoe ktoe ktoe ktoe	naterial im  2011  0  n.a.  0  0	ported fro 2012 0 n.a. 0 0	7 (p.160)
Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	Raw I Unit ktoe ktoe ktoe ktoe ktoe ktoe	naterial im  2011  0  n.a.  0  0	2012 0 n.a. 0	7 (p.160)
Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	Raw I Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe	naterial im  2011  0  n.a.  0  0  0  0	nported fro 2012 0 n.a. 0 0 0 0	7 (p.160) 8 (p.160)
Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products siomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	Raw I Unit ktoe ktoe ktoe ktoe ktoe unit	naterial im  2011  0  n.a.  0  0  0  2011	0 n.a. 0 0 0 0 0 2012	7 (p.160) 8 (p.160)
Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	Raw I Unit ktoe ktoe ktoe ktoe ktoe Unit ktoe	naterial im  2011  0  n.a.  0  0  0  2011  0	ported fro  2012  0  n.a.  0  0  0  2012  0	m non-EU  Commen 7 (p.160)  8 (p.160)  Commen 9 (p.160)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels	Raw I Unit ktoe ktoe ktoe ktoe ktoe Unit ktoe ktoe	naterial im  2011  0  n.a.  0  0  2011  0  0  0  0  0  0  0  0  0  0  0  0	ported fro  2012  0  n.a.  0  0  2012  0  0  0  0  0  0  0  0  0  0  0  0  0	7 (p.160) 8 (p.160)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste  Others  Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Others	Raw I Unit ktoe ktoe ktoe ktoe ktoe ktoe ktoe kto	naterial im  2011  0  n.a.  0  0  2011  0  0  0  0  0  0  0  0  0  0  0  0	ported fro  2012  0  n.a.  0  0  2012  0  0  0  0  0  0  0  0  0  0  0  0  0	7 (p.160) 8 (p.160)
Biomass supply for heating and electricity  Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass  Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels	Raw I Unit ktoe ktoe ktoe ktoe ktoe Unit ktoe ktoe	naterial im  2011  0  n.a.  0  0  2011  0  0  0  0  0  0  0  0  0  0  0  0	ported fro  2012  0  n.a.  0  0  2012  0  0  0  0  0  0  0  0  0  0  0  0  0	7 (p.160) 8 (p.160)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	6167	6125.1	10 (p.160)
Land used for short rotation trees	ha	0.215	0.32	11 (p.160)
Land used for other energy crops such as grasses	ha	0.1	0.1	12 (p.160)

Table 205: Romanian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	13 (p.160)
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

Table 206: Romanian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	31131	30349	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	17279	15852	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	13196	13896	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	656	601	

Table 207: Romanian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	1306	0	
2011	794	0	
2012	942	0	
2013	805	0	
2014	855	0	
2015	910	0	
2016	890	0	
2017	885	0	
2018	640	0	
2019	310	0	
2020	0	0	

Table 208: Romanian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Romania (ktoe) (see Table 9 of the NREAP)

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### Comments for Romania

- 1: The gross final consumption of energy from RES in transport (row C) comes exclusively from the consumption of electricity from RES in transport, included in row B. Therefore, row D = row A + row B.
- 2: Normalised.
- 3: Comment 'CHP' refers to 'Hydropower Plant with Pumping'.
- 4: Normalised.
- 5: Excluding pumping.
- 6: In the 2011-2012 period of analysis only the biofuels meeting the sustainability criteria are reported.
- 7: In 2011 domestic wood biomass production (including fire wood, wood biomass) (14 245 thousand tons, i.e. 3 476 thousand toe) was higher than domestic consumption (14 177 thousand tons, i.e. 3 459 thousand toe). Import and export amounts were recorded, and variation of stock, with surplus at export and stock increase at the end of the year. Under these conditions it was deemed that domestic consumption was fully covered from domestic production. In 2012 domestic wood biomass production (including fire wood, wood biomass) (15 539 thousand tons, i.e. 3 795 thousand toe) was higher than domestic consumption (14 968 thousand tons, i.e. 3654 thousand toe). Import and export amounts were recorded, and variation of stock, with surplus at export and stock increase at the end of the year. Under these conditions it was deemed that domestic consumption was fully covered from domestic production.
- 8: The energy crops were used for briquettes and pellets. These crops are reported for the first time in 2011, 2012. Approximately 75% of the reported amount was crops of energy willow.
- 9: Amount of domestic raw material in 2011: 174 [kton] maize and 290 [kton] sunflower and rape. In 2012: 212 [kton] maize and 273 [kton] sunflower and rape. The total production (thousand ton) of raw materials is reported, for biofuels and contained primary energy, regardless of whether the produced biofuels meet the sustainability criteria or not.
- 10: In 2011: maize 2589.7 [ha], wheat 1947 [ha], potatoes 242.6 [ha], sunflower 995 [ha] and rape 392.7 [ha]. In 2012: maize 2731 [ha], wheat 1997.6 [ha], potatoes 223.5 [ha], sunflower 1067.7 [ha] and rape 105.3 [ha].
- 11: Regards energy willow.
- 12: Regards myscanthus.
- 13: In Romania difficulties persist with regards to achieving the necessary infrastructure for a large-scale use of waste, and with regards to funding support schemes that facilitate the introduction of costly technologies, as well as the biofuels mentioned in Article 21(2). Some provisions introduced in 2012 with regards to reducing the mandatory quotas set forth for biofuels in the gas and diesel oil sold at gas stations, in case of the biofuels from waste, residues, cellulosic material of non-food origin and ligno-cellulosic material, amongst other factors, led to the occurrence of the first applications for obtaining biofuels from food waste in Romania in 2013.

### 25 Slovakia

	Unit	2011	2012	Comment
Renewable heating and cooling	%	10.7	10.5	
Renewable electricity	%	19.9	20.5	
Renewable Transport	%	5.6	4.5	
Overall renewable energy share	%	11.9	11.7	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 209: Slovakian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Slovakia (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	564	532	
Gross final consumption of electricity from RES	ktoe	497	507	
Gross final consumption of energy from RES in transport	ktoe	122	96	
Gross total RES consumption	ktoe	1183	1135	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	1183	1135	

Table 210: Slovakian PR Table 1a: Calculation table for the renewable energy contribution in Slovakia of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 211: Slovakian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Slovakia for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

		20	11		
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	n.a.	n.a.	n.a.	n.a.	
Hydropower (non pumped)	1607	4562	392	33.2%	
Hydropower <1 MW (non pumped)	32	91	8	0.7%	
Hydropower 1 MW - 10 MW (non pumped)	67	190	16	1.4%	
Hydropower >10 MW (non pumped)	1508	4281	368	31.1%	
Hydropower pumped storage Hydropower mixed (normalised)	916 n.a.	368 n.a.	32 n.a.	2.7% n.a.	
Geothermal	0	0	0	0.0%	
Solar	n.a.	n.a.	n.a.	n.a.	
Solar photovoltaic	496	397	34	2.9%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	n.a.	n.a.	n.a.	
Wind power	n.a.	n.a.	n.a.	n.a.	
Onshore wind	3	6	1	0.0%	
Offshore wind	0	n.a.	n.a.	n.a.	
Biomass	197	819	70	6.0%	1 (p.166)
Solid biomass	176	706	61	5.1%	
Biogas	21	113	10	0.8%	
Bioliquids Total	3219	<b>5784</b>	0 <b>497</b>	0.0% <b>42.0</b> %	
		819	_		
Total CHP	197	819	70	6.0%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			6	0.5%	
Solar thermal			5	0.4%	
Biomass			553	46.8%	2 (p.166)
Solid biomass			530	44.8%	
Biogas			23	1.9%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			n.a.	n.a.	
Aerothermal heat pumps			0	0.0% 0.0%	
Geothermal heat pumps Hydrothermal heat pumps			0	0.0%	
Total			564	47.7%	
Total district heating			106	9.0%	
Total biomass in households			44	3.7%	
iotai bioinass in nousenoius				3.770	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			14.6	1.2%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			97.7	8.3%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			9.2	0.8%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			9.2	0.8%	
Other biofuels Other biofuels Article 21.2			0	0.0% 0.0%	
Total			<b>121.5</b>	10.3%	
Total			121.3	10.376	

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	n.a.	n.a.	n.a.	n.a.	
Hydropower (non pumped)	1607	4522	389	32.9%	
Hydropower <1 MW (non pumped)	32	90	8	0.7%	
Hydropower 1 MW - 10 MW (non pumped)	67	189	16	1.4%	
Hydropower >10 MW (non pumped)	1508	4243	365	30.8%	
Hydropower pumped storage	916	336	29	2.4%	
Hydropower mixed (normalised)	n.a.	n.a.	n.a.	n.a.	
Geothermal	0	0	0	0.0%	
Solar	n.a.	n.a.	n.a.	n.a.	
Solar photovoltaic	513	424	36	3.1%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy Wind power	n.a.	n.a. n.a.	n.a.	n.a. n.a.	
Onshore wind	3	6	1	0.0%	
Offshore wind	0	n.a.	n.a.	n.a.	
Biomass	215	941	81	6.8%	1 (p.166)
Solid biomass	174	751	65	5.5%	Ι (β.100)
Biogas	41	190	16	1.4%	
Bioliquids	0	0	0	0.0%	
Total	3251	5893	507	42.8%	
Total CHP	215	941	81	6.8%	
Renewable Heating and Cooling			ktoe	%	Comment
			Rioc	/*	Comment
Geothermal			6	0.5%	
Solar thermal			5	0.4%	
Biomass			521	44.0%	2 (p.166)
Solid biomass			499	42.2%	
Biogas			22	1.9%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			n.a.	n.a.	
Aerothermal heat pumps Geothermal heat pumps			0	0.0% 0.0%	
Hydrothermal heat pumps			0	0.0%	
Total			532	45.0%	
Total district heating			176	14.9%	
<u>_</u>					
Total biomass in households			37	3.1%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			14.5	1.2%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	
Bioethanol / bio-ETBE imported			0	0.0%	
Biodiesel			71.5	6.0%	
Biodiesel Article 21.2			0	0.0%	
Biodiesel imported			0	0.0%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			9.9	0.8%	
Renewable electricity road transport			0	0.0%	
Renewable electricity non-road transport			9.9	0.8%	
Other biofuels			0	0.0%	
Other biofuels Article 21.2			0	0.0%	
Total			95.5	8.1%	

Table 212: Slovakian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Slovakia for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 213:** Slovakian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	271.9	314.1	
Indirect supply of wood biomass	ktoe	529.6	539.9	
Energy crops	ktoe	122.2	188.8	
Agricultural by-products / processed residues and fishery by-products	ktoe	0	0	
Biomass from waste	ktoe	16.1	17.7	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	939.8	1060.5	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	93.8	n.a.	3 (p.166)
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	93.8	0	
Total biomass for all sectors*	ktoe	1033.6	1060.5	
Biomass supply for heating and electricity	Ray	v material	imported t	rom EU
,	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other	ktoe	0	0	Commen
wooded land energy generation				
ndirect supply of wood biomass	ktoe	0	0	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery by-products	ktoe	0	0	
Biomass from waste	ktoe	0	0	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	n.a.	n.a.	3 (p.166)
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	0	0	
Total biomass for all sectors*	ktoe	0	0	
Biomass supply for heating and electricity	Pow r	natorial im	ported fro	m non-EU
sioniass supply for heating and electricity			Ĭ	
	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other	ktoe	8.9	11.6	
wooded land energy generation	ktoe	19.3	24.2	
wooded land energy generation ndirect supply of wood biomass	ktoe ktoe	19.3 0	24.2	
wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery				
wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products	ktoe ktoe	0	0	
wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	ktoe	0	0	
wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe	0 0	0 0	
wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe ktoe	0 0 0 n.a.	0 0 0 n.a.	Commen
wooded land energy generation ndirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe ktoe ktoe	0 0 0 n.a. 28.2	0 0 0 n.a. 35.8	Commen 3 (p.166)
wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	ktoe ktoe ktoe ktoe	0 0 n.a. 28.2	0 0 0 n.a. 35.8	Commen 3 (p.166)
wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe ktoe ktoe Unit	0 0 n.a. 28.2 2011 n.a.	0 0 n.a. 35.8 2012 n.a.	
wooded land energy generation indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe Unit ktoe ktoe	0 0 n.a. 28.2 2011 n.a.	0 0 n.a. 35.8 2012 n.a.	

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	153000	152000	4 (p.166)
Land used for short rotation trees	ha	0	0	
Land used for other energy crops such as grasses	ha	0	0	

Table 214: Slovakian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	0	0	
Consumption - Fuel type X	ktoe	0	0	
Total production Art.21.2.biofuels	ktoe	0	0	
Total consumption Art.21.2. biofuels	ktoe	0	0	
Share of 21(2) fuels from total RES-T	%	0	0	

Table 215: Slovakian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	6280000	6204000	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	4114000	4191000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	198300	1872000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	183000	141000	

Table 216: Slovakian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	0	
2011	181	0	
2012	240	0	
2013	228	0	
2014	313	0	
2015	305	0	
2016	364	0	
2017	269	0	
2018	349	0	
2019	190	0	
2020	143	0	

Table 217: Slovakian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Slovakia (ktoe) (see Table 9 of the NREAP)

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### Comments for Slovakia

- 1: Calculated sum.
- 2: Calculated sum.
- 3: Regards rapeseed (65 ktoe in 2011 and 55 ktoe in 2012) and maize (28.8 ktoe in both 2011 and 2012).
- 4: Regards rapeseed (98000 [ha] in 2011 and 73000 [ha] in 2012) and maize (54000 [ha] in 2011 and 80000 [ha] in 2012).

### 26 Slovenia

	Unit	2011	2012	Comment
Renewable heating and cooling	%	28.68	30.57	
Renewable electricity	%	30.81	31.36	
Renewable Transport	%	2.11	2.88	
Overall renewable energy share	%	19.42	20.23	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 218: Slovenian PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Slovenia (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	583.6	588.9	
Gross final consumption of electricity from RES	ktoe	383.4	390.1	
Gross final consumption of energy from RES in transport	ktoe	39.8	55.4	
Gross total RES consumption	ktoe	1006.7	1034.4	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	1006.7	1034.4	

Table 219: Slovenian PR Table 1a: Calculation table for the renewable energy contribution in Slovenia of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 220: Slovenian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Slovenia for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

		20	11		
	Capacity		Energy		Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	1253	4196.6	361	35.7%	
Hydropower (non pumped)	1073	3601.7	310	30.6%	
Hydropower <1 MW (non pumped)	117	203.6	18	1.7%	
Hydropower 1 MW - 10 MW (non pumped)	42	183.1	16	1.6%	
Hydropower >10 MW (non pumped)	914	3215	276	27.3%	
Hydropower pumped storage	180	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)  Geothermal	0	0	0	0.0%	
Solar	57	0 65.7	6	0.0% 0.6%	
Solar photovoltaic	57	65.7	6	0.6%	
Concentrated solar power	0	03.7	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	0	0	0	0.0%	
Onshore wind	n.a.	n.a.	n.a.	n.a.	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	54	251.8	22	2.1%	
Solid biomass	33	125.1	11	1.1%	
Biogas	21	126.6	11	1.1%	
Bioliquids	0	0	0	0.0%	
Total	1364	4514	388	38.4%	
Total CHP	n.a.	246	21	2.1%	
<b>R</b> enewable Heating and Cooling			ktoe	%	Comment
Geothermal			28.2	2.8%	
Solar thermal			8.8	0.9%	
Biomass			546.5	54.0%	
Solid biomass			538.6	53.2%	
Biogas			7.9	0.8% 0.0%	
Bioliquids Renewable energy from heat pumps			0	0.0%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps			0	0.0%	
Total			583.6	57.7%	
Total district heating			0	0.0%	
Total biomass in households			462.4	45.7%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			3.7	0.4%	
Bioethanol / bio-ETBE Article 21.2			3.7	0.4%	
Bioethanol / bio-ETBE imported			3.7	0.4%	
Biodiesel			31.3	3.1%	
Biodiesel Article 21.2			31.3	3.1%	
Biodiesel imported			30.9	3.1%	1 (p.172)
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			4.8	0.5%	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport			4.8	0.5%	
Other biofuels			n.a.	n.a.	
Other biofuels Article 21.2			n.a.	n.a. <b>3.9</b> %	
Total			39.8	3.3%	

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	1254	4158.4	358	35.3%	
Hydropower (non pumped)	1074	3860.3	332	32.8%	
Hydropower <1 MW (non pumped)	119	216.1	19	1.8%	
Hydropower 1 MW - 10 MW (non pumped)	41	189.5	16	1.6%	
Hydropower >10 MW (non pumped)	914	3454.7	297	29.4%	
Hydropower pumped storage	180	n.a.	n.a.	n.a.	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	142	162.8	14	1.4%	
Solar photovoltaic	142	162.8	14	1.4%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	0	0	0	0.0%	
Onshore wind	n.a.	n.a.	n.a.	n.a.	
Offshore wind	n.a.	n.a.	n.a.	n.a.	
Biomass	59	267.3	23	2.3%	
Solid biomass	30	114.2	10	1.0%	
Biogas	29	153.1	13	1.3%	
Bioliquids	0	0	0	0.0%	
Total	1455	4588.5	395	39.0%	
Total CHP	n.a.	262.4	23	2.2%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			31	3.1%	
Solar thermal			9.4	0.9%	
Biomass			548.6	54.2%	
Solid biomass			536.8	53.1%	
Biogas			11.7	1.2%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			0	0.0%	
Aerothermal heat pumps			0	0.0%	
Geothermal heat pumps			0	0.0%	
Hydrothermal heat pumps  Total	_		588.9	0.0% <b>58.2</b> %	
Total district heating			0	0.0%	
Total biomass in households			471.3	46.6%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			5.3	0.5%	
Bioethanol / bio-ETBE Article 21.2			5.3	0.5%	
Bioethanol / bio-ETBE imported			5.3	0.5%	
Biodiesel			45.7	4.5%	
Biodiesel Article 21.2			45.7	4.5%	
Biodiesel imported			44.8	4.4%	1 (p.172)
Hydrogen from renewables			n.a.	n.a.	,
Renewable electricity			4.4	0.4%	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport			4.4	0.4%	
Other biofuels			n.a.	n.a.	
Other biofuels Article 21.2			n.a.	n.a.	
Total			55.4	5.5%	

Table 221: Slovenian PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Slovenia for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 222:** Slovenian PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass ktoe Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others total biomass for heating and electricity* ktoe Biomass supply for transport Unit Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others ktoe Total biomass for transport* ktoe Energy crops and short rotation trees for biofuels ktoe Others ktoe Total biomass for all sectors* ktoe Energy crops and short rotation trees for biofuels ktoe Others ktoe Others ktoe Energy crops and short rotation trees for biofuels ktoe Others ktoe Others ktoe Energy crops and short rotation trees for biofuels ktoe Others ktoe Others ktoe Energy crops and short rotation trees for biofuels ktoe Others Other Othe	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2012 0 0 0 0 0 0 0 2012 n.a. n.a. n.a. n.a. n.a. n.a. n.a. 2012	Commen Commen Commen Commen
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Biomass supply for heating and electricity  Unit Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity*  Linit Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others  Total biomass for transport*  Linit Total biomass for all sectors*  Ktoe  Biomass supply for heating and electricity  Ra  Unit Direct supply of wood biomass from forests and other wooded land energy generation	Raw materia  2011 n.a. n.a. n.a. n.a. n.a. n.a. n.a.	n.a. n.a. n.a. n.a. n.a. n.a.	Commen
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Biomass from waste Others  Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others  Total biomass for transport*  ktoe  Total biomass for all sectors*  Biomass supply for heating and electricity  Ra  Unit Direct supply of wood biomass from forests and other wooded land energy generation	n.a.	n.a.	Commen
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Energy crops and short rotation trees for biofuels Others  Total biomass for transport*  ktoe  Total biomass for all sectors*  ktoe  Biomass supply for heating and electricity  Ra  Unit  Direct supply of wood biomass from forests and other wooded land energy generation	n.a.	n.a.	
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Biomass for all sectors*  Biomass supply for heating and electricity  Ra  Unit  Direct supply of wood biomass from forests and other wooded land energy generation		n.a.	
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Direct supply of wood biomass from forests and other ktoe wooded land energy generation	w material ir	nported fro	om non-EU
wooded land energy generation	2011	2012	Commen
0.0	n.a.	n.a.	
Rtitle	n.a.	n.a.	
Energy crops ktoe	n.a.	n.a.	
Agricultural by-products / processed residues and fishery ktoe	n.a.	n.a.	
Biomass from waste ktoe	n.a.	n.a.	
Others ktoe	n.a.	n.a.	
Total biomass for heating and electricity* ktoe	n.a.	n.a.	
Biomass supply for transport Unit		2012	Commen
Common arable crops for biofuels ktoe	2011		
Energy crops and short rotation trees for biofuels ktoe		n.a.	
Others ktoe	n.a.	n.a.	
Total biomass for transport* ktoe	n.a. n.a.		
Total biomass for all sectors* ktoe	n.a. n.a. n.a.	n.a.	

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	4770	5141	2 (p.172)
Land used for short rotation trees	ha	n.a.	n.a.	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

**Table 223:** Slovenian PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	
Consumption - Fuel type X	ktoe	n.a.	n.a.	
Total production Art.21.2.biofuels	ktoe	n.a.	n.a.	
Total consumption Art.21.2. biofuels	ktoe	n.a.	n.a.	
Share of 21(2) fuels from total RES-T	%	n.a.	n.a.	

**Table 224:** Slovenian PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	4400958	4776419	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	2763292	3081351	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	1574543	1602211	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	63124	92857	

**Table 225:** Slovenian PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	n.a.	
2011	0	n.a.	
2012	0	n.a.	
2013	0	n.a.	
2014	0	n.a.	
2015	0	n.a.	
2016	0	n.a.	
2017	0	n.a.	
2018	0	n.a.	
2019	0	n.a.	
2020	0	n.a.	

Table 226: Slovenian PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Slovenia (ktoe) (see Table 9 of the NREAP)

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### Comments for Slovenia

- 1: Slovenia has no oil refineries. We import all liquid fuels, for transport as well as for heating. The liquid fuels for transport which we import frequently contain a small proportion of biofuel.
- 2: The data concern rapeseed. In Slovenia, the production of biofuels from oil 'obtained by pressing oilseed rape seeds' offers the greatest potential. The bulk of rapeseed produced in Slovenia is sold to Austria, while vegetable oil is imported from the Balkan region for the production of biodiesel. In Slovenia in 2010 only one registered producer produced biodiesel, in the amount of 20 561 tonnes. In 2011 it produced 649 tonnes and, in 2012, 1 059 tonnes. In the assessment of the ministry responsible for agriculture, Slovenia has an area of at most 6 000 to 7 000 hectares suitable for the cultivation of rapeseed, which would be sufficient to produce approximately 11 to 22 tonnes of biodiesel.

## **27**Spain

	Unit	2011	2012	Comment
Renewable heating and cooling	%	13.6	14	
Renewable electricity	%	31.6	33.5	
Renewable Transport	%	6.66296	29 <b>163</b> 72982	5 1 (p.178)
Overall renewable energy share	%	13.2	14.3	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 227: Spanish PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Spain (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	4093	4145	
Gross final consumption of electricity from RES	ktoe	7639	8023	
Gross final consumption of energy from RES in transport	ktoe	1799	2203	2 (p.178)
Gross total RES consumption	ktoe	11840	12282	
Transfer of RES to other Member States	ktoe	n.a.	n.a.	
Transfer of RES from other Member States and 3rd countries	ktoe	n.a.	n.a.	
RES consumption adjusted for target	ktoe	11840	12282	

Table 228: Spanish PR Table 1a: Calculation table for the renewable energy contribution in Spain of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 229: Spanish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Spain for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	n.a.	n.a.	n.a.	n.a.	
Hydropower (non pumped)	13283	28833	2479	18.3%	
Hydropower <1 MW (non pumped)	276	n.a.	n.a.	n.a.	3 (p.178)
Hydropower 1 MW - 10 MW (non pumped)	1655	n.a.	n.a.	n.a.	4 (p.178)
Hydropower >10 MW (non pumped)	11352	n.a.	n.a.	n.a.	5 (p.178)
Hydropower pumped storage	5257	2315 2616	199 225	1.5%	
Hydropower mixed (normalised) Geothermal	2792 0	2010	0	1.7% 0.0%	
Solar	5501	9400	808	6.0%	
Solar photovoltaic	4352	7441	640	4.7%	
Concentrated solar power	1149	1959	168	1.2%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	21529	44644	3839	28.3%	
Onshore wind	21529	n.a.	n.a.	n.a.	
Offshore wind	0	n.a.	n.a.	n.a.	
Biomass	772	3814	328	2.4%	
Solid biomass	563	3011	259	1.9%	
Biogas	209	803	69	0.5%	
Bioliquids	43977	89307	7670	0.0%	6 (p.178)
Total	43877		7679	56.6%	ь (р.178)
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			17	0.1%	7 (p.178)
Solar thermal			205	1.5%	· (p:=: -)
Biomass			3871	28.5%	
Solid biomass			3816	28.1%	
Biogas			55	0.4%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			n.a.	n.a.	8 (p.178)
Aerothermal heat pumps			n.a.	n.a.	
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps  Total			n.a. <b>4093</b>	n.a. <b>30.2</b> %	
Total district heating			n.a.	n.a.	
Total biomass in households				18.2%	
Total biomass in nousenoids			2472	18.2%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			225		Comment
Bioethanol / bio-ETBE Article 21.2				1.7% n.a.	
Bioethanol / bio-ETBE imported			n.a. n.a.	n.a.	
Biodiesel			1392	10.3%	
Biodiesel Article 21.2			n.a.	n.a.	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			108	0.8%	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport			108	0.8%	
Other biofuels			74	0.5%	9 (p.178)
Other biofuels Article 21.2			n.a.	n.a.	
Total			1799	13.3%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	n.a.	n.a.	n.a.	n.a.	
Hydropower (non pumped)	13293	27594	2373	17.5%	
Hydropower <1 MW (non pumped)	279	n.a.	n.a.	n.a.	3 (p.178)
Hydropower 1 MW - 10 MW (non pumped)	1663	n.a.	n.a.	n.a.	4 (p.178)
Hydropower >10 MW (non pumped)	11351	n.a.	n.a.	n.a.	5 (p.178)
Hydropower pumped storage	5257	3617	311	2.3%	(6:2:0)
Hydropower mixed (normalised)	2792	2535	218	1.6%	
Geothermal	0	0	0	0.0%	
Solar	6603	11968	1029	7.6%	
Solar photovoltaic	4603	8193	704	5.2%	
Concentrated solar power	2000	3775	325	2.4%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	22775	47560	4089	30.1%	
Onshore wind	22775	n.a.	n.a.	n.a.	
Offshore wind	0	n.a.	n.a.	n.a.	
Biomass	858	4262	366	2.7%	
Solid biomass	640	3396	292	2.7%	
	218	866	74	0.5%	
Biogas Bioliquids	0	0	0	0.5%	
Total	46321	93919	8076		C (= 170)
				59.5%	6 (p.178)
Total CHP	n.a.	n.a.	n.a.	n.a.	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			18	0.1%	7 (p.178)
Solar thermal			220	1.6%	(6:2:0)
Biomass			3907	28.8%	
Solid biomass			3851	28.4%	
Biogas			55	0.4%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			n.a.	n.a.	8 (p.178)
Aerothermal heat pumps			n.a.	n.a.	(1.1.1.1)
Geothermal heat pumps			n.a.	n.a.	
Hydrothermal heat pumps			n.a.	n.a.	
Total			4145	30.5%	
Total district heating			n.a.	n.a.	
Total biomass in households			2485	18.3%	
Para de la Transación				0/	6
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE Bioethanol / bio-ETBE Article 21.2			200	1.5%	
Bioethanol / bio-ETBE imported			n.a.	n.a. n.a.	
			n.a.		
Biodiesel			1889	13.9%	
Biodiesel Article 21.2			n.a.	n.a.	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			114	0.8%	
Renewable electricity road transport			n.a.	n.a.	
Renewable electricity non-road transport			114	0.8%	
Other biofuels			n.a.	n.a.	9 (p.178)
Other biofuels Article 21.2			n.a.	n.a.	
Total			2203	16.2%	

Table 230: Spanish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Spain for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 231:** Spanish PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity Domestic raw n				
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	1612	1530	
Indirect supply of wood biomass	ktoe	1926	1879	
Energy crops	ktoe	237	322	
Agricultural by-products / processed residues and fishery	ktoe	2035	1939	
by-products			400	
Biomass from waste Others	ktoe	529	498	
Total biomass for heating and electricity*	ktoe ktoe	n.a. 6339	n.a. 6168	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	102	n.a.	Comment
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	102	0	
Total biomass for all sectors*	ktoe	6441	6168	
Biomass supply for heating and electricity	Rav	v material	imported f	rom EU
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	0	0	
Indirect supply of wood biomass	ktoe	0	0	
Energy crops	ktoe	0	0	
Agricultural by-products / processed residues and fishery	ktoe	0	0	
by-products Biomass from waste	ktoe	0	0	
Others	ktoe	n.a.	n.a.	
Total biomass for heating and electricity*	ktoe	0	0	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	38	n.a.	
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	n.a.	n.a.	
Total biomass for transport*	ktoe	38	0	
Total biomass for all sectors*	ktoe	38	0	
Biomass supply for heating and electricity	Raw r	naterial im	ported fro	m non-EU
	Unit	2011	2012	Comment
	Offic			
Direct supply of wood biomass from forests and other	ktoe	0	0	
wooded land energy generation	ktoe		_	
wooded land energy generation Indirect supply of wood biomass	ktoe ktoe	0	0	
wooded land energy generation	ktoe		_	
wooded land energy generation Indirect supply of wood biomass Energy crops	ktoe ktoe ktoe	0	0 0	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery	ktoe ktoe ktoe	0	0 0	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 0 n.a.	0 0 0 0 n.a.	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste	ktoe ktoe ktoe ktoe	0 0 0	0 0 0	
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others	ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 0 n.a.	0 0 0 0 n.a.	Comment
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 0 n.a. 0 2011	0 0 0 0 n.a. 0 2012	Comment
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 0 n.a. 0 2011 38	0 0 0 n.a. 0 2012 n.a.	Comment
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 n.a. 0 2011 38 0 n.a.	0 0 0 n.a. 0 2012 n.a. 0 n.a.	Comment
wooded land energy generation Indirect supply of wood biomass Energy crops Agricultural by-products / processed residues and fishery by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe ktoe ktoe ktoe ktoe ktoe	0 0 0 0 n.a. 0 2011 38	0 0 0 n.a. 0 2012 n.a.	Comment

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	50291	0	10 (p.178)
Land used for short rotation trees	ha	n.a.	n.a.	
Land used for other energy crops such as grasses	ha	n.a.	n.a.	

Table 232: Spanish PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	179.9	n.a.	11 (p.178)
Consumption - Fuel type X	ktoe	95.1	n.a.	12 (p.178)
Total production Art.21.2.biofuels	ktoe	179.9	n.a.	
Total consumption Art.21.2. biofuels	ktoe	95.1	n.a.	
Share of 21(2) fuels from total RES-T	%	n.a.	n.a.	

Table 233: Spanish PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	53653831	56856813	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	35829249	37629056	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	12185633	12340261	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	5638950	6887495	

Table 234: Spanish PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	0	
2011	3337	0	
2012	3956	0	
2013	3388	0	
2014	3878	0	
2015	2804	0	
2016	3469	0	
2017	2049	0	
2018	2793	0	
2019	0	0	
2020	839	0	

Table 235: Spanish PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Spain (ktoe) (see Table 9 of the NREAP)

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### **Comments for Spain**

- 1: The original values (0.4% in both years) might be based on renewable electricity in transport only, see comment in Table 1a. Here the values have been increased according to the ratio of the possible mistake.
- 2: The values in the Spanish Table 1a (108 ktoe in 2011 and 114 ktoe in 2012) obviously refer to the entries 'Renewable electricity' in Table 1d. The current data refer to the total value from Table 1d.
- 3: We are unable to provide a breakdown per capacity of the standardised hydroelectric energy production data, as we do not have a breakdown of capacity for the past fifteen years.
- 4: See comment 27.
- 5: See comment 27.
- 6: Minus pumping.
- 7: The data referring to renewable energy from heat pumps is partially included under geothermal energy.
- 8: The data referring to renewable energy from heat pumps is partially included under geothermal energy. Data relating to aerothermal technologies is yet to be incorporated as we are awaiting the completion of a specific study on heat pumps, which the IDAE (Institute for Energy Diversification and Saving) intends to carry out shortly.
- 9: HVO. Data prepared using information published in the National Energy Commission's [NEC] 2011 Annual Report on the obligation to use biofuels. As of the date of preparing this report, the 2012 report from the National Markets and Competition Commission (NMCC), the entity that the NEC has joined, was not available. We have therefore not included data on the production of biofuels for 2012.
- 10: Breakdown for 2011: wheat (soft and hard) 15246 [ha], barley 12100 [ha], corn 18674 [ha], sunflower and safflower 2653 [ha] and rape 1618 [ha].
- 11: Biodiesel from UCO and animal fats.
- 12: Biodiesel from UCO and animal fats.

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	Unit	2011	2012	Comment
Renewable heating and cooling	%	62.5	65.6	
Renewable electricity	%	59.9	60	
Renewable Transport	%	9.4	12.6	
Overall renewable energy share	%	48.8	51	
Renewables through cooperation mechanism	%	0	-0.1	
Surplus for cooperation mechanism	%	7.3	9.3	

Table 236: Swedish PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in Sweden (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	9156	9661	
Gross final consumption of electricity from RES	ktoe	7232	7443	
Gross final consumption of energy from RES in transport	ktoe	607	736	1 (p.184)
Gross total RES consumption	ktoe	16994	17840	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	16994	17810	

Table 237: Swedish PR Table 1a: Calculation table for the renewable energy contribution in Sweden of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

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Table 238: Swedish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Sweden for 2011 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity	Energy			Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	16577	68509	5891	35.3%	
Hydropower (non pumped)	16478	66419	5711	34.3%	
Hydropower <1 MW (non pumped)	174	600	52	0.3%	2 (p.184)
Hydropower 1 MW - 10 MW (non pumped)	782	3000	258	1.5%	3 (p.184)
Hydropower >10 MW (non pumped)	15522	62819	5401	32.4%	4 (p.184)
Hydropower pumped storage	99	122	10	0.1%	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	12	11	1	0.0%	
Solar photovoltaic	12	11	1	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	2769	5591	481	2.9%	
Onshore wind	2605	5590	481	2.9%	5 (p.184)
Offshore wind	163	490	42	0.3%	6 (p.184)
Biomass	3401	9674	832	5.0%	- ()
Solid biomass	3397	9641	829	5.0%	7 (p.184)
Biogas	4	33	3	0.0%	
Bioliquids	0	0	0	0.0%	8 (p.184)
Total	22759	85645	7364	44.2%	
Total CHP	n.a.	11536	992	5.9%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			11	0.1%	
Biomass			7525	45.1%	9 (p.184)
Solid biomass			7485	44.9%	10 (p.184)
Biogas			40	0.2%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			1163	7.0%	11 (p.184)
Aerothermal heat pumps			245	1.5%	12 (p.184)
Geothermal heat pumps			786	4.7%	13 (p.184)
Hydrothermal heat pumps			n.a.	n.a.	
Total			8700	52.2%	14 (p.184)
Total district heating			2582	15.5%	15 (p.184)
Total biomass in households			1170	7.0%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			197	1.2%	
Bioethanol / bio-ETBE Article 21.2			7	0.0%	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			215	1.3%	
Biodiesel Article 21.2			28	0.2%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			132	0.8%	
Renewable electricity road transport			n.a.	n.a.	16 (p.184)
Renewable electricity non-road transport			132	0.8%	" '
Other biofuels			62	0.4%	17 (p.184)
Other biofuels Article 21.2			61	0.4%	" '
Total			607	3.6%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	16414	68506	5890	35.3%	
Hydropower (non pumped)	16315	78915	6785	40.7%	
Hydropower <1 MW (non pumped)	186	799	69	0.4%	2 (p.184)
Hydropower 1 MW - 10 MW (non pumped)	767	3500	301	1.8%	3 (p.184)
Hydropower >10 MW (non pumped)	15362	74566	6412	38.5%	4 (p.184)
Hydropower pumped storage	99	126	11	0.1%	" ,
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	24	19	2	0.0%	
Solar photovoltaic	24	19	2	0.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	0	0	0	0.0%	
Wind power	3607	7348	632	3.8%	
Onshore wind	3443	6700	576	3.5%	5 (p.184)
Offshore wind	163	460	40	0.2%	6 (p.184)
Biomass	4055	10527	905	5.4%	
Solid biomass	3522	10507	903	5.4%	7 (p.184)
Biogas	5	20	2	0.0%	
Bioliquids	528	0	0	0.0%	8 (p.184)
Total	24100	88062	7572	45.4%	
Total CHP	n.a.	12194	1048	6.3%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0	0.0%	
Solar thermal			11	0.1%	
Biomass			7964	47.8%	9 (p.184)
Solid biomass			7921	47.5%	10 (p.184)
Biogas			43	0.3%	
Bioliquids	_		0	0.0%	44 ( . 404)
Renewable energy from heat pumps			1177	7.1%	11 (p.184)
Aerothermal heat pumps			245	1.5%	12 (p.184)
Geothermal heat pumps			786	4.7%	13 (p.184)
Hydrothermal heat pumps	_		n.a.	n.a.	44 ( . 404)
Total			9152	54.9%	14 (p.184)
Total district heating			3050	18.3%	15 (p.184)
Total biomass in households			1189	7.1%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			197	1.2%	
Bioethanol / bio-ETBE Article 21.2			3	0.0%	
Bioethanol / bio-ETBE imported			n.a.	n.a.	
Biodiesel			331	2.0%	
Biodiesel Article 21.2			102	0.6%	
Biodiesel imported			n.a.	n.a.	
Hydrogen from renewables			n.a.	n.a.	
Renewable electricity			129	0.8%	
Renewable electricity road transport			n.a.	n.a.	16 (p.184)
Renewable electricity non-road transport			129	0.8%	,
Other biofuels			79	0.5%	17 (p.184)
Other biofuels Article 21.2			78	0.5%	,
Total			736	4.4%	

Table 239: Swedish PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in Sweden for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

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**Table 240:** Swedish PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass   title   19	Biomass supply for heating and electricity		Domestic	raw mate	rial
		Unit	2011	2012	Comment
Energy crops   Received   Agricultural by-products   Processed residues and fishery   Products   Processed residues and fishery   Products   Processed residues and fishery   Received   Processed	• • •	ktoe	2766	3098	18 (p.185)
Agricultural by-products / processed residues and fishery by-products   ktoe   751   751   21 (p.185)	5. 5	ktoe	7054	6785	19 (p.185)
Dy-products   Richard	Energy crops	ktoe	19	20	
Others         ktoe         45         79           Total biomass for heating and electricity*         ktoe         10759         10881           Biomass supply for transport         Unit         2011         2012         Comment           Common arable crops for biofuels         ktoe         0         0         23 (p.185)           Others         ktoe         96         51         24 (p.185)           Total biomass for transport*         ktoe         10935         11205           Biomass supply for heating and electricity         Raw material imported from EU           Direct supply of wood biomass from forests and other wooded land energy generation indirect supply of wood biomass         ktoe         18         7         18 (p.185)           Energy crops         ktoe         163         39         19 (p.185)         19 (p.185)           Energy crops         ktoe         163         39         19 (p.185)         19 (p.185)           Energy crops         ktoe         163         39         19 (p.185)         19 (p.185)           Energy crops         ktoe         163         39         19 (p.185)         19 (p.185)           Energy crops         ktoe         163         39         19 (p.185)         19 (p.185) <t< td=""><td>, , , , , , , , , , , , , , , , , , , ,</td><td>ktoe</td><td>124</td><td>148</td><td>20 (p.185)</td></t<>	, , , , , , , , , , , , , , , , , , , ,	ktoe	124	148	20 (p.185)
Total biomass for heating and electricity*   Ktoe   10759   10881	Biomass from waste	ktoe	751	751	21 (p.185)
Biomass supply for transport			-		
Common arable crops for biofuels   Rice   80   273   22 (p.185)	Total biomass for heating and electricity*	ktoe	10759	10881	
Energy crops and short rotation trees for biofuels	Biomass supply for transport	Unit	2011	2012	Comment
Name	· · · · · · · · · · · · · · · · · · ·		- 11		
Total biomass for all sectors*   ktoe   176   324			-	-	
Biomass supply for heating and electricity    Raw material imported from EU					24 (p.185)
Biomass supply for heating and electricity    Raw material imported from EU					
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass   Refricultural by-products / processed residues and fishery by-products   Richard State	lotal biomass for all sectors*	Ktoe	10935	11205	
Direct supply of wood biomass from forests and other wooded land energy generation Indirect supply of wood biomass   Refricultural by-products / processed residues and fishery by-products   Richard State					
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by-products Biomass from waste Others Richard Spin Masse Others Richard Spin Masse Others Richard Spin Masse Others Richard Spin Masse Richard Spi	Energy crops	ktoe	n.a.	n.a.	
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Energy crops and short rotation trees for biofuels ktoe 0 0 23 (p.185) Others ktoe 9 51 24 (p.185) Total biomass for transport* ktoe 251 324	Total bioliuss for fleating and electricity		2011	2012	Comment
Others         ktoe         9         51         24 (p.185)           Total biomass for transport*         ktoe         251         324		Unit			
Total biomass for transport* ktoe 251 324	Biomass supply for transport			273	22 (p.185)
	Biomass supply for transport  Common arable crops for biofuels	ktoe	242		
Total biomass for all sectors* ktoe 423 507	Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Others	ktoe ktoe	242 0 9	0 51	23 (p.185)
	Biomass supply for transport  Common arable crops for biofuels  Energy crops and short rotation trees for biofuels  Others	ktoe ktoe ktoe	242 0 9	0 51	23 (p.185)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	n.a.	n.a.	25 (p.185)
Land used for short rotation trees	ha	12064	11861	26 (p.185)
Land used for other energy crops such as grasses	ha	912	828	27 (p.185)

Table 241: Swedish PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	93	127	28 (p.185)
Consumption - Fuel type X	ktoe	96	184	29 (p.185)
Total production Art.21.2.biofuels	ktoe	92	126	
Total consumption Art.21.2. biofuels	ktoe	95	183	
Share of 21(2) fuels from total RES-T	%	31	46	

Table 242: Swedish PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	86000000	98000000	30 (p.185)
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	58000000	67000000	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	27000000	31000000	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	1000000	1400000	

Table 243: Swedish PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	2020	0	
2011	2200	0	
2012	2930	0	
2013	2470	0	
2014	2560	0	
2015	2120	0	
2016	2220	0	
2017	1590	0	
2018	1680	0	
2019	1150	0	
2020	610	0	

Table 244: Swedish PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Sweden (ktoe) (see Table 9 of the NREAP)

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#### Comments for Sweden

- 1: Note that this is the actual contribution, not double-counting, and that renewable electricity for forms of transport (see Table 1d on page 8 of the Swedish Progress Report) is not included here but under 'B', 'Gross final consumption of electricity from RES').
- 2: Unlike the total fields for hydropower, the division of hydropower by the output of the power station has not been normalised, as statistics are not available for the entire period (15 years) required for normalisation. This is also the case for the division of onshore/offshore wind power.
- 3: See comment 28.
- 4: See comment 28.
- 5: Unlike the total field for wind power, the division of onshore/offshore wind power has not been normalised, as statistics are not available for the entire period (15 years) required for normalisation.
- 6: See comment 28.
- 7: The Swedish Progress Report separately specifies electricity generation from waste. In 2011 the energy from the renewable share of waste amounted to 1860 [GWh], for 2012 the value amounted to 1662 [GWh].
- 8: Note by ECN: the electricity generation in 2012 (0 [GWh]) does not correspond to the positive capacity defined for that year (528 [ktoe]).
- 9: The Swedish Progress Report separately specifies heat generation from waste. In 2011 the energy from the renewable share of waste amounted to 456 [ktoe], for 2012 the value amounted to 509 [ktoe].
- 10: See comment 28.
- 11: In the Table only the contribution from large heat pumps in the district heating network is included in the total fields for heat pumps. The sub-categories for heat pumps in the table only include contributions from small heat pumps. The estimated amount of energy from the small heat pumps has been calculated in accordance with the Commission's guidelines (2013/114/EU). The data for 2011 for small heat pumps have also been used for 2012 as more recent statistics were not available.
- 12: See comment 28.
- 13: Including hydrothermal (water-borne) heat. See comment 28.
- 14: Renewable share of waste is included in the table.
- 15: Renewable share of waste is included in the table.
- 16: There are a few electric vehicles in the road transport system in Sweden. In 2011 and 2012, the number of vehicles was 366 and 603 respectively (excluding electric hybrids and plug-in hybrids).
- 17: The value for 2011 refers to biogas, the value for 2012 refers to both biogas and DME.
- 18: The definition of this biomass category should be understood in line with Table 7 of part 4.6.1 of Commission Decision C (2009) 5174 final establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC. The following forest fuels are included in the reporting: round timber and fuel wood, residues from tree felling such as branches, tops and (stumps), the forestry industry's solid by-products such as shavings and bark, etc., the forestry industry's liquid by-products such as black liquors, crude tall oil, and tall oil pitch, recovered (recycled) wood such as packing material, old furniture and demolition timber and processed fuel wood such as pellets, briquettes and wood powder. A variety of forest biofuel raw materials and biofuels are imported (including pellets, round timber, wood waste and shavings/sawdust). In such cases, the import quantities of these raw materials are reported by the Swedish Forest Agency67, the Swedish Wood Fuel Association68 and the Swedish Pellet Association69. In these instances the quantity

is reported separately. Indirect imports also occur, i.e. when the forest industry imports round timber for forestry purposes. When processing round timber, whether this is done mechanically in a sawmill or processed into pulp, by-products are generated that can be used for energy purposes. There are no reliable statistics for this.

19: See comment 28.

- 20: See comment 28. The biofuels and biofuel raw materials included are: cereals, straw, short rotation trees (Salix), bio-oils (animal and/or vegetable oils and fats) and olive pits, sunflower pellets, bean pods/husks, etc.
- 21: The renewable fraction of the waste has been consistently assumed to be 60% (for reference and reasoning, see point 12 of the template). The renewable fraction of solid municipal waste, including biowaste and the biodegradable fraction of industrial waste is specified in tonnes of dry weight.
- 22: It was judged not to be possible to report raw materials in weight in a fair and useful way, as the different raw materials are not comparable in terms of weight in relation to energy content.
- 23: See comment 28. Since neither energy crops nor short rotation trees are used for the production of biofuel in Sweden, there are no data about these in Table 4.
- 24: See comment 28. Values for 'primary energy in domestic raw material' refer to category 'other biomass-based supply for transport' (66 ktoe in 2011 and 85 ktoe in 2012) and residues/by-products from the pulp and paper industry (sulphite liquor and tall oil, 30 ktoe in 2011 and 51 ktoe in 2012). Values for 'primary energy production in imported raw material from EU' refer to category 'other biomass-based supply for transport' (9 ktoe in 2011 and 49 ktoe in 2012) and residues/by-products from the pulp and paper industry (sulphite liquor and tall oil 0 ktoe in 2011 and 2 ktoe in 2012). Values for 'primary energy production in imported raw material from non-EU' refer to category 'other biomass-based supply for transport' (4 ktoe in 2011 and 10 ktoe in 2012) and residues/by-products from the pulp and paper industry (sulphite liquor and tall oil, 0 ktoe in 2011 and 2 ktoe in 2012). 25: The Swedish Board of Agriculture's statistics for traditional arable crops do not specify
- the purpose for which the crops are used.

  26: For 2011: 11080 [ha], salix, 613 [ha] poplar and 371 [ha] hybrid aspen. For 2012:
- 27: For 2011: 817 [ha] reed canary grass and 95 [ha] hemp. For 2012: 766 [ha] reed canary grass and 62 [ha] hemp.

10637 [ha] salix, 947 [ha] poplar and 277 [ha] hybrid aspen.

- 28: Values 93 (2011) and 127 (2012) were calculated from ranges 92 94 and 126 128 respectively. Biogas (57 ktoe in 2011 and 73 ktoe in 2012), DME (<1 ktoe in 2011 and <1 ktoe in 2012), Ethanol (7 ktoe in 2011 and 3 ktoe in 2012), FAME (<1 ktoe in 2011 and <1 ktoe in 2012) and HVO (hydrogenated vegetable oils) (28 ktoe in 2011 and 50 ktoe in 2012).
- 29: Values 96 (2011) and 184 (2012) were calculated from ranges 95 97 and 183 185 respectively. Biogas (61 ktoe in 2011 and 78 ktoe in 2012), DME (<1 ktoe in 2011 and <1 ktoe in 2012), Ethanol (7 ktoe in 2011 and 3 ktoe in 2012), FAME (<1 ktoe in 2011 and <1 ktoe in 2012) and HVO (28 ktoe in 2011 and 102 ktoe in 2012).
- 30: This table was calculated for two cases in which different outcomes were shown, see Swedissh Progress Report (page 49 and 50).

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### The United Kingdom

	Unit	2011	2012	Comment
Renewable heating and cooling	%	2.3	2.3	
Renewable electricity	%	8.8	10.8	
Renewable Transport	%	2.7	3.7	
Overall renewable energy share	%	3.8	4.2	
Renewables through cooperation mechanism	%	0	0	
Surplus for cooperation mechanism	%	0	0	

Table 245: UK's PR Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources in United Kingdom (see Table 3 and Table 4a of the NREAP)

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	1193	1272	
Gross final consumption of electricity from RES	ktoe	2809	3460	
Gross final consumption of energy from RES in transport	ktoe	968	880	
Gross total RES consumption	ktoe	4969	5613	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	4969	5613	

Table 246: UK's PR Table 1a: Calculation table for the renewable energy contribution in United Kingdom of each sector to final energy consumption (ktoe) (see Table 4a of the NREAP)

Table 247: UK's PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in United Kingdom for **2011** to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
<b>R</b> enewable Electricity	MW	GWh	ktoe	%	
Hydropower	1675	5115	440	8.7%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	92	183	16	0.3%	
Hydropower 1 MW - 10 MW (non pumped)	180	552	47	0.9%	
Hydropower >10 MW (non pumped)	1403	4380	377	7.5%	
Hydropower pumped storage Hydropower mixed (normalised)	2744	2906	250	5.0% 0.0%	
Geothermal	0	0	0	0.0%	
Solar	993	244	21	0.4%	
Solar photovoltaic	993	244	21	0.4%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	3	1	0	0.0%	
Wind power	n.a.	14104	1213	24.1%	
Onshore wind	4638	9754	839	16.7%	
Offshore wind	1838	4351	374	7.4%	
Biomass	3117	13200	1135	22.5%	
Solid biomass	1869	7344	631	12.5%	
Biogas	1248	5857	504	10.0%	
Bioliquids Total	12264	32666	2 <b>809</b>	0.0% <b>55.8%</b>	
		0_00			
Total CHP	306	1131	97	1.9%	
<b>R</b> enewable Heating and Cooling			ktoe	%	Comment
Geothermal			0.8	0.0%	
Solar thermal			122	2.4%	
Biomass			981	19.5%	
Solid biomass			909	18.0%	
Biogas			72	1.4%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			47	0.9%	
Aerothermal heat pumps			24.3	0.5%	1 (p.192)
Geothermal heat pumps			22.6	0.4%	2 (p.192)
Hydrothermal heat pumps  Total			n.a. <b>1193</b>	n.a. <b>23.7%</b>	3 (p.192) 4 (p.192)
***					4 (p.192)
Total district heating			n.a.	n.a.	
Total biomass in households			357	7.1%	
<b>R</b> enewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			330	6.6%	
Bioethanol / bio-ETBE Article 21.2			0	0.0%	5 (p.192)
Bioethanol / bio-ETBE imported			283	5.6%	,, ,
Biodiesel			635	12.6%	
Biodiesel Article 21.2			0	0.0%	6 (p.192)
Biodiesel imported			511	10.1%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			66	1.3%	- /
Renewable electricity road transport			0.322	0.0%	7 (p.192)
Renewable electricity non-road transport			66	1.3%	0 (n 103)
Other biofuels Other biofuels Article 21.2			4 0	0.1% 0.0%	8 (p.192)
Total			1035	20.5%	9 (p.192)
10111			1033	20.3/0	

		20	12		
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	1686	5186	446	8.9%	
Hydropower (non pumped)	n.a.	n.a.	n.a.	n.a.	
Hydropower <1 MW (non pumped)	101	209	18	0.4%	
Hydropower 1 MW - 10 MW (non pumped)	182	566	49	1.0%	
Hydropower >10 MW (non pumped)	1403	4412	379	7.5%	
Hydropower pumped storage	2744	2966	255	5.1%	
Hydropower mixed (normalised)	0	0	0	0.0%	
Geothermal	0	0	0	0.0%	
Solar	1706	1188	102	2.0%	
Solar photovoltaic	1706	1188	102	2.0%	
Concentrated solar power	0	0	0	0.0%	
Tidal, wave and ocean energy	7	4	0	0.0%	
Wind power	n.a.	18666	1605	31.9%	
Onshore wind	5893	11735	1009	20.0%	
Offshore wind	2995	6931	596	11.8%	
Biomass	3251	15198	1307	25.9%	
Solid biomass	2016	9325	802	15.9%	
Biogas	1235	5874	505	10.0%	
Bioliquids	0	0	0	0.0%	
Total	15538	40243	3460	68.7%	
Total CHP	316	1176	101	2.0%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			0.8	0.0%	
Solar thermal			153	3.0%	
Biomass			1000	19.9%	
Solid biomass			922	18.3%	
Biogas			78	1.5%	
Bioliquids			0	0.0%	
Renewable energy from heat pumps			67.3	1.3%	
Aerothermal heat pumps			38.3	0.8%	1 (p.192)
Geothermal heat pumps			29	0.6%	2 (p.192)
Hydrothermal heat pumps			n.a.	n.a.	3 (p.192)
Total			1272	25.3%	4 (p.192)

Table 248: UK's PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in United Kingdom for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

Renewable Transport		ktoe	%	Comment
Bioethanol / bio-ETBE		387	7.7%	
Bioethanol / bio-ETBE Article 21.2		0	0.0%	5 (p.192)
Bioethanol / bio-ETBE imported		312	6.2%	
Biodiesel		471	9.4%	
Biodiesel Article 21.2		453	9.0%	6 (p.192)
Biodiesel imported		339	6.7%	
Hydrogen from renewables		0	0.0%	
Renewable electricity		69	1.4%	
Renewable electricity road transport		0.4	0.0%	7 (p.192)
Renewable electricity non-road transport		69	1.4%	
Other biofuels		24	0.5%	8 (p.192)
Other biofuels Article 21.2		19	0.4%	9 (p.192)
Total		951	18.9%	

Total district heating

Total biomass in households

**Table 249:** UK's PR Table 4: Biomass supply for heating and electricity (see Table 7 of the NREAP)

Biomass supply for heating and electricity		Domestic	raw mate	rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	535	456	
Indirect supply of wood biomass	ktoe	952	954	
Energy crops	ktoe	44	19	10 (p.192)
Agricultural by-products / processed residues and fishery	ktoe	492	633	
by-products Biomass from waste	ktoe	2894	3118	
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	4917	5180	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	0	n.a.	11 (p.192)
Energy crops and short rotation trees for biofuels	ktoe	0	n.a.	12 (p.192)
Others	ktoe	n.a.	n.a.	13 (p.192)
Total biomass for transport*	ktoe	0	n.a.	
Total biomass for all sectors*	ktoe	4917	5180	
Biomass supply for heating and electricity	ļ	w material		
Division of a facility of the	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	26	n.a.	
Indirect supply of wood biomass	ktoe	436	651	
Energy crops	ktoe	1	n.a.	10 (p.192)
Agricultural by-products / processed residues and fishery by-products	ktoe	180	98	
Biomass from waste	ktoe	n.a.	n.a.	
Others	ktoe	0	0	
Total biomass for heating and electricity*	ktoe	643	749	
Biomass supply for transport	Unit	2011	2012	Comment
Common arable crops for biofuels	ktoe	n.a.	n.a.	11 (p.192)
Energy crops and short rotation trees for biofuels	ktoe	n.a.	n.a.	12 (p.192)
Others	ktoe	n.a.	n.a.	13 (p.192)
Total biomass for transport*	ktoe	n.a.	n.a.	
Total biomass for all sectors*	ktoe	643	749	
Street, and for horizontal but the				
Biomass supply for heating and electricity				m non-EU
Direct complete force of the control of	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	n.a.	n.a.	
Indirect supply of wood biomass	ktoe	n.a.	n.a.	
Energy crops	ktoe	n.a.	n.a.	10 (p.192)
	ktoe	n.a.	n.a.	,
Agricultural by-products / processed residues and fishery		11.0.		
Agricultural by-products / processed residues and fishery by-products Biomass from waste	ktoe	n.a.	n.a.	
by-products				
by-products Biomass from waste	ktoe	n.a.	n.a.	
by-products Biomass from waste Others	ktoe ktoe	n.a. n.a.	n.a. n.a.	Comment
by-products Biomass from waste Others Total biomass for heating and electricity*	ktoe ktoe ktoe	n.a. n.a. n.a.	n.a. n.a. n.a.	Comment 11 (p.192)
by-products Biomass from waste Others Total biomass for heating and electricity* Biomass supply for transport	ktoe ktoe ktoe Unit	n.a. n.a. n.a.	n.a. n.a. n.a.	11 (p.192) 12 (p.192)
by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels Others	ktoe ktoe Unit ktoe ktoe	n.a. n.a. n.a. 2011 n.a. n.a.	n.a. n.a. n.a. 2012 n.a. n.a.	11 (p.192)
by-products Biomass from waste Others Total biomass for heating and electricity*  Biomass supply for transport  Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe ktoe ktoe Unit ktoe ktoe	n.a. n.a. n.a. 2011 n.a. n.a.	n.a. n.a. n.a. 2012 n.a. n.a.	11 (p.192) 12 (p.192)

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	32617	14942	14 (p.192)
Land used for short rotation trees	ha	2720	2551	15 (p.192)
Land used for other energy crops such as grasses	ha	8075	7517	16 (p.192)

**Table 250:** UK's PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (see Table 8 of the NREAP)

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	n.a.	n.a.	
Consumption - Fuel type X	ktoe	n.a.	n.a.	
Total production Art.21.2.biofuels	ktoe	n.a.	n.a.	
Total consumption Art.21.2. biofuels	ktoe	565	441	17 (p.192)
Share of 21(2) fuels from total RES-T	%	59	53	

**Table 251:** UK's PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe)

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	n.a.	n.a.	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	20056863	28169890	18 (p.192)
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	n.a.	n.a.	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	2192207	1983928	19 (p.192)

**Table 252:** UK's PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	0	0	
2011	0	-90	
2012	0	-90	
2013	210	0	
2014	210	0	
2015	0	0	
2016	0	0	
2017	0	0	
2018	0	0	
2019	0	0	
2020	0	0	

Table 253: UK's PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in United Kingdom (ktoe) (see Table 9 of the NREAP)

#### Comments for the United Kingdom

- 1: Note ECN: it is not entirely clear to which heat pump type the value refers.
- 2: See comment 29.
- 3: See comment 29.
- 4: Derived heat: 42 ktoe in 2011 and 51 ktoe in 2012.
- 5: Double counting measures were not implemented in the UK until 15 December 2011.
- 6: Double counting measures were not implemented in the UK until 15 December 2011.
- 7: Note for 2011 value: figures for road and non-road transport taken from Digest UK Energy Statistics report page 116 (2011) and page 112. See UK Progress Report footnote 22 for URLs.
- 8: Bio-MTBE: 0 ktoe in 2011 and 13 ktoe in 2012; biogas: 1 ktoe in 2011 and 1 ktoe in 2012; biomethanol: 0 ktoe in 2011 and 10 ktoe in 2012; hvo: 3 ktoe in 2011 and 0 ktoe in 2012; pure plant oil: 23 ktoe in 2011 and 23 ktoe in 2012.
- 9: Double counting measures were not implemented in the UK until 15 December 2011.
- 10: Comment ECN: check the unit.
- 11: See table 4 of the United Kingdom Progress Report for all detail.
- 12: See table 4 of the United Kingdom Progress Report for all detail.
- 13: See table 4 of the United Kingdom Progress Report for all detail.
- 14: Oilseed rape: 6258 ktoe in 2011 and 3202 ktoe in 2012; sugar beet: 3314 ktoe in 2011 and 9843 ktoe in 2012; wheat: 23045 ktoe in 2011 and 1897 ktoe in 2012.
- 15: Data relate to England only.
- 16: Data relate to England only.
- 17: Biofuels from 'by-products'.
- 18: Net GHG savings from electricity have been calculated using the average CO2 emissions factor for the fossil fuel mix for that year, as published in table 5C in chapter 5 of the Digest of UK Energy Statistics, 2013, available at: www.gov.uk/government/publications/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes
- 19: Net direct GHG savings for transport have been calculated using the carbon intensity data reported by suppliers for the fuel supplied. This included a mix of RED Annex V default values and actual data calculated by fuel suppliers using guidance published by the Department for Transport in line with Annex V.

#### All 28 Member States

	Unit	2011	2012	Comment
Renewable heating and cooling	%	n.a.	n.a.	
Renewable electricity	%	n.a.	n.a.	
Renewable Transport	%	n.a.	n.a.	
Overall renewable energy share	%	n.a.	n.a.	
Renewables through cooperation mechanism	%	n.a.	n.a.	
Surplus for cooperation mechanism	%	n.a.	n.a.	

Table 254: All 28 Member States PR Table 1: These values for the sectoral and overall shares of energy from renewable sources in all 28 Member States cannot be calculated since the Progress Reports do not provide info on the gross final energy consumption in the Member States

	Unit	2011	2012	Comment
Gross final consumption of RES for heating and cooling	ktoe	78402	83276	
Gross final consumption of electricity from RES	ktoe	60412	65734	
Gross final consumption of energy from RES in transport	ktoe	14599	15304	
Gross total RES consumption	ktoe	147437	157926	
Transfer of RES to other Member States	ktoe	0	0	
Transfer of RES from other Member States and 3rd countries	ktoe	0	0	
RES consumption adjusted for target	ktoe	145932	156219	

Table 255: All 28 Member States PR Table 1a: Calculation table for the renewable energy contribution in all 28 Member States of each sector to final energy consumption (ktoe)

Table 256: All 28 Member States PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in All 28 Member States for  ${\bf 2011}$  to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

	2011				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	121513	318417	27379	17.9%	
Hydropower (non pumped)	94549	292074	25114	16.4%	
Hydropower <1 MW (non pumped)	3284	10263	882	0.6%	
Hydropower 1 MW - 10 MW (non pumped)	10325	28699	2468	1.6%	
Hydropower >10 MW (non pumped)	91447	249204	21428	14.0%	
Hydropower pumped storage	30899	18246	1569	1.0%	
Hydropower mixed (normalised)	26540	48421	4163	2.7%	
Geothermal	778	5940	511	0.3%	
Solar	52110	47164	4055	2.7%	
Solar photovoltaic	51462	45615	3922	2.6%	
Concentrated solar power	1151	1959	168	0.1%	
Tidal, wave and ocean energy	243	478	41	0.0%	
Wind power	87813	175556	15095	9.9%	
Onshore wind	89563	117175	10075	6.6%	
Offshore wind	3457	7536	648	0.4%	
Biomass	25626	123965	10659	7.0%	
Solid biomass	16640	80820	6949	4.5%	
Biogas	7100	37886	3258	2.1%	
Bioliquids	1153	3054	263	0.2%	
Total	313583	709838	61035	39.9%	
Total CHP	6085	70799	6088	4.0%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			570	0.4%	
Solar thermal			1759	1.2%	
Biomass			68351	44.7%	
Solid biomass			64207	42.0%	
Biogas			2098	1.4%	
Bioliquids			226	0.1%	
Renewable energy from heat pumps			6107	4.0%	
Aerothermal heat pumps			4151	2.7%	
Geothermal heat pumps			1492	1.0%	
Hydrothermal heat pumps			82	0.1%	
Total			76865	50.3%	
Total district heating			7335	4.8%	
Total biomass in households			35476	23.2%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			2771	1.8%	
Bioethanol / bio-ETBE Article 21.2			57	0.0%	
Bioethanol / bio-ETBE imported			643	0.4%	
Biodiesel			10101	6.6%	
Biodiesel Article 21.2			993	0.6%	
Biodiesel imported			2241	1.5%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			1294	0.8%	
Renewable electricity road transport			18	0.0%	
Renewable electricity non-road transport			1276	0.8%	
Other biofuels			393	0.3%	
Other biofuels Article 21.2			66	0.0%	
Total			14934	9.8%	

	2012				
	Capacity		Energy		Comment
Renewable Electricity	MW	GWh	ktoe	%	
Hydropower	121746	313478	26954	17.6%	
Hydropower (non pumped)	94676	308838	26555	17.4%	
Hydropower <1 MW (non pumped)	3389	10828	931	0.6%	
Hydropower 1 MW - 10 MW (non pumped)	10419	29472	2534	1.7%	
Hydropower >10 MW (non pumped)	91568	260624	22410	14.7%	
Hydropower pumped storage	31058	20275	1743	1.1%	
Hydropower mixed (normalised)	26647	48933	4207	2.8%	
Geothermal	782	5815	500	0.3%	
Solar	70280	71010	6106	4.0%	
Solar photovoltaic	68810	67673	5819	3.8%	
Concentrated solar power	2002	3775	325	0.2%	
Tidal, wave and ocean energy	247	462	40	0.0%	
Wind power	97483	198713	17086	11.2%	
Onshore wind	99962	132848	11423	7.5%	
Offshore wind	4772	10235	880	0.6%	
Biomass	28723	140389	12071	7.9%	
Solid biomass	17772	88495	7609	5.0%	
Biogas	8339	46445	3994	2.6%	
Bioliquids	1856	3228	278	0.2%	
Total	347178	766627	65918	43.1%	
Total CHP	6996	80465	6919	4.5%	
Renewable Heating and Cooling			ktoe	%	Comment
Geothermal			591	0.4%	
Solar thermal			1896	1.2%	
Biomass			72217	47.3%	
Solid biomass			69706	45.6%	
Biogas			2234	1.5%	
Bioliquids			205	0.1%	
Renewable energy from heat pumps			6762	4.4%	
Aerothermal heat pumps			4671	3.1%	
Geothermal heat pumps			1579	1.0%	
Hydrothermal heat pumps			86	0.1%	
Total			81553	53.4%	
Total district heating			7821	5.1%	
Total biomass in households			38526	25.2%	
Renewable Transport			ktoe	%	Comment
Bioethanol / bio-ETBE			2775	1.8%	
Bioethanol / bio-ETBE Article 21.2			73	0.0%	
Bioethanol / bio-ETBE imported			615	0.0%	
Biodiesel			10827	7.1%	
Biodiesel Article 21.2			1991	1.3%	
Biodiesel imported			2286	1.5%	
Hydrogen from renewables			0	0.0%	
Renewable electricity			1332	0.9%	
Renewable electricity road transport			18	0.0%	
Renewable electricity non-road transport			1314	0.9%	
Other biofuels			254	0.2%	
Other biofuels Article 21.2			122	0.1%	
Total			15648	10.2%	

Table 257: All 28 Member States PR Table 1b, Table 1c and Table 1d: Total actual contribution (installed capacity, gross electricity generation, final energy consumption) from each renewable energy technology in All 28 Member States for 2012 to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity (see Table 10a of the NREAP), heating and cooling (see Table 11 of the NREAP) and in the transport sector (see Table 12 of the NREAP)

**Table 258:** All 28 Member States PR Table 4: Biomass supply for heating and electricity

Biomass supply for heating and electricity	Domestic raw material			rial
	Unit	2011	2012	Comment
Direct supply of wood biomass from forests and other	ktoe	132113	146412	
wooded land energy generation				
Indirect supply of wood biomass	ktoe	233142	237233	
Energy crops	ktoe	1357	1575	
Agricultural by-products / processed residues and fishery	ktoe	5800	6300	
by-products Biomass from waste	ktoe	11450	12000	
Others	ktoe	479	511	
Total biomass for heating and electricity*	ktoe	384341	404029	
· · · · · · · · · · · · · · · · · · ·				Camman
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	2548	1696	
Energy crops and short rotation trees for biofuels	ktoe	5	0	
Others	ktoe	130	69	
Total biomass for transport*	ktoe	2684	1765	
Total biomass for all sectors*	ktoe	387024	405794	
Biomass supply for heating and electricity	Ra	w material	imported f	rom EU
	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other wooded land energy generation	ktoe	1412	1337	
ndirect supply of wood biomass	ktoe	3018	3418	
Energy crops	ktoe	53	104	
Agricultural by-products / processed residues and fishery by-products	ktoe	215	140	
Biomass from waste	ktoe	7	2	
Others	ktoe	58	56	
Total biomass for heating and electricity*	ktoe	4763	5058	
Biomass supply for transport	Unit	2011	2012	Commen
Common arable crops for biofuels	ktoe	1993	1696	
Energy crops and short rotation trees for biofuels	ktoe	0	0	
Others	ktoe	28	69	
Total biomass for transport*	ktoe	2021	1765	
Total biomass for all sectors*	ktoe	6784	6823	
Biomass supply for heating and electricity	Raw	material im	ported fro	m non-EU
	Unit	2011	2012	Commen
Direct supply of wood biomass from forests and other	ktoe	344	465	
vooded land energy generation ndirect supply of wood biomass	ktoe	810	1211	
Energy crops	ktoe	446	466	
Agricultural by-products / processed residues and fishery	ktoe	18	17	
DV-products	ktoe	23	26	
		0	0	
Biomass from waste	ktoe		2184	
Dithers	ktoe ktoe	1641	2201	
Ditiomass from waste Others Total biomass for heating and electricity*		1641 2011	2012	Commen
Biomass from waste  Others  Fotal biomass for heating and electricity*  Biomass supply for transport	ktoe			Commen
Biomass from waste Others Fotal biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels	ktoe Unit	2011	2012	Commen
Biomass from waste Others Fotal biomass for heating and electricity* Biomass supply for transport Common arable crops for biofuels Energy crops and short rotation trees for biofuels	ktoe Unit ktoe	<b>2011</b> 1993	2012 1696	Commen
Description of the state of the	Unit ktoe ktoe	2011 1993 0	2012 1696 0	Commen

 $<sup>^*</sup>$  The values indicated with '\*' are calculated values and have not been mentioned in the Progress Reports as such.

	Unit	2011	2012	Comment
Land used for common arable crops and oil seeds	ha	11402634	11865496	
Land used for short rotation trees	ha	50125	51922	
Land used for other energy crops such as grasses	ha	73082	64102	

**Table 259:** All 28 Member States PR Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production

	Unit	2011	2012	Comment
Production - Fuel type X	ktoe	892	1354	
Consumption - Fuel type X	ktoe	1124	1199	
Total production Art.21.2.biofuels	ktoe	738	702	
Total consumption Art.21.2. biofuels	ktoe	1588	1981	
Share of 21(2) fuels from total RES-T	%	n.a.	n.a.	

Table 260: All 28 Member States PR Table 5: Production and consumption of Article 21(2) biofuels (ktoe). Shares cannot be calculated since the Progress Reports do not provide info on the gross final energy consumption in the Member States

	Unit	2011	2012	Comment
Total net GHG emission saving from RES	t CO <sub>2</sub> -eq	591825514	656381901	
Net GHG saving from the use of RES-E	t CO <sub>2</sub> -eq	385684773	442584202	
Net GHG saving from the use of RES-H/C	t CO <sub>2</sub> -eq	195669495	211191511	
Net GHG saving from the use of RES-T	t CO <sub>2</sub> -eq	30936614	34150005	

**Table 261:** All 28 Member States PR Table 6: Estimated GHG emission savings from the use of renewable energy

	Actual/estimated excess production	Actual/estimated deficit production	Comment
Renewable energy	n.a.	n.a.	
Origin/destination	n.a.	n.a.	
Unit	ktoe	ktoe	
2010	9615	-52	
2011	22592	-1788	
2012	27244	-658	
2013	22514	233	
2014	24656	380	
2015	20443	269	
2016	22327	396	
2017	17542	138	
2018	18924	274	
2019	7245	75	
2020	9439	-93	

Table 262: All 28 Member States PR Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in all 28 Member States (ktoe)

#### Comments for all 28 Member States

See the comments for the individual Member States.

# Table 1: The sectoral and overall RES shares

**Table 263:** PR Table 1: Renewable heating and cooling share (%), defined in terms of gross final energy consumption

	Unit	2011	2012	Comment
Austria	%	45.5	45	
Belgium	%	4.68	6.64	
Bulgaria	%	24.9	27.5	
Croatia	%	12.8	13.5	
Cyprus	%	18.9	21.5	
Czech Republic	%	12.65	13.64	
Denmark	%	31.77	33.32	
Estonia	%	48.4	41.4	
Finland	%	45.9	48.2	
France	%	15.8	17.2	
Germany	%	10.8	11.1	1 (p.78)
Greece	%	20.23	24.43	1 (p.84)
Hungary	%	12.28	13.54	
Ireland	%	4.7	5.2	
Italy	%	12.49	12.81	
Latvia	%	44.83	47	
Lithuania	%	33.68	35.41	
Luxembourg	%	4.8	4.99	
Malta	%	5.76	12.47	
Netherlands	%	3.3	3.4	
Poland	%	13.38	13.66	
Portugal	%	35	33	
Romania	%	24.31	25.74	
Slovakia	%	10.7	10.5	
Slovenia	%	28.68	30.57	
Spain	%	13.6	14	
Sweden	%	62.5	65.6	
United Kingdom	%	2.3	2.3	
All 28 Member States	%	n.a.	n.a.	

	Unit	2011	2012	Comment
A al de				
Austria	%	64.5	65.3	
Belgium	%	8.83	11.12	
Bulgaria	%	13.6	16.7	
Croatia	%	34.5	35.6	
Cyprus	%	3.9	5.9	
Czech Republic	%	10.6	11.64	
Denmark	%	35.88	38.69	
Estonia	%	12.2	15.7	
Finland	%	29.4	29.5	
France	%	16.4	16.7	
Germany	%	20.9	23.6	
Greece	%	13.82	16.48	
Hungary	%	6.35	6.1	
Ireland	%	17.6	19.6	
Italy	%	23.55	27.42	
Latvia	%	44.7	44.88	
Lithuania	%	9	10.9	
Luxembourg	%	4.07	4.64	
Malta	%	0.64	90.99	
Netherlands	%	9.8	10.5	
Poland	%	8.15	10.68	
Portugal	%	45.9	47.6	
Romania	%	31.13	33.57	
Slovakia	%	19.9	20.5	
Slovenia	%	30.81	31.36	
Spain	%	31.6	33.5	
Sweden	%	59.9	60	
United Kingdom	%	8.8	10.8	
All 28 Member States	%	n.a.	n.a.	

**Table 264:** PR Table 1: Renewable electricity share (%), defined in terms of gross final energy consumption

**Table 265:** PR Table 1: Renewable Transport share (%), defined in terms of gross final energy consumption

	Unit	2011	2012	Comment
Austria	%	6.7	7	
Belgium	%	4	4.46	
Bulgaria	%	0.4	0.3	
Croatia	%	1.4	2.2	
Cyprus	%	2.1	2.4	
Czech Republic	%	5.9	5.59	
Denmark	%	2.76	5.8	
Estonia	%	0.1	0.1	
Finland	%	6.4	7.9	
France	%	6.9	7.1	
Germany	%	5.9	6.9	
Greece	%	0.74	1.06	
Hungary	%	5.05	4.49	
Ireland	%	3.7	3.8	
Italy	%	4.69	5.84	
Latvia	%	3.24	3.1	
Lithuania	%	3.7	4.8	
Luxembourg	%	2.05	2.22	
Malta	%	1.07	3.84	
Netherlands	%	4.6	5	
Poland	%	6.51	6.09	
Portugal	%	0.4	0.4	
Romania	%	2.05	4.15	
Slovakia	%	5.6	4.5	
Slovenia	%	2.11	2.88	
Spain	%	6.662962963	7.729824561	1 (p.178)
Sweden	%	9.4	12.6	
United Kingdom	%	2.7	3.7	
All 28 Member States	%	n.a.	n.a.	

	1			
	Unit	2011	2012	Comment
Austria	%	30.7	32.2	
Belgium	%	5.17	6.81	
Bulgaria	%	14.6	16.4	
Croatia	%	14.2	15.1	
Cyprus	%	6.1	7	1 (p.40)
Czech Republic	%	10.47	11.22	
Denmark	%	23.99	25.97	
Estonia	%	25.9	24.8	
Finland	%	33.5	35.1	
France	%	12.7	13.7	
Germany	%	11.6	12.4	
Greece	%	11.03	13.83	2 (p.84)
Hungary	%	9.06	9.6	
Ireland	%	6.5	7.1	
Italy	%	12.27	13.53	
Latvia	%	33.55	35.78	
Lithuania	%	20.23	21.72	
Luxembourg	%	2.87	3.13	
Malta	%	1.33	2.7	
Netherlands	%	4.3	4.5	
Poland	%	10.42	11.04	
Portugal	%	24.5	24.6	
Romania	%	21.2	22.9	
Slovakia	%	11.9	11.7	
Slovenia	%	19.42	20.23	
Spain	%	13.2	14.3	
Sweden	%	48.8	51	
United Kingdom	%	3.8	4.2	
All 28 Member States	%	n.a.	n.a.	

**Table 266:** PR Table 1: Overall renewable energy share (%), defined in terms of gross final energy consumption

**Table 267:** PR Table 1: Renewables through cooperation mechanism, share (%) defined in terms of gross final energy consumption

	Unit	2011	2012	Comment
Austria	%	0	0	
Belgium	%	0	0	
Bulgaria	%	0	0	
Croatia	%	0	0	
Cyprus	%	0	0	
Czech Republic	%	0	0	
Denmark	%	n.a.	n.a.	
Estonia	%	0	0	
Finland	%	0	0	
France	%	0	0	
Germany	%	0	0	
Greece	%	n.a.	n.a.	
Hungary	%	0	0	
Ireland	%	n.a.	n.a.	
Italy	%	0	0	
Latvia	%	n.a.	n.a.	
Lithuania	%	n.a.	n.a.	
Luxembourg	%	n.a.	n.a.	
Malta	%	0	0	
Netherlands	%	0	0	
Poland	%	0	0	
Portugal	%	n.a.	n.a.	
Romania	%	n.a.	n.a.	
Slovakia	%	0	0	
Slovenia	%	0	0	
Spain	%	n.a.	n.a.	
Sweden	%	0	-0.1	
United Kingdom	%	0	0	
All 28 Member States	%	n.a.	n.a.	

	Unit	2011	2012	Comment
Austria	%	0	0	
Belgium	%	0	0	
Bulgaria	%	0	0	
Croatia	%	0	0	
Cyprus	%	0	0	
Czech Republic	%	0	0	
Denmark	%	n.a.	n.a.	
Estonia	%	0	0	
Finland	%	0	0	
France	%	0	0	
Germany	%	3.4	4.2	
Greece	%	n.a.	n.a.	
Hungary	%	0	0	
Ireland	%	n.a.	n.a.	
Italy	%	0	0	
Latvia	%	n.a.	n.a.	
Lithuania	%	n.a.	n.a.	
Luxembourg	%	n.a.	n.a.	
Malta	%	0	0	
Netherlands	%	0	0	
Poland	%	1.66	2.28	
Portugal	%	n.a.	n.a.	
Romania	%	n.a.	n.a.	
Slovakia	%	0	0	
Slovenia	%	n.a.	n.a.	
Spain	%	n.a.	n.a.	
Sweden	%	7.3	9.3	
United Kingdom	%	0	0	
All 28 Member States	%	n.a.	n.a.	

**Table 268:** PR Table 1: Surplus for cooperation mechanism, share (%) defined in terms of gross final energy consumption

# Table 1a: RES consumption in all sectors

**Table 269:** PR Table 1a: Gross final consumption of RES for heating and cooling (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	4072	4301	
Belgium	ktoe	947.9	1309.8	1 (p.28)
Bulgaria	ktoe	1043.3	1122	
Croatia	ktoe	367.9	385.5	
Cyprus	ktoe	83.58	81.95	
Czech Republic	ktoe	1800	1904	
Denmark	ktoe	2470	2571.6	
Estonia	ktoe	667	655	
Finland	ktoe	6325	6808	
France	ktoe	10173	11763	
Germany	ktoe	11445	12165	2 (p.78)
Greece	ktoe	1355	1492	
Hungary	ktoe	1133	1115	
Ireland	ktoe	218	232	
Italy	ktoe	7217.7	7387.5	
Latvia	ktoe	1059	1188	
Lithuania	ktoe	872	937	
Luxembourg	ktoe	49.8	53.5	
Malta	ktoe	3.73	7.37	
Netherlands	ktoe	875	939	
Poland	ktoe	4920.7	5066.1	
Portugal	ktoe	2210	1905	
Romania	ktoe	3504.16	3687.73	
Slovakia	ktoe	564	532	
Slovenia	ktoe	583.6	588.9	
Spain	ktoe	4093	4145	
Sweden	ktoe	9156	9661	
United Kingdom	ktoe	1193	1272	
All 28 Member States	ktoe	78402.37	83275.95	

	Unit	2011	2012	Comment
Austria	ktoe	3908	4016	
Belgium	ktoe	668.2	848.2	
Bulgaria	ktoe	456	545.8	
Croatia	ktoe	541.9	552.9	
Cyprus	ktoe	15.3	22.1	
Czech Republic	ktoe	623	693	
Denmark	ktoe	1117.9	1184.8	
Estonia	ktoe	97	130	
Finland	ktoe	2188	2209	1 (p.64)
France	ktoe	7200	7541	
Germany	ktoe	10646	12035	3 (p.78)
Greece	ktoe	739	877	3 (p.84)
Hungary	ktoe	233	222	
Ireland	ktoe	423	468	
Italy	ktoe	6838.1	7839.8	
Latvia	ktoe	278	299	
Lithuania	ktoe	84	103	
Luxembourg	ktoe	22.8	25.2	
Malta	ktoe	1.19	1.94	
Netherlands	ktoe	1003	1047	
Poland	ktoe	1053.2	1404.4	
Portugal	ktoe	2144	2174	1 (p.154)
Romania	ktoe	1570.74	1671.58	
Slovakia	ktoe	497	507	
Slovenia	ktoe	383.4	390.1	
Spain	ktoe	7639	8023	
Sweden	ktoe	7232	7443	
United Kingdom	ktoe	2809	3460	
All 28 Member States	ktoe	60411.73	65733.82	

**Table 270:** PR Table 1a: Gross final consumption of electricity from RES (ktoe)

**Table 271:** PR Table 1a: Gross final consumption of energy from RES in transport (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	571	586	
Belgium	ktoe	364.5	372.8	
Bulgaria	ktoe	5.9	5.1	
Croatia	ktoe	17	31.3	
Cyprus	ktoe	16.01	17	
Czech Republic	ktoe	307	290	
Denmark	ktoe	143.2	213	
Estonia	ktoe	1	1	
Finland	ktoe	213	216	
France	ktoe	2981	3053	
Germany	ktoe	2986	3131	4 (p.78)
Greece	ktoe	46	51	4 (p.84)
Hungary	ktoe	162	137	
Ireland	ktoe	98	85	
Italy	ktoe	1575.3	1551.6	
Latvia	ktoe	27	24	
Lithuania	ktoe	46	62	
Luxembourg	ktoe	47.8	49.5	
Malta	ktoe	1.32	3.03	
Netherlands	ktoe	349	349	
Poland	ktoe	987.3	877.1	
Portugal	ktoe	17	18	
Romania	ktoe	100.85	210.41	
Slovakia	ktoe	122	96	
Slovenia	ktoe	39.8	55.4	
Spain	ktoe	1799	2203	2 (p.178)
Sweden	ktoe	607	736	1 (p.184)
United Kingdom	ktoe	968	880	
All 28 Member States	ktoe	14598.98	15304.24	

	Unit	2011	2012	Comment
Austria	ktoe	8551	8902	
Belgium	ktoe	1980.6	2530.8	
Bulgaria	ktoe	1505.2	1672.9	
Croatia	ktoe	927	970	
Cyprus	ktoe	114.892	121.055	
Czech Republic	ktoe	2731	2888	
Denmark	ktoe	3731.1	3969.4	
Estonia	ktoe	765	789	
Finland	ktoe	8726	9234	
France	ktoe	19800	22021	
Germany	ktoe	25077	27331	5 (p.78)
Greece	ktoe	2140	2420	5 (p.84)
Hungary	ktoe	1528	1474	
Ireland	ktoe	739	785	
Italy	ktoe	15631.2	16778.9	
Latvia	ktoe	1364	1510	
Lithuania	ktoe	1002	1102	
Luxembourg	ktoe	120.6	128.2	
Malta	ktoe	6.25	12.35	
Netherlands	ktoe	2228	2336	
Poland	ktoe	6961.2	7347.6	
Portugal	ktoe	4371	4098	
Romania	ktoe	5175.74	5569.73	1 (p.160)
Slovakia	ktoe	1183	1135	
Slovenia	ktoe	1006.7	1034.4	
Spain	ktoe	11840	12282	
Sweden	ktoe	16994	17840	
United Kingdom	ktoe	4969	5613	
All 28 Member States	ktoe	147437.382	157925.935	

**Table 272:** PR Table 1a: Gross total RES consumption (ktoe)

**Table 273:** PR Table 1a: Transfer of RES to other Member States (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	0	0	
Denmark	ktoe	n.a.	n.a.	
Estonia	ktoe	0	0	
Finland	ktoe	0	0	
France	ktoe	0	0	
Germany	ktoe	0	0	
Greece	ktoe	0	0	
Hungary	ktoe	0	0	
Ireland	ktoe	n.a.	n.a.	
Italy	ktoe	0	0	
Latvia	ktoe	n.a.	n.a.	
Lithuania	ktoe	0	0	
Luxembourg	ktoe	n.a.	n.a.	
Malta	ktoe	0	0	
Netherlands	ktoe	0	0	
Poland	ktoe	0	0	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	0	0	
Slovakia	ktoe	0	0	
Slovenia	ktoe	0	0	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	0	0	
United Kingdom	ktoe	0	0	
All 28 Member States	ktoe	0	0	

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	0	0	
Denmark	ktoe	n.a.	n.a.	
Estonia	ktoe	0	0	
Finland	ktoe	0	0	
France	ktoe	0	0	
Germany	ktoe	0	0	
Greece	ktoe	0	0	
Hungary	ktoe	0	0	
Ireland	ktoe	n.a.	n.a.	
Italy	ktoe	0	0	
Latvia	ktoe	n.a.	n.a.	
Lithuania	ktoe	0	0	
Luxembourg	ktoe	n.a.	n.a.	
Malta	ktoe	0	0	
Netherlands	ktoe	0	0	
Poland	ktoe	0	0	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	0	0	
Slovakia	ktoe	0	0	
Slovenia	ktoe	0	0	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	0	0	
United Kingdom	ktoe	0	0	
All 28 Member States	ktoe	0	0	

**Table 274:** PR Table 1a: Transfer of RES from other Member States and 3rd countries (ktoe)

**Table 275:** PR Table 1a: RES consumption adjusted for target (ktoe)

	Unit	2011	2012	Comment		
Austria	ktoe	8551	8902			
Belgium	ktoe	1980.6	2530.8			
Bulgaria	ktoe	0	0			
Croatia	ktoe	927	970			
Cyprus	ktoe	114.892	121.055			
Czech Republic	ktoe	2731	2888			
Denmark	ktoe	n.a.	n.a.			
Estonia	ktoe	765	786	1 (p.58)		
Finland	ktoe	8726	9234			
France	ktoe	19800	22021			
Germany	ktoe	25077	27331			
Greece	ktoe	2140	2420			
Hungary	ktoe	1528	1474			
Ireland	ktoe	739	785			
Italy	ktoe	15631.2	16778.9			
Latvia	ktoe	1364	1510			
Lithuania	ktoe	1002	1102			
Luxembourg	ktoe	120.3	127.6			
Malta	ktoe	6.25	12.35			
Netherlands	ktoe	2228	2336			
Poland	ktoe	6961.2	7347.6			
Portugal	ktoe	4371	4098			
Romania	ktoe	5175.74	5569.73			
Slovakia	ktoe	1183	1135			
Slovenia	ktoe	1006.7	1034.4			
Spain	ktoe	11840	12282			
Sweden	ktoe	16994	17810			
United Kingdom	ktoe	4969	5613			
All 28 Member States	ktoe	145931.882	156219.435			

# Table 1b: Actual RES-E contributions

**Table 276:** PR Table 1b: Hydropower (MW, GWh)

	20	2011		2012	
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	12980	38659	13076	39311	
Belgium	1426	379	1424	371.7	2 (p.28)
Bulgaria	3108	4413	3129	4488	
Croatia	2139	5970	2140	5963	
Cyprus	0	0	0	0	
Czech Republic	1050	1963	1064	2129	
Denmark	9	22.1	9	22.1	
Estonia	5	13	8	23	
Finland	3196	14020	3198	14241	
France	25617	68369	25654	67659	
Germany	11436	21970	11257	21880	
Greece	3224	4446	3236	4468	6 (p.84)
Hungary	55	217	55	219	
Ireland	529	752	529	971	
Italy	21737	44012	21880	44141	
Latvia	1576	3097.2	1576	3140.2	1 (p.116)
Lithuania	876	425	876	430	
Luxembourg	34	102	34	103	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	37	100	37	100	1 (p.140)
Poland	940	2352.3	945	2358.7	
Portugal	5551	12114	5717	6660	2 (p.154)
Romania	6483	17201	6548	16948.7	2 (p.160)
Slovakia	n.a.	n.a.	n.a.	n.a.	
Slovenia	1253	4196.6	1254	4158.4	
Spain	n.a.	n.a.	n.a.	n.a.	
Sweden	16577	68509	16414	68506	
United Kingdom	1675	5115	1686	5186	
All 28 Member States	121513.2	318417	121746.3	313477.6	

	20	11	20	12	
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	7947	35043	7968	35462	
Belgium	119	296.6	117	314.8	
Bulgaria	2095	3982	2116	4241	
Croatia	n.a.	n.a.	n.a.	n.a.	
Cyprus	0	0	0	0	
Czech Republic	n.a.	n.a.	n.a.	n.a.	
Denmark	9	22.7	9	21.5	
Estonia	5	13	8	23	
Finland	3196	12008	3198	13139	
France	18632	59958	18669	59485	1 (p.70)
Germany	4469	21948	4451	21862	
Greece	2525	4106	2537	4127	7 (p.84)
Hungary	n.a.	n.a.	n.a.	n.a.	
Ireland	237	752	237	759	
Italy	14193	33283	14326	36303	
Latvia	1576	3100.8	1576	3144.1	
Lithuania	116	419	116	425	
Luxembourg	34	102	34	103	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	n.a.	n.a.	n.a.	n.a.	
Poland	564	2336.8	569	2347	
Portugal	n.a.	n.a.	n.a.	n.a.	
Romania	6391	11286.9	6456	12190.7	
Slovakia	1607	4562	1607	4522	
Slovenia	1073	3601.7	1074	3860.3	
Spain	13283	28833	13293	27594	
Sweden	16478	66419	16315	78915	
United Kingdom	n.a.	n.a.	n.a.	n.a.	
All 28 Member States	94549	292073.5	94676	308838.4	

**Table 277:** PR Table 1b: Hydropower (non pumped) (MW, GWh)

**Table 278:** PR Table 1b: Hydropower <1 MW (non pumped) (MW, GWh)

	20	11	20		
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	368	1544	391	1556	
Belgium	9	188	9	204	
Bulgaria	47	106	51	124	
Croatia	0	0	0	0	
Cyprus	0	0	0	0	
Czech Republic	142	397	149	391	
Denmark	5	9.9	6	11.7	
Estonia	5	13	8	23	
Finland	32	110	32	131	
France	435	1542	431	1509	
Germany	700	2687	713	2734	
Greece	34	108	34	109	8 (p.84)
Hungary	3.22	15	3.49	20	
Ireland	20	63	20	65	
Italy	548	1765	570	1974	
Latvia	25	62.6	25	64.5	
Lithuania	18	54	18	55	
Luxembourg	2	6	2	6	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	0	0	0	0	2 (p.140)
Poland	82	350.6	88	374.9	1 (p.148)
Portugal	34	88	32	73	
Romania	84	76	90	89	
Slovakia	32	91	32	90	
Slovenia	117	203.6	119	216.1	
Spain	276	n.a.	279	n.a.	3 (p.178)
Sweden	174	600	186	799	2 (p.184)
United Kingdom	92	183	101	209	
All 28 Member States	3284.22	10262.7	3389.49	10828.2	

	20	2011		2012	
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	795	3307	793	3096	
Belgium	55	153.7	53	160.2	
Bulgaria	226	509	234	567	
Croatia	31	67	32	102	
Cyprus	0	0	0	0	
Czech Republic	155	498	163	526	
Denmark	4	12.8	3	9.8	
Estonia	0	0	0	0	
Finland	283	843	283	937	
France	1610	5722	1611	5592	
Germany	1088	4679	1067	4582	
Greece	172	514	184	549	9 (p.84)
Hungary	10.68	40	10.68	39	
Ireland	21	67	21	68	
Italy	2271	6351	2335	7018	
Latvia	1	3.2	1	3.6	
Lithuania	8	20	8	21	
Luxembourg	32	96	32	97	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	2	5	2	5	3 (p.140)
Poland	186	621.6	185	619.4	2 (p.148)
Portugal	343	849	348	553	
Romania	305	415.9	333	482.5	
Slovakia	67	190	67	189	
Slovenia	42	183.1	41	189.5	
Spain	1655	n.a.	1663	n.a.	4 (p.178)
Sweden	782	3000	767	3500	3 (p.184)
United Kingdom	180	552	182	566	
All 28 Member States	10324.78	28699.4	10418.78	29472.2	

**Table 279:** PR Table 1b: Hydropower 1 MW - 10 MW (non pumped) (MW, GWh)

**Table 280:** PR Table 1b: Hydropower >10 MW (non pumped) (MW, GWh)

	20	2011		2012		
	Capacity	Energy	Capacity	Energy	Comment	
	MW	GWh	MW	GWh		
Austria	6784	30192	6784	30810		
Belgium	55	124.1	55	134.2		
Bulgaria	1822	3367	1831	3550		
Croatia	2108	5903	2108	5861		
Cyprus	0	0	0	0		
Czech Republic	753	1069	753	1212		
Denmark	0	0	0	0		
Estonia	0	0	0	0		
Finland	2881	11055	2883	12071		
France	16587	52723	16627	52409		
Germany	2681	13830	2671	13810		
Greece	2319	3484	2319	3468	10 (p.84)	
Hungary	40.9	161	40.9	160		
Ireland	196	622	196	627		
Italy	11374	25168	11421	27311		
Latvia	1550	3035	1550	3076		
Lithuania	90	345	90	349		
Luxembourg	0	0	0	0		
Malta	n.a.	n.a.	n.a.	n.a.		
Netherlands	35	95	35	95	4 (p.140)	
Poland	296	1364.6	296	1352.7	3 (p.148)	
Portugal	5174	11177	5337	6034		
Romania	6002	10795	6033	11619.1		
Slovakia	1508	4281	1508	4243		
Slovenia	914	3215	914	3454.7		
Spain	11352	n.a.	11351	n.a.	5 (p.178)	
Sweden	15522	62819	15362	74566	4 (p.184)	
United Kingdom	1403	4380	1403	4412		
All 28 Member States	91447	249204.4	91568	260624.3		

	20	11	2012		
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	5033	3616	5108	3849	1 (p.22)
Belgium	1307	n.a.	1307	n.a.	
Bulgaria	864	n.a.	864	n.a.	
Croatia	0	16	0	16	
Cyprus	0	0	0	0	
Czech Republic	n.a.	n.a.	n.a.	n.a.	
Denmark	0	0	0	0	
Estonia	0	0	0	0	
Finland	0	0	0	0	
France	1808	5018	1808	4826	
Germany	5811	0	5650	0	
Greece	0	0	0	0	
Hungary	n.a.	n.a.	n.a.	n.a.	
Ireland	292	0	292	212	1 (p.104)
Italy	3957	1934	3957	1979	1 (p.110)
Latvia	0	0	0	0	
Lithuania	n.a.	n.a.	n.a.	n.a.	
Luxembourg	1134	1174	1134	1164	1 (p.128)
Malta	n.a.	n.a.	n.a.	n.a.	,
Netherlands	0	0	0	0	5 (p.140)
Poland	376	n.a.	376	n.a.	/
Portugal	1029	575	1274	1038	
Romania	92	202	92	146	3 (p.160)
Slovakia	916	368	916	336	,
Slovenia	180	n.a.	180	n.a.	
Spain	5257	2315	5257	3617	
Sweden	99	122	99	126	
United Kingdom	2744	2906	2744	2966	
All 28 Member States	30899	18246.3	31058	20275.3	

**Table 281:** PR Table 1b: Hydropower pumped storage (MW, GWh)

**Table 282:** PR Table 1b: Hydropower mixed (normalised) (MW, GWh)

	20	2011		2012	
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	12980	38659	13076	39311	
Belgium	0	0	0	0	3 (p.28)
Bulgaria	149	322	149	339	
Croatia	n.a.	n.a.	n.a.	n.a.	
Cyprus	0	0	0	0	
Czech Republic	n.a.	n.a.	n.a.	n.a.	
Denmark	0	0	0	0	
Estonia	0	0	0	0	
Finland	0	0	0	0	
France	5177	3393	5177	3348	2 (p.70)
Germany	1156	751	1156	736	
Greece	699	502	699	499	11 (p.84)
Hungary	n.a.	n.a.	n.a.	n.a.	
Ireland	n.a.	n.a.	n.a.	n.a.	
Italy	3587	2178	3598	2165	
Latvia	0	0	0	0	
Lithuania	n.a.	n.a.	n.a.	n.a.	
Luxembourg	0	0	0	0	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	0	0	0	0	
Poland	0	0	0	0	
Portugal	n.a.	n.a.	n.a.	n.a.	
Romania	n.a.	n.a.	n.a.	n.a.	
Slovakia	n.a.	n.a.	n.a.	n.a.	
Slovenia	0	0	0	0	
Spain	2792	2616	2792	2535	
Sweden	0	0	0	0	
United Kingdom	0	0	0	0	
All 28 Member States	26540	48421	26647	48933	

	20	11	2012		
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	1	1	1	1	
Belgium	0	0	0	0	
Bulgaria	0	0	0	0	
Croatia	0	0	n.a.	n.a.	
Cyprus	0	0	0	0	
Czech Republic	0	0	0	0	
Denmark	0	0	0	0	
Estonia	0	0	0	0	
Finland	0	0	0	0	
France	16	56	16	51	
Germany	8	19	12	25	
Greece	0	0	0	0	
Hungary	0	0	0	0	
Ireland	n.a.	n.a.	n.a.	n.a.	
Italy	728	5654	728	5592	
Latvia	0	0	0	0	
Lithuania	n.a.	n.a.	n.a.	n.a.	
Luxembourg	0	0	0	0	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	0	0	0	0	
Poland	0	0	0	0	
Portugal	25	210	25	146	
Romania	0	0	0	0	
Slovakia	0	0	0	0	
Slovenia	0	0	0	0	
Spain	0	0	0	0	
Sweden	0	0	0	0	
United Kingdom	0	0	0	0	
All 28 Member States	778	5940	782	5815	

**Table 283:** PR Table 1b: Geothermal electricity (MW, GWh)

**Table 284:** PR Table 1b: Solar electricity (PV and CSP) (MW, GWh)

	20	11	2012		
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	317	174	363	337	
Belgium	1391	1169.6	2581	2148.3	
Bulgaria	154	101	1013	814	
Croatia	6	12	6	7	
Cyprus	10.6	11.89	17.7	21.44	
Czech Republic	1913	2182	2022	2149	
Denmark	17	15	399	103.9	
Estonia	0	0	0	0	
Finland	8	5	8	5	
France	2942	2358	4056	4446	
Germany	25039	19599	32643	26380	
Greece	612	610	1536	1694	
Hungary	4	2	12	8	
Ireland	0.67	0.46	0.73	0.5	2 (p.104)
Italy	12773	10796	16420	18862	
Latvia	0	0	0	0	2 (p.116)
Lithuania	n.a.	n.a.	7	2	
Luxembourg	41	26	75	38	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	145	100	365	254	
Poland	1	0.2	1	1.1	
Portugal	172	280	238	393	
Romania	1	1.4	41	8	
Slovakia	n.a.	n.a.	n.a.	n.a.	
Slovenia	57	65.7	142	162.8	
Spain	5501	9400	6603	11968	
Sweden	12	11	24	19	
United Kingdom	993	244	1706	1188	
All 28 Member States	52110.27	47164.35	70279.83	71010.34	

2011 2012 Capacity Capacity Energy Comment Energy MW GWh MW GWh Austria 317 174 363 337 Belgium 1391 1169.6 2581 2148.3 Bulgaria 154 101 1013 814 Croatia 6 12 6 7 10.6 11.89 17.7 21.44 Cyprus Czech Republic 1913 2182 2022 2149 Denmark 17 15 399 103.9 Estonia 0 0 0 0 Finland 8 5 8 5 4056 France 2942 2358 4446 Germany 25037 19599 32641 26380 1694 Greece 612 610 1536 Hungary 4 2 12 8 Ireland 0.67 0.46 0.73 0.5 Italy 12773 10796 16420 18862 0 0 0 0 Latvia 7 Lithuania n.a. n.a. 2 75 2 (p.128) Luxembourg 41 26 38 18.72 Malta 6.65 12.392 13.6 Netherlands 145 100 365 254 Poland 1 0.2 1 1.1 Portugal 172 280 238 393 Romania 1 1.4 41 8 Slovakia 496 397 513 424 Slovenia 57 65.7 142 162.8 Spain 4352 7441 4603 8193 Sweden 12 11 24 19 United Kingdom 993 244 1706 1188 All 28 Member States 51461.92 45614.742 68809.55 67672.94

**Table 285:** PR Table 1b: Solar photovoltaic (PV) (MW, GWh)

**Table 286:** PR Table 1b: Concentrated solar power (CSP) (MW, GWh)

	20	11	20		
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	0	0	0	0	
Belgium	0	0	0	0	
Bulgaria	0	0	0	0	
Croatia	0	0	n.a.	n.a.	
Cyprus	0	0	0	0	
Czech Republic	0	0	0	0	
Denmark	0	0	0	0	
Estonia	0	0	0	0	
Finland	0	0	0	0	
France	0	0	0	0	
Germany	2	0	2	0	
Greece	0	0	0	0	
Hungary	0	0	0	0	
Ireland	n.a.	n.a.	n.a.	n.a.	
Italy	0	0	0	0	
Latvia	0	0	0	0	
Lithuania	n.a.	n.a.	n.a.	n.a.	
Luxembourg	0	0	0	0	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	0	0	0	0	
Poland	0	0	0	0	
Portugal	0	0	0	0	
Romania	0	0	0	0	
Slovakia	0	0	0	0	
Slovenia	0	0	0	0	
Spain	1149	1959	2000	3775	
Sweden	0	0	0	0	
United Kingdom	0	0	0	0	
All 28 Member States	1151	1959	2002	3775	

	20	11	20	12	
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	0	0	0	0	
Belgium	0	0	0	0	
Bulgaria	0	0	0	0	
Croatia	0	0	n.a.	n.a.	
Cyprus	0	0	0	0	
Czech Republic	n.a.	n.a.	n.a.	n.a.	
Denmark	0	0	0	0	
Estonia	0	0	0	0	
Finland	0	0	0	0	
France	240	477	240	458	
Germany	0	0	0	0	
Greece	0	0	0	0	
Hungary	0	0	0	0	
Ireland	n.a.	n.a.	n.a.	n.a.	
Italy	0	0	0	0	
Latvia	0	0	0	0	
Lithuania	n.a.	n.a.	n.a.	n.a.	
Luxembourg	0	0	0	0	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	0	0	0	0	
Poland	0	0	0	0	
Portugal	0	0	0.33	0.003	
Romania	0	0	0	0	
Slovakia	0	n.a.	0	n.a.	
Slovenia	0	0	0	0	
Spain	0	0	0	0	
Sweden	0	0	0	0	
United Kingdom	3	1	7	4	
All 28 Member States	243	478	247.33	462.003	

**Table 287:** PR Table 1b: Tidal, wave and ocean energy (electricity) (MW, GWh)

**Table 288:** PR Table 1b: Wind power (onshore and offshore) (MW, GWh)

	20	2011		2012		
	Capacity	Energy	Capacity	Energy	Comment	
	MW	GWh	MW	GWh		
Austria	1080	2089	1316	2412		
Belgium	1069	2055.3	1364	2602.8		
Bulgaria	541	802	677	1039		
Croatia	125	287	158	348		
Cyprus	133.5	113.78	146.7	184.61		
Czech Republic	213	397	258	416		
Denmark	3952	8699.5	4163	9333.2		
Estonia	180	348	266	500		
Finland	199	402	257	474		
France	6808	12531	7623	14186		
Germany	29060	46746	31304	49335		
Greece	1640	3356	1753	3870		
Hungary	323	645	325	701		
Ireland	1631	3830	1763	4247		
Italy	6918	10266	8102	12402		
Latvia	36	64.6	59	98.4	3 (p.116)	
Lithuania	202	409	275	562		
Luxembourg	45	67	58	74		
Malta	n.a.	n.a.	n.a.	n.a.		
Netherlands	2316	4725	2433	4939	6 (p.140)	
Poland	1800	2922	2564	4510.3		
Portugal	4256	9162	4414	10260		
Romania	988	1299.5	1822	2645.1	4 (p.160)	
Slovakia	n.a.	n.a.	n.a.	n.a.		
Slovenia	0	0	0	0		
Spain	21529	44644	22775	47560		
Sweden	2769	5591	3607	7348		
United Kingdom	n.a.	14104	n.a.	18666		
All 28 Member States	87813.4	175555.98	97482.7	198713.01		

2011 2012 Capacity Energy Comment Capacity Energy MW GWh MW GWh Austria 1080 2089 1316 2412 Belgium n.a. n.a. n.a. n.a. Bulgaria 541 802 677 1039 Croatia 125 287 158 348 133.5 113.78 146.7 184.61 Cyprus Czech Republic 397 258 213 416 Denmark 3081 6747 3241 7270 Estonia 180 348 266 500 197 Finland 255 n.a. n.a. France 6808 12531 7623 14186 Germany 28730 46746 30869 49335 Greece 1640 3356 1753 3870 Hungary 323 645 325 701 Ireland 1606 0 1738 0 Italy 6918 10266 8102 12402 59 Latvia 36 64.6 98.4 Lithuania n.a. n.a. n.a. n.a. 74 Luxembourg 45 67 58 Malta n.a. n.a. n.a. n.a. Netherlands 2088 3982 2205 4156 Poland 1800 2922 2564 4510.3 Portugal 4256 9162 4412 10260 Romania 988 1299.5 1822 2645.1 Slovakia 3 6 3 6 Slovenia n.a. n.a. n.a. n.a. Spain 21529 22775 n.a. n.a. Sweden 2605 5590 3443 6700 5 (p.184) **United Kingdom** 4638 9754 5893 11735 All 28 Member States 89563.4 117175.18 99961.7 132848.01

**Table 289:** PR Table 1b: Onshore wind (MW, GWh)

**Table 290:** PR Table 1b: Offshore wind (MW, GWh)

	20	11	2012		
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	0	0	0	0	
Belgium	n.a.	n.a.	n.a.	n.a.	
Bulgaria	0	0	0	0	
Croatia	0	n.a.	n.a.	n.a.	
Cyprus	0	0	0	0	
Czech Republic	0	0	0	0	
Denmark	871	1952	922	2062	
Estonia	0	0	0	0	
Finland	2	n.a.	2	n.a.	
France	0	0	0	0	
Germany	330	0	435	0	
Greece	0	0	0	0	
Hungary	0	0	0	0	
Ireland	25	0	25	0	
Italy	0	0	0	0	
Latvia	0	0	0	0	
Lithuania	n.a.	n.a.	n.a.	n.a.	
Luxembourg	0	0	0	0	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	228	743	228	782	
Poland	0	0	0	0	
Portugal	0	0	2	0.023	
Romania	0	0	0	0	
Slovakia	0	n.a.	0	n.a.	
Slovenia	n.a.	n.a.	n.a.	n.a.	
Spain	0	n.a.	0	n.a.	
Sweden	163	490	163	460	6 (p.184)
United Kingdom	1838	4351	2995	6931	
All 28 Member States	3457	7536	4772	10235.023	

2011 2012 Capacity Energy Comment Capacity Energy MW GWh MW GWh Austria 2015 4523 2062 4642 Belgium 911 3652.8 874 4348 4 (p.28) Bulgaria 11 56 14 66 Croatia 5 33 53 11 8.7 51.61 9.5 50.24 Cyprus Czech Republic 177 2704 300 3372 Denmark 988 3426 3554 1236 Estonia 67 781 67 1001 Finland 1910 10953 1956 10846 France 993 5513 1090 5708 Germany 5607 32839 6052 39580 Greece 45 199 45 197 Hungary 392 1844 348 1656 Ireland 39 339 60 441 Italy 2631 10832 3555 12342 2 (p.110) Latvia 30 119.4 66 288.6 Lithuania 33 158 53 218 91 Luxembourg 20 96 20 Malta n.a. n.a. n.a. n.a. Netherlands 1297 7071 1243 7239 Poland 277 7599.5 583 10094.1 Portugal 598 3219 606 3195 Romania 30 196.7 35 211.7 Slovakia 197 819 215 941 1 (p.166) Slovenia 54 251.8 59 267.3 Spain 772 3814 858 4262 Sweden 3401 9674 4055 10527 United Kingdom 3117 13200 3251 15198 All 28 Member States 25625.7 123964.81 28723.3 140388.84

**Table 291:** PR Table 1b: Biomass for electricity (MW, GWh)

**Table 292:** PR Table 1b: Solid biomass for electricity (MW, GWh)

	20	2011		2012		
	Capacity	Energy	Capacity	Energy	Comment	
	MW	GWh	MW	GWh		
Austria	1628	3898	1672	4003		
Belgium	701	3125.9	678	3684.5		
Bulgaria	6	37	14	65		
Croatia	3	0	3	0		
Cyprus	0	0	0	0		
Czech Republic	n.a.	1775	n.a.	1904		
Denmark	921	3077.7	1156	3175.8		
Estonia	63	766	63	985		
Finland	1910	10819	1956	10706		
France	787	4306	843	4424	3 (p.70)	
Germany	1966	11296	2034	12091		
Greece	0	0	0	0		
Hungary	343	1656	298	1421		
Ireland	5	137	20	242		
Italy	421	2522	538	2582		
Latvia	5	12.8	23	64.4		
Lithuania	18	121	38	116		
Luxembourg	7	38	7	36		
Malta	n.a.	n.a.	n.a.	n.a.		
Netherlands	1063	6011	1007	6195	7 (p.140)	
Poland	175	7148.4	455	9528.7	4 (p.148)	
Portugal	554	3058	555	2986		
Romania	26	188.1	30	192.3		
Slovakia	176	706	174	751		
Slovenia	33	125.1	30	114.2		
Spain	563	3011	640	3396		
Sweden	3397	9641	3522	10507	7 (p.184)	
United Kingdom	1869	7344	2016	9325		
All 28 Member States	16639.7	80820.2	17771.7	88495.1		

2011 2012 Capacity Energy Capacity Energy Comment MW GWh MW GWh Austria 372 625 377 639 Belgium 129 526.9 141 663.5 Bulgaria 5 19 0 1 Croatia 2 33 8 53 8.7 50.49 9.5 50.04 Cyprus Czech Republic 177 929 300 1468 Denmark 77 348.3 80 378.2 Estonia 4 15 4 16 0 Finland 0 134 140 France 208 1207 247 1284 4 (p.70) Germany 3337 21189 3764 27238 Greece 45 199 45 197 Hungary 49 188 50 235 Ireland 34 202 40 199 Italy 732 3405 1274 4620 25 105.4 223.4 Latvia 43 42 Lithuania 15 37 15 10 55 Luxembourg 10 58 3.03 Malta n.a. 1.55 n.a. Netherlands 217 1060 219 1043 8 (p.140) Poland 102 451.1 128 565.4 Portugal 44 161 51 209 Romania 4 8.6 5 19.4 Slovakia 21 113 41 190 Slovenia 21 126.6 29 153.1 Spain 209 803 218 866 Sweden 4 33 5 20 United Kingdom 1248 5857 1235 5874 All 28 Member States 7099.9 37885.74 8338.6 46444.77

**Table 293:** PR Table 1b: Biogas for electricity (MW, GWh)

**Table 294:** PR Table 1b: Bioliquids for electricity (MW, GWh)

	2011		20		
	Capacity	Energy	Capacity	Energy	Comment
	MW	GWh	MW	GWh	
Austria	15	0	13	0	
Belgium	81	0	55	0	
Bulgaria	0	0	0	0	
Croatia	0	n.a.	n.a.	n.a.	
Cyprus	n.a.	1.12	n.a.	0.2	
Czech Republic	n.a.	n.a.	n.a.	n.a.	
Denmark	0	0	0	0	
Estonia	0	0	0	0	
Finland	0	0	0	0	
France	0	0	0	0	
Germany	304	354	254	250	
Greece	0	0	0	0	
Hungary	0	0	0	0	
Ireland	0	0	0	0	
Italy	736	2698	989	2977	
Latvia	0	1.2	0	0.8	
Lithuania	n.a.	n.a.	n.a.	n.a.	
Luxembourg	0	0	0	0	
Malta	n.a.	n.a.	n.a.	n.a.	
Netherlands	17	0	17	0	9 (p.140)
Poland	0	0	0	0	
Portugal	0	0	0	0	
Romania	0	0	0	0	
Slovakia	0	0	0	0	
Slovenia	0	0	0	0	
Spain	0	0	0	0	
Sweden	0	0	528	0	8 (p.184)
United Kingdom	0	0	0	0	
All 28 Member States	1153	3054.32	1856	3228	

2011 2012 Capacity Comment Capacity Energy Energy MW GWh MW GWh Austria 16393 45446 16818 46703 Belgium 4797 7256.685 6243 9470.795 Bulgaria 3814 5373 4833 6407 2275 6371 Croatia 6302 2316 177.28 Cyprus 152.8 173.9 256.29 Czech Republic 3353 7246 3644 8066 4976 5807 Denmark 12162.6 13013.3 Estonia 252 1159 341 1524 Finland 25380 5419 25566 5313 France 36616 89304 38679 92508 5 (p.70) 71150 121173 81268 137200 Germany Greece 5521 8611 6570 10229 12 (p.84) Hungary 774 2708 740 2584 Ireland 2200 4921 2353 5659 Italy 44787 81561 50685 93339 3 (p.110) 3281.2 Latvia 1642 1701 3527.3 Lithuania 1111 992 1211 1212 Luxembourg 148 291 187 306 3 (p.128) Malta n.a. 13.942 n.a. 16.63 Netherlands 3795 11996 4078 12532 Poland 3018 12874 4093 16964.2 Portugal 10602 24985 11000 20654 Romania 7410 18707.6 8354 19813.6 5 (p.160) Slovakia 3219 5784 3251 5893 Slovenia 1364 4514 1455 4588.5 Spain 43877 89307 46321 93919 6 (p.178) 22759 85645 24100 88062 Sweden 12264 32666 15538 40243 **United Kingdom** All 28 Member States 313582.9 709837.507 347178.4 766627.115

**Table 295:** PR Table 1b: Total for electricity (MW, GWh)

**Table 296:** PR Table 1b: Total CHP (electric) (MW, GWh)

	20	2011		2012		
	Capacity	Energy	Capacity	Energy	Comment	
	MW	GWh	MW	GWh		
Austria	1254	2719	1259	2533		
Belgium	308.7	1736.4	222.4	1791		
Bulgaria	n.a.	56	n.a.	66		
Croatia	3	0	3	0		
Cyprus	8.52	50.49	9.32	50.04		
Czech Republic	n.a.	1888	n.a.	2848		
Denmark	988	3424.2	1236	3551.5		
Estonia	n.a.	454	n.a.	597		
Finland	n.a.	9068	n.a.	9568		
France	592	2950	713	3248		
Germany	n.a.	16151	n.a.	19073	6 (p.78)	
Greece	n.a.	n.a.	n.a.	n.a.		
Hungary	134.4	253	138	268		
Ireland	10.9	38	11.3	40	3 (p.104)	
Italy	1084	4224	1642	5193		
Latvia	n.a.	116.3	n.a.	282.9		
Lithuania	n.a.	n.a.	n.a.	n.a.		
Luxembourg	9	53	9	56		
Malta	n.a.	n.a.	n.a.	n.a.		
Netherlands	807	4439	846	4752		
Poland	n.a.	7600.9	n.a.	10094.3		
Portugal	383	1734	376	1721		
Romania	n.a.	111.9	n.a.	158.6		
Slovakia	197	819	215	941		
Slovenia	n.a.	246	n.a.	262.4		
Spain	n.a.	n.a.	n.a.	n.a.		
Sweden	n.a.	11536	n.a.	12194		
United Kingdom	306	1131	316	1176		
All 28 Member States	6085.22	70799.29	6995.72	80464.84		

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## Table 1c: Actual RES-H/C contributions

**Table 297:** PR Table 1c: Geothermal heat (ktoe)

	Unit	2011	2012	Comment
				Comment
Austria	ktoe	20	22	
Belgium	ktoe	2.6	2.8	
Bulgaria	ktoe	33	33	
Croatia	ktoe	6.2	7.4	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	0	0	
Denmark	ktoe	2	3.4	
Estonia	ktoe	0	0	
Finland	ktoe	0	0	
France	ktoe	89	94	
Germany	ktoe	60	66	
Greece	ktoe	16	13	
Hungary	ktoe	104	107	
Ireland	ktoe	n.a.	n.a.	
Italy	ktoe	139	134	
Latvia	ktoe	0	0	
Lithuania	ktoe	2	2	
Luxembourg	ktoe	0	0	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	8	12	
Poland	ktoe	12.7	15.8	
Portugal	ktoe	1.6	1.6	
Romania	ktoe	22.2	21.6	
Slovakia	ktoe	6	6	
Slovenia	ktoe	28.2	31	
Spain	ktoe	17	18	7 (p.178)
Sweden	ktoe	0	0	
United Kingdom	ktoe	0.8	0.8	
All 28 Member States	ktoe	570.3	591.4	

	Unit	2011	2012	Comment
Austria	ktoe	167	173	
Belgium	ktoe	14.4	15.3	
Bulgaria	ktoe	14	15	
Croatia	ktoe	6.7	9.6	
Cyprus	ktoe	62.99	64.47	
Czech Republic	ktoe	11	13	
Denmark	ktoe	18.8	29.9	
Estonia	ktoe	0	0	
Finland	ktoe	1	1	
France	ktoe	121	133	
Germany	ktoe	554	576	
Greece	ktoe	183	184	
Hungary	ktoe	6	6	
Ireland	ktoe	8.1	10.2	
Italy	ktoe	140	155	
Latvia	ktoe	n.a.	n.a.	4 (p.116)
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	1	1.7	
Malta	ktoe	2.88	3.88	
Netherlands	ktoe	25	26	
Poland	ktoe	10.4	13	
Portugal	ktoe	59.5	67.4	
Romania	ktoe	0	0.1	
Slovakia	ktoe	5	5	
Slovenia	ktoe	8.8	9.4	
Spain	ktoe	205	220	
Sweden	ktoe	11	11	
United Kingdom	ktoe	122	153	
All 28 Member States	ktoe	1758.57	1895.95	

**Table 298:** PR Table 1c: Solar thermal heat (ktoe)

**Table 299:** PR Table 1c: Biomass heat (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	3888	4094	
Belgium	ktoe	865.8	1243.9	5 (p.28)
Bulgaria	ktoe	944	1005	
Croatia	ktoe	337.3	349.5	
Cyprus	ktoe	19.55	16	
Czech Republic	ktoe	1737	1829	
Denmark	ktoe	1987.2	2079.7	
Estonia	ktoe	667	655	
Finland	ktoe	5962	6365	
France	ktoe	9017	10309	
Germany	ktoe	9460	9997	
Greece	ktoe	1093	1193	
Hungary	ktoe	1023	1002	
Ireland	ktoe	192.5	203.9	4 (p.104)
Italy	ktoe	4481	4485	4 (p.110)
Latvia	ktoe	1059.2	1187.5	
Lithuania	ktoe	871	935	
Luxembourg	ktoe	51.7	54.5	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	728	771	
Poland	ktoe	4860	4998.5	5 (p.148)
Portugal	ktoe	2148.7	1836.5	
Romania	ktoe	3481.9	3666	
Slovakia	ktoe	553	521	2 (p.166)
Slovenia	ktoe	546.5	548.6	
Spain	ktoe	3871	3907	
Sweden	ktoe	7525	7964	9 (p.184)
United Kingdom	ktoe	981	1000	
All 28 Member States	ktoe	68351.35	72216.6	

	Unit	2011	2012	Comment
Austria	ktoe	3856	4048	
Belgium	ktoe	820	1179.8	
Bulgaria	ktoe	943	1005	
Croatia	ktoe	336.6	348.4	
Cyprus	ktoe	15.27	11.68	2 (p.40)
Czech Republic	ktoe	n.a.	1721	
Denmark	ktoe	1941.4	2029.7	
Estonia	ktoe	666	654	
Finland	ktoe	5904	6316	
France	ktoe	8881	10158	
Germany	ktoe	8269	8742	
Greece	ktoe	1078	1178	
Hungary	ktoe	1011	985	
Ireland	ktoe	183	195	
Italy	ktoe	4044	4210	
Latvia	ktoe	1048.7	1167.4	
Lithuania	ktoe	867	931	
Luxembourg	ktoe	45.7	47.5	4 (p.128)
Malta	ktoe	0.65	0.65	
Netherlands	ktoe	612	641	10 (p.140)
Poland	ktoe	4787.1	4913.2	
Portugal	ktoe	2148.7	1836.5	
Romania	ktoe	3469.9	3657.8	
Slovakia	ktoe	530	499	
Slovenia	ktoe	538.6	536.8	
Spain	ktoe	3816	3851	
Sweden	ktoe	7485	7921	10 (p.184)
United Kingdom	ktoe	909	922	
All 28 Member States	ktoe	64206.62	69706.43	

**Table 300:** PR Table 1c: Solid biomass heat (ktoe)

**Table 301:** PR Table 1c: Biogas heat (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	32	46	
Belgium	ktoe	45.7	64.2	
Bulgaria	ktoe	1	0	
Croatia	ktoe	0.7	1.1	
Cyprus	ktoe	4.28	4.32	
Czech Republic	ktoe	n.a.	108	
Denmark	ktoe	45.8	50	
Estonia	ktoe	1	1	
Finland	ktoe	28	37	
France	ktoe	136	151	
Germany	ktoe	1020	1085	
Greece	ktoe	14.8	15.2	
Hungary	ktoe	12	18	
Ireland	ktoe	9.5	8.9	
Italy	ktoe	330	183	
Latvia	ktoe	7.7	17.8	
Lithuania	ktoe	4	4	
Luxembourg	ktoe	6	7	5 (p.128)
Malta	ktoe	0.31	0.41	
Netherlands	ktoe	116	129	11 (p.140)
Poland	ktoe	72.9	85.3	
Portugal	ktoe	0	0	
Romania	ktoe	12	8.2	
Slovakia	ktoe	23	22	
Slovenia	ktoe	7.9	11.7	
Spain	ktoe	55	55	
Sweden	ktoe	40	43	
United Kingdom	ktoe	72	78	
All 28 Member States	ktoe	2097.59	2234.13	

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	0	0	
Denmark	ktoe	0	0	
Estonia	ktoe	0	0	
Finland	ktoe	30	12	
France	ktoe	0	0	
Germany	ktoe	171	170	
Greece	ktoe	0	0	
Hungary	ktoe	0	0	
Ireland	ktoe	0	0	
Italy	ktoe	22	21	
Latvia	ktoe	2.8	2.3	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	0	0	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	n.a.	n.a.	
Poland	ktoe	0	0	
Portugal	ktoe	0	0	
Romania	ktoe	0	0	
Slovakia	ktoe	0	0	
Slovenia	ktoe	0	0	
Spain	ktoe	0	0	
Sweden	ktoe	0	0	
United Kingdom	ktoe	0	0	
All 28 Member States	ktoe	225.8	205.3	

**Table 302:** PR Table 1c: Bioliquids heat (ktoe)

**Table 303:** PR Table 1c: Renewable energy from heat pumps (ktoe)

	ktoe	0	0	0
Austria	ktoe	133	145	
Belgium	ktoe	19	23.4	
Bulgaria	ktoe	42	47	
Croatia	ktoe	21.4	26.4	
Cyprus	ktoe	1.05	1.48	
Czech Republic	ktoe	52	62	
Denmark	ktoe	115.4	116.6	
Estonia	ktoe	0	0	
Finland	ktoe	276	315	
France	ktoe	945	1227	6 (p.70)
Germany	ktoe	613	682	
Greece	ktoe	82	102	
Hungary	ktoe	n.a.	n.a.	1 (p.98)
Ireland	ktoe	18	18	
Italy	ktoe	2457	2613	
Latvia	ktoe	n.a.	n.a.	5 (p.116)
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	1.2	1.2	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	115	131	
Poland	ktoe	5.7	6.4	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	0	0	
Slovakia	ktoe	n.a.	n.a.	
Slovenia	ktoe	0	0	
Spain	ktoe	n.a.	n.a.	8 (p.178)
Sweden	ktoe	1163	1177	11 (p.184)
United Kingdom	ktoe	47	67.3	
All 28 Member States	ktoe	6106.75	6761.78	

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	20	24.3	
Cyprus	ktoe	n.a.	n.a.	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	59.6	60.7	
Estonia	ktoe	0	0	
Finland	ktoe	190	212	
France	ktoe	819	1076	
Germany	ktoe	263	308	
Greece	ktoe	75	93	
Hungary	ktoe	n.a.	n.a.	
Ireland	ktoe	n.a.	n.a.	
Italy	ktoe	2400	2548	
Latvia	ktoe	n.a.	n.a.	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	n.a.	n.a.	
Malta	ktoe	0	1.76	1 (p.134)
Netherlands	ktoe	55	63	
Poland	ktoe	0.4	0.5	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	n.a.	n.a.	
Slovakia	ktoe	0	0	
Slovenia	ktoe	0	0	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	245	245	12 (p.184)
United Kingdom	ktoe	24.3	38.3	1 (p.192)
All 28 Member States	ktoe	4151.3	4670.56	

**Table 304:** PR Table 1c: Aerothermal heat pumps (ktoe)

Table 305: PR Table 1c: Geothermal heat pumps (ktoe)

		2011	2012	
	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	n.a.	n.a.	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	55.8	55.9	
Estonia	ktoe	0	0	
Finland	ktoe	86	103	
France	ktoe	126	151	7 (p.70)
Germany	ktoe	276	297	
Greece	ktoe	7	9	
Hungary	ktoe	n.a.	n.a.	
Ireland	ktoe	18	18	
Italy	ktoe	51	58	
Latvia	ktoe	n.a.	n.a.	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	n.a.	n.a.	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	60	68	12 (p.140)
Poland	ktoe	3.6	4.2	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	n.a.	n.a.	
Slovakia	ktoe	0	0	
Slovenia	ktoe	0	0	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	786	786	13 (p.184)
United Kingdom	ktoe	22.6	29	2 (p.192)
All 28 Member States	ktoe	1492	1579.1	

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	1.4	2.1	
Cyprus	ktoe	n.a.	n.a.	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	0	0	
Estonia	ktoe	0	0	
Finland	ktoe	0	0	
France	ktoe	0	0	8 (p.70)
Germany	ktoe	73	76	
Greece	ktoe	0	0	
Hungary	ktoe	n.a.	n.a.	
Ireland	ktoe	n.a.	n.a.	
Italy	ktoe	6	6	
Latvia	ktoe	n.a.	n.a.	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	n.a.	n.a.	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	n.a.	n.a.	13 (p.140)
Poland	ktoe	1.6	1.6	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	n.a.	n.a.	
Slovakia	ktoe	0	0	
Slovenia	ktoe	0	0	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	n.a.	n.a.	
United Kingdom	ktoe	n.a.	n.a.	3 (p.192)
All 28 Member States	ktoe	82	85.7	

**Table 306:** PR Table 1c: Hydrothermal heat pumps (ktoe)

**Table 307:** PR Table 1c: Total heat (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	4208	4434	
Belgium	ktoe	901.7	1285.4	
Bulgaria	ktoe	1033	1101	
Croatia	ktoe	371.6	392.8	
Cyprus	ktoe	83.59	81.95	
Czech Republic	ktoe	1800	1904	
Denmark	ktoe	2123.5	2229.7	
Estonia	ktoe	667	655	
Finland	ktoe	6240	6681	
France	ktoe	10173	11763	
Germany	ktoe	10687	11321	
Greece	ktoe	1374	1492	
Hungary	ktoe	1133	1115	
Ireland	ktoe	218	232	
Italy	ktoe	7218	7388	
Latvia	ktoe	1059.2	1187.5	
Lithuania	ktoe	873	937	
Luxembourg	ktoe	53.9	57.4	
Malta	ktoe	3.84	6.7	
Netherlands	ktoe	875	939	
Poland	ktoe	4920.7	5066.1	
Portugal	ktoe	2209.7	1905.4	
Romania	ktoe	3504.2	3687.7	
Slovakia	ktoe	564	532	
Slovenia	ktoe	583.6	588.9	
Spain	ktoe	4093	4145	
Sweden	ktoe	8700	9152	14 (p.184)
United Kingdom	ktoe	1193	1272	4 (p.192)
All 28 Member States	ktoe	76864.53	81552.55	

	Unit	2011	2012	Comment
Austria	ktoe	875	890	
Belgium	ktoe	0	0	6 (p.28)
Bulgaria	ktoe	0	0	
Croatia	ktoe	28.4	31.7	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	79	79	
Denmark	ktoe	1185	1301	
Estonia	ktoe	302	268	
Finland	ktoe	630	759	
France	ktoe	480	n.a.	
Germany	ktoe	507	641	
Greece	ktoe	0	0	
Hungary	ktoe	75	85	
Ireland	ktoe	n.a.	n.a.	
Italy	ktoe	161	171	
Latvia	ktoe	94.8	120.5	
Lithuania	ktoe	n.a.	n.a.	1 (p.122)
Luxembourg	ktoe	2.9	3.1	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	209	230	14 (p.140)
Poland	ktoe	n.a.	n.a.	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	17.8	16	
Slovakia	ktoe	106	176	
Slovenia	ktoe	0	0	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	2582	3050	15 (p.184)
United Kingdom	ktoe	n.a.	n.a.	
All 28 Member States	ktoe	7334.9	7821.3	

**Table 308:** PR Table 1c: Total district heating (heat) (ktoe)

**Table 309:** PR Table 1c: Total biomass in households (heat) (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	1515	1686	
Belgium	ktoe	243.9	789.1	7 (p.28)
Bulgaria	ktoe	747	759	
Croatia	ktoe	306	313.8	
Cyprus	ktoe	5.49	5.75	3 (p.40)
Czech Republic	ktoe	1106	1140	
Denmark	ktoe	856.7	848.4	
Estonia	ktoe	365	387	
Finland	ktoe	1217	1330	
France	ktoe	6180	7155	
Germany	ktoe	5804	6397	
Greece	ktoe	790	954	
Hungary	ktoe	724	724	
Ireland	ktoe	22	27	
Italy	ktoe	3545	3619	
Latvia	ktoe	624.4	664.6	
Lithuania	ktoe	n.a.	n.a.	2 (p.122)
Luxembourg	ktoe	14.8	17.6	
Malta	ktoe	0	0	
Netherlands	ktoe	299	302	
Poland	ktoe	2746.7	2790.9	
Portugal	ktoe	711.9	767	
Romania	ktoe	3146.7	3283.7	
Slovakia	ktoe	44	37	
Slovenia	ktoe	462.4	471.3	
Spain	ktoe	2472	2485	
Sweden	ktoe	1170	1189	
United Kingdom	ktoe	357	383	
All 28 Member States	ktoe	35475.99	38526.15	

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## Table 1d: Actual RES-T contributions

**Table 310:** PR Table 1d: Bioethanol / bio-ETBE (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	66	67	
Belgium	ktoe	48	48	
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	59	59	
Denmark	ktoe	n.a.	n.a.	1 (p.52)
Estonia	ktoe	0	0	
Finland	ktoe	88	90	
France	ktoe	392	418	
Germany	ktoe	782	792	
Greece	ktoe	0	0	
Hungary	ktoe	46	34	
Ireland	ktoe	29	29	
Italy	ktoe	114	103	
Latvia	ktoe	7.7	6.4	
Lithuania	ktoe	10	9	
Luxembourg	ktoe	7	1	
Malta	ktoe	0	0	
Netherlands	ktoe	149	124	
Poland	ktoe	178.76	153.93	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	24.6	37	
Slovakia	ktoe	14.6	14.5	
Slovenia	ktoe	3.7	5.3	
Spain	ktoe	225	200	
Sweden	ktoe	197	197	
United Kingdom	ktoe	330	387	
All 28 Member States	ktoe	2771.36	2775.13	

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	8 (p.28)
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	n.a.	n.a.	
Estonia	ktoe	0	0	
Finland	ktoe	0.5	10	
France	ktoe	0	0	
Germany	ktoe	0	2	
Greece	ktoe	0	0	
Hungary	ktoe	0	0	
Ireland	ktoe	29	29	
Italy	ktoe	7	3	
Latvia	ktoe	0	0	
Lithuania	ktoe	10	9	3 (p.122)
Luxembourg	ktoe	0	0	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	n.a.	12	
Poland	ktoe	0	0	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	0	0	
Slovakia	ktoe	0	0	
Slovenia	ktoe	3.7	5.3	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	7	3	
United Kingdom	ktoe	0	0	5 (p.192)
All 28 Member States	ktoe	57.2	73.3	

**Table 311:** PR Table 1d: Bioethanol / bio-ETBE Article 21.2 (ktoe)

**Table 312:** PR Table 1d: Bioethanol / bio-ETBE imported (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	38	39	
Belgium	ktoe	0	0	9 (p.28)
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	n.a.	n.a.	
Estonia	ktoe	0	0	
Finland	ktoe	n.a.	n.a.	
France	ktoe	84	77	
Germany	ktoe	n.a.	n.a.	
Greece	ktoe	0	0	
Hungary	ktoe	46	34	
Ireland	ktoe	29	29	
Italy	ktoe	50	45	
Latvia	ktoe	11.3	10.7	6 (p.116)
Lithuania	ktoe	6	7	
Luxembourg	ktoe	7	1	
Malta	ktoe	0	0	
Netherlands	ktoe	n.a.	n.a.	
Poland	ktoe	85.17	31.09	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	0	23.58	
Slovakia	ktoe	0	0	
Slovenia	ktoe	3.7	5.3	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	n.a.	n.a.	
United Kingdom	ktoe	283	312	
All 28 Member States	ktoe	643.17	614.67	

	Unit	2011	2012	Comment
Austria	ktoe	333	348	
Belgium	ktoe	290.1	298	
Bulgaria	ktoe	0	0	
Croatia	ktoe	17.4	32.1	
Cyprus	ktoe	16.01	17	
Czech Republic	ktoe	241	221	
Denmark	ktoe	n.a.	n.a.	2 (p.52)
Estonia	ktoe	0	0	
Finland	ktoe	108	108	
France	ktoe	2393	2424	
Germany	ktoe	1989	2034	
Greece	ktoe	20	24	
Hungary	ktoe	116	103	
Ireland	ktoe	68	56	
Italy	ktoe	1296	1262	
Latvia	ktoe	16.9	15.1	
Lithuania	ktoe	35	52	
Luxembourg	ktoe	39	46	
Malta	ktoe	1.32	3.03	
Netherlands	ktoe	172	194	
Poland	ktoe	535.63	635.6	6 (p.148)
Portugal	ktoe	4.1	4.2	
Romania	ktoe	38.4	141.31	
Slovakia	ktoe	97.7	71.5	
Slovenia	ktoe	31.3	45.7	
Spain	ktoe	1392	1889	
Sweden	ktoe	215	331	
United Kingdom	ktoe	635	471	
All 28 Member States	ktoe	10100.86	10826.54	

**Table 313:** PR Table 1d: Biodiesel (ktoe)

**Table 314:** PR Table 1d: Biodiesel Article 21.2 (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	10 (p.28)
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0.1	0.1	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	n.a.	n.a.	
Estonia	ktoe	0	0	
Finland	ktoe	51.5	95	
France	ktoe	358	125	
Germany	ktoe	40	365	
Greece	ktoe	20	24	
Hungary	ktoe	18	17	
Ireland	ktoe	68	56	
Italy	ktoe	57	338	
Latvia	ktoe	0	0	
Lithuania	ktoe	35	52	
Luxembourg	ktoe	0	0	
Malta	ktoe	1.32	3.03	
Netherlands	ktoe	n.a.	182	
Poland	ktoe	280.85	128.58	
Portugal	ktoe	4.1	4.2	
Romania	ktoe	0	0	
Slovakia	ktoe	0	0	
Slovenia	ktoe	31.3	45.7	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	28	102	
United Kingdom	ktoe	0	453	6 (p.192)
All 28 Member States	ktoe	993.17	1990.61	

	Unit	2011	2012	Comment
Austria	ktoe	252	249	
Belgium	ktoe	51.9	52.7	11 (p.28)
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	10.49	10.63	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	n.a.	n.a.	
Estonia	ktoe	0	0	
Finland	ktoe	n.a.	n.a.	
France	ktoe	444	359	
Germany	ktoe	n.a.	n.a.	
Greece	ktoe	n.a.	n.a.	
Hungary	ktoe	19	18	
Ireland	ktoe	42	33	
Italy	ktoe	764	1009	
Latvia	ktoe	8.9	5.1	7 (p.116)
Lithuania	ktoe	30	33	
Luxembourg	ktoe	39	46	
Malta	ktoe	0	0	
Netherlands	ktoe	n.a.	n.a.	
Poland	ktoe	0	0	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	38.14	86.6	
Slovakia	ktoe	0	0	
Slovenia	ktoe	30.9	44.8	1 (p.172)
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	n.a.	n.a.	
United Kingdom	ktoe	511	339	
All 28 Member States	ktoe	2241.33	2285.83	

**Table 315:** PR Table 1d: Biodiesel imported (ktoe)

**Table 316:** PR Table 1d: Hydrogen from renewables (ktoe)

	ktoe	252	249	0
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	n.a.	n.a.	
Estonia	ktoe	0	0	
Finland	ktoe	0	0	
France	ktoe	0	0	
Germany	ktoe	0	0	
Greece	ktoe	0	0	
Hungary	ktoe	0	0	
Ireland	ktoe	0	0	
Italy	ktoe	0	0	
Latvia	ktoe	0	0	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	0	0	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	0	0	
Poland	ktoe	0	0	
Portugal	ktoe	n.a.	n.a.	
Romania	ktoe	0	0	
Slovakia	ktoe	0	0	
Slovenia	ktoe	n.a.	n.a.	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	n.a.	n.a.	
United Kingdom	ktoe	0	0	
All 28 Member States	ktoe	0	0	

	Unit	2011	2012	Comment
Austria	ktoe	175	173	
Belgium	ktoe	26.4	26.8	
Bulgaria	ktoe	8	6.1	
Croatia	ktoe	9.5	10	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	8	9	
Denmark	ktoe	13.2	18.1	
Estonia	ktoe	0.9	0.9	
Finland	ktoe	17	18	
France	ktoe	196	209	
Germany	ktoe	182	188	
Greece	ktoe	3.3	3.2	
Hungary	ktoe	18	17	
Ireland	ktoe	0.53	0.58	
Italy	ktoe	175	186	
Latvia	ktoe	4.5	4.7	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	2	2	
Malta	ktoe	0	0	
Netherlands	ktoe	28	30	
Poland	ktoe	53.73	54.23	
Portugal	ktoe	13.5	14.6	
Romania	ktoe	39.75	34.51	
Slovakia	ktoe	9.2	9.9	
Slovenia	ktoe	4.8	4.4	
Spain	ktoe	108	114	
Sweden	ktoe	132	129	
United Kingdom	ktoe	66	69	
All 28 Member States	ktoe	1294.31	1332.02	

**Table 317:** PR Table 1d: Renewable electricity in (road and non-road) transport (ktoe)

**Table 318:** PR Table 1d: Renewable electricity road transport (ktoe)

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	3.4	1.7	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	0	0	
Estonia	ktoe	0.4	0.4	
Finland	ktoe	0	0	
France	ktoe	0	1	
Germany	ktoe	1	1	7 (p.78)
Greece	ktoe	2.1	2.2	
Hungary	ktoe	0	0	
Ireland	ktoe	n.a.	n.a.	
Italy	ktoe	5	5	
Latvia	ktoe	2.3	2.4	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	0	0	
Malta	ktoe	0	0	
Netherlands	ktoe	0	0	
Poland	ktoe	0.32	0.34	
Portugal	ktoe	0	0	
Romania	ktoe	3.2	4.05	
Slovakia	ktoe	0	0	
Slovenia	ktoe	n.a.	n.a.	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	n.a.	n.a.	16 (p.184)
United Kingdom	ktoe	0.322	0.4	7 (p.192)
All 28 Member States	ktoe	18.042	18.49	

	Unit	2011	2012	Comment
Austria	ktoe	175	173	
Belgium	ktoe	26.4	26.8	
Bulgaria	ktoe	4.6	4.4	
Croatia	ktoe	9.5	10	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	8	9	
Denmark	ktoe	13.2	18.1	
Estonia	ktoe	0.5	0.5	
Finland	ktoe	17	18	
France	ktoe	196	209	
Germany	ktoe	181	187	8 (p.78)
Greece	ktoe	1.3	1	
Hungary	ktoe	18	17	
Ireland	ktoe	0.53	0.58	
Italy	ktoe	170	181	
Latvia	ktoe	2.1	2.3	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	2	2	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	28	30	
Poland	ktoe	53.41	53.89	
Portugal	ktoe	13.1	14	
Romania	ktoe	36.55	30.46	
Slovakia	ktoe	9.2	9.9	
Slovenia	ktoe	4.8	4.4	
Spain	ktoe	108	114	
Sweden	ktoe	132	129	
United Kingdom	ktoe	66	69	
All 28 Member States	ktoe	1276.19	1314.33	

**Table 319:** PR Table 1d: Renewable electricity non-road transport (ktoe)

**Table 320:** PR Table 1d: Other biofuels (ktoe)

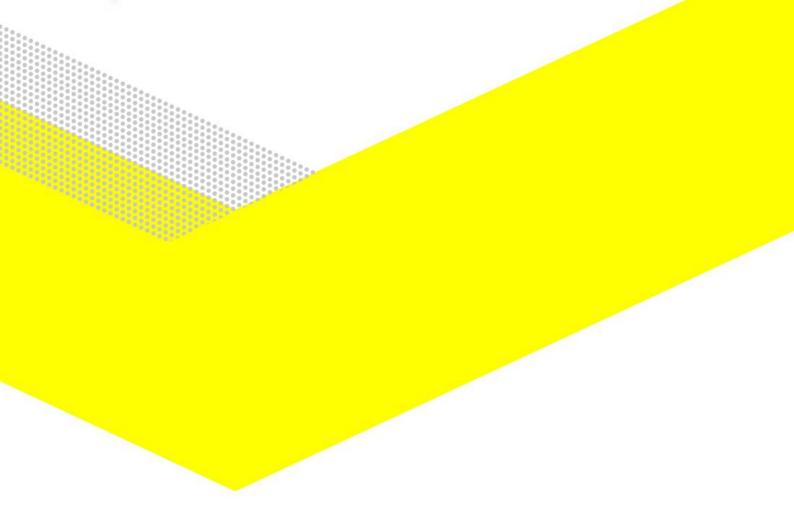
	Unit	2011	2012	Comment
	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	0	0	
Denmark	ktoe	0	0	
Estonia	ktoe	0	0	
Finland	ktoe	0.1	0.3	2 (p.64)
France	ktoe	0	0	
Germany	ktoe	34	117	9 (p.78)
Greece	ktoe	0	0	
Hungary	ktoe	0	0	
Ireland	ktoe	0.12	0.08	
Italy	ktoe	0	0	
Latvia	ktoe	0	0	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	0	0	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	n.a.	n.a.	
Poland	ktoe	219.2	33.37	7 (p.148)
Portugal	ktoe	0	0	
Romania	ktoe	0.02	0.02	
Slovakia	ktoe	0	0	
Slovenia	ktoe	n.a.	n.a.	
Spain	ktoe	74	n.a.	9 (p.178)
Sweden	ktoe	62	79	17 (p.184)
United Kingdom	ktoe	4	24	8 (p.192)
All 28 Member States	ktoe	393.44	253.77	

	Unit	2011	2012	Comment
Austria	ktoe	0	0	
Belgium	ktoe	0	0	12 (p.28)
Bulgaria	ktoe	0	0	
Croatia	ktoe	0	0	
Cyprus	ktoe	0	0	
Czech Republic	ktoe	n.a.	n.a.	
Denmark	ktoe	0	0	
Estonia	ktoe	0	0	
Finland	ktoe	n.a.	n.a.	
France	ktoe	0	0	
Germany	ktoe	5	25	
Greece	ktoe	0	0	
Hungary	ktoe	0	0	
Ireland	ktoe	0.12	0.08	
Italy	ktoe	0	0	
Latvia	ktoe	0	0	
Lithuania	ktoe	n.a.	n.a.	
Luxembourg	ktoe	0	0	
Malta	ktoe	n.a.	n.a.	
Netherlands	ktoe	n.a.	n.a.	
Poland	ktoe	0	0	
Portugal	ktoe	0	0	
Romania	ktoe	0	0	
Slovakia	ktoe	0	0	
Slovenia	ktoe	n.a.	n.a.	
Spain	ktoe	n.a.	n.a.	
Sweden	ktoe	61	78	
United Kingdom	ktoe	0	19	9 (p.192)
All 28 Member States	ktoe	66.12	122.08	

**Table 321:** PR Table 1d: Other biofuels Article 21.2 (ktoe)

**Table 322:** PR Table 1d: Total (transport) (ktoe)

	Unit	2011	2012	Comment	
Austria	ktoe	660	651		
Belgium	ktoe	364.5	372.8		
Bulgaria	ktoe	8	6.1		
Croatia	ktoe	26.9	42.2		
Cyprus	ktoe	16.01	17		
Czech Republic	ktoe	307	290		
Denmark	ktoe	147.3	221.8		
Estonia	ktoe	0.9	0.9		
Finland	ktoe	213	216		
France	ktoe	2981	3051	9 (p.70)	
Germany	ktoe	2986	3131		
Greece	ktoe	23.3	27.2		
Hungary	ktoe	180	154	2 (p.98)	
Ireland	ktoe	98	85		
Italy	ktoe	1575	1552	5 (p.110)	
Latvia	ktoe	26.8	23.9	8 (p.116)	
Lithuania	ktoe	45	61		
Luxembourg	ktoe	48	49	6 (p.128)	
Malta	ktoe	1.32	3.03		
Netherlands	ktoe	516	544	15 (p.140)	
Poland	ktoe	987.32	877.13		
Portugal	ktoe	17.1	18.2		
Romania	ktoe	102.76	212.84	6 (p.160)	
Slovakia	ktoe	121.5	95.5		
Slovenia	ktoe	39.8	55.4		
Spain	ktoe	1799	2203		
Sweden	ktoe	607	736		
United Kingdom	ktoe	1035	951		
All 28 Member States	ktoe	14933.51	15648		



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