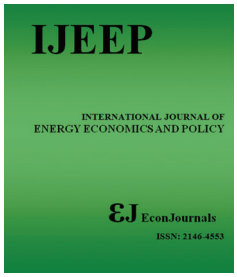

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Public-Private Participation in Energy Infrastructure in Middle East and North African Countries: The Role of Institutions for Renewable Energy Sources Diffusion

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ABSTRACT

Investment in infrastructure, although historically dominated by public intervention, are experiencing a growing role for public and private partnership. This trend traced a steady increase since the start of privatization and liberalization process that took place in most OECD countries in the 90s and peaked in 2012. Middle East and North African (MENA) countries are hungry for infrastructural investment, but looking at the consolidated global trends in energy investment, it emerges that its performance is particularly poor in attracting private participation. However, Morocco was able to figure among the top destination countries for energy investment. Together with Jordan they represent the only two countries able to attract energy investment in the region mostly in renewable energy technology. Evidence shows that Morocco and Jordan are those that perform better in terms of political stability score and rule of law score according to the World Bank. The institutional and political endowment in MENA countries appear to be inappropriate to secure the level of infrastructural investment in the energy sector, in particular when dominated by long lead times and irreversibility. In this context, renewable energy sources investment offer a valid alternative, when the necessary pre-conditions are put in place and when the regulatory design is able to offset, at least partially, the higher country risk that investor are likely to face.

Keywords: Public Private Partnership, Investment, Middle East and North Africa, Energy Transition, Institutional Endowment, Renewable Energy Sources Investment
JEL Classifications: D02, L43, O13

1. INTRODUCTION

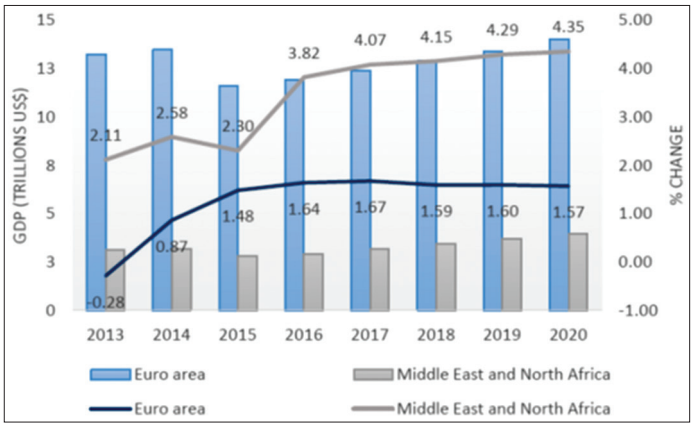
The existing Mediterranean energy infrastructure was mostly designed and built more than 50 years ago and were based on the national-level energy policies and security of supply priorities of the time. Since then, the energy landscape has changed dramatically. Now, national dynamics must be harmonized with regional and global policies. In particular, climate change policies and energy security measures will have a great impact on the existing energy infrastructures, requiring, in most countries in the region, that energy infrastructures need to be modernized considerably.

South and East Mediterranean Countries[1] (SEMCs) currently account for just above 25% of the total gross domestic product (GDP) of the region but are expected to grow at twice the rate of the North Mediterranean Countries (NMCs) (Figure 1). By 2030, SEMCs will represent 33% of the region's total GDP. This tendency is mirrored also by the demographics in the region. The population is growing at a faster rate in the SEMCs than the NMCs. By 2030 60% of the population will be in countries on the south shore of the basin (OME, 2015).

Energy demand and supply will be greatly affected by these economic and demographic patterns, in particular in Middle East and North Africa (MENA) countries where energy demand is still significantly correlated with GDP. On the contrary, in NMCs the slow economic cycle and flat demographic trend, combined with increasing energy efficiency measures, will limit energy demand. However, this tendency to reduce the gap among countries located on two shores of the Mediterranean basin still leaves MENA

1 Algeria, Egypt, Libya, Morocco, Tunisia, Turkey, Israel, Jordan, Lebanon, Palestine, Syria.

Figure 1: Gross domestic product at constant prices and percent change



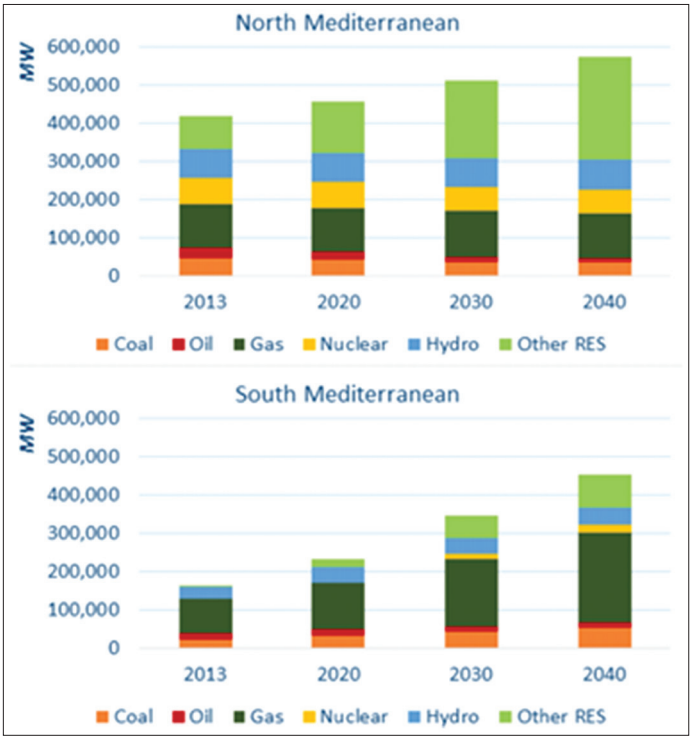
Source: International Monetary Fund, World Economic Outlook Database, October 2015

countries consuming only 50% the electricity of the NMCs in 2020 on a per capita basis. Moreover 20 million people in the region are without access to electricity, while at least 12 million use traditional biomass for cooking and heating (REN21, 2013. p. 30).

In order to face this growing demand and to cope with the fast expansion of the total population living in urban settlements, electricity demand, and consequent supply is predicted to increase rapidly in the coming years. OME in 2015, estimated that over €715 billion of investment in additional capacity will be needed by 2030 to meet the generation needs. This is translated in a capacity addition of 446 GW of natural gas-fired power plants by 2040 and 449 GW of Renewable Energy Sources (RESs) (Figure 2). The non-hydro additional RES will amount to 331 GW. Of this additional capacity respectively 280 GW (natural gas), 105 GW (RES total) and 61GW (RES non-hydro) will be installed in the South. In total 313 GW of new generation capacity will be added to the system in the south, while 218 GW in the North. The World Bank[2] in 2010 estimated that the region needs investments in excess of €27 billion a year (US$ 30 billion) up to 2040. This number represents about 3% of the region's total projected GDP, and implies a rate of investment three times higher than the rest of the world. This staggering amount is required, according to the World Bank, to deal with a number of key issues that, at present, reduce the attractiveness of the energy sector in the region. Reduced subsidies for fossil fuel consumption, environmental protection, additional generation capacity and the promotion of intra-regional cross-border energy trade are all envisioned to be an important part of the solution to the region's energy challenges.

The increased generation fleet and the significant penetration of RES generation, on both sides of the basin, requires not only the strengthening and integration of the Southern Mediterranean networks but also their integration with the Northern ones. The association of the Mediterranean TSOs[3] (Med-TSO) is expecting the construction of an additional 33,000 km of high voltage lines

Figure 2: Additional installed capacity Mediterranean region



Source: OME 2015

and at least 3000 MW of North-South Interconnections. Med-TSO estimated the investment required, for the additional transport capacity, to be in the order of €20 billion by 2020 (Med-TSO, 2013).

Therefore, the electricity sector in the region is required to respond to a combination of short-term goals and long-term patterns that will guide the development of the system in the coming decades (Poudineh and Rubino, 2016). Additional interconnection are also key enablers for other energy policy objectives. In particular, to comply with climate change and RES targets that have now been set up in most countries in the region (Brand, 2016). We will explore the existing evidence by providing information on the evolution of public and private partnership (PPP), therefore looking at the private participation in infrastructure (PPI). Private sector participation in the provision of infrastructure services began in the early 1990s in a few pioneer countries, including Argentina, Chile, Malaysia, and Mexico (Panayotou, 1998). It has since spread throughout the developing world: 137 developing countries have implemented infrastructure projects with private participation in at least one sector since 1990 (PPI Database, 2015). Whereas governments remain the main source of infrastructure financing in developing countries, providing around 70% of the funds necessary, the private sector is also a key source, contributing 22% — well beyond the 8% provided by official development assistance. Large deficits remain, with current investment in infrastructure meeting less than half the needs in developing countries. These deficits have motivated many governments to view private participation in the provision of infrastructure services as an integral part of their development strategy. This is particularly true with reference to the current needs and the status of the energy sector in the Mediterranean region.

2 These reference figures are highly cited. It comes from a background document accessible via the following link: http://go.worldbank.org/88TPPX6OF0 (the entire document is not accessible anymore).

3 In 2013, Med-TSO started its activity. Med-TSO includes electricity companies operating the grids of 17 Mediterranean Countries.

Table 1: Total investment by sector and sub-sector (1992-2015)

Sector	Sub-sector	Value of investment (US$ million)	Number of projects	Average investment size (US$ million)	Relative weight in value (in N %)
Electricity		794.380	4445	179	90 (86)
	Generation	676.690	3551	191	77 (69)
	Distribution	80.622	699	115	9 (13)
	Transmission	37.068	195	190	4 (4)
Gas		85.010	738	115	10 (14)
	Distribution	33.597	633	53	4 (12)
	Transmission	51.413	105	490	6 (2)
Grand total		879.390	5183	170	100

Source: Authors' elaboration based on World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org). Date: 17/06/2016. PPI: Private participation in infrastructure

The Mediterranean energy sector present a high degree of interdependence, both for electricity and gas (Cambini and Rubino, 2014). Despite its long history of interaction, the Mediterranean today is a highly fragmented region that is facing unprecedented challenges in its social, economic and political dimensions (Roy, 2012). In a situation where persisting discrepancies are expected to last for the coming decades, although with a declining gap, there is certainly an economic justification for the promotion and development of cross-border electricity and gas transmission infrastructures (L'Abbate et al., 2014). Cross border interconnection is expected to play a positive and significant role in reducing the energy gap among sub-regional markets (Rubino, 2014). Moreover, the significant role that renewable energy generation will play in the Euro-Mediterranean region requires national electricity systems become highly interconnected and robust to growing demand. In addition, they need to be able to accommodate the presence, in the generation mix of large quantities or intermittent wind and photovoltaic generation. Although state-level energy policies are still dominant in the energy sector, it is indisputable that MENA countries will not be able to deliver investment of this variety and size only via public budget. Therefore, it is important at this stage to shed a light on how regional markets are scoring in term of capability to attract private investments, and their abilities to cooperate with the private sector to deliver the necessary investment required.

This paper look at how energy infrastructures are evolving worldwide. The focus of this analysis is to evaluate the performance and trends of PPP in infrastructure (in the next section). It will then explore MENA region performance and in particular at RES investment in Morocco and Jordan in Sections 2 and 3. This overview will allow to draw, in the final section of the paper some conclusions and final remarks.

2. GLOBAL OVERVIEW

The focus of this analysis is to evaluate the performance and trends of PPP in energy infrastructures[4] at global and in the MENA regional. An infrastructure investment is considered to entail a public-private participation when a PPP establish a contract "[…] for providing a public asset or service, in which the private party bears significant risk and management responsibility" (World Bank, Asian Development Bank, Inter-American Development Bank, 2014). In addition, the remuneration allowed to finance the infrastructure need to be linked to performance, in order to qualify the investment considered as PPP. This proposed definition, adopted by the World Bank, allows to include in the analysis a wide spectrum of investment projects, including new assets and services and different level of private participation and engagement on the projects. We will refer to these type of investments in the remainder of the paper[5].

Following this definition, we find out that total PPP investment[6] in energy infrastructures was US$ 37.8 billion in 2015, compared to US$ 46.7 billion in 2014. The level of total investment is still below the values of 2007, and is registering a declining trend since 2012.

The vast majority of PPI projects in energy took place in the Electricity sector recording 4445 since 1991, with only 738 project being developed in the gas sector in the same period. Also in 2015 the largest number of new projects were in electricity (200) and only 3 in gas. The electricity sector had most of the new projects and was also the sector with the greatest value in investment committed, receiving over US$794 billion, or 90% of total energy investment. The gas sector accounted for US$85 billion, or 10% (Table 1). The largest subsector able to attract PPI investment is electricity generation, representing alone 77% of the total investment committed or 69% in terms of number of projects. It is interesting to notice that very few transmission projects have been financed via PPI, in both sub sector, confirming the complexity of such infrastructural endeavor.

When we look at the performance per region (Table 2) it is noticeable the significant drop of the level on investment in Latin America and the Caribbean and Europe and Central Asia on a Year over Year (YoY) basis. At a more general level MENA countries and Sub-Saharan Africa, together represent only 8% of the level of global energy investment against 37% of Latin America and

4 Energy investments have been included in the evaluation according to their primary sector, that is classified according to the four infrastructure sectors covered in the PPI Project Database (Energy, Transport, Water, ICT) and is defined by the main infrastructure services provided by the project to the public. For projects that provide services across more than one infrastructure sector, the secondary sector is the second main infrastructure service that the project provides to the public. Most common multi-sector projects involve the energy (electricity) and water sectors services. For projects that involve both electricity and water services, energy has been recorded as the primary sector and water as the secondary one. Therefore, aggregated reports attribute investment of those projects to the energy sector rather than to the water one.

5 PPP and PPI will be used interchangeably in this paper.

6 "Investment" refers to investment commitments at the time of financial closure or in the case of brownfield concessions, contract signing.

Table 2: Total energy investment committed by region, 1992-2015

Region	2015 (*)	Total investment	%	Number of projects	%	Average size (*)
LAC	10.929	324.203	37	2.309	45	140
EAP	11.937	179.408	20	1.110	21	162
SA	3.806	165.395	19	729	14	227
Europe and Central Asia	2.530	141.240	16	724	14	195
Sub-Saharan Africa	6.451	37.021	4	245	5	151
MENA	2.228	32.123	4	66	1	487
Grand total	37.881	879.390		5.183		

*in US$ MLN Source: Authors' elaboration based on World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org). Date: 17/06/2016. PPI: Private participation in infrastructure, LAC: Latin American and Caribbean, EAP: East Asia and Pacific, SA: South Asia

Caribbean and respectively 20%, 19% and 16% of East Asia Pacific region, South Asia (SA) and Europe and Central Asia.

In this framework, is interesting to notice that energy investment in MENA, are of a significant larger size, compared with similar investments in other regions. While the volume of investment in the MENA is comparable to those in Sub Saharan Africa (SSA) its number is significantly lower. We will explore in the remainder of the paper on possible factors that have determined such visible result. The top six countries engaged in PPI in energy in the last 3 years (2013-5) were: (1) Turkey, (2) Brazil, (3) Chile, (4) Mexico, (5) China and (6) South Africa. These six countries attracted US$74 billion of investment, representing 54% of all the PPI commitments in emerging economies.

The three regions with investment increases — East Asia and Pacific (EAP), SA and SSA recorded cumulative gains of only US$ 6.7 billion, not enough to offset the year-over-year (YoY) decline of US$ 8.8 billion in 2015. By effect of the relative changes in PPI, the region able to attract most investment is EAP, overtaking Latin American and Caribbean (LAC). Despite these declines SSA auspiciously received their highest investment volume ever recorded — US$6.5 billion in 24 new projects, all in electricity generation. Leading the way was Solar CSP plant in South Africa (US$ 900 million), a combined cycle gas turbine turbine built in Nigeria (US$ 880 million) and a coal fired plant in Zambia (US$ 830).

Among all regions, the total number of new energy projects was 203, slightly higher than the previous year. Of the 203, more than one third was in LAC (70); SA had 35; EAP had 57; ECA had 7; MNA had 10 in addition to the 24 already mentioned in SSA. Notably, ECA dropped precipitously from 22 projects in 2014 to just 7 in 2015. Much of this was a result of Turkey, which dropped from 14 projects to just 3 YoYs. Meanwhile, MNA more than doubled from 4 to 10. The remaining four regions were roughly in-line with 2014 project totals, although with a general declining trend.

3. REGIONAL OVERVIEW – MENA REGION

The MENA moved from the sixth position to the fifth, in 2014 increasing slightly over the prior year but moving again on the sixth position the following year (Figure 4). PPI in MENA country comprise just 6% of global energy sector PPI at US$2.2 billion. Between 2013 and 2015 only Jordan and Morocco managed to commit PPI investment in energy projects for a total of US$7.5 billion (Table 3).

Table 3: Investment committed in MENA region by country, energy sector (2012-2014)

Country	2013*	2014*	2015*	Cumulative (1992-2015)*	Total (2013-2015)*
Morocco	1.438	2.600	1.800	17.117	5.838
Jordan	1.102	161	428	3.030	1.691
Algeria	0	0	0	5.962	0
Egypt, Arab Republic	0	0	0	2.372	0
Tunisia	0	0	0	948	0
Total MENA	2.540	2.761	2.228	32.122	7.592

*In US$ Million. Source: Authors' elaboration based on World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org). Date: 17/06/2016. PPI: Private participation in infrastructure, MENA: Middle East and North African

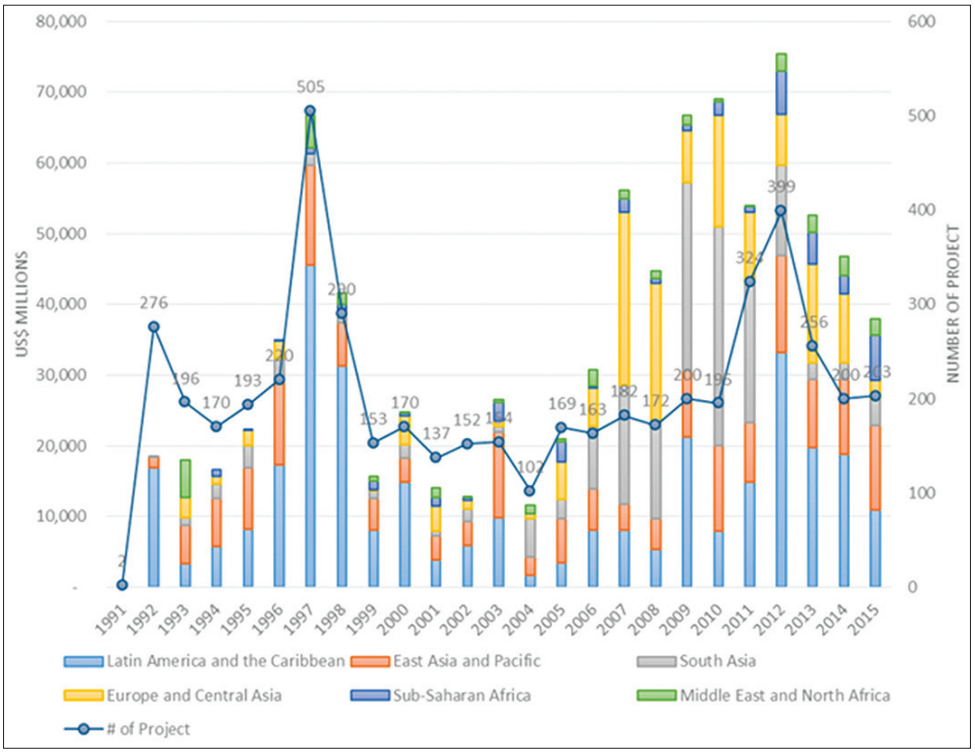
If we look at the longer history of PPI Energy investment in the region (Figure 3), we notice that investment in MENA region only represents 2% of the global investor in the sector in, resulting as the least performing region, globally. Investment in MENA region is recovering from a 15-year investment low. The number of transaction is still below 2009 level, and is struggling to recover after the financial crisis.

It is notable in Figure 3 that PPP in the region experienced a "double dip" (in 2008 and 2011). The volume of investment is now just above the pre 2006 level; however, PPP investment in energy after 2011 took place only in two countries, Morocco and Jordan. In 2015 10 project have been closed (8 in Jordan the remaining 2 in Morocco) for a total of US$ 2.2 Billion with a 23% decrease on a YoY basis. Since 2013, 22 new project have been concluded, 18 of whom in renewable generation.

The level of PPP investment depends on a number of factors. Within this long list, it is interesting for us to identify those that have played a significant role for the energy context in MENA countries. We can group these factors into three main categories: (1) Factors that determine governments to engage in PPP, (2) the underlying context in terms of the overall macroeconomic environment, and (3) factors that affect the incentive and motivation of the private sector to enter into a PPP.

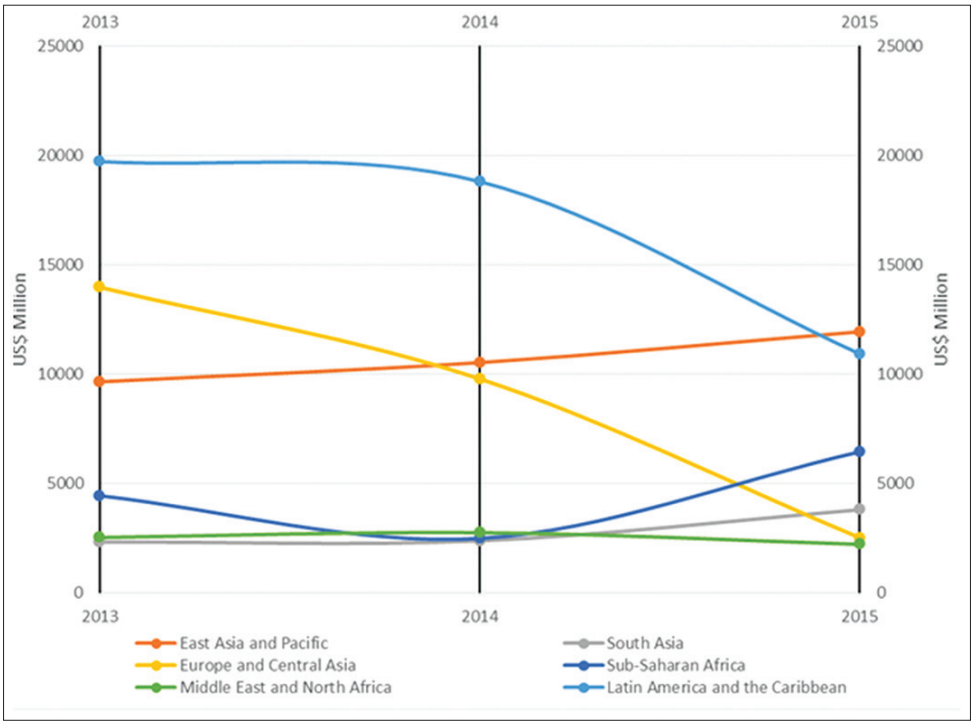
The country risk (Ponti, 2016), that takes into consideration, among other indicators, the political unrest in the region, is likely to require a significant mark up in the return required by the remuneration of investment in the region, in particular when characterized by long lead times. Finally, the great emphasis currently placed on investment in RESs is likely to require a good ability of the government to adapt the existing energy paradigm, mostly based on fossil fuel generation, to the a new and diverse

Figure 3: Total investment in energy, by region



Source: World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org). Date: 17/06/2016

Figure 4: Total investment in energy by region (2013-2015)

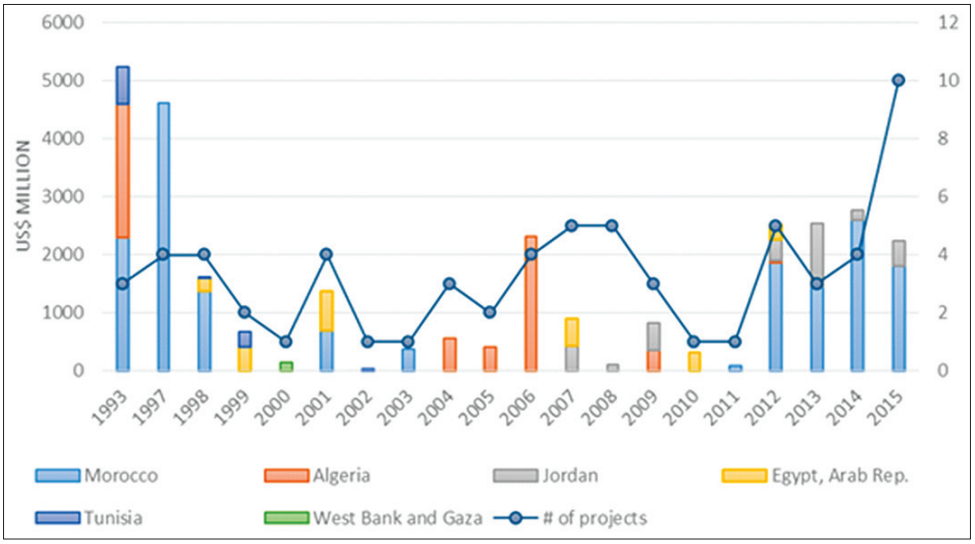


Source: Authors' elaboration based on World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org). Date: 17/06/2016

model. Therefore, showing a certain capacity to evolve to the changing needs emerging in the new energy scenario. The factors will be described more carefully below.

Governmental engagement in PPI - Most MENA countries, in order to raise the expected level of investment for generation infrastructures in the coming 15 years, are devoting an increasing attention to develop an investor friendly environment. Some of the most recent energy policies, including the establishment of national RES targets and feed in tariff for newly added renewable generation, have been set up to encourage private participation in energy investment and to signal a gradual opening of their internal

Figure 5: Total investment in energy in Middle East and North African



Source: Authors' elaboration based on World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org). Date: 17/06/2016

markets. As of today, all countries in the region have announced targets for the deployment of renewable technologies in their energy systems (Brand, 2016).

Macroeconomic environment - A second group of factors, depend on the general framework under which Infrastructure investment takes place. In addition to strong demographic growth that led to a bottom heavy population pyramid the IMF World Economic Outlook expects an average GDP growth of 5.1% up to 2018. While these factors typically led to an expansion of infrastructure needs, recent political developments have led to a contraction of fiscal space. The instability of the region inherently creates uncertainty about the future, making large upfront commitments difficult. The political stability (PS) score, as defined by the Worldwide Governance Indicators project (World Bank), is significantly lower, on average, for MENA region when compared to the other regions in the database. However, Morocco and Jordan are the countries more politically stable with a score respectively of 2.11 and 1.942 (Table 4), against an average of 1.44 in the region. As a comparison the score for Egypt in 2014 is 0.99.

Finally, the third group of factors takes into consideration all those aspects considered critical by private investors, such as: Adequate regulatory framework and proper enforcement of laws, Independence of regulatory. The Rule of Low (RoL) score represent a synthetic indicator that can reflect those aspects. Also for this indicator Morocco and Jordan show a score above the region average, respectively of 2.98 and 2.44 (Table 5). As a benchmark, for the same indicator, the score registered in Algeria is 1.7 and in Egypt is 1.9.

As discussed in Abrardi et al. (2016) there is a number of robust evidence that suggest a positive correlation between the presence of an appropriate institutional framework, in each country, and the level of investment that is realized. It is therefore not surprisingly that Morocco and Jordan show a (relatively) high score in terms of

Table 4: PS (2012-2014)

Country	2012	2013	2014
Morocco	2.04	2.02	2.11
Jordan	1.98	1.88	1.94
Tunisia	1.76	1.57	1.57
MENA average	1.47	1.41	1.44
Algeria	1.18	1.32	1.33
Egypt, Arab Republic	1.04	0.85	0.92

PS and absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism (0=weak; 5=strong); Source: Authors' elaboration from World Bank (WGI: Worldwide Global Indicators). PS: Political stability

Table 5: RoL (2012-2014)

Country	2012	2013	2014
Jordan	2.87	2.89	2.98
Morocco	2.29	2.24	2.44
Tunisia	2.34	2.29	2.38
Mena average	2.26	2.23	2.29
Egypt, Arab Republic	2.04	1.90	1.90
Algeria	1.75	1.84	1.77

Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. (0=weak; 5=strong); Source: Author's elaboration from World Bank (WGI: Worldwide Global Indicators). RoL: Rule of law

PS[7] and for RoL[8]. These two factors play a significant and positive role in providing an environment conducive to better engagement of private investments. PS signal the existence of sufficient social and political cohesion that, among other benefits, contributes to lower the returns on investment required by investors (via a lower

7 "Reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism" from the The Worldwide Governance Indicators project.

8 "Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" from the The Worldwide Governance Indicators project.

country risk). RoL score, on the other hand, influences the growth rate of developing countries by restraining the government from intervening with *ad-hoc* actions and offsetting private initiatives. This improves the investors' state of confidence about the expected return of their investments and provides legal protection to business activities. Morocco and Jordan show the highest scores in both indicators, and not surprisingly, they are the only two countries that have been able to attract a significant number of PPP investments in energy infrastructures. We will review, in the remainder of the paper, a description of the energy policy in Morocco and Jordan.

4. CASE STUDIES IN THE MEDITERRANEAN: MOROCCO AND JORDAN

4.1. Morocco's Gradual Energy Strategy

The seeds of this success, relative to the performance of the overall MENA region, is evident in cases such as Morocco and Jordan. The process of energy sector liberalization in Morocco dates back to 1995, when a first liberalization strategy (to liberalize power generation) was introduced. However, it was only at the end of the last decade that the government of Morocco considered a more far-reaching energy strategy, to respond to the challenges that this sector represents for the country. In 2009, the Moroccan government developed a National Energy Strategy (NES) that focused on achieving tangible results and attaining precise targets:

i. Establish an optimized fuel mix;
ii. Increase deployment of renewable technologies;
iii. Promote private investments;
iv. Promote energy saving and use efficiency;
v. Promote regional integration.

Accordingly, additional power capacities were scheduled to be added by the year 2020. In addition, Morocco launched its renewable energy programme, which consists of achieving overall installed capacities of 2000 MW wind energy and 2000 MW solar energy, and of increasing its hydropower capacity to 2000 MW, by 2020. To achieve the renewable energy targets a new institutional framework was set up which resulted in the creation of:

- The Moroccan Solar Energy Agency to pilot the solar programme (Plan Solaire),
- An energy investment firm to promote private investments in energy sector,
- An institute (IRESEN; L'Institut de Recherche en Energie Solaire et Energies Nouvelles) to promote research, innovation, and development in the energy sector.

Meanwhile, the government started to update, renew, or set new rules in the legal and administrative framework related to power generation, transmission, and distribution with special focus on renewables. Therefore, within the Moroccan context, a variety of stakeholders are concerned with renewables. The existence of this institutional stakeholders' arena demonstrates the high level of interest that Morocco has in renewable energy in particular, and in sustainable development in general. As a result Morocco was able to feature among the top six destination countries for energy investment between 2012 and 2014, attracting nearly US$6 billion of PPP (representing 5.6% of the total investment in the period considered).

Four large projects were financed. However, the lack of incentives and regulatory framework for distributed generation and small-scale projects (such as roof top PV), as well as the lack of any specific indication in relation to the type of technologies targeted by the Plan Solaire, prevented market expansion. For instance, a system of feed-in tariffs is still missing, while net-metering schemes have been under discussion for a very long time now with no concrete progress. Thus, the current legal and administrative frameworks do not yet enable an effective development of small and medium-scale renewable energy projects. Notwithstanding these possible downsides, the trend for PPPs in the energy sector is robust in Morocco and is driving a slow, but steady transition toward a sustainable energy system.

4.2. Renewable Energy in Jordan

The policy of the Government of Jordan in the field of energy was shaped through the adoption of the updated NES in Jordan for the period 2007-2020. The main goals of the energy strategy are:

- The provision of a reliable energy supply by increasing the share of local energy resources in the energy mix;
- Reducing dependency on imported oil;
- Diversifying energy resources;
- Enhancing environmental protection.

These goals are to be achieved through maximizing the utilization of domestic resources such as oil shale and natural gas, expanding the development of renewable energy projects, and promoting energy conservation and awareness. Jordan's government has underlined its commitment to reach these ambitious targets and issued the Renewable Energy and Energy Efficiency Law on 17 April 2012. With this law, for the first time, unsolicited or direct proposal submission is allowed, where investors have the opportunity to identify and develop renewable grid-connected electricity production projects on their own and propose them to the Ministry of Energy and Mineral Resources. The Tafila wind power project, with a capacity of 117 MW, was the first project to be undertaken through the direct proposal process.

Specifically, the government invited developers to submit expressions of interest for the development of renewable projects, indicating the maximum tariffs that the government would pay for different types of renewable power. In the developers' expression of interest, the land required for the project and the proposed size and type of facility had to be identified. Memoranda of understanding are issued for expressions of interest which are acceptable to the government; these provide developers with an exclusivity period of 24 months, during which time they are required to develop the project, sign project agreements with the government, and reach financial closure.

As a result of the introduction of this bottom-up approach, 13 PPP projects were developed between 2012 and 2014, amounting to an investment commitment of US$1.8 billion. The number of requests for the connection of renewable energy systems, according to

the Net-Metering system, has reached 430 requests with 12,352 kW of capacity; of these, 291 (with 2554 kW of capacity) were connected and in operation during the year 2013.

5. CONCLUSION

PPP is a relatively new feature of Infrastructure investments in many low and middle-income economies. Since 1990 a growing number of countries is experiencing an increasing participation of the private sector in supporting the development and diffusion of effective infrastructures endowment. PPP can be beneficial for public service provision for at least a couple of economic reasons: Firstly, It enhance the economic efficiency of service provision (de Bettignies and Ross, 2004) and secondly, allows government to define the characteristic of the service they need, the business model around which this service has to be provided without the need to own (entirely) the assets (Kirkpatric et al., 2006). Theoretical studies and empirical evidences illustrated how a number of factors coalesce to play a relevant role in determining the level and magnitude of private engagement in PPI. According to Mengistu (2013) these factors can be grouped into three main categories: (1) Factors that determine governments to engage the private sector in infrastructure financing; (2) the underlying context in terms of the overall macroeconomic environment, which drives to some extent the respective motivations of the public and private sectors, and (3) factors that affect the incentive and motivation of the private sector to enter into a PPP with the government.

The evidence collected indicates that the available public budgets are not able to match the investment needs of the region (Allal and Urbani, 2016) and that an enhanced level of PPI investment is needed (Cambini and Rubino, 2016) in most MENA countries. Brand (2016) also discussed how some of the most recent energy policy initiatives (e.g. RES target and feed in tariff) have been specifically set up to encourage private participation in energy investment. Therefore, it appears that the factors inducing governments to engage the private sector in infrastructure financing are present in the MENA region, and currently represent one of the main driver in the recent policy dynamics[9].

The second group of factors, those that determine the general framework under which Infrastructure investment takes place, and that define the conditions that both private and public investor need to consider, have been discussed by Ponti (2016). Ponti concluded that country risk is always considered when planning long-term investment. Countries perceived less financially stable are obliged to grant investors higher returns to offset country risk, thus increasing the total investment costs.

Finally, the third group of factors, that takes into consideration those aspects considered critical by private investors, include, adequate regulatory framework and proper enforcement of laws, Independence of regulatory institutions and processes, access to credit, consumers' ability to pay for services, government effectiveness and responsiveness and PS and public opinion on private provision of infrastructure services. Abrardi et al. (2016) have carefully explored the role that the institutional endowment play in favoring investment in the energy sector. It emerges that the presence of a National Regulatory Agency determines a positive impact on investments.

In our analysis, we have turned our attention on how PPP investment evolved in low and middle-income countries at a global level and possible explanation for the observed trend. The analysis, performed looking at the data made available by the PPI Database[10], has shown that the region able to attract the most investment is Latin America and Caribbean that collected more than 45% of the global investment in the period 1992-2015. MENA countries only represent 4% of global investment in the same period. Historically MENA countries have been unable to attract an adequate level of investment, also compared to the GDP level of the region. When we focus on regional level we find out that only Morocco and Jordan have been able to attract PPP investments. Moreover, the social and political unrest experienced in 2011 have stopped this already weak trend, reducing further the level of PPP investment in the region, that appear to be struggling to recover since then.

PPPs are expected to play a growing role in infrastructure investment because they represent a shortcut to the modernization of the energy sector and the provision of much-needed infrastructure. Different strategies are possible to achieve the attraction of private stakeholders. The two most successful cases in the MENA region illustrate that both decentralized and centralized models can be viable. In the first case, positive results have emerged from Jordan following an attempt to promote widespread diffusion and social acceptance of RES, while promoting, at the same time, domestic and residential installations. Decentralized energy projects are also promoted as part of government's localism and rural development agenda, as citizens, rural communities, local authorities, and private organizations are now involved in energy projects and investments, thus developing solutions that meet local needs and involve local stakeholders. In contrast, Morocco has promoted a centralized investment strategy, to attract a few flagship projects, in combination with a policy to develop, at the same time, green growth and a RES industrial sector. This main strength of the policy framework also represents the main limitation of the Moroccan renewable energy strategy – that it is focused solely on large-scale projects.

The evidence collected illustrates the fact that stabilization of the remuneration provided with the most common regulatory tool for RES technologies (in particular a RES quota and target)

9 Countries in the region are striving for attract investment from private and public funds in strategic economic sectors. A recent example includes the organization of an economic development conference in Egypt. The Egypt Economic Development Conference (EEDC) was a 3-day event that took place in Sharm el-Sheikh. On March 13, 2015. The EEDC attracted pledges of $12.5 billion in assistance from Egypt's allies in the Gulf Cooperation Council, $33.2 billion in investment agreements and a further $89 billion in Memorandum of Understandings. See , for example, The Wall Street Journal, 2015, March 15.

10 The PPI Database contains 25 years of data on private participation in infrastructure in 137 countries. The data set includes information on more than 4300 infrastructure projects that have reached financial closure. It covers projects in transport, energy, telecommunications, and water and sanitation. The database highlights contractual arrangements, committed investment, and key information on investor http://ppi.worldbank.org/

is essential to provide the necessary guarantees, and certainly represents a positive step toward RES penetration. However, while widely diffused, such measures need to be accompanied by a long-term strategy – one capable of generating an environment conducive to investment – in order to become effective. In such a framework, the strategies adopted in Morocco and Jordan, although different in their approach, have been able to provide these preconditions. These two approaches can well represent possible alternative models for the active participation of the private sector in energy investment. To this end, recent policy development, particularly in Egypt and Algeria, testifies for a move toward a more sustainable and investment-friendly environment in the region.

REFERENCES

Abrardi, L., Cambini, C., Rondi, L. (2016), Investment and regulation in MENA countries: The impact of regulatory independence. In: Alessandro, R., Maria, T.C.C., Veronica, L., Ilhan, O., editors. Regulation and Investments in Energy Markets. San Francisco: Academic Press. p243-273.

Allal, H., Urbani, M. (2016), Financing Mediterranean electricity infrastructure: Challenges and opportunities for an interconnected mediterranean grid. In: Alessandro, R., Maria, T.C.C., Veronica, L., Ilhan, O., editors. Regulation and Investments in Energy Markets. San Francisco: Academic Press. p275-291.

Brand, B. (2016), The renewable energy targets of the MENA countries: Objectives, achievability, and relevance for the mediterranean energy collaboration. In: Alessandro, R., Maria, T.C.C., Veronica, L., Ilhan, O., editors. Regulation and Investments in Energy Markets. San Francisco: Academic Press. p89-100.

Cambini, C., Rubino, A. (2014), Regional energy initiatives. MedReg and the Energy Community. London: Routledge.

Cambini, C., Rubino, A. (2016), EU pressures and institutions for future Mediterranean energy markets: Evidence from a perception survey. In: Alessandro, R., Maria, T.C.C., Veronica, L., Ilhan, O., editors. Regulation and Investments in Energy Markets. San Francisco: Academic Press. p133-153.

De Bettignies, J., Ross, T. (2004), The economics of public private partnerships. Canadian Public Policy, 30(2), 135-154.

Kirkpatric, C., Parker, D., Zhang, Y. (2006), Foreign direct investment in infrastructure in developing countries: Does regulation make a difference? Transnational Corporations, 15(1), 143-171.

L'Abbate, A., Migliavacca, G., Calisti, R., Brancucci Martinez-Anido, C., Aymen, C., Fulli, G. (2014), Electricity exchanges with North Africa at 2030, The European and the Italina approach. In: Cambini, C., Rubino, A., editors. Regional Energy Initiatives. MedReg and the Energy Community. London: Routledge. p225-245.

Med-TSO. (2013), Master Plan of the Mediterranean Interconnections and Related Investments. Rome: Med-TSO.

Mengistu, T. (2013), Emerging Infrastructure Financing Mechanism in Sub-Saharan Africa. Pardee RAND Graduate School. Santa Monica: RAND Corporation.

OME. (2015), Observatoire Mediterranéèn de l'Energie. Mediterranean Energy Perspective. Paris: OME.

Panayotou, T. (1998), The Role of The Private Sector in Sustainable Infrastructure Development. Cambridge, MA: Harvard Institute for International Development.

Ponti, A. (2016), Investing in infrastructures: What financial markets want. In: Alessandro, R., Maria, T.C.C., Veronica, L., Ilhan, O., editors. Regulation and Investments in Energy Markets. San Francisco: Academic Press. p311-331.

Poudineh, R., Rubino, A. (2016), Business Model for Cross-Border Interconnections in the Mediterranean Basin. Oxford: Oxford Institute for Energy Studies.

Private Participation in Infrastructure Database. (2015), Public-Private Infrastructure Advisory Facility, (PPIAF). Available from: http://www.ppiaf.org.

REN21. (2013), MENA Renewable Status Report. Paris: REN21 Secretariat. Available from: http://www.ren21.net/Portals/0/documents/activities/Regional%20Reports/MENA_2013_lowres.pdf.

Roy, O. (2012), The transformation of the Arab World. Journal of Democracy, 3(23), 5-18.

Rubino, A. (2014), A mediterranean electricity co-operation strategy. vision and rationale. In: Cambini, C., Rubino, A., editors. Regional Energy Initiatives. MedReg and the Energy Community. London: Routledge.

Egypt's Sisi Closes Economic Conference with Call for Further Investment. The Wall Street Journal. Available from: http://www.on.wsj.com/1JrSotp. [Last accessed on 2015 March 15].

World Bank, Asian Development Bank, Inter-American Development Bank. (2014), Public-Private Partnerships. Reference Guide. Version 2.0. Washington, DC: World Bank Publications.