



What are the market and policy barriers for introduction of advanced biofuels? - Key findings

David Chiaramonti, Theodor Goumas

ART Fuels Forum

RE-CORD/University of Florence

c/o Dept.of Industrial Engineering, Univ.of Florence, Italy

11-12 April 2018

ETIP-B 8th Stakeholder Plenary Meeting, International Auditorium, Brussels

Outlook

- 01** ART Fuel Goals & Objectives
- The Platform **02**
- 03** REDII and AFF Key Messages
- Conclusions **04**

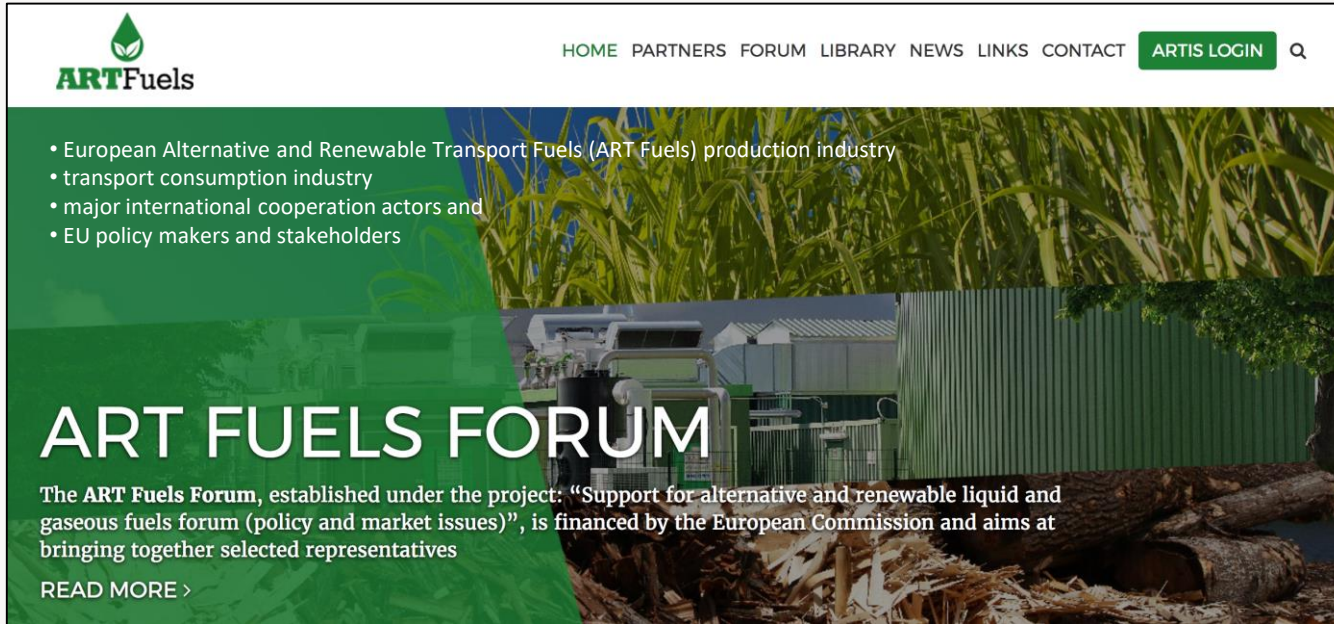
slide 1

01

ART Fuels Goals & Objectives

ART Fuels Forum (H2020) - *Altern.&Ren.Transport Fuels*

- Alternative and Renewable Fuels Forum – supported by EC-DG Energy
- **Goal: Market & Policies** post 2020 (to 2030).
- ~ 100 participants (Members, Affiliate, Observers).



The screenshot shows the website for the ART Fuels Forum. At the top left is the ART Fuels logo. To the right is a navigation menu with links for HOME, PARTNERS, FORUM, LIBRARY, NEWS, LINKS, and CONTACT. A green button labeled 'ARTIS LOGIN' and a search icon are also present. Below the navigation is a green banner with a background image of a cornfield and a bio-refinery. The banner contains the following text:

- European Alternative and Renewable Transport Fuels (ART Fuels) production industry
- transport consumption industry
- major international cooperation actors and
- EU policy makers and stakeholders

ART FUELS FORUM

The ART Fuels Forum, established under the project: “Support for alternative and renewable liquid and gaseous fuels forum (policy and market issues)”, is financed by the European Commission and aims at bringing together selected representatives

READ MORE >



<http://artfuelsforum.eu/>

02

The Platform

The ART Fuels Forum (AFF) Industrial Platform



Support for alternative and renewable liquid and gaseous fuels forum (policy and market issues)

The **ART Fuels Forum** established under the project: "Support for alternative and renewable liquid and gaseous fuels forum (policy and market issues)", is financed by the European Commission and aims at bringing together selected representatives of:

- the European **Alternative and Renewable Transport Fuels (ART Fuels)** production industry
- the transport consumption industry
- the main international cooperation actors and
- the EU policy makers and stakeholders

towards facilitating discussion and elaboration of common issues on policy and market penetration barriers for these fuels.

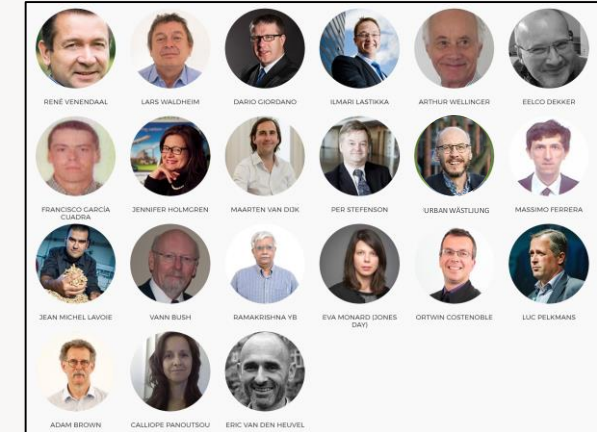
The project contributes to enhancing and strengthening the understanding of the needs of the ART Fuels sector in view of improving:

- policy understanding and its implementation at European level
- appreciation of market uptake issues
- technology insight and deployment issues
- appreciation of international cooperation, WTO and GHG emissions issues

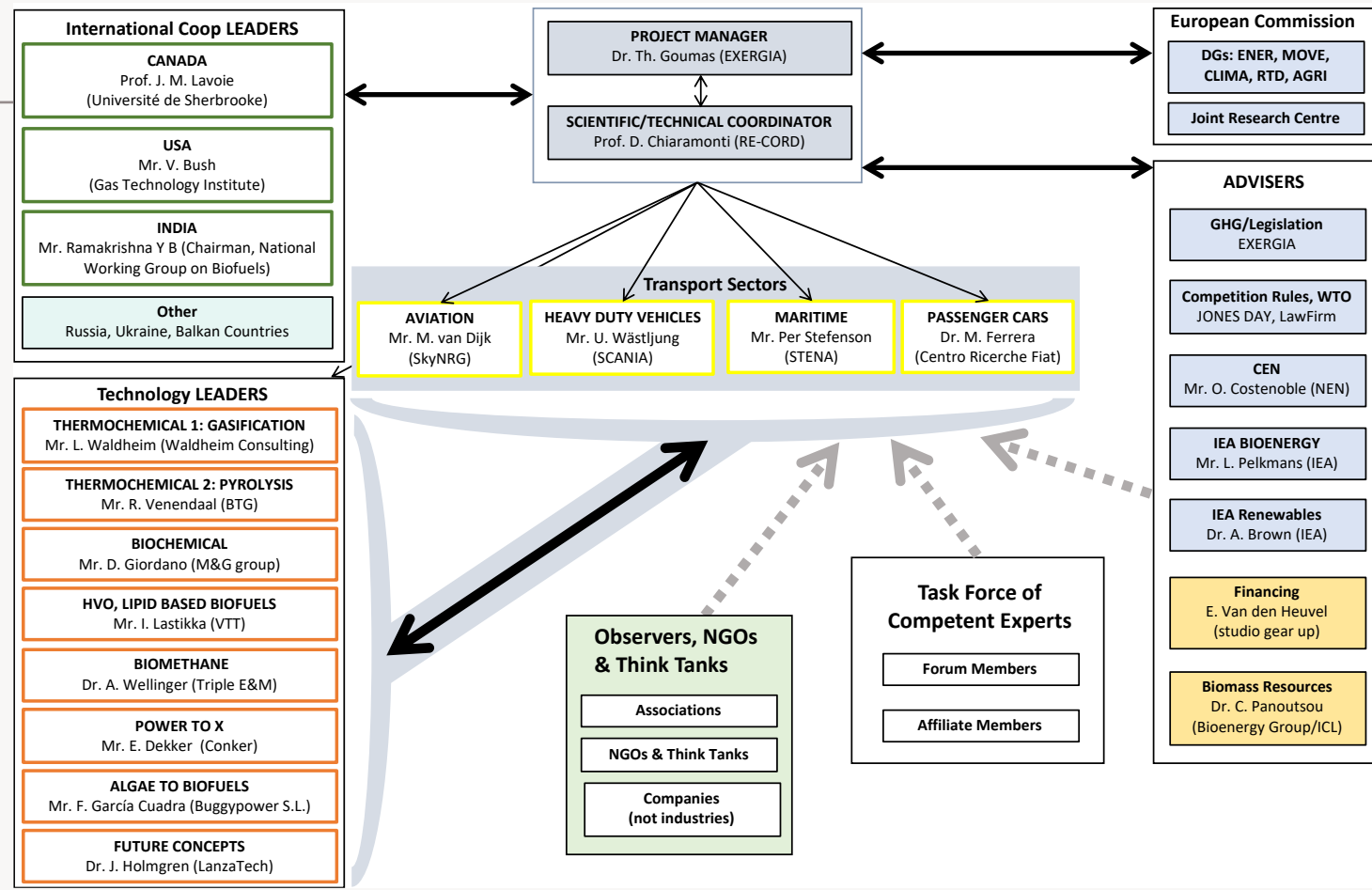
The Forum integrates a series of organized and structured discussions, plenary meetings, preparation of position papers, etc. towards shaping strategies and policies for market deployment of ART Fuels. ♣



All logos are property of their respective owners



ART-Fuels Forum structure



Workshop

The role of low carbon fuels in decarbonising transport: the emerging consensus from international initiatives

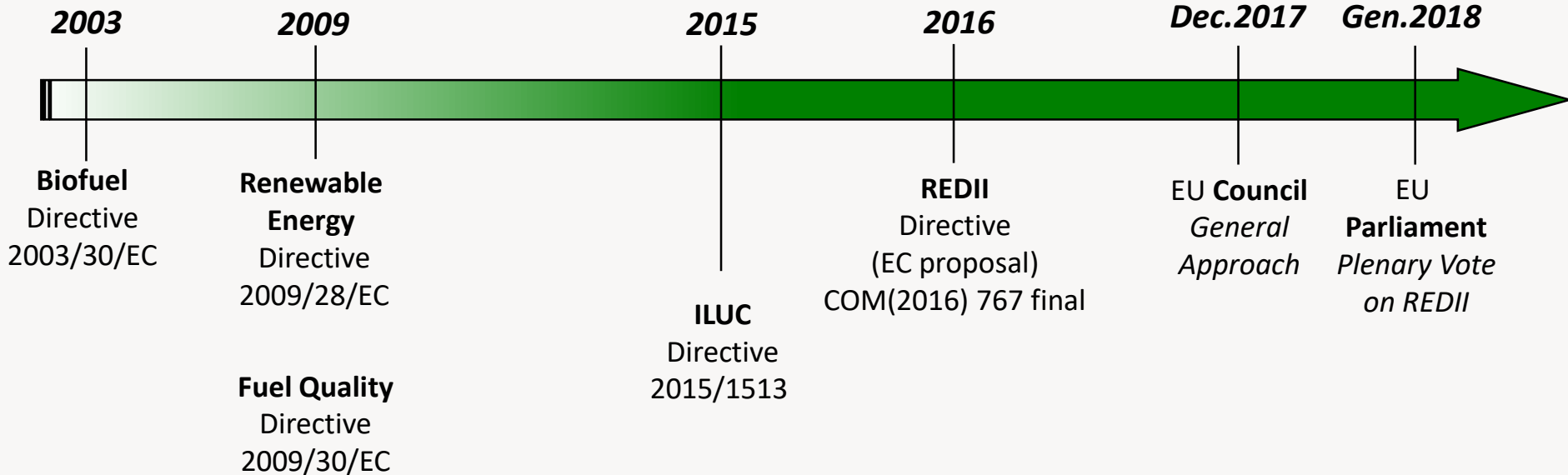
10/11/4/2018, Brussels, BE



03

REDII and AFF Key Messages

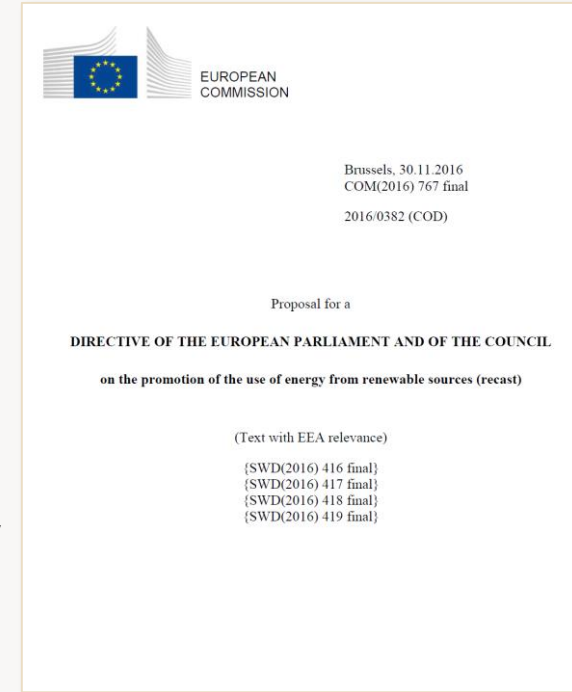
Summary of Legislative pathway to REDII



EU Policy – The REDII debate

- EC proposed the new Directive on Renewable Energy (REDII) on Nov 2016
 - Following SubGroup on Advanced Biofuels - SGAB
 - SGAB work was endorsed by the ART Fuel Forum, which is further elaborating industry views and messages
 - ✓ Industry needs certain conditions to invest in **Demo** and **First-Of-A-Kind (FOAK)** plants
- ❑ The **Definition of AB** and ART Fuel was among the very first issues tackled, reiterating SGAB def.

“AB are those produced from biomass other than food/feed crops while meeting the EU sustainability regime under the legislation in force”.



DIRECTIVE (EU) 2015/1513 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 9 September 2015

amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources

(Text with EEA relevance)

I

(Legislative acts)

DIRECTIVES

DIRECTIVE (EU) 2015/1513 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 9 September 2015

amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 114 thereof in relation to Article 1(3) to (13) and Article 17(1) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee,

After consulting the Committee of the Regions,

Acting in accordance with the ordinary legislative procedure,

Whereas:

- (1) Pursuant to Article 3(4) of Directive 2009/28/EC, Member States are to ensure that the share of energy from renewable sources in the final consumption of energy in the transport sector is at least 10 % of the final consumption of energy in the transport sector by 2020. Directive 2009/28/EC also stresses the need for Member States to ensure that a mandatory percentage target for energy efficiency is achieved in the transport sector, and that the importance of energy efficiency also for green growth is stressed. Member States are encouraged to include more detailed information on energy efficiency in their reports to be submitted in accordance with Article 17(1) of Directive 2009/28/EC and other Union law, and to report on energy efficiency in the transport sector.

(¹) OJ C 198, 10.7.2013, p. 56.

(²) Position of the European Parliament of 11 September 2013 (not yet adopted) and Decision of the Council of 13 July 2013 (not yet adopted) (OJ C 30, 12.2.2015, p. 1).

(³) Directive 2009/28/EC of the European Parliament and of the Council of 19 May 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directive 2001/77/EC.

(⁴) Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC.

ANNEX IX

Part A. Feedstocks and fuels, the contribution of which towards the target referred to in the first subparagraph of Article 3(4) shall be considered to be twice their energy content:

- (a) Algae if cultivated on land in ponds or photobioreactors.
- (b) Biomass fraction of mixed municipal waste, but not separated household waste subject to recycling targets under point (a) of Article 11(2) of Directive 2008/98/EC.
- (c) Bio-waste as defined in Article 3(4) of Directive 2008/98/EC from private households subject to separate collection as defined in Article 3(11) of that Directive.
- (d) Biomass fraction of industrial waste not fit for use in the food or feed chain, including material from retail and wholesale and the agro-food and fish and aquaculture industry, and excluding feedstocks listed in part B of this Annex.
- (e) Straw.
- (f) Animal manure and sewage sludge.
- (g) Palm oil mill effluent and empty palm fruit bunches.
- (h) Tall oil pitch.
- (i) Crude glycerine.
- (j) Bagasse.
- (k) Grape marcs and wine lees.
- (l) Nut shells.
- (m) Husks.
- (n) Cobs cleaned of kernels of corn.

Only feedstock list. No technology-related definition.

- (o) Biomass fraction of wastes and residues from forestry and forest-based industries, i.e. bark, branches, pre-commercial thinnings, leaves, needles, tree tops, saw dust, cutter shavings, black liquor, brown liquor, fibre sludge, lignin and tall oil.
- (p) Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2.
- (q) Other ligno-cellulosic material as defined in point (r) of the second paragraph of Article 2 except saw logs and veneer logs.
- (r) Renewable liquid and gaseous transport fuels of non-biological origin.
- (s) Carbon capture and utilisation for transport purposes, if the energy source is renewable in accordance with point (a) of the second paragraph of Article 2.
- (t) Bacteria, if the energy source is renewable in accordance with point (a) of the second paragraph of Article 2.

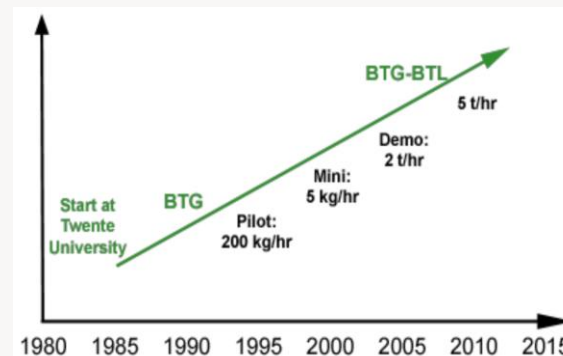
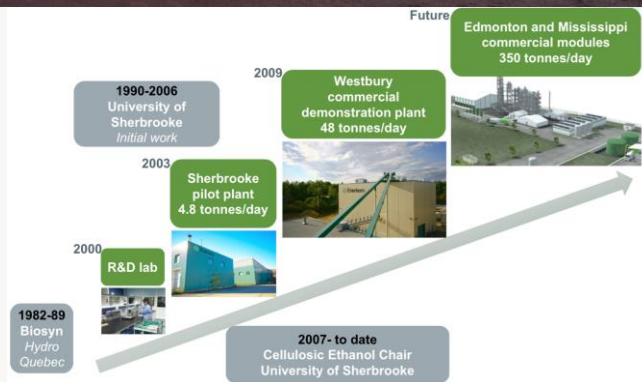
Part B. Feedstocks, the contribution of which towards the target referred to in the first subparagraph of Article 3(4) shall be considered to be twice their energy content:

- (a) Used cooking oil.
- (b) Animal fats classified as categories 1 and 2 in accordance with Regulation (EC) No 1069/2009 of the European Parliament and of the Council (¹)

(¹) Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation) (OJ L 300, 14.11.2009, p. 1).

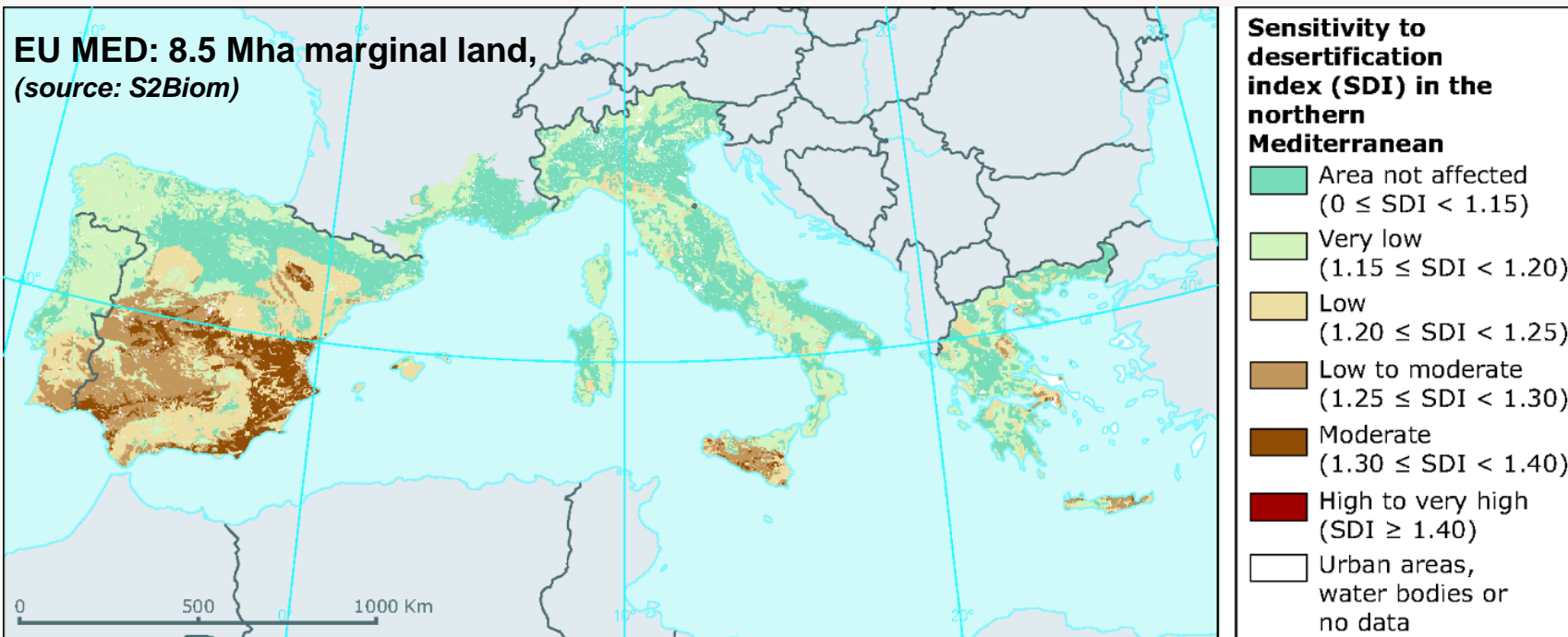
- **LONG-TERM STABLE POLICY FRAMEWORK**
- **PENALTIES FOR NON-COMPLIANCE**
- **POST 2030 PROVISIONS**
- **SUSTAINABILITY CRITERIA**
- **1G TO AB TRANSITION**
- **FINANCING**
- **SPECIFIC INCENTIVES FOR AVIATION**
- **MULTIPLIER FACTORS**
- **PROTECTION OF INVESTMENTS**
- **GHG EMISSION FROM WASTE TO BE REASSESSED**
- **SPECIAL ATTENTION TO NEW TECHNOLOGIES**
- **BIOMASS CO-PROCESSING IN PETROLEUM REFINERIES**

From R&D to Demo to Industrial - *no shortcuts to market*



- **LONG-TERM STABLE POLICY FRAMEWORK**
- **POST 2030 PROVISIONS**
- **1G TO AB TRANSITION**
- **PROTECTION OF INVESTMENTS**
- **PENALTIES FOR NON-COMPLIANCE**
- **SUSTAINABILITY CRITERIA**
- **FINANCING**
- **SPECIFIC INCENTIVES FOR AVIATION**
- **MULTIPLIER FACTORS**
- **GHG EMISSION FROM WASTE TO BE REASSESSED**
- **SPECIAL ATTENTION TO NEW TECHNOLOGIES**
- **BIOMASS CO-PROCESSING IN PETROLEUM REFINERIES**

- **TAILOR-MADE SOLUTIONS NEEDED** - AFF welcomes a tailor-made solution for aviation and wants to emphasize that there can be different ways to structure such support mechanisms and that the multiplier might not be the most effective option [..] a 1.2 factor will not be sufficient [...]. On the other hand, if EC is open to discuss other mechanisms [..] strong preference to work on an auctioning system [...]
- **AVIATION IS A GLOBAL INDUSTRY: MEASURES NEED ALIGNMENT** - Any measures taken in a European context will have an (economic) impact on EU carriers in this global competitive playing field. Ensuring alignment at international level is key (e.g. ICAO).
- **SUPPORT TOWARDS UPSCALING** - First upscaling of the sustainable aviation fuel industry will be relying heavily on non Annex-IX feedstock [..] conversion technologies that can use Annex-IX feedstock are not ready for commercial scale up (i.e. not ASTM certified and low TRL [...])
- **INDECISIVENESS WILL PUT THE EU EVEN FURTHER BEHIND** – [..] Serious policy/market efforts are emerging in US, China, Canada, Norway, UK, Brazil Australia, Japan etc.



AFF positions (after EP-ENVI Committee vote)

- **1** - transport specific renewable energy target for Member States or a fuel supplier obligation.
- **2** - Maintaining the list of feedstocks from Annex IX as it is, as proposed by the Commission, whilst allowing to add feedstock to the list in the future but not removing any.
- **3** - Establishing binding specific targets (dedicated sub-mandates) for the different categories of biofuels and other sustainable transportation alternatives
- **4** - Incentivizing the use of alternative fuels in aviation and marine sectors with concrete policy measures.
- **5** - Focusing efforts on limiting the use of fossil fuels in transport rather than limiting sustainable crop based biofuels. A 7% cap on sustainable crop-based biofuels should not be reduced until 2030.

EU Parliament (17.1.18)

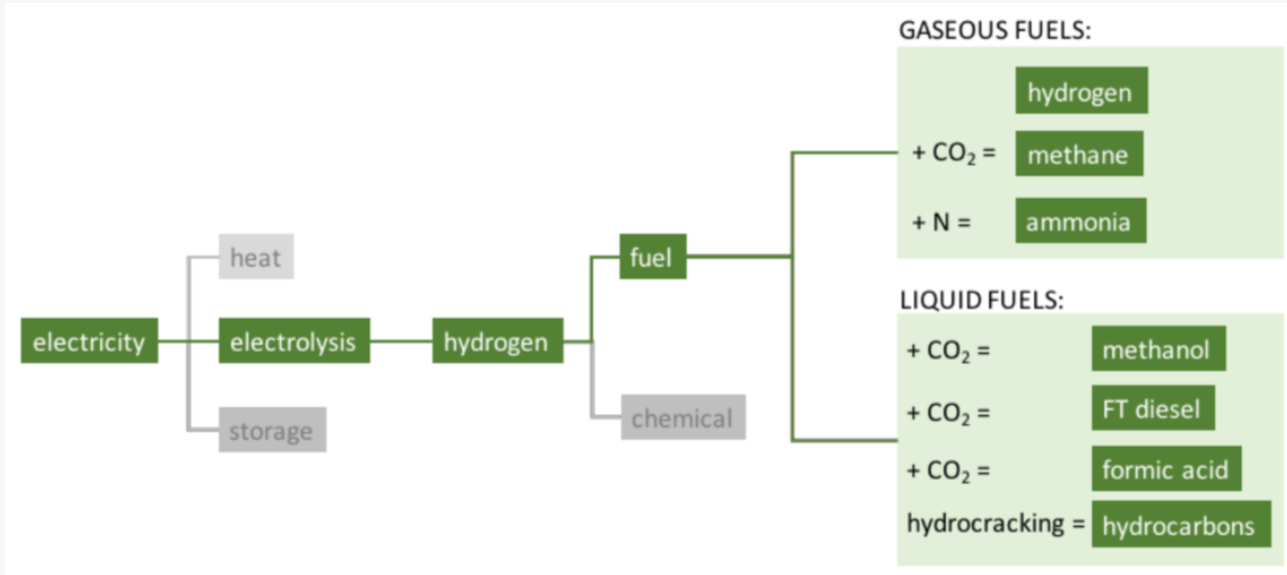
- Binding EU Target at **12% of RES in Transports** (in addition to 35% En.Eff and 35% RES in Fin.En.Cons.).
- **Conventional Biofuels** (“1st Gen”) limited to 2017 share: National caps at 2017 level, **min 2%, max 7%**.
- **Palm oil ban by 2021.**
- **Advanced biofuel, renewable fuels of non-biological origin, waste-based fuels and renewable electricity in transports: at least 1.5% at 2021, 10% at 2030.**
- **Multiple counting: 2x Aviation, 1.2x maritime, 2.5x electricity.**
- Member States must set National targets, and then monitor and achieve these.
- Definition of AB extended to include waste-based fuels, but **MSWs-fuels removed from Annex IX**

EU Council (18.12.17)

- Target of **14% of renewables in transports** by al 2030 in each Member State
- **3% sub-target at 2030** for the Advanced Biofuels, entitled by **double counting**, as well as **intermediate target of 1% at 2025.**
- **Electric mobility** promoted by a **5x** multiple counting, and **2x** in renewable **rail** transports
- Maintain the **7% cap for conventional biofuels**, to ensure certainty for investors.

Other elements on GHG emission reduction and sustainability for liquid, solid and gaseous biofuels exist in the both the Council and EP positions.

Still various critical matters on the ground. The EU Industry brings **key messages/statements through AFF in REDII debate**



- **Power-To-X estimated potential - 0.5-0.7%** total EU energy demand for transport (Source: SGAB), i.e. **10%** of REDII target.

- **Barriers 1** - Only if the installation is **directly connected** to a renewable electricity installation is it possible to qualify the entire output as renewable, but in this case the installation may not be connected to the electricity grid. **Unnecessarily restrictive condition:** GO (current or revised/improved, to avoid risks of kWh double counting) should be retained sufficient.
- **Barriers 2** - In ENVI compromise amendment 2A the definition of RFNBO is amended by adding an additional requirement “where any **carbon feedstock is captured from the ambient air**”. In Europe alone, there are **9.000 point sources of CO2 at high concentrations**, emitting more than **1.5 billion tons of CO2 per annum**. This amount of CO2 equals more than **500 million tons of oil equivalent** in terms of Power-to-X fuels.

Source	Type CO ₂	Output (ton/hour)	Concentration
Industrial flue gases (e.g. steel mill, refinery)	Fossil	700	10%-15%
Ethanol fermentation (e.g. brewery, fuel production)	Biogenic	50	95%
Biogas upgrading	Biogenic	0,7	90%

- **Barriers 3** – Subtargets introduced by REDII proposal in Article 25.1, different sub-quotas listed in Annex X.
 - *Annex X – Part A sets a maximum contribution of **3,8% from liquid biofuels made from food or feed crops in 2030***
 - *Annex X – Part B sets a minimum share of energy from all **feedstocks listed in Annex IX, renewable transport fuels of non-biological origin, waste-based fossil fuels and renewable electricity at 6,8% in 2030***
 - *Annex X – Part C sets a minimum share of **advanced biofuels** from feedstocks listed in Annex IX Table A at **3,6% in 2030***
- Surprisingly **RFNBO** has been removed from Annex IX Part A for no apparent reason.

- Am.274 → The following has been **deleted**: “(b) Biomass fraction of mixed municipal waste, but not separated household waste subject to recycling targets under point (a) of Article 11(2) of Directive 2008/98/EC.”

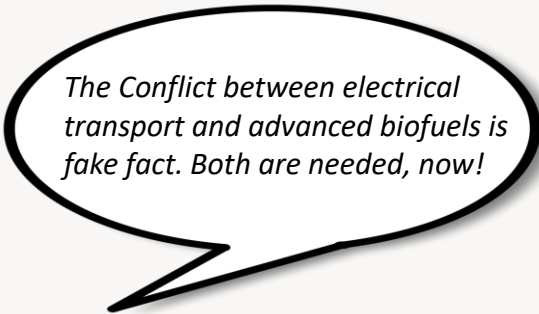
Line b) MSW of Annex IX has been deleted as part of the block vote during the plenary session. At the same time, the definition of advanced biofuels has been extended to include ‘waste and residues’ as well as the definition of biomass for WTE to include MSW. There is definitively a clear contradiction here.

04

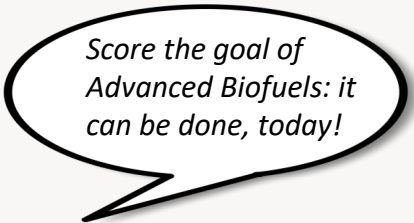
Conclusions

Follow-up on the RED II debate

- Continuation of market and policy analysis in the frame of RED II
- Elaboration of market and policy documents using simple language to be addressed to Policymakers (EC, EP, the Council)
- Elaboration of simple messages (“public messages”) to communicate the need to further consider AB in the decarbonization process
- Enhancement of communication channels to reach out to the to Policymakers (EC, EP, the Council)

A large, black-outlined speech bubble with a drop shadow, containing text.

The Conflict between electrical transport and advanced biofuels is fake fact. Both are needed, now!

A smaller, black-outlined speech bubble with a drop shadow, containing text.

Score the goal of Advanced Biofuels: it can be done, today!

Contribution to **EC consultations** on new Directives, Regulations:

- **DG CLIMA: Post 2020 Light Vehicle CO2 Regulation**

setting emission performance standards for new passenger cars and for new light commercial vehicles as part of the Union's integrated approach to reduce CO2 emissions from light-duty vehicles and amending Regulation (EC) No 715/2007 (recast)

- **DG CLIMA: Establishment of the Innovation Fund**

In the context of revision of the EU emission trading system (EU ETS), which includes the creation of an Innovation Fund. The Innovation Fund should be endowed with 450m allowances to support large-scale demonstration of activities in carbon capture and storage, renewable energy and low-carbon innovation in energy intensive industry, including carbon capture and use

ENERGY & ENVIRONMENT
CONSULTANTS

Omiron Str. & Vissarionos 1
10672 Athens (GR)
Tel: +30 210 6996185,
e-mail: office@exergia.gr

Ren. Energy Consortium for R&D
c/o Dept. of Industrial Engineering
Univ. of Florence, Viale Morgagni 40
50134 Florence (IT)
Tel: +39 055 2758690
e-mail: info@re-cord.org



David Chiaramonti

david.chiaramonti@re-cord.org - david.chiaramonti@unifi.it - <http://www.re-cord.org>

www.artfuelsforum.eu
artfuels@exergia.gr