Thinking outside the box: New perspectives on industrial Demand Side Flexibility (?)

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IEA WS on RENEWABLE ENERGIES for MANUFACTURING INDUSTRIES
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CEPI in brief

EUROPE'S PAPER INDUSTRY - A KEY PARTNER FOR EUROPE

100% BIO-BASED PRODUCTS

515 COMPANIES

72% RECYCLING RATE

75 BILLION EUROS TURNOVER

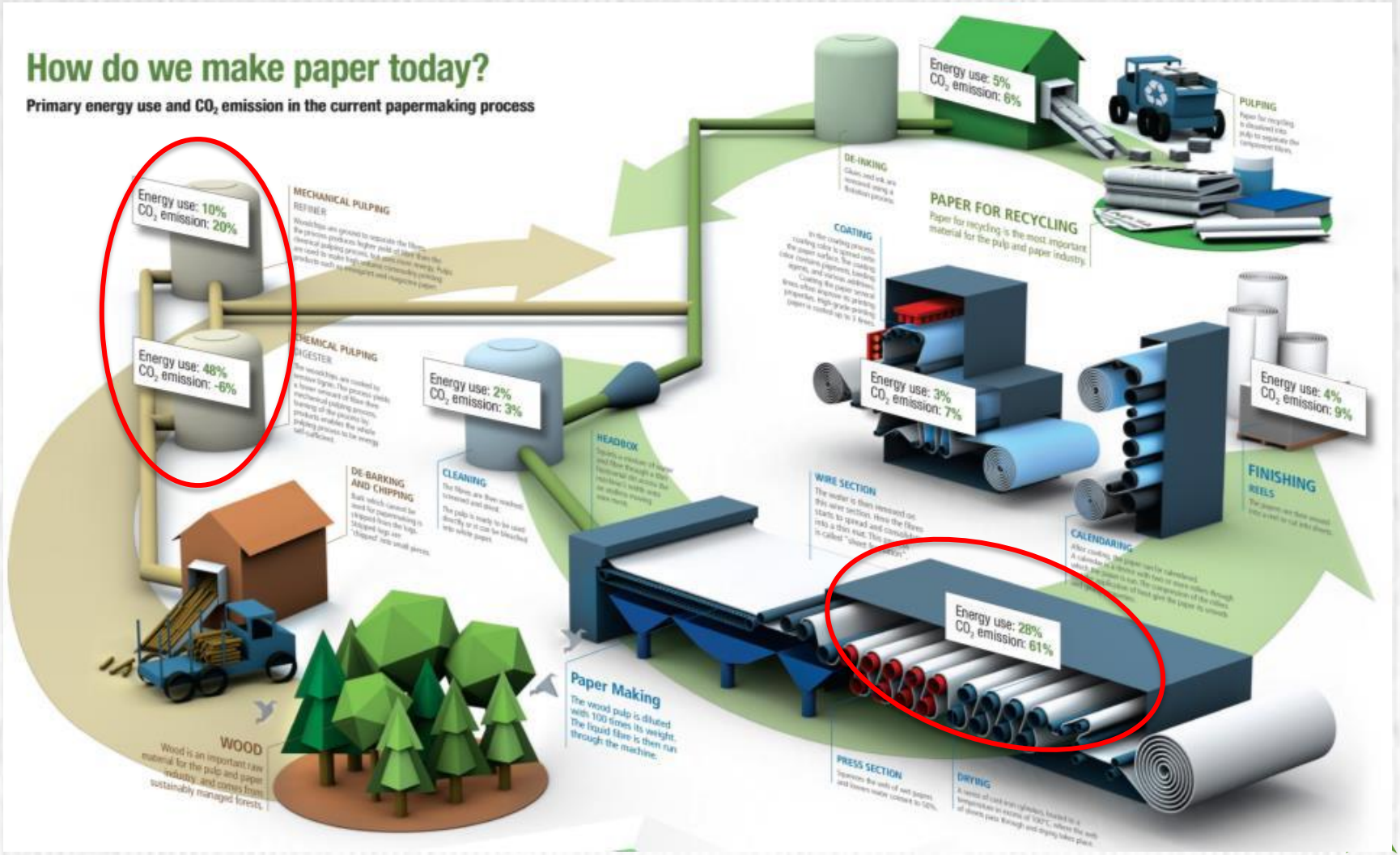
15 BILLION EUROS ADDED TO THE EUROPEAN GDP EVERY YEAR

22% OF PAPER PRODUCTION IS EXPORTED

83% OF FIBRES USED ARE SOURCED IN EUROPE

5 billion-euro investments planned in Europe in 2015-17

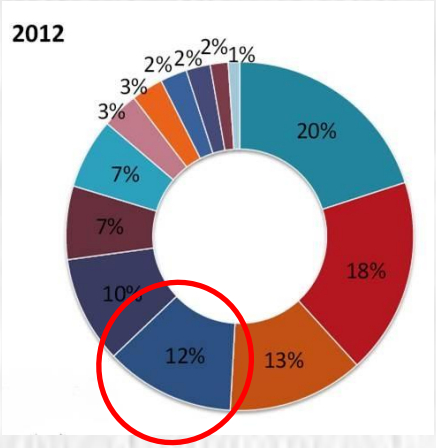
The pulp and paper industry in a snapshot



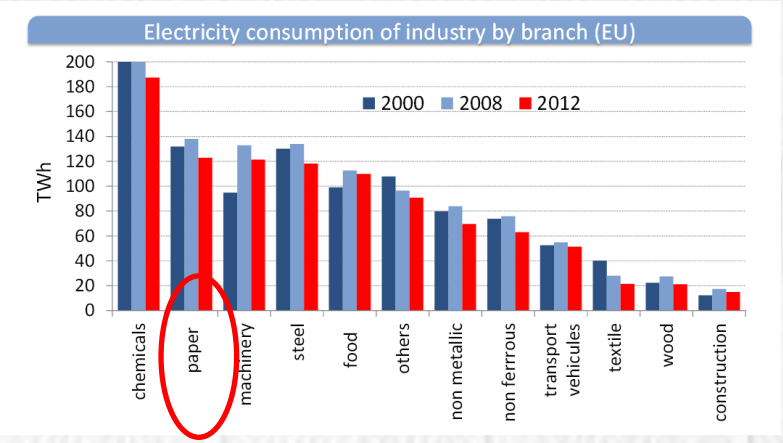
A renewable, recyclable, innovative, bio-based, made in Europe industry

The paper industry, from an energy and climate perspective

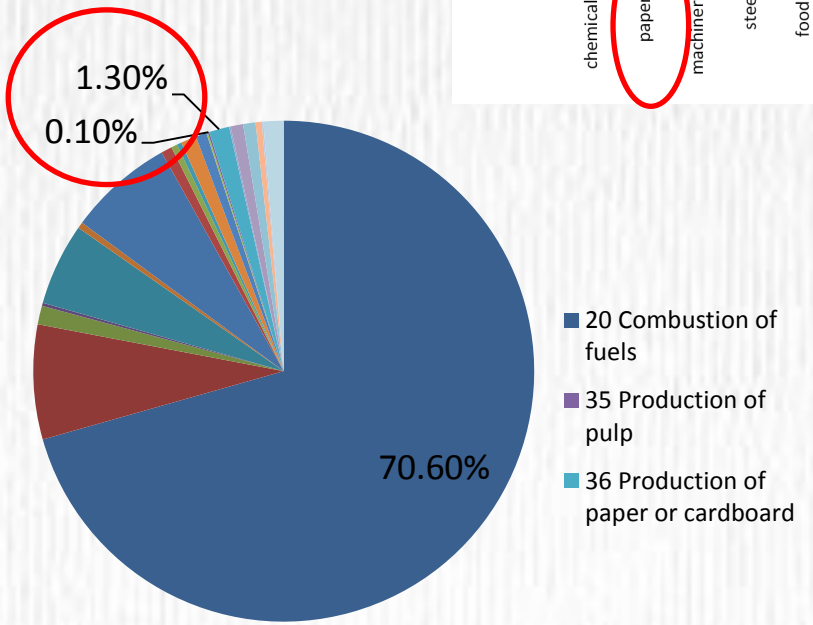
4th largest industrial energy user



2nd largest industrial electricity user



And yet, only about 1.5% of EU ETS emissions

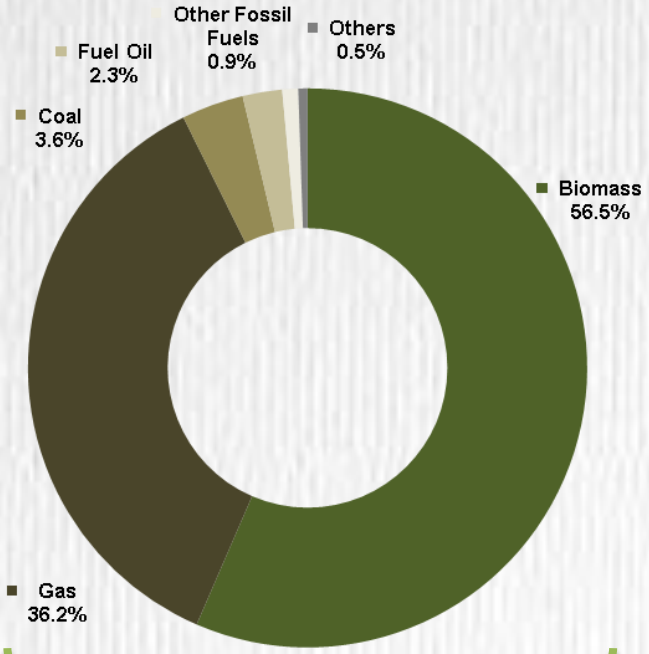


Share of 2013 EU ETS emissions (%)

Sources: Odyssee-MURE project, EEA

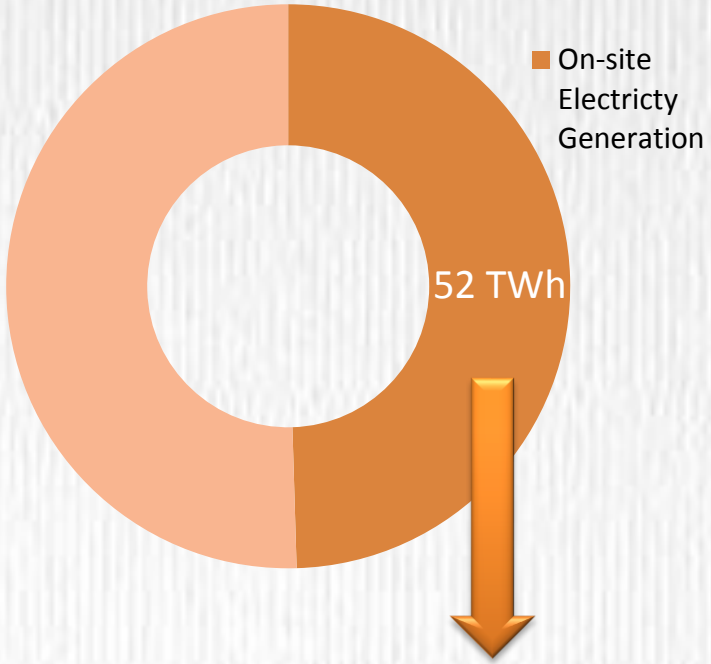
Role of CHP in the paper industry

Total Fuels Consumption:
1,196, 450TJ



Used in CHP

Total electricity Consumed:
102 TWh

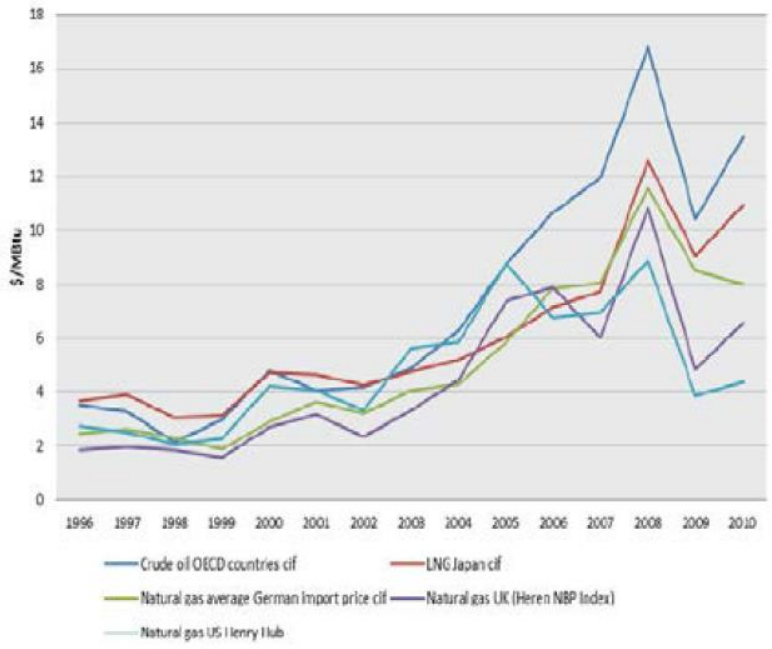


96.4% from CHP

2012 figures

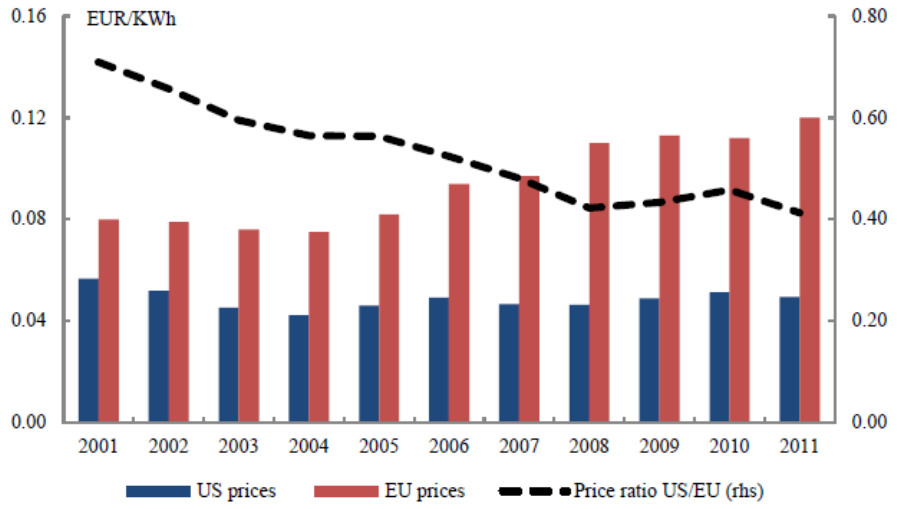
Rising gap in energy prices rise is a competitive problem

Graph I.2.5: **Wholesale natural gas prices in Germany, Japan, UK and US compared with crude oil price**



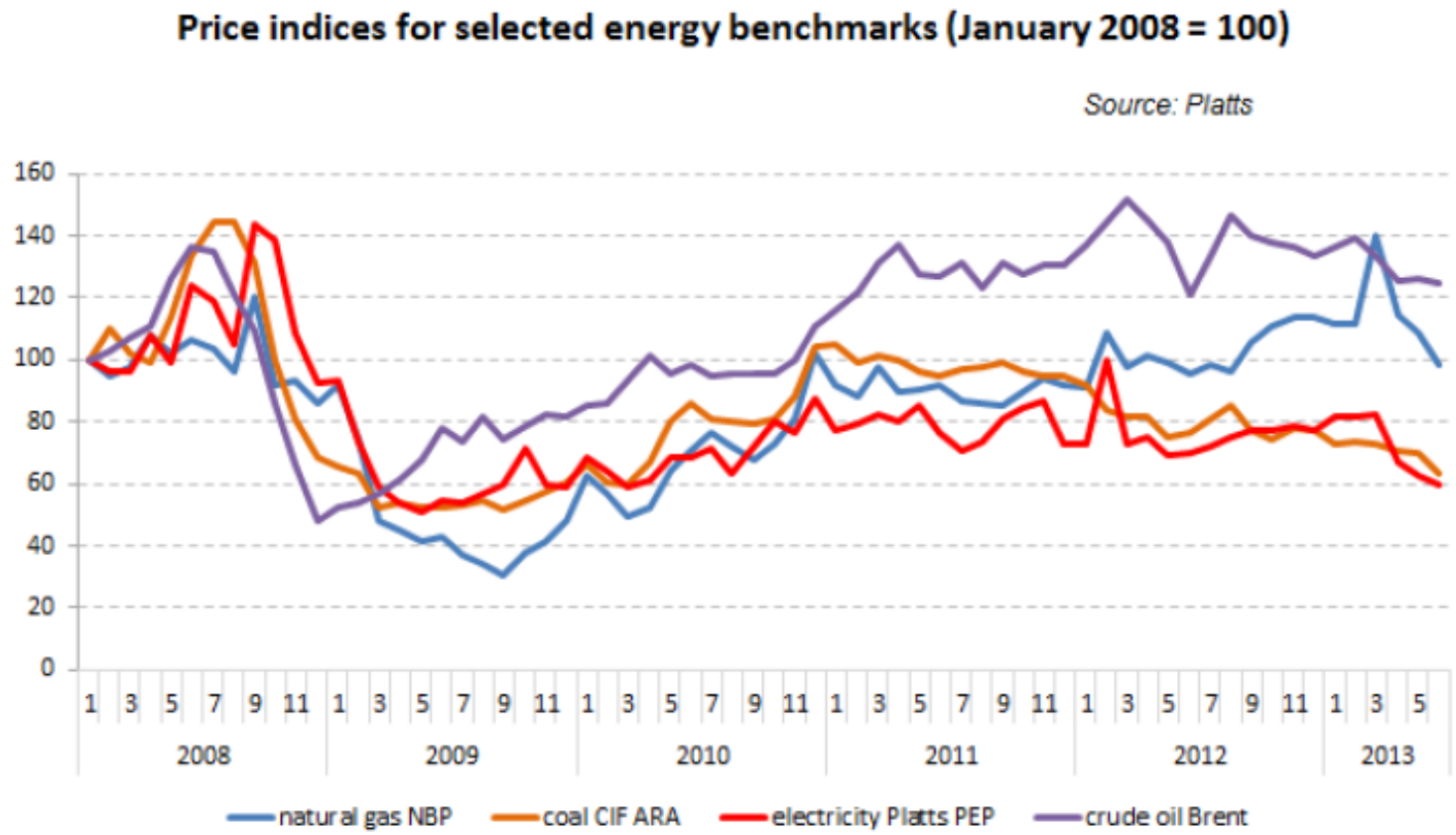
Source: European Commission (2012).

Graph I.2.8: **End-user electricity prices for industry**



However, not all energy components are increasing…

Figure 17. Evolution of European average wholesale electricity prices vis-à-vis coal and gas prices



-40%

Can we turn the problem into an opportunity to support industrial competitiveness?

What could an industrial installation potentially do via demand-side programmes?

- Adjust energy consumption?

  "I import electricity unless I am incentivised not to do so"

  - Pros: a company would shift or reduce production, if electricity prices are cheaper or if it is adequately rewarded to do so
  - Cons: it requires flexibility on the production side (very little potential in Pulp and Paper Industry due to the specificities of the production process)

- Adjust energy production?

  "I do no import electricity unless I am incentivised to do so"

  - Pros: PPIs are partially (electricity auto-generation) or fully (heat) outside the electricity market. Shutting or lowering down auto-production, one could create additional electricity demand without affecting production
  - Cons: a business case will be required, where
    - electricity imported is cheaper than the one auto-produced, and
    - the ROI on additional CAPEX investments is positive.

The hidden potential of the Pulp & Paper Industry

RES-E (TWh)	2013
PV	81
Wind	234
TOTAL	315

PPI electricity purchased from the grid (TWh)	2013
TOTAL	50

This is what the electricity system sees…

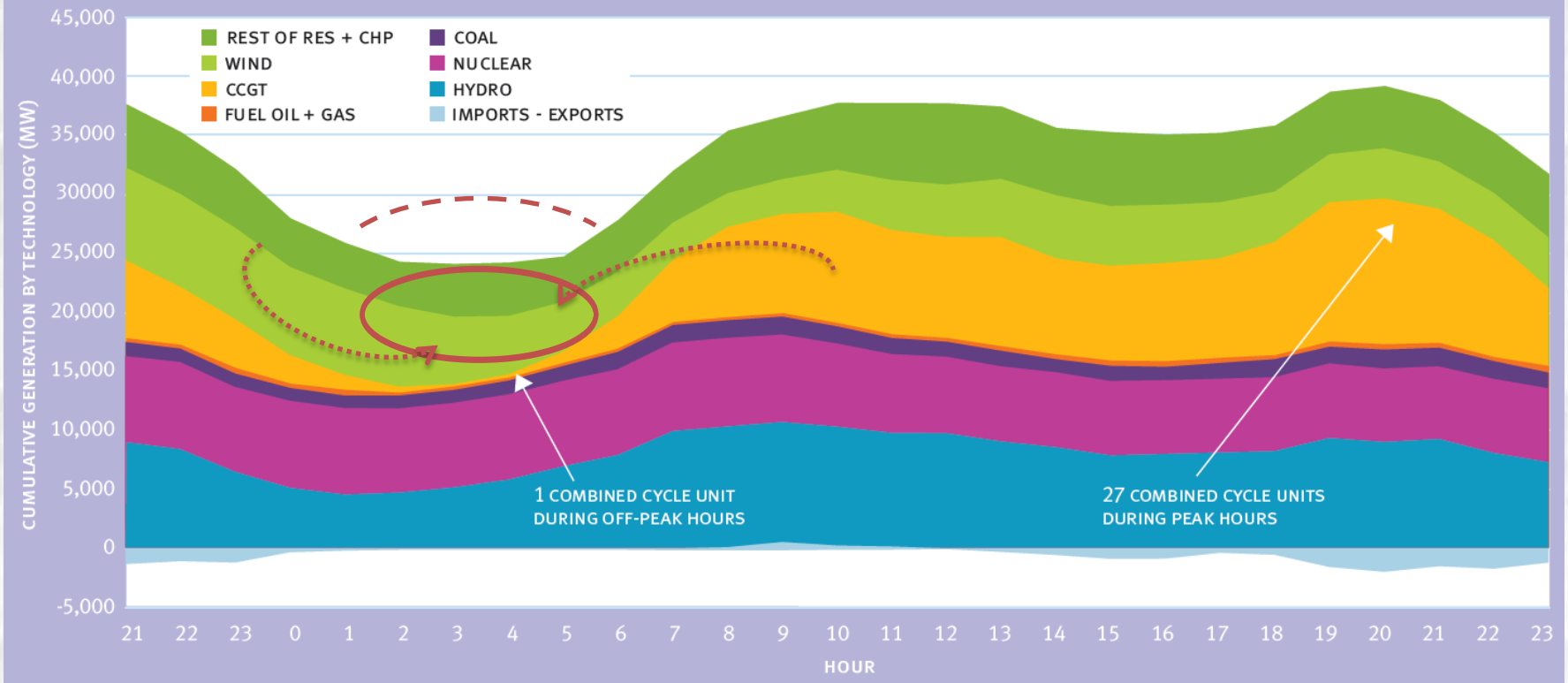
PPI on-site energy generation (TWh)	2013
Electricity	52
Heat	138
TOTAL	190

… but this is what the electricity system DOES NOT see!!!

Sources: EuObserv'ER, CEPI

What would happen when ad hoc bringing off-grid energy demand into the electricity network?

Figure 5: Example of flexible back-up capacity needed within the Spanish system – 3 March 2010



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

Benefits vs Barriers

Benefits

- It meets the three-dimensional EU Energy Policy challenge:
  - Competitiveness (lower energy costs)
  - Security of Supply (lower demand for gas)
  - Environment (lower CO_2 emissions, air polluting substances…)
- Creates value instead of destroying it
  (industrial production vs. losses in energy storage)
- Reduces RES curtailment (less costs for compensation)
- Increases running hours for thermal power plants
  (better profitability for power plants/less costs for compensation)
- Requires lower CAPEX
  (compared to power plants or grids expansion)

Cheaper electricity

Barriers

- Network charges and fees when importing electricity
- Split incentive: stability vs. flexibility
- Lack of visibility over investment profitability
- Upfront costs to adapt to flexible generation

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The way forward

- The potential of industrial demand side flexibility should move higher at political level: it is a more cost-effective and quickly implementable solution compared to all other alternatives (capacity remuneration schemes, grid expansion, household demand-response programmes, etc.).
- Removal of regulatory barriers to create extra demand for electricity at a time of need: no extra costs (tariffs, levies, taxes) when participating in Demand-Side Flexibility (DSF) programmes.
- Maintain current incentives for on-site generation, to keep baseload industrial demand off-grid.
- DSF to be compatible with energy efficiency targets: 100% energy efficiency for electricity taken from the grid when participating in DSF programmes .
- Need for regulators/network operators to ensure visibility on the yearly amount of hours a paper mill should reasonably expect to be called when participating in DSF programmes.
- Participation in DSF programmes would require significant changes in the way industry operates, both from a technological and industrial processes perspective. Support for Research, Development and Innovation would be needed.

Thank you!

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