“Development history of biomass heat market”

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World Bioenergy Association (WBA) – join the global voice of bioenergy!
structure

• A global overview
• Development in Europe
• 4 examples: Lithuania, Sweden, Austria, Italy
• conclusions and outlook
The need for heat

Heat makes up about 50% of final energy. Heat is needed for different purposes:

• Cooking, warm water, residential heating, commercial&service sector and industry

• The demand depends globally on the region and the state of development:
  - Africa main demand cooking,
  - developed countries in the Northern hemisphere: residential sector, industry
Biomass for heat

2013 total global biomass: 57.7EJ; 85% of global biomass goes to heat, (49,5 EJ);

FEEDSTOCK:
• Firewood – woodchips – pellets – charcoal - all kind of byproducts (waste, straw)

TECHNOLOGIES
• Open fire, simple wood stoves for firewood
• Wood chip boilers of all sizes (10 kW – 100 MW)
• Pellet boilers
• District heating grids for the distribution of heat as warm water

BIOMASS USE: as direct heat (98%) or as derived heat (2%) globally.
Global direct heat generation from biomass

year 2000: 40.1EJ  2013: 48.5 EJ (+ 21%)
Global derived heat generation from biomass
year 2000: 415 PJ, 2013: 893 PJ (+115%)

Derived heat:
biomass goes to transformation
plants (heat plants, CHP plants) - from here
To the final consumer (Industry, residential etc.)

Leading region (green): Europe
Top countries in Europe 28:
Sweden, Germany, Finland, Denmark, Austria
A global overview

**Development in Europe**

4 examples: Lithuania, Sweden, Austria, Italy

conclusions and outlook
EU 28: Bioenergy in the gross final energy consumption for heating & cooling, 2014

2010: 86.3% fossil heat
12.9% bioheat and 0.8% other RES heat

2014:
- 82% fossil heat (405 Mtoe)
- 16% from biomass (77 Mtoe)
- 2% other RES (10 Mtoe)

The contribution of biomass is steadily growing.
EU28, RES share in heating&cooling, 2000 – 2014
from 10.2% in 2000 to 17.7% in 2014

**Biomass to heat**
- 2000: 52 Mtoe
- 2014: 77 Mtoe
- Projected in Action Plans
  - 2020: 90 Mtoe

A growth of 73% in 20 years

Bioheat the most important sector
Of total biomass.

Two main reasons for this growth:
1. Strong extension of district heat with biomass
2. Fast deployment of the pellet sector

Source: AEBIOM statistical report 2016
EU 28: bioheat in final energy consumption, 2014
main users: 1. residential 2. industry 3. derived heat

Total energy consumption of biomass for heating in EU-28: 76,998 ktoe
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Derived heat for district heating in the EU 28. Examples: Lithuania, Sweden, Austria

Different situation in the European countries

- **Eastern Europe**: during the central planning period before 1989 a strong district heating sector was established based on fossil fuels
- **Nordic Europe**: a long tradition of strong district heating systems
- **Central Europe**: District on biomass developed in the last 30 years
- **Other parts of Europe**: district heating of lower importance
Lithuania: Biomass replaces fossil fuels in district heating (source: Litbioma, Vilma Gaubyte),

Years 2015-2016 finalizing the transition from gas to biomass in DH of Lithuania.

- 2000: oil and gas 97% (blue and red columns) biomass&fuel 3% (green and grey)
- 2010: oil and gas: 79%, biomass, others: 21%
- 2014: oil and gas: 49.5%; biomass, others: 50.5%
- 2020: oil and gas: 20%; biomass and others 80%

How:
Government policies – grants
Competitive forest resources
Innovation, new companies
Also Vilnius, capital of Lithuania, gets a biomass plant
Sweden: transformation of the district heating sector, CO2 Taxation
Biomass district heating in Austria

• Year 1985: 5 district heating plants around 20 MW
• Year 2015: 2108 district heating plants, 1860 MW th
  129 CHP plants, 318 MW el

How?
Government grants for new plants and heating grids
Strong support by forest and agric. Policy as part of a regional Development program
Austria: biomass district heating plants
2015

- 2108 Biomass district heating plants
  - 1,860 MW thermal power
  - 4,650 GWh heat produced

- 129 Biomasse CHP plants
  - 318 MW Power
  - 1,980 GWh electricity/a, 4,520 GWh heat

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Curtsey to Christoph Pfemeter,
AUSTRIAN BIOMASS ASSOCIATION
Austria: district heating plants
The role of pellets in the EU 28
2015: global 28 Mto production, Europe 20 Mt consumption
Europe: 12.9 Mt wood pellets for heating in 2015

Sweden: mainly for DH, Italy mainly for pellet stoves
Austria: biomass boilers for residential heating
Italy: amazing growth of the pellets market for residential heating

Final Consumption of Pellet in Italy in 2014

- Pellet stoves: 96%
- Pellet residential boilers <35 kW: 15%
- Pellet commercial boilers >35 kW: 4%
- Pellet industrial boilers <1 MW: 0%

~2,9 Mln tonnes

96% is consumed in the residential sector

Big boilers use mainly woodchips
Italy: pellet stoves are booming
Italy: more than 3 Mt pellets in 2016

Forecast of Final Consumption of Pellet at 2017

- Drop of demand in 2013, the consumption was roughly the same of 2012
- Main causes: mild winter (-30% of heating energy demand) and cheaper oil
- The prediction is to reach 3 Million tonnes in 2015
Italy: within 10 years from 600,000 to 2.6 Mio pellets stoves

Pellet Stoves. The Main Market Segment

- Sales peak in 2006 and 2013, ~275,000 new stoves
- Over 2.2 Million stoves
- Strong competition on the market with low margins for the stoves manufacturers

Source: REF-a 2014
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Biomass to heat – an evaluation

• The challenge of climate change – how to comply with the Paris agreement?

• The transformation of the heating sector to renewables is far too slow! EU 28: Within ten years from 10 to 18% RES heat. More than 80% of the heat supply based on fossil fuels!

• But Paris requires a Fossil Exit within the coming 25 years!
Alarming development of the CO₂ concentration in the atmosphere

In the last 10 years the concentration grew 2.5 ppm per year, five times faster than in the last two centuries. 2015 the critical threshold of 400 ppm was crossed!

We should be aware of this alarming signal!
The oil prices: drop from 120 Dollar/b to 50 Dollar/b
Low oil price – a unique opportunity for CO2 taxation, seize the chance!

• Low oil prices: consumers invest more into and consume more fossil fuels,

• A contradiction to climate mitigation

• The current oil price level: a unique chance to introduce carbon taxes!
Needed: an accelerated penetration of RES in the heat market

• Technologies available, potential (Biomass, solar, geothermal) available, What we need?

• Awareness building

• Government support policies – taxation of fossil fuels, investment grants, training, education, research, international cooperation

• A well performing biomass to heat industry
Thank you!
And join WBA, the global voice of the bioenergy industry!

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