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IndustRE project - Is industrial demand response complementary or competitive to pumped hydro storage?

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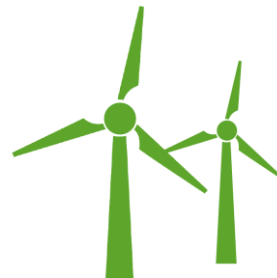


The challenge

The cost-effective integration
of variable renewable
electricity into the European
power systems

The rising cost of electricity
and its effects on the
competitiveness of the
European Industry

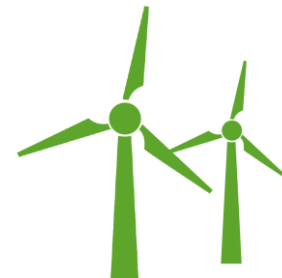
IndustRE sees the **industrial electricity demand flexibility**
as an opportunity to deal with both challenges at the
same time



Project objectives

The project brings together the large industry with the renewable energy community in order find common ground and create win-win situations.

- Formulate business models
- Develop tools to facilitate their adoption
- Quantify the potential benefits for the power system
- Formulate policy recommendations



Business models context

2015

Outline all possible ways that the **electricity demand flexibility of industrial plants** can derive and deliver benefits to the power system

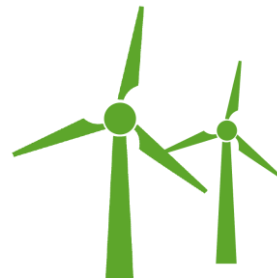
2016

These “business models” are further detailed and adapted to the target countries

Tools are developed to advise industrial plants on concrete actions

2017

Case studies will be implemented and policy recommendations formulated



Project Focus & Geographical Coverage

The project will be relevant to all industries in Europe, but the key focus is:



Chemicals



Non-ferrous metals



Steel



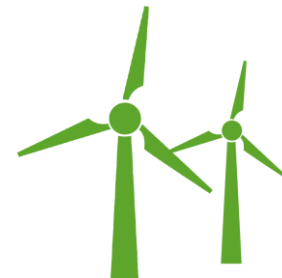
Cold storage



Water treatment

These five sectors - with 302 TWh/year - represent around **10%** of Europe's total electricity consumption.

The project will apply to all European countries, with particular focus in Belgium, France, Germany, Italy, Spain and the UK. These six countries represent more than **65%** of the EU population and almost **80%** of Europe's installed wind and PV capacity.



Business Models Type A: Before gate closure

A.1

Adapting consumption to Time of Use tariffs (static price signals)

A.2

Response to dynamic price signals:

A.2.1) Industry with a generic energy supplier

A.2.2) Industry with a supplier that has renewable energy assets

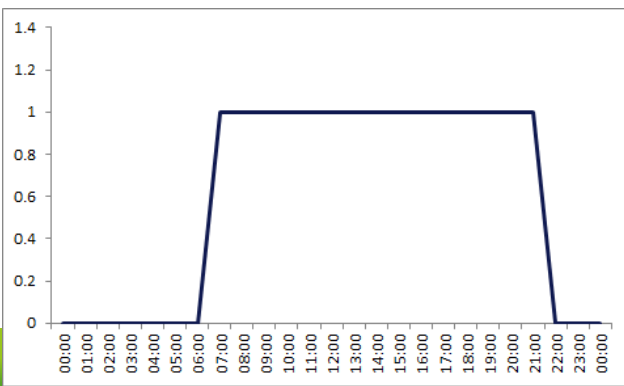
A.2.3) Industry with on-site renewable generation.

A.3

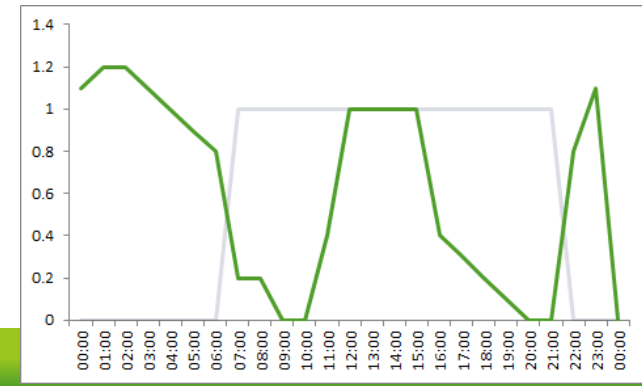
Energy procurement from wholesale / spot market (either with or without on-site renewable generation)

A.4

Reduction of peak power (lower contracted power, lower fix term)



Market signals
or supplier
requests



Business Models Type B: After gate closure

B.1

Offering reserve capacity to the system operator, either directly or through an aggregator

Primary, Secondary and/or Tertiary reserves

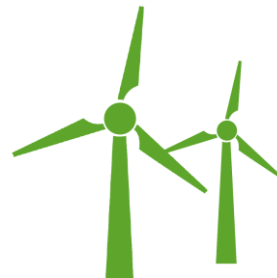
B.2

Offering reserve capacity to the balancing responsible party

B.3

Other services to system operator:

- Long-term generation investment deferral (capacity markets)
- Network congestion management
- Reactive power control
- Distribution system services



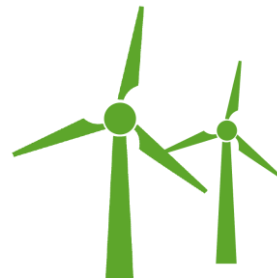
Stakeholder Consultation



Web survey: Open until 10th of November



Workshop in Brussels: October 27th PM



Role of Demand Response

Purpose – areas where DSR can help



System benefits

- Provides **flexibility**
- Provides **firm capacity**
- Reduces need for **network** expansions (through reducing peak load)
- **Lowers CO2** emissions
- **Increasing competition** in electricity system (Demand Response is often cheaper than generation)
- Delivers **additional income** for participating industrial and commercial companies
- Drives **innovation** and empowers consumer to participate in the electricity market

Taken from “Mapping Demand Response in Europe Today – 2015, Smart Energy Demand Coalition (SEDC)

Demand Response vs variable speed PHES

- Demand response has similar characteristics with decentralised storage solutions - in fact decentralised storage located at consumption (or generation) sites further enhances demand response options.
- A large part of the demand response potential can be activated today without any infrastructure requirements and without geographical limitations
- Taking into account the electricity consumers from the smallest to the largest (aggregated) demand response can have an important impact also at the transmission level





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