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Main author: SkyNRG

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Executive summary

Sustainable aviation fuels is currently, and for the years to come, more expensive than fossil jet fuels. This price gap is one of the main reasons for the limited activity in supply-chain development. Due to the price sensitivity of the aviation industry, airlines are not able to pay more for their fuel. A mechanism to cover the price premium on the short term, should therefore be developed.

An opportunity to cover part of the price premium emerged within the European Union's Renewable Energy Directive (RED). The voluntary inclusion of SAF in the RED obligation is a mechanism implemented into legislation in The Netherlands since 2013. From 2016 onwards it will be possible for other member states to facilitate this as well, due to a change in the RED and Fuel Quality Directive (FQD) under the recent ILUC amendment: *"In the case of suppliers of biofuels in aviation, Member States may permit such suppliers to choose to become contributors to the reduction obligation provided that those biofuels comply with the sustainability criteria"* – Directive 2015/153 amending FQD (98/70/EC) and the RED (2009/28/EC).

As all member states have implemented the RED differently, not all member states will have the same opportunities of implementing the voluntary aviation opt-in. Therefore, this report aims to give a structured insight in which EU member states can (easily) include the RED aviation opt-in.

The member states were analysed on a number of criteria after which five categories could be distinguished. These categories are meant to indicate the aviation opt-in potential, where 1 is the category for member states where the opt-in is already implemented and category 5 is the category for member states with the least promising circumstances to implement the voluntary aviation opt-in into the existing legislation.

1. The first category consists of the member states in which the aviation opt-in is already included in the legislation. This only holds for the Netherlands. No HBE registrant has currently used the aviation opt-in option in the Dutch legislation yet, however, SkyNRG has made the blueprint of how it could work and is working on proving this system by physically pushing SAF through the entire process.
2. The second category consists of member states that have a tradable certificate system in place for road biofuels. It is important to note that it must be possible to trade these certificates independently from the physical biofuel, as the idea of covering the price premium will not work if the certificates generated by producing SAF cannot be sold to obligated parties in the road transport industry.
3. In the third category, member states have shown in various interviews or policy documents an interest in the aviation industry and the possibility of including the aviation sector under the RED legislation. However in contrast to category 2, these member states do not have a freely tradable mechanism in place.
4. The fourth category, includes member states with no specific focus on the aviation industry. These member states do have a wide variety of policies to stimulate biofuels and renewable energy. Certificate systems for power generation or without tradable possibilities are included in this category. Also countries with a very large

potential due to large local demand, an existing second generation biofuel company or an alternative policy to financially stimulate biofuels are taken into account.

5. The fifth and final category includes all member states without any specific biofuel policy and with low scores on the other criteria. This is the category furthest away from an aviation opt-in in the near future.

Category 1	Category 2	Category 3	Category 4	Category 5
The Netherlands	Ireland	France	Croatia	Austria
	Italy	Sweden	Denmark	Bulgaria
	Portugal	Germany	Finland	Cyprus
	Spain	Belgium		Czech Republic
	United Kingdom			Estonia
				Greece
				Hungary
				Latvia
				Lithuania
				Luxembourg
				Malta
				Poland
				Romania
				Slovakia
				Slovenia

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Abbreviations

ASTM	American Society for Testing and Materials
BOS	Biofuel Obligation Scheme
CIC	Certificates of Immission into Consumption
CNMC	Comisión Nacional de los Mercados y la Competencia
CO ₂	Carbon Dioxide
EC	European Commission
ENMC	Entidade Nacional Para O Mercado de Combustiveis
EU	European Union
FQD	Fuel Quality Directive
GHG	Green House Gas
GSE	Gestore Servizi Energetici
HBE	Hernieuwbare Energie Eenheid (Renewable Energy Certificates)
HEFA	Hydrotreated Esters and Fatty Acids
ILUC	Indirect Land Use Change
KLM	Koninklijke Luchtvaart Maatschappij
MS	Member State
NEA	Nederlandse Emissie Autoriteit (Dutch Emission Authority)
NORA	National Oil Reserves Agency
PoS	Proof of Sustainability
RED	Renewable Energy Directive
RTFC	Renewable Transport Fuel Certificate
RTFO	Renewable Transport Fuel Obligation
SAF	Sustainable Aviation Fuels
TdB	Titulo de Biocombustivel
UCO	Used Cooking Oil

Definitions

N/A

Introduction

Sustainable aviation fuels is currently, and for the years to come, more expensive than fossil jet fuels. This price gap is one of the main reasons for the limited activity in supply-chain development. Due to the price sensitivity of the aviation industry, airlines are not able to pay more for their fuel. A mechanism to cover the price premium on the short term, should therefore be developed.

An opportunity to cover part of the price premium emerged within the European Union's Renewable Energy Directive (RED). The voluntary inclusion of SAF in the RED obligation is a mechanism implemented into legislation in The Netherlands since 2013. From 2016 onwards it will be possible for other member states to facilitate this as well, due to a change in the RED and Fuel Quality Directive (FQD) under the recent ILUC amendment:

"In the case of suppliers of biofuels in aviation, Member States may permit such suppliers to choose to become contributors to the reduction obligation provided that those biofuels comply with the sustainability criteria" – Directive 2015/153 amending FQD (98/70/EC) and the RED (2009/28/EC).

As all member states have implemented the RED differently, not all member states will have the same opportunities of implementing the voluntary aviation opt-in. Therefore, this report aims to give a structured insight in which EU member states can include the RED aviation opt-in.

First all member states are analysed on a set of criteria, the criteria focus on the current state of the RED implementation. The existence of a certificate system is central in the analyses, as such a certificate system allows for the aviation opt-in. As an additional criterion the local production and fuel demand are also analysed as these determine the chances of implementing a regional supply-chain.

In this report, first the method of criteria analysis is explained, this is followed by the analysis of all 28 member states.

Method

The analysis is based on four criteria, in the following a brief explanation is provided on the criteria and the method of analysis. Every MS is assigned to a category after which analysing the criteria.¹ Five categories can be distinguished, category 1 is the category in which the aviation opt-in is already present in legislation while category 5 is the category for MS with the least promising circumstances to implement the voluntary aviation opt-in into the existing legislation.

Policy

a. Obligation

Every Member State (MS) is, under the Renewable Energy Directive², obligated to have a 10% share of the total energy in the transport sector coming from Renewable Energy Sources (RES) by 2020. In this section it is determined how each MS is pursuing this goal and what the current (2014) share of RES in the transport sector is according to (Eurostat, 2014a) data.

b. Certificate System

The MS can forward the obligation to stakeholders in the MS' fuel sector in order to reach 10% in 2020. One of the methods to do this is by using 'green certificates'. A stakeholder is, within such a system, obligated to have a certain amount of green certificates (based on the amount of fuel produced or traded within the MS). These certificates can generally be received by either producing biofuel and blending it into the conventional fuel supply, or by buying certificates from either a non-obligated party that produces biofuels or from another stakeholder who generated too many green certificates for their own obligation. This trading scheme is the most important criterion for this analysis as the aviation sector is not included in the 10% obligation as stated in RED. This means that, when producing SAF, the green certificates can be sold to an obligated party. This could cover part of the premium that exists between bio and conventional jet fuel.

c. Other Incentives

Other clear biofuel incentives that might be an opportunity to cover the price premium are also included in the analyses. This criterion is also used as an indication for the MS' activities on stimulating renewable technologies in general.

Local Production

d. Advanced Biofuel Producers

Is there an advanced biofuel producer currently active, and what is the historical activity of the MS with producing biofuels.³

e. Feedstock Opportunity Score

Based on a previous study of SkyNRG; the feedstock opportunity score is based on the following criteria: Agricultural productivity, Oilseed crop yield, Harvested oil seed, Arable land, Unused arable land, UCO potential. Every country receives a score from 0 – 1 from which a European average is calculated. In this report the feedstock opportunity score is indicated as above EU average, EU average or below EU average.

Fuel Demand

f. Domestic Jet Fuel Demand

1 The analysis is primarily based on the National Action plans of each EU MS (European Commission, 2010) and the National progress reports on renewable energy goals (European Commission, 2013).

2 Renewable Energy Directive, 2009/28/EC; Directive 2015/1513, amending RED 2009/28/EC

3 This is based on each EU Member States website on the European Biofuels Technology Platform; for example: <http://biofuelstp.eu/country/austria.html>

The domestic jet fuel demand is taken from Eurostat⁴ and based on the 2014 fuel levels. The fuel demand is indicated in metric tonnes / year, as this is the prevailing way of showing fuel use. As for the feedstock score, it is also indicated whether a country has a below EU average, EU average or above EU average fuel demand.

g. Main Local Airline Sustainability Score

The Airline sustainability score is important as it can aggregate demand for bio jet fuel. The score is based on the main local airline in a specific Member State. And scores are indicated as follows:

- 0) No clear sustainability strategy
- +) Clear sustainability strategy with CO2 reduction and reporting (without SAF)
- ++) Clear sustainability strategy with CO2 reduction and reporting (including SAF)
- +++ Clear sustainability strategy with CO2 reduction and reporting (including SAF + already conducted SAF flights or involved in major SAF projects)

h.

Support from specific governmental bodies

This criterion includes possible governmental bodies that could help influence the biofuel policy making. The Department of Defence (DoD) is an example of a governmental body that could help with the acceleration of biofuels, as they have large incentives in creating a stable fuel supply line.

⁴ (Eurostat, 2014b)

Austria - Category 5

1. Policy

Obligation Stimulation

Austria has set obligations on importers and distributors of transport fuels to include biofuels in their fuel mix. Obligations build up to 10% in 2020, as prescribed by the RED. Austria does apply Article 21(2) from the RED, stating the contribution made by biofuels produced from wastes, residues, non-food cellulosic material, and lingo cellulosic material is considered to be twice that made by other biofuels. Companies are not allowed to distribute their fuels if the obligation criterion is not met. Austria is already very close to their 10% target with 8.9%, mainly due to electricity in transport and the blending of biodiesel.

Certificate System

No trading scheme or system of certificates exist in Austria.

Other Incentives

- Investment subsidies exist for the purchase of electric vehicles.
- Feed-In tariffs for electricity production from renewable sources exist.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Austria.

Feedstock Opportunity Score

Austria has a below average feedstock opportunity score.

3. Fuel Demand

Domestic Fuel Demand

Austria had, in 2014, a domestic fuel demand of: 663.000 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

Austrian airlines has a ++ performance on sustainability.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Austria.

Belgium - Category 3

1. Policy

Obligation Stimulation

Belgium has, in the transport sector, introduced an obligation system of biofuels and made it mandatory for the fuel industry to include a proportion of biofuels in the fuel mix. Obligations build up to 10% in 2020, as prescribed by the RED. Belgium is currently with 4.9% slightly behind schedule on reaching the 10%.

Certificate System

A Renewable Energy Trading system exists for the production of electricity. Suppliers of electricity to consumers are obliged to have such certificates and thus need to produce or buy these. There is currently no certificate system for Biofuels in Belgium.

Other Incentives

- Tax exemptions exist for biofuel producers, thus they don't have to pay any taxes on the produced fuels.
- The government take an exemplary role on electrical vehicle use and supports this EV development with tax incentives for vehicles and charging stations.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Belgium.

Feedstock Opportunity Score

Belgium has a below average feedstock opportunity score.

3. Fuel Demand

Domestic Fuel Demand

Belgium had, in 2014, a domestic fuel demand of: 1.278.728 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

Brussels Airlines has a + performance on sustainability.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Belgium.

Bulgaria - Category 5

1. Policy

Obligation Stimulation

Bulgaria has set obligations on importers and distributors of transport fuels to include biofuels in their fuel mix. Obligations build up to 10% in 2020, as prescribed by the RED. No stimulating policy exists apart from the obligations. In 2014, Bulgaria had a share of 5.3% from renewable sources in the transport sector. The State Agency for Metrology and Technical Surveillance is the monitoring organisation of the obligation.

Certificate System

No trading scheme or system of certificates exist in Bulgaria.

Other Incentives

- There is a tax reduction for fuel producers and distributors for blended biofuel products, with at least 4 – 5% biofuel in the blend.
- There are some voluntary investment stimulation programs, for sustainable energy projects.
- Feed-In tariffs for electricity production from renewable sources exist.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Bulgaria.

Feedstock Opportunity Score

Bulgaria has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Bulgaria had, in 2014, a domestic fuel demand of: 166.633 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

Bulgaria air has no ambition to meet certain sustainability criteria and thus scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Bulgaria.

Croatia - Category 4

1. Policy

Obligation Stimulation

Croatia has set obligations on importers and distributors of transport fuels to include biofuels in their fuel mix. Obligations build up to 10% in 2020, as prescribed by the RED. In 2014, Croatia was behind schedule on 2,1% from renewable sources in the transport sector. MINGO is responsible for the establishment and supervision of measures. HROTE is responsible for the implementation of measures.

Certificate System

No trading scheme or system of certificates exist in Croatia.

Other Incentives

- There is a tax reduction for fuel producers and distributors for biofuels.
- Biofuels are stimulated with a cash incentive. Biofuel producers get 0.22 €/L biodiesel and 0,003 €/L bioethanol. Producers must have the status of an eligible producer and produce more than 1 TJ of biofuel annually, in order to receive this financial stimulation (AEBIOM, 2015).

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Croatia.

Feedstock Opportunity Score

Croatia has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Croatia had, in 2014, a domestic fuel demand of: 127.247 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

Air Croatia has no ambition to meet certain sustainability criteria and thus scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Croatia.

Cyprus - Category 5

1. Policy

Obligation Stimulation

Cyprus has the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, however there are no obligations set on the importers and/or distributors of transport fuels. In 2014, Cyprus was behind schedule with 2,7% from renewable sources in the transport sector.

Certificate System

No trading scheme or system of certificates exist in Cyprus.

Other Incentives

- No other incentives exist to possibly stimulate biofuels.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Cyprus.

Feedstock Opportunity Score

Cyprus has a high above score on feedstock opportunity, this is mainly due to their large amount of unused arable land and their favourable climate. In practice this might not be very useful for actual biofuel production.

3. Fuel Demand

Domestic Fuel Demand

Cyprus had, in 2014, a domestic fuel demand of: 243.940 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

The local airline went bankrupt and has thus no sustainability score.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Croatia.

Czech Republic - Category 5

1. Policy

Obligation Stimulation

Czech Republic has the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and has obligated the distributors of transport fuels to blend in percentages of biofuels into their fuel mix. In 2014, Czech Republic was on schedule with 6,1% from renewable sources in the transport sector.

Certificate System

No trading scheme or system of certificates exist in Czech Republic.

Other Incentives

- There are tax incentives for the high percentage (e.g. E85) biofuels.
- Feed-In tariffs exist to stimulate sustainable energy production

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in the Czech Republic.

Feedstock Opportunity Score

Czech Republic has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Czech Republic had, in 2014, a domestic fuel demand of: 294.174 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

Czech Airlines has no ambition to meet certain sustainability criteria and thus scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Czech Republic.

Denmark- Category 4

1. Policy

Obligation Stimulation

Denmark has the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and has obligated the market of distributors who trade diesel and petrol on the market. In 2014, Denmark was behind schedule with their 5,8% from renewable sources in the transport sector. Although Denmark has a very ambitious goal of a 40% RES share in total energy, biofuels aren't stimulated specifically. However, in March 2016 the Danish government decides on a new obligation of specifically second generation biofuels to a 2.5% blend level (The Danish Government, 2013; European Biomass Industry Association, 2013).

Certificate System

No trading scheme or system of certificates exist in Denmark.

Other Incentives

- There are tax incentives for electric vehicles
- There is an exemption from CO2 tax for biofuels
- There are R&D budgets for the development of biofuel facilities
- Feed-In tariffs exist to stimulate sustainable energy production

2. Local Production

Advanced Biofuel Producers

- Dong Energy is a large energy company and has some demonstration facilities.
- Maabjerg Energy Centre, NER300 project (Maabjerg Energy Center, 2016).

Feedstock Opportunity Score

Denmark has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Denmark had, in 2014, a domestic fuel demand of: 870.208 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

Scandinavian Airlines has an extensive sustainability program and thus scores +++.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Denmark.

Estonia - Category 5

1. Policy

Obligation Stimulation

Estonia has the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED. However, the market of distributors is not obligated. In 2014, Estonia is very far behind schedule with only 0,2% renewable sources in the transport sector.

Certificate System

No trading scheme or system of certificates exist in Estonia.

Other Incentives

- Fuel excise duty does not hold for biofuels in Estonia

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Estonia.

Feedstock Opportunity Score

Estonia has a below average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Estonia had, in 2014, a domestic fuel demand of: 28.147 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

The main airline of Estonia is bankrupt and therefore has no sustainability score.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Estonia.

Finland - Category 4

1. Policy

Obligation Stimulation

Finland has set obligations on importers and distributors of transport fuels to include biofuels in their fuel mix. Obligations are set higher than the 10% in 2020, as prescribed by the RED. Currently Finland already reached 20.9%, which is the highest percentage of biofuels blended into the fuel mix of all EU Member States.

Certificate System

No trading scheme or system of certificates exist in Finland.

Other Incentives

- A taxation mechanism exists to drive biofuel development into the direction of advanced biofuels, as fuels are taxed on the amount of life cycle CO₂ emissions.
- A number of local investment programs to stimulate biomass and renewable electricity development.

2. Local Production

Advanced Biofuel Producers

- UPM Biofuels, the world leading wood-based biodiesel producer is located in Finland and is responsible for the sharp increase in renewable diesel in the country.

Feedstock Opportunity Score

Finland has a below average score on feedstock opportunity, however it should be noted that this feedstock opportunity does not take the large wood industry of Finland into account.

3. Fuel Demand

Domestic Fuel Demand

Finland had, in 2014, a domestic fuel demand of: 727.714 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

Finnair has an extensive program with high sustainability criteria and thus scores +++.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Finland.

France - Category 3

1. Policy

Obligation Stimulation

France has set obligations on importers and distributors of transport fuels to include biofuels in their fuel mix. Obligations are set to reach the 10% in 2020, as prescribed by the RED. Currently France reached 7.8 %, which is on track to reach the 10% in 2020.

Certificate System

No tradable certificate system exists in France.

Other Incentives

- Biodiesel and bioethanol used for fuel purposes and blended within conventional fuels benefit from a partial exemption of the domestic consumption tax. Depending on the source of biofuels the tax exemptions are € 0,14/L for Ethanol and € 0,08 / L for Biodiesel. This rule only holds for fuels with at least a 7% biofuel component.
- An extensive feed-in tariffs system exists to stimulate sustainable electricity generation
- A number of local investment programs to stimulate biomass and renewable electricity development.

2. Local Production

Advanced Biofuel Producers

- Total is investing in converting an oil refinery to process UCO and other waste streams into biofuels.
- BioTfuel is developing new facilities for the production of advanced biofuels as well.

Feedstock Opportunity Score

France has an above average feedstock opportunity score.

3. Fuel Demand

Domestic Fuel Demand

France had, in 2014, a domestic fuel demand of: 6.752.221 metric tonnes/year. This is an above EU average demand.

Main airline sustainability goals

Air France – KLM has high ambitions to meet sustainability criteria and thus scores +++.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in France.

Germany - Category 3

5. Policy

Obligation Stimulation

Germany has set obligations on importers and distributors of transport fuels to include biofuels in their fuel mix. Obligations are set to reach the 10% in 2020, as prescribed by the RED. Currently Germany reached 6,6 %, which is on track to reach the 10% in 2020. This system is changed in 2015 into the Greenhouse Gas quota, in which Germany strives for 6% greenhouse gas reduction in 2020, this corresponds with RED legislation, but is a different approach of 'counting' emission reduction levels.

Certificate System

A transformation towards the greenhouse gas quotas has taken place in 2015. In this greenhouse gas quota system, trading between obligated and non-obligated parties is possible. This is a major possibility to include SAF as the system is very comparable to the Dutch situation (UFOP, 2014; Department for Transport, 2015)

Germany has an extensive tradable certificate system for electricity production. As in Sweden, these 'Guarantees of Origin' are in place to stimulate green electricity production, however with some changes in regulation biofuels might be able to create such guarantees of origin and therewith compete on the market as well.

Other Incentives

- Biofuels profit from reduced taxes on production.
- Germany has an extensive legislative framework to stimulate electricity with the GO's and feed-in tariffs.

6. Local Production

Advanced Biofuel Producers

- Many research facilities are working on the development of advanced biofuels, no large commercial facilities have been build yet.

Feedstock Opportunity Score

Germany has an average feedstock opportunity score.

7. Fuel Demand

Domestic Fuel Demand

Germany had, in 2014, a domestic fuel demand of: 8.793.847 metric tonnes/year. This is an above EU average demand.

Main airline sustainability goals

Lufthansa has high ambitions to meet sustainability criteria and thus scores +++.

8. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Germany.

Greece - Category 5

1. Policy

Obligation Stimulation

Greece is working towards meeting the 2020 targets through the elaboration of specific policies and measures and the acceleration of the green economy through green development and enhanced competitiveness of the private sector. Biodiesel quantities are, in contrast to other EU MS, allocated through tenders towards producers or importers who are interested in participating in this quota system. So far this does not seem to work well, as Greece reached 1.4% out of the 10% target.

Certificate System

Greece has no certificate system in place to support the biofuel development.

Other Incentives

- A Feed-In tariff exist to stimulate renewable electricity generation

2. Local Production

Advanced Biofuel Producers

- Elin Biofuels S.A. is a local producer of biofuels, that tries to stimulate advanced biofuels.

Feedstock Opportunity Score

Greece has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Greece had, in 2014, a domestic fuel demand of: 966.572 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

Aegean Airline has committed to improve fuel consumption by 1.5% each year until 2020; to stabilize carbon dioxide emissions and achieve a net zero carbon footprint starting in 2020; to reduce carbon dioxide emission levels by 50% from 2005 until 2050. These are the standard sustainability goals and do not directly take biofuels into account and therefore a + score.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production biofuels in Greece.

Hungary - Category 5

1. Policy

Obligation Stimulation

In Hungary regulations for the use of biofuels have existed since 2005. In the first period, which lasted until 2009, they provided incentives for the use of biofuels through tax reliefs. In 2009 the tax relief on biofuels admixed to petrol and motor diesel oil was abolished, and was replaced by a marketing obligation (imposing heavy fines in the case of failure to fulfil this obligation). Hungary is on track of reaching the 10% target, as they currently are on a 6.9% share.

Certificate System

Hungary has no certificate system in place to support the biofuel development.

Other Incentives

- A Feed-In tariff exist to stimulate renewable electricity generation

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Hungary.

Feedstock Opportunity Score

Hungary has a below average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Hungary had, in 2014, a domestic fuel demand of: 159.792 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

Wizz air, the local airline, has no sustainability goals and scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production biofuels in Hungary.

Ireland - Category 2

1. Policy

Obligation Stimulation

Ireland has set out a Biofuel Obligation Scheme (known as BOS in Ireland). Currently, Ireland reached 5.2% and they are working towards the 10% goal in 2020. Ireland also had a tax relief policy in place, however this ended in 2010.

Certificate System

Ireland is a country with a tradable certificate scheme which is in place to stimulate and force the local fuel importers and producers to put biofuels on the market. Important is that while the volume of levy paid biofuels placed on the market will dictate how many BOS certificates each party can apply for, it will be the number of BOS certificates held in each party's account at the end of the reconciliation period which will determine if the obligation is met, not the physical volume of biofuel placed on the market. BOS certificates can therefore also be transferred between BOS participants, independently of the biofuel. The price of certificates is a commercial matter between the buyer and seller. The organisation in place of administration and control of this system is the National Oil Reserves Agency (NORA).

Other Incentives

- Ireland has the ambitious target of having 10% of all cars being electric Vehicles (EV) in 2020. There is a grant scheme in place to stimulate this goal.
- Ireland has a Renewable Energy Feed-In Tariff in place to stimulate the generation of sustainable electricity.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Ireland.

Feedstock Opportunity Score

Ireland has a below average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Ireland had, in 2014, a domestic fuel demand of: 633.109 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

Air Lingus has no sustainability goals and scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production biofuels in Ireland.

Italy - Category 2

1. Policy

Obligation Stimulation

Italy states: looking to the future, the intention is to take action mainly through the obligatory minimum quota, in line with sustainability criteria and taking into account second- and third-generation biofuel development, as well as the social sustainability of biofuels. Italy therefore put out an obligation stimulation and currently reached: 4.5%, a little behind schedule for the 10% goal in 2020.

Certificate System

“Certificates for making biofuels available for consumption” were established in order to monitor the fulfilment of this obligation. The certificates are issued on an annual basis by the Ministry for Agriculture, Food and Forestry (MIPAAF). One certificate verifies that 10 Gcal of biofuel have been made available for consumption in Italy. Article 21 biofuels are granted one certificate for every 5 Gcal of biofuels. The certificates are tradable, so it is possible for those liable for the obligation to make biofuel available to fulfil the legal obligation by buying certificates from other parties who have too many. The certificates are traded through bilateral negotiations and subsequent notification to the MIPAAF certification system.

Other Incentives

- Italy has an extensive Feed-In Tariff system in place to stimulate the generation of sustainable electricity. This replaced an obligation policy for electricity from 2012 onwards.

2. Local Production

Advanced Biofuel Producers

- ENI, is producing biofuels with the Honeywell-UOP technology
- Beta Renewable has a cellulosic ethanol plant at Crescentino

Feedstock Opportunity Score

Italy has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Italy had, in 2014, a domestic fuel demand of: 3.708.840 metric tonnes/year. This is an above EU average demand.

Main airline sustainability goals

Alitalia has a program to reach sustainability goals and scores ++.

4. Support from governmental Bodies (e.g. DoD)

‘Flotta Verde’ is a military initiative in collaboration with the ‘Green Fleet’ initiative of the US Navy. This military body is putting effort in the development of biofuels for military purposes (Jim Lane, 2015)

Latvia - Category 5

1. Policy

Obligation Stimulation

Latvia has an obligation scheme in place to obligate the fuel importers and producers in the country to blend in a percentage of biofuels. However, Latvia currently has a share of 3.2% biofuels and thus is fairly behind schedule on reaching the 10% in 2020.

Certificate System

Latvia has no certificate trading scheme in place to stimulate biofuels.

Other Incentives

- Latvia has a system in place for the reduction of excise duty, this applies for different types of biofuels.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Latvia.

Feedstock Opportunity Score

Latvia has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Latvia had, in 2014, a domestic fuel demand of: 120.992 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

Air Baltic, the local airline in Latvia, has no sustainability goals and scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production biofuels in Latvia.

Lithuania - Category 5

1. Policy

Obligation Stimulation

Lithuania has the obligation of reaching 10% of RES shares in 2020. However, they have not obligated any party in specific to fulfil this apart from stating that 'the state is responsible for the formation of appropriate conditions'. Although no party is obligated specifically, Lithuania currently has a share of 4.6% biofuels in their fuel mix.

Certificate System

Lithuania has no certificate trading scheme in place to stimulate biofuels.

Other Incentives

- Lithuania has some incentives in place for the generation of renewable electricity, policies on biofuels are very limited.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Lithuania.

Feedstock Opportunity Score

Lithuania has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Lithuania had, in 2014, a domestic fuel demand of: 74.570 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

The local airline in Lithuania is bankrupt and thus scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production biofuels in Lithuania.

Luxembourg - Category 5

1. Policy

Obligation Stimulation

Luxembourg has obligated fuel importers to mix biofuels into their fuel blend, this has currently resulted in a share of 5.2% biofuels in their fuel mix.

Certificate System

luxembourg has no certificate trading scheme in place to stimulate biofuels.

Other Incentives

- Luxembourg has Feed-In Tariffs in place to stimulate electricity generation.
- Also investments are available to stimulate smart networks as well as the infrastructure to support charging of electrical vehicles

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Luxembourg.

Feedstock Opportunity Score

Luxembourg has a below average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Luxembourg had, in 2014, a domestic fuel demand of: 365.255 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

The local airline in Luxembourg, Luxair, has some sustainability goals and scores +.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production biofuels in Luxembourg.

Malta - Category 5

1. Policy

Obligation Stimulation

Malta has the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and has obligated the market of distributors and importers of diesel and petrol. In 2014, Malta is a little behind schedule with a 4.7% share of renewable sources in the transport sector.

Certificate System

No trading scheme or system of certificates exist in Malta.

Other Incentives

- Fuel excise duty does not hold for biofuels in Malta, which lowers the price gap between conventional fuels.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Malta.

Feedstock Opportunity Score

Malta has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Malta had, in 2014, a domestic fuel demand of: 103.401 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

Airmalta has no sustainability goals and scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Malta.

The Netherlands - Category 1

1. Policy

Obligation Stimulation

The Netherlands are working towards the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and has obligated the market of distributors and importers of diesel and petrol. In 2014, the Netherlands are on schedule with a 5.7% share of renewable sources in the transport sector.

Certificate System

A 'Bio ticket' trading scheme exists in the Netherlands, this system is called 'Hernieuwbare Brandstofeenheden (HBE's). Fuel importers are obliged to have such bio tickets, they can choose whether to produce biofuels themselves to create bio tickets, or whether they buy biofuels from another organisation and therewith buy bio tickets. This system is the only system in the EU that provides producers of SAF the opportunity to get bio tickets, which can then be sold to obligated parties. This results in the possibility to cover the premium between fossil fuels and SAF and will therefore be the example for other EU Member States.

Other Incentives

- Numerous other incentives exist in the Netherlands on financial stimulation of renewable energy generation.
- A Feed-In tariff exist to stimulate renewable electricity generation

2. Local Production

Advanced Biofuel Producers

- Neste Oil has a large production facility in Rotterdam, which is part of the Bioport Holland initiative in which SkyNRG, KLM, the Dutch Government, the Port of Rotterdam and Schiphol participate.

Feedstock Opportunity Score

The Netherlands have a below average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

The Netherlands had, in 2014, a domestic fuel demand of: 3.448.387 metric tonnes/year. This is an above EU average demand.

Main airline sustainability goals

Air France – KLM has high ambitions to meet sustainability criteria and thus scores +++.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in the Netherlands.

Poland - Category 5

1. Policy

Obligation Stimulation

Poland has not obligated fuel importers and producers as they have been stimulating biofuels with the use of tax relief policies. After 2011 they stopped with this legislation as well. Currently the focus is on stimulating renewable electricity generation. Currently Poland has a 5.7% share of RES in the transport sector, in 2014. In 2011 this was 6.4% so current legislation does not seem to stimulate biofuel development sufficiently.

Certificate System

Poland has no certificate trading scheme in place to stimulate biofuels.

Other Incentives

- Poland has an auction system in place to stimulate the projects with the best prospects for renewable energy generation.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Poland.

Feedstock Opportunity Score

Poland has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Poland had, in 2014, a domestic fuel demand of: 526.972 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

The local airline in Poland, LOT Airlines, has no significant sustainability goals and scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production biofuels in Poland.

Portugal - Category 2

1. Policy

Obligation Stimulation

Portugal was working towards the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and had obligated the market of distributors and importers of diesel and petrol until 2010, they reached a share of 5.3% RES but dropped to 0.4% right after the FQD banned soybean based biodiesel from the list of renewable feedstocks. In 2014, Portugal is back on 3.4% share of RES in their transport, which is well behind the targets. However, numerous policies are in place to stimulate biofuels (Hanson & Mendes, 2011; Trennepohl, 2013).

Certificate System

Companies introducing fuels on the Portugese markets are obliged to include biofuels. The system in Portugal to monitor this, is called: 'Titulo de Biocombustiel' (TdB's). These biofuel entitlements are tradable units, if a company obliged to have TdB's is missing these they get fined. Some technologies receive extra TdB's per Toe produced biofuel, which is known as the double counting principle in other Member States (Global Agricultural Information Network, 2015).

Other Incentives

- There is a large subsidy scheme to stimulate electric driving
- There are partial and total tax exemptions for some of the biofuels.
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2. Local Production

Advanced Biofuel Producers

- IncBio is a large manufacturer of biodiesel from UCO, and has a history of producing biofuel from other first generation feedstocks as well.

Feedstock Opportunity Score

Portugal has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Portugal had, in 2014, a domestic fuel demand of: 1.049.937 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

Tap Portugal has some sustainability goals and therefore scores +.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Portugal.

Romania - Category 5

1. Policy

Obligation Stimulation

Romania is working towards the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and has obligated the market of distributors and importers of diesel and petrol. In 2014, they reached a share of 3.8 % RES in their transport, which is behind the target. Obligations prescribe 5% biodiesel and 4.5% bioethanol blends.

Certificate System

No trading scheme or system of certificates exist in Romania.

Other Incentives

- Some policies to enable renewable electricity generation, focus on electricity and very limited biofuel policies.

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2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Romania.

Feedstock Opportunity Score

Romania has a high above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Romania had, in 2014, a domestic fuel demand of: 206.313 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

TAROM has some substantial sustainability goals and thus scores ++.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Romania.

Slovakia - Category 5

1. Policy

Obligation Stimulation

Slovakia is working towards the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and has obligated the market of distributors and importers of diesel and petrol. In 2014, they reached a share of 6.9% RES in their transport, which is on track of reaching their targets.

Certificate System

No trading scheme or system of certificates exist in Slovakia.

Other Incentives

- Biofuels are exempt of excise taxes.
- Some policies exist to stimulate electrical generation from renewable sources.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Slovakia.

Feedstock Opportunity Score

Slovakia has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Slovakia had, in 2014, a domestic fuel demand of: 40.461 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

The local airline went bankrupt and has no sustainability goals and therefore no score.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Slovakia.

Slovenia - Category 5

1. Policy

Obligation Stimulation

Slovakia is working towards the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED, and has obligated the market of distributors and importers of diesel and petrol. In 2014, they reached a share of 2.6% RES in their transport, which is behind the schedule of reaching their targets.

Certificate System

No trading scheme or system of certificates exist in Slovenia.

Other Incentives

- Biofuels are exempt of excise taxes.
- Feed-In tariffs exist to stimulate electrical generation from renewable sources.

2. Local Production

Advanced Biofuel Producers

No advanced biofuel producers exist in Slovenia.

Feedstock Opportunity Score

Slovenia has a below average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Slovenia had, in 2014, a domestic fuel demand of: 25.410 metric tonnes/year. This is a below EU average demand.

Main airline sustainability goals

Adria Airways has no sustainability goals and thus scores 0.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Slovenia.

Spain - Category 2

1. Policy

Obligation Stimulation

Spain was already working with obligations before the RED legislation came into place. They have created larger obligations to reach 10% RES in 2020. There is no specific support for biofuels that meet the criteria of Article 21(2) of the directive, this is the article about double counting waste stream biofuels. Spain is currently on a low share of 0.5% RES in the transport sector, this is probably due to the fact they do not take into account double counting, while the other MS are using this method to increase percentages.

Certificate System

Spain has a trading scheme, in which obligated parties need to have certificates to conform to the obligation rules. The National Energy Commission (NEC) manages this system, and will allow for the parties to transfer certificates while also acting as a control mechanism for the obligation.

Other Incentives

- An investment system is in place for existing and future renewable facilities to receive a payment that covers the investment costs that an efficient and well-managed company will not be able to recover from the market.
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2. Local Production

Advanced Biofuel Producers

- Abengoa is a large producer of biofuels and is situated in Salamanca with a facility.

Feedstock Opportunity Score

Spain has an above average score on feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

Spain had, in 2014, a domestic fuel demand of: 5.149.217 metric tonnes/year. This is an above EU average demand.

Main airline sustainability goals

Iberia has good sustainability goals and thus scores ++.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Spain.

Sweden - Category 3

1. Policy

Obligation Stimulation

Sweden is well above the renewable target for transport that builds up to 10% in 2020 as prescribed in the RED. In 2014 Sweden already reached a share of 19.2% RES in their transport sector. Since 2014 Sweden put out a quota on the fuel importers and producers to further enhance the biofuel development (Government offices of Sweden, 2009).

Certificate System

An extensive certificate trading scheme exist in Sweden for electricity. This system could be used as a starting point for biofuels, as the certificates for a kWh of electricity could be translated into Joules of biofuels produced. In order to reach this, changes in legislation need to take place. Both an opportunity and barrier is the fact that the certificates can be traded between Norway and Sweden, this implies a bigger market. However, also more legislation to include SAF as a 'producer' of these certificates.

Other Incentives

- Biofuels are exempt of excise taxes.
- A number of electricity certificate schemes to force electricity suppliers to include renewable energy into their electricity mix.
- There is also an emission trading scheme available for the energy generation industry.

2. Local Production

Advanced Biofuel Producers

- Swedish Biofuels, focussing on aviation fuels work closely with SkyNRG.
- Fortum is a producer of biofuels from wood based material.

Feedstock Opportunity Score

Sweden has a below average score on feedstock opportunity, however it should be noted that this feedstock opportunity does not take the large wood reserves into account, which are significant in Sweden.

3. Fuel Demand

Domestic Fuel Demand

Sweden had, in 2014, a domestic fuel demand of: 874.215 metric tonnes/year. This is an EU average demand.

Main airline sustainability goals

The SAS has high sustainability targets and biofuel involvement +++.

4. Support from governmental Bodies (e.g. DoD)

There is no specific governmental body involved to stimulate the production or wider distribution of Biofuels in Sweden, although the wood and paper industry are two strong industries who have a large interest in biofuel opportunities.

United Kingdom - Category 2

1. Policy

Obligation Stimulation

The UK has obligated the market suppliers (over 450.000 liters of fuel) under the Renewable Transport Fuel Obligation (RTFO). The market organisations can choose to either supply biofuel and earn certificates, buy the certificates from others who have supplied or pay the buy-out price. In 2014, the UK transport market has a RES share of 4.9%, which makes them little behind on schedule of the 10% target in 2020.

Certificate System

The RTFO works with a certificate scheme and is amended extensively since 2011 to stimulate advanced biofuels with double counting measures and mandatory sustainability criteria are set. As said, certificates exist which can be traded separately from the biofuels between obligated and non-obligated parties.

Other Incentives

- The electricity market is also obligated with shares of renewable generated electricity
- Feed in Tariff Schemes exist to stimulate sustainable electricity generation.

2. Local Production

Advanced Biofuel Producers

- Solena GreenSky was an interesting project, however due to lack of financing failed to get going.
- In December 2014, the UK Department for Transport launched the Advanced Biofuel Demonstration Competition to support the production of UK-based advanced biofuels. The Competition will provide up to £25 million in grant funding for major demonstration projects providing transformative and innovative solutions. Ricardo-AEA and E4tech have been appointed as delivery partners for the Competition and post-award monitoring.

Feedstock Opportunity Score

The United Kingdom has a below average score for feedstock opportunity.

3. Fuel Demand

Domestic Fuel Demand

The United Kingdom has the highest domestic fuel demand of all member states; 11.364.889 metric tonnes / year.

Main airline sustainability goals

British Airways has extensive sustainability goals and therefore scores +++.

4. Support from governmental Bodies (e.g. DoD)

No specific governmental body is involved in the biofuel development in the UK.

Conclusion

The country analysis shows the potential of each EU Member State to include SAF in the legislation to stimulate biofuels under the Renewable Energy Directive. Five categories can be distinguished from this analysis.

Table 1. Overview of categorization 28 member states

Category 1	Category 2	Category 3	Category 4	Category 5
The Netherlands	Ireland	France	Croatia	Austria
	Italy	Sweden	Denmark	Bulgaria
	Portugal	Germany	Finland	Cyprus
	Spain	Belgium		Czech Republic
	United Kingdom			Estonia
				Greece
				Hungary
				Latvia
				Lithuania
				Luxembourg
				Malta
				Poland
				Romania
				Slovakia
				Slovenia

1. The first category consists of the member states in which the aviation opt-in is already included in the legislation. This only holds for the Netherlands. No HBE registrant has currently used the aviation opt-in option in the Dutch legislation yet, however, SkyNRG has made the blueprint of how it could work and is working on proving this system by physically pushing SAF through the entire process.
2. The second category consists of member states that have a tradable certificate system in place for road biofuels. It is important to note that it must be possible to trade these certificates independently from the physical biofuel, as the idea of covering the price premium will not work if the certificates generated by producing SAF cannot be sold to obligated parties in the road transport industry.
3. In the third category, member states have shown in various interviews or policy documents an interest in the aviation industry and the possibility of including the aviation sector under the RED legislation. However in contrast to category 2, these member states do not have a freely tradable mechanism in place.
4. The fourth category, includes member states with no specific focus on the aviation industry. These member states do have a wide variety of policies to stimulate biofuels and renewable energy. Certificate systems for power generation or without tradable possibilities are included in this category. Also countries with a very large potential due to large local demand, an existing second generation biofuel company or an alternative policy to financially stimulate biofuels are taken into account.

5. The fifth and final category includes all member states without any specific biofuel policy and with low scores on the other criteria. This is the category furthest away from an aviation opt-in in the near future.



Figure 1. Overview of member state potential to include the aviation opt-in

The member states in category two have the biggest opportunity to implement the aviation opt-in into their current certificate systems under the Renewable Energy Directive. Therefore, these member states will be further analysed in part D3.14 of the ITAKA research project. As categories three and four are interested and have reasonable opportunities to implement SAF, SkyNRG got involved with some of these member states to involve them in the process of implementing the aviation opt-in. The fifth category member states are not further analysed.

References

AEBIOM, (2015). AEBIOM Statistical Report 2015. Retrieved from <http://www.aebiom.org/>
Department for Transport, (2015). Low Carbon Fuels, GHG reporting scheme in Germany
European Biofuels Technology Platform, (2015). Accessed: February 2016 from:

<http://biofuelstp.eu/country/austria.html>

<http://biofuelstp.eu/country/belgium.html>

<http://biofuelstp.eu/country/bulgaria.html>

<http://biofuelstp.eu/country/croatia.html>

<http://biofuelstp.eu/country/cyprus.html>

<http://biofuelstp.eu/country/czech-republic.html>

<http://biofuelstp.eu/country/denmark.html>

<http://biofuelstp.eu/country/estonia.html>

<http://biofuelstp.eu/country/finland.html>

<http://biofuelstp.eu/country/france.html>

<http://biofuelstp.eu/country/germany.html>

<http://biofuelstp.eu/country/greece.html>

<http://biofuelstp.eu/country/hungary.html>

<http://biofuelstp.eu/country/ireland.html>

<http://biofuelstp.eu/country/italy.html>

<http://biofuelstp.eu/country/lithuania.html>

<http://biofuelstp.eu/country/luxembourg.html>

<http://biofuelstp.eu/country/malta.html>

<http://biofuelstp.eu/country/poland.html>

<http://biofuelstp.eu/country/portugal.html>

<http://biofuelstp.eu/country/romania.html>

<http://biofuelstp.eu/country/slovakia.html>

<http://biofuelstp.eu/country/slovenia.html>

<http://biofuelstp.eu/country/spain.html>

<http://biofuelstp.eu/country/sweden.html>

<http://biofuelstp.eu/country/netherlands.html>

http://biofuelstp.eu/country/united_kingdom.html

European Biomass Industry Association, (2013). Comparative analysis of the different legal frameworks; Identification of barriers and opportunities.

European Commission, (2010). National Action Plans of EU member states. Retrieved February, 2016 from: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>

European Commission, (2013). National progress reports on renewable energy goals pursuant to Article 22 of Directive 2009/28/EC. Retrieved February, 2016 from: <https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports>

Eurostat, (2014a). Energy from renewable sources. Retrieved from <http://ec.europa.eu/eurostat/web/energy/data/shares>

Eurostat, (2014b). Final energy consumption by product. Retrieved February 23, 2016, from <http://ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=ten00095&language=en>

Global Agricultural Information Network, (2015). EU-28 Biofuel Mandates in the EU by Member State.

Government Offices of Sweden, (2009). Sweden ' s first progress report on the development of renewable energy pursuant to Article 22 of Directive 2009 / 28 / EC, (December).

Hanson, R., & Mendes, D. M., (2011). Portugal Portugal Biofuels Standing Report, 1–13.

Jim Lane, (2015). Whats new different and hot in military and aviation biofuels. Retrieved March, 2016 from <http://www.biofuelsdigest.com/bdigest/2015/02/19/whats-new-different-and-hot-in-military-and-aviation-biofuels/>

Maabjerg Energy Center, (2016). Maabjerg Energy Center.

The Danish Government, (2013). The Danish Climate Policy Plan, (August), 61. Retrieved from <http://www.ens.dk/en/policy/danish-climate-energy-policy>

The European Parliament and the Council of the European Union, (1998). Directive 98/70/EC. *Official Journal of the European Union*, 58–67.

The European Parliament and the Council of the European Union,(2009). Renewable Energy

Directive 2009/28/EC. *Official Journal of the European Union*, 52, 140. Retrieved from <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2009:140:FULL&from=EN>

The European Parliament and the Council of the European Union, (2015). Directive 2015/1513 of the European Parliament and of the Council. *Official Journal of The European Union*

Trennepohl, N., (2013). *Renewable energy policy database and support*. Retrieved from <http://www.res-legal.eu/home/>

UFOP, (2014). Information about the conversion of the biofuel promotion from an energy quota to a greenhouse gas quota starting in 2015, 2009.