



Federal Ministry
of Economics
and Technology



The Importance of Energy Efficiency for Energy, Environment and Economy – Experiences in Germany and Perspectives for Vietnam

Dr. Hans-Joachim Ziesing, Ecologic Institute, Berlin

www.renewables-made-in-germany.com



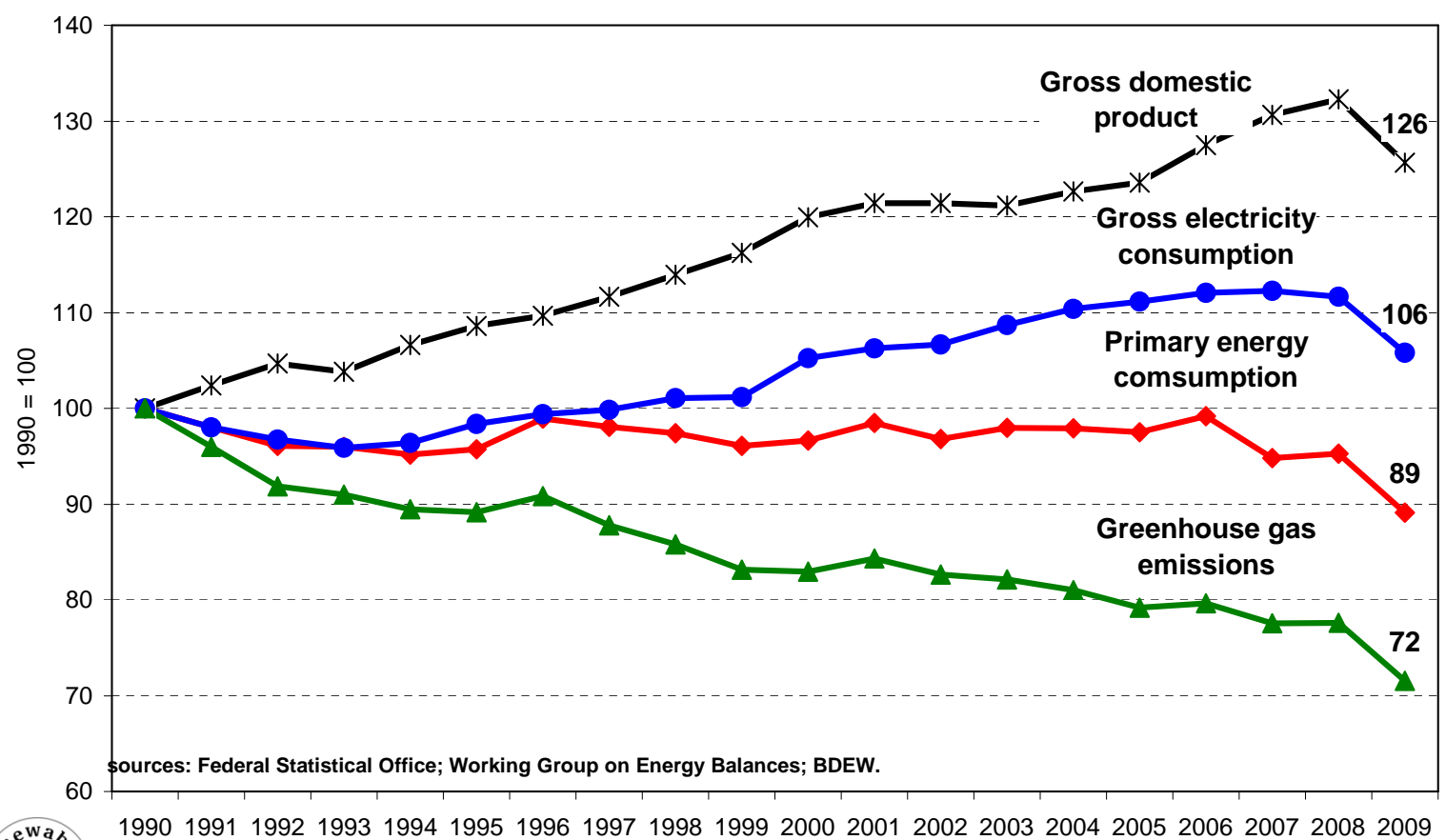
Agenda

- ▶ Facts & figures: Energy efficiency in Germany
- ▶ Influence of EU on national policies
- ▶ Targets, policies and measures in Germany concerning energy efficiency
- ▶ Site effects of Germany's energy policy
- ▶ Energy efficiency: An international comparison including Vietnam
- ▶ Conclusions

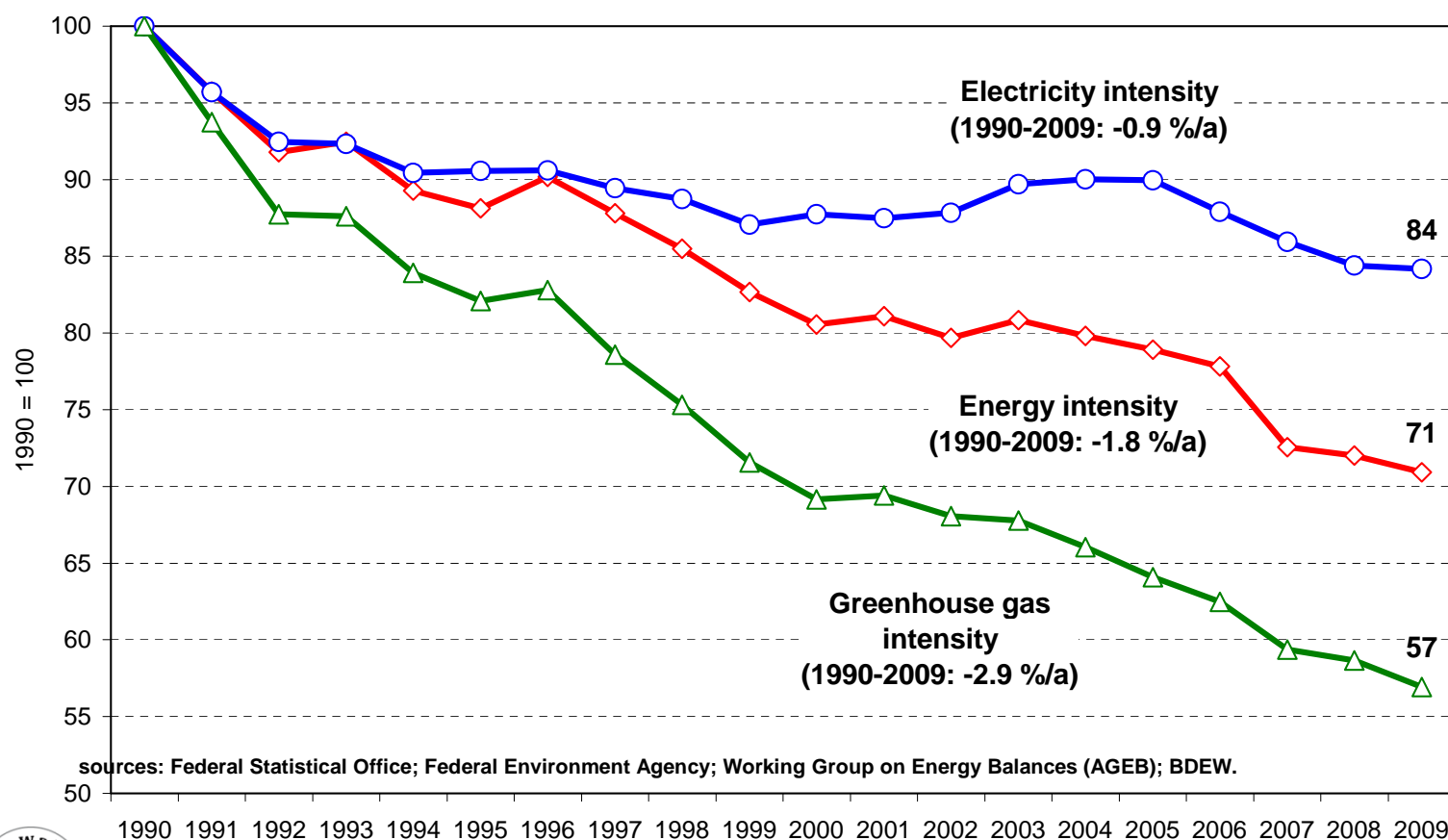
Why should we improve energy efficiency?

- ▶ Energy efficiency constitutes a key competitive factor and, therefore, regional economic policy.
- ▶ Energy efficiency contributes to greater security of supply and increased availability of exhaustible energy sources.
- ▶ Energy efficiency is applied environmental policy and the most effective means, from the point of view of costs, of reducing greenhouse gas emissions.

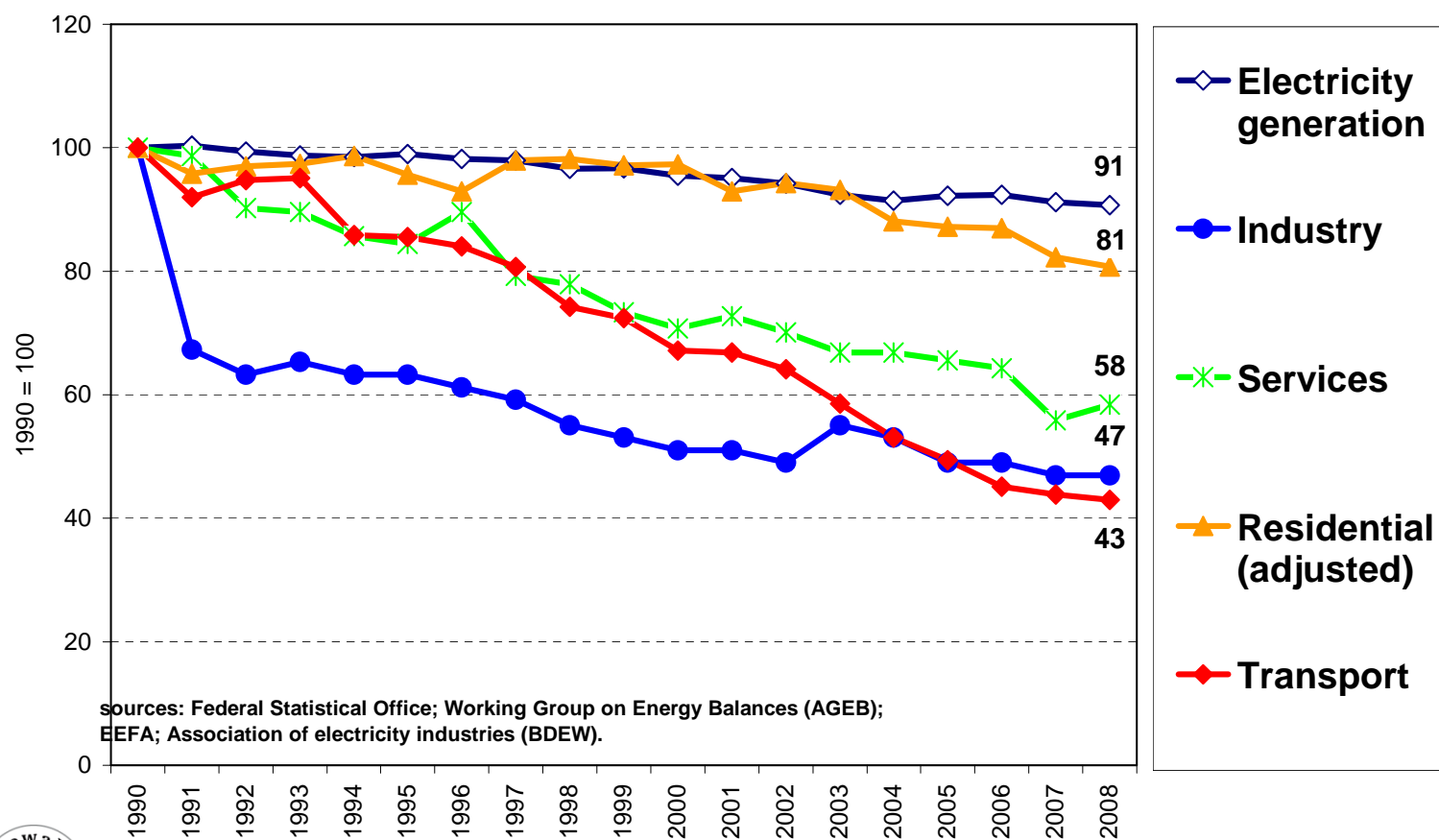
GDP, primary energy and gross electricity consumption, greenhouse gas emissions in Germany 1990 to 2009



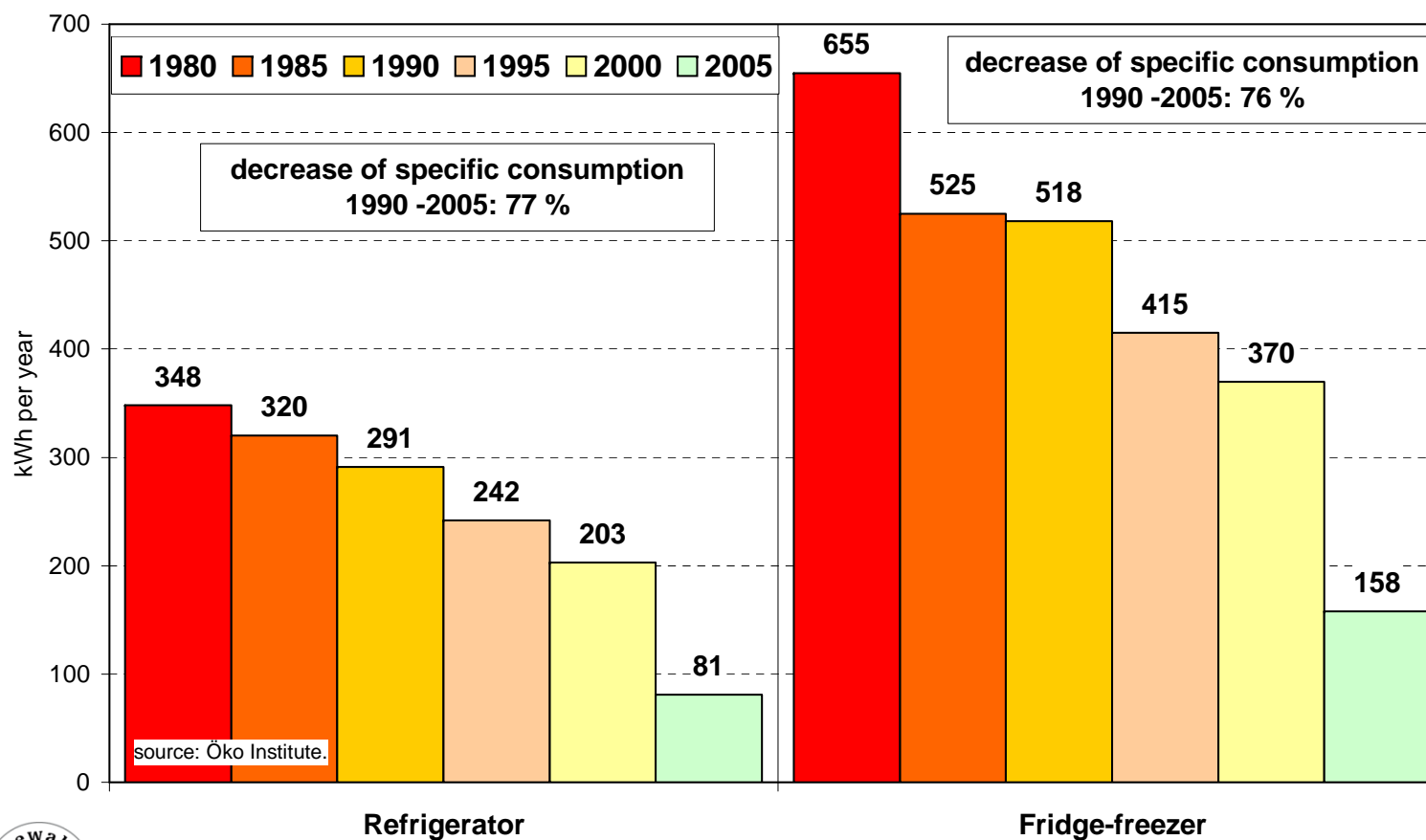
Energy, electricity and greenhouse gas intensity in Germany 1990 to 2009



Sectoral energy efficiency in Germany 1990 to 2008



Specific electricity consumption of fridges and freezers in Germany 1990 to 2005



Some examples of efficiency improvements in Germany (I)

- ▶ **Energy productivity**
 - overall economy (1990-2009): + 1.8 %/a
 - industry (1990-2008): + 1.5 %/a
- ▶ **Electricity productivity**
 - overall economy (1990-2009): + 0.9 %/a
 - industry (1990-2008): + 0,2 %/a
- ▶ **Efficiency in electricity generation**
1990: 37.2 % ; 2008: 40.9 % : + 0,5 %/a
- ▶ **GHG productivity 1990-2009:** + 2.9 %/a

Some examples of efficiency improvements in Germany (II)

- ▶ **Reduction of fuel consumption 1994-2007**
 - Otto cars
(from 9,2 to 8,2 l/100 km) - 0,9 %/a
 - Diesel cars
(from 7,5 to 6,9 l/100 km) - 0,7 %/a

- ▶ **Reduction of residential energy use per sqm**
 - 1992 to 2007 - 1,5 %/a
 - but 2000 to 2007 - 3,5 %/a

Strong influence of EU Directives concerning improvements of energy efficiency in member states ...

- ▶ on the energy performance of buildings
- ▶ on the promotion of cogeneration
- ▶ establishing a framework for the setting of ecodesign requirements for energy-using products
- ▶ establishing a scheme for greenhouse gas emission allowance trading in the EU
- ▶ on energy end-use efficiency and energy services.

EU directive 2006/32/EC on energy end-use efficiency and energy services (I)

- ▶ Stipulates a national indicative energy savings target for the from 2008 to 2016 as an indicative energy end-use savings target in the amount of 9% of the annual average consumption of all energy users over the last five years.
- ▶ Energy services companies, energy distributors, distribution system operators and energy retailers, as well as final customers, are committed to energy saving measures.

EU directive 2006/32/EC on energy end-use efficiency and energy services (II)

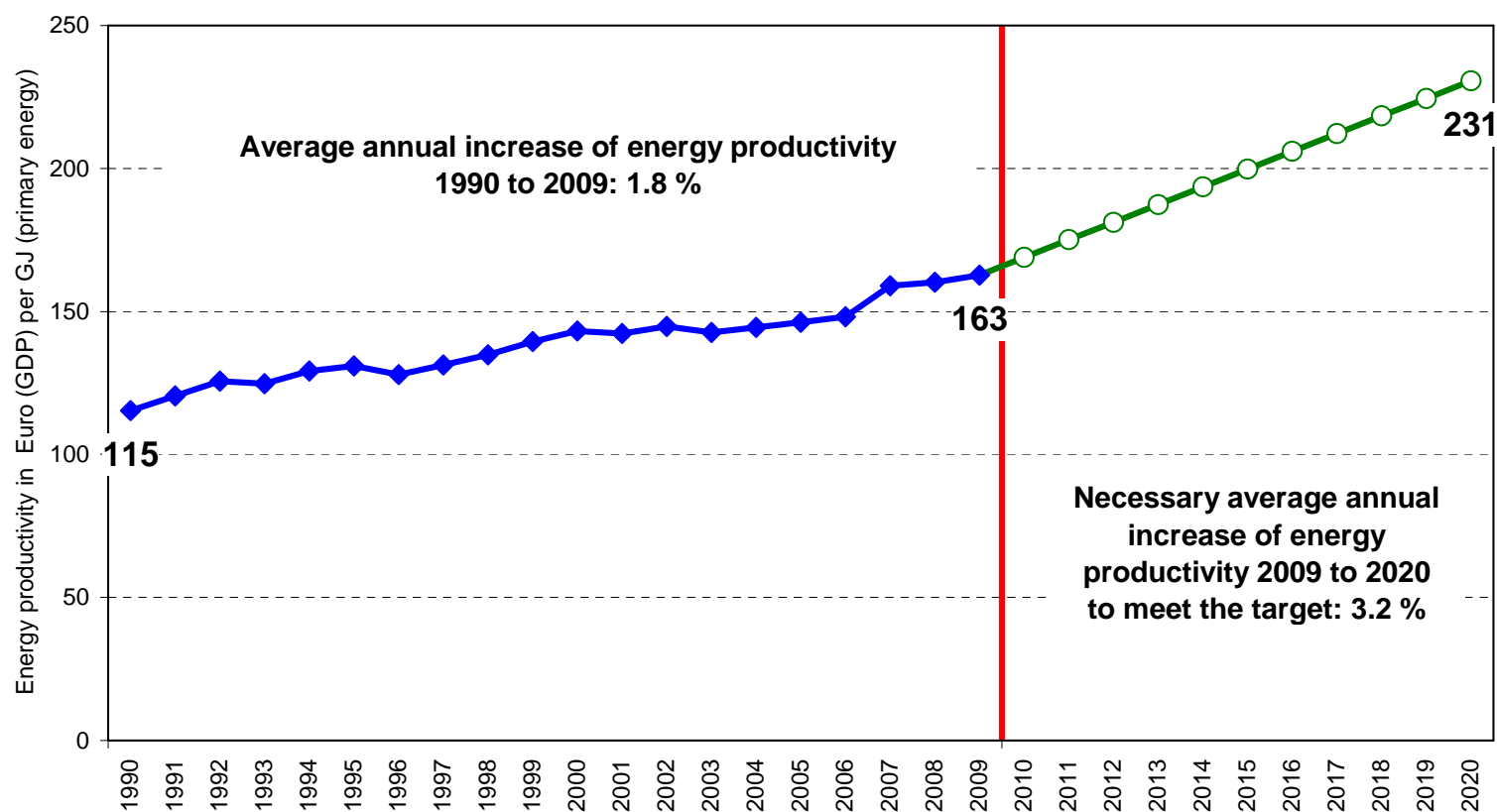
- ▶ According to the EU Directive member states have to compile a National Energy Efficiency Action Plan (NEEAP).
- ▶ The purpose of NEEAP:
Describe how Germany will fulfill the obligations arising from the directive, in particular those measures by means of which Germany is striving to achieve the final indicative energy savings target of 9 %.

Quantitative targets of Energy and Environmental Policy in Germany

- ▶ **Greenhouse gas emissions:**
 - Reduction of 40% (-21% by 2008/2012) vs. 1990
- ▶ **Renewable energies : Increasing share**
 - in electricity generation (25-30%), heat sector (14 %) and fuel production (17 %)
- ▶ **Combined heat and power plants (CHP):**
 - Doubling present share in electricity up to 25 %
- ▶ **Energy productivity: Doubling vs. 1990.**
- ▶ **Energy efficiency in new buildings:**
 - Stepwise Reduction of energy consumption by 30%.



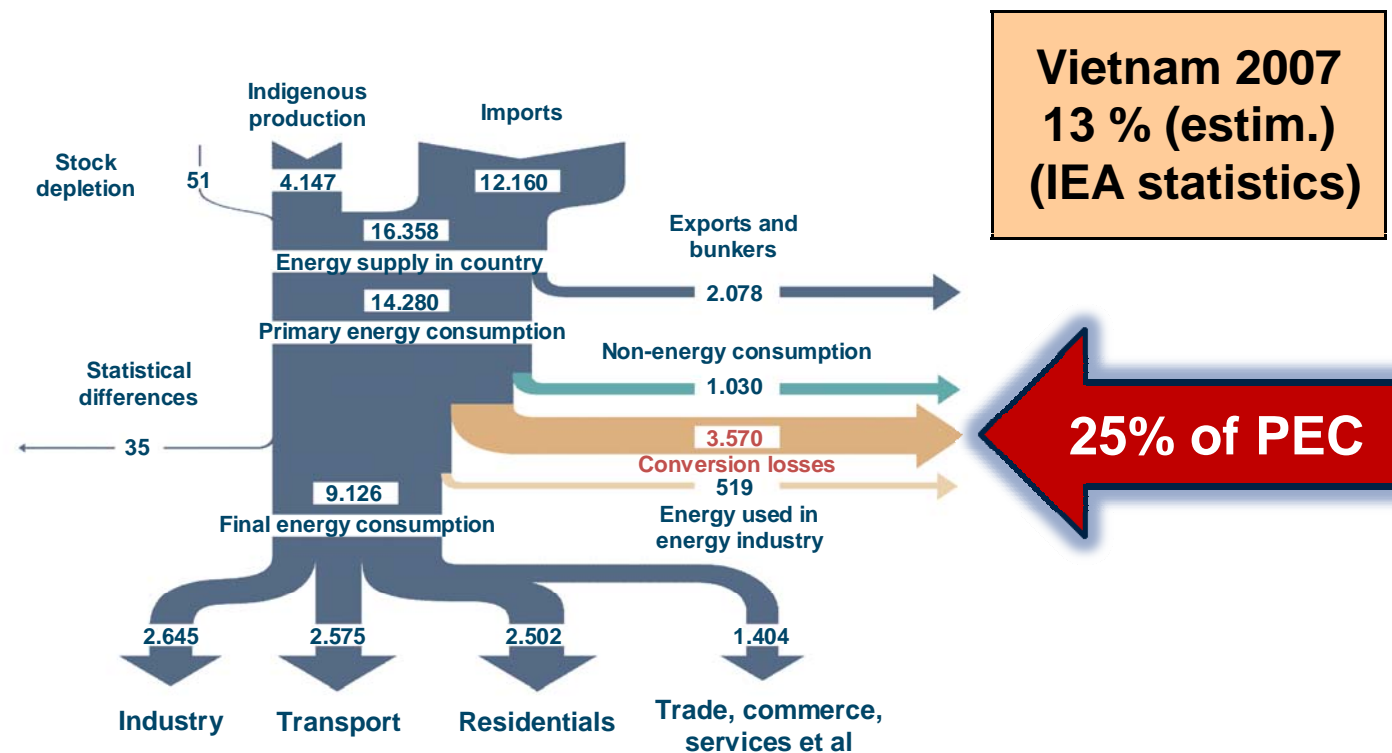
Energy productivity in Germany: Development 1990 – 2009 and governments target 2020



Sources: Federal Statistical Office; Workungs Group on Energy Balances (AGEB); Federal Government.

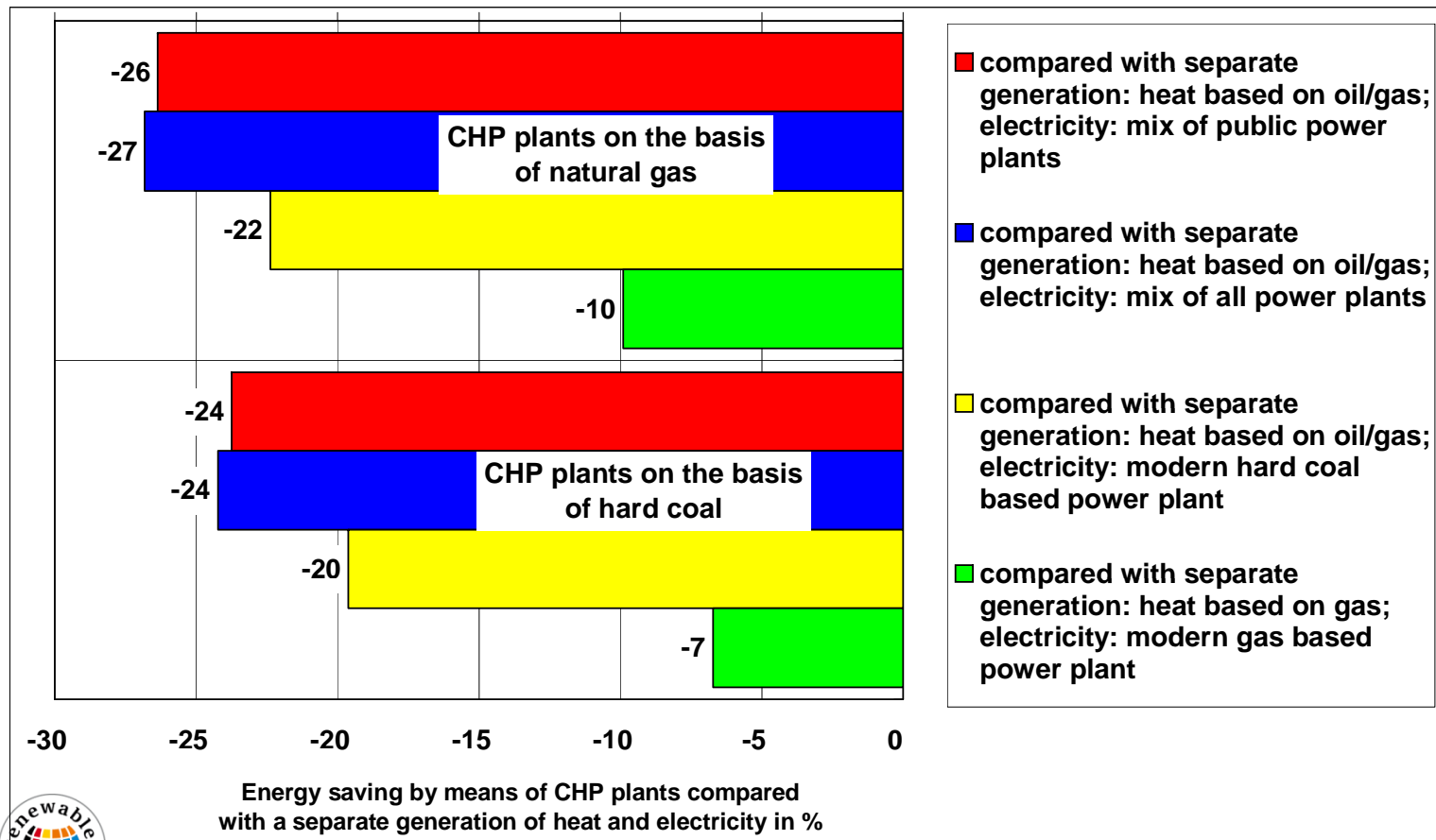


Energy flow sheet for Germany 2008: CHP plants as a mean to reduce conversion losses



Primary energy share of renewable energies 8.7 %
Source: Working Group on Energy Balances 09/2009

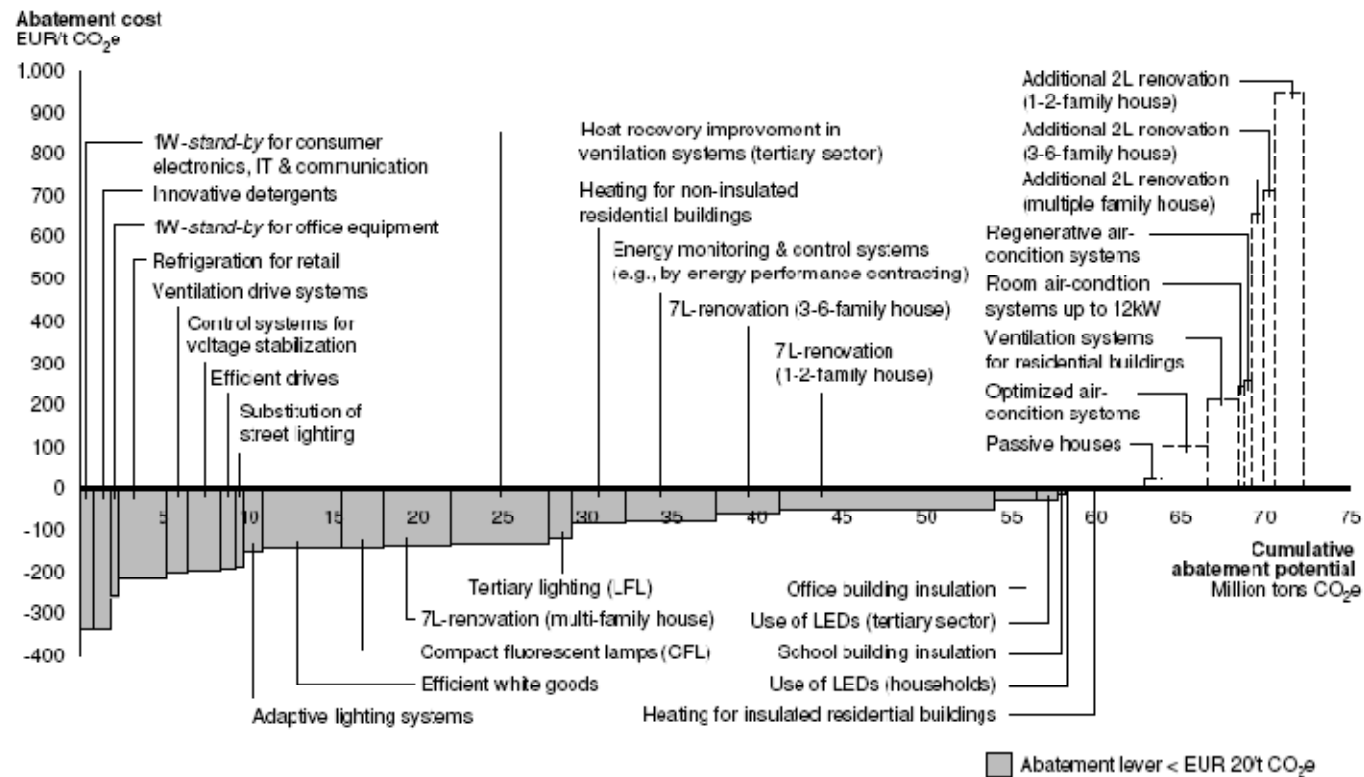
Energy savings by means of CHP plants



McKinsey: Abatement cost curve for building sector in Germany 2020

Buildings sector: Abatement cost curve – Germany 2020

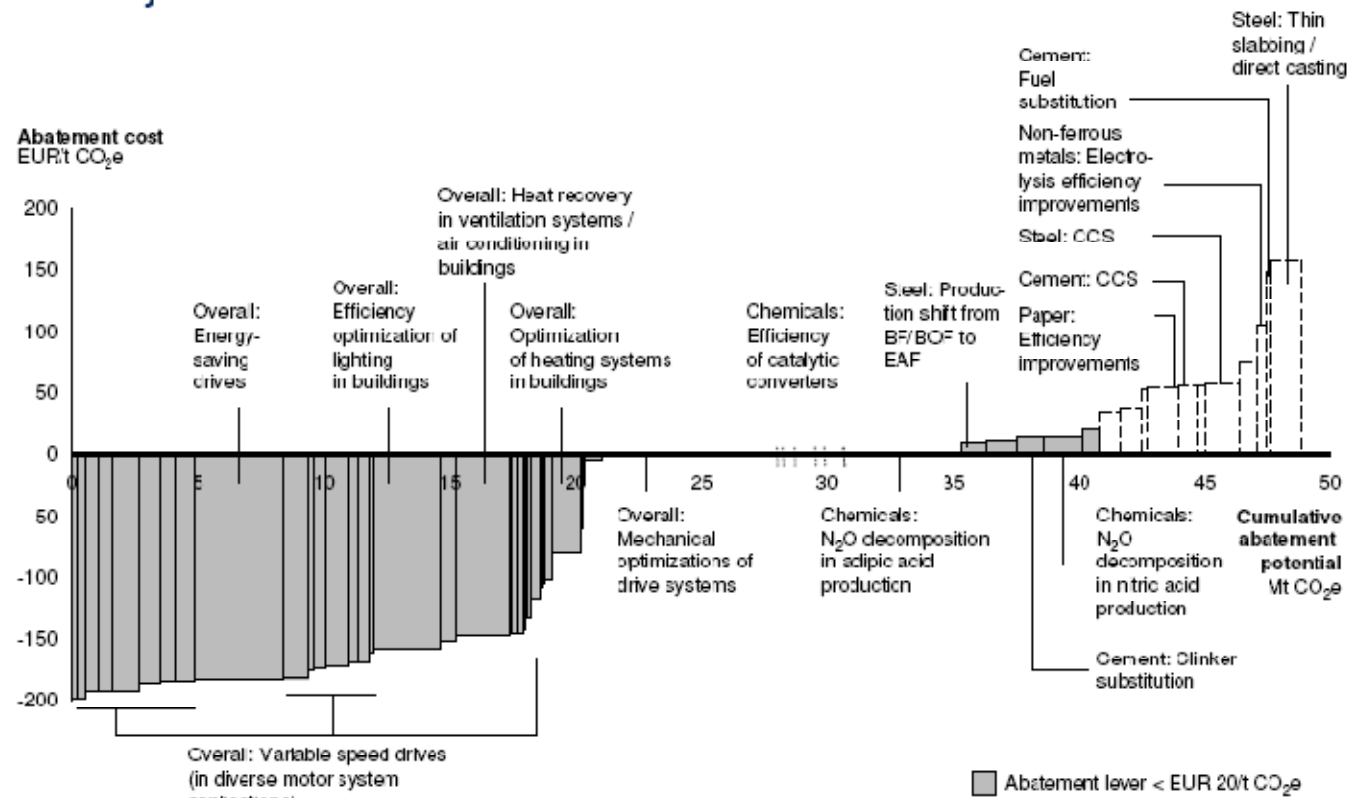
DECISION-MAKER
PERSPECTIVE



McKinsey: Abatement cost curve for industrial sector in Germany 2020

Industrial sector: Abatement cost curve – Germany 2020

DECISION-MAKER
PERSPECTIVE



Categories Instruments of Germany's policy to improve energy efficiency

- ▶ Regulatory laws
- ▶ Fiscal regulations
- ▶ Fundings
- ▶ Research and Development
- ▶ Voluntary Agreements
- ▶ Training and Education
- ▶ Information, motivation and communication

Implementation of the present German Integrated Energy and Climate Programme regarding Energy Efficiency (I)

- ▶ **Amendment to the Combined Heat and Power Act**
(bonus system for electricity fed into the grid; total fundings: 750 million Euro per year within a period of six years)
- ▶ **Amendment to the Energy Industry Act (EnWG)**
on liberalising metering
(Opening this field up to competition)
- ▶ **Ordinance on electricity and gas meters**
(specifies the requirements for the introduction of smart metering)
- ▶ **Clean power plants**
(obligatory use of the most modern emissions-reduction systems)

Implementation of the present German Integrated Energy and Climate Programme regarding Energy Efficiency (II)

- ▶ Guidelines on the procurement of energy-efficient products and services
- ▶ Introduction of energy management systems
(agreement on the coupling of tax relief with the adoption of energy management)
- ▶ Amendment of Energy Conservation Act and Energy Saving Ordinance
(stricter energy-related requirements for new and existing buildings: -30%)

Implementation of the present German Integrated Energy and Climate Programme regarding Energy Efficiency (III)

- ▶ Regulations on the gradual removal of night-storage heaters used for space heating
(support under the modernization program to reduce CO₂ emissions in buildings)
- ▶ Amendment to Heating Costs Ordinance
(70% of heating costs have to split up according to consumption)
- ▶ Modernization Program to reduce CO₂ emissions from buildings
(funding for energy-efficient modernization of residential buildings and local authorities facilities)

Implementation of the present German Integrated Energy and Climate Programme regarding Energy Efficiency (IV)

- ▶ **Energy-efficient modernization of social infrastructure**
(a pact between the Federation, the Länder and local authorities with the goal of primary energy savings of up to 50 % per refurbished building)
- ▶ **Program for the energy-efficient modernization of federal buildings**
(realization of the extensive potential for energy and cost savings, in accordance with the Government's commitment)

Implementation of the present German Integrated Energy and Climate Programme regarding Energy Efficiency (V)

- ▶ Agreement on key elements for changing basis of vehicle tax
(vehicle tax to be based on specific CO₂ emissions)
- ▶ CO₂ strategy for passenger cars
(binding CO₂ values on EU level)
- ▶ Energy labeling of passenger cars
(clear labeling providing information about energy efficiency)
- ▶ Reinforcing the influence of the HGV toll
(greater differentiation of toll rates by emissions classes)

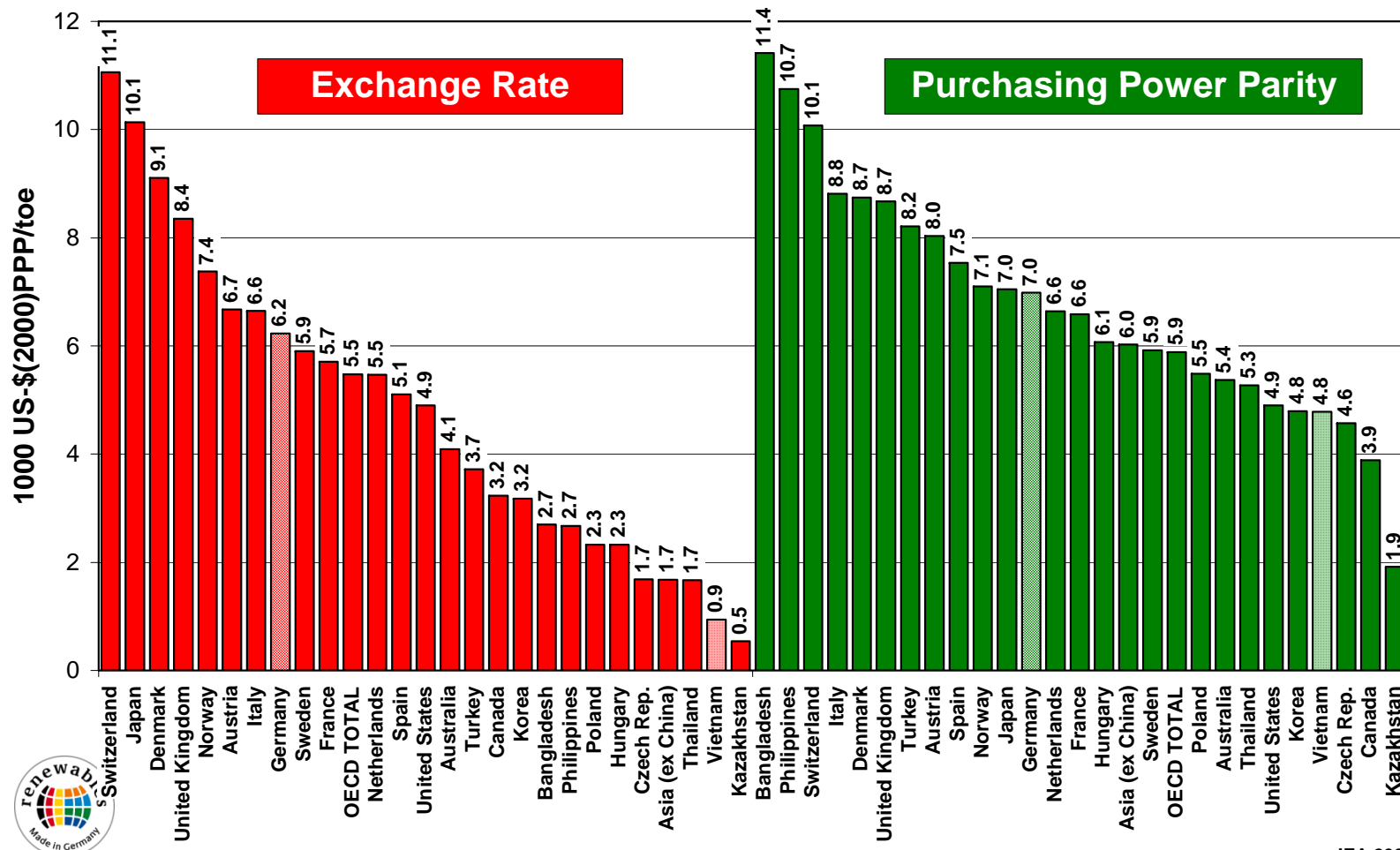
Site effects of Germany's policy based on 33 concrete measures for increased energy efficiency and energy savings

Compared with a reference case by 2020 additional...

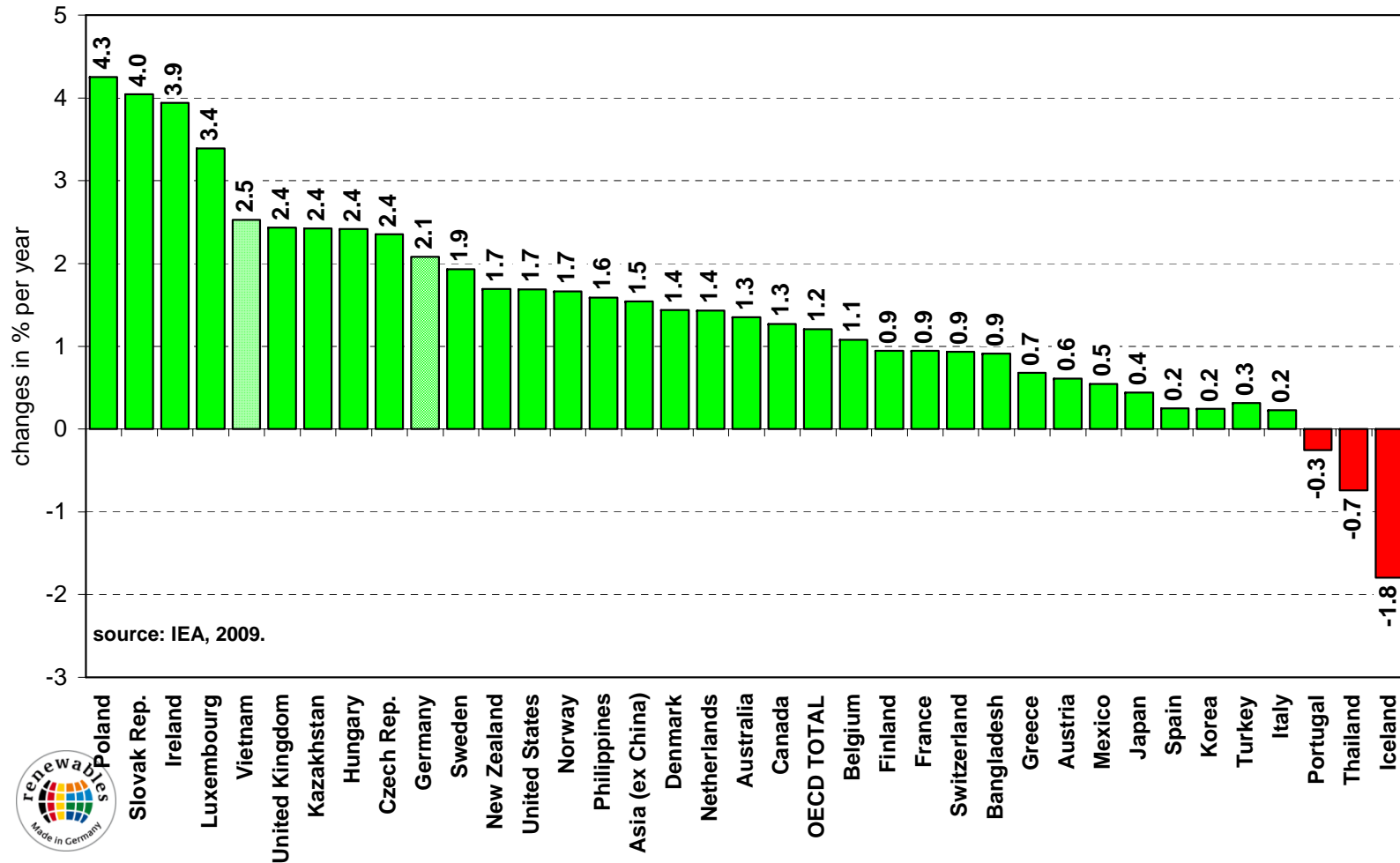
- ▶ energy savings amount to around 10 % of present final energy consumption,
- ▶ electricity savings add up to 12 % of present electricity generation
- ▶ reduction of CO₂ emissions come to 77 Mt, around 9 % of 2008's emissions
- ▶ investments, savings of energy costs and higher productivity result in additional effects on employment in the amount of 260000 employees
- ▶ macroeconomic demand enhances the GDP by 0.9 %
- ▶ expansion of export potentials and creation of lead markets.



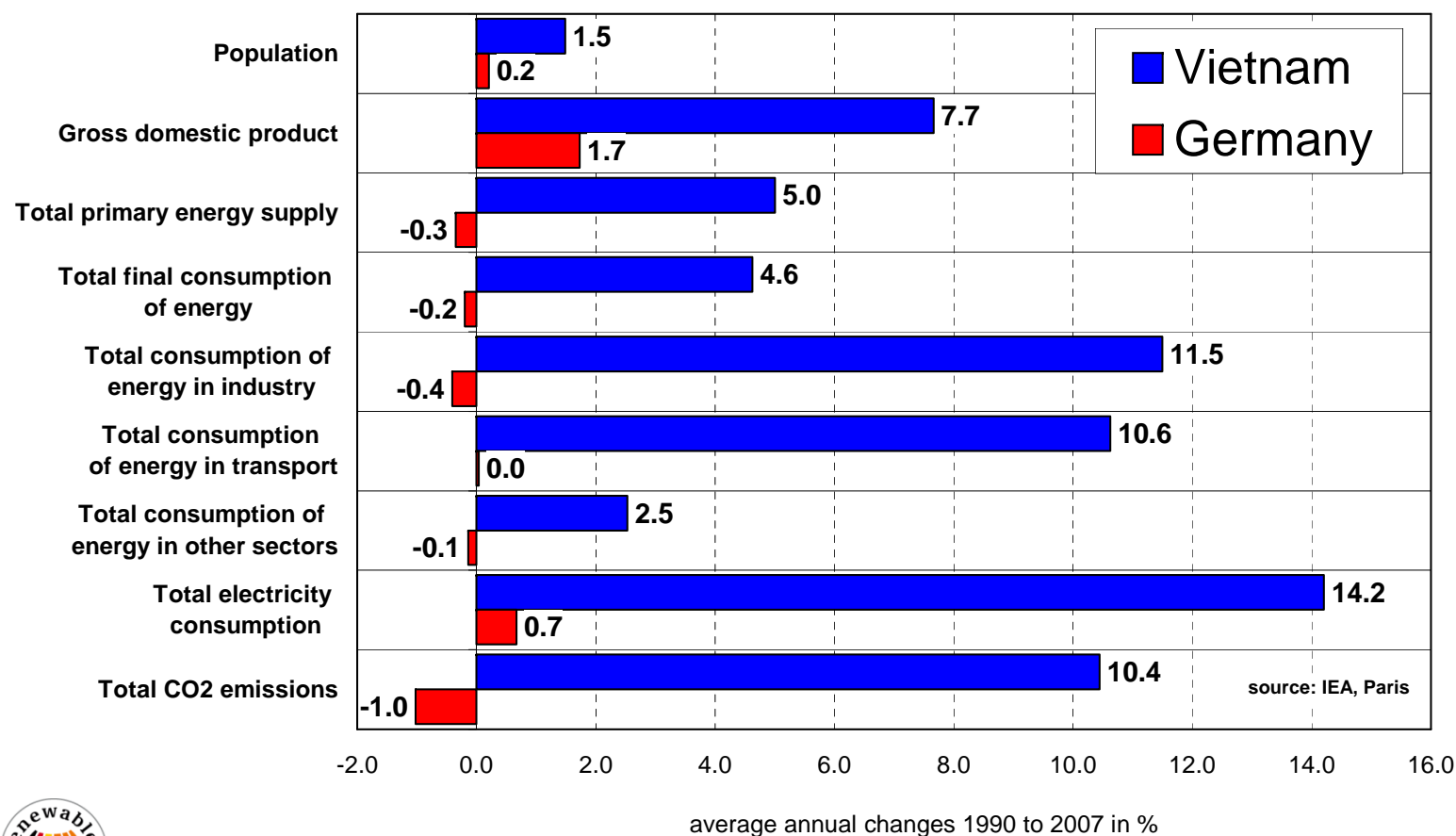
Energy Productivity in selected Countries 2007



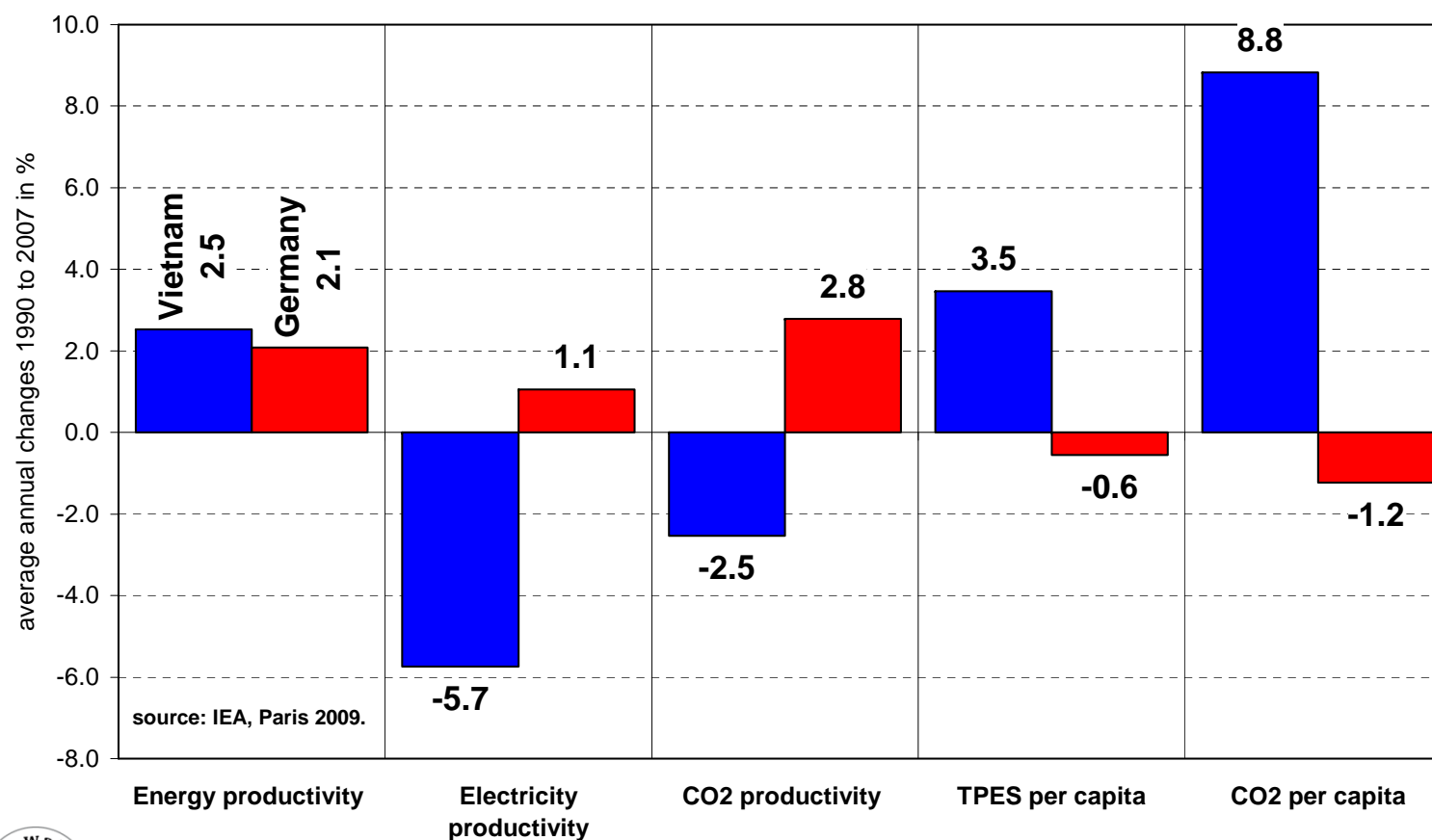
Percentage increase of Energy Productivity in selected Countries 1990 to 2007



Main drivers for energy consumption in Vietnam and Germany 1990-2007



Development of specific indicators in Vietnam and Germany 1990 to 2007



Some conclusions (I)

- ▶ Energy efficiency should be a core element of a sustainable energy strategy in all countries.
- ▶ Improvements of energy efficiency could help Vietnam to limit the growth of energy consumption and CO₂ emissions.
- ▶ Energy efficiency is not only good for energy reasons but also provides positive employment effects and environmental and economical benefits.

Some conclusions (II)

- ▶ In Germany still large technical and economical potential for huge investments in energy efficiency are exist. This also means an immense chance for industry and investors. Vietnam might also profit by activating such potentials.
- ▶ Significant improvements of energy efficiency can not be realized by market forces only, it needs an effective policy with striking frameworks for the different agents in economy and society.

Finally an important note by the International Energy Agency regarding Energy Efficiency

“Improvements in energy efficiency can deliver some of the largest and cheapest CO₂ reductions. Importantly in a time of financial crisis, they can also often be implemented quickly and bring more benefits for employment than any other category of energy technology. Investment in energy efficiency now will also delay the need for new supply capacity, giving more time for other, new low carbon technologies to mature and so lowering the overall costs of deployment. Unfortunately, stubborn barriers exist to the deployment of many energy efficient technologies and so governments need to help remove or overcome them.”



**Thank you
for your attention
hzielsing@t-online.de**