Sustainable Energy Policy and Strategies for Europe

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ABSTRACT SUBMISSION DEADLINE **JUNE 1st, 2014**

The Conference Objectives

As Europe strives to overcome the economic crisis, energy stands out both as a conditioning factor and as an opportunity. The energy situation is evolving in Europe as well as in the rest of the world, where new actors, the emerging economies, are taking the leading role. Political developments in several areas of the globe (North Africa and Middle East, the Caspian region, ASEAN countries) are reshaping the geopolitical situation, generating some worries about the security of supply in the EU countries.

The crisis has somewhat released the pressure on energy demand and allowed to reach objectives in the reduction of greenhouse gas emissions that seemed out of reach, but as the European Energy Roadmap to 2050 makes clear the objectives for 2020 and beyond are likely to require a renewed, powerful effort as soon as the economy is back on the track.

Important steps towards the establishment of a really open and competitive energy market in Europe have been achieved, but much remains to be done. Energy technologies (as evidenced in the SET-Plan) have evolved and contributed new solutions, as in the case of non-conventional hydrocarbon resources, but this has happened more as gradual step-by-step improvements than by real breakthroughs. The evolution of these technologies has been influenced by the instruments adopted by governments to promote new sources or new solutions rather than directly by market demand. The use of "market instruments" to steer the energy choices in the direction of sustainability is the subject of animated discussions, based on the analysis of diverse case studies. The hope of obtaining reductions of energy costs by these means has been often frustrated.

Some sectors show difficulties in moving in the right direction (in terms of economy as well as sustainability): the outstanding example is the transport sector, where, apart from the improvement of the efficiency of vehicles, there is little sign of moving from the present paradigm (with private prevailing over public transport, road over track and waterways,) and sporadic attempts are done to reduce the need of displacements (both of people and of goods). Another sector which is meeting institutional rather than technical difficulties is the building sector, especially as concerns distribution of costs and revenues among the different actors.

The first (dual) plenary session of the Conference will be devoted to the European Energy Road Map to 2050, and to the response to environmental challenges.

The next plenary sessions will deal with the specific energy aspects of transportation, and to the efficiency of energy utilisation in buildings. The last two plenary sessions will be devoted to energy geopolitics and emerging countries, and to the regulation of energy markets.

Can torrefied products enhance the European bioenergy portfolio?

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Overview

In order to investigate possible (dis-)advantages of deploying torrefaction technologies, the experimental work done within the FP7 SECTOR (Solid Sustainable Energy Carriers from Biomass by Means of Torrefaction) project is complimented by extensive desk studies and modelling work. The combination of torrefaction and pelletisation or briquetting can lead to higher energy densities for biomass commodities than single pelletisation and therefore holds the potential to enhance the renewables product portfolio of not only the European energy market but also a biobased industry in general. We simulate a large range of production and utilisation pathways based on torrefaction that could become relevant in the near future under different framework conditions. We evaluate corresponding biomass-to-end-use chains in terms of socio-economics and GHG-emissions. This results in a comparative biomass-to-end-use chain assessment for several scenarios highlighting chains plausible to be implemented in the following decade as well as the possible impact of torrefaction and torrefied products on biomass trade.

Methods

A biomass-to-end-use chain simulation tool (BioChainS) was developed to assess the large number of production and utilisation pathways based on torrefaction which are discussed within the project community and could become relevant in the near future. Different feedstocks are simulated to be processed to torrefied and, as a reference, to white pellets and briquettes in several countries and world regions. Direct consumption of these commodities for industrial or domestic deployment of energy or further processing to biochemicals and biomaterials respectively are considered. Related costs and GHG-emissions are calculated. Direct consumption costs are extended with transport cost functions which are further used to generate cost ranges and break even distances for competing commodities. This approach tackles the crucial and complex part of transport in biomass trade. On one side feed-in tariffs, other supporting schemes and fossil fuel prices outline the capability to pay a certain biomass price for most of the examined end users. On the other side the distances biomass can be transported until this financial threshold is reached give an insight into the quantity of biomass available to meet the end user demands. In four storylines the exogenous data for possible future political and technical framework conditions for the period of 2020 to 2030 are drawn. Deployment scenarios for torrefied biomass are simulated by using this exogenous data including quantitative effects of policies regarding biomass supply, demand and research and development. Deployment strategies for torrefied biomass under different framework conditions are formulated based on a thorough sensitivity assessment of the driving parameters.

Results

Scenarios regarding on how and to which extent the torrefaction technology can broaden the biomass portfolio in the European energy market and its biobased industry are calculated highlighting the competitiveness of torrefied pellets against reference energy carriers under different framework conditions. A thorough assessment of possible relevant biomass-to-end-use chains based on torrefaction results in cost-efficient and environmentally sound deployment strategies for this commodity and further outlines risks and bottlenecks for the diffusion of the torrefaction technology and torrefied products.

Conclusions

The method developed within this research is capable not only to simulate if biomass can be an economically viable option for substituting fossil fuels and fossil fuel byproducts but also to compare different supply chains which qualify for this purpose. Further work within the SECTOR project will extend selected examples of the comparative biomass-to-end-use chain assessment with a full environmental assessment and overall conclusions and recommendations for stakeholders, policy makers and international sustainability forums will be derived.

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