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Novozymes' response to EC public consultation
on the Green Paper ' A 2030 framework for climate and energy policies'

Novozymes welcomes the opportunity to provide a response to the European Commission Green Paper on the 2030 framework for Climate and Energy policies. We recognise the importance of a sound, stable and long-term policy framework that will deliver the certainty needed for investments to materialise.
More input has been submitted via our trade association ePURE as well as the European Biofuels Technology Platform. We would like to further emphasize answers to the following questions in our role of stakeholder in the conventional and advanced biofuels industries.

1- Lessons learnt from the 2020 framework and the present state of EU energy system

- Biofuels are at present the only proven, readily available technology to curb GHG emissions in the transport sector. According to the International Energy Agency (IEA) Technology Roadmap *Biofuels for Transport*, biofuels could provide up to 27% of world transportation fuel by 2050, delivering significant CO2 emission savings when produced sustainably.
- Restoring the confidence in a sector that has been subject to a moving and uncertain policy framework must come from defining a new, long term, stable and comprehensive policy framework that will give clear signals that biofuels with high GHG savings will be part of the EU energy mix. Constant changes in legislation have prevented investments in best performing biofuels facilities, in particular advanced technologies
- For this to happen, higher ethanol blends (i.e. beyond E10) will be needed to fulfill the climate and energy targets. However, currently announced advanced biofuel projects would be sufficient to meet the IEA roadmap vision only until 2015. Beyond 2015, considerably more new projects will be needed, and even more so after 2020. Advanced biofuels offer additional benefits and significant progress has been achieved for several production pathways, some of which are ready for commercial deployment, provided the right framework conditions and financing is put in place.
- There is a need for strengthened action at EU level, as highlighted by the implementation of the Renewable Energy Directive, that has led to some degree of fragmentation between Member States, thus calling for EU uniform action and implementation in a post 2020 framework. A wide and single market for renewables will not be achieved by fragmented national approaches, since biofuels need to be produced and available in sufficient quantities and according to same standards across the European Union.
- The Fuel Quality Directive and Renewable Energy Directive need to be consistent and work towards similar objectives. The introduction of multiple counting for advanced biofuels in the RED had negative implications on the achievability of the FQD target and therefore worked as a disincentive for advanced biofuels. This situation should be avoided in the future.

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2- Targets

The need for mandatory sectorial targets

- **Mandatory** targets associated with penalties for failure to comply are the way to go as The progress made towards meeting the EU's 20-20-20 objectives shows: while Europe is on track for its 20% GHG emissions reductions and its 20% renewables share, it is lagging behind for its 20% efficiency objective, due mainly to the lack of mandatory objectives.
- A combination of mandatory targets for GHG emissions reduction, renewable energy and energy efficiency must be established by 2030
    - Going for a sole GHG emissions reduction target by 2030 would jeopardise the EU ability to achieve its 2050 GHG emissions reduction objectives and/or make it more costly. EU energy and climate policy is about GHG emissions reduction, increased competitiveness and improved energy security. Focusing on GHG emissions reduction only by 2030 would not bring the necessary investments in more promising innovative technologies that will prove necessary by 2050.
- Moreover in the event of a new economic slowdown, GHG emissions reductions may once again be achieved because of reduced industrial activities and not because of energy efficiency measures and renewables deployment. Because the main energy demand growth and the steady increase in GHG emissions comes from the transport sector, it is equally important to **pursue sectorial targets as initiated by the RED towards 2020**. The experience where the RED followed the first Biofuels Directive (Directive 2003/30, containing merely indicative targets, largely missed by the vast majority of the Member States), is an illustration of the need for mandatory targets in the transport sector. **Increased energy efficiency and CO2 emissions reductions for vehicles should be pursued in parallel, not alone.**

The revision of the climate and energy policy should serve to solve some of the inconsistencies observed in the implementation of the Renewable Energy Directive and Fuel Quality Directive:

- In the RED, the European Union opted to encourage the diversification of feedstocks used to produce biofuels by introducing the double counting rule. Biofuels derived from wastes, residues and lignocellulosic materials count for double their real energy value in terms of their contribution to the national objectives. This administrative support was meant to initiate a greater interest in using this type of biofuels and could create indirectly a greater value for those products. However this instrument has failed to create conditions for investment in breakthrough technologies and to boost advanced biofuels deployment. Also in the 27 National Renewable Action Plans very little consideration is given to article 21.2 material-based biofuels. The tool also suffered from uneven implementation across Member States.
- **A dedicated sub-target for advanced biofuels.** A ramping-up, achievable sub-target for advanced biofuels would secure a market share. It would also reduce investment risk and lower competition with well-established biofuel pathways. Mandatory targets will only be effective if they are combined with high and stable, mandatory penalties for non-compliance – the proceeds of which could be returned to producers or contribute to the financing of demonstration and flagship plants. Advanced biofuels would remain eligible for the rest of the target, once the sub-target is fulfilled. Technology neutrality is critical for this measure- no winners should be picked upfront. With this measure the market would settle the price needed to ensure sufficient production. There would therefore be no budgetary implications for the EU or its Member States.
- The achievability of RED and FQD targets must be carefully assessed, and instruments must be consistent. In the past, the introduction of multiple counting for advanced biofuels in the RED had negative implications on the achievability of the FQD target since multiple counting was not replicated.

To reflect on the economic viability and the changing degree of maturity of technologies in the 2030 framework, financial incentives can be phased out once a certain market penetration has been achieved, as shown by the US recent ending of the blender tax credit for conventional corn ethanol end of 2011. The journey towards competitiveness is expected to be the same for most European biofuels in the medium term provided mandatory targets are maintained.

For advanced biofuels however, without additional policy measures to stimulate investment in scale-up, supply of relevant feedstocks and up-take of advanced biofuels, Europe is missing a unique, sustainable industrialization opportunity within the wider concept of biobased economy.

3- Instruments

In addition to securing the demand through a dedicated sub-target for advanced biofuels, a combination of the incentives shown below will help to overcome the obstacles inhibiting investment into advanced biofuel scale-up and bring advanced biofuel technologies across the "valley of death" between R&D and commercialization – a valley we need to cross to ensure future low cost and EU based production of advanced biofuels. Bioenergy is about agriculture/forestry, research and innovation and regional development policies; hence the need to better connect various policies and ensure they all work towards the same objectives

- **Feedstock collection and supply-chain incentives.** In most EU countries there is no or limited experience with large-scale collection and storage of biomass. Therefore incentives are needed to help establish agriculture and forestry biomass supply-chains and thus reduce feedstock uncertainty and the overall risk of advanced biofuel scale-up investments. It would also promote EU production and self sufficiency. These incentives could be implemented in the Common Agricultural Policy (CAP) revision as part of redirecting the CAP towards sustainable and renewable energy but it should also cover the mobilization of woody biomass from forest, underpinning recent initiatives in the forest sector.
- **A realistic investment support for demonstration and first-of-its-kind commercial-scale plants (financing of EIBI and the Biobased Industries Public Private Partnership).** The up-front investments required for building these plants is and risky – not least because they will have to compete with existing, non-renewable and unsustainable energy technologies. Compounding this, the ongoing global financial and economic crisis has made investors and lenders more risk averse. Getting equity and especially debt finance for demonstration of first-of-its-kind commercial scale plants is therefore proving close to impossible. In order to reap the benefits of EU excellence in biobased R&D and address the innovation valley of death faced by biobased industries, EU research and innovation policy must increasingly invest in the latest stages of innovation: demonstration and deployment. Financing the European Industrial Bioenergy Initiative (EIBI) and the Biobased Industries Public Private Partnership are ones of the last opportunities not to miss the train of the advanced biobased economy.

A comprehensive policy framework is key to success. The issue also needs to be addressed holistically and consistent EU action in form of legislation is needed as follows:

- Amending the Fuel Quality Directive (FQD): currently, the limit for ethanol as a petrol component is respectively at 10% by volume, which is insufficient to reach the targets established by the Renewable Energy Directive (RED). In order to be coherent with the RED requirements and to allow higher biofuels blend in motor fuels placed on the market, the FQD needs to be amended.

- Reviewing the Energy Taxation Directive (ETD) to rebalance Europe's structural diesel/petrol unbalance: with both conventional and advanced ethanol good environmental performance, it is paramount to push for more ethanol into the fuel pool. This triggers an additional leverage to the much needed rebalancing of the petrol/diesel unbalance in the European Union.
  With this in mind, efforts must be pursued so that the Energy Taxation Directive proposal is discussed and adopted in the short term. In particular, it proposes to move away from volume based taxation to energy content taxation, and to introduce a carbon tax element. This adaption is absolutely necessary to solve the paradox of clean renewable fuels being taxed at a higher rate than polluting fossil fuels. It is also a prerequisite for the successful market introduction of higher biofuel blends. This move deserves highest support from Member States.
- Introducing a European-wide pump law: Sweden successfully built-up fuelling infrastructure for E85 by obliging pump owners to provide at least one alternative fuel per filling station. The alternative fuel of choice in Sweden was mostly E85. The EU should learn from this experience and elaborate a coherent and ambitious plan for the roll-out of higher blends pumps across its territory.
- Ensure coherent policies: In order to successfully introduce a significant amount of alternative fuels on the EU market, contradictory policy signals need to be avoided. One example is the implementation rules on CO2 emissions for passenger cars (Regulation 443/2009). Constructors of Flex-Fuel-Vehicles (FFV) are currently not entitled to a CO2 credit for their FFVs because there are not enough E85 filling stations available. With this implementation measure the Commission fell into the trap of the chicken-and-egg-logic, the result being a disincentive to produce more environmental friendly cars.

4- Competitiveness and security of supply

Industrial biotechnology alone has the potential to reduce between 1 and 2.5 billion tonnes of CO2 equivalent emissions per year by 2030[i]. WWF has identified four cornerstones for the realisation of a low-carbon economy; these are:

- Improved efficiency, where industrial biotechnology results in more efficient use of natural resources and reduced energy consumption;
- Switching to biofuels:
  - Rapid deployment of next-generation biofuels has potential to deliver about 1 billion tonnes of emission reductions by 2030, 50% more than in a scenario when only conventional biofuels are placed on the market;
  - Biofuels help to develop the technologies and infra- structures that establish a stronger market for bio-based materials.
- Replacing petrochemicals with bio-based materials:
  - The substitution of petrochemicals with bio-based processes and ingredients can produce significant GHG emission reductions;
  - Biorefineries can produce a broad range of end products and create production systems that dramatically reduce the input needed as well as waste.
- Closing the loop: biorefineries enable the re-use of waste materials as feedstock for energy and materials.

Following this pathway to a low carbon economy will not only bring benefits in terms of reducing pressure on land and climate change mitigation but also help Europe's economic growth.

- It will change Europe from being a net oil importer to exporter of technology and bio-based products. Bloomberg New Energy Finance estimated the development of Europe's next

generation ethanol industry could displace 68% of its fossil petrol consumption and generate up to EUR 12 billion of revenues in the EU27 per year by 2030[ii].

- As a result green jobs will be created and remain locally, as outsourcing is not possible because the transportation of biomass is not feasible on long distance. The job creation potential is large in the EU27 not only in the agriculture and technology sectors, but also in the construction and transport sectors. Bloomberg New Energy Finance estimates that up to 900,000 man-years of employment could be created in Europe by 2030.

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[i] Industrial Biotechnology – More than green fuel in a dirty economy? WWF Denmark, 2009.

[ii] Moving towards a next-generation ethanol economy, Bloomberg New Energy Finance, 2011.