

AUSTRIA'S ENERGY STRATEGY



AUSTRIAN ENERGY AGENCY IN A NUTSHELL

- Austria's national Energy Agency (*1977)
- 70 employees
- 7 Million € annual turnover
- independent Think Tank: from basic decision-making to implementation
- about 50 members from policy & economy
- 4 business units
 - Energy & climate policy
 - Energy economics, infrastructure and security of supply
 - Buildings, businesses, households, end-user technologies
 - Mobility & transport

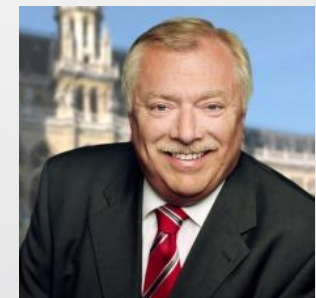
President:
Minister of Environment
Nikolaus Berlakovich



Vice -President:
Minister of Economy
Reinhold Mitterlehner



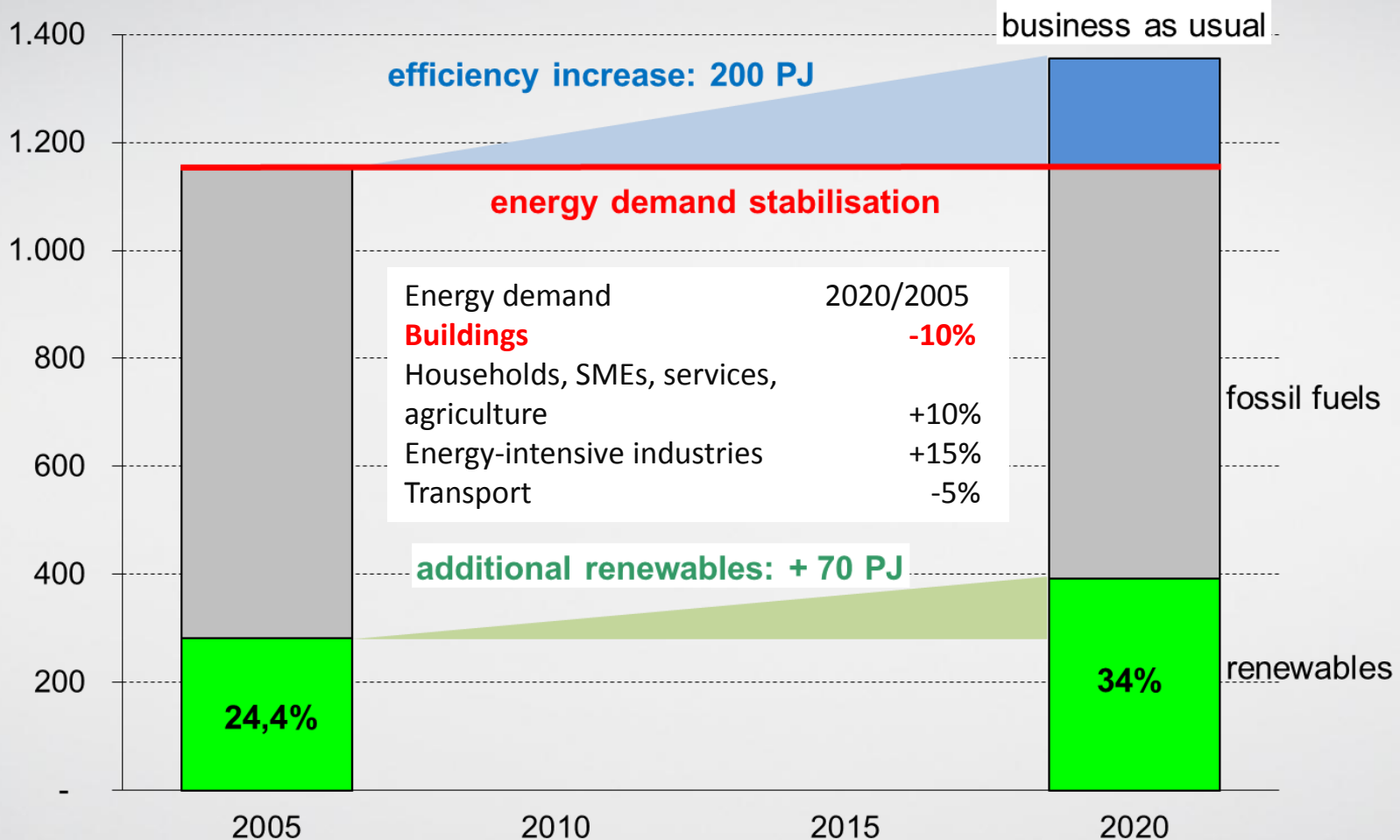
Vice-President:
Mayor of Vienna
Michael Häupl



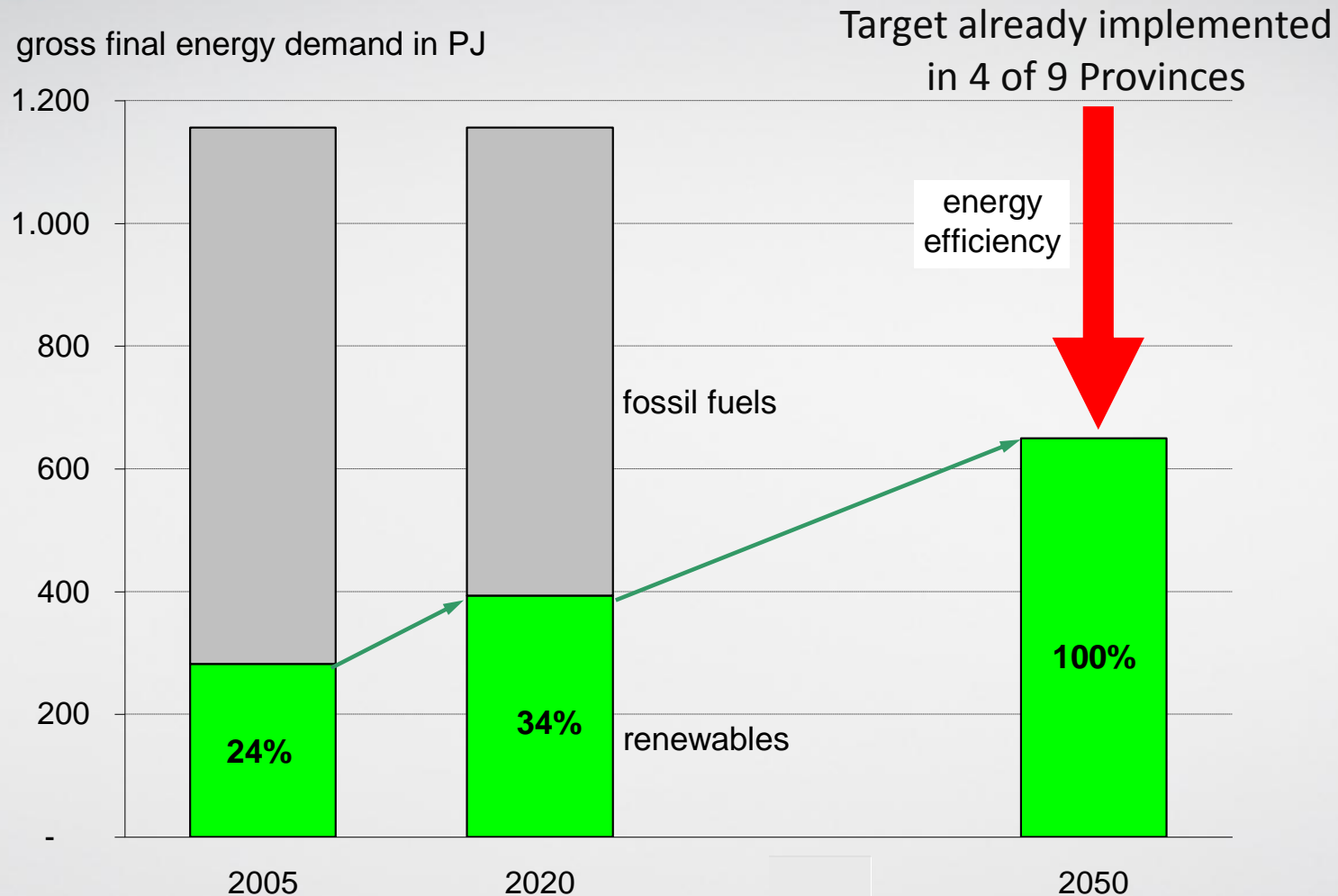
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ENERGY EFFICIENCY IS THE KEY

gross final energy demand in PJ



VISION 2050: HIGH EFFICIENCY, RENEWABLE BASED SUPPLY



ENERGY STRATEGY IN NUMBERS

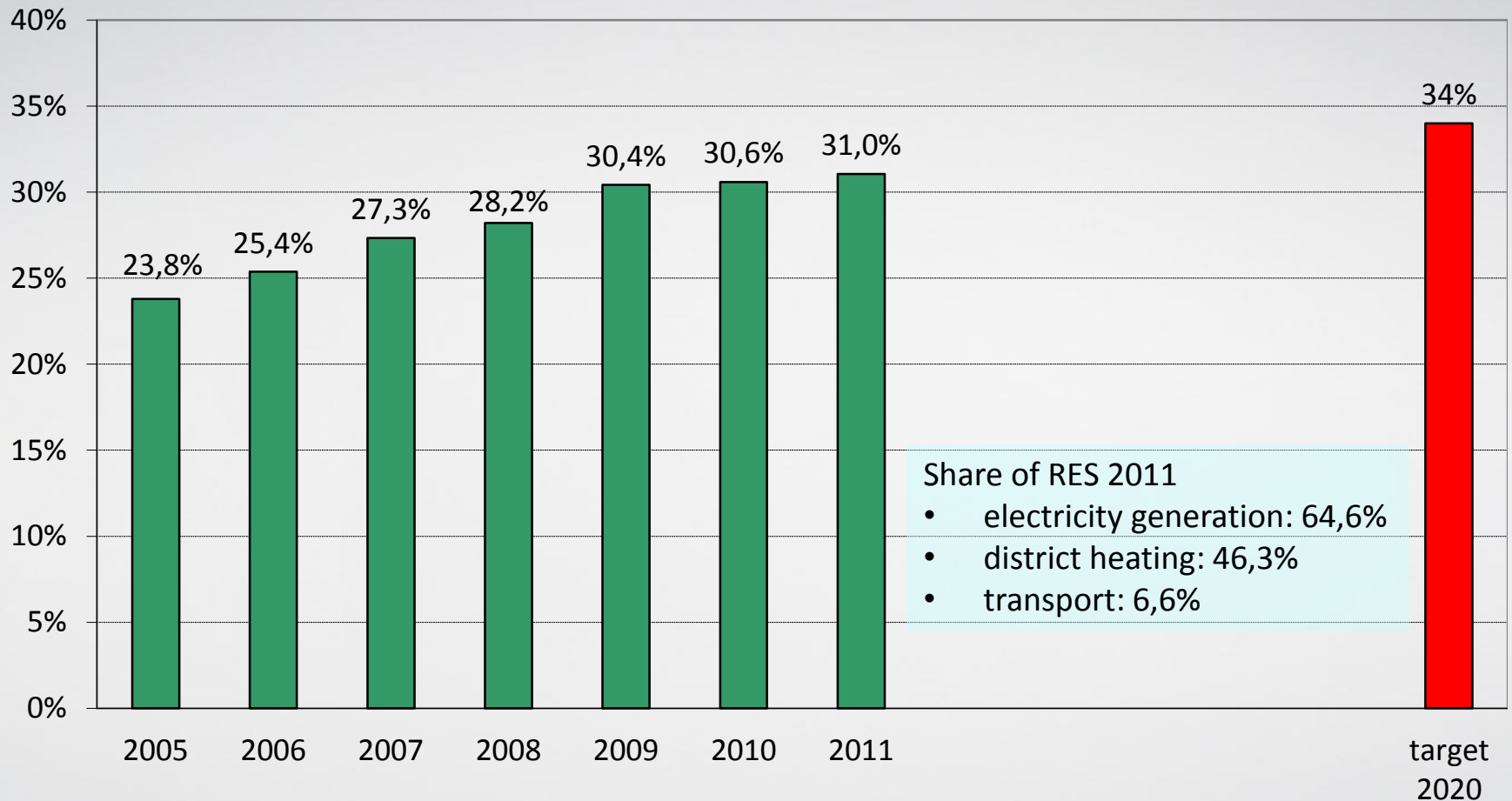
Final energy consumption	2005	2008	2020
Oil	496.0	444.2	362.3
Coal	24.8	24.3	27.3
Natural gas	202.7	187.8	191.2
District heating	55.1	62.2	59.0
Conventional electricity	57.7	44.1	42.9
Electricity from renewable energy	147.8	163.0	179.9
District heating from renewable energy	14.9	23.5	38.2
Heating from renewable energy	117.0	121.6	143.4
Biofuels	2.3	17.9	34.0
Total renewable energy	282.0	326.0	395.6
Total final energy consumption	1,118.4	1,088.5	1,078.3
Consumption by energy industry and electricity/district heating losses	37.7	43.2	36.6
Gross final energy consumption*	1,156.0	1,131.8	1,114.9
Renewable energy share of gross final energy consumption	24.40%	28.80%	35.48%

* Final energy consumption + consumption by energy industry & electricity/district heating losses. Calculation basis for share of renewable energy according to EU guidelines

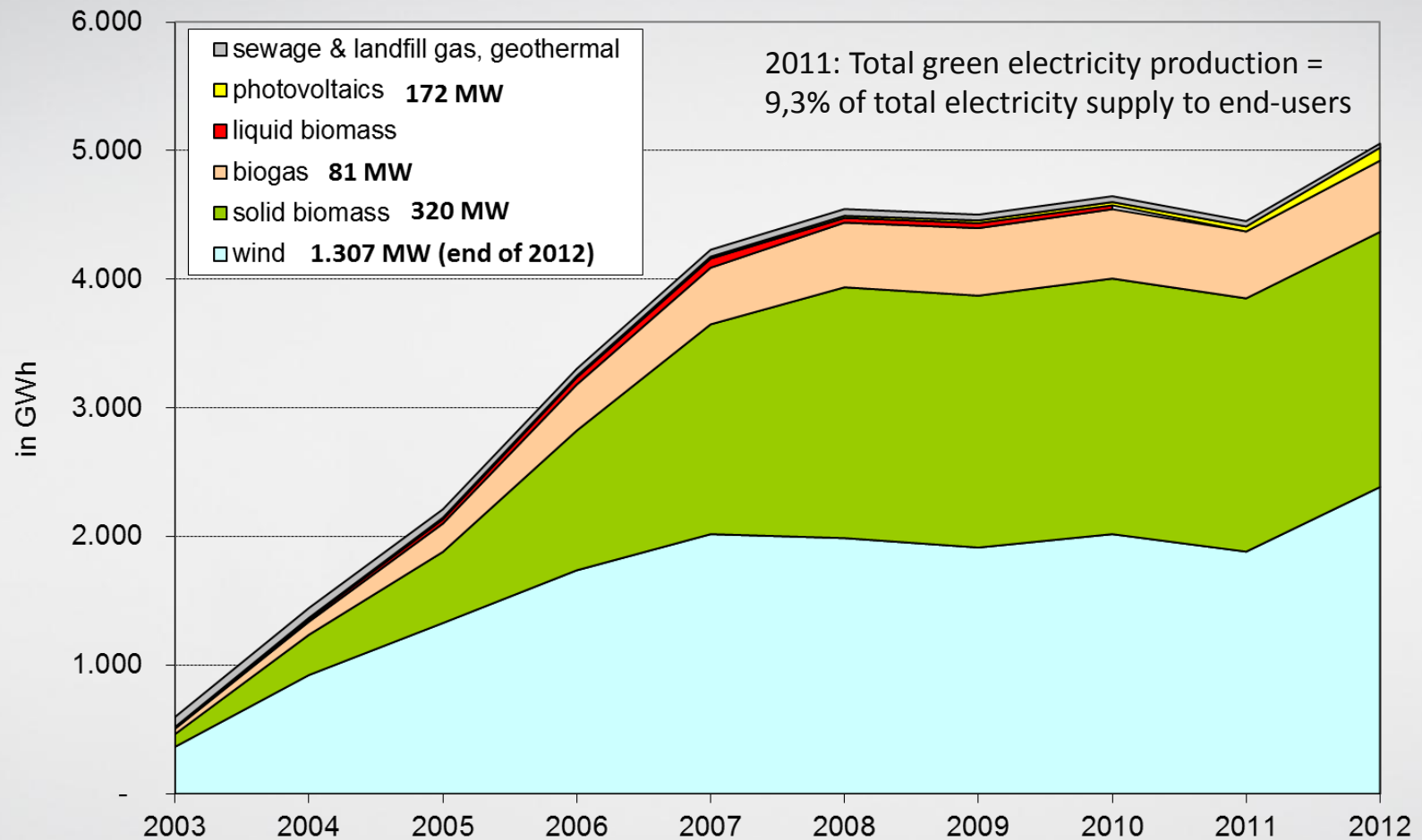
Source: Austrian Energy Agency

SUPPLY SIDE: EXAMPLE GREEN ELECTRICITY

INCREASING TREND OF RENEWABLES MARKET SHARE (CALCULATED ON THE BASIS OF THE RES-DIRECTIVE METHODOLOGY)

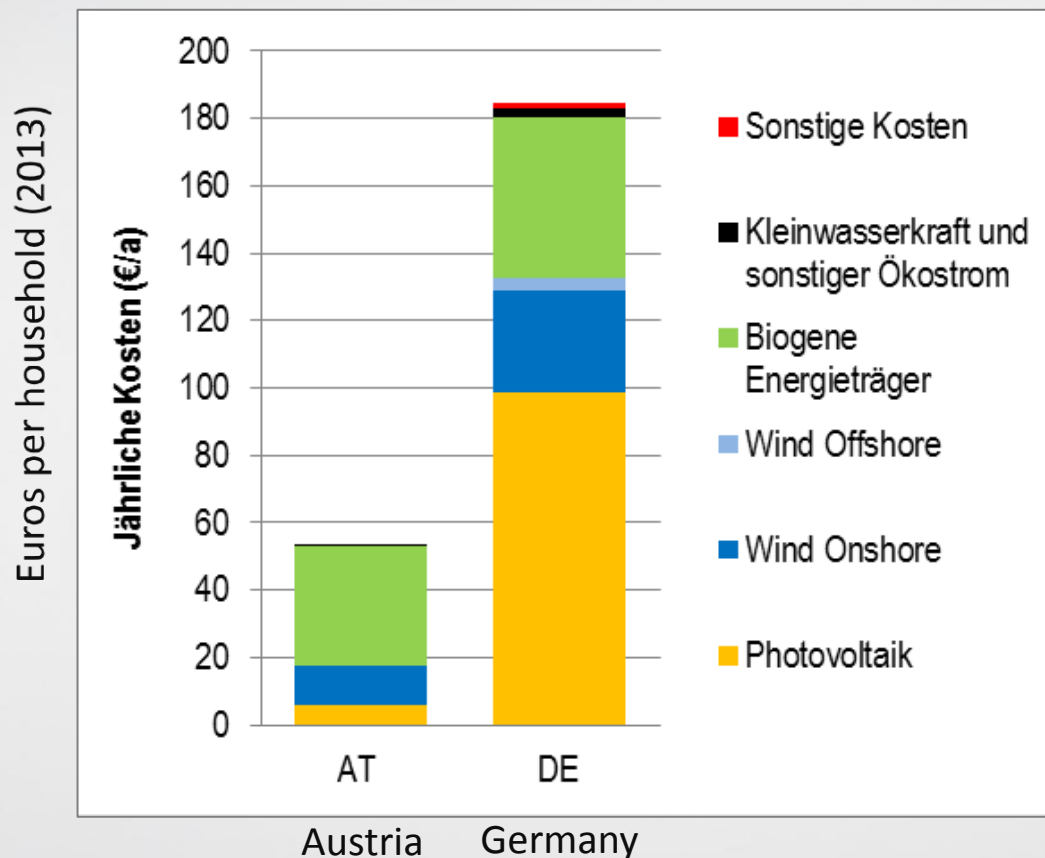


DEVELOPMENT OF FUNDED GREEN ELECTRICITY (EXCEPT SMALL HYDRO)



COSTS FOR HOUSEHOLDS DIFFER SIGNIFICANTLY BETWEEN AUSTRIA AND GERMANY

Financial contribution of a typical household with 3.500 kWh to the green electricity support scheme in 2013



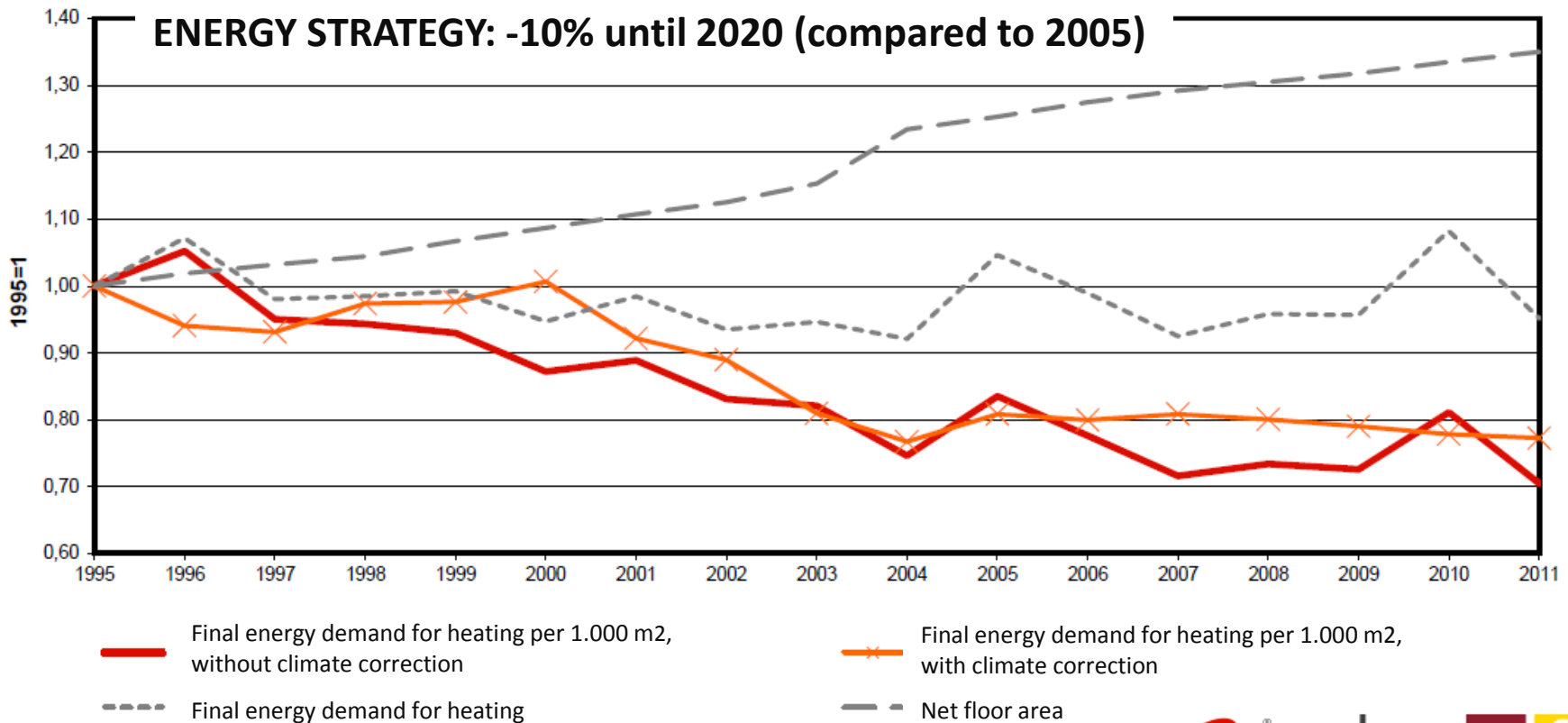
TARGETS OF THE GREEN ELECTRICITY ACT 2012 FOR 2015/2020

- Intermediate target for additional installations in the period 2010 to 2015
 - **Hydro Power:** **700 MW** (3.4 TWh p.a.)
 - **Wind:** **700 MW** (1.5 TWh p. a.)
 - **PV:** **500 MW** (0.5 TWh p. a.)
 - **Biomass and Biogas:** **100 MW** (0.6 TWh p. a.)
only when supply with resources can be ensured

- Targets for additional installations in the period 2016 to 2020
 - **Hydro Power:** **300 MW** (0,7 TWh p.a.)
 - **Wind:** **1.300 MW** (2,5 TWh p. a.)
 - **PV:** **700 MW** (0,7 TWh p. a.)
 - **Biomass and Biogas:** **100 MW** (0,6 TWh p. a.)
only when supply with resources can be ensured

DEMAND SIDE: ENERGY EFFICIENCY OF BUILDINGS

DECREASING TREND IN HEATING INTENSITY FOR PRIVATE HOUSEHOLDS



Datengrundlagen: Statistik Austria, Berechnungen: Österreichische Energieagentur
 1) Nutzfläche der Hauptwohnsitzwohnungen, permanently occupied dwellings

REQUIREMENTS SET BY DIRECTIVE 2010/31/EU ON ENERGY PERFORMANCE OF BUILDINGS

- Methodology for calculating the energy performance of buildings
- Setting of minimum energy performance requirements
- Calculation of cost-optimal levels of minimum energy performance standards
- New buildings
 - Considering high-efficiency alternatives (renewables, small cogeneration, district heating & cooling, heat pumps)
- Existing buildings
 - Ensuring energy performance upgrades when buildings undergo major renovation
 - Encouraging the installation of high-efficiency alternative systems
- Requirements for technical building systems
 - At least for heating, hot water, air-conditioning, large ventilation or a combination thereof
- Inspection of heating systems and air-conditioning systems (incl. Reports)
- Considering **financial incentives** and the removal of barriers
- **National plans for nearly zero-energy buildings**
 - By 31 December 2020: all new buildings
 - After 31 December 2018: all buildings occupied and owned by public authorities
 - Establishing a system of energy performance certificates

(REDESIGNING) ENERGY PERFORMANCE CERTIFICATES

Indicators:

- Space heating demand (HWB)
- Overall energy performance factor (f_{GEE})
- Overall primary energy demand (PEB)
- Overall CO₂ emissions (CO₂)


Criteria: HWB, PEB, CO₂, energy performance

Energy performance criterion:

- meet stricter requirements on HWB or
- meet stricter f_{GEE} by using more efficient technical building system and/or heat recovery, PV, wind energy on-site or the like

($F_{GEE} = 1$ corresponds with 2007 requirements)

Energieausweis für Wohngebäude



BEZEICHNUNG

Gebäude(-teil)	Baujahr	
Nutzungsprofil	Letzte Veränderung	
Straße	Katastralgemeinde	
PLZ/Ort	KG-Nr.	
Grundstücksnr.	Seehöhe	

SPEZIFISCHER HEIZWÄRMEBEDARF, PRIMÄRENERGIEBEDARF, KOHLEN-DIOXIDEMISSIONEN UND GESAMTENERGIEEFFIZIENZ-FAKTOR (STANDORTKLIMA)

	HWB _{ix}	PEB _{ix}	CO ₂ _{ix}	f _{GEE}
A ++				
A +				
A				
B				
C				
D				
E				
F				
G				

A

(Beispiel)

B

(Beispiel)

A+

(Beispiel)

A

(Beispiel)

HWB: Der **Heizwärmebedarf** beschreibt jene Wärmemenge, welche den Käufern rechnerisch zur Beheizung zugeführt werden muss.

WWB: Der **Wärmezusatzwärmebedarf** ist als flächenbezogener Defaultwert festgelegt. Er entspricht ca. einem Liter Wasser je Quadratmeter Brutto-Graundfläche, welches um ca. 30 °C (also beispielsweise von 8 °C auf 38 °C) erwärmt wird.

HEB: Beim **Heizenergiebedarf** werden zusätzlich zum Nutzenergiebedarf die Verluste der Haustechnik im Gebäude berücksichtigt. Dazu zählen beispielsweise die Verluste des Rücklaufs, der Energiebedarf von Umwälzpumpen etc.

INSE: Der **Innenstromerfordernisbedarf** ist als flächenbezogener Defaultwert festgelegt. Er entspricht ca. dem durchschnittlichen flächenbezogenen Stromverbrauch in einem durchschnittlichen österreichischen Haushalt.

EEB: Beim **Endenergiebedarf** wird zusätzlich zum Heizenergiebedarf der Haushaltsstrombedarf berücksichtigt. Der Endenergiebedarf entspricht jener Energiemenge, die eingeholt werden muss.

PEB: Der **Primärenergiebedarf** schließt die gesamte Energie für den Bedarf im Gebäude einschließlich aller Vorleistungen mit ein. Dieser weist einen erneuerbaren und einen nicht-erneuerbaren Anteil auf. Der Ermittlungszeitraum für die Konversionsfaktoren ist 2004 – 2006.

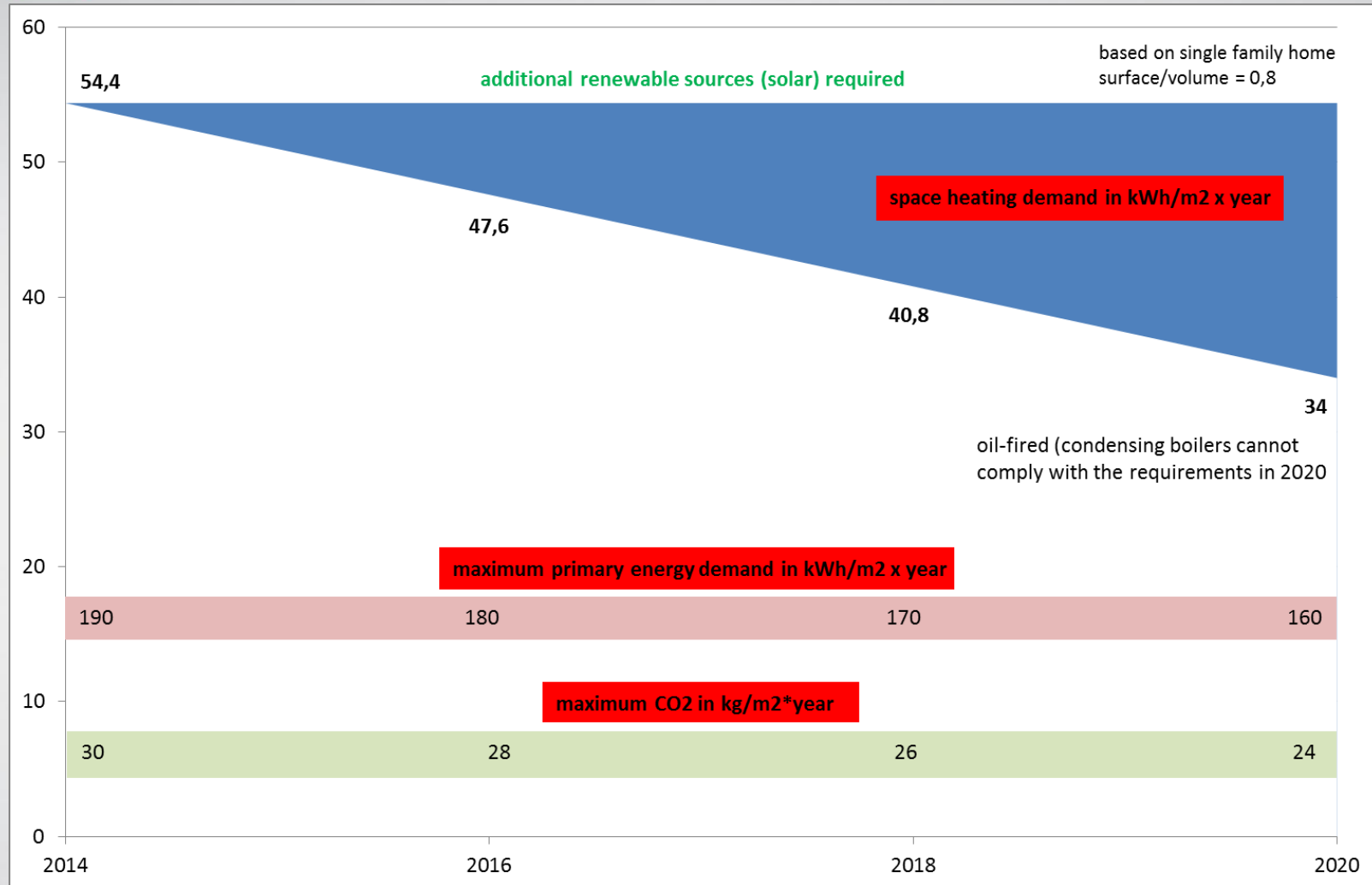
CO₂: GemäÙ dem Endenergiebedarf zuzurechnenden **Rücklaufverlustemissionen**, einschließlich jener für Transport und Erzeugung sowie aller Verluste. In deren Berechnung wurden übliche Allokationsregeln unterstellt.

f_{GEE}: Der **Gesamtergebnisenergieeffizienz-Faktor** ist der Quotient aus dem Endenergiebedarf und einem Referenz-Endenergiebedarf (Anforderung 2007).

Alle Werte gelten unter der Annahme eines normierten Betriebs- und Innenverhaltens. Sie geben den Jahresbedarf pro Quadratmeter behaunter Brutto-Graundfläche an.

Dieser Energieausweis entspricht den Vorgaben der Richtlinie 6 „Energieeffizienz und Wärmeschutz“ des Österreichischen Instituts für Bautechnik in Umsetzung der Richtlinie 2002/91/EG über die Gesamtenergieeffizienz von Gebäuden und des Energieausweis-Vorlage-Gesetzes (EA-VG).

AUSTRIA'S NATIONAL PLAN FOR NEW BUILDINGS (NEARLY ZERO-ENERGY)



DEVELOPING THE “BUILDINGS OF TOMORROW”

EXAMPLE: LIFECYCLETOWER

HYBRID WOODEN HOUSE < 20 FLOORS



Project Manager:
Michael Zangerl (michael.zangerl@rhomborgbau.at)

DEVELOPING THE “BUILDINGS OF TOMORROW” EXAMPLE: PLUS ENERGY OFFICE

Refurbishment to plus energy standard of the Technical University Vienna
Biggest facade integrated PV facility in Austria



Project Manager:

Helmut Schöberl (helmut.schoeberl@schoeberlpoell.at)

BUT: NO FUNDAMENTAL ENERGY SAVINGS WITHOUT EXISTING BUILDINGS



EXAMPLE: VIENNA, WISSGRILLGASSE APARTMENT BUILDING

- Built in the period of promoterism, renovated in 2011
- Space heating demand: $186\text{kWh/m}^2\text{a} \rightarrow 28\text{kWh/m}^2\text{a}$



EXAMPLE: LINZ, MAKARTSTRASSE APARTMENT BUILDING

- Built in 1958, renovated in 2006
- Space heating demand: $179 \text{ kWh/m}^2\text{a} \rightarrow 14 \text{ kWh/m}^2\text{a}$

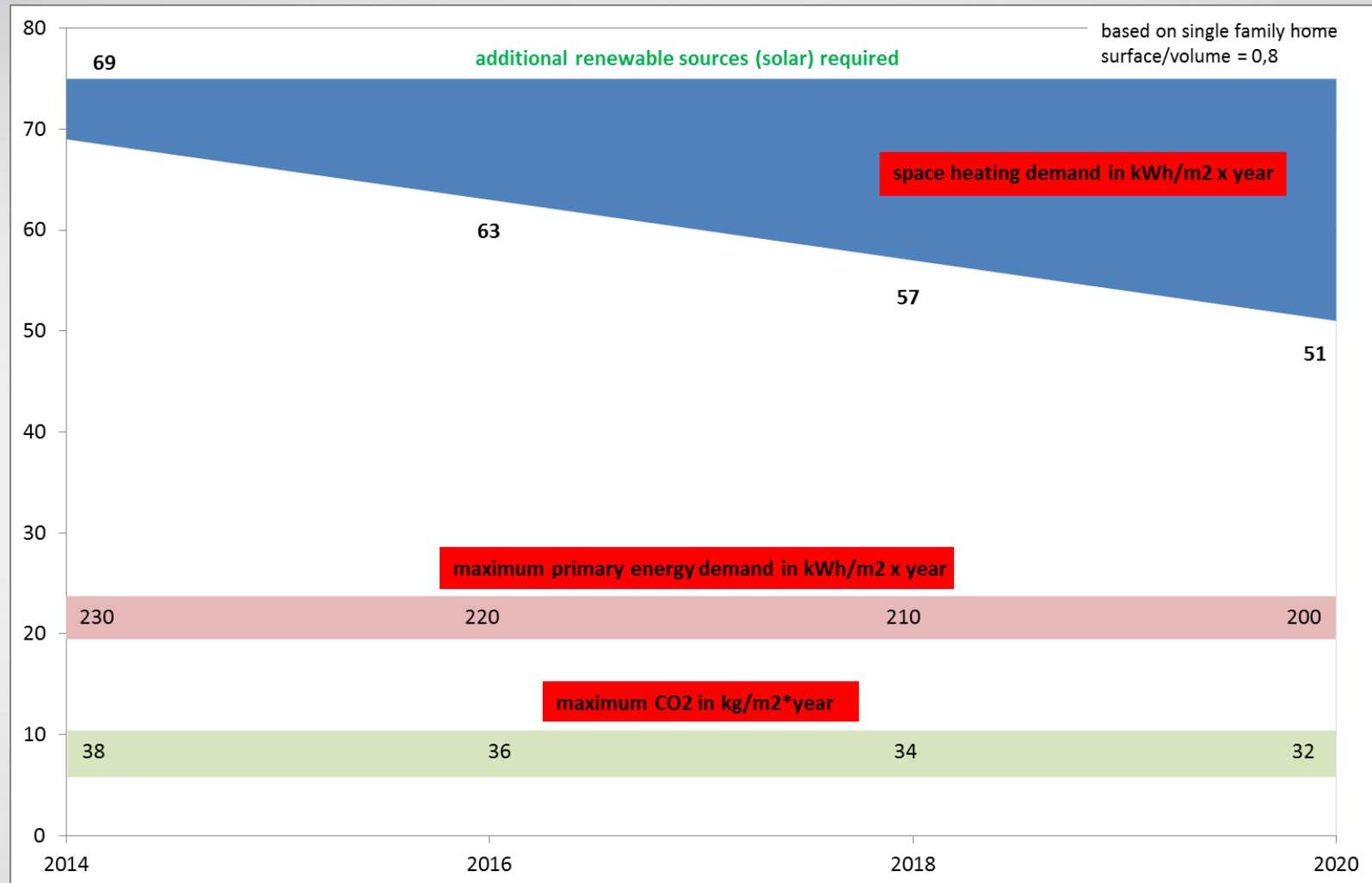


EXAMPLE: LANGENZERSDORF, SECONDARY SCHOOL

- Renovated in 2010
- Space heating demand: $219 \text{ kWh/m}^2\text{a} \rightarrow 15 \text{ kWh/m}^2\text{a}$



AUSTRIA'S NATIONAL PLAN FOR MAJOR RENOVATIONS

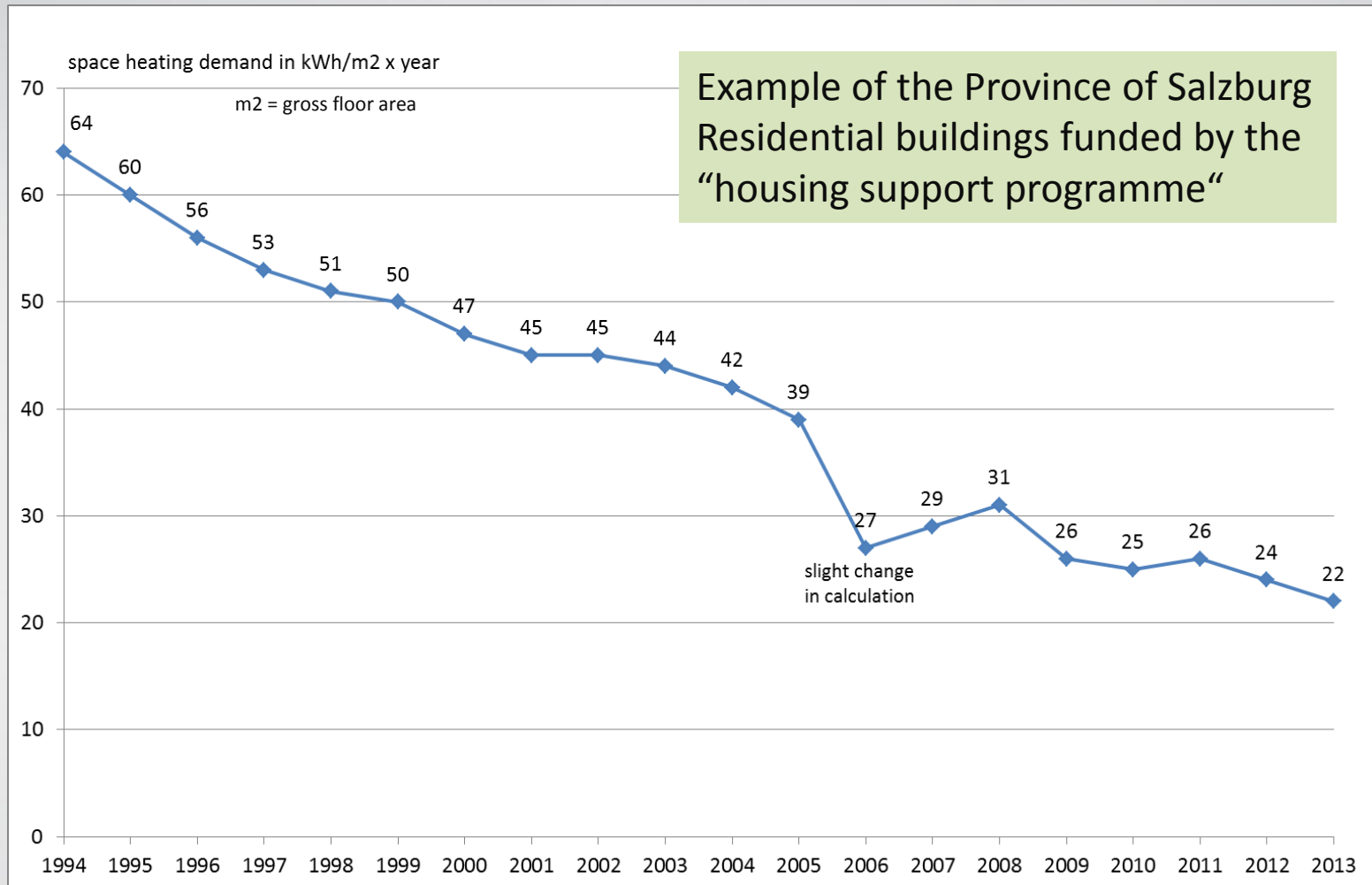


HOUSING SUPPORT: PROVINCES

- All of the 9 Austrian federal states (Laender) provide social housing support programmes
 - Favourable loan or grants
- Large share of new and major renovated buildings receive such support
 - Up to 90 % of new buildings before 2010, 50 % in the last years
- Always stronger requirements than in the regional building codes
 - Applies to new buildings, major renovation and building elements
 - Graded grants according to energy efficiency and other building qualities
 - Higher support in case of more sustainable solutions, such as usage of renewables, ecological materials
- Subsidised homes almost meet the 2020 requirements of the National Plan
- Budget 2011: EUR 2.660 million
 - New construction: EUR 1.560 million
 - Renovation: EUR 700 million
 - Social assistance for housing: EUR 400 million



DEVELOPING AN ENERGY PERFORMANCE FOR NEW (FUNDED) BUILDINGS



HOUSING SUPPORT: FEDERAL RENOVATION CHEQUE

- Provided in addition to regional housing renovation support
- Grants for specified deep thermal renovation
- Additional grants in case of:
 - Renewable heating systems
 - Wooden windows
 - Ecological insulation materials
 - Listed buildings
- Grants for partial renovation, i.e. of building elements
- Grants for companies also possible
- 2013
 - Volume: EUR 123 million (of which 93 are for households)
 - Up to EUR 9.300 per project
 - Building certificate required



SUMMARY

- Energy strategy of 2010 is the first demand-driven approach
 - in the past renewables played a central role in Austria`s energy policy
 - But significant increases in the share of renewables were not achievable because energy & electricity consumption were still growing
- Energy efficiency is the key
 - Focus on buildings and transport
 - Implementation of the EU energy efficiency directive will bring additional stimulus
- Renewables already rank second in Austria`s fuel mix
 - Electricity generation is the “easiest” sector to reach 100% renewables
 - But requires an appropriate system/market model, at least for Central Europe
- Need for “promotional measures” for efficiency and renewables will continue:
there is no free lunch

THANK YOU FOR YOUR ATTENTION!

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Chief Scientific Officer

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