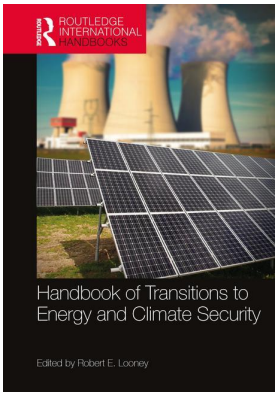

Handbook of Transitions to Energy and Climate Security

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Renewable energy in the MENA

Publication details
https://www.routledgehandbooks.com/doi/10.4324/9781315723617-5
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Published online on: 29 Nov 2016

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Renewable energy in the MENA

Why did the Desertec approach fail?

Luigi Carafa and Gonzalo Escribano

Introduction

A Desertec Industrial Initiative (Dii) was created in 2009 with an ambitious mission to source 15% of Europe's power needs from North African desert solar power by 2050. As in other developing countries, deploying solar energy in the Middle East and North Africa (MENA) implies significant investment risks which are higher than in developed countries. Higher risks for investors are linked to uncertainties in a number of areas such as weak regulations for the promotion of electricity from renewable energy sources (RES-E), lack of qualified staff, construction delays, and so forth (see section 3). Higher investment risks translate into higher overall project finance costs.

The Desertec approach was aimed to reduce the above uncertainties and create a pipeline of projects across the region, but failed to do so. In October 2014, the export-based Desertec vision collapsed.[1]

At the time of writing, engineers are completing Ouarzazate Noor I Concentrated Solar Power (CSP) plant in Morocco – the first large-scale solar project which most resembles the initial Desertec concept. 500,000 parabolic mirrors placed in 800 rows follow the sun as it moves throughout the day. Each solar mirror is 12 metres high and focused on a steel pipeline carrying a heat transfer solution. This solution is warmed during the process, getting into a heat engine where it is mixed with water to create steam that turns power generating turbines. This 160 MW plant will become operational by the end of 2015, providing electricity to 275,000 homes. It will be followed by Noor 2 and 3 plants later in 2017.[2]

Why did political and industrial initiatives built around the Desertec vision fail in the end? This chapter seeks to answer this question. To do so, Section 2 takes stock of the state of development of renewable energy in the MENA. Section 3 tracks the trajectory of industrial initiatives and political cooperation such as Dii and the Mediterranean Solar Plan, and it delves deep into the causes of failure of the Desertec vision. Section 4 analyses a number of misperceptions regarding energy security that negatively affected the realization of the Desertec vision. Section 5 elaborates on the need to re-think regional and industrial cooperation around a more inclusive narrative of sustainable energy development. For the sake of clarity, this

chapter restricts its focus to Europe's MENA neighbouring countries, excluding Turkey, Yemen, Sudan, Saudi Arabia, UAE, Iraq, Kuwait, Qatar, and Bahrain.

This chapter makes three main contributions. Firstly, it investigates why the Desertec approach failed to boost a broad regional energy transition in the MENA – arguing that the lack of public acceptance of a vision based on electricity export towards Europe coupled with the changing political situation in several MENA countries resulted in the lack of a clear project pipeline across the region. Secondly, it contributes to the growing body of literature on the economics of renewable energy in the MENA. Thirdly, this study makes a contribution to the debate on the future of regional energy cooperation in the MENA.

Renewable energy in the MENA: the state of development

Electricity is a key concern for the countries of the Middle East and North Africa. Power generation takes up the largest share of primary energy, i.e. mostly fossil fuels. The electricity sector equally represents the largest source of carbon emissions in the region – with 943 million tonnes of CO_2 per year ($MtCO_2$/year) accounting for 42% of total emissions in 2011.[3]

MENA countries account for almost half of total pre-tax global energy subsidies, with expenditure reaching USD 236 billion in 2011 compared to a global total of USD 481 billion.[4] Coupled with this, booming population and economic development make electricity consumption grow twice as fast as the world average.[5]

Power generation capacities will have to be quadrupled until 2050. In other words, MENA countries will need infrastructure investments of at least USD 676 billion by 2050.[6] Under a business-as-usual scenario, growing electricity demand will continue to rely on fossil fuels mostly. This implies that net exporting countries will experience a reduction in their hydrocarbon export capacity; net importing countries will experience an increase in their fossil fuel import bill and its associated fiscal costs. As a result, power-related carbon emissions are set to steadily increase rather than decrease.

To escape business-as-usual and reduce carbon emissions, MENA countries need to shift towards electricity from renewable energy sources (mostly solar and wind) as well as increase energy efficiency. In order to better understand the state of progress and the challenges that lie ahead in the MENA, three important factors have to be taken into account: technology development, finance and policy.

From a technology development perspective, photovoltaic (PV) and wind technologies registered dramatic progress over the last decade and became fully competitive for power generation vis-à-vis fossil fuel power generation. Solar thermal technologies, also known as concentrated solar power, hold a great potential in the MENA but still need to advance along its cost curve. Electricity from CSP can be supplied 24 hours-a-day, 7 days-a-week, 365 days-a-year with no need for a fossil fuel back-up. Given the high upfront costs, CSP developments have been limited to hybrid plants or pilot projects such as the Ouarzazate Noor I plant – which is expected to be operational by the end of 2015. The pipeline of the CSP project is slowly growing as technology development progresses along the cost curve. Chiefly, further technology development of heat storage is needed to bring costs down. For ongoing CSP projects to be profitable in the MENA, concessional finance has been of primary importance. The case of the Noor CSP complex in Morocco is a telling example.[7]

From a finance perspective, a transition to RES-E poses remarkable challenges to MENA countries. Firstly, conventional power generation investments have to be shifted from high-carbon to low-carbon technologies. Secondly, investments need to be further topped up by USD 739 billion by 2050[8] – with fossil fuels still dominating the electricity fuel mix, and with a

large development of non-hydro renewables (mainly solar and wind). Solar and wind power plants require higher upfront costs than fossil fuel-based power plants. In addition to that, fossil fuel subsidies also have a downside distortive effect on upfront costs. Meanwhile, solar and wind power plants require smaller maintenance costs than fossil fuel-based power plants.

The total renewable energy finance attracted by MENA countries substantively increased from $0.6 billion in 2004 to $12.6 billion in 2014.[9] Renewable energy investment towards the MENA increased every year by 36% on average, registering the world's second-highest mean annual growth rate only following China. Over the last decade, the largest shares within the whole region went to Jordan, Egypt, and Morocco – the latter tops the list with $635 million for the 160MW Ouarzazate Noor I CSP project. (see Table 5.1).

These data show a positive upward trend, registering a dramatic increase in investments towards the MENA between 2012 and 2014. This reflects the high-quality of solar and wind energy resources as well as the vast untapped potential which the MENA is endowed with. However, the region as a whole is still lagging behind at a global scale. The MENA only accounted for around 1–1.5% of the global total renewable energy investment between 2004 and 2011. In 2014, the MENA only accounted for 4.7% of the global total renewable energy investment – a long way after China, Europe, Asia and the United States (in this order).

From a policy perspective, MENA countries are still lagging behind. The Arab Future Energy Index registers the state of play of MENA governments in this respect.[10] With the only exceptions of Morocco and Jordan, all the other MENA countries score very low in terms of policy frameworks, institutional capacity, market structure and financing capacity. Egypt, Tunisia, Palestine, and Algeria score below 40%. Lebanon stops at 26%. While most of the MENA countries identified clear renewable energy targets, only Morocco and Jordan started to develop consistent national policies and have been able to attract significant public and private investment to date going beyond $500 million investment per project.[11]

Cooperation has been reinforced and further developed at regional, multilateral, and industrial levels. At regional level, the European Union (EU) and its MENA neighbours are engaged in intergovernmental cooperation within the Mediterranean Solar Plan. A number of regional technical platforms were established. At multilateral level, IFIs are implementing a USD 750 million MENA CSP Investment Plan endorsed by the Clean Technology Fund.[12] At industrial level, three private industrial consortiums were established, namely the Desertec Industrial Initiative, Medgrid, and Res4Med.

To this point, the landscape for solar and wind deployment has changed favourably as compared to 2004 – a time when developments were extremely limited. Most positive developments occurred at the national level, where there is an increasing awareness by governments of the urgent need to act as well as of the opportunities unleashed by renewables. There are big yet surmountable challenges for MENA governments which call for an increasing reform of their electricity sectors. Beyond the national level, International Financial Institutions (IFIs) played a key role in facilitating concessional finance towards reference projects such as Ouarzazate Noor I CSP plant in Morocco. By contrast, industrial and political approaches have failed or achieved little change so far.

Why did Desertec and the Mediterranean Solar Plan fail to boost a regional transition to renewables in the MENA?

This section explores the reasons why industrial and political approaches built around the Desertec vision failed to boost a sustained transition to renewables in the MENA region.

Table 5.1 Renewable energy investment in the MENA, $ billion (2004–2014)

Unit ($bn per year)	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
MENA	0.6	0.8	1.1	2.4	2.3	1.7	4.2	2.9	10.4	8.7	12.6
China	3.0	8.2	11.1	16.6	25.7	39.5	38.7	49.1	62.8	62.6	83.3
Europe	23.6	33.6	46.7	66.4	81.6	81.2	111.1	120.7	89.6	57.3	57.5
Asia (without China and India)	7.2	9.2	10.0	12.5	13.6	13.7	19.3	24.1	30.5	44.7	48.7
United States	5.4	11.6	29.1	33.0	35.1	24.3	35.1	50.0	38.2	36.0	38.3
World total	45.1	72.9	112.1	153.9	181.8	178.5	237.2	278.8	256.4	231.8	270.2
MENA share of world total	1.3%	1.1%	1%	1.5%	1.3%	0.9%	1.8%	1%	4%	3.7%	4.7%

Own calculations based on data from BNEF, *Global Trends*.

An important premise is needed at this point. From a project financing perspective, developing solar and wind power plants in the MENA implies significant investment risks which are higher than in developed countries.[13] Higher risks are linked to uncertainties in a number of areas such as sub-optimal regulations for the promotion of RES-E, lack of qualified staff, construction delays, weak government institutions, corruption, and so forth.[14] When compared to a similar project in developed countries, higher investment risks translate into an extra cost in the overall project finance costs. Industrial and political approaches built around the Desertec vision aimed to reduce the above uncertainties and create a pipeline of projects across the region.

Behind the so-called Desertec concept there was a partnership between the Club of Rome, the Hamburg Climate Protection Foundation and the National Energy Research Centre of Jordan founded in 2003 under the label Trans-Mediterranean Renewable Energy Cooperation Network (TREC). In collaboration with scientists of the German Aerospace Centre (DLR), TREC put forward a vision of an EU-MENA community of shared clean energy and water interests.[15] The Desertec concept gained support from both politics and industry in Germany, and later at European level. A White Book for Desertec was presented at the European Parliament in November 2007. The Desertec concept received further support at legislative level with Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Article 9 of this directive would virtually allow EU member states to import clean electricity from third countries.

In July 2009 a group of mostly German companies established the Desertec Industrial Initiative (Dii) with the aim of turning the Desertec concept into a reality by 2050. In July 2010 a French initiative called Medgrid was created, later followed by an Italian industrial initiative called Renewable energy solutions for the Mediterranean (Res4Med).

Initially, Dii started out with the aim of developing large-scale projects across the MENA. With the global downturn and the Arab uprisings, however, this business model became challenging. Dii had to face the defection of key German shareholders Bosch, Siemens, E.ON and associated partner Bilfinger – which changed their business strategies, in some cases (i.e. Siemens) even closing down their CSP departments. The lack of public acceptance of the Desertec vision (i.e. electricity export towards Europe) coupled with big uncertainties about the changing political situation in several MENA countries resulted in the lack of a clear project pipeline across the region. This paved the way for a fundamental transformation of Dii in October 2014.[16]

At political level, intergovernmental cooperation was framed under the Mediterranean Solar Plan (MSP) umbrella. The Union for the Mediterranean (UfM) initiated a multi-stakeholder process, in an attempt to create a regional strategy for the deployment of 20 GW of installed renewable energy capacity by 2020 along with the necessary transmission capacity and cross-border interconnections.[17] In addition to this, the European Commission created in 2010 a technical assistance project named 'Paving the Way for the Mediterranean Solar Plan' (PWMSP). With a budget of EUR 4.6 million, this project provided technical analysis of issues as varied as regulatory frameworks, support to investment, infrastructure requirements and transfer of knowledge.[18]

Such a multi-stakeholder process managed to achieve a low-common-denominator strategy in Jordan in May 2013.[19] This regional strategy, called 'Master Plan', was supposed to be submitted to the UfM Energy Ministerial Conference for political endorsement in December of the same year, but did not make it to the final political stage. While objections in the field of energy cooperation traditionally arose from partners in the South of the Mediterranean, this time things went differently. Spain had little option other than to oppose the submission of this document to the Energy Ministers. Madrid did not support a German-Moroccan proposal of

statistical transfer (rather than physical transfer) of electricity. Likewise, Madrid expressed its concerns about clean electricity trade from Morocco to Europe when there is an overcapacity in Spain.[20]

Spain currently exports electricity to Morocco, covering as much as 10% of the domestic electricity consumption. However, more sustained electricity cooperation between Spain and Morocco could be mutually beneficial in the long run – unleashing possibilities to better integrate renewables into the energy mix in both countries. Better connection of this larger grid with the European grid would offer export avenues for overcapacity via France.

For this to happen, France and Spain should put an end to an old dispute on the reinforcement of their cross-border electricity interconnections. Paris maintains the Iberian Peninsula in the condition of an 'electricity island' with an interconnection capacity as low as 3%. In October 2014, the European Council asked the European Commission and EU countries to take urgent measures to reach a 10% minimum electricity interconnection capacity target by 2020. The European Council also added a non-binding target of 15% interconnectivity by 2030.[21] This requires real commitment of all national governments (France included) in order to escape politics and focus on serious policy.

Debunking the myths of RES-E in the MENA

The deployment of RES in the EU's Southern Neighbourhood has been hampered by European misperceptions regarding energy security. This continues to be one of the main arguments put forward by its critics. It has been argued that contrary to domestic RES generation, which improves energy security through the reduction of energy imports and energy dependency, importing RES electricity from the Southern shore of the Mediterranean would increase European energy dependency and therefore its supply insecurity. This section takes the opposite view, showing that under certain conditions RES imports do not necessarily harm European energy security and can even improve it.

In fact, vested interests and RES protectionism in the European energy sector may well be behind these rather unspecified energy security concerns. The Desertec timing (as happened with the Mediterranean Solar Plan) was especially unfortunate because the Arab Spring caught its promoters by surprise. The increased perception of geopolitical risks associated with the project was not adequately factored in, nor were its long-term economic development spill-overs, as will be seen in the next section. Because of this, Desertec was unable to capitalize the role of RES in fostering economic development and therefore long-term political stability. Instead of constructing a discourse for sustainable and inclusive development aligned with the demands expressed by the Arab Spring, Desertec got entrenched in an obsolete Eurocentric and elite-driven regional approach unable to articulate a new narrative addressing the contribution of RES to mitigate geopolitical risks.

The energy security implications for Europe of importing RES from Mediterranean Partner Countries (MPCs) have been analysed applying portfolio choice theory and its risk-cost trade-off. Assuming that solar electricity generation from North Africa is included in the EU's energy portfolio under the same risk conditions prevailing in the EU (same return/cost variability), both PV) and thermo-solar (CSP) technologies yield higher returns in MPCs due to higher insolation levels, pushing the efficient risk/cost frontier upwards. Thus, the equilibrium shifts towards a more efficient portfolio with lower cost levels and similar risks. In turn, if lower costs come with higher risk levels, the equilibrium may not achieve any significant improvement in the cost-risk trade-off. In the worst-case scenario the integration of MPCs RES into the EU could outpace the above-mentioned cost reductions with even higher risk levels.[22] It has been

suggested that electricity policies in MPCs are path-dependent, and that technical and financial assistance should target areas with a particular de-risking potential: namely capacity-building on project assessment, project finance, and grid management.[23]

The usual claim is that RES imports from MPCs imply the same geopolitical risks associated with energy dependence in fossil fuels: dependency upon foreign resources. However, this argument is not supported by a careful economic analysis of international RES and risks.[24] In the first place, access to RES generation from abroad entails the diversification of geographical origins, energy sources, or both. In that case, the European vulnerability could actually decrease for a given energy dependency ratio.[25] New RES resources and technologies from new exporting countries increase European energy diversification, reducing vulnerability even if they come from the same countries that traditionally supply the EU with fossil fuels. For instance, importing solar electricity from Algeria into the EU does increase both diversification and dependence for both the EU (supply) and Algeria (demand). From a portfolio perspective such a diversification of sources and suppliers reduces vulnerability, compensating for the deterioration of energy dependence indicators.

Second, the technical characteristics of RES also limit their use as a political weapon. Electricity generation from RES cannot be stored or re-routed as easily as hydrocarbons. Electricity storage costs will remain high in the medium term, while re-directing electricity exports is not possible in the absence of expensive and lengthy to build infrastructures, like high tension lines and interconnectors. Therefore, a Mediterranean Partner Country could not just cut its electricity supply to the EU without simply wasting the resource, at least in the short term. In the longer run, redirecting green electricity supply towards domestic markets would require transmission investments and could increase its cost above either politically or economically acceptable levels in countries already afflicted by the dual problem of poor household difficulties with energy access and the associated (and fiscally unsustainable) cost of energy subsidies to mitigate energy poverty.

Regulation and geopolitics constitute the main risks faced by RES investments in MPCs. Starting with regulatory risks, it is worth mentioning that they are not the monopoly of MPCs, as shown by the recent German and Spanish regulatory changes in their respective RES support schemes. As stated above, the upward shift in the risk/cost efficient frontier can only occur under similar levels of regulatory risk and property rights protection that prevails in the importing market. In this regard, the risk to European consumers of RES imports from Southern Mediterranean producers depends upon the regulatory and institutional convergence of these countries towards the energy-related *acquis communautaire*. While such a convergence can be initially limited to renewable electricity, it may incrementally spill over the whole electricity sector, given its physical and normative inter-connectedness.

To reduce regulatory risk, the EU followed a dual track approach. On the European side, the Commission delivered an institutional framework in Directive 2009/28 on renewable energy, introducing the possibility of developing joint projects and support mechanisms, and eventually extending flexibility mechanisms to neighbouring countries. On the other hand, MPCs should converge towards the EU energy-related *acquis communautaire*, at least in the field of renewable energy. This convergence entails highly technical issues, like the interoperability of electricity systems and the related harmonization of certifications and standards. But it also touches on more sensitive issues that may alter national political economy balances, like support mechanisms and its control, access to the grid, public procurement rules or authorizations.

Both paths failed in several respects, and not only due to unfortunate timing. The mechanisms established by the Commission were thought to reduce the regulatory risks of exporting RES electricity to the EU. Nobody anticipated (in a 2009 Directive) that the financial crisis was

to pulverize all electricity demand projections, and therefore that no RES electricity imports will be needed to fulfil the 2020 national RES targets (20%). Moreover, electricity demand stagnation in the EU left European utilities afflicted by excess capacity. As of today, if there were infrastructures and regulation frameworks in place, it would be European utilities exporting electricity to MPCs, to be sure, mainly non-renewable electricity. In fact, the only functioning synchronized electricity interconnection between the EU and the MPCs is used to export electricity from Spain to Morocco (as much as 10% of Moroccan domestic electricity consumption). However, it should be taken into account that the existing interconnections with EU neighbours are based on regulated exchanges, which has necessitated to date extraordinary non-market figures.[26]

Finally, RES support fatigue in the midst of a fiscal crisis erased the appetite for new (and even worse) transnational support mechanisms in countries. This is why Spain blocked the Mediterranean Solar Plan on the grounds that before interconnecting the EU with its neighbours it would be wise to interconnect the EU itself. This was the death certificate for the only proposal to date that has tried to explore a differentiated regulatory framework limited to renewable energies outside the EU. So, the regulation enacted by the EU became obsolete in market terms: the demand was simply not there and European utilities' appetite for RES disappeared within the EU, not to mention those Mediterranean countries where revolutions were taking place. The risks the European Commission wanted to address became irrelevant because of new market conditions, but also due to the emergence of geopolitical risks. Compared to geopolitics, regulatory risks are much easier to manage (or should be), so when geopolitical instability enters the scene, concerns on regulation tend to fade away.

The irruption of the geopolitical logic also led us to the failure of normative convergence from the Mediterranean side. With the only exception of Morocco, by 2011 the countries targeted by Desertec (mainly Egypt and Tunisia) entered difficult and uncertain political times. The Middle East dimension (the Gulf Cooperation countries) was closed due to the Syrian and then Iraqi wars. In this context, the deployment of renewables was the last priority for these countries. In North Africa, only Algeria and Morocco remained stable enough to advance in reforming its energy sector. And only Morocco has made significant in-roads in converging, however slowly and in a fragmented manner, towards EU-like, or at least EU-compatible RES rules. Furthermore, in Morocco it has led to a process of normative diffusion through policy networks with potential spillovers on the whole energy sector. Egypt and Tunisia are trying to catch up, but it will take time for regulatory improvements to be more visible than political instability or security concerns. Adaptation and mitigation policy incentives are equally lagging well behind those enacted by the EU.[27]

Only in this regard, RES geopolitics is not that different from hydrocarbons. While there are clear limitations on the capacity to project power through RES, access to renewable resources involves geopolitical risks to the same extent that accessing oil or gas fields, but no more. The point here is not that RES do not imply such kinds of risk, but rather that this is not a risk specific to RES: certainly it is going to be very difficult to develop RES investments in Libya in coming years, but this is exactly the case with oil and gas investments. In the same vein but from the regulatory perspective, RES investments in Algeria face the same regulatory and fiscal burdens that have almost paralysed investment in the hydrocarbon sector. But this does not mean that RES cannot be developed in politically stable countries involved in a (slow) reform process of their energy policies, like Morocco; or that it should not be conceived as a tool to foster energy development and sustainability (environmental and economic) in countries like Tunisia, Jordan or Egypt.

There is no great regulatory design that can counteract current geopolitical drivers, be it a Euromed Energy Community or a Mediterranean Platform for renewable energies as proposed by the European Commission. However, a more differentiated approach that takes account of the different geopolitical and regulatory contexts and delivers tangible results in the short term would be needed to deal with diverging MPCs preferences. After all, differentiation entails geopolitics by other (normative) means. On a country level: taking stock of Moroccan stability, proximity, existing infrastructures and gradual energy reforms; and offering Tunisia the incentives to develop its solar and wind resources. On the deployment strategy: favour institutional innovation, reduce scale and forget about RES exports in the short term. On the timing: leave scaling up for the medium term with technologies' cost reduction and focus on supplying domestic demand. Regional designs, including imports and exports in a homogeneous Mediterranean energy space, are urgent, but for the long term.

Re-framing regional cooperation around a narrative of sustainable energy development

Geopolitics and lack of regulatory convergence were not the only external obstacles to the Desertec initiative. As shown, the institutional framework was not sufficiently propitious for its de-risking strategies to deliver real incentives to investors. Moreover, the European narrative focused on narrow economic and technical issues, without developing a coherent and inclusive discourse that could make a difference when compared with traditional energy relations. On the geopolitical arena it did not address the fundamental question that RES could improve not only European, but also North African energy security, especially in fossil fuel importers like Morocco, Tunisia, Jordan and Egypt.

Concerning regulatory convergence, the 'Europeanization' narrative turned out to be counterproductive, as happened with other 'external governance' European initiatives in the neighbourhood. However 'normative' they were labelled, they were received as geopolitics by other (normative) means. For instance, the Neighbourhood Policy has been criticized for proposing an empire by example or imposing regional normative hegemony,[28] or for neglecting that its soft normative approach has hard consequences for the people living in the European neighbourhood.[29] At any rate, external governance and Europeanization cannot constitute a sufficiently attractive narrative for sustainable energy cooperation in the Mediterranean. The most descriptive definition of such a narrative came from the Algerian government when it labelled the Neighbourhood Policy '*gouvernance par télécommande*', and few moves have been made from the European side to change that perception in MPCs.

The European narrative has failed to deliver a credible framework partly because it has not addressed MPCs' preferences properly. For sure, these countries were interested in profiting from structural comparative advantages like high insolation or wind load factors, as well as abundant land and labour. But they were, and still are, more interested in building dynamic advantages like industrial clusters, innovative regulation, technological transfers, training and technical skills. This section identifies the lack of a European narrative on RES cooperation being a driver for economic development in MPCs as one of the main weaknesses in the European approach. Instead, at best it was perceived in the Southern shore of the Mediterranean as a eurocentric project to serve European environmental preferences. Less indulgent observers only saw a strategy to promote European utilities, industries and engineering firms, and something that could be termed renewable imperialism in the sense that it replicates previous (and to some extent existing) European patterns of resource extraction.[30]

Perhaps more importantly, the European discourse was completely disconnected from the more constructive narrative that the Union for the Mediterranean inherited from the Barcelona Process: achieving a shared space of peace and prosperity in the Euro-Mediterranean region. The EU missed the opportunity to elaborate such a narrative for the first time in energy issues, portraying RES as an instrument of sustainable energy development in the Mediterranean. Energy development would imply RES supplying part of the increase in its electricity demand; contributing to modernize MPCs energy services and alleviate energy poverty; and using their renewable energy resources to dynamize the economy and create jobs. Their demands to the EU were the provision of technical cooperation, training and technology transfers to fully reap the overall benefits and externalities of RES deployment.

The literature on the impact of RES deployment confirms the potential for significant economic gains in MPCs. De Arce et al. conclude that RES deployment will push Moroccan GDP between 1.17% and 1.9% at the end of the period (2040) according to different scenarios.[31] Always depending on the scenario, between 267,000 and 482,000 jobs could be created. Other simulation exercises also confirm the economic viability of renewable energies in an eventual Euro-Mediterranean power system.[32] For instance, the optimization of RES goals could actually decrease overall energy system costs in the region.[33] However, some authors highlight that institutional lags remain in place. Even in Morocco, by far the most advanced MPC in this field, the literature identifies obstacles related to uncertainty and informality, concluding that in the CSP sector any significant increase in foreign investment requires removing several financial and legal barriers.[34] Other studies show that, by 2050, RES shares close to 100% are possible for North Africa by 2050, with RES-E exports gaining importance only after 2030.[35]

It is true that renewable energy deployment cannot be a 'saviour-for-all', and that it requires fundamental domestic reforms, like existing energy market pricing mechanisms or providing different fiscal and regulatory incentives.[36] Another frequent criticism is the top-down approach followed by both the EU and MPCs. Cambini and Franzi find that this is the preferred option by MPC regulators to deliver policy diffusion, and therefore rule change.[37] However, this approach has proved to date unable to offer an inclusive model that deviates from the usual elite-driven processes that pervade Euro-Mediterranean relations, especially in energy matters. RES were narrowly conceived as a strategy to achieve European environmental objectives and promoting its renewable industries, utilities and engineering firms, neglecting the dynamic benefits expected from MPCs. But it also suffered from a 'more of the same' syndrome that tends to affect the reception of EU external governance mechanisms in its neighbourhood.

That was a missed opportunity, because few projects can reassemble features like sustainability, modernization, social and economic development, decentralization and rent-avoidance. All these elements should have been considered to develop a soft power narrative able to attract reform-minded actors and offering incentives to local populations: RES electricity access, jobs and ownership of their natural resources. Whether the lessons from the failure of Desertec or the Mediterranean Solar Plan were learned remain to be seen. The European Commission pretends to have adopted a more bottom-up approach in its new Mediterranean Renewable Energy Platform, but the inclusive and sustainable development narrative is still absent and there are no significant incentives in sight for RES to really become a game changer or a catalyst for further energy integration in the Euro-Mediterranean space.

Conclusion

The electricity sector represents the largest source of carbon emissions in the MENA region. Booming population and economic development makes electricity consumption grow twice as

fast as the world average. The renewable energy finance attracted by MENA countries has substantively increased between 2012 and 2014. However, the region as a whole is still lagging behind at a global scale, accounting in 2014 only for 4.7% of global renewable energy investment.

This chapter has shown that, from a project financing perspective, developing renewables in the MENA implies higher investment risks than in developed countries due to the uncertainties in areas such as sub-optimal tools to promote renewable electricity, lack of qualified manpower, construction delays, weak government institutions, and the like. Industrial and political initiatives built around the Desertec vision aimed to reduce the above uncertainties and create a pipeline of projects across the region. However, the lack of public acceptance of the Desertec vision (i.e. renewable electricity exports towards Europe) coupled with big uncertainties about the changing political situation in several MENA countries resulted in the lack of a clear project pipeline across the region.

This chapter has sought to show that there is no great regulatory design that can compensate for current geopolitical drivers, whether a Euromed Energy Community or a Mediterranean Platform for renewable energies as proposed by the Commission. However, a more differentiated approach that takes account of the different geopolitical and regulatory contexts would be needed in order to accommodate diverging MPCs' preferences. In this regard, differentiation entails geopolitics by other (normative) means. At a country level, this chapter's conclusions point to the need to take stock of Moroccan stability, geographical position, infrastructures and incremental energy reforms. It also suggests offering Tunisia the incentives to develop its solar and wind resources. Regarding the deployment strategy, our conclusion highlights the need to foster institutional innovation, reducing the scale of deployment, and being pragmatic by not insisting on the issue of RES exports, at least in the short term. Scaling up should wait for further cost reduction in RES technologies, and focus on supplying domestic demand. Regional designs, including imports and exports in a homogeneous Mediterranean energy space, are a long-term endeavour.

Finally, the Desertec top-down approach has proved unable to offer an inclusive model that deviates from elite-driven processes. RES were narrowly conceived as a strategy to achieve European environmental and economic objectives, neglecting the dynamic benefits expected by MPCs and distorting their reception of EU external governance mechanisms in the domain of RES-E. This was a missed opportunity, because Desertec or the Mediterranean Solar Plan could have developed a much needed Euro-Mediterranean energy narrative based on ideational drivers like sustainability, modernization, social and economic development, decentralization and rent-avoidance. Such a soft power European energy narrative could have attracted reform-minded actors, but also local populations by offering them improved electricity access, jobs and ownership of their natural resources. While the European Commission has adopted a more bottom-up approach for its brand-new Mediterranean Renewable Energy Platform, the narratives of inclusive and sustainable development are still absent for RES to become a driver for energy integration in the Euro-Mediterranean energy space.

Notes

1 Desertec Industrial Initiative (Dii), *Dii is Entering a New Phase: Dii Adapts its Business Model to Provide Concrete Services for Renewable Energy Projects*, press release (Rome: Dii, 2014).
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