Clean heating, green jobs

How Upper Austria developed its pellet heating market

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The State of Upper Austria
Oberösterreich

Capital:	Linz
Population:	1.38 million (similar to NH)
Area:	4,600 mi² (similar to CT)
Economic activities:	industry, service sector, tourism, 25% of the Austrian industrial exports

O.O. Energiesparverband is the state agency for renewable energy & energy efficiency & provides services to private households, SMEs, public bodies

The Oekoenergie-Cluster Upper Austria (OEC)

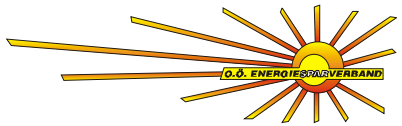
- network of renewable energy & energy efficiency companies in Upper Austria
- 160 partner companies
- since 2000, managed by O.Ö. Energiesparverband
- www.oec-en.at

- **Turnover:** 2.2 billion US$
- **Employees:** 7,300
- **Export share:** > 50 %

Solar thermal, Biomass, Efficient Buildings

Biomass boiler producers - company headquarters in Upper Austria & OEC partners

More info: www.oec-en.at



Renewable energy sources in Upper Austria

- Share of renewable energy: **34 % of total primary energy demand**
  (15 % hydro, 15 % clean biomass,
  4 % solar & other renewables)
- Share of renewable heating: **50 % of total heating demand**
- Avoided imports of fossil fuels: >**1.2 billion US$** per year

By 2030, all electricity and space heating will come from renewables!

➜ reduction of heat demand by 39 %
➜ reduction of electricity demand by 0.5 %/year
➜ minus 65 % CO_2 emissions

Motivation for 100 % renewable targets

- **climate protection:**
  → increasing temperatures
  → more natural disasters

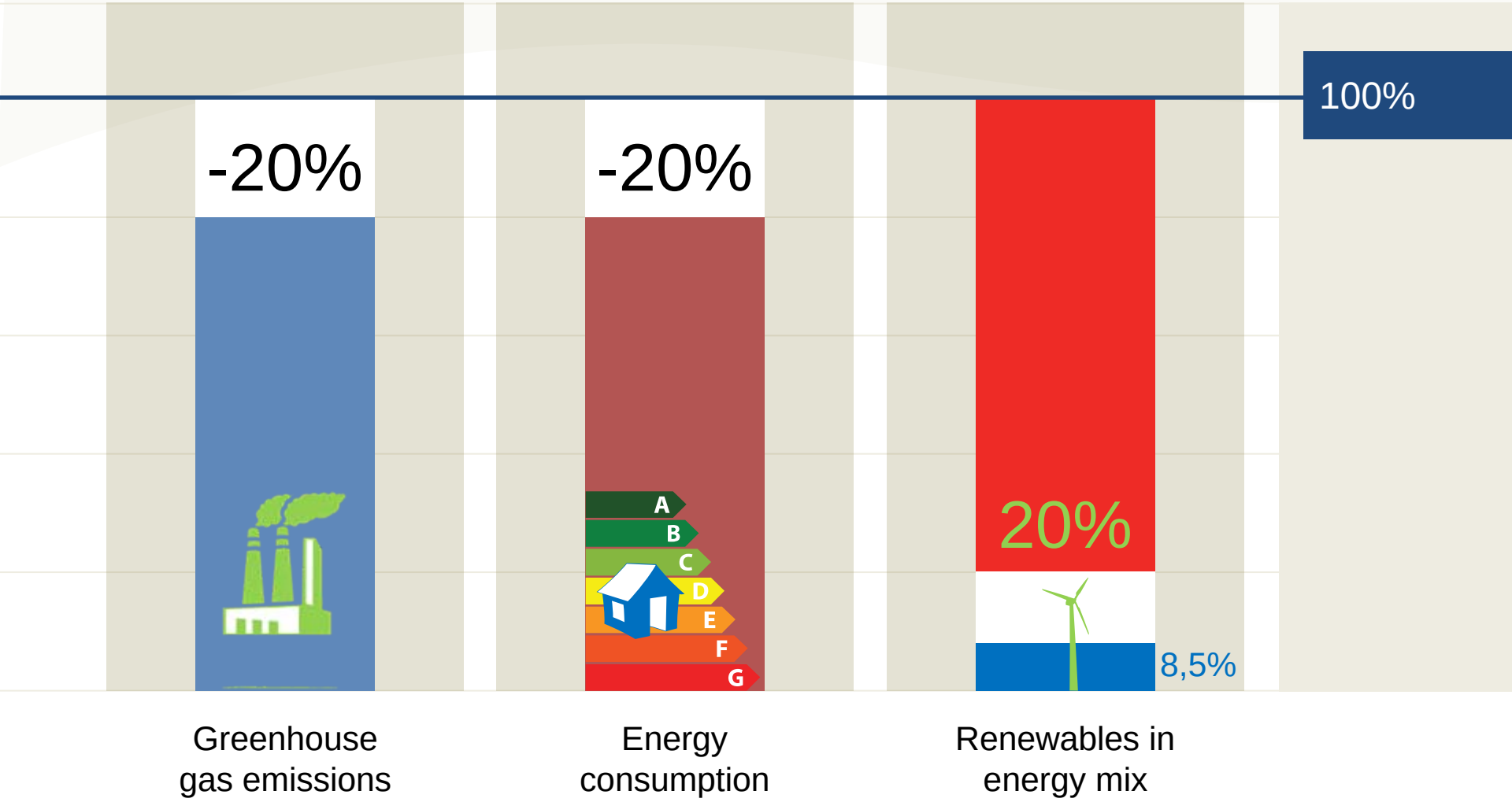
- **increasing costs**:
  → social problems ("energy poverty")
  → negative impact on the competitiveness of companies, especially price fluctuations
  → loss of purchasing power

- **import dependency** from geopolitically unstable regions

- **innovation and employment** ("green jobs")

- **economic perspectives for the farming/forestry sector**

The 20-20-20 EU Policy: EU Targets by 2020



Source: European Commission

Why biomass heating?

- a **sustainable** and **carbon-neutral** fuel
- especially **suitable for heating** of buildings
- modern heating systems are **fully automated** with **ultra-low emissions**
- ensures **energy independence**
- supports the local **forest economy**

→ **The region of Upper Austria has pioneered biomass heating in the last two decades and achieved global leadership in small-scale systems.**

→ **25 % of all biomass boilers installed in the EU are produced in Upper Austria**

Economic impact of biomass heating in Upper Austria

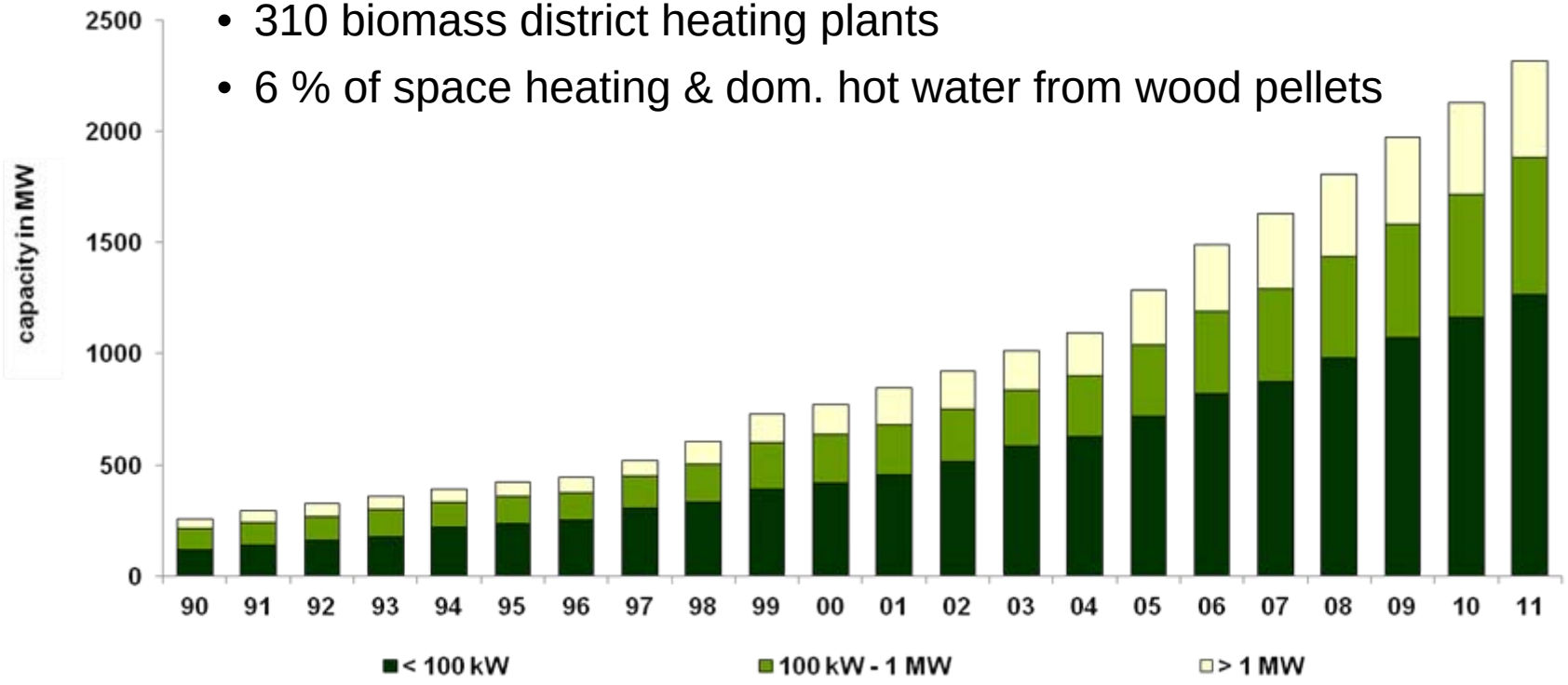
• Total employment in biomass heating	4,500 jobs
• Annual revenue of biomass boiler/ stove industry in Upper Austria (production, sales, installation):	750 million US$
• Annual investments in new biomass heating systems:	150 million US$
• Annual sales of biomass heating fuels:	130 million US$

Biomass heating technologies

					
technology	automatic pellet heating	modern firewood boilers	automatic wood chip boilers	district heating	combined heat & power stations
fuel	pellets 	firewood 	wood chips 	wood chips 	whole trees 
typical installed capacity	5-15 kW	20-40 kW	50-150 kW	100 kW-3 MW	>1 MW_{el} > 10 MW_{th}
users, customers	single-family homes	farm buildings	public & commercial buildings	all buildings	all buildings
fuel supply	bulk delivery	usually from own forest	often by local farmers-forest owners	cooperative members & form sawmills	farmers & sawmills & other channels

Biomass heating in Upper Austria clean, efficient, fully automated

- 15 % of total energy consumption
- 41,000 biomass heating installations (20,000 automatic pellet heating systems)
- 310 biomass district heating plants
- 6 % of space heating & dom. hot water from wood pellets



Overcoming the chicken or the egg problem

Building up a local market for automatic pellet heating

The pellet supply chain

- pellets meeting strict fuel quality standards (production & handling)
- distributors for bulk delivery (fully-pressurized trucks & skills to handle pellets)

The equipment

- well-functioning pellet boilers, stringent emission standards
- high consumer convenience
- if not: pellet boilers are likely to remain a niche market
- technicians trained to install and service the equipment

The customers

- individual homes able and willing to invest
- larger buildings (to avoid overly-long payback for bulk delivery systems)

Information and awareness for market actors and stakeholders

- a new approach to heating needs information, awareness & training
- for potential pellet producers & distributors, heating companies, installers, public administration & permitting agencies & potential customers

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Carrots, sticks and tambourines

Upper Austria's sustainable energy strategy

3 Pillars

Upper Austria's sustainable energy strategy – example biomass heating

"sticks"

Regulatory measures

- Emission & efficiency standards
- Fuel requirements
- Renewable heating mandate
- Minimum requirements heating & cooling

"carrots"

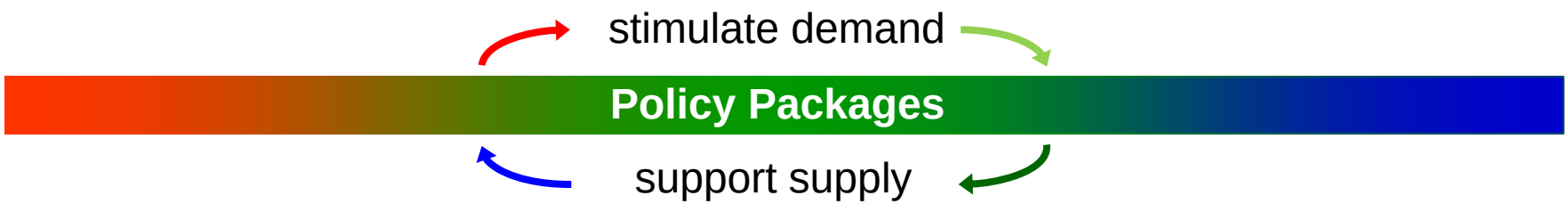
Financial measures

- Investment grant programs
- Renewable heating as a program requirement
- Contracting program
- Regional R & D program, pilot projects

"tambourines"

Information & training

- Energy advice
- Training programs
- Publications, campaigns & competitions
- Local energy action plans
- OEC - sustainable energy business network



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Main policy instruments for biomass heating

- Driving the market through standards
- Financial incentives
- Renewable heating mandates/obligations
- Advice, information and awareness campaigns
- Education & training
- Supporting biomass heating manufacturers

Driving the market through standards

Fuel

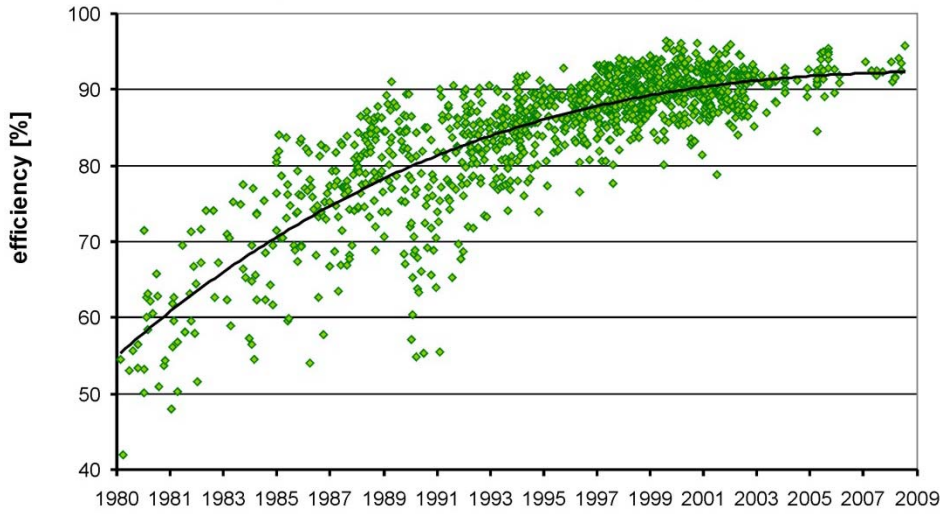
- early standardisation of pellet fuels: a important reason for Austria's pionieering role
- highly standardised fuel allows for high efficiency and low emission combustion technologies were developed based on and optimised for the standardised fuel
- warranty of the boilers only if standardised pellets are used
- European pellet fuel standard

Equipment standards (Upper Austria)

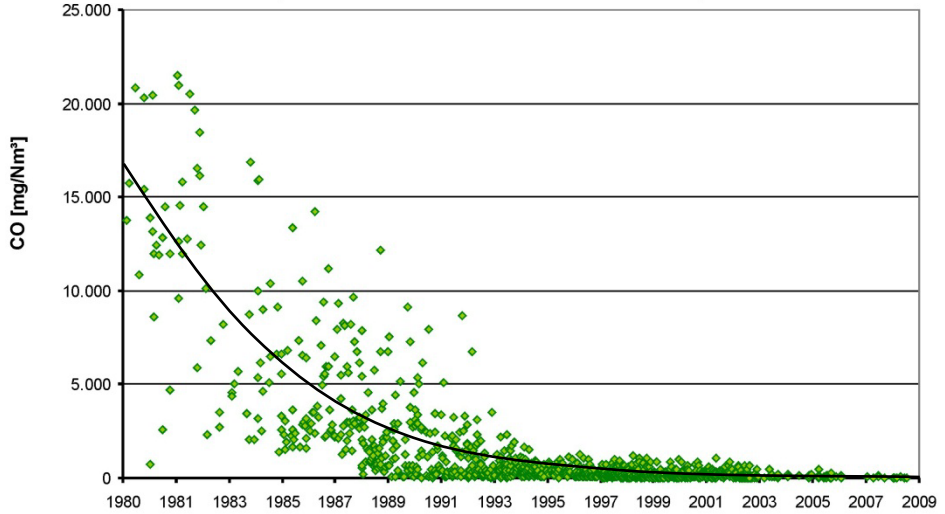
- efficiency and emission standards
- regularely up-dated to drive innovation

Driving the market through standards: Fuels & Equipment

Example: Emissions & efficiency of biomass boilers: results from 1,000+ boiler tests



Efficiency factor of tested biomass boilers



CO emissions of tested biomass boilers

Source: FJ-BLT Wieselburg; Bioenergy 2020+

Raising awareness & skills

- **end consumers**, e.g.:
  - costs (higher investment costs, lower fuel costs, public support)
  - where to install (storage), how to operate
  - fuel supply (availability, price stability)

- **installers, building professionals**, e.g.
  - technical know-how to plan & install & service, storage solutions

- **stakeholders, media, authorities** e.g.
  - sustainability of biomass
  - costs

Biomass Tank – an information programme in the early market development phase
1997-1999

- **market analysis** on automatic pellet heating systems and pellet logistics
- **test run** in 8 family homes (heating season 1997)
  conclusions: storage room should be sized according to the annual heating demand, storage rooms have to properly sealed during delivery, only boilers meeting standards should be installed
- **info leaflets** for 4 targets groups (end consumers, fuel distributors, boiler manufacturers, fuel manufacturers)
- **on-site check** of 60 pellet heating systems, collection of operational experiences
- **half-day info events** for installers: 100+ installers participated

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Market development activities today

- **energy advice** (15,000 individual face-to-face advice sessions, for homeowners, public bodies and companies training programmes)
- **"Energy Academy"** (for professionals across the value chain: manufacturers, planners, installers, building professionals, users)
- **technical site-visits** for potential users (commercial + public buildings)
- **market analysis:** survey to 1,100 homeowners that installed a biomass heating system or a heat pump in the last years
- **export support programme**
- **competitions & campaigns**


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Einreichschluss: 30. Jänner 2009

State R&D programme

- regional support programme for research, development and demonstration of innovative energy technologies (energy efficiency & renewable energy sources)
- new products, methods and procedures
- > 110 R&D projects implemented in Upper Austria
- 62 million Euro investment triggered by 12.4 million Euro public support
- Examples: condensing pellets boiler, industrial biomass ORC application, very small scale-biomass boilers (for lowest energy buildings), combined solar-biomass solutions, innovative control system for biomass boilers, biogas transport systems etc.

Business model: "Biomass Heat Contracting"

- an energy service company (an ESCO) invests in and operates a biomass heating system located on the premises of the client and sells the heat to the owners/users of the building at an agreed price
- investment is paid back over contract period (through the heat price)

Good reasons for heat contracting

- client can not/does not want to invest, the ESCOs does
- client does not want to be bothered with fuel purchase and boiler maintenance
- ESCOs as specialists in purchasing and handling the biomass fuels ensure that plants are running at optimal efficiency
- dedicated funding programme

Business model: Biomass district heating

- cooperatives of "farmers-forest owners" build and operate small-scale biomass district heating systems typically suppling village centers
- they become successful "heat entrepreneurs"
- often 50-70% of the fuel comes from the cooperative members' own forests

Good reasons for biomass district heating

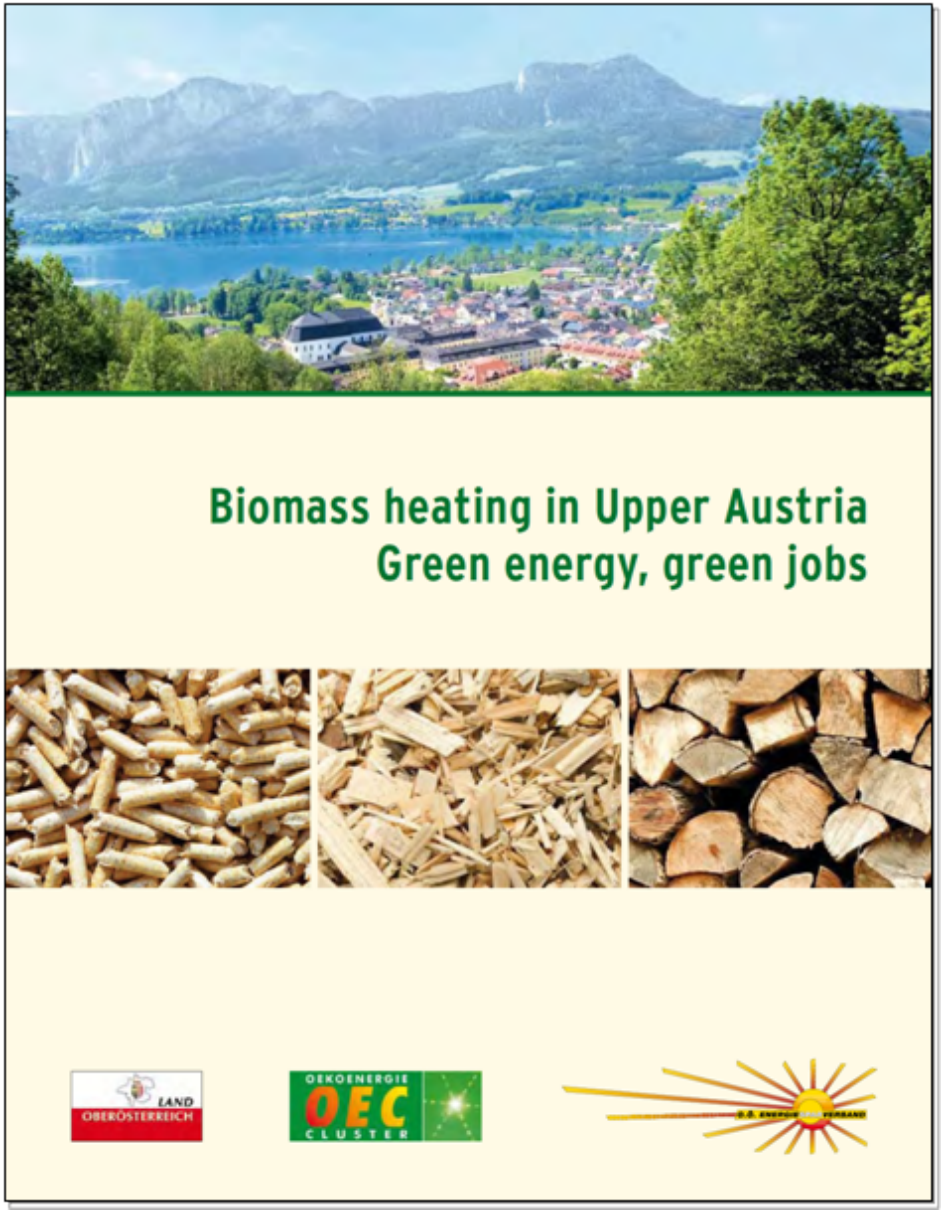
- very local fuel supply, energy independence
- cooperative is perceived as more reliable as one single operator
- income for local farmers
- value for forestry residues
- environmental benefits
- dedicated funding programme

How to get a biomass heating market started

- take a "package approach" (regulatory, financial & training/awareness programmes)
- communicate the benefits (not "just" climate protection)
- allow for a learning curve across the value chain (demonstration programmes & pellets campaigns & training)
- identify most promising markets (often new construction)
- understand progress & communicate success & take corrective action (market intelligence)
- take a longer term perspective

Report & video
available at

www.oec-en.at



International Training Seminar on Biomass Heating

September 10-13, 2012, Linz/Austria

- 3-day training seminar with technical training sessions & site-visits
- biomass heating technologies & market development (wood pellets & wood chips)
- in English
- folders in your conference bags and at www.oec-en.at

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European Pellet Conference: February 27 – 28, 2013

- The latest on policy, market & technology trends, innovation, sustainability
- **World Pellet Business & Technology Forum**
- **Pellet Networking Platform**
- **Pellet News Worldwide**
- Site-visits
- Trade show: 100+ biomass-related exhibitors
- held in Wels/Austria

Get involved:

Call for Papers, Projects & Speakers

Deadline: October 8, 2012

www.wsed.at

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World Sustainable Energy Days 2012

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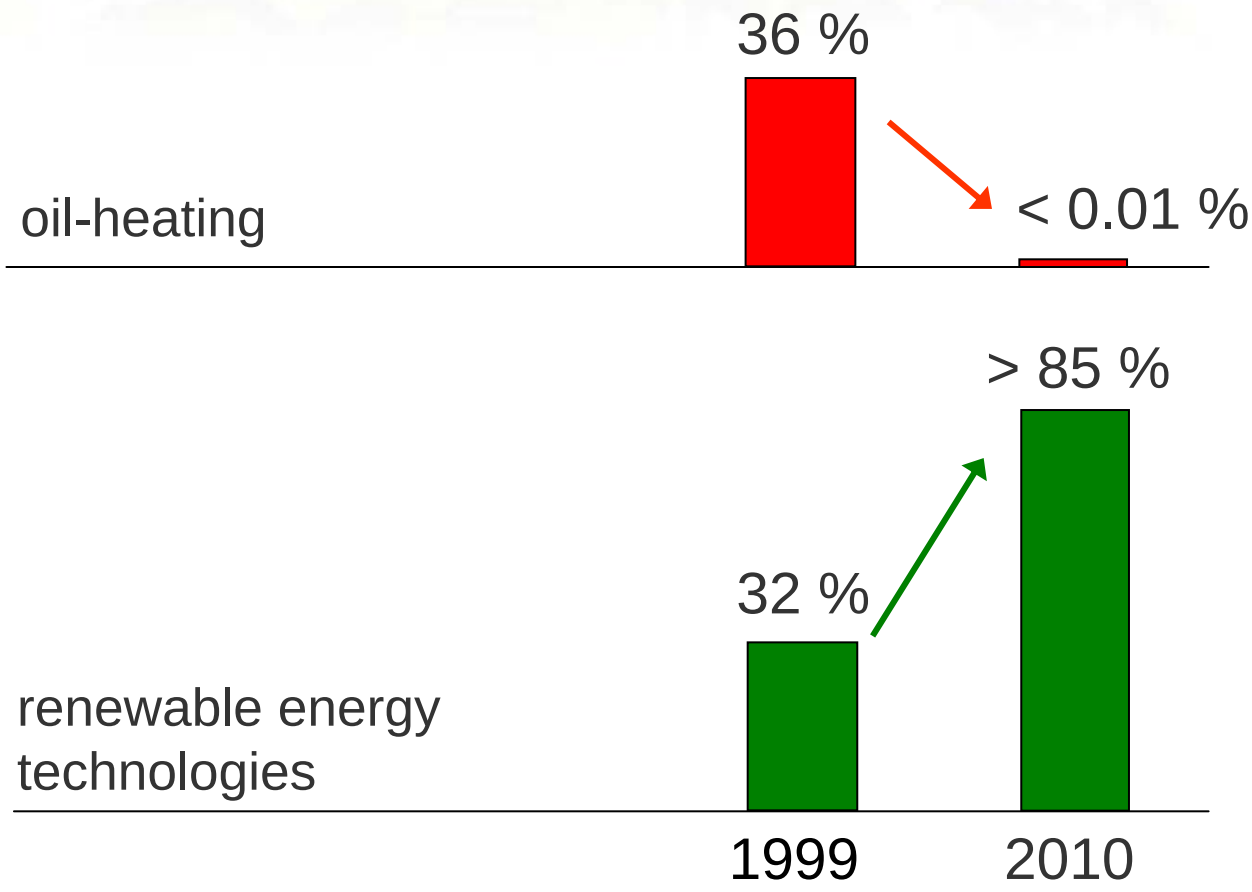
The end of the oil-era?



Thank you very much for your attention!

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