Co-funded by the Intelligent Energy Europe
Programme of the European Union

Contract N°: IEE/11/845/SI2.616378

Bringing Europe and Third countries closer together through renewable Energies

BETTER

D 7.2: Action Plan for Renewable Energy Cooperation between Turkey and EU Member States

Project Coordinator: ***CIEMAT***

Work Package ***7*** *Leader Organization:* ***ECN***

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PREFACE

BETTER intends to address RES cooperation between the EU and third countries. The RES Directive allows Member States to cooperate with third countries to achieve their 2020 RES targets in a more cost efficient way. The core objective of BETTER is to assess, through case studies, stakeholders involvement and integrated analysis, to what extent this cooperation *can help Europe achieve its RES targets in 2020 and beyond, trigger the deployment of RES electricity projects in third countries and create win-win circumstances for all involved parties*.

The case studies focusing on **North Africa, the Western Balkans and Turkey** will investigate the technical, socio-economic and environmental aspects of RES cooperation. Additionally, an integrated assessment will be undertaken from the "EU plus third countries" perspective, including a quantitative cost-benefit evaluation of feasible policy approaches as well as strategic power system analyses. Impacts on the achievement of EU climate targets, energy security, and macro-economic aspects will be also analysed.

The strong involvement of all relevant stakeholders will enable a more thorough understanding of the variables at play, an identification and prioritisation of necessary policy prerequisites. The dissemination strategy lays a special emphasis on reaching European-wide actors and stakeholders, well, beyond the target area region.

PROJECT PARTNERS

N°	Participant name	Short Name	Country code
CO1	Centro de Investigaciones Energéticas, Tecnológicas y Medioambientales	CIEMAT	ES
CB2	German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt e.V.)	DLR	DE
CB3	Energy Research Centre of the Netherlands	ECN	NL
CB4	JOANNEUM RESEARCH Forschungsgesellschaft mbH	JR	AT
CB5	National Technical University of Athens	NTUA	GR
CB6	Observatoire Mediterranéen de l'Energie	OME	FR
CB7	Potsdam Institute for Climate Impact Research	PIK	DE
CB8	Vienna University of Technology	TUWIEN	AT
CB9	United Nations Development Program	UNDP	HR

Executive Summary

The energy strategy focus and the cooperation between Turkey and the EU has been on natural gas, mainly based on Turkey's strategic geographical location at the crossroads of major natural gas-rich regions such as the Caspian and the Middle East on the one hand, and a major natural gas consuming region, Europe, on the other hand. While cooperation on renewable energy (RES) has been recognised in recent dialogues between EU and Turkey it has not attracted the deserved attention yet. However, cooperation between Turkey and the EU on renewable energy and creating an integrated and interconnected energy market that leads to a ''green energy market'' will be mutually beneficial. The recent EU Communication 'A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy' highlights the importance of enhanced regional cooperation with neighbouring countries, particularly from the perspective of improving energy security and Turkey can offer a significant contribution to the Energy Union goals.

As part of BETTER, an IEE funded project, and supported by previous results in the project this Action Plan presents the main outcomes of possible future RES expansion and cooperation opportunities between Turkey and the EU and the strategic actions needed to achieve the vision **'An integrated renewable energy system between Turkey and the EU that serves a sustainable energy future for all'.** Although cooperation mechanisms within the RES Directive are the starting point for assessing and identifying renewable energy cooperation opportunities between Turkey and the EU, this Action Plan goes beyond and aims at helping Turkey enhance its RES sector and create the right environment to be involved in renewable energy trade/export to the EU. A fundamental prerequisite for the realization of any renewable electricity (RES-E) exports from Turkey to the EU lies in creating win-win projects for both Turkey and EU Member States involved.

DIRECTIVE 2009/28/EC introduced cooperation mechanisms to facilitate cost-efficient target achievement, allowing Member States to support the development of renewable energy generation in other countries and count this generation towards its own target.

Article 6. Statistical transfers: Allows EU Member States (MSs) to transfer the statistical value of a quantity of renewable energy produced among the MSs for RES target compliance purposes.

Article 7. Joint Projects between EU MSs: Allows to finance a RES project jointly thus sharing the costs and benefits of the project (i.e. a specific new plant is identified and the output of the plant is shared (statistically) between to cooperating MSs).

Article 8. Joint Support Schemes: Allows to coordinate national support schemes for RES deployment between the MSs, and count towards the national targets through a statistical transfer or through e.g. an ex-ante or ex-post agreed distribution rule.

Article 9. Joint Projects with third countries: Allows EU MS to finance RES projects (limited to electricity) in third countries, physically import the produced electricity and

Neither Turkey nor any EU neighbouring countries would profit from a strategy that considers exporting Turkey's cleanest energy options to other countries while Turkey meets its own demand by using fossil fuels. Creating win-win projects that are viable from both EU and Turkey perspective will require identifying and ensuring that Turkey receives the utmost benefits from any RES cooperation. As such, expanding RES in

Turkey first to meet its increasing demand is set as a prerequisite. Only after that any excess potential can be considered as export potential to the EU.

The bottom up assessment within the BETTER project shows that there are huge opportunities for RES deployment in Turkey that would satisfy approximately 30% to 60% of the gross electricity inland consumption, based on how far the barriers are mitigated and the support policies strengthened. The higher end of the figure corresponds to a higher and technologically diverse portfolio for RES electricity generation in 2030 whereas the lower end corresponds to more Business as Usual (BAU). Such large amounts of RES deployment will require significant amounts of capital expenditures that are in the order of 50 to 230 billion € by 2030, respectively. On the other hand, these expenditures in RES technologies will contribute to the economic activity in the country that could amount to 100 to 450 billion € in 2030. Furthermore, they would result in 100 to 350 thousand jobs.

The integrated assessment study, on the other hand, looks at the EU RES demand and the possible role of joint RES projects with non EU countries based on the mechanism introduced in Article 9 of the EU RES Directive. Scenarios consider two possible pathways for Turkey: (i) becoming a Member of the EU and/or the Energy Community and (ii) Turkey staying as non-affiliated to the EU Membership. The first option enables Turkey to be involved in all of the RES cooperation mechanisms (introduced above) in which virtual (statistical) trade is an important element. The second option requires physical export of RES-E from Turkey to the EU premises. Moreover, the study analyses what happens if Turkey pursues a high RES target or a low RES target and what if EU policy goes beyond the current RES target of 27% by 2030 and aims a more stringent target, for instance 32.5% RES in gross final energy consumption in 2030. The scenario results compare between the reference case of RES cooperation limited to EU Member States (EU only) and the full cooperation case (EU plus) where the EU is assumed to extend the geographical scope of RES cooperation towards its neighbouring countries and regions.

Based on the assumption that a joint market is established for RES in the electricity sector, allowing full RES cooperation across the EU and Turkey in the period post 2020, Turkey could satisfy over 30% of gross electricity consumption and export approximately 47 TWh RES-E to the EU in 2030, increasing to 103 TWh in 2040. In accordance with the virtual and/or physical exchange of RES volumes and certificates the EU28 would pay for parts of the RES-E expansion in Turkey (and benefits from a cheaper and sustainable power supply system). In monetary terms, this would mean a transfer from the EU in size of 360 million € on average per year in the period up to 2030, declining to 130 million € annually in the forthcoming decade (2031 to 2040) because of a decline of certificate prices. These figures reflect the most likely scenario result up to 2030 that considers a RES target that is (more or less) in line with the Turkish official targets and the EU28 official target of 27% RES. It is, however, necessary to highlight the fact that if Turkey considers a higher RES target, and whether Turkey stays unattached to the EU and the Energy Community or not, would significantly change the picture and Turkey would even become a net importer of RES-E by 2030. Moreover, any higher ambitions at the EU28 side would result in much increased RES-E export potentials from Turkey to the EU. High transmission capacity between Turkey and the EU and access to hydro storage facilities would maximise the economic benefit of variable RES generation.

There are huge opportunities for RES expansion in Turkey and the possibilities for RES cooperation with the EU that can be beneficial to all parties involved, particularly beyond 2030. Against these opportunities there are significant challenges and barriers that require large efforts to overcome. Only when the existing barriers and future challenges are mitigated in Turkey the opportunities can be achieved. Based on these challenges a number of strategic actions are recommended and briefly introduced below.

1. Overcome existing non-technical barriers to RES expansion in Turkey
   a. Improve administrative procedures through simplified and more efficient permit and authorisation procedures. This will increase investors interest, reduce costs and lead to higher RES penetration.
   b. Define dedicated RES Zones that are more attractive to the investors. As such, the measurement requirements (for instance wind speed measurements) can be shortened and land restrictions can be simplified. Next to that, the infrastructure requirements can be met to ease the grid connection.
2. Develop long term national renewable energy strategy
   a. Define binding renewable energy targets up to 2030 and give investment signals for future RES considerations up to 2050.
   b. Define possible RES cooperation opportunities and strategies on whether and how to involve RES cooperation with the EU in the future.
3. Strengthen electricity interconnections with the EU and prepare grounds for RES trade
   a. Develop working mechanisms for the identification and joint promotion of mutually beneficial cross-border infrastructure projects. Work also on a regional basis to define and build infrastructure projects and generation capacities.
4. Maximise benefits of RES expansion and cooperation to Turkey
   a. Develop a cross-cutting policy mix (e.g.: industrial policies, promoting education and training, technology transfer, etc.) tailored to the country specificities and needs that lead to large local content shares and thus maximize the economic value creation from existing and future RES-deployment.
   b. Safeguard any possible negative environmental and socio-economic impacts. When implementing RES expansion, other impacts that occur in-situ have to be accounted and environmental safeguard measures have to be designed and put in place similar to CDM or a Sustainable Desert Power Certificate (Schinke and Klawitter, 2014). Citizens' participation should be ensured through the publication of the environmental impact assessment studies for comments, increasing public acceptance through transparency.
5. Create awareness among the public and the civil society
   a. Foster public acceptance through engaging the public and civil society in RES projects. Introduce a fair revenue sharing mechanism that would benefit the investors, local community, private land owners, etc.
   b. Conduct transparent consultation procedures in which the benefits, risks, costs and possible solutions are communicated through a participatory process.

Next to these, the cooperation with ENTSO-E and ACER shall be strengthened. Developing a regional grid concept that adequately reflects the growing RES generation in the region would be necessary. Already good steps are taken in this respect. A Long-Term Agreement that will form the legal basis for permanent operation of Turkey's electricity system with the Continental Europe electricity grid is signed between TEIAS and ENTSO-E as of April 15th, 2015.

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ABBREVIATIONS

BAU	Business as Usual
BO	Build Operate
BOT	Build-Operate-Transfer
DisCos	Distribution companies
EMRA	Turkish Energy Market Regulatory Authority
ENTSO-E	The European Network of Transmission System Operators for Electricity
EPIAS	Energy Markets Operation Joint Stock Company
EU	European Union
EÜAŞ	Turkish Electricity Generation Company
MENR	Ministry of Energy and Natural Resources
M&A	Merger and Acquisition
MS	Member States
NREAP	National Renewable Energy Action Plan
RES	Renewable energy resources
RED	Renewable Energy Directive
RES-E	Renewable electricity
SNPmax	Strengthened National Policies
TEDAS	Turkish electricity distribution company
TEIAS	Turkish electricity transmission company
TETAŞ	Turkish Electricity Trading and Contracting Company
TOR	Transfer-of-Operation-Rights
UCTE	the Union for the Co-ordination of Transmission of Electricity

1. INTRODUCTION

1.1. RATIONALE

Ensuring sufficient energy supply at affordable prices to its growing economy remains the Turkish government's main policy concern on energy given the significant increase in demand. Energy security has also become a political priority for the EU. Since there is a common interest in closer integration of energy markets and energy policies, there is great scope for cooperation on energy issues, not only on natural gas, but also on renewable energy resources (RES).

Turkey holds a significant amount of renewable energy resources. While this has been recognised by the government and the renewable energy law was drafted in 2009 the current deployment of renewable energy sources is insignificant when compared with the potentials. At the same time, Europe aims at meeting a significant share of its consumption from renewable energy resources and recognises the importance of cooperation both within and outside the EU. The existing energy cooperation that mainly focuses on fossil fuel can be expanded to renewable energy and provide the platform that results in mutual benefits. The recent EU Communication 'A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy[1] highlights the importance of enhanced regional cooperation with neighbouring countries, particularly from the perspective of improving energy security and it recognises specifically the RES potential of South East Europe. Turkey could play a significant role in this region and contribute to e Energy Union goals.

The EU Renewable Energy Directive(Directive 2009/28/EU) (hereafter RES Directive) introduces cooperation mechanisms to allow Member States to achieve their national targets in a cost-efficient manner. Article 9 of the RES Directive refers to Joint Projects with Third Countries that allows for one or several Member States to cooperate with a third country, to develop a RES project in the territory of the third country. This project would receive financial support from the contributing EU countries and in return (a share of) the produced renewable electricity would be physically exported to the EU territories to be consumed and counted towards the EU Member State(s) targets. Joint Projects with Third Countries is one of four different cooperation mechanisms listed in the RES Directive.

As part of the BETTER, an IEE funded project, and supported by previous results in the project this Action plan presents the main outcomes of possible future cooperation opportunities between Turkey and the EU and the strategic actions needed to achieve those opportunities. Although the cooperation mechanisms within the RES Directive is the starting point for assessing and identifying renewable energy cooperation opportunities between Turkey and EU, this Action Plan goes beyond and aims at an integrated renewable energy system between Turkey and EU that results in mutual benefits to all countries involved, Joint RES Projects being one of them. Thus the term 'RES cooperation' is not only limited to joint RES projects between Turkeys and the EU Member States, but, includes other forms of cooperation such as technology transfer from the EU as well as joint efforts to further reduce the cost of RES-E technologies and to establish interconnections which are not only necessary for RES-E exports but also for exploiting the benefits of better integrated electricity system that help Turkey enhance its RES sector and create the right environment to involve in renewable energy import/export. A fundamental prerequisite for the realization of any renewable electricity (RES-E) exports from Turkey to the EU lies in creating win-win projects for both Turkey and EU Member States involved. Neither Turkey nor any EU neighbouring countries would profit from a strategy that considers exporting Turkey's cleanest energy options to other countries and Turkey meeting its own demand

1 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, 'A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy' (COM/2015/080 final).

with fossil fuels. Creating win-win projects that are viable from both EU and Turkey perspective will require identifying and ensuring that Turkey receive utmost benefits from any RES cooperation.

The purpose of this Action Plan is therefore to identify what needs to be done and in which timeframe. For simplification, the Action Plan considers three timeframes; short term (from now up to 2020), mid-term (2020-2030) and long-term (beyond 2030). This Action Plan targets national and regional policy makers primarily in Turkey.

1.2 Objective to be reached

This Action Plan can be considered a key step in a process to create an effective framework for renewable energy cooperation between the EU and Turkey. The intend of this Action Plan is to identify those actions that would be required to reach mutually beneficial RES cooperation and ensure that win-win circumstances both for Turkey and EU are seized and the high-level strategies and specific actions required to achieve the vision and mission are outlined.

VISION

An integrated renewable energy system between turkey and the EU that serves to a sustainable energy future for all.

MISSION

To ensure the expansion of renewable energy in Turkey through cooperation with the EU that results in net benefits for both Turkey and the EU.

GOALS

- Turkey satisfies around 33 to 56% of the electricity demand from RES in 2030.
- 100-300 thousand jobs are created and 100-650 billion € economic activity is induced in Turkey by 2030.
- Even in the case of 27% RES by 2030 Europe may then achieve 2.3% of the demand for RES-E in 2030 through imports from Turkey and would save around 1.2 billion € support expenditures on average per year in the period up to 2030.

1.3 Approach

This Action Plan has been developed under the Intelligent Energy Europe (IEE) – funded project BETTER[2] and is largely based on input from BETTER project deliverables, particularly relating to the Turkey Case Study. The BETTER project addresses RES cooperation between the EU and neighbouring countries, namely North Africa, Turkey and Western Balkans. Turkey Case study (ref) has looked into the energy system in Turkey, with a clear focus on the power sector and assessed the renewable energy production potentials based on a number of policy scenario. Furthermore, Case Study assessed the socio-economic and environmental consequences of further RES deployment and conducted a SWOT analysis that presents weaknesses, strengths, opportunities and the challenges of RES expansion and further cooperation with the EU. Relevant studies can be found from http://www.better-project.net/content/results.

1.4 Report outline

This report consist of 4 chapters. Chapter 2 presents the overview of the Turkish energy system and the role of RES development in Turkey. It presents the overview of the electricity market structure, the current status

[2] http://www.better-project.net/

of electricity distribution and transmission grid and the RES potentials and the related policy process. This chapter also summarises the results of the bottom up scenario analysis that give indications in terms of what Turkey's RES expansion potentials are up to 2030. Moreover, the socio-economic impacts of these scenarios in terms of capital expenditures, the national economic activity created and job creation are presented. Chapter 3 focuses on prospects for RES cooperation between turkey and the EU. The details of cooperation mechanisms within the RES Directive and the current EU-Turkey energy relations and the possible options to engage in RES cooperation are detailed. This caper also presents the integrated assessment study results dedicated to Turkey. Based on the scenario analysis RES export potentials from Turkey to the EU are detailed. Moreover, the impacts from increases RES-E cooperation between Turkey and the EU in terms of direct economic impacts , impacts on costs, expenditures and benefits such as fossil fuel and GHG emissions avoided are presented. This chapter also presents the challenges to RES expansion and cooperation.

Finally Chapter 4 introduces the identified strategies and the time farmed actions to ensure RES expansion and set the grounds for future RES cooperation with Europe.

2. Overview of energy system and the role of RES development in Turkey

2.1 Turkish energy system

Turkey has become one of the fastest growing energy markets in the world due to its rapidly growing economy. After China, Turkey faces the second highest energy consumption growth. Turkish primary energy consumption was around 122.8 Mtoe (Mega tons of oil equivalent) in 2013 and is expected to rise to over 218 Mtoe by 2023 (Ministry of Energy and Natural Resources, 2013). The gross power generation was approximately 220.4 billion kWh in 2014 with an 9% increase compared to 2011. The present primary energy resources are dominated by oil, natural gas and coal, renewables representing approximately 10 % of the total primary energy resources (see Figure 1).

Turkey's Economic Outlook 2013

- GDP per capita increase from 3,492 USD in 2002 to 10.807 USD in 2013.
- Economic growth by 3.6% in 2013.
- Inflation rate 7.4% in 2013.
- Annual Exports of 151.3 USD billion in 2013.
- Annual Imports of 248.3 USD billion in 2013.
- Budget deficit to GDP 1.2%.

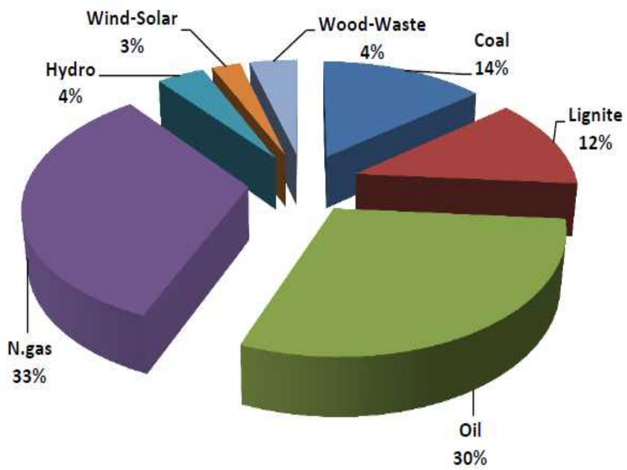

Figure 1 Primary energy resource distribution, 2011

Turkey imports approximately 75 % of its energy, and the net energy import bill has historically accounted for over two-thirds of the country's current account deficit (IMF, 2013). The Turkish electricity market is one of the fastest growing in the world. In 2012, approximately 252 TWh of electricity was supplied to the domestic market, corresponding to around 5.1% annual growth from 2011. The average growth rate for the last five years (2007-2012) was 7.5% and it is projected to grow (see Figure 2). In response to these challenges energy policy in Turkey prioritises to satisfy the increasing energy demand of the country and securing the energy supply. Turkey's strategic geographical location at the crossroads of major natural gas-rich regions such the Caspian and the Middle East on the one hand, and a major natural gas-consuming region, Europe, on the other hand has paved the way for the emergence of a vision on which Turkey would eventually play the role of key transit country of future natural gas flows from Azerbaijan, Turkmenistan, Iraq and Iran to Europe. The recent developments–Ukraine crisis and the natural gas discoveries in the Eastern Mediterranean (offshore Israel and Cyprus)–has restated Turkeys geographical importance.

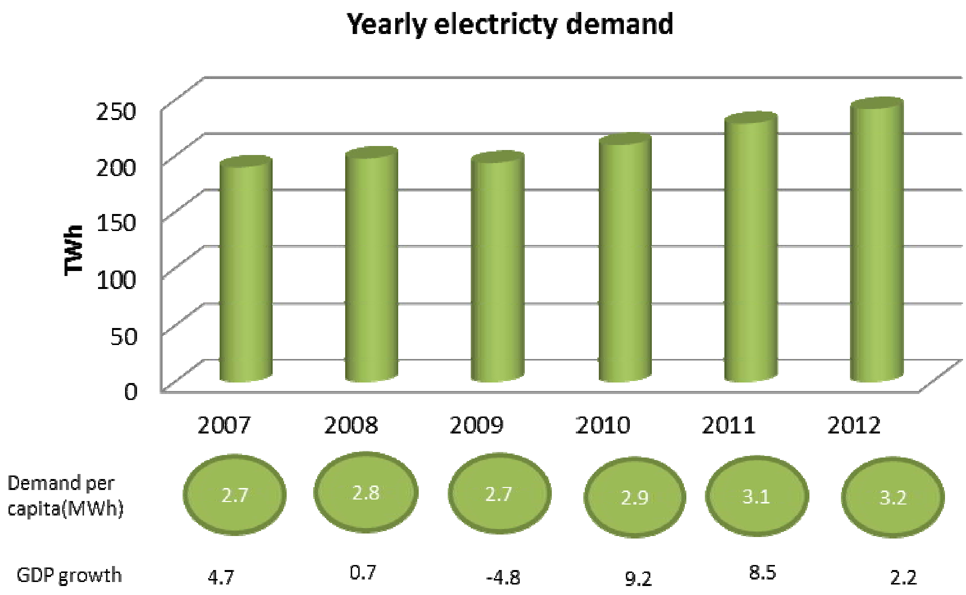

Figure 2 Historical yearly electricity demand growth (EMRA, 2013)

In line with these ambitions Turkish government has issued a vision document that comprises three pillars: (i) minimizing energy dependence; (ii) preparing for a low carbon age; and (iii) enhancing the position of Turkey in global energy diplomacy. Turkey aims to reduce the energy import bill by using more local resources such as hydropower, other renewable forms of energy and also coal, while embarking on a nuclear power program.

2.2 Electricity market structure

Strategic Plans of Turkish Government

- Increase the share of renewable resources by 2023 to at least 30 percent
  - 10,000 MW installed capacity for wind by 2015 and 20 GW by 2023 (from 802.8 MW in 2009)
  - 300 MWe installed capacity geothermal by 2015 (from77.2 MW in 2009)
  - Utilize all hydro capacity for electricity generation by 2023
  - Construction of 5,000 MW additional installed capacity for small hydro in 2023.
- Utilize all local coal resources for power production by 2023.
- 10 GW Nuclear.
- 60.717 km transmission lines (from 49.104 km).
- 158.460MVA power distribution unit capacity (from 98.996MVA).
- 5 billion m^3 natural gas storage capacity (from 2.6 billion m^3).
- Decrease electricity loss-theft to 5% and extending the use of smart grids.
- 125.000 MW installed power (up from 54.423 MW).

The liberalization of Turkish electricity market starts in late 1980s and progresses rapidly in the last decade. The share of private sector in electricity generation is currently 80%. Organised wholesale operations in the market will soon be carried out by recently created Energy Markets Operation Joint Stock Company (EPIAS, or Turkish Energy Exchange). The ownership unbundling of the Turkish electricity transmission company (TEIAS) is in place. Turkey is steadily achieving a fully competitive market.

Installed capacity approx. 70 GW in 2015 • EÜAŞ (Turkish Electricity Generation Company) 44%, however, EÜAŞ privatisation is the pipeline • BO/BOT/TOR (‘Build Operate’ , ‘Build-Operate-Transfer’,’Transfer-of-Operation-Rights’) 16% • Private Sector 40% • 20% market share limitation (on generation)	State-owned monopoly • Market Financial Settlement Centre (market operator) is a part of TEİAŞ • National Load Dispatch Centre(system operator) is a part of TEİAŞ	• Contracts between EÜAŞ-Turkish Electricity Trading and Contracting Company (TETAŞ) and TETAŞ-distribution companies (DisCos) account for the major part of the bilateral contracts • TETAŞ has take-or-pay contracts w/BO/BOT/TOR plants • 20% market share limitation	TEDAŞ was divided into 21 different distribution regions, which are separate DisCos • DisCo privatizations are completed.	As of 2013, the eligible consumer (consumers who are free to choose their suppliers because their yearly consumption is above the regulated threshold) limit is 5,000 kWh (targeted to be zero by the end of 2015). The market opening rate was 77% as of 2012. • As of 2012, distribution and retail sales operations have been separated and DisCos have been legally unbundled.

2.3 The electricity transmission grid

The Electricity Market Law of 2001 obliges the transmission and distribution companies to allow open, guaranteed, and non-discriminatory access to the network by third parties to facilitate competition in the electricity market. The grid codes and electricity market licensing regulations incorporate the principles and practices of third-party access and its requirements enhancement of investment interest and creation of international partnerships. Third-party access to the networks, connection fees, and system usage tariffs are all regulated by the Turkish Energy Market Regulatory Authority (EMRA).

The Turkish electricity market import export regulations follow Regulation 1228/2003 of the European Commission. Transmission system capacity for export-import transactions is allocated pro rata by the Turkish Electricity Transmission Company (TEIAS). TEIAS is obliged to use a bidding process, when such demand from traders exceeds available capacity. Procedures relating to transmission access are mostly in line with EU Directives. When the capacity demand for imports/exports is within the available capacity, normally regulated transmission tariffs apply.

Turkey is already interconnected with the European Member States. Its interconnections are directed firstly to the north rather than the south. In particular, the Turkish grid is interconnected to those of Armenia (220 kV), Azerbaijan (154 kV), Bulgaria (400 kV), Georgia (220 kV), Greece (154 kV), Iran (154 kV and 400 kV), Iraq (400 kV), and Syria (400 kV). The net transfer capacity (NTC) for import to Turkey is within the range of 800–1300 MW, while NTC for export from Turkey is within the range of 1000–1100 MW

The transmission system design characteristics and operation principles in Turkey are in accordance with the Transmission System Grid Code Regulation and Electric Transmission System Supply Reliability and Quality Regulations. Both of the regulations and system operation principles are in line with ENTSO-E best practices. The Turkish system has been synchronously connected to the ENTSO-E system since September 2013. The parallel trial interconnection of the Turkish power grid with the ENTSO-E's Continental European Synchronous Area is expected to be fully functional by the end of 2014. Today, Turkey has two lines to Bulgaria and one to Greece and can benefit from the synchronous interconnections with the European platform of ENTSO-E, which will be further developed in the future to increase the cross-border capacity with Europe, and thus improve trading opportunities. In April 2015, the Long-Term Agreement is signed between TEIAS and ENTSO-E, which will form the legal basis for permanent operation of Turkey's electricity system with the Continental Europe electricity grid.

Figure 3 Turkish electricity transmission system is interconnected with neighbours (OME, 201X)

Turkey's joining the Union for the Co-ordination of Transmission of Electricity (UCTE) through interconnections with Greece is a key element of the Mediterranean Electricity Ring. It interconnects the systems of France, Spain, Morocco, Algeria, Tunisia, Libya, Egypt, Near Eastern countries, Turkey, Greece, and Italy. Similarly, the Turkey-Bulgaria link is a key element of the initiative of Black Sea Electricity Ring, which interconnects the systems of Russia, Ukraine, Romania, Bulgaria, Turkey, and Georgia.

In view of its impending membership in UCTE and synchronous operation with the European grid, Turkey would seem a convenient gateway to the European electricity markets.

According to a study, conducted by TUBITAK Energy institute and funded by TEIAS, the long term development of the national grid (2013 to 2022) are prone to some risks around the main population centres (such as İstanbul, İzmir, Antalya, Adana and Mersin) as the summertime peak loads will give rise to congestion and overload according to assumed supply and demand values. Most of this overloading is thought to result from summer air-conditioning needs in overcrowded urban areas.

2.4 Renewable potentials and RES policy in Turkey

Turkey has extraordinary resources regarding solar, wind, geothermal and bioenergy technologies. According to a number of studies hydro power technical potential is two to four times the current electricity production from hydro power, namely over 200 TWh annually. For solar power studies even estimate the technical potential to range between 300 and 6105 TWh annually. While these figures present the magnitude of the different technical potentials, it is important to define what is realisable in the mid-to long term and how far the policies in place can drive renewable energy expansion in Turkey.

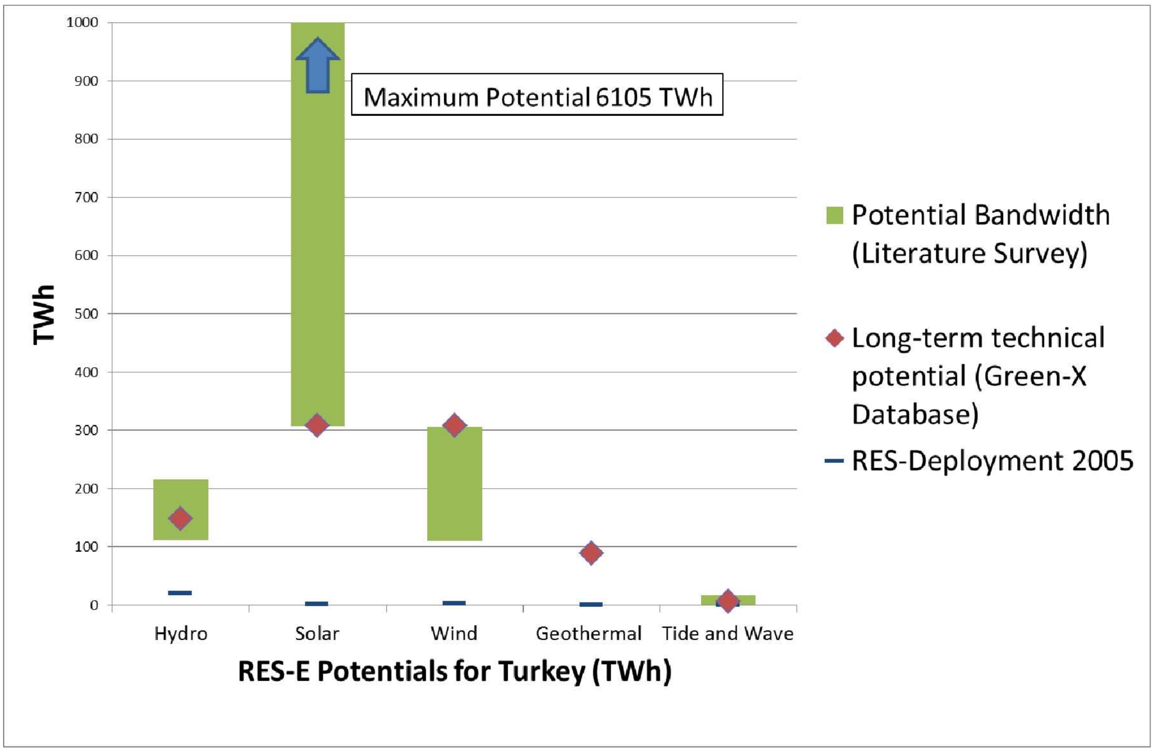

Figure 4 Technical RES-E potentials of Turkey

There has been little progress since the publication of the Renewable Energy Law in 2005 due to the lack of secondary legislations and relatively low feed-in tariffs. Therefore, this law was revised in December 2010 by Law No 6094 on 'Amendments for the Law on Renewable Energy Resources for Generation of Electrical Energy' in which the incentives were differentiated on the basis of resources and a new focus was laid on the introduction of local content requirements. Based on this law:

- Suppliers are indirectly obliged to purchase renewable electricity.
- The scope of time for support mechanism is extended for facilities that are commissioned before December 31, 2015 to December 31, 2020.
- Feed-in tariffs are based on USD and not subject to any escalation.
- Land usage fee incentives are introduced.

RES Policy

The milestone for renewable energy policy in Turkey is **Law No 5346-Renewable Energy Resources for the Generation of Electricity Energy** that introduced policy incentives for the first time in 2005.

EMRA has been set up to issue 'Renewable Energy Resource Certificates' (RER Certificates) to legal entities that hold generation licenses for facilities that generate energy using any of these resources.

The new Electricity Market Law(Law No. 6446) has introduced some changes to the current electricity market system. According to this new law the maximum installed capacity for a renewable energy plant to operate without a license has been raised to 1 MW, with the ease of increasing up to 5 times (5 MW) by a decree of the Council of Ministers without a change in the Law. Furthermore, with the new Law, there is no limit for renewable energy facilities that serve for self-consumption without feeding into the grid. The pre-licensing step is defined in the licensing process and all merger and acquisition (M&A) activities at this stage are restricted. For wind and solar power plants that would compete for the grid access rights, the tendering process has been modified to reduce the 20 year payment period of contribution fees to the Transmission System Operator to 3 years. The contribution fee that was paid according to generated kWh was modified to be paid for unit installed capacity (per MW).

Table 1 Feed-in tariff in Turkey for Renewable Energy

	Feed-in tariffs in Turkey for Renewable Energy	Local Content Bonus
Technology	(USD cent/kWh)	
Wind energy	7.3	USD$ 0.8 cent/kWh for the local wing production, USD$ 1.0 cent/kWh for the locally produced generator and the power electronics, USD$ 0.6 cent/kWh for the local turbine tower and USD$ 1.3 cent/kWh for the locally produced mechanical parts for the rotor and nacelle groups.
Solar	13.3	USD$ 0.8 cent/kWh for the domestic PV panel integration and solar structural mechanical manufacturing, USD$ 1.3 cent/kWh for the locally produced PV modules, USD$ 3.5 cent/kWh for the locally produced PV module forming cells, USD$ 0.6 cent/kWh for the domestically produced inverter and USD$ 0.5 cent/kWh for the equipment that focuses sun rays on PV modules.
Hydro	7.3	USD$ 1.3 cent/kWh if the turbines are locally produced and USD$ 1.0 cent/kWh if the generator and the power electronics are locally produced.
Biomass	13.3	
Geothermal	10.5	USD$ 1.3 cent/kWh for the locally produced steam and gas turbines and USD$ 0.7 cent/kWh for the domestic generator and power electronics.

2.5 Scenario analysis of RES generation potential up to 2030

The renewable energy policy in Turkey is relatively new, thus the implementation is yet to be seen. Within the BETTER project future RES deployment possibilities in Turkey are analysed based on a range of possible policy pathways using the Green-X model[3]. The details of this analysis can be found in BETTER D 5.3.

The results of the two main scenarios are introduced in this section, namely the 'Business as Usual (BAU)' scenario and the 'Strengthened National Policies (SNPmax)' scenario, providing a range of RES expansion capacity in Turkey. While the BAU scenario focuses on the current national RES policy in Turkey and presents the likely future RES expansion in the country the SNP scenario foresees a future, in which the Turkish national policy measures are comparable to the EU average support level and non-economic barriers, such as the complex and long-lasting administrative processes for the approval of new projects, additional payments (e.g. licensing costs, fixed and auctioned grid connection fees, balancing costs in case of direct marketing) that hinder investors from entering the market for RES in Turkey, are mitigated.

According to the modelling results Turkey could satisfy around 9.5% of the overall gross final energy demand by 2030 (see Figure 6) based on the current policies in place. There are huge opportunities for RES deployment in Turkey, reaching approximately 26.4 % of gross final energy demand in 2030 when more strengthened national RES policies are considered (see Figure 7). As can been seen in Figure 5 RES-E generation could be in the range of 118 and 389 TWh in 2030, corresponding to 30% and 66% gross inland consumption.

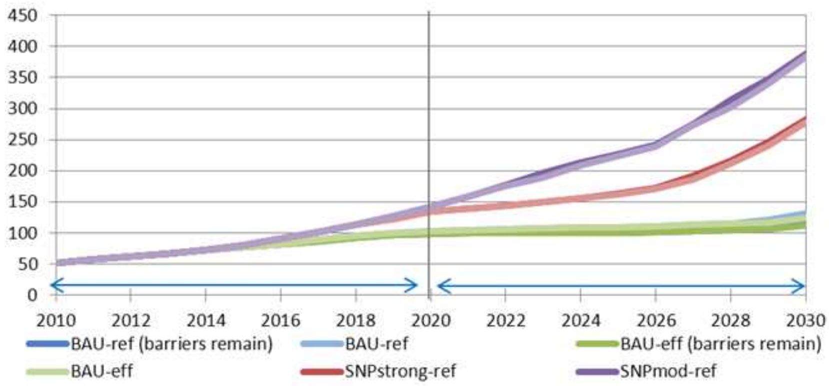

Figure 5 Electricity generation from RES in Turkey according to different scenarios

[3] See www.green-x.at

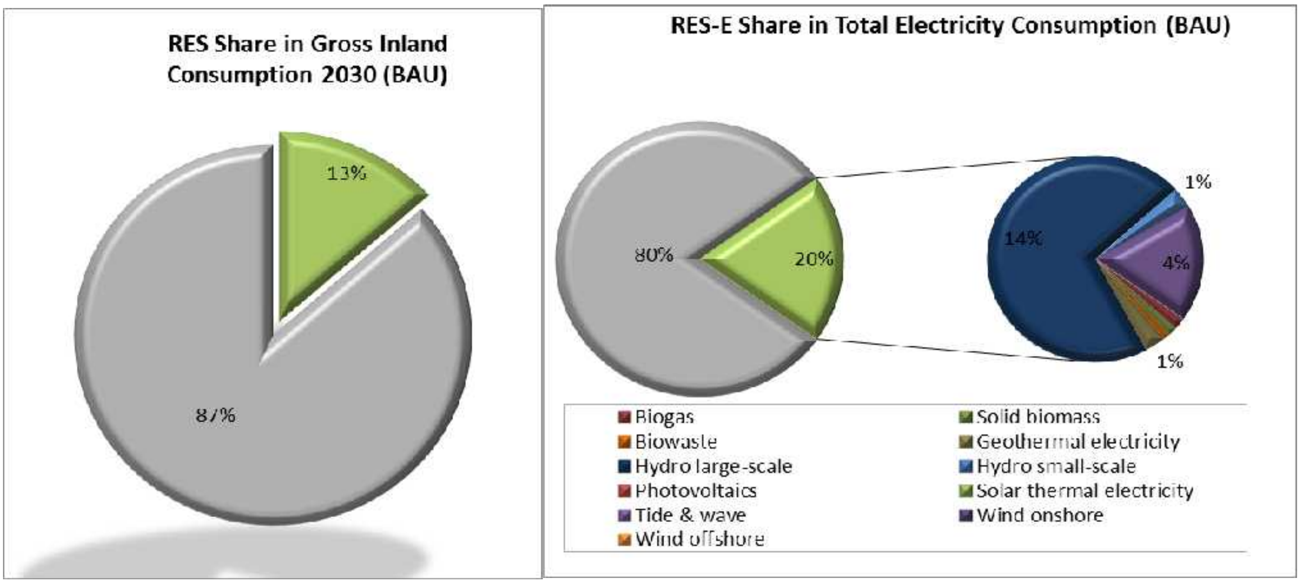

Figure 6 RES share in gross inland consumption (left) and the RES-E share in total electricity consumption in 2030 according to BAU scenario

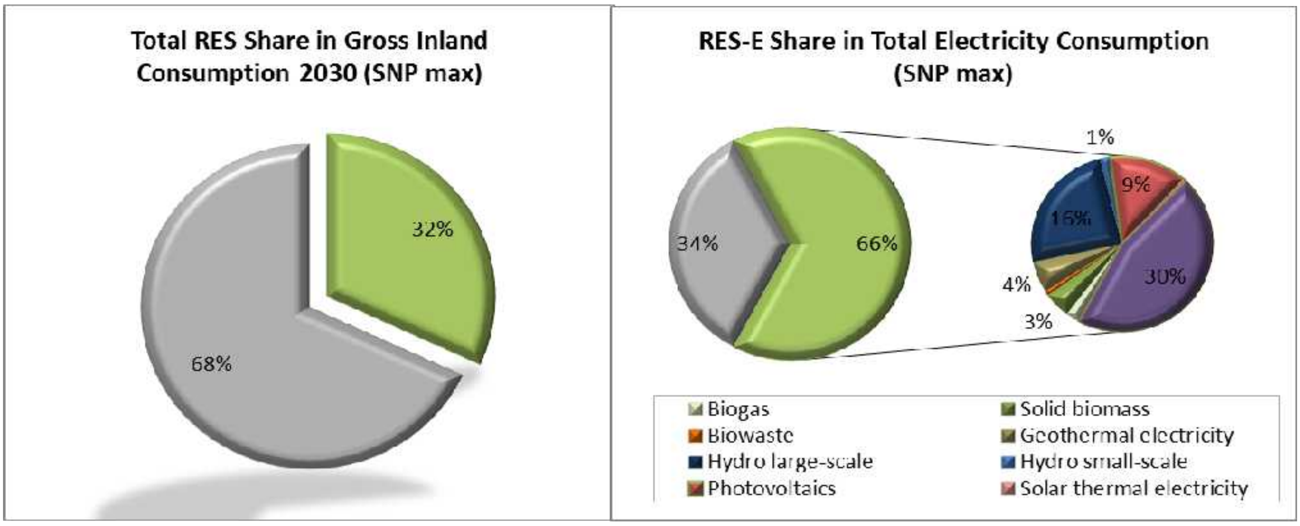

Figure 7 RES share in gross inland consumption (left) and the RES-E share in total electricity consumption in 2030 according to SNPmax scenario

In the BAU scenario, electricity generation from large scale hydro is approximately 84 TWh in 2030. This is followed by onshore wind, amounting to~22 TWh. According to the modelling results neither photovoltaics and solar thermal electricity nor tide and wave or offshore wind is deployed in this scenario. On the other hand the SNPmax scenario ensures a higher and technologically more diverse portfolio for RES electricity generation in 2030. The mix consists of approximately 95 TWh of large-scale hydro power and an even larger amount of onshore wind that can increased to an annual generation of 176 TWh. In this scenario, photovoltaics can also expand greatly and contribute to the electricity generation mix with around 57 TWh. Biomass and biogas technologies provide smaller amounts, offshore wind and tide and wave remain marginal in comparison to the other technologies. Figure 6 and Figure 7 give a comprehensive overview on the two scenarios.

In Figure 8 Turkey's 2023 official goals are compared with the scenario analysis results. These goals are in the middle or lower range of the future RES deployment possibilities, implying that the official RES goals and the current RES policies are not aligned yet.

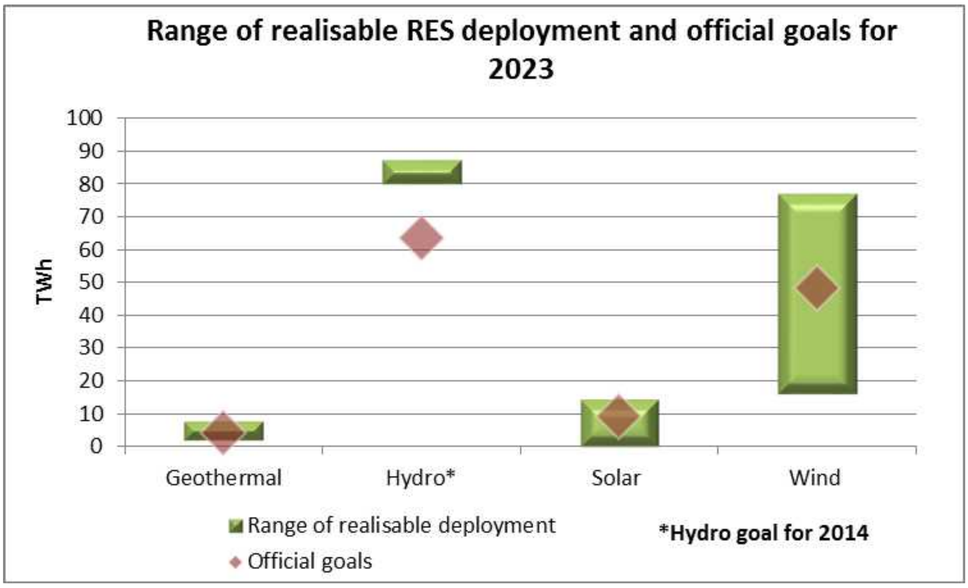

Figure 8 Comparison of the RES deployment with the official goals of Turkey in 2023

2.6 Socio-economic impacts of the scenarios

2.6.1 Capital expenditures and the national economic activity created

Large amounts of investment will be needed to deploy renewables in 2020 and 2030 in Turkey according to the future scenarios considered (see Figure 9). Even in the BAU scenario, the required investments imply 5% and 4% of the national GDP in 2020 and 2030 respectively. Accordingly, the more ambitious scenario (SNP) will need investments which represent 10 and 21 % of Turkish GDP in 2020 and 2030 respectively. Thus, mobilising such amounts of financial resources will be an important challenge.

On the other hand, these expenditures shall be evaluated in relation to their effects to the overall national economic activity. Said in other words, every euro invested in any RES technology will increase the total economic activity in Turkey by 1.73 €[4]. Figure 10 illustrates the total economic activity (which includes both direct and indirect effects) resulting from the deployment of RES under each of the scenarios considered and differentiated by small, medium and full local content. The share of local content in the manufacturing and construction phase greatly influences the total economic activity results. When comparing the 100% local content scenario results with the medium local content (70%) and low local content (50%) scenarios, the total increase in the demand of goods and services in the economy is reduced by approximately 66% and 47% respectively. Thus, the economic implications of reaching a high share of local value are not negligible. In order to reach the necessary local content shares besides the effects of local content requirements, the

[4] Based on the capital expenditures figures, the Turkish multiplier factors by technology from (Turnali K, 2014) have been considered. The average total domestic multiplier of RES investment is 1.73.

right policy mix which is crosscutting and tailored to country-specific conditions (e.g. industrial policy, R&D, training and capacity building) must have been put in place in advance.

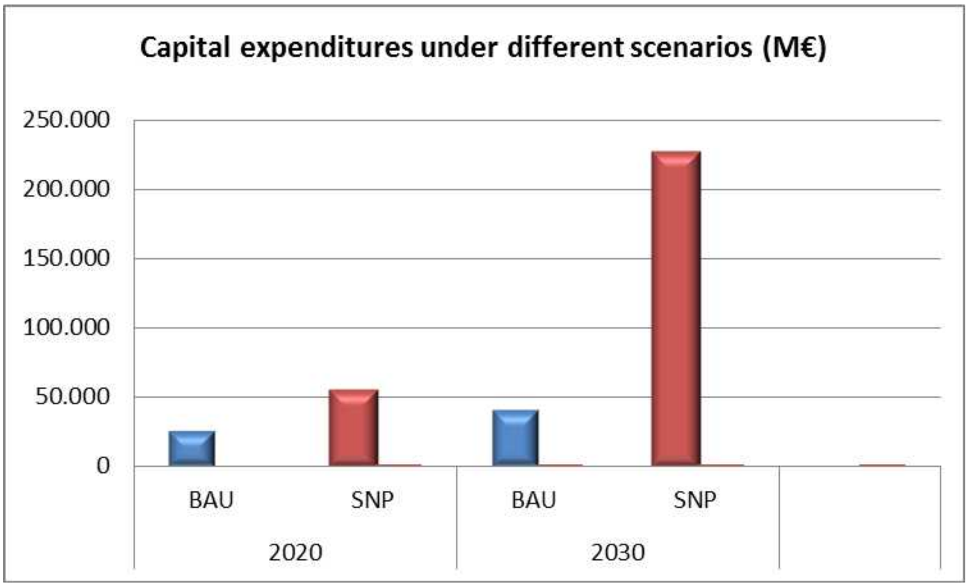

Figure 9 Necessary Capital Expenditure for total RES-E under different scenarios in 2020 and 2030

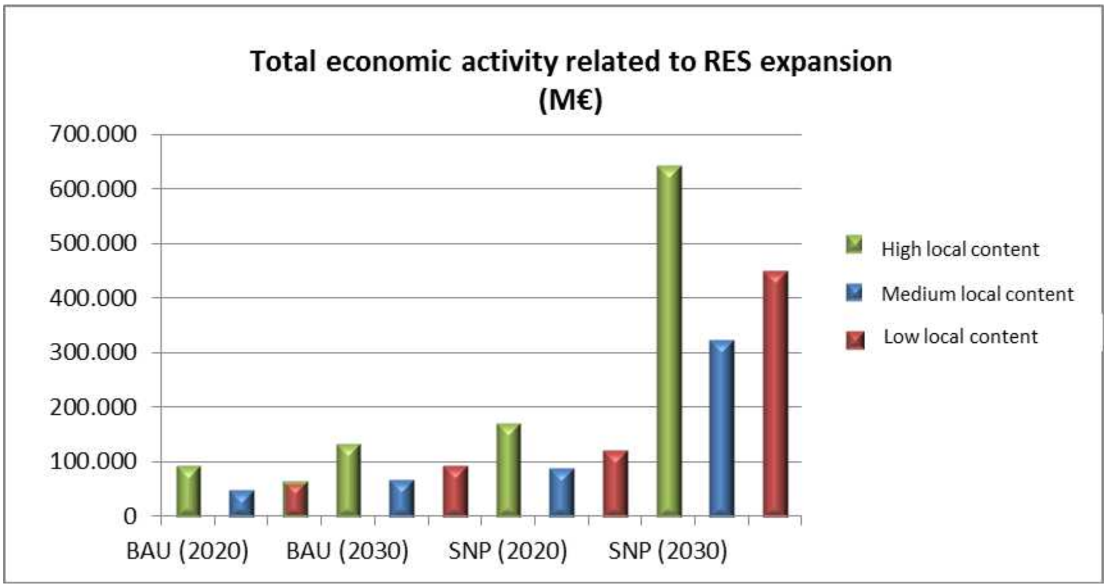

Figure 10 Total Economic Activity induced by different RES-Deployment Scenarios

2.6.2 Job creation

The employment generated due to RES deployment is often divided into two categories: investment, the most employment intensive part, which approximately lasts the first two years of the plant's lifetime, and operation and maintenance which lasts for all the plant's lifetime (Rutovitz, J. and Harris, S. 2012). Similarly, jobs can be categorized as direct (jobs created in the manufacturing, construction or installation of the plant) as well as indirect (in other sectors not directly related to the energy project). Similarly, jobs can be created as a result of induced effects.

Depending on the technology, jobs can be created through RES-E deployment. These fall into the categories direct and indirect employment and can be further categorized into investment (during construction) and O&M (long-term) jobs. In onshore wind power, for instance, between 15387 and 38447 jobs could be created in 2020 in the investment phase, and a minimum of 6928 up to 12224 could come about in O&M.

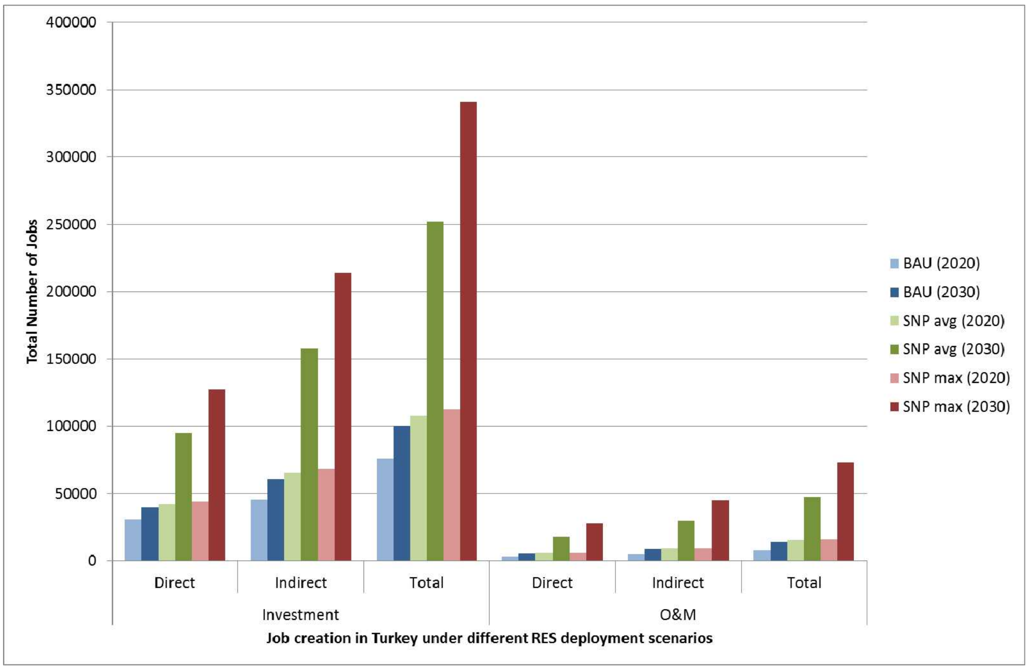

Figure 11 Job creation in Turkey under different RES deployment scenarios (in 2020 and 2030)

Further details of socio-economic impacts in terms of the methodology applied and the assumptions considered can be found at D5.3 Case study report on prospects for RES cooperation with Turkey using cooperation mechanisms (see http://www.better-project.net/content/results).

3 Prospects for Renewable Energy Cooperation between Turkey and the European Union

3.1 Overview of EU - Turkey energy relations

> In 2014, the EC's annual Enlargement report that includes a Progress Report on Turkey highlights the importance of Turkey's strategic location and the will of the EU to further cooperate with Turkey in the area of energy security. The Report assesses the progress in the fields of energy, especially in areas relevant to security of supply, the internal market for electricity , and renewable energy.
>
> Regarding the internal energy market, the Report states that Turkey has made considerable progress in the field of privatisation of the electricity market although the progress is not yet completed.
>
> Regarding electricity networks, the completion of electricity interconnection lines between Bulgaria and Georgia was declared as advantageous endeavour in terms of energy supply security.

Energy security is a common policy priority both for the EU and Turkey. Turkey's strategic geographical location at the crossroads of major natural gas-rich regions such as the Caspian and the Middle East on the one hand, and Europe, on the other hand has been the driving force of the EU-Turkey energy relations. Recent developments¬-the Ukraine crisis and the natural gas discoveries in the Eastern Mediterranean (offshore Israel and Cyprus)- have once more proved the significance of EU-Turkey energy cooperation. However, the slow accession process of Turkey to the EU (Turkey's accession negotiations date back to 2005) and the blockage on the energy chapter[5] put some limits to the EU-Turkey energy policy coordination and market integration. While Turkey has, to a large extent, harmonised its legal framework on electricity and gas markets, renewable energy and energy efficiency with the EU further market integration requires cross-border infrastructure and a stable and transparent legal and regulatory framework. Recently, Turkey, as a candidate country, has prepared a Renewable Energy Action Plan (NREAP)[6], in line with the EU RES Directive, as a manifestation of its commitment to those renewable energy targets and the EU accession. Not opening the energy chapter may hamper the continued development of physical infrastructure; slow the pace of implementation of the legal framework ; pave the way for likely prolongation of existing loopholes in Turkey's energy laws and regulations; and also lead the EU and Turkey to continue to have fragmented energy policies and rules which separate markets and undermine security of supply (Karpuz, 2014).

On the other hand, EU launched the so called 'Positive Agenda' to enhance the negotiations by fostering cooperation in a number of areas , including energy in May 2012. The topics of mutual interest were listed as:

- Long term perspectives on energy scenarios and energy mix
- Market integration and development of infrastructure of common interest
- Global and regional energy cooperation
- Promotion of renewable energy, energy efficiency and clean technologies

[5] Opening of energy chapter negotiations has been politically blocked in the European Council by the Republic if Cyprus.

[6] The Government of the Republic of Turkey, Ministry of Energy and Natural Resources and Yenilenebilir Enerji Genel Mudurlugu, has carried out the National Renewable Energy Action Plan for the period 2013-2023 and can be found from http://www.eie.gov.tr/duyurular_haberler/document/Turkiye_Ulusal_Yenilenebilir_Enerji_Eylem_Plani.PDF.

- Nuclear safety and radiation protections.

Turkey is currently an observer to the Energy Community, an initiative of the EU to extend its internal energy market towards neighbouring countries in its Eastern and South Eastern neighbourhood. The members of the Energy Community, so called Contracting Parties, commit to implement the relevant EU rules in energy, environment and competition. Turkish government may consider joining the Energy Community while this will mean unilaterally aligning its goals with those of the EU energy acquis. Turkey has already undertaken major steps aligning its energy market rules with EU standards. On the other hand, opening up the EU's Energy Chapter[7] may pave the way for Turkey to become a member of the Energy Community any way (Karpuz, 2014).

3.2 EU RES Directive and the RES cooperation mechanisms

The EU Member States set the so called 20-20-20 targets in 2007, in which three key objectives, to be achieved by 2020, were defined: (i) 20% reduction of EU greenhouse gas emissions from 1990 levels, (ii) increasing the share of energy consumption from renewable energy sources (RES) to 20%, and (iii) increasing energy efficiency by 20%. Besides the environmental benefits, the promotion of renewable energies has been also a priority for the EU for other reasons. The diversification of energy supply increases the energy security and strengthens the competitiveness of the energy market. Additionally, the development of these industries could bring positive socio-economic impacts to the society.

In 2009, the RES Directive(DIRECTIVE 2009/28/EC) was adopted in the context of the EU's climate and energy package, introducing binding national Member State targets for the share of renewable energy resources in total energy consumption, totalling 20% by 2020 across the EU as a whole. The RES Directive also introduced cooperation mechanisms to facilitate cost-efficient target achievement, allowing Member States to support the development of renewable energy generation in other countries and count this generation towards its own target.

Cooperation mechanisms

Article 6. Statistical transfers: Allows EU Member States to transfer the statistical value of a quantity of renewable energy produced in one Member State to another Member State for RES target compliance purposes.

Article 7. Joint Projects between EU Member States: Allows EU Member States to finance a RES project jointly thus sharing the costs and benefits of the project (i.e. a specific new plant is identified and the output of the plant is shared (statistically) between to cooperating Member States).

Article 8. Joint Support Schemes: Allows EU Member States to coordinate their national support schemes for RES deployment, and allow a certain amount of energy from renewable sources produced in one Member State to count towards the national targets of another either through a statistical transfer or through e.g. an ex-ante or ex-post agreed distribution rule.

Article 9. Joint Projects with third countries: Allows EU Member States to finance RES projects (limited to electricity) in third countries , physically import the produced electricity and count towards the 2020 target.

[7] Negotiations on the chapter, which are part of the EU's accession procedure, had been put on hold following a unilateral blockage of six chapters by southern Cyprus in 2009.

Article 9 of the RES Directive refers **to Joint Projects with Third Countries**. As described in the European Commission's guidance document on cooperation mechanisms, Joint Projects with Third Countries *'allow for one or several Member States to cooperate with a third country, in supporting a renewable energy project outside of EU Member States' territory, resulting in (part of) the energy produced accounting towards Member States' 2020 targets. The central additional condition compared with intra-EU cooperation is that only electricity projects are eligible and that physical import of the electricity into the EU is mandatory. The Directive requires consumption in the EU.'* Entering joint Projects with Third Countries is one of four different cooperation mechanisms listed in the RES Directive

The main purpose of the mechanism is to increase the cost-effectiveness of meeting the targets. Neighbouring countries may in turn benefit inter alia from strengthening their renewable energy sector through financial support from Member States, from capacity and technological development as well as indirect socio-economic benefits.

Currently there are no such projects in place. The only examples – a Memorandum of Understanding between the UK and the Republic of Ireland[8] to explore the benefits of renewable trading for the two countries and the bilateral agreement between Italy and Serbia to trade renewable electricity through Montenegro – are unlikely to result in joint projects that are up and running before 2020. The post 2020 framework is not fully understood yet. The EU announced the 27% RES target in 2030 and did not require nationally binding targets. The uncertainty related to how to reach this target creates risks to the success of Joint RES projects. Next to that, the precondition of renewable electricity to be physically transported to EU puts a significant barrier to joint RES projects. Currently, neither the interconnection capacities between EU and the neighbouring countries nor within the EU are capable of importing RES electricity and the very long lead times to build interconnection lines make joint RES projects, at least for the coming 5 to 10 years, not very feasible. Additionally, there is growing energy demand in neighbouring countries while the opposite happens in the EU reducing the attractiveness of trade in the short term.

The success of any concrete joint RES project, in the medium to long term, will require immediate actions. The actions will have three components. Component one will focus on RES cooperation between Turkey and the EU that aims at further developing the market for RES in Turkey. Component two is upgrading interconnection lines between Turkey and the EU and component three is setting the framework for joint RES projects.

Key RES-E cooperation mechanism drivers for Turkey

- Create labour and local content from RES.
- Create industrial development opportunities.
- Become an energy exporter country.
- Create income from domestic resources.
- Increase security of electricity supply.

Key RES-E cooperation mechanism drivers for EU Member States

- Diversify energy portfolio & supply regions.
- Enhance energy relations with Turkey.
- Provide a level playing field for European companies to operate in Turkey.
- Cost effective achievement of 2020 RES targets.

[8] https://www.gov.uk/government/news/energy-trading-creates-opportunities-for-ireland-uk-davey-rabbitte.

3.3 Key considerations for Turkey's involvement in cooperation mechanisms

Whether and how Turkey can apply the cooperation mechanisms will mostly depend on the country's future political dimension and the EU energy policy framework beyond 2020.

- Turkey joining the EU, signing the Energy Community Treaty or staying as unattached to the EU and the political process the country will follow (i.e. becoming an EEA Member, or involving in bilateral agreements such as Switzerland) play a significant role for RES cooperation under the RES Directive. In case Turkey adopts the RES Directive the country will have to set an overall RES target that potentially will be in line with the methodology[9] applied to EU MSs and the Energy Community Contracting Parties. Next to that, **Turkey could benefit from all of the cooperation mechanisms introduced in the RES Directive**, for instance statistical transfer of renewable electricity, if becomes a member of the EU and/or Energy Community. When Turkey stays as unattached, this will give, to some degree, the freedom to define the national RES target that could potentially be much less stringent than the previous option.

> Turkey's main priority is satisfying its increasing energy demand followed by diversifying its energy portfolio to contribute to the security of energy supply. Any business case and win-win circumstances shall contribute to these goals.

- The EU energy policy framework beyond 2020 will also play a crucial role when it comes to renewable energy cooperation mechanisms. Whilst the 2030 ambitions for promoting RES in the EU are now clear, more clarity is overdue on some relevant issues regarding the future framework under which RES cooperation mechanisms will have to be developed. This relates among others to the new governance structure which will be required to ensure the achievement of the EU-wide target of a 27% RES share by 2030. The EU Council Conclusions of October 2014 give clear signals to expand EU's energy 'acquis communitaire' to enlargement including neighbouring countries and to facilitate coordination of national energy policies and foster regional cooperation between Member States. This confirms EU wishes to foster energy cooperation with neighbouring countries. Uncertainty beyond 2030 in relation to whether and how the national targets will be decided may have consequences to the Turkish target setting process beyond 2020 provided that Turkey becomes a member of the EU and/or the Energy Community.
- One of the main prerequisites of RES cooperation with its neighbours (Article 9) is the physical transfer of renewable electricity to the EU. Limited interconnection capacities between Turkey and the EU MSs will strongly limit possible exports to the EU. Next to that, the limited interconnection capacities within Europe hinders the flow of electricity to the Member States that are in need of RES electricity. Next to these, EU RES cooperation relations with other neighbouring countries such as the West Balkans and North Africa will affect the possible cooperation options with Turkey.

> Turkey may export RES-E only after meeting its national RES target. Thus, a business case will focus on the surplus potential and only when it is profitable can be exported to the EU. In case of statistical transfer Turkey can utilise also the surplus potential domestically and also receive the revenue from this trade.

Given the very short time frame up to 2020 it is not very likely to

[9] Methodology used by the European Commission to calculate the allocation of the EU's 20% target among its Member States involves three elements: Share of renewables in gross final energy consumption (GFEC) in 2005; Flat rate increase of 5.5%, being half the total effort required by the EU to achieve their desired 20% share; and Additional residual effort determined on the basis of relative GDP per capita.

assume that Turkey will engage in any concrete joint RES projects with the EU up till then. This, however, does not lessen the importance of defining a long term vision and setting the necessary building blocks and the framework to achieve the set goals.

3.4 Scenarios for RES cooperation between Turkey and the EU

3.4.1 Integrated assessment scenario description

Integrated assessment study within the BETTER project (BETTER D6.4) has assessed RES cooperation scenarios in the mid-(2030) and long-term(2040) perspective, geographically including the 28 EU Member States as well as the Western Balkan region, Turkey and North Africa as additional cooperation partners.

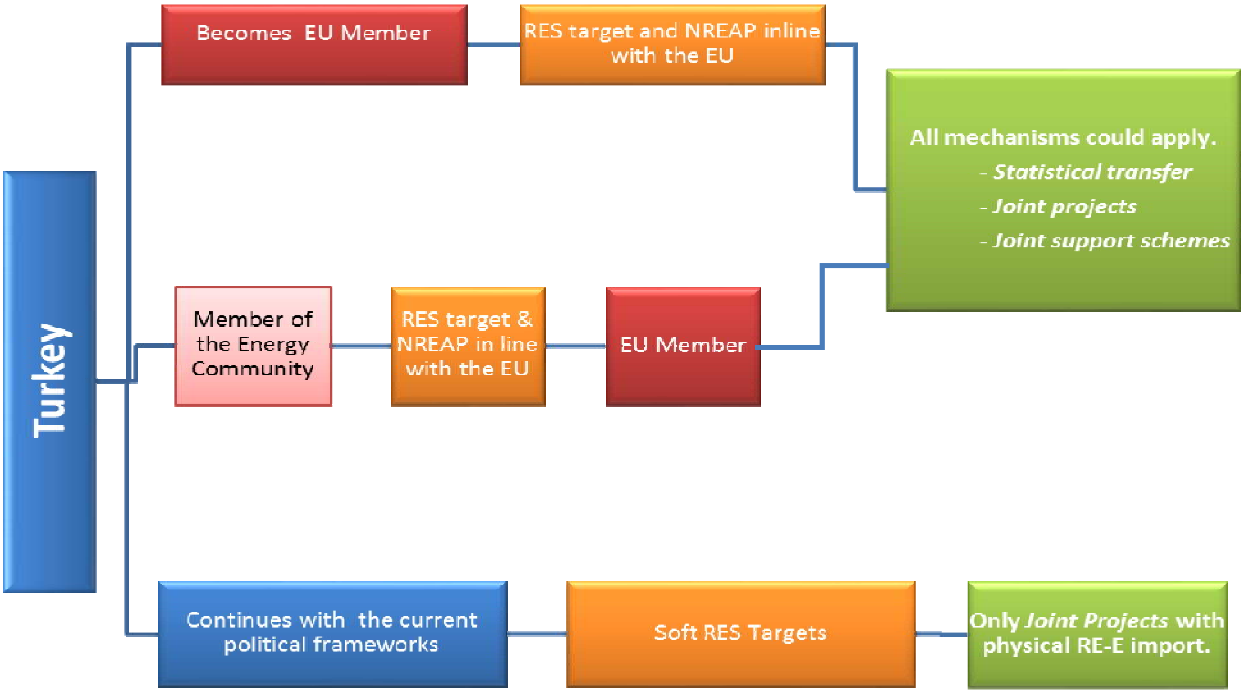

Figure 12 Possible cooperation pathways Turkey may follow

Scenarios considered two possible pathways (i) Turkey becoming a Member of the EU and/or the Energy Community and (ii) Turkey staying as unattached. This two distinctive pathways are illustrated in Figure 12 solely to present the cooperation options Turkey may engage in the coming period. The first option enables Turkey to involve in all of the RES cooperation mechanisms, in which virtual (statistical) trade is an important element. The second option requires physical trade that needs significant investments to construct further interconnection capacities both between Turkey and the neighbouring MSs and within the EU.

An overview of the scenarios that are most relevant to Turkey is presented in Figure 13 and briefly introduced below.

- **EU only scenarios**: these are the reference cases. They consider RES cooperation only within the EU.
- **EU plus scenarios**: these cases consider RES cooperation both within the EU and with the neighbouring countries, such as Turkey, West Balkan and North Africa regions.
- **EU only (weak target)**: this case represents the EU official RES target of 27% RES by 2030 to be achieved with only RES cooperation within the EU.

- **EU only (TR-Sensitivity)(weak target)**: this case represents the EU official RES target of 27% RES by 2030 to be achieved with only RES cooperation within the EU.
- **EU plus (weak target)**: this case represent the EU official RES target of 27% in 2030 to be achieved by both cooperation within the EU and with the neighbours. Turkey is assumed to be part of the EU/EC
- **EU plus-Turkey**: non affiliation to EU/EC (weak target): while being the same as EU plus (weak case) Turkey has considered to have lower RES targets in 2030 in comparison to EU plus case.
- The scenarios related to strong RES targets vary from the weak targets in terms of the RES target considered for the EU in 2030 to be higher (32.5%) and presented as a sensitivity.

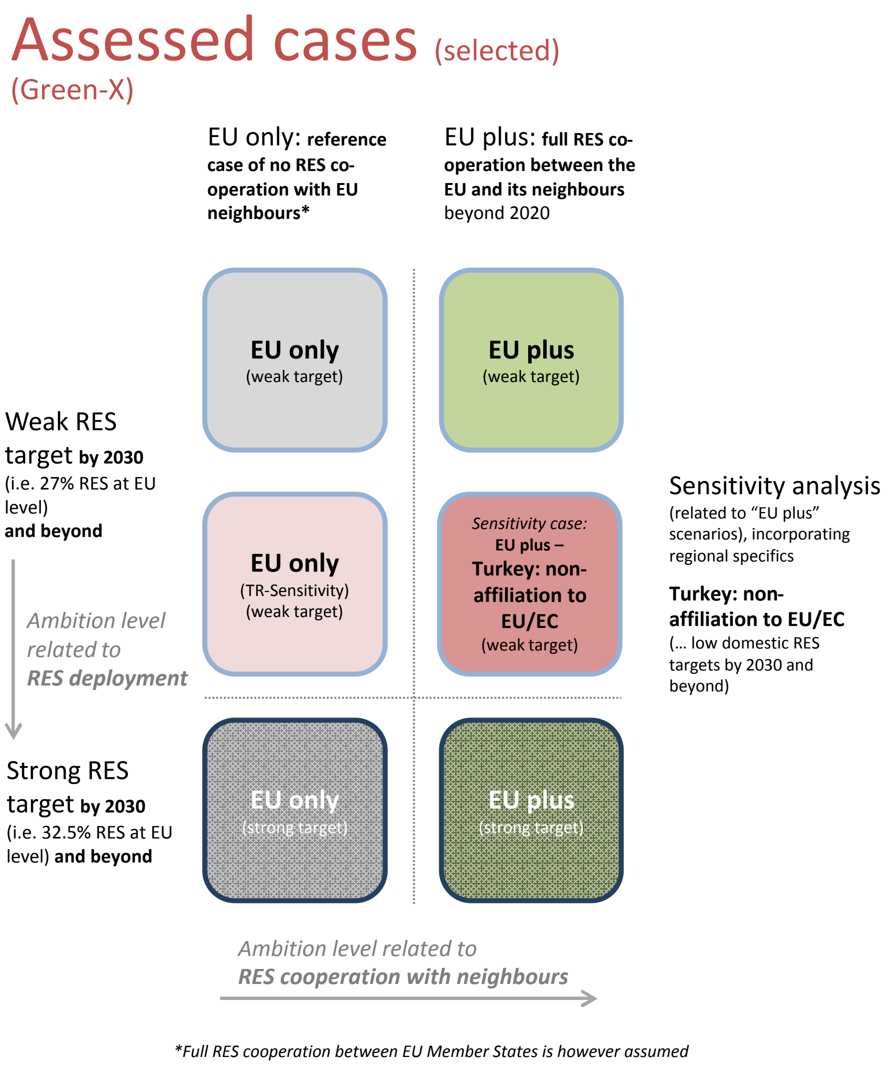

Figure 13 Overview of the assessed cases within the Integrated Assessment (done by use of the Green-X model)

3.4.2 Scenario results

Key results related to total RES deployment in Turkey

A comparison is undertaken between the reference case of RES cooperation limited to EU Member States (EU only) and the full cooperation case (EU plus) where the EU is assumed to extend the geographical scope of RES cooperation towards its neighbouring countries and regions (West Balkans, North Africa and Turkey). This exercise is done twice – i.e. once for a future RES target in accordance with the agreed 27% RES target by 2030 at EU level (illustrated as weak) and once for a strong RES target (32.5% RES by 2030). Figure 14 illustrates the renewable electricity deployment in Turkey based on the different scenarios. The scenarios named as Turkey as non-affiliated to EU and/or Energy Community consider lower RES policy ambitions by 2030 and beyond when compared with the other scenarios. For instance, RES-E generation in the EU only scenario with Turkey non-affiliated to EU/EC is approximately 197 TWh, correspond to 33.2% of the gross electricity demand in 2030. On the other hand, EU only and the EU plus scenarios assume RES-E generation to be around 245-251 TWh, representing 39.4% and 41.4% of gross electricity demand in 2030, respectively. Logically, a stronger target for the EU corresponds to stronger RES-E generation in Turkey. Under a 'weak target for the EU North Africa region could provide the 'least cost RES-E options', whereas a stronger demand from the EU (strong target) Turkey could offer moderate- costs RES options to the EU.

The estimated future RES-E generation according to the assessed scenarios within the integrated assessment lies in the corridor of around 197 TWh (EU only-Turkey: non-affiliated to EU/EC, weak target) to 245 TWh (EU plus, weak target) in 2030, and 343 TWh (EU only-Turkey: non-affiliation to EU/EC, weak target) to 395 TWh (EU plus, weak target) in 2040. RES-E generation is continuously higher in the full cooperation (EU plus) case when a strong target is assumed, compared to the reference (EU only) case, where no cooperation with the EU is assumed to take place. This means that under a strong EU RES target Turkey would act as (virtual) exporter, meaning that domestic RES-E generation is higher in the 'EU plus' compared to the 'EU only' scenario, whereas under a weak target Turkey would become an importer.

When Turkey is assumed to involve in full RES cooperation with the EU and politically stay non-affiliated to the EU RES-E generation will be approximately 234 TWh, corresponding to 39.4% of the gross electricity demand in 2030 (EU plus (weak)-Turkey non-affiliated). Turkey's becoming a member of the EU or the Energy Community would result in increased RES-E generation, corresponding to around 41.4% of gross energy demand in Turkey in 2030. The difference is related to the assumed relatively higher RES policy ambitious in Turkey when Turkey is assumed to join the EU and/or the Energy Community.

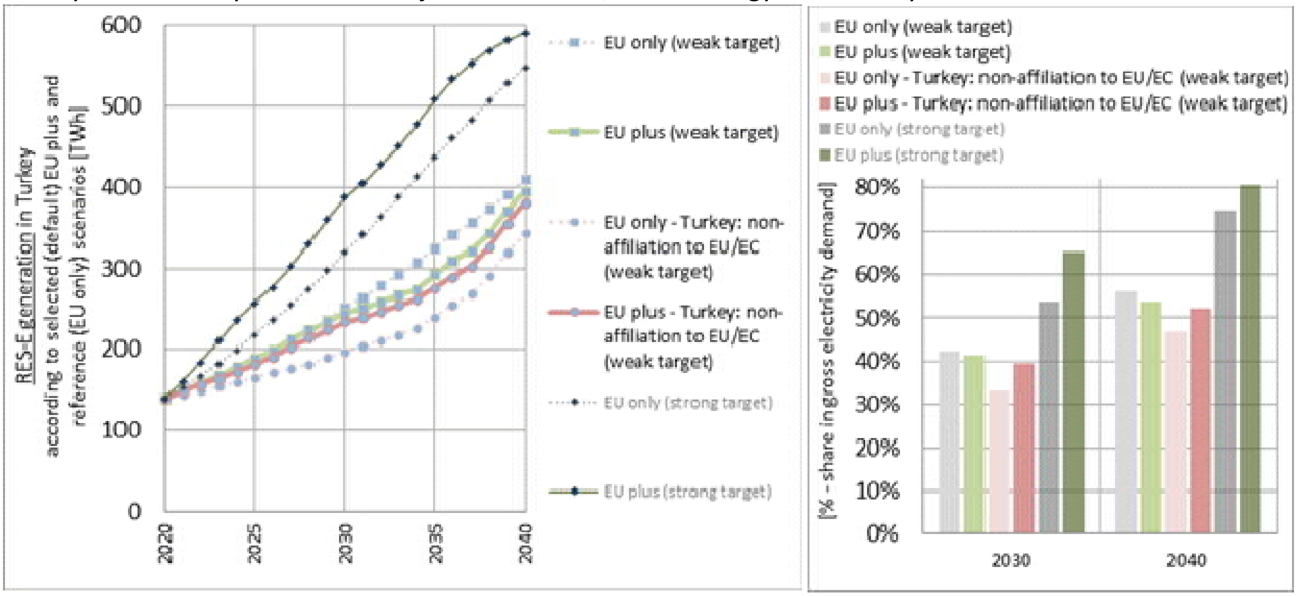

Figure 14 RES-E generation (on the right) and RES-E as share of the gross electricity demand in Turkey according to EU only and EU plus scenarios

Key results related to RES-E export/trade

The following figures elaborate on how different levels of RES generation could be exchanged by 2030 and by 2040, respectively, dependent on whether Turkey and the EU (and the Energy Community) implements a strong or a weak target for RES generation. Note that all this builds on the assumption that a joint market is established for RES in the electricity sector, allowing full RES cooperation across the EU and its assessed neighbouring countries in the period post 2020 (i.e. 'EU plus' scenarios). As can be seen in Figure 15 a weak domestic RES target pursued by Turkey (meaning that Turkey is non-affiliated to the EU and/or the Energy Community) would imply the possibility to export around 37 TWh RES-E to the EU. This would even increase up to 103 TWh in 2040. When Turkey sets RES targets in accordance with the EC methodology applied to the EU Member States in 2020, target that are higher than the officially set Targets, Turkey would import approximately 5.7 TWh to reach its domestic targets more cost-effectively in 2030. A more ambitious EU target will mean higher RES-E export possibilities to the EU, up to 68 TWh in 2030. In average Turkey's RES-E export potential is around 20 TWh in the period 2021-2030, increasing to 54 TWh in average between 2031-2040.

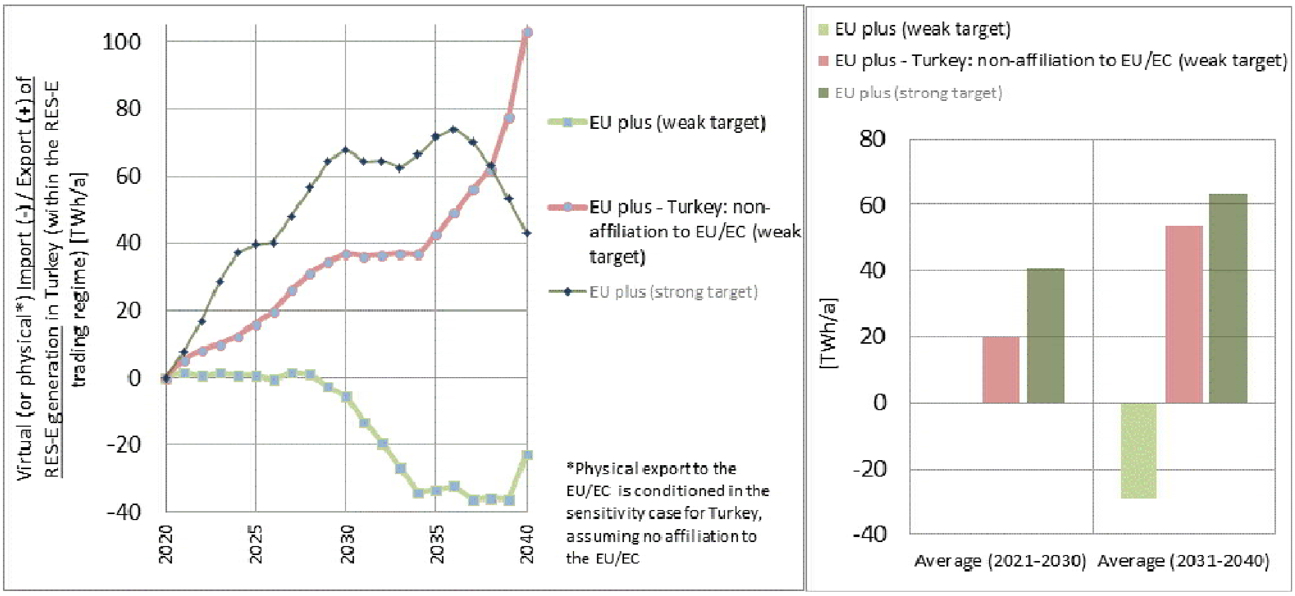

Figure 15 (Virtual or physical) Exchange of RES volumes in absolute terms (TWh) (left) and the average exchange between (2021-2030) and (2031-2040) (right) according to EU plus (full cooperation) scenarios following a strong or weak RES target

3.5 Impacts from increased RES-E cooperation between Turkey and the EU

This section looks at the consequences of increased RES cooperation, indicating direct economic impacts to Turkey and the EU. For the EU economic impacts are related to support for renewables, e.g. the decline of certificate prices and the accompanying savings in support expenditures as a consequence of an enlarged geographical market for RES-E, offering some 'low hanging fruits' at the EU'S neighbours. For Turkey, it is the direct monetary transfer form EU to Turkey to export RES-E or in case of Turkey importing RES-E from Turkey to EU the savings in support expenditures. Furthermore, we look at environmental and socio-economic co-effects that come along with the increased cooperation between EU and neighbouring regions.

3.5.1 Direct economic impacts on the support for renewables at EU level

To enable conclusions on the economic feasibility of the different levels of RES deployment, they have to be quantified, i.e. expressed in economic terms. Figure 16 shows in which ways the certificate price could evolve given different RES cooperation scenarios. One can see that independent from the RES target ambitions considerable savings are possible. Comparing the reference cases (EU only – i.e. RES cooperation is limited to EU28 member states only) to the full cooperation scenarios (EU plus), one can observe a substantial certificate price difference. Thus, extending the geographical scope of the RES market allows for significant savings related to the support for RES.

Expressed in numerical terms, this would mean that the official EU RES target of 27% would yield a certificate price of 23.9 € per MWh[10] in 2030 at the EU when no cooperation with EU neighbours takes place (EU only). This certificate price would fall to 13.5 €/MWh in 2030 in the full cooperation (EU plus) scenario. Certificate price in Turkey would decrease from 14.9 €/MWh to 13.5 €/ MWh when Turkey joins the expended EU RES market. This difference would mainly correspond to import of relatively cheaper RES-E from other regions, namely North Africa, to Turkey so that Turkey meets its RES targets (that are higher than the current Turkey official targets). In case of Turkey following a lower domestic RES target would mean much cheaper certificate prices since only the low hanging fruits will be utilised. Moreover, this leads to a decline of the demand for RES-E also at the aggregated level (EU plus all neighbouring regions) which, in turn, has important consequences on the regional split in the full cooperation case (EU plus): Turkey would become an exporter and the level of support required declines. For Turkey this implies however that exporting a small share of the generated RES-E would lead to an increase of certificate prices from 9.5 € (domestic market only) to 12.4 € per MWh (enlarged market: EU plus neighbours). For Europe expanding its RES market to neighbouring countries would then appear even more beneficial in economic terms.

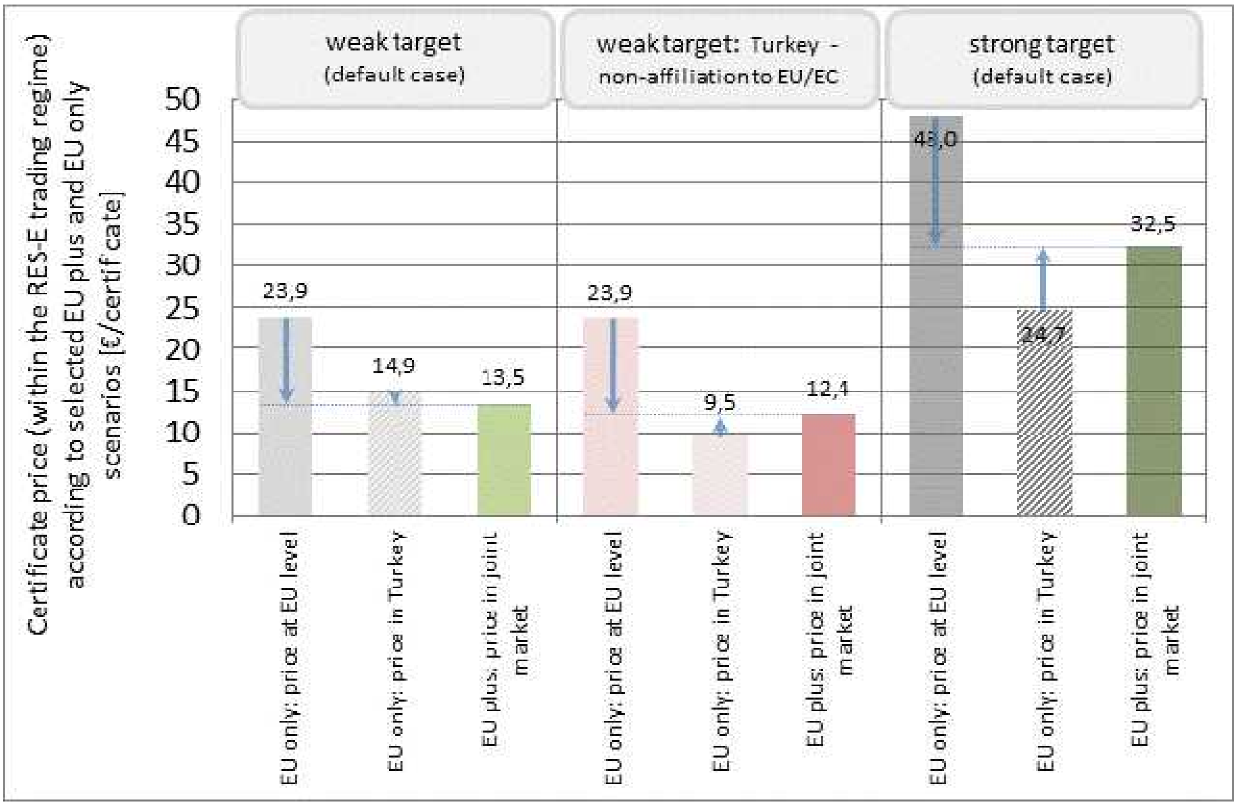

Figure 16 Certificate price (within the RES-E trading regime) according to selected EU plus and EU only scenarios

The trade of green certificates between Turkey and the EU within the RES-E trading regime under a full cooperation scenario comes along with a monetary transfer between the regions. Multiplying traded RES volumes as expressed in Figure 15 with corresponding certificates prices according to the full cooperation (EU plus) scenarios yields the monetary transfer of support payments for RES-E between Turkey and the EU.

10 Since a uniform RES-E trading regime is assumed where no technology banding is foreseen, one green certificate equals one MWh of RES generation.

Thus, Figure 17 shows the average yearly resulting transfer between the EU28 and Turkey under a weak and a strong RES target for two distinct time spans: in the period 2021 to 2030 and in the subsequent decade, i.e. from 2031 to 2040. In accordance with the virtual and/or physical exchange of RES volumes and certificates the EU28 would pay for parts of the RES-E expansion in Turkey (but, as discussed above, benefits from a cheaper and sustainable power supply system). In monetary terms, this means under the recently adopted RES target of 27% by 2030 a transfer from the EU in size of 360 million € on average per year in the period up to 2030, declining to 130 million € annually in the forthcoming decade (2031 to 2040) because of a decline of certificate prices.

In case Turkey joins the EU or the EC and at the same time sets a more ambitious RES target this would result in around 100 million € monetary transfer from Turkey to the EU on average in the time frame 2031 to 2040. The main reason behind this is that achieving higher RES targets would require utilising more RES-E options, among them also a higher proportion of moderate cost to expensive technology options (e.g. a higher deployment of CSP or offshore wind).

In the case Europe pursues a stronger RES target (i.e. around 32.5 % RES in 2030) the volumes increase to 1.6 billion € on average per year in the period 2021 to 2030, and in the period up to 2040, respectively. For Turkey this represents an income, compensating (parts of) the increase in support expenditures. Thus, in accordance with the exchange of RES volumes as discussed above and the target Turkey would set in 2030 this represents for Turkey an additional income over the whole assessment period whereas Turkey may become an importing region when more ambitious RES targets are aimed for in Turkey.

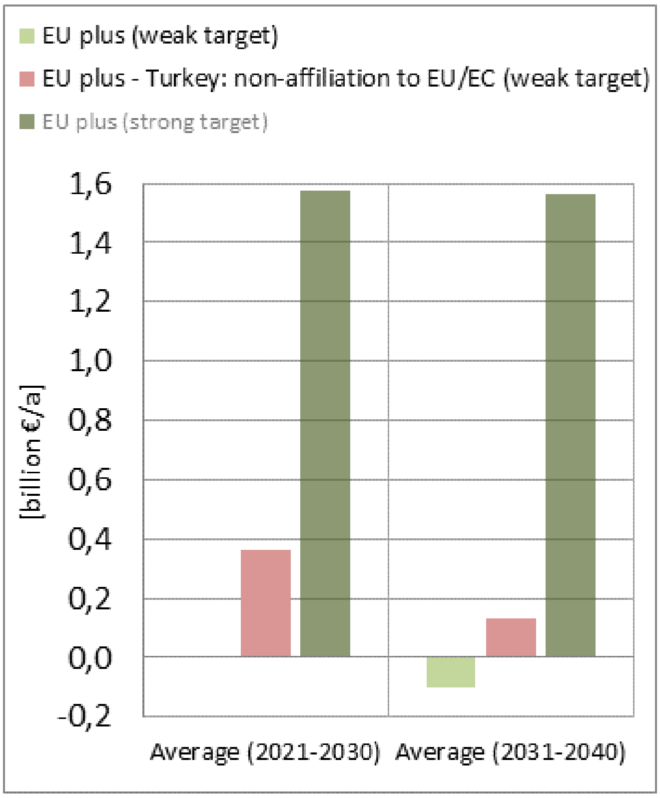

Figure 17 Monetary transfer from(-) / to(+) Turkey within the RES-E trading regime according to selected scenarios

3.5.2 Impacts on costs, expenditures and benefits

Indicators on costs, expenditures and benefits that come along with renewables deployment offer central information for decision makers. Specifically for our assessment of the impacts of increased RES-E cooperation between Turkey and EU we have to look at the changes that arise in this respect, i.e. when moving from a reference case where no cooperation is proclaimed with the EU to the full cooperation case where Turkey and the EU establish and participate in a joint market for renewable electricity. In this context,

Figure 18 summarise the change in assessed costs, expenditures and benefits arising from the proclaimed RES-E cooperation in the focal period 2021 to 2040. More precisely, the graph provides for the researched selected cases the on average per year throughout the period 2021 to 2040 arising change in investment needs and in resulting costs – i.e. additional generation cost, and support expenditures – when moving from the reference to the full cooperation scenarios under a weak or a strong RES target. Moreover, they offer an indication of the accompanying benefits in terms of supply security (avoided fossil fuels expressed in monetary terms – with impact on a country's trade balance) and climate protection (avoided CO2 emissions – monetarily expressed as avoided external costs of carbon[11]).

As can be seen in Figure 18 **investments in renewables** would increase significantly. Increase in annual capital expenditures for RES-E are calculated as on average 2 billion € in the time frame 2021-2040 for the scenario in which Turkey follows domestically a low RES target but involves in RES cooperation with the EU when compared with the EU only scenario. This could decrease to 1.4 billion €/a if both the EU and Turkey follows a stronger RES target. In return, the capital expenditures in Europe will decline. In the case of a more ambitious RES target in Turkey and becoming a member of the EU and/or the Energy Community , annual capital expenditures would be decreased by 500 million € on average. The main reason for this decrease is that Turkey would virtually (statistically) import RES-E from the EU rather than utilising more expensive renewable resource in the country to reach the set targets.

Cost savings with respect to **support expenditures for renewables** would be around 0.3 billion € in the scenario that considers the 27% RES target in Europe and Turkey joins the EU/EC. Under a strong EU RES target support expenditures would increase by 1.2 billion € on average per year compared to the reference case of no RES cooperation with the EU. The reason for this trend is that, although RES markets in Turkey would be smaller in size under a weak EU target, the benefits in terms of support cost savings appear larger due to the low certificate prices that can be expected under a joint RES market. Under a strong target this is however not always the case: the additional 'income' from the joint trading market – i.e. the fact that the support payments for the additional domestic RES-E generation (compared to reference) would then be financed from elsewhere – has to pay off the increase in support levels that would then be needed also for the domestic RES market.

[11] In accordance with literature a median value of 65 € per ton of CO_2 is used for the monetary expression.

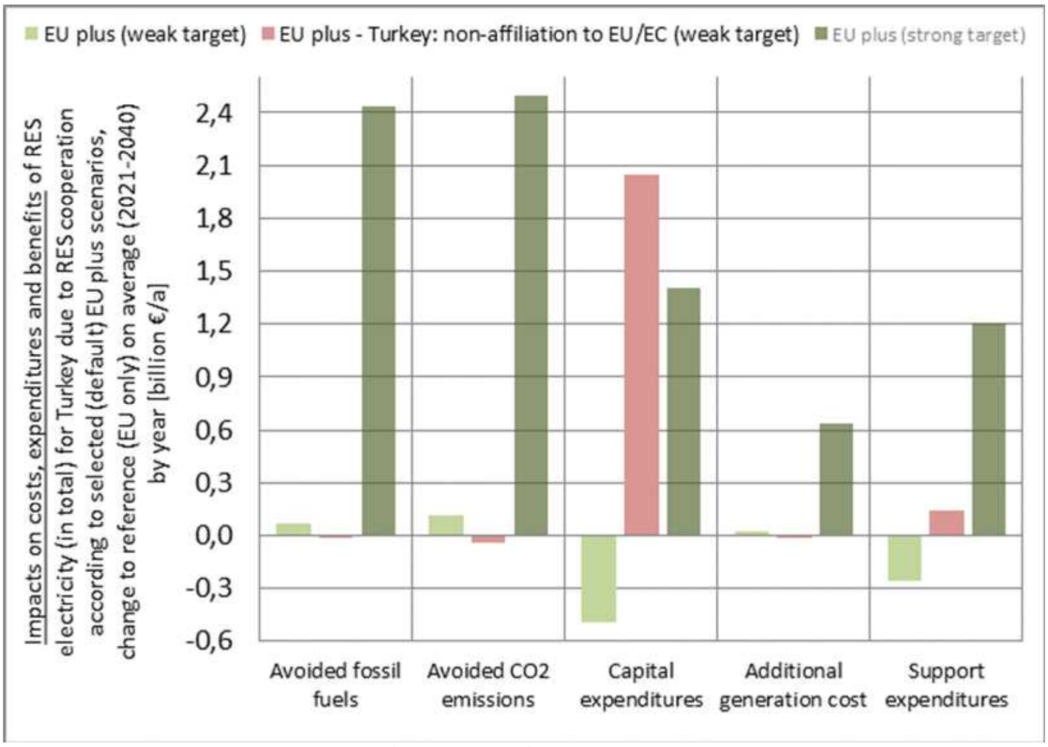

Figure 18 Impacts on yearly average (2021 to 2040) costs, expenditures and benefits of RES-E according to selected EU plus (full cooperation) scenarios in comparison to reference (EU only) scenarios

A closer look at the assessed **benefits (avoidance of fossil fuels and CO2 emissions)** and their respective changes shows that significant increase in fossil fuel and CO2 emission avoidance can be identified in the case of a strong target. The key reason for this positive trend is that for Turkey (since assumed being part of the Energy Community post 2020) only virtual exchange of RES volumes with the EU is assumed as underlying principle in the joint RES trading regime. This lets Turkey benefit locally from the increased RES expansion under a joint RES market with the EU. EU plus (weak target) scenarios represent a more pessimistic picture when compared with the strong scenarios and even negative figures for the case in which Turkey is consider to have non-affiliation to the EU and the Energy Community. In this scenario Turkey would be exporting RES-E to the EU physically, which means that the avoided fossil fuels and the avoided CO2 emissions will occur in the EU premises.

3.5.3 Employment and the economic activity effects

As introduced in section 2.6 RES expansion can result in significant amounts of job and economic activity for the country. Exporting 37 TWh RES-E in 2030 according to the EU plus (weak) Turkey non-affiliated to the EU/Energy Community scenario will, in principal, not influence the employment opportunities. Instead the necessary investments to construct such installations will be derived from the EU. In return the economic activity created in Turkey and the corresponding job creation (in the range of 34 thousand jobs) will be the result of foreign investments in the country.

3.6 Challenges to RES expansion and cooperation in Turkey

The previous chapters presented the huge opportunities for RES expansion in Turkey and the RES cooperation possibilities with the EU in terms of concrete joint RES projects that are beneficial to all parties involved, particularly beyond 2030. Against these opportunities there are significant challenges and barriers that require large efforts to overcome. Only when the existing barriers and future challenges are mitigated in Turkey the opportunities can be achieved.

Key barriers to RES expansion and the future challenges to renewable electricity export in Turkey are detailed in the case study in BETTER project (D5.3 Case study report on prospects for RES cooperation with Turkey using cooperation mechanisms) and briefly listed below:

- Administrative hurdles like planning delays and restrictions, lack of coordination between different authorities, long-lead times in obtaining authorisation (For instance wind energy developers need to get permits from nearly fifteen institutions such as Ministry of Defence, Ministry of Forestry and Water Affairs, and Ministry of Environment and Urbanization), costs for obtaining permissions are important barriers to RES investments.
- A limit of 600 MW has been set for the total amount of licensed capacity in PV power. This limit has been criticized as being too low by market players.
- Next to these, public opposition, mainly to hydro power plants is considered as an important issue to tackle, especially given the significant potential and high national commitment to exploit these resources.
- Another important issue is the national energy strategy that is based on centralized approaches to deal with the import dependency and high demand growth. The Turkish national strategy plan considers start of a nuclear power program, the construction of additional gas-fired power plants and the expansion of coal utilisation. As such, the potential co-benefits of RES deployment are not fully realized by national policy makers.
- When it comes to RES cooperation with the EU and the possible renewable electricity export potential there are a number of challenges that need to be scaled down.
    - The energy demand in the country is expected to roughly double over the next decade, and electricity demand is likely to increase even faster. With the existing supply and new energy infrastructure investments it will be challenging to provide the required energy supply.
    - Next to that, the technical limitations on the distribution network lead to increase of electrical losses and availability problems on the network. In addition, despite the fact that the Turkish electricity market has a multitude of different electricity sources from various energy forms, there is no complete and detailed inventory of the capabilities of existing infrastructure in the country.
    - The power system analysis carried out within the BETTER project shows that the integration of higher amounts of RES (in particular wind onshore and solar PV) is technically possible with the existing high voltage grid. However, the results indicate that this involves frequent and severe interventions by the TSO in order to maintain grid stability. This interventions leads to additional redispatch costs that can be in the range of 1.7 to 2.6 billion €, or 3 to 5 €/MWh.
    - Physical export of surplus RES electricity to the EU is limited approximately 50 TWh due to physical grid restrictions of the existing power lines connecting Turkey to Greece and Bulgaria. A significant investment will be needed to increase this capacity.

4. Strategic Actions and timing of implementation

Starting with the premises that EU is keen on decarbonising its energy system and both the EU and the Turkish governments acknowledge the benefits of RES cooperation this chapter attempts to provide a roadmap of actions that aims to ensure the expansion of renewables in Turkey by eliminating the weaknesses and avoiding the treats and at the same time exploiting the cooperation opportunities with the EU that results in net benefits for both parties. Strategic actions are dedicated to achieve specific goals as part of the Vision and the Mission.

The actions are listed as short and mid-term. The short term actions represent the immediate actions up to 2020, in general, and focus on the present country conditions with an aim to expand RES in Turkey. The mid-term actions that consider actions beyond 2020 are intended to bring Turkey and Europe more closer together and create markets that are mutually beneficial from 2030 onwards.

VISION
An integrated renewable energy system between turkey and the EU that serves to a sustainable energy future for all

MISSION
To ensure the expansion of renewable energy in Turkey through cooperation with the EU that results in net benefits for both Turkey and the EU

STRATEGIC and ENABLING PILLARS

NO	STRATEGIC ACTIONS
1	**Overcome existing non-technical barriers to RES expansion**
2	**Develop long term national renewable energy strategy**
3	**Strengthen electricity interconnections with the EU and prepare the grounds for RES trade**
4	**Maximise benefits of RES expansion and cooperation to Turkey**
5	**Create awareness among the public and the civil society related to socio-economic and environmental impacts of RES expansion & RES cooperation**

4.1 Strategy 1: Overcome existing non-technical barriers to RES expansion

Short-term action 1: Improve administrative procedures

RATIONALE

Administrative hurdles like planning delays and restrictions, lack of coordination between different authorities, long-lead times in obtaining authorisation, costly licencing and permits procedures are burdening the investors and delaying the new renewable energy projects. Therefore, there is a need to improve the administrative procedures to enable a large penetration of renewable energy in Turkey[12]. A one-stop-shop for licencing procedure can be enabled and time limits can be set to administrative procedures.

DESIRED OUTCOMES

Simplified and more efficient permit and authorisation procedures, resulting in lower project costs.

SUPPORTING ACTIONS

A sound legislative and regulatory framework will help decide what permits and authorisations are necessary for different RES projects and who will be in charge of granting the documents. Sharing of best practices in the EU Member States can support the process of aligning procedures.

IMPLEMENTATION CONSIDERATIONS

Clear guidelines for applying procedures should become available, such that investors will be able to apply for the procedures swiftly and in the right order. Civil servants can be trained to assist the investors and increase the efficiency in this process.

Mid-term action 1: Define RES Zones

RATIONALE

Land restrictions, 1 full year wind/(solar) measurement and the grid connection rights are the most critical steps for solar and wind power plants. Based on the Wind Energy and Solar Energy Atlas of Turkey priority regions and even areas can be defined as RES Zones by the Ministry. Within those Zones, the measurement requirements can be shortened and the land restrictions simplified. Next to that, the infrastructure requirements can be met to ease the grid connection.

DESIRED OUTCOMES

Dedicated RES Zones that are most attractive to the investors.

SUPPORTING ACTIONS

Regulatory framework outlining the procedures to define and construct RES Zones can be tabled down in agreement with the other Ministries including the Ministry of Environment, Agriculture and the Industry.

IMPLEMENTATION CONSIDERATIONS

Dedicated RES zones shall be identified in close collaboration with the civil society organisations and the public to ensure public consensus.

[12] Include the info on small non licence generation and the improvement already done…

4.2 Strategy 2: Develop long term national renewable energy strategy

Short- term action 1: Develop national renewable energy strategy

RATIONALE

There is already a strategy document in Turkey to guide national electricity sector development (MENR, 2009). Recently, a National Renewable Energy Action Plan that is in line with the targets set in the strategy document is also issued. This Action plan has a time frame up to 2023 and only an indicative renewable electricity target by 2030 is included in it. Defining concrete mid and long-term goals, focusing on 2030 and beyond and covering all sectors (namely electricity, heating and cooling and transport) will give clear signals to the investors. Besides, cooperation opportunities with the EU can be highlighted. These should be based on scientifically sound assessments that not only focus on the techno-economic analysis but also social, economic and environmental impacts..

DESIRED OUTCOMES

Binding renewable energy targets up to 2030 that cover all sectors and signals for RES cooperation with the EU. Future RES considerations that have a long term perspective(for instance 2050).

SUPPORTING ACTIONS

Conduct feasibility and impact assessment studies for future RES expansion possibilities in collaboration and coordination with research organisations and the private sector.

IMPLEMENTATION CONSIDERATIONS

In order to ensure long-term acceptance, viability and support the strategy document should be the outcome of a broad public consultation and the engagement with public institutions, research centres, associations and social partners and with direct and indirect stakeholders in the energy sector.

Mid-term action 1: Define possible RES cooperation opportunities with the EU

RATIONALE

Based on the outcomes of the BETTER study there are RES cooperation opportunities between Turkey and the EU, beyond 2030. Turkey may further analyse such cooperation possibilities and define strategies to harness them.

DESIRED OUTCOMES

Defines strategies on whether and how to involve in future RES cooperation with the EU.

SUPPORTING ACTIONS

Consult with the private investors to define cooperation opportunities and conduct pre-feasibility studies that on the one hand look at the surplus RES potentials in the country and on the other hand the possible EU MSs that may be in need of such demand.

IMPLEMENTATION CONSIDERATIONS

In case cooperation opportunities are identified by the Government it is very important to define related impacts and identify accompanying measures to foster the benefits and minimise the costs to be ready for trade negotiations.

4.3 Strategy 3: Strengthen electricity interconnections with the EU and prepare the grounds for RES trade

Short-term action 1: Define mutually beneficial cross-border infrastructure projects
RATIONALE In 2011, Turkey replaced the old import and export regulation with the new one to regulate the cross-border energy trade and to comply with the European Union Regulation on Conditions for Access to the Network for Cross-border Exchanges in Electricity, the Electricity Market Import and Export Regulation (No 714/2009). Next to that, in 2010, the Turkish power system was synchronized with the interconnected power systems of Continental Europe. Recently**,** the Turkish power system has signed an unprecedented agreement on the permanent synchronous operations with ENTSO-E's Continental Europe Region. The existing capacity enables export of around 50TWh electricity. Further capacity increase would serve mutually to both sides and strengthen further RES Cooperation.
DESIRED OUTCOMES Further capacity increase to enable increase electricity trade.
SUPPORTING ACTIONS Develop working mechanisms for the identification and joint promotion of mutually beneficial cross-border infrastructure projects
IMPLEMENTATION CONSIDERATIONS

Mid-term action 1: Promote establishing the South East Europe power market
RATIONALE Recognising the significant RES potential of Turkey (and South East Europe) we recommend that in parallel with the plan for the Southern Gas initiative developing also a Southern Electricity Corridor which connects the high RES potential of Turkey and the European Union. Such a project will contribute to the Turkish economic development, more economic achievement of RES integration and environmental and climate goals and to balancing the growing variable RES generation in Europe (incl Turkey).
DESIRED OUTCOMES A South East Electricity Corridor based on national power exchanges and market coupling.
SUPPORTING ACTIONS Involve in the ongoing discussions about a potential 'South East Europe Grid project'. When and if the project is initiated be part of the project.
IMPLEMENTATION CONSIDERATIONS

4.4 Strategy 4: Maximise benefits of RES expansion and cooperation to Turkey

Short-term action 1: Enhance the value creation

RATIONALE

The potential value creation of RES expansion (economic activity stimulation as well as job creation) is highly relevant for Turkey. Nevertheless, such impacts should not be taken for granted as they greatly depend on the readiness and capabilities of the local industry as well as the local work force.

DESIRED OUTCOMES

Develop a cross-cutting policy mix (e.g.: industrial policies, promoting education and training, technology transfer, etc.) tailored to the country specificities and needs that lead to large local content shares and thus maximize the economic value creation from existing and future RES-deployment.

SUPPORTING ACTIONS

Assess the impact that RES deployment can have on value creation to make informed policy decisions. The analysis should be conducted along the different segments of the value chain.

IMPLEMENTATION CONSIDERATIONS

The right policy mix (industrial policies, education policies, R&D programmes, etc.) shall be aimed at reaching the largest domestic content share possible but might take some time to achieve it. Such policy mix should not put extra burden to the tax payers while the benefits are limited. Next to that it should not block the competition or be against the WTO competition and the free movement of goods regulations.

Short-term action 2: Minimize environmental impacts from RES

RATIONALE

Considering the modelling exercises carried out in BETTER Turkey has the potentials to expand RES in the short term, decreasing the current use of fossil fuels and therefore the environmental impacts associated to them. In the long term, Turkey might play an important role in RES exports/imports within Europe, which will also diminish the environmental impacts at a European level.

DESIRED OUTCOMES

Those technologies with the highest potentials and the lowest environmental impacts should be supported, taking into account the whole life time and all stages along the life cycle. Although climate change is the main focus nowadays, other impacts such as toxicity, acidification or water depletion should be considered.

SUPPORTING ACTIONS

A detailed study by technology is necessary in order to properly locate the RES plants, maximizing the potentials and minimizing the environmental impacts.

IMPLEMENTATION CONSIDERATIONS

When implementing RES expansion, other impacts that occur in-situ have to be accounted and environmental safeguard measures have to be design and put in place similar to CDM or a Sustainable Desert Power Certificate (Schinke and Klawitter, 2014). Citizens' participation should be ensured through the publication of the environmental impact assessment studies for comments, increasing the public acceptance through transparency.

4.5 Strategy 5: Create awareness among the public and the civil society related to socio-economic and environmental impacts of RES expansion & RES cooperation

Short term action 1: Foster public and civil society acceptance in RES projects
RATIONALE Public acceptance of RES is likely to be much higher if the public is aware about their potential socio-economic and environmental benefits (compared to other fossil fuel technologies) and if the public is directly informed and involved in RES projects. The latter will also help facilitate the implementation process, as local communities are more likely to participate (i.e.: in energy cooperatives) when they are given the opportunity to do so.
DESIRED OUTCOMES The public is aware about the potential benefits that RES deployment will have for them in terms of socio-economic and environmental benefits at the macro and local level. The public is involved in RES projects, e.g. through energy communities or cooperatives, and has significant power in the energy market through this.
SUPPORTING ACTIONS Develop awareness campaigns about the potential benefits that RES projects at the national and local level. Increase public acceptance by introducing measures to enhance positive impacts on the local population (ie: through job and income provision, building up knowledge and skills and improvements to the infrastructure of local communities). Ensure community engagement and transparent decision-making. Public in general and in particular local communities that will be affected by the project are regularly informed about the project throughout its life cycle. To the extent possible, invited to actively participate in consultation, decision making processes as well as benefit sharing.
IMPLEMENTATION CONSIDERATIONS It might be difficult to involve the public in RES projects with their financial support of the project (e.g. through cooperatives), so different types of engagement need to be considered as well.

Mid-term action 1: Conduct transparent consultation process related to joint RES projects with the EU

RATIONALE

RES cooperation with the EU in relation to renewable electricity export will require bilateral and/or multilateral agreements that require strong political will from all parties involved. Political support to RES joint projects in Turkey will depend on the public acceptance. If, for instance, negative or unjust effects are perceived by civil society, lobby groups, local inhabitants or non-governmental organisations and if these groups have a direct or indirect authority to influence the political power, the implementation of joint projects will be jeopardized (Ellenbeck, et al, 2012). In fact, the push from the domestic actors in the political and societal sphere could only make this mechanism a success.

On the other hand, public acceptance of such a complex mechanism can be very difficult/cumbersome. The benefits of involving in a cooperation mechanism versus reliance on domestic resources need to be clearly communicated to the public.

DESIRED OUTCOMES

Broad acceptance of Joint RES Projects with the EU.

SUPPORTING ACTIONS

Assess socio-economic and environmental impacts of RES expansion in the country. Analyse costs and benefits of possible joint RES projects.

IMPLEMENTATION CONSIDERATIONS

Transparent and Clear communication with the public with the information related to all costs and benefits of joint RES projects to society.

5 References

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