



The Federal Ministry  
for the Environment,  
Nature Conservation  
and Nuclear Safety

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# **Paving the Way for German Offshore Wind Deployment**

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## **Wind Energy Research at Offshore Test Site**

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# Germany's Renewable Energy Strategy

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- National targets
- Market Deployment
- Research and Development



# Renewable Energy in Germany New Targets

Year in %	2007	Targets		
		2010	2020	2050
Primary Energy	> 5.8	4.2	16	50
Electricity	> 13.0	12.5	<b>25-30</b> IECP	
Biofuels		5.75	<b>17</b> IECP	
Heat			<b>14</b> IECP	

IECP – Integrated Energy and Climate Programme as of August 2007



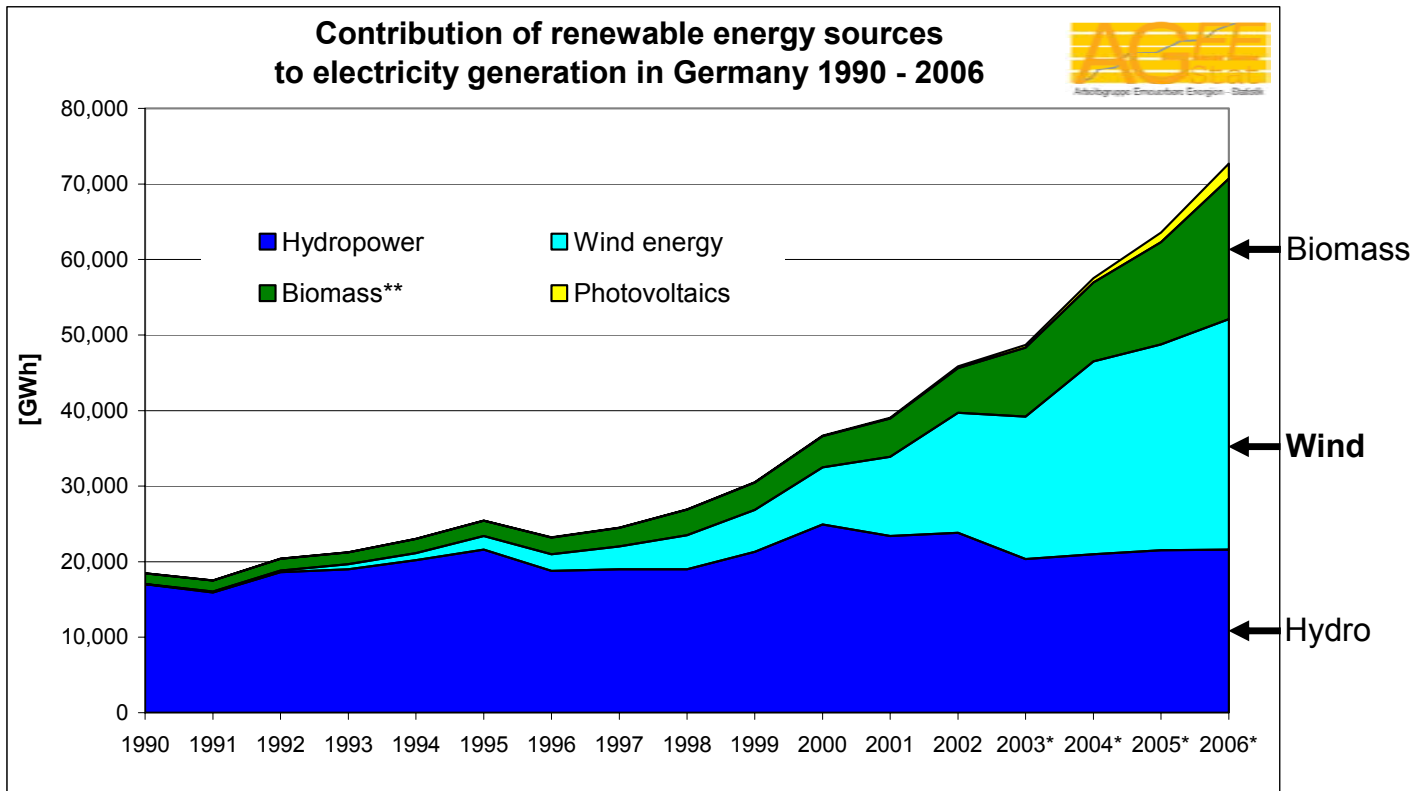
# Market Deployment Instruments

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- Electricity: Renewable Energy Sources Act  
→ *Feed-in Guarantee*
  - Heat: Market Incentive Programme  
→ *Grants and Loans*  
Renewable Energies Heat Act  
→ *Adopted by Government*
  - Biofuels: → *Tax Reduction/Blending Obligation*
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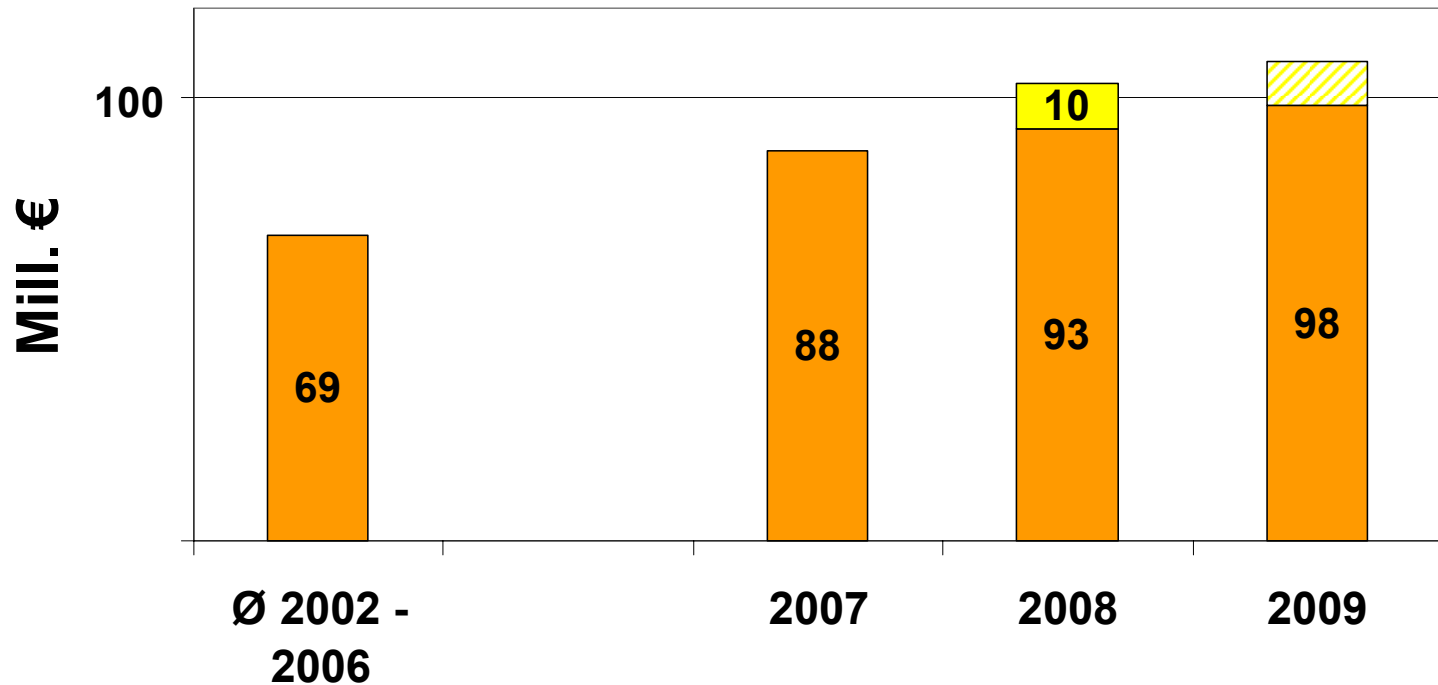


# Development of Renewables in the Electricity Sector





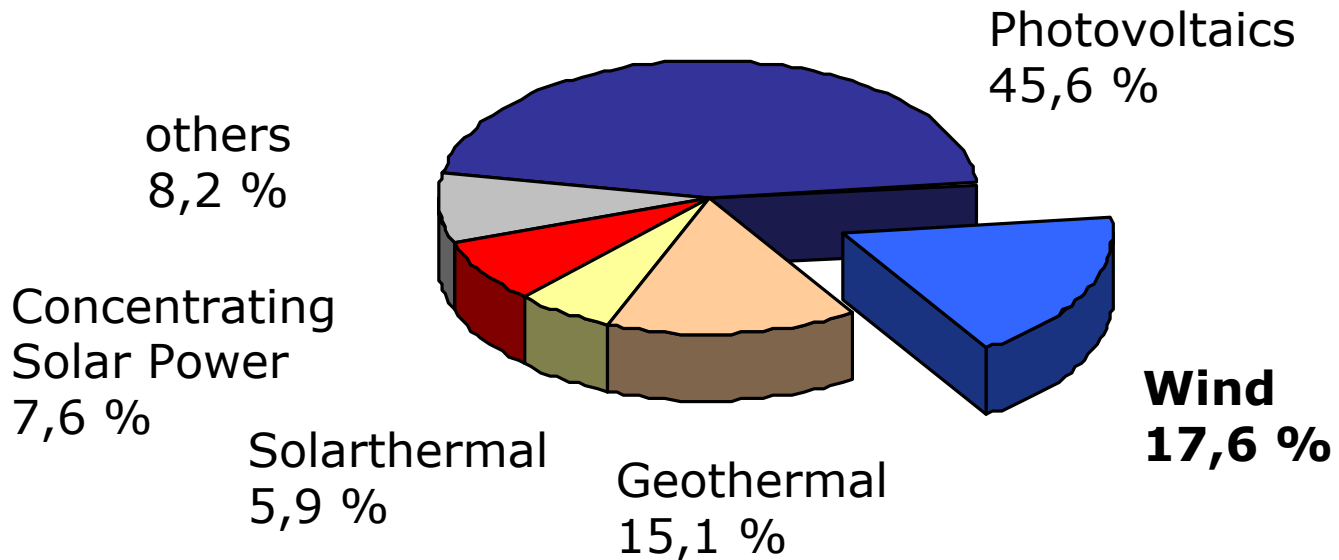
# Budget for Applied Research on Renewable Energies (BMU)





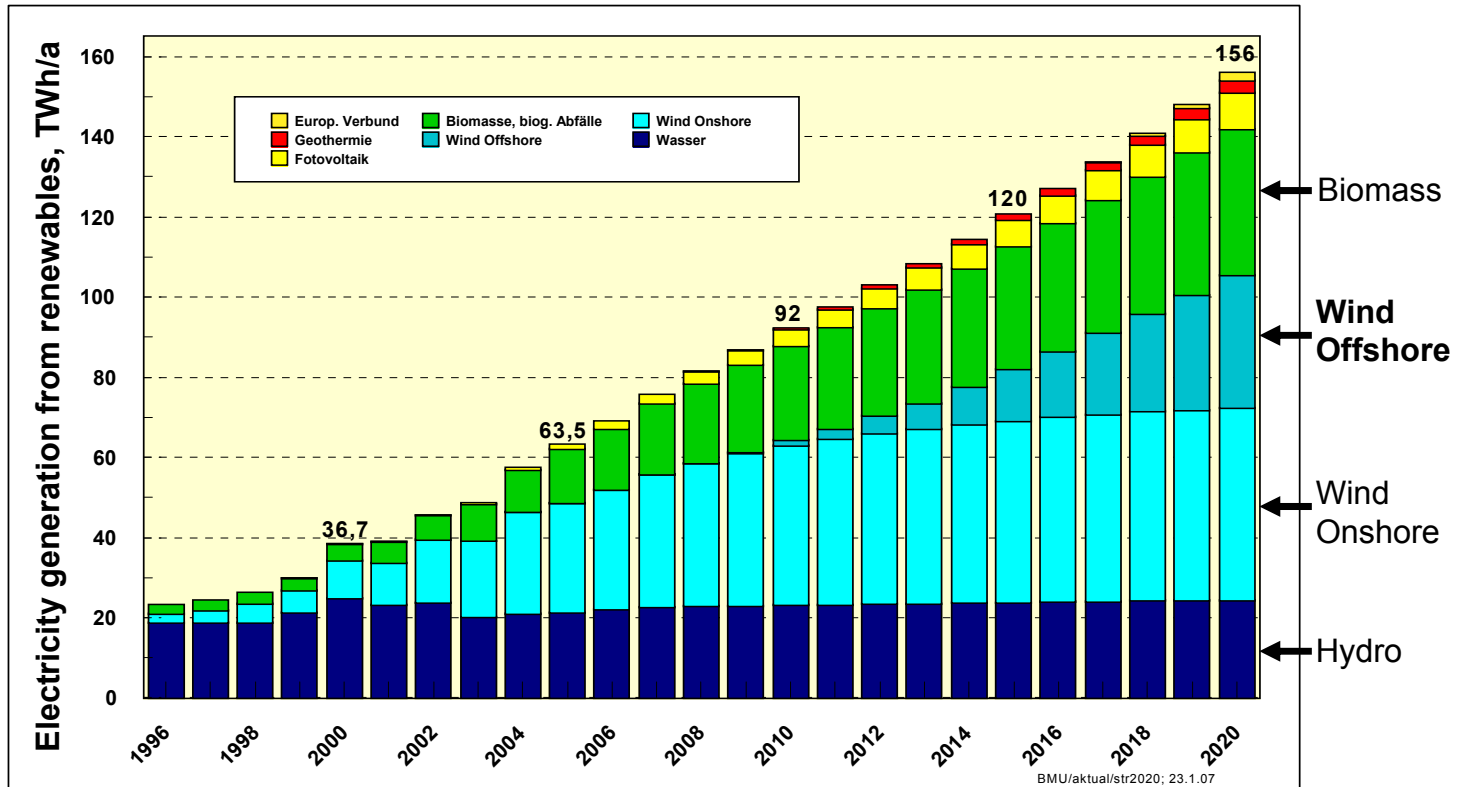
# BMU R&D Budget for RE Shares 2002-2006

**Annual budget** (mean 2002-2006)  
**69 Mill. Euro**





# Renewables Scenario in the Electricity Sector





# Offshore Wind Energy in Germany

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Status: 18 offshore wind farms approved, but  
1<sup>st</sup> installation not before 2008/09 exp.

## Breaking barriers 2007

- **Infrastructure Acceleration Act** with obligation for TSOs to ensure grid access at sea
  - Further improvement in legislation:  
**Revised Renewable Energy Sources Act**  
with higher tariffs for wind offshore under way
  - Research and development:  
**offshore wind** is an expanding **RD&D focus**
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# Research Focus Offshore Test Site



- Wind farm "Alpha Ventus", capacity 60 MW  
**12 offshore wind turbines of 5 MW-class**
- Near platform FINO I
- Water depth ~ 28 m
- Grid connection  
> 60 km offshore  
~ 4 km onshore
- **Operation** of 1<sup>st</sup> six  
turbines **planned**  
**in 2008**





# Offshore Test Site – a brief history

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- 2005      **BMU support** for purchase of rights on approved offshore wind farm for RD&D
- 2006      Announcement of **BMU research funding** ~ 50 mill. Euro over 5 years
- Consortium** set up out of three power companies to erect & operate test site
- Declaration** of industry, utilities and authorities to foster an offshore test site
- 2006-07   **Progress on planning & coordination** of site and research activities
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# Offshore Test Site BMU Funding for R&D Projects

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R&D-Budget: 50 Mill. Euro over 5 years

Goals:

- Offshore demonstration of high-end multi-megawatt wind turbines
- Cost reductions for future offshore wind farms by further developments on foundations, logistics and control technology
- Advanced experience on operation, costs, grid integration and ecological impact



# Offshore Test Site R&D Demand on Coordination

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Continuous coordination between wind farm operator, manufacturers & scientists is essential

- bring in line expectations of scientific community and interests of owners
  - enable access to systems on- and offshore
  - ensure use of data during & after operation
  - solve questions of warranty
  - coordinate logistics (sensor mounting, access)
  - coordinate and define safety aspects
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# Research at Alpha Ventus (RAVE)

## RAVE – Coordination Project

- Scientific Coordination
- Planning and coordination of Measurements
- Public Relations
- Coordinator: ISET/DEWI
- Funding: 1.15 Mio. € over three year period





# Research at Alpha Ventus Continuous Coordination

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- Continuous coordination of scientific requirements and specifications
- Measurement Catalogue and Scheme  
[at least one single wind turbine of each manufacturer will be equipped with sensors substantially, incl. foundation]
- Data Management
- Document Management amongst partners
- Mediation and clearance



# Research at Alpha Ventus Projects 2007

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13 single projects, funding more than 12 mill. €

- Incremental development and innovative optimisations of offshore wind turbines
- Development of LIDAR wind measuring
- Concept for monitoring of German offshore wind energy deployment
- Loads at offshore foundations
- Ecologic research - evaluation of standard concept for environmental impact assessment



# Research at Alpha Ventus Next Steps

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## RAVE – Research and event agenda

- RAVE kick-off-congress in Berlin, Spring 2008
- International conference in 2009  
(incl. European pilot offshore wind projects)
- Cooperation with EU's TP Wind and EAWE

## Integration of further RAVE projects possible (according to BMU's funding scheme)

- 1<sup>st</sup> selection of proposals for new projects '08  
done



# Research at Alpha Ventus First Projects 2008

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## Planned Projects 2008

- Development of a new design concept for offshore foundations
- Grid integration
- Verification of offshore turbine designs
- Operating noises and sound propagation between tower and water
- Realization of the joint RAVE measurements and data management



# Offshore Wind Energy in Germany

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## Outlook and Conclusion

- **Framework conditions** for expansion of offshore wind development have been and will be **optimised** substantially
- „**Lighthouse Project**“ Offshore Test Site as concerted action of industry, utilities, science and authorities **paves the way** for German wind energy development offshore
- **BMU accelerates** offshore wind development **with comprehensive research funding**



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# Thank you for your attention!



Bundesministerium  
für Umwelt, Naturschutz  
und Reaktorsicherheit



Further information:

**[www.erneuerbare-energien.de](http://www.erneuerbare-energien.de)**

**[www.rave-offshore.de](http://www.rave-offshore.de)**

**[www.fino-offshore.de](http://www.fino-offshore.de)**

Offshore wind energy

**[www.alpha-ventus.de](http://www.alpha-ventus.de)**

**[www.offshore-wind.de](http://www.offshore-wind.de)**

**[www.bsh.de](http://www.bsh.de)**