Final results

Study on the quantification of Demand Response (DR) benefits to electricity suppliers and consumers thanks to the reduction of wholesale prices in Europe in winter 2022/2023

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DR4EU
DEMAND RESPONSE FOR EUROPE

Sponsored by:

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Executive summary

DR4EU has mandated CL Energy to provide an assessment of DR benefits to electricity suppliers and consumers thanks to the reduction of wholesale prices during one year in Europe

Modelling approach

DR capacity
30 GW
(5% of peak load)

DR volume
10 TWh/year
(0.3% of annual demand)

France, GB, Germany and Italy represent more than half of the European DR capacity

- A total **30 GW of DR capacity** is considered for the period (July 2022 – June 2023) in Europe, accounting for 5% of the European peak load.
- We simulated a realistic DR portfolio of activation hours: capacities are available for various durations, from a few ten hours to 600 hours per year.
- The total volume of DSR amounts to **10 TWh per calendar year,** or 0,3% of EU annual power demand.
- The country allocation of DR capacity is based on existing studies of pan-European DR potential and taking into account the more advanced stage of DR development in France and GB.

DR benefits assessment

DR benefits for suppliers
4700 M€
(1.4% of power sourcing cost)

- The considered DR portfolio reduces energy sourcing costs by approximately **4700 M€** in Europe between July 2022 and June 2023.

DR "costs" for suppliers
1400 M€

- Over the same time horizon, suppliers incur "costs" to buy DR in the market of **1400 M€**, thus providing market-based revenues for DR.

Benefits versus costs
+335%

- Market benefits for suppliers, as they save on their sourcing costs, are **335%** of their "cost" as they buy DR in the market – i.e. 235% net benefit

Price cap at around **150 €/MWh** from an average highest price reduction of up to **-120 €/MWh**

- Thanks to DR participation, price volatility on European spot markets reduces, i.e. spikes are avoided and capped at around **150 €/MWh** thanks to an average reduction of the highest hourly prices of up to **-120 €/MWh**.

CO_2 emission reduction
6.7 Mt
Gas saved
1.5 bcm

- In terms of GHG, the 30 GW DR portfolio avoids **6.7 Mt/year of CO_2 emissions**, mostly avoiding use of natural gas generation (**1.5 bcm**)