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The way forward

Policy and Development of Renewable Energies in Germany

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Federal Ministry for the Environment,
Nature Conservation and Nuclear Safety

Damascus, 21 June 2007

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Key factors for the future:
EU > 30% / 20% / 20%
by 2020

- **Climate change**:
  limit temperature increase to 2°C:
  >-30% GHG emissions (at least -20% GHG)
- **Energy security**: reduce import dependence
- **Competitiveness**: innovative industries
  > 20 % Renewable Energy (2005: 6.5 %)
  > Saving 20% of EU's energy consumption

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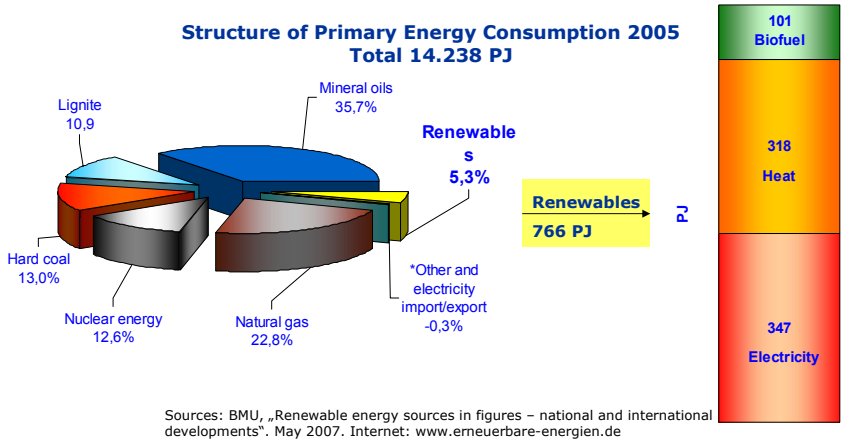
Primary Energy Consumption (2006)



Sources: BMU, „Renewable energy sources in figures – national and international developments". May 2007. Internet: www.erneuerbare-energien.de

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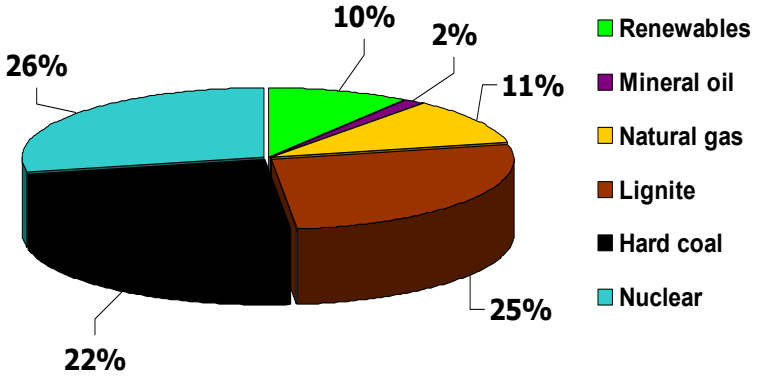
Electricity generation (2005)



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Objectives for Energy Policy

- **Energy Efficiency**
  - Efficient use of fossil energy (gas power plants, CHP)
  - Less losses (Grid)
  - More efficient devices
  - Isolation, transport
- **Renewable Energies**
  - Electricity
  - Heat
  - Transport
- **Energy Saving**

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German Targets for RE

- **Primary energy supply**
  2010: 4.2 % (2000: 2.1%; 2006: 5.3%)
  2020: 16.0 % and up to 50% by 2050
- **Electricity**
  2010: 12.5 % (2000: 6.2%; 2006: 11.8%)
  2020: 27.0 %
- **Bio fuels**
  2010: 6.75 % (2000: 0.3%; 2006: 4.7%)
  2020: 12.5%
- **Heating/Cooling**
  2020: 14.0% (2000: 3.9%; 2006: 5.9%)

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Instruments in Germany

- Renewable Energy Sources Act (EEG)
  > *Feed-in guarantee*
- Market Incentive Programme
  > *Grants and loans*
- Bio fuels > *Blending obligation/ Quota system*
- Research and Development

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How does the EEG work (I)?

- Priority access for RE to the power grid
- Priority transmission and distribution
- Obligation of grid operators to purchase the electricity produced from RE
- Fixed price ("tariff") for every kilowatt hour produced from RE for 20 years

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How does the EEG work (II)?

- Equalisation of additional costs for electricity from RE between all grid operators and electricity suppliers
- All different types of RE are considered and tariffs are differentiated by source and size of the plant
- Annual decrease due to technical development (degression)

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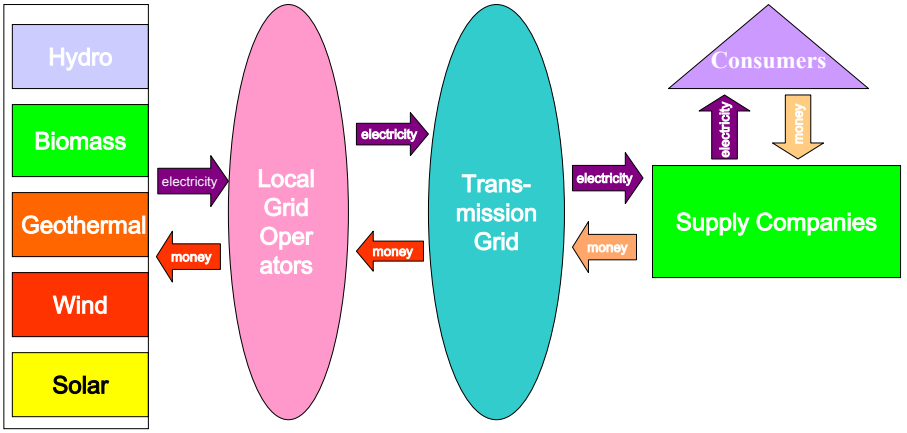
How does the EEG work?



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Feed-in tariffs (2006)

	2006 Cent/kWh	Degression
Hydropower	**6.65 - 9.67**	**0%**
Biomass (<20 MW)	**8.15 – 17.16**	**1.5%**
Geothermal Energy (<20MW)	**7.16 – 15.00**	**1.0%**
Wind energy (onshore)	**5.28 - 8.36**	**2.0%**
Wind energy (offshore)	**6.19 - 9.10**	**2.0%**
Solar energy	**40.60 – 56.80**	**5% - 6.5%**

Sources: BMU. www.erneuerbare-energien.de, Stand: September 2006

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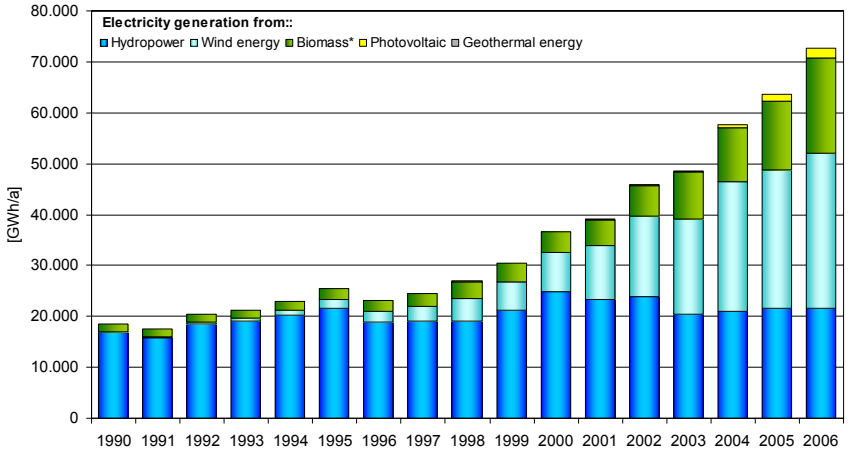
Electricity Generation from RE



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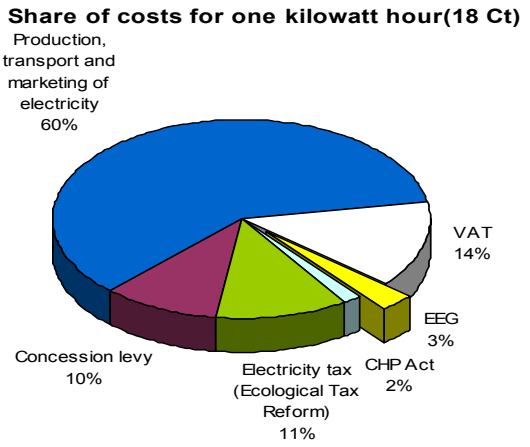
Cost for the Promotion of RE just 3%



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RE Heat Promotion: The Market Incentive Program (MAP)

Supports of 2000-2006:

- conveyances for 2000- 2006: 827 Mio. €
- Investment volumes of the promoted measures: 6,5 Billion €

Balance of 2006:

- conveyances: about 160 Mio. €
- Investment volumes: about 1,6 Billion €

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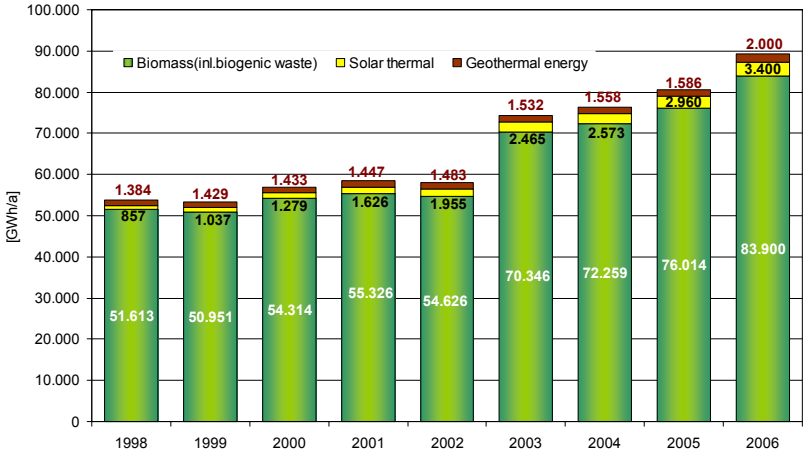
Heat supply from RE



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Outlook 2007

- Program volume 213 Mio. €
- New promotion starting from middle of January 2007
- Innovation bonus for new technologies to the cooling and process heat
- Efficiency bonus planned for 2008

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Biofuels: Fiscal regulations

- Until 31.7.2006 all biofuels were exempted from energy taxation
- High value of energy tax exemption:
  - tax rate on diesel fuel: 47 Ct/l
  - tax rate gasoline: 65 Ct/l
- Driver for change of support system were tax expenditure losses
- System change from 1.1.2007 from price regulation (by tax exemption) to quantity regulation (by quota system)

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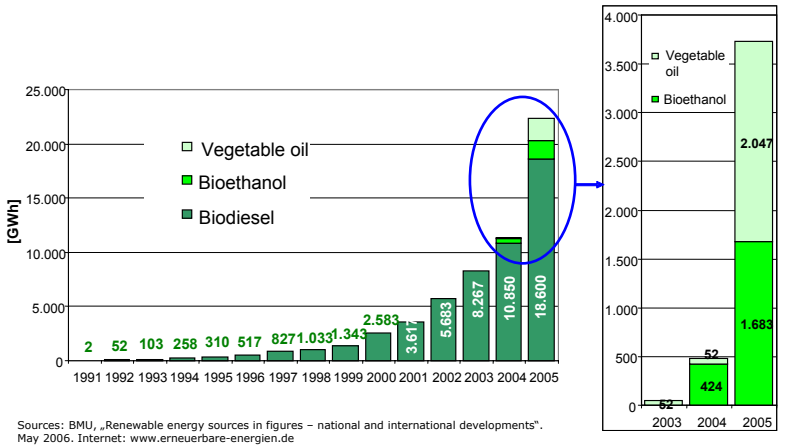
Contribution of RE sources to fuel supply (1991 – 2005)



Sources: BMU, „Renewable energy sources in figures – national and international developments". May 2006. Internet: www.erneuerbare-energien.de

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Quota on biofuels

- quota system starts 1.1.2007
- based on energy content
- sub-quotas - remain valid also after 2009
- current share is more than doubled until 2015:

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Diesel fuel	**4.4%**	**4.4%**	**4.4%**	**4.4%**	**4.4%**	**4.4%**	**4.4%**	**4.4%**	**4.4%**
Gasoline	**1.2%**	**2.0%**	**2.8%**	**3.6%**	**3.6%**	**3.6%**	**3.6%**	**3.6%**	**3.6%**
Total quota			**6.25%**	**6.75%**	**7.0%**	**7.25%**	**7.5%**	**7.75%**	**8.0%**

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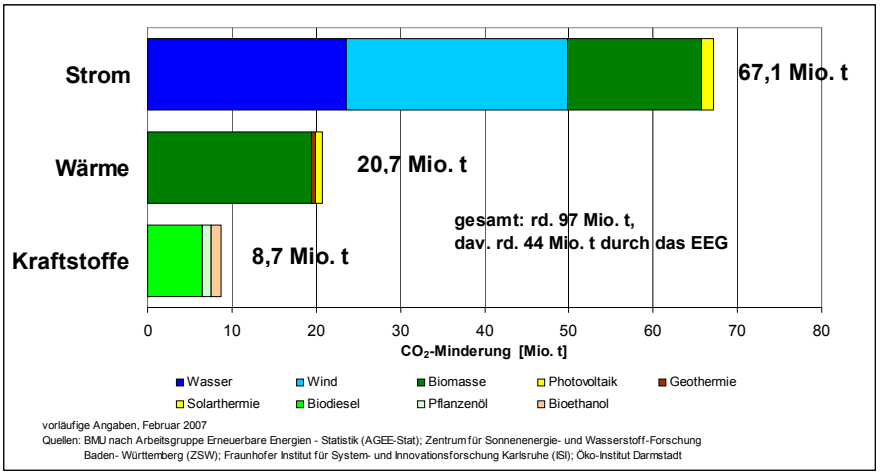
Avoided Emissions from renewable energy sources: 97 Mio. t in 2006



vorläufige Angaben, Februar 2007
Quellen: BMU nach Arbeitsgruppe Erneuerbare Energien - Statistik (AGEE-Stat); Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden- Württemberg (ZSW); Fraunhofer Institut für System- und Innovationsforschung Karlsruhe (ISI); Öko-Institut Darmstadt

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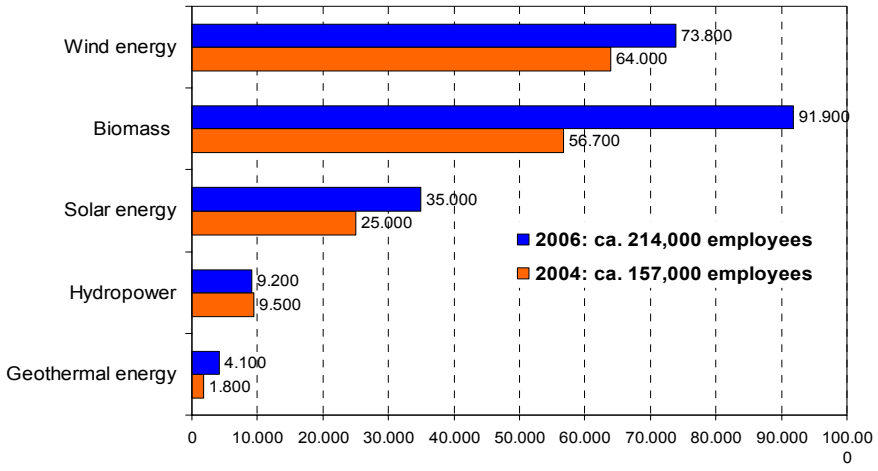
Employment effects (2006)



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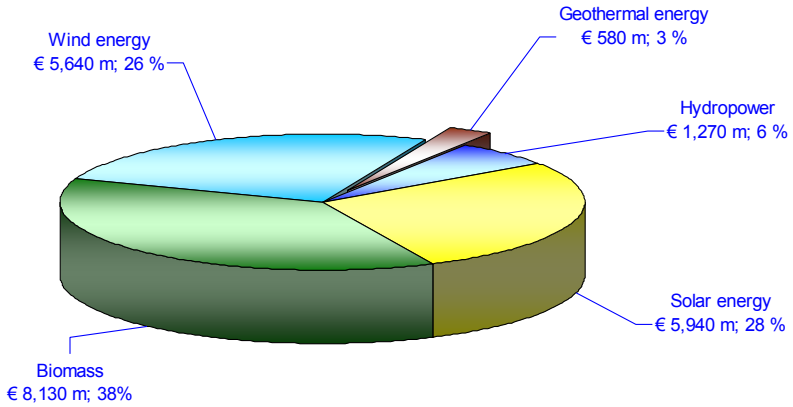
Total turnover with renewable energy sources in 2006



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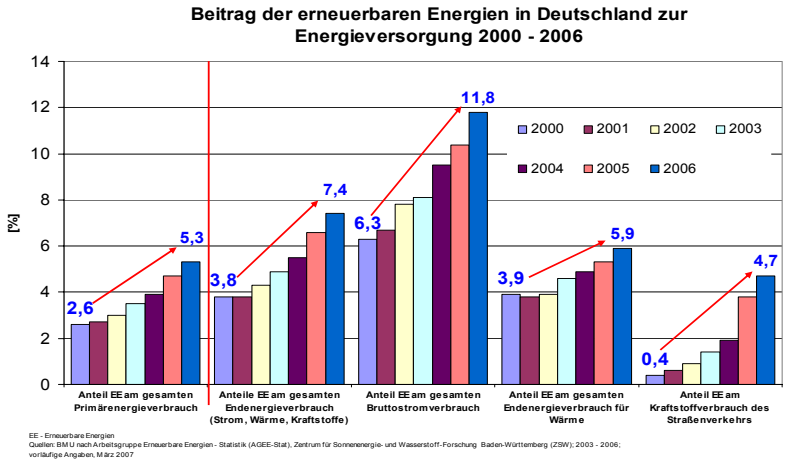
Development of RE in Germany 2006



EE - Erneuerbare Energien
Quellen: BMU nach Arbeitsgruppe Erneuerbare Energien - Statistik (AGEE-Stat), Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW); 2003 - 2006; vorläufige Angaben, März 2007

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Achievements of the EEG

- Share of RE in power production: about 11.8 % in 2006 [1998: 4.7%]
- 214,000 jobs in RE industries (2006)
- 21.6 Billion Euro turnover (2006)
- 97 Mio. tons of CO_2-reduction (2006)
- 1.6 € per month/household (2005)

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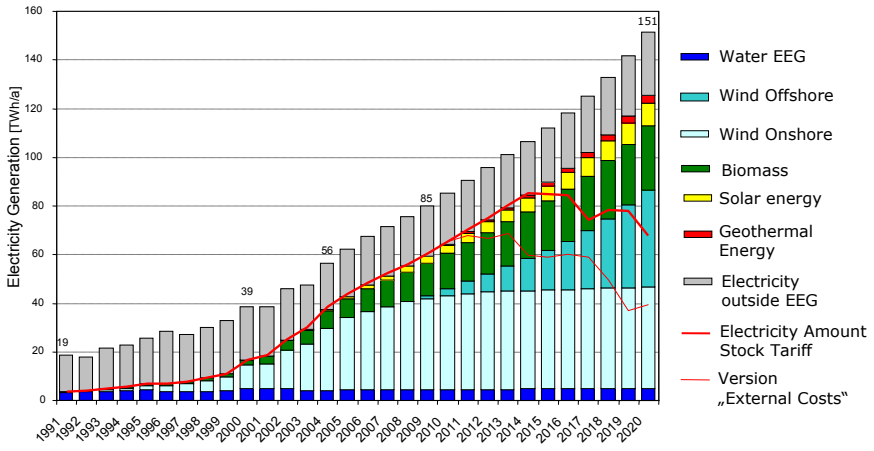
Expected Development



Sources: Bernd Wenzel et al., *Stromerzeugung aus Erneuerbaren Energien: Ausbau und Kostenentwicklung bis 2020*. Zeitschrift für Energiewirtschaft, Journal 2 / 2006.

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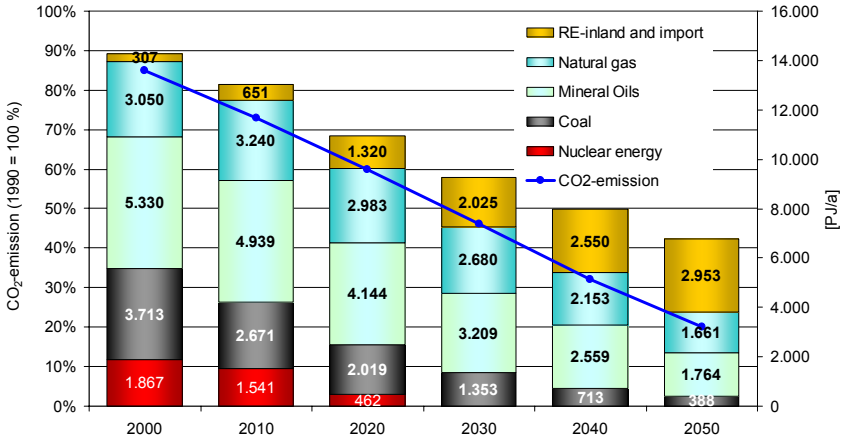
Development of RE in primary energy consumption and CO_2-emission by 2050



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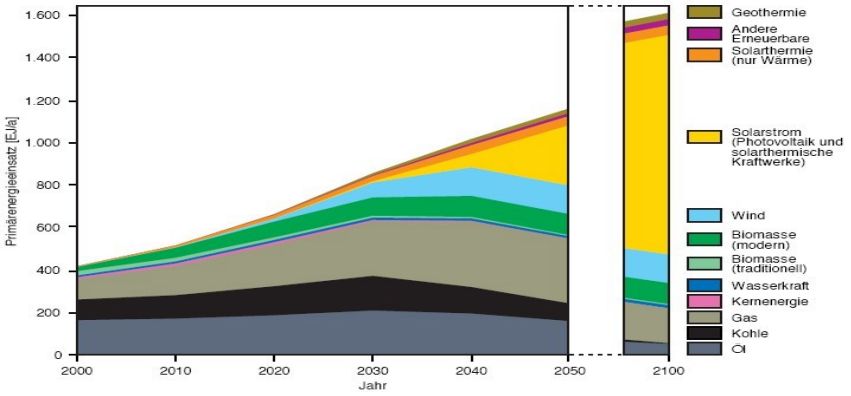
Global Scenario up to 2050



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Thank you for your attention !