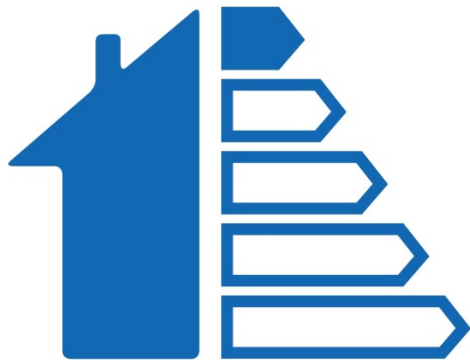


The implementation of the EU Buildings Directive in Austria



Gerhard Dell

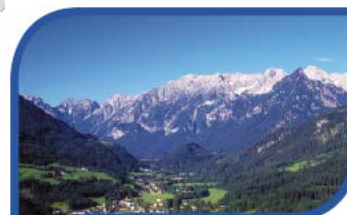
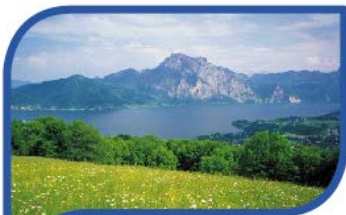
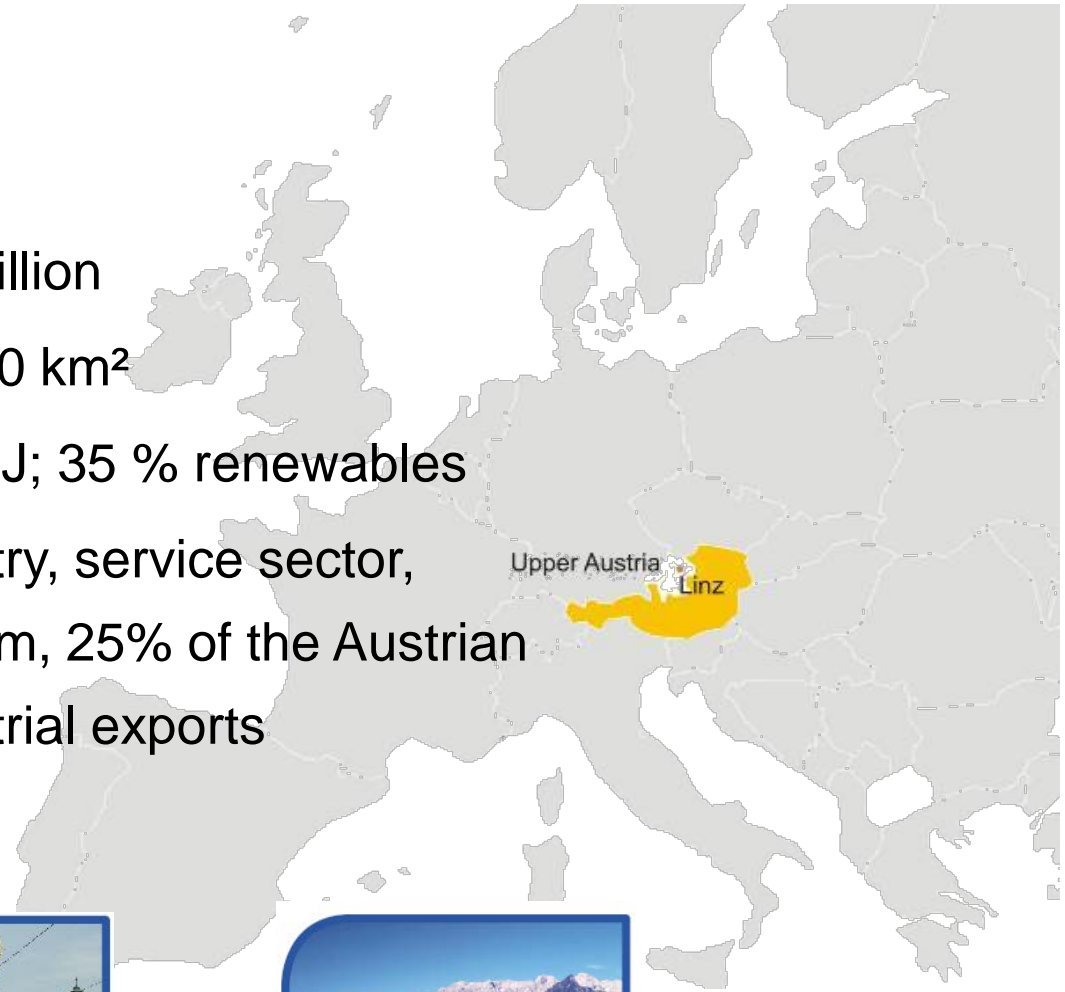
**Energy Commissioner Upper Austria
Director OÖ Energiesparverband**

www.energiesparverband.at

The Region of Upper Austria Oberösterreich



- Capital: Linz
- Population: 1.4 million
- Area: 12,000 km²
- Gross inland cons: 300 PJ; 35 % renewables
- Economic activities: industry, service sector, tourism, 25% of the Austrian industrial exports



Organisation

- energy agency of Upper Austria
- founded (in 1991) and mostly funded by the regional government
- promotes **energy efficiency** and **renewable energy**
- provides **services** to private households, public bodies & businesses

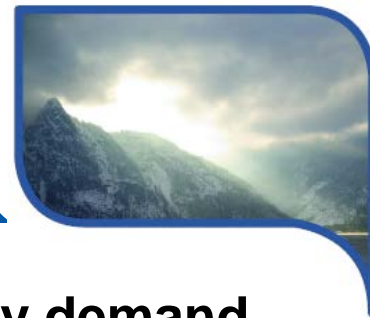


Services

- Energy advice (10,000 sessions/a)
- Building certification (>100,000 buildings rated since 1993)
- Training programmes
- Management of regional subsidy programmes
- Public awareness campaigns, events, publications
- Pilot projects
- Municipal energy strategies
- European cooperation
- World Sustainable Energy Days
- OEC network

Renewable energy & energy efficiency

Energy Action Plan of Upper Austria



- Share of renewable energy: **35 % of total primary energy demand**
(16 % biomass, 14 % hydro, 5 % solar & other renewables)
- Share of renewable energy: **50 % of total heating demand**
> 80 % of total electricity demand
- Avoided imports of fossil fuels: **> 1 billion Euro** per year

Energy Action Plan:

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 % CO₂ emissions

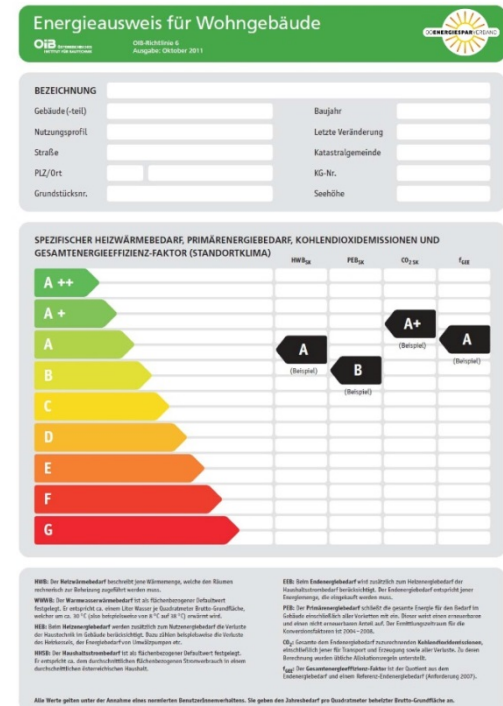
The National Plans



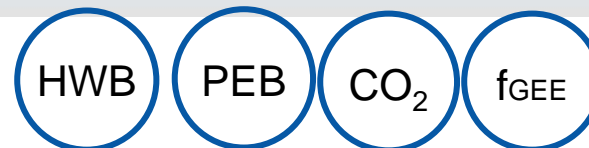
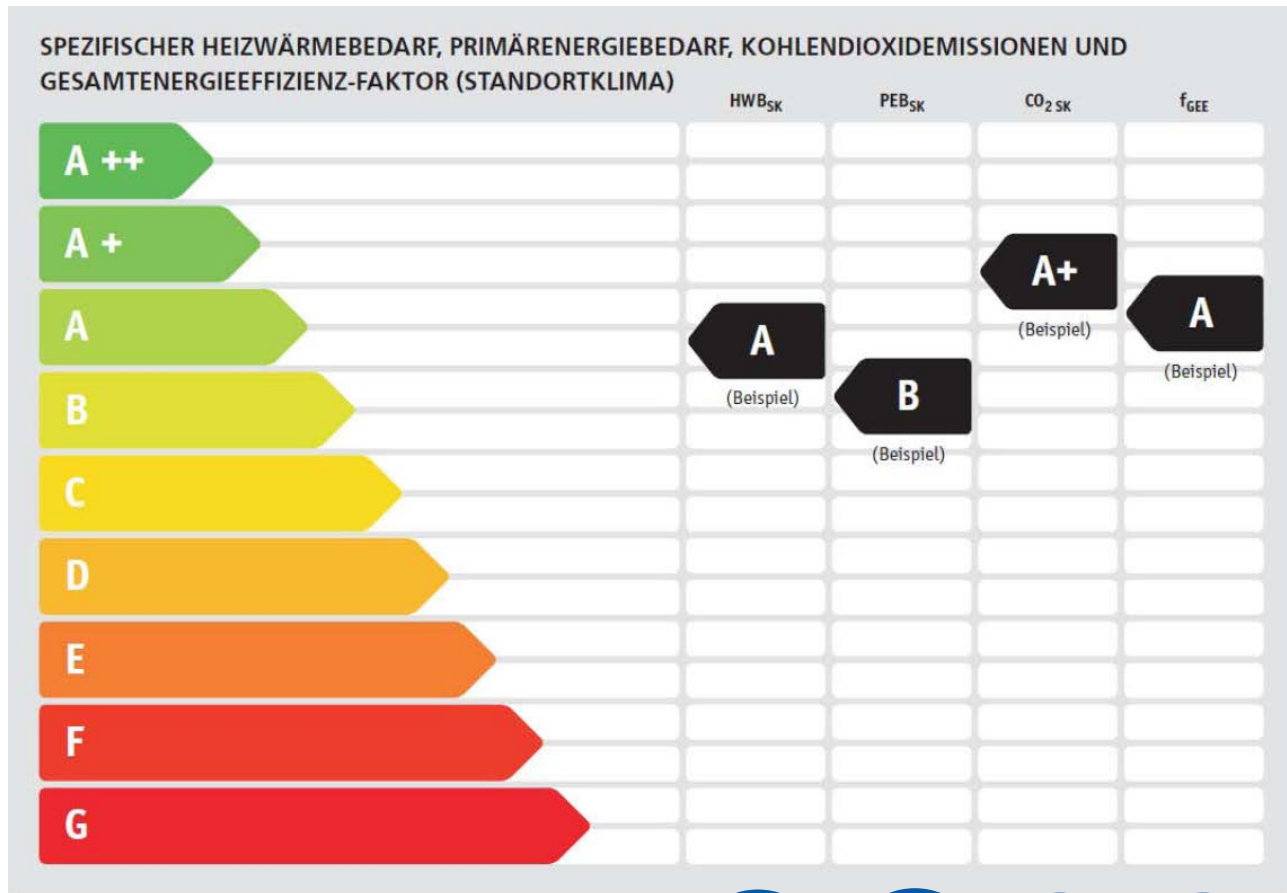
Member States must draw up national plans for **increasing the number** of NZEBs which include - among others:

the **definition** of **NZEBs**, reflecting their national, regional or local conditions, and including a **numerical indicator of primary energy** use expressed in kWh/m² per year.

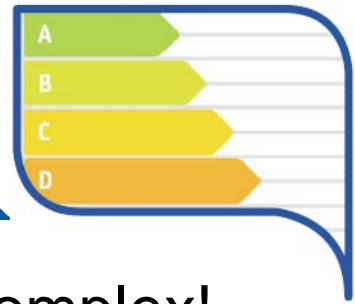
In Austria, joint **implementation by the 9 regions**, supported by the OIB (joint institutes of the regions).



Defined energy performance indicators in Austria



Why 4 indicators?



- Looking at the overall efficiency of buildings is complex!
- Different needs need to be satisfied

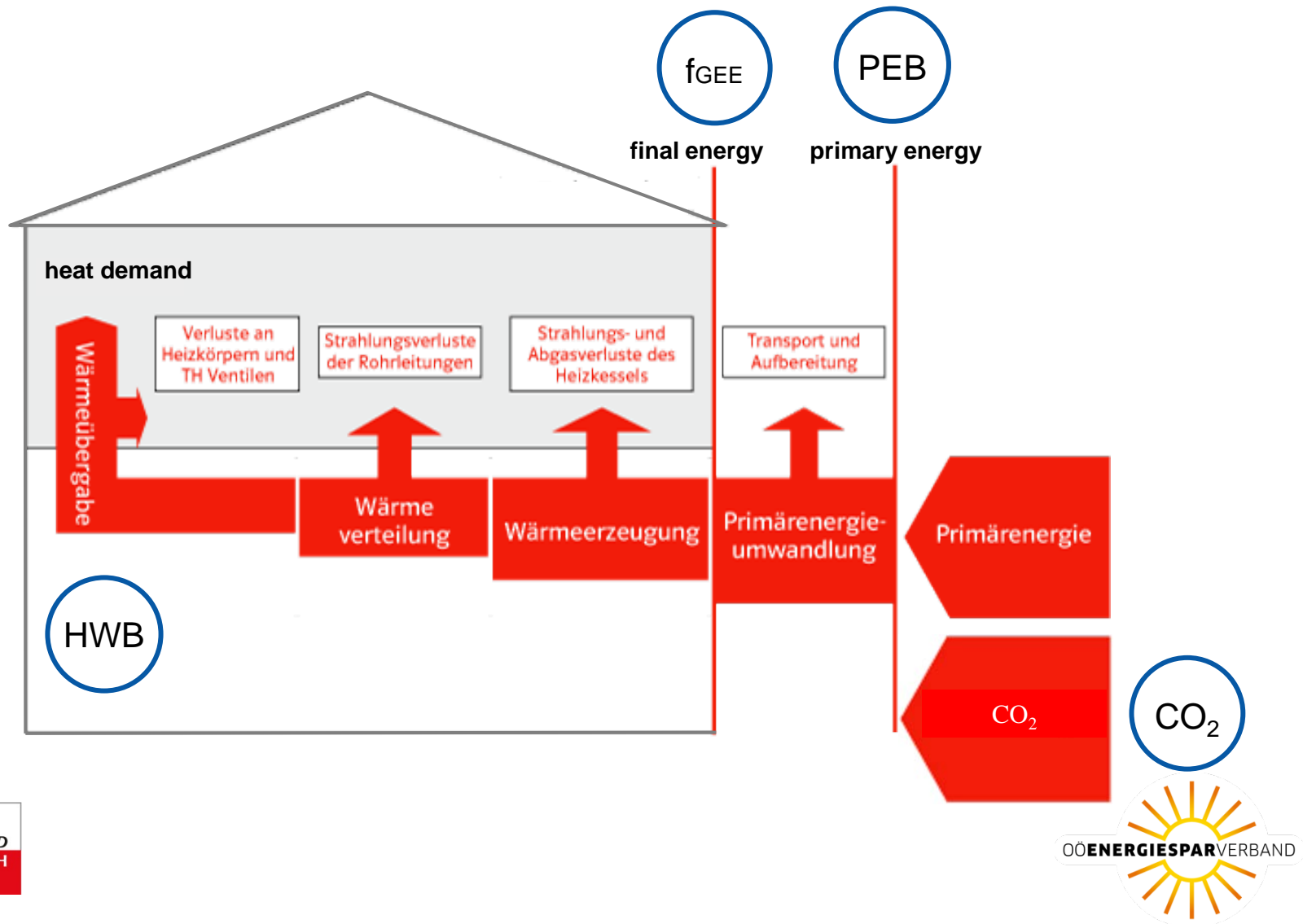
HWB (heat demand): insulation levels (thermal quality of the building)

PEB (primary energy demand): use of resources

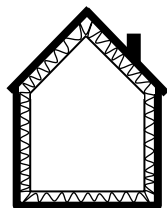
CO₂: climate protection

f_{GEE} (total energy performance factor): energy performance (costs)

Primary energy -> final energy -> heating energy demand



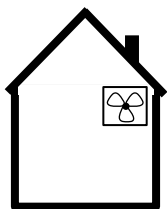
Variations to achieve similar energy performance



better insulation

$$\text{HWB} = 36$$

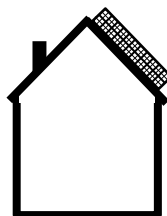
$$f_{\text{GEE}} = 0,78$$



ventilation with heat recovery

$$\text{HWB} = 36$$

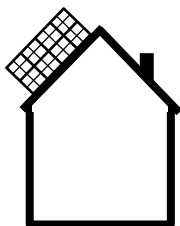
$$f_{\text{GEE}} = 0,78$$



8 m² thermal solar collectors

$$\text{HWB} = 45$$

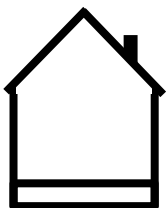
$$f_{\text{GEE}} = 0,78$$



2 kW_{peak} PV

$$\text{HWB} = 45$$

$$f_{\text{GEE}} = 0,78$$



Low temperature heat distribution systems instead of high temperature distr. system

$$\text{HWB} = 40$$

$$f_{\text{GEE}} = 0,78$$

National Plan – Austria

Example new homes

	HWB _{max} [kWh/m ² a]	f _{GEE,max} [-]	PEB _{max} [kWh/m ² a]	CO ₂ max [kg/m ² a]
2014	16 × (1 + 3,0 / ℓ _c) 54	0,90	190	30
2016	14 × (1 + 3,0 / ℓ _c) 48		180	28
	oder			
	16 × (1 + 3,0 / ℓ _c) 54	0,85		
2018	12 × (1 + 3,0 / ℓ _c) 41		170	26
	oder			
	16 × (1 + 3,0 / ℓ _c) 54	0,80		
2020	10 × (1 + 3,0 / ℓ _c) 34		160	24
	oder			
	16 × (1 + 3,0 / ℓ _c) 54	0,75		

○ Bei einem Eigenheim, A/V = 0,8

Cost – optimal levels

Jahr	WWB_max (kWh/m²a)	Energieeffizienz (l)	PEB_max (kWh/m²a)	CO_2_max (kg/m²a)
2014	$16 \times (1 + 30 / L)$ (54)	0.90	190	30
2016	$14 \times (1 + 30 / L)$ (48)	oder	180	28
	$12 \times (1 + 30 / L)$ (42)	oder	170	26
2018	$16 \times (1 + 30 / L)$ (54)	oder	180	26
	$10 \times (1 + 30 / L)$ (30)	oder	160	24
2020	$16 \times (1 + 30 / L)$ (54)	oder	160	24

Osterreichisches Institut für Bautechnik

OiB-Richtlinie 6

OiB - Dokument

zum Nachweis der

Kostenoptimalität

der Anforderungen der OIB-RL6 bzw.
des Nationalen Plans
gemäß
Artikel 4 (2) zu 2010/31/EU

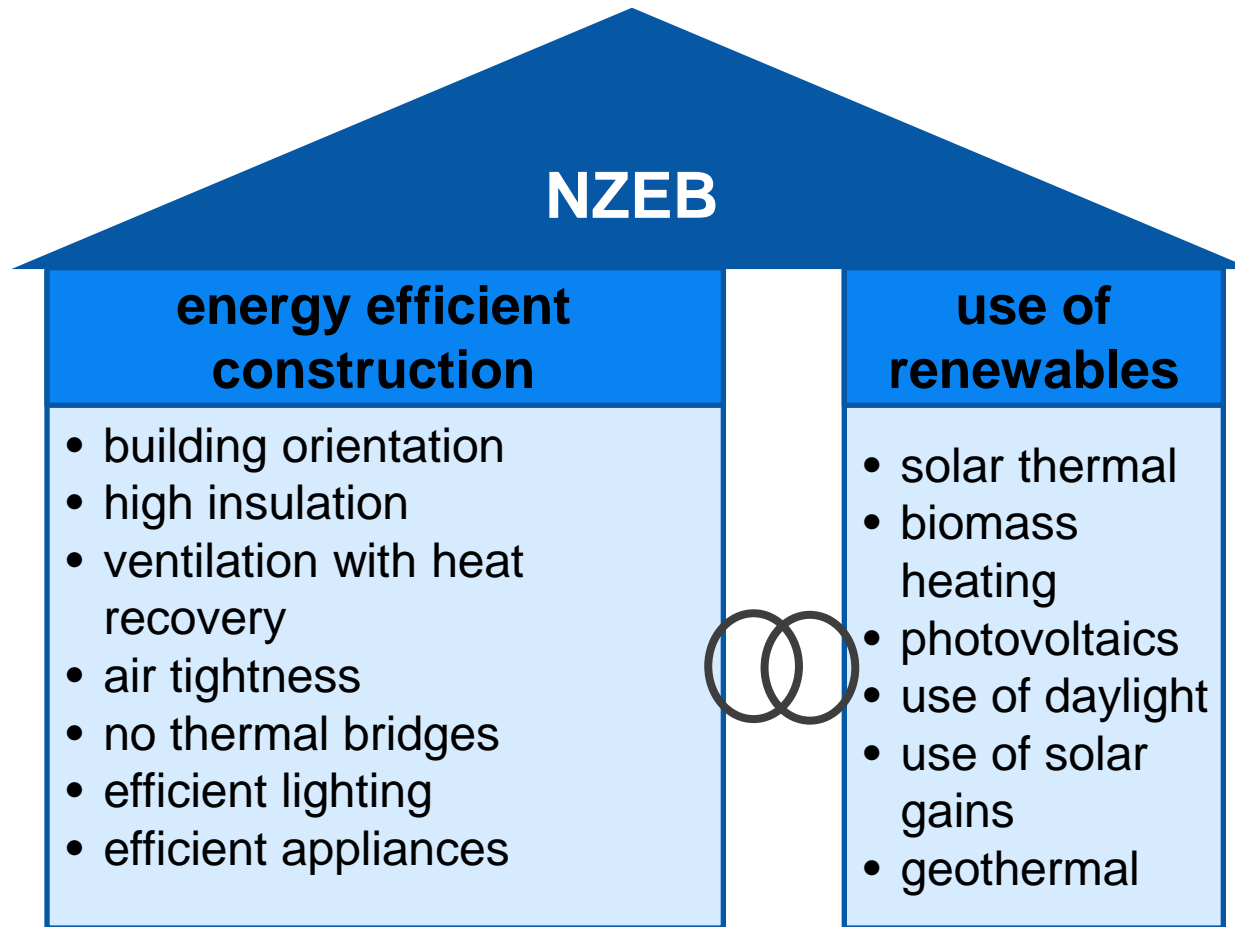
Cost-optimal levels of minimum energy performance requirements

Dieses Rahmendokument basiert auf den Beratungsergebnissen der von der Landesantidirektorenkonferenz zur Koordinierung der Umsetzung der RICHTLINIE 2010/31/EU DES EUROPÄISCHEN PARLAMENTES UND DES RATES vom 19. Mai 2010 über die Gesamtenergieeffizienz von Gebäuden eingesetzten Ländersperngruppe in der Verbindung mit der Bundesländer und des Sachverständigenrates für bautechnische Richtlinien – Untergruppe Energieeffizienz und Wärmeschutz (DVBETRL 6) im Osterreichischen Institut für Bautechnik.

OiB-Rahmendokument zum "Nachweis der Kostenoptimalität" der Anforderungen der OIB-RL6 bzw. des Nationalen Plans" gemäß GEG0:2010
Stand 17. März 2013

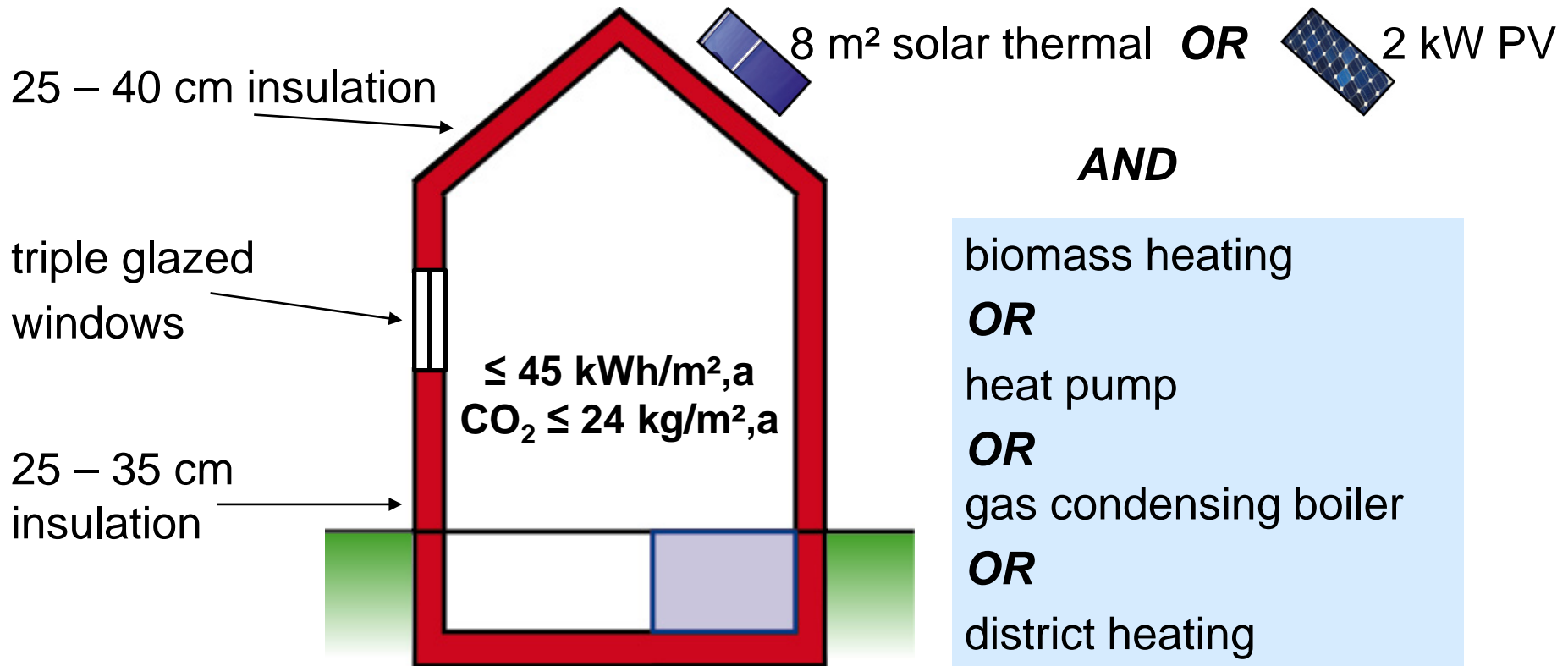
Seite 1 von 151

NZEB combine energy efficiency and renewables

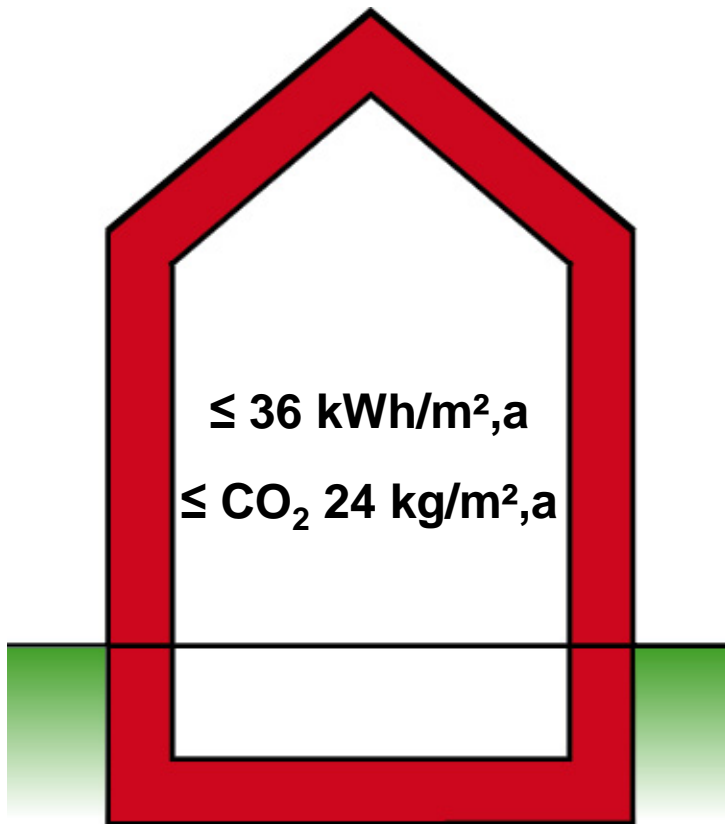


Many combinations possible: more efficiency - more renewables
Separation of "insulation" and "heating systems" has come to an end

Examples from Upper Austria (1): Single-family home



Examples from Upper Austria (2): Single-family home



biomass heating

OR

heat pump **AND** PV

OR

gas condensing boiler **AND** solar thermal

OR

district heating

Examples NZEB-buildings (1)

- Public building (school building), Altmünster, Upper Austria
- treated floor area: 13,000 m²
- heat demand: 15 kWh/m²a
- 400 kW wood chip boiler
- solar thermal collectors 90 m²
- 10 kW_{peak} PV



Examples NZEB-buildings (2)

- One-family house
- prefabricated elements
- heat demand: 5 kWh/m²a
- ventilation system with heat recovery
- 15 m² solar heating system,
10 kW wood pellet stove



Examples NZEB-buildings (3)

- Multi-family building (social housing)
- 9 flats, low energy building standard
- heat demand : 21 kWh/m²,a
- 50 kW wood pellet heating system
- 22 m² solar thermal collectors



TAG DER OFFENEN TÜR IN NIEDRIGSTENERGIEHÄUSERN

Der OÖ Energiesparverband lädt ein!

- more than 80 NZEBs opened their doors
- 1,090 visitors

HEUTE SCHAUEN – MORGEN BAUEN:

Holen Sie sich Anregungen für effizientes Bauen & Sanieren, über 80 Gebäude öffnen ihre Türen!

Freitag, 15. 11. 2013 & Samstag, 16. 11. 2013 in ganz Oberösterreich

Anmeldung & Info: www.haeuserschauen.at



What will change for the energy efficiency sector?



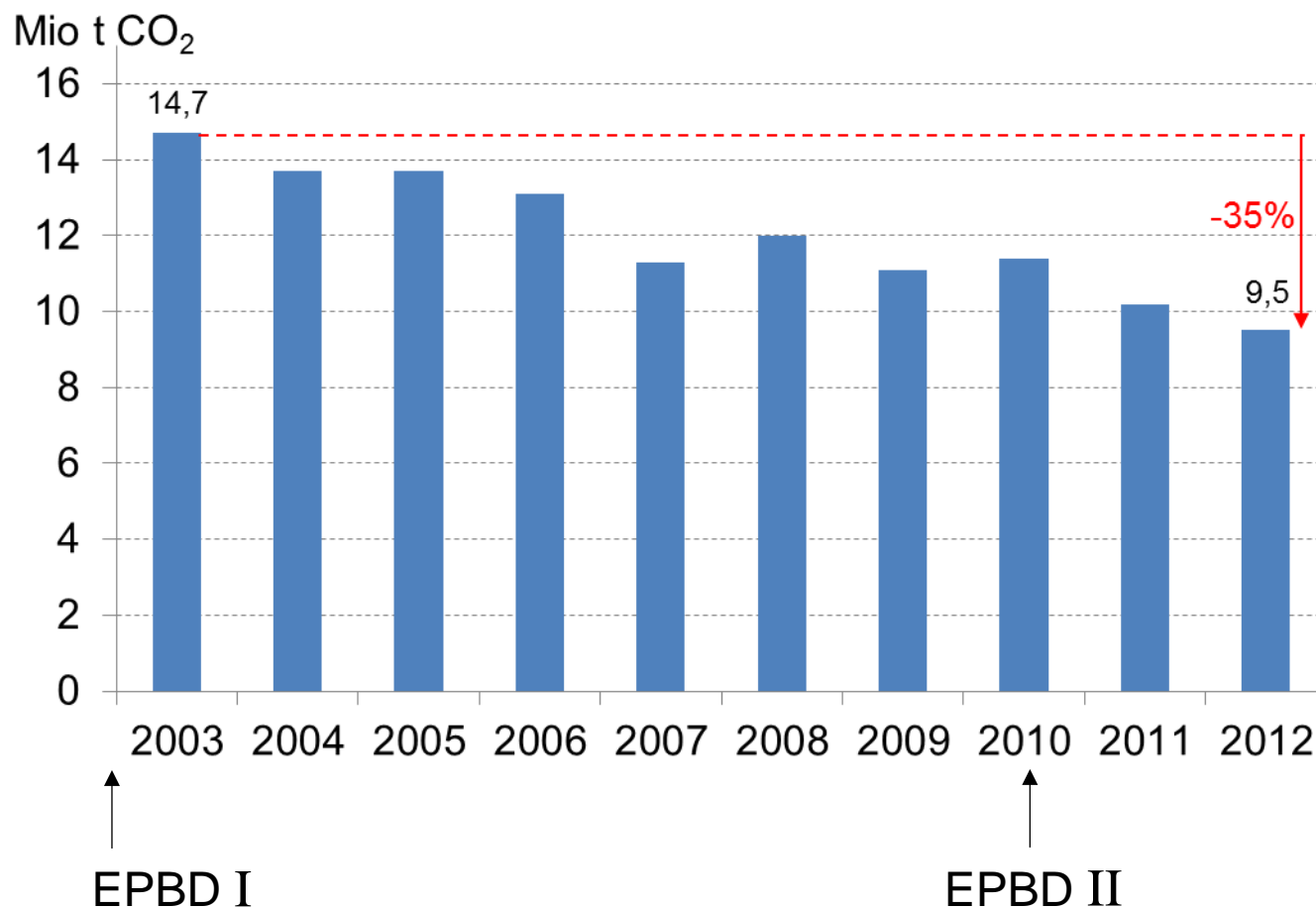
- **decreasing heat demands** per m² → with implications on **the choice** of heating systems
- higher requirements in the **overall system efficiency** of heating systems (including distribution systems) → requires **more interaction** with between building technologies
- **complexity** increases significantly!
- primary energy (and **CO₂**) becomes slowly a decision making reality on building owner level

What we see in the NZEB market in Upper Austria



- **energy performance certificate** has - step by step - fundamentally **changed the building market** (e.g. for young families thinking about their new single-family homes, energy efficiency and renewables are key elements in their planning process)
- **heating installers** were **quicker** in learning about efficient buildings, **architects** were **slower** in the uptake of renewables
- policy **leadership resulted** in numerous leading renewable energy companies (especially in the heating sector): number of **employees** in the Oekoenergie-Cluster grew from 1,600 to 8,900 in 12 years

Greenhouse gas emissions Austria - buildings



Source: UBA

Thank you!



Gerhard Dell

**Energy Commissioner Upper Austria
Director OÖ Energiesparverband**

www.energiesparverband.at