Energy Transition in Germany - Power to the people!　ドイツのエネルギー転換

Global Conference for a Nuclear Free World　　*パワー・トゥ・ザ・ピープル！*

Tokyo, 16.12. 2012　　*トーマス・ブリュアー　グリーンピース*

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Success criteria – “Power to the people” *Feed In Tariff System*

成功の条件　―　パワー・トゥ・ザ・ピープル
固定価格買い取り制度

- ✓ Guaranteed rates for feeding in renewable energy, specific rates for each technology (for 20 years)

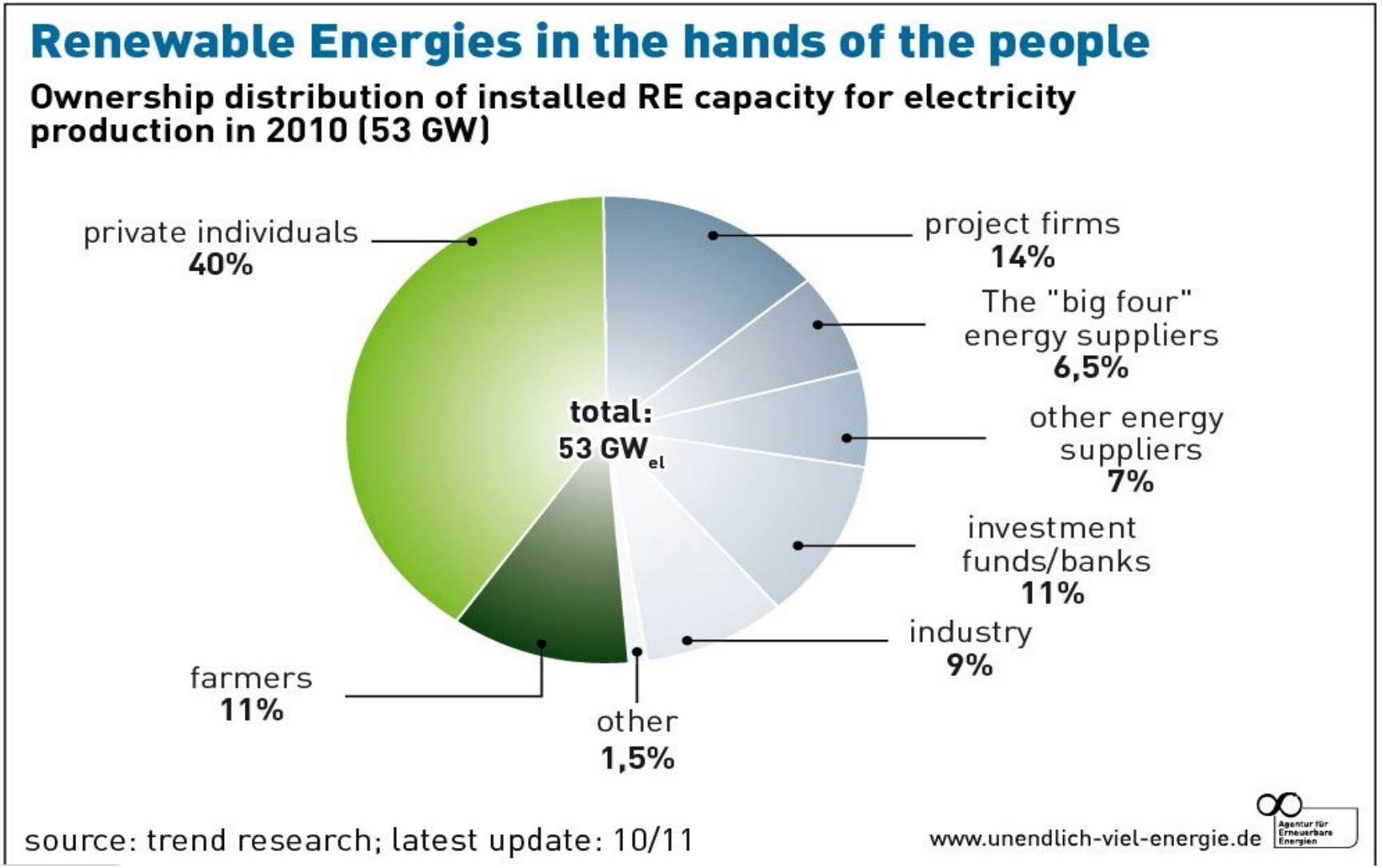
  自然エネルギーの固定価格買い取りを保証(20年間)
- ✓ “Anyone” is allowed to benefit from Feed In Tariff (e.g. private Individuals, Farmers, Energy Cooperatives, Utilities)

  “誰も”が、固定価格買い取り制度から利益を享受（個人、産業界、農家、電力共同組合／市民電力、電力会社など）
- ✓ Priority access to the grid for renewable power generators

  自然エネルギーの優先接続
- ✓ No cap on size and amount (PV since 2012: 52 GW)

  容量への上限なし （太陽光発電　2012年より：52GW）
- ✓ Costs incurred by consumers through the electricity price

  電力料金を通して、消費者がコストを負担



自然エネルギーは市民のもの

2010年に導入された自然エネルギー発電設備（53GW)の所有者内訳—— 40%が個人

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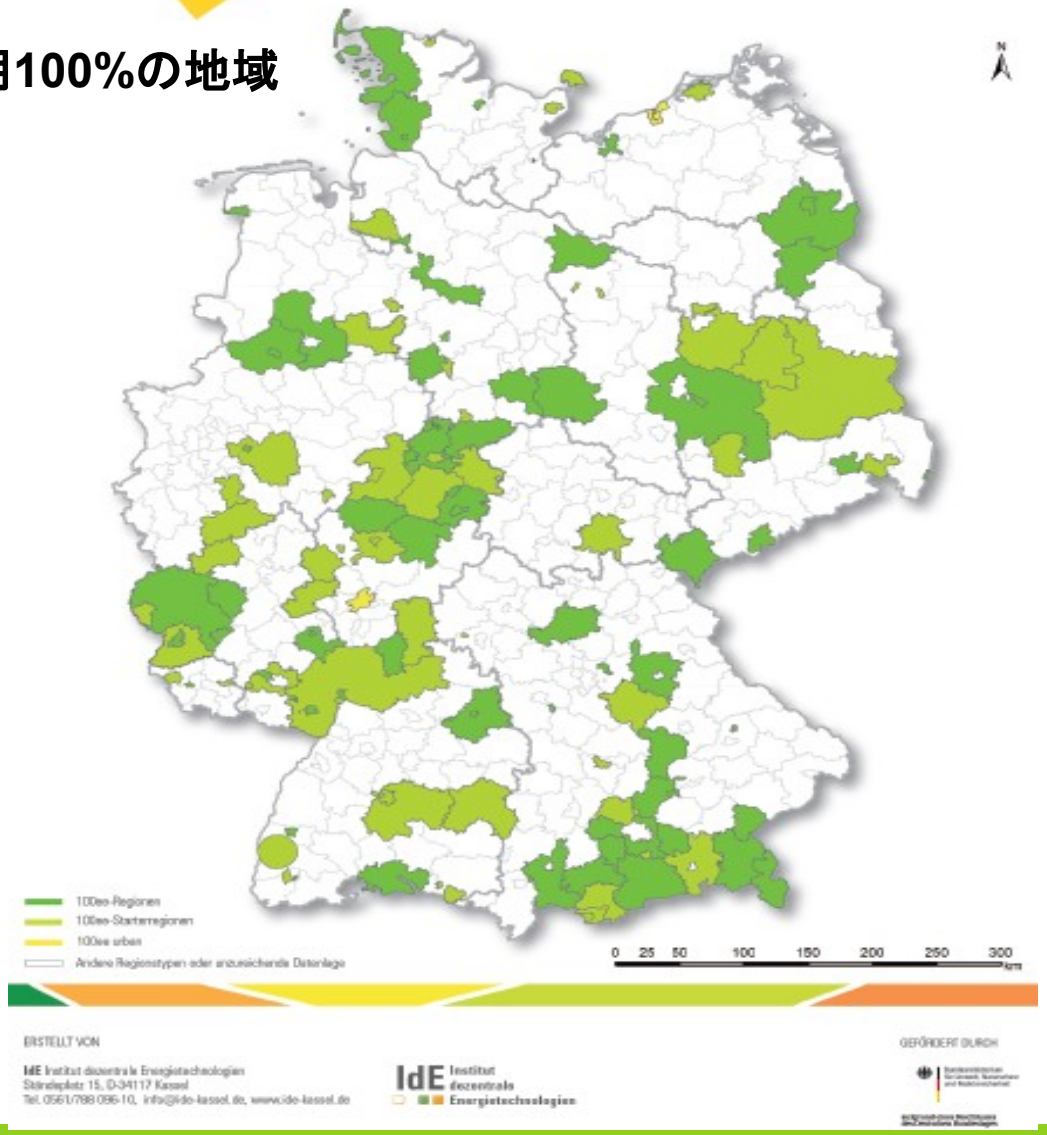
自然エネルギー利用100%の地域



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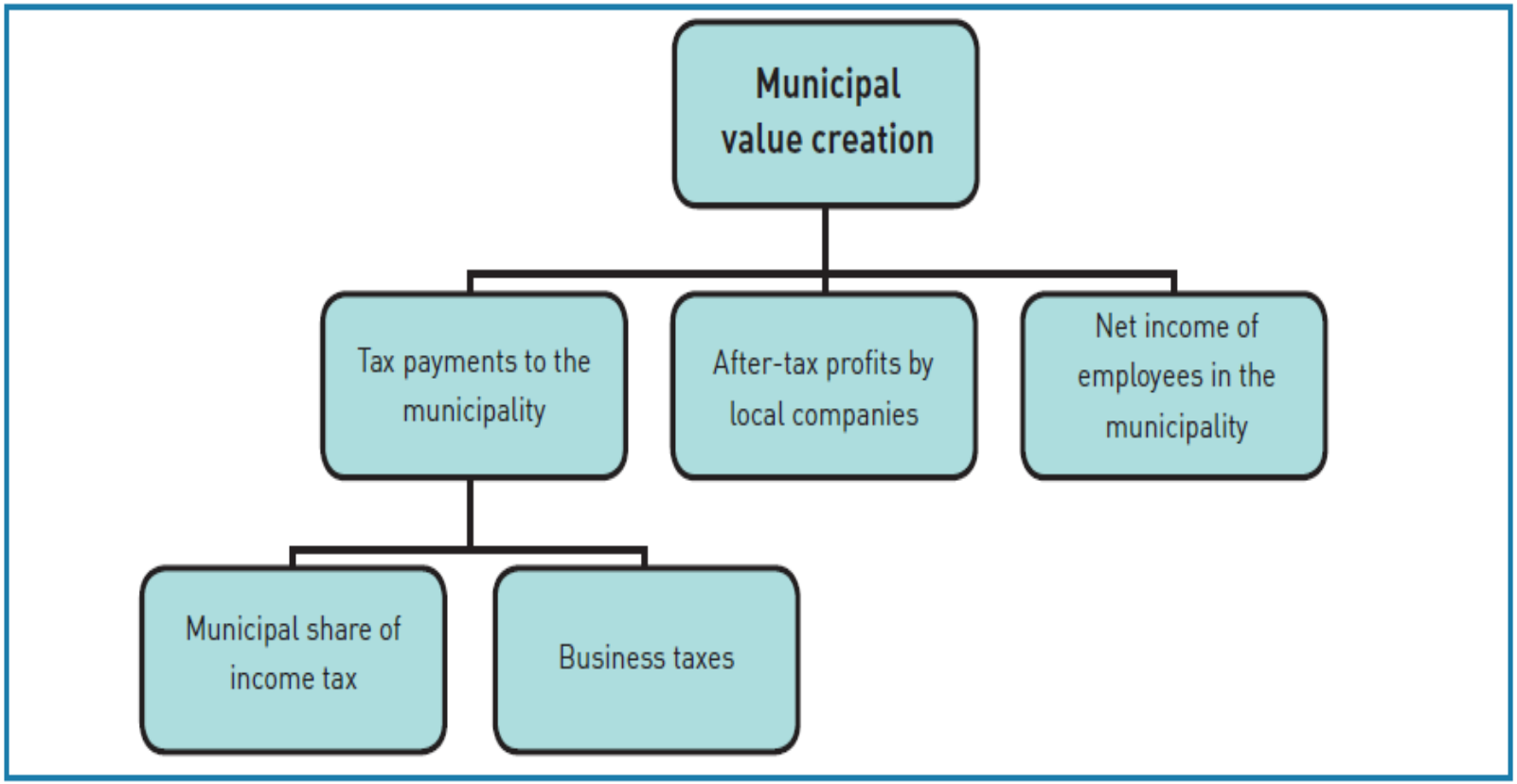
The value creation effects of renewable energies in municipalities



Source: IÖW

地方自治体における自然エネルギーによる複合的な利益

・税収　・地方企業による課税後の利益　・雇用
・所得税の地方自治体分　・法人税

地方自治体における自然エネルギーからの利益、2009～2011

Municipal value creation from renewable energies, 2009 – 2011

Wertschöpfungskette	2009	2010	2011
Wind energy 風力	€2,050 million	€2,241 million	€2,246 million
Photovoltaics 太陽光	€2,445 million	€5,764 million	€3,882 million
Small hydroelectric plant 小水力	€30 million	€129 million	€76 million
Biogas バイオガス	€557 million	€584 million	€673 million
Biomass (wood) バイオマス（木質）	€537 million	€563 million	€675 million
Geothermal heat pumps 地熱	€253 million	€282 million	€305 million
Solar thermal energy 太陽熱	€354 million	€224 million	€347 million
Biofuels バイオ燃料	€557 million	€747 million	€745 million
Total 合計	**€6,785 million**	**€10,533 million**	**€8,948 million**
... of which taxes to the municipality 自治体へ	€624 million	€904 million	€841 million
... of which corporate profits 企業へ	€2,878 million	€3,743 million	€3,795 million
... of which income through employment 雇用	€3,283 million	€5,887 million	€4,311 million

Source: AG Energiebilanzen

Phase out nuclear energy & jobs

原発廃止と雇用

- 8.000 direct jobs in NPP, 30.000 indirect jobs (research, construction, supplier)
  原子力発電所での直接的な雇用：8,000、間接的（研究、建設、メーカー）：30,000
- Decommissioning retains jobs for some time
  廃炉には時間がかかる
- New jobs in the Renewable Industry: + 220.000 since 2004
  自然エネルギー産業での新規雇用：220,000人以上（ 2004年～）

- Accompanied measures　付随する対策
  - Transition policy / Industrial development　転換期政策/産業開発
  - Re-education programs　再教育プログラム
  - Majority of universities students in Germany study today renewable energy technologies and not nuclear power
    ドイツ大学生の多くが自然エネルギーを研究、原子力は少数派

ドイツ自然エネルギー産業の雇用

風力

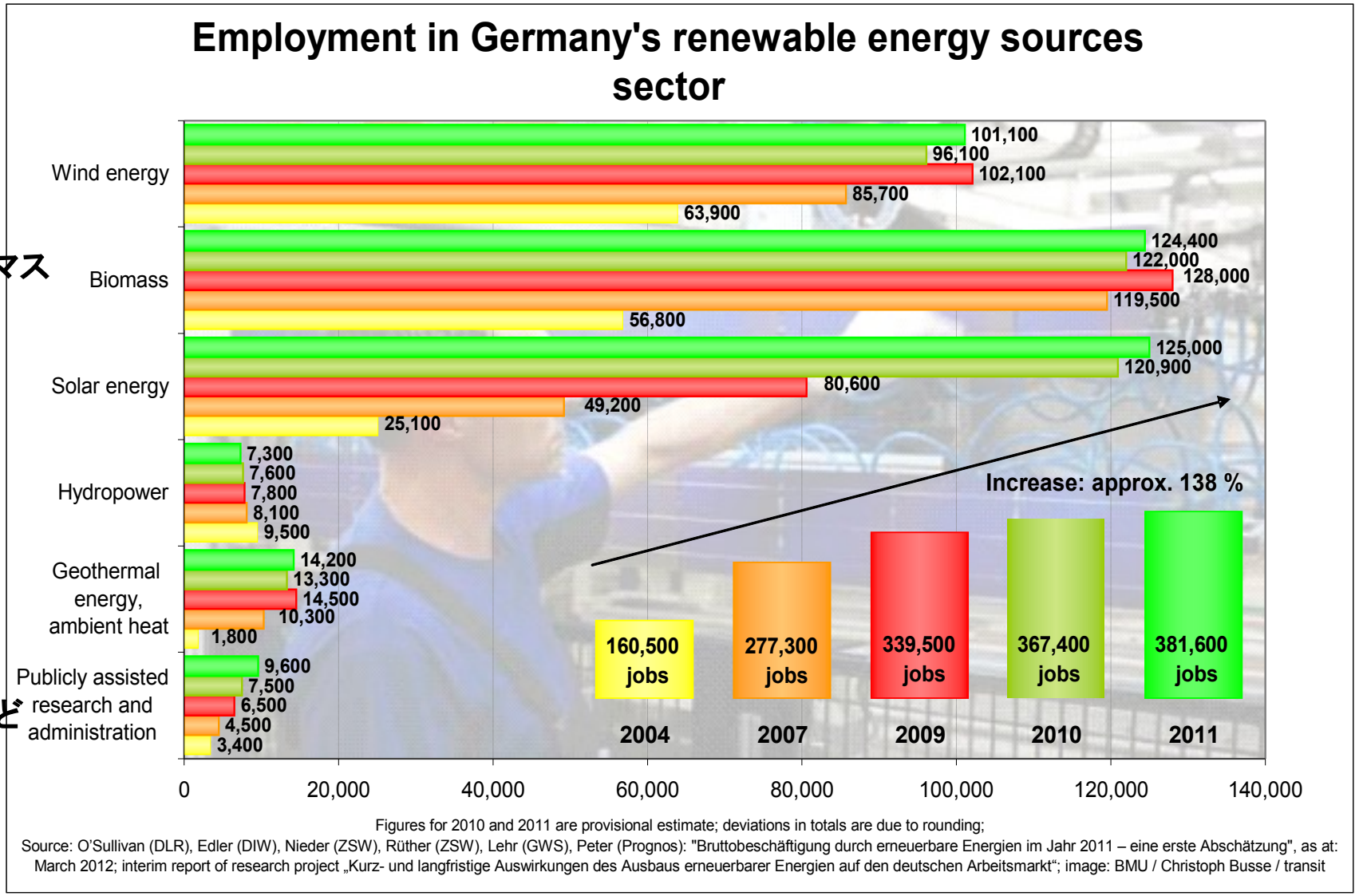
バイオマス

太陽

水力

地熱

研究など



Figures for 2010 and 2011 are provisional estimate; deviations in totals are due to rounding;
Source: O'Sullivan (DLR), Edler (DIW), Nieder (ZSW), Rüther (ZSW), Lehr (GWS), Peter (Prognos): "Bruttobeschäftigung durch erneuerbare Energien im Jahr 2011 – eine erste Abschätzung", as at: March 2012; interim report of research project „Kurz- und langfristige Auswirkungen des Ausbaus erneuerbarer Energien auf den deutschen Arbeitsmarkt"; image: BMU / Christoph Busse / transit

Conclusion
結論

- The energy transition in Germany started with the anti-nuclear movement in the seventies and entered effective government policy in 2000
  ドイツのエネルギー転換は、1970年代の反核運動から始まり、2000年に政府の政策となった。
- nuclear phase out and renewable development are strongly linked
  原発の段階的廃止と自然エネルギーの発展に、強い関連性
- The Feed In Tariff system brings “Power to the people” and is the most important “driver” of the Energy Transition
  固定価格買い取り制度は「パワー・トゥ・ザ・ピープル」（市民が電力を取り戻す）を可能にし、エネルギー転換に最も重要な役割を果たす
- renewable energies have a positive economic impact and are strongly supported by federal states / communities
  自然エネルギーは経済に前向きな影響をもたらし、地域の行政やコミュニティに強く支持されている。

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Dankeschön!
ARIGATO!

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BACK UP SLIDES

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Energy by the People

- 600 Energy cooperatives with 80.000 members
- 74x “100percent renewable energy region”, 52x “100percent starter region” = regions represent 20 Mio. People
- 93percent of German citizens support “intensified energy transition”

Historical Overview

2000 **First chapter** (social democrat-green coalition)

- nuclear phase out contract
- renewable energy act

2005 **Confirmation of phase out path** (conservative-social democrat coalition)

2010 **Life-time extension for nuclear pp** (conservative-liberal coalition)

- life-time extension for nuclear power plants (+12 years)
- energy concept 2050/long-term targets on renewables and co2

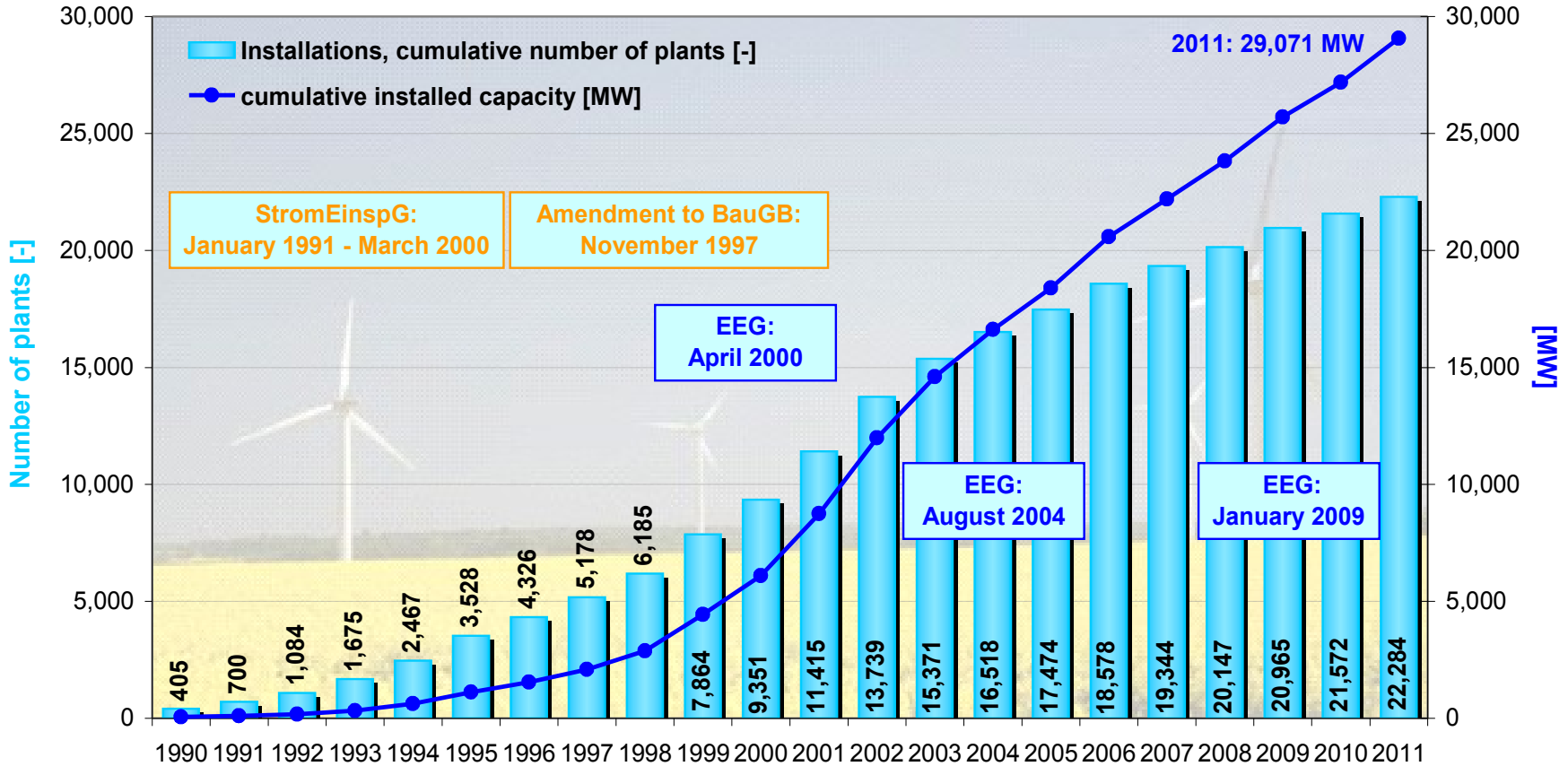
2011 **Second chapter** (conservative-liberal coalition)

- final report ethics commission
- phase out decision by government and parliament

Main decisions in 2011

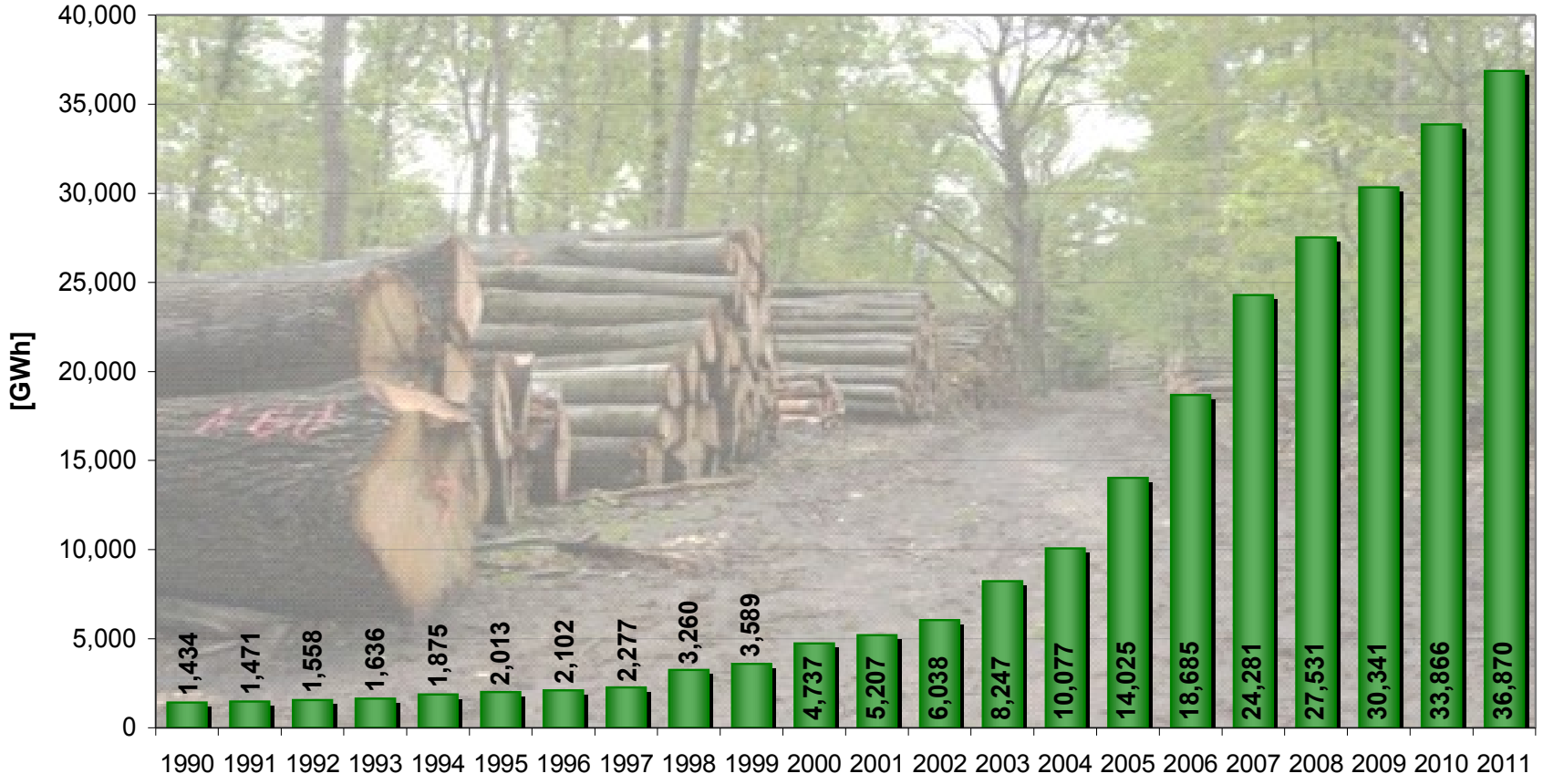
- ✓ Nuclear energy phase-out until 2022
- ✓ Shutdown oldest 7 NPP + NPP Krümmel
- ✓ Confirmation of CO_2-targets -40% till 2020, 80-95% till 2050
- ✓ Confirmation of Renewable electricity targets 35% in 2020 and 80% share in 2050
- ✓ Grid extension initiative

Development of the number and installed capacity of wind energy plants in Germany



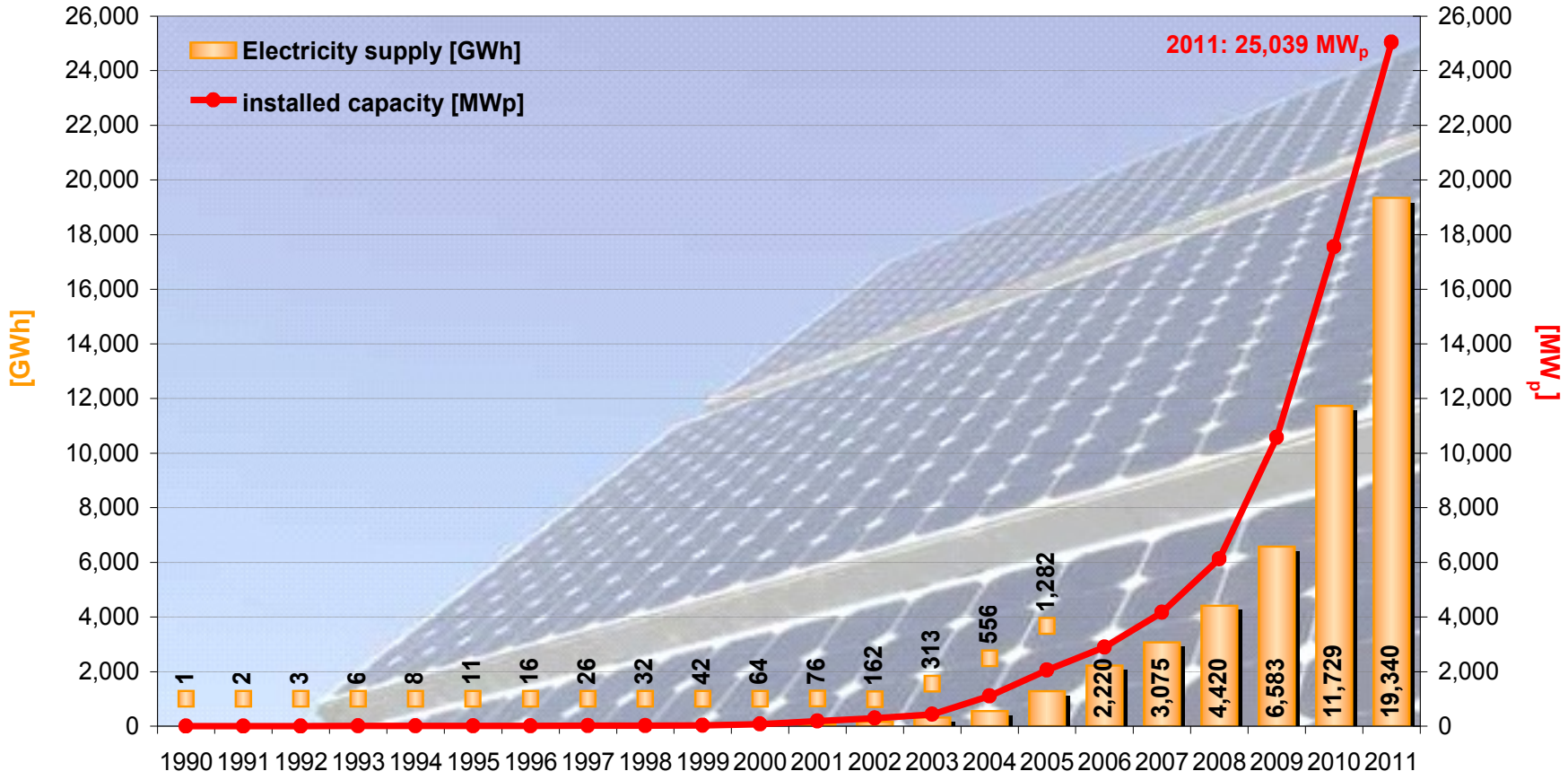
Sources: C. Ender, J.P. Molly, website Deutsches Windenergie-Institut (DEWI) and DEWI-Magazin No. 40, pp 30-42:"Wind energy use in Germany, as at 31.12.2011";
1 MW = 1 Mill. Watt; StromEinspG: Act on the Sale of Electricity to the Grid; BauGB: Construction Code; EEG: Renewable Energy Sources Act; image: BMU / Brigitte Hiss; all figures provisional

Development of biomass * use for electricity supply in Germany



* Solid and liquid biomass, biogas, sewage and landfill gas; 1 GWh = 1 Mill. kWh;
Source: BMU-KI III 1 according to Working Group on Renewable Energy-Statistics (AGEE-Stat); image: BMU / Brigitte Hiss; as at: July 2012; all figures provisional

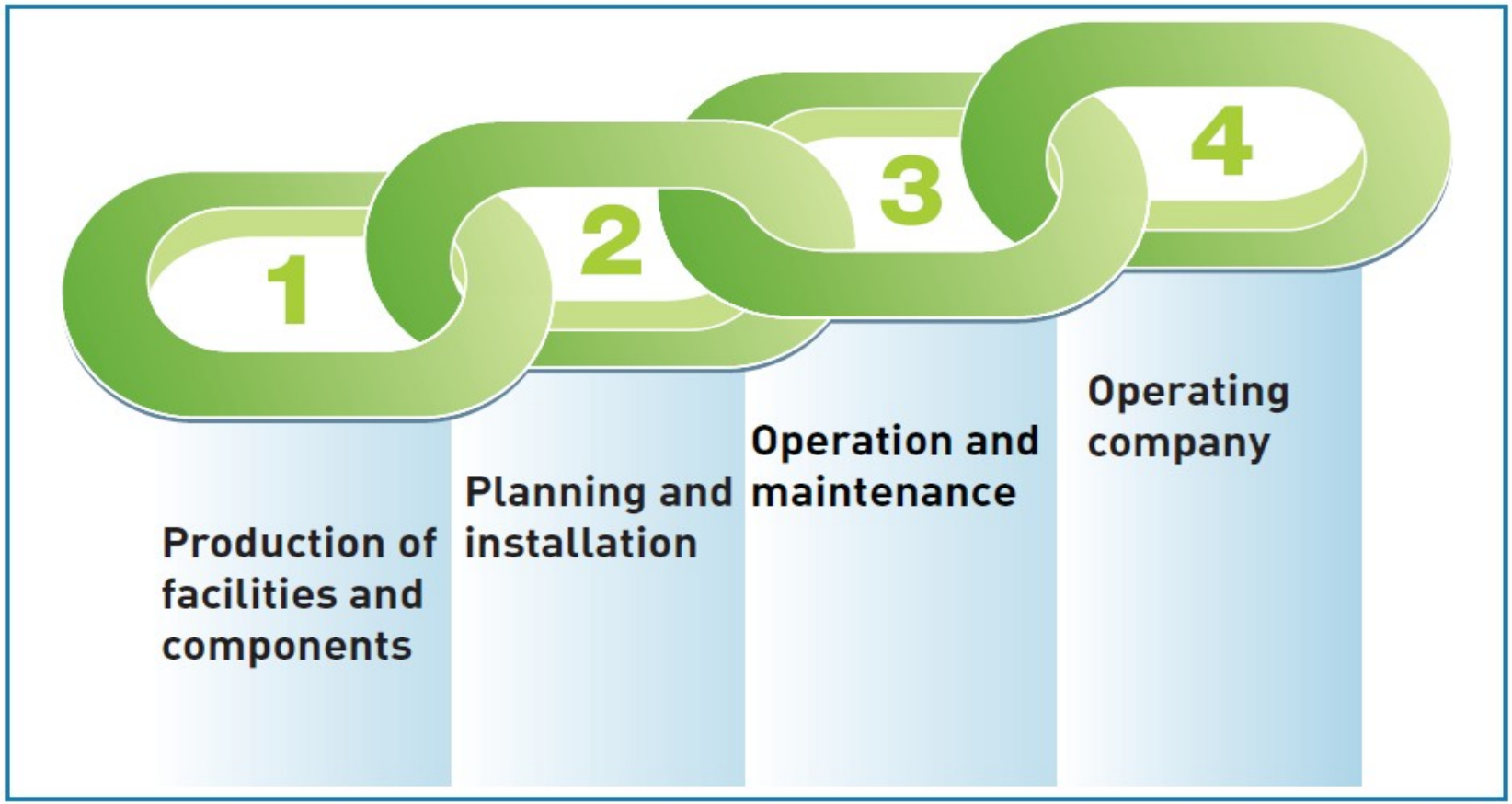
Installed capacity and energy supply from photovoltaic installations in Germany



Source: BMU-KI III 1 according to Working Group on Renewable Energy-Statistics (AGEE-Stat);
1 GWh = 1 Mill. kWh; 1 MW = 1 Mill. Watt; image: BMU / Bernd Müller; as at: July 2012; all figures provisional

What Are Value Creation Stages?

The renewable energies value creation chain



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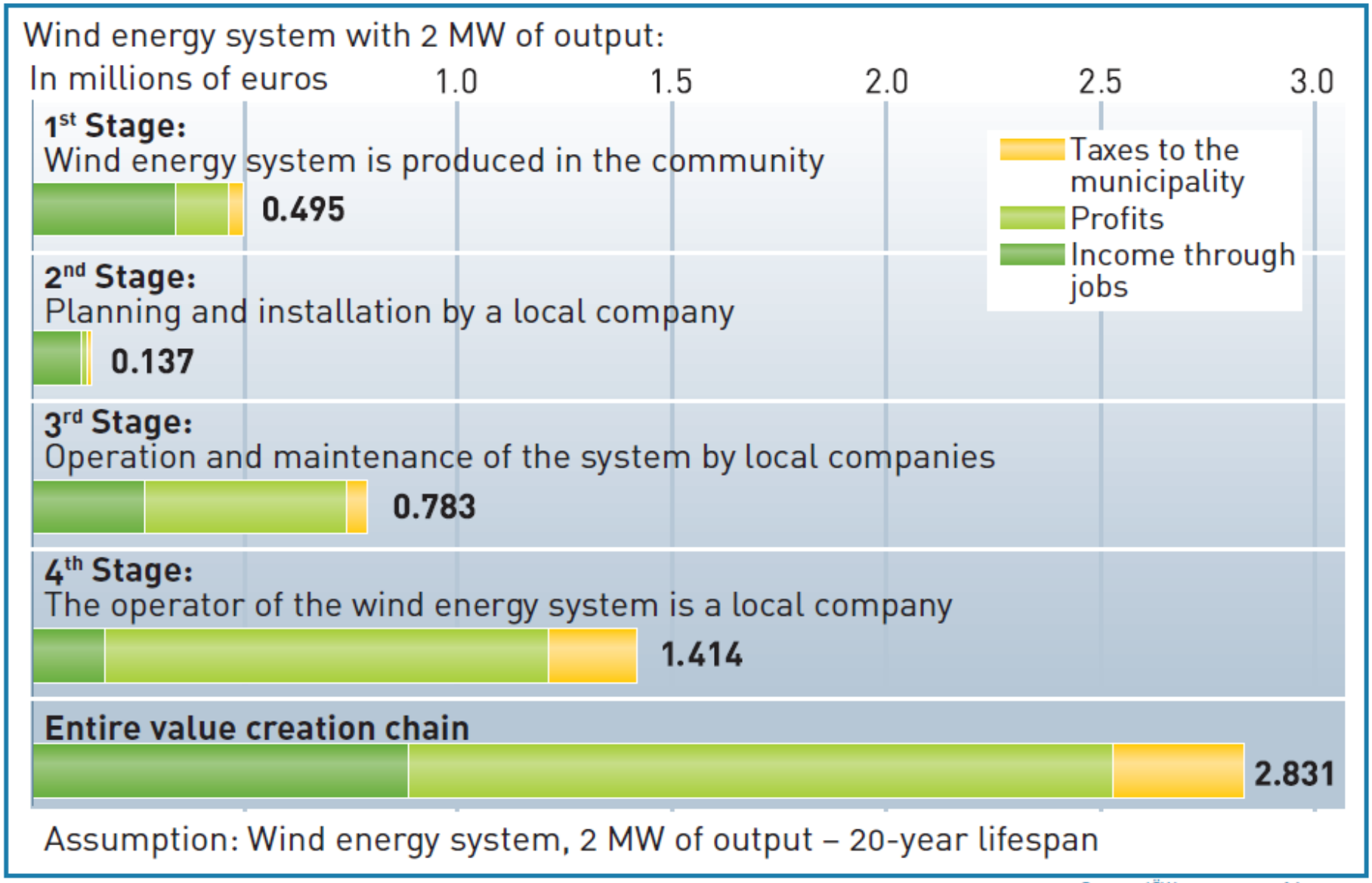
A complete value creation chain means more profit for the community

The more stages of the broadly diversified value creation chain are located in a community, the more income, profits and taxes will be generated.



Source: IÖW, current as of Aug. 2010

Tax payments to a municipality for a 2 MW wind energy system

Value creation stages	Business tax		Municipal share of income tax		Total (20 years)
	euros / year	euros / 20 years	euros / year	euros / 20 years	
... if system is manufactured in the community	€19,700*	€19,700	€18,740*	€18,740	**€38,440**
... if planning and installation are provided by local companies	€2,820*	€2,820	€5,320*	€5,320	**€8,140**
...if system operation and maintenance are provided by local community	€1,360	€27,200	€1,060	€21,200	**€48,400**
... if the operator is locally resident (30% of business tax yield to the municipality where the operator has its office, 70% for the municipality of the system site)	€8,440	€168,800	€2,160	€43,200	**€212,000**
... if the operator is not locally resident (70% for the municipality of the system site)	€5,920	€118,400			**€118,400**
Total (with only 70% of business tax yield)	€29,800	€168,120			**€256,580**
Total (with 30+70% of business tax yield)	**€32,320**	**€218,520**	**€27,280**	**€88,460**	**€306,980**

Source: IÖW

*One-time tax payment in the year of system installation

Decommissioning I

Nuclear Power Plant Obrigheim

Closed: May 2005	decommissioning phase 2008 till 2020
Workforce 2002:	249 jobs
Workforce 2011:	325 jobs (180 EnBW and 145 third parties)

Nuclear Power Plant Gundremmingen A

Closed: January 1977	decommissioning phase 1983 till 2005
workforce 1999:	450 jobs

Nuclear Power Plants Gundremmingen B and C

Workforce 2008:	771 jobs

Decommissioning II

Nuclear Power Plant Stade

Closed: Nov. 2003	decommissioning phase 2004 till 2014
Workforce 2002:	300 jobs
Workforce 2008:	450 jobs
Workforce 2010:	345 jobs (125 E.ON and 220 third parties)

Nuclear Power Plant Würgassen

Closed: 1997	decommissioning phase 1997 till 2014
workforce 1997:	roughly 500 jobs
Workforce 2011:	474 jobs (128 E.ON and 346 third parties)

External Costs of nuclear power in Germany or the myth about cheap nuclear energy!

Governmental subsidies and advantages for nuclear energy from 1950 till 2010 in Germany:

Direct finacial aid:	82.4 bn EUR
Tax advantages:	112.5 bn EUR
Emission trading:	8.7 bn EUR
Market structure (no competition):	35.7 bn EUR
Total:	**239.3 bn EUR**
Further expected till 2022:	110.3 bn EUR

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Net profit from renewables for the German economy in 2011

	bn EUR	
extra costs for renewable energy	-13,5	
Saved energy imports	6.0	
Merit order effect	4.6	
Avoided external costs for fossil fuels	10.1	
value creation in municipalities	8.9	

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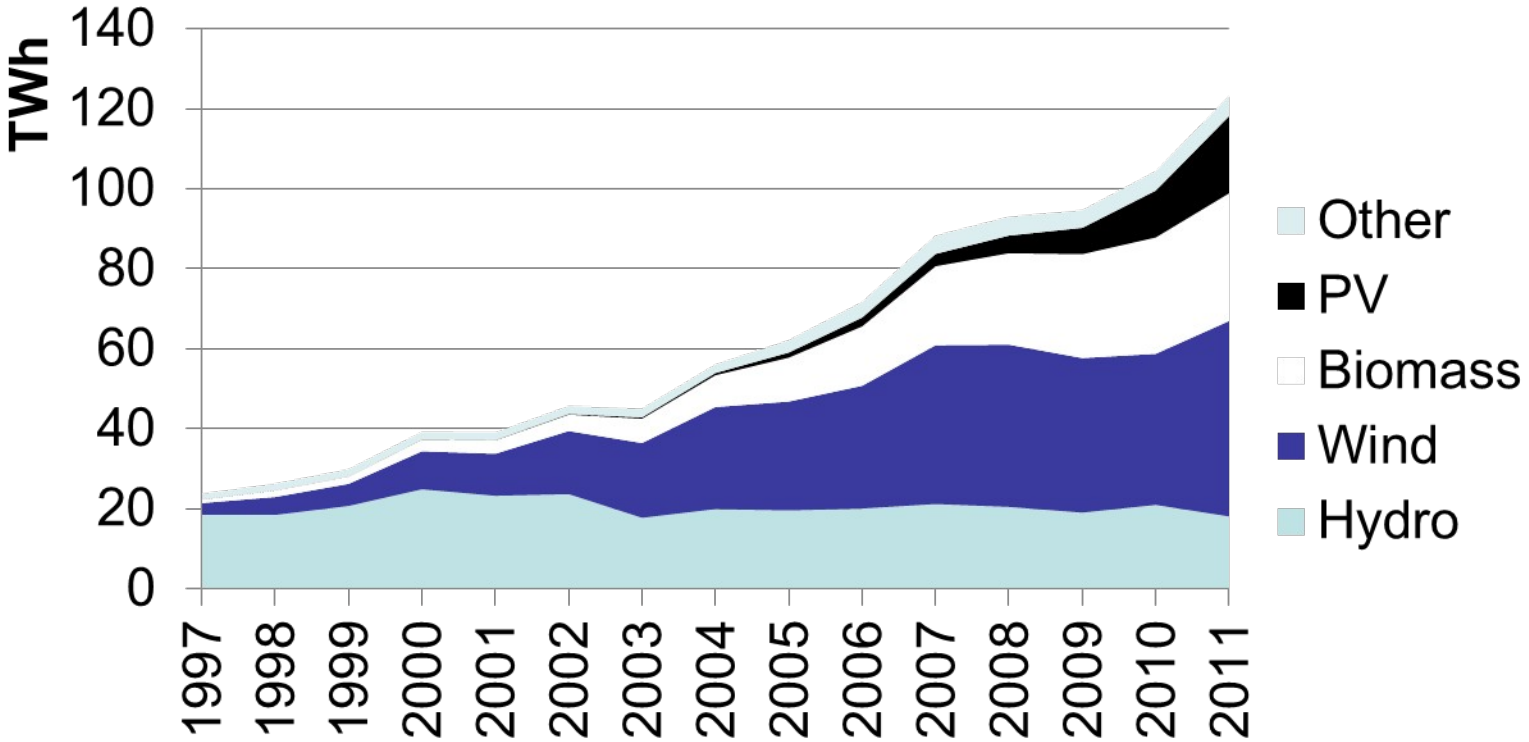
Renewable power generation in Germany



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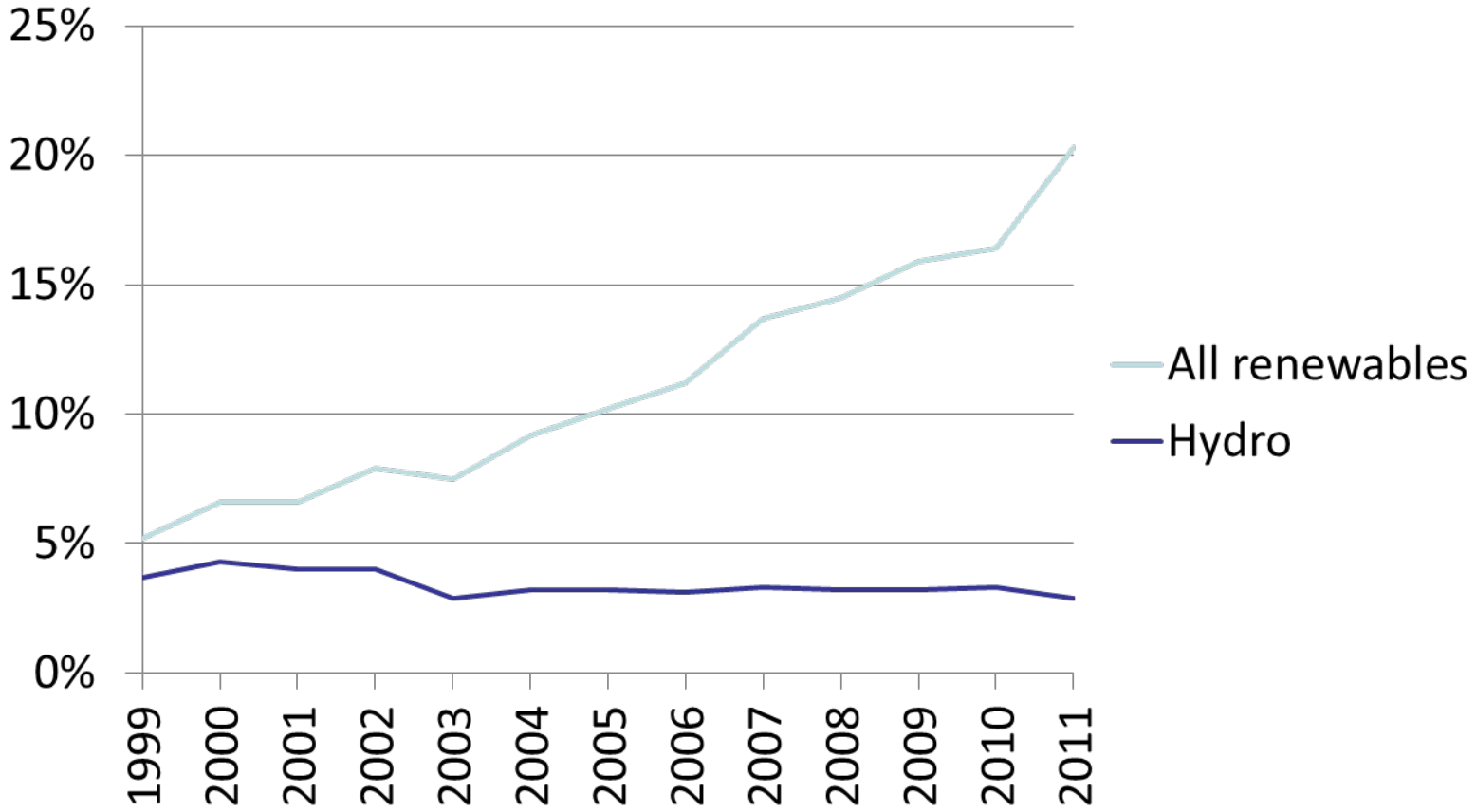
Renewable energy share of German power generation



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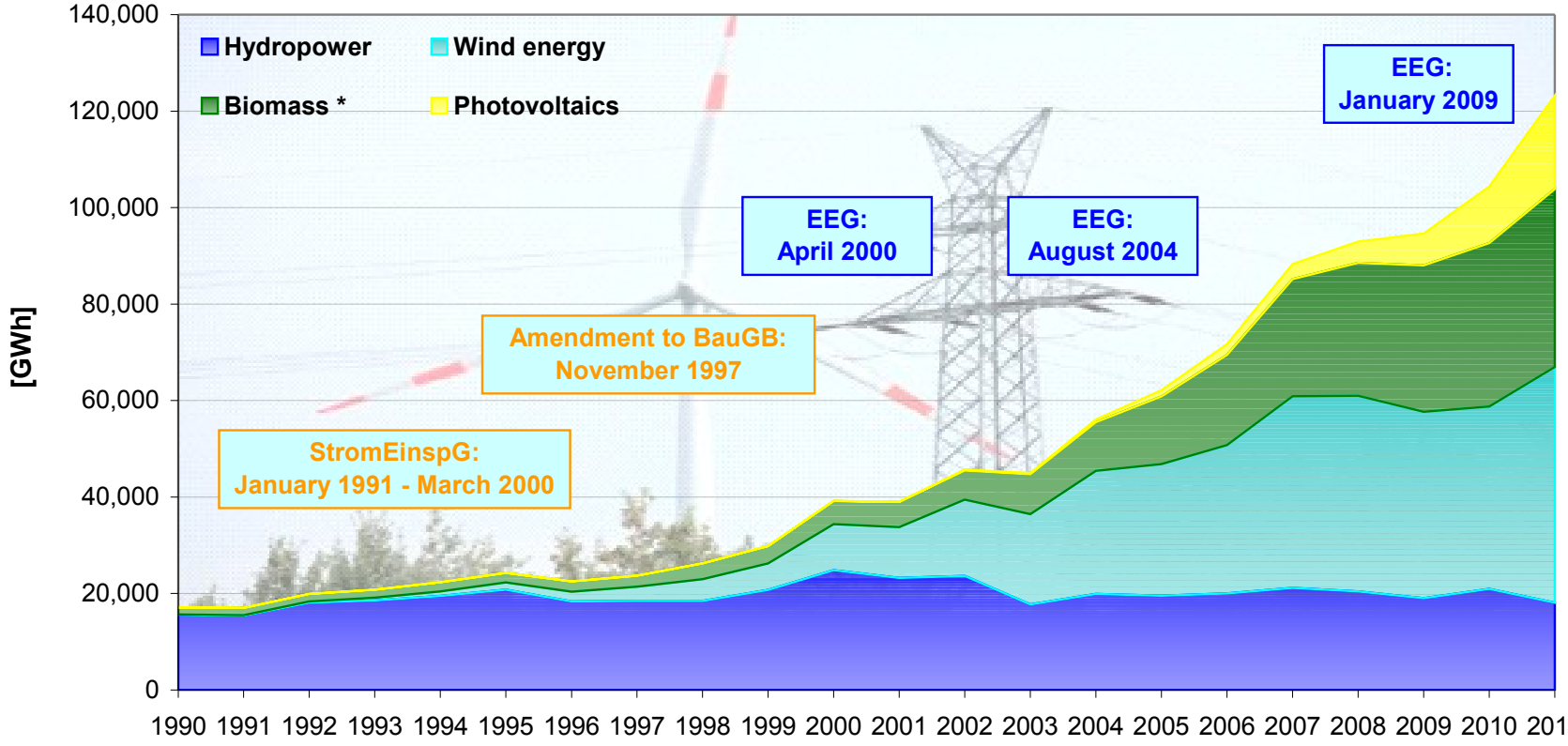
Development of renewables-based electricity generation in Germany since 1990



* Solid and liquid biomass, biogas, sewage and landfill gas, biogenic fraction of waste; electricity from geothermal energy not presented due to negligible quantities produced; 1 GWh = 1 Mill. kWh;
StromEinspG: Act on the Sale of Electricity to the Grid; BauGB: Construction Code; EEG: Renewable Energy Sources Act;
Source: BMU-KI III 1 according to Working Group on Renewable Energy-Statistics (AGEE-Stat); image: BMU / Christoph Edelhoff; as at: July 2012; all figures provisional

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