



Generation Adequacy

Generation Performance and Security of Supply

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2nd CEER-MEDREG Roundtable

Malta, 19 May 2016



MedReg Countries Current Situation

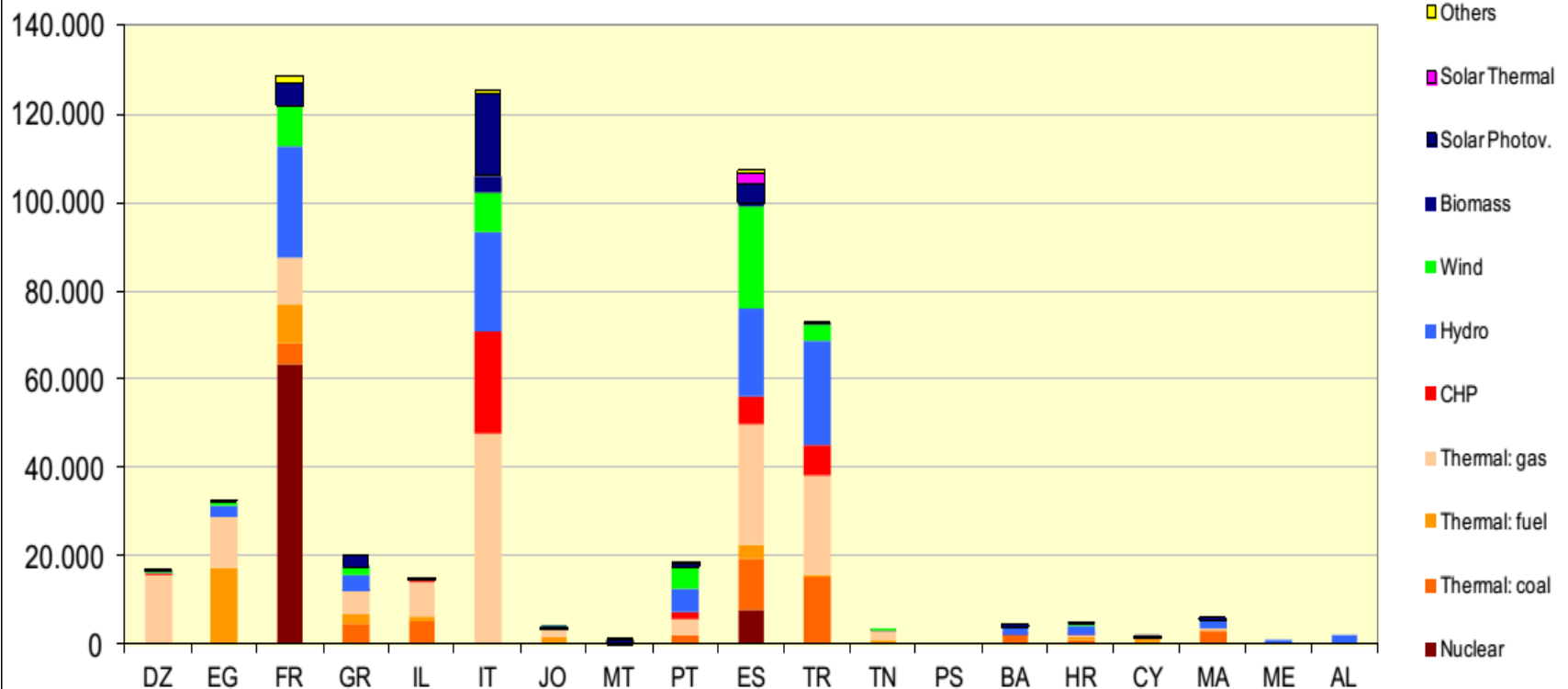
- **Internal Market Structure**
 - Liberalised wholesale market
 - Unbundled electricity sector
 - Vertically integrated power sector
- **Regional Market Structure**
 - Northern shore: multiregional market coupling projects
 - Southern shore: interconnected systems but no regional markets

MedReg Countries Current Situation

- **Electricity demand**
 - Steady or decreasing in EU countries
 - Increasing in non-EU countries
- **Generation**
 - Increase of installed capacity and generation from Renewable Energy Sources (RES) in almost all countries
 - Increase of RES share in electrical systems
 - ➔ increasing shares of intermittent generation

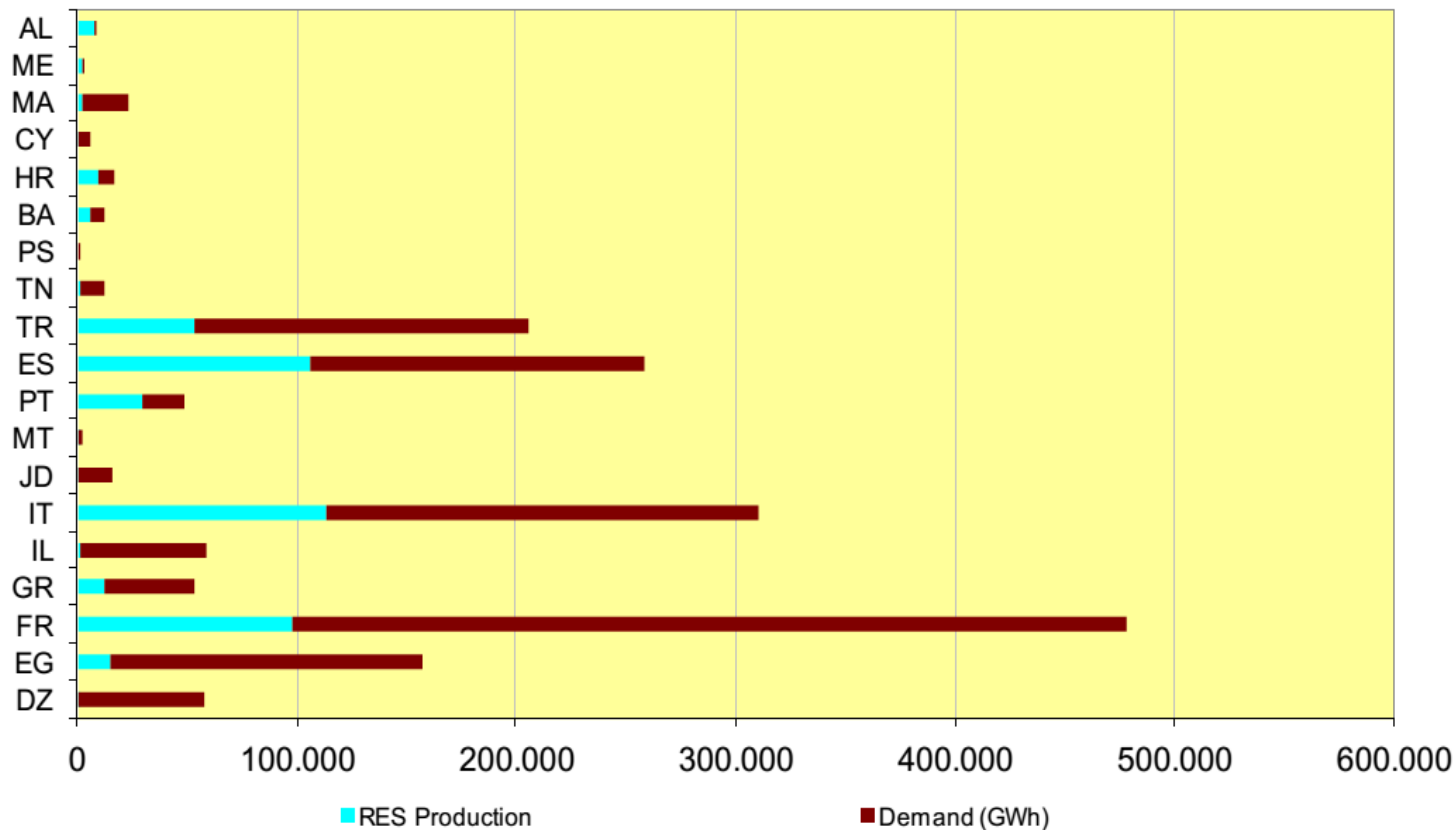
Generation Installed Capacity (2014)

Installed Capacity per technology



Contribution of RES generation in final energy demand

RES production / Demand (GWh)



Generation performance

Background

- Security of supply: high priority issue for MedReg members and energy regulators
- Generation adequacy: national issue → regional issue
- Different approaches to undertake generation adequacy assessments
- MedReg countries: increasing shares of variable generation
→ Need for high power plant performance (reliability and availability)

Generation performance MedReg Questionnaire

Aim

- Identify which tools are used by regulators/TSOs to evaluate performance of power plants
- Analyze practices and methods used in Mediterranean countries in case of failures in generation plants (e.g. application of penalties)
- **Objectives**
 - Promote exchange of data and best practices
 - Ensure that the generation plants will submit all relevant information required to monitor compliance with the issued generation license
 - Evaluate and compare technical performance of power plants

Questionnaire content 1/2

Part I : Performance

- Power Generation and Regulation
- Key Performance Indicators (KPIs) :
Availability Factor, Forced Outage Factor, Scheduled Outage Factor, Generating Unit Tripping, Service Factor, Heat Rate, Auxiliary Consumption
- KPIs Definitions and Formulas
- National practices: applied KPIs, Formulas
- Data collection for each KPI

Questionnaire content 2/2

Part II : Penalties

- Penalties applied to producers in case of power plant failure in each member country
- Implementation tools (contracts, regulations,...)
- Responsible party for determining and controlling the application of penalties
- Payment of penalties
- Challenges and impacts
- Role of regulatory authorities

Questionnaire

- Questionnaire launched in November 2015
- Responses were provided by 10 NRAs : Albania, Algeria, Egypt, France, Israel, Italy, Palestine, Portugal, Spain and Turkey
- Respondents could not always reply to all questions: data not available, question not applicable to the country, ...

Results

Preliminary findings (1/2)

- Responsibility for assessment and monitoring
 - Shared among TSOs and regulators
 - Yet in most countries the responsibility lies with the TSOs
- Applied KPIs
 - Most used: availability factor, forced outage factor and scheduled outage factor
 - Other indicators: starting reliability, utilization factor, CO₂/kWh,
 - Homogeneity of definitions and formulas
- Data received: only 4 members submitted data on KPIs

Results

Preliminary findings (2/2)

- Penalties :
 - Countries with regulated generation: not applicable
 - Liberalized markets:
 - ✓ Market mechanism
 - ✓ Instruments: regulation, contracts
 - ✓ Specified mechanisms for small electrical systems
 - Important role for NRAs
 - Challenges: availability of data
 - Impact of penalties: low

Next Steps

Developments

- Establish relationship between generation performance and security of supply
- Specify role of regulators (TSOs) in the generation performance evaluation
- Best practices on how to handle generation failure

Recommendations

- At national level: Setting the appropriate indicators and thresholds to measure generation performance
- At regional level (MedReg countries): Enhance data quality by comparing results and sharing reliable data for benchmarking

Case Study: Algeria

- Electricity Demand: strongly increasing (2005-2015 : 7,5% per year)
- Low Interconnection Capacity
- Unavailable export capacity in neighbouring countries
- Electricity Generation:
 - Thermal generation parc
 - High degree of unavailability
 - Heavy investments
 - Delay in construction
 - RES: important programme (22 GW in 2030)

Case Study: Algeria

	2011	2012	2013	2014	2015
Installed Capacity (MW)	10 900	12 050	14 200	15 500	16 000
Available Capacity (MW)	8 500	9 500	10 930	11 200	12 150
Peak Load (MW)	8 746	10 363	10 464	10 927	12 410
Load shedding	Yes	Yes	Yes	No	Yes
Importation (MW)	<150				

 Security of supply conditioned by power plants' performance



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Thank you for your attention!

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Supported by the European Union