



European Commission
JRC - Institute for Energy
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Contents of Presentation

The EU Renewables Directive

1. Mandatory targets
 2. Grid access
 3. Sustainability criteria
 4. Other policy documents
 5. Market support/Standards
- Relevant References and Contact Details

Binding Renewable Energy Targets by 2020

Renewable Energy Directive (2009/28/EC)

- **20% share** in overall final energy consumption
- **10% share** in all forms of transport (*not limited to biofuel*)
- **Biofuels count** for them all

Fuel Quality Directive (2009/30/EC)

- **6% reduction** greenhouse gas emissions from road transport fuels

Note: Energy and climate policy also demands 20% increase in energy efficiency and 20% reduction in CO₂ emissions by 2020

The Renewables Directive

- Grid Access: Electricity and Gas

Article 16 (7):

Member States shall ensure that charging of transmission and distribution tariffs does not discriminate against electricity from renewable sources, in particular in peripheral regions.

Member States shall ensure that charging of transmission and distribution tariffs does not discriminate against gas from renewable sources

The New Renewables Directive

- Grid Access: Gas

Article 16 (9):

Where relevant, Member States shall assess the need to extend existing gas network infrastructure to facilitate integration of gas from renewable sources

Article 16 (10):

Where relevant, Member States shall require grid operators to publish technical rules regarding network connection (viz. gas quality, odourisation, pressure) and publish connection tariffs for renewable gas sources

Mandatory sustainability criteria for biofuels

- **GHG saving of at least 35%**
 - 50% from 2017
 - 60% for new installations from 2018
 - default values and calculation method for actual values included (Annex V)
- **No raw material from converted land with:**
 - high biodiversity value
 - Primary forest, protected areas, biodiverse grassland
 - high carbon stock
 - Forests, peatland, wetlands

The New Renewables Directive

- Calculation of GHG Impact

Article 19 (1)

Defines the method for calculation, using the methodology given in Annex V.C. Typical and default values for GHG emissions for "cultivation", "transport" and "processing" steps are given in Annex V.D & E

Here, the clear difference between the GHGs for biofuels produced from energy crops and those produced from wastes/residues are clearly seen

Some GHG Savings in the RED

- Default GHG savings compared with fossil petrol/diesel
(Annex V.A)

<i>Biogas* from municipal organic waste</i>	<i>73%</i>
<i>Biogas* from wet manure</i>	<i>81%</i>
<i>Biogas* from dry manure</i>	<i>82%</i>
<i>Rapeseed biodiesel</i>	<i>38%</i>
<i>Palm oil biodiesel (process not specified)</i>	<i>19%</i>
<i>Palm oil biodiesel (CH₄ capture at mill)</i>	<i>56%</i>
<i>Sugar beet ethanol</i>	<i>52%</i>
<i>Sugar cane ethanol</i>	<i>71%</i>

(* in the form of compressed biomethane compatible with natural gas)

Revision of Default Values for Biofuels

Proposals made in 2011 (Impact Assessment)

revision of default values for existing pathways
amendment of biogas pathways
including use of energy crops

Note: 60% GHG saving can currently be interpreted from data in renewables directive

The Added Benefit of Waste

- Advanced and 2nd generation biofuels are biofuels produced from ligno-cellulosic biomass and waste – these fuels count double to 2020 national renewable transport fuels target.

Potential of Advanced and 2nd Generation Biofuels

- Advanced and 2nd generation biofuels projected to provide 15 EJ/y* by 2030 (= total current use of oil in transport, 350 Mtoe/y)

* Within EU + Ukraine: EU REFUEL project (www.refuel.eu)

Still to Come for Cultivated Crops !!!

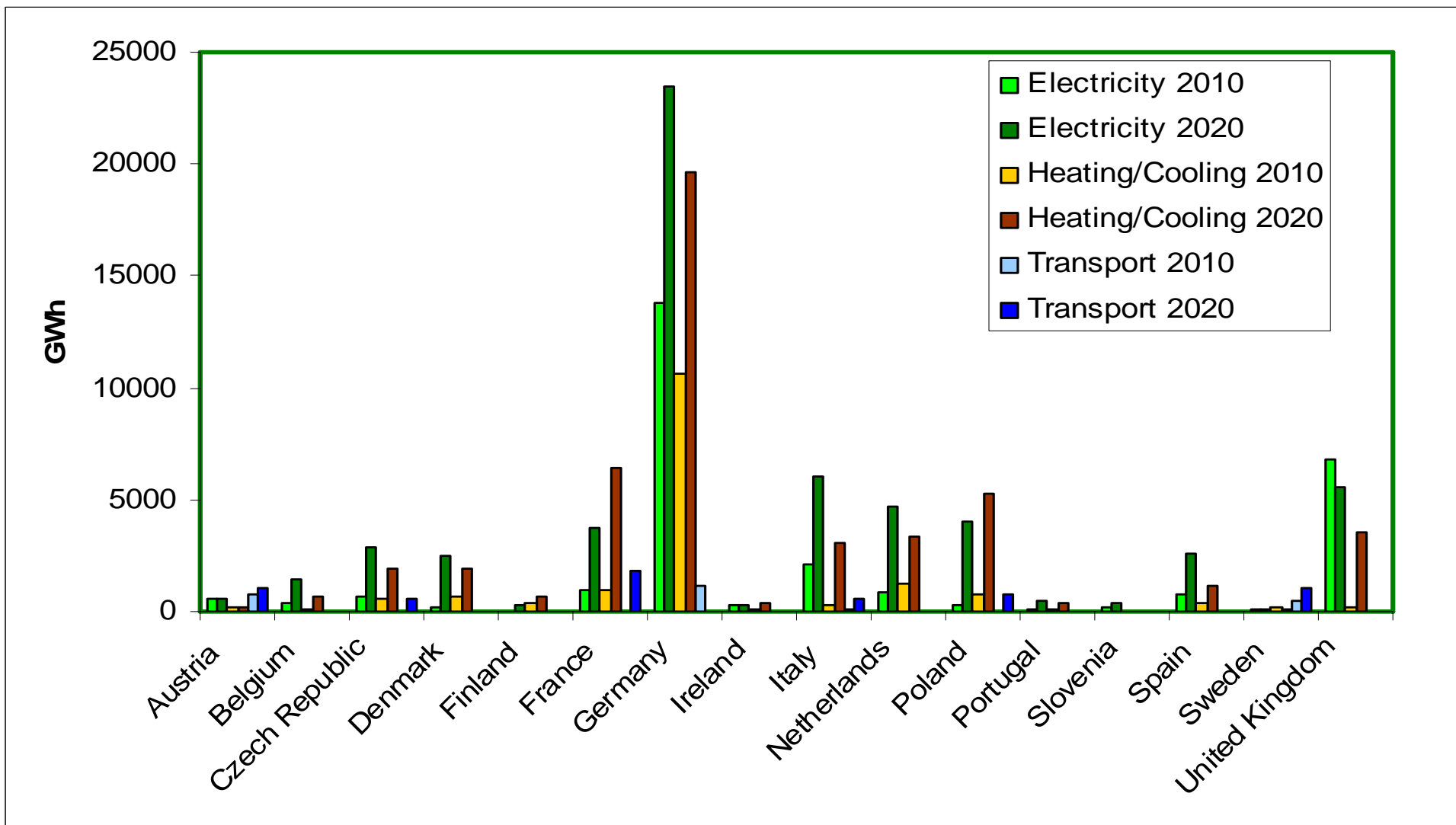
Land Use Change component still to be added to calculation of GHG Impact!!!

Article 19 (6)

*Concerning the as yet un-quantified effects of **Indirect Land Use Change (ILUC)***, safeguards to be provided to ensure certainty for investment undertaken before the ILUC methodology is applied. So, for installations producing biofuels before 2014, measures shall not apply before 2018, provided they then achieve a GHG saving of at least 45%*

** Report on ILUC effects due by 31-12-2010*

Biogas from 2010 - 2020 (NREAPS)



The European Bioenergy Industrial Initiative*

7 Value Chains

Including 2nd generation and other advanced biofuels, high efficiency CHP, intermediate carriers, but no specific inclusion of biogas from AD

Biogas production can be part of an integrated process where the main process is covered by one of the 7 Value Chains (e.g. for utilisation of process residues and providing CHP for the main process)

* Ells form part of the implementation of the European Strategic Energy Technologies Plan (SET-Plan)

EU White Paper Roadmap to a Single Transport Area

COM (2011) 144

- focus on “growing out of oil” with new technological solutions (new engines, materials and design; new fuels and propulsion systems), health benefits from clean vehicles (43 + 44)
- strategy for transport in close cooperation with the SET-Plan (Energy) (45)
- standardisation to avoid fragmentation (47)
- elimination of tax distortions (59)

Transition fuels versus ready-made fuels for use far into the future !!!!!!! Methane

Biomethane as a Transport Fuel

Future Transport Fuels Report (01-2011)

Conclusions:

- NG engine technology already well established
- Emissions with NG/biomethane reach EURO 6
- Emissions: low-NO_x, up to 24% lower CO₂ than petrol, particulates close to zero
- Dual-fuel at 75-85% NG with diesel possible - engine can run on 100% diesel (=good transition technology)
- Harmonised standards for gas grid injection and building of extensive refuelling infrastructure highest priority
- Biomethane could be readily available as CNG or LNG
- Double yield / hectare for biomethane versus bioethanol

Market Support

- **Proposed European Standards for Biogas/Biomethane**

DG ENER mandate to CEN* to formulate new standards supporting the exploitation of biofuels, particularly biogas.

Specific targeted standards:

- composition of biogas for injection into natural gas pipelines (CEN/TC234/WG9)
- fuel quality standard for biomethane use in transport applications (CEN/TC19)

* The European Standards Organisation

Recent Development:

Mandate from the European Commission is for both gas grid injection and vehicle fuel.

CEN has decided to combine the work and has formed a new Technical Committee

from CEN/TC234/WG9 + CEN/TC19
= CEN/TC408

NL Chairman, F Secretary
To be kicked-off in 2011



CEN/TC408

Working on mandate from the European Commission:

Main Aim:

- accommodate biomethane in grid with acceptable consequences (local and transport grids)
- specification for injection should comply with H-gas standard under preparation (2014)

Gaps in Knowledge:

- system integrity (contaminants - O_2 , CO_2 , H_2S , ammonia, siloxanes, PAHs,
- health issues (CO , PAHs, pathogens,
- aspects of gas exchangeability

Other Relevant Legislation

Waste Framework Directive (WFD) 2008/98/EC (22.11.2008) – with impacts on treatment of biowaste and digestate/compost

End-of-waste criteria for “Biodegradable Waste Subject to Biological Treatment”, Technical Working Group kick-off meeting, March 2nd 2011

NEW: Study on the suitability of different waste-derived fuels for end-of-waste status: could have an impact on biowaste utilisation
- consultation open from 8 September **until 28 October 2011**
<http://susproc.jrc.ec.europa.eu/activities/waste/index.html>

New Industrial Emissions Directive (IED) 2010/75/EU (24.11.2010) – “recast” IPPC directive and now the guiding directive for BREFs

Thank you for your attention

Relevant References and Contact Details

- **Energy and Climate Change website:**
http://ec.europa.eu/energy/strategies/2008/2008_01_climate_change_en.htm
 - **Bioenergy and Sustainability**
http://ec.europa.eu/energy/renewables/bioenergy/sustainability_criteria_en.htm
 - **Europa – Biomass/Biogas/Biofuels:**
http://ec.europa.eu/energy/res/sectors/bioenergy_en.htm
 - **Waste Framework Directive:**
<http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2008:312:SOM:EN:HTML>
 - **Industrial Emissions/BREFS:** <http://eippcb.jrc.es/reference/>
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- **Contact Point for Waste and Biomass Related Activities at JRC-
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