



**Commissioner Carlos Moedas**

**MEETING WITH CEOs OF EUROPEAN COMPANIES  
COMMITTED TO THE DEVELOPMENT OF LOW CARBON  
TRANSPORT FUELS**

**Commissioner's Office**

**25 February 2016**

**15:00-15:30**

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## **KEY MESSAGES**

- Advanced biofuels are an essential part of the EU renewable energy mix for achieving the 2030 Energy and Climate and COP21 goals through decarbonisation of transport.
- Reaching competitiveness in advanced biofuels, which will be essential for their deployment and market uptake, is a shared responsibility between the public sector and industry to which the Commission responds with research and innovation actions, policies and financing instruments (e.g. the action plans of the integrated SET-Plan as well as the InnovFin instrument).
- Advanced biofuels are an integral but not focused part of the bioeconomy vision, where they can contribute to EU growth with competitiveness and added value of integrated biorefineries.
- The Commission will monitor how the European targets are implemented with the National Renewable Energy Plans and look at the cooperation between the Member States in the context of the revised renewable energy policy and decarbonisation of transport.
- A question to the industry however: are the National Renewable Energy Plans not enough certainty for industrial investments in advanced biofuels?

<b>KEY FIGURES</b>	<b>FP7</b>	<b>Horizon 2020</b>
Total number of participations	1768	320
Total number of signed grant agreements	390	52
ERC – Number of grantees	37	2
Marie Skłodowska-Curie – Number of grantees	261	39
EU total financial contribution to participation <sup>1</sup>	€83.6 m	€138.6 m

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<sup>1</sup> This corresponds to a search on keywords biofuels, bioenergy and biomass, as all are involved in biofuel projects.

# 1. STEERING BRIEF

## 1.1 Scene setter

On 25 February 2016 from 15:00-15:30 you will meeting:

- [REDACTED], Novozymes,
- [REDACTED], UPM,
- [REDACTED], M&G Chemicals,
- [REDACTED], ST1,
- [REDACTED], EnergoChemica, and
- possibly high level representatives from Abengoa, Clariant and DuPont Industrial Biosciences, whose names are still to be determined.

The CEOs are in Brussels on the occasion of a high-level conference on advanced biofuels and its contribution to the Energy Union, organised in the morning of 25 February in the European Parliament. The companies participating in this meeting are leading technology producers and flagship plant owners of advanced biofuels.

The meeting will focus on advanced biofuels and their market deployment, for which the companies are seeking support for the innovation required, and market stability for their commercialization. The following specific agenda items were communicated:

- *The role of innovation and financing (incl. EU support received so far e.g. FP7, BBI JU, NER300, etc.)*
- *The type of measures that can encourage deployment and market uptake for advanced biofuels technologies that are ready.*
- *Advanced biofuels' contribution to the Bioeconomy Vision and EU growth agenda.*
- *Policy-wise, the sector will closely look at contributing to the Communication decarbonisation of transport and the revised renewable energy policy, due in 2016 and it is likely that this will be discussed during the meeting as well.*

## 1.2 Objectives

- To pass on the message that advanced biofuels are a key element of the EU renewable energy for achieving the 2030 Energy and Climate goals.
- To pass on the message that the Commission supports reaching competitiveness of advanced biofuels through research and innovation actions and policies, offering tailor-made financing instruments, and encourages the technology leaders to take investment decisions.
- To raise awareness that the Commission will monitor the impact of national plans and cooperation between the Member States.
- To obtain a better understanding of which measures would be important to the industry.

## 1.3 Line to take

- **On the role of innovation and financing** (incl. EU support received so far e.g. FP7, BBI JU, NER300, etc.), the research, innovation and market up-take actions for advanced biofuels are addressed under the SC3-Energy and to some extent in the Biobased Industries Joint Undertaking for H2020 while support is also provided from other programmes (NER300, Investment Plan for Europe, Joint Programming with Member States).

- **On the type of measures that can encourage deployment and market uptake** for advanced biofuels technologies that are ready there is on-going work on the research and innovation empowerment through the action plans that will be proposed by the Integrated SET Plan and STRIA to strengthen market take-up and increase deployment of renewable fuels and advanced biofuels for sustainable transport.
- **On the Advanced biofuels' contribution to the Bioeconomy Vision and EU growth agenda**, the advanced biofuels are a critical element of the overall bioeconomy vision in which they are part of bio-refining business models that can prove their competitiveness and added-value to existing business.
- **Policy-wise, the sector will closely look at contributing to the Communication on decarbonisation of transport and the revised renewable energy policy, due in 2016.** Investments should depend on competitiveness towards which the Commission contributes its share offering supportive Horizon 2020 research and innovation actions, innovation-related policies and innovation financing instruments like InnovFin and EFSI and may facilitate the market enlargement of advanced biofuels in Europe by promoting the coordination and cooperation between the Member States as highlighted in the 2030 policy framework.

## 2. SPEAKING POINTS

- The Energy Union strategy of 25 February 2015 together with the Paris Agreement reached at COP21 created a new momentum to reach the objective of making the EU the world number one in renewable energy.
- Today, research, innovation and market up-take actions for advanced biofuels have received more than **€2 billion** of public support from the Seventh Framework Programme, the Horizon 2020 and the New Entrants Reserve (NER300) Programmes, and from the Joint Programming with Member States. **60%** of this public money financed large scale demonstration of advanced biofuels technologies. Besides the Energy work programme, the Bio-Based Industries Joint Undertaking may finance a limited number of stand-alone bioethanol activities conceived as a stepping stone towards integrated biorefineries and a flourishing bioeconomy.
- Currently, the European Investment Bank foresees to finance first-of-a-kind plants with loans through the pilot facility InnovFin.
- To encourage deployment and market uptake of advanced biofuels we are at present putting in place the integrated Strategic Energy Technology (SET) Plan and the Strategic Transport Research and Innovation Agenda (STRIA) which form the technological framework for research and innovation acceleration in advanced biofuels. Industrial stakeholders' are invited to provide inputs for example with the European Technology and Innovation Platform in Bioenergy.
- The forthcoming renewable energy package and bioenergy sustainability policy will put in place the EU measures needed to attain the 2030 target of at least 27% for renewable energy and the 2030 target of at least 40% greenhouse gas emissions reduction. The Commission is revising the EU Emissions Trading System. Moreover, an action plan on second and third

generation biofuels and other alternative, sustainable fuels will be put in place later this year to aid the decarbonisation of transport and its integration with the energy system. This Action Plan will focus on market push elements such as targets on production capacity and competitive pricing for Biofuels to stimulate market uptake.

- We clearly see the case for R&I demand-side management and supply-side stability as a shared responsibility between the public sector and industry with advanced biofuels substantially contributing to the Bioeconomy Vision and EU growth agenda. Within the Energy Union Actions, the Commission offers its share with the on-going advancement of the necessary policy for sustainable biomass and biofuels, the innovation-related policy and the financing instruments that up-take the innovation risks. However, biomass availability and cost need to be addressed within the overall bioeconomy vision for all biomass origins and uses.
- As I see it, advanced biofuels have a central role in fulfilling the 2030 Energy and Climate Policy objectives. Their importance in the decarbonisation of transport, notably in aviation and heavy road is clear. So the question arises in which way could we best stimulate the cooperation between the Member States and the coordination of their national plans towards achieving the EU policy targets?
- That said, I recognise that the advanced biofuels sector is not moving very successfully in terms of markets. I therefore have 2 questions:
  - Please tell me which other concrete steps are required to create a well function market for biofuels?
  - Second, are you actively cooperating with influential user communities, like the aviation sector?



### 3. DEFENSIVE POINTS

***In the absence of a specific sub-target for renewable energy in the transport sector, is it realistic to expect that advanced biofuels will contribute to the 2030 Energy and Climate targets?***

The European Council concluded in October 2014 that there will be no specific sub-target for renewable energy in the transport sector 2030. Nevertheless, the contribution of advanced biofuels is deemed necessary to achieve the 40% GHG reduction target and the share of 27% renewables in the EU energy consumption. This is because transport is responsible for around a quarter of the EU's greenhouse gas emissions, making it the second-biggest emitting sector after energy and its emissions have been constantly increasing well above the 1990 levels. The energy needs for certain sub-sectors such as heavy road and aviation, representing nearly one third of the transport energy consumption, will continue to depend solely on liquid fuels until 2030 and beyond. Generally, all transport sectors require liquid combustion fuels with high energy density. Even the maritime sector which consumes 10% of the transport energy will require action to reduce its emissions. Moreover, the road decarbonisation scenario for reaching 80% GHG reduction from the 1990 levels under effective technologies and global climate action foresees a contribution of 25% from biofuels by 2050. The Commission does not think it appropriate to establish new targets for renewable energy or the greenhouse gas intensity of fuels used in the transport sector or any other sub-sector after 2020. The Commission has already indicated, for example, that food-based biofuels should not receive public support after 2020. The focus of policy development should be on second and third generation biofuels and other alternative, sustainable fuels

***Investments in advanced biofuels are frozen due to the lack of a market incentive post 2020. Will a proposal of a binding energy based blending mandate of advanced biofuels or alternatively a binding greenhouse gas abatement mandate with dedicated advanced biofuels quota on fuel suppliers be more effective for the roll-out of the necessary investments?***

The market outlook for advanced biofuels is promising and the opportunity for their deployment is now. Long-term investments will rather depend on competitiveness of advanced biofuels and the Commission is working towards achieving it. Besides its supportive research and innovation activities under Horizon 2020, the Commission is preparing the necessary policy for sustainable biomass and biofuels to ensure the supply-side stability. In addition, the Commission has been developing innovation-related policies and financial instruments to support research, development, innovation and market uptake of these technologies. The technology providers also have their share in the commercialisation risk. Beyond clearly demonstrating the benefits of their technologies for the Energy and Climate Policy, they should seek to engage in partnerships with the demand sector and the financial investors and make full use of the Commission's Programmes and financial instruments. To further assist the investments roll-out, the Commission will monitor the national plans and targets to assess whether overall a sufficient market pull for advanced biofuels is in place. If necessary, the Commission may facilitate the market enlargement of advanced biofuels in Europe by promoting the coordination and cooperation between the Member States

***How will the Commission ensure that different policies, such as the Renewable Energy Directive and the Waste Framework Directive, do not contradict the development of***

***advanced biofuels vis-à-vis their expected role for transport decarbonisation, and in particular for aviation?***

The revision of the Renewable Energy and the Waste Framework Directives are now being elaborated concurrently under the Energy Union framework actions. The interactions among the dedicated policy groups bring the unique opportunity to consider in the discussions all impacts of each policy to the other and thus develop both in a synergetic and concerted way. Advanced biofuels and in particular for transport sectors that will depend on liquid fuels in the long-term, may have a role to play as recycled products beyond energy recovery.

***Does the Bio-Based Industries Joint Undertaking finance stand-alone biofuels projects?***

The focus of the Bio-Based Industries Joint Undertaking is to foster the production of highest value-added and resource efficient products, such as bio-based products and industrial materials. This complements the support provided to the production of advanced biofuels, and heat and power from biomass, under Horizon 2020's Societal Challenge 3 "Secure, clean and efficient energy". Following the letter sent on June 20, 2014 by 4 members of the Bio-based Industries Consortium, including Novozymes, to former Commissioner Geoghegan-Quinn, the Commission agreed to allow the Joint undertaking to finance a limited number of stand-alone bioethanol activities conceived as a stepping stone to integrated biorefineries.

#### 4. CURRICULUM VITAE

[REDACTED]



[REDACTED] **Novozymes**

[REDACTED]



[REDACTED], **UPM**

[REDACTED]



[REDACTED], **MG Chemicals**

[REDACTED]



[REDACTED], **ST1**

[REDACTED]



[REDACTED], **EnergoChemica**

[REDACTED]



## **5. BACKGROUND INFORMATION**

### **5.1 Energy Union actions and relation to advanced biofuels**

On 25 February 2015, the Commission adopted 'A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy'. The publication of this strategy created a new momentum to bring about the transition to a low-carbon, secure and competitive economy and to deliver on one of the 10 priorities of the Juncker Commission.

Europe has a policy framework for energy and climate for 2030 agreed at the European Council in October 2014. The Commission is preparing the renewable energy package and bioenergy sustainability policy for the post 2020 period. These proposals will include EU measures and policies, which together with Member States efforts as laid out in their national plans, are needed to attain the 2030 target of at least 27% for renewable energy and facilitate investments in renewable energy. The Commission will promote the coordination and cooperation between the Member States and their national plans for reaching the 2030 energy and climate targets, as highlighted in the 2030 policy framework. The public consultation on the future revision of the Renewable Energy Directive will be completed on 10 February and the one on Bioenergy Sustainability will be launched in February.

In order to meet the 2030 emissions reduction target of at least 40%, the Commission has proposed a revision of the EU Emissions Trading System (ETS) and will also make a proposal on the implementation of the non-ETS target (Effort Sharing Decision), which will be accompanied by a legislative proposal on land use, land use change and forestry (LULUCF). The proposal on the post-2020 effort-sharing decision is expected in Q2-Q3 of 2016, and Transport (along with Buildings and Agriculture) is one of the targeted sectors. In Q3, the Commission should come out with a Communication on the Decarbonisation of Transport. The low carbon fuel sector will be attached to the recognition of the environmental benefits of using sustainable biofuels

The integration of the energy and transport systems together with the improvement of the energy efficiency, the decarbonisation and the progressive switch to alternative fuels in transport are on-going. The Commission is preparing a comprehensive road transport package, promoting more efficient pricing of infrastructure, the roll-out of intelligent transport solutions and enhancing transport energy efficiency. The Commission will take further action to create the right market conditions for an increased deployment of alternative fuels and to further promote procurement of clean vehicles through a mix of national, regional and local measures supported by the EU. A Communication on decarbonising the transport sector, including an action plan on second and third generation biofuels and other alternative, sustainable fuels is foreseen in 2016.

### **5.2 European Strategic Energy Technology Plan (SET-Plan)**

The Commission announced an integrated Energy Union Research, Innovation and Competitiveness strategy for energy and climate in its Work Programme 2016 adopted in October 2015. This aims at using synergies of efforts across the various sectors, including low-carbon energy technologies, transport R&I and global competitiveness of the EU on energy and climate technologies and innovation. Having as main instruments an Integrated Strategic Energy Technology (SET) Plan and a Strategic Transport Research and Innovation Agenda (STRIA), the main objective of this strategy is to accelerate the energy transformation in Europe and ensure that such a transformation is used for the EU industry to reach a leading

position in low-carbon technologies, thereby fostering green growth and jobs. The final strategy is expected to be adopted in 2016.

The European Strategic Energy Technology Plan (SET-Plan) aims to accelerate the development and deployment of low-carbon technologies. It seeks to improve new technologies and bring down costs by co-ordinating research and helping to finance projects. The upgraded SET Plan adopted in September 2015 with the Communication on the Integrated SET Plan, is the first research and innovation deliverable on which the fifth dimension of the Energy Union will be built. It proposes ten focused research and innovation actions to accelerate the energy system's transformation and create jobs and growth, ensuring the European Union's leadership in the development and deployment of low-carbon energy technologies. These actions will contribute to achieve the research and innovation objectives of the Energy Union. Among them, three actions; namely to become the global leader in renewable energy, to reduce the cost of key technologies and to diversify and strengthen options for sustainable transport, address directly the 2030 energy and climate package targets while responding to the Energy Union objectives.

### **5.3 EU support of advanced biofuels in FP7, H2020, NER300, BBI JU and InnovFin**

The public support has reached a total of about €2 billion for research, innovation and market uptake actions in advanced biofuels so far. Under the Seventh Framework Programme (FP7) and the Energy Theme, the Commission supported research and innovation in advanced biofuels with €398 million. Large demonstration projects received €185 million (47%) of this amount and another €55 million under Joint Programming between the Commission and the Member States via the ERANET Plus instrument. Under Horizon 2020 and the Societal Challenge 'Secure, Clean and Efficient Energy', advanced biofuels have been addressed with 12 topics in the two Work Programmes 2014-2015 and 2016-2017 and received so far nearly €70 million for research and innovation and market uptake actions and EUR 30 million for innovation actions. In addition another €22 million was awarded to large demonstration projects under Joint Programming between the Commission and the Member States via the ERANET Cofund instrument. Other parts of the FP7 and Horizon 2020 contributed EUR 486 and 39 million respectively. Furthermore, EUR 933 million were distributed to pre-commercial innovative bioenergy and biofuel projects from the NER300 Programme via the allowances reserved in the new entrants reserve of the Emissions Trading Scheme

Approximately, another €100 million are available for advanced biofuels under the Energy Societal Challenge in the WP2016-2017 calls. Further support up to €100 million for innovative projects on advanced bioethanol is available this year under the Bio-Based industries Joint Undertaking (BBI JU) as a stepping stone towards integrated biorefineries.

In addition, through the pilot facility InnovFin, established between the Commission and the European Investments Bank for financing first-of-a-kind projects, €50 million is available for innovative first-of-a-kind renewable projects in 2016. The budget of this action complements the allocation of €100 million in 2015 to this pilot facility from revenues and repayments generated by the Risk Sharing Financing Facility under the seventh Framework Programme. Furthermore, the bank offers loans for investments for innovation actions notably through the Risk Sharing Finance Facility (RSFF). The financial instrument InnovFin was established by ring-fencing Horizon 2020 renewables budget to top up innovative projects that can repay a loan, either by the promoter/ borrower or through project revenues. The Commission funds will up-take the risks of the loans provided by the European Investment Bank. Today, InnovFin products are demand-driven. There is no earmarking per renewables sector, and operate under a first come – first served basis.

#### **5.4 European Fund for Strategic Investments (EFSI)**

Out of the 42 projects approved by the European Investment Bank so far, 17 projects are in the energy sector and 5 in research, development and innovation. At least 2 projects submitted to the energy sector of the EFSI are currently being evaluated. One project related to advanced biofuels was awarded in 2015 EFSI funds under the Research, Development and Innovation part: The European Investment Bank has granted a €125 million loan to Spanish company Abengoa –a bioethanol producer- to support its research, development and innovation activities, €50 million of which is backed by the EU budget guarantee under the EFSI and the rest €75 million is supported through InnovFin backed by Horizon 2020.

#### **5.5 Bioeconomy and BioBased Industries Joint Undertaking (BBI JU) state of play**

The Bio-Based Industries Joint Undertaking (BBI JU) is a new €3.7 billion Public-Private Partnership between the EU and the Bio-based Industries Consortium. Operating under Horizon 2020, it is driven by a Strategic Innovation and Research Agenda (SIRA) developed by the industry.

The political case for BBI is straightforward: it attracts private investments in Europe, hence enabling the EU to compete in the global bioeconomy race; it sources and produces bio-based products such as food, feed, chemicals and materials and fuels locally, hence reducing the EU's dependency on imports; it lays down the foundations of the post-petroleum society, hence contributing to meeting EU's climate change targets; it creates a new economy with a strong emphasis on regional development, hence boosting sustainable growth and jobs. .

## **5.6 Sustainable Biofuels and ILUC Directive**

First generation (1G) biofuels are derived from the edible part of food & feed crops (cereal starch, sugar or vegetable oil). It includes both, conventional bioethanol and biodiesel. Second generation (2G) biofuels are made from non-food & feed feedstock (e.g. straw, waste, or energy crops). Generally they can be derived from lignocellulosic feedstock or organic wastes. Third generation (3G) biofuels are those from the conversion of CO<sub>2</sub> and renewable energy with the help of autotrophic organisms and for the time being are essentially biofuels from algae. The term "advanced biofuels" encompasses all biofuels with better fuel properties than 1G biofuels, or produced from non-food feedstock sources. It includes 2G, 3G and some novel 1G biofuels (such as Hydrogenated Vegetable Oils- HVO). For reasons of sustainability and security of supply, the EU research and innovation priorities today focus on second-generation and advanced biofuels and on more efficient and environmentally-friendly technologies, to avoid competition with food, to reduce land demand and to enlarge the range of non-food resources as biomass feedstock.

To be considered sustainable under the RED and thus receive government support or count towards national renewable energy targets, biofuels must achieve greenhouse gas savings of at least 35% in comparison to fossil fuels, 50% in 2017 and 60% in 2018 only for new production plants. Emissions from cultivation, processing, and transport are taken into account in greenhouse gas savings. Biofuels cannot be grown in areas converted from land with previously high carbon stock such as wetlands or forests and cannot be produced from raw materials obtained from land with high biodiversity such as primary forests or highly biodiverse grasslands.

The ILUC directive foresees a 7% cap for conventional biofuels and biofuels from energy crops not meeting the sustainability criteria and a non-binding target of 0.5 % for advanced biofuels by 2020. Member states shall seek to achieve the objective of a minimum of advanced biofuels produced and set within 18 months a national target. The indicative target is double counted towards the 10% RES target in transport. The eligible feedstocks for the 0,5% target are listed in Annex IX, part A of the directive. Measures should be in place for a comprehensive and technology-neutral approach for a promotion and expansion of advanced biofuels after 2020. The effectiveness of the incentives for development and deployment of advanced biofuel technologies should be taken into account. The Commission should present in 2018 a renewable energy roadmap for the post 2020 period including for the transport sector.

## **5.7 Biofuels and climate change**

To assess the net effect on greenhouse gas emissions of replacing fossil fuels by biofuels, one has to analyse emissions on the whole process of producing, transporting and using the fuel. Life-Cycle Analysis is the main tool used to do this. It compares a specific biofuel system with a reference system, often petrol.

Greenhouse gas balances differ widely depending on the type of crop, on the location, and on how feedstock production and fuel processing are carried out. Biofuels from some sources can even generate more greenhouse gas emissions than fossil fuels.

A large factor contributing to greenhouse gas emissions is the amount of fossil energy used for feedstock production and transport, including for fertilizer and pesticide manufacture, for cultivation and harvesting of the crops, and or in the biofuel production process itself.

Emissions of nitrous oxide are another important factor, released when nitrogen fertilizers are used, with a greenhouse gas effect around 300 times stronger than that of carbon dioxide.

By-products from biofuel production such as proteins for animal feed make a positive contribution to climate change mitigation because they save energy and greenhouse gas emissions that would otherwise have been needed to produce the feed by classical ways.

Most studies have found that producing first generation biofuels usually yields reductions in greenhouse gas emissions of 20 to 60% when fossil fuels are replaced provided the most efficient systems are used and carbon dioxide emissions from changes in land-use are excluded.

However, changes in land use can have additional effects on greenhouse gas emissions. When forest or grassland is converted to farmland to produce feedstock, or to produce crops that have been displaced by feedstock production, carbon stored in the soil is released into the atmosphere, together with the carbon originally stored in the primary forest. The effects can be so great that they negate the benefits of biofuels. These indirect land-use changes (ILUCs) are regrettably very difficult to assess. It is therefore a great challenge to try to cover them in legislation in a meaningful way.

The problem does not occur with later generations of biofuels, not produced from crops, but rather from waste or by biological means. They don't give rise to ILUCs and therefore usual have a greater greenhouse gas saving. However, some of these techniques still require developments and innovation.