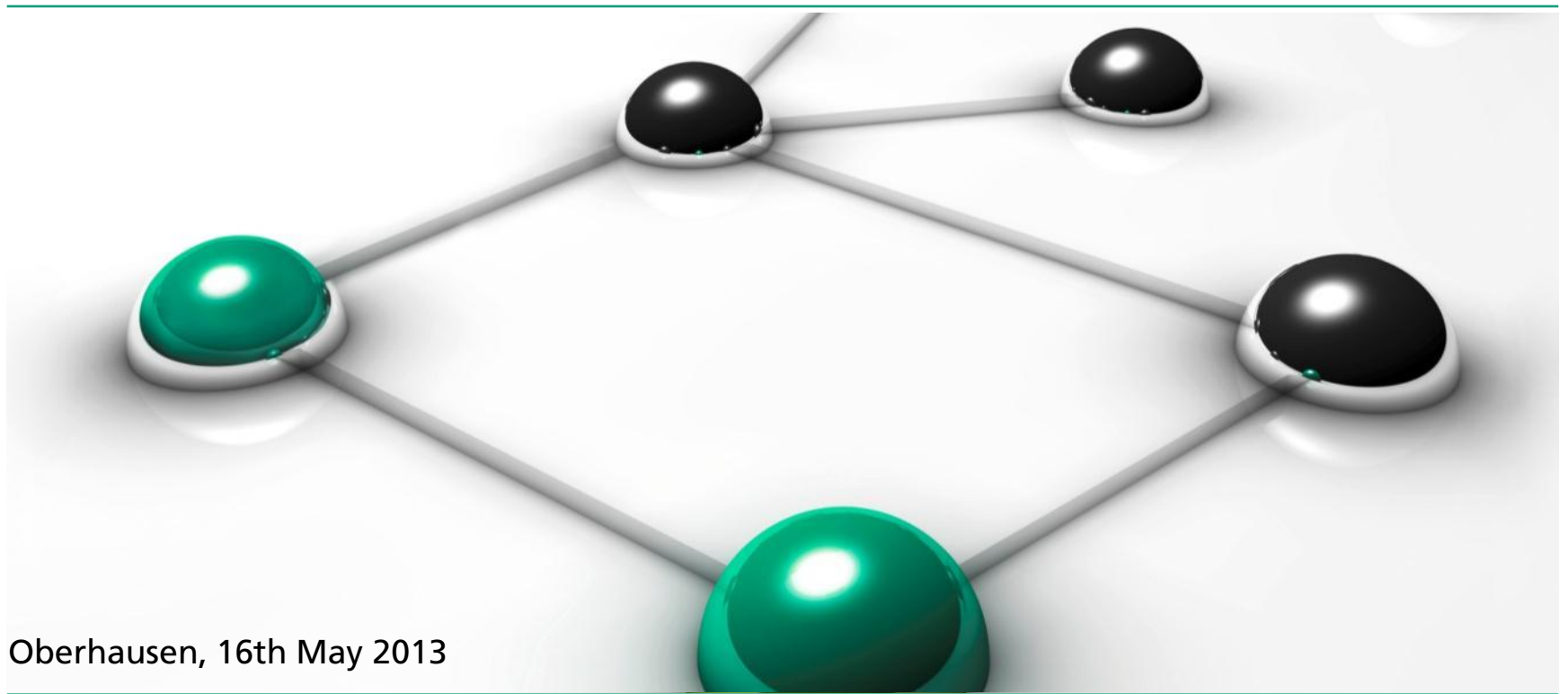

Biogas and biomethane markets in Western and Southern Europe

Sabine Strauch, Fraunhofer UMSICHT



Oberhausen, 16th May 2013

Fraunhofer UMSICHT

Portfolio in Biogas Technology

- Research topics
 - process monitoring and optimisation of fermentation
 - public acceptance of biogas plants / renewable energy sources
 - biogas purification and upgrading
 - feed-in of biogas into natural gas grids
 - biomethanation – power to gas
- Feasibility studies and expertises (substrate supply, economic efficiency, climate balance etc.)
- Analysis of substrates and products of fermentation
- Realisation of continuous laboratory scale fermentation processes
- Design and construction from laboratory scale to pilot and demonstration plants



Agenda

- Italy
- Spain
- France

- Targets
- Status quo
- Support schemes
- Current developments

Agenda

- Italy
- Spain
- France



Biogas in Italy

Targets and status quo

- NREAP: 17% RES in 2020
- Targets for Biogas in 2015: 545 MWel installed
- National Energy Strategy 2013: Biomethane for use in the transport sector



Biogas in Italy

Targets and status quo

- 2011: 480 MW_{el} installed on biogas*
- 2012: 760 MW_{el} installed, 950 plants*
- Two biomethane plants realised



*incl. agricultural, biowaste, sewage, landfill gas)

Biogas in Italy

Support schemes - biogas

- 2009-2012:
 - All inclusive tariff of 28 €cent/kWh_{el} (P_{el} < 1 MW_{el})
 - 15 years grandfathering
- 2013:
 - New feed-in tariff scheme with bonus system (co-generation, by-products)
 - 20 years grandfathering
 - Application system for biogas projects exceeding 100 kW_{el}



Biogas in Italy

Current development - Biogas

Renewable source	Type	Power	WORKING LIFE of PLANTS	Basic incentive tariff
Biogas	a) products of biological origin	1<PS=300	20	180
		300<P=600	20	160
		600<P=1000	20	140
		1000<P=5000	20	104
		P>5000	20	91
	b) by-products of biological origin referred to in table 1-A, and non-source separated waste other than that referred to under c	1<PS=300	20	236
		300<P=600	20	206
		600<P=1000	20	178
		1000<P=5000	20	125
		P>5000	20	101
	c) waste for which the biodegradable part is determined as a fixed amount as set out in Annexe 2	1<PS=1000	20	216
		1000<P=5000	20	109
		P>5000	20	85

Values for commissioning in 2013, -2% per year for subsequent years.

Source: Consorzio biogas, 2012

Biogas in Italy

Current development - Biomethane

- Biomethane is allowed to be fed into the grid (Decree No 28/2011)
- Biomethane feed-in tariff under discussion
 - 1. Biomethane plant Malagrotta landfill
 - 2. Biomethane plant in San Giovanni Persiceto (close to Bologna)



Malagrotta landfill site

Agenda

- Italy
- Spain
- France



Biogas in Spain

Targets and status quo

- NREAP RES-E 2020: 20%
- Targets for Biogas
 - 2015: 0.72 Mtoe (8.3 TWh)



Biogas in Spain

Support schemes

- 2007: Real Decreto 661/2007 provided feed-in tariffs for RES
- Biogas tariffs are either fixed feed-in tariffs or premium on electricity market price
- 2010: Amendment of the tariffs
- No financial support for biomethane



Biogas in Spain

Targets and current status

- Status in 2012:
 - 170 MW installed on biogas*
 - One biomethane plant at Valdemingomez landfill, Madrid



*incl. agricultural, biowaste, sewage, landfill gas)

Biogas in Spain

Targets and current status

- Biogas production mainly from LFG (ca. 83%)
- Large agricultural sector
 - 54% of Spain's area is agricultural land
 - 0.46 ha agricultural land / inhabitant
- Huge gas potential from substrates such as manure and agricultural residues



Biogas in Spain

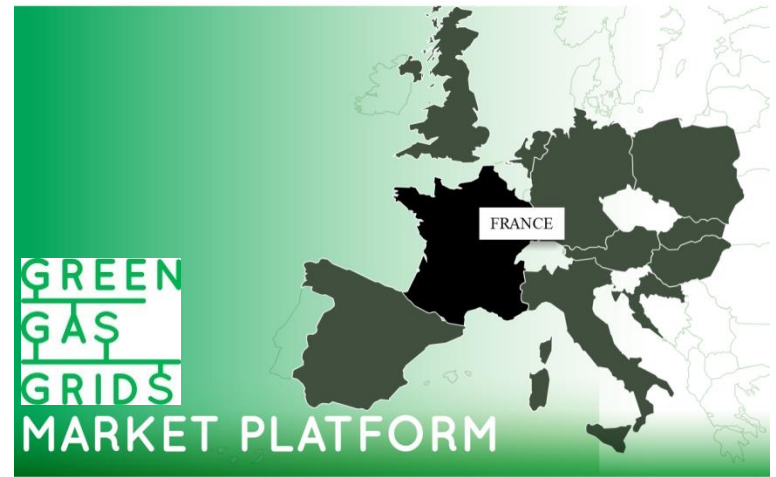
Potential

Source	Total potential (TWh)	Accesible potential (TWh)	Available potential (TWh)
Biogas from agricultural industry	40,33	21,95	16,57
Biogas from organic fraction of MSW	9,05	3,62	1,45
Biogas from sewage sludge	1,91	1,43	1,43
LFG	11,14	2,43	1,69
Total	62,43	29,43	21,15

Source: Ministerio de economico y competitividad

Agenda

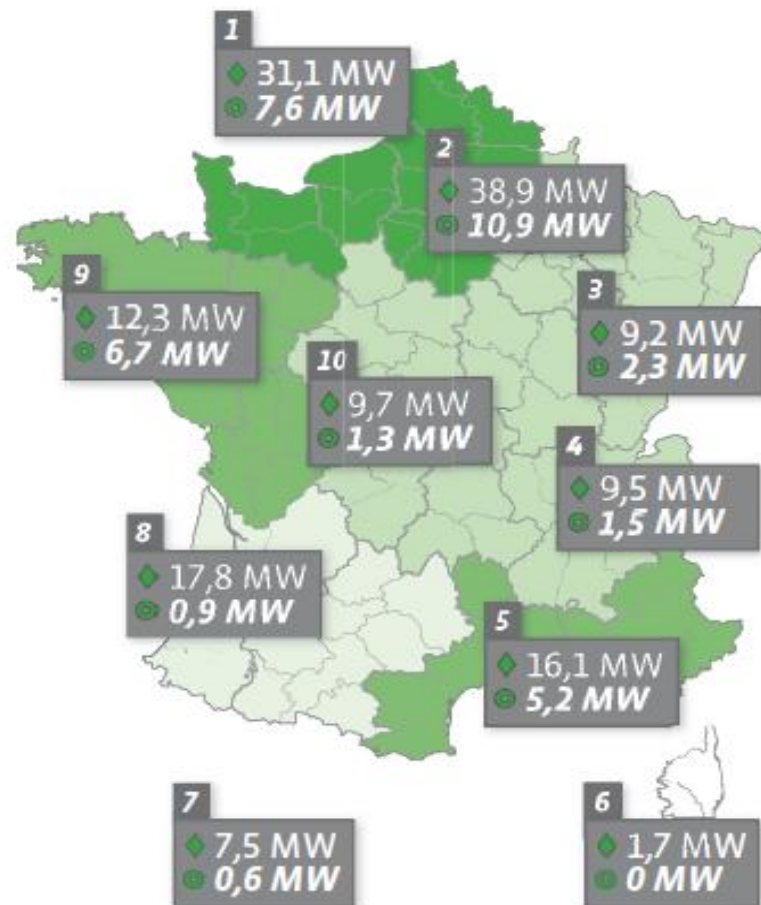
- Italy
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Biogas in Italy

Targets and status quo

- NREAP RES-E 2020: 23%
- Targets for Biogas in 2020
 - 625 MW_{el} / 1500 plants
- Status in 2012
 - rd. 300 biogas plants (rd. 190 MW_{el})
 - Three biomethane plants realised, one in comissioning, new projects in the pipeline



Source: ADEME

Biogas in France

Status quo - Biomethane

Location	Year of commissioning	Upgrading technology	Capacity of biomethane production [Nm ³ / h]
Claye Souilly	2009	PSA and membrane	100
Lille / Sequedin	2007	Water scrubber upgrading biogas from biowaste AD	700
Lille / Marquette *	2009	Water scrubber	100

* (plant closed until 2014 for renovation of waste water treatment)

Biogas in France

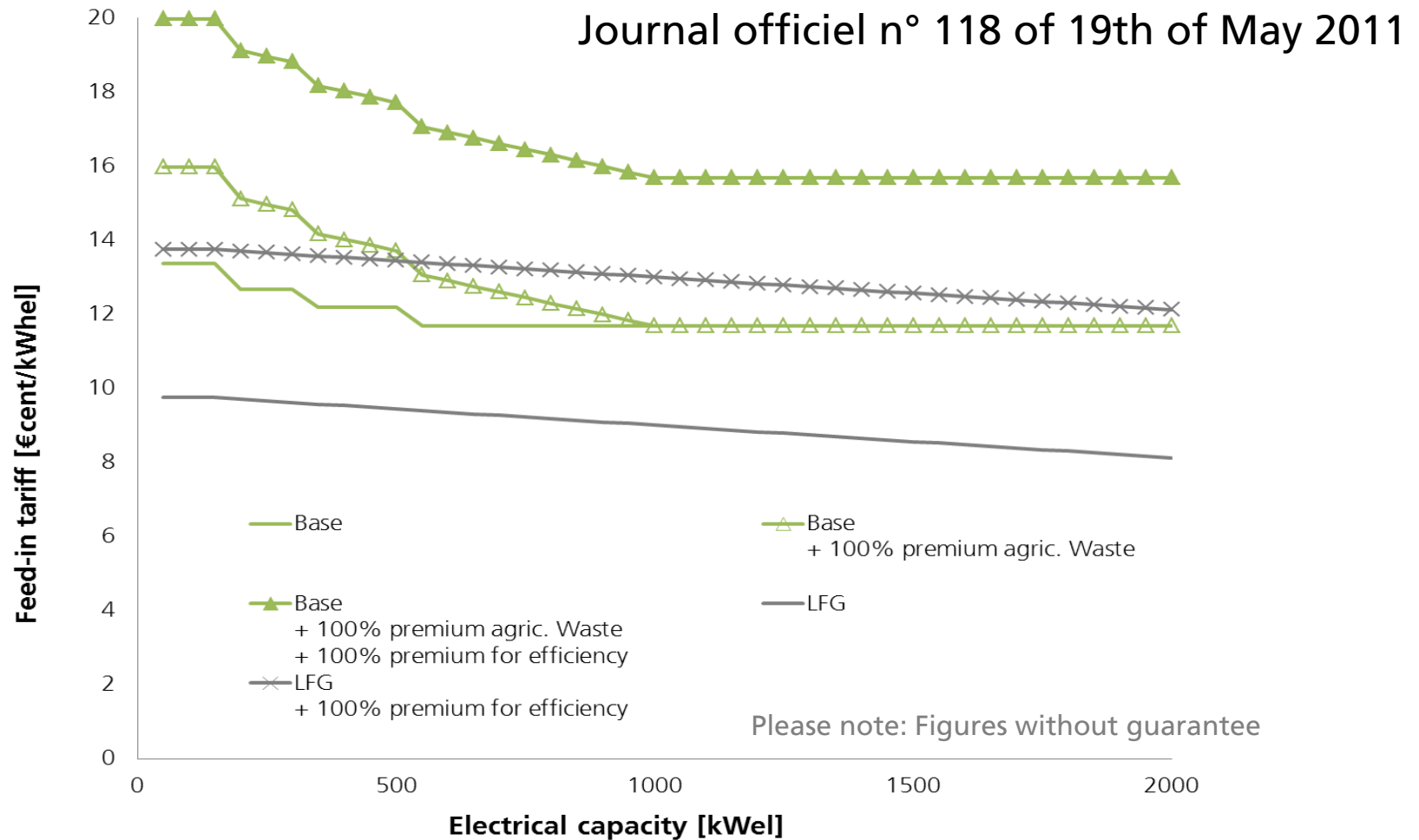
Support schemes

- Journal officiel n° 118 of 19th of May 2011 announced new FIT scheme for biogas:
 - Base tariff: 13.37 – 11.19 €cent/kWh
 - LFG: 9.745 – 8.121 €cent/kWh
 - Premium for efficiency up to 4 €cent/kWh
 - Premium for use of agricultural residues up to 2.6 €cent/kWh
- 15 years grandfathering



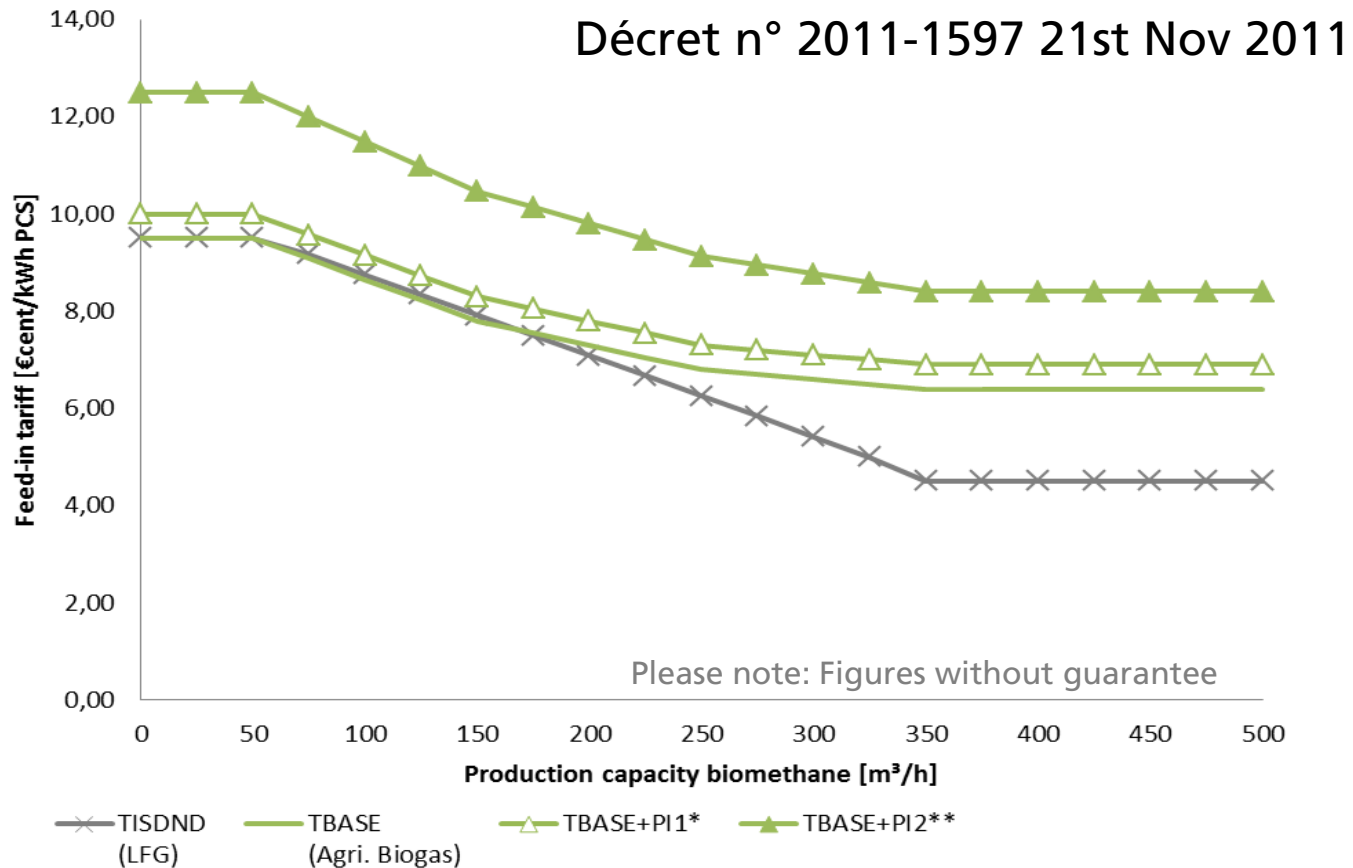
Biogas in France

Support schemes - Biogas



Biogas in France

Support schemes - Biomethane



*PI1 - Premium for municipal waste
 **PI2 - Premium for agroindustry waste
 PCS - Pouvoir calorifique supérieur (gross calorific value)

Summary

- Italy

- Reduction of the strong market dynamics of the recent years
- New FIT scheme with bonus system focusses e.g. on smaller plants, nitrogen removal and co-generation
- Biomethane under discussion for transport applications

- France

- FIT for electricity encourage biogas market
- Biomethane FIT exist,
- Biomethane projects in the pipeline

- Spain

- High potential in agricultural sector, but no dynamic at the moment due to unattractive FIT

- Check out the **GreenGasGrids** Market Platform at www.greengasgrids.eu

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