



Federal Ministry
of Economics
and Technology



Energy Efficiency - Made in Germany

Policy framework conditions for energy efficiency in Germany

23. November 2010

**Dipl. Ing. Jan-Martin Rhiemeier, Ecofys
Exportinitiative Energy Efficiency**

On behalf of the German Federal Ministry of Economics and Technology

www.efficiency-from-germany.info

Presentation content

- ▶ **Introduction: energy efficiency in Germany**
- ▶ **Energy efficiency targets and related policies in EU and Germany**
- ▶ **Outlook on further energy efficiency stimulating policy instruments in EU and Germany**



Federal Ministry
of Economics
and Technology



Energy Efficiency - Made in Germany

Introduction: energy efficiency in Germany

www.efficiency-from-germany.info

Energy Efficiency in Germany – Long-term Experience (1)

- ▶ **Energy consumption in Germany is structurally high, as**
 - ▶ **It has been highly industrialised for decades**
 - ▶ **It is a densely populated country**
- ▶ **Availability of domestic fossil energy resources is limited/expensive (deep coal mining)**
- ▶ **=> Energy has always been comparatively scarce/expensive**
- ▶ **=> High vulnerability from oil price shocks of the 1970s**
- ▶ **Since mid 1970s: Regulatory measures defining efficiency standards were implemented**
- ▶ **Not one major legal framework but a multitude of energy savings approaches, mainly in building and industrial sectors**

Energy Efficiency in Germany – Long-term Experience (2)

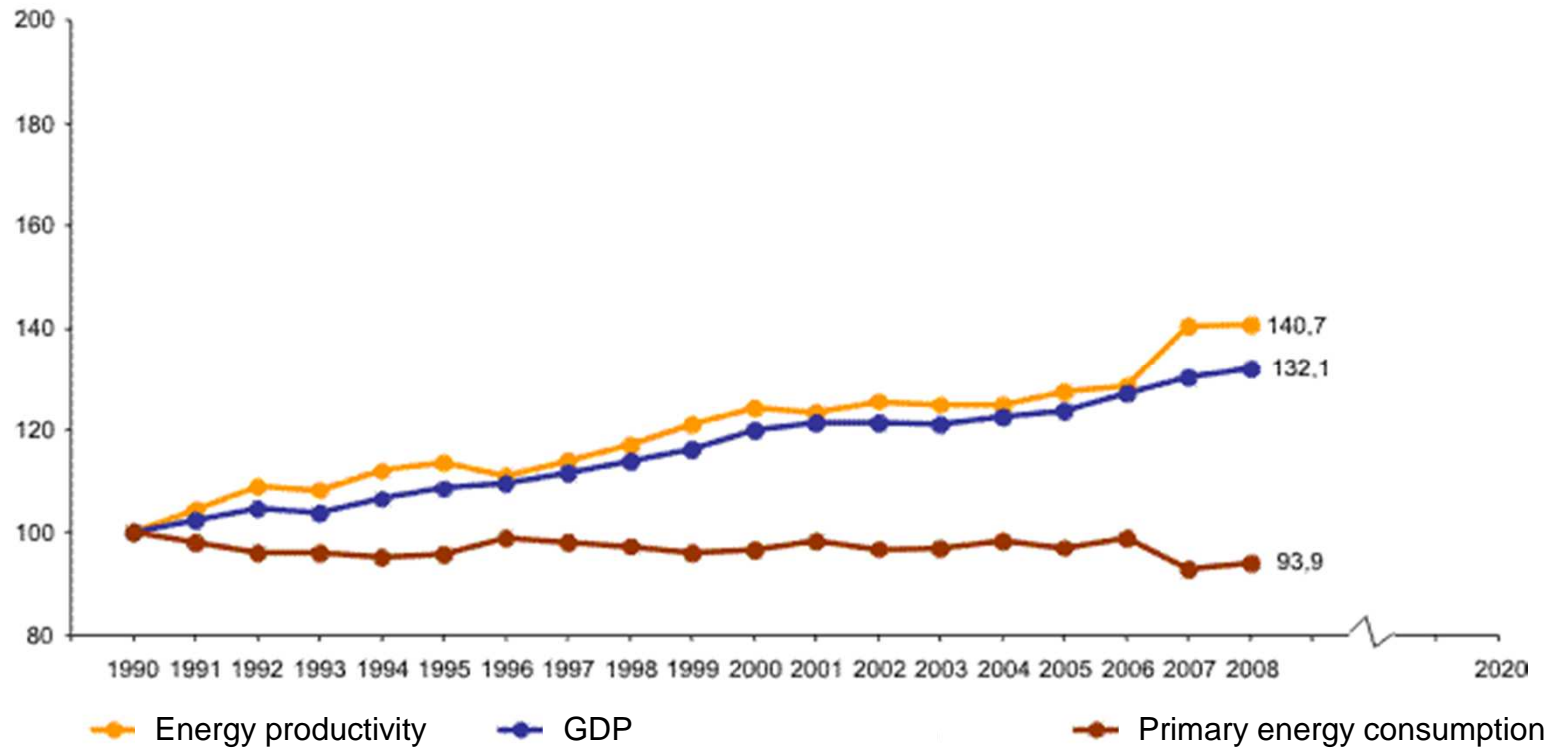
- ▶ **German industrial sectors and suppliers, a.o. mechanical engineering, are highly specialized**
- ▶ **High engineering standards + need for rational use of energy = high level of energy efficiency**
- ▶ **In 1990s decoupling of GDP growth and energy consumption: energy productivity (€ GDP per GJ) increased by 40.7% 1990-2008**
- ▶ **1990-2006: average improvement in specific energy consumption (energy intensity) of 1.7% p. a.**
- ▶ **Today, German industrial sectors apply highly efficient processes and provide innovative energy efficiency products**



Energy productivity in Germany 1990 - 2008

Energieproduktivität

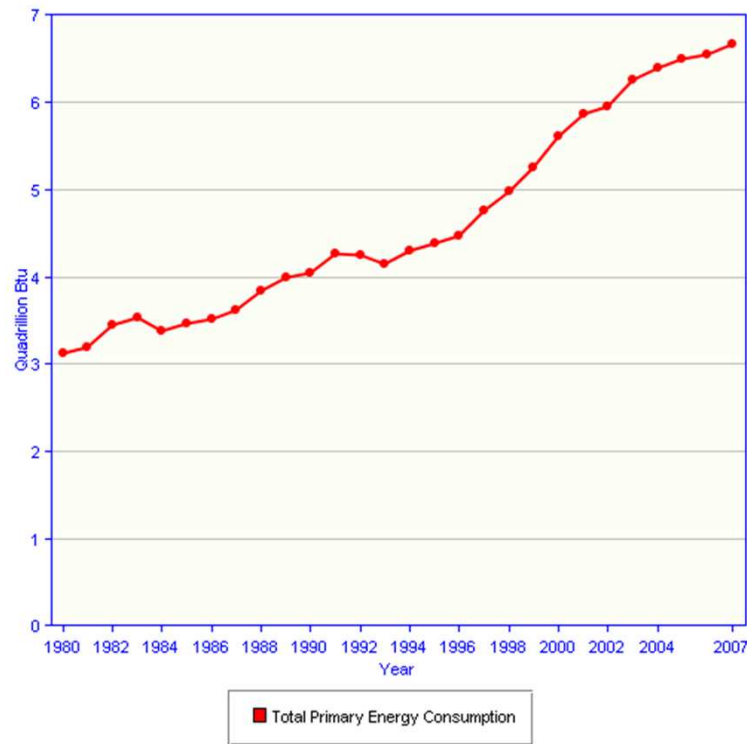
Index 1990 = 100



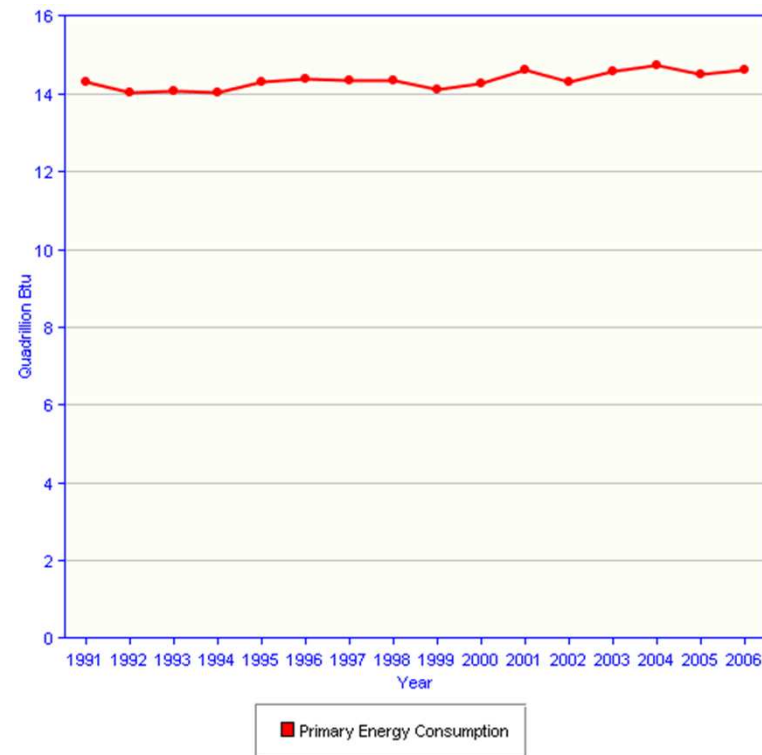
Quelle: Bruttoinlandsprodukt - Statistisches Bundesamt (Mitteilung vom 06.07.2009); Primärenergieverbrauch - AG Energiebilanzen 04/2009

Primary Energy Consumption in Spain & Germany

Spain



Germany



Efficiency technologies with high savings potentials

- ▶ **Efficient compressed air systems**
- ▶ **Efficient electric engines**
- ▶ **Efficient pump systems**
- ▶ **Efficient electric lighting**
- ▶ **Efficient ventilation and cooling systems**
- ▶ **Efficient heating and warm water**
- ▶ **Efficient industrial stoves**
- ▶ **Cogeneration of power and heat**
- ▶ **Information technology (IT)**

And: a huge savings potential lies in efficient system design!

Energy Efficiency - Made in Germany

Energy efficiency targets and related policies in the EU and Germany

www.efficiency-from-germany.info

The role of EU legislation

- ▶ Since mid 1990s, EU legislation regarding energy efficiency has become binding for member states
- ▶ National legislation has to be in line with/ must implement EU policy standards (EU-ETS, EcoDesign Directive etc.)

EU: energy efficiency targets

- ▶ **In 2007 European governments agreed on 2020 targets:**
 - ▶ 20% reduction of CO₂ emissions in comparison with 1990 CO₂ levels
 - ▶ 20% of EU energy consumption from renewable sources
 - ▶ 20% reduction of primary energy use compared to projected levels (reduction by means of improving energy efficiency)

- ▶ **Energy Efficiency Action plan**
 - ▶ Reduce primary energy use in Europe by means of improving energy efficiency

EU: policy used for stimulation energy efficiency

- ▶ **Emission Trading Scheme (ETS)**
 - ▶ CO₂ emission cap for the power supply sector + energy intensive manufacturing sectors
 - ▶ Combustion inst. > 20MW, refineries, coke ovens, iron & steel, cement, glass, ceramics, pulp & paper
 - ▶ after 2012: (N)F metals, aluminum (PFCs), lime, mineral wool, gypsum, carbon black, several chemicals
 - ▶ 3-years introductory phase until 2007, phase 2 identical with Kyoto commitment from 2008-2012
 - ▶ Third phase (2013-2020)
 - ▶ No more free allocation for power supply
 - ▶ Allocation based on benchmarking

EU: policy used for stimulation energy efficiency

▶ **Eco-design Directive**

- ▶ Establishing a framework for the setting of mandatory ecodesign requirements for energy-using products, including minimum energy efficiency standards
- ▶ Energy use targeted: all energy-using products (except vehicles for transport)
- ▶ Specification of energy efficiency standards for different product groups in subsequent implementing measures (ongoing)

EU: policy used for stimulation energy efficiency

- ▶ **Energy Service Directive (ESD)**
 - ▶ European directive to promote the use of energy efficiency
 - ▶ Allows for voluntary as well as legislative measures
 - ▶ Each EU country has to deliver a National Energy Efficiency Action Plan (NEEAP)
 - ▶ Applies to all users of energy except those that fall under the ETS

Germany: energy efficiency targets (1)

- ▶ **German climate policy (2007)**
 - ▶ 40% reduction of GHG emissions 1990 - 2020
 - ▶ 30% RES electricity and 14% RES heat by 2020
 - ▶ Doubling of energy productivity 1990 – 2020

- ▶ **German Energy Concept (2010)**
 - ▶ Reconfirms 40% emission reduction target for 2020
 - ▶ Target for 2050: at least 80% emission savings
 - ▶ Reduce electricity consumption by 10% 2008 – 2020
 - ▶ Double energy efficient building renovation rate
 - ▶ Reduce heat demand of buildings by 20% until 2020

Germany: energy efficiency targets (2)

- ▶ **EU-burden sharing**
 - ▶ 14% CO₂ reduction until 2020 for non-ETS sectors

- ▶ **National Energy Efficiency Action plan**
 - ▶ Reduce the German non-ETS energy use by 9% in comparison to average 2001-2005, over a period 9 years

Germany: policy instruments used to support energy efficiency (1)

- ▶ Act on CHP (law)
 - ▶ Modernising and developing cogeneration
- ▶ EnEV (building codes)
 - ▶ Energy performance standards for buildings
 - ▶ Since 2009 also industrial buildings incorporated
- ▶ Regulations on small and medium sized firing installations
 - ▶ Limits on emissions and waste gases loss allowed
- ▶ Low interest loans (financial incentive)
 - ▶ Loans with low interests to SME's for energy efficiency investments (KfW)

Germany: policy instruments used to support energy efficiency (2)

- ▶ Energy efficiency networks (financial incentive)
 - ▶ Network of different companies
 - ▶ Joint use of energy efficiency consultancy
 - ▶ Financially supported by government
- ▶ Energy Management Systems (incentive)
 - ▶ EEG (RE-Feed-In) cost exemption for energy intensive industries requires use of energy management
- ▶ Energy and climate fund (financial incentive)
 - ▶ Financial support for various energy efficiency measures (2011 onwards)

Germany: policy instruments used to support energy efficiency (3)

- ▶ Advice campaigns (information)
 - ▶ Information campaigns on e.g. energy efficiency in compressed air technologies
- ▶ Research and developments (financial incentive)
 - ▶ Subsidies for research and development projects
 - ▶ Total in “Klimazwei” research program €35 million
- ▶ Promoting demonstration projects (financial incentive)
 - ▶ Funding for demonstration projects
 - ▶ Total in “Klimazwei” research program €35 million



Federal Ministry
of Economics
and Technology



Energy Efficiency - Made in Germany

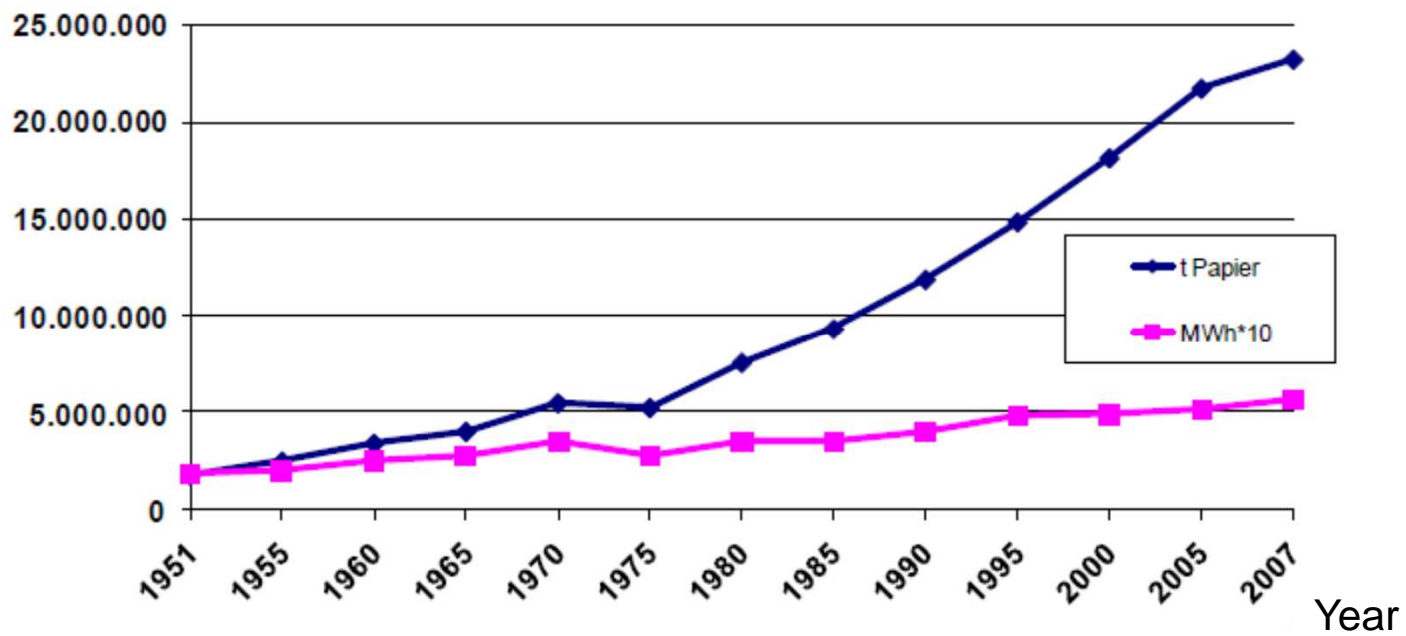
Sectoral energy efficiency development in Germany

www.efficiency-from-germany.info

Example 1: German paper industry (1)

- ▶ **One of the five main energy consumers in the German industry**
- ▶ **Since 1955 energy use has decreased from 8.2 kWh per ton to 2.7 kWh per ton**
- ▶ **Main energy efficiency improvements:**
 - ▶ Use of CHP
 - ▶ Development of heat recovery units
 - ▶ Improvement in mechanical dewatering
 - ▶ Higher amount of recovered paper as material input

Example 1: German paper industry (2)

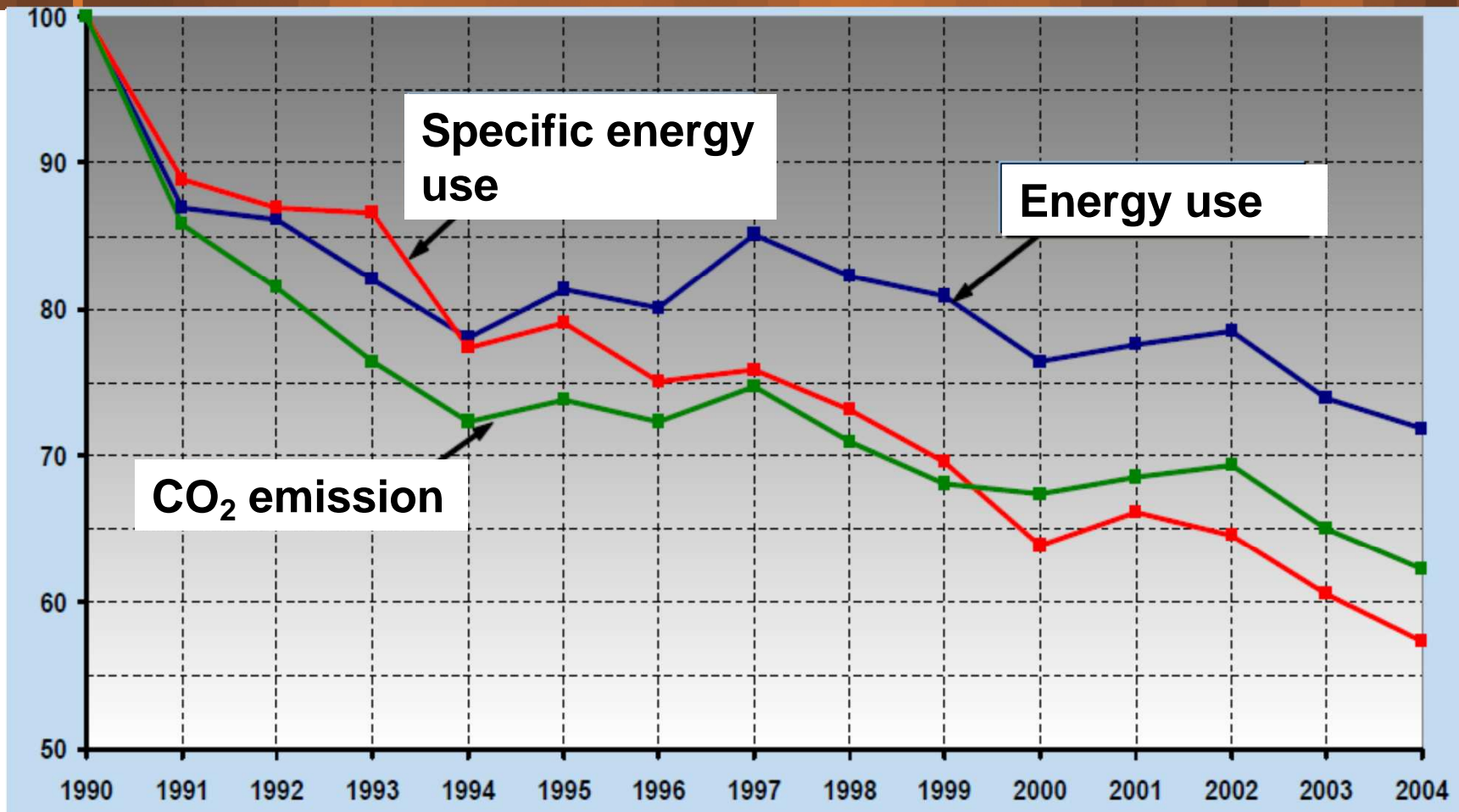


Source: Götz 2008

Example 2: German chemical industry (1)

- ▶ **Important export sector (76.6% of chemical production exported in 2006)**
- ▶ **Large energy consumer; responsible for 10% of total electricity use in Germany**
- ▶ **Yearly energy costs of €4 billion**
- ▶ **Strong increase in energy efficiency during the last 20 years**

Example 2: German chemical industry (2)



Source: Staudigl 2007

Energy Efficiency - Made in Germany

Outlook on further energy efficiency
stimulating policy instruments in the EU
and Germany

www.efficiency-from-germany.info

European policy

- ▶ European Top Runner Strategy
 - ▶ Differentiating Energy consumption labelling
 - ▶ Best appliance labelling
 - ▶ Eco-design

European policy

- ▶ **Emission trading scheme third phase**
 - ▶ No more free allocation for power supply
 - ▶ Allocation based on benchmarking

- ▶ **2011: European Energy Efficiency Plan until 2020**
 - ▶ New measures to reach 20% energy efficiency target 2020?

- ▶ **2011: new Directive on energy efficiency and savings**
 - ▶ Update of energy service directive

German policy (Energy concept and NEEAP)

- ▶ Energy management systems
 - ▶ Energy tax exemptions are only granted if energy management systems are applied
- ▶ New Energy Efficiency Fund
 - ▶ Further incentives for energy management, optimisation of processes a
 - ▶ development of efficient technologies
 - ▶ Advice programs
- ▶ Standardisation and extension of contracting models
 - ▶ Compressed air
 - ▶ Lighting
 - ▶ Heating and ventilation
- ▶ New instruments to reach ambitious targets?

Companies present at the event:

- ▶ 2 G Energietechnik GmbH – Combined Heat and Power
- ▶ DIAL GmbH – Industrial Lighting
- ▶ MDM Diels GmbH – Ventilation Engineering
- ▶ MPA INTENCON – Infrared Heating
- ▶ MSF-Vathauer Antriebstechnik GmbH & Co. KG – Drive Engineering
- ▶ TRILUX GmbH & Co. KG – Lighting



Federal Ministry
of Economics
and Technology



Energy Efficiency - Made in Germany

Thank you for your attention!

www.efficiency-from-germany.info