



# Smart Energy Demand Coalition

**Consumer Empowerment &  
Demand Response in Europe**

**DR Snap Shot**





# SEDC

Smart Energy Demand Coalition



## Our Membership



# Smart Energy Demand Coalition

The **SEDC** is an not-for-profit industry group,  
representing the requirements of programs involving  
**Smart Energy Demand**  
in order to support the 2020 objectives, further the  
development of the Smart Grid and ensure improved  
end-consumer benefits

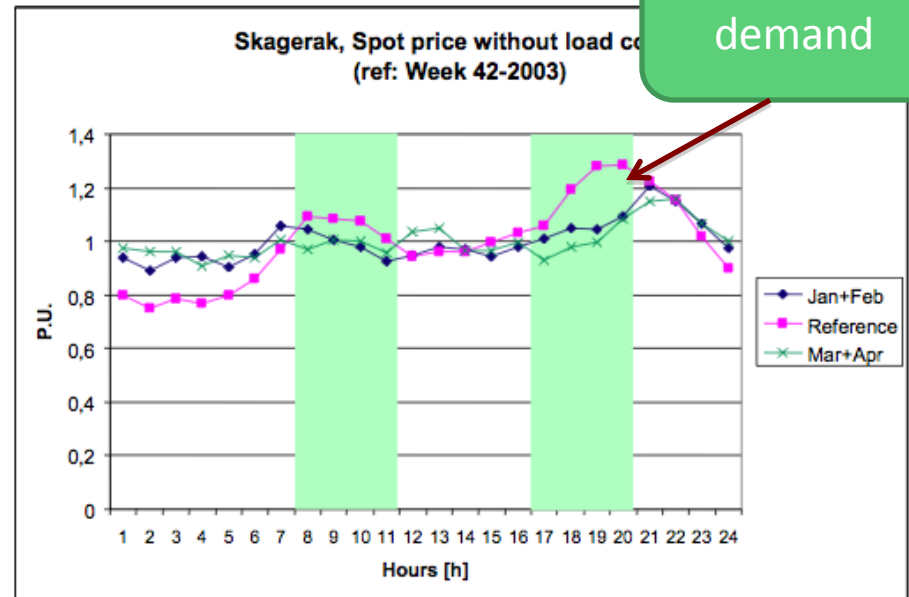


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# Demand Response

To deliver value Demand **MUST** have equal access to the electricity markets

- **USA 4.7 Billion Business Direct Revenue after 5 years access to markets**
- **Up to 8% of peak cut in certain US States**
- **Europe 3.5 billion potential in Direct Revenue**
- **6-13% potential for peak clipping**
- **No Public Technological Investment Needed**



Consumers' pay to cut demand must be = to Generation's and have access to same markets

# Demand Response The Power of Access

## Environmental

Lowers CO2 Emissions

Improves total System Efficiency

Lowers the cost of wind integration

Increases the consumption/use of renewable generation

Increases earning and use of clean distributed generation technologies  
**such as Cogeneration** (creating virtual power plants)

## Economic – the power of consumer access to markets

- Current potential in Europe **€3.5 billion direct revenues** – into **local** economies
- Creates **local** jobs
- Improves investment potential of **local** businesses
- Avoided investment in Grid, Network and Generation infrastructure



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# Barriers and Article 12

## Our findings in Demand Response Snap Shot

### **A Repeated pattern of regulatory barriers stretching across 23 of 27 Member States**

Historical tender requirements by Grid Operators for bidding into the wholesale electricity markets are written for generation – not demand side resources.

- **Block demand participating in the electricity markets**
- **Block Demand Response**

Good examples of successful change in GB, Ireland and France but support at the European level is essential

**Amendments in Article 12 by Claude Turmes, Peter Liese and Fiona Hall** ensures demand side access and the equal treatment of European Consumers within the energy markets.

It enables Demand Response to develop in Europe





THANK YOU

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<http://sedc-coalition.eu/>

## European Examples

### A few examples of Demand Side Barriers

- A 24/7 resource availability requirement for peak consumption programs (Austria)
- A 16 hour load reduction duration requirement (Slovenia)
- Lack of regulation or applicability of load reduction measurements (Most Markets)
- Minimal single bid requirements ranging from 4 MW in Ireland to 25 MW or even 50 MW (France)
- Lack of appropriate base load measurement requirements (GB, Germany... )
- Lack of clear payment and contract structures for demand reductions (Most markets)
- Lack of information on intra-day prices making it impossible to calculate the value of a Demand Response, bid causing investment and payment uncertainty (Nordpool)
- Demand side resources barred from existing capacity markets (Poland, Greece)
- The aggregation of Commercial/Industrial loads is not as yet enabled (Italy)
- .....

## How to get there?

- **Tender requirements** to enter the organized energy markets must be made compatible with demand side resources rather than only generation. **Equal access to market and free competition should be required**
- **Capacity's value** should become transparent and equally accessible to all parties.
  - Availability payments, Reserves payments, capacity markets or access to existing capacity markets should be required.

**Article 12 should refer specifically to Demand Response and support these developments**

## Example Changes ins Regulation

### *EED Article XII: NEW from DR Snap Shot*

**8) Member States shall ensure that a market operator, especially but not limited to the Transmission Systems Operator (TSO) acts as an impartial third party within the organized electricity markets between all forms of electricity providers and demand response providers. In this capacity they shall validate the execution of Demand Response measurement operations and the financial operations of Demand Response programs. A mechanism to enable coordination between different market actors to avoid the actions of a party penalizing other parties.**

## Example Changes in Regulation

### *EED Article XII: NEW from DR Snap Shot*

*9) Member States shall ensure the market operator, especially but not limited to the TSO provides market applicable Demand Response Tender specifications (market entry requirements), appropriate for Demand Response programs within a minimum of one organized electricity market, especially but not limited to the tertiary reserves markets and the capacity markets.*

*The Member States will complete this regulation, and submit information at the appropriate level of detail to the Commission by December 31, 2013.*

# Example Changes ins Regulation

## ***EED Article XII: NEW from DR Snap Shot***

### ***Tender specifications shall include reasonable:***

- *Minimum number of kW aggregated capacity needed for participation*
- *Baseline measurement methodology*
- *Minimum number of kW needed for participation per metered location (if any)*
- *Duration of demand response activation*
- *Timing of demand response activation*
- *Notice time for activation of demand response*
- *Telemetry requirements*
- *Penalty requirement*
- *Frequency of demand response activation*
- *Intervals between activations*
- *Tender duration timeframe.*
- *The option to bid on positive or negative capacity*
- *Availability payments*



## Main Negative Findings

### Only 3 EU Member States Enabling C&I DR by Third Parties

**GB:** Tender Requirements  
& (soon) Capacity Market

**France:** Developing Tender  
Requirements  
Capacity Market (2016)

**Ireland:** Tender Requirements

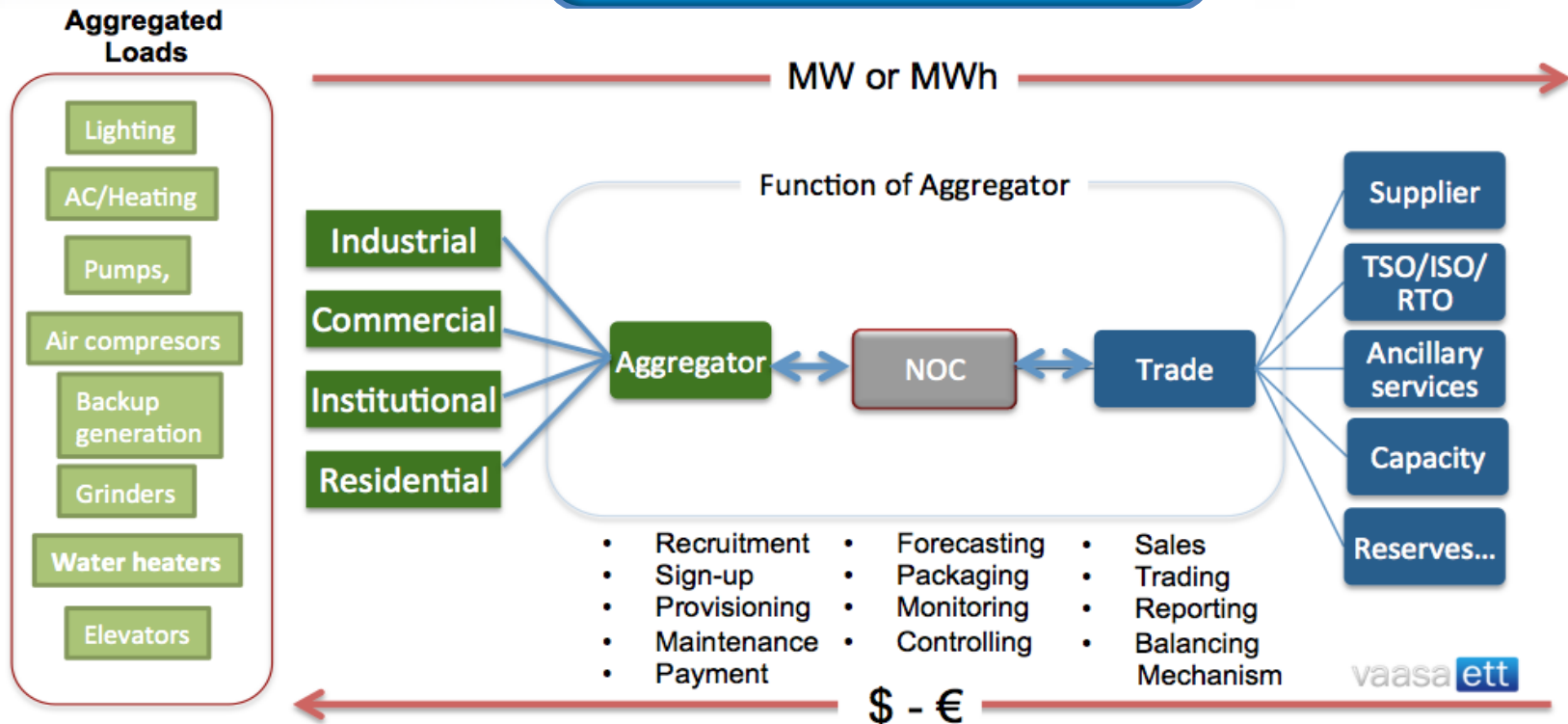
**Germany:** Entelios is working  
But has not as yet received  
Active support.



Over 20 out of 27 Member States **decisive barriers** to open  
markets competition



# Function of Aggregator



## Value Areas for Market Players

### Consumer

- Direct revenue
- Do-good
- Use of back-up Generation
- Control

### Government

- Security of Supply
- Justification Smart Grid
- Value to voters
- Avoided investment
- Green
- Increased wind and solar

### Generation

- Energy Management System
- Bidding potential into new markets,
- Lower cycling costs,
- Increase efficiency...
- New communication requirements fulfilled...

### ISO/Market

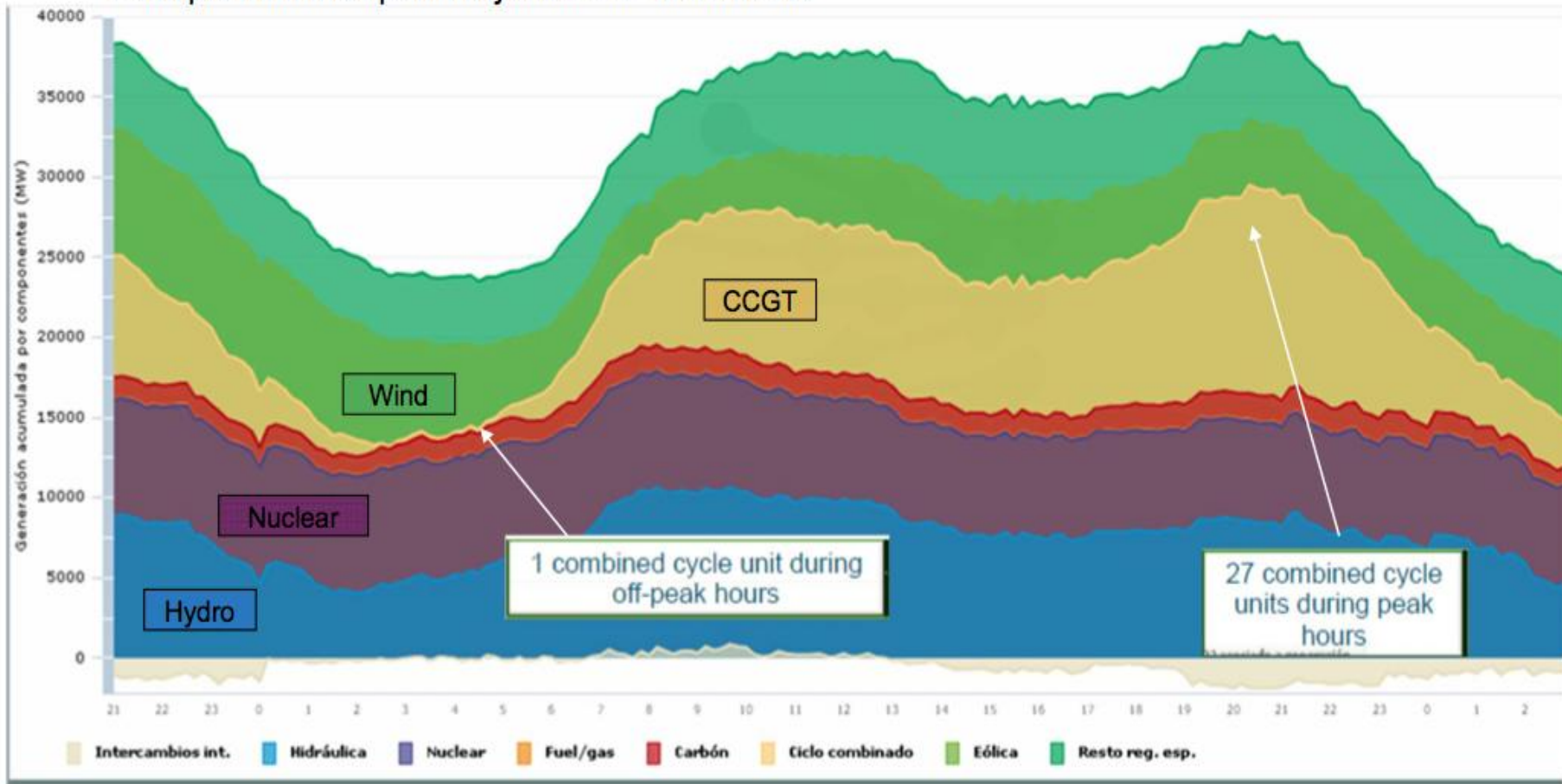
- Policy – affordable, sustainable, reliable
- Best mix for assets
- Enlarge market for existing power plants
- Virtual power plant product

### Retailer

- Service to customers
- Control of purchasing risk
- Green
- Revenues

# Demand Response

Example from the Spanish system – 3<sup>rd</sup> March 2010

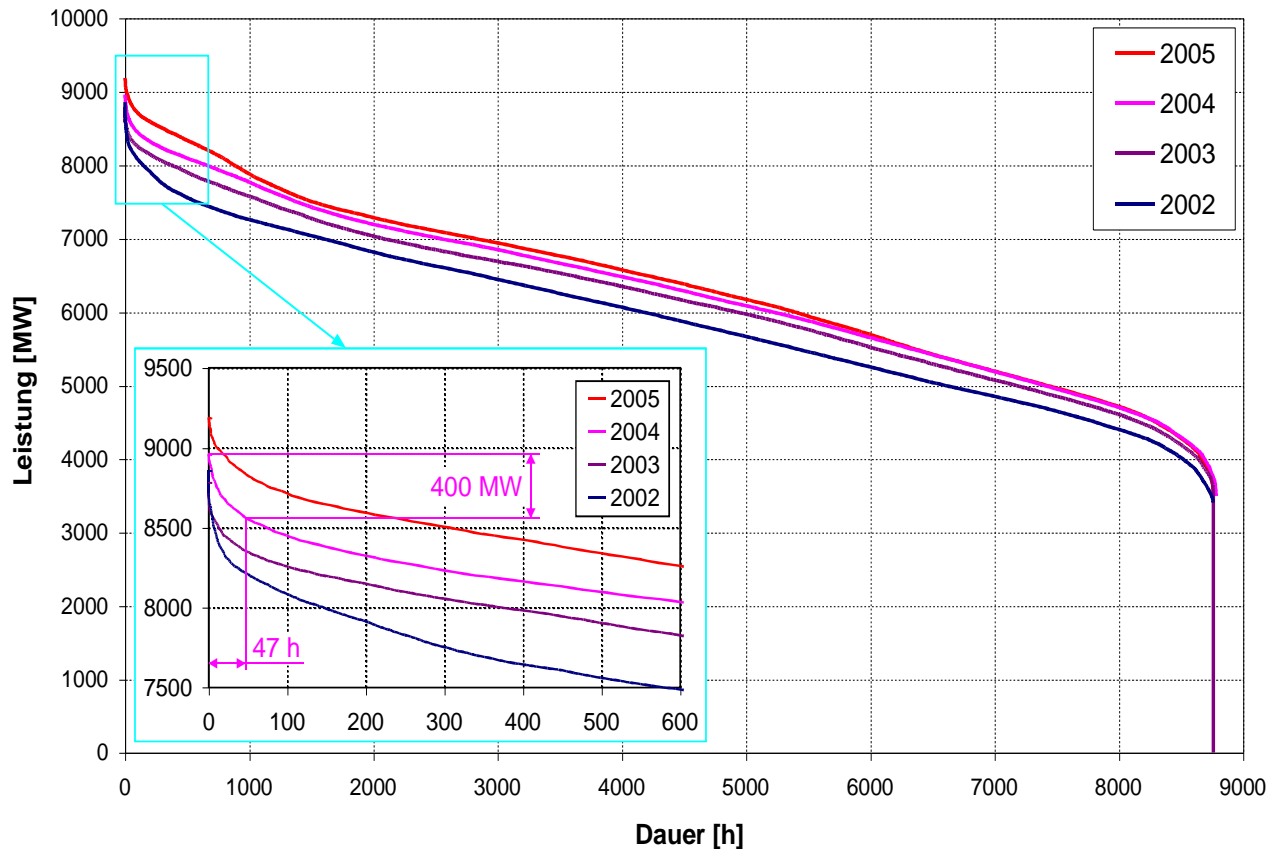


Source: data from Red Eléctrica de España (REE), figure elaborated by Endesa



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# Demand Response

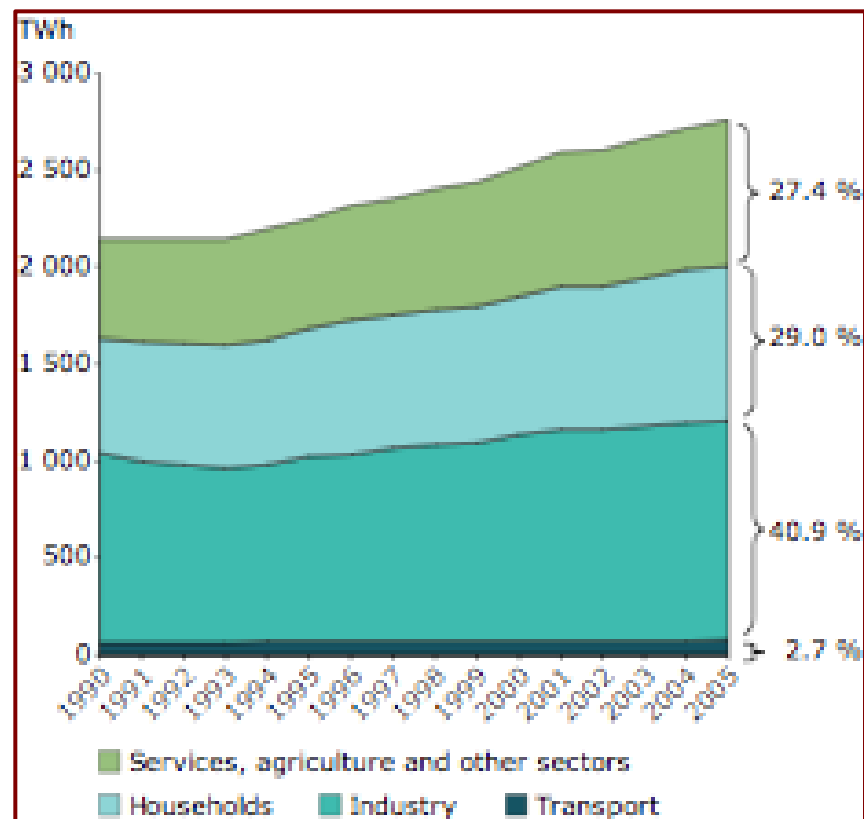


Austria: Last 500 MW is used less than 50 hours a year



## Commercial Industrial Demand Response “the low hanging fruit”

- 2700 TWh Consumption EU
  - 41% Industrial
  - 27% Commercial
  - 30% Residential
- Aggregator experiences such as Entelios Germany are showing that **EU Industries can and are willing to shift**  
**Between: 20-50% of their load**



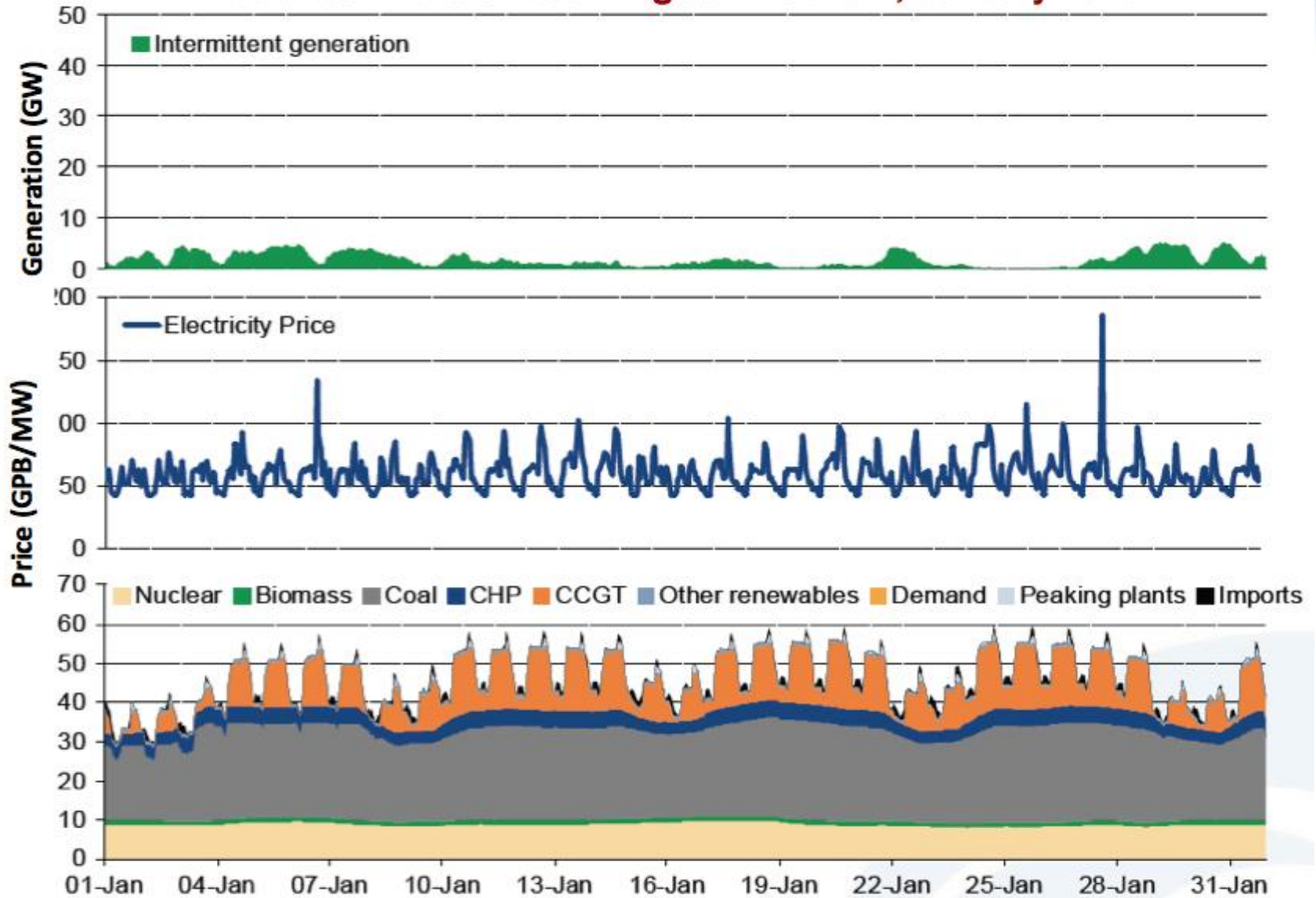
## Potential Of Demand Response For Europe

|  | Moderate Scenario | Dynamic Scenario | Dynamic % of EU 2020 Targets                             |
|--|-------------------|------------------|--|
| Energy Savings   | 59 TWh            | 202 TWh          | 50%  |
| CO2 Emissions reduction  | 30 Mt             | 100 Mt           | 25%<br>(50% of electricity industry share of obligation) |
| Peak Generation Capacity Avoided   | 28 GW             | 72 GW            |  |
| Avoided Investment   | € 20 billion      | €50 billion*     |  |
| <p>Notes:</p> <p>* Based on an average cost of 400M€ per GW of thermal plant, plus taking into account an average difference between demand and gross generation of 15%, plus 50% additional savings for T&amp;D infrastructure (taken as a conservative estimate). This amounts to 700 M€ per GW avoided.</p> |                   |                  |  |

**VaasaETT,  
Cappgemini,  
Enerdata  
(2008)**

### The Potential of Residential and Commercial DR and Feedback Programs in the EU 15 Member States

## Production of renewable energy, electricity prices and balance in the United Kingdom network, January 2010



Source: Poyry

The graphs present the growth of different factors in Jan 2020





The SEDC focus is to promote Demand Side programs such as:

- Commercial, Industrial, Residential **Demand Response**
- Energy usage **Feedback** and information
- **Prosumer** program development
- **Smart home**, in-home and in-building automation
- **Electric vehicle** charging management

and other programs related to making demand a **smart**, interactive part of the energy value.



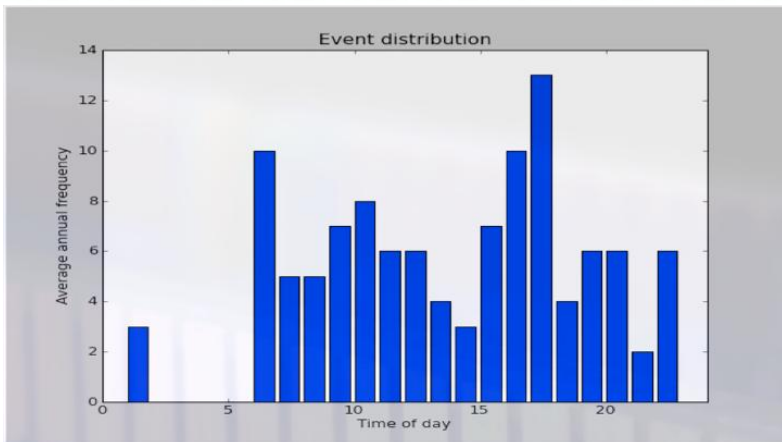
## Commercial Industrial Demand Response

- Why is should it be a central concern?

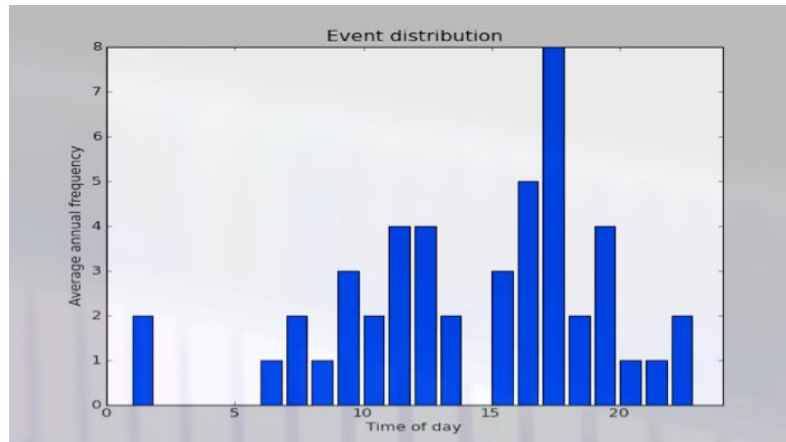
- 1) C&I DR Cuts peaks in consumption: Taking away need for peaking plants used less than 200 hours a year.
- 2) C&I DR Lowers GHG emissions but cutting the need for coal and gas spinning reserve
- 3) C&I DR Balances wind – in a cost effective, clean manner
- 4) **C&I CR Puts ALL revenue back into the local business environment**



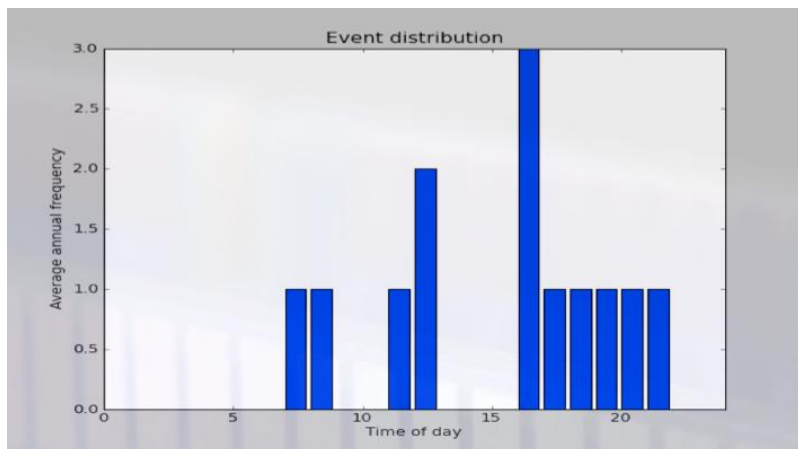
# What we now provide with fossil fuels



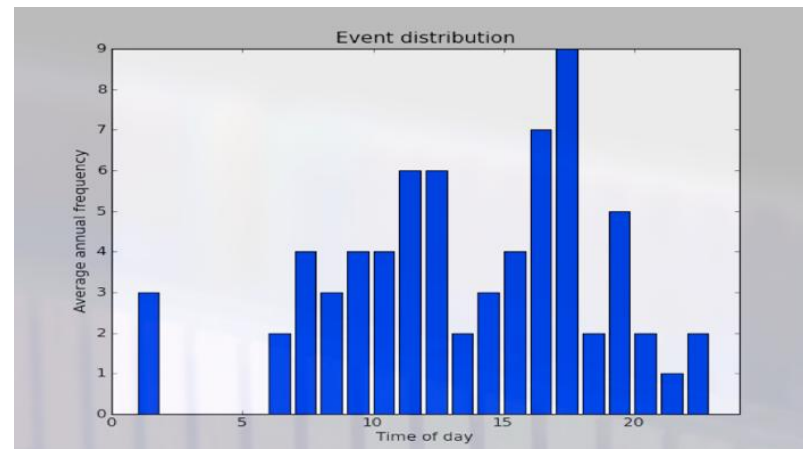
Regulation Program Event Frequency 2007-Present. NYISO  
Average TOTAL: 111 calls



10 min non-spinning Reserves. Event Frequency 2007-Present. NYISO  
Average TOTAL: 92 Calls



30 min Non-spinning Reserves. Event Frequency 2007-Present. NYISO. Average TOTAL: 13 calls



10 min Spinning Reserves. Event Frequency 2007-Present. NYISO Average TOTAL: 68 calls

NOTE: The "Annual Frequency" range from a maximum of 3 to 14 times annually

# The Energy Efficiency Directive

## The EE Directive provides support for:

- **Metering and informative billing** to give consumers control over their consumption and increase energy efficiency (Article 8)
- **Energy services** and energy service companies (Article 14)
- **Network tariffs and regulation** that provide incentives for grid operators to offer system services to network users which will encourage and reward efficiency and peak shifting (Article 12)



## In the April Communication the Commission Recognizes

- EU's energy and environmental policy goals need an extensive, fast & efficient upgrade of the existing grid
- The centrality of the Demand Side programs within the deployment of the Smart Grid
- Resistance experienced in putting Smart Grid Technologies more generation in the field.  
(Optimization important)
- CEER recently closed a two months consultation period that asked for advice on Demand Response and smart meters



## The Energy Efficiency Directive Recognizes

### The EE Directive provides support for:

(Annex XI) “Energy efficiency criteria for energy network regulation and for network tariffs set or approved by energy regulatory authorities”

- Active participation of Demand Side in Energy Wholesale Markets,
- Creation and strengthening of Demand Response programs
- Strengthening of competition in these markets
- Creating tariff schemes which reflect capacity issues



## SEDC Current Actions

- **Support the Energy Efficiency Directive** within the EU Parliament and the Member States and add amendments to Article 12.
- **Publication and release of 80,000 page SEDC Demand Side Research Library**
- **Sharing Research JRC:** Continuous collection and comparison of Dynamic Pricing and Feedback Pilots
  - Over 100 analysed. Sharing these results and the library with the JRC
- ***“A Demand Response Snap Shot”***
  - How it is now for companies creating Demand Response programs in Europe right now and what are their main regulatory barriers.
  - Provide pro-active suggestions for solutions
- Increase awareness of the need for **Capacity Mechanisms** in the wholesale markets structure where energy savings can be sold reflecting real market values.

