

Core Theme 7

RES in Transport



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1 In a Nutshell

With less than four years to go, Member States (MS) are now in a crucial phase of implementing the Renewable Energy Directive and achieving the target of 10% renewable energy in transport. According to the latest data from Eurostat, it is clear that most EU countries are on track to meet this target. MS utilize a number of policies to stimulate the use of renewable energy in the transport sector:

Most Member States work with binding blending obligation targets, but tax measures and subsidies are still very common instruments in Europe. The share of renewables in transport is currently around 6%¹.

However, some Member States are facing difficulties to achieve the final goal, since they are fully dependent on imports without having their own blending facilities. Electricity and hydrogen are by far not enough to bridge that gap. Due to the fact that every Member State has to reach the 10% target in 2020, tailor-made solutions for individual countries are not easy to find.

Since the Renewable Energy Directive (RED) came into force in 2009, the framework has changed significantly. The role of biofuels in transport, in particular, has created more controversial discussion compared to seven years ago. With only four years to go, most Member States are rapidly increasing the share of renewable energy in transport, in order to fulfil the 2020 target of 10%. Currently, however, it is still unclear how EU Member States will continue with the decarbonisation of fuels in transport after 2020. The political agreement for the 2030 climate and energy package agreed a 40% greenhouse gas reduction target binding on Member States, but no sector specific targets. Will Member States continue their obligations for the share of renewable energy in transport? Or will they pursue a more CO₂-reduction based target? What role will the EU take in supporting the 2030 package? The discussion about the 2020-2030 energy framework is still ongoing and the outcome of these discussions is still unclear. This uncertainty has a negative effect on investments in advanced biofuels development and deployment. It is the hope of many that the soon to be published Communication of the European Commission on the strategy of decarbonizing transport will bring more clarification to this debate. These political uncertainties and the significant changes in opinion, particularly regarding the sustainability and role of food crop derived biofuels as a solution for the decarbonising of transport, are probably the biggest differences between CA-RES Phase I and CA-RES Phase II.

Apart from this, the long debate in the Council about the ILUC (Indirect Land Use Change) legislative framework overshadowed the discussions in Core Theme 7 (CT7). It showed that there are different opinions between Member States about the role food crop derived biofuels should play in the future, about sustainability, the environmental impact of conventional food crop based biofuels and many other relevant aspects.

¹ Eurostat (2016). Energy from Renewable Sources. Luxembourg, March, 2016. http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_from_renewable_sources

During the second phase of the Concerted Action (CA-RES II), the discussions focussed on the implementation of the ILUC legislation in respect to Article 7a of the Fuel Quality Directive (FQD) and measures to optimize the fuel mix like the introduction of E10 and electric vehicles now that crop-based fuels are limited. Besides this, participants of CT7 looked at the availability and stimulation of advanced biofuels at competitive prices and put focus on the different alternative fuels and which role they should play in different transport modalities.

Given the fact that the availability of advanced biofuels, mostly with a better environmental performance than conventional ones, is currently under pressure, CT7 participants discussed the question of whether the incentives are enough in order to stimulate their production. Furthermore, do the greater environmental benefits from these types of biofuels justify the expensive incentives? What will the ideal mix, in relation to electricity and hydrogen, be in 2020? These questions set the basis for the discussions within Core Theme 7 of CA-RES II. CT7 participants looked at the total life cycle environment performance of different types of biofuels and learned that the classification in conventional and advanced biofuels does not say everything about their real impact. To answer the questions, which are the best biofuels and how we can stimulate them, a more holistic approach is needed.

Core Theme 7 participants also learned that there are multiple drivers and several families of technologies (biochemical, thermochemical and pyrolysis). Some of these technologies are at a turning point towards commercialisation: lignocellulosic ethanol, butane technology and a number of gasification routes. These technologies are being demonstrated or will be demonstrated as soon as plants are in the commissioning stage. Some options are still at the research and demonstration stage, but look very promising.

Participants, within the framework of RED and the implication of the FQD for the achievability of the RED target, looked at which fuels will play a role in 2020. How can we reach the 2020 targets? Which renewable fuel will play a role in which transport modality? The National Action Plans, in which Member States give their vision on 2020, will also have an impact on the period beyond 2020.

The achievability of the 2020 goal was a central topic in all of the CT7 parallel sessions. The expected mix of alternative fuels, including electricity in 2020, was a subject of discussion.

CT7 participants learned that this mix significantly differs amongst EU countries. Every country makes its own considerations: many countries believe that electric driving will play a more and more important role, while others think biomethane will play a significant role in decarbonising transport. Other EU Member States are of the belief that traditional ethanol or biodiesel will continue to be important. Under Core Theme 7, a Task Force on biomethane was set up that tackled various issues, including the reporting of biomethane under Art. 22 RED, its implications for national & cross-border trade, and mass balance in the RED.

Both the ILUC and the FQD have an effect on the current implementation of the Renewable Energy Directive and the fulfilment of the 10% target for transport. The implementation of the ILUC legislation in respect to Article 7a of the FQD raises a lot of questions for the Member States. There is uncertainty regarding the availability of most advanced biofuels at competitive prices which fall under the definition of Annex IX A to fulfil the sub-target of 0.5%. Another crucial point is the compliance with the FQD in 2020. How can oil companies show compliance using Upstream Emission Reduction Rights (UERs)? A harmonized European system to control this issue is lacking so far. A main conclusion can already be drawn: a stable EU political framework for renewable energy in transport is of utmost importance for further policy measures at Member State level and for investments that have to be made by industry for sustainable fuels in the future.



2 Topic in the Spotlight

In the course of the years 2013-2016, CA-RES II meetings were more and more influenced by the approaching end of the 2020 policy framework. As a result, discussions focussed on uncertainties that have an effect on achieving the 2020 targets. Participants of CT7 noticed that the current climate package proposal 2020-2030 gives no clear incentive for investments in the transport sector. Additionally, the lagging implementing rules in Article 7a of the Fuel Quality Directive and the ILUC proposal resulted in investment uncertainties. But a milestone was achieved in 2015 when the Council, Parliament and Commission agreed on a compromise on how to deal with indirect land use effects of biofuels in the ILUC Directive. This Directive introduces a cap on conventional biofuels of max 7% as well as a sub-target for most advanced biofuels of 0.5% (indicative). A list of feedstocks and fuels that contribute to this sub-target is included in an Annex to the ILUC Directive.

The level of the cap on conventional food crop derived biofuels is a national discussion. Some countries aim for the maximum of 7% due to the use of national resources and limited access to advanced fuels and conventional waste derived fuels, others aim for a lower cap mainly due to research published by the European Commission, which indicates that 7% food crop biofuels could increase greenhouse gas emissions when ILUC is accounted for. While some Member States will launch double counting to fill in the gap between the 7% conventional biofuel cap and the 10% target, others consider to end this possibility to optimize the contribution to the overall renewable energy goal of the RED.

In the ILUC Directive, Annex IX is included to clarify which feedstocks qualify to produce fuels that may be double counted to fulfil the 10% target. At the same time, Part A of this Annex shows the feedstocks that may count towards the sub-target of most advanced biofuels. Many questions still remain on the practical use of this list.

The possibility to use Upstream Emission Reductions (UERs) for fulfilling the 6% FQD target came up during the discussions. The major challenge here is to find certified additional rights within a fraud proof system between all Member States that will be up and running by 2020.

With the ILUC Directive in place, calculations on the fuel mix in 2020 and availability of feedstocks can be made. That also puts new focus on the blend walls. Some Member States consider the introduction of E10 and they exchange experiences with countries that have already done so. The use of drop-in fuels like Hydrotreated Vegetable Oil (HVO), being a diesel substitute, can offer a solution to reach the 10% renewable energy in transport in spite of the blend walls.

3 Challenge Meets Solution

3.1 Highlights from the Discussions

During the CA-RES II meetings of CT7, it was clear to the participants that renewable energy will play an important role in the transport sector in the future. While hydrogen, biogas and electricity will probably gain more significance post-2020, biofuels are at the moment the major player in increasing renewable energy in transport. It is expected that this will still be the case in the period post-2020, especially in long distance freight, aviation and probably shipping.

During the first meeting of this Core Team, the question of “what we will do beyond 2020” was a constant factor. The climate package framework 2020-2030 proposed by the Commission in its current form clearly places the responsibility for the implementation of renewables on separate Member State policies. At the same time, the White Paper “Roadmap to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System”² outlines a strategy to reduce CO₂ emissions in the transport sector by 60% until 2050, based on 1990s level.

Most Member States think that renewable energy will play a more important role in the future transport sector. Which type of renewable fuels the different Member States focus on until 2020 depends strongly on their natural resources, agriculture and infrastructure. In the long-term, advanced biofuels are commonly seen as the most desired in order to satisfy the industries’ demand for better performing biofuels and the political demand to reduce the risk of ILUC. Advanced biofuels produced from lignocellulosic feedstocks are still not available at competitive prices, although participants learned that some types of advanced biofuels are close to market introduction. In 10-15 years’ time, these types of biofuels could play a significant role.

The White Paper goals are rendered in different papers, like transport roadmaps, in several Member States. This outlook on the fuel mix beyond 2020 is important to attract investors.

Good practices are shown. But based on the experiences of Member States, who are at the forefront of development and market implementation, a clear policy framework beyond 2020 with long-term perspective incentives is now needed for actual investments. A Communication of the European Commission on decarbonisation of transport is expected in the first half of 2016 and a proposal for a new renewable/bio energy policy (RED II) is planned for the second half of 2016.

² European Commission (2011): White Paper - Roadmap to a Single European Transport Area - Towards a Competitive and Resource Efficient Transport System. Luxembourg, March, 2011. http://ec.europa.eu/transport/themes/strategies/doc/2011_white_paper/white_paper_com%282011%29_144_en.pdf

During the CT7 parallel sessions, experiences were shared on electric vehicles in Norway and the Netherlands, high blend biofuels in France, and on the achievability of the targets and renewable fuels from non-biological origin in the United Kingdom. There are many promising developments that call for different approaches depending on the policy framework within individual Member States.

The ILUC Directive and the FQD reporting rules were issues that featured quite prominently in the last couple of CT7 parallel sessions. The discussions that took place during the plenary meetings showed that Member States are in the process of taking up policy choices, which in many countries turns out to be a challenging process as various transport-related targets need to be taken into consideration (the 10% target for RES in transport, the 6% FQD target and the 7% cap and 0.5% sub-target introduced by the ILUC Directive). The discussions revealed that there are still many questions on the effect and the impact of the choices to be made. The evolving policy context continues to affect the current implementation of the Renewable Energy Directive.

Each Member State, making its own choices depending on resources and market position, discussed the considered level of the cap on conventional food crop derived biofuels, the implementation methods of Annex IX in relation to the sub target, the use of HVO, drop in fuels and higher blends, waste hierarchy and/or making the 6% FQD target leading instead of making the 10% RES in transport target leading. The new recognition period for several voluntary systems is important for the biofuel market and has therefore been discussed at the CA-RES II meetings. Moreover, renewable energy from non-bio origin is entering the market. The European Commission considers that, if these new fuel sources can be proven to be renewable, they may count towards the (sub)target.

A Task Force on Biogas under CT7 explored biogas' contribution in transport, cross border issues and accounting mechanisms.

The IEE-project BioGrace II has shown technically incorrect and inconsistent GHG values as set in Annex V of the RED. The timeframe to implement possible corrections in the current directive would bring us to 2020. Therefore, possible changes and updates could be included in the RED II proposal. Calculations until 2020 will thus be made on the current values. It was noted that in RED II the possibility for a more frequent update of reference values could be considered.

3.2 Experiences

Electric Vehicles

Electric vehicles (EVs) are very successful in Norway: 15% of all new cars sold are EVs, due to tax incentives, free access to public transport lanes, ferries, parking and withdrawal of road toll. While conventional cars are highly taxed, electric vehicles enjoy these special (fiscal) treatments in order to make them competitive. The program was so successful that bus lanes now have congestion problems due to all the EVs. It must be noted that in Norway EVs are often the second or even third car in a household and that EVs are not necessarily replacing conventional cars.

Experiences in the Netherlands are quite comparable, although with less impressive figures. In the Netherlands in the year 2015, 5% of all new cars sold were (semi)-electric vehicles, namely plug-in hybrids and full-electric cars. This development was stimulated by tax incentives accompanied by free parking facilities and a good charging infrastructure. The success of the stimulating policy opened a social debate about the effects of this policy in relation to the small group that benefits from it. As a result, the tax incentive was reduced to pure electric vehicles only.

Despite the negative aspects, most participants agreed that temporary tax incentives are needed in order to stimulate a market introduction of new innovations, like battery electric vehicles (BEVs), fuel cell electric vehicles (FCEVs) and plug-in hybrid electric vehicles (PHEVs).

High Blends

France has successfully implemented two types of (high) blend fuels: the E10 and E85 bio ethanol fuels, which are widely available and accepted by the public. Biofuels play a major role in France for achieving the 2020 targets. In 2015, the blending obligation in diesel fuels was 7.7% and 7.0% in gasoline fuels (including a maximum target of 0.35% double counting biofuels). This target is one of the highest in Europe, a fact that was aided by the blending obligation and the tax incentives. The positive experience gained from E10 is especially valuable for other countries to learn from.



4 Main Findings and Achievements

During the second phase of the CA-RES, Core Theme 7 focussed on a wide range of topics. Starting from the environmental impact of advanced biofuels and policy instruments to stimulate them at competitive prices, followed by the simplification of the sustainability certification and the harmonization of voluntary and national systems, followed by future fuel mix strategies and ending up with the implementation of the ILUC legislative framework in relationship to the fulfillment of the 10% RED target, Article 7a of the FQD and its Upstream Emission Reduction Rights (UERs).

Biofuels and the Environment

Environmental impacts of biofuels differ quite a lot. There remain differences of perspective on these impacts too, particularly with regard to food crop derived biofuels and ILUC. The challenge is to make use of the available feedstock for advanced biofuels in the period towards 2020 and beyond. The main aspects of this challenge are technology, competitiveness (reasonable prices) and sustainability. To further develop advanced biofuels, we need long-term incentives, whereas double counting is only a temporary incentive. In an ideal situation, biofuels should be considered on their sustainability performance and not be categorized in generations or conventional vs. advanced. Additional measures, besides the common sustainability aspects, which should be taken into account, are the quantity that is needed, the location and (local) market circumstances.

The challenge is how to translate this complex matrix into practical policy instruments. Participants learned that within a timeframe of approximately 10 years, it is expected that lignocellulosic advanced biofuels can be available at reasonable prices. Next to lignocellulose, other Annex IX feedstocks are expected to play an increasingly important role, their importance depending on availability of the feedstock, GHG savings of the biofuel produced from the feedstock and price of the biofuel.

However, there is still a lot of uncertainty since there is no long-term (post-2020) policy framework, and therefore no investment security, for biofuels. Clear and stable policies are a prerequisite for advanced biofuels to have a significant market share in the period between 2020 and 2030. Some Member States have set targets for advanced biofuels after 2020, and others are considering targets for 2030.

Certification of Sustainability

Participants took notice of the fact that the European Commission has written a letter to the voluntary certifications systems in order to apply for the extension of the control mechanisms earlier in the certification chain of custody of double counted biofuels, especially Used Cooking Oil Methyl Esters (UCOME), in order to detect and avoid fraud. A Task Force was set up in order to inventory signals of fraud with UCOME. This resulted in a voluntary agreement between the implementing agencies of various Member States to inform each other in case of suspect transactions. The work of the Task Force on Used Cooking Oil (UCO) Fraud issues was set on hold in awaiting of results of certification system improvements (based on the EC letter).

One Member State has evaluated its national system for sustainability requirements. Even though a national system has proven to be a cheaper alternative than a voluntary scheme certification to provide evidence of sustainability, even national systems are creating a high economic burden on industry to provide proof of sustainability. The costs are especially high for SMEs, e.g. biomethane producers.

Post-2020 Framework

During the discussions, Core Theme 7 participants took notice of the Council conclusions regarding the European Climate Package 2020-2030, where the Council applies for the examination of instruments and measures for a comprehensive and technology-neutral approach for renewable energy sources in transport also after 2020. However, a clear policy framework for the period after 2020 is lacking so far. Up to now it is unclear how the European Union will support the decarbonisation of the transport sector and what EU policy framework will apply for renewable transport fuels, including sustainability criteria. The discussion about the 2020-2030 energy framework is still ongoing and the outcome is still unclear. These uncertainties played a significant role in our discussions in Core Theme 7. CT7 participants emphasized the need to share best practices pertaining to the implementation of the directives, which both have a timeframe of up to 2020. Every policy and investment decision taken now by economic operators has an impact on the timeframe beyond 2020.

The European Commission is still thinking about post-2020 framework for low-carbon fuels and GHG savings in transport. Member States were informed that a Communication of the European Commission on decarbonisation of transport can be expected in June 2016 and a proposal for a new renewable/bioenergy policy (RED II) is planned for the second half of 2016. A public consultation on a new renewable energy directive has also been held.



The Right Mix

The lack of a clear post-2020 framework makes it difficult for Member States to make the necessary policy decisions and also provides instability for future investments in the market for biofuels or other renewable energy sources for transport. As a result, it has a major impact on the development of future strategies on the fuel mix for the upcoming decades. Some Member States are struggling with the right mix of conventional and advanced biofuels, electric vehicles, biomethane and other forms of renewable energy. Member States make their own considerations and the strategies among countries differ a lot. A significant number of Member States believe that the zero emission power train in passenger cars will provide an increasingly important contribution to achieve the long-term perspective goals, but also that this will take a long time, and that not all transport sectors can be electrified. During the CT7 parallel sessions, two Member States presented examples of what fiscal incentives can do to stimulate a significant share of electric vehicles on the road.

Meanwhile, other Member States believe that the future lies in biomethane. In this context, Core Team 7 established a Task Force that examined the contribution of biomethane in transport and cross-border trade issues and the counting mechanisms. The Task Force explored the potential of biomethane national and cross-border trade by efficient transport (like natural gas grids) in a transparent way without infringing existing legislation, keeping incentives and without forcing stakeholders to shift to less efficient transport.

Most Member States consider that biofuels can play a significant role in decarbonising the transport sector beyond 2020, though there are different views on whether and to what extent food crop derived biofuels should make a contribution. At least some Member States already intend to continue with blending obligations after 2020, even though a European framework is lacking. Some of these countries do have a strong local production of ethanol or FAME.

Some Member States presented their future fuel mix strategies. Most countries agree that the limited available sustainable biofuels should better be used in transport modalities like long distance freight, shipping and aviation rather than in passenger cars. This would make more sense in the long-term.



Heavy Duty Transport

When it comes to heavy duty transport, CT7 participants learned that the technical solutions from car manufacturers are already available, but commercial scale of available energy sources is the bottleneck. In this context, strong policy measures and long-term perspective for investments could help to increase the commerciality of those energy sources. Local authorities have a strong role to fulfil when it comes to zero emission city logistics and clean power for transport. National authorities should take the lead in setting out a long-term stable policy framework and a harmonised European approach. Taxes, for example, should be based on energy or even better CO₂ and not, like now, on the type of fuel. The role of LNG or CNG in heavy-duty transport is probably limited, whereas biodiesel and HE95 (high blend ethanol) could play a bigger role in decarbonising the sector.

Implementing the ILUC Directive

CT7 participants considered the importance of the ILUC legislation. This legislation is crucial for many Member States to fulfil the 2020 target. For the consumer acceptance of biofuels, especially high blends like E10, it is of utmost importance that no doubts on sustainability could damage the image of such fuels. Although the ILUC agreement is probably not the most optimal solution, it gives Member States control over the level of contribution from food crops towards meeting their targets.

All Member States are right in the middle of the implementation of the ILUC Directive. The discussions that took place showed that Member States are still deciding which policy choices to take, especially when taking all the various transport-related targets into consideration. The discussions revealed that there are still many questions about the effect and the impact of the choices to be made.

Upstream Emission Reductions

There are also more open questions than answers for the time being on the use of Upstream Emission Reductions (UER) to fulfil the FQD target. The major challenge is to find certified additional rights within a fraud proof system between all Member States up and running by 2020. The possible use of the clean development mechanism (CDM) created as part of the Kyoto Protocol was suggested as a solution to that.

5 Abbreviations

Participating countries are referred to according to their two-letter country codes as defined by ISO 3166-1 alpha-2 standard (AT – Austria, BE – Belgium, etc.).

Abbreviation	Meaning
BEV	Battery Electric Vehicle
CA-RES	Concerted Action on the Renewable Energy Sources Directive
CDM	Clean Development Mechanism
CT7	Core Theme 7
CO ₂	Carbon dioxide
EU	European Union
EV	Electric vehicle
FAME	Fatty Acid Methyl Esters
FCEV	Fuel cell electric vehicle (running on hydrogen)
FQD	Fuel Quality Directive (2009/30/EC)
GHG	Greenhouse Gas
HVO	Hydrotreated Vegetable Oil
IEE	Intelligent Energy Europe
ILUC	Indirect land use change (sustainability aspect of land based biofuel crops)
MS	Member States
PHEV	Plug-in Hybrid Electric Vehicle
RED	Renewable Energy Directive (2009/28/EC)
RED II	The recast of the Renewable Energy Directive
RES	Renewable Energy Sources
UCO	Used Cooking Oil
UCOME	Used Cooking Oil Methyl Ester (biodiesel made from UCO)
UER	Upstream Emissions Reduction
VS	Voluntary Schemes in order to verify the sustainability of biofuels and liquid biomass to show compliance with the directive

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For further information please visit www.ca-res.eu

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