Austrian Energy Agency

Austria‘s efforts to increase energy efficiency

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Kiew, 17th March 2010
EU: Rationale for energy efficiency

Technologies that can reduce global CO2 emissions from energy combustion

- Energy savings
- Fossil fuel switch
- Renewable energies
- Nuclear energy
- Carbon sequestration
- Emission of reduction case

Mt CO2

1990 2000 2010 2020 2030 2040 2050

Avoided emissions
EU Directive on Energy end-use efficiency and energy savings

- Need to increase end-use energy efficiency:
  - reduction of primary energy use
  - reduction of CO₂ emissions
  - link to the 20/20/20 goals of the EU

- Purpose
  - provide framework that favors efficient use of energy
  - create the conditions for the development of a market for energy services and other energy efficiency improvement measures
 Directive 2006/32/EC 82

Scope:
- providers of energy efficiency improvements
- distributors
- distribution system operators
- retail energy sales companies
- final customers (exceptions)

Targets:
- by 2016: 9% indicative energy savings target
First National Action Plan for Energy Efficiency

- Determination of the indicative targets:
  - 80,4 PJ or 22,34 TWh (2016)
  - 17,9 PJ (intermediate target 2010)

- Energy saving strategy and measures
  - government program
  - Energy-concepts, -program and guidelines of the Austrian regions
  - Promotion schemes for residential buildings
  - domestic Environmental promotion schemes
  - Austrian Energy Strategy

- Public sector as role model

- Information and consulting service
Energy Efficiency - Competences of the Austrian Energy Agency

- **Development of the 1st National Action Plan for Energy Efficiency**
- **Monitoring body** (Dir. 2006/32 EC Art. 4)
  - Verification of the energy savings as a result of energy services and other energy efficiency improvement measures
  - Development of bottom-up methods
- **Coordination of the energy action program according to the governmental program**
  - Estimation of potential for energy saving measures
  - Framework for voluntary measures
Potential for Energy Savings until 2020: 93,55 PJ

- Traffic and mobility: 40,5 PJ
- Room Heating: 40,9 PJ
- Electricity: 6,7 PJ
- Industrial CHP: 5,5 PJ
Energy efficiency for Buildings

- Building code requires minimum standard
- Subsidy schemes for residential buildings (2.4 billion € per year) support construction of low energy buildings and passive houses
- "klima:aktiv"-standard promotes ecological construction (including building materials)
- Energy certification show up the quality of buildings
- **Target 1:** only passive buildings until 2015 at the latest
- **Target 2:** significant increase of renovation
  - Rehabilitation/modernisation of all buildings from 1950 to 1980 until 2020
  - Modernisation of Federal buildings via contracting
Energy conservation in buildings - reduction of energy demand for room heating in private houses

NO BTV 1996 = Bauordnung in Niederösterreich 1996
NEH = Niedrigenergiehaus
PH = Passivhaus
Top-Standard of residential buildings, ...
... but also of commercial buildings
Austrian building stock

- 2.05 million buildings
- 75% are single family houses and detached houses
- 14% non-residential buildings
- 21% of residential buildings constructed before 1919
- 47% of residential buildings constructed 1945-1981
Austrian building stock

- 2.05 million buildings
- 75% are **single family** houses and detached houses
- 14% **non-residential** buildings (main share: tourism and offices)

**Main issue:** heating energy consumption

**Main issue:** electricity consumption, cooling

**Energy consumption for electric appliances and cooling is increasing!**
Policy instruments and target groups

- Energy certificate / building regulation
  - Building owners residential sector
- Grants and subsidies
  - Building owners non-residential sector
- Awareness creation
  - Tenants (individuals and commercial)
Subsidy for energy efficiency measures and renewable energy use

- Most important indicator for energy efficiency performance: heating energy demand [kWh/m²a]
- Usually, requirements depend on the surface to volume ratio
  - lower requirements for single family buildings
  - higher requirements for multifamily buildings
- In addition, grants are available for renewable energy technologies, e.g. biomass, solar thermal plants, heat pumps.
New construction

- New construction = additional buildings, causing additional energy consumption and CO2 emissions
- Therefore energy consumption and CO2 emissions should be reduced as much as possible
- Subsidy schemes:
  - Defined energy efficiency categories represented by heating energy demand values [kWh/m2a] with funds allocated to them
  - In addition, there are subventions available for the use of renewable energy technologies
New building construction: mandatory energy performance requirements

- **Example Province of Styria:**
- Single family houses must achieve the minimum requirement 65 kWh/m²a as a condition to receive social housing subsidy
- In addition, the following subsidies are offered depending on the energy efficiency performance:
  - **Category low energy house:**
    - maximum 52 kWh/m²a
    - additional € 10,000
  - **Category super low energy house:**
    - maximum 39 kWh/m²a
    - additional € 15,000
  - **Category passive house:**
    - maximum 15 kWh/m²a
    - additional € 25,000
New construction: more ambitious mandatory requirements

- Burgenland: 40 kWh/m²a heating energy demand for single family houses; additional grant (up to € 28,000) for passive house standard

- Vienna implements the following conditions since 2009:
  - 45 kWh/m²a heating energy demand for single family houses without controlled ventilation
  - 33 kWh/m²a for single family houses with controlled ventilation
Building renovation to increase energy efficiency of building stock

- The Austrian building stock (residential buildings) implies a significant energy saving potential
  - Average heating energy demand of multifamily buildings is estimated 90 kWh/m²a
  - Average heating energy demand of single family houses and detached houses is estimated 200 kWh/m²a
- Ambitious targets: increase energy related renovation rate from < 1% to 3% p.a.
- Shifting subsidies from new construction to renovation necessary (negotiations Federal state – Länder)
Which strategy is best to tap the full savings potential?

- Ambitious targets (low heating energy demand)

OR

- Moderate threshold and amount of funding depending on the energy performance
Which strategy ist best?

- Ambitious targets:
  - no obligation for energy related renovations
  - less investment in energy related building renovation if requirements set by the subsidy scheme are too strict

- Therefore the subsidy schemes of the Austrian provinces offer:
  - Defined energy efficiency categories represented by heating energy demand values [kWh/m2a] with funds allocated to them. **Moderate threshold to encourage** potentially interested building owners to aim also for energy related improvement
  - Subventions available for renewable energy use connected with subsidies for the renovation of the heating system
  - Subsidies for the renovation of single components (e.g. windows, insulation of top ceiling)
## Energy conservation in buildings

### new constructions

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### building stock

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**BAU today**

**BAU renovation today**

**BAU in the future**

**existing quality**
Advantages of a stepwise energy efficiency related subsidy scheme

- Attracts as many building owners as possible and rewards energy related measures
  - The highest subsidy is available for a renovation according to passive house standard

- Takes into account technical and economical challenges in the renovation sector:
  - **Technical barriers** connected with the structure of the existing building may not allow passive house renovation
  - **Financial barriers**: a highly ambitious renovation might not be affordable
A barrier for optimised renovation and a solution

- The renovation of the building envelope and the heating system might not be due at the same time
- In practical terms: building owner carries out isolated measures without holistic renovation concept \(\rightarrow\) no optimisation of energy performance
- Vorarlberg funds the elaboration of a comprehensive renovation concept with € 600, in order to give an incentive for optimised major renovations
- Even if all measures are not implemented at the same time due to financial reasons, the building owner is provided with a renovation plan:
  - recommending appropriate measures and
  - scheduling them in the correct sequence
Subsidies to address the non-residential sector (renovation)

Subsidies to improve energy efficiency of building envelope and windows of buildings constructed before 1.1.1990

- Target group: commercial
- Amount:
  - max. 30 % of total energy related investment cost, energy indicator is max. 50 kWh/m²a
  - max. 20% of total energy related investment cost, energy indicator is between 50 und 70 kWh/m²a
Summary

- Energy related social housing subsidy schemes are important instruments to activate energy savings and renewable energy gains in the residential building sector.
- They reward energy performance better than the minimum requirements set by the respective legislation.
- Energy efficiency standards have been improving constantly in new construction as well as in building renovation.
- In new construction there is the intention to limit social housing subsidies to passive house standard in the near future.
- Regarding building stock there are still technical and economical limitations regarding the broad realisation of passive house renovations; however, super low energy houses seem to be a realistic standard in the near future.
AEA’s Main working areas

- sustainable and secure energy systems
- efficient and thus environmentally friendly production, conversion and use of energy
- renewable energy sources
- innovative energy technologies

Cooperation within projects and networks on national, EU and international level
Austrian Energy Partnerships and Cooperations

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Austrian Energy Partnerships – an Overview

- **Political Commitment**

- **Managed by AEA and a selected partner in the partner country**

- **Promotion of Renewable Energy and Energy Efficiency**

- **Point of departure for the development of closer co-operations**

- **Platform for the identification and realisation of concrete investment projects and preparation of „Joint Implementation“ in the framework of Kyoto Protocol**

- **Austrian Energy partnerships with SK, CZ, BG, RO, UA, BY and SLO**
Thank you for your attention!

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Energy certificate for residential buildings
Energy certificate for non-residential buildings