



THE MEDITERRANEAN ENERGY SECTOR: THE ROLE OF INDEPENDENT REGULATORS

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Veronica Lenzi*

Research and Scientific Manager

MEDREG - Mediterranean Energy Regulators

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C/ John M. Keynes 1-11. Despacho 316 | 08034 Barcelona

Tel. 34 - 93 403 37 66

www.funseam.com

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Introduction

Mediterranean energy markets have historically been subject to the sways of politics. This has made investments in the region difficult, both among North African countries and between North Africa and the EU. Energy regulators are the public authorities tasked with the creation of secondary legislation that promotes a balanced development of the grids as well as successfully protect the rights of consumers in the electricity and gas domains. Since 2007, MEDREG, the Association of Mediterranean Energy Regulators, gathers National Regulatory Authorities (NRAs) of the region with the scope to promote a common framework of rules that can support trade, ensure security of supply and harmonize technical standards to the benefit of enterprises and consumers.

The scope of this paper is to provide a clear set of information on the energy condition of the Mediterranean area and give insights on the role that energy regulators play to foster a fair and harmonized regulatory environment capable of improving and balancing conditions for investors and consumers.

This paper starts with an overview of the current condition of regional energy markets and identifies the main challenges that have to be addressed to ensure that development of the energy sector keeps up with growing demand. It then provides a series of recommendations on the steps regulators considered pivotal to re-launch energy investments in the Mediterranean basin. The third section moves to the other side of the energy market, i.e., consumers, and sheds light on the role national regulatory authorities play in supporting access to the grid. The fourth section concludes.

The Mediterranean Energy Sector: The Role of Independent Regulators

The Mediterranean region is characterized by a gap between countries of the Northern¹ and Southern² shore. Countries on the Northern shore of the Mediterranean depend on energy imports for most of their consumption, while countries on the Southern shore are richer in natural resources and are endowed with substantial Renewable Energy Sources (RES), but are also experiencing a slight increase in demand. Trade exchanged between the two shores of the Mediterranean are relevant, despite the fall in European Union (EU) consumption due to the economic crisis. In 2000 North Africa accounted for 28% of the total EU natural gas imports, which became 37.4% in 2012 and subsequently reduced to 28.5% in 2014³.

The political turmoil that, since 2011, has interested the Arab countries of the region increased the perception of an unstable regulatory and policy environment, which in turn may negatively affect production and investments. On top of that, the Middle East and North Africa (MENA) region has been suffering for a long time from artificially high energy intensity, due to the elevated level and diffusion of energy subsidies. In the same period, the EU upgraded its requirements in terms of energy efficiency and production from RES, supporting the neighboring countries of the Balkans towards the same goal.

1. The energy context of the Mediterranean⁴ region: Growing demand and substantial RES potential

1.1. Consumption and production

According to the analysis of the Observatoire Méditerranéen de l'Énergie (OME)⁵, the combination of economic growth, urbanization and demographic increase will considerably influence the primary energy consumption of the MENA region. OME forecasts that, from

¹ Countries on the Northern part of the Mediterranean basin: Albania, Bosnia and Herzegovina, Croatia, Cyprus, France, Greece, Italy, Malta, Montenegro, Portugal, Slovenia, Spain, Turkey

² Countries on the Southern part of the Mediterranean basin: Algeria, Egypt, Israel, Jordan, Libya, Morocco, Palestine, Tunisia

³ DG ENER (2014) Quarterly Report on European Gas Markets

⁴ Countries of the Basin listed in footnotes 1 and 2

⁵ OME (2011) Mediterranean Energy Perspectives

2010 to 2030 energy consumption will increase by 100%, from 335 to 660 Million Tonnes of Oil Equivalent (Mtoe). Electricity demand will specifically grow by 170%, passing from 570 Terawatt (TWh) in 2009 to 1,565 TWh in 2030. RES will play a role in this growth, albeit secondary. Fossil fuels will continue to have the lion's share in the regional energy landscape, as they will account for slightly more than 80% of the total electricity generation capacity.

Economic development takes place mostly in the Northern shore of the Mediterranean, which currently produces three quarters of the Mediterranean Gross Domestic Product (GDP). According to estimates, the majority of the demographic rise will take place in the Southern shore, expanding the population of the region from the current 492 million people to 582 million by 2030. Coherently with these data, primary energy demand has increased in both shores for a total of 988 Mtoe in 2009, although the economic development of the Northern shore has absorbed two-thirds of it.

The production of energy has increased by 1.3% per year since 1990, up to 636 Mtoe in 2009, thus showing a slower development than demand and making the region a net importer of energy. Looking more closely at the power generation capacity currently installed in the region, it is possible to notice that natural gas is the main source used (33%), followed by hydropower (18%), nuclear power (14%), coal (13%), oil (12%), and non-hydro RES (10%), for a total of 496 gigawatts (GW). All Northern shore countries are energy importers, in the Southern shore Algeria, Egypt and Libya are net exporters, while countries such as Morocco and Tunisia are importers from bordering countries.

The sustained growth in energy demand implies that current energy infrastructure is no longer adequate and new investments are necessary. According to the World Bank (WB)⁶, the MENA energy sector will need at least 30 billion USD (United States Dollars) per year for the next 30 years, which corresponds to about 3% of the whole projected regional GDP.

1.2. Fossil fuels and the role of subsidies

Fuels subsidies have historically been used to support energy security, domestic energy production and access to energy. Oil is one of the most highly subsidized fuels. Historically, oil has been the most relevant fuel in the Mediterranean⁷ energy mix. While demand for oil in the

⁶ World Bank (2011) *Africa's Power Infrastructure Investment, Integration, Efficiency*

⁷ Countries of the Basin listed in footnotes 1 and 2

last 20 years continued to grow, this fuel reduced its share in the overall energy mix due to the increase in the usage of natural gas to generate electricity.

The International Energy Agency (IEA) calculated that roughly 8% of the energy subsidies for fossil fuels provisioned in the region actually reach households in need, thus making subsidies unfit for the scope⁸. As a consequence, despite the fact that around 98% of the Southern shore population is connected to the grid, energy poverty is on the rise. The most vulnerable categories of the population live in isolated rural areas or urban slums, where precarious access to electricity negatively influence their already difficult socio-economic development. In light of the Arab uprisings, then, changing domestic energy conditions represent a challenge for governments of the region, which will shape both their internal energy markets and the trends of energy trade at regional level.

Subsidies may support a first improvement of habits for poor residents of developing countries as they encourage the use of fuels, such as liquefied petroleum gas (LPG), which are cleaner and more efficient than traditional biomass used by low income population. They may help the development of coal mining regions and increase security of supply, as RES still give an unpredictable contribution to the grid. Additionally, for resource-endowed countries, they represent a tangible way of sharing with the population the economic benefits coming from their energy exports. However, subsidies have some severe downfalls. In most cases, they have encouraged higher consumption, working against the rational and efficient use of energy resources on the part of consumers and energy intensive industries. During time, the MENA region showed very high rate of electricity consumption accompanied by substantially cheap electricity tariffs. It should also be noticed that the cost sustained by governments to ensure subsidies has often led them to cut other social and economic budgetary expenses. Also, while fossil fuel subsidies help low income population to move from biomass to LPG, they discourage further improvements such as the use of RES.

The WB⁹ has underlined how energy subsidies worldwide tend to mostly benefit those consumers that make the largest use of energy. The International Monetary Fund (IMF)¹⁰ supported this view through an estimate affirming that the revenue gain from eliminating energy subsidies would be 2.9 trillion USD (3.6% of global GDP) in 2015. Looking at the MENA region, IMF calculated that pre-tax energy subsidies (corresponding to the difference between

⁸ IEA (2014) World Energy Outlook

⁹ Vagliasindi, M. (2012) Implementing Energy Subsidy Reforms: Evidence from Developing Countries

¹⁰ IMF (2015) Counting the Cost of Energy Subsidies

the value of consumption at world and domestic prices) cost around 237 billion USD in 2011¹¹, which equals to 8.6% of the region's GDP and 48% of total world energy subsidies. Half of the subsidies provided by MENA countries concern petroleum products, while the rest is divided between electricity and natural gas.

1.3. Renewable energy sources

The RES potential of the MENA region is very consistent and several countries (such as Algeria, Morocco and Egypt) have launched ambitious plans to increase the quantity of electricity produced from RES. According to the IEA, the share of renewable energy in the total MENA region power generation shall increase from the 2% registered in 2010 to 12% by 2035¹². Currently, RES potential is not fully exploited, and renewables account for just 1% of the total primary energy supply (TPS) of the region as well as for 3.5% of the regional generation of electricity. Morocco and Egypt have on average a better performance, generating 11% and 9.5% of their electricity from RES in 2011, respectively. In MENA countries, over 90% of RES generation is hydroelectric and just in Egypt and Morocco non-hydro RES account for more than 1% of the total electricity generated. Notwithstanding the fact that the current level of RES development is not very high, the Southern shore of the Mediterranean benefit from a great endowment in terms of renewable energy sources, accounting for 45% of the global potential, with solar resources being the main source available.

In the MENA region, interest to develop RES mainly comes from international cooperation and multilateral initiatives, as the region has yet to implement measures that concretely favors the use of its energy potential on a large scale. In a region characterized by a swinging economic development, RES can offer net importers of energy with the opportunity to access cheaper energy, thus meeting a larger share of their energy needs domestically. As for net energy exporters, the use of RES allow to increase trade of conventional sources or to increase security storage. In both cases, RES-generated electricity can increase the regional trade, both South-South and South-North.

The main source of hydropower in North Africa is the Aswan Dam situated in Egypt and active since 1971. In the 1980s, Egypt founded the National Renewable Energy Authority (NREA)

¹¹ IMF (2014) Energy Subsidies in the Middle East and North Africa: Lessons for Reform

¹² IEA (2012) World Energy Outlook

but did not put in place any specific support mechanism for the generation of electricity from RES. In the last years, Egypt has developed its wind farms with the scope of facing growing demand for energy and the increasingly frequent blackouts. This is also leading to a reinforcement of the current grid, as the best spots for wind farms are far from the centers of demand.

The Egyptian government seems keen to resume investments on RES, as the Minister of Investment Ashraf Salaman reportedly affirmed that the Egyptian government aims at attracting 45 billion dollars over the next few years.¹³ These declarations have been boosted by the Egypt Economic Development Conference held in March 2015, where firms signed Memorandum of Understanding (MoU) to develop wind and photovoltaic projects for roughly 10 billion dollars. RES4MED reports that the Egyptian Feed-in tariff (FiTs) program in the first phase aims at contracting 2.3 GW of solar power by the end of 2017¹⁴. The total includes 2 GW of large scale projects and 300 MW of small rooftop systems. In order to promote large scale projects that interest institutional investors, this typology of stakeholders benefits from access to sovereign guarantees for installations exceeding 20MW. This means that, should the Egyptian Electricity Holding Company be unable to pay for the electricity that it buys from the installations, the Egyptian Minister of Finance would take over payments. At the same time, the government has committed to reduce subsidies to fossil fuels that feed conventional power plants, facing a full removal by 2018. This move should reduce the price gap between RES-generated and conventionally generated electricity.

In Israel, since the 1970s solar resources have been used for heating purposes. The lacking of a more consistent development so far may be due to the small extension of the country, which makes it difficult to develop proper economies of scale. However, the country is boosting RES deployment. In 2009, Israel introduced a Feed-In-Tariff to reach its target of 9% renewable electricity generation by 2020. The electricity regulator revised the basis of tariff calculation for the FiTs of the photovoltaic sector. The regulator intends to avoid the gradual disconnection of FiTs from actual costs with unreasonable margins. Accordingly, to eventually reach grid parity the tariff for each separate project shall encourage the industry to consider global cost standards, including taxes and levies.

¹³ <http://www.dailynewsegypt.com/2015/05/25/45bn-for-egypts-new-renewable-energy-sector-investment-minister/>

¹⁴ RES4MED (2015) Unlocking the renewable energy investment opportunities in the Mediterranean: A regional perspective

Morocco and Tunisia have worked to develop hydro and wind power in the last years. In Tunisia, over 40 public-private partnership arrangements constitute the bulk of the Tunisian Solar plan. The National Fund for Energy Conservation (FNME) provides further financial support to RES electricity installations.

In the wider context of its National Energy Strategy, since 2009 the Moroccan government invested on the promotion of RES with the aim to attract foreign investors. Energy security concerns also played a relevant role in this choice, as Moroccan electricity imports from Spain continue to grow, now touching 20% of Moroccan yearly electricity needs. The national plan for RES builds on Moroccan relevant potential for solar and wind power and establishes to reach 42% of capacity coming from RES by 2020. To fulfill this goal, it is necessary to reach 2GW of solar energy, 2GW of wind power and 2GW of hydropower capacity.

The government reacted by founding the Moroccan Agency for Solar Energy (MASEN) in 2009, with the aim of developing a specific regulatory framework for solar projects. These new regulations should create an attractive legal and institutional context that can make projects visible and have them financed. MASEN uses competitive bidding processes open at international level to this scope. These bidding require provision of data on the sites for projects, provisions on the infrastructures that are necessary and optimized risk allocations. In the same year, it was passed a law that gave operators the opportunity to generate RES on behalf of individual or groups of consumers connected in medium or high voltage, provided that those consumers use the generated electricity only for their own consumption.

In February 2010, Morocco passed a law liberalizing the renewable energy sector. The law introduced the opening to competition of renewable electricity production and the possibility to export electricity produced from RES through the national grid against the payment of an annual fee to the state. More recently, in 2012, a draft law on Public-Private Partnerships (PPP) was published, including a direct reference to the concept of 'availability-based payments', whereby remuneration of the private entity depends on the availability of an asset or the performance of a service. Morocco is currently in the process of establishing an independent regulator for electricity, an institution which would boost transparency and accountability in the sector.

Despite the considerable economic potential RES have in the region, several factors risk to make these projects economically unsustainable under the current legislative and regulatory framework. Main barriers include access to finance, as RES projects lead to banks asking for

high premiums; market risks, as macroeconomic indicators tend to fluctuate erratically; technology expertise, as productivity tends to fail due to limited expertise, also among public administrations.

1.4. Recommendations to support infrastructure investments in the Mediterranean energy sector

The picture of Mediterranean energy markets suggests that, while progress have been made on paper, several actions are needed to boost trade and ensure consumers are taken into account when designing and implementing national energy plans. In 2015, MEDREG has finalized a report titled “Interconnection Infrastructures In The Mediterranean: A Challenging Environment For Investments”¹⁵. This study aimed at mapping current cross-border existing infrastructure and infrastructure projects in the Mediterranean and use the results to assess the main barriers faced by investors and policy-makers when dealing with infrastructure project proposals. The report was put in consultation and received 37 comment papers. MEDREG used those contributions to complement the findings of its report and draft a set of recommendations that should identify tools necessary for the creation of a sound environment for investments in the Mediterranean region. These recommendations also serve to set the playground for the next chapter on EU-Mediterranean energy cooperation.

1. Establish competitive and reliable energy markets

The majority of existing electricity and gas infrastructures have been built so far for security of supply needs. Today, infrastructure investments are also driven by market forces and face regional competition. Public policy decisions are therefore decisive to foster and secure investments. In some Mediterranean countries they are even more relevant than economic factors to develop their internal markets. Policy makers should devote considerable efforts to connect investment plans to the progressive opening of their national markets.

2. Promote deeper harmonization of national regulatory frameworks

¹⁵ Mostafa, M., Dastan, S.A., Lenzi, V. (2015) Interconnection Infrastructures In The Mediterranean: A Challenging Environment For Investments

The absence of a regulatory level playing field between the Northern and Southern shores of the Mediterranean is particularly negative for investments, as different sets of rules exist in the various Mediterranean sub-regions. In particular, it should be noted that South-South dialogue and regulatory harmonization need strong improvements in order to build efficient cross-border interconnections. The European Union in the last decade has made good and substantial steps towards a more harmonized regulatory framework. This regional process could be eventually replicated in the Mediterranean region. Nevertheless, in the absence of a formal commitment of Mediterranean policy-makers, all stakeholders have to voluntarily engage now to establish deeper legal harmonization. Stronger cooperation between EU, Middle East and North African countries is also a precondition to establish a regional energy market with a sound investment climate.

3. Increase the use of existing interconnections in the Southern shore

Despite the existence of several South-South Mediterranean interconnections, electricity trade among these countries has remained modest. The average level of interconnections use is no more than one third of the total capacity. This can be mainly attributed to the political and economic barriers. In several cases, technical issues also add to the problem. Integrated resource planning is therefore essential at the national as well as at the regional level to review, understand, and provide input to the planning decisions of the interconnection projects. For an integrated resource planning process to be effective, it should include both a meaningful stakeholder process and a proper oversight from an engaged regulator. In particular, a successful utility's resource plan should take into detailed consideration the following aspects: reserves and reliability, supply options, load forecast, demand-side management, fuel prices, environmental constraints, evaluation of existing resources, integrated analysis, time frame, and uncertainty. A proper assessment of the existing situation would help designing a consistent methodology to evaluate energy infrastructure investments and take adequate planning decisions.

4. Evaluate the economic benefits of new cross-border infrastructure projects

The potential increase of investment volumes will create strong needs for political consensus and investment bankability, thus requiring the definition of an appropriate regulatory framework. The case of the European Union clearly shows this is the way ahead to maintain and reinforce investments. Developing sound methodologies for cost-benefit analysis (CBA)

will help supporting investment decisions in the region. The economic assessment shall also take into account security of supply and social considerations. An effective way to ensure risk-adjusted returns to investors could also include the use of 'priority premiums', which compensate the additional risk and complexity of new projects.

5. Enhance cooperation between regulators and TSOs

The dialogue and technical coordination between regulators and TSOs, both at national and regional level, is becoming pivotal to build an effective and efficient regional energy market. It contributes to the transparency and stability of the regulatory and economic frameworks, which is essential for attracting investments in the Mediterranean basin. TSOs play a central role in identifying investment needs and assessing infrastructure projects. It is advisable that TSOs regularly provide data to regulators and are responsible for drafting investment plans, which are then subject to regulatory scrutiny. The regular and transparent exchange of information and know-how among regulators and TSOs could synergize the efforts for cooperation in the Mediterranean.

6. Design a Ten-Year Network Development Plan (TYNDP) for the Mediterranean region

The assessment of overall costs and benefits deriving from infrastructure investments (in particular new ones) is a complex task and needs very careful consideration. In the medium term, the focus lies on the improvement of the use of existing infrastructures and the definition of common rules regarding new ones. In the medium to long term, it could be beneficial for the region to develop a Mediterranean TYNDP based on a sound methodology developed by TSOs and assessed by regulators.

7. Identify Projects of Mediterranean Common Interest

Considering the experience of the Energy Community with Projects of Common Interest (PCIs), MEDREG could also consider a list of infrastructure projects that are of interest for the whole region. The selection process should be transparent and non-discriminatory.

According to the data on electricity and gas flow analyzed in the MEDREG report and the responses to the MEDREG's public consultation, under the current forecasts for demand and

given their acknowledged technical specifications, some projects seem particularly relevant for the energy development of the MENA region.

For electricity, there are three main electricity corridors of strategic benefit to the Mediterranean region. These three corridors are the west corridor (Morocco - Spain), the central corridor (Maghreb - Italy, most notably the submarine cable between Tunisia and Italy) and the east corridor (Middle East - Turkey). They have the potential to contribute in enhancing the region's electricity security and environmental goals by diversifying its energy supply and increasing trade of RES-generated electricity. However, in order to successfully carry the significant flow of energy forecasted for these interconnections, the corridors require the reinforcement of the corresponding South-South interconnections, in particular the underexploited cross-border interconnection between Algeria and Morocco.

For gas, the capacity developments of Spanish interconnections with Portugal and France will be of critical importance in terms of introducing further amount of gas from North-Western Africa to North-Western Europe. The North-South interconnection will be further enhanced by the introduction on the market of newly explored Eastern Mediterranean gas resources. The Trans-Anatolian Natural Gas Pipeline (TANAP), together with simultaneously built new pipelines through the Adriatic, could serve to the goal of diversifying resources for south-Eastern European countries.

8. Support technology innovation to improve the condition of vulnerable consumers

The great and growing level of investments involving renewable energy sources is dramatically changing electricity markets. During the last twenty years, Southern Mediterranean countries have elaborated different institutional schemes with the aim to promote the usage of renewable energy sources. While every country has developed its own approach, most of them have raised the bar of their objectives concerning generation and development of RES. Almost all the countries have passed or are discussing legislation regulating the sector. However, incentive measures tend to be limited and only a few of these regulations foresee the use of feed-in tariffs as means of support. In most cases, the use of authorization procedures or tax exemptions is preferred. New regulatory regimes (e.g. balancing) are necessary to integrate RES in the electricity grids. Power systems will be deeply impacted by technology innovation, which is subject to a complex interplay between the public sector, private market actors and the surrounding institutional environment. Regulators should put in place a solid knowledge in order to transfer this value to final

customers (e.g., smart grids). In particular, distributed generation could represent an important chapter that links greater investment in RES to the reduction of fuel poverty and the creation of better conditions for vulnerable consumers in areas where the grid is not already developed. Technology innovation is also key to improve specific national aspects of Mediterranean energy markets concerning consumers, such as technical safety, quality of service and provision of transparent and complete information to the benefit of household consumers.

2. Energy cooperation in the Euro-Mediterranean region

Hydrocarbons exchanges have historically been the center of energy trade in the Euro-Mediterranean region. Currently, energy cooperation is shifting towards the electricity sector, most notably for RES-based electricity generation. The neighboring policy of the European Union towards the Southern shore of the Mediterranean has increasingly concentrated its narrative on the need to focus energy market integration and the stimulus of investments over efficient and low-carbon energy technologies. Because there is substantial seasonal complementarity between the two shores of the Mediterranean, it is in principle possible to link the overall Mediterranean basin through a 'ring' connecting the different electricity corridors of the region.

Through time, the EU has developed several initiatives to bring together Mediterranean countries around the subject of energy policy and regulation. The first initiative was the EuroMed Partnership (also called the Barcelona Process) in 1995. For the first time, a multilateral approach was used in the region. This initiative was followed by the more comprehensive European Neighborhood Policy in 2003 and by the creation of the Union for the Mediterranean (UfM) in 2008. UfM promoted the idea of having multilateral cooperation in the context of an intergovernmental framework. The Mediterranean Solar Plan (MSP) was presented in July 2008 at the Paris summit, by the Heads of State and Governments of the 27 EU Member States and 16 Southern and Eastern Mediterranean Countries. It aimed at developing 20 GW of additional renewable energy capacity in the region by 2020, as well as promoting energy efficiency. However, through time some governments expressed reserves on the tools to concretely implement the MSP. For this reason, the project remains currently unachieved.

In 2011, in its communication called 'A Partnership for Democracy and Shared Prosperity with the Southern Mediterranean' the EU mentioned the establishment of a EU-Southern Mediterranean Energy Community to foster the development of joint RES investments that could benefit both shores of the Mediterranean. In the same year, energy was also put at the forefront of a joint communication of the European Commission and the High Representative of the EU for Foreign Affairs dealing with policy changes in the EU Neighborhood Policy to reflect the security and market evolution in the region.

Several bilateral cooperation contacts among countries also took place during the same timeframe. The European Neighborhood Policy (ENP) indeed encouraged cooperation between the EU and Southern Mediterranean countries through the use of Action Plans that should support the advancement of market reforms in the medium term. However, these Action Plans often lack practical tools to implement the goals they propose. For this reason, the EU has increased the sponsorship of initiatives that are built around a bottom-up approach, so that neighboring countries can feel they are a full part of the harmonization process. For this reason, the EU started financing associations such as the Mediterranean Energy Regulators (MEDREG) and the Mediterranean Transmission System Operators (Med-TSO) which put Northern and Southern actors at the same table and work on a useful synthesis of their objectives and experiences.

The existence of MEDREG and Med-TSO has the potential to establish a credible forum of discussion with the EU and the other relevant regional energy stakeholders. Med-TSO should engage in the development of regional planning procedures that increase consistency among transmission plans at national level. A clear and consistent methodology for the allocation of investment costs among the different Transmission System Operators (TSOs) would also be of major importance. Indeed, the reinforcement of national transmission capacities benefit bordering countries as well, allowing for additional transfer capacity. The 2013 cooperation agreement between MEDREG and Med-TSO and the 2014 Memorandum of Understanding signed between MEDREG, Med-TSO and the EC are positive steps already taken in this direction. The pursuit of harmonized interconnections in the region has led to some results in the past. The Eight Country Interconnection Project (EIJLLPST) concerning Egypt, Iraq, Jordan, Libya, Lebanon, Palestine, Syria and Turkey has achieved the synchronous interconnection of the first seven countries, while Turkey has achieved synchronization with the European system. Algeria, Morocco and Tunisia have worked in the past to achieve

synchronization through the Maghreb Countries Interconnection Project (IMME), but the project has so far been unable to go beyond capacity-building activities.

MEDREG should be involved in the definition of principles to share costs between the various transmission system operators and, consequently, between the different consumers of the member countries. Indeed, new interconnections capacity may be particularly useful for locations that are physically distant from the existing infrastructure. The regulation of international power trade requires a framework that incentivizes third party access to the different networks. Currently, network codes for cross-border transactions are not present in the MENA region. For instance, transmission costs in Algeria are defined on a case-by-case basis¹⁶ with national utilities, making it difficult to forecast the cost of exporting energy. This situation suggests that South-South interconnections should be enhanced both physically, by building new infrastructure, and economically, by developing energy exchanges that are based on defined cross-border trading rules and integrated commercial transactions.

The EU could further boost this process by making energy the center of multilateral negotiations with countries of the MENA region. In the recent past, the EC made direct reference to the creation of a Southern Mediterranean Energy Community¹⁷, but it gave no further specification on the tools and detailed objectives of such a community. The establishment of a community that institutionalizes tools to promote energy exchanges and trade seems to be a necessary complement to the bottom-up initiatives currently taking place in the region. The current focus on the EU Energy Union should also lead to improve the role that the EU plays towards its Southern borders.

Opening a credible window of opportunity for the integration of Southern Mediterranean energy markets within the European one requires the development of a system that incentivize the adoption of transparent and accountable regulation while not having the same lure used with the Balkan countries, i.e. the perspective of EU membership. The establishment of the UfM Euro-Mediterranean Platforms on Regional Electricity Markets (REM), Gas and Renewable Energy and Energy Efficiency (REEE) is a relevant step in this direction. But the scope and tools of these Platforms are yet to be defined and it is not currently possible to clearly distinguish the role each actor will play within these fora. It is important that technical

¹⁶ Van Son, P. and Ruderer, D. (2015) Capturing synergies among the power markets around the Mediterranean

¹⁷ EC (2012) Implementation of the European Neighborhood Policy in 2012 regional report: A partnership for democracy and shared prosperity with the Southern Mediterranean

and market reforms, as well as a clear methodology to evaluate investments, are kept at the center of the EU's action towards MENA countries. The existence of MEDREG and Med-TSO should be the main bulk for the design and establishment of any institutionalized form of cooperation.

3. The role of energy regulators in the MENA region and the case of energy poverty

Regulators of economic activities play a pivotal role in ensuring that market operate in a proper manner. In order to exert their role, though, they have to be independent, i.e. arbitrate between the different and often complex interests of market actors and ensure the sustainability and neutrality of market operations. Regulators generally are at the crossroads of a high-risk environment connecting the private sector, end-users and public authorities. In order to be defined as independent entities, they should be able to balance between the various positive influences received by market actors, all the while having the instruments to counteract undue ones.

Constant interaction with market and institutional players is also what makes the voice of regulators being heard. Regulators are fundamental actors in the policy framework as they are tasked with the implementation of several relevant public policies. On a daily basis, regulators exchange and interact with ministries and parliaments, which set policies objective and revise them, the regulated industry -which has to comply with decisions taken and provide relevant data to the regulator- and the consumers -who should be the ultimate beneficiaries of national policies. Being independent and neutral with regard to the other counterparts is therefore pivotal for the good performance of the regulator.¹⁸

The role of regulators in the context of the Euro-Mediterranean energy cooperation has been growing during the last decade. In order to benefit from the best practices developed in the area and share the problems they have to face, in 2007 Mediterranean energy regulators have associated themselves into MEDREG. MEDREG has been working to support regulators in mitigating market failures and avoid market distortions through the exchange of expertise and the realization of reports on various topics of interest for the regulators of the region. Being a precondition to implement all the competences regulators are tasked with, independence has therefore been one topic at the center of MEDREG's activity. Indeed, an

¹⁸ OECD (2015) Being an independent regulator: the why and the how

independent regulator has better tools to resist political pressures that may endanger cost recovery, the quality of service and the maintenance of infrastructures by trying to reduce prices for household consumers in the regulated segments of the market.



Figure 1: MEDREG Principles for Effective Regulation

3.1. Energy poverty in the MENA region

A problematic issue for energy supply in the MENA region, particularly in rural areas, is the high level of unreliability of the grid. Several reasons can cause this problem. Network suppliers may lack enough available capacity to serve all consumers and thus have to ration supplies, mostly to rural areas. Endemic underinvestment in the maintenance and improvement of the lines also cause technical problems and outages, which add to the frequent illegal connection of households to the network, which in itself causes overloads. Even in areas where mini-grids projects are active, the capacity of generation facilities only allow a few hours of service per day, depending on fuel availability. This results into a highly volatile electricity supply. This unreliability not only represents a breach to quality of supply for the connected consumers, but also discourage non-connected consumers from joining the grid when possible, opting instead for the more expensive option of self-generation in order to accomplish the activities for which they require electricity. In the MENA region, underinvestment in electricity infrastructure became a constant aspect of the sector, leading to shortfalls in the economic development of countries.

There are four key issues that public institutions need to address in order to create adequate policy frameworks for connecting to the grid.

- Incentivize utilities to expand their network infrastructure to areas that are mostly non-connected, also providing support in fighting energy theft and illegal connections.
- Support disadvantaged citizens in the bureaucratic process to connect to the grid.
- Provide specific incentives for utilities to serve unconnected people.
- Support poor people financially in order to facilitate their access to energy.

For all of the above mentioned objectives, the regulator play a particularly important role. Guaranteeing energy security and sustainable development requires the consolidation of electricity and gas infrastructures. An independent regulator with clear powers and competences enables an efficient market design and promotes networks management with a consistent level of transparency and access to information. This, in turn, enhances favorable conditions for energy infrastructure investments with the aim to guarantee higher quality of supply at sustainable prices.

The role regulators can play to fight energy poverty is also essential. Any regulation aiming at increasing access to energy should be based on several aspects pertaining to efficient regulatory governance, mostly concerned with the way regulation should be implemented in order to deliver its objectives.

Electrification rate in the MENA region reached 94%, with energy intensity steadily increasing in the last 25 years. Two-thirds of consumers connected to the grid live in urban areas, where the access rate in the last twenty years increased at twice the rate of rural areas. The country that made more progress so far is Egypt, whose electrification rate grew by 1.6% between 1990 and 2010.¹⁹ However, almost 6% (18 million people) of the MENA population still lacks access to electricity, which corresponds to 1.5% of people without energy access worldwide.²⁰

It should also be noted that electrification rates do not provide a complete picture concerning the regional energy situation. While electrification is virtually present, in practice low income levels and scattered geography often prevents the actual access to electricity. According to the World Bank²¹, due to the low incomes or to missing network coverage, 20 million people in the region cannot access electricity in a continuative and satisfactory way. These people then tend to rely on biomass fuels (waste materials and firewood) and kerosene, which are low-quality and polluting fuels. Interestingly, this habit seems to partially continue even when the

¹⁹ International Renewable Energy Agency (2011) Scenarios and Strategies for Africa

²⁰ International Energy Agency (2014) World Energy Outlook

²¹ Portale, E. and de Wit, J. (2014) Tracking Progress Toward Sustainable Energy for All in the Middle East and North Africa", World Bank

household income increases, contradicting the notion that increasing money availability leads to choosing higher quality fuels. In fact, while the population of most MENA countries are above the low-income average of 242 kWh per capita, numbers are partially distorted by the industry consumption and do not fully account for the habits of the households.

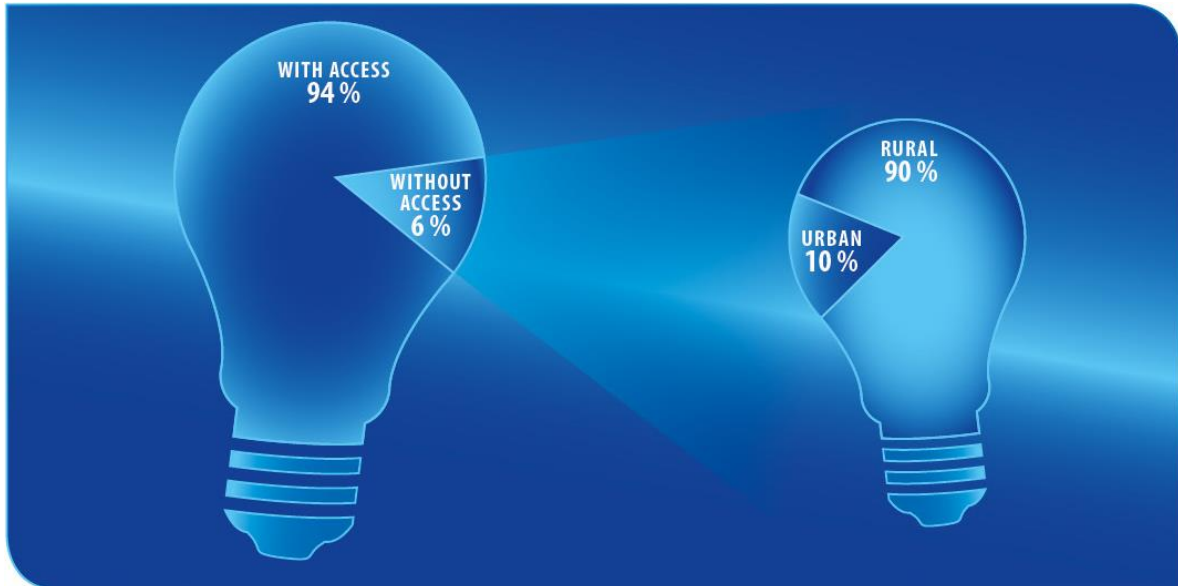


Figure 2 - Electricity access deficit in North Africa. Source: World Bank (2014)

In order to provide an effective environment for consumers and potential consumers as well as for companies and investors, the competences of regulators should include the following:

- Ensure instrument for all interested citizens to connect, facilitating the access to off-the-grid solutions for electricity supply when on-the-grid alternatives are not available.
- Define standards for electricity quality, including continuity and quality of supply.
- Set the levels and structures of tariffs for the use of infrastructures, periodically assessing and revising them in order to promote an efficient management and support necessary developments.
- Manage subsidies, both indirect (actions that may affect regulatory decisions) and direct (resulting from a regulatory decision), evaluating how they are likely to affect patterns of supply and demand.
- Collect data collecting from regulated companies, so to monitor energy markets and systems state to the benefit of all energy market stakeholders.

- Provide clear and no-discriminatory licensing and permitting, including the management of dispute settlement about licenses, the information that should be provided to obtain a license and the obligations that a license entails.
- Promote competition and efficient market structure, establish competitive retail and wholesale markets, and protect customers.
- Promote energy efficiency and the use of renewable energy sources, as well as support poor electricity users.

As said, the reason for creating strong and independent regulators is that they have the task to increase efficiency and effectiveness in the energy sector. However, even when regulators are autonomous in theory, in practice they may be captured by the political power or unable to be transparent and accessible to the consumers. Where these problems happened, they impacted vulnerable and poor consumers for the worse. Regulators need to be independent in order to be less exposed to political pressures and to properly act in the public interest.

This calls for careful consideration when designing or reforming the role and functions of an independent energy regulator. The mandate to protect poor consumers can be referred to the broader mandate to protect consumer interests. However, as poor consumers are for the most part unable to make their voice heard, an explicit pro-poor mandate should be given to those regulators that operate in countries where lack of energy access plagues a considerable amount of citizens. In these cases, the United Nations²² suggest considering the creation of a low-income advisory body that performs specific pro-poor programs and that ensures that poor consumers are represented along with the other consumer categories.

Independent energy regulators serve to deliver consumers and utilities a service in an accountable and transparent way. Regulators operating in the same region share common goals and challenges. They include ensuring proper market conditions (including access) to all the actors, guaranteeing good quality of energy supply at an affordable price, informing and protecting consumers and citizens, and promoting an efficient and affordable integration of renewable energy sources.

Besides energy connections, with a view also to more developed countries affected by the economic crisis, the challenge is to support vulnerable energy consumers and poor citizens, fighting fuel poverty through the usage of social tariffs. In Italy, the government has

²² United Nations Industrial Development Organization and Renewable Energy and Energy Efficiency Partnership (2007) Sustainable Energy Regulation and Policy-Making for Africa

introduced a protection mechanism targeted to domestic customers living in condition of economic hardship or with severe health problems. This mechanism has been active since 2009 for electricity supplies and since 2010 for natural gas supplies. Eligible customers receive a discount of about 20% on the electricity bill and 15% on the gas bill, depending on the number of people living in the same household. An additional bonus is set for those customers who use electricity for domestic medical appliances in order to compensate for the costs for their consumptions. At the end of 2014 the bonus was applied to about 1 million households. The number of households receiving an electricity discount as a result of physical hardship was about 24.000. As of that date, about 600.000 gas customers benefitted from the gas bonus for economic hardship.

The social bonus is funded by a small levy applied to all consumers bills. The mechanism has been declared fully compatible with competition in electricity and gas retail markets as vulnerable customers are free to choose their suppliers on the energy market.

4. Conclusions²³

Mediterranean national energy markets are today at very different degrees of maturity. In the Southern shore²⁴ utilities are state-owned and operate either based on vertically integrated service providers or using a single buyer model. Most of these utilities are running at high degree of subsidies, which do not provide a right price signal for private investors. Therefore, most of the investments are financed by the state. However, states face increasing difficulties in keeping the current level of subsidies. Reform of the electricity and gas sectors are being discussed in various Southern countries. Egypt, for example, is currently designing a substantial reform of its electricity sector. The presence of independent regulators is pivotal to guarantee that reforms balance between the needs of investors and consumers, and to subsequently provide investors with a clear framework of rules.

Indeed, regulators should dedicate increasing attention to enhance the level of efficiency interoperability and the quality of planning of energy infrastructures. Cross-border infrastructures are crucial to overcome the actual fragmentation of the Mediterranean energy system. The creation of adequate, integrated and reliable energy networks is a prerequisite to deliver a properly functioning energy market that will enhance security of supply, integration

²³ Lenzi, V. and Di Gaetano, N. (2015) Energy access as a key factor for human development

²⁴ Southern shore countries are listed in footnote 2

of renewable energy sources, energy efficiency and will enable consumers to benefit from new technologies and a smart use of energy.

The establishment of an appropriate and effective Mediterranean energy framework is a key factor to build an environment that fosters sustainable economic development. Regulation can support a more efficient infrastructure system with monitored energy flows both for electricity and gas, as well as promote new investments for infrastructures of regional interest to create the condition for a competitive regional energy market. For countries where a working legal framework already exists, it is important to maintain and improve it in order to balance industrial initiatives and consumer protection for the benefit of all parties.

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