Towards a low carbon electricity industry: employment effects & opportunities for the Social Partners

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Methodology

- A joint project by Syndex and ADAPT
- Syndex realised a study, based on an extensive literature review
  - On the expected evolution of the electricity system in the coming decades: production, but also transmission and distribution
  - Its impacts in terms of employment and skills, mostly in Europe and a few ones at a worldwide level
- Completed by ADAPT with two online surveys among the affiliates of the European social partners – one for employer and local trade union representatives and another for full-time trade union officials
  - David Tarren’s presentation this afternoon
- 4 Steering Committees between February and October
  - With EPSU, EURELECTRIC and EMCEF representatives
The electricity sector at a crossroads of the priorities of the EU: the fight against climate change and the 2020 strategy

- The “3 x 20” objectives of the European Climate Package to reduce greenhouse gas emissions
  - a) Reduce GHG emission by at least 20 % in 2020 compared to 1990 levels
  - b) Provide 20 % of primary energy by 2020 using renewable energy sources
  - c) Increase energy efficiency by 20 % in 2020

- Demand for electricity is increasing, in a context of strong dependency to foreign imports
  - Europe is today depending on foreign imports for 50 % of its energy consumption. This could increase to 70 % in 2030 with current trends
  - Consumption in OECD Europe to increase from 3 136 TWh in 2007, to 4 071 TWh in 2030 (+ 30 %) according to IEA
A just transition is necessary to anticipate the changes and manage the impacts on workers

- The transformation of the electricity sector will involve changes to the occupational structure, skills and competencies and career paths

- A “just transition can be seen as:
  - the shift towards a more sustainable and environmentally friendly economy,
  - based on social dialogue between governments, employers and trade unions,
  - in a way that promotes high economic growth and investments in low-carbon technologies,
  - while ensuring a smooth social transition through adaptation and mitigation actions as well as through the development of skilling and reskilling programs (or just new skills) and the creation of quality jobs

- This concept must be coherent with ILO definition of « decent work »
Current distribution of electricity capacity and production in Europe

- Conventional thermal representing more than half of capacity and production in 2008
- Europe is witnessing a rapid expansion in renewable energy technology: wind, photovoltaic, biomass, geothermal, solar thermal, wave and tidal
- Nuclear represents only 15% of installed capacity but 25% of total production
- Installed capacity is around 800 GW in Europe

<table>
<thead>
<tr>
<th>Technology</th>
<th>Capacity (%)</th>
<th>Production (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional thermal</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>Nuclear</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Hydro</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>RES (without hydro)</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

Installed capacity is around 800 GW in Europe
Comparison of different scenarios of production’s mix evolution by 2030

Installed capacity of 1100 GW for EURELECTRIC vs 1073 GW for Commission

But with a different mix:
- More important part of fossils (thanks to CCS) to the detriment of nuclear
- Renewables globally at a similar level, with more solar and less biomass

Even if all countries are going to experiment changes, all will not be affected by the same way
Brief summary of main studies - Eurelectric Powerchoices

- Assumption of 75% reduction of GHG emissions in Europe in 2050
  - « New technology with an adequate transition period can accommodate the objective of stabilizing of carbon missions from all sources, and with aggressive application of technology, carbon emissions reductions of 60-80% can be achieved by 2050 »

- Energy mix and improvement of traditional energies get combined. This scenario increases energy independence

- Fuel mix in 2050: RES = 40 %, Fossils with CCS = 30 %, Nuclear = 28 %

- Main recommendations: immediate and strong policies are necessary
  - Support mechanisms in place until 2020 and decreasing on next decade
  - From 2030, CO2 price becomes the only driver of low carbon technologies deployment
Brief summary of main studies - ETUC (Syndex + WMP)

- Comparison of 3 scenarios: baseline, DG TREN and NSAT/Syndex (DG Envt)
- All energies are important in the future mix. Hypothesis of nuclear relaunch
- Creation of 71,000 new jobs in RES in 2030, and 31,000 new jobs in CCS in NSAT Syndex scenario
- Policy measures:
  - In favour of a fixed carbon price
  - Fear financialisation of fighting against climate change
  - Support mechanisms required, both at European and regional levels, to manage the transition
Brief summary of main studies - GHK

- Point of departure is the economic crisis, which will obviously lead to restructuring. This must be well organised in order to respect Lisbon strategy conditions.

- Coal extraction is decreasing but giving up or continuation of each type of energy will be driven by demand.

- Main conclusions:
  - to drive efficiently restructuring, needs of anticipating change, to plan and prepare, and then provide social support measures.
  - investments were realised but they are still insufficient.
  - employment impact analysis can only be appreciated in a qualitative way.
  - Restructuring depend of strategic choices of companies: risk anticipation is possible.
  - Jobs opportunities are through anticipation and risk estimation.
Brief summary of main studies - Greenpeace

- Scenario « Energy revolution » :
  - 42% of worldwide electricity and 86% of European one produced from renewables in 2030
  - Energy efficiency measures

- 2 millions more jobs in the energy sector between 2010 and 2030 instead of 500 000 less pursuing actual tendencies in terms of consumption and energy mix
Brief summary of main studies included - DG TREN (Fraunhofer ISI)

- Pro-renewables study, less characterising other energy sources

- Increase of employment in RES and decrease in traditional energies
  - Decrease will be less important than increase because the labour intensity of the conventional energy sector is lower than the renewables one
  - 2.3 millions jobs in 2020 (macroeconomic level, not only electricity sector). 2.8 millions if adopting accelerate deployment policies
  - Employment reduction in traditional energies, but EU ambitious objectives will lead to an improvement of skills for most graduates as investments will be focused on knowledge intensive generation technologies

- Consumers and companies choices have an indirect impact on employment level. Investment and fuels demand are the main drivers of employment growth in the sector

- Importance of financial support at short term to reach the objectives
  - Estimated level of investment necessary between 2006 and 2030: 1530 B€
Brief summary of main studies - UNEP/ILO/IOE/ITUC

- Collective work on the current and the future situation of greens jobs in the world and in numerous business sectors

- Energy mix: nuclear power not considered as an environmentally acceptable alternative to fossil fuels
  - “given unresolved safety, health, and environmental issues with regard to the operations of power plants and the dangerous, long-lived waste products that result”

- EU15 in 2020: 1.4 million jobs under current policy, 2.5 million jobs under advanced renewable strategy (of which 60 to 70% in RES)

- 5 challenges to manage the transition: Employment, Rights, Social Protection, Social Dialogue and Equity
A balanced mix seems the most effective in terms of capacity installed

- We can characterize 3 types of scenarios for Europe’s future energy mix (2030 to 2050):
  - Baseline scenarios
  - Pro-renewable scenarios
  - Scenarios that promote a balanced mix

- A well-balanced mix combining renewable and traditional energy production is possible, even with a commitment to decarbonising electricity production
  - As new technologies, like carbon capture and storage, develop

- Major advantage of this mix is that it already matches existing demand, and in the future will also require the building of fewer new production sites
### Number of jobs in Operations & Maintenance, in Baseline, Syndex (based on DG Envt) and Power Choices scenarios for 2030 and comparison with 2005 figures

<table>
<thead>
<tr>
<th>2005</th>
<th>2030</th>
<th>2030 vs 2005 (absolute figure and % of annual change)</th>
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<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>NSAT Syndex</td>
</tr>
<tr>
<td>Solids</td>
<td>85</td>
<td>86</td>
</tr>
<tr>
<td>Solids CCS</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oil</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Nuclear</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>Gas</td>
<td>36</td>
<td>72</td>
</tr>
<tr>
<td>Hydro</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Wind onshore</td>
<td>10</td>
<td>37</td>
</tr>
<tr>
<td>Wind offshore</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Solar</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Other Renewables</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Biomass</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>219</td>
<td>274</td>
</tr>
</tbody>
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Data in 1000 FTE / year. Source: Syndex
General trends for the future of workforce in the European electricity sector

- The number of jobs depends on the geographical situation and technological specificity.

- Even if the energy sector will employ more workers than today, there will have less new jobs than existing jobs with skills adapting.

- The contraction of the employment in some areas (for example coal-based power plants) cannot be fully compensated with the development of other jobs in renewables, as far as the jobs and the statutes are different.

- Rhythm of deployment of clean coal technologies like CCS will also influence these evolutions.

- European labour market will begin to contract from 2020 with workers retiring and a low rate of entrants. The impact will be compounded by the relatively higher age of the Electricity workforce.
Transition will not concern only electricity production but also transmission networks and distribution

- The European electricity network ought to be modernised to take into account the future energy mix
- New grids (smart grids and super grids) will be necessary to provide a more user-oriented service, enabling the achievement of the 3 x 20 targets and guaranteeing high security, quality and economic efficiency of electricity supply
- Although a great deal of consideration is being given to the future of these networks, the question of financing remains unresolved
- Distribution will be deeply impacted by the large deployment of smart meters until 2020
Consequence on skills demand

- Work in the future will require job holders to possess a higher level of skills than at the present.
- This is due to a number of reasons including the increased use of technology in work.
- Studies have identified skill needs in:
  - Generic skills: leadership
  - STEM skills: science, technology, engineering and mathematics
  - e-skills
- For transmission and distribution, new skills will be required to fill the gap generated by the technological changes that will be introduced, and new tasks will emerge, particularly in connection with the technological risks’ supervision.
Electricity sector needs a skill strategy

- Skill strategy responses will have to be organised and must anticipate future skill needs in order to establish effective training programmes.

- Anticipation of what skills are needed in the future is essential to balance the demands from the industry with the supply of labour with the appropriate skills.
  - Just over a third of employers said that their company has undertaken specific initiatives to forecast their skill and competency requirements for the future.

- Skills investment should concern not only the amelioration of training and educational infrastructures and programs, but also about incentives in order to motivate workers to follow the training.