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Independent Regulatory Agencies and Rules Harmonization for the Electricity Sector and Renewables in the Mediterranean Region

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Abstract

The paper analyses the existing regulatory framework for the electricity and renewables sectors, and the role of regulatory agencies in Northern Africa and Middle East countries, under the promotion by the European Union. Using data collected through an original survey directed at regulators, ministry departments and energy companies of the southern Mediterranean, the study is aimed at assessing the extent of agencies' independence looking at three main dimensions of independence: regulatory instruments available to regulators and decision making autonomy; regulators' organizational autonomy; regulators accountability. Results show that those countries having established an independent regulator have a more credible regulatory framework than those countries in which such body does not exist. In particular, the analysis shows that Turkey, Croatia and Jordan have defined a regulatory framework that limits administrative expropriation and, consequently, creates an environment more suitable for attracting investments in the electricity and renewables sector. On the institutional ground, this is probably related with the harmonization of regulatory standards promoted by the European Union through the *neighbouring policy*, for the Jordan case, and the membership perspective, in the Turkish and Croatian case.

Keywords: Independent Agencies; Investments; Mediterranean

[Forthcoming *Energy Policy* 2013]

1. Introduction

This paper investigates the extent of independence and decision making autonomy of energy regulatory agencies in the Mediterranean region. Institutional background of countries involved in this study would let scholars be sceptic on potentials for effective regulatory changes in the region. Nevertheless, a process of rules harmonization between the European and Northern African shores of the Mediterranean Sea seems emerging thanks to joint initiatives of cooperation on energy, renewables mainly, exploitation. Rules harmonization, one of the pilaster of Euro-Mediterranean cooperation, requires strong coordination among actors involved and make new organizations, such as regulatory agencies for the energy sector management, a relevant case study.

The aim of this paper, thus, is not to define the better reforming model countries involved in this study have to adopt, rather to identify how current reform processes in a key sector such as energy may be shifted towards a more responsible development path.

Being one of the features characterizing the process of liberalization (OECD, 2002)[1], agencies' independence from political power and stakeholders is widely recognised as a guarantee of regulatory commitments of a country (Majone, 1996; Gilardi, 2005a). With regards to the energy sector, the establishment of Independent Regulatory Agencies (IRAs) may favour investments in networks infrastructure and, considering the increasing relevance of renewable energy sources, facilitates system adaptation to the integration of intermittent renewable sources such as solar and wind.

Regulatory agencies have been recently set-up in relevant energy producers and transit countries of the Mediterranean region, Middle East and Northern Africa (MENA) countries mainly. The Mediterranean region, currently at the centre of renovating interests on electricity and renewables, is highly involved in European frameworks of cooperation, with energy rules convergence as one of

[1] The OECD (2002) describes establishment of Independent regulatory agencies as "one of the most widespread institutions of *modern* regulatory governance".

the main objectives to achieve.[2] In the aftermath of current initiatives and investment projects, such as the Mediterranean Solar Plan and the Desertec, a harmonized and transparent regulatory framework at wider Mediterranean level is required. Thus, the progressive establishment of IRAs in the southern Mediterranean region is here analysed jointly with the degree of adoption of those regulatory standards qualifying the globalization of regulation (Levy and Spiller, 1994; Levi-Faur 2005). Our study, which includes original data from IRAs in the Mediterranean region, mainly refers to findings from a survey launched on January 2012 among Mediterranean regulators and energy companies. Data have been collected from Egypt, Jordan, Morocco, Tunisia, Turkey, and Croatia. All respondents belongs to regulatory agencies with the exception of Morocco and Tunisia, where IRAs have not been set-up and answers have been provided respectively by the energy company, ONE, and the Ministry of Industry. Turkey and Croatia are currently candidate members to enter the European Union (EU) in next years and therefore they are already in the process of harmonizing their regulatory framework on energy sectors. These two countries then represent a useful benchmark on how rule harmonization from EU may affect the implementation of reforms by a non-EU country. Moreover, the analysis is completed with information drawn from official documents on Algeria, Israel and Lebanon. Libya and Syria have not been considered due to the unclear political situation, and civil war, at the moment in which the analysis started.

Following a similar analysis for European countries (Larsen et al., 2006), our study is the first paper that aims at providing an assessment on the degree of independence of regulators in developing countries, providing new and original data - collected with a dedicate questionnaire to national regulators - on the extent of southern Mediterranean independence of energy regulatory bodies. With this regard, data organization follows three dimensions of agencies' independence: decision making autonomy, organizational autonomy, and agencies' accountability. Survey's results show that regulatory agencies in the region are mainly advisory bodies of executives, the latter being the

[2] The World Bank also played a leading role in promoting regulatory and competitive reforms, especially in both South America and Africa (Kessides, 2004). However, in recent years the EU pressure for rule harmonization is much more prevailing (Radaelli, 2003; Lavenex and Schimmelfennig, 2009).

sole having decision making powers on issues such as tariff setting and Third Party Access regime. Moreover, network unbundling in the region remains essentially functional, and state-owned companies own and manage networks in the majority of cases here considered. To sum-up, in MENA countries IRAs have been established before liberalizing the electricity sector but their degree of independence in regulatory decisions is still limited.

The paper is structured into five sections: Section 2 critically reviews the rationale behind IRAs' establishment. It analyse the model of IRAs as affirmed in the EU, being regulatory convergence in the Mediterranean region mainly promoted by the EU. Section 3 provides detailed description of our research method. Methods for data collection and assessment of the index of independency are described. The empirical analysis of IRAs in the mentioned countries is provided in Section 4. In Section 5 the study of regulatory harmonization in the electricity and renewables sector within the Mediterranean region is reported. Section 6 concludes.

2. Rationale behind regulatory agencies' independence

2.1 Restructuring utility industries: the role of IRAs

Introducing elements of competition in traditionally state-managed sectors, requires agencies' independence being substantial in terms of agencies' legitimacy, accountability, and capture risks (Larsen et al. 2005 and 2006). When regulators are "not independent" and regulation is carried on by Ministries or other governmental entities, the government can either directly force or indirectly influence the regulators to ex-post modify their decisions, thus constraining the regulators' ability to commit to their regulatory policy. This lack of commitment leads to time-inconsistent decisions, undermining firms' performance and investment incentives. Indeed, politicians are generally perceived as "bad regulators" (Stigler, 1971), since their intervention can generate uncertainty in the regulatory policy that in turn negatively affects firm's decisions, especially in infrastructure investment.

The rationale behind the creation of an independent authority lies in the attempt to insulate regulators from political interference aimed at influencing regulated firms' investment, employment decisions or price setting processes, particularly when the government has ownership stakes in the utility. IRAs institutional design have thus to assure: agencies' independence, since the decision making point of view, from the Executive power; agencies' accountability, in front of the elected bodies; and agencies' autonomy, in terms of financial resources to be managed and expertise to be recruited in order to reduce capture risks and asymmetric information problems. Thus, the inception of truly independent agencies create a more stable regulatory environment and this in turn has a positive impact on the investment decisions of public utilities, both in Europe (Cambini and Rondi 2011) and in Latin America and Caribbean countries (Gutierrez 2003; Andres et al. 2006; Correa et al 2006; Andres et al. 2007; Andres et al. 2008).

The institutional context of the country has been assessed as the main influential factor when reforming the electricity sector (Levy and Spiller 1994; Gutierrez 2003; Zhang et al. 2006). As regards the energy sector, indeed, Cubbin and Stern (2006) show that, in those countries where an independent agency has been set-up, generation capacity has been improved, confirming the relation between performance of the utility sector and the governance of regulatory institutions. Nonetheless, Latin America shows cases of positive implementation of energy sector reforms such as the Chilean case where IRA was established in 1978 (Newbery 2001).[3] Establishing IRA, thus, is part of sequences of steps in reforming utilities that firstly requires an institutional environment capable of limiting administrative discretion. Alternatively, established agencies may be seriously at risk of being captured.

[3] Similar results have been found for the telecommunication industry. For example, Trillas and Montoya (2011) present an analysis of the evolution of telecoms regulatory independent agencies for 23 Latin American and Caribbean countries. Defining agencies' independence in terms of regulators' political vulnerability, the authors show that higher degree of authorities' independence is associated with larger investment in infrastructure and a higher subscription by users.

In line with the experience of the US (Geradin 2004; Joskow 2007), the EU makes the establishment of IRAs at member countries level one of the pivotal element to the competitiveness of utilities. In Europe, the Great Britain was the first country to adopt IRAs (Saal 2002; Cambini et al. 2012). At EU level, the Directive 2003/54/EC carefully defined the institutional design of regulatory bodies, and provided a first framework for a pan-European coordination among regulators through the ERGEG - European Regulators Group for Electricity and Gas set-up. Then, the Directive 2009/72/EC, part of a third package of directives aimed at utilities liberalization and energy market integration, further stressed the role of agencies, their duties and the need for their effective independence; a strengthened coordination at EU level through the Agency for the Cooperation of Energy Regulators (ACER), was affirmed. IRAs, thus, gradually emerge in the EU regulatory experience as the instrument pivotal to the electricity sector liberalization. Built on the EU domestic regulatory experience, the model of IRAs is the one the EU promotes in the Mediterranean neighbouring countries through partnership programmes and cooperation initiatives. Coherently with the literature mentioned in this section, the EU action has been directed at influencing those institutional factors that my affect utility reform projects. Thus, EU programmes have been directed at the state capacity building through the promotion of good governance and rule of law. Firstly the Euro-Mediterranean Partnership (1995) and secondly the European Neighbourhood Policy (2004), foster sustainable economic growth and market integration at Euro-Mediterranean level to be defined on shared regulatory standards mainly. The improvement of MENA rule of law and good governance is pursued through technical issues of cooperation, as in the case of the Mediterranean Solar Plan adopted within the Union for the Mediterranean initiative (2008). Being mainly based on promotion, and adoption, of regulatory standards, EU programmes favour a form of functional Euro-Mediterranean integration, which allow both to circumvent those "*macro-political obstacles that have traditionally impeded the advancement of co-operation in the region*" (Darbouche 2011, p.195), and improve countries' transparency and rule of law. Thus, IRAs have to be viewed in the wider framework of EU rule of law and good governance promotion, being

a case of transparent regulatory practices of a country. With this regard, the 2007 Euro-Mediterranean Ministerial Conference provided, for the first time, the assessment of the regulatory framework for the electricity sector at MENA countries level, including the role of existing regulatory agencies, and the degree of diffusion of EU regulatory standards[4]. Moreover, the EU role as rules promoter was, although indirectly, assessed.

Rules promotion may only partially explains the reasons behind spreading regulatory practices. Following the institutional economics literature, rules are implemented differently depending on countries' institutional endowment (North 1990). With this regard, Levy and Spiller (1996) highlight how judiciary independency, functioning checks and balances system, veto players and contending social interests, as well as administrative capabilities of a country, are *exogenous* factors directly impacting on countries' regulatory restraints and independence of regulatory agencies. The relevance of non-economic barriers and administrative capabilities to the implementation of specific policies, such as those for renewables, have been stressed with regards to EU Mediterranean countries too in comparison to northern ones (Lüthi 2010; Lüthi and Wüstenhagen, 2011). The second part of this section, thus, contains study's assumption on explanatory factors for IRAs' set-up at MENA level and the potential impact of countries' institutional endowment on independence of regulatory bodies.

2.2 The establishment of IRAs: pitfalls of countries' institutional endowment

The rationale behind IRAs establishment are (Levy and Spiller, 1994):

- the time inconsistency, and
- the regulatory commitments/credibility issues.

Electricity is one of the sectors in which *time inconsistency problems* arise in association with different and very often contending social interests. In democratic contexts, it is the legislative-executive dynamic, as well as the alternation of parties in power, that reveals such contending

[4] The 2007 Country Reports are available for Algeria, Egypt, Israel, Jordan, Morocco, Syria, Tunisia and Turkey

interests. Delegating the rules' implementation phase to technical agencies, thus, reduces the instability of the regulatory framework of a country that may be eventually associated to the possibility, for a government, of being replaced by other parties having different preferences, and representing different social interests. With regards to the majority of MENA countries, long lasting regimes show that such a "risk" of being replaced through democratic alternation of parties in power was almost absent for the past 20 years. Nonetheless, popular uprising throughout 2011 revealed the high degree of vulnerability of consolidated authoritarian regimes. Lack of sufficient checks and balances between domestic institutions, strong power of incumbents, poor level of rule of law and good governance, and a bureaucracy largely dependent by the ruling élites, are those institutional factors characterizing MENA endowment. In such a context, the rational behind IRAs' set-up may be viewed as strengthening incumbents' regulatory discretion to the expenses of eventual opposition forces, and parties, in case of regime change. With this regard, the close relation between bureaucrats and incumbents makes government's self-binding, through effective IRAs' autonomy in decision making, less severe than expected. The close relation between bureaucrats and incumbents reinforces the capacity to *infiltrate bureaucracy* by élites in powers (Gilardi 2005a). Similarly, the lingering relation between incumbents and bureaucrats strengthen bureaucratic élites, making bureaucrats one of most relevant players in the region. Being MENA a public-driven economy mainly, bureaucrats are influent actors in those reforming processes that involve the utility sector too. To certain extent, bureaucrats may *infiltrate elite in power*, having developed that knowledge and technical expertise necessary for influencing the implementation of rules and reforming projects; they are those actors that may assure continuity in the sector' management, and stability of the regulatory framework also in case of unexpected regimes change, such as the ones occurred during 2011-2012.

The second reason behind IRAs' set-up and independence is the regulatory commitments/credibility. Regulatory credibility is the sole insurance against the risk of administrative expropriation; when such credibility is lacking, it signals that political commitments

towards sector liberalization is missing, and the regulatory environment of the country is not transparent. The stability of authoritarian and monarchical regimes of the last 20 years has not been capable of generating new investments in the electricity directed at improving both cross-border and MENA – EU power exchanges, the latter being limited to the interconnection between Spain and Morocco (Medring 2010). As Levy and Spiller state (1994), the credibility of regulation in the utility sector is higher in countries in which executive and legislative discretions are reciprocally counterbalanced, than in countries where such counterbalance does not exist or is weak. Missing executive-legislative counterbalance, every form of regulatory intervention may be easily knocked over. In this case, administrative expropriation is a serious risk for foreign investors interested in obtaining a fair return to their investments. Considering the scenario of MENA countries, the functioning judiciary power remains the sole capable of assuring that degree of regulatory credibility for spurring new investments. The judiciary power, when independent, works as restraint to incumbents' discretion. Thus, the highest is the degree of judiciary independence, the lowest is the regulatory commitment problem. In MENA region, such independence is undermined by poor resources available, arbitrary decisions on judges' appointment and dismissal, as well as career improvements, and incumbents' interference in the administration of justice when verdicts refer to regime opponents mainly (Freedom House 2011).

3. IRAs in the Mediterranean region. The Survey method

This study assumes countries' institutional background, and political cleavages, as relevant for the definition of the country's regulatory governance (Jordana and Levi-Faur 2006; Potrafke, 2010; Belloc and Nicita 2011). With this regard, in order to understand the extent of independence of regulators in the Mediterranean region, and the role played by countries' institutional background, the dimensions of decision making autonomy, organizational autonomy, and accountability have been translated into a questionnaire. The survey has been directed at southern Mediterranean energy regulators and electricity companies. The objective of the survey is twofold: tackling the issue of

regulators' independence in the Mediterranean region, and provide a measure of regulatory convergence in the area. The paragraphs that follow clarify data collection and assessment of independence index methods.

3.1 The data collection

Questions in the survey refer to standards for electricity sector liberalization mentioned in EU documents and plans for cooperation adopted since the 1996, when the Euro-Mediterranean energy partnership was launched in the framework of the Euro-Mediterranean policy. The survey[5] has been launched on January 2012 with the support of the Mediterranean Energy Observatory (OME), Paris. The text of the survey has been firstly tested by experts of the *Florence School of Regulation* at the European University Institute (EUI, Florence) and the *Oxford Energy Institute*. Then, invitations to take part to the study have been sent to energy companies and regulators members of the OME and the Association of Mediterranean Regulators for electricity and gas (MedReg).

Moving from MedReg Institutional Group recommendations on minimum requirements necessary for assuring agencies' independence (2008), and previous studies on the issue (Gilardi 2002; 2005 a, b; Johannsen et al. 2004; Larsen et al. 2006), the survey includes questions referring to regulators' competences, internal organization and budget, relation with the political power and stakeholders. It has been structured into an introductory section and 5 sections related to the electricity sector organization and the role of respondents' organization. The introductory section (question 1 to 6) asks to define the organization whose respondents are referring to, distinguishing between national regulatory agencies (IRAs) and other bodies, such as offices, ministry's departments, or companies responsible for the sector. Question on the year of IRA establishment, number of employees and agencies' normative source (ordinary law, regulation, decree etc.), conclude the introductory part. The five sections on the electricity sector organization and the role of respondents' organization, have been organized as follows:

[5] The survey is included in the Appendix to the paper and is available to the author upon request

- Section A *Energy Sector Organization*: Unbundling, Tariff setting mechanisms, the TPA regime and the role of regulators;
- Section B *Regulator's competences* having regards to Tariffs, License issue, Dispute settlement, Consumers' protection;
- Section C *Energy Efficiency and Renewables*, policies and regulators' role;
- Section D *Regulator's Relations with Stakeholders*, the political power mainly;
- Section E *Regulator's Internal Organization*.

The survey follows a standard methodology for capturing IRA independence. Usually, limits of the survey method adopted derives by focusing on formal aspects of independence, while substantial independence remains overlooked. The way our study overcome these criticalities is given by the sequence of information asked and the relevance given to decision making tools in the hands of regulators. Rather than laws and decrees establishing agencies, we look at the decision making process and regulatory tools having regards to specific aspects of regulation and related IRAs competences.

3.2 Assessment of independence index

One of the first papers on measuring agency independence was by Stern and Holder (1999). The work assess Asian agencies' independence on the base of two variables: agencies' institutional design, and informal aspects - processes and practices - of regulation. This study has been firstly considered due to the relevance of the substantial aspects of independence on formal ones. With the aim of enlightening processes and practices of regulation in the MENA region, as well as contribute to previous works on MENA energy regulatory framework, we adopted three main variables. These variables constitute the three dimensions under which IRAs independence has been measured.

To this regard, our variables vary between 0, absence or very low degree of independence, and 1, presence of a fully independent agency. Binary variables have been adopted also in Gilardi (2002)

and Johannsen et al. (2004) seminal studies. These works mainly stress formal aspects of independence as well as difficulties related to a unique definition of independence. In order to take into consideration these limits, our study try to overcome criticalities applying a consolidated method of measuring agencies' independence to a regional context, usually overlooked in terms of regulatory performance, through the identification of three dimensions of independence: decision making autonomy, organizational autonomy, and accountability. Arranged around these three main issues, question in the survey allow to investigate the extent of both formal and substantial independence while binary variables provide with a reasonable method of measuring agencies' independence. Thus, in line with Hanretty and Koop (2009), agencies' independence is here conceived in relative terms: each single issue for which the IRA is independent relatively contributes to the independence of the agency.

The index of agencies' independence has been, then, defined as a simple average of the scores of the three dimensions of independence we consider. As in previous studies by Correa et al. (2006), Brown et al. (2006), and Andres et al. (2007), our analysis defines three sub-indexes for the assessment of both formal and substantial aspects of regulatory agencies' independence. Specifically, as for Andres et al. (2007), decision making legitimacy, autonomy, and accountability of regulators are dimensions on the base of which regulatory performance in each country is measured and is considered in the sub-indexes definition. Answers are reported for each dimension of independence considered.

Data referring to countries that have not established an IRA have not been considered in the index assessment. Data referring to countries and organizations that did not answer to the survey, but of which information are available in the literature have been considered for both index assessment and the description of the regulatory framework of the electricity sector in order to provide for the organization of all available information for the entire region. The literature we refer to consists of Country Reports from the "Paving the way to the Mediterranean Solar Plan" initiative (2012) and the Euro-Mediterranean Ministerial Conference, Limassol (2007). The Presentation of Algerian

authority CREG, taken on May 2011 at European University Institute during the MedReg training seminar, is also considered.

4. Dimensions of independence of regulatory agencies in the Mediterranean region

With the aim of defining the current regulatory framework in the Mediterranean region, and harmonization with the EU system, the data here reported includes countries involved by the European Neighbourhood Policy – Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Tunisia - and countries candidate to the European membership – Turkey and Croatia[6] - as benchmark for new reforming countries. Table 1 reports data on organizations that participate to the survey, while table 2 refers to data for those countries that did not reply to the questionnaire.

Table 1 Survey Respondents

Relation with the EU*	**Country Name**	**IRA's Name**	**Acronym**	***Other Regulatory Body***	***Acronym***	**Sector**	**Year set-up**	**N. Employee**	**Normative source**
PC	**Egypt**	Egyptian Electric Utility and Consumer Protection Regulatory Agency	EgyptERA			Electricity	2001	70	Presidential Degree
PC	**Jordan**	Electricity Regulatory Commission	ERC			Electricity	2001	85	General Electricity Law No. 64, 2002
CC	**Turkey**	Energy Market Regulatory Authority	EMRA			Electricity Gas Oil LNG	2001	467	Law no: 4628
CC	**Croatia**	Croatian Energy Regulatory Agency	HERA			Electricity Gas Thermal energy	2005	57	Energy Activities Regulation Act
PC	**Morocco**			Office National d'Electricité	ONE	Electricity	1963	8705	Dahir

[6] Croatia will be officially admitted to the EU by July 2013

PC	**Tunisia**			Ministry of Industry - Directorate general of Energy	MIN	Electricity Gas		20	Function of the ministry

*__NOTE__: It refers to the relation with the EU. PC: partner countries involved in the cooperation programmes; CC: candidate countries to EU membership.

Table 2 Missing survey respondents

Relation with the EU*	**Missing cases MENA**	**IRAs' name**	**Acronym**	***Other Regulatory Body***	**Acronym**	**Sector**	**Year set-up**	**N. Employee**	**Normative source**
PC	**Algeria**	Electricity and Gas Regulatory Commission	CREG			Electricity Gas	2002	50	Law N. 02-01 February 5, 2002 on electricity and the distribution of gas
PC	**Israel**	Public Utility Authority	PUA			Electricity	2003	30	Electricity law 2003
PC	**Lebanon**			Ministry of Energy and Water	MEW	Electricity Gas			-

*__NOTE__: It refers to the relation with the EU. PC: partner countries involved in the cooperation programmes; CC: candidate countries to EU membership.

These data allow to make comparison and to identify the eventual rules convergence processes among some of the most interesting cases for the electricity sector organization and renewable energy policies throughout the Mediterranean.

4.1 Decision making autonomy

Data referring to independence of IRAs in the implementation of different regulatory tools are summarized in Table 3. The Table reports exclusive and/or shared competences having regards to sections A and B of the survey.

Table 3 Dimension 1 – IRAs Tools and Decision making autonomy

†	Network planning	Year	Competent Other body*	Tariff setting	Competent Other Body*	TPA	year	Competent Other body*	License issue	Service quality	Disputes settlement	year	Consumers' protection	Other body*	year	MEAN **
Egypt	0	-	PC	0	CA	0.5	-	-	1	-	1	2001	1	-	2001	0.50
Jordan	1	2002	-	1		1	-		1	1	1	2002	1	-	2002	1.00
Turkey	1	2002	-	-		1	2002		1	1	1	2002	1	-	2002	0.86
Croatia	1	2005		-	CA	1	2006		1	0	1	2006	0.5	M	2006	0.64
Tunisia	0	-	PC	-	CA	0.5	2009	PC	0	0	1	-	1	-	-	-
Morocco	0	-	PC	-	CA	0	-	PC	1	1	0	-	0.5	-	-	-
Algeria††	0	-	PC	-	-	1	2002	-	1	1	1	2002	1	-	2002	0.71
Israel††	0	-	PC	1	-	1	2003	-	1	1	1	2003	-	-	2003	0.71
Lebanon††	0	-	PC	-	-		-	-	0.5	0.5		-	1	-	-	-

† The table refers to agencies' competences, 1=Full Competent,; 0.5= Shared Competencies or Consultative Role; 0=Not Competent; -= No Information
†† Data available in the Euro-Mediterranean Ministerial Conference, Limassol (2007), Country Reports.

***NOTE**: it refers to other body having exclusive or shred competencies with the regulator. PC: Public company; CA: Central Administration; M: Ministry; NA= Information Not Available
****NOTE**: Average of the scores registered for the seven dimensions considered. The value is not calculated for Morocco, Tunisia and Lebanon for which IRAs are not existent.

As Table 3 shows, among MENA countries, only Jordan ERC may be defined as fully independent (at least from a formal point of view) under the first dimension here considered. Jordan's authority is fully competent for those aspects identified as pivotal to sector's liberalization: Unbundling, TPA and tariff setting. The other well performing agency is, to this stage of analysis, the Turkish one. The Turkish EMRA has, with the sole exception of tariffs' definition, decision making powers on all regulatory issues given in the survey. For those Mediterranean countries for which an IRA does not exist, the electricity sector's most sensitive aspects are co-managed by public companies and central administration apparatus. These results, may be considered a first confirmation of the relevance of central administration and executive power, as described in Section 2. It is the executive, indeed, that has decisional power with regards to regulatory aspects on which the effective independence and operational autonomy of a regulatory agency may be measured. Thus, when looking at those issues on which credible regulatory commitments and independence of regulators are measured in this study – unbundling, TPA and tariffs' setting - we may conclude that IRAs in the Mediterranean area are not truly autonomous and independent in the decision process.[7]

4.2 Regulators' organizational autonomy

The data available for the regulators' internal organization and autonomy are reported in Table 4. Here we summarized findings from section E of the survey. This section has been organized following those organizational features "universally recommended" and fundamental in order to assure agencies' independence (Johannsen et al. 2004; Larsen et al. 2006). It represents an opportunity to define the degree of independence of energy regulators looking at internal procedures for the organization of the work and its management within the organization.

With regards to decisions on the regulators' internal organization, this competence is shared between the regulator and the legislative power in the Egyptian and Jordan case; it is full

[7] It is worth pointing out that even in countries that declare to have *legal* capability on price setting decisions, this does not implies that these regulators might not be influence by external (i.e. government) pressure. Our aim here is to define in which country the regulator has a *formal* independence in price setting, while the analysis on *real* independence is analysed with our sequence of sub-indexes.

competence of the regulator in the Croatian case. Turkish agency answers to the question generically and simply refers to the law as the normative source at the base of regulators' internal organization; thus, it has not been possible to attribute any quantitative measures. With regards to the personnel policy, it is a competence that the IRAs shares with the legislative power in the Egyptian, Jordan and Turkish case. Such as for decisions on the agency's internal organization, in the Croatian case personnel policy is under the sole competence of the regulator. Looking at the organizational structure of the IRAs' board, the model of Regulatory Council is the most selected one compared to the Single Head Regulator.

In the study, Regulatory Council model is provided with higher scores than Single Head model, being convinced that a collegial board is more independent than a single chief, usually directly appointed by the executive head. Finally, with regards to IRAs budget, low scores are registered. Information on budget autonomy and approval describe one of the most important aspects of organizational autonomy of regulators: it provides knowledge of regulator's potential for using resources independently from the political will, including the possibility to appoint experts and qualified human resources. The executive power is competent for the Regulator's budget definition and approval. The IRAs budget is generally defined for 1 year.

The index we calculate shows the poor degree of autonomy of IRAs from southern Mediterranean countries. Croatia is the best performing, while Jordan is now ranked a 0.44 as Egypt and Turkey is only 0.31. As reported in Section 3 on index assessment, missing data for Israelian and Algerian authorities makes the assessment of the dimension 2 of agencies' independence impossible.

Table 4 Dimension 2 -IRAs' Organizational autonomy

†	Internal Organisation	Competent Other Body	Personnel Policy	Competent Other Body	Internal Structure	Competent Other Body	Budget definition	Competent Other Body	Budget lag in years	MEAN*
Egypt	0.5	0.5	0.5	0.5	-	Board of Directors	0.5	Executive	1	0.44
Jordan	0.5	0.5	0.5	0.5	0.75	-	0	Executive	1	0.44
Turkey	-	-	0.5	0.5	0.75	-	1	-	1	0.31
Croatia	1	-	1	-	0.75	-	0	Executive	1	0.69
Tunisia	1	-	1	-	-	-		-	1	-
Morocco	1	-	1	-	0.5	-	0.5	Executive	3	-
Algeria††	-	-	-	-	0.75	-	0	-	-	-
Israel	-	-	-	-	-	-	-	-	-	-
Lebanon	-	-	-	-	-	-	-	-	-	-

† The table refers to Regulators' internal organization and decision making autonomy. 1=Full competent; 0.5=Shared competences, Regulator and Legislative powers; 0= Not Competent at all, Executive power; -= No Information. Regulatory Council model Score=0.75; Single Head Regulator Score=0.5

†† These data have been taken by CREG presentation (May 2011).

***NOTE**: Average of the four elements considered

4.3 Regulators' relationship with the political power, and accountability measures

Answers to questions on accountability provisions are summarized in Table 4. Section D of the survey is entirely dedicated to this dimension of independence. In this part of the study, we look at effective regulators' independence from all those actors interested in limiting regulators' actions. Such as for dimension 2 of independence, the assessment of the third dimension of independence for Israelian and Algerian agencies is impossible due to missing data.

Table 5 Dimension 3 - Accountability measures

†	The Regulator, the Government and the Stakeholders*	Appeal against Regulator's decisions: bodies involved	Regulators' formal obligations towards the Executive **	Regulators' formal obligations towards the Legislative***	Mean****
Egypt	0	Courts	0	0	0.25
Jordan	1	Courts	0.5	-	0.75
Turkey	0.75	Courts	1	-	0.56
Croatia	0.75	Courts	1	0.5	0.81
Tunisia	0	Courts	-	-	-
Morocco	0	Executive	0	0	-
Algeria††	0	-	-	-	-
Israel††	0.75	-	-	-	-
Lebanon	-	-	-	-	-

† The table refers to Regulators' relations with executive and legislative powers, and stakeholders.
††Data available in Algerian CREG presentation (May 2011) and Israel Country Report from the Euro-Mediterranean Ministerial Conference, Limassol (2007)

***NOTE**: For countries choosing the "Independent" model we score this choice equal to 0.75 when IRA is not full competent for Unbundling, TPA and tariff setting. For countries choosing "Ministry" model we score this choice equal to 0 when IRA is not full competent for Unbundling, TPA and tariff setting (see Table 3)
****NOTE:** 0=Annual Reporting for Executive Approval; No obligations towards Legislative. 0.5= Annual Reporting for Executive Information; Annual Reporting for Legislative Information. 1= No obligations towards Executive;
***** **NOTE**: Average of the four elements considered.

The relation between regulators, on one side, and the political power and stakeholders, on the other side, is relevant considering the risk of a *façade* independence, such as in those cases when the regulator derives instructions from the executive power. Firstly, we asked respondents to identify, among the options provided, the model that characterizes relations between IRAs, the executive

power and the stakeholders. The options provided in the survey refer to three kind of relations: advisory, ministry, and independent model.

In the first case no compulsory decision are taken by regulator, which is a sort of specialised councillor of the government. It is the government that has direct relation with stakeholders. In the ministry model, the regulator is an office, or department, within the executive. It has no autonomy, and cannot entail direct relations with stakeholders, except for those taken on behalf of the government or ministry. In the independent model, the regulator does not require approval from the executive power for taking decision on regulatory aspects and is autonomous in using regulatory tools, as those identified in the first dimension of independence. With the exception of Egypt, that chooses the ministry model, the other respondents selected the independent model. We controlled these answers with those provided under dimension 1 – regulatory competences. Considered the missing exclusive competences on unbundling, TPA and tariffs' setting, we scored such a choice with 0.75 in the Turkish and Croatian case. All of them affirmed IRAs not having full competences on tariff setting, mainly. This adjustment allows controlling the coherence of answers provided.

With regards to the role of the executive power in case of appeal against regulator's decision, it should be stressed that Courts/Administrative tribunal is the option chosen by all IRAs respondents. The role of judiciary power is relevant in countries in which the sole limit to incumbents' discretion is represented by an independent magistracy. With regards to MENA countries, as explained in Section 2, the independence of magistracy may be defined at risk of being undermined by groups in power, with the sole exception of Israel, Turkey and Jordan.

Finally, the section closes with two questions related to obligations of the regulator in front of the executive and legislative powers. The answers to these questions directly assess are the accountability dimension of independence.

Survey's answers confirm low independence from the executive power in the EgyptERA case. The Egyptian agency has to submit an annual report to the executive for approval; while, there are no accountability provisions related to relations between the regulator and the legislative power. Jordan

ERC is not required to receive approval or to inform both the executive and the legislative of its work. Turkish EMRA need to inform both the executive and legislative powers; while Croatian HERA need to inform the executive power and submit an annual report for approval to the legislative power. The sub-index defined, thus, register very low values of independence for the Egyptian authority, while highest values are registered by Croatia and Jordan.

4.4 Independence index

As mentioned in the paragraph 3.2, a final index of independence is assessed as single average of the three sub-indexes defined. Table 6 reports the final data. On a scale from 0 to 1, none of the investigated agencies are graded with 1, full independent IRAs. Jordan and Croatia are among non-EU countries, those better performing. In the Croatian case, being the country candidate to the EU membership, a direct influence of the EU can be identified. Such direct influence, we may conclude, works better than in the Turkish case. Jordan confirms to be an interesting case in terms of regulatory commitments. Although a monarchy with strong powers of the executive on the energy sector, Jordan is the sole case of IRA, within the southern Mediterranean, having decisional power on issues such as tariffs. Moreover, Courts may intervene in case of appeal against regulator's decision, confirming the better functioning of the judiciary power as restraints to executive and regulators' administrative discretion, than in other MENA countries. Thus, compared to the other southern Mediterranean countries having already established an IRA and taking part in the survey, Jordan is the most interesting case of regulatory agency conceived as insurance against administrative expropriations.

Table 6 Independence index

†	D1	D2	D3	Index
Egypt	0.50	0.44	0.25	0.40
Jordan	1.00	0.44	0.75	0.73
Turkey	0.86	0.31	0.56	0.58
Croatia	0.64	0.69	0.81	0.71
Algeria	0.71	-	-	-
Israel	0.71	-	-	-

† The table reports the index of Independence of those regulatory agencies for the electricity sector that took part in the survey and for which data are available in the literature. The index is assessed as simple average of the scores registered for each of the three dimensions of independence investigated.

5. Rules harmonization in the Mediterranean region: the electricity sector and renewables

In this Section we analyse the electricity regulatory framework, as well as ad hoc provisions for renewables, resulting from the survey. Information have been reported also for those countries such as Algeria, Israel and Lebanon, that did not take part in the survey. The analysis here developed mainly refers to the section A and C of the survey, which investigates those aspects of the *acquis communautaire* on energy promoted through the Euro-Mediterranean cooperation, and section E on renewables.

In the first part of section A, question on managing networks, share of Independent Power Producer (IPP), TPA regime and transmission tariff system, have been included in order to understand how much it has been achieved in terms of sector liberalization and the creation of a safe environment for potential private, foreigners included, investors. Specifically, questions from 7 to 12, refers to sector's unbundling; answers are summarised in Table 7.

Table 7 Electricity sector Unbundling and IPP system

	Sector Unbundled	IPP%	IPP year	Distribution Network Owner	Network manager
Egypt	Y	10 - 19	2002	Public Comp.	Public Comp.
Jordan	Y	20 - 29	2010	Gov.	IRA
Turkey	Y	20 - 29	2003	Public Comp.	Comp.
Croatia	Y	10 - 19	2004	Public Comp.	Comp.
Tunisia	N	20 - 29	1996	Public Comp.	Public Comp.
Morocco	N	40 - 49	1996	Local Admin.	Public Comp.
Algeria†	Y	25		Public Comp.	Public Comp.
Israel†	E	0.6-20	1996	Public Comp.	Public Comp.
Lebanon††	-	-	-	Public Comp.	Public Comp.

† Data have been extracted from Country Reports delivered at the Euro-Mediterranean Ministerial Conference, Limassol (2007), and more recent reports from the "Paving the way to the Mediterranean Solar Plan" initiative (2012)
†† Data have been extracted from the Country Report released by the "Paving the way to the Mediterranean Solar Plan" initiative (2012)

NOTE: Y= Yes; N= No; E= expected;
Public Companies; Private Companies; Local Administration; Gov.=Government, Executive Comp.: Companies; IRA= the Regulatory agency

The unbundling is one of the main aspects promoted at Euro-Mediterranean level in close relation with the adoption of incentive regulation and the definition of TPA regime. With this regard, all countries in which an IRA exists have unbundled the electricity sector or are expected to complete it, such as Israel, in the immediate future. The exceptions are by Morocco and Tunisia, among

survey's respondents, and Lebanon, among non respondents; all of them have not established an IRA. The main characteristic of unbundling in MENA countries is the functional separation of generation, transport, and distribution activities, with the last two activities being under monopoly regime. Moreover, the coincidence between owner and manager of the networks, which are the state-owned companies, persists. Typically, state-owned, and vertically integrated, companies own and manage the distribution network, with the sole exception of Jordan; in this case the Government and the IRA manage the network.

Table 7 reports different percentage of IPP per country with the year in which the system has been defined. The most critical situation is the Lebanese one, where a law for reforming the sector, launched in 2002, is in standby and a regulatory agency is missing. Egyptian low percentage of IPP is also recorded. Although the intention to allow new IPPs and implement renewables policies with a direct involvement of the regulatory agency competent for license issue, the situation seems now blocked by the political turmoil. The Moroccan case is the one obtaining highest percentage of IPPs. Contracts for energy production, with guarantee of purchase by the state-owned company ONE, have been concluded with companies Jorf Lasfar Energy Company (JLEC), Compagnie Wind of the Strait (CED) and Electric Power of Tahaddart (EET) (Paving the way for the Mediterranean Solar Plan - Moroccan Report, 2012). Nonetheless, the state-owned company ONE is the one allowed to buy energy produced confirming the model of Single Buyer. Tunisian and Jordan IPPs percentage are the same as for Turkey. IPP concessions are provided though a tender, both in the Tunisian case (with the state-owned company STEG as Single Buyer) and in Jordan. This situation is confirmed for energy generation from renewables too (Paving the way for the Mediterranean Solar Plan - Tunisian and Jordan Reports, 2012)

The analysis proceeds with the study of the transmission tariff system and TPA regime. With regards to transmission tariffs, the survey asks to choose among the following options: cost plus/ rate of return (RoR), price cap (PC), and revenue cap (Vogelsang, 2002; Joskow, 2008). As Table 8 shows, Egypt, Jordan, and Croatia selected, as current transmission tariff, the RoR; Turkey

indicated the revenue cap. Considering previous studies on the argument, Algeria adopts a cost of service mechanism, as well as Israel (European Commission 2007). Considering that respondents did not answered to the question on the tariff structure (question 14 in the Appendix I), the emerging scenario refers to the main literature on the argument.

On the base of transmission tariff system indicated by our respondents we may argue that MENA regulatory framework for electricity generated from both conventional power plants and renewable sources has potentials for incentivising innovation and efficiency. RoR consists of defining a "*normal profit or rate of return on the firm's regulatory asset base after allowing for efficient capital and operating costs*" (Parker 2002, p.501), implying a fix but certain profit margin allowed to the company. The price cap stimulates cost efficiency through the use of index of productivity change set for a specific regulatory period; such index is adjusted for changes in input prices, quality and efficiency targets imposed by the regulator. Letting costs and prices diverge during the regulatory lag, provides firms incentives to implement cost reducing investment and innovations (Egert, 2009; Cambini and Rondi, 2010). Both methods indicated by our respondents have their pro and cons. The RoR is criticised because of over-investments due to the fact that profit is set according to the size of the asset (Parker 2002). While, PC regulation, allowing revenues being divergent from costs during a pre-defined period of time, "*can favour investment on innovation, at least in the short term"*, but *"does not promise specific long-term returns on investment*" (Armstrong and Sappington 2006, p.341).. It is important to note that the decision to adopt one or another regulatory mechanism depends on the prevailing condition in terms of existing stock of investment and efficiency and quality goals. Our aim is not to assess if a country is adopting the better regulatory mechanism to its specific situation; instead, our analysis aims at providing evidence of which kind of regulatory mechanisms has been implemented and at inferring on the expected impact they might have on efficiency and investment incentives.

Clear information on TPA criteria are missing. In this case, the authors are aware that having omitted answers' options in the definition of the question results in lacking clarity of information

provided. Indeed, a specific TPA regime does not emerge and the role of regulatory agencies is not clear. With regards to the electricity trading, TPA regime when existent permits third parties' access to the transmission network and the subsequent purchasing-selling of electricity at regulated or negotiated prices. The opposite is true when the Single Buyer model exists, and only one buyer buys electricity, usually at the lowest price, by producers and sells it to customers. Regulatory agencies' role, under a TPA regime, is to set wholesale access regulated charges (Medreg 2010). TPA is maybe the most common element among MENA countries, and the most divergent one between MENA and European countries. While a regulated TPA regime is the most diffused form of TPA in EU countries, the MENA case is still characterized by the absence of such regime and of an effective energy market exchanges.

As emerges from the survey, the tools available to regulators for guaranteeing TPA non-discrimination and transparency are: template contracts to be followed by the utility companies in the Egyptian case; dispute resolution between companies and customers are also given. Licensing issue and legal provisions for TPA exist in the Jordan and Croatian cases. Algerian 2002 law provided for the introduction of TPA regime. although country studies of 2007 still affirmed that an effective regime still need to be defined. Finally, Tunisian's regulatory framework, allows a generic TPA regime if these parties "satisfy the conditions to access the network"; no further explanation are provided.

Table 8 Tariff system and TPA regime

	Transmission tariff	**Tariff, year**	**Regulatory lag**	**Tariff, previous system**	**TPA criteria**
Egypt	Cost plus/Rate of Return	2010	1	Cost plus/Rate of Return	Template contracts

Jordan	Cost plus/Rate of Return		1		Licenses
Turkey	Revenue cap	2003	3		non-discrimination
Croatia	Cost plus/Rate of Return	2006	1	Cost plus/Rate of Return	
Tunisia	Not applicable				
Morocco	Not applicable				
Algeria†	Cost of service				non-discrimination
Israel†	Costs and fixed rate of return				
Lebanon					

† Data taken by Country Reports delivered at the Euro-Mediterranean Ministerial Conference, Limassol (2007).

On the base of results from the study of IPP regime, transmission tariff system and TPA regime, we may affirm that there still high differences among countries considered but these differences are less sensitive in those cases having established a regulatory agency and that the more the agency is independent, the better the sector perform in terms of favouring access to of new producers electricity generation and transmission also from renewable sources. Jordan, thus, results the best performer and the country providing potential investors with security of limited risk for administrative expropriation.

Current developments in the field of energy efficiency and renewable sources are also analysed. Both are pivotal considering the increasing energy demands from the southern Mediterranean countries and persisting energy dependency from European countries. The Mediterranean area has huge potentials for electricity from intermittent renewable sources; strong coordination between generators and distributors of the two shores of the Mediterranean Sea is, thus, required. Interconnections at south-south and north-south level raise the issue of defining a shared

institutional framework made up of common standards and rules. The section E of the survey refers to: regulators' competences concerning energy efficiency and renewables, renewables priorities, constraints countries expect to find deploying renewables, their needs, and eventual programming instruments already defined or forthcoming. Table 9 provides a synthesis of organizations competent for energy efficiency and renewables.

Table 9 Energy Efficiency and Renewables

	Energy Efficiency (EE) Authority	Year	Renewables (RES) Authority	Year	EE Incentive system	RES Incentives*	RES Objectives (%)	RES Objectives (year)
Egypt	ad hoc IRA		New and Renewable Energy Authority (NREA)	1990		FIT; TE		
Jordan	Ministry		ERC		TE; Time based pricing; energy audits	FIT; TE; TAX	11% to 15 %	2016 - 2020
Turkey	Ministry	2007	EMRA		White certificates; energy audits	FIT	26% to 30%	2021 - 2025
Croatia	ad hoc IRA	2006	Ministry	2007		FIT	11% to 15 %	2016 - 2020
Tunisia	Ministry		Ministry	2011		TE	<10%	2010 - 2015
Morocco	Ministry		Ministry	2009	Time based pricing	FIT	16% to 20%	2016 - 2020
Algeria†	Ministry		Renewable Energy Commissioner - Ministry			FIT;FIP;TAX; Bank loans	40%	2020
Israel†						FIP	10%	2020
Lebanon†	Ministry - Lebanese Center for Energy Conservation		Ministry - Lebanese Center for Energy Conservation			Bank loans	12%	2020

***NOTE**: Feed-in-tariff=FIT; Feed-in-Premiums=FIP; Tax Measures=Tax; Tender=TE; Green Certificates=GC
† Data have been extracted from the Country Reports released by the "Paving the way to the Mediterranean Solar Plan" initiative (2012)

As shown in Table 9, energy efficiency and renewables are not the either exclusive nor shared competences of IRAs of the region with the exception of Jordan and Turkey. Ministries, and specific directorates within them, are mainly involved in the definition and implementation of energy efficiency and renewables policies. Maybe due to the very recent interests in the issue, renewables are widely managed by ministries and energy state-owned companies of the southern Mediterranean. The situation is different country by country; it goes from the missing legal framework in which the Lebanese sector develops (the 2002 law for the electricity sector, providing for the establishment of national IRA, has never been implemented and the organization working mainly as the regulator is the state-owned company Electricité Du Liban) to better defined situations, such as the one of Turkey and Jordan where national IRAs have specific competences in the sector. The lacking involvement of regulatory agencies in cases such as Algeria and Egypt, as well as the absence of a Moroccan IRA, raise doubts on the capacity to create a positive environment for investments in renewables generation and energy distribution for three of the countries more directly involved by European, public and private, projects.

Moreover, the answers provided in the survey, as well as existing studies on MENA countries, clarifies the existing constraints to energy efficiency and renewables deployment countries have to face. The following have been indicated by the respondents as the most relevant constraints:

- lack of financing due to high costs;
- lack of investments due to low incentives;
- unavailability of adequate technologies at reasonable prices.

These constraints impede the developing of efficiency in electricity production and distribution. The high investment costs, the scarce availability of new technologies at accessible prices, may make efforts in promoting energy efficiency and renewables not easily to be remunerated. Eventually, incentive mechanisms provided have been analyzed. Incentive mechanisms indicated in the survey, are feed-in tariffs; taxation measures; green certificate; tender mechanisms. To improve energy efficiency, competitive tenders are used in the majority of cases, while Feed-in tariffs (FIT) is the

instrument mainly used for incentivise renewables. These mechanisms are still managed by the executive power. FIT, as well as Feed-in Premiums (FIP), consists of general purchase obligations at regulated prices granted to operators of renewable electricity plants for the electricity they feed into the grid. FIT, thus, are "*preferential, technology specific and government regulated*" (IEA/OECD 2008). While FIT is a total price per unit of electricity paid to the producers, FIP is a bonus additional to the electricity market price. Where present, as in the Israelian and Algerian cases, premiums introduce competition between producers in the electricity market. Usually, such tariffs should be defined for a period of 10-20 years in order to guarantee that degree of stability to investments decisions. Indeed, if on one hand, the tariff is regulated, providing a certain degree of security to investors, on the other hand, the FIT may be object of frequent *amendments*, undermining investors return and the credibility of the regulatory framework for the renewable policy. Thus, also for deploying renewables, countries regulatory culture and regulatory commitments matter.

6. Conclusion

In this paper we report the results from an original survey directed at the energy regulators of the southern Mediterranean area aiming at assessing the extent of regulatory agencies' independence in such area. Results show that IRAs from the southern Mediterranean region have apparently full decisional autonomy and a certain degree of independence on issues such as consumers' protection, dispute settlements and license issues. However, the data reveals also that tariff setting remain in the hand of executive powers limiting the effective decision making autonomy of IRAs.

In cases such as Algeria and Egypt, the liberalization process mainly consists of functional unbundling: the public company separates into different branches (i.e. Algeria) or different companies for generation, transmission and distribution (i.e. Egypt) still under the government control. In these countries the regulatory agency is mainly an advisory body of the government, while it is state-owned energy companies that behave like the sector manager. Lebanon presents the

more critical situation restraining any project for IPP attraction and sector's restructuring in a transparent way. The unclear legislative framework limits the deployment of initiatives for renewable and energy efficiency too, given the absence of a regulatory agency competent on licensing and eventually dispute settlement issues. On the contrary, among MENA countries, Jordan results the most promising both in terms of sector's restructuring and deployment of projects in favour of renewable sources.

Among countries in which IRAs do not exist, Morocco and Tunisia, two countries at the centre of international donors and private actors interested in deploying renewables, tend to preserve the dominant position of the state companies and limit potential new entrants.

In our analysis, we consider also two Mediterranean countries interested by EU membership process. While for Croatia membership process is almost concluded, in the Turkish case this rests to be defined. Nonetheless both countries are under direct influence of the EU, the adoption of *acquis communautaire* being one of the pre-requisite for membership. The two countries confirm as the most interesting case, in terms of harmonization with EU standards, together with Jordan. These results, expected in the Turkish and Croatian cases, are quite new in the Jordan one.

Our results also show that, consistently with the literature on the rationale behind the establishment of independent regulatory agencies, countries' regulatory commitments are better defined and the sector better performing in those countries registering the highest degree of agencies' independence than in those having poorly independent regulatory bodies.

At a first look, the picture that emerge from our survey reveal limits of a regulatory framework that have to favour investment projects on renewables and energy efficiency, mainly considering the risk of not having a clear discipline for new IPPs accessing grid networks and the persisting model of Single Buyers (i.e. state-owned companies). At a closer look, indeed, our data also show potentials for future developments. Declared constraints such as the lack of infrastructure investments due to low incentives, in fact, reveal the need for both financial resources and technical assistance directed at the implementation of incentive measures. The mechanism directed at incentivise sector's

efficiency and renewables is mainly feed in tariffs, a tool designed for accelerate investments on renewables technologies. In the end, both non-respondents and respondents to our survey, with the exception of Egypt, identify precise objectives in terms of percentage of energy to be produced by renewables in the immediate future and forecast the adoption of specific regulatory tools.

Future developments of this study may be directed at assessing the influence that countries' institutional background may have on the existing and future model of regulation, usually distinguished between market conforming and market controlling model. Finally, an assessment of risks of administrative expropriation may be provided in particular for those countries that are going to attract new investments on electricity generation from renewables but that maintains a vertically integrated system with a tariff discipline regulated by governments.

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Appendix – Survey text

1. What is the Organization you are referring to?
Please select one of the two options:
- National Regulation Authority for Energy NRA;
- Other regulatory body responsible for Energy sector (i.e.: Ministry departments, Offices) OTHER BODY.

2. Please indicate the name of this Organization.

3. The Regulator you are referring to is responsible for:
- Electricity
- Gas
- Electricity and Gas
- Other, please specify

4. In which year has the Regulator been established?

5. Could you please type the number of employees?

6. Please indicate the normative source that established the Regulator

Section A: *Energy Sector Organization*
7. Has the sector been unbundled (separated) into generation, transmission and commercialization?
- Yes
- No
- Forthcoming, please specify the year

8. Who is responsible for network planning approval and since when?
- Public company
- The Regulator
- Ministry/Government
- Other.

9. Please specify the percentage of energy produced by Independent Power Producer (IPP) for 2010

10. When the IPP system has been established?

11. Who is the distribution network owner?
- Public company
- Ministry/Government
- Local administrations
- Other.

12. Who is the distribution network manager?
- The owner and the manager coincide
- Other.

13. Who is responsible for tariffs definition?
- The Regulator
- Public company
- Public Authorities central administration
- Public Authorities local administration
- Other.

14. Please indicate the tariff structure set by the regulator in a synthetic way (i.e. by using formula)

15. Which is the transmission tariff mechanism adopted?
- Cost plus/Rate of Return
- Price Cap
- Revenue Cap
- Other.

16. Since when the chosen transmission tariff mechanism is applied?

17. What is the regulatory lag (length of time between tariffs rate reviews)?

18. Which was the previous tariff mechanism implemented?
- Cost plus/Rate of Return
- Price Cap
- Revenue Cap
- Other.

19. Is the Regulator responsible for Third Party Access (TPA)?
- Yes
- No
- Only consultative role
- Sharing competences with other bodies, please specify

20. Since when the Regulator is responsible for TPA?

21. What kind of means the Regulator dispose for guaranteeing TPA non-discrimination and transparency?

22. Can you please specify criteria provided by your legislation?

Section B: *Regulator competences*

23 Is the Regulator's competent for authorization procedures (i.e.: licensing the network access etc)? If yes, please type for which aspects he is competent and since when.

24. Is the Regulator responsible of service quality regulation? If yes, please type for which aspects he is competent (i.e. transmission, generation etc) and since when?

25. Is the Regulator in charge of dispute settlement (i.e.: between the authority and energy companies; between companies and their customers)?
- Yes
- No
- Only consultative role
- Sharing competences with other bodies, please specify

26. Since when is the Regulator competent for disputes settlement?

27. Is the Regulator competent for consumers' protection?
- Yes
- No
- Only consultative role
- Sharing competences with other bodies, please specify

28. Since when is the Regulator in charge of consumers' protection?

Section C: *Energy Efficiency & Renewables*

29. Please indicate the institution in charge of energy efficiency

30. Since when it is competent for energy efficiency?

31. Which are the mechanisms the body competent of energy efficiency has adopted or is going to adopt in the next future?
- tender mechanisms;
- time based pricing;
- white certificates markets;

- energy audits;
- other.

32. Which are the main constraints the body in charge of energy efficiency found or is expecting to find in implementing the above mentioned instruments?
- lack of financing due to high costs
- lack of investments due to low incentives
- lack of private sector involvement
- unavailability of adequate technologies at reasonable prices
- lack of political involvement
- lack of citizens' involvement
- lack of communication
- other.

33. Please type the name of the Body in charge of renewables

34. Since when it is in charge of renewables?

35. Is the body in charge of renewables competent in setting incentive policy?
- Yes
- No
- Only consultative role
- Sharing competences with other bodies, please specify

36. Please identify the incentive mechanisms your country have defined for electricity production from Renewables
- feed-in tariffs;
- taxation measures;
- green certificate;
- tender mechanisms;
- other.

37. Which are the objectives to be achieved by your country in terms of electricity produced from Renewable sources?

38. Which are the main priorities your National Renewable Energy Policy is based on?
- Support to investments
- Research and Development support
- Price definition mechanisms
- Improved Competition among Operators
- Other criteria.

39. Please type the name of the Policy or Programme for electricity production from Renewables you are referring to and the year of adoption?

Section D: *Regulator's Relations with Stakeholders*

40. How are the relations between the Regulator, the Government and the Stakeholders (i.e.: energy industry; consumers) defined?

- The Regulator is an advisor of the Government. Final decisions are taken by the Government. NO DIRECT relation between Regulator and Stakeholders.
- The ministry model: The Regulator is a body of the Government and has NO DIRECT relation with Stakeholders.
- The independent model: The Regulator is separate by the Government. The Regulator has decision power and DIRECT relation with Stakeholders
- Other.

41. In case of appeal against Regulator's decisions, the following are involved:
- Courts and /or administrative tribunal
- Government Ministry of Energy
- Parliament
- Other.

42. Which are the formal obligations of the Regulator towards the Executive (the President, the Prime Minister and Ministries) Power?

- Presentation of annual report for information only
- None
- Presentation of annual report for approval
- Other.

43. Which are the formal obligations of the Regulator towards Legislative (i.e.: the Parliament, or the Assembly) Power?

- Presentation of annual report for information only
- None
- Presentation of annual report for approval
- Other.

Section E: *Regulator's Internal Organization*

44. Who decides the Regulator internal organisation (internal procedures, allocation of responsibility, tasks etc)?

- The regulator,
- The Executive power,
- The Legislative power,
- Both regulator and executive,
- Both regulator and legislative.
- Other.

45. Who is in charge of the Regulator personnel policy (recruitment, promotion, salaries)?

- The regulator,
- The Executive power,
- The Legislative power,
- Both regulator and executive,
- Both regulator and legislative.
- Other.

46. Choose the option that better fits with the organizational structure of the Regulator

- Single Head Regulator, one President plus Regulatory staff;
- Regulatory Council Chairman plus Council members, and Regulatory Staff;
- Other.

47. Who is competent for the Regulator's budget definition and approval (i.e.: the government, the regulator)?

48. For what duration of time the budget is defined? (i.e.: annual budget; multi annual budget, in this case please type the number of years).