

Christina Sager

Implementation of EPBD in Germany

Belgrade, 06. Oktober 2006

Legal context.

Responsibility of Implementation:

- Federal Ministry of Transport, Building and Urban Development
- Ministry of Economics and Technology
- Ministry for the Environment, Natural Conservation and Nuclear Safety

EU-Buildings Directive: Necessary regulations in Germany.

- **Holistic requirements for the energy demand of buildings**
 - for residential buildings already achieved by EnEV
 - for service buildings amendment of EnEV; Inclusion of air-conditioning and lighting necessary (DIN 18599)
- **Minimum requirements for new buildings**
 - already defined in Energy Conservation Ordinance (EnEV)
 - no tightening of the requirements of EnEV
- **Inspection of boilers and air-conditioners**
 - regulations for air-conditioners necessary
- **Energy certificates**
 - development of standardised requirements for energy certificates (including method for data collection and calculation)
- **accreditation and certification of issuers**

Situation in the year 2004

- **EnEV 2004 (Energy Savings Ordinance):**
 - Energy certificates **mandatory for new / substantially refurbished buildings**
 - Minimum requirements **for new / substantially refurbished buildings**
 - Holistic Calculation method (in-line with EPBD-requirements)
 - Inspection **of boilers**
- **To do:**
 - Development of a calculation method for non-residential buildings **(integrating a/c, cooling and lighting) DIN V 18599**, draft version in July 2005
 - Energy certification for existing buildings
 - Inspection procedures for air-conditioning systems
 - Admission / certification **of issuers of energy-certificates**

EnEV 2006: State of implementation.

- Amendment of **EnEG** (Energy-Savings-Law) necessary (umbrella law)
- Amendment of EnEG was approved by the German Bundestag (Federal Parliament) on June 30th 2005 and by the German Bundesrat (States Council) on July 8th 2005
- All details of the implementation will be regulated by **EnEV 2006** (Energy-Savings-Ordinance).
- All calculation-methods (residential and non-residential buildings) are available
- Referee Draft of EnEV 2006 was presented before elections in September 2005.
- Coming into force of **EnEV 2006** in 2006 (detailed schedule will be finalised by the new Federal Government)

Calculation procedures.

- Existing calculation procedures for residential buildings will stay in force:
 - Mainly two German pre-standards (mainly transpositions of EN 832)
 - DIN V 4108-6: 2003-06
 - DIN V 4701-10: 2003-08
- New calculation procedure primarily for non residential buildings was initiated by Federal Government.
 - interdisciplinary standardisation work including all aspects of the EPBD
 - DIN V 18599 (Part 1 – 10)

Requirements for new buildings.

- Are kept on present level for all types of buildings
- Revision of requirements to follow later

- Requirements are function of building type / use
- Surface / Volume ratio
- Requirements are defined for:
 - a maximum primary energy demand,
 - a maximum average u-value
 - maximal U-values of each element of the building's surface area
 - several requirements on quality of boilers, controls and pipe insulation
 - building air-tightness and
 - avoiding of thermal bridges.

Requirements for the building envelope.

— Thermal Insulation Ordinance (WSchVO)

	<u>new buildings</u>	<u>existing buildings</u>
1977	<ul style="list-style-type: none"> — limitation of the mean heat loss due to transmission — requirements for building elements (minimum thermal insulation; double glazing; air-tightness) 	—
1984	<ul style="list-style-type: none"> — requirements tightened by 20 % 	—
1995	<ul style="list-style-type: none"> — requirements tightened by 30 % — limitation of the annual energy demand for heating — Certificate on energy demand for heating 	<ul style="list-style-type: none"> — when undergoing extensive renovation: requirements for the new building elements

Requirements for the heating systems.

- Federal Immission Control Act (1. BImSchV)
- Heating Installations Ordinance (HeizAnIV)

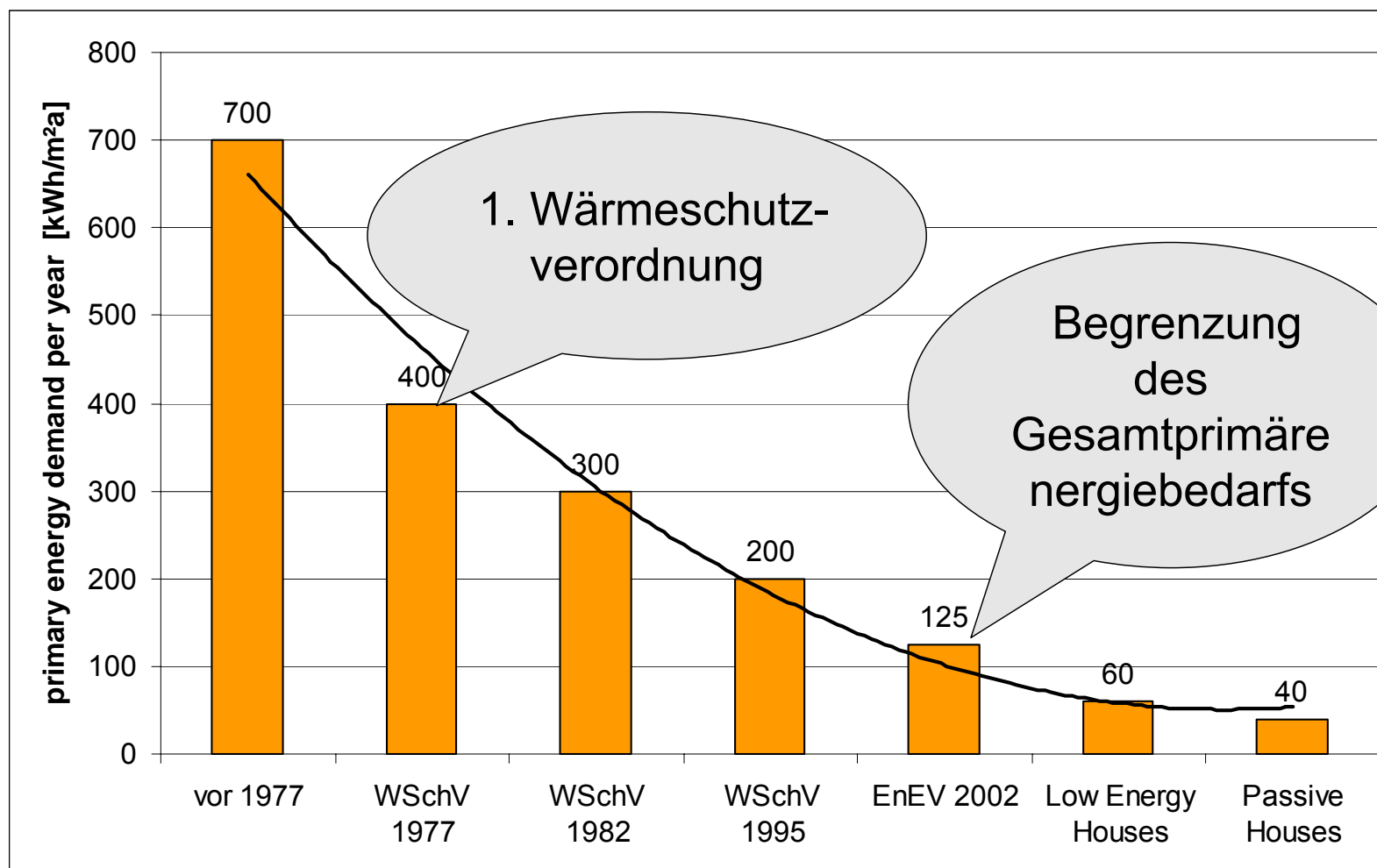
	<u>new buildings</u>	<u>existing buildings</u>
1994	<ul style="list-style-type: none"> — reduction of heat losses by <ul style="list-style-type: none"> — thermal insulation of pipes and fittings — external temperature and time-dependent controls — installation of thermostats — limitation of stand-by losses 	
1997	<ul style="list-style-type: none"> — definition of limit values for emissions — definition of limit values for the degree of efficiency of heating systems 	

Requirements on single elements:

	external walls	windows	roofs	ceilings to unheated
1977	$\leq 1,45$ [W/m ² ·K]		$\leq 0,45$ [W/m ² ·K]	$\leq 0,80$ [W/m ² ·K]
1984	$\leq 1,20$ [W/m ² ·K]		$\leq 0,30$ [W/m ² ·K]	$\leq 0,55$ [W/m ² ·K]
1995	$\leq 0,50$ [W/m ² ·K]	$\leq 1,80$ [W/m ² ·K]	$\leq 0,30$ [W/m ² ·K]	$\leq 0,50$ [W/m ² ·K]
2002/ 2004	$\leq 0,45$ [W/m ² ·K]	$\leq 1,70$ [W/m ² ·K]	$\leq 0,30$ [W/m ² ·K]	$\leq 0,40$ [W/m ² ·K]
2006*	$\leq 0,45$ [W/m ² ·K]	$\leq 1,70$ [W/m ² ·K]	$\leq 0,30$ [W/m ² ·K]	$\leq 0,40$ [W/m ² ·K]

* EnEV 2006 draft, no change in requirement level.

Überblick: Energieverbrauch in Deutschland



Requirements of the Energy Conservation Ordinance (EnEV)

	<u>new buildings</u>	<u>existing buildings</u>
2002	<ul style="list-style-type: none"> — limitation of the annual primary energy demand — limitation of the heat losses due to transmission — mandatory energy certificates for new buildings 	<ul style="list-style-type: none"> — when renovated: limitation of the heat transfer coefficients — obligatory modernisation of old boilers — thermal insulation of pipes and accessible attics
additional requirements:		
2006	<ul style="list-style-type: none"> — limitation of the annual primary energy demand including the demand for cooling and lighting in non-residential buildings 	<ul style="list-style-type: none"> — introduction of energy certificates for buildings sold or rented out — public display of energy certificates in public buildings

Energieeinsparverordnung - EnEV

EnEV:

Integrierter Ansatz:

Gesamtenergieeffizienz von Gebäuden

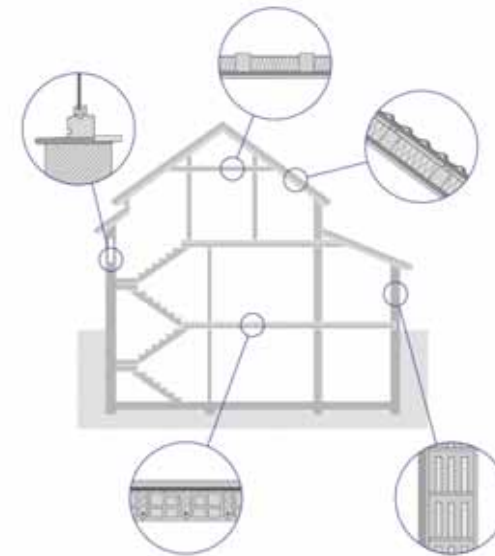
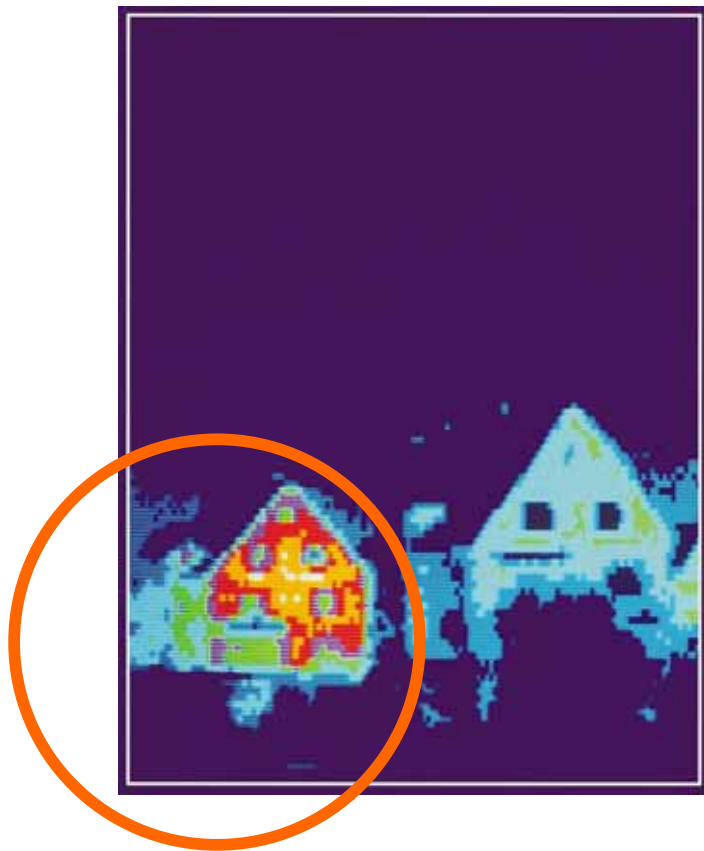
Anforderungen an die Gebäudehülle

	Neubau	Bestand
1977	<ul style="list-style-type: none"> Begrenzung des mittleren Transmissionswärmeverlust Bauteilanforderungen (k-Werte; Isolierverglasung; Dichtigkeit) 	-
1984	<ul style="list-style-type: none"> Anforderungswerte um ca. 20 % verschärft 	-
1995	<ul style="list-style-type: none"> Anforderungswerte um ca. 30 % verschärft Begrenzung des Jahres-Heizwärmebedarfes Wärmebedarfsausweis 	<ul style="list-style-type: none"> Bei großflächiger Sanierung: Bauteilanforderungen für zu erneuernde Bauteile

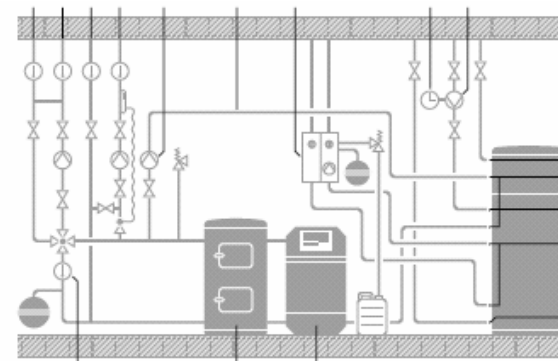
Anforderungen an Anlagentechnik

	Neubau	Bestand
1994	<ul style="list-style-type: none"> Verminderung von Wärmeverlusten durch <ul style="list-style-type: none"> Dämmung von Rohrleitungen und Armaturen Außentemperatur- oder tageszeitabhängige Anlagenregelung Installation von Thermostaten Begrenzung von Betriebsbereitschaftsverlusten 	
1997	<ul style="list-style-type: none"> Festlegung von Emissionsgrenzwerten Festlegung von Grenzwerten für den Nutzungsgrad der Heizanlage 	

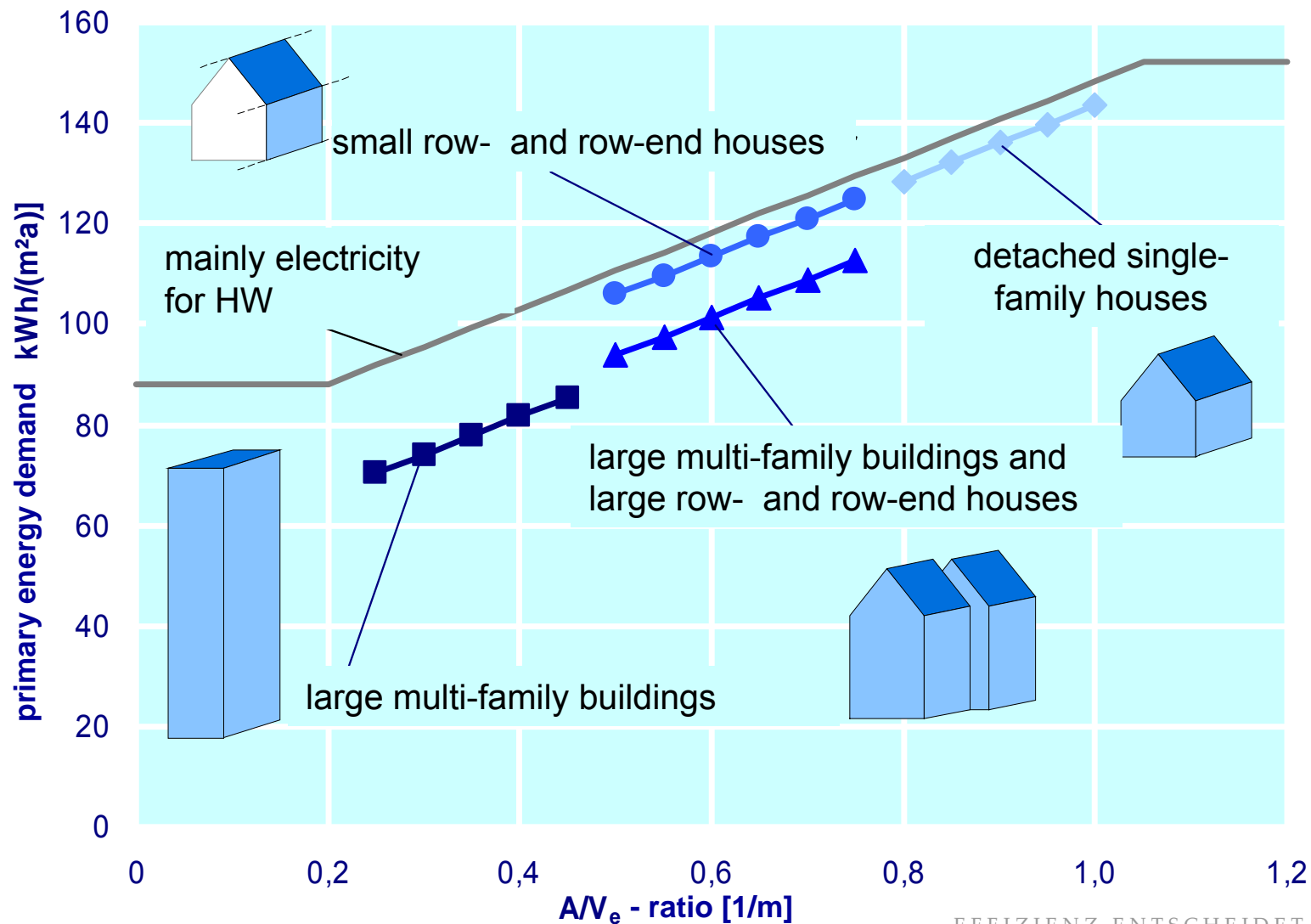
Overall requirements on primary energy demand.



+



Requirements on primary energy demand.



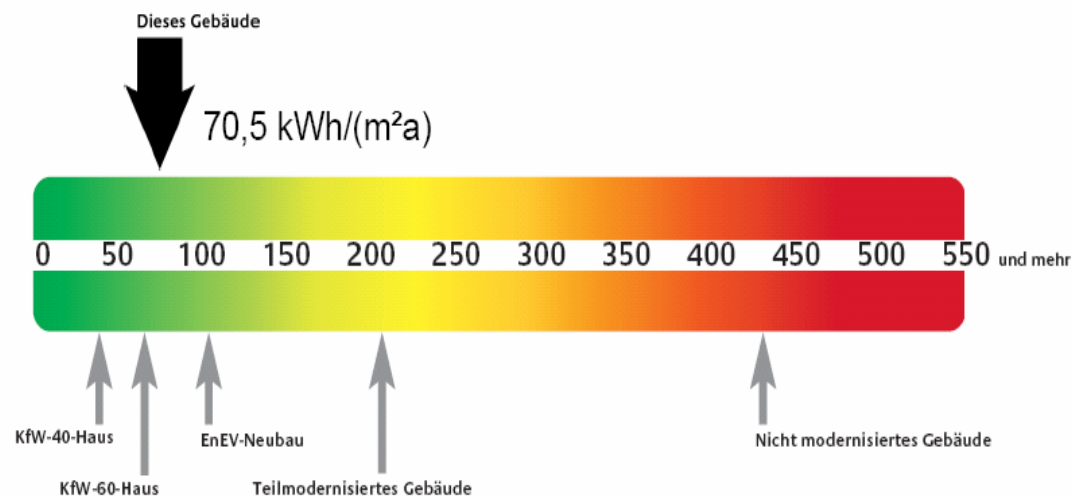
Requirements for major refurbishments.

- Have to be met if:
 - more than 20% of the building element (outside walls, roof, windows etc.) are subject to refurbishment.
 - The requirements in cases of refurbishment consist of either
 - a maximum primary energy demand (140% new buildings) and
 - a maximum average U-value (140% new buildings)
- or
- maximum U-values (stated in Ordinance “state of the art”) for each element subject to the refurbishment.

EU-Buildings Directive: Requirements for the energy certificate.

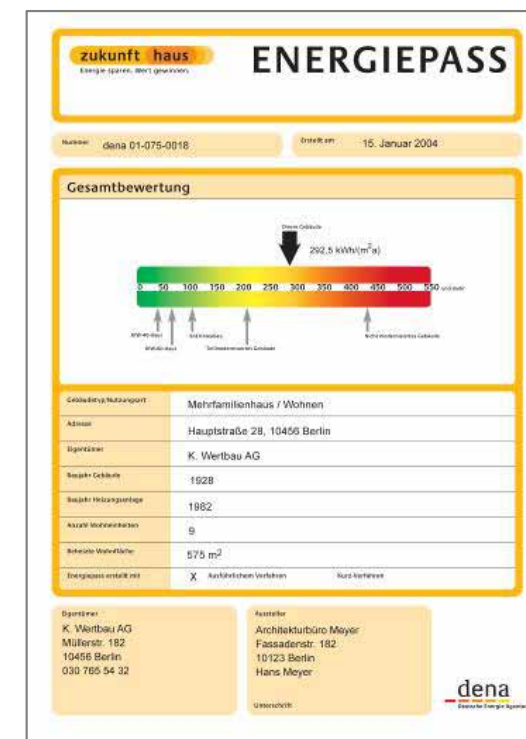
The certificate has to contain three main pieces of information according to the Directive:

- energy indicator / energy rating
- reference values
- renovation measures



Goals of the energy certificate.

- **market transparency** in the building sector
- energy efficiency as a **sign of quality** for flats and buildings
- **marketing instrument** for the housing industry and for building owners
- Creating incentives for **innovation and investment** for new and existing buildings
- Preparing the market for the **implementation of the EU-Buildings Directive**



Certification of buildings.

- In force for new buildings since 2002
- Conditions for existing buildings:

		operational rating	asset rating	start issuing (new buildings)	start issuing (existing buildings)
residential	Individual houses	Yes *)	Yes	2007 immediately after amended Ordinance gets into force	In 3 steps (still subject of political negotiations)
	Flats	Yes	Yes		
non-residential and public buildings	privat	Yes	Yes		
	public	Yes	Yes		
		*) conditions for application to small houses are still subject of political negotiations			

Inspections of boilers and air-conditioners.

- covered by the Small and Medium combustion Plant Ordinance (BImSchV) – last amendment 1997
- Inspections of boilers are exclusively done by the district master chimney sweeper.
- functional inspection of AC-equipment are included in the maintenance schedule,
- other (long-term) issues should be done by engineers on special order.



Efficiency decides.