Slides prepared by EC Power for the WG3 "Calculation" (revision of space/combination & water heater ErP regulations)

About EC POWER

- Founded in 1996
- Head office in Aarhus, Denmark
- Academy in Berlin, Germany
- Sales in Europe and Americas
- +10,000 systems in operation
- Market leader in the 6-20 kWe segment
- > 27 patents
- Extensive partnerships, examples:
Sector Coupling – Energy efficiency and flexibility

Energy Harvesting and Processing
- 100 % Renewable Energy
- Surplus electricity converted to gas and stored

Energy Consumer
- +100 % system efficiency
- Switch between gas and electricity supply

On-site Sector Coupling – The Energy Center

Please note, this illustration is only to show the basic concept of the Energy Center, any real system includes additional (or other) components, for example it could be heat storage, boilers, solar panels etc.
On-site Sector Coupling – Flexibility

Watch movie to see how the Energy Center copes with fluctuations in wind power, while the load remains unchanged.

Please note, this illustration only shows the basic concept of the Energy Center. A real system includes additional components, for example heat storage, boiler, solar panels etc.

On-site Sector Coupling – EC Power installation 2007 –

An unassuming reality
**CASE: “Hadbjerg Skole”, a School in Favrskov, Denmark**

- **Municipal School built 1928/1961/2012**
  - 440 students
- **Energy Center built 2017**
  - CHP, electric load tracker
  - Heat store, consumption balancing
  - Heat pump, heat booster
  - Boiler, back up heat
- **Energy Center annual performance**
  - 63% power supply, rest from grid
  - 100% heat supply (10% from boiler)
  - 130% total energy efficiency

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<th>Year</th>
<th>Before Sep 2017</th>
<th>After Sep 2017</th>
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<td>Energy Center Solution</td>
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<td></td>
<td>400 kW Gas Boiler</td>
<td>1 x 20 kW Gas CHP</td>
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<td>1 x 800 l Heat Store</td>
<td>1 x 20 kW Heat Pump</td>
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<td>400 kW Gas Boiler</td>
<td>400 kW Gas Boiler</td>
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**CO₂ Tonnes**

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**Annual Energy Costs**

- Natural Gas & General Power Mix
- Optional Green Gas & Green Power Certificates
- Annual Energy Costs
- Annual Carbon Footprint

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<th>Year</th>
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CASE: “Hadbjerg Skole”, a School in Favrskov, Denmark

Annual Energy Flow & Carbon Footprint without On-Site Sector Coupling / XRG® Energy Center

Reference

Total Energy Consumption 487223 kWh

Total Energy Demand 420350 kWh

Heat Loss 17.5 %

Gas (HVC) 76.9 %

Building’s annual heat demand

Electricity 22.2 kWh

Gas (HVC) 5.3 %

Building’s annual electricity demand

Coal 86.7 %

Biomass & Waste 2.1 %

Nuclear 0.1 %

Wind/Electrification 2.9 %

Natural Gas 8.9 %

CASE: “Hadbjerg Skole”, a School in Favrskov, Denmark

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Annual Energy Flow & Carbon Footprint with On-Site Sector Coupling / XRG® Energy Center & Green Certificates