



Bundesministerium
für Verkehr, Bau
und Stadtentwicklung

Energy-efficiency of buildings - The German and the European organisation of law codes

Federal Ministry of Transport, Building and Urban Development

Unit B 12

Energy-efficiency, energy saving and renewable energies in the building sector

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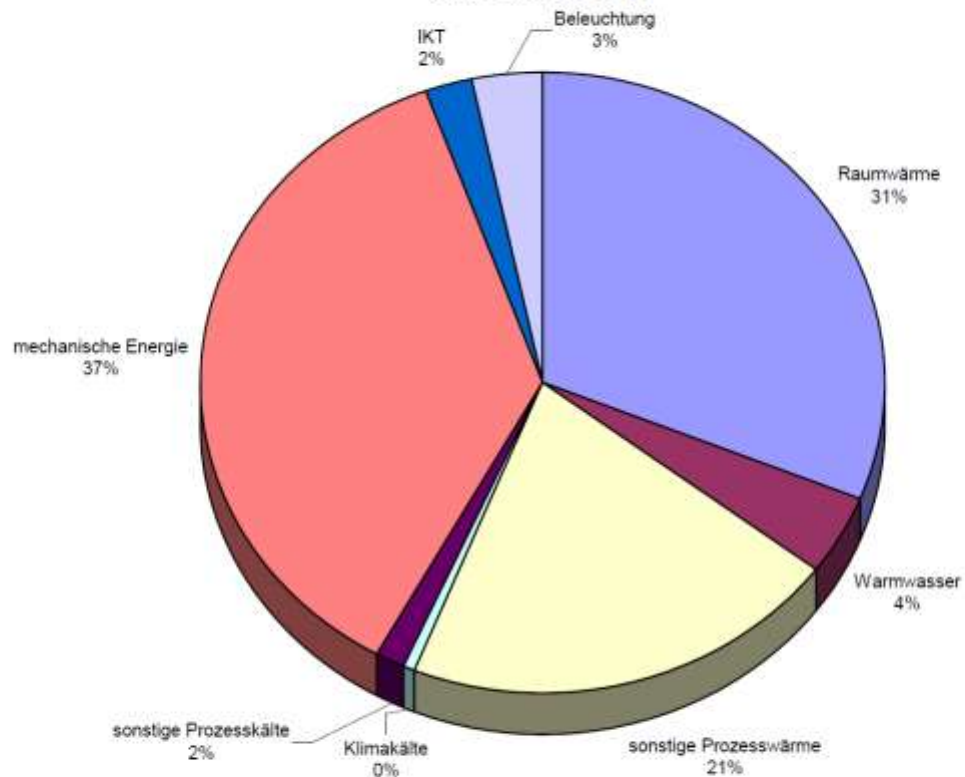


Outlook

- Reasons to save energy in buildings by federal laws?
- European Framework EPBD
- Development of regulations in Germany
- Requirements
- Who is involved
- Results

Energy-consumption in Germany by application area

Energieverbrauch nach Anwendungsbereichen in Deutschland 2010
insgesamt 9.060 PJ



Quelle: AG Energiebilanzen, BDEW

European framework:

security of energy supply

- reducing demand of energy
- saving energy
- more energy efficiency and renewables

economic efficiency, competitiveness

- reducing energy costs
- economic measures for more energy efficiency
- decreasing energy demand especially for existing buildings

sustainability, climate protection

- Kyoto Protocol/
follow-up agreement
- climate change,
global warming,
ghg emissions
.....

European obligation

DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 19 May 2010 on the energy performance of buildings (recast) – (guidelines for all MS)
more: www.buildup.eu

Implementation in Germany: “Energy Saving Order” (EnEV)
Requirements for new and existing buildings (e.g. refurbishments, energy certificates)

EPDB - covered scopes e.g.:

heating systems

insulation, energetic
quality of building envelope

hot water supply

air conditioning systems

ventilation

energy certificates

illumination

renewable energies

DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 19 May 2010
on the energy performance of buildings
(recast)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 194(2) thereof,

Having regard to the proposal from the European Commission,

Having regard to the opinion of the European Economic and Social Committee ⁽¹⁾,

Having regard to the opinion of the Committee of the Regions ⁽²⁾,

Acting in accordance with the ordinary legislative procedure ⁽³⁾,

Together with an increased use of energy from renewable sources, measures taken to reduce energy consumption in the Union would allow the Union to comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), and to honour both its long term commitment to maintain the global temperature rise below 2 °C, and its commitment to reduce, by 2020, overall greenhouse gas emissions by at least 20 % below 1990 levels, and by 30 % in the event of an international agreement being reached. Reduced energy consumption and an increased use of energy from renewable sources also have an important part to play in promoting security of energy supply, technological developments and in creating opportunities for employment and regional development, in particular in rural areas.

- (4) Management of energy demand is an important tool enabling the Union to influence the global energy market and hence the security of energy supply in the medium and long term.

EPBD

Article 2

Definitions

For the purpose of this Directive, the following definitions shall apply:

...

2. 'nearly zero-energy building' means a building that has a very high energy performance, ...The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby;

EPBD

Article 9

Nearly zero-energy buildings

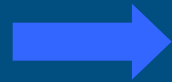
1. Member States shall ensure that:

(a) by 31 December 2020, all new buildings are nearly zero- energy buildings; and

(b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.

Member States shall draw up national plans for increasing the number of nearly zero-energy buildings. These national plans may include targets differentiated according to the category of building.

Strategies to increase energy efficiency e.g.



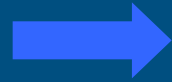
Law

Energy Saving Order (EnEV) – Energy Certificates, Energy demand for space heating lower than about 50 kWh/(m²xa)



Financial benefits

promotion by e.g. KfW-Federal Bank – additional BAFA for renewable energies



Information, transparency in the market, best practice projects
promoting Energy Certificates, PR



Research

program for research in the building sector – ca. 9 Mio. €/a

The way to the “EnEV”

before 2002:

- Heat Insulation Ordinance (1...3)
- Heating systems Ordinance (1....3)



“Energy Saving Order – EnEV 2002”



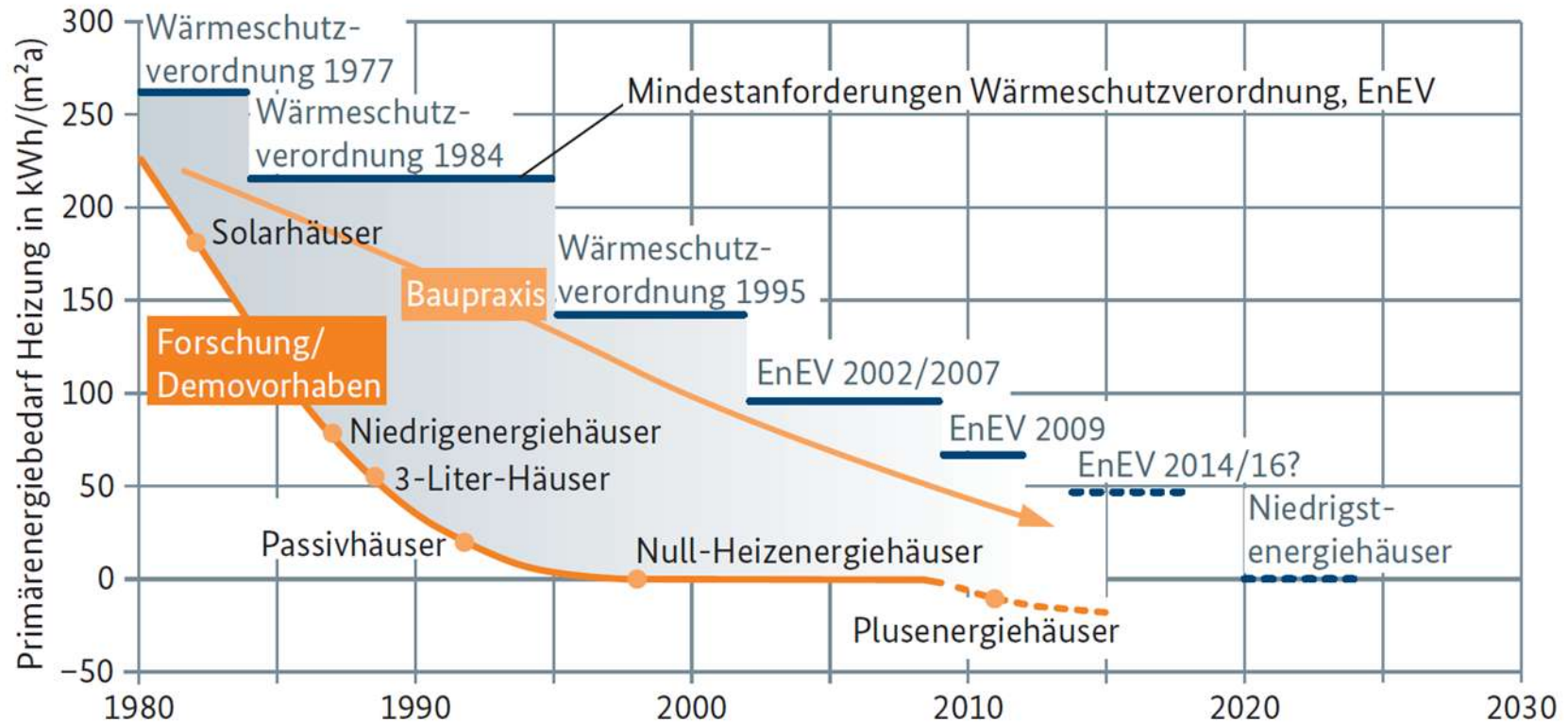
“EnEV 2007” - Energy certificates



“EnEV 2009” - 30 % less energy consumption

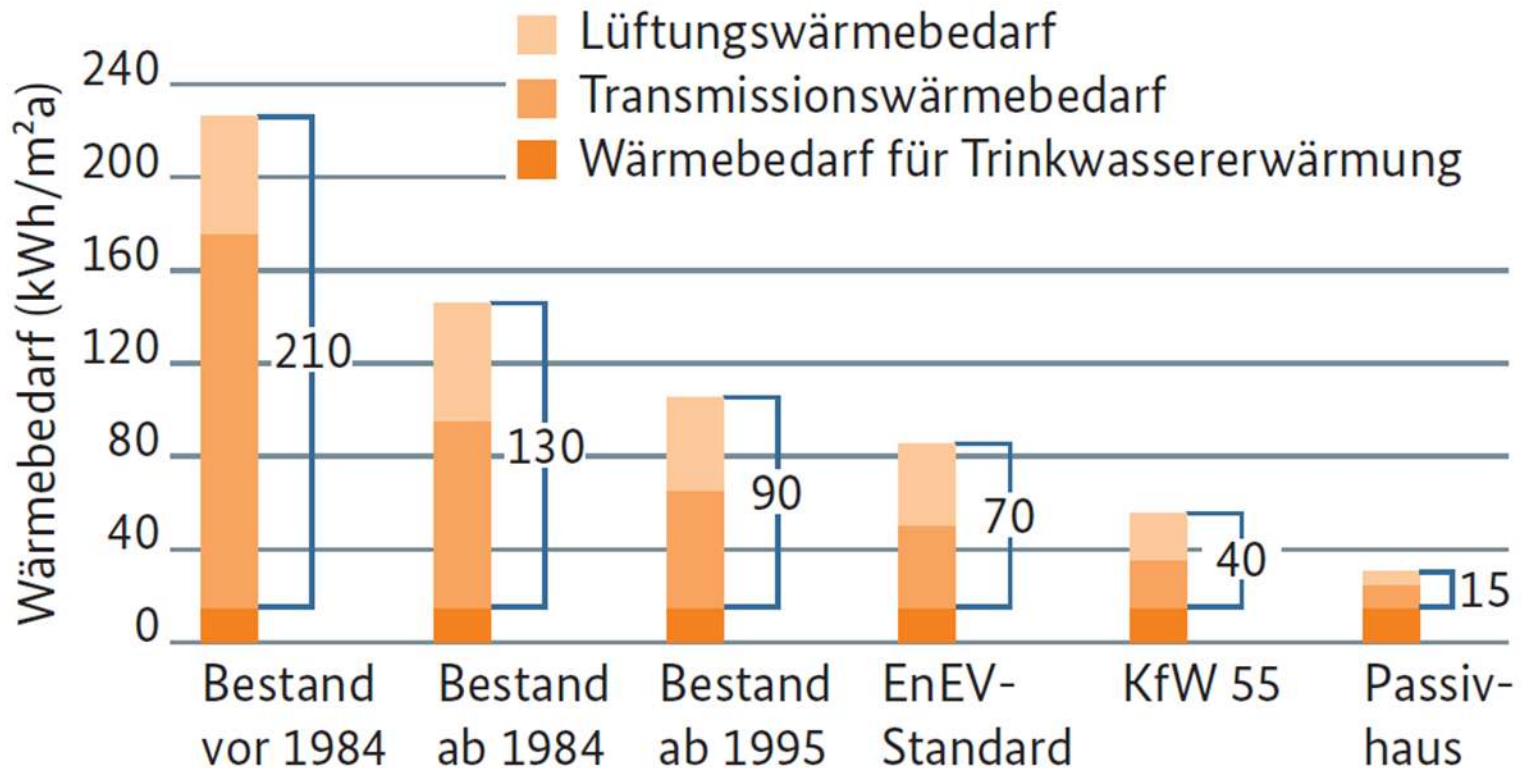
Improvements in the buildings sector

e.g. using EE- techniques and thermal solar systems



source BMVBS

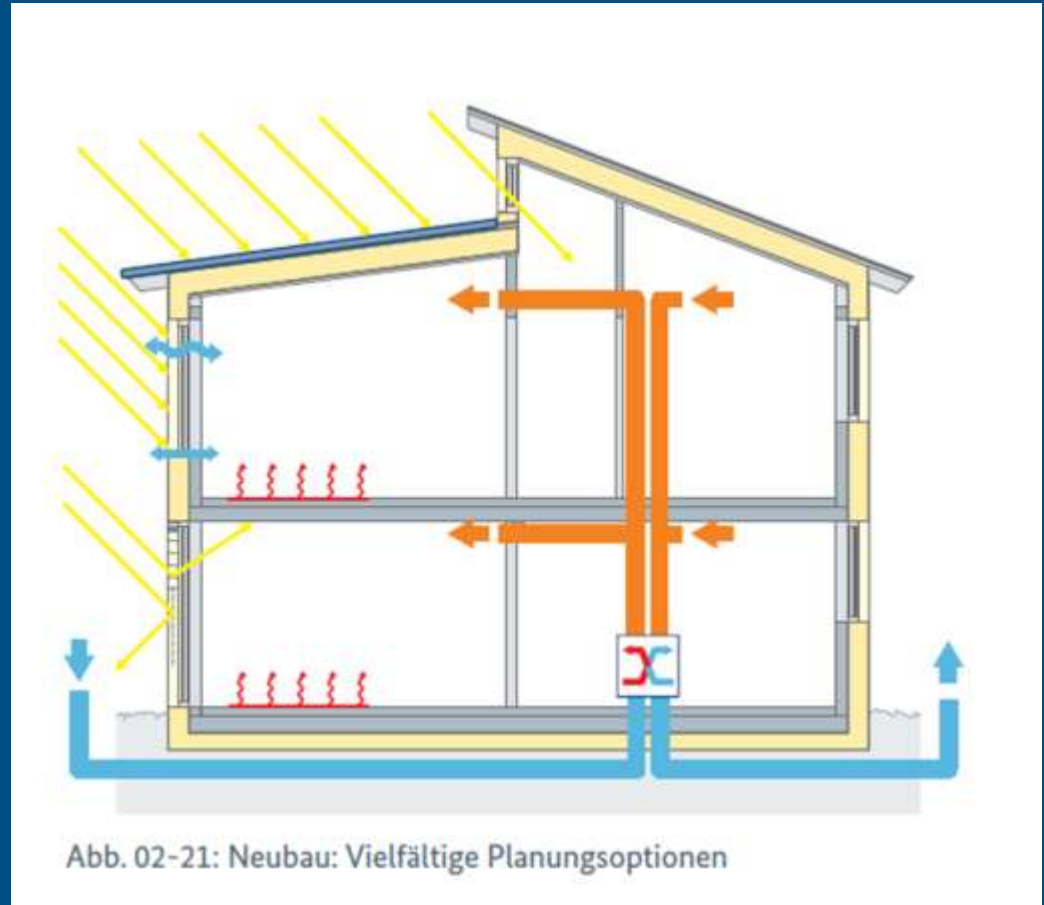
Energy Consumption



From existing buildings to passive houses

New Buildings

- many options for energy efficient engineering



Existing Buildings

- Use of potentials in the existing buildings stock

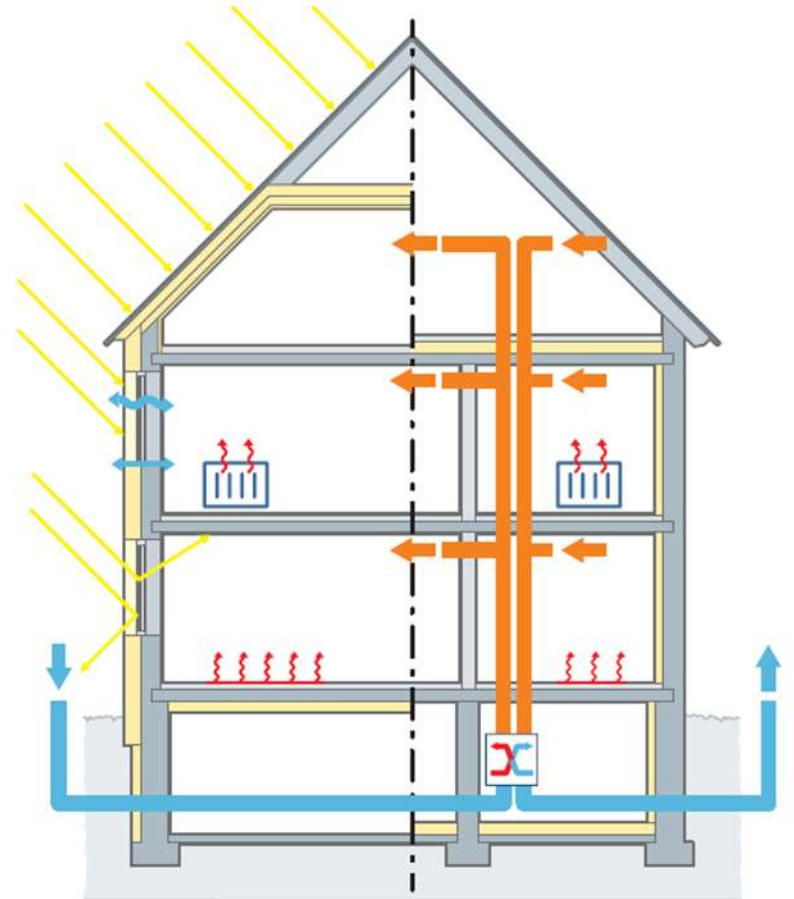


Abb. 02-22: Altbau: Potenziale des Bestandes nutzen

Energy Certificates

- lead to more transparency and promote innovative solutions for the whole building
- since 2008 in Germany an obligation also for existing buildings (in case of selling and renting)

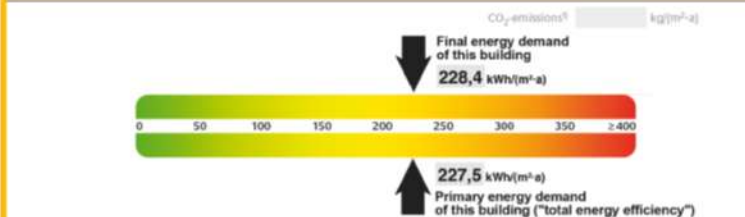
Energy performance certificate for residential buildings in accordance with sections 16 et seq. of the German Energy Saving Ordinance (EnEV)

Calculated energy demand of the building

Address
building Part

2

Energy demand



Final energy demand

Energy source	Annual final energy demand in kWh/(m ² -a)			Total in kWh/(m ² -a)
	Heating	Hot water	Auxiliary equipment ⁴⁾	

Replacement measures¹⁾

Requirements under § 7 No. 2 EEWärmeG⁶⁾

The required values tightened by 15% are complied with.

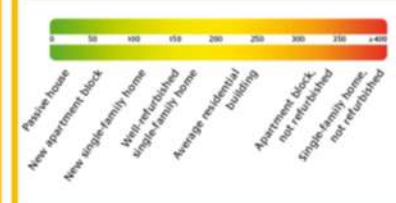
Requirements under § 7 No. 2 in conjunction with § 8 EEWärmeG

The EnEV required values are tightened by _____ %

Primary energy demand
Tightened value required: _____ kWh/(m²-a)

Transmission heat loss H_T³⁾
Tightened value required: _____ W/(m²-K)

Reference values – final energy demand



Notes on the calculation method

The German Energy Saving Ordinance (EnEV) allows two alternative calculation procedures for calculating the energy demand, which can lead to different results in individual cases. Due to standardised boundary conditions, the indicated values do not permit certain conclusions about the actual energy consumption. The stated demand values are specific values per square metre of building floor area (A_b) in accordance with the German Energy Saving Ordinance.

¹⁾ Voluntary information. ²⁾ In new buildings and modernisation in the case of § 10 para. 1 sentence 2 EnEV. ³⁾ Only in new buildings in the case of application of § 7 No. 2 EEWärmeG. ⁴⁾ Including cooling, if applicable. ⁵⁾ EEWärmeG: German Renewable Energy Heat Act.

Note: This is merely a translation of the German Energy Performance Certificate. Only the German version of this form does comply with the German Energy Saving Ordinance (EnEV).

Who is involved in Germany e.g.:

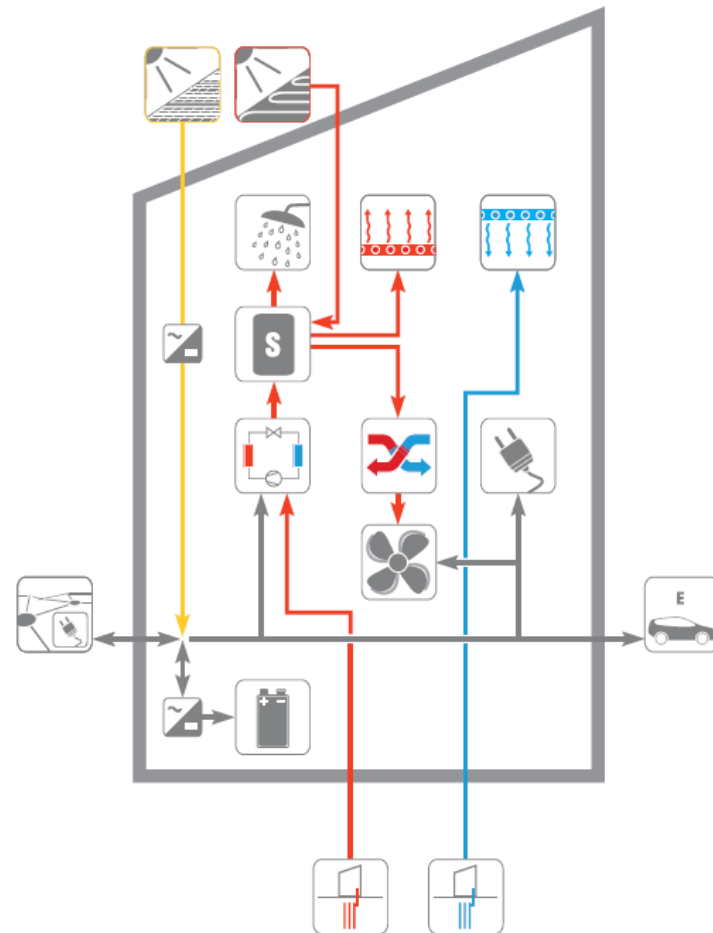
- ministries e.g. for Buildings, Economics and Environment - regulations
- local Administrations - enforcement, execution
- industry – product development,
- technical colleges, universities – education, research
- handcraft - education, training, apprenticeship
- energy agencies - promotion, best practice e.g. www.dena.de
- www.kfw.de, www.bafa.de - financial benefits
- house owners, energy consumers

Results

- decrease of energy demand through better techniques and products e.g. windows, insulation products
- increase of energy efficiency e.g. high-efficient heating, cooling and air-conditioning systems
- increasing use of renewable energy e.g. solar heating/cooling
- better building design, engineering and combination of technical systems and the building construction
- further development of regulations, education and training quality level
- best practice examples to promote solutions for future standards

Plus Energy House

Example for
possible technique
to realize a plus
energy house





Plus Energy House



thank you for your attention!

Federal Ministry of Transport, Building and Urban Development

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