



Demand Side Flexibility

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Session VIc - May 28th 2015

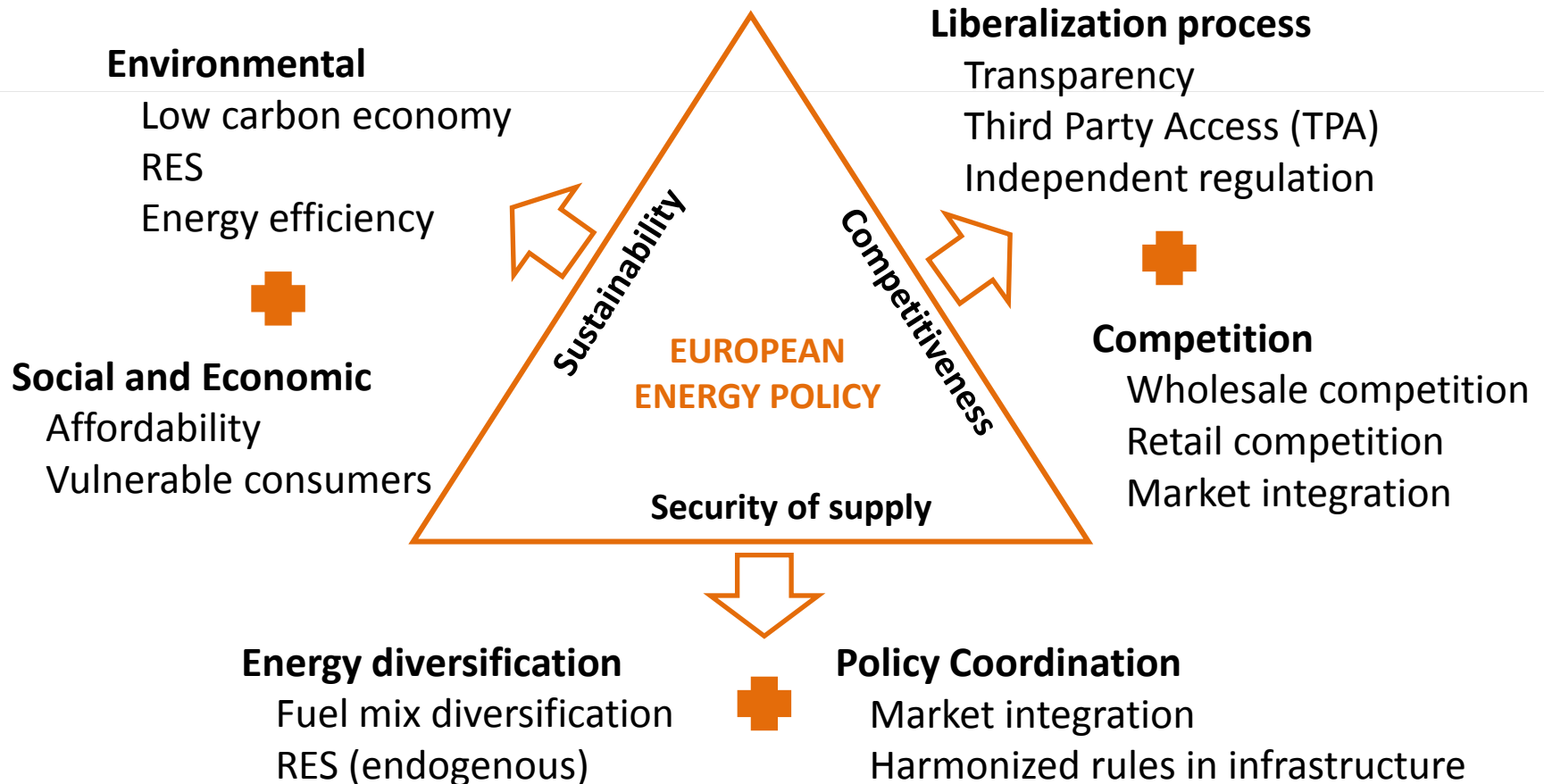


AGENDA

- EU Energy policy and evolution
- Challenges and opportunities for DSF
- Demand side flexibility in practice

EU Energy policy and evolution

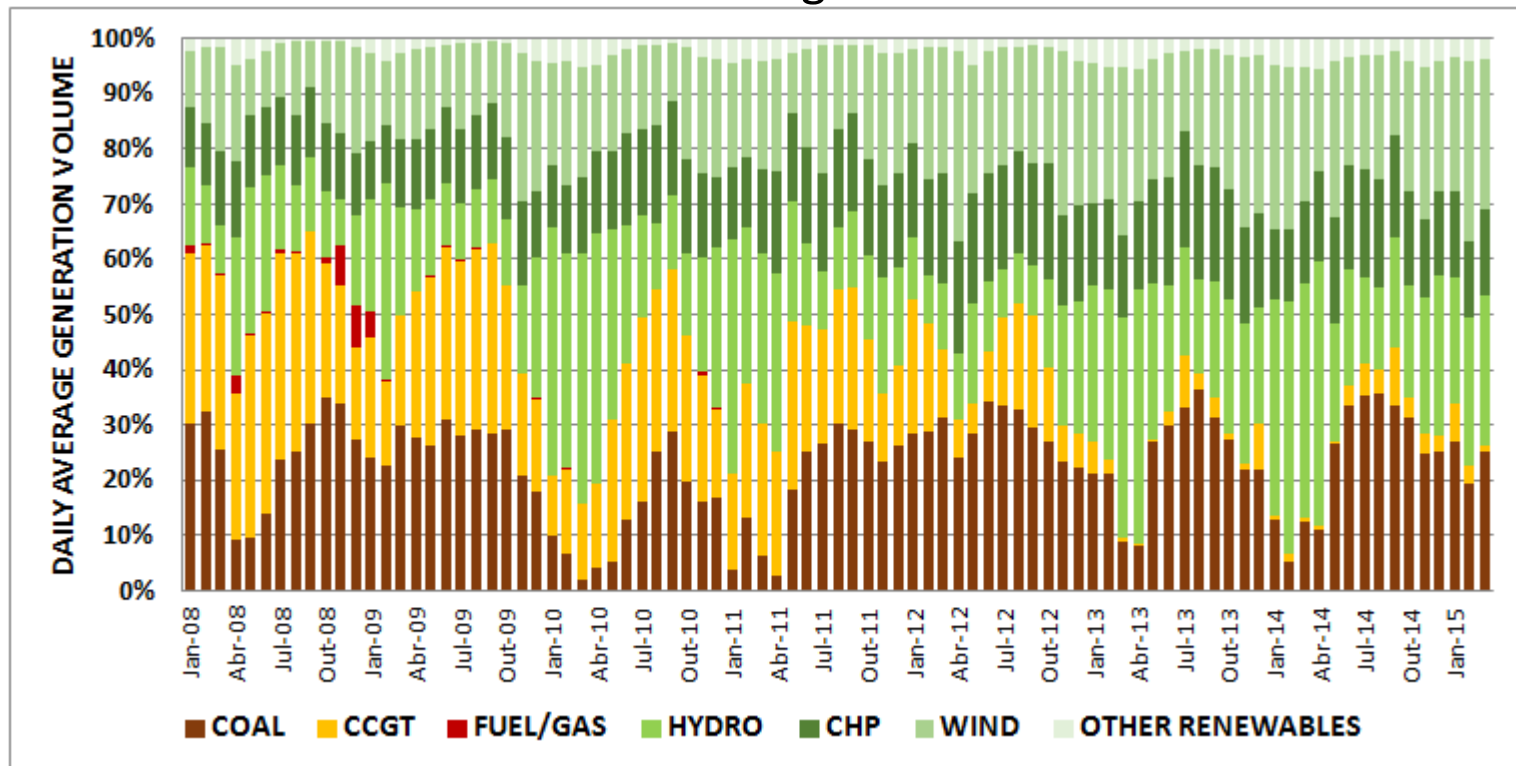
Main features and objectives



Challenges and opportunities for DSF

The shift to a higher RES supply model – Portugal example

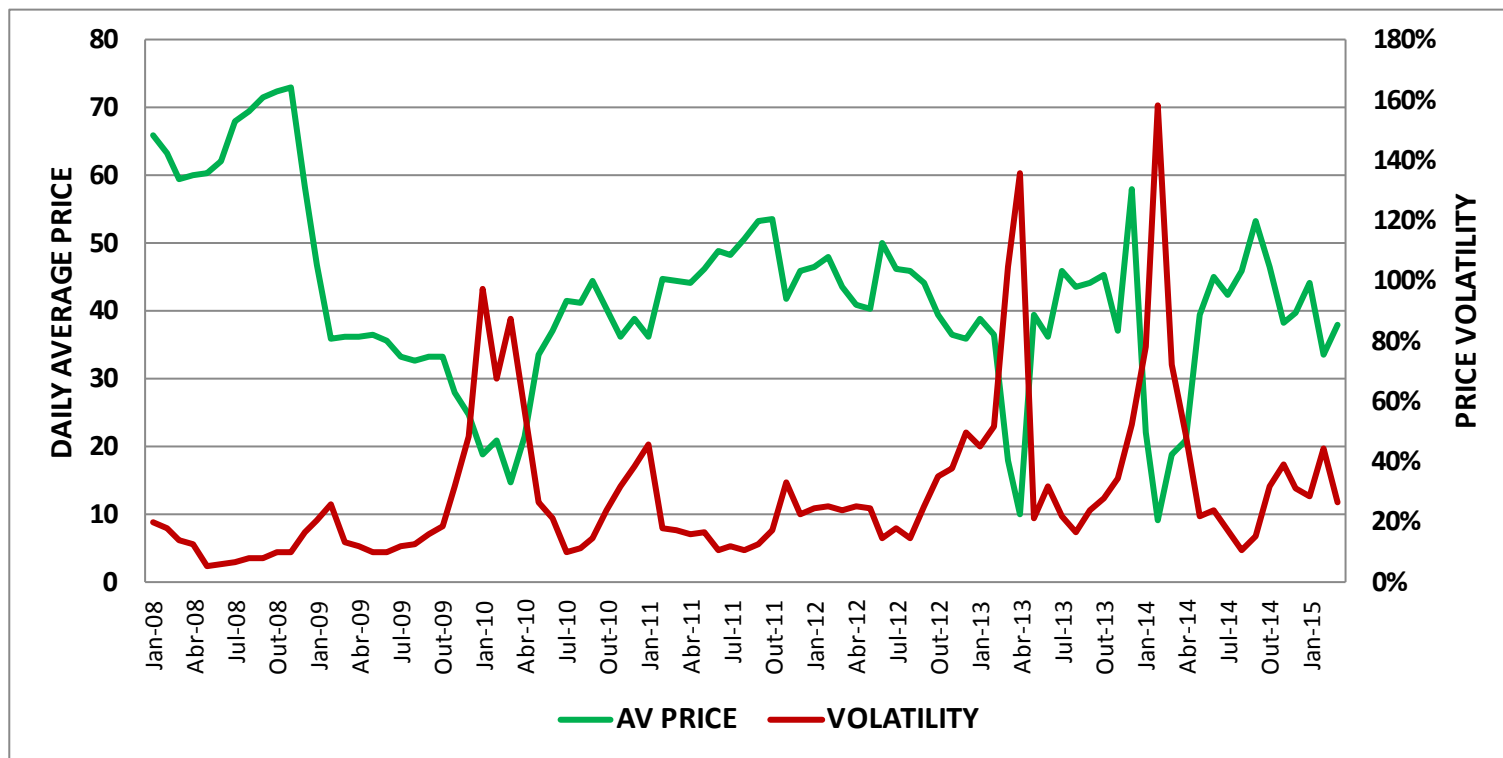
- Higher penetration of RES generation
 - Lower carbon supply, but...
 - ...increased share of intermittent generation



Challenges and opportunities for DSF

The shift to a higher RES supply model – Portugal example

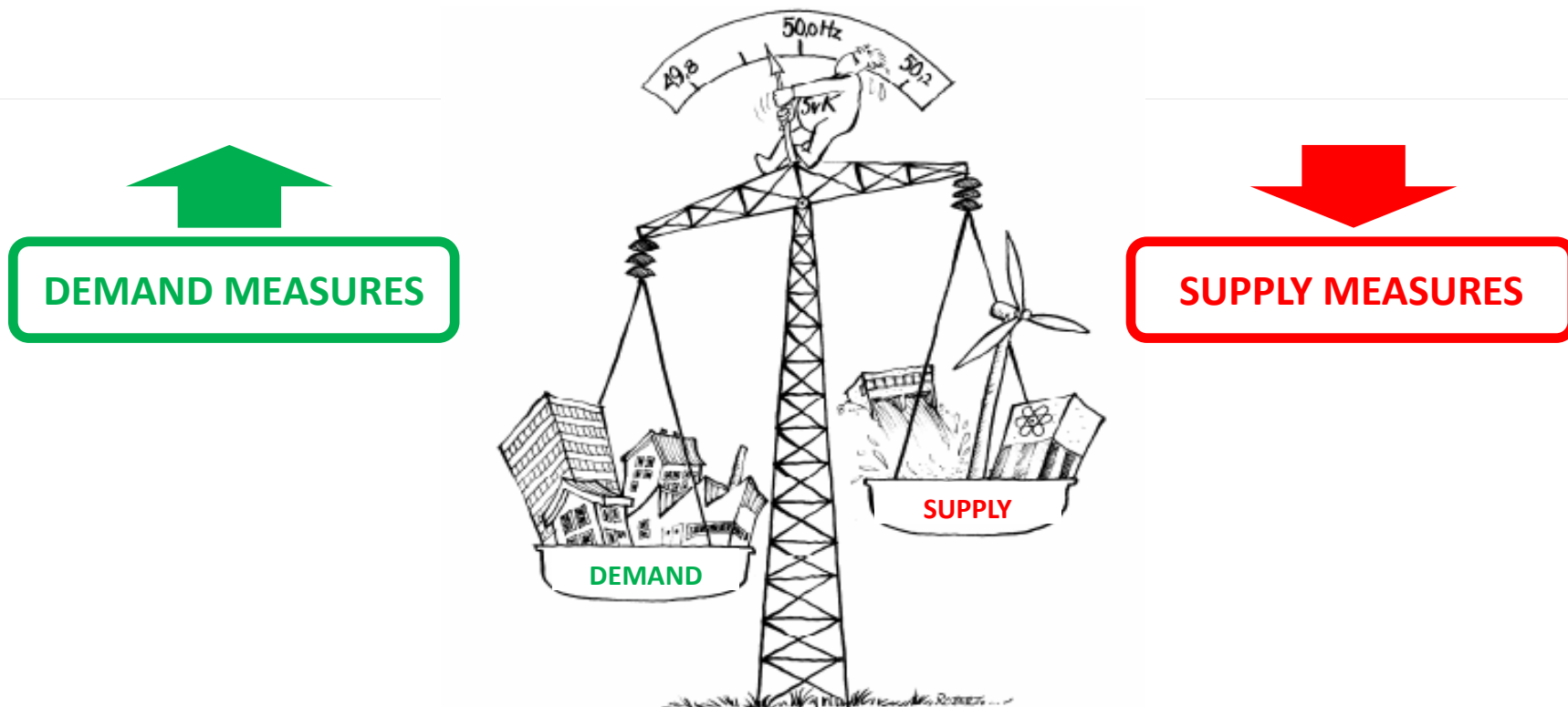
- More intermittency means... more volatility (in price)
 - Short run uncertainty (and volume hedging)
 - Need of (price) hedging solutions



Challenges and opportunities for DSF

What (new) role for demand and supply interaction?

Promotion of Integrated Resource Planning (IRP)



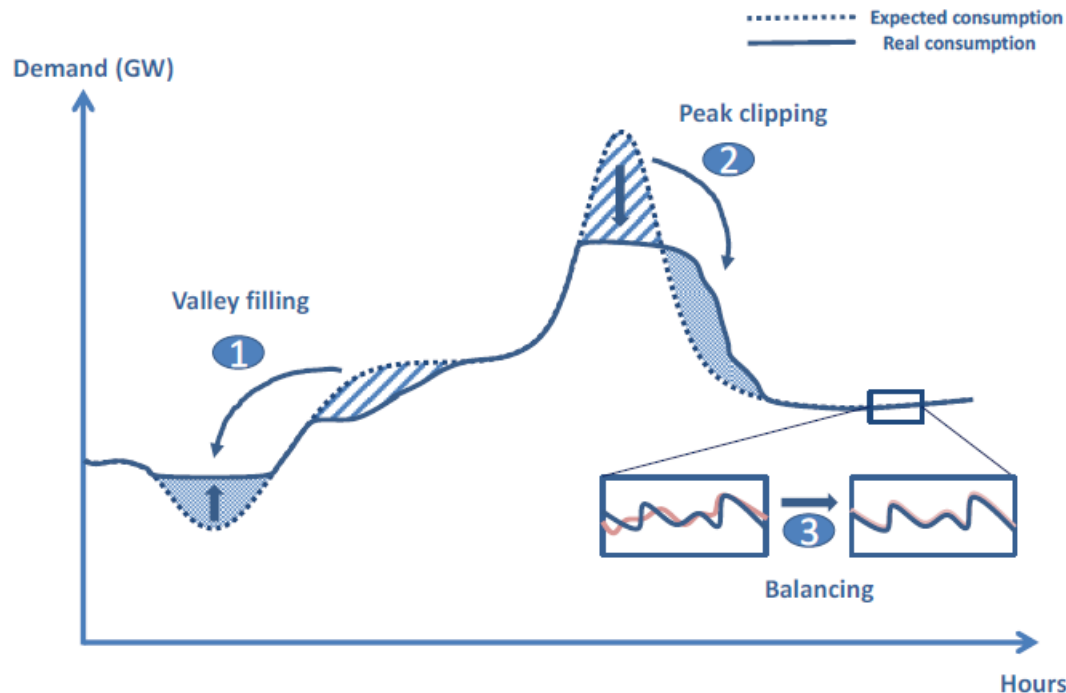
Traditional Vision (Supply follows Demand) **has to change!**

In order to have a affordable energy system, it is important that demand starts following an increasingly Variable Uncontrolled Renewable Supply

Challenges and opportunities for DSF

The main concepts

- DSF induces less volume “volatility”: valley filling, peak shifting and balancing
- Change in demand behavior to foster volume stability



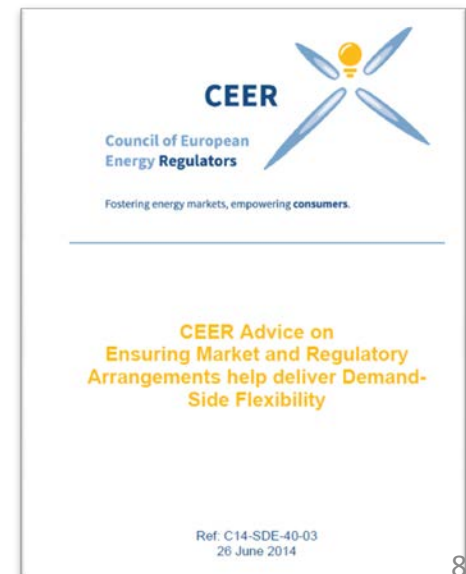
Challenges and opportunities for DSF

How to benefit from demand side flexibility?

- **Delays** and/or prevents the need for **additional investments**
- Important **tool to handle** rising and large shares of **intermittent generation**
- Potential of **decreasing consumer's energy bills** as DSF helps preventing peak
- **Reduction of energy costs** for consumers providing flexibility to the market
- DSF can be **cheaper and much faster** available

Win-win solution!

For stability, integrity and adequacy of the electricity system, consumers in general and consumers who participate.

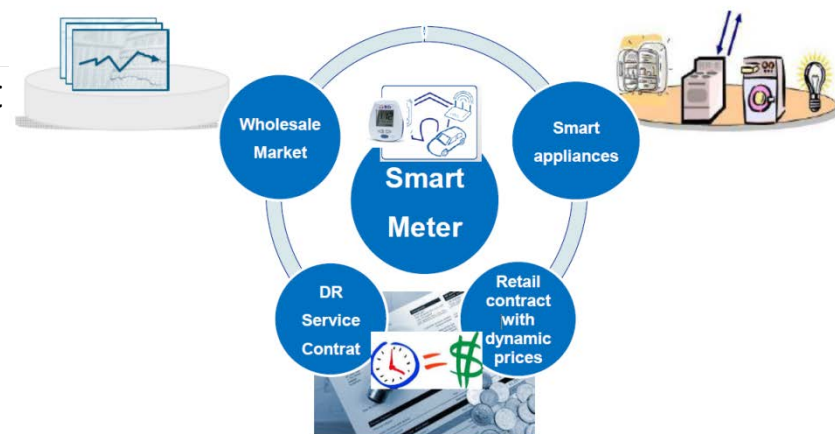


Challenges and opportunities for DSF

What to do for demand flexibility?

- **Clear Governance:** definition of roles, responsibilities and relationship of/among market players (aggregators, Balance Responsible Party, DSOs, supplier, prosumers...)
- **Market oriented:** Establish rules for access to the balance and/or wholesale energy markets
- **Consumer trust and awareness:** Policies and procedures to ensure consumer confidence, data privacy and cyber security, and make consumers aware of the value of its flexibility; train and inform consumers
- **Incentives & Innovation:** Give clear incentives to demand participation; enable new business models and technologies; innovative tariffs and pricing strategies (strong incentive)

It Takes More Than Two to Tango

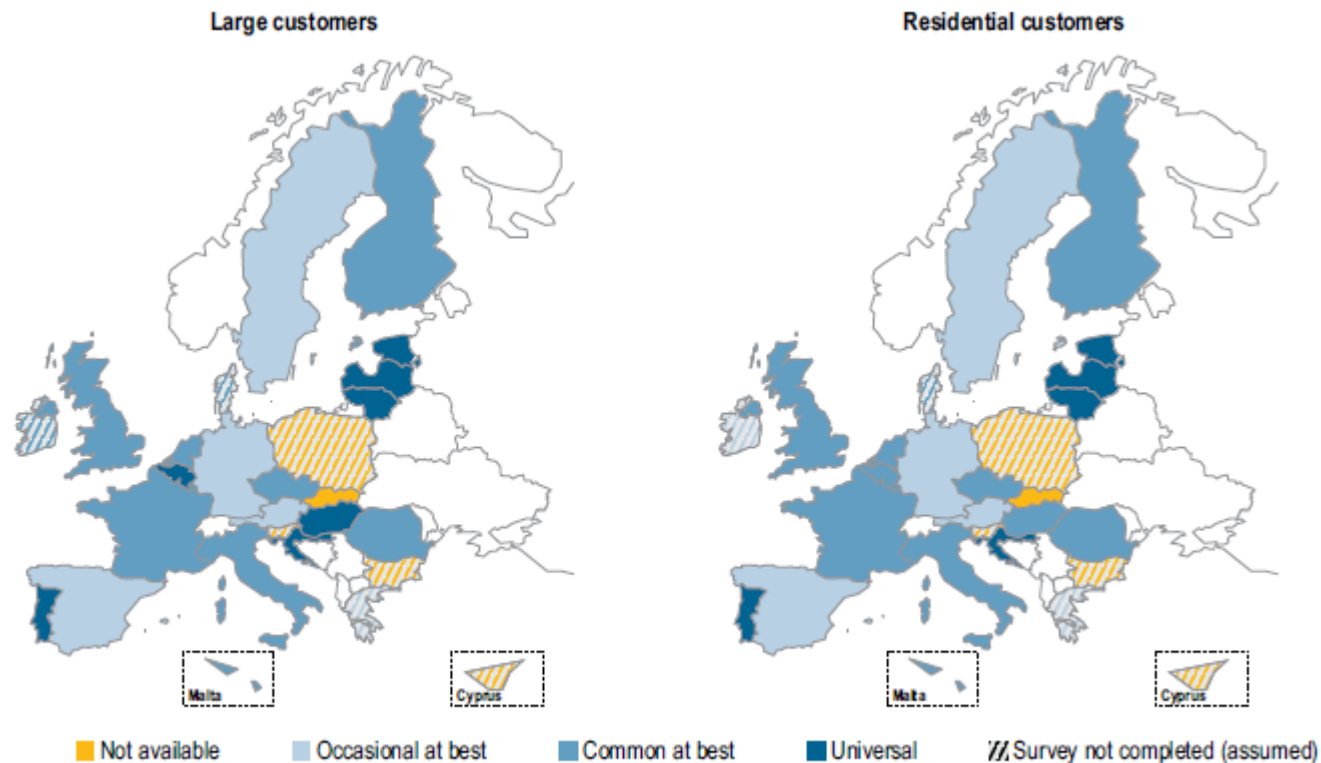


Member States and regulators have a crucial role in the approval of a legal and regulatory framework which encourages the participation of demand

Demand side flexibility in practice

Time-based electricity prices by customer group in Europe

- Time-based prices, which are a DSF instrument, are already available in several European Countries. Portugal is at the forefront

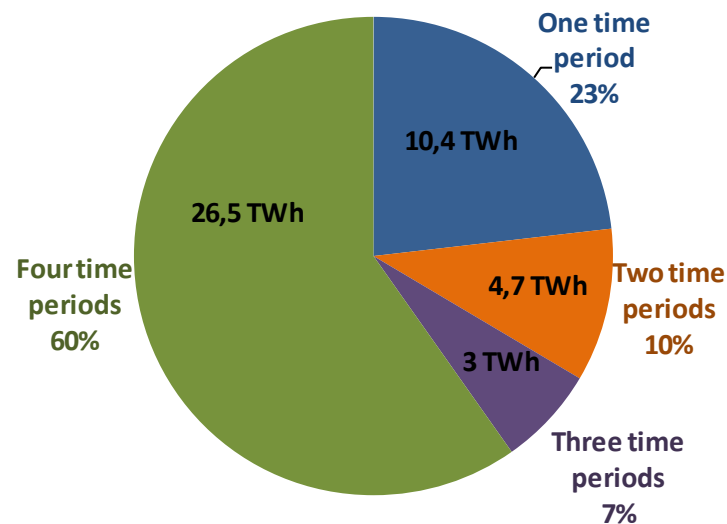


Demand side flexibility in practice

Time of Use Tariffs in Portugal

- Time of use network tariffs and Time of use end user tariffs
 - Tariffs with four time periods in VHV, HV, MV and Special LV (Contracted Power > 41,4 kVA) – industrial and high power service consumers
 - Tariffs with three time periods in Normal LV > 20,7 kVA (Contracted Power between 20,7 kVA and 41,4 kVA) – essentially services
 - Tariffs with one, two and three time periods in Normal LV ≤ 20,7 kVA (essentially household consumers)

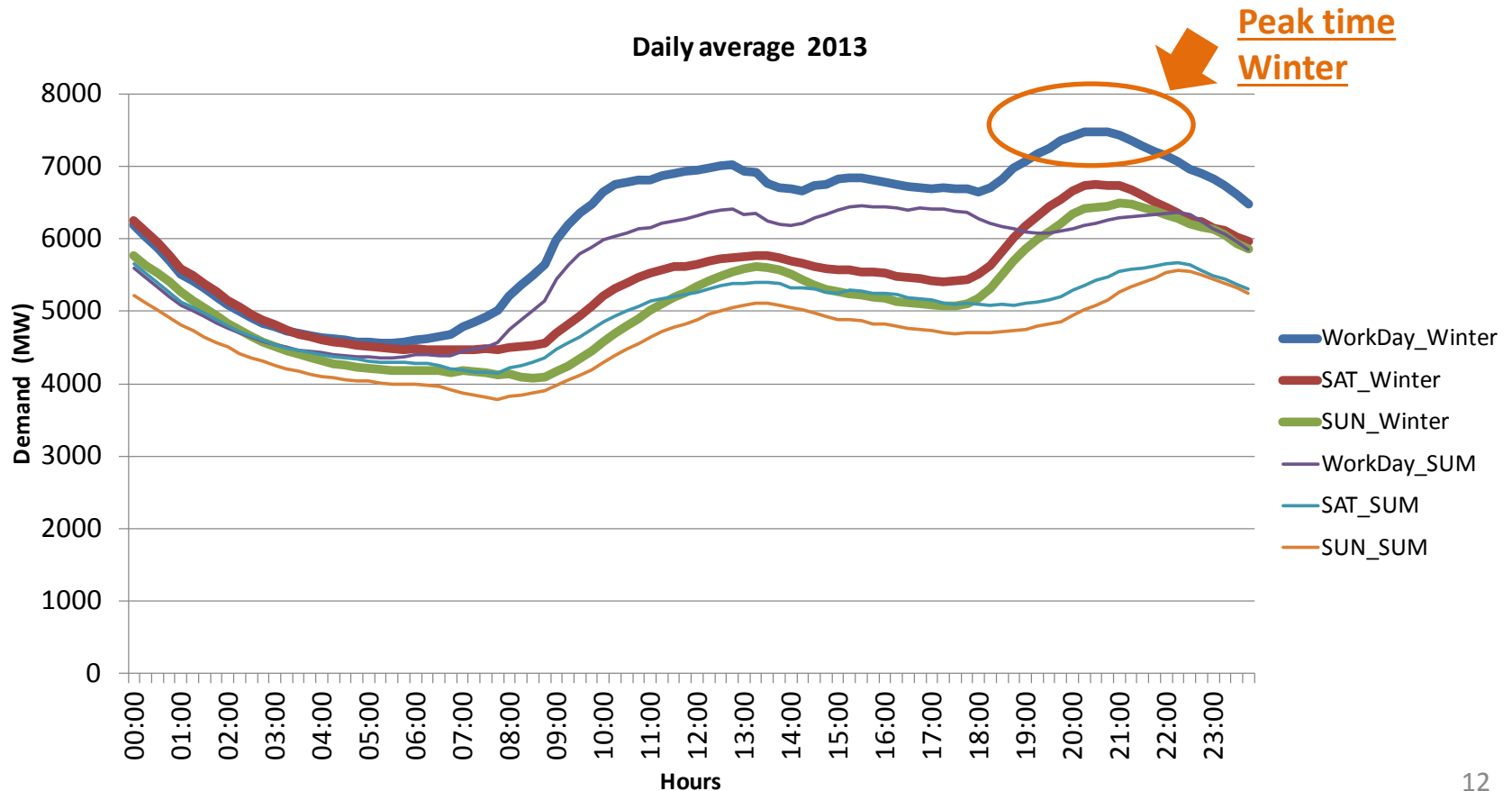
80% of consumption in Portugal has time of use tariffs with different price energies enabling DSF



Demand side flexibility in practice

System needs in large industrial consumption – Portugal

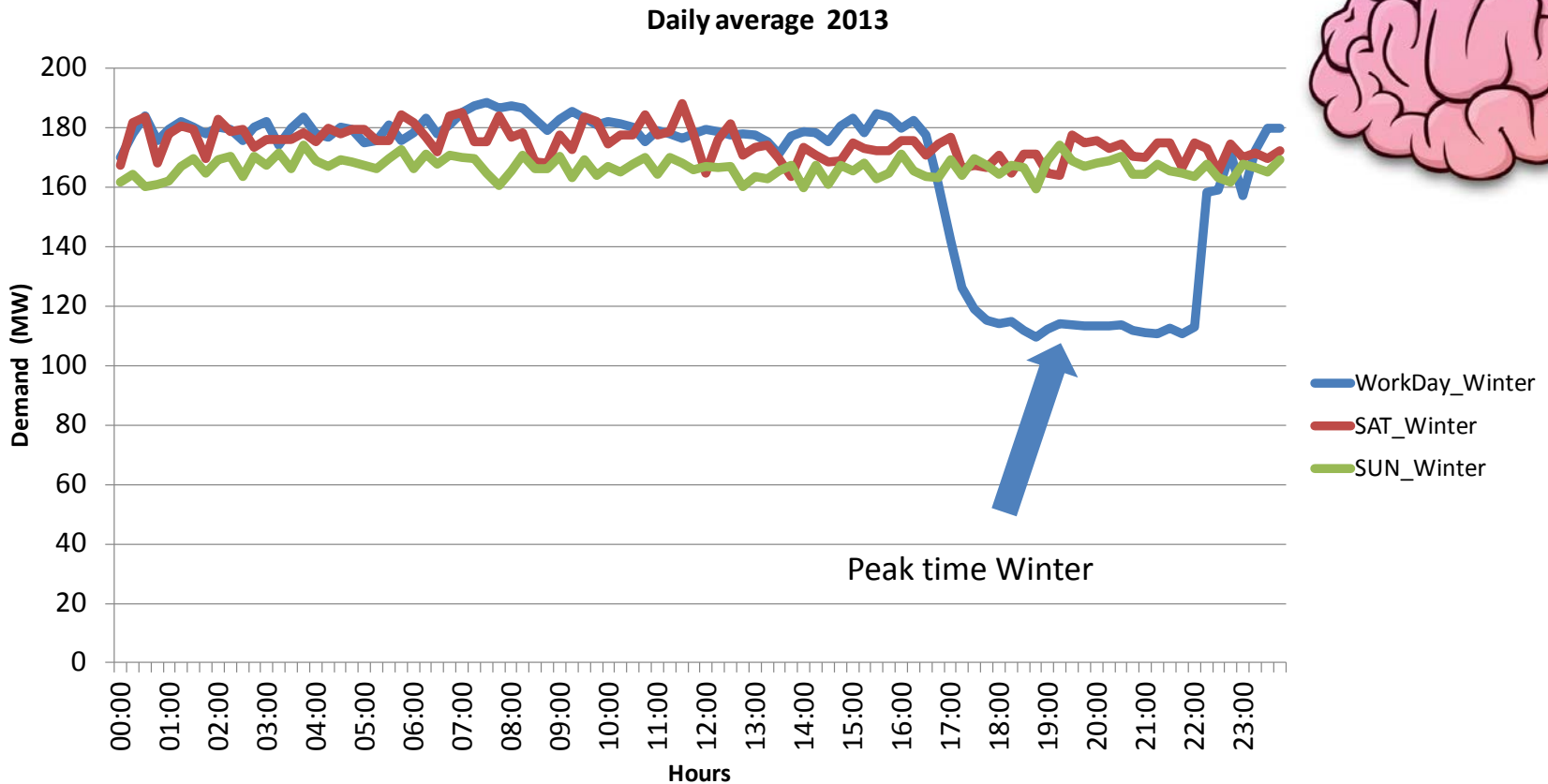
- Monthly load curves of the transmission network in very high voltage (VHV) - Portugal



Demand side flexibility in practice

Demand response for large industrial consumers - Portugal

- Hourly average for typical day (telemetry)



Demand side flexibility in practice

Demand Side vs. Supply Side - Perspectives and Opportunities

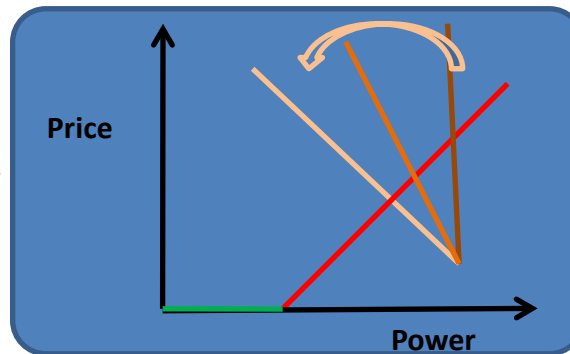
- **Intermittence** problems caused by RES can be solved, acting both on supply side and on demand side
- Demand side management and **decentralized** storage should not be ignored - although demand side measures have higher **uncertainty** associated they might have **lower cost**
- The adoption of smart tariffs (ToU and **dynamic** tariffs) and **incentive** schemes to promote **efficiency** on consumption should be promoted
- Exploring demand flexibility requires **market oriented approaches** and a good knowledge of **consumer's minds!**

Demand side flexibility in practice

Demand Side vs. Supply Side - Perspectives and Opportunities

- Use the responsiveness of demand is critical to meet the needs at a lower cost

Demand elasticity is part of the solution!



Acting both on supply and demand side will contribute to meet the 3 dimensions of Security of Supply (security, firmness and adequacy) at the lower cost

Demand side flexibility in practice

Demand Side vs. Supply Side - Perspectives and Opportunities

Demand flexibility solutions fits models with already high penetration of renewable (e.g. Iberia) and...



Demand side flexibility in practice

Demand Side vs. Supply Side - Perspectives and Opportunities

...models with increasing investment needs and introduction of renewables to meet demand needs (e.g. MEDREG)





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Thank you

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