



# Quality of electricity supply

## MedReg work and example of France

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# Introduction

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- In 2013, the MedReg EWG prepared a report on quality of electricity supply
- Questions: how do market structures influence the quality of supply? How to improve the performances of DSOs?
- Quality of supply has to be managed at several levels along the electricity chain
  - High voltage: stability of frequency, etc.
  - Distribution: supply continuity, voltage stability, etc

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# MEDREG's report on quality of supply



# Approach followed in MedReg report

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- **What is Quality of Supply?**

*what customers get in return for their paid bills*

- **Why should it be benchmarked and evaluated?**

*for the benefit of electricity markets and customers*

- **Who should carry this responsibility?**

*basically regulators - DSOs*

- **Why did we focus on distribution grids?**

*in a large number of MedReg countries, the only way of link with customers is via DSOs, due to markets structures You can find more types of slides in the layout!*

# Influence of the organisation of the electricity value chain

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- The quality of the vertical coordination within the electricity chain is an important driver for quality of supply
- Unbundling and competition have been introduced in countries of the Northern shore of the Mediterranean
- Southern countries have either non competitive markets or partly unbundled ones (integrated monopoly or single buyer).
- In unbundled systems, quality and continuity of supplies are secured through different mechanisms and norms, including contractual commitments and incentive regimes

# Structure of the Distribution/Retail and Supply Markets

Monopoly	Single Buyer (SB)	Wholesale Competition	Retail Competition
		<ul style="list-style-type: none"> <li>• D/ R have the choice to buy from power pool or bilateral contracts</li> <li>• G compete to supply power</li> </ul>	<ul style="list-style-type: none"> <li>• C have the choice between various suppliers</li> <li>• Retail industry is competitive</li> <li>• Distribution separated from retail</li> </ul>
Algeria – Egypt – Bosnia – Croatia – Malta		France*	Italy – Spain- Portugal*
<p>Legend:</p> <p>G- Generation, T- Transmission, D- Distribution, R- Retailer, C- customers, SO- System Operator</p> <p> Who chooses       Who competes</p>			

# Quality of supply in distribution systems

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- 3 categories of indicators:
  - Continuity of supply (outages)
  - Quality of supply (voltage stability, frequency, etc.)
  - Commercial quality (the speed and accuracy with which customer requests are handled : connection, customer care, technical service, metering and billing)
- Objectives of the benchmarking and performance evaluation:
  - encourage operators to provide a satisfactory level of quality, at reasonable costs
  - provide the NRAs with information needed to identify problems
  - strengthen the safeguard measures in favor of the final customers with general and specific standards of commercial quality

# Supply quality on distribution systems

## *Example of indicators of voltage quality*

Quality of Supply Voltage Values	Portugal	Spain	France	Italy	Malta	Bosnia	Algeria
Magnitude of supply voltage	√	√	√	√	√	√	.....
Power frequency	√	√	.....	√	√	√	.....
Supply voltage variations	√	.....	√	√	√	√	√
Magnitude of rapid voltage change	.....	.....	.....	√	√	√	.....
Flicker severity	√	.....	.....	√	√	√	.....
Supply voltage dips	√	.....	.....	√	√	√	.....
Electric supply interruption	.....	√	√	√	√	√	.....
Transient overvoltage between live conductors and earth	.....	.....	.....	√	√	√	.....
Supply voltage unbalance	√	.....	.....	√	√	√	.....
Supply voltage harmonics	√	.....	.....	√	√	√	.....





# Recommendations from the report

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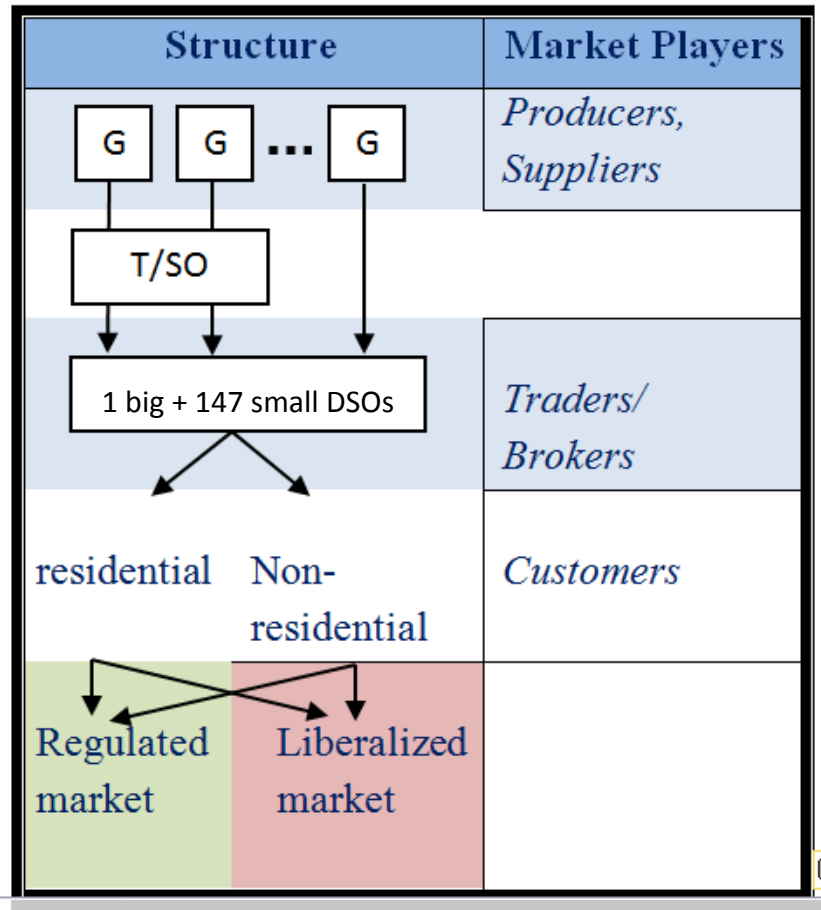
- Regulatory bodies in countries with monopolies or single buyer models should adopt benchmarking methodologies and economic incentives to promote the quality of supply
- Advise to regulators:
  - Improve the availability of detailed and accurate data to allow for evaluating quality of supply and provides the DSOs with accurate, timely, and detailed information
  - Develop economic incentives to drive operators towards a proper level of quality
  - Find a proper balance between cost and quality

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# The example of France



# Structure of the French electricity system



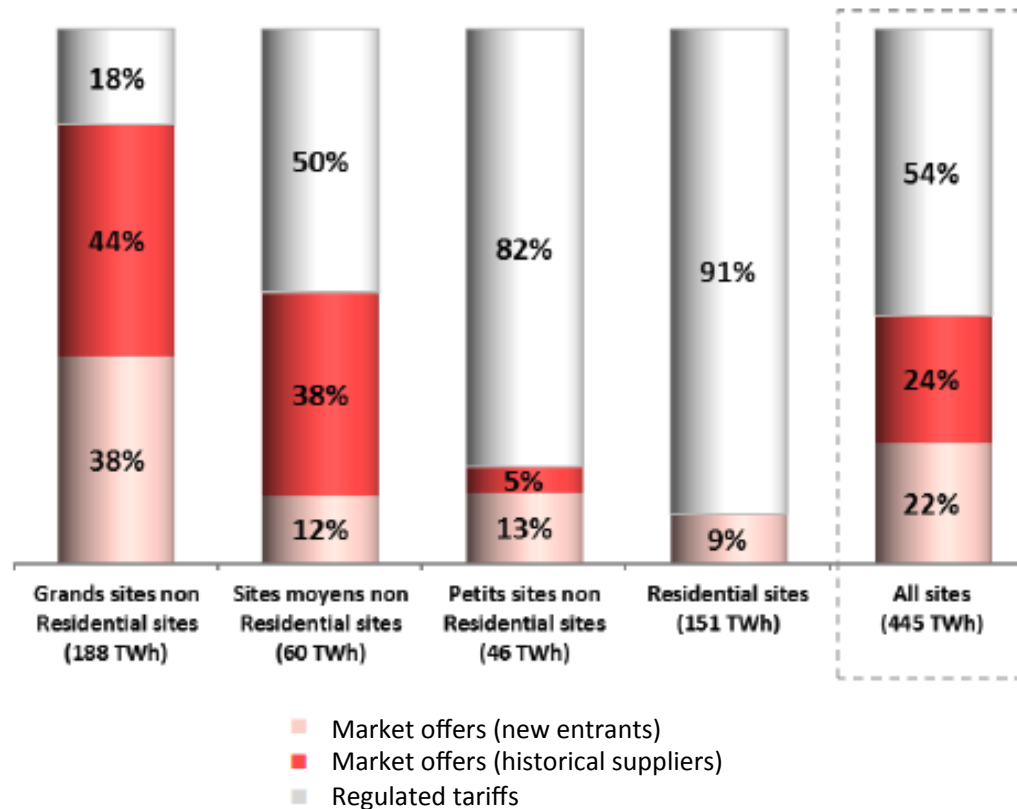
- 1 TSO
- 1 dominant DSO (95% of supplies), local distribution companies
- Competition on wholesale and retail segments
- Regulated tariffs for a part of the population

# Electricity suppliers in France (non-incumbent)

		Grands sites non résidentiels	Sites moyens non résidentiels	Petits sites non résidentiels	Sites Résidentiels
Alpiq		•			
Alterna		•	•	•	•
Axpo		•			
Direct Énergie		•	•	•	•
E.ON Energie		•	•		
Edenkia		•			
Enalp		•	•		
Enel France		•	•		
Enercoop		•	•	•	•
Energem		•	•	•	•
Energies Libres		•	•		
Enovos		•			
ENGIE		•	•	•	•
GEG Source d'Énergies		•	•	•	•
Hydronext		•	•		
Hydroption		•	•		
Iberdrola		•	•	•	
Lampiris			•	•	•
Lucia		•	•	•	•
Planète OUI			•	•	•
Proxelia		•	•	•	•
Sélia		•	•	•	•
Total			•	•	
Vattenfall		•	•		

- Market share of alternative suppliers end 2015
  - Households: 29%
  - Others: 31,1%
- Market offers represented 54% of electricity consumption in 2015 in volume

# Electricity consumption in France in 2015 per type of consumer and supplier



Sources : GRD, RTE, Fournisseurs historiques – Analyse : CRE

# Overview of the quality of supply in France

## *Legal Frame work*

- Regulatory texts provide "global " thresholds, which relate to the percentage of users with a poor quality of supply by department and concession, and 'local' thresholds, which apply at each point of connection to the DSO and at the substations

	Distribution		Transport	
Continuity of Supply	« Global » thresholds	Based on: - Interruption time - Number of short interruptions - Number of long interruptions	Thresholds at the substations (feeding DSOs)	Based on: - Number of long interruptions
	« Local » thresholds	Based on: - Number of long interruptions		
Voltage level	« Global » thresholds	Based on: - Averaged voltage on 10 mins		
	« Local » thresholds	Based on: - Averaged voltage on 10 mins		

# Incentive Scheme for the Continuity of Supply

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- France uses a combination of rewards and penalties for both distribution and transmission network continuity regulation.

## At the transmission level

- Interruption frequency and average interruption time are the continuity indicators used for the transmission level (SAIFI +MAIFI and AIT according to CEER terms)
- For the transmission company, the expected level of continuity, i.e. the level that corresponds to no penalty and no reward, is set at 2.4 minutes for the period between 2009 and 2012.

# Incentive Scheme for the Continuity of Supply

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## At the distribution level

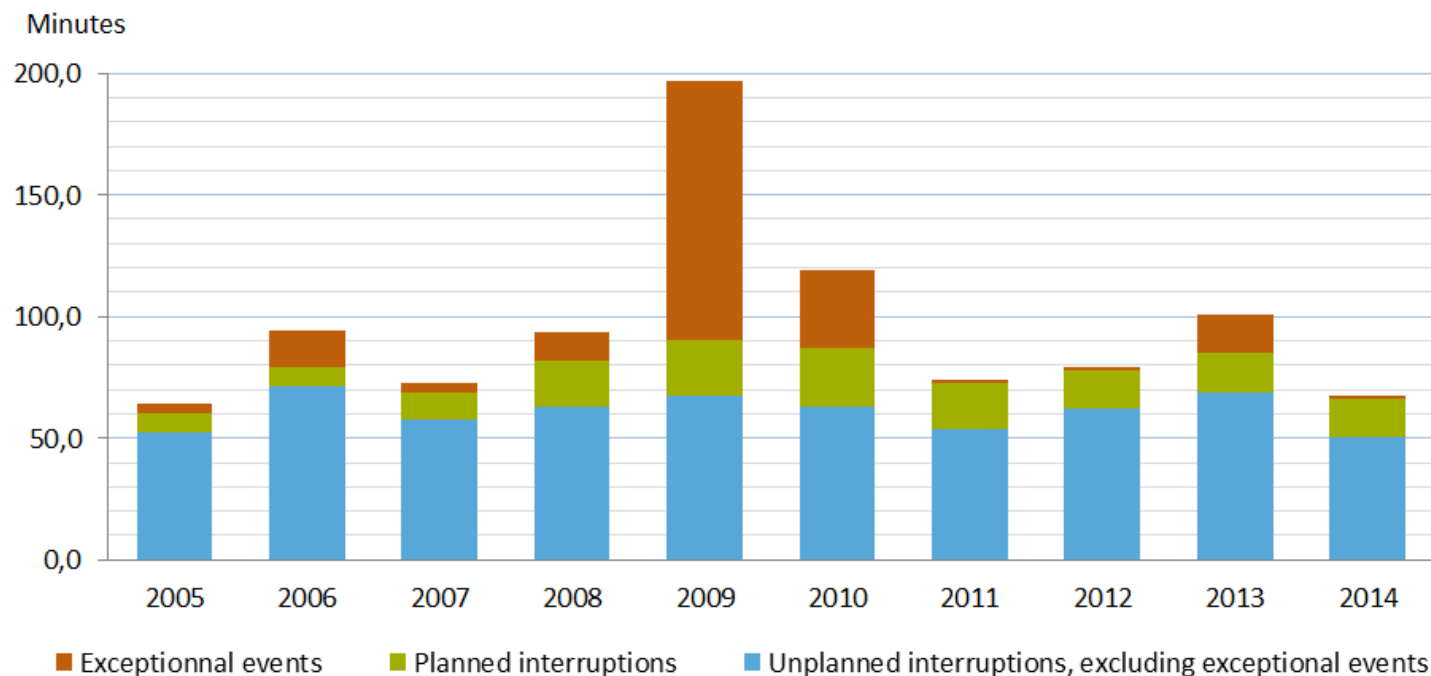
- Average interruption duration is addressed at distribution level (SAIDI)
- The expected level of continuity (i.e. the level that corresponds to no penalty and no reward) is set at 68 minutes for 2014, 67 minutes for 2015, 66 minutes for 2016 and 65 minutes for 2017.

The expected level of continuity is estimated in line with the investment program of the distribution and transmission companies and past values of indicators considered in the incentive scheme.



# Incentive Scheme for the Continuity of Supply

## Incentive regulation for the DSO based on SAIDI indicator



Average annual cut for users of Low Voltage networks managed by ERDF

Target for 2014: 68 minutes

# The tariff reimbursement in case of long interruptions (over 6 hours)

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- The main DSO ERDF (covers 95% of supplies) has to refund 20% of the annual amount of the fixed part of the tariff\* to the customer by interruption between 6 h and 12 h, 40% by interruption between 12 h and 18 h etc. up to 100% max
  - Example: 1 interruption of 7 hours + 1 interruption of 15 hours = 60% of the fixed part of the tariff refunded to the customer
- For other small DSOs and the TSO (RTE) has to refund 2%

\* Fixed part of the tariff: part paid by the customer depending on the power capacity of its facility

Variable part of the tariff: depending on the energy consumed by the customer

# Contractual commitments (Access contracts)

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## At the transmission level

- Access contracts are approved by CRE
- These contracts include commitments:
  - on the frequency and on the interruption time in the case of work or not;
  - on the voltage quality (flicker, voltage dips, etc.).
- It is possible to contract “premium quality contract” for the voltage quality with better commitments on voltage dips

## At distribution level

- Access contracts are only notified at CRE
- The level of commitments is usually lower than the transmission level



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# Thank you for your attention!

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