



Contract N°: IEE/11/845/SI2.616378

***Bringing Europe and Third countries closer together
through renewable Energies***

BETTER

***D2.1: EU RES cooperation initiatives with third
Countries - North Africa, West Balkans and Turkey***



*Project Coordinator: **CIEMAT**
Work Package 2 Leader Organization: **CIEMAT***

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Project Coordinator: CIEMAT

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PREFACE

BETTER intends to address renewable energy (RES) cooperation between the EU and third countries. The Directive on the promotion of renewable energy sources (EC, 2009) 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 Méditerranéen 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



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List of abbreviations

AA	Association Agreement
AECID	Agencia Española de Cooperación Internacional para el Desarrollo (<i>Spanish Agency for International Cooperation and Development</i>)
AFD	Agence Française de Développement (<i>French Development Agency</i>)
CESI	Confédération européenne des syndicats indépendants (<i>European Confederation of Independent Trade Unions</i>)
CDM	Clean Development Mechanism
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EFI	European Financing Institutions
ENP	European Neighbourhood Policy
ENTSO-E	European Network of Transmission System Operators for Electricity
EPNI	European Neighbourhood and Partnership Instrument
ESCO	Energy Service Company
EUROMED	Euro-Mediterranean Partnership
FEMIP	Facility for Euro-Mediterranean Investment and Partnership
GATT	General Agreement on Trades and Tariffs
GEEREF	Global Energy Efficiency and Renewable Energy Fund
GSE	Gestore dei Servizi Energetici
ICER	International Confederation of Energy Regulators
IEE	Intelligent Energy for Europe
KfW	Kreditanstalt für Wiederaufbau (<i>German Reconstruction Credit Institute</i>)
MED CSP	Concentrating solar power for the Mediterranean region
MEDEMIP	Support for the Enhanced Integration and the Improved Security of the Euro-Mediterranean Energy Market
MEDREG	Association of the Mediterranean Regulators for Electricity and Gas
MEDRES	Study on Cost effective renewable energy for rural areas in the Mediterranean region

MEDRING	Study on developing a Mediterranean ring
MENA	Middle Eastern and North African
MPC	Mediterranean Partner Countries
MSP	Mediterranean Solar Plan
MSP-IPP	MSP Renewable Energy and Energy Efficiency Project Preparation Initiative
NAMA	Nationally Appropriate Mitigation Action
NEEDS	Near East Engineering and Development Services
NREAP	National renewable energy action plans
PCA	Partnership and Cooperation Agreement
PECI	Projects of Energy Community Interest
PWFMSPP	Paving the Way for the Mediterranean Solar Plan
RES	Renewable energy sources
TA	Technical Assistance
TRANS-CSP	Trans-Mediterranean interconnection for Concentrating Solar Power
TREC	Trans-Mediterranean Renewable Energy Cooperation
UfM	Union for the Mediterranean
WeBSEDF	Western Balkans Sustainable Energy Direct Financing Facility

Executive Summary

One major element of EU's external energy policy is expanding its energy norms and regulations to neighbourhood countries and beyond to achieve its energy policy priorities - safe, secure, affordable and sustainable energy supply. The importance of external energy policy has been acknowledged in the European Union's 2007 "energy package", and Second Strategic Energy Review (EC, 2008) and the European Commission's Communication on security of energy supply and international cooperation—"the EU Energy Policy: Engaging with Partners beyond Our Borders" (EC, 2011a). The EU Renewable Energy Directive (here after RES Directive) provides another element to cross-border cooperation by allowing Member States to fulfil their 2020 renewable energy (RES) targets by implementing joint projects in third countries. Even though the Member States' national renewable energy action plans (NREAPs) to reach their RES targets do not indicate any significant use of this mechanism, the RES Directive acknowledges the importance of renewable energy as part of external energy policy.

This report aims at presenting the political framework between the EU and the BETTER project target regions (North Africa, Western Balkans and Turkey) with regards to (renewable) energy and the relevant initiatives and the projects to set the scene for RES joint projects as defined in Article 9 of the RES Directive.

The main objectives of this study report are to:

- ▲ Review energy treaties, agreements, and partnerships to assess their relevance to cooperation mechanism with Third countries.
- ▲ Analyse the relevance of the recent projects and initiatives to BETTER project and improve and trigger the communication and synergies between BETTER project partners and the relevant projects.

Current political framework and its relevance to cooperation mechanism with Third countries

A wide range of institutions and instruments are already available for cooperation between the EU and its partner countries with regard to energy policy. In general, these frameworks have been established to ensure the security of the Union's energy supply, promote free and transparent energy markets, and combat climate change. While the institutions and the instruments so far established have focused on fossil fuel energy carriers and issues related to them, they inherently include access to sustainable energy and promotion of renewable energy production and consumption. In this respect, they can also serve to renewable energy projects under cooperation mechanism with Third countries.

The Energy Charter Treaty, the first and the only binding multilateral intergovernmental agreement in energy yield, could play an important role in promoting renewable energy in BETTER target countries, particularly the countries in which the perceived degree of political risks is high. Geographical expansion of this Treaty to North African countries and thus applying the uniform rules could create a level playing field for investment in the renewable energy sector and minimise the non-commercial risks associated with such investments. Among the North African countries with the observer status (Algeria, Egypt, Morocco and Tunisia), Morocco signed the Charter in September 2012. The uniform rules, the Treaty provides a more balanced and efficient framework for

international cooperation than what is offered by bilateral agreements. Moreover, considering the strategic geo-political significance of energy, international governance system of international energy markets based on legal rules is increasingly important for overall international security.

The Energy Charter Treaty is in the process of modernization, which means the geographical expansion of the constituency and the updating of its statutes to modern conditions. Such a modernisation could strengthen the Treaty and cover renewable energy projects more explicitly¹.

Next to this Treaty, Europe has been strengthening its external energy co-operation with the countries adjacent to the EU through the European Neighbourhood Policy (ENP). The ENP is viewed by the EU as a strategic way of enhancing political links and promoting social development, good governance and security in its close vicinity. The ENP policy covers regional and multilateral co-operation initiatives like the Eastern Partnership, the Black Sea Synergy and the “Union for Mediterranean” (UfM). The UfM provides the policy framework in which the EU elaborates its external policies towards the North African countries. The UfM aims at building a Master Plan until 2012 and works on key issues such as regulatory framework, financial instruments, infrastructure, technologies, transfer of know-how, etc. Next to that, it identifies and supports pilot projects for a Mediterranean solar energy plan, one of the priority projects of the UfM.

Another very important Treaty, the Energy Community Treaty (ECT), links the EU to Western Balkans. It aims at creating a stable regulatory and market framework through the implementation of key parts of the EU legislation, including the electricity and gas directives and regulations, key environment directives relevant for energy sector. In October 2012, the Energy Community Ministerial Council agreed on the implementation of the RES Directive. With this decision, Albania, Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Kosovo, Moldova, Montenegro, Serbia and Ukraine commit to a binding share of renewable energy as part of their overall consumption in 2020. This enables the Western Balkan countries **to participate in all cooperation mechanisms**, meaning in particular that statistical transfers of renewable energy for the purposes of target achievement will be possible independently from physical flow of electricity.

Widening the Energy Community Treaty could improve EU's external relations. Applying such a legally binding instrument to other non-EU countries could help EU expand its norms, rules and instruments towards its far neighbours. There are proposals to deepen the regulatory scope of the ECT and extend the framework to Turkey and the Mediterranean countries in order to secure a Mediterranean Energy Ring that would enhance the integration.

Turkey has an observer status to the Energy Community Treaty, which does limit renewable energy cooperation to only Article 9 within the flexible mechanisms of the RES Directive. On the other hand, Turkey is also an accession country to the EU and is already adopting the energy *acquis*. Given the significant renewable energy potential and the strategic importance to the EU as an energy hub, the possibility to implementing all flexibility mechanisms of the RES Directive could promote the renewable energy deployment in Turkey and at the same time reaching the EU 2020 renewable targets cost effectively. This could be done either through Turkey becoming a member to the Energy Community Treaty or expanding the coverage of the RES Directive to Turkey as an accession

¹ The Treaty covers all types of energy materials and products, inclusive of electricity and energy-related equipment. The renewable energy sources are not mentioned but the provisions on investment protection apply also to investments in hydropower, solar, wind energy, and all other renewable energy sources

country to the EU. In fact, among the official acceding countries to the EU (Croatia, Turkey, Iceland, Macedonia, Montenegro and Serbia), Turkey is the only country that does not have the right to apply all of the flexibility mechanisms.

A review of the progress of the Energy Community Treaty, however, indicates that there is a large gap between the theory (political commitments) and practice (full implementation of the Energy Community *acquis* and enforcement of the rules adopted). The flexibility mechanisms within the RES Directive could only function when this gap is closed, the Partner countries to ECT address their investment challenges such as those resulting from the modernisation of the electricity transmission and distribution networks and interconnectors, from the EU requirements and measures related to energy efficiency.

The political framework promoting RES projects and making use of the flexibility mechanisms of the RES Directive should also ensure that the environmental protection issues and the sustainable use of energy resources are given the appropriate weight in accordance with EU climate protection goals. In this regard, not only the energy political framework but the environmental frameworks in each country should be reviewed in the case studies (which has not been covered in this report). The Partners of the Energy Community Treaty are obliged to adopt the environmental *acquis communautaire*² related to energy. Turkey, as an accession country, is already obliged to adopt its regulations also related to environment. For the North African countries, on the other hand, a mechanism that harmonises the environmental aspects of the RES projects (at least within Article 9) would be necessary.

The review of existing institutions and cooperation formats shows that these can play a role in promoting renewable energy and implementing joint projects under the RES Directive. However, it may be necessary to coordinate the existing lines of cooperation effectively so that they do not pose conflicting rules nor they duplicate each other. As indicated previously, most of the frameworks established over the last decades focus on conventional energy and transmission, whereas the development of renewable energy is quite recent. As such, it would be advisable to strengthen the renewable energy related issues through e.g. additional provisions and amendments.

Table 1: Overview of key EU-Third country cooperation frameworks, both 'legislative' and policy

Name	Type of instrument	Objective/coverage	Geographical coverage
Energy Charter Treaty	Multilateral framework for cross-border co-operation.	Covers all aspects of commercial energy activities including trade, transit, investments and energy efficiency. The treaty is legally binding, including dispute resolution procedures.	The treaty has been signed or acceded to by fifty-one countries and the European Union.
Energy Community Treaty (ECT)	Multilateral framework for cross-border co-operation.	Aims at establishing a common regulatory framework for energy markets in contracting parties by extending the <i>acquis communautaire</i> of the European Union to the	EU on the one side, and on the other: Albania, Bosnia and Herzegovina, Croatia, Republic of Macedonia, Montenegro, Serbia, Moldova, Ukraine, Kosovo (UNMIK).

² French term referring to the cumulative body of European Community laws, comprising the European Commission (EC)'s objectives, substantive rules, policies and, in particular, the primary and secondary legislation and case law – all of which form part of the legal order of the European Union (EU).

		territories of participating countries. It covers the relevant fields of energy, environment, and competition of the EU legislation.	
European Neighbourhood Policy (ENP)	EU Policy covering EU-third country cooperation.	Developed in 2004, with the objective of avoiding the emergence of new dividing lines between the enlarged EU and neighbours, and instead strengthening the prosperity, stability and security of all. Central to the ENP are the bilateral Action Plans between the EU and each ENP partner, which set out an agenda of political and economic reforms with short and medium-term priorities of 3 to 5 years. The ENP policy covers regional and multilateral co-operation initiatives, such as the “Union for Mediterranean (UfM)”	EU, Turkey, and the North African countries (Algeria, Egypt, Libya, Morocco, Tunisia) are among the 16 partners addressed by the ENP
Facility for Euro-Mediterranean Investment and Partnership (FEMIP)	Financing facility	Creating an investment-friendly environment enabling the private sector to flourish by improving infrastructure in the following sectors (energy, transport and telecom, environment, and human and social capital). Energy covers RES as well as generation, transmission and distribution. of power	Countries funding in 2010/2011 included: Algeria, Egypt, Gaza and the West Bank, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia and Turkey.

Relevance of recently conducted and ongoing projects/initiatives to BETTER

The majority of the projects reviewed in this report focus on the Mediterranean region. These projects can, however, feed in to the North African case study within BETTER. The objective of the BETTER North African case study is to assess the potential of the cooperation mechanism with Third countries in helping Europe to achieve its RES-E targets and to trigger the faster implementation of RES electricity projects in **North Africa** by 2020 and beyond.

Recent and on-going projects cover several aspects pertaining to the energy systems of the Mediterranean region, such as energy grid infrastructure, energy demand, energy policies, and the regulatory & legal framework. Table 2 below presents an overview of selected projects included in this study report.

Table 2: Overview of past and on-going studies relevant to scope (topic and geographical) of the BETTER project

Project (Acronym)	Overall objective	Geographical coverage	How can the BETTER project complement
Concentrating Solar Power for the Mediterranean Region (MED-CSP)	Create a database for decision makers showing the potential of RES to solve the regional energy and water shortage and the corresponding cost escalation.	EU-MENA (Europe, Middle East, North Africa)	Study showed that renewable energy resources are plentiful and can cope with the growing demand of the EU-MENA region. BETTER can address how these available resources could be utilised through cooperation mechanisms.
Trans-Mediterranean interconnection for Concentrating Solar Power (TRANS-CSP)	Provide a comprehensive database on the present and expected demand for electricity and firm power capacity, quantify the available RES and their applicability for power, provide scenarios of the electricity supply system until 2050, and evaluate the resulting socio-economic and environmental impacts for each of the analysed countries.	EU-MENA (Europe, Middle East, North Africa)	Study provides a first information base, which the BETTER project can build on, for the design of a political framework that would facilitate a renewable energy partnership and a common free trade area for renewable energies in EU-MENA.
Paving the Way for the Mediterranean Solar Plan (PWFMSP)	Aims to assist the Mediterranean Partner Countries to create conditions that are conducive to greater use of sustainable energy based on solar, wind and other RES, combined with energy efficiency and savings in the region. This includes results and activities which contribute to the development and implementation of the MSP. The project is funded under the ENP (see above).	MENA countries	Better coordination between countries could improve the uptake of RES in the Mediterranean Partner Countries. BETTER could contribute to improved coordination not only in the Mediterranean region but also BETTER project is the two additional regions it covers: Western Balkans and Turkey.
Study on developing a Mediterranean ring (MEDRING)	Aimed to source, update and analyse relevant as well as authentic performance data of the electricity sector of 24 countries and territories forming the Mediterranean ring. In particular, the study aimed to discuss possible technical solutions for closing the Mediterranean Ring, together with solutions for South-North corridors for export of large quantities of power generated from renewable energy sources to Europe, discuss the constraint on the South Eastern Mediterranean Countries (SEMC) grids and the impact on the EU grids, formulate a series of recommendations on how to progress the ring.		Study on developing a Mediterranean ring (MEDRING).
Support for the Enhanced Integration and the Improved Security of the Euro-Mediterranean Energy Market (MED-EMIP)	Aims to establish a regional platform for energy policy dialogue and exchange of experiences related to secure energy supplies, diversify energy sources, and reduction of the environmental impact of energy-related activities. It promotes energy sector reform in the Mediterranean Countries, with a shift towards sustainable and clean energy, facilitates dialogue in and among these countries to help them in achieving consistency, harmonization and convergence of their national energy policies and institutional and legislative frameworks, and stimulates technology transfer and market development. Additionally, it offers an internet based information system including technical and management tools.	Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Occupied Palestinian Territory, Syria, Tunisia and Turkey	This platform undertakes a number of key activities, including: organisation of country visits to get updated information on the energy situation and related need; offers demand-driven support to Partner Countries, based on their needs; assists in policy formulation, policy advice, counselling and other types of technical assistance; holds roundtables, seminars and brainstorming sessions; disseminates information on best practices and technologies.
MEDGRID	Aims include: designing a Mediterranean transmission network able to export 5GW into Europe by 2020; promoting regulation favourable to investment and to the viability of generation projects on the southern rim of the Mediterranean; this will involve buy-back schemes, emissions trading, fiscal incentives, etc.; assessing the positive effects of investment in infrastructure and electricity trading on growth, economic activity and job creation; developing technical cooperation over trans-Mediterranean projects; and promoting European technology and industry on the global market, especially in renewable electricity generation, DC technology and HVDC submarine cables	MENA countries	Study provides an important first information base and stakeholder network, which the BETTER project can build on. In particular, Medgrid is working very closely with authorities in the countries involved, the EC, the scientific community, development banks and funds, NGOs.

MED-CSP analysed the RES potentials available in the European Union- Middle Eastern and North African (EU-MENA) region for each technology and for each country, while detailed mapping of resources and a quantification of the technical and economic potentials by country in terms of renewable electricity is provided. Another study, the TRANS-CSP comprises a comprehensive database on the present and expected demand for electricity and firm power capacity, quantifies the available renewable energy resources and their applicability for power, provides scenarios of the electricity supply system until 2050. This study also evaluates the resulting socio-economic and environmental impacts for each of the analysed countries. MEDRING and the MEDGRID study focus exclusively on electricity interconnections in the region and their export to Europe, studying their feasibility from the technical, economic and institutional standpoints. One of the Ad-Hoc working group within the Association of the Mediterranean Regulators for Electricity and Gas (MEDREG) looks into the flexibility mechanisms of the RES Directive (Group on environment). The BETTER project will seek to work closely with this group. An important component of the Mediterranean Solar Plan, support to investment, has been covered within Paving the Way for the Mediterranean Solar Plan (PWFMS) and a Facility for Euro-Mediterranean Investment and Partnership FEMIP study conducted by the European Investment Bank (EIB). These two works will also support the work within BETTER project.

In general the socio-economic and environmental aspects of exporting renewable electricity from North African countries to Europe are weakly touched upon in a few studies. Moreover, none of the mentioned studies includes the European perspective on this, meaning the added value to reach the renewable energy targets and other socio-economic and environmental impacts to Europe. Another important topic that has not been covered in these studies is the functioning of different mechanisms in supporting renewable electricity projects. How mechanisms, such as the Clean Development Mechanism (CDM), Nationally Appropriate Mitigation Actions (NAMAs), and Article 9 of the RES Directive would interact and support such projects has not been covered (for further information about this issue, see Deliverable 2.3 of the BETTER project).

Another strength of the BETTER project is the two other regions it covers: **Western Balkans and Turkey**. As Western Balkans committed to the RES Directive, there can be a stronger impetus to promote renewable energy projects in the region and transfer a certain share to the EU statistically. As an accession country to the EU and holding significant RES potential, Turkey could play an important role in helping EU reach its targets.

All in all, the Western Balkan countries and Turkey with large renewable energy potentials require more detailed work, whereas many on-going initiatives for the Mediterranean region could benefit from a better coordination.

1 INTRODUCTION AND BACKGROUND

Directive 2009/28/EC on the promotion of the use of energy from renewable sources (hereafter the RES Directive) lays down individual mandatory targets for the share of energy from renewable sources in final energy consumption for each Member State. The Directive also defines indicative trajectories and corresponding interim targets for Member States. According to Article 3(2) of the RES Directive, Member States are under the legal obligation to "introduce measures effectively designed to ensure that the share of energy from renewable sources equals or exceeds that shown in the indicative trajectory". These measures can be of a purely national nature but they can also be based on cooperation between Member States and other countries to whom the RES Directive is applicable and on cooperation with third countries under certain conditions.

The RES Directive defines a set of mechanisms to facilitate cross-border support of energy from renewable sources as a tool to optimise the energy system. These mechanisms, which introduce flexibility for Member States on a voluntary cooperation basis, refer to:

- ▲ statistical transfers between Member States (Art. 6),
- ▲ joint projects between Member States (Art 7,8),
- ▲ joint projects between Member States and third parties (Art 9,10) and
- ▲ joint support schemes between Member States (Art. 11).

The Member States can use statistical transfers, and develop joint projects and joint support schemes in bilateral or multilateral ways.

Art. 9 of the RES Directive allows for one or several Member States to cooperate with a third country, by supporting a renewable energy project in this country in exchange for (a part of) the energy produced to be accounted towards Member States' 2020 targets, the so called "joint project with third countries". Compared to intra-EU cooperation, only electricity projects are eligible in combination with physical import of the electricity into the EU. The main purpose of the mechanism is to increase the cost-effectiveness of meeting the targets. Third 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.

This report represents deliverable D2.1 of the EU-funded project BETTER, which aims in particular to analyse EU's relations to Third countries with respect to RES, and options for developing these more effectively. As such, the report aims to provide a basis for comparison with alternative scenario(s) developed within the project (WP6) in order to determine the extent to which renewables can help reach and go beyond 2020 targets in a cost efficient way via co-operation with third countries.

The outline of the report is as follows:

Chapter 2 summarises briefly Member States' plans to make use of "joint projects with third countries". Chapter 3 presents the EU's energy policy relations to third countries³, with particular

³ From this point onwards third countries term will refer to BETTER project focus regions, namely North Africa, Western Balkans and Turkey

emphasis on renewable energy policy, and identifies the options for developing those relations that will set the framework to exploit the renewable energy potential more effectively. Existing (renewable) energy policy relations with the countries/regions included in the BETTER study (North Africa, West Balkans and Turkey) are summarised in chapters 4 to 6. Additionally, the most recent projects that are relevant to BETTER projects and other partnerships are introduced with an aim of avoiding any overlapping work and increasing the efficiency in the course of the project. Chapter 7 presents relevant international treaties and other institutions. Conclusions are presented in chapter 8.

2 MEMBER STATES PLANS TO USE COOPERATION MECHANISM

The RES Directive includes several reporting requirements on the planned or expected use of cooperation mechanisms as a means to achieve national renewable energy targets by 2020. These include:

- ▲ National Renewable Energy Action Plans (NREAPS) submitted by June 2010 (Article 4(2)).
- ▲ Forecast reports submitted six months prior to the NREAPs (Article 4(3)).
- ▲ National Progress reports submitted by 31 December 2011, and every two years thereafter (Article 22(1)).

According to the forecast reports, four Member States (France, Greece, Italy, and Spain) noted specifically that they may use cooperation mechanisms to develop renewable energy in third countries (either in the context of the Mediterranean Solar Plan or in the Western Balkan countries). Italy is a particularly interesting case as it is the only country anticipating a relatively large deficit in reaching its 2020 target. Italy has expressed intention to meet the deficit through joint projects with third countries, i.e. Switzerland, Albania, Montenegro and Tunisia.

The NREAPs reflect the similar information as the forecast documents when it concerns the cooperation with third countries. According to the NREAP reports⁴:

- ▲ France considers participating to joint projects related to the Mediterranean Solar Plan (MSP) without however quantifying the planned commitment.
- ▲ Germany also sees the cooperation mechanisms as a promising opportunity for targeted cooperation in the future, and is thus interested in these mechanism will develop.
- ▲ Italy is assessing the possibility of using cooperation mechanisms with third countries. The targeted amount to fill the gap between 2020 RES target and national RES deployment appears comparatively impressive: 0.8% of gross final energy demand, corresponding to 1.1 Mtoe shall be imported from abroad by 2020. Premising the necessary interconnection lines, Italy is assuming to import from Albania, Tunisia and the Balkan states.
- ▲ Spain indicates joint projects with third countries (and statistical transfer) as the most attractive flexible mechanism(s). Spain awards priority to actions that help meet the energy targets of the Mediterranean Solar Plan. However, given the forecast surplus vis-à-vis the target, Spain does not foresee the purchase of renewable energy from any third country within the framework of Article 9 of RES Directive (2009/28/EC). Similarly, EU countries that plan to use this mechanism to import renewable energy through the interconnection between Spain and Morocco should be aware of the existing technical, market and/or regulatory restrictions, especially the weak electrical interconnections with the rest of the European Union through France.

Also in their progress reports submitted in 2011, the same Member States reflect their interest to joint project with third countries but do not present any concrete action plans. In summary,

- ▲ Germany considers importing solar power from North African countries as an important contribution towards future energy supply in Europe and due to strategic industry interests. Solar thermal power stations (Concentrated Solar Power), due to better storage capability is

⁴ See website: http://ec.europa.eu/energy/renewables/action_plan_en.htm.

considered to be a means to ensure needs-based energy production through renewables in Germany. In order to make headway on implementation of Article 9 of the RES Directive, Germany supports the execution of the first reference projects importing power from renewables from North Africa under the Union for the Mediterranean's solar plan.

- ▲ Italy has transposed the provisions on the subject of statistical transfer, joint projects between and with third countries into its legal system by Legislative Decree No 28/201. It can however be expected that this situation will change during the remaining phase of the implementation of the RES Directive up to 2020 when the most easily accessible renewable energy potential especially in countries with lower resources will already have been exploited.

It can thus be expected that cooperation mechanisms will get more attention when the economic and non-economic benefits are (perceived to be) larger than the associated financial and political costs and risks. For parameters that may affect the implementation of joint project with third countries please visit Deliverable 2.4 of the BETTER project.

3 EXTERNAL DIMENSION OF EU ENERGY POLICY

The main objectives of EU energy policy are security of energy supply, competitiveness and sustainability. The 2020 Energy Strategy (COM (2010) 639) identifies strengthening the external dimension of the EU energy policy as one of the key priorities to reach these objectives. The regulatory framework put in place at the EU level entails important consequences towards other non-EU countries as in the field of network access, safety and competition provisions. In order to complete the internal market for electricity and gas in 2014, as set by the European Council, it is urgent to develop its external dimension (COM (2011) 539).

In its Communication on Energy infrastructure priorities for 2020 and beyond (COM (2010) 677) the Commission outlined a master plan for an integrated energy network taking into account key interconnections with third countries. While the focus is mainly on gas import pipelines and oil transportation corridors, the importance of the Mediterranean region in EU energy supply, potentially for renewable sources, is acknowledged. One of the key follow-up actions promoting cooperation on renewable energy projects with the southern Mediterranean countries is the framework of the Mediterranean Solar Plan, and the launching of pilot solar plant project in 2011-2012.

EU has already developed a number of frameworks for cooperation through energy dialogs, Memoranda of Understanding (MoU) and bilateral agreements. Table 3 summarises the existing international frameworks and agreements relevant to the energy sector and the BETTER project focus countries. The following chapters detail the on-going frameworks and introduce the projects and partnerships that yield from these frameworks and are relevant to the BETTER project focus.

Table 3: EU's exiting international instruments (source: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2011:1022:FIN:EN:PDF>)

Country/groups of countries	Political instruments				Bilateral legal instruments				Multilateral legal instruments				
	Energy dialogues	Memorandum of Understanding	ENP Action Plan/Roadmap/	Other	PCA /Association agreement/SAAs/Fra network agreement	FTA /Non-preferential Agreements /TA /EEA	Euratom agreements	Science and technology cooperation agreement	Energy Community	Energy Charter Treaty	World Trade Organisation	Non-proliferation treaty	ITER agreement
Turkey				X ^{1,2}	X	x		X ³	(x) ⁴	x	x	x	
Western Balkans													
Albania				X ¹ Error! Bookmark not defined.	X	x		X ³	x	x	x	x	
Croatia				X ¹	X	x	X ⁵	X ³	x	x	x		x
Kosovo					X				x				
Serbia					X ⁶	x		X ³	x		X ⁶		x
Macedonia					X	x		X ³	x	x	x		x
Montenegro				X ¹	X	x		X ³	x		X ⁶		X
Bosnia				X ¹	(x) ⁶	x		X ³	x	x			x
North-Africa													
Algeria	X	x	X	X ^{1,7}	X	x				X ⁴		X ⁶	x
Egypt	X	x	X	x	X	x		x		X ⁴		x	
Libya ⁸								X ⁶			X ⁶		x
Morocco	X	X ⁹	X	X ^{1,7}	X	x		x		X ⁴		x	x
Tunisia			X	X ^{1,7}	X	x		x		X ⁴		X	X

¹ The Union of the Mediterranean / ² Baku Initiative / ³ Associated to FP7 / ⁴ Observer / ⁵ ECURIE agreement / ⁶ Pending / ⁷ European Neighborhood Policy / ⁸ EU sanctions/restrictive measures in place / ⁹ Energy Declaration

4 EU-NORTH AFRICA ENERGY RELATIONS

This chapter highlights existing and key EU-North Africa energy cooperation initiatives, including recent or on-going projects. In particular, the chapter includes a brief description of the European Neighbourhood Policy (ENP), the Euro-Mediterranean Partnership (EUROMED) and the Union for the Mediterranean (UfM), the EU-funded project ‘Support for the Enhanced Integration and the Improved Security of the Euro-Mediterranean Energy Market’ (MED-EMIP), and other EU-funded studies, such as the MEDRING study and Paving the Way for the Mediterranean Solar Plan (PWFMSP) project.

4.1 European Neighbourhood Policy

The European Neighbourhood Policy (ENP) was launched in 2004 to promote closer relations with the countries adjacent to the EU⁵. The EU and each ENP partner reach agreement across a wide range of fields within certain “common” areas such as cooperation on political and security issues, to economic and trade matters, mobility, environment, integration of transport and energy networks or scientific and cultural cooperation. From an energy security perspective, this stability can be regarded as essential for reducing the risks associated with continued supply, and it thus becomes an important instrument for availability and reliability of supplies. The EU provides financial and technical assistance to support the implementation of these objectives, in support of partners’ own efforts. The North African countries (Algeria, Egypt, Libya, Morocco, and Tunisia) are among the 16 partners addressed by the ENP.

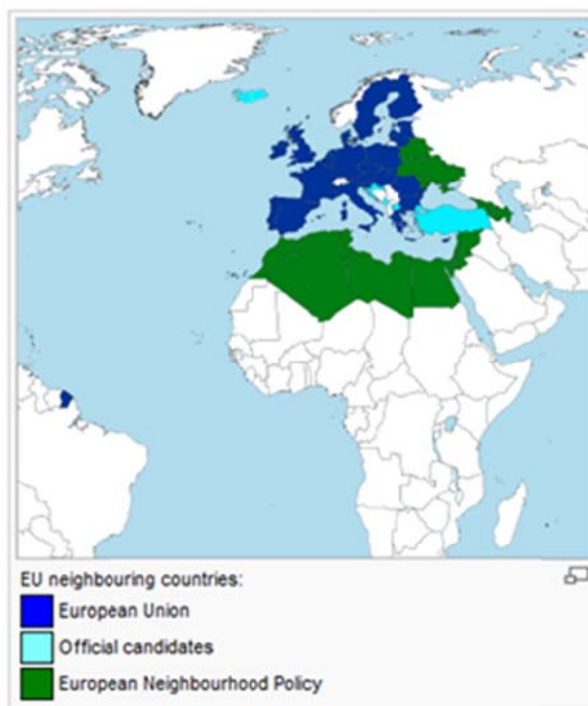


Figure 1: European Neighbourhood Policy countries (source: http://en.wikipedia.org/wiki/European_Neighbourhood_Policy)

The ENP policy is further enriched with regional and multilateral co-operation initiatives like:

- ▲ The Eastern Partnership (launched in 2009)⁶,

⁵ http://ec.europa.eu/world/enp/index_en.htm, last visited 15.11.2012

⁶ The Eastern Partnership focuses on Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. Since these countries are not the BETTER project focus countries, this report does not elaborate on this partnership.

- ▲ The Union for the Mediterranean (the Euro-Mediterranean Partnership, formerly known as the Barcelona Process, re-launched in July 2008) (described in section 4.2.1), and
- ▲ The Black Sea Synergy (launched in 2008).

The Black Sea Synergy supports regional development in South-East Europe. By encouraging cooperation between the countries surrounding the Black Sea, the synergy offers a forum for tackling common problems while encouraging political and economic reform. The Black Sea region includes Greece, Bulgaria, Romania and Moldova in the west, Ukraine and Russia in the north, Georgia, Armenia and Azerbaijan in the east and Turkey in the south.

The bilateral Action Plans between the EU and each ENP partner are an important component of the ENP. These set out an agenda of political and economic reforms with short and medium-term priorities of three to five years. The ENP builds upon existing agreements between the EU and the partner in question: Partnership and Cooperation Agreements (PCA) or Association Agreements (AA). Several of the ENP Action Plans have set up the prioritised measures for energy cooperation (Escribano, 2010), encompassing the necessary political and economic reforms, among other things related to trade, security and energy. In return, the EU offers increased assistance and enhanced market access. The most important bilateral institutional relations are elaborated below.

In the recent Communication from the European Commission, Delivering a new European Neighbourhood Policy (EC, 2011b), the EC and the High Representative of the EU inform that the EC will consult Southern Mediterranean partners in 2012 to establish energy partnerships as a first step towards regional electricity and renewable energy market integration, with the long-term perspective of establishing an EU-Southern Mediterranean Energy Community.

4.1.1 Action Plans

Countries wishing to deepen their relationship with the EU agree in doing joint bilateral action plans. These set out an agenda of political and economic reforms for a period of three to five years. To date, 12 action plans have been agreed, among which Egypt, Morocco, Tunisia are presented below as these are the BETTER project focus countries. While the action plans cover a number of topics, this report focuses on the energy related objectives of the action plans.

In June 2010, Algeria, Morocco and Tunisia adopted an action plan for the period 2010-2015, confirming their intention to establish a Maghreb electricity market as a preparation for gradual integration with the EU energy market (COM (2011) 303).⁷

EU-Egypt Action Plan⁸

In October 2010, the Commission and Egypt held an energy dialogue under the EU-Egypt Memorandum of Understanding (MoU) on a strategic partnership⁹. The Action Plan between Egypt and the EU, within the European Neighbourhood Policy, sets ambitious objectives. Enhanced cooperation in the energy sector is one of the priority actions laid down in this plan. Actions such as cooperation in energy policy exchanges, the gradual convergence towards the EU internal electricity

⁷ http://ec.europa.eu/world/enp/pdf/progress2011/sec_11_645_en.pdf

⁸ http://ec.europa.eu/world/enp/pdf/action_plans/egypt_enp_ap_final_en.pdf

⁹ http://ec.europa.eu/world/enp/pdf/progress2011/sec_11_645_en.pdf

and gas market principles, the development of energy networks, and enhancing energy efficiency and the use of renewable energy are the important components of this action plan.

Concerning the progress on energy efficiency and the use of renewable energy sources, actions include:

- ▲ Taking steps to develop an Action Plan including a financial plan for improving energy efficiency and enhancing the use of renewable energy.
- ▲ Reinforcing the institutions dealing with energy efficiency and renewable energy sources.
- ▲ Cooperating to develop mechanisms for effective introduction of renewable energy into the Egyptian Electricity Market and promote technology transfer and know-how in this area.
- ▲ Pursuing measures in energy efficiency and renewable energy sources.
- ▲ Progressing to reach Egypt's target to ensure that 3 % of the electric energy needs are covered by the year 2010 by renewable energy sources.

According to the 2011 Progress Report¹⁰, the Supreme Energy Council decided to update the Egyptian energy strategy for 2030 in the light of the new situation in the country. On this basis, a white paper will be drafted with EU assistance. The EU and Egypt launches a project to help strengthen the electricity regulators. Egypt further develops its electricity networks. It remains committed to enhancing the use of renewable energy and energy efficiency. The Neighbourhood Investment Facility (NIF) co-finances several projects in this area, including the development of a renewable energy/energy efficiency master plan and the development of wind and solar power plants. The EU-Morocco and EU-Tunisia action plans were both adopted in July 2005 and covered a five year time frame.

EU-Morocco Action Plan

The actions related to energy sector are as follows:

- ▲ Strengthen Moroccan energy policy at national and regional level.
- ▲ Strengthen Morocco's role in regional energy supply security.
- ▲ Strengthen the energy observation and forecasting system.
- ▲ Gradual integration of the Moroccan electricity market into the European electricity market, pursuant to the Memorandum of Understanding (Rome, 2 December 2003) on the gradual integration of the electricity markets of the Maghreb countries into the EU's internal electricity market.
- ▲ Strengthen energy demand management and the use of renewable energy sources.

EU-Tunisia Action Plan

The actions agreed upon are:

- ▲ Step up energy cooperation with a view to gradual convergence, taking account of the characteristics of the Tunisian market, towards the objectives of EU energy policy.

¹⁰ http://ec.europa.eu/world/enp/docs/2012_enp_pack/progress_report_egypt_en.pdf

- ▲ Gradual future integration of Maghreb energy markets into the EU internal energy market, establish a Maghreb electricity and gas market with a view to convergence towards the principles of the EU internal electricity and gas markets.
- ▲ Develop the gas sector.
- ▲ Reinforce, develop and optimise energy networks and infrastructures.
- ▲ Step up energy efficiency and the use of renewable energy sources.

4.2 EU–Mediterranean cooperation

4.2.1 Euro-Mediterranean Partnership (EUROMED) and the Union for the Mediterranean (UfM)

The Euro-Mediterranean (EuroMed) Partnership (also called Barcelona Process) started in 1995 to strengthen the relations with the countries in the Mashriq and Maghreb regions. This partnership laid the foundations of the Union for the Mediterranean (*UfM*), *an institution building on the EuroMed partnership*.

In July 2008, the Heads of states and governments of the European and Mediterranean countries launched the Union for the Mediterranean (*UfM*), which provides impetus for regional cooperation. Along with the 27 EU Member States, 16 Southern Mediterranean, African and Middle Eastern countries are members of the *Union for the Mediterranean*: Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Israel, Jordan, Lebanon, Mauritania, Monaco, Montenegro, Morocco, the Palestinian Authority, Syria, Tunisia and Turkey (EC, 2012¹¹).

The Mediterranean solar energy plan is one of the priority projects of the UfM. It explores opportunities for developing alternative energy sources in the region. The plan targets the build-up of 20 GW of renewable energy production capacity, mainly wind and solar, including international interconnections around the Mediterranean by 2020. For comparison, the current capacity in this region is slightly above 1 GW (excluding hydro). Exporting a part of the renewable electricity produced in the region to the EU and using the revenues generated by these exports to develop profitable and sustainable projects is part of the objectives.

A number of European Financing Institutions (EFIs) (including European Investment Bank (EIB), Agence Française de Développement (AFD)¹², Kreditanstalt für Wiederaufbau (KfW)¹³, Agencia Española de Cooperación Internacional para el Desarrollo (AECID)¹⁴ and European Bank of Reconstruction and Development (EBRD) have established the “MSP Renewable Energy and Energy Efficiency Project Preparation Initiative” (MSP-PPI) to facilitate the mobilization of funds for investments. This initiative is financed by the EU funded Neighbourhood Investment Facility (NIF), managed by the European Commission. This support covers 100% of the costs related to Technical Assistance (TA) for preparing sustainable energy investment projects in the eight partner countries: Algeria, Egypt, Jordan, Lebanon, Morocco, Syria¹⁵, Tunisia, and West Bank & Gaza, as well as in

¹¹ http://www.eeas.europa.eu/euromed/index_en.htm

¹² French Development Agency.

¹³ German Reconstruction Credit Institute.

¹⁴ Spanish Agency for International Cooperation and Development.

¹⁵ Following EU sanctions in November 2011, the EIB has suspended all loan disbursements and TA contracts for projects with the Syrian state.

Libya in the near future. The financial assistance is intended to support investment projects which are already at an advanced stage of preparation, and which have a high probability of being financed and implemented in a reasonable timeframe.

The Moroccan Solar Plan is one of the six concrete projects of the Union for the Mediterranean, launched by the Euro-Mediterranean Heads of State and Government during the Paris Summit, held on 13th July 2008, to promote the production and use of renewable energies (more specifically, turning the Mediterranean partner countries into producers and exporters of solar energy).

The 500 MW Ouarzazate complex is the first project launched under the Moroccan Solar Plan. It will be developed through different successive phases. The project is the first phase of the complex and will follow the Independent Power Producer model already implemented in Morocco. It is expected to comprise one thermal solar power plant with a production capacity between 125 and 160 MW, with a minimum of around 450 MWh of thermal storage. The project is scheduled to begin operation in early 2014 (<http://www.eib.org/projects/pipeline/2010/20100242.htm>).

4.2.2 MED-EMIP - energy cooperation (2007-2012)

Financed by the European Commission, the project MED-EMIP (Support for the Enhanced Integration and the Improved Security of the Euro-Mediterranean Energy Market) aims at enhancing the integration of the energy markets in the Euro-Med region and promotes improved security and sustainability. It supports the transfer of knowledge on renewable energy related issues, encouraging its use in the Mediterranean Partner Countries.

The countries involved are Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Occupied Palestinian Territory, Syria¹⁶, Tunisia and Turkey.

The project establishes a regional platform for energy policy dialogue and exchange of experiences related to secure energy supplies, diversify energy sources, and reduction of the environmental impact of energy-related activities. Additionally, it offers an internet based information system including technical and management tools.

The following activities have been carried out to this end:

- ▲ An internet portal has been set up, instruments for online analysis developed and newsletters published.
- ▲ A study on developing a Mediterranean ring (MEDRING) for improved integration of the electricity market has been prepared.
- ▲ An analysis instrument to compare the cost efficiency of demand and supply measures has been developed and used in several partner countries with the involvement of finance ministries and planning institutions.

¹⁶ EU Cooperation with Syria is currently suspended due to the political situation in the country; however, since in principle Syria is eligible for cooperation under the ENPI, activities may be taken up again once the situation improves

- ▲ There has been cooperation with the League of Arab States and the Arab Union for Producers, Transporters and Distributors of Electricity on subjects such as energy efficiency, CDM, Demand Side Management (DSM) and adaptation to EU directives.
- ▲ Support has been given to the Mediterranean Solar Plan.
- ▲ As well as cooperation with other regional projects and institutions, there has also been cooperation with Israel and the occupied Palestinian territories.

GIZ International Services (GIZ IS) as consortium leader, MED-EMIP cooperation partners include the Observatoire Méditerranéen pour l'Energie (OME) in Paris, Near East Engineering and Development Services (NEEDS) in Beirut, and the law firm Kubbier Rechtsanwälte in Brussels.

In the context of the MED-EMIP project, the 'MEDRING Update Study-Electricity Sector' project was initiated. The objective was to source, update and analyse relevant as well as authentic performance data of the electricity sector of 24 countries and territories forming the Mediterranean ring in support of a 2010 Communication of the Commission concerning improved integration of the electricity market. The study aimed at:

- ▲ Highlighting and reflecting the developments since 2002, taking into consideration related studies and activities that were implemented over this period by various projects,
- ▲ Discuss possible technical solutions for closing the Mediterranean Ring, together with solutions for South-North electricity corridors for the export to Europe of large quantities of power generated from renewable energy sources,
- ▲ Discuss the constraint on the SEMC grids and the impact on the EU grids,
- ▲ Formulate a series of recommendations on how to progress the ring.

This study has produced four volumes covering overview of the power systems of the Mediterranean basin, analysing and recommending for the closure of the Ring and North-South electricity corridor, market potential and finance impact of solar power generation in the Partner countries, and mapping the Sea Basin for electricity power corridors.

4.2.3 MEDREG Association

MEDREG-the Association of Mediterranean Regulators for Electricity and Gas, was established in 2007 under the Italian law. The objective of this initiative is to promote a transparent, stable and harmonised regulatory framework in the MED-Region. It intends to foster co-operation, information exchange and assistance among members. It gathers energy regulators from the following countries: Albania, Algeria, Bosnia-Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Malta, Montenegro, Morocco, Palestinian Authority, Portugal, Slovenia, Spain, Tunisia and Turkey.

The mission of this association is as follows:

- ▲ Guarantee greater harmonization of the energy markets and legislations and to seek progressive market integration in the Euro-Mediterranean region.
- ▲ Foster sustainable development in the energy sector through greater efficiency and integration of energy markets based on secure, safe, cost-effective and environmentally sustainable energy systems.

- ▲ Support initiatives of common interest in key areas such as infrastructure development, investment financing and research.
- ▲ Provide capacity building activities through trainings, seminars and working groups in collaboration with FSR (Florence School of Regulation).
- ▲ Foster co-operation, information exchange and assistance among members providing a permanent discussion framework.

The association created 4 task groups. These are presented in Table 4 below.

Table 4: Presentation of the MEDREG task groups and their respective objectives

Task groups	Objectives
<i>Special task force on infrastructures investment</i>	<p>Assess the planned energy investments in MEDREG countries in the medium and long term, analyse issues related to the achievement of these investments and to define possible activities and actions to be carried out by MEDREG, in cooperation with national and international stakeholders.</p> <p>In 2012 the task force plans to draft a preliminary note on energy investments in the Mediterranean region (evaluation; constraints; technical, economic and financial aspects and others). For September 2012, organisation of a bilateral workshop MEDREG-EBRD on investment needs for electricity distribution infrastructure and quality of supply, in line with the new priorities of EBRD towards Mediterranean countries, starting with pilot projects in Egypt, Jordan, Morocco and Tunisia is set to their agenda. This is followed by an organization of a first round table on energy investments in the Mediterranean in parallel of the MEDREG 14th GA with the participation of multilateral stakeholders and financial international institutions in November 2012.</p> <p>In the period 2012-2013 the task force plans to realise in-depth analysis and production of road maps, studies and recommendations on specific aspects of energy investments in the Mediterranean (with presentation of progress reports) , followed by a meeting with the participation of multiple stakeholders and financial international institutions. (Nov. 2013).</p> <p>Their target for 2015-2020 defines common regulatory positions on electricity and gas infrastructures in the Mediterranean region (priorities, financing, tariff structures).</p>
<i>High level task force on the Integration of Electricity Markets of Maghreb Countries (IMME TF)</i>	<p>This task force aims at enhancing energy cooperation at regional level, allowing progressively a wider integration process throughout the Mediterranean area, following a step-by-step approach.</p> <p>The task force plans to elaborate on the common rules for the access to electricity networks in 2012 and strengthen the energy market opening process in 2013. Their target is defining a harmonised regulatory framework in view of the integration of electricity markets of Maghreb countries by 2015.</p>
<i>High Level Task Force on the cooperation</i>	<p>The International Confederation of Energy Regulators (ICER) is a networking tool launched in October 2009, aiming at facilitating the dialogue and coordination</p>

with the International Confederation of Energy Regulators (ICER TF) between worldwide Energy Regulators. The activities of ICER enhance information sharing and the exchange of best practices among regional associations of regulators, through their participation in specific working groups. MEDREG will follow-up on the activities of this working group (detailed under ICER subsection) and support them.

Consumers Special Task Force (CUS TF) This task aims at promoting and updating the MEDREG Recommendations on the minimal requirements to ensure consumer protection in the Mediterranean region.

Next to the task forces, the association sets four Ad-Hoc groups to cover the institutional aspects, electricity, gas, environment, and renewable energy sources and energy efficiency. A brief introduction of these groups are presented below

1. The Ad-hoc Group on Institutional Issues (INS AG)

This group has been set up to enhance closer coordination through mutual knowledge, information exchange and trainings between Mediterranean regulators. The group started its activities in 2007 working on the Benchmarking study on the organisation and competencies of Mediterranean regulators. The main objectives of this group are:

- ▲ Assessing the current status of regulatory framework and institutions, their competencies, resources and expertise;
- ▲ Carrying out thematic studies on specific areas like legal framework for settlement disputes, interconnections, etc.;
- ▲ Coordinating the dialogue on energy regulation with the EU, international institutes, regional organisations of regulators and other bodies;
- ▲ Coordinating, together with the Presidency and the Permanent Secretariat, the High level Task Forces on the Integration of Electricity Markets of Maghreb countries (IMME TF) and on the cooperation with the International Confederation of Energy Regulators (ICER TF).

The group will continue working on the harmonisation of the rules and principles governing the missions and organisation of independent energy regulatory authorities, based on MEDREG Recommendations.

2. Electricity AD-Hoc Group

The objective of the ad- hoc Group is to promote the integration of member countries electricity markets. The aim of the group is to establish an investor friendly environment in MEDREG countries in the field of electricity generation, transmission, distribution and trade, as well as to harmonize the legal and technical framework. More detailed objectives of this group are:

- ▲ Present and future interconnections infrastructure needs (for the establishment of an integrated electricity market) from the technical, economic, and financial perspectives;
- ▲ Future of Smart Grids in MEDREG countries;
- ▲ Market design, including unbundling of sector activities; transparency of market information and services, non-discriminatory Third Party Access (TPA) to infrastructure and services, tariff methodologies, price regulation;

- ▲ Operational issues concerning cross border exchange and congestion management practices: monitor electricity exchange activities among member countries, propose unified/general rules/guidelines for electricity exchanges among member countries, investigate the possibility of establishing a reliability council*;
- ▲ Establish a recommended implementation plan to implement the recommended cross border trade guidelines;
- ▲ Establish a benchmarking process for both the internal market organization and cross border practices (including MEDRING implementation status).

3. Ad-Hoc group on gas

This group will study possible recommendations and requirements that could lead to the development of an integrated, competitive, secure and functioning gas market in the MEDREG region.

4. Ad-Hoc group on Environment (RES AG)

The RES AG will explore the issues related with environment, Kyoto commitment, renewable energy sources and energy efficiency, focusing on the opportunities arising from existing and future partnerships in the Mediterranean Basin. The group will:

- ▲ Promote the exchange of information, knowledge and experiences;
- ▲ Analyse main regulatory mechanisms on: environment protection; promotion of Renewable Energy Sources (RES) and Combined Heat and Power (CHP); energy efficiency promotion including integration to the grids and smart metering issues;
- ▲ Evaluate the results of the different mechanisms in the national contexts, analysing success factors and critical issues;
- ▲ Analyse the possible effects of the introduction at a national level of successful mechanisms adopted in other countries;
- ▲ Assess the possibility of collaboration as regards the flexible mechanisms introduced by the RES Directive;
- ▲ Study the effects of linking the European Emission Trading Scheme (ETS) with schemes introduced in non-EU countries;
- ▲ Study best options to promote RES in isolated systems;
- ▲ Participate in the ICER¹⁷ Virtual Working Group 2 (Climate Change)

The association is supported by the European Union and the Council of European Energy Regulators.

¹⁷ The International Confederation of Energy Regulators (ICER) is a voluntary framework for cooperation between energy regulators from around the globe. Its' aim is to improve public and policy-maker awareness and understanding of energy regulation and its role in addressing a wide spectrum of socio-economic, environmental and market issues.

4.2.4 Paving the Way for the Mediterranean Solar Plan

Paving the Way for the Mediterranean Solar Plan (PWFMSPP) is a project funded under the European Neighbourhood and Partnership Instrument (EPNI). The project started in September 2010, with a duration of 3 years, to provide the EU and Mediterranean Partner Countries (MPC) with a platform for dialog and preparation of joint activity. It concentrates on four thematic lines:

- ▲ Support MPC in creating the appropriate harmonized regulatory framework for RES based investments in the power sector
- ▲ Transfer of know-how and experience between the MPC themselves and with the EU Member States and promote cooperation in Research, Development and Innovation and transfer of clean technologies
- ▲ Support the MPC to implement sustainable energy policies promoting the use of RE sources in power generation and energy efficiency
- ▲ Improve the economic and financial framework for investments in the use of RE, in particular solar energy.

The project has constructed a set of detailed national roadmaps that focus upon renewable energy policy and a regional roadmap on a broader scale that includes proposals for the steps to be taken at the regional level towards the harmonization of policies for renewable energy, energy efficiency and for power sector reform. Regulatory roadmaps and the regional roadmap can be downloaded from the project web page¹⁸.

The objective of this line of activity is to elaborate the basis for assessing MSP projects in a consistent way by taking into account generally accepted methodologies for economic and financial investment appraisal and bi- and multilateral schemes of sharing the costs and benefits. The implementation of the task facilitates an exchange of know-how with the objective to identify, to develop and to promote bankable MSP investment proposals.

The results achieved in the analysis are presented in a consolidated study on "RES-e cost benefit analysis and cost sharing" issued in 5 volumes as presented in Table 5 below:

Table 5: Results from the study on "RES-e cost benefit analysis and cost sharing"

Volumes	Content/scope
Volume 1	Cost benefits analysis of RES-e investments: Assumes the perspective of RES-e investment projects by presenting the approach of cost-benefit analysis and by broadening the scope in identifying the requirements for national incentive schemes and international cooperation agreements.
Volume 2	Determination of cost-sharing formulae: Discusses the requirements for deployment of RES-e technologies in appropriate national incentive schemes and international agreements. This complements the project perspective by an analysis of incentive schemes, of the policy formulation and implementation process and on-going EU – MPC cooperation initiatives. The study presents the methodology of Impact Assessments of incentive schemes.
Volume 3	Technical notes: Contains technical notes on: (i) Economic value of carbon avoidance, (ii) post-Kyoto cooperation, (iii) portfolio theory to value the economic cost of fossil energy price

¹⁸ See: http://www.pavingtheway-msp.eu/index.php?option=com_downloads&task=category&cid=8&Itemid=56.

uncertainty, (iv) Multi-criteria analysis.

Volume 4 RES-e technology data base: Presents a technical documentation on RES-e technologies together with a discussion of their costs and it the presents the cash-flow model developed used in the case studies for Egypt and Algeria.

Volume 5 Case studies (not yet available): The Impact Assessment approach will be illustrated in form of case studies covering Algeria's and Morocco's RE programmes, Egypt's wind energy programme, the Italy-Tunisia ELMED project, and the feed-in-tariff discussion in England and Germany.

(Reports from the volumes can be downloaded from the following website: http://www.pavingtheway-msp.eu/index.php?option=com_content&task=view&id=46&Itemid=56).

The project has established an inventory of expertise centres in the field of energy efficiency and renewable energies in the Mediterranean Partner Countries by conducting a survey, via questionnaires. The inventory report summarising the information collected from 37 centres can be downloaded from the project web page¹⁹.

An initial project activity was a benchmarking of the institutional setting providing a detailed overview of policies on sustainable energy in the Mediterranean Partner Countries. This is complemented by an "Evaluation of the Gaps". The objective was to determine the gaps in relation to different aspects of EE&RE policies, institutions and instruments within MPCs and with Italy and Spain, and to reinforce and empower the existing energy efficiency and renewable energy public agencies as well as the private energy services companies (ESCOs) in order to develop economic incentives and financial structures favourable to RE and EE policies.

Roadmaps on Sustainable Energy Policy for the Mediterranean Partner Countries are under elaboration. Further the project is preparing reports on Policies to allow Renewable Energy to be deployed competitively, including institutional arrangements for the registration of CDM projects and Certificates of Origin and the promotion of grid connected renewable. This will be summarized in a Manual of Best Practice.

In December 2011, the project issued reports on the infrastructure requirements for the integration of renewable energy in the Mediterranean partner countries' electricity systems. The reports, which are highly relevant for the BETTER project, include the relevant technical data of the network to perform the assessment of the needs for grid development and to make recommendation on the charging and usage protocol of the interconnections.

Further the project has elaborated national reports on Power System 2020 which analyse the adequacy of the electricity infrastructure as compared to the national expansion plans in particular concerning electricity generation by solar and wind energy.

The project is cooperating with the Association of Mediterranean Transmission System Operators (Med-TSO) and supports their first major study project, the elaboration of the Masterplan for the Mediterranean Electricity Interconnection. The will aim at defining a Reference Mediterranean Grid, including the interconnections and the related internal reinforcements of the grid. The activity will focus on:

¹⁹ See: http://www.pavingtheway-msp.eu/index.php?option=com_content&task=view&id=46&Itemid=56.

- ▲ Sharing criteria among the Mediterranean TSOs, consistent with ENTSO-E experience, of a coordinated rolling planning of transmission infrastructures;
- ▲ Analysing projects of interconnections and related reinforcements of internal grids planned in the short-term, whose feasibility studies are available and where applicable, eligible for European PCI (Project of Common Interest) and ENTSO-E coordinated planning procedures

The project consortium led by the German consulting firm MVV Decon, includes two national EU transmission system operators, TERNA (Italy) and RTE (France) as well as ENEA (Italy), national EU energy agencies and Sonelgaz (Algeria) energy utility companies in the Mediterranean Partner Countries. It is also supported by the nine Mediterranean Partner Countries local experts.

Table 6: List of the local experts from the Paving the Way for the Mediterranean solar Plan project

Country	Project coordinator	Email
Algeria	Mohamed Tayeb Maddi	mt_maddi@hotmail.com
Egypt	Mohamed Salah (jr) Elsobki	lnstrumne@hotmail.com
Israel	Z'ev Gross	gross.zev@gmail.com
Jordan	Ahmad Hiyasat	ahiyasat@yahoo.com
Lebanon	Ziad Jaber	ziadjaber@yahoo.com
Morocco	Mohamed Boutachali	mboutachali2@mail.com
Palestinian Territories	Imad Ibrik	iibrik@yahoo.com
Syria	Mohammed Khalil Sheki	mk-sheki@scs-net.org
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4.2.5 MED-CSP

The *Concentrating Solar Power for the Mediterranean Region (MED CSP)* is a project which focused on the electricity and water supply of the regions of Southern Europe (Portugal, Spain, Italy, Greece, Cyprus, Malta), North Africa (Morocco, Algeria, Tunisia, Libya, Egypt), Western Asia (Turkey, Iran, Iraq, Jordan, Israel, Lebanon, Syria) and the Arabian Peninsula (Saudi Arabia, Yemen, Oman, United Arab Emirates, Kuwait, Qatar, Bahrain) (DLR, 2005a). Main scope is to create a database for decision makers showing the potential of renewable energies to solve the regional energy and water shortage and the corresponding cost escalation (DLR, 2005b).

A set of criteria for sustainability is defined including not only environmental issues, but also socioeconomic efficiency and security of supply.

A scenario is developed showing (figure 2) that the growing demand for electricity and water can be satisfied in an affordable way by a well balanced mix of technologies and resources .

In particular, within the MED CSP framework, an overview of the present efforts and achievements in EU and MENA to reach sustainability in the energy sector is implemented, showing that the

measures taken up to now do not suffice to avoid increased climate gas emissions by the power sector. Also, an overview on the renewable energy technology portfolio is provided and renewable energy applications in the electricity sector including co-generation and sea water desalination. are presented.

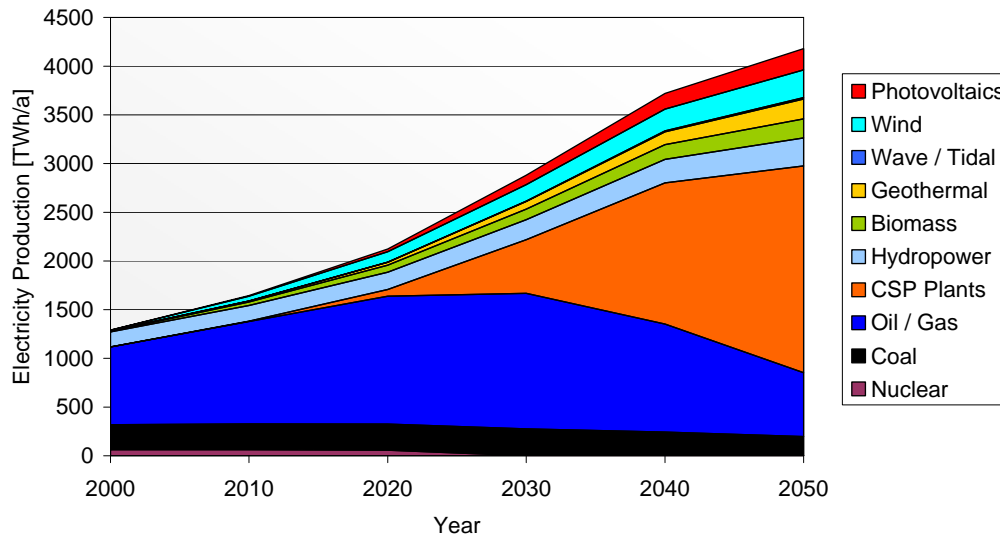


Figure 2: Annual electricity demand and generation within the countries in the MED-CSP scenario (DLR, 2005b)

Furthermore, the renewable energy potentials available in the EU-MENA region for each technology and for each country are analysed, while detailed mapping of resources and a quantification of the technical and economic potentials by country in terms of renewable electricity is provided, along with a representation of the quality of the different resources of each country, through special performance indicators. These performance indicators include Full Load Hours per Year (for Hydro, Bio, Wind, Wave/Tidal), Temperature at 5000 m Depth (for geothermal), Direct Normal Irradiance (for CSP) and Global Horizontal Irradiance (for PV).

Moreover the demand side potential for electricity and water for each country of the region as well as the possible step-by-step expansion of renewable energies in the Mediterranean region until 2050 scenario (Figure 2) were quantified. The MED-CSP scenario shows a way to match resources and demand in the frame of the technical, economic, ecologic and social constraints of each country in a sustainable way. Furthermore, the socio-economic and environmental impacts of the scenario are presented. Finally, the policy instruments and possibilities of finance from Kyoto-instruments to tax reductions, feed-in-laws and international grants are described.

One of the recommendations from the MED-CSP project is that an adequate set of policy instruments must be established immediately to accelerate renewable energy deployment in the EU and MENA region. Given the objective of identifying and facilitating opportunities to establish cooperation mechanisms between EU and certain MENA countries, the BETTER project should in principle build on these recommendations and attempt make them more concrete.

4.2.6 TRANS-CSP

The *Trans-Mediterranean interconnection for Concentrating Solar Power (TRANS CSP)* is a study analysing the renewable electricity potentials in Europe and their capability to provide firm power capacity on demand (DLR, 2006a). The concept includes an interconnection of the electricity grids of Europe and the MENA region and evaluates the potential and benefits of solar power imports from the South.

The TRANS-CSP study comprised a comprehensive data base on the present and expected demand for electricity and firm power capacity (DLR, 2006b), quantifies the available renewable energy resources and their applicability for power, provides scenarios of the electricity supply system until 2050 and evaluates the resulting socio-economic and environmental impacts for each of the analysed countries. In the TRANS-CSP study the technical options of transferring solar electricity from MENA region to Europe via hydrogen, through the conventional Alternating Current (AC) grid and by a possible future high voltage direct current (HVDC) infrastructure.

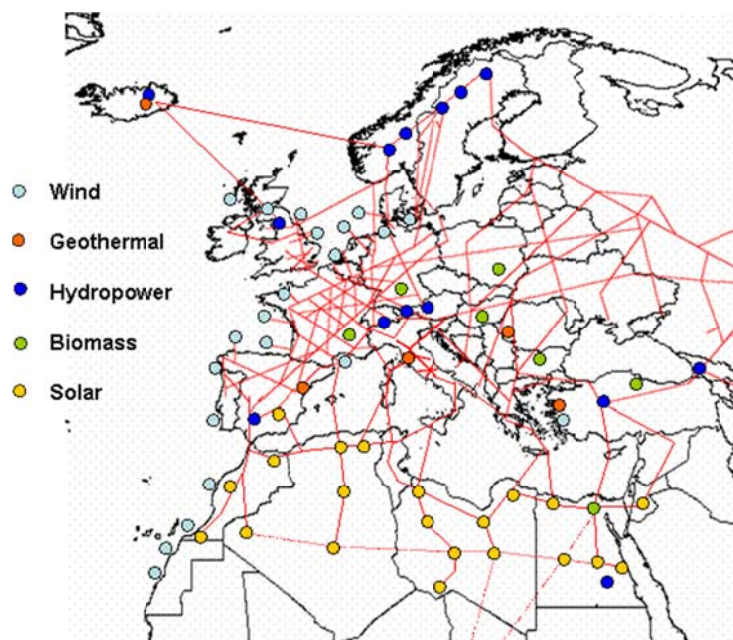


Figure 3: Vision of an EU-MENA backbone grid using HVDC power transmission technology (DLR, 2009)

The main indicators of the total EU-MENA High Voltage Direct Current (HVDC) interconnection and Concentrating Solar Power (CSP) plants from 2020 – 2050 according to the TRANS-CSP scenario are depicted in Table 7. In the final stage in 2050, lines with a capacity of 5 GW each will transmit about 700 TWh/y of electricity from 20 different locations in the MENA region to the main centres of demand in Europe.

Table 7: Main indicators of the total EU-MENA HVDC interconnection and CSP plants (DLR, 2006b)

Year		2020	2030	2040	2050
Transfer Capacity GW		2 x 5	8 x 5	14 x 5	20 x 5
Electricity Transfer TWh/y		60	230	470	700
Capacity Factor		0.60	0.67	0.75	0.80
Turnover Billion €/y		3.8	12.5	24	35
Land Area km x km	CSP HVDC	15 x 15 3100 x 0.1	30 x 30 3600 x 0.4	40 x 40 3600 x 0.7	50 x 50 3600 x 1.0
Investment Billion €	CSP HVDC	42 5	143 20	245 31	350 45
Elec. Cost €/kWh	CSP HVDC	0.050 0.014	0.045 0.010	0.040 0.010	0.040 0.010

Furthermore, the capability of a well balanced mix of renewable and fossil energy sources (domestic and imported) to provide secure, inexpensive and sustainable electricity for the supply of each of the European countries (scenario) is set and demonstrated. The political and financial issues of a strategy following the TRANS-CSP scenario are discussed, as well as the socio-economic and environmental impacts of the scenario.

With regard to RES integration, the TRANS-CSP study showed the need for efficient back-up infrastructure necessary to complement the renewable electricity mix, providing firm capacity on demand by quickly reacting, natural gas fired peaking plants, and by an efficient grid infrastructure to distribute renewable electricity from the best centres of production to the main centres of demand. The TRANS-CSP study provides a first information base, which the BETTER project can build on, for the design of a political framework that would facilitate a renewable energy partnership and a common free trade area for renewable energies in EU-MENA.

4.2.7 DESERTEC Foundation

DESERTEC Foundations is a global civil society initiative with a mission to implement DESERTEC Concept, a solution to provide climate protection, energy security and development by generating sustainable power from the sites where renewable sources of energy are at their most abundant. It was established in 2009 as a non-profit foundation. Through projects in Morocco, Egypt and Tunisia, and the DESERTEC University Network, it supports knowledge transfer and educational cooperation. It fosters exchange and cooperation with the private sector, for example with the foundation of the industrial initiative Dii GmbH, which will be described in section 4.2.9.

The DESERTEC Concept was developed by an international network of politicians, academics and economists. The Trans-Mediterranean Renewable Energy Cooperation (short: TREC) network later emerged the DESERTEC Foundation. The research institutes for renewable sources of the governments of Morocco (CDER), Algeria (NEAL), Libya (CSES), Egypt (NREA), Jordan (NERC) and Yemen (Universities of Sana'a and Aden) as well as the German Aerospace Centre (DLR) made significant contributions towards the development of the DESERTEC Concept. The studies were financed by the German Ministry of the Environment (BMU).

The results of the DESERTEC studies as well as proposals for action regarding the implementation of DESERTEC in the EU-MENA region (Europe, Middle East and North Africa) were summarized in a White Book, which was presented in the European Parliament in 2007.

In 2010, the DESERTEC Foundation launched the DESERTEC University Network as a platform for scientific and academic collaboration. It is committed to developing know-how and implementing study programs related to renewable energies. Besides the DESERTEC Foundation, the founding members are 18 universities and research facilities from the MENA region. Further universities from Europe have subsequently joined the network.

- ▲ In 2009, WEREEMa project is funded by the European Union and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. Under the leadership of the Investitionsbank Schleswig-Holstein, the DESERTEC Foundation and partners from Morocco and Germany are working together to improve the framework conditions for the rapid development of wind and other renewable energies in Morocco. This will be achieved through building capacity in education and research, network studies, wind measurements, pilot projects and economic cooperation.
- ▲ Another project, RE-Generation MENA, is funded by the German Foreign Office. The objective is to focus on a greater involvement of students in Egypt and Tunisia in the EU-MENA renewable energy sector. It aims to equip them with the skills to contribute fully to the democratic process by demanding the necessary conditions for the expansion of renewable energies in Egypt and Tunisia.
- ▲ On October 2012, the Ministry for Education and Scientific Research in Algeria and the German Ministry for the Environment, Nature Conservation and Nuclear Safety have agreed to cooperate on the construction of the first North African Solar Tower CSP plant. The pilot project is designed mainly for scientific research and will have a capacity of 7MW. The plans include a plant powered exclusively by solar energy, as well as one in hybrid combination with a gas driven power station. The German ambassador in Algeria, Götz Lingenthal stated that this project will help to further improve the German-Algerian Cooperation between the countries.

4.2.8 Dii Industrial Initiative

In 2009, the DESERTEC Foundation founded the industrial initiative Dii GmbH together with partners from the industrial and finance sectors.

Dii aims to bring the Desertec Concept in the focus region EU-MENA into reality, together with its 55 industrial partners across 13 countries (Dii, 2012). It is working towards the creation of a market for renewable energy from MENA deserts. The energy is intended to meet the local demand of the producing countries and should enable these countries to export such energy to Europe.

In 2011, Dii succeeded in concluding politically supported cooperation agreements (Memoranda of Understandings (MoUs)) in three countries - Morocco, Tunisia and Algeria - to support the development of renewables. In line with these agreements, Dii is developing country strategies in close collaboration with local partners which contain analyses of the sites, electricity networks,

regulatory structure, markets and socio-economic aspects and which will provide the basis for the first joint reference projects²⁰.

The following provides an update of the developments in the three countries:

- ▲ *Algeria*: The Algerian energy supplier Sonelgaz and Dii signed a Memorandum of Understanding on their future collaboration in December 2011. The agreement was reached in the presence of the EU Energy Commissioner Günther Oettinger and the Algerian Minister for Energy and Mining Youcef Yousfi during a high-level meeting between Algeria and the EU in Brussels. The focus of this partnership is the intense exchange of technical expertise, market development issues and support of renewable energy advancement in Algeria. The activities on both sides of this collaboration will promote industrial cooperation in Algeria, including the creation of jobs. This partnership represents the first step towards developing joint projects in Algeria.
- ▲ *Morocco*: In May 2011, Dii and the Moroccan Agency for Solar Energy (MASEN), signed a Memorandum of Understanding for the development of a large solar project in Morocco. The specificity of this first Dii Reference Project is to demonstrate the export feasibility of solar generated electricity in the deserts to Europe, using existing lines between Spain and Morocco. MASEN acts as project developer and manages the overall process in Morocco, especially the specification of the project and the identification of locations. Dii acts as enabler, providing its expertise in developing a feasible business case for the planned solar project. This Reference Project, with a total capacity of 500 MW, will be a combination of solar thermal power plants (400 MW) and photovoltaics (100 MW). The estimated cost for the entire Reference Project in Morocco is approx. €2 billion. The first phase of the project will be a 150 MW pilot plant expected to be a solar thermal station with an estimated cost of €600 million. Following specification, invitation to tender and construction, the first available power from the joint Dii/MASEN project could be fed into the Moroccan and Spanish grids around 2014-16 depending on the technology selected. Dii, in co-operation with the system operator ONEE and IAEW/RWTH Aachen, has carried out a grid congestion analysis, which highlights the feasibility of integrating the Reference Project into the Moroccan grid.
- ▲ *Tunisia*: In Tunisia, STEG Énergies Renouvelables, a subsidiary of the Tunisian state utility company, and Dii are currently working on a pre-feasibility study within the framework of a co-operation agreement signed by Dii and Tunisian authorities in 2011. The study focuses on substantial solar and wind energy projects in Tunisia. Technical and regulatory prerequisites, necessary for both local energy consumption and the export of electricity to neighbouring countries, as well as the capacity of the electricity network to integrate desert power, are being reviewed. The study also evaluates the financing of a possible reference project in Tunisia together with EU member states, the Tunisian government, local and European industries. In January 2012, several sites for the development of large-scale renewable energy projects were identified.

4.2.9 The transgreen project / Medgrid

Transgreen was founded within the framework of the Mediterranean Solar Plan of the Union for the Mediterranean. This industrial initiative is aimed at promoting the construction of power transmission

²⁰ http://www.diiemena.com/fileadmin/Daten/Downloads/Factsheet%20on%20Dii/Factsheet_Dii%20Referenzprojekte_EN.pdf.

lines in the Mediterranean region and thus complementing the work of Dii GmbH. TransGreen will be part of the Mediterranean Solar Plan, a scheme aiming to help countries on the southern shore of the Mediterranean, such as North African countries, to develop their energy potential and cope with an increasing demand. The plan aims to produce solar energy for 20GW by 2020, 5GW of which to be exported to Europe. TransGreen will deliver to Europe, part of the energy generated by Desertec. The project, a French initiative, aims to bring together power companies, network operators and high-tension equipment makers. A consortium of twenty plus utilities, grid operators, equipment makers, financing institutions and investors, mostly European, envisioned Medgrid in December 2010. The objective is to transmit electricity from solar or wind power plants to load centres on either rim of the Mediterranean. Medgrid is promoting new high capacity electricity links around the Mediterranean, studying their feasibility from the technical, economic and institutional standpoints. Medgrid was set up to develop electrical interconnections between countries north, south and east of the Mediterranean. Medgrid has several missions, as follows (MEDGRID, 2012):

- ▲ To design a Mediterranean transmission network able to export 5GW into Europe by 2020;
- ▲ To promote regulation favourable to investment and to the viability of generation projects on the southern rim of the Mediterranean; this will involve buy-back schemes, emissions trading, fiscal incentives, etc;
- ▲ To assess the positive effects of investment in infrastructure and electricity trading on growth, economic activity and job creation;
- ▲ To develop technical cooperation over trans-Mediterranean projects;
- ▲ To promote European technology and industry on the global market, especially in renewable electricity generation, DC technology and HVDC submarine cables.

Under a first phase running until 2012, the consortium would carry out feasibility studies for laying a huge network of high-tension, undersea power lines.

4.2.10 UfM and Dii Cooperation

In May 2012, the Union for the Mediterranean (UfM) and Dii have signed a Memorandum of Understanding for future collaboration, as both institutions strive for the same long-term objective in fostering the use of renewable energy in the Mediterranean region (UfM; Dii, 2012). The UfM and Dii will work on enhancing and intensifying their cooperation in order to utilize existing synergies. UfM and Dii will develop their long-term strategies “Mediterranean Solar Plan” and “Desert Power 2050” for one common cause. In particular, both organisations will cooperate in the fields of policy and regulatory frameworks, assessment of transmission and storage infrastructures, EU-MENA interconnections, financing tools and support schemes. A further crucial issue apparent in the Mediterranean Region will also be addressed., that being the socio-economic and industrial development and employment promotion.

4.2.11 Dii and Medgrid Cooperation

In November 2011 a Memorandum of Understanding (MoU) between the Desertec Industry Initiative (Dii) and Medgrid closer cooperation between the two private industry initiatives, which are key to the promotion of a renewable energy partnership between the EU and countries in the Southern Mediterranean was signed (EC, 2011). Areas of cooperation will include exchange of information,

update on progress, joint evaluation of potential synergies, and joint efforts on the EU and MENA level to obtain a more favourable regulatory framework for renewable energy markets.

4.2.12 MEDRES

The aim of the project Cost Effective Renewable Energy for Rural Areas in the Mediterranean Region (MEDRES), funded under the EU-FP6 programme, is to foster international cooperation along the Mediterranean region on the use of innovative energy technologies and solutions to achieve sustainable development in the area. In order to contribute to this ambitious objective, enhanced knowledge transfer and knowledge sharing are needed. Based on this, a quite balanced consortium composed of several participants with complementary skills from the Euro-Mediterranean region has been built up under the coordination of the Observatoire Méditerranéen de l'Energie, OME (ADEME, 2009).

Basic objectives of the project include:

- ▲ to assess the opportunities for cost-effective renewable energies for rural areas and villages (by selection and analysis of pilot projects);
- ▲ to assess the real effectiveness of “new” technologies through better knowledge of end user acceptability for energy efficient technologies and practices;
- ▲ to measure the impact of electrification on socio-economic development in rural areas.

In particular, four very different projects were selected,

- ▲ *The Moroccan case study:* from solar home systems (SHS) to the national grid in the village of Oulad Ali Ben Ahmed;
- ▲ *The Algerian case study:* micro PV plants and the national grid as two parallel supply schemes;
- ▲ *The Tunisian case study:* electrification of scattered households in the village of Sers with solar home systems (SHS);
- ▲ *The Egyptian case study:* electrification of the village of El Mathany with a wind and diesel hybrid system.

Moreover, two types of questionnaires were developed, structured in a way to attain as much information as possible regarding the studied households identification, the health conditions, access to education, access to leisure, life at work, access to electricity and the level of involvement of the population in the project design and implementation. The overall representation of the four case studies indicators is exhibited in Figure 4.

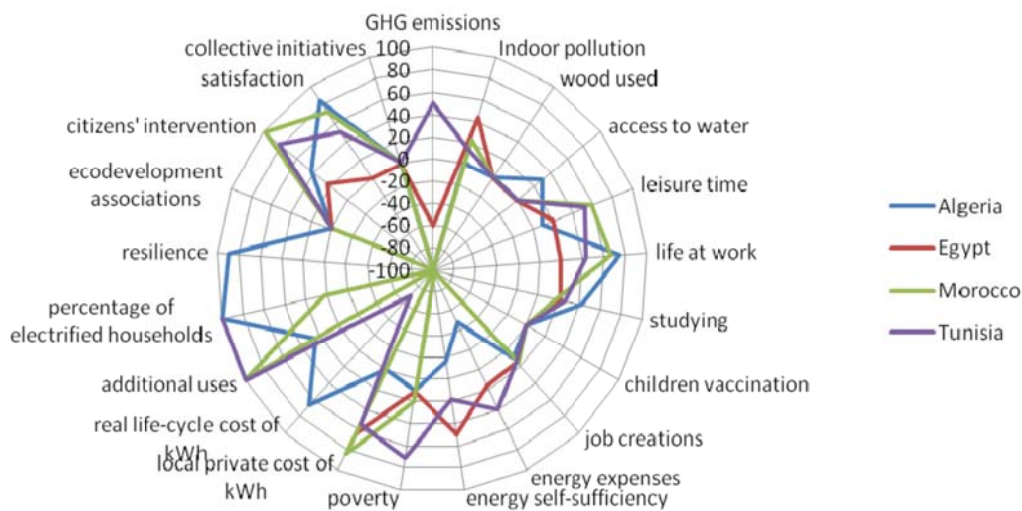


Figure 4: Global representation of the indicators for the four case studies (ADEME, 2009)

4.2.13 RES4MED

RES4MED (Renewable Energy Solutions for the Mediterranean) is a non-profit association that aims at promoting the development of renewable energy and its transportation in the Mediterranean area. This platform is established by Enel Green Power together with Edison, Confédération européenne des syndicats indépendants (CESI), Gestore dei Servizi Energetici (GSE), Price Waterhouse Cooper (PwC) and the Polytechnic of Milan. RES4MED intends to be an additional reference point for Southern Mediterranean and Balkan stakeholders and expects to play the role of “network of networks” for the on-going Mediterranean Initiatives by:

- ▲ contributing to a foster deployment of RE plants and systems in order to satisfy Southern and Eastern countries’ needs – both large scale power and distributed energy;
- ▲ supporting the planning and design phases of additional national electric grids to supply an efficient distribution of clean energy towards local consumption centres;
- ▲ fostering medium term regional interconnections between southern EU, northern Africa and Balkans in order to facilitate import of part of the energy produced, also to increase bankability of such projects;
- ▲ considering social, economic benefits for host countries.

4.2.14 TuNuR

TuNur is a joint-venture formed by Nur Energie and group of Tunisian investors. TuNUR has been endorsed by the DESERTEC Foundation and is a concrete project developing all the key elements of DESERTEC Concept. TuNur is also a shareholder in the MedGrid initiative and an associate partner in the Dii.

TuNur will be a 2000 MW Concentrating Solar-thermal Power (CSP) tower plant in Tunisia. To be able to supply electricity day and night, the plant will be equipped with heat storage tanks. This will provide stability to electricity grids with fluctuating energy sources such as photovoltaic and wind power. Electricity from the plant will be exported to Europe by sub-marine high-voltage direct current cables via Italy.