



MEDITERRANEAN ELECTRICITY MARKETS OBSERVATORY  
(MEMO) PART 2

**– Regional electricity markets –**

Comparison of responses from 2010 and 2015  
V4 – May 2015

Electricity Working Group

MED15-19GA-4.1 ELE



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## 1. Background

In line with its Action Plan, MedReg decided to set up a Mediterranean Electricity Markets Observatory (MEMO) in order to assess the progress in establishing and integrating national and (sub)regional markets. The MEMO relies on a periodical survey filled in every three years by MedReg members since 2007.

The first part of the MEMO on national markets deals with issues such as generation and transmission capacities, reinforcement of interconnections, financial viability of projects and unbundling requirements. The second part of the MEMO on regional markets assesses the status and recent developments with regard to e.g. international trade priorities, (sub)regional market structures and transmission rights.

While the survey regarding national markets was updated and adopted by the General Assembly in June 2014, the survey on (sub)regional markets is to be updated in May 2015. A questionnaire was sent to all MedReg members in order to collect updated data and responses.

When comparing the answers received one should notice that the questionnaire has been adapted taking into account the comments from members and modifying the investigated time horizon from 2015 to 2020. Furthermore not all regulators that replied to the questionnaire in 2010 participated in the survey of 2015 and vice versa, other members replied for the first time to the questionnaire in 2015, and this for different reasons. Finally, it should be noted that for both years respondents did not always reply to all questions e.g. for some data was not available, the question is not applicable to the country. For the next edition of the MEMO on regional markets the questionnaire will be revised taking into account the findings.

In 2010, twelve regulators replied to the questionnaire in 2015 fifteen MedReg members provided answers.

*Table 1: Responses received: comparison 2010 and 2015*

Country	Regulator <sup>1</sup>	Country code	2010	2015
Albania	ERE	AL	--	✓
Algeria	CREG	DZ	✓	✓
Bosnia i Hercegovina	SERC	BiH	✓	✓
Croatia	HERA	HR	--	✓
Cyprus	CERA	CY	--	--
Egypt	EgyptERA	EG	✓	✓
France	CRE	FR	✓	✓
Greece	RAE	GR	✓	✓
Israel	PUA	ISR	--	✓
Italy	AEEGSI	IT	✓	✓
Jordan	EMRC	JO	✓	✓

<sup>1</sup> Regulator or ministry if there is no regulator in place yet in the country.

Libya <sup>2</sup>	ME	LY	N/A	--
Malta	MRA	MT	✓	✓
Montenegro	REGAGEN	ME	✓	✓
Morocco	MEMEE	MO	--	--
Palestine	PERC	PS	--	--
Portugal	ERSE	PT	✓	✓
Slovenia	AGEN-RS	SL	--	--
Spain	CNMC	ES	✓	✓
Tunisia	MIT	TN	--	--
Turkey	EMRA	TR	✓	✓

Source: MedReg

## 2. Evaluation of responses and comparison with those of 2010

### **(a) Interconnection and Market Structure**

#### (a.1) Internal Structure of the Electricity Sector Organization

As concluded in the 2010 Benchmarking report, diverse forms and stages of maturity of the power markets exist in MedReg countries. There were only a few changes in the responses from 2010 to 2015: GR moved from a single buyer model to a liberalised wholesale market and additional information on HR and JO was provided.

*Table 2: Past (2010), present (2015) and future (2020) of evolutions regarding the national power market structure (responses 2010 and update 2015)*

Country	2010	2015	2020
Albania	--	unbundled	liberalised wholesale market
Algeria	unbundled	unbundled	liberalised wholesale market
BiH	unbundled	liberalised wholesale market	liberalised wholesale market
Croatia	--	liberalised wholesale market	liberalised wholesale market
Cyprus	--	--	--
Egypt	unbundled	unbundled	unbundled
France	liberalised wholesale market	liberalised wholesale market	liberalised wholesale market
Greece	single buyer model	liberalised wholesale market	liberalised wholesale market
Israel	--	fully vertically integrated	fully vertically integrated
Italy	liberalised wholesale market	liberalised wholesale market	liberalised wholesale market

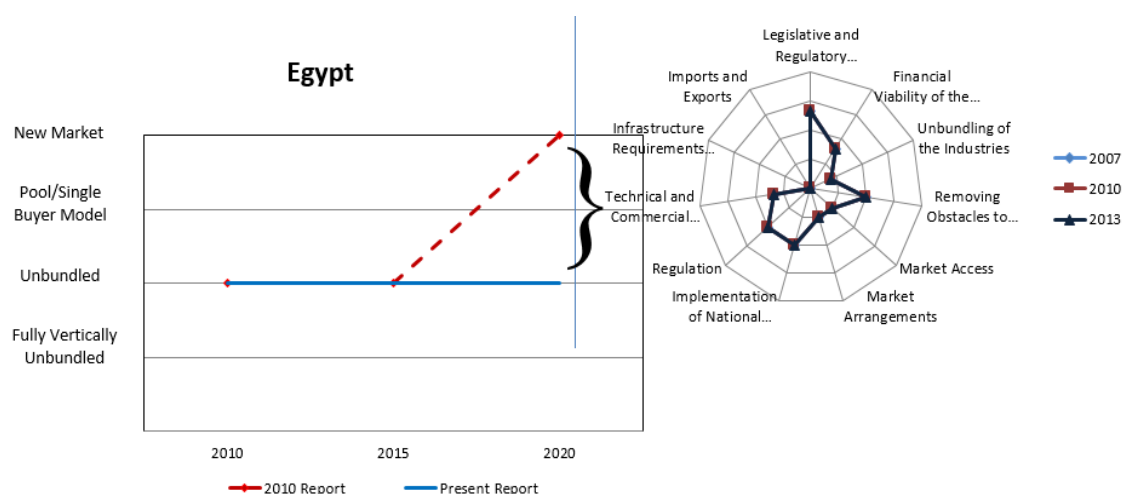
<sup>2</sup> Libya joined MedReg in June 2013.

Jordan	--	single buyer model	single buyer model
Libya <sup>3</sup>	n/a	--	--
Malta	fully vertically integrated	fully vertically integrated	fully vertically integrated
Montenegro	--	unbundled	unbundled
Morocco	--	--	--
Palestinian Territories	--	--	--
Portugal	liberalised wholesale market	liberalised wholesale market	liberalised wholesale market
Slovenia	--	--	--
Spain	liberalised wholesale market	liberalised wholesale market	liberalised wholesale market
Tunisia	--	--	--
Turkey	liberalised wholesale market	liberalised wholesale market	liberalised wholesale market

Source: MedReg

For example when comparing the responses from 2010 and 2015 there is no evolution regarding the indicators examined in EG due to the current political situation as shows figure 1. However, progress with regard to other issues the electricity sector can be observed<sup>4</sup>.

Figure 1 Impact of the regulatory framework on internal market structure development: Egypt



Source: MedReg

### Situation 2015

BiH HR FR GR IT PT ES and TR have a liberalised wholesale market. In Croatia and Greece for example bilateral contracts between buyers and sellers are only of financial nature and there is no balancing market yet. In Croatia regulated tariffs exist

<sup>3</sup> Libya became a member of MedReg in June 2013.

<sup>4</sup> "Towards a MedReg Electricity Market Observatory (MEMO): PART ONE: NATIONAL MARKET OBSERVATORY" report

for households.

In AL DZ EG and ME the structure of the electricity sector is unbundled. In Egypt for example no electricity market exists until now. The Egyptian Electricity Transmission Company (EETC) acts as a system operator and as a single buyer for generated electricity.

JO has a single buyer model in place.

The Israeli and Maltese power sector is fully vertically integrated. However, large industrial customers can directly contract with generators to supply part/all of their demand. In Israel at present 40% of the power generation is provided by IPP's either via bilateral contracts or by selling directly to the grid.

### Expected evolutions by 2020

Out of 15 regulators that responded to the questionnaire, ten indicated that they expect to have in 2020 a liberalised wholesale market in place, one a single buyer model (JO) and two an unbundled market (EG, ME) while only two (ISR, MT) are expecting the national market to remain fully vertically integrated. Nevertheless, the comparison shows that since 2010 four national markets (AL, DZ, BiH, GR) have undergone or will undergo considerable structural changes moving from one model to another.

Continental EU markets will remain liberalised and regional market integration will progress. The European electricity market design is evolving constantly in order to improve it. The regulatory framework is adapted and improved regularly, notably through the adoption of European network codes covering issues such as e.g. capacity allocation, balancing, interoperability. Once adopted, these codes are binding for all EU countries.

The Algerian market is expected to move from an unbundled to a liberalised wholesale market.

The situation in EG ISR JO MT and TR is expected to remain unchanged.

The ECRB region will progressively converge with EU legislation. BiH has already liberalised its wholesale market. In Albania a new energy law is to be adopted in 2015 to adapt the market model to the 3rd EU energy package requirements. This will change the structure of the electricity sector considerably. However, in Montenegro the market is expected to remain unbundled while the Albanian wholesale market is expected to become liberalised.

### (a.2) Power Pool Form

Compared with 2010, only BiH and GR changed from one power pool form to another: BiH set up a loose pool and GR moved from a tight pool to a spot market. In the other countries the situation remains unchanged.

EG, ISR and MT have a tight pool in place meaning that dispatching of power plants

is centralised.

The power systems of DZ and JO are internally interconnected and synchronized. Power trade is managed by long term agreements.

In FR IT PT ES and TR electricity is sold over power exchanges. France has a spot market which is coupled with most neighbouring power exchanges. As a result, interconnection capacity management is dealt with via implicit auctions for day-ahead capacity products, allowing for an efficient management of supply at a cross-border level.

In short time in Croatia a power exchange is expected to open.

Looking at the Balkan region, there is no power exchange in place. In BiH GR and ME the Coordinated Auction Office regrouping countries from South East Europe (SEE CAO) based in Podgorica performs transmission capacity auctions. The operator in BiH (ISO BiH) and in Serbia (Elektromreža Srbije - EMS) carry out transmission capacity auctions on the border of BiH-Serbia as EMS does not participate in the SEE CAO. In BiH 17 out of 25 licenced suppliers were active on the wholesale market transactions in 2014. Albania is expected to join the SEE CAO this year (2015).

The Greek TSO ADMIE is also a member of the European Capacity Allocating Service Company for Central Western Europe, the borders of Italy, Northern Switzerland and parts of Scandinavia.

*Table 2: Power pool forms in MedReg countries 2010 and 2015*

Country	2010	2015
Albania	--	N/A
Algeria	--	Interconnection
BiH	Interconnection	Loose Pool
Croatia	--	Tight Pool
Cyprus	--	--
Egypt	Tight Pool	Tight Pool
France	Spot Market Pool	Spot Market Pool
Greece	Tight Pool	Spot Market Pool
Israel	--	Tight Pool
Italy	Spot Market Pool	Spot Market Pool
Jordan	--	Interconnection
Libya <sup>5</sup>	--	--
Malta	--	Tight Pool
Montenegro	--	Tight Pool
Morocco	--	--
Palestinian Territories	--	--

<sup>5</sup> Libya became a member of MedReg in June 2013.

Portugal	Spot Market Pool	Spot Market Pool
Slovenia	--	--
Spain	Spot Market Pool	Spot Market Pool
Tunisia	-	-
Turkey	Spot Market Pool	Spot Market Pool

Source: MedReg

### (a.3) Regional Electricity Market Structure

When comparing the responses of 2010 and 2015, it is interesting to note that on the Northern shore of the Mediterranean, where market integration was already well underway, multiregional market coupling projects expanded or are planning to expand even further. Even though there is no regional market as such, market coupling is boosting the power exchanges in the region.

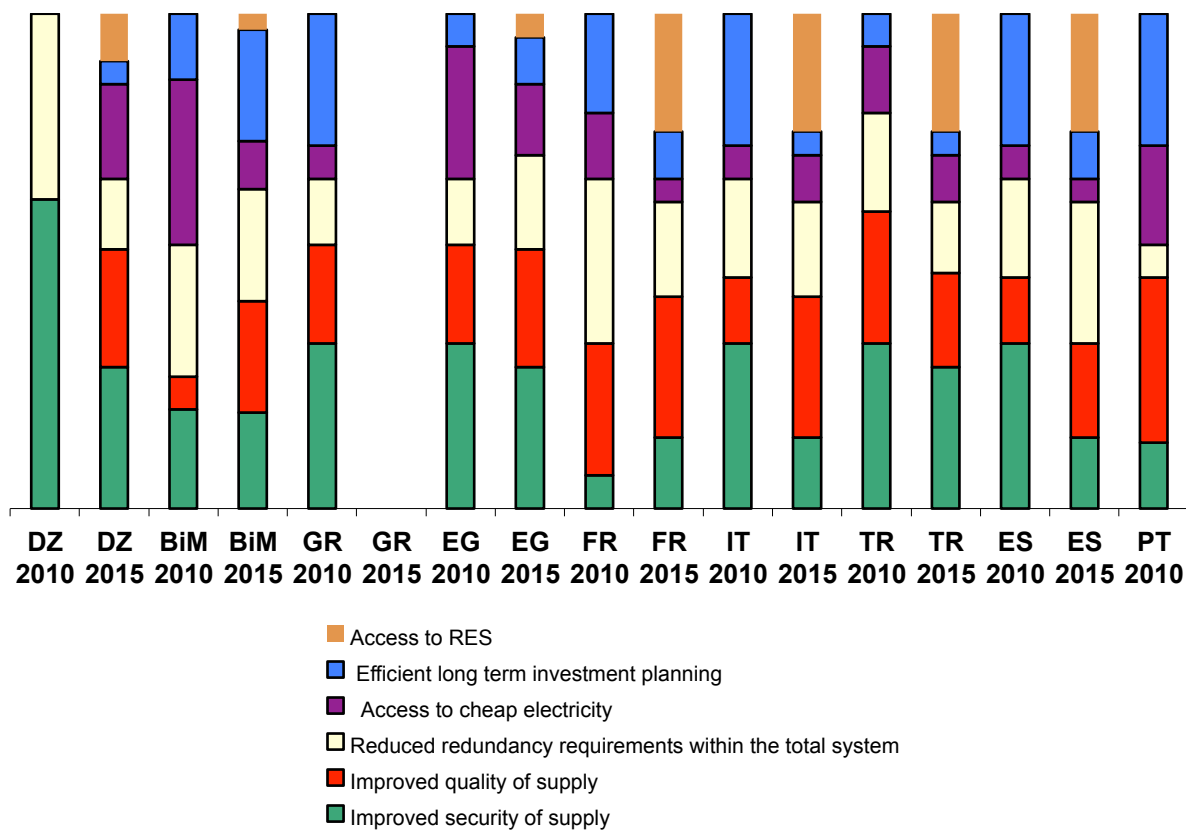
FR IT PT ES are part of multiregional market coupling projects. Since 2007 ES and PT are part of the Iberian Market MIBEL which is operated by the OMIE. Since 2011 Italy and Slovenia are coupled. The Italian market operator GME is responsible in the area. FR PT IT ES are coupled with their neighbouring markets (and beyond). Market coupling has been applied to 19 countries, creating a kind of regional market unless interconnections are congested. This mechanism will become EU wide legally binding and is for the time being known as PCR (Price Coupling of Region) Different power exchanges are operating in the market coupling area such as Nord Pool, EPEX, APX and OMIE. The Greek power market is to be coupled with the Italian one through the European PCR in the near future. As regards to Switzerland, both the TSOs and the Power Exchanges involved are ready to join the coupling from a technical point of view, however political issues between Switzerland and the European Union block the process.

Looking at the Maghreb countries (DZ, MO, TU) despite a first step towards closes regional cooperation under IMME (*Intégration des marchés maghrébins de l'électricité*) launched in 2008, regional integration is not progressing since 2011 and power exchanges are dealt with bilaterally.

The same goes for HR EG JO, MT and ISR which were and are not part of a regional market in 2010 and 2015. However all have interconnections with some neighbouring countries. MT got recently interconnected with the EU grid via Sicily.

*(a.4) Priority of purpose for international traded*

*Figure 2 Priorities per country: 2010 compared with 2015*



*Source: MedReg*

Compared to the questionnaire from 2010 a new possible priority was given as a choice. In addition to improved security or quality of supply, reduced redundancy requirements within the total system, access and cheap electricity and efficient long term investment planning, respondents could also choose access to RES.

In 2010 security of supply was considered by most regulators as one of the priorities for international trade of electricity while only in PT access to cheap electricity was listed first. In 2010 quality of supply scored rather low which is not the case in 2015. Compared to the answers provided in 2015, there is thus a shift of priorities regarding international trade purposes and a clearer North-South/East divide. Nevertheless, with the exception of FR efficient long term investment planning was also in 2010 not considered as a top priority.

In 2015 nearly all respondents<sup>6</sup> declared that regional interconnections and integration improve considerably security of supply. Regulators from the Northern shore of the Mediterranean (IT ES PT FR) and ME consider that interconnections and regional integration have notably a positive impact on guaranteeing access to

<sup>6</sup> MRA did not indicate any priority purpose for international trade.



cheap electricity. While on the Eastern (TR) and Southern shores (DZ EG JO) as well as BiH and GR, regulators see the positive impact on quality of supply as priority. For HR security of supply and quality of supply are most important reasons for developing interconnections.

The main purpose of market integration in the EU is to reduce the overall cost of supply through an optimum use of generators. Market coupling allows applying the call for different production means according to growing marginal cost. Interconnections also serve security of supply, but, in big systems like in France, this point is of a lesser importance except during very high consumption spikes.

The Italian electricity system is facing a period of excess capacity. Thus in the short run security of supply is not the main issue. Nevertheless, security of supply can become an issue in the long term. In contrast, wholesale electricity prices in Italy still remain above the average of neighbouring countries. As a consequence, Italy is a net importer of electricity and cheap electricity is the main driver for international trade. In the recent years Italy experienced a huge increase in electricity produced from renewable sources, so the 2020 target (26%) is close to be reached. This is why access to electricity from renewable sources does not appear as leading factor for international trade.

15 regulators indicated that access to RES and efficient long term planning process are not one of the most important added values of regional cooperation.

#### (a.5) Ancillary Services

Compared to 2010 the situation in 2015 regarding the existence of ancillary services has not evolved in DZ, EG, FR, IT, PT, ES and TR.

In AL HR DZ EG and ISR there are no ancillary services. In the absence of a power market, in Egypt ancillary services are coordinated bilaterally between the Egyptian National Energy Control Centre and the generators.

In BiH, FR, IT, ME, ES and TR there is a spinning reserve having a contracted value of e.g. 600 MW (FR) and 780 MW (GR).

In 2014 the Italian TSO bought 12.2 million MWh to create upward reserve margins and sold 4.7 million MWh to create downward reserve margins in the ex-ante dispatching market (a sort of intraday market taking place before the real time or balancing market).

In PT there is since 2008 a market based mechanism to contract spinning reserve while for reactive power minimum values must be provided mandatorily by power generators.

In BiH where no ancillary services in 2010, different reserves were set up (spinning reserve, hot start and black start). The spinning reserve of 50-55 MW is provided by operators of Hydro Power Plants (HPP) on a monthly basis. The hot start is provided on the level of a specific regional balancing control block which consists of BiH, Slovenia and Croatia. BiH's share in the total hot start is 184 MW. The black start is

an obligation for HPP.

In GR there is a spinning reserve (in the range of 360-780 MW) and reactive power (in the range of 600-1000 MW).

MRA indicated that the question regarding ancillary services is not applicable to MT.

#### (a.6) Transmission Rights Related Issues

Like in 2010, most of the respondents<sup>7</sup> considered in 2015 their level of comfort with the emergence of an independent regional TSO dealing with transmission rights rather low. All regulators indicated being comfortable with the proposal that the national TSOs own and manage the network and must respect access rules. Indeed, in most countries (DZ, BiH, HR, FR, PT, ES, TR) the national TSOs are already the main responsible for dealing with transmission related issues.

However compared with 2010 there is a sensible change as in 2015 four respondents (EG, GR, IT, ES) indicated being relatively at ease with the emergence of a regional TSO which was not the case in 2010.

Results are mixed concerning national vs. central dispatching for implementing efficiently system requirements. While in both years a large majority is at ease with the proposal that national dispatching is coordinated at regional level, no clear conclusion regarding the regulators' common preference can be drawn for central dispatching.

Regarding a centrally managed short term power exchange in 2015 a large majority of respondents consider it as a viable solution they would be comfortable with, while in 2010 answers were mixed and tended rather to a low level of comfort.

Responses are mixed with regard to the degree of comfort with a centrally managed balancing market. While in 2010 the trend was indicating a low level of comfort, in 2015 this proposal scores significantly higher. In practice for instance, in France, the TSO supervises the balancing market. Moreover, there are some cross-border exchanges for balancing purpose if cross border capacity is left at this timeframe (with United Kingdom and Spain it is done according to a TSO-TSO model. In addition German and Swiss market players can participate directly to the French balancing market.

In the Mediterranean region no regional regulator exists. While in 2010 all respondents estimated their comfort with the emergence of a regional regulator as rather low, in 2015 half of the respondents consider it as a possibility they would be relatively comfortable with. The same trend towards a broader acceptance of intensified regional coordination can be observed regarding the possible arbitration role of a regional regulator with regard to international trade issues. In 2010 all

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<sup>7</sup> MRA did not indicate any level of comfort with the proposals made regarding the implementation of system requirement linked to transmission rights.

respondents were not very at ease with it, while in 2015 four regulators (DZ EG FR IT) would be relatively comfortable and one regulator even very comfortable (ES) with such an evolution.

Regional coordination and cooperation is institutionalised within the EU, notably since May 2010 when the Agency for the cooperation of energy regulators (ACER) was set up. ACER has specific powers and missions in this regard. Nevertheless, EU national regulators are responsible for enforcement, while they cooperate and coordinate their decisions dealing with interconnection management with their concerned counterparts. In the EU arbitration and dispute settlement for regional issues (but not regarding international trade) could be handled by ACER and the European Commission. In general ACER has a facilitator role and can take individual binding decisions on cross-border issues (cf. Annexe 1).

The Energy Community Regulatory Board (ECRB, Balkan region) has also assigned tasks with regard to regional cooperation notably by providing coordinated regulatory positions to energy policy debates, harmonizing regulatory rules across borders and sharing regulatory knowledge and experience. ECRB acts as a facilitator to set up a harmonised and reliable regulatory framework with the goal to establish a single energy market in the Energy Community and beyond (cf. Annexe 2).

Like in 2010 most respondents indicated in 2015 that they would be very comfortable with discussing jointly issues linked to the setting up of a regional power pool. However in contrast to 2010, in 2015 three regulators (HR, IT, TR) would be rather uncomfortable with such a solution.

With regard to the possibility of having a regional regulator that sets the transmission wheeling tariffs most of the respondents are very comfortable with and only four (DZ HR, GR FR) are not at ease with such a proposal. In BiH transmission tariffs are applied on domestic consumption. The European Inter TSO Compensation mechanism is applied on export, import and transit flows.

Table 3: Degree of comfort of respondents with the following proposals regarding the treatment of transmission right issues (2010 and 2015)<sup>8</sup>

	Interconnection Transmission Lines owned by an independent regional TSO, jointly owned by participants.		National links in network owned and operated by national TSO, bound by an open access agreement.		Central dispatch of an interconnection network, with national dispatchers taking dispatch instructions as a priority.		National dispatch with advice from a coordination centre relating to the Regional Power Pool entry and exit points.		Centrally managed short term market power exchange.	
	2010	2015	2010	2015	2010	2015	2010	2015	2010	2015
<b>Low</b>	BiH GR EG IT PT ES TR	DZ FR ME PT TR BiH HR	EG		GR IT PT ES	IT PT ES	GR PT	DZ PT TR BiH GR HR	BiH GR IT	DZ BiH HR
<b>Medium</b>		EG IT ES GR	DZ			EG ME GR HR	BiH	ME ES	ES	GR
<b>High</b>			BiH GR IT ES PT TR	DZ EG FR IT ME PT ES TR BiH GR HR	DZ BiH EG TR	DZ TR BiH	IT ES	EG IT	PT TR	EG FR IT ME PT ES TR

	Centrally managed Balancing Market.		Regional Regulator coordinating the enabling of national regulation and then enforcing it.		Regional Regulator providing arbitration services for international trade.		Regulation managed by national regulators with an association to debate the Regional Power Pool issues.		Transmission wheeling tariff unrelated to internal Transmission Use of System (TUOS) tariff and set by regional regulator.	
	2010	2015	2010	2015	2010	2015	2010	2015	2010	2015
<b>Low</b>	GR IT PT	DZ PT BiH HR	BiH GR IT PT ES TR	FR PT TR BiH GR HR	BiH GR IT PT ES TR	ME PT TR BiH GR HR		IT TR HR	PT TR	DZ FR GR HR
<b>Medium</b>	ES	GR		DZ EG IT ME ES		DZ EG FR IT	BiH	ME BiH		IT ME
<b>High</b>	BiH TR	EG FR IT ME ES TR				ES	GR IT PT ES TR	DZ EG FR PT ES GR	BiH GR IT ES	EG PT ES TR BiH

Source: MedReg

<sup>8</sup> The colour indicates the majority of responses.

Figure 3 Transmission right issues country-by-country

Country	2010	2015	Country	2010	2015
Algeria			Italy		
BiH			Portugal		
Croatia	N/A		Monte-negro	N/A	
Egypt			Spain		
France	N/A		Turkey		
Greece					
	<ul style="list-style-type: none"> <li> Interconnection TLs owned by an independent regional TSO, jointly owned by participants.</li> <li> National links in network owned and operated by National TSO, bound by an open access agreement.</li> <li> Central dispatch of an interconnection network, with national dispatchers taking dispatch instructions as a priority.</li> <li> National dispatch with advice from a coordination center relating to the Regional Power Pool entry and exit points</li> <li> Centrally managed short term market power exchange.</li> <li> Centrally managed Balancing Market</li> <li> Regional Regulator coordinating the enabling of national regulation and then enforcing it.</li> <li> Regional Regulator providing arbitration services for international trades.</li> <li> Regulation managed by national regulators with an association to debate the Regional Power Pool issues.</li> <li> Transmission wheeling tariff unrelated to internal Transmission Use of System (TUOS) tariff and set by regional regulator.</li> </ul>				

Source: MedReg

## **(b) Interconnection Data<sup>9</sup>**

As MT was not interconnected until March 2015 to a neighbouring country, data is not available for the past years and 2014.

### **(b.1) Volume of Demand, Imports, and Exports in Total**

#### **Situation in 2014**

The volume of demand in the countries examined ranges from 16 196 MWh (HR), over between 48.8-60.5 million MWh (PT GR and DZ) up to 14.7 billion MWh (EG).

In Italy the actual import of electricity represents 14% of total electricity demand. Taking into account that the current price differential with neighbouring countries is larger than 10€/MWh, the volume of imported energy in case of no capacity constraints would be presumably by far larger. However it is not known how much import would be needed to eliminate the price differential.

Export is considered also very low in DZ, EG JO and TR (close to 0%). While AL, FR GR and ME would expect exporting respectively between 15% and 20% of power generation, the figures for PT and ES are expected to be lower (below 10%). In BiH power export represents 40% of the total generation being a net exporter with 2 800 GWh exported in 2014. In HR power export represents about 54%.

Assuming no technical constraints, power import in DZ and EG is expected to be very low (close to 0%), low in ES and TR (below 4%), moderate in FR GR PT and IT (between 6 and 17%), higher in AL, BiH HR and ME (between 28% and 67%) and very high in Jordan (100%).

Due to the particular political situation in Israel there are neither power import nor export figures available.

*Table 4: Data regarding the volume of demand, import to cover demand and power export*

<b>Country</b>	<b>Demand (MWh)</b>	<b>Import (%)</b>	<b>Export (%)</b>
Albania	7 796 000	44%	15%
Algeria	60 500 000	0%	0.50%
BiH	N/A	50%	40%
Croatia	16 196	67.27%	53.97%
Cyprus	--	--	--
Egypt	14 681 700 000	77 GWh ~ 0%	474 GWh ~ 0.03%
France	465 300 000	5.9%	17%
Greece	50 415 000	17%	17%
Israel	N/A	N/A	N/A
Italy	309 000 000	14%	N/A
Jordan	434 880	100%	0%
Libya	--	--	--
Malta	N/A	N/A	N/A
Montenegro	3 160 926	28%	20.49%

<sup>9</sup> N/A means that either the question is not applicable to the country or that data is not available. Indeed, the amount of data collection by NRAs differs from country to country and some data is not considered as indispensable to carry out regulatory tasks (e.g. market surveillance).

Morocco	--	--	--
Palestinian Territories	--	--	--
Portugal	48 822 000	8.4%	6.5%
Spain	243 486 000	1.3%	2.7%
Tunisia	--	--	--
Turkey	240 154	3.1%	0.5%

Source: data submitted by MedReg members (2014 data)

### Situation in 2020

In 2020 import is expected to remain the same as in 2014 in AL DZ EG GR FR and IT. In BiH HR TR ES and PT the regulators expect imports to increase and to decrease in ME.

Regarding power export AL DZ BiH HR JO ME PT and ES expect an increase by 2020, while in EG, TR GR and FR export volumes are expected to remain stable at the same level as in 2014.

In Egypt with the launch of a feed-in tariff programme, the main objective is to narrow the gap between supply and demand and also to achieve a reasonable reserve margin for the national electricity sector. Therefore, it is assumed that import and export figures are very much likely to remain the same in 2014 and 2020.

In France for example, developments by 2020 are going to be evaluated this year (2015) within the “Multiannual Energy Planning”, which is driven by the Ministry responsible for energy issues. Nonetheless, it is likely that both import and export increases (to fit short-term dispatch optimization driven today by prices and tomorrow by variable renewable generation), without necessarily changing the net balance.

### (b.2) Base Load, Imports, and Capacity available for Potential Export

#### Situation in 2014

Data on base load is available only in very few countries.

Imported power used for based load is lowest in AL (430 MW) and highest in EG (28 000 MW). There is no spare capacity in EG at base load duration available for power import, but in AL BIH HR and PT (from nearly 10% in HR up to 50% in AL).

Export capacity at base load is around 82% in BiH and 15% in PT and AL but 0% in EG.

Table 5: Data regarding base load situation

Country	Base Load (MW)	Imported Power (%)	Export Capacity (%)
Albania	430	50%	15%
Algeria	N/A	0%	N/A
BiH	833	44%	82%
Croatia	1 166	9.51%	N/A
Cyprus	--	--	--
Egypt	20 000	~ 0%	~ 0%
France	N/A	N/A	N/A
Greece	4 500	N/A	N/A
Israel	N/A	N/A	N/A
Italy	N/A	N/A	N/A
Jordan	N/A	N/A	N/A
Libya	--	--	--
Malta	N/A	N/A	N/A
Montenegro	N/A	N/A	N/A
Morocco	--	--	--
Palestinian Territories	--	--	--
Portugal	3 290	30%	16.5%
Spain	N/A	N/A	N/A
Tunisia	--	--	--
Turkey	N/A	N/A	N/A

Source: data submitted by MedReg members (2014 data)

### Situation in 2020

The amount of imported power used for base load is expected to remain stable in AL DZ, to increase in HR BiH MT and PT and to decrease in EG.

Spare capacity for export is expected to grow in AL DZ BiH HR EG and PT and to increase in HR.

Israel could have in the near future extra capacity of up to 25% (up to 3 000 MW) which part of it can be exported, depending on the season of the year.

MT is expecting the amount of imported power spent for base load to increase in 2020 due to the new interconnection with Italy but spare capacity available to export to remain the same as in 2014.

In PT import/export values depend strongly on market price, namely nowadays that consumption has reduced and combined cycle natural gas power plants are less used.

Regarding ES a number of assumptions should be made before providing data. Cross-border exchanges take place following market price signals regardless of the level of demand in the system (base or peak load).



### (b.3) Peak Load, Imports, and Capacity available for Potential Export

#### Situation in 2014

Data on peak load is available only in very few countries.

The peak load in the responses examined ranges between 1 475 MW (AL) and 28 000 MW (EG). The estimated imported power spent for peak load varies between 0% (DZ, EG, PT) and 28% (AL). At peak loads there is no spare export capacity in AL and EG, but 5% in DZ, 31% in BiH and 58% in PT.

*Table 5: Data regarding base load situation*

Country	Peak Load (MW)	Imported Power (%)	Export Capacity (%)
Albania	1 475	28%	0%
Algeria	10 927	0%	5%
BiH	2 207	16.5%	31%
Croatia	2 974	26.49%	N/A
Cyprus	--	--	--
Egypt	28 000	~ 0%	~ 0%
France	N/A	N/A	N/A
Greece	9 300	N/A	N/A
Israel	N/A	N/A	N/A
Italy	N/A	N/A	N/A
Jordan	N/A	N/A	N/A
Libya	--	--	--
Malta	N/A	N/A	N/A
Montenegro	N/A	N/A	N/A
Morocco	--	--	--
Palestinian Territories	--	--	--
Portugal	8 313	0%	58%
Spain	N/A	N/A	N/A
Tunisia	--	--	--
Turkey	N/A	N/A	N/A

*Source: data submitted by MedReg members (2014 data)*

#### Situation in 2020

Spare capacity available for import at peak load is expected to increase in BiH HR and PT, while in AL and DZ it is expected to be at the same level as in 2014 and should decrease in EG and in JO.

As regards export, capacity available at peak load is expected to increase in AL BiH DZ HR and JO and to remain stable in EG and PT.

In PT import/export values depend strongly on market price, namely nowadays that consumption has reduced and combined cycle natural gas power plants are less used.

Regarding ES a number of assumptions should be made before providing data. Cross-border exchanges take place following market price signals regardless of the

level of demand in the system (base or peak load).

*Table 6: Outlook for 2020 regarding evolution of demand, import and export capacity*

Country	(b.1) Volume of Demand, Imports, and Exports in Total - 2020		(b.2) Base Load, Imports, and Capacity available for Potential Export - 2020		(b.3) Peak Load, Imports, and Capacity available for Potential Export 2020	
	Import	Export	Imported Power	Spare Capacity	Import	Export
Albania	same as 2014	increasing	same as 2014	increasing	same as 2014	increasing
Algeria	same as 2014	increasing	same as 2014	increasing	same as 2014	increasing
BiH	increasing	increasing	increasing	increasing	increasing	increasing
Croatia	increasing	increasing	increasing	increasing	increasing	increasing
Cyprus	---	---	---	---	---	---
Egypt	same as 2014	same as 2014	decreasing	increasing	decreasing	same as 2014
France	same as 2014	same as 2014	N/A	N/A	N/A	N/A
Greece	same as 2014	same as 2014	---	---	---	---
Israel	N/A	N/A	N/A	N/A	N/A	N/A
Italy	same as 2014	N/A	N/A	N/A	N/A	N/A
Jordan	N/A	increasing	N/A	N/A	decreasing	increasing
Libya	---	---	---	---	---	---
Malta	N/A	N/A	increasing	same as 2014	N/A	N/A
Montenegro	decreasing	increasing	N/A	N/A	N/A	N/A
Morocco	---	---	---	---	---	---
Palestinian Territories	---	---	---	---	---	---
Portugal	increasing	increasing	increasing	increasing	increasing	same as 2014
Slovenia	---	---	---	---	---	---
Spain	increasing	increasing	N/A	N/A	N/A	N/A
Tunisia	---	---	---	---	---	---
Turkey	increasing	same as 2014	N/A	N/A	N/A	N/A

*Source: responses submitted by MedReg members (2014 data)*

### 3. Conclusions

Observing the national and regional electricity markets development over a period of time in MedReg member countries provides an insight to where and how the electricity markets in the region are heading to. The actual situation and expected evolution of the past and current status of the electricity markets are to be identified, discussed, and evaluated. The findings and concluded recommendations will indeed fasten the way towards a sound fully national and regional competitive electricity markets. These developments will establish a path for achieving homogenous cross-border trade in the future among MedReg member countries and beyond.

The updated report shows that situations differ from country to country but that regional integration is progressing at different speed in different areas of the Mediterranean (EU, Balkans, South-East, South).

Regional cooperation projects help intensifying regional integration and power exchanges. For example on the Northern shore market coupling projects are expanding. Most of the Southern shore countries are not part of a regional market but all are interconnected with their neighbouring countries. In some countries (FR IT PT ES and TR) power is sold over power exchanges, while others (BiH ME AL GR) have started to organise transmission capacity auctions. However, on the Southern shore, despite a first step towards closer regional cooperation under the IMME launched in 2008, regional integration is not progressing since 2011. In DZ and JO long term contracts prevail and power exchanges are dealt with bilaterally.

Regarding the impact of regional integration, there is a shift of priorities compared with 2010 and a clearer North/South divide. While in 2015 the Northern shore regulators and the one from Montenegro stressed notably the positive impact on access to cheap electricity, Eastern and Southern shore regulators as well as the Greek and BiH regulators see improved quality of supply as a priority. Nevertheless, all regulators indicated that interconnections and regional integration improve considerably the security of supply. However, it was not expected that access to electricity from RES is considered by almost all respondents as a rather low priority for international trade in 2015.

In the Southern and Eastern shore of the Mediterranean, market integration does not seem to be perceived as an economic opportunity: it seems that no major benefits are expected from the creation of (sub) regional market(s). However, in the absence of well-established electricity markets there are no market signals as well, so cross border trade cannot be duly valorised and consequently appreciated.

By 2020 eight out of fifteen regulators expect power export of their country to increase (AL, DZ, BiH, HR, JO, ME, PT, ES) while the other four (EG GR FR TR) consider it to remain at the same level as in 2015. Power import is expected to remain the same as in 2014 in AL DZ EG GR FR and IT while it should increase in BiH TR ES and PT. Only few regulators collect data regarding peak or base load capacity, therefore it is difficult to draw conclusions at regional level on this issue.

When comparing with 2010, responses in 2015 show that most of the regulators have become more familiar with the observatory. Furthermore it can be deduced that

the developments/evolutions are slow but steady and are directly related to the developments/evolutions in national regulations and markets.

The questionnaire will be updated for each edition of the MEMO report in order to take account of the findings, data availability and issues to be investigated further. The next update of the report on regional markets is planned in 3 years-time (publication in 2018).

Furthermore, based on the findings of the conclusions of the MEMO reports on national and regional markets, MedReg will investigate in 2016 how to elaborate roadmaps for each (sub)region in the MedReg area in order to overcome regional integration and develop markets<sup>10</sup>.

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<sup>10</sup> See MedReg Action Plan 2015-2017 available on our website.

## Annexe 1 – ACER competences with regard to regional cooperation

The Agency for the Cooperation of Energy Regulators (ACER), a European Union Agency, was created by the EU Third Energy Package to further progress the completion of the internal energy market both for electricity and natural gas. ACER was officially launched in March 2011. ACER ensures that market integration and the harmonisation of regulatory frameworks are achieved within the framework of the EU's energy policy objectives

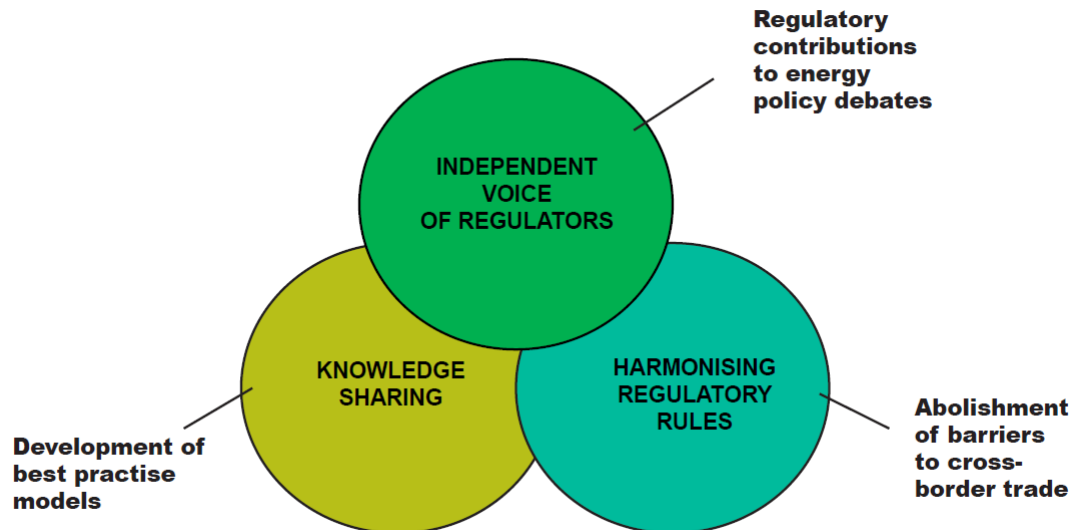
The Agency has been assigned a specific role regarding regional cooperation; including monitoring of the cooperation of national regulatory authorities and of the European network for transmission system operators for electricity and for gas on the one hand, and monitoring of the progress achieved by the Regional Initiatives on the other hand.

The Regional Initiatives which were set up on a voluntary basis by European energy regulators in 2006 and allow testing solutions for cross-border issues carry out early implementation of the EU acquis (notably the network codes) and come up with pilot-projects which can be exported from one region to the others. ACER is coordinating these regional initiatives.

[http://www.acer.europa.eu/Electricity/Regional\\_initiatives/Pages/default.aspx](http://www.acer.europa.eu/Electricity/Regional_initiatives/Pages/default.aspx)

## Annexe 2 – ECRB competences with regard to regional cooperation

The Energy Community Regulatory Board (ECRB) is the independent regional body of energy regulators in the Energy Community and beyond. ECRB activities build on three pillars: providing coordinated regulatory positions to energy policy debates, harmonizing regulatory rules across borders and sharing regulatory knowledge and experience.



ECRB promotes the development of a competitive, efficient and sustainable regional energy market that works in public interest. A harmonised and reliable regulatory framework is essential for building trust of investors and customers. Their mission is to facilitate this process for the benefit of Energy Community businesses and citizens. ECRB's advice contributes to achieving the goal of establishing a single energy market in the Energy Community and beyond by building a bridge between the technical needs of the regulated industry and the interest of customers.

[https://www.energy-community.org/portal/page/portal/ENC\\_HOME/ENERGY\\_COMMUNITY/Institutions/ECRB](https://www.energy-community.org/portal/page/portal/ENC_HOME/ENERGY_COMMUNITY/Institutions/ECRB)

## Acronyms

ACER	Agency for the cooperation of energy regulators
ECRB	Energy Community Regulatory Board
EU	European Union
HPP	Hydro Power Plant
IMME	Intégration des marchés maghrébins de l'électricité
MIBEL	Mercado Ibérico de la Electricidad
OMIE	Operador del Mercado Ibérico
PCR	Price Coupling of Regions
RES	Renewable Energy Sources
SEE CAO	South East Europe Capacity Allocation Office
TSO	Transmission System Operator