Renewable energy strategy
Public consultation
07 February 2012

Joint observations

- **IFP Energies nouvelles (FR)**
- **SINTEF Group (NO)**
- **TNO - The Netherlands Organisation for Applied Scientific Research (NL)**

Three of the major Research Organizations in Europe have taken the initiative to jointly present their views on the European renewable energy strategy.
This joint initiative is based on their long term cooperation in the fields of energy, transport, oil and gas and environment, to the benefit of technology and society.
With a joint turnover of over 1200 million EURO (2010) and about 8000 employees, the three organizations are a major contributor to the European and worldwide research efforts in the field of clean energy. They have regularly worked together over the last 15 years for their national and regional authorities, the European Commission and the industry.

IFP Energies nouvelles, SINTEF and TNO have pooled their expertise together in an Alliance. The TRI4CCS Alliance is based on a shared vision of the development of carbon capture and storage technology. IFPEN, SINTEF and TNO have joined forces to deliver more rapidly the technologies needed for worldwide deployment of CCS. The Alliance aims at serving the research needs of industry while developing innovative solutions and products that cover the entire CCS chain. TRI4CCS has been launched in June 2011 in Trondheim.

The use of renewable energies addresses a dual objective: to tackle climate change resulting from CO_2 emissions and to reduce energy dependence on oil, particularly in the transport sector. The renewable sector is expected to be an important source of growth and job creation in Europe. For example, the number of people employed in the wind sector alone is expected to more than double in Europe from 2010 to 2020, rising from 189 000 people in 2010 to 462 000 people in 2020. **The European renewable energy strategy must be part of a broader European energy policy that has to be built and consolidated.** As stated in the Energy Roadmap 2050, for the coming decades, the clean use of fossil fuels will remain essential for the security of energy supply and for the technology position of Europe in the world. Energy transition will be a long and challenging process. All energy options must be kept open to ensure that responses are as appropriate as possible, both environmentally and economically (for example, ensure a sustainable deployment of unconventional gas in Europe). In this context one important challenge is to develop technologies that will allow us to continue to use fossil fuels, but also to reduce CO_2 emissions by capturing, transporting and storing it while maintaining industrial competitiveness in a global market. CO_2 capture, transport and storage (CCS) in geological systems could bridge the transition period we need to develop and implement sustainable energy sources. CCS is a transition technology that will play a role up to 2100 as the transition from carbon based energy to CO_2 free energy will need considerable time to achieve. Besides, combined with bioenergies, CCS will be the only technology to offer a "carbon negative" option in the future and is a long term solution for emissions from industrial sources.

Today important barriers remain and hamper the massive deployment of renewables. Most of these barriers are common for electricity production, heating and cooling and transport:

- Renewables lead to a high Cost of Electricity (CoE), which prevents their development at a larger scale, except for some specific cases such as hydroelectricity and onshore wind. This leads to a situation today where their growth is based on government subsidies until they can come closer to grid parity. A higher CO_2 price and favorable framework conditions are needed to encourage investments in renewables and CCS with appropriate financial mechanism to support first of a kind commercial plants. Industry needs long term visibility to invest in renewables with a dynamic CO_2 market and steady incentives. After 2020, incentives will continue to be necessary for emerging technologies. Driving the cost down of these energies should be a priority in the current context of the European economies.

- Before setting new binding targets, the existing legal framework has to be clarified if the European union wants to achieve the 2020 goals. Administrative burden, length of procedures and lack of standards are slowing down the deployment of renewables.

- There is a need to develop interoperable smart grids that allow decentralization of energy production, integration of renewable energies and new low carbon technologies into the network. A particular attention should be given to the integration of decentralize renewable energies into the network at local level. The role of cities and regions in the development of flexible energy grids should be emphasized. At the same time, smart metering, monitoring and decision support systems need to be developed and installed allowing for a real time balancing of production and demand.

- With an increasing share of variable renewable energy sources like wind and solar connected to the European grid, it is crucial to develop and optimize a strong transnational transmission system and all energy storage technologies to be able to handle the fluctuations in both production and demand. To maintain a stable and reliable high-quality and flexible pan-European energy system, it is fundamental to develop storage options at multiple time scales ranging from seconds via hours and days to weeks. Research to develop technologies, to reduce costs, to minimize environmental impacts and to develop effective markets and legislation for energy storage is needed for all available and future technologies. More attention will need to be given to research into storage methods using limited primary (raw material) resources such as underground energy storage, hydro-storage, heat- and cold storage and exchange, both at a local (household) scale and at a larger scale (industrial or utilities).

- Offshore wind represents a possibility for very large scale generation of renewable energy without drawing on land resources. Over 100 GW of offshore wind projects are already in various stages of planning. Realization of these projects would produce about 10 % of Europe's electricity avoiding about 200 million tones of CO_2. European targets are 40 GW by 2020 and 150 GW by 2030. Continued progress in developing offshore wind farms and offshore grids, research to bring forward innovations and cost reductions, development of effective markets and legislation are key issues to meet the targets.

- Offshore grids are vital for enabling the integration of large scale offshore wind, as well as connecting the hydro power system in the Nordic countries to Northern Europe. Offshore grids will enable more renewable offshore wind coming onshore at a lower cost than through point-to-point connections. A future meshed subsea transmission HVDC grid will thus give a substantial contribution towards fulfilling Europe's challenging objectives regarding renewable energy, well in line with the EU energy infrastructure priority corridors. In addition, such a grid will also open opportunities for elimination of large point emissions by electrification of offshore oil and gas installations.

- Solar technologies are a growing contributor to the European energy mix. To allow a broader deployment of solar energy, major breakthroughs are expected, especially in photovoltaics, to increase the efficiency and bring the cost of technologies down.

- Judging biomass as a renewable energy resource, the expansion of its availability is physically limited. Beyond 2020, and probably earlier, considerable means should be implemented to mobilize sustainable biomass energy in sufficient quantity. The deployment of logistic supply for cultivation, harvesting, storage, conditioning and the deployment of sustainability certification schemes will require substantial effort (costs, labor, etc.). In this context competition for biomass between energy and transport sectors will be a major issue that will have to be discussed and solved at the European level.

- Public awareness and acceptance of new energy technologies, storage and transmission is a key for their deployment. Research investments will be needed to, using the new media, bring to the public useful information to understand the

technologies, advantages and risks involved of new developments and to make the public at large aware of the choices for the future of quality of life.

Sustainability

Criteria defined in both the Renewable Energy Directive (RED) and the Fuel Quality Directive (FQD) are relevant approaches to ensure that the growth of biomass use in Europe is sustainable. However, implementation of those criteria is difficult since corresponding definition and assessment methodologies still need to be clarified. As examples, additional information are still required on Indirect Land Use Change (ILUC), biodiversity and even on classical GHG emissions assessments since corresponding RED methodology is not fully defined and thus confusing for some technologies. Moreover, the list of default values for well to wheels GHG emissions of biofuels and bioliquids provided in RED Annex V is not exhaustive and shall be updated with additional technologies (notably biofuel chains for air transport). Therefore, GHG assessment methodology should be precised to be enforceable to all biofuels and bioliquids, including co-processing of renewable and non renewable resources[1].

As a conclusion, before opening a debate on new potential sustainability criteria, we believe that priority shall be given:

- to clarification on existing criteria (assessment methodologies that have to be enforceable for all possible technologies),
- to extension of the application of RED sustainability criteria for 2020 to all biomass energy uses.

These measures comply with a widely admitted principle according to which policies should be technology neutral: sustainability criteria must be applied for all energy technologies, storage options and transmission. Well-developed indices for sustainability exists for some technologies, but there is a lack of standardization and a need for integrated criteria looking at the whole energy system. The definition of additional sustainability criteria should be based on conclusions of ongoing international expert groups (such as Global Bioenergy Partnership - GBEP). As an example, we believe that including water issues in sustainability requirements for 2020+ should be relevant and possible, thanks to guidelines provided by future 14046 ISO standard (still in preparation : ISO/TC 207, Environmental management, SC 5, Life Cycle assessment, WG 8, Water footprint).

[1] As an example, co-processing of renewable and non renewable resources that can be developed to produce partly renewable road and air fuels, synthetic natural gas or hydrogen raises specific methodological questions that are not covered in the RED (several European working groups – such as CEN TC383 or the European Expert Group on Future Transport Fuels – have already reported this). Legislation shall be completed notably on the basis of existing European Commission communication (C 160/13) which states that when a fuel consists only partly of renewable material, only the biomass-derived part has to meet the WTW GHG emission threshold defined in the RED and this biomass-derived part is equal to the share of biomass in the energy content of the overall feedstock. WTW GHG emission default values for these biofuels should be defined as "Equal to that of the biomass-based production pathway; the share of biofuels being calculated as equal to the share of biomass in the energy content of the overall feedstock".

R&D

Many scientific and technological obstacles need to be overcome to develop clean energy production technologies. With the SET-Plan, the European union has stressed the urgent need to speed up the development of low carbon energy technologies. According to the European Industrial Initiatives roadmaps the need for financing is huge: 50 billion euro over the next ten years.

We are happy to see that the budget proposed by the European Commission for energy research in Horizon 2020 has increased significantly compared to the FP7 one, from 2,3 billion euro to 6,5 billion euro. However, it is clear that the long history of underspending in R&D and innovation within energy cannot be addressed by this alone given the magnitude of the energy problem. Energy is clearly one of the Grand Challenges and the need for more brave investment in R&D and innovation is clear as highlighted in other key economies. A different magnitude of investment is needed to be able to reach targets set by EU, also beyond the 2020 vision. Horizon 2020 is a great opportunity to settle the right framework for financing deployment of low carbon technologies. Bringing down the cost of low carbon energy technologies remains the main challenge in the perspective of a decarbonised energy mix. So priority should be given to the support of demonstrations and first commercial plants. In parallel, support to the EERA joint programs and to pre-competitive research projects is necessary to allow the development of future generations of technologies and products.