"Development history of biomass heat market"

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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.





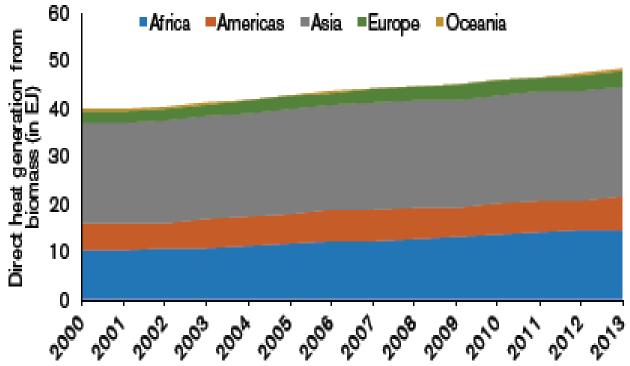


Figure 37 Direct heat generation from biomass.



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



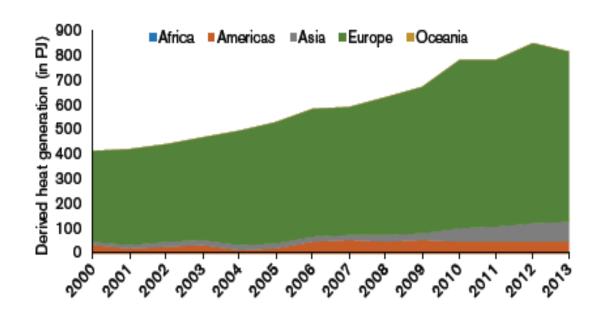


Figure 38 Derived heat generation from biomass

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



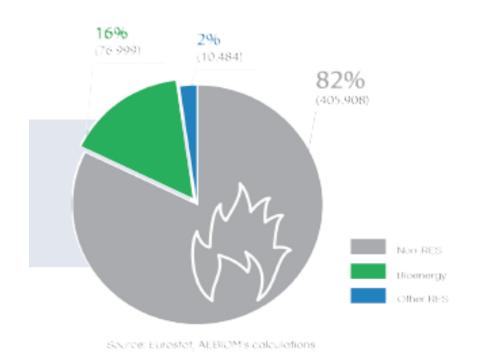
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EU 28: Bioenergy in the gross final energy consumption for heating&cooling, 2014





2010: 86,3% fossil heat

12,9% bioheat and 0.8% other RES heat

2014: 82% fossil heat (405Mtoe)

16% from biomass (77 Mtoe)

2% other RES (10 Mtoe9

The contribution of biomass is steadily growing

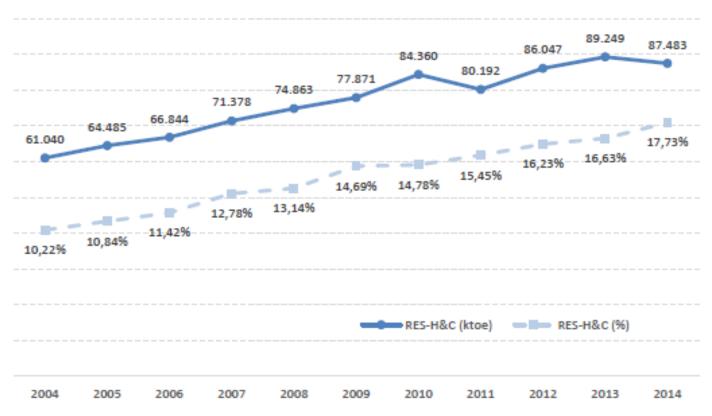


EU28, RES share in heating&cooling, 2000 – 2014

from 10,2% in 2000 to 17,7% in 2014



Figure 4.1 Evolution of RES share in heating and cooling in EU28 2004-2014 (ktoe,%)

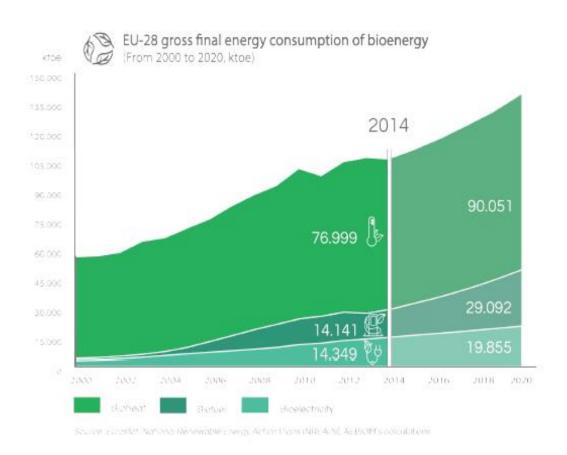


Source: Eurostat



Biomass in the EU 28: 2000 – 2014 - 2020





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

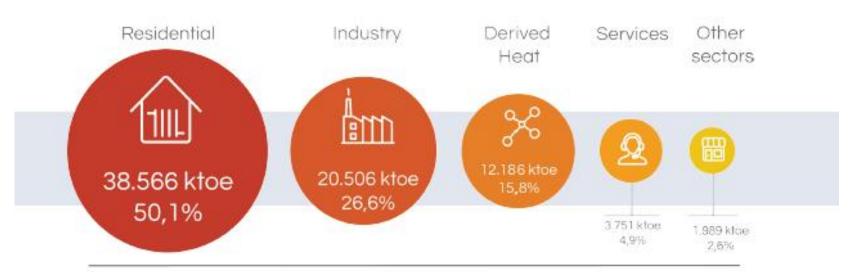
Source: AEBIOM statistical report 2016



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

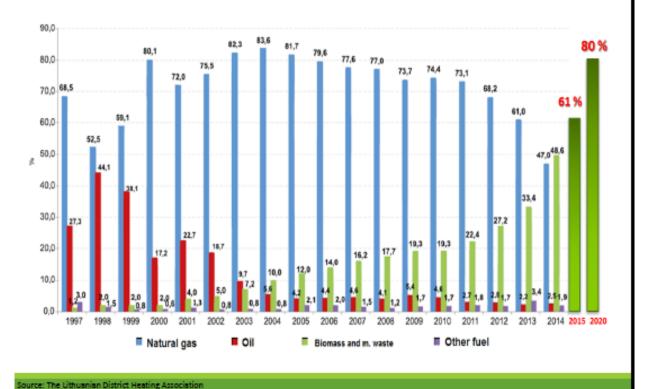
- Eastern Europe: during the central planning period before 1989 a strong district heating sector was establisehd based on fossil fuels
- Nordic Europe: a long tradition of strong district heating systems
- Central Europe: District on biomass developed in the last 30 years
- Other parts of Europe: district 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.



SSOCIATION

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%

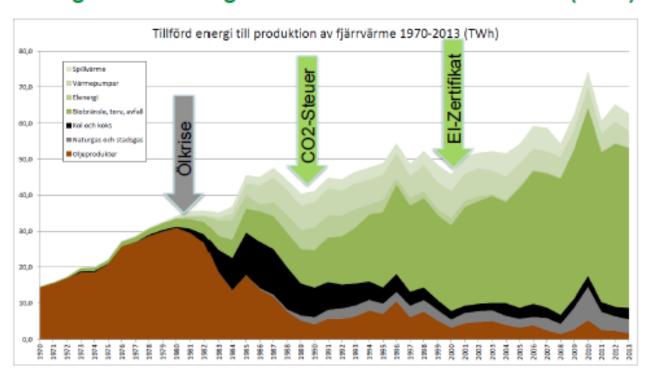
How:

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



Energieanwendung in der Fernwärme 1970-2013 (TWh)







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

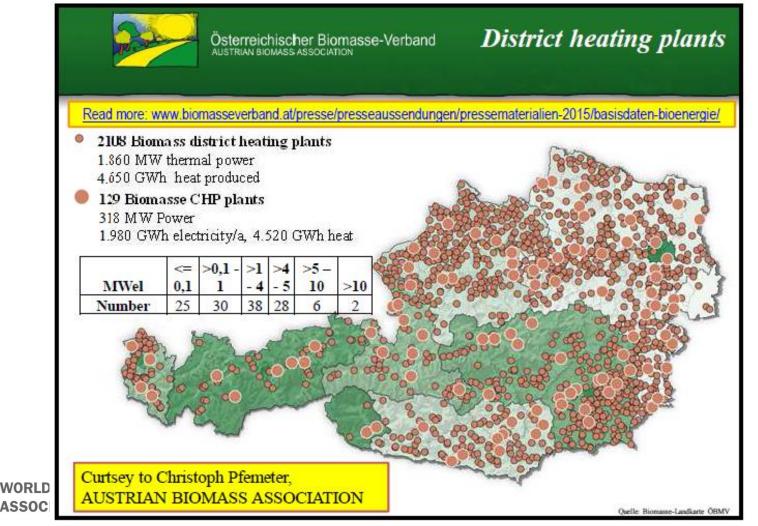
How?

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





Austria: district heating plants







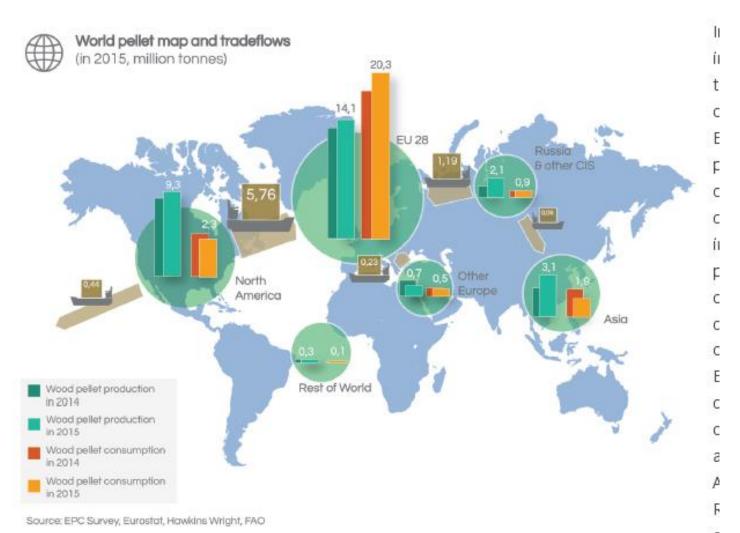




The role of pellets in the EU 28

2015: global 28 Mto production, Europe 20 Mt consumption



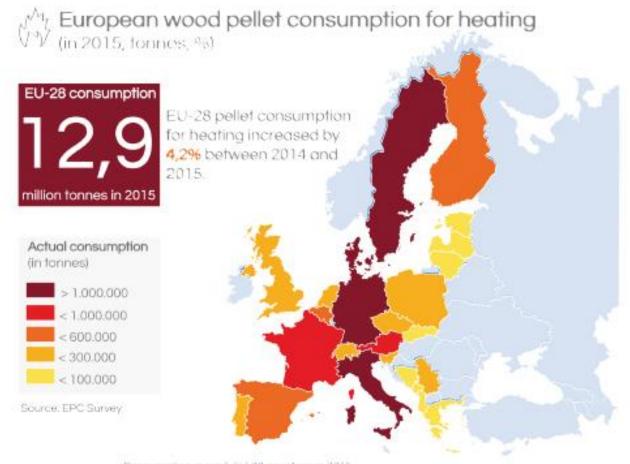




Europe: 12.9 Mt wood pellets for heating in 2015

Sweden: mainly for DH, Italy mainly for pellet stoves







Austria: biomass boilers for residential heating



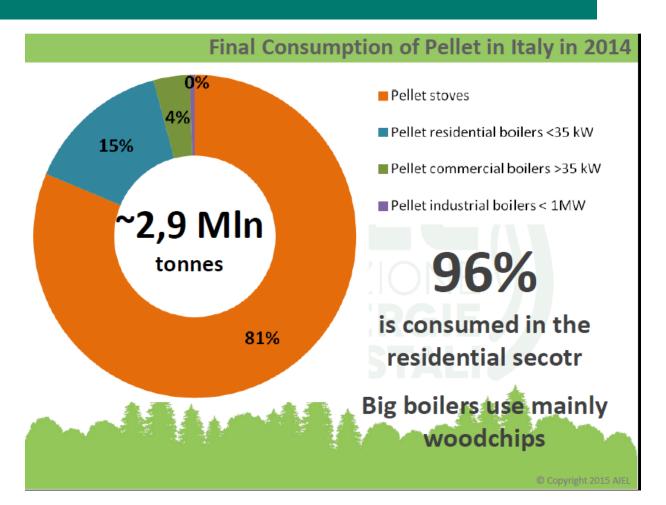








Italy: amazing growth of the pellets market for residential heating





Italy: pellet stoves are booming



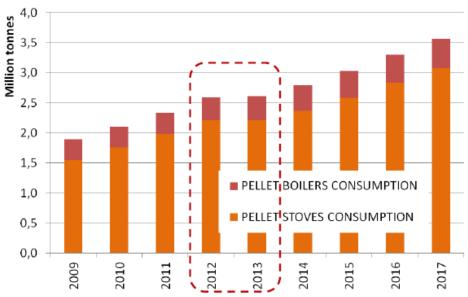
Pellet stoves – the most frequently used technology





Italy: more than 3 Mt pellets in 2016





Drop of demand in 2013, the consumption was roughly the same of 2012

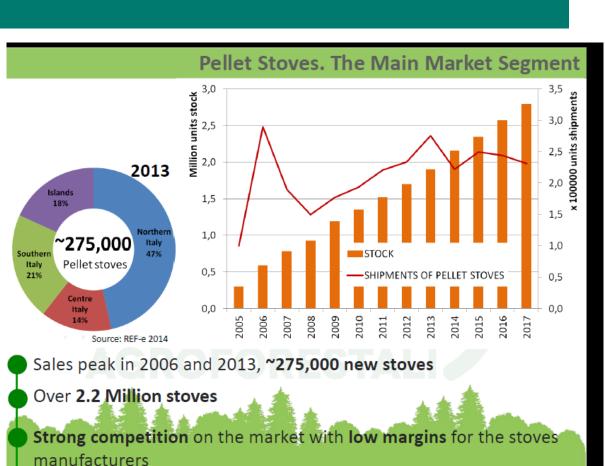
Main causes: mild winter (-30% of heating energy demand) and cheaper oil

The prediction is to reach 3 Million tonnes in 2015

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Italy: within 10 years from 600 000 to 2,6 Mio pellets stoves





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Biomass to heat – an evaluation



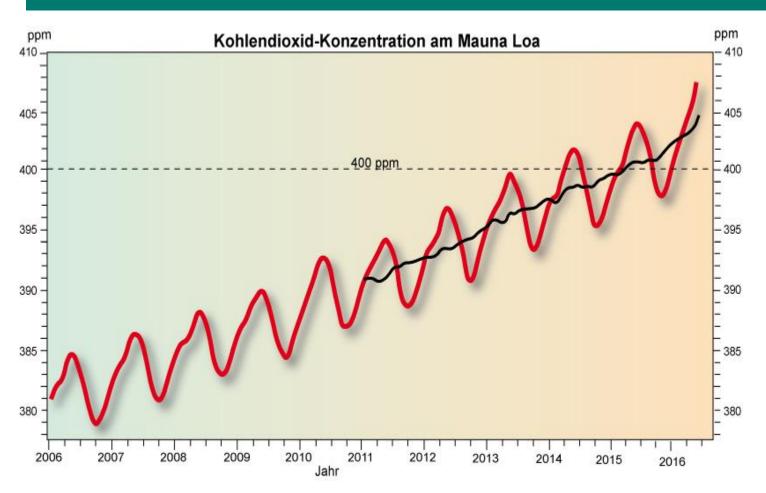
- The challenge of climate change how to comply with the Paris agreement?
- The transformation of the heating sector to renewables is far too slow! EU 28: Within ten years from 10 to 18% RES heat. More than 80% of the heat supply based on fossil fuels!

But Paris requires a Fossil Exit within the coming 25 years!



Alarming development of th CO₂ concentration in the atmospere





In the last 10 years the Concentration grew 2,5 ppm Per year, five time faster Than in 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 oilprices: 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



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

- Awarenessbuilding
- 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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