

# CA-RES

WORKING GROUP 8

## RES in transport and biofuels



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# In a Nutshell

The Working Group Renewable Energy Sources in transport and biofuels deals with the implementation of Articles 3.4 and 17 - 21 of the RES Directive, which requires Member States to ensure that at least ten percent of all energy consumption in the transport sector comes from renewable sources.

All energy carriers which can be used in transport are included under this definition. Biofuels, biogas, electricity and hydrogen from renewable sources can all play a role.

In order to help Member States with the implementation of the relevant articles, the participants have shared their views, information and best practices relating to various topics. In the starting phase, the participants gave an overview on the current level of implementation in the Member States and the obstacles they are faced with. They did this based on the National Renewable Energy Action Plans. It was immediately clear that policy in Member States differs depending on how they will meet the 2020 target. For example, some Member States have subsidies or other financial incentives and most Member States have established a suppliers' obligation in order to increase the amount of renewable energy in transport.

The implementation of the sustainability criteria for biofuels and the control mechanisms, such as certification schemes were discussed as well. Member States policy regarding the certification of sustainability shows a varied picture. Some Member States focus on voluntary schemes, adopted by the Commission. Others focus more on their own national system. Participants concluded that the co-existence of two types of schemes can cause confusion and often makes it difficult for suppliers to show compliance with the criteria in the directive. However, harmonisation between the schemes, especially the national ones seemed to be difficult.

Another very relevant issue which is discussed quite often is the double counting of advanced biofuels. This is probably the most notable issue which shows that harmonisation of policy is a huge challenge. Participants discussed the definitions for wastes and residues, support schemes for advanced biofuels and signs of fraud in the market for biodiesel, produced from used cooking oils. Although only eight Member States have fully implemented this part of the directive, this topic was of great interest to all participants.

## One Topic in the Spotlight

In light of the achievability of the target the participants discussed the availability of alternative renewable fuels and the relationship with the CO<sub>2</sub> emission target in the Fuel Quality Directive. The scope during the starting phase was focused on implementing issues and the variety of policies required to achieve the 2020 target. Later on in the process participants felt a greater need to exchange views and best practices regarding the double counting issues. The directive at this point gives more scope for interpretation and so the implementation remains far from being harmonised.

In the last phase the group focused on new developments like the indirect land use changes of conventional biofuels (ILUC). A practical aspect of this discussion is the Low Indirect Impact Biofuels (LIIB) methodology which could stimulate new ideas regarding national policy frameworks in order to create incentives for low ILUC biofuels. This methodology is approved and works well on a local farm level. Local farmers and producers can choose this certification method in addition to existing voluntary schemes or national schemes. The certifying body then looks concretely at the indirect land use change impact. Especially unused waste land which is cultivated for biofuel crops or intensification of the use of existing farm land can show the low indirect impact. This method shows also that there are huge differences between various conventional biofuel crops.

During the last three years the learning curve for the group has been huge. Where in the beginning phase the knowledge about the directive differed a lot among the members, we now have advanced discussions about complex issues. One of the main results is that the group is aware of all the different approaches in the various Member States and the impact of these in the European market. The discussions led to many bilateral contacts and the first steps towards a more harmonized approach can be seen. An example which can be mentioned is that on a regional scale Member States recognised other national systems. A number of Member States is establishing a new legal framework, including a list with materials which count twice towards the target. Even if the lists differ in some aspects from each other, this development can be seen as a successful outcome from the integrated discussions in the group.

A fragmented biofuels policy can cause market distortion. Every kind of clarification or harmonisation and every kind of collaboration between individual Member States can help market players who are operating all over Europe. Even though there is still a long way to go we have set out steps in the right direction. The greatest added value is the exchange of knowledge and best practices between participants.

The topic discussed the most during the Concerted Action in this working group was Article 21.2 of the RES Directive. This Article says:

“For the purposes of demonstrating compliance with national renewable energy obligations placed on operators and the target for the use of energy from renewable sources in all forms of transport referred to in Article 3(4), the contribution made by biofuels produced from wastes, residues, non-food cellulosic material, and ligno-cellulosic material shall be considered to be twice that made by other biofuels.”<sup>1</sup>

This Article is probably the most complex one, taking also into account that only every third country has fully implemented it yet. The directive does not provide a clear definition on what wastes and residues are. Countries can decide their own definitions. This leads to a fragmented situation in Europe where some feedstocks are counted twice in country A but not necessarily in country B. The participants gave a mandate to a working group under the Renewables Fuels Regulators Club (REFUREC) to devise a list of biofuels which can be double counted. This list could be used as an inspiration for Member States to set up national lists. Although national lists still differ from each other, the REFUREC list helped Member States to make one collaborative list.

Participants also discussed the certification of these types of biofuels. Compliance with the RES Directive is only guaranteed by the certification systems when it comes to the greenhouse gas emission reduction target. Other aspects, such as the control of whether the feedstock really is a waste, are an obligation of the Member States. This was detected as a problem. This problem is still not solved and should be discussed further in the future. First initiatives are taken by verifiers and certification systems need to come up with ideas to address this.

The participants concluded that in some cases the double counting mechanism is a powerful instrument, which can cause undesirable effects and in some cases signs of fraud were detected. This is especially problematic for biodiesel, produced from used cooking oils (UCO). We concluded that the price of UCO is sometimes even higher than the price for the cheapest

<sup>1</sup> Directive 2009/28/EC article 21.2



virgin oil. In order to better understand what is taking place in that market it was agreed to build a steering committee, which sets out a research request to the Joint Research Centre of the Commission. The research is now finalized and has come with some initial conclusions:

- The import of UCO has significantly increased during the last years, especially from outside the EU.
- The market of UCO collectors is not very well organized.
- The price increased significantly.
- The chemical composition changes when virgin oil is used; while heating virgin cooking oil the number of fatty ethers changes.

The group concluded that these results are worth to study further. It was agreed to follow up on this in order to give concrete relevant insights to facilitate the policy maker in establishing tools to avoid fraudulent behaviour. Talking about double counting biofuels also means talking about advanced biofuels. This type of biofuels does not normally compete with food or feed and does have a low risk on ILUC. It was concluded that for some advanced techniques the double counting mechanism is still insufficient to stimulate market introduction at reasonable prices. This is especially the case for the production of ethanol from lignocelluloses (LC). This conclusion leads the discussion onto the question of whether countries should create additional incentives in order to stimulate this type of biofuels.

Especially for advanced biofuels produced from lignocelluloses the support of Member States is in a research and development (R&D) phase.

Besides the eight countries which have fully implemented the double counting mechanism, eight other Member States have a subsidy scheme and/or a fiscal measure in place as an incentive for the development and production of 2<sup>nd</sup> generation biofuels. Most Member States that have support schemes in place do not prioritise specific feedstocks.

Most Member States have support programmes in place for R&D projects on advanced biofuels. These programmes are either specific programmes aiming to promote R&D in advanced biofuels or general support programmes, for which advanced biofuel projects can be eligible. Eight Member States are currently supporting pilot or demonstration plants for the production of advanced biofuels or LC biofuels. Technologies include the production of Fischer-Tropsch/ Biomass to Liquids (BTL) products, Bio Synthetic Natural Gas (SNG), Dimethyl Ether (DME),

lignocelluloses ethanol, and biofuels from algae and wastes/residues. In order for projects to be eligible for the support scheme the same sustainability criteria as defined in the EU Renewable Energy Sources Directive (2009/28/EC) are mentioned: innovation, production potential and costs, energy security, greenhouse gas (GHG) balance, and domestic economic development. Time scales for support measures in pilot and demonstration projects are typically 3-6 years. Past experiences of support schemes for advanced biofuels are limited among the Member States.

By the end of the discussion on double counting of advanced biofuels the group concluded the following:

- Despite their benefits in terms of sustainability and diversification of feedstocks, the contribution of advanced (or Article 21.2) biofuels to the 2020 target of 10% renewable energy in transport is expected to be small.
- Double counting proves to be sufficient for creating a market demand for developed and inexpensive technologies producing biofuels from wastes and residues (such as biodiesel from UCO). However, double counting is not effective in promoting ligno-cellulosic (LC) biofuels, which are in the development phase and are more expensive.
- Costs of LC biofuels could be reduced substantially in the next decade, but this cost reduction only occurs if production plants are actually built. Currently, only a few EU Member States are supporting a limited number of pilot and demonstration projects for LC biofuels. More action is needed at European level.
- For LC biofuels to develop further, long-term policy and investment security is needed to encourage industry investments, which is a challenge due to uncertainties regarding policy (i.e. ILUC discussion) and the economic situation in the EU.
- A possible support measure for advanced biofuels is to implement a legal sub target for LC biofuels in the long run, under the condition that its design is in accordance with EU legislation and WTO rules. Legal sub targets for biofuels from used cooking oils seem to be unnecessary because the production of this biofuel is already ongoing.

# Challenge Meets Solution



In the light of the achievability of the target, the working group discussed the availability of alternative renewable energy in transport. Independently from the outcomes of negotiations regarding the Commission proposal on ILUC, the necessity to find alternatives was broadly shared. Availability will be the challenge in approaching years.

This topic also led to discussions on how to achieve the 10% target in 2020, especially with a proposed cap on conventional biofuels. The implementation of the sustainability criteria for biofuels and the control mechanisms, such as certification schemes were also discussed. Member States policy regarding the certification of sustainability shows a varied picture. Some Member States focus on voluntary schemes, adopted by the Commission. Others focus more on their own national systems. Participants concluded that the co-existence of two types of schemes can cause confusion and makes it problematic for suppliers to show compliance with the criteria in the directive. On the other hand, harmonisation between the schemes, especially the national ones seemed to be challenging.

### 3.1 Member States' Experiences and Expectations

When the EU Member States were questioned regarding the achievability of the RES Directive target of 10% and the achieved mix of renewable energy in transport in 2020 in their own countries and the EU as a whole, most EU Member States estimated the attainment of the RES Directive target to be moderate (8 MS) or high (5 MS). 4 MS estimated it to be very high. 2 MS mentioned that if the new EC proposal is adopted, the achievability will change from (very) high to low.

The most important factor which influences the achievability of the 10% RES Directive target is the (un)availability of biofuels/biomass, especially the low/uncertain development of advanced biofuel production. The (un)availability of biofuels in compliance with the sustainability criteria and the (un)availability of (sustainable) agricultural biomass at reasonable prices should also be mentioned.

During the discussions several MS mentioned the availability/uncertainty of a (long-term) national/EU legal framework as a very important factor. Another factor is the double counting of biofuels produced from wastes and residues. Several economic factors are mentioned, such as the production costs, fuel prices, and the economic competitiveness of new technologies. Looking at the solutions most Member States see the incentives for promoting alternatives to conventional biofuels as most reasonable. Some MS indicate that no further measures are needed. Some MS did not suggest a specific alternative, but argued that alternatives in general should be supported. Several participants cited the importance of double/quadruple counting of biofuels e.g. from wastes and residues. In addition, alternatives for liquid biofuels were mentioned: biogas, electricity (and hybrid cars), hydrogen, and renewable methanol. By taking a closer look at biogas it was concluded that there is only limited experience with biogas in transport. Only 2 MS report extensive experience.

About half of the responding Member States report some support for the production of biogas, like tax/financial incentives for biogas production, injection and vehicles, and support of research and development.

Member States generally expect only a marginal or no contribution of biogas (0-1.5% of total energy used in transport sector) in transport for the future. According to the discussions, biogas is/will be mostly used in passenger cars (e.g. in captive fleets), public transport (buses), and trucks. Non-road mobile machinery could be a promising option in the future.

The reasons mentioned for promoting biogas in transport are the reduction of greenhouse gas emissions and polluting emissions, use of nationally available resources (wastes and residues), and increasing energy security/diversification of fuels/decrease dependence on oil. A number of Member States do have a support scheme in place for biogas to be used for electricity and heat generation. Promotion measures mentioned include: fuel excise tax exemption, investment grants, facilitating grid access, support of the agricultural sector, double counting of biogas, fiscal measures, and introduction of a quota obligation system.

In Member States that have implemented sustainability criteria in accordance with the RES Directive, biogas needs to meet the same requirements as liquid biofuels. The main barriers for the development of biogas in transport are related to the production of biogas (e.g. higher production costs, competition with other uses, lack of production (capacity), costs of subsidies, difficult permit process), the lack of a biogas/natural gas distribution infrastructure, and the lack of compatible vehicles and a shortage of national technical specifications for the use of biogas as a fuel. The lack of long-term policy, e.g. on fuel excise for natural gas and biogas, was also mentioned.

A closer look at electricity in transport shows that countries have only limited experience with electricity in transport. Some have experience in the use of electricity in rail transport (trains, trams) and road transport (passenger cars, (trolley) buses). Member States generally expect the contribution of electricity in transport to be low (0-1.5%). According to the outcome of the discussions, electricity is/will be mostly used in passenger cars (including plug-in hybrids), trams and trolley/hybrid buses, and trains. Light commercial vehicles, non- road mobile machinery, and motor cycles may be interesting options too. Member States mostly mention financial promotion measures for electricity in transport, e.g. financial incentives for electric vehicles and charging stations and reduced registration fees. Furthermore, research, development and demonstration should be promoted.

Most barriers mentioned by the Member States relate to the infrastructure (high charging time, lack of infrastructure, increase of electricity demand) and electric cars (high costs of vehicles and batteries, small driving range, limited availability of mainstream electric car models), and the lack of standardization, especially regarding charging infrastructure.

Most Member States have very little or no experience with hydrogen in transport. Some MS have had demonstration projects, for example fuel cell buses.

The contribution of hydrogen in 2020 is expected to be zero or very low. Passenger cars are expected to be a promising sector for the future use of hydrogen. In addition, some Member States see a potential for hydrogen use in inland navigation vessels, trucks, buses, and non-road mobile machinery.

Promotion measures mentioned include the support of R&D and pilot/demonstration projects. In order to promote the use of hydrogen in transport tax incentives could be granted similar to those for electric vehicles.

Most barriers mentioned by the Member States are techno-economic factors, such as the development of a new filling station infrastructure and the commercial availability of hydrogen cars ("chicken and egg problem"). The high costs and uncertainty of technology developments, e.g. fuel cells and on-board storage of hydrogen, are also mentioned. Moreover, the lack of technical specifications and standardisation of hydrogen technologies are mentioned.

### 3.2 Good Practices

A general remark on good practice was as follows: during the meetings there were several presentations from Member States about their registering system. Participants have learned a lot from the approaches of Germany, The United Kingdom, Sweden and The Netherlands. Identifying the different ways of registering biofuels helps participants to detect practical obstacles for international trading of these fuels.

A particularly good practice is the LIIB methodology regarding the promotion of low ILUC risk biofuels. This methodology was developed by a consortium of three parties (Ecofys consultancy, WWF and The Roundtable of Sustainable Biofuels (RSB)) and focuses on the stimulation of low ILUC risk biofuels. The presented and discussed methodology gives policy makers a tool to stimulate the so-called better biofuels. Pursuant to the LIIB definition for this type of biofuels, they are produced from biomass which is cultivated additionally without displacing current agricultural production, or they are biofuels produced from wastes or residues without displacing current non-bioenergy uses of these materials. The methodology identifies and certifies low ILUC risk biofuels, and can be used in addition to the existing and adopted certification systems. The certification method is applied at farm level, so it enables individual EU farmers to say 'my biofuel production does not cause ILUC'.

The discussion about stimulation of low ILUC risk biofuels taught us that certified low ILUC biofuels need a policy incentive, either a stimulus or an exemption from a penalty.

Good examples for best practices are also the presented registering systems of Sweden, Germany and the United Kingdom. Most countries have a registering system in order to monitor quantity and quality standards of biofuels which comes to the national market in order to fulfill the target. Some systems follow all the steps down the whole chain others using more mass balance principles and split up administrative and physical flow. Especially when it comes to cross border trade it is interesting to know the different approaches of registering biofuels so that the national administrative bodies can try to connect to other systems where this is necessary. Beside this the three presented systems inspired other Member States setting up their own registering system to take a closer look at this systems.

# 4

## Main Findings and Achievements

The implementation of policy on renewable energy in transport and especially the biofuel policy shows a wide range of varied approaches within the Member States. Although we all have to work with the same directive, interpretation and implementation gives a lot of scope for national peculiarities. Countries have their own focus when it comes to biofuel policy. This has to do with a range of different settings: some Member States already have a significant agricultural production capacity for biofuels, others import almost everything. Some countries focus on environmental aspects, like climate protection or sustainability, whilst others focus on energy independency or agricultural interests. And some countries profit from trading in biofuels or want themselves to promote the production of advanced biofuels.

The Concerted Action brings policy makers together in order to discuss these different approaches and find solutions for cases where differences form an obstacle. It was concluded that a clear definition of wastes and residues is lacking in the RES Directive. This makes the implementation of the double counting mechanisms difficult and countries are choosing a range of differing approaches. A main finding at this point is the results of the collaboration with the Renewable Fuels Regulators Club (REFUREC). A working group under REFUREC devised a set of definitions about wastes and residues and co-products. They did this at the request of the Concerted Action. On behalf of the Concerted Action they also formulated a recommended list of feedstocks which could be double counted. Some Member States have started to work out a national list which is essentially based on the REFUREC list. This list acts as guidance.

Another finding is the research which has been established at JRC relating to the market situation of used cooking oil as a double counted feedstock for biodiesel. JRC also carried out lab studies in order to have some tools for regulators to differentiate used oils from virgin ones in order to avoid fraud. The preliminary findings are not sufficient to make strong policy conclusions, and so this issue must be followed up in the future.

Furthermore the group concluded that the achievability of the 10% target is a challenging one, especially when more alternative types of renewable fuels are required, like biogas, electricity or hydrogen. Advanced biofuels, even when they are counted twice or four times, will play a minor role in achieving the target.

The certification of sustainability is different in various Member States. Some almost only use the voluntary schemes, adopted by the Commission. Others mainly use their own national system. Mutual recognition from all MS is considered at this stage to be a step too far but,

based on contacts in the Concerted Action, there are already bilateral agreements between Member States in some regions of Europe. This helps to overcome difficulties in cross border trading. The fact that participants also know the various registering systems in different countries significantly helps to overcome obstacles. In the future work on certification and registering harmonisation should be continued where this is possible.

To conclude it is clear that the Concerted Action noticeably helps to bring policy makers together to discuss a wide range of topics. Tools like the CA-RES website help participants to have an interactive forum on which to share knowledge.

Topic	Issue	Outcomes	Future
Double counting mechanism	<ul style="list-style-type: none"> <li>- Lack of harmonisation and definition (wastes and residues)</li> <li>- UCO fraud</li> </ul>	<ul style="list-style-type: none"> <li>- Recommended list</li> <li>- JRC study with preliminary finding</li> </ul>	<ul style="list-style-type: none"> <li>- Countries will more and more establish a list and this knowledge will input into MS opinion in the Council about ILUC</li> <li>- Will be continued</li> </ul>
ILUC proposal	Initial confusion about the proposal	Better understanding feeds input in Council and national policy framework	Negotiation
Biogas in transport	The methodology of counting biogas in the grid towards the transport target	Discussion started	Will be continued
Register of biofuels	Registers differ significantly	MS in regions recognised other national schemes	Discussion will be continued in REFUREC
Verification systems	Certification of double counted biofuels is a problem	First possible solutions were discussed	Should be continued in the future

## The Way Ahead

The work of the last three years should continue.

The following main challenges should be addressed further:

1. Fraud risk for double counting biofuels, especially used cooking oil. The JRC research should be followed up
2. Biogas and statistics. Biogas injected in the grid can only count numerically towards the transport target. An administrative counting for 100% towards the transport target is not possible within the Eurostat systematics. Member States foresee a role for biogas in transport, but this can only be realised if all the biogas can count towards the transport target.
3. Certification/verification and registration of double counting biofuels. The certification of biofuels in general and of double counted biofuels in particular concerns a number of Member States. The co-existence of national schemes and voluntary schemes causes confusion. Next to this the registry of biofuels can cause problems, since there is no EU-wide registry that keeps track of all internationally traded double counting biofuels. National registers that are already in place are not connected and this provides opportunities for fraud, i.e. the multiple claiming of double counting biofuels in more than one Member State. There are initiatives from market players like the Trace your claim system, which can possibly help to resolve this and help to harmonize the certification and registering. An important concern is the certification or verification of biofuels made from wastes and residues. In most Member States certification or verification now starts at the biofuel producer and should commence earlier in the chain. Germany has established national legislation on this issue. Inventories of the problems involved in establishing the origin of the feedstock of double counted biofuels are necessary. In addition, an overview of all the initiatives in the market that are aiming to tackle this should be prepared. Beside this, the first results of the German experience could be examined. Cooperation with REFUREC on this matter would be useful.

## Abbreviations

Abbreviation	Full name
BTL	Biomass to liquid
CA-RES	Concerted Action on the Renewable Energy Sources Directive
DME	Dimethyl Ether
FQD	Fuel Quality Directive
EU	European Union
GHG	Greenhouse gas
ILUC	Indirect land use change
LIIB methodology	Low Indirect Impact Biofuels
LC	Lignocelluloses
MS	Member States
R&D	Research and Development
REFUREC	Renewable Fuels Regulators Club
RES Directive	Renewable Energy Sources Directive
RSB	Roundtable of sustainable biofuels
SNG	Synthetic natural Gas
UCO	Used cooking oil
WTO	World Trade Organisation
WWF	World Wide Fund for Nature

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