BIOSURF
Fuelling Biomethane

www.fnr.de

Sustainable raw material supply for the Production of Biomethane

Paris
23/11/2016
Diego Piedra-Garcia

Gefördert durch:

Bundesministerium für Ernährung und Landwirtschaft

aufgrund eines Beschlusses des Deutschen Bundestages

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

FNR
Fachagentur Nachwachsende Rohstoffe e.V.

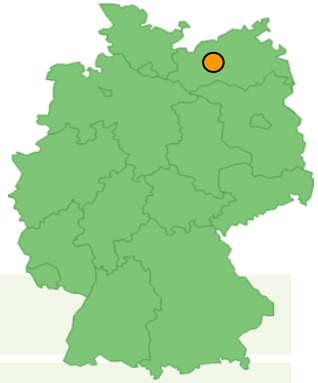
Introduction:

Agency for Renewable Resources (FNR)

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Fachagentur Nachwachsende Rohstoffe e. V.

BIOSURF Fuelling Biomethane



Facts

Foundation:	October 1993
Main office:	18276 Gülzow-Prüzen
Support:	Federal Ministry of Food and Agriculture (BMEL) and State of Mecklenburg- Western Pomerania
Employees:	85
Legal status:	Registered association with 78 members (7 voting members)
Tasks:	• Promotion of research, development and demonstration (project management) • Information & advice • Public relations • International and EU activities
Target groups:	Industry, SME, public and private research institutes, universities, government agencies

currant state: 16.11.2016

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

WP 4: Sustainable Biomethane Production

Relevant Sustainability Criteria and Management Practices in different countries

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

WP 4: Sustainable Raw Material Supply for the Production of Biomethane

BIOSURF assesses and evaluates:

- Availability and potential of **sustainable feedstocks**
- National **sustainability criteria & indicators**, incl. a gap analysis
- And eventually produces „**Guidelines** for biomethane value chain evaluation“

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Legislation and Regulations on Sustainability Criteria in Europe

At European Level: the most important regulations containing relevant sustainability criteria (SC) for biomethane production are:

- **Renewable Energy Directive (RED -** DIRECTIVE 2009/28/EC**)**
- **Fuel Quality Directive (FQD –** DIRECTIVE 2009/30/EC**)**
- **Communication from the Commission on voluntary schemes and default values (**COM 2010/ C 160/01**)**
- **Indirect Land Use Change Directive (iLUC –** "amendments to RED and FQD"; DIRECTIVE (EU)2015/1513**)**

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Sustainability criteria defined by the Renewable Energy Directive

GHG Savings

- 35 % **GHG emission reduction** in comparison to fossil fuel; 50 % as of 2017 and 60 % as of 2018
- Defines the GHG emission value for the **fossil comparator**: 83,8 g CO_2equ/ MJ for transport
- GHG emission calculations: entire life cycle is included
- Definition of **default values** only for municipal waste, manure and slurry
- **Bonus** of 29 g CO_2equ/ MJ for using biomass from degraded land

Biodiversity

- **Feedstock restrictions**: no biomass from land with high biodiversity value, i.e.
  - ⇒ Primary forest or other wooded land
  - ⇒ Dedicated nature protection areas
  - ⇒ Highly biodiverse grasslands

    (does not apply for production of biofuels from waste and residues)

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Land use

- No use of Biomass grown on **land with high carbon stock** (wetlands, continuously forested areas, peatland)

Sustainable Farm Management & Protection of soil water and air

- **„Cross-compliance“ requirements** for good agricultural practice as defined in Council Regulation (EC) 73/2009

The sustainability criteria apply for biomethane that is used as transport fuel. The EC does not define any obligatory sustainability requirements for biomethane that is used for generating electricity and/ or heat. Member states may define sustainability requirements themselves (e.g. Germany: Renewable Energy Act; Renewable Heat Act)

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

National implementation of sustainability criteria

- There are numerous sustainability criteria that are relevant for biomethane production/ use/ trade particularly when used as biofuel for transport
- All 6 focus countries have transposed the respective EU-regulations into national law
- At national level, additional requirements have been identified mainly for feedstock use (e.g. France, Germany, Italy)

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

National implementation of sustainability criteria

- **Germany, France, the UK and Austria**: a **consistent further increase** of biomethane production and its use - and consequently the **adaptation of relevant national regulations** - can be observed
- National specificities regarding biomethane production as well as the way of (financially) supporting and promoting this market branch
- **Hungary and Italy**:
- So far, **no functioning biomethane market**
- Main reason: **confusion** created by **too many** and sometimes **inconsistent regulations**
  Regulatory measures often change hastily and agencies supervising the biogas industry are numerous and their actions are frequently uncoordinated
- Result: **biomethane industry is in its infancy**
- Need for **further supportive legislative measures**, regulations and incentives
- The **technical standards** for biomethane **injection to the grid** need to be developed
- The **interest and the awareness level** of the general public in renewables and biogas must be **elevated**

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Comparison of the 6 focus countries

Table 1: National Regulations on Biodiversity/ Land use/ Sustainable farm management

COUNTRY	Biodiversity/ Land use/ Sustainable farm management
GERMANY	Same as EU regulations
AUSTRIA	Same as EU regulations
FRANCE	Biomethane producers have to respect the criteria described in the French regulations for biomethane production, like **feedstock restrictions and specification for the use of digestate** These criteria are **not linked to EU regulations** applied to biofuels because biomethane is not recognized as biofuel
UK	Same as EU regulations
HUNGARY	Same as EU regulations
ITALY	Same as EU regulations

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Comparison of the 6 focus countries

- Table 2 : National GHG saving targets in the focus countries

	GHG savings		
COUNTRY	% 2016	% 2017	% 2018
RED	35%	50%	60%
GERMANY	35%	50%	60%
AUSTRIA	35%	50%	60%
FRANCE	35%	50%	60%
UK	**60%**	60%	60%
HUNGARY	35%	50%	60%
ITALY	35%	50%	60%

UK has imposed more ambitious targets: wants to reach 60 % reduction target two years earlier

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Comparison of the 6 focus countries

Table 3: Default values for GHG calculation in the focus countries

COUNTRY	DEFAULT VALUE FOR GHG CALCULATION
RED	23 gCO2eq/MJ organic fraction of **municipal waste**; 16 gCO2eq/MJ for biogas produced from **liquid slurry**; 15 gCO2eq/MJ for **manure**.
GERMANY	Same as RED
AUSTRIA	Same as RED
FRANCE	No default value for feedstocks used for biomethane production because it is not recognized as biofuel
UK	Same as RED
HUNGARY	Same as RED
ITALY	If at European level there are no specific default values, it is possible to use the nationally defined default values for corn silage, rye grass, organic fractions of waste for recycling and left overs

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Comparison of the 6 focus countries

Table 4: Feedstocks considered for double counting in the focus countries

COUNTRY	Feedstock considered for double counting
ILUC-Directive	Mainly waste & ligno-cellulosic/non-food cellulosic biomass
GERMANY	According to ILUC – directive - **Waste is defined** in "Law on recycling management"; **Exception** for used cooking oils and fats - Residues (raw glycerine, tall oil pitch, wet and dry manure, oils and fats from vegetables) In Jan 2015, the energy-based **biofuel quota changed to a GHG quota**
AUSTRIA	According to ILUC-Directive
FRANCE	According to ILUC-Directive (not **applicable to biomethane** because it is not recognized as biofuel)
UK	In the UK **waste and residues do not count twice** for the purposes of meeting the UK's overall renewable energy target
HUNGARY	According to ILUC-Directive
ITALY	According to ILUC-Directive; and other specified residues

Challenge: Absence of a harmonised European waste and residue list

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Comparison of the 6 focus countries

Table 5: Existence of sustainability criteria (SC) for biomethane used as biofuel for transport and for electricity and heat generation in the focus countries

	Sustainability criteria for biomethane as	
COUNTRY	BIOFUEL	ELECTRICITY/ HEAT
GERMANY	YES	**YES**
AUSTRIA	YES	NO
FRANCE	**NO**	NO
UK	YES	**YES**
HUNGARY	YES	NO
ITALY	YES	NO

Only **Germany** and the **UK** have published their national regulations that include SC also for biomethan used for electricity and/ or heat generation. **France** has not recognised biomethane as biofuel

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Sustainability Certification Systems

- **Additional sustainability requirements** are in some cases also part of **voluntary sustainability certification schemes**
- Only some of those are **recognised by the EC**: REDcert, ISCC, NTA 8080
- Provide relevant **definitions & guidelines** for sustainable biofuel production/ use
- Facilitate **sustainability verification** by an independent body
- 19 voluntary schemes (recognised by EC) in total; only the named ones are relevant for biomethane and the involved biomass production

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Sustainability Certification Systems

- Several voluntary schemes for sustainability certification that have not applied for recognition by the EC
- Most of them aim to certify biomethane as environment friendly "green" product => marketing tool on the free gas market
- They **do not aim to fulfil** the sustainability criteria and their certification as defined by the EC *(some are nevertheless compliant with the European Energy Certification Scheme (EECS))*
- Generally not acknowledged by any national subsidy scheme

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Sustainability Certification Systems

- Examples:
  - Naturemade Biomethane (Switzerland)
  - Biomethane Certificate Scheme (UK)
  - Green Gas Certification Scheme (UK)
  - Green Gas Label (Germany)

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

BIOSURF
Fuelling Biomethane

ISABEL
powered by your local community

The **ISABEL** project aims to foster the concept of **community biogas** and lead the way for its market take-up based on a vision that includes three core interacting elements:
(i) local production & consumption,
(ii) community involvement,
(iii) sustainable biogas.

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Contact

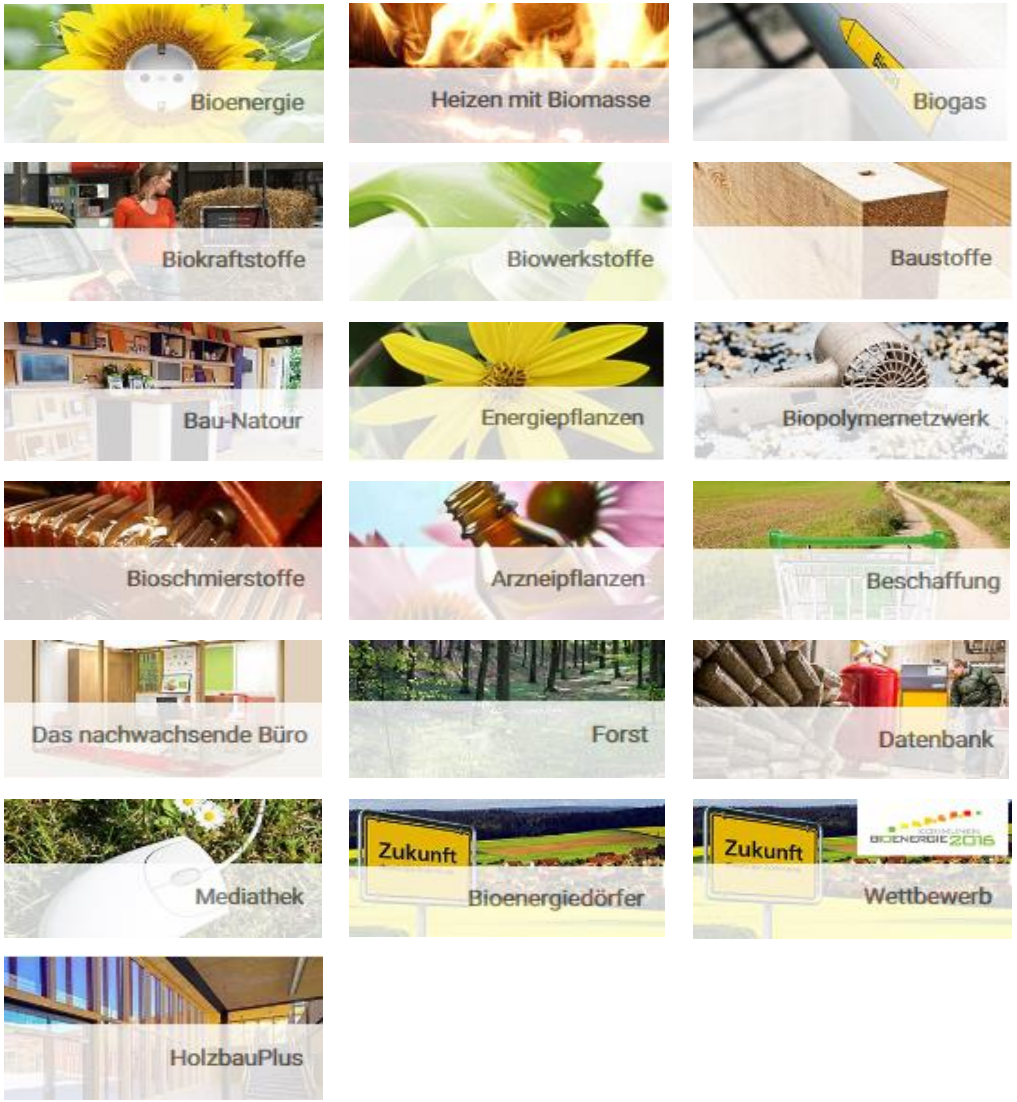
BIOSURF
Fuelling Biomethane

Thank you for your attention!

Fachagentur
Nachwachsende Rohstoffe e.V.
OT Gülzow
Hofplatz 1
D-18276 Gülzow-Prüzen
Germany

Tel.: +49 3843 6930-181
Fax: +49 3843 6930-102

E-Mail: d.PiedraGarcia@fnr.de
Internet: www.fnr.de
international.fnr.de



This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Discussion

- What are your ideas about a cross-sectoral sustainability matrix?
  - Environmental
  - Economic
  - Social
- What about ILUC?
  - GHG-Saving
  - Biodiverisity
  - Land use
  - Sustainable Farm Management & Protection of soil water and air
  - „Cross-compliance“ requirements for good agricultural practice as defined in Council Regulation (EC) 73/2009

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Discussion

- What are your experiences in regard to sustainability requirements in the biomethane sector? Where do you see:
  - ⇒Opportunities
  - ⇒Necessities
  - ⇒Challenges/ barriers linked to the compliance with existing SC
  - ⇒Areas for improvement

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

- The NEEDS (New Energy Externalities Developments for Sustainability) project propose a matrix of sustainability criteria and indicators

- Source: Hirschberg et al. 2008, Final set of sustainability criteria and indicators for assessment of electricity supply options. http://www.needs-project.org/2009/Deliverables/RS2b%20D3.2%20-%20Criteria&Indicators.pdf

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Economic		
Impact on customers	**Indicator**	**Estimation Method**
Energy generation cost	Average generation cost	Extrapolation of current cost
Impacts on overall Economy		
Employment	Direct and indirect labour	Labour due to plant construction and biomass production as well as generation and service
Autonomy of energy use	Medium to long-term independence from foreign energy sources	Used amount of gas
Impacts on utility		
Financial risks		
Capital investment exposure	Total capital cost	Cost estimation
Impact of fuel price changes	Ratio of the fuel cost to the generation cost	Forecast fuel cost divided by forecast average generation cost
Risk due to changes in boundary conditions	Construction time	Estimated construction time
Operation		
"Merit order" for dispatch purposes	Total average variable cost or "dispatch cost"	Forecast fuel cost and variable O&M cost
Flexibility of dispatch	Composite indicator	Expert judgement
Availability	Equivalent availability factor	Industry statistics

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Social		
1. Security/reliability of energy provision		
1.a)Political threats to continuity of energy service		
Diversity of primary energy suppliers	Market concentration in the primary energy supply	Expert judgement
1.b) Flexibility and adaptation	Flexibility to incorporate technological change	Expert judgement
2. Political stability and legitimacy		
Potential of conflicts induced by energy systems	Potential of energy system induced conflicts	Expert judgement
Willingness to act (mobilization potential)	Willingness of NGOs and other citizen movements to act against realisation of an option	Expert judgement
Necessity of participative decision-making processes	Community acceptance and participation	Expert judgement

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

3. Social and individual risks		
3.a) Expert-based risk estimates for normal operation		
Non-fatal illnesses due to normal operation	Morbidity due to normal operation	Impact Pathway Approach (IPA)
3.b) Expert-based Risk Estimates for accidents		
Expected Health effects from accidents	Expected mortality due to severe accidents	Risk Assessment (RA)
Maximum consequences of accidents	Maximum credible number of fatalities per accident	Risk Assessment (RA)

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

4. Quality of life		
4.a) Socially compatible Development		
Equitable life conditions	Share of the effective energy costs in the budget of a social welfare recipient	Expert judgement
Work quality	Work qualifications expressed as average years of education for workforce	Expert judgement
4.b) Effects on the Quality of Landscape and Residential Area		
Effects on the quality of the landscape	Functional and aesthetic impact of energy infrastructure on landscape	Expert judgement
Noise exposure	Extent to which residents feel highly affected by noise	Expert judgement
Contribution to traffic	Total traffic load	Life Cycle Assessment (LCA)

This project has received funding from the European Union's Horizon 2020 research and innovation programme.