



State of play of RED sustainability criteria implementation and reflection on advanced biofuels

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Implementation EU sustainability criteria

- **What has been done?**
- **What is the Commission working on?**
- **Technical issues**





What has been done?

April 2009: Renewable Energy Directive adopted

June 2010: Commission guidance adopted

- Communication on the practical implementation
- Communication in voluntary schemes and default values
- Land carbon stock calculation guideline

July 2011: First seven voluntary schemes adopted

- http://ec.europa.eu/energy/renewables/biofuels/sustainability_criteria_en.htm





What is the Commission working on? (1/2)

- **Definitions of ‘biodiverse grasslands’ and ‘severely degraded/heavily contaminated land’**
- **Assessment/approval of further voluntary schemes: (circa 19 under evaluation)**
- **Transposition law (deadline for notification 5 Dec 2010)**
 - **Infringement procedures launched**
 - **Assessment ongoing**





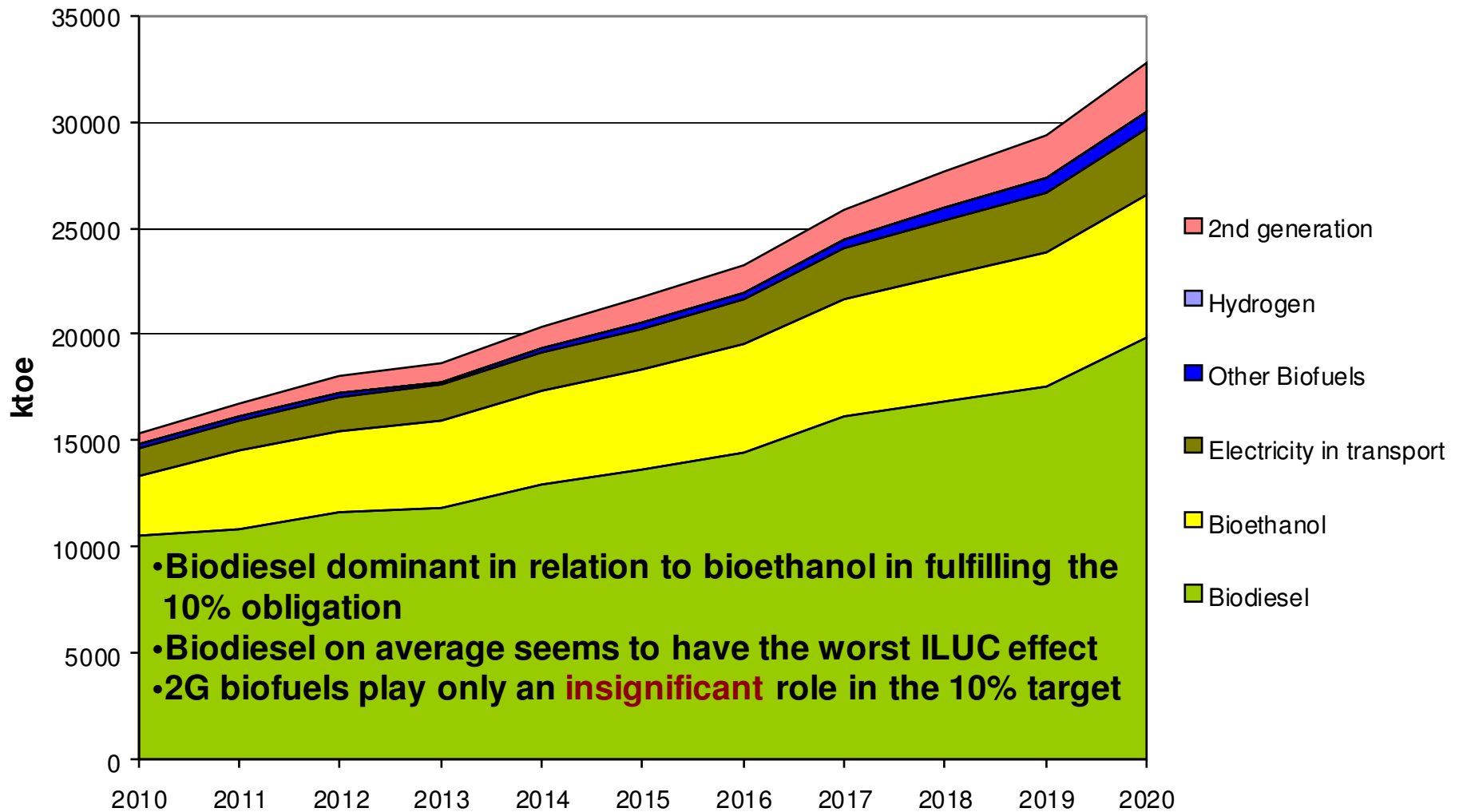
What is the Commission working on? (2/2)

- **Update of Annex V default values: not yet decided when**
- **Indirect land use change**
 - **Report December 2010**
 - **Deficiencies and uncertainties associated with the modelling**
 - **Indirect land-use change can have an impact on GHG savings of biofuels**
 - **Impact assessment to be finalised soon**
 - **Focusing on four policy options**
 - **If appropriate with a proposal for amending the legislation**





NREAPs: Technology breakdown (transport)





Incentives for advanced biofuels

- **Support under the 7th RTD Framework Programme**
- **Specific initiatives under the SET-plan, including the European Industrial Bioenergy Initiative**
- **Double counting towards 10% target for “...biofuels produced from wastes, residues, non-food cellulosic material and ligno-cellulosic material...” (RED Art 21.2)**





FP7 Ongoing Contract – EC Support 9.2 M€

**KACELLE Contract, Consortium led by Dong Energy
INBICON process, ethanol from straw**





FP7 Ongoing Contract – EC Support 8.2 M€





Commission's work on 2050 (March 2011)

- Low carbon economy roadmap 2050
 - Minus 54% to 67% GHG in transport in 2050 (compared to 1990)
- Transport 2050 White Paper
 - Halve the use of 'conventionally-fuelled' cars in urban transport by 2030; phase them out in cities by 2050.
 - 40% "low carbon sustainable fuels" in aviation
 - 40-50% reduction of EU CO₂ emissions from maritime bunker fuels





White Paper on Transport

Analysis

The use of sustainable biodiesel would reduce the emissions from **road freight transport**. By 2050, biofuels could represent around **40%** of energy consumption in long distance road freight, where electrification has a lower potential.

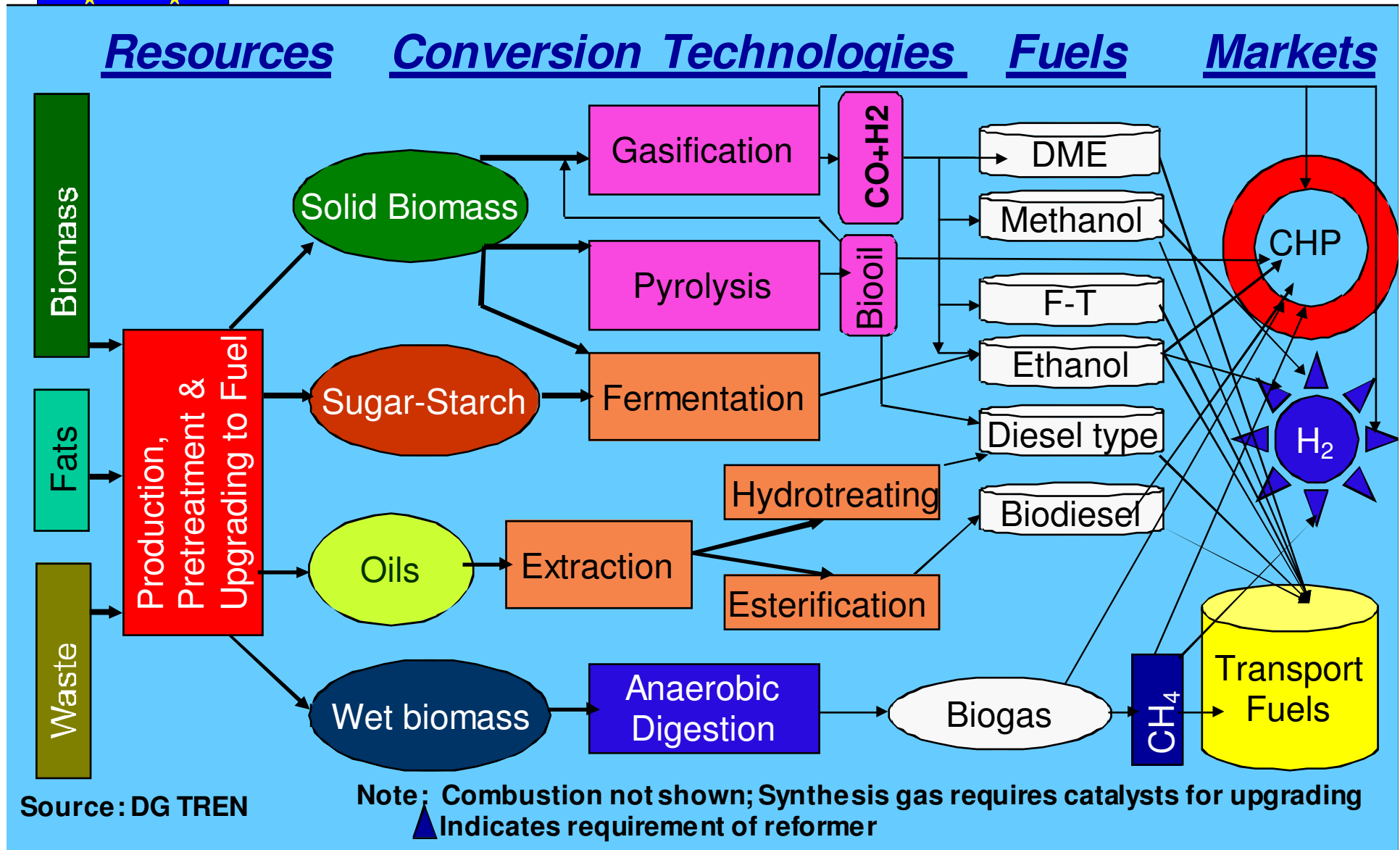
Low carbon fuels in **aviation** to reach **40%** by 2050.

Overall, the emissions from **maritime bunker fuels** could be cut by **40%** by 2050 compared to 2005 levels.





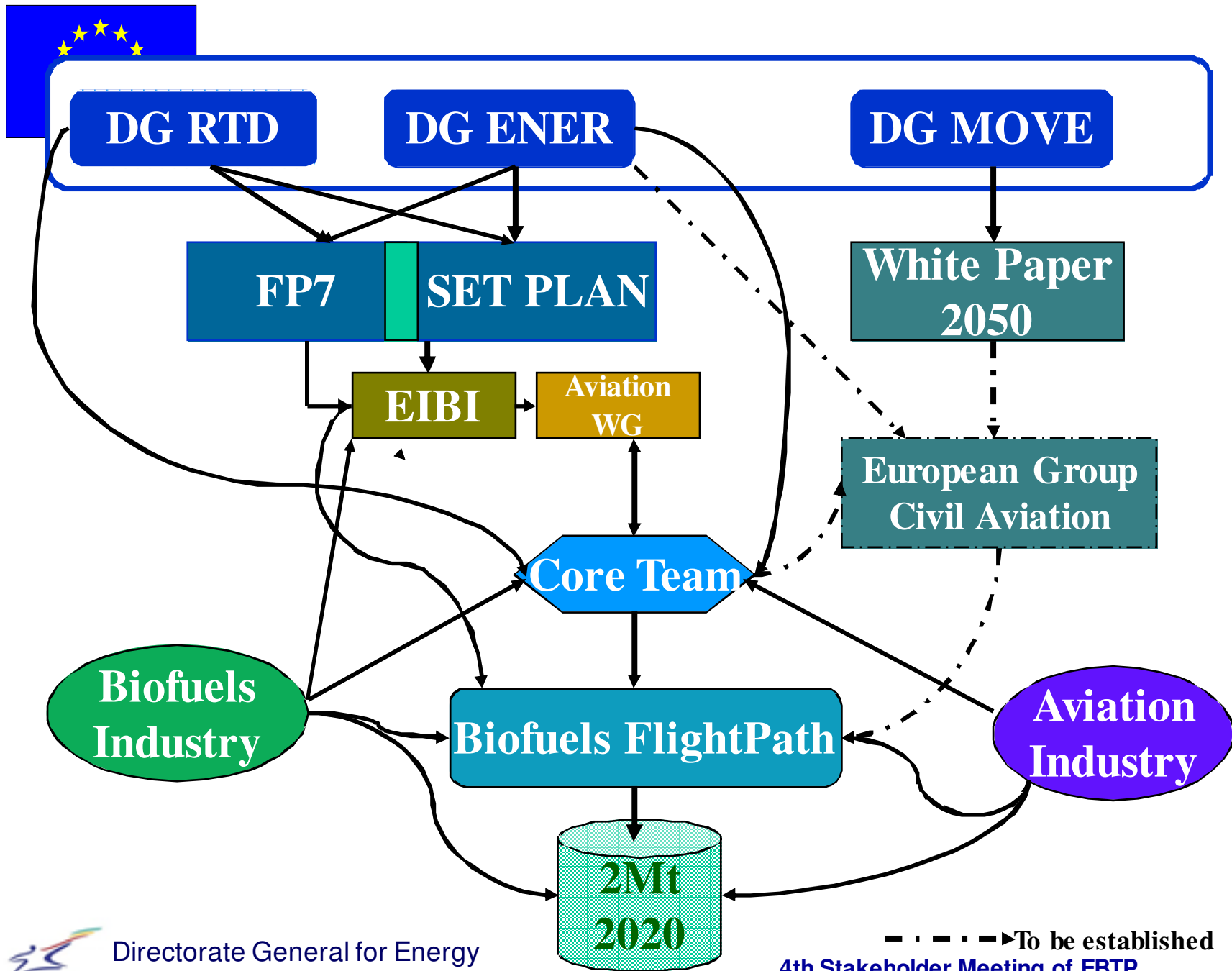
Overview of Conversion Pathways (1)



Source: DG TREN

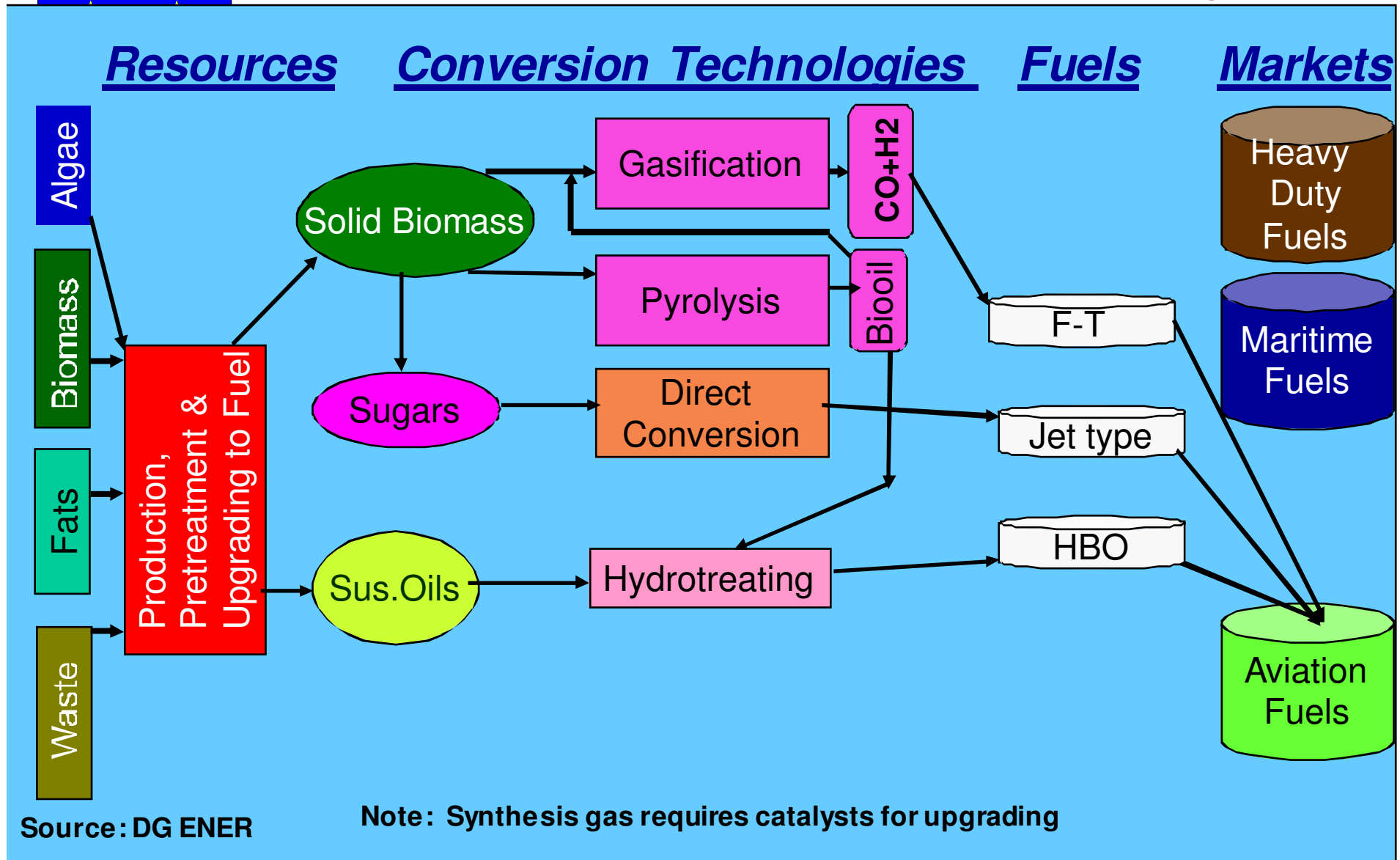
Note: Combustion not shown; Synthesis gas requires catalysts for upgrading
▲ Indicates requirement of reformer





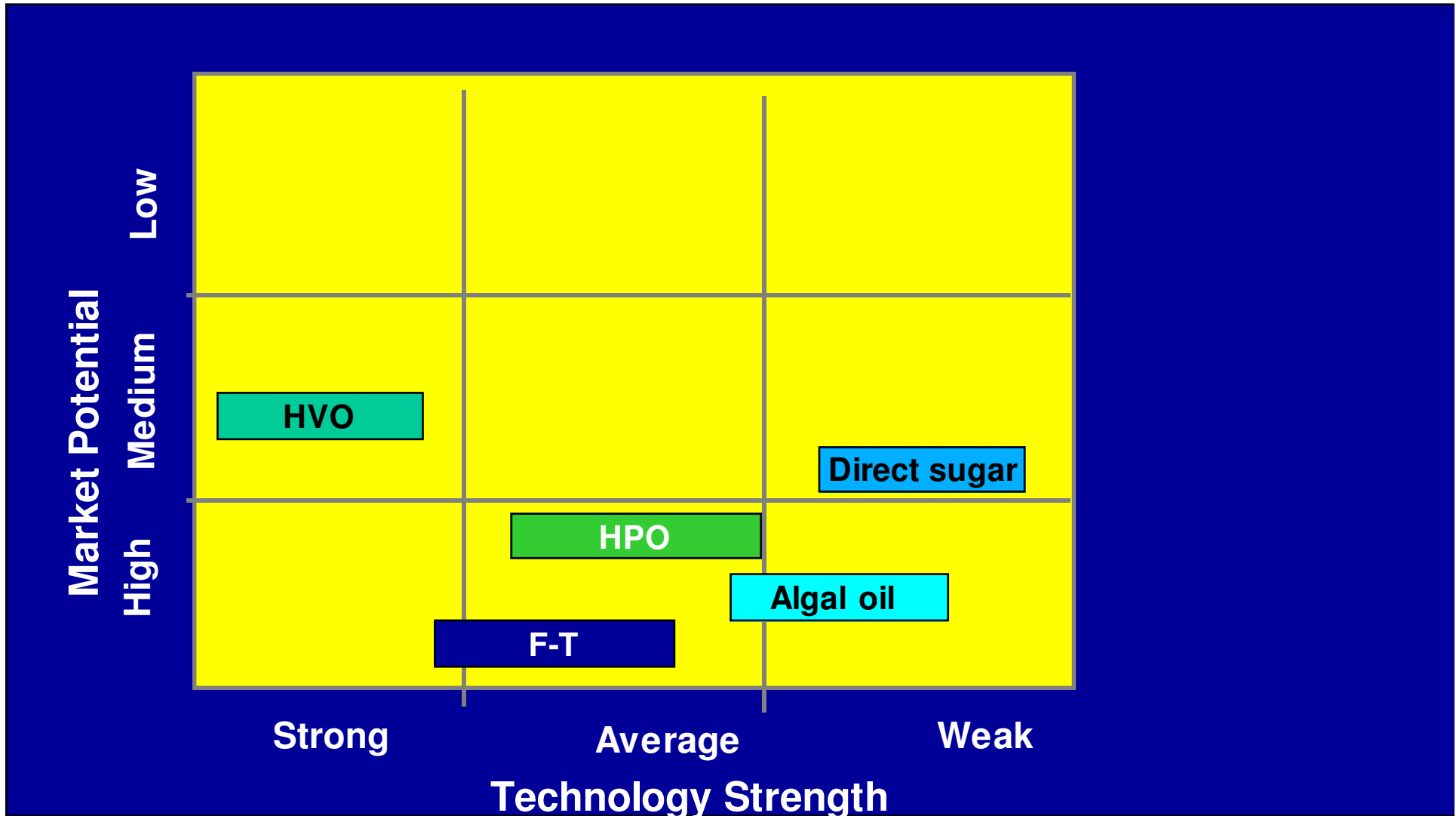


Overview of Conversion Pathways (2)





Status of Processes





Market Opportunities for Bio-Paraffins

	Existing Technology	New Technology
Existing Markets	Market Penetration HVO	Product Development Fischer-Tropsch & HPO Algal oil based bio-paraffins Direct conversion of sugars
New Markets	Market Development HVO from resources meeting full sustainability criteria	Diversification Heavy Duty transport Maritime transport BioChemicals





Biofuels allocation???

In aviation only Fischer-Tropsch (FT) & Hydrogenated Vegetable Oils can be used....limitations for road transport...

Heavy duty engines rely on FAME, FT and HVO...
with EURO 6 heavy duty engines will not be able to run on
FAME

.....but so does the maritime transport.....

Availability of HVOs may be limited due to on their weak sustainability/ILUC character...

So where do the above considerations leave us?

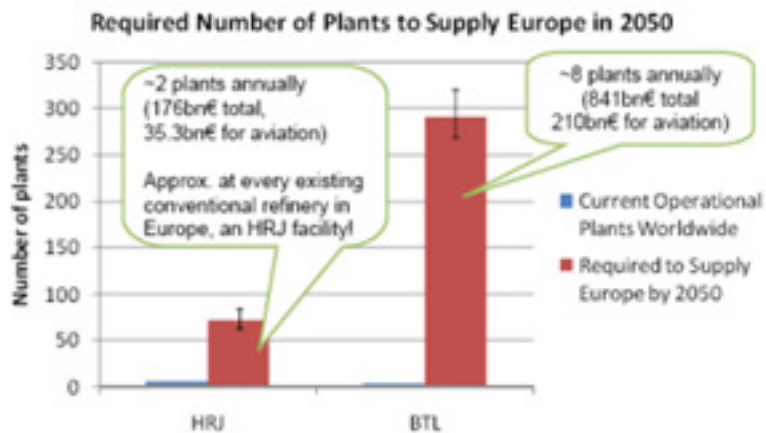




The Number of Fuel Production Plants in 2050 is Large



SWAFEA Study Biofuels in Aviation



Producing sufficient aviation biofuel in 2050 would require approximately:

80 HRJ plants
OR
290 BTL plants*
(or a combination of both)

In short: to be able to realistically achieve targets, we would need to start construction now, accelerate fast, and keep up the pace with access to unlimited cheap capital despite initial negative returns.

BTL: 1 Mt product capacity, € 2.9 billion, 250 kt capacity for aviation
HRJ: 5 Mt product capacity, € 2.2 billion, 1 Mt capacity for aviation
For comparison, a conventional refinery in Europe: 7.5 Mt crude capacity (150 000 bbl/day), world-class refinery is bigger)

SWAFEA RESTRICTED

80 HVO plants or 290 BTL plants by 2050

Or 2 HVO plants annually, 5Mt capacity, 1Mt for Aviation, €2,2 billion per plant or €176 bn total of which €35,6 bn for aviation.

Or 8 BTL plants annually, 1Mt capacity, 250 kt for Aviation, 2,9 billion per plant or €841 billion to total of which €210 bn for aviation.





Key Issues

How many of the technologies under development will meet the 60% GHG reduction?

What are the costs and how to pay for them?

We need a thorough re-evaluation of the various technologies under development, not on generic value chains, but on the specific processes.

The Commission plans to start this work for the paraffinic biofuels under the Biofuels FlightPath.



Conclusions

The European Commission strongly supports Bioenergy & biofuels with legislative actions & various programmes for technological advances & market penetration.

The EU biofuels sustainability scheme is operational and Member States are implementing

Biofuels' progress is solid but not fast enough to meet objectives.

In addition to biofuels we need to develop and use other alternative fuels. The Industry has to play a leading role.

The 2050 Transport targets will create new momentum.





Thank you for your attention

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