

# Germany's Climate and Energy Policy

**Energizing the transition to a low carbon economy**

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# Germany's Integrated Climate and Energy Policy, ICEP

## Goals:

- » Climate protection
- » Energy security
- » Economic growth
- » Employment opportunities
- » Industrial innovation



## **Germany has made significant progress in tackling its carbon footprint**

### **Germany is on track to achieve its Kyoto Protocol target**

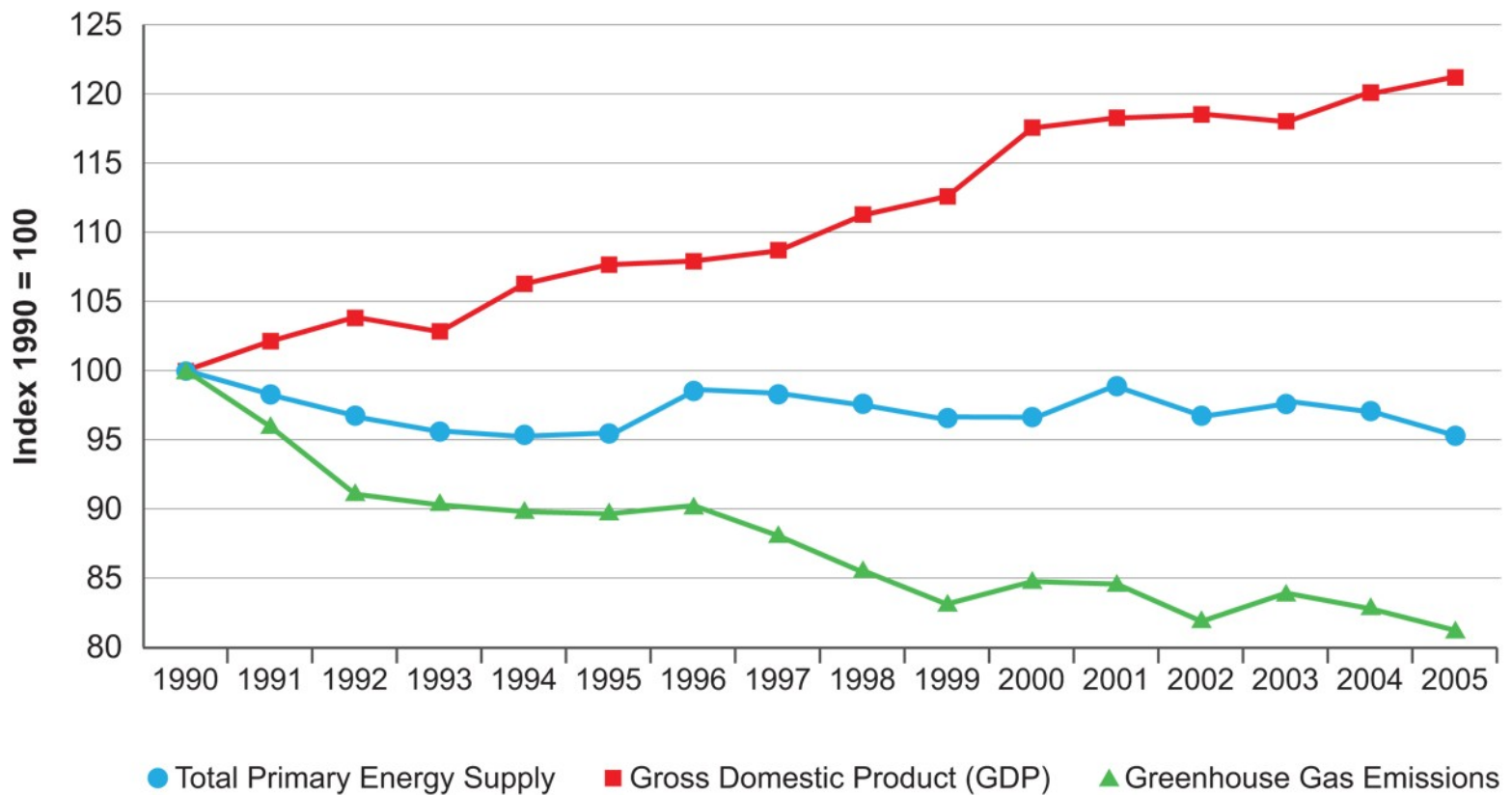
- Kyoto commitment: 21% reduction until 2012 compared with 1990 levels
- Reduction to date: 21.4%

### **Main drivers for the reduction**

- Structural changes in German industries due to German reunification
- Shift to power generation from renewable energy



# Addressing Economic Growth and GHG Emissions in Germany



Source: Statistisches Bundesamt; Umweltbundesamt, AGEB



# Germany has set ambitious targets for 2020

- ✓ 40% less GHG emissions (270 Mio. tons)
- ✓ 30% share of renewable energy in electricity (2008: 15.3%)
- ✓ 14% share of renewable energy in heating
- ✓ Doubling of energy efficiency
- ✓ Doubling of co-generation (CHP)

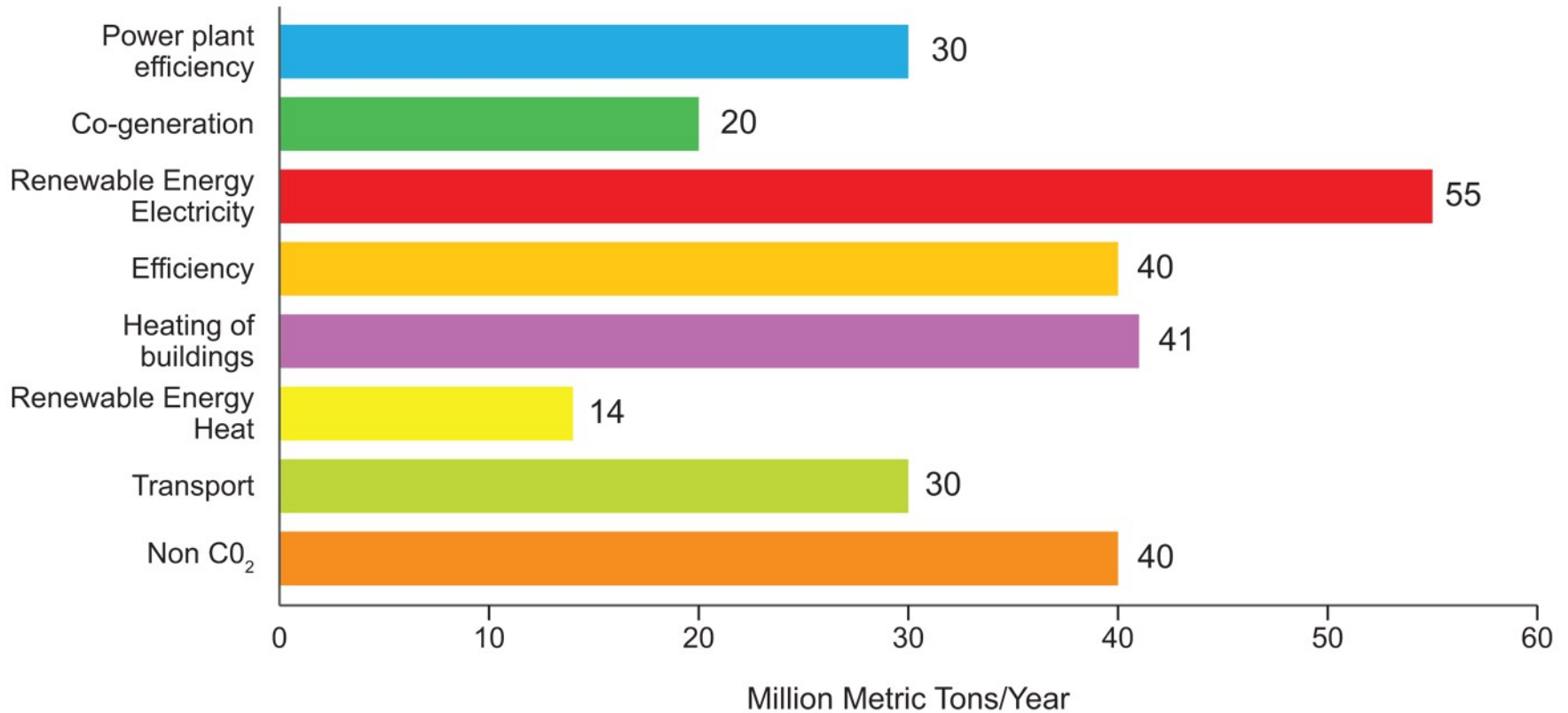




## ICEP covers eight core sectors

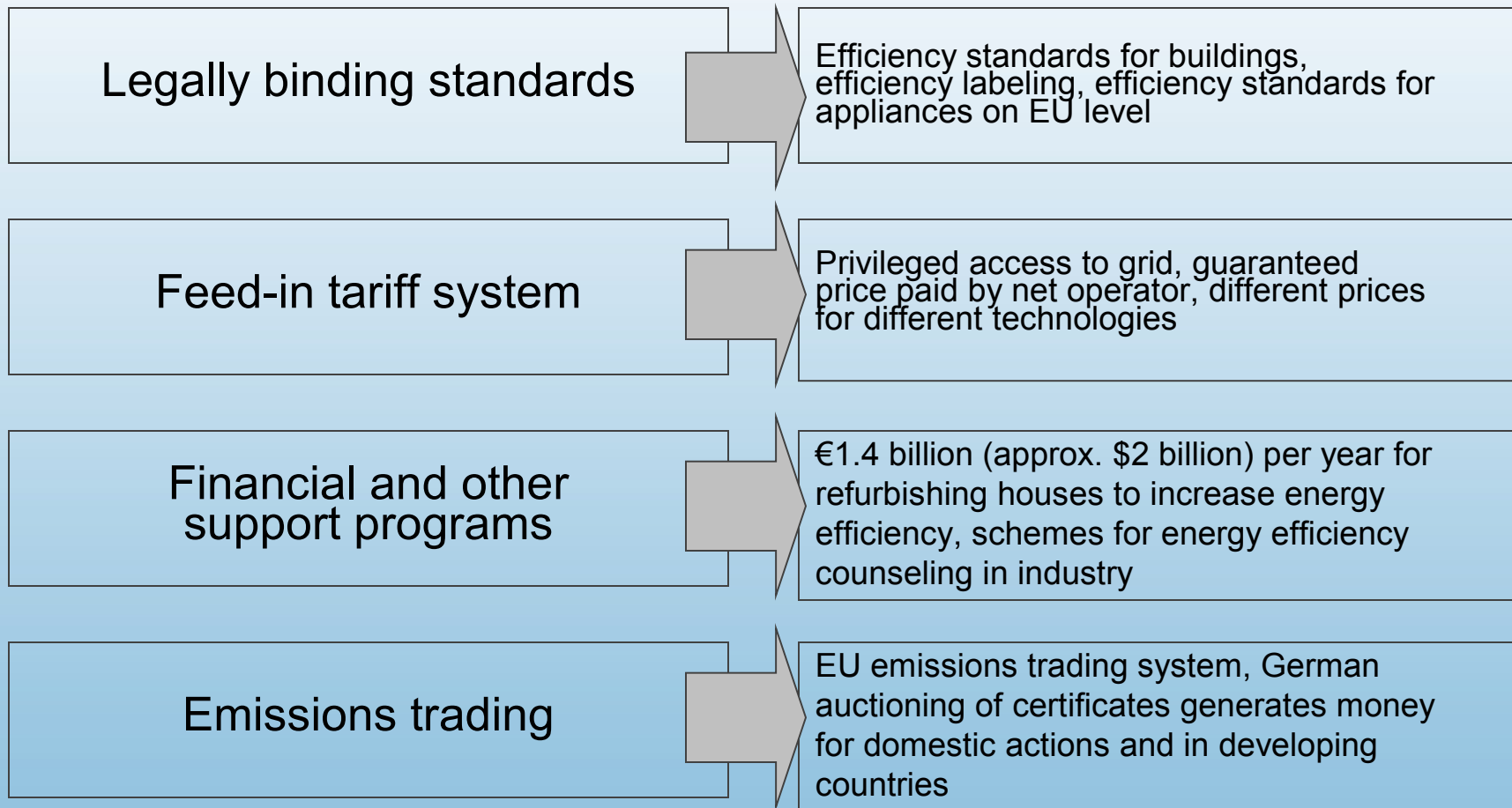
Total annual reduction of 270 million metric tons CO<sub>2</sub> by 2020

### Reduction contributions in various sectors by 2020





# Germany's climate toolbox

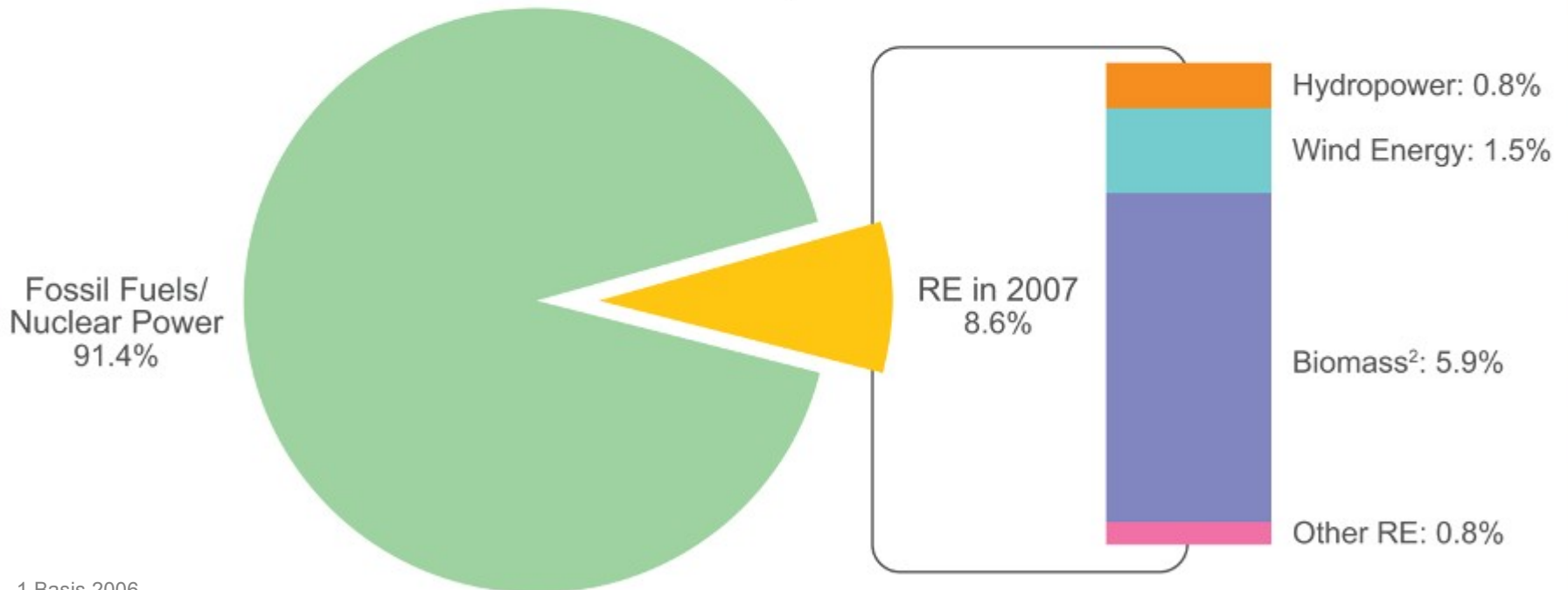




# German renewable energy (RE) sources

## Final energy consumption in Germany in 2007

Total: 9,423 PJ<sup>1</sup>



1. Basis 2006

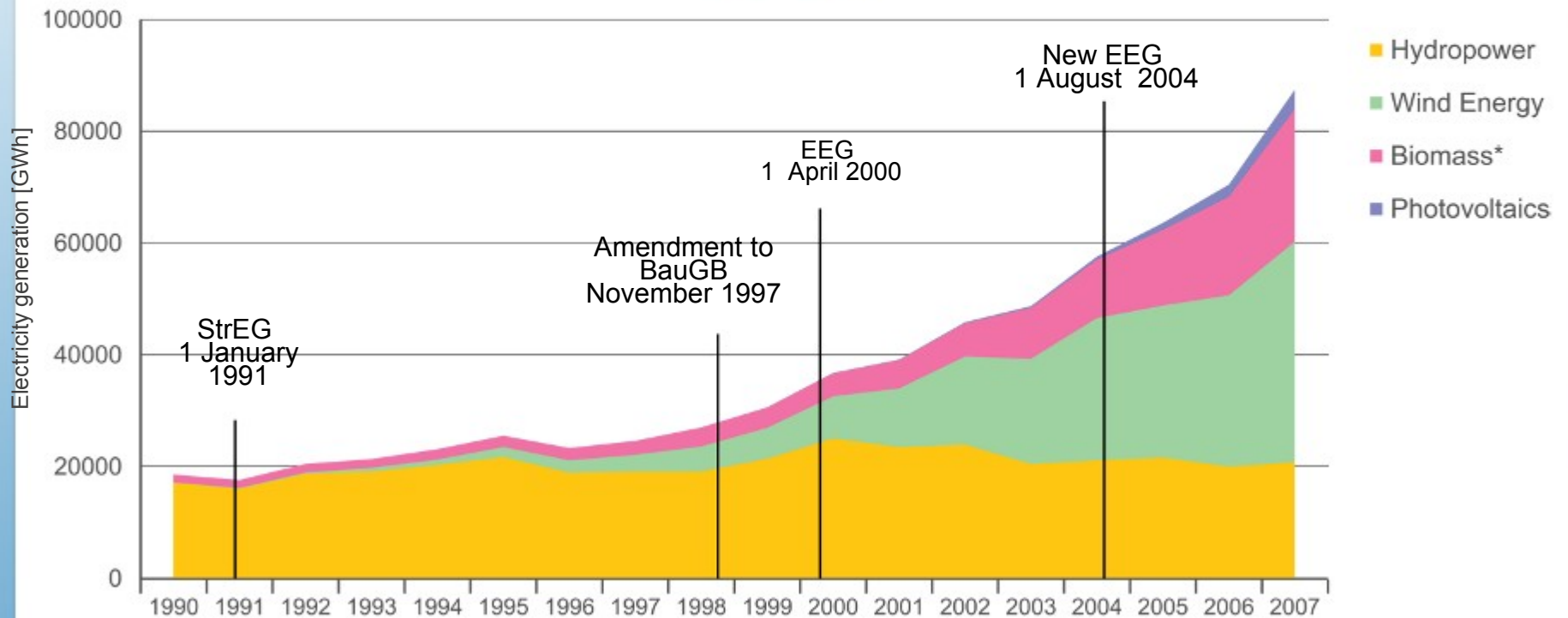
2. Solid, liquid, gaseous biomass, biogenic share of waste, landfill and sewage gas

RE - renewable energies; Version: June 2008; all figures provisional



# In Germany, reliance on renewable energy is growing

## Development of electricity generation from renewable energies in Germany 1990 - 2007



\*solid, liquid, gaseous biomass, biogenic share of waste, landfill and sewage gas;

StrEG: Act on the Sale of Electricity to the Grid, BauGB: Construction Code; Electricity from geothermal energy is not presented due to the low volumes of electricity;  
Source: BMU according to Working Group on Renewable Energies/Statistics (AGEE-Stat); Version: June 2008; all figures



**Key to this success:**

## **The Renewable Energy Sources Act (EEG)**

- » **Feed in Tariff System**
- » **Obligation of grid operators to buy electricity from RE sources**
- » **Priority transmission and distribution of electricity from RE**
- » **Fixed price („tariffs“) for every kilowatt hour produced from RE for 20 years**
- » **All different types of RE are included and tariffs are differentiated by source and size of plant**
- » **Tariffs to be reduced each year in step with technological progress (1.5% - 6.5%)**
- » **Additional costs are apportioned to the consumer in accordance with regional supply and demand**



## Degression of Tariffs

The degression factor reduces the feed-in tariffs each year for new installations to stimulate technological innovation and manufacturing efficiency.

<b>Guaranteed Prices for Renewable Power Generation in Germany Beginning in 2004 per Renewable Energy Sources Act (EEG)</b>			
<b>Energy Source</b>	<b>Grid Feed-In Tariff Ct/kWh</b>	<b>Degression Factor for New Contracts</b>	<b>Qualifications</b>
Hydro	3.7 – 9.67	1%/a for plants exceeding 5 MW	Up to 150 MW Upgrading until 2012
Wind	5.5 – 9.1	2%/a	Differentiated by wind intensity of site
Biomass & Biogas	3.9 – 21.5	1.5 %/a	
Landfill-, Sewage- & Mine Gas	6.65 – 9.67	1.5 %/a	
Photovoltaic & Solar Thermal	45.7 – 62.4	5 – 6.5%/a	Differentiated by mounting & location
Geothermal	7.16 – 15.0	1%/a	Degression beginning in 2010



# Costs and Benefits

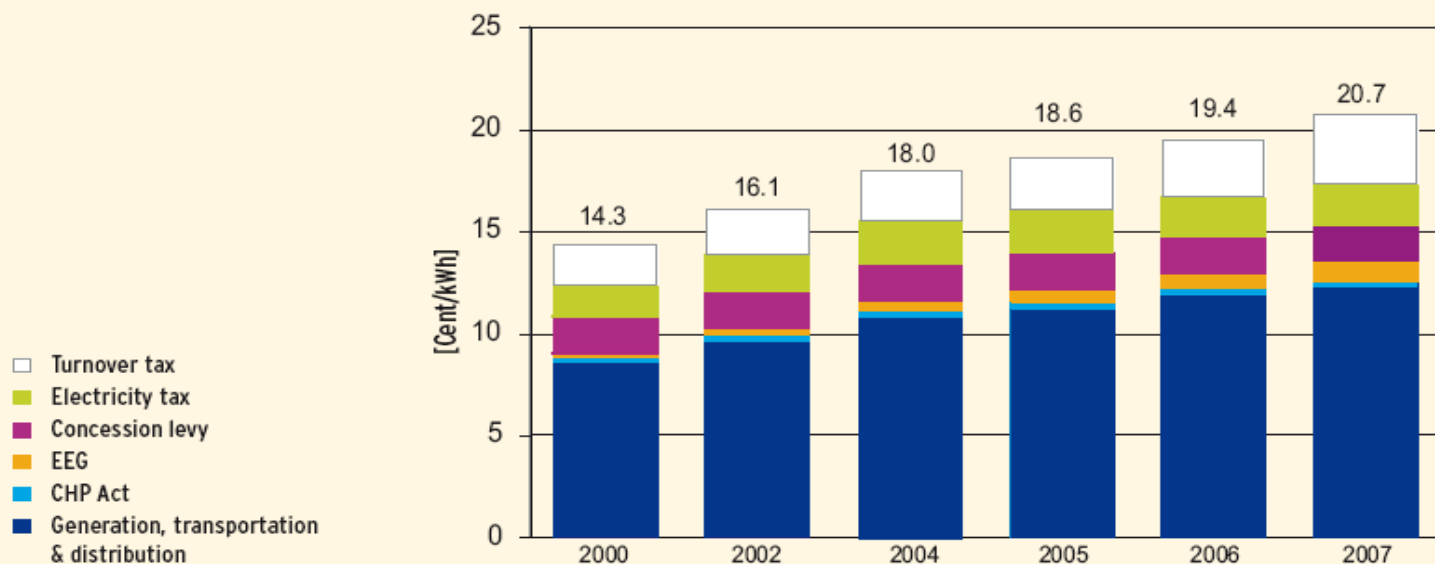
## Overview: Costs and Benefits of the Renewable Energy Law in Germany (EEG)

	2007	2010	2015	2020
<b>Costs of EEG</b> (Differential costs)	4.3 bn Euro	6.3 bn Euro	7.1 bn Euro	5.9 bn Euro
<b>EEG-Share in the Cost</b>	1 cent/kWh	1.5 cent/kWh	1.7 cent/kWh	1.5 cent/kWh
<b>Costs for Households</b> (3500 kWh/ year)	3 Euro/month	4.4 Euro/month	5 Euro/month	4.5 Euro/month
<b>Avoided external costs</b>	4.3 bn Euro	N/A	N/A	> 10 bn Euro

Source: German Environment Ministry (BMU), Umweltwirtschaftsbericht 2009



## Cost shares for one kilowatt hour (kWh) of electricity for household customers in Germany



Turnover tax	2.0	2.2	2.5	2.6	2.7	3.3
Electricity tax	1.5	1.8	2.0	2.0	2.0	2.0
Concession levy	1.8	1.8	1.8	1.8	1.8	1.8
EEG	0.2	0.3	0.5	0.6	0.8	1.0
CHP Act	0.2	0.3	0.3	0.3	0.3	0.3
Generation, transportation & distribution	8.6	9.7	10.8	11.2	11.8	12.2
<b>Total</b>	<b>14.3</b>	<b>16.1</b>	<b>18.0</b>	<b>18.6</b>	<b>19.4</b>	<b>20.7</b>

EEG Renewable Energy Sources Act

CHP Act Combined Heat and Power (Cogeneration) Act

Source: BMU publication „Renewable energy sources in figures - national and international development“, Status: June 2008



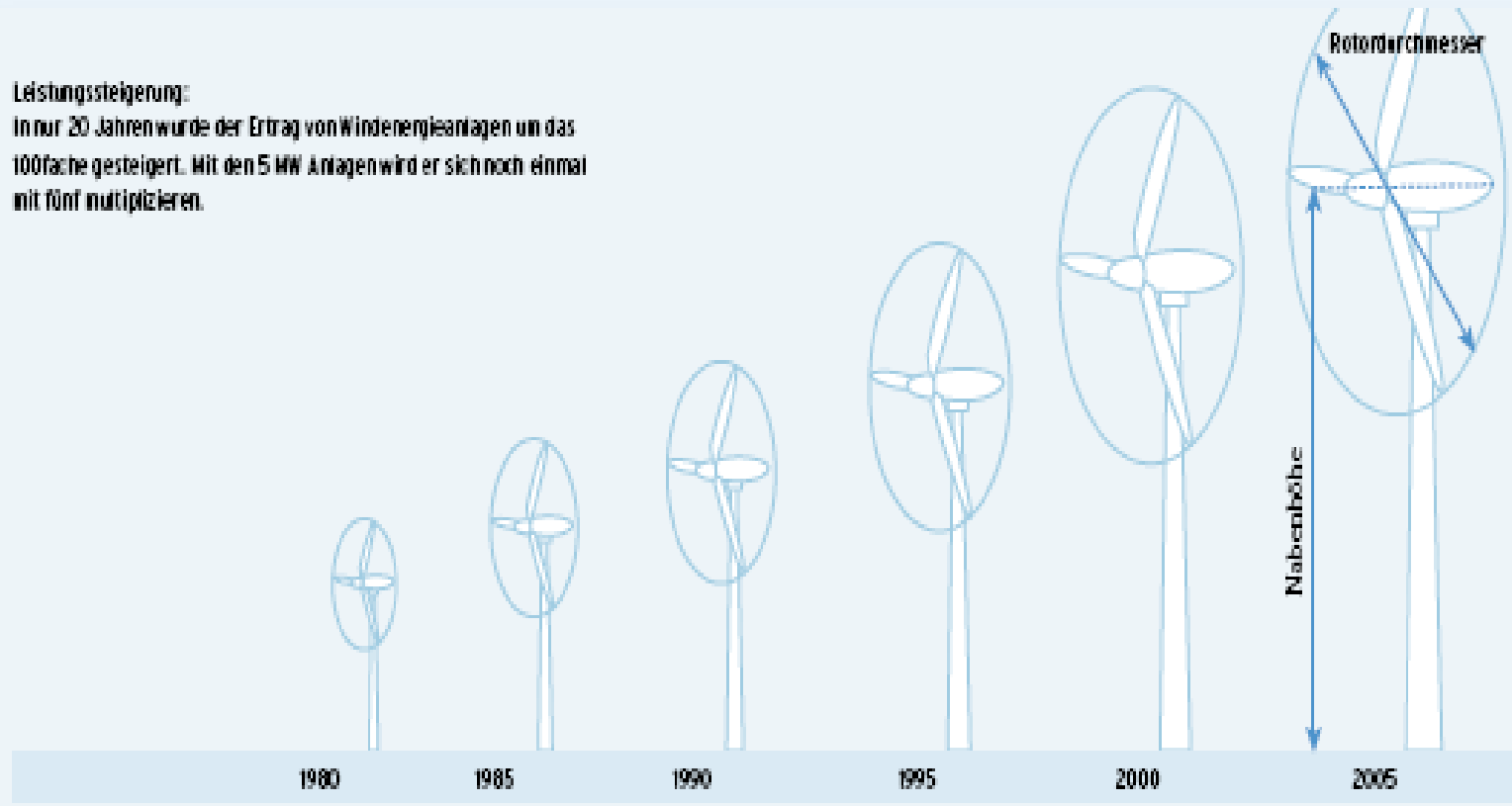
# Renewable Energy Sources Act

- » **Reliability:** Long term planning security for investors
- » **Innovation:** Technology-specific incentives create „lead markets“
- » **Flexibility:** Adapts to technological and market development



# Capacity increase of wind turbines since 1980

Leistungssteigerung:  
In nur 20 Jahren wurde der Ertrag von Windenergieanlagen um das 100fache gesteigert. Mit den 5 MW Anlagen wird er sich noch einmal mit fünf multiplizieren.

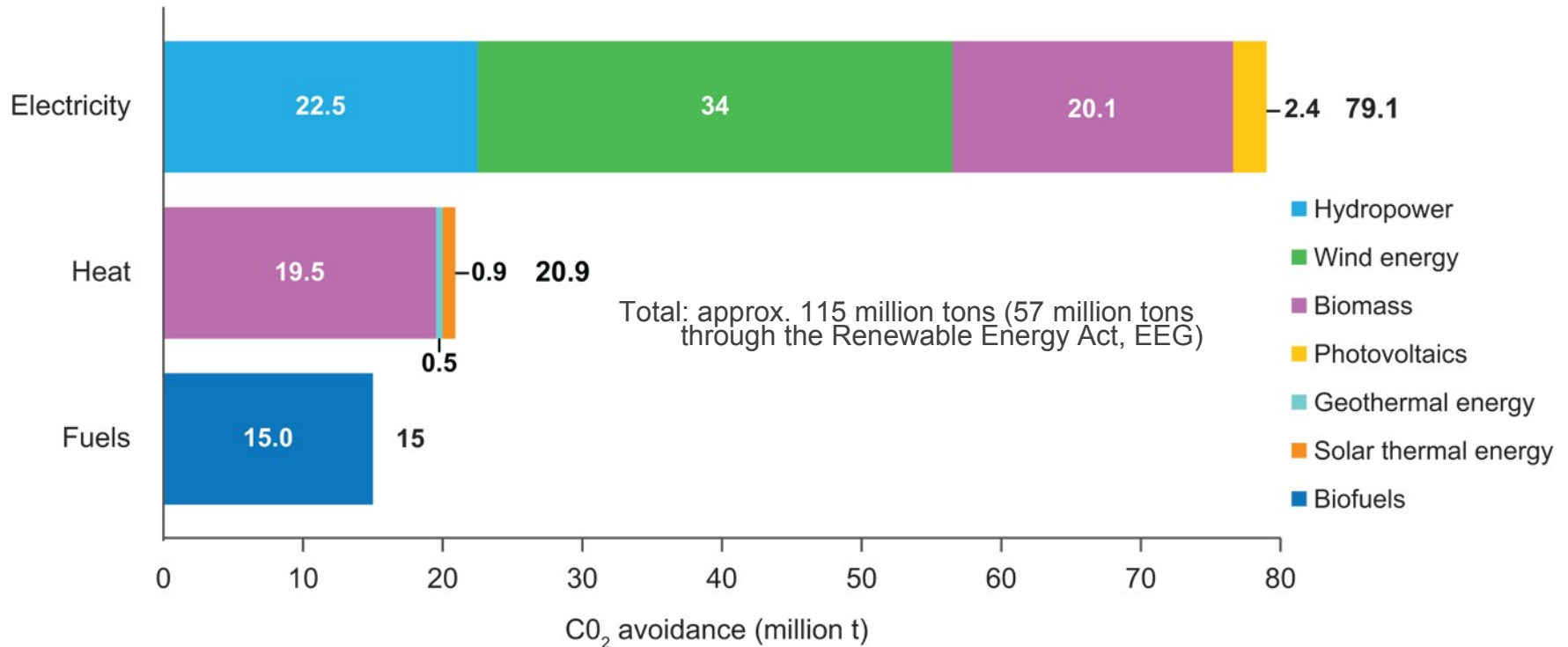


Nennleistung:	30 kW	80 kW	250 kW	600 kW	1500 kW	5.000 kW
Rotordurchmesser:	15 m	20 m	30 m	46 m	70 m	115 m
Nabenhöhe:	30 m	40 m	50 m	78 m	100 m	120 m
Jahresenergieertrag:	35.000 kW/h	95.000 kW/h	400.000 kW/h	1.250.000 kW/h	3.500.000 kW/h	17.000.000 kW/h



# Germany's reliance on renewable energy has reduced greenhouse gas emissions

## Total CO<sub>2</sub> avoidance via the use of renewable energy sources in Germany 2007

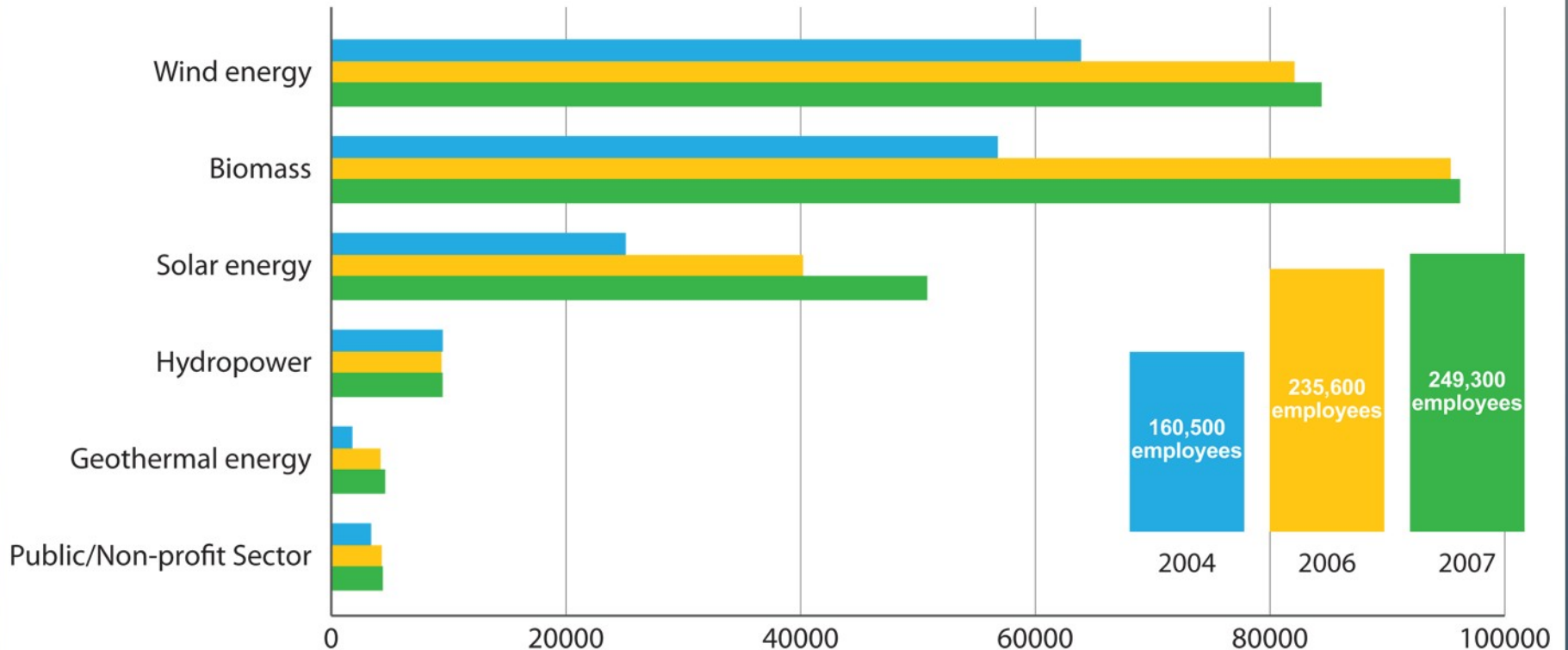


Source: BMU according to Working Group on Renewable Energies/Statistics (AGEE-Stat)



## And created jobs

### Employees in the German renewable energy sector 2004, 2006, 2007



Source: BMU-Projekt "Kurz- und langfristige Auswirkungen des Ausbaus der erneuerbaren Energien auf den deutschen Arbeitsmarkt ,March 2008"



# The Establishment of an International Agency for Renewable Energy, IRENA Founding Conference on January 26, Bonn, Germany

IRENA can include developing countries and involve them in the climate negotiation process

Positive response from developing and emerging economies and demand for an international renewable energy agency

The U.S. which also supports the development and dissemination of renewable energy technology, is welcome to join the initiative in the near future.



THANK YOU!

More information at:

[www.bmu.de](http://www.bmu.de)

[www.feed-in-cooperation.de](http://www.feed-in-cooperation.de)

[www.erneuerbare.de](http://www.erneuerbare.de)

[www.irena.org](http://www.irena.org)

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