



Industrial Demand Side Flexibility to Optimize Renewable Power Use and Enhance Industrial Competitiveness in the EU

Industrial demand response has gained importance over the last few years. It not only enables industrial power consumers to facilitate the growing share of so-called non-programmable renewable energy sources, but will also be crucial in enhancing the stability of power networks (e.g. to minimize the risk of blackouts).

This paper was developed by the Green Growth Platform's Industrial Sectors Advisory Council (ACII). The Council draws on expertise from European sectoral associations to advise on solutions to the challenges facing Europe's industry when transitioning to a low carbon economy. The recommendations have been developed in consultation with the Green Growth Platform's Energy Intensive sectors, which include senior representatives from the aluminum, chemicals, ceramic, metals and paper sectors as well as industrial associations.

The Green Growth Platformⁱ brings together European Ministers from Belgium, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Luxemburg, the Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, the United Kingdom with business and parliamentarians to catalyse and champion a European policy and economic framework that supports the delivery of an orderly low carbon transition. The Green Growth Platform and its four Advisory Councils were established and are managed by the Cambridge Institute for Sustainability Leadershipⁱⁱ and the Prince of Wales's Corporate Leaders Groupⁱⁱⁱ.

The untapped potential for industrial demand side management

While demand-side management is well known in Europe, there still is an important “untapped potential” in further developing new programmes for industrial sectors. The way traditional demand-side programmes operate is well known to industry. Demand-side programmes for industry were primarily designed as a way to react to network congestions due to peak in electricity demand. However, one of the critical elements of the electricity system is how to properly integrate electricity generated from “variable”, or “non-programmable” renewable energy sources, like wind and solar, at a time of low or no demand. Therefore, the traditional demand-side programmes appear rather inadequate in coping with this challenge.

According to one study¹, the total load management potential in the EU energy intensive industry could be up to 16 GW. If confirmed by other studies, this would represent a significant cost-saving for final consumers. In this respect, we invite the European Commission and Member States to assess the full potential at EU and national level.

While most R&D programmes focus on energy storage and on demand-side programmes for households, the energy intensive industry is in a rather unique position to potentially provide solutions to efficiently absorb excess electricity supply, while creating value for the EU economy.

For instance, what would happen if, at a time of excess electricity supply, industry ramps up electricity demand by ad-hoc moving from “off” to “on” the grid? It would absorb the peak of cheap electricity supply while keeping the industrial output unchanged. This would mean more value per kWh, less primary energy consumption, lower carbon

¹Klobasa; Marian “Load Management and Demand Side Management in Germany and other EU Countries, Fraunhofer ISI, 2012



emissions and, as a consequence, increased industrial competitiveness. However, not all energy intensive processes can apply this flexibility, due to technical, operational and market constraints.

In most cases technology is already available and deployable. Key is how to develop the proper regulatory framework to stimulate investments in this direction. In this respect, learning from national experiences in managing excess electricity supply in the grid would be beneficial.

Moreover, with the support of additional Research Development and Innovation (RDI) projects, more options could be envisaged in the near future, whereby electro-technologies could be progressively introduced into processes that currently use fossil fuels.

Regulatory, market and legislative barriers

Regulatory, market and legislative barriers are the main reason for not tapping the full potential of industrial demand side management. Without addressing this aspect first, it will be impossible for any plant operator to start any cost-benefit analysis to assess how to adapt operations in a way that would deliver on-site financial benefits. At the moment, coping with the excess of non-programmable renewable energy sources' supply requires the network operator to curtail electricity generation. In general, curtailing is not really a cost-effective solution. And specifically for these types of renewable energy, curtailing is particularly inefficient, as these technologies produce at zero marginal prices.

Currently, network tariffs and network charges (including levies and taxes) are set in a way that discourages industries from accessing the grid. This approach is in principle correct, as it tends to promote stable and predictable demand from big energy users. However, in this context, the network operator needs a service to balance the network, which the industry is ready to provide. However, instead of being remunerated for such a service, industry would have to pay for offering it, to the benefit of the network operator. In Germany, for instance, should an auto-producer decide to import electricity from the grid, it would face additional costs of at least €70/MWh.

A proper regulatory framework should incentivise both the "off-the-grid" base-load demand, and the flexibility to bring "on-the-grid" ad hoc electricity demand to help match the excess electricity generation from non-programmable renewable energy sources.

Currently, industry lacks crucial information to build a proper business case for balancing renewable energy. There should be some kind of guarantee on the minimum yearly number of hours one should reasonably expect to be called for providing services to balance the market. This minimum number of hours should be provided by the regulator and/or network operator and should be the founding element of any contractual agreement.

In many cases, the industry is subject to stringent energy efficiency targets. In case of demand side flexibility, deliberately stopping CHP units would negatively impact the industry performance. In order to promote energy efficiency programmes while incentivising demand-side management, the legislation should clearly state that importing electricity from the grid would be done to absorb the load from wind and solar electricity. Therefore the electricity imported should be counted as 100% energy efficient.

Practical short-term actions for policy makers

National legislators could:

- Remove regulatory barriers to create extra demand for electricity at a time of need, including no extra costs (tariffs, levies, taxes) when participating in demand side management programmes;
- Maintain current incentives for on-site generation.

At the European level we recommend:

- The European Commission and Council to acknowledge the full potential embedded in the (market- based) instrument of industrial demand side management to enable higher levels of renewable energy in Europe while maintaining the competitiveness of energy intensive industries and enhancing the energy security of the EU economy;
- The European Commission and Council to ensure that this instrument is market-based and therefore built upon voluntary participation by industrial actors;
- The European Commission to:
 - Develop a strategic action plan to assess the economic potential of demand side management for industry, in particular the market-based approaches, and recommendaon to tap the full potential by 2030. This plan should acknowledge both the power peak-shaving and valley filling potential of demand response;
 - Monitor and enforce the provision in the 2014-2020 guidelines for environmental and energy aid which states that Member States should primarily consider alternative ways of achieving generation adequacy which do not negatively impact on the objective of phasing out environmentally harmful subsidies, such as facilitating demand side management and increasing interconnection capacity;
 - The ongoing adoption of the Network Code on Demand Connection (pursuant Art. 6(6) of the Regulation (EC) No 714/2009) by the European Commission should be improved to maximise the current and future (depending on legislative initiatives) use of demand side management in Europe;
 - Include industrial demand response as part of the legislative reviews that will happen to implement the EU's 2030 climate and energy framework;
 - The European Commission should acknowledge the potential of streamlining existing EU energy (efficiency) legislation, so that it encourages, and not prevents, industrial demand response.

Sources:

- ⁱ Green Growth Platform - <http://www.cisl.cam.ac.uk/business-action/low-carbon-transformation/green-growth-platform>
- ⁱⁱ Cambridge Institute for Sustainability Leadership - <http://www.cisl.cam.ac.uk>
- ⁱⁱⁱ Corporate Leaders Group - <http://www.cisl.cam.ac.uk/business-action/low-carbon-transformation/clg>

Disclaimer:

The consultation process undertaken by the Green Growth Platform Advisory Council on Industrial Sectors does not constitute full endorsement of this paper from the organisations represented and only reflects the views of those representatives consulted.



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