European Union Key Energy Figures
Current Trends and EU 2030 Objectives Assessment

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EU Key Energy Indicators
Current Trends and EU 2030 Objectives Assessment

- Key Energy Indicators are shaken with fluctuant economic and political conditions
- Nevertheless medium and long term trends depend mostly on market fundamentals and structural decisions / policies

$CO_2$ emissions, Power Mix, Renewables, Energy Efficiency... :
- Where do we stand early 2015 ?
- How can we assess EU 2020 trends and 2030 objectives ?
Energy consumption is declining in the EU

- Primary Energy consumption reducing for almost 10 years
  - Reduced GDP growth
  - Energy Intensity decrease thanks to Energy Efficiency improvement (1.5pt / y)
- Electricity consumption now also decreasing (4 years)
  - No more substitution
- Differences depending on the countries
CO$_2$ emissions continue to decrease slowly

- Directly linked with energy consumption trends
- Limited Carbon Intensity decrease with substitutions:
  - Electricity & Biomass $↗$
  - Oil $↘$
  - Power mix:
    RES $↗$ Gas $↘$ Coal $→$
2014 events and potential impact

- Ukraine & Russia
  - Stronger focus on energy supply security
    - Reinforcement of energy independence objective
    - Actions to reinforce suppliers diversity

- EU 2030 Framework for Energy and Climate Policies
  - Change of trend in the CO$_2$ emissions reduction objectives

- Oil price strong decrease
  - Impact on supply structure + shale O&G competitiveness + investments reduction (Oil, LNG...)
  - Impact on country economic policies
EU 2020 3*20 Objectives – Situation end 2014

- EU is on the way to meet its 2020 Climate & Energy targets
  - GHG emissions reductions: -20% vs 1990
  - Share of Renewables: 20% of final energy
  - Energy consumption: -20% vs projection

- These results have been strongly impacted by the sluggish economic growth
  - Carbon intensity reduction < Planned trend

- Some key enablers have not yet been (fully) deployed
  - ETS market
  - Energy Efficiency investments
EU 2030 Climate & Energy Framework

Agreed headline targets
2030 Framework for Climate and Energy

2020
-20% Greenhouse Gas Emissions
20% Renewable Energy
20% Energy Efficiency
10% Interconnection

2030
≤ - 40% Greenhouse Gas Emissions
≥ 27% Renewable Energy
≥ 27%* Energy Efficiency
15% Interconnection

* To be reviewed by 2020, having in mind an EU level of 30%

New governance system + indicators

Enerdata
EU 2030 Objectives Assessment
A clear change in the trends

<table>
<thead>
<tr>
<th>Yearly average evolution</th>
<th>2000-2010</th>
<th>2010-2020</th>
<th>2020-2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth (%/year)</td>
<td>1.5 %</td>
<td>1.4 %</td>
<td>1.7 %</td>
</tr>
<tr>
<td>Primary Demand (%/year)</td>
<td>0.2 %</td>
<td>-0.5 %</td>
<td>-0.4 %</td>
</tr>
<tr>
<td>Energy Intensity (%/year)</td>
<td>-1.3 %</td>
<td>-1.9 %</td>
<td>-2.1 %</td>
</tr>
<tr>
<td>New RES power capacities (GW/year)</td>
<td>18</td>
<td>31</td>
<td>27</td>
</tr>
<tr>
<td>Carbon Intensity (%/year)</td>
<td>-2.0 %</td>
<td>-2.5 %</td>
<td>-3.5 %</td>
</tr>
</tbody>
</table>

- Analysis of the EU2030 Objectives using POLES model
- Projections based on Enerdata EU2030 scenario
New Member States (13): A shifting energy mix

- Low energy consumption per capita
- Large potential for energy efficiency to cover energy intensity gap with EU-15
- Large development of nuclear and renewables
- Shale gas: even if tapped, would make a low contribution to energy independence
- EU Climate & Energy policies: larger role for gas, but also for nuclear & renewables

Energy demand, New MS

Analysis based on Enerdata scenario

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2030 “BAU”</th>
<th>2030 EU Obj</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>20%</td>
<td>24%</td>
<td>25%</td>
</tr>
<tr>
<td>Gas</td>
<td>37%</td>
<td>29%</td>
<td>19%</td>
</tr>
<tr>
<td>Nuc.</td>
<td>18%</td>
<td>24%</td>
<td>33%</td>
</tr>
<tr>
<td>Bio.</td>
<td>9%</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td>Coal</td>
<td>8%</td>
<td>11%</td>
<td>14%</td>
</tr>
<tr>
<td>Hydro</td>
<td>25%</td>
<td>24%</td>
<td>23%</td>
</tr>
<tr>
<td>Wind</td>
<td>23%</td>
<td>23%</td>
<td>25%</td>
</tr>
<tr>
<td>Solar</td>
<td>11%</td>
<td>14%</td>
<td>11%</td>
</tr>
<tr>
<td>Oth.</td>
<td>8%</td>
<td>11%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Analysis based on Enerdata scenario
GHG Emissions reduction sources in New MS

- New MS would bring 1/3 of EU reductions
- Large role for Energy Efficiency
- Switch Coal → Gas, RES and Nuclear
- Non-CO2 GHG reduction potential

Cumulative reductions 2010-2030: 4 840 MtCO2e

- Non-CO2 GHG + CO2 process
- Analysis based on Enerdata scenario

- Demand reduction: 21%
- Fossil switch: 26%
- CCS: 4%
- Elec, heat, H2: 2%
- Biomass: 7%
- Nuclear: 10%
- Industry: 9%
- Waste: 11%
- Agriculture: 3%
- Other REN: 7%
- Electrolysis and H2: 2%
- CCS: 4%
- Elec, heat, H2: 2%
- Biomass: 7%
- Nuclear: 10%
- Industry: 9%
- Waste: 11%
- Agriculture: 3%
- Other REN: 7%
Additional outputs from the EU 2030 analysis

- **Fossil fuels** remain dominant but decrease
  - Decrease from 75% to 65% of the mix, and drop 20% in volume, by 2030
  - In New MS, ambitious objectives would entail cuts in coal and shifts to gas, renewables and nuclear

- **27% Energy Efficiency** objective will require a change in the investment trend

- **Carbon value** would become a significant factor in investment decisions after 2020
  - ETS sectors: carbon price would reach 80€ / tCO2 by 2030
  - Non-ETS sectors: significant policies & measures and associated investments needed to contain a carbon price to that level
Thank you for your attention!