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Renewables within RWE's capacity and generation mix
(as of December 31th, 2010)

Power plant capacity by primary energy source
(as of 12/2010, under IFRS)

- **Hard coal**: 15,143 MW, 29.0%
- **Lignite**: 10,954 MW, 21.0%
- **Pumped storage, oil, other**: 5,146 MW, 9.9%
- **Renewable energies**: 2,947 MW, 5.6%
- **Gas**: 11,729 MW, 22.5%
- **Nuclear**: 6,295 MW, 12.1%

Total: 52,214 MW

Electricity production by primary energy source
(as of 2010, under IFRS)

- **Hard coal**: 55.2 TWh, 24.5%
- **Lignite**: 71.0 TWh, 31.5%
- **Pumped storage, oil, other**: 2.2 TWh, 1.0%
- **Renewable energies**: 8.9 TWh, 4.0%
- **Gas**: 42.8 TWh, 19.0%
- **Nuclear**: 45.2 TWh, 20.1%

Total: 225.3 TWh
Renewable energy in RWE Group today: A leading renewables generation position in Europe

RWE Group renewable energy capacity in operation by technology and country (Accounting view\(^1\) + PPA, as of Q4 2010)

- **Hydro** 27%
- **Biomass** 14%
- **Offshore wind** 5%
- **Onshore wind** 54%
- **Spain** 14%
- **Poland** 4%
- **Others** 6%
- **Netherlands** 18%
- **UK** 18%
- **Germany** 40%

**Total installed capacity: 2.9 GW\(^2\)**

> **2.9 GW operational renewables assets** (December 2010) account for roughly:
- 6% of the Group’s generation capacity and
- 4% of electricity generation\(^3\)

> **2.3 GW is operated by RWE Innogy**, in which RWE pooled its renewable energy activities

> Essent operates 0.3 GW of biomass co-firing within its hard coal power stations

> Another 0.3 GW have not been transferred to RWE Innogy in February 2008 and are held by RWE Deutschland AG and RWE Power AG

---

1) Capacity with <50% RWEI ownership is consolidated to 0 MW, capacity with 50% is consolidated to 50% of capacity, and capacity with >50% RWE Innogy ownership is consolidated to 100% of capacity.

2) RWE Group renewables capacity, of which 2.3 GW are operated by RWE Innogy (December 2010).

3) Capacity with <50% RWEI ownership is consolidated to 0 MW, capacity with 50% is consolidated to 50% of capacity, and capacity with >50% RWE Innogy ownership is consolidated to 100% of capacity.
Focus on wind, hydro and biomass while also supporting new technologies

RWE Innogy

Overview
- Established in February 2008
- Bundling renewables activities and competencies across RWE Group
  - Focus on capacity growth in commercially mature renewable technologies, i.e. wind, biomass and hydro
  - Research & Development and Venture Capital to drive the development of emerging technologies, e.g. solar, geothermal, marine
- European focus
- Asset portfolio of 2.4 GW in operation and 1.1 GW under construction mainly located in United Kingdom, Germany, Spain, Netherlands, Italy, France and Poland (Accounting view + PPA as at Q4 2010)
- Project pipeline of 18.2 GW consisting mainly of wind, hydro and biomass (Accounting view + PPA as at Q4 2010)

Business Area

<table>
<thead>
<tr>
<th>Wind onshore</th>
<th>Wind offshore</th>
<th>Hydro</th>
<th>Biomass</th>
<th>New Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Wind onshore" /></td>
<td><img src="image" alt="Wind offshore" /></td>
<td><img src="image" alt="Hydro" /></td>
<td><img src="image" alt="Biomass" /></td>
<td><img src="image" alt="New Applications" /></td>
</tr>
</tbody>
</table>

Focus and Strategy

- **Wind onshore**: Key technology for capacity growth
  - Focus on organic growth
  - Focus markets include Germany, UK, Spain, Italy, Netherlands, France and Central- and South-Eastern Europe

- **Wind offshore**: Key technology for capacity growth
  - Organic growth strategy leveraging strong position in UK
  - Focus markets include UK, Germany and Netherlands

- **Hydro**: Run-of-river projects and storage plants
  - Development of hydro power projects
  - Focus areas are South-Eastern Europe and Turkey

- **Biomass**: Development of biomass plants
  - Regional focus on RWE core markets and Central- and South-Eastern Europe

- **New Applications**: Driving innovative renewable technologies to commercial stage through Venture Capital and R&D and proving large scale commercial feasibility by operating demonstration plants
RWE Innogy management team:
experienced – well connected – international

Prof. Dr. Fritz Vahrenholt
CEO
- Hydro Power & New Applications
- Communication
- Markets & Political Affairs/CR
- Human Resources
- Strategy & Ventures

Dr. Hans Bünting
CFO
- Information Management
- Legal
- M&A
- Finance
- Procurement
- Tax, Accounts & Treasury

Paul Coffey
COO
- Commercial
- Wind EE
- Wind UK
- Wind WE
- Wind Offshore
- Operational Safety
- Biomass

Education
- Degree in chemistry
- Doctorate in chemistry

- Degree in business administration
- Doctorate in business administration

- Degree in business and finance

Career Milestones
- 2001 – 08 CEO REpower Systems AG, Hamburg
- 1998 – 01 Member of the Board of Directors of Deutsche Shell AG
- 1991 – 97 Senator and Principal of the City of Hamburg Environmental Ministry
- 1984 – 90 Deputy Minister City of Hamburg Environmental Ministry
- 1981 – 84 Head of Department of Environmental Policy, Waste Management and Air Pollution Control at the Hessian Ministry of Regional Development, Environment, Agriculture and Forestry
- 1976 – 81 Head of Section Chemical Industry, Federal Environment Agency

- 2004 – 08 Head of risk management RWE AG
- 2000 – 04 RWE Trading GmbH, various management positions in finance and risk controlling
- 1995 – 00 RWE Energie AG, various positions in finance and risk controlling
- 1990 – 95 Ruhr University Bochum, research associate

- 2008 – 09 Managing Director Operations & Technology, Generation, at RWE npower plc
- 2007 – 08 Managing Director npower Business, Retail, at RWE npower plc
- 2005 – 07 Director Commercial Asset Management, Generation, at RWE npower plc
- 2002 – 05 Head of Commercial Development, European Wholesale Origination at RWE Trading GmbH
- 1989 – 02 Diverse range of positions at Northern Electric Plc including: energy retailing, trading & risk management and power generation
Strong European footprint with focus on wind and hydro

<table>
<thead>
<tr>
<th>In MWel</th>
<th>Onshore Wind</th>
<th>Offshore Wind</th>
<th>Biomass</th>
<th>Hydro</th>
<th>Biogas</th>
<th>Solar</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RWE Innogy</strong>&lt;sup&gt;1)&lt;/sup&gt; operational capacities: Accounting view&lt;sup&gt;2)&lt;/sup&gt; + power purchase agreements, Q4 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>445&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>107</td>
<td>376</td>
<td>1&lt;sup&gt;6)&lt;/sup&gt;</td>
<td>1</td>
<td>930</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>316&lt;sup&gt;4)&lt;/sup&gt;</td>
<td>150&lt;sup&gt;4)&lt;/sup&gt;</td>
<td>69</td>
<td></td>
<td></td>
<td>535</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>400</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>412</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>201&lt;sup&gt;1)&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>201</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>36</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>108</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td></td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td></td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td></td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td></td>
</tr>
<tr>
<td><strong>Total RWE Innogy</strong>&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>1,556</td>
<td>150</td>
<td>126&lt;sup&gt;5)&lt;/sup&gt;</td>
<td>541</td>
<td>1</td>
<td>1</td>
<td>2,375</td>
</tr>
</tbody>
</table>

| **RWE Innogy**<sup>1)</sup> operational capacities: Pro rata view<sup>3)</sup> + power purchase agreements, Q4 2010 |
| Germany | 447<sup>1)</sup> | 105 | 357 | 2<sup>6)</sup> | 1 | 912 |
| UK | 361<sup>4)</sup> | 150<sup>4)</sup> | 69 | | | 580 |
| Spain | 396 | | 10 | | | 406 |
| Netherlands | 201<sup>1)</sup> | | | | | 201 |
| France | 36 | | 45 | | | 81 |
| Poland | 92 | | | | | 92 |
| Italy | 26 | | | | | 26 |
| Switzerland | | 23 | | | | 23 |
| Czech Republic | | 20 | | | | 20 |
| Portugal | | 3 | | 15 | | 18 |
| Belgium | | 8 | | | | 8 |
| **Total RWE Innogy**<sup>1)</sup> | 1,562 | 158 | 125<sup>5)</sup> | 519 | 2 | 1<sup>7)</sup> | 2,367 |

<sup>1)</sup> Essent contributed 232 MW onshore wind assets in the Netherlands and 405 MW in Germany as of September 30, 2009. The total operational capacity has decreased due to the decommissioning of WP Eemsmond (Kenetech) (32MW), a condition associated with the development of another onshore site.

<sup>2)</sup> Capacity with <50% RWEI ownership is consolidated to 0 MW, capacity with 50% is consolidated to 50% of capacity, and capacity with >50% RWEI ownership is consolidated to 100% of capacity.

<sup>3)</sup> Capacity equal to share of ownership.

<sup>4)</sup> 316 (361 pro rata view) MW onshore = 101 MW Innogy wholly owned assets + 196 (241 pro rata view) MW of Zephyr assets + 19 MW of Green GECCO assets. RWE Innogy operates 601 MW, of which 391 MW (331 MW onshore/60 MW offshore) is owned by Zephyr Investments Ltd which is 1/3 owned by RWE Innogy. Of the 331 MW onshore, 196 MW is 100% contracted to RWE npower through PPAs (power purchase agreements). An additional capacity of 135 MW is contracted to the NFPA (Non-Fossil Fuel Purchasing Agency). Of the offshore capacity of 150 MW, 90 MW is wholly owned by RWE Innogy. 60 MW offshore capacity is owned by Zephyr and is 100% contracted to RWE npower through a PPA. Of the onshore capacity, 19MW is owned by Green GECCO GmbH & Co KG (51% owned by RWE Innogy) and is contracted to RWE Npower Renewables Ltd through a PPA.

<sup>5)</sup> Including 32 MW of biomass/fossil mix, 14 MW of fossil capacity.

<sup>6)</sup> Includes only Biogas used directly in power generation.

<sup>7)</sup> RWE Innogy owns solar capacity in both Germany and Spain (of which only the former is visible above due to rounding).
RWE Innogy has a significant pipeline of 18.2 GW wind, hydro and biomass projects (Accounting view + PPA as at Q4 2010)

Project pipeline by technology & status (electricity generation capacity in GW)

Accounting View + Power Purchase Agreements¹) (Q4 2010)

<table>
<thead>
<tr>
<th>Technology</th>
<th>Status 1</th>
<th>Status 2</th>
<th>Status 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>9.1</td>
<td></td>
<td></td>
<td>18.2</td>
</tr>
<tr>
<td>Biomass</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Offshore wind</td>
<td></td>
<td>8.8</td>
<td></td>
<td>8.8</td>
</tr>
<tr>
<td>Onshore wind</td>
<td></td>
<td></td>
<td></td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>9.1</td>
<td>8.8</td>
<td>0.3</td>
<td>18.2</td>
</tr>
</tbody>
</table>

Pro Rata View + Power Purchase Agreements²) (Q4 2010)

<table>
<thead>
<tr>
<th>Technology</th>
<th>Status 1</th>
<th>Status 2</th>
<th>Status 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>7.9</td>
<td></td>
<td></td>
<td>18.4</td>
</tr>
<tr>
<td>Biomass</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Offshore wind</td>
<td></td>
<td>10.2</td>
<td></td>
<td>10.2</td>
</tr>
<tr>
<td>Onshore wind</td>
<td></td>
<td></td>
<td></td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>7.9</td>
<td>10.2</td>
<td>0.3</td>
<td>18.4</td>
</tr>
</tbody>
</table>

Note:
Pipeline status 1 – Permitted projects: all permits (including grid) in place, but not yet under construction
Pipeline status 2 – Unconsented projects: RWEI has rights to the project, e.g. land agreements
Pipeline status 3 – Prospects: identified sites with a known MW capacity, initial discussion on agreements

¹) For pipeline projects no power purchase agreement (PPA) is assumed. Therefore, pipeline projects with <50% RWEI ownership are consolidated to 0 MW, pipeline projects with 50% are consolidated to 50% of capacity, and pipeline projects with >50% RWE Innogy ownership are consolidated to 100% of capacity.

²) For pipeline projects no power purchase agreement (PPA) is assumed. Pipeline capacity equal to share of ownership.
RWE Innogy continues with its ambitious investment programme

> Clear commitment to grow our renewable business

> Focused capex programme 2011 – 2013 leads to adjustment of targets. We expect to achieve our 4.5 GW target in 2014. This will be in line with an operational result of approx. € 500 million

> Earnings development is back-end loaded due to concentration on large-scale offshore wind projects and upfront costs for project pipeline

> Operating assets expected to cover their cost of capital already in 2011

> Divisional ROCE/WACC break even (including work in progress) is expected for 2016

---

1 Consolidated capacity in operation or under construction
Germany plays an important role both in today's asset base and growth ambitions

RWE Innogy assets Germany

- RWE Innogy's headquarter located in Essen; offices in Hamburg, Dortmund, Berlin
- Leading German onshore wind farm operator
- First offshore wind park under construction
- 45 run-of-river and storage plants along the rivers Mosel, Saar and Ruhr
- Biomass and fossil CHP plants operated and developed by RWE Innogy Cogen
- First biogas plants in Grevenbroich and Güterglück

<table>
<thead>
<tr>
<th>Technology</th>
<th>In operation</th>
<th>Under construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind onshore</td>
<td>445&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>10</td>
</tr>
<tr>
<td>Wind offshore</td>
<td></td>
<td>295</td>
</tr>
<tr>
<td>Biomass</td>
<td>107</td>
<td>8</td>
</tr>
<tr>
<td>Biogas</td>
<td>1&lt;sup&gt;3)&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>376</td>
<td></td>
</tr>
<tr>
<td>Solar</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup) Table shows electrical capacity respectively equivalent electrical capacity only.
<sup>2)</sup> Includes 405 MW Essent onshore wind capacities.
<sup>3)</sup> Includes only Biogas used directly in power generation.

(Accounting view + PPA as at Q4 2010)
RWE Innogy has a significant track record and a strong position in the UK

RWE Innogy activities UK

> RWE Innogy’s UK activities comprise the wind and hydro power assets of RWE npower renewables and RWE npower’s share of the Zephyr portfolio of onshore and offshore wind energy projects

> Significant pipeline of onshore and offshore wind projects at various stages of development

> Two major biomass projects under development at Stallingborough (65 MW_{el}) and Markinch (53 MW_{el})

> RWE Innogy headquarters in the UK are located in Swindon

<table>
<thead>
<tr>
<th>Capacity (MW_{el})</th>
<th>In operation</th>
<th>Under construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind onshore</td>
<td>316(^1)</td>
<td>69</td>
</tr>
<tr>
<td>Wind offshore</td>
<td>150(^1)</td>
<td>598</td>
</tr>
<tr>
<td>Biomass</td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>Biogas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>69</td>
<td>4</td>
</tr>
<tr>
<td>Solar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Accounting view + PPA as at Q4 2010)

1) Of the onshore capacity to 316 MW, 101 MW Innogy wholly owned assets and 196 MW of Zephyr assets and 19 MW of Green GECCO assets. See also footnote 1) on slide 9.

2) Of the offshore capacity of 150 MW, 90 MW is wholly owned by RWE Innogy. 60 MW offshore capacity is owned by Zephyr and is 100% contracted to RWE npower through a PPA.
On the Iberian peninsula RWE Innogy is present via INVESTERG, AERSA and RWE Innogy Iberia Biomasa S.L.U.

RWE Innogy activities peninsula

> RWE Innogy present in Portugal and Spain through its subsidiaries
  - INVESTERG (Portugal)
  - AERSA (Spain)
  both focusing on onshore wind and hydro
  - RWE Innogy Iberia Biomasa S.L.U. (Spain), focusing on biomass business
    - Short rotation crops at Villamartin planted in June 2009
    - Biomass transformation plant (BTP) at Trabisa

<table>
<thead>
<tr>
<th>Capacity (MW_{op})</th>
<th>In operation</th>
<th>Under construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind onshore</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Wind offshore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass/Biogas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Solar</td>
<td>6 )¹</td>
<td></td>
</tr>
</tbody>
</table>

(Accounting view + PPA as at Q4 2010)

¹) Pro-rata. 50 MW Andasol 3 Concentrated Solar Power plant currently under construction, RWE Innogy and RheinEnergie jointly hold 25.1% of the shares via a holding company (RWE Innogy: 51%, RheinEnergie: 49%).
In France RWE Innogy continues hydro operations and participates in attractive wind development market

RWE Innogy assets France

- Petit Caux
- Forières
- Hauts Traits
- Region Paris
- Region Alps
- Region Loire
- Region Nice

RWE Innogy activities France

- Energies France is a 100% subsidiary of RWE Innogy with locations in Paris and Forbach (Département Moselle)
- Hydro operations since 1980s
- Major focus on development of wind power projects
- Onshore wind pipeline with projects in Pays de la Loire, Normandy and Midi Pyrénées

<table>
<thead>
<tr>
<th>Capacity (MW_e)</th>
<th>In operation</th>
<th>Under construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind onshore</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>Wind offshore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass/Biogas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Solar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Accounting view + PPA as at Q4 2010)
Innogy’s Business Approach
In order to be trusted leaders in sustainability, renewable energy and innovative technology…

RWE Innogy aims to …

- be among the top 5 companies in the European renewable energy sector
- contribute to the RWE Group’s growth strategy
- provide sustainable value added to the RWE Group
- be a key element in RWE’s CO$_2$ reduction programme
- stand for state of the art operation of renewable technology
- be a leading player in developing new renewable technologies
Proficient in coping with all critical success factors in the value chain

### Critical Success Factors

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>Relationship with Land Owners</th>
<th>Evaluation of E.g. Wind Speed Data</th>
<th>Timely Response and High Consenting Success Rate</th>
<th>Access to Equipment and Service Providers at Right Price</th>
<th>Build to Time and Budget</th>
<th>Early Identification of Performance Commitments</th>
<th>High Plant Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RWE Innogy</strong></td>
<td>Local Offices or Development Partners in All Key Regions</td>
<td>Strong Team of In-House Specialists</td>
<td>Mix of Project Management and Environmental Science Capability</td>
<td>Plant Procurement Specialists and Strong Links with Suppliers</td>
<td>Specialist In-House Project Management Capability</td>
<td>In-House Testing Capability</td>
<td>Twelve Years Experience of Operating Wind Farms</td>
</tr>
</tbody>
</table>

Source: Goldman Sachs Report (Sept. 2007), updated and edited by RWE Innogy.
Risk diversification across technologies, regions and support mechanisms

...technology

...technology

...country

...country

...support mechanism

...support mechanism

...meteorological risk

...meteorological risk
Organic business and flexible partnership approach adopted to local situation

Adoption of partnership model for market entry and growth strategy in attractive markets depend on market characteristics and RWE’s regional strength.
Renewable Technologies
## Overview of technologies in RWE Innogy’s main focus

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Wind Offshore</th>
<th>Wind Onshore</th>
<th>Biomass</th>
<th>Hydro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maturity of technology</strong></td>
<td>&gt; Some technical hurdles but industry is making substantial progress</td>
<td>&gt; Mature</td>
<td>&gt; Mature</td>
<td>&gt; Very mature</td>
</tr>
<tr>
<td><strong>Markets</strong></td>
<td>&gt; UK: growing</td>
<td>&gt; CE/SE: stable</td>
<td>&gt; Germany, UK, Italy and Spain: growing</td>
<td>&gt; CE/SE: mature</td>
</tr>
<tr>
<td></td>
<td>&gt; Germany, Netherlands, Belgium: emerging</td>
<td>&gt; EE: growing</td>
<td>&gt; Czech Republic &amp; Romania: emerging</td>
<td>&gt; SEE: growing, significant potential</td>
</tr>
<tr>
<td><strong>Specialities</strong></td>
<td>&gt; Deep-water technology at demonstration stage</td>
<td>&gt; Partly fragmented markets</td>
<td>&gt; Feedstock dependency</td>
<td>&gt; Large scale hydro limited to few countries in Europe</td>
</tr>
<tr>
<td></td>
<td>&gt; Partnerships share risk and expertise</td>
<td></td>
<td>&gt; Sustainability</td>
<td>&gt; Long run times</td>
</tr>
<tr>
<td><strong>Size of projects (capacity)</strong></td>
<td>&gt; Large (500 – 1,000 MW)</td>
<td>&gt; Small to medium (20 – 200 MW)</td>
<td>&gt; Small to medium (5 – 80 MW)</td>
<td>&gt; Average size &gt;1 MW and all types</td>
</tr>
<tr>
<td><strong>Approx. load factor</strong></td>
<td>35 – 40%</td>
<td>25 – 30%</td>
<td>80%</td>
<td>50%</td>
</tr>
</tbody>
</table>
## New Applications on their path to commercialisation

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Solar Thermal</th>
<th>Biogas</th>
<th>Geothermal</th>
<th>Tidal &amp; Wave</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maturity of technology</strong></td>
<td>&gt; Solar Thermal: maturing</td>
<td>&gt; Core technology: mature</td>
<td>&gt; Geothermal: mature</td>
<td>&gt; Tidal Stream: demonstration phase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Feed-into the gas grid: maturing</td>
<td>&gt; Hot Dry Rock: demonstration phase</td>
<td>&gt; Wave: demonstration phase</td>
</tr>
<tr>
<td><strong>Markets</strong></td>
<td>&gt; Spain, Italy, Greece, Turkey: growing</td>
<td>&gt; Germany: growing, strong targets by government</td>
<td>&gt; Italy, Turkey, Greece: mature</td>
<td>&gt; France and UK: emerging</td>
</tr>
<tr>
<td></td>
<td>&gt; North Africa: potential</td>
<td></td>
<td>&gt; North Africa: potential</td>
<td>&gt; Number of available locations for Tidal limited</td>
</tr>
<tr>
<td><strong>Specialities</strong></td>
<td>&gt; Storage systems</td>
<td>&gt; Feedstock dependency</td>
<td>&gt; Potential strongly depends on geological situation</td>
<td>&gt; Tidal: predictable power generation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Feed-in into the grid</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Size of projects</strong></td>
<td>&gt; Small to medium: 20 – 150 MW</td>
<td>&gt; Small: 5 – 50 MW</td>
<td>&gt; Small: 3 – 5 MW Germany; up to 50 MW e.g. Italy, Turkey, Greece</td>
<td>&gt; Small: 5 – 10 MW, depends on technical progress</td>
</tr>
<tr>
<td>(capacity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Approx. load factor</strong></td>
<td>57%</td>
<td>90%</td>
<td>90%</td>
<td>25 – 35%</td>
</tr>
</tbody>
</table>
Wind Offshore
Europe clearly leading the pack in offshore wind energy

> Europe is leading in offshore wind energy with an installed capacity of 2,600 MW in 2010.

> The installed capacity in Europe is expected to grow by an average of 28% p.a. to 30.1 GW in 2020 – Europe will continue in leading the pack in offshore wind as other regions focus on exploiting the onshore potential.

> Despite the strong growth rates, offshore wind will still be small in relation to onshore wind, accounting for only 14% of the European wind capacities in 2020.

Offshore wind market in Europe to grow by 28% p.a. until 2020, representing 14% of the wind market

> Offshore technology still immature and current progress slow – accounts for only 2% of total accumulated and 4% of newly installed capacity as of 2008

> Currently, stronger short-term growth is prevented by:
  - Only limited number of companies with practical offshore experience (Siemens, REpower, Vestas)
  - Still high prices for wind turbines and long delivery times
  - Technical issues with some of the first large offshore wind farms

> However, significant offshore capacity already in planning stage

> The share of offshore is expected to reach 14% in 2020 as onshore growth slows down in Europe

> Growth in offshore is mainly driven by:
  - Strong pipeline of projects
  - Technological developments addressing the still existing challenges
  - Strong regulatory support (high political targets & attractive remuneration schemes)

The major growth markets in EU for offshore wind are UK and Germany

Offshore wind markets in Europe

- UK
- Germany
- Sweden
- Ireland
- Spain
- Italy
- Poland
- Netherlands
- Denmark
- Belgium
- France

Accumulated installation 2008 – 20 (GW)

Share in accumulated capacity 2020

Natural offshore wind conditions (at 50 m height)

- > 9
- 8.0 – 9.0
- 7.0 – 8.0
- 5.5 – 7.0
- < 5.5

Turbines dominate cost of wind projects

For both on- and offshore projects, wind turbines dominate the capex split – appropriate turbine prices are thus crucial for an attractive return on investment.

Offshore investment split varies according to project details, e.g. water depth, distance to shore, grid connection works, etc.

Cost of grid connection depends on distance to coast, foundation also depends on depth of water – in contrast to the UK market, the grid operator in Germany is obliged to connect the projects to the electricity grid and to bear capital and finance cost.

Source: RWE Innogy.
Few large players share the market for on- and offshore wind turbines

Global market shares (newly installed capacity in 2008)

- 19.8%
- 18.6%
- 12.0%
- 10.0%
- 9.0%
- 6.9%
- 5.0%
- 4.6%
- 4.0%
- 3.8%
- 3.3%

Global offshore market shares (of total 1.5 GW installed capacity, 12/2008)

- Vestas: 51.6%
- GE Wind: 2.4%
- Gamesa: 0.3%
- Enercon: 42.2%
- Sinovel: 0.3%
- Acciona: 2.6%
- Goldwind: 1.6%
- REpower: 2.6%
- Nordex: 1.6%
- REpower
t- WinWind: 1.6%

- Turbine suppliers are establishing long-term commitments, strategic partnerships or even backward integration with component suppliers
- Component suppliers have been increasing manufacturing capacity due to long-term planning horizon
- Onshore: New capacity will come from capacity build up and emergence of new players, e.g. from China and India

1) Suzlon holds a stake of 90.7% in REpower Systems AG.
RWE Innogy focus:
Offshore wind is an engineering skill & scale game

**European Market Features**

- Maturing technology with high rate of innovation, but limited track record
- Main growth countries are Germany and the UK
- Few suppliers with proven technology
- Technology with relatively high generation cost per MWh but existing support mechanisms provide attractive remuneration
- Large scale projects often funded through partnerships models

**Opportunities**

- Wind resource better than onshore (load factors 35%+)
- Attractive growth opportunities & industrial scale projects
- Technology progress with significant cost reduction potential
- Strong political support reduces regulatory risks

**Challenges**

- Tight supply situation across the value chain
- Relative to onshore wind, high maintenance risks far out at sea: safety, costs, access, technology
- Limited best practice track record available make it a skill game

**RWE Innogy Strengths**

- Secure key value chain technologies (e.g. turbines, vessels)
- Recruit best offshore experts available (build in-house know-how)
Offshore wind power: RWE Innogy has strong starting position in the UK

Markets and operations
Technology & markets
> Immature market: 2.6 GW installed offshore wind capacity in EU-27 in 2008
> Strong market growth in medium to long term
  – Time horizon depends on technical progress and development of approval procedures
> Significant technological challenges remain especially in offshore foundations and structures
> Trends: technical hurdles overcome, allocation of attractive sites, development of projects, M&A of projects

RWE Innogy's assets
(Accounting view + PPA as at Q4 2010)
> 150 MW\(^1\) offshore wind farm (North Hoyle, Rhyl Flats) in operation and 598 MW (Greater Gabbard\(^2\), Gwynt y Môr\(^3\)) under construction in UK and 295 MW (Nordsee Ost) under construction in Germany
> 27% stake in Belgian offshore wind project Thornton Bank - 30 MW already operational, additional capacity of 295 MW to be commissioned by the end of 2013

---

1) Of the offshore capacity of 150 MW, 90 MW is wholly owned by RWE Innogy. 60 MW offshore capacity is owned by Zephyr and is 100% contracted to RWE npower through a PPA.

2) Total capacity 504 MW, 50% ownership RWE Innogy.

3) Total capacity 576 MW, 60% ownership RWE Innogy.
RWE Innogy actual project development for offshore wind in UK and Germany

Examples of offshore wind projects

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Wind Farm</th>
<th>Size</th>
<th>Distance to shore</th>
<th>Water depth</th>
<th>First generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gwynt y Môr</td>
<td>160 x 3.6 MW Siemens turbines (576 MW), 124 km²</td>
<td>13 km off the coast of North Wales</td>
<td>12 – 28 m depth</td>
<td>First generation in 2013, full generation in 2014</td>
</tr>
<tr>
<td>2</td>
<td>Greater Gabbard¹</td>
<td>140 x 3.6 MW Siemens turbines (504 MW¹), 147 km²</td>
<td>25 – 47 km offshore</td>
<td>24 – 34 m depth</td>
<td>First generation in December 2010, full generation in late 2011</td>
</tr>
<tr>
<td>3</td>
<td>Nordsee Ost</td>
<td>48 x 6 MW REpower turbines (288 MW), 34 km²</td>
<td>32 – 45 km offshore</td>
<td>22 – 26 m depth</td>
<td>First generation in 2012, full generation in 2013</td>
</tr>
</tbody>
</table>

¹ 50% owned by RWE Innogy.
Wind Onshore
The world market for wind energy

Installed wind power capacity (in GW)

Top 10 with > 80% of newly installed capacity (in GW)

Top 10 with > 85% of total installed capacity (in GW)

Onshore wind in Europe: Steady path for solid growth

- Installed capacity in Europe has grown 17% p.a. since 2004, corresponding to an average of 7.6 GW p.a. incremental capacity.
- In certain areas, electricity production from wind energy has grown to a significant level (e.g. 20% in Denmark, > 7% in Germany, in some German federal states exceeding 30%, > 8% in Spain as of 2006).

- Steady path for solid growth
  - European onshore wind expected to increase installed capacity by 9% p.a. until 2020 (10.3 GW annual incremental capacity).
  - Spain, France, UK, Italy and Germany with 62% of net additions in installed capacity by 2020.
  - Focus moving to medium sized markets which will grow faster.
  - Medium- to long-term growth is expected to slow down due to increased saturation of large markets and shift towards offshore.

Major markets in EU based on size and wind resources

Onshore wind markets in Europe

Accumulated installation 2008 – 20 (GW)

Spain
Germany
France
UK
Italy

Natural onshore wind conditions (at 50 m height)

Wind speed m/s
- > 7.5
- 6.5 – 7.5
- 5.5 – 6.5
- 4.5 – 5.5
- < 4.5

European wind power continued strong growth in 2010 - still dominated by onshore wind

- In 2010, installed wind power capacity increased by 12% to 84.1 GW in EU-27
  - Onshore wind accounted for 81.1 GW (96% of total installed wind power capacity), corresponding to a growth rate of 11.4%
  - With an installed capacity of 2.9 GW in 2010 (+42.7% y-o-y), offshore wind still holds a minor share of 3.5% in the European wind market

- New installations in EU-27 amounted to 9,259 MW in 2010
  - TOP 3 countries Spain (1,516 MW), Germany (1,493 MW) and France (1,086 MW) account for 44% of 2010 installation

Source: European Wind Energy Association (February 2011).
Evolution of turbine technologies

> Wind turbines are getting larger – along with scaling-up efforts aiming to design multi-MW turbines for offshore application, developers have demanded larger turbines

> Average offshore turbine in 2010 was 3 MW and will increase to 4 MW in the coming years

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal capacity</th>
<th>Rotor diameter (m)</th>
<th>Hub height (m)</th>
<th>Electricity output p.a. (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>30 kW</td>
<td>15</td>
<td>30</td>
<td>35,000</td>
</tr>
<tr>
<td>1985</td>
<td>80 kW</td>
<td>20</td>
<td>40</td>
<td>95,000</td>
</tr>
<tr>
<td>1990</td>
<td>250 kW</td>
<td>30</td>
<td>50</td>
<td>400,000</td>
</tr>
<tr>
<td>1995</td>
<td>600 kW</td>
<td>46</td>
<td>78</td>
<td>1,250,000</td>
</tr>
<tr>
<td>2000</td>
<td>1,500 kW</td>
<td>70</td>
<td>100</td>
<td>3,500,000</td>
</tr>
<tr>
<td>2005</td>
<td>3,000 kW</td>
<td>90</td>
<td>105</td>
<td>approx 6,900,000</td>
</tr>
<tr>
<td>2010</td>
<td>6,000 kW</td>
<td>126</td>
<td>135</td>
<td>approx. 20,000,000</td>
</tr>
</tbody>
</table>

1) Only for offshore wind projects
RWE Innogy focus: Onshore wind is a must-have for fast growth

European Market Features

- Mature technology but still room for innovation
- Significant capacities installed in Western Europe still with attractive growth and repowering potential
- Growing number of opportunities in Eastern Europe
- Trend towards M&A driven consolidation
- Many turbine suppliers available with long-term track record
- Turbine supply turning from supplier- to customer-driven market

Opportunities

- Stable support schemes in most European countries promote growth
- Low cost and fast construction of significant capacity
- Short/mid-term opportunities to profit from distressed sellers

Challenges

- Intense competition for best wind sites
- Large project pipelines necessary due to regulatory risk associated with building consent

RWE Innogy Strengths

- Strong existing wind farm portfolio and significant track record in new build and operation
- Regional diversification to reduce country-specific regulatory risks
- Growth strategy with focus on organic projects, but making use of short-term opportunities also through M&A
- Large realisable project pipeline

1) In comparison to other renewable energy technologies
Onshore wind power is a key element in RWE Innogy's growth strategy

Onshore wind capacity

- United Kingdom: 316 MW
- Poland: 108 MW
- Netherlands: 201 MW
- Germany: 445 MW
- France: 36 MW
- Italy: 50 MW
- Spain: 400 MW

Markets and operations

Technology & markets

- Relatively mature markets especially in Germany and Spain
- 81.1 GW capacity installed in EU27 as of 2010
  - High maturity of technology
  - Power generation costs competitive with conventional energy sources
- Still attractive growth rates & repowering potential in mature markets
- In the foreseeable future positive and stable financial support systems (e.g. fixed feed-in tariffs/obligations)
- Trend: consolidation through M&A

RWE Innogy's assets

(Accounting view + PPA as at Q4 2010)

- 1.56 GW onshore wind farms in operation (of which Zephyr UK 196 MW under economic control of RWE Innogy) and 95 MW under construction

1) 316 MW onshore = 101 MW Innogy wholly owned assets + 196 MW of Zephyr assets + 19 MW of Green GECCO assets. Please refer to footnote on slide 9 for further explanation.
2) Essent contributed 232 MW onshore wind assets in the Netherlands and 405 MW in Germany as of September 30, 2009.
Examples of RWE Innogy wind projects in Poland and Spain

Wind farm **Suwalki**

- **Location**
  - In Masuria/Poland, approx. 50 km to the Lithuania frontier
- **Technical data**
  - Installed capacity: 41.4 MW
  - 18 wind turbines type SWT 2.3 a 2.3 MW from Siemens
  - Rotor diameter: 92.6 m
  - Tip height: approximately 150 m
  - Start-up: 4th quarter 2009

Wind farm **Las Planas**

- **Location**
  - Located 12 km in the south of Zaragoza/Spain on the plateau „Plana de Zaragoza”
  - 600 m above sea level
- **Technical data**
  - Installed capacity: 90 MW
  - 120 wind turbines a 750 kW
  - Hub height: 55 m
  - Rotor diameter: 48 m
  - Full load hours round about 2,600 h/a (load factor of 30%)
  - Start-up in February 2002
Biomass
Operational costs and profitability are highly dependent on feedstock price and availability

**Levelised cost structure for biomass (in €/MWh)**

- Equipment costs
- Project development
- Site preparation
- Total (CAPEX)
- OPEX (w/o feedstock)
- Feedstock
- Total

**Levelised cost structure for biomass depending on feedstock price and plant size (in €/MWh)**

- Supporting price range (Germany, Poland, UK)

Operational expenditure is very dependent on feedstock costs – no possibility of hedging/long-term supply contracts

- Feedstock share on overall costs: 25 – 40%
- Feedstock costs differ depending on feedstock type and transportation

Overview of feedstock costs (transportation to plant included):

- Residues (wood): 5 – 30 €/ton (average: 12.5 €/ton)
- Residues (crops): 5 – 40 €/ton
- Energy crops: 20 – 60 €/ton (up to 100 €/ton)

Source: DLR, IE Leipzig.
RWE Innogy focus:
Biomass is a viable option for “green” capacity

European Market Features

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Efficient generation of power and heat (CHP): Supply of heat, process steam, electricity, compressed air and cooling energy</td>
<td>&gt; Focus on integrated biomass business based on diverse sources such as fresh and residual wood, energy crops and pellets</td>
</tr>
<tr>
<td>&gt; Solid biomass plant technology is mature and guarantees a stable performance</td>
<td>&gt; Favorable regulatory support in most European countries as biomass is expected to contribute significantly to EU renewable targets</td>
</tr>
<tr>
<td>&gt; Solid biomass as main fuel is becoming a globally traded commodity</td>
<td>&gt; Key markets are Germany, the UK, Spain, Italy and CEE</td>
</tr>
</tbody>
</table>

Opportunities

> Key advantage over other renewable technologies: ability to operate at high utilization rates and to generate base load electricity
> Still attractive market growth: Biomass potential not yet exploited by far
> Efficiency improvements of existing facilities possible through extensions and modifications

Challenges

> Feedstock represents 25 – 40% share of full costs, but cannot be effectively hedged: strong position in feedstock supply is thus crucial
> Only limited scalability of power plants especially due to feedstock availability and logistic cost issues limit growth potential
> Securing sustainability of biomass fuel sourcing

RWE Innogy Strengths

> Strong group-wide biomass expertise bundled within RWE Innogy – pooling of support and expert functions
> Access to partners such as municipalities and industry through RWE Group is a key success factor in CHP business
> Ensuring high operational availability in the long-run through preventive maintenance
> Creation of a fully integrated biomass supply chain to secure feedstock for future projects (e.g. own growing energy plantations, forest wood)
Biomass combined heat and power: Focused on development of larger scaled project opportunities

Biomass capacity

Germany
107 MW_{el} / 683 MW_{th}

Czech Republic
19 MW_{el} / 247 MW_{th}

Markets and operations
Technology & markets
> Biomass enjoys favourable regulatory support in most European countries and is expected to contribute significantly to the EU renewable energy targets
> Solid biomass plant technology is mature and mainly used for distributed power generation
> Economic feasibility of projects strongly depends on access to feedstock which accounts for 25-40% of production costs
> Utilisation of CHP (combined heat and power) generation elevates efficiency and profitability (critical in some markets)

RWE Innogy's assets
(Accounting view + PPA as at Q4 2010)
> RWE Innogy Cogen bundling biomass competencies within RWE Group
> 126 MW_{el} \textsuperscript{1) biomass/CHP capacity in operation and 80 MW_{el} under construction
> Joint venture Eco Heat International with Austrian Kelag for developing biomass projects in South-Eastern Europe
> Integration BTB GmbH for CHP in Berlin
> Joint venture with Fri-El Green Power for development of biomass power plant projects in Italy

\textsuperscript{1) Includes 32 MW_{el} mixed fossil/biomass capacity (co-firing - combustion of biomass partly substituting fossil fuels).}
Share of forest biomass will increase in future feed-stock supply

Overview

Logging remains from wood cuttings
Regular thinning of forests
Preventing forest diseases (bark beetle)
Clearing of rootstock if necessary
Loggings from road maintenance and landscape management

Advantages of short rotation crops

Utilization of marginal agricultural sites
Low input of fertilizer, herbicides, etc.
Erosion protection, humus accumulation, low soil disturbance
New in rural areas – added values remains in the region
Forest experts with a track record in
  managing forest (planting, cultivating, harvesting)
  buying timber
  dealing with logging crews
Experience in implementing new forest management systems
Experience in utilising unused biomass (e.g. logging remains) to improve efficiency
Example: Biomass-fired CHP plant in Wittgenstein

**Overview**

**Purpose of plant**
- Provision of process steam to pellet factory, electricity is fed into the grid

**Main components**
- Grate-fired furnace by Weiss
- Steam turbine by TGM

**Technical details**
- Electrical capacity of turbine: 5 MW_{el}
- Thermal capacity: 25 MW_{th}
- Steam capacity: 30 t/h
- Heat supply of up to 17 MW_{th}

**Fuel input**
- Biomass – fresh wood, 100,000 t/a

**Status quo**
- Operational
Hydro
Hydro: Mature technology but still some opportunities in Western and huge potential in South-Eastern Europe

> More than 300 TWh/year of unused economical hydro power potential in Europe

> Almost two-thirds of the economical potential in South-Eastern Europe is not developed

1) Average values of the following sources: WEC, 2007 Survey of Energy Resources; EUROSTAT; UCTE; Europe’s hydropower potential today and in the future, CESR, University of Kassel; Hydropower & Dams World Atlas, 2007.
RWE Innogy focus:
Hydro power is cost competitive and sustainable

European Market Features

- Very mature technology with limited innovation potential
- Huge new build potential in SEE and Turkey with focus on large scale plants
- Limited new build potential in Western European markets
- Relatively high utilisation, compared to other renewable technologies

Opportunities

- Increasing electricity demand and – at the same time – capacity shortage in SEE and Turkey
- Advanced legal system and power trading
- Allows for load shaped generation

Challenges

- Access to grid
- Time consuming approval processes
- Regional partnerships often required
- Environmental aspects

RWE Innogy Strengths

- Technology well covered by experienced staff of RWE Innogy with over 100 years experience
- Centralised asset management, decentralised operation and maintenance
- Full value chain can be covered in Europe
- Portfolio containing combination of peak and base load plants
- Regional partnerships established
- Ability to coordinate large amount of plants according to demand of international markets
Hydro power represents an area of growth for RWE Innogy

Markets and operations
Technology & markets
> Small hydro plants (< 10 MW) expected to have significant share in future capacity growth in Western Europe
> Most significant growth potential of several GW in South-Eastern Europe and Turkey
  – Strategic partnerships helpful
  – Large hydro plants > 100 MW feasible
  – Run-of-river and storage plants for reliable power supply needed in South-Eastern Europe
  – Market price system for hydro favorable

RWE Innogy's assets
(Accounting view + PPA as at Q4 2010)
> Hydro power plants with 541 MW in operation
> 4 MW under construction
Example: Hydro power plants in operation

**Hydro power plant Albbruck-Dogern**
- Albbruck-Dogern, Baden-Württemberg
- Kaplan Bulb Turbine
- 24 MW electrical generation capacity
- 180 GWh annual electricity generation
- 50,000 households will be supplied with CO₂-free electricity
- Start of operation in December 2009

**Hydro power plant Heimbach**
- Heimbach, North Rhine-Westphalia
- 2 Francis Turbines
- 16 MW electrical generation capacity
- 25 GWh annual electricity generation
- In operation since 1905, modernised in 1975
- Listed building
New Applications & Venture Capital
Concentrated Solar Power (CSP) can be a significant part of our future energy supply

European Market Features

- Approved and reliable way to produce CO₂-free electric energy
- CSP is expected to become commercially mature within the next 20 years
- In combination with thermal storage CSP is capable of providing base load electricity
- Worldwide about 2 GW under construction
- More than 20 GW in operation expected until 2020
- Desertec project evaluates the potential supply of 15% of the European energy demand with solar power from the Sahara region by 2050

Opportunities

- Fastly growing market, especially in Spain – many countries in Southern Europe are developing support systems
- Although CSP is not a new technology, it is already far more cost-efficient than solar PV and offers significant further cost reduction potential

Challenges

- Further cost reduction is crucial
- High capex per MW installed – access to capital essential
- Research and development of new applications and technologies (e.g. cost efficient storage and solar tower)

RWE Innogy’s Approach

- Increase investment in projects on the Iberian peninsula
- Gain know-how to profit from early mover opportunity
- Investigate in new solar markets around the Mediterranean Sea
RWE Innogy is already engaged in one of the largest CSP projects: Andasol 3

Markets
> CSP is a rapidly growing technology
> First European CSP tariff established in Spain, other South European countries expected to follow

Technology
> Parabolic trough technology
> Capacity: 50 MW electrical power output
> Location: Southern Spain in the province of Granada
> RWE Innogy and RheinEnergie jointly hold 25.1% of the shares via a holding company (RWE Innogy: 51%, RheinEnergie: 49%)
> Construction started in March 2009, connection to the grid expected in autumn 2011
> Thermal storage using Molten Salt technology with a capacity of 1,010 MWh allows electricity production even at night or in times the sun is not shining
> Contrary to PV a CSP plant with thermal storage is dispatchable
Biogas is a multifunctional, storable renewable energy source

European Market Features

- Commercial biogas production is a fairly new technology, but already at the edge of marketability
- Political target: substitution of annually 6 bn m³ natural gas by 2020 and up to 10 bn m³ by 2030 in Germany, international markets still lagging behind
- Strong trend towards decentral gas production, purification and feed-in of biomethane into gas grid
- Development of large-scale biogas plant concepts; development of industrial standards

Opportunities

- Further cost reduction expected in the short- and mid-term
- Biogas is viable option for municipalities, which have to source an increasing part of energy from renewables
- Significant and efficient transport and storage capacities are already in place
- Cooperation with farmers and strategic market players
- Win-win-situation: digestate conditioning and fertilizer production

Challenges

- Feedstock supply is crucial, but cannot be effectively hedged
- Limited scalability of power plants especially due to feedstock availability and logistic issues
- Legal regulations concerning restrictions of the use of biomethane obliged to be amended (e.g. Wärme-EEG)
- Extensive research and testing of new substrates for biogas production have to be done

RWE Innogy Approach & Strengths

- Regional site-specific plant concepts regarding substrate availability
- Utilisation of various substrates like manure and agricultural by-products
- Focus of gas purification and biomethane feed-in into the gas grid
- Realisation of efficient large-scale biogas plant concepts
Biogas – one of the most efficient ways to use biomass for power & heat generation

**Technology & markets**
- Use of alternative substrates to maize (manure, sugar beet)
- Biogas plant technology is adapted to the agriculture area
- Biogas upgrading and biomethane feed-in
- Digestate conditioning and fertilizer production
- Cooperation with farmers and strategic market players

**RWE Innogy’s assets**
(Accounting view + PPA as at Q4 2010)
- RWE Innogy GmbH bundles biogas competencies within RWE Group
- 0.7 MW_{el} biogas CHP and 6.7 MW_{th} biomethane feed-in into the gas grid in operation (in total 4 MW_{el} CHP capacity)
- Current development of an innovative biogas concept based on manure only, in conjunction with regional farmers’ association
- RWE Innogy plans to extend its biogas activities and to build up further thermal biogas capacity

**Biogas plant Güterglück (feed-in of biomethane)**
- Güterglück, Saxony-Anhalt
- Gas treatment and feed-in into the gas grid
- 6.7 MW thermal capacity
- 52 GWh annual biomethane output, equivalent to 21 MWh_{el}
- CO_{2}-emission avoidance of 15,000 ton per year
- In operation since Q3 2009
Implementation and operation of demonstration plants to enhance marketability of new applications

**Geothermal**
- Investigation of sites in Southern Molasse Basin and Upper Rhine Graben Preparation for drilling and power plant construction
- GeoHybrid scheme: Combining biogas and geothermal energy to be developed at Frankfurt Airport

**Marine**
- Demonstration wave power plant at Islay Island together with Wavegen
- 9 years operational experience
- Investigation of potential sites for tidal stream power plants

**Micro wind turbine**
- Quiet Revolution micro wind turbine with 5 kW capacity
- Decentral power generation on top of buildings or piles
- Low-noise technology
- Easy installation
- Demonstration plant at ETEC-building in Essen
Innogy Venture Capital is driving the commercialisation of innovative renewable energy technologies

Innogy Venture Capital GmbH invests for RWE Innogy in carbon neutral, central and decentral renewable energy generation and storage technologies in Europe. The aim is to successfully bring innovative technologies in this area to commercial maturity.

> 9 companies
> More than €52m committed capital
> Diversified in terms of technologies, countries and stages
Venture Capital promotes competitive advantage and profitable growth for RWE

**Competitive advantage**
- Promotion of new market segments
- Commercialise innovative technologies
- Testing of new business models

**Strong CSR\(^1\) culture**
- Create high tech jobs
- Address climate change
- Address resource limitations
- Ensure security of supply
- Finance start ups & innovation

**Profitable growth**
- Identify growth options for RWE Group
- Realise financial returns
- Manage risks through portfolio approach

\(^1\) CSR = Corporate Social Responsibility
R&D improves conversion of already established renewable energies, opens up new business segments and assesses alternative technologies

**Technologies and Research & Development**

**Comprehensive R&D drivers**

- Strong growth path of RWE Innogy
- Profitability for most renewable energies still based on the regulatory recognition of environmental impact of conventional energy sources
- Maturity of most conversion technologies not yet on equal level with conventional power plants
- Tapping of additional potential through new technologies

**R&D targets**

- Improve profitability of the core businesses by reducing costs and increasing availability
- Allow further growth and opening of new business segments
- Develop and sustain know-how
- Support the good reputation of the company
Political Framework
EU targets a renewable energy share of 20% in gross final energy consumption by 2020

Overall share of renewable energy in EU¹)

<table>
<thead>
<tr>
<th>Year</th>
<th>Gap</th>
<th>Target 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>9.7</td>
<td>20.0</td>
</tr>
<tr>
<td>2008</td>
<td>10.3</td>
<td></td>
</tr>
</tbody>
</table>

> Target of 20% share of renewables in gross final EU energy consumption by 2020, i.e. covering
  - Power
  - Heating/cooling
  - Transport

> At least 10% of gross final consumption of energy in transport in 2020 in each country


Individual country targets

<table>
<thead>
<tr>
<th>Country</th>
<th>RES share in gross final energy consumption in 2008 (%)</th>
<th>RES share in gross final energy consumption in 2020 (according to Directive 2009/28/EC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>44.4%</td>
<td>50.2%</td>
</tr>
<tr>
<td>Latvia</td>
<td>29.9%</td>
<td>40%</td>
</tr>
<tr>
<td>Finland</td>
<td>30.5%</td>
<td>38%</td>
</tr>
<tr>
<td>Austria</td>
<td>28.5%</td>
<td>34%</td>
</tr>
<tr>
<td>Portugal</td>
<td>23.2%</td>
<td>31%</td>
</tr>
<tr>
<td>Denmark</td>
<td>18.8%</td>
<td>30%</td>
</tr>
<tr>
<td>Estonia</td>
<td>19.1%</td>
<td>25%</td>
</tr>
<tr>
<td>Slovenia</td>
<td>15.1%</td>
<td>25%</td>
</tr>
<tr>
<td>Romania</td>
<td>20.4%</td>
<td>24%</td>
</tr>
<tr>
<td>France</td>
<td>11.0%</td>
<td>23%</td>
</tr>
<tr>
<td>Lithuania</td>
<td>15.3%</td>
<td>23%</td>
</tr>
<tr>
<td>Spain</td>
<td>10.7%</td>
<td>23%</td>
</tr>
<tr>
<td>Germany</td>
<td>9.1%</td>
<td>18%</td>
</tr>
<tr>
<td>Greece</td>
<td>8.0%</td>
<td>18%</td>
</tr>
<tr>
<td>Italy</td>
<td>6.8%</td>
<td>17%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>3.4%</td>
<td>15%</td>
</tr>
<tr>
<td>Ireland</td>
<td>3.8%</td>
<td>16%</td>
</tr>
<tr>
<td>Poland</td>
<td>7.9%</td>
<td>15%</td>
</tr>
<tr>
<td>UK</td>
<td>2.2%</td>
<td>15%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3.2%</td>
<td>14%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>3.4%</td>
<td>13%</td>
</tr>
<tr>
<td>Belgium</td>
<td>3.3%</td>
<td>13%</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>7.2%</td>
<td>13%</td>
</tr>
<tr>
<td>Cyprus</td>
<td>4.1%</td>
<td>13%</td>
</tr>
<tr>
<td>Hungary</td>
<td>6.6%</td>
<td>3%</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>2.1%</td>
<td>11%</td>
</tr>
<tr>
<td>Malta</td>
<td>0.2%</td>
<td>10%</td>
</tr>
</tbody>
</table>

National target for RES share in gross final energy consumption in 2020 (according to Directive 2009/28/EC)

Gap up to target achievement for 2020 based on national RES potential as forecasted by MS
(% indicates target achievement as cited in NREAP)

RES share in gross final energy consumption in 2008 (%)

# Mechanisms to support renewable energy generation in Europe

## Main types of support mechanism

<table>
<thead>
<tr>
<th>Characteristics of mechanism:</th>
<th>Strength/Weakness:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quota obligation &amp; tradable certificates</strong></td>
<td>Forces suppliers to take action to meet their obligation, market based system should drive costs down</td>
</tr>
<tr>
<td>&gt; Electricity suppliers are obliged to have a certain proportion of their electricity from renewable sources</td>
<td>&gt; Lack of revenue certainty, cost of administration, failure to support immature technologies</td>
</tr>
<tr>
<td>&gt; Renewable Energy Certificate is a tradable commodity proving that certain electricity is generated using renewable energy sources (per MWh)</td>
<td></td>
</tr>
<tr>
<td>&gt; Certificates are traded to fulfil renewable obligations</td>
<td></td>
</tr>
<tr>
<td>&gt; Renewable power generators receive wholesale market price for generated power plus the value of the certificate</td>
<td></td>
</tr>
</tbody>
</table>

**Feed-in tariffs / Fixed Premium**

<table>
<thead>
<tr>
<th>Characteristics of mechanism:</th>
<th>Strength/Weakness:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Renewable energy producers are paid a fixed tariff</td>
<td>Price and investment certainty</td>
</tr>
<tr>
<td>– Instead of pool price (Feed-in tariffs)</td>
<td>&gt; Political risk, cost to consumers, generator does not receive CO₂ upside</td>
</tr>
<tr>
<td>– In addition to pool price (Price premium)</td>
<td></td>
</tr>
<tr>
<td>&gt; Tariffs usually vary depending on technology, capacity and age of power plant and are typically limited in time</td>
<td></td>
</tr>
</tbody>
</table>

Source: EREF – Prices for renewable energies in Europe: Feed-in tariffs versus quota systems – a comparison, 2006/2007; Datamonitor – Are national policies sufficient to drive renewable investment? – April 2007; EC [52]; BMU (January 2007); FORRES 2020 – Analysis of the renewable energy sources’ evolution up to 2020 (Fraunhofer et al, April 2005)
UK: Renewables support framework based on renewable obligations and tradable certificates

Renewables support in UK

<table>
<thead>
<tr>
<th>Legal framework</th>
<th>&gt; Renewables Obligation (RO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price mechanism</td>
<td>&gt; Certificate-based, indirect variable subsidy</td>
</tr>
<tr>
<td>Length of mechanism</td>
<td>&gt; Annual Compliance Periods (CPs), legislation from 2002 until 2036/37</td>
</tr>
<tr>
<td>Value of mechanism</td>
<td>&gt; Renewables Obligation Certificate (ROC) value for 2009/10 (CP10) was £52.34/MWh</td>
</tr>
<tr>
<td>Other earnings captured</td>
<td>&gt; Power price, Levy Exemption Certificates</td>
</tr>
<tr>
<td>CO₂ hedge effectiveness</td>
<td>&gt; Yes – from power price earnings</td>
</tr>
<tr>
<td>Future legislation changes</td>
<td>&gt; From April 2011, Offshore wind farms will be accredited in phases with 20 years of support per phase. &gt; The current ROC bands are under review. The proposed bands will be published in Autumn 2011 and come into effect in April 2013 &gt; Government is undertaking an Energy Market Review which may replace the RO with an alternative mechanism from 2017</td>
</tr>
</tbody>
</table>

* Entitlement is increased by 0.5 ROC if combined with CHP

ROC bands by technology (effective from April 2009)

<table>
<thead>
<tr>
<th>Band</th>
<th>Support level (ROC/MWh)</th>
<th>Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established</td>
<td>0.25</td>
<td>Landfill gas</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>Co-firing of non-energy crop biomass*, sewage gas</td>
</tr>
<tr>
<td>Reference</td>
<td>1.0</td>
<td>Onshore wind, hydro, co-firing of energy crop*</td>
</tr>
<tr>
<td>Post-demonstration</td>
<td>1.5</td>
<td>Dedicated biomass*</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>Offshore wind</td>
</tr>
<tr>
<td>Emerging technologies</td>
<td>2.0</td>
<td>Wave, tidal, dedicated biomass using energy crops, dedicated biomass with CHP (both energy crop and non-energy crop)</td>
</tr>
</tbody>
</table>

* Entitlement is increased by 0.5 ROC if combined with CHP
UK: Revenues from renewable energy combine market price, ROC purchase and tax incentives

Support mechanism

- **Buy-out price** sets the rate suppliers need to pay if they don’t present sufficient ROCs (£38.69/ROC for April ’11 to March ’12).

- The proceeds of the buy-out fund are paid back on a pro-rated basis to suppliers that have presented ROCs (recycling mechanism).

- Wholesale baseload power price (variable) + Buy-out price (fix) + Recycle price (variable) + Levy exemption certificates (LECs, fix)

- Climate Change Levy (CCL) is an energy tax payable by industrial and commercial consumers since April 2001. Electricity generated from renewables is exempt from CCL (£4.56 per MWh in 2008).


### Renewables Obligation Certificates (ROC)

- A ROC is the green certificate issued for electricity from eligible renewable source, which is both generated and consumed within the UK.

- Generators are issued ROCs (which they can then sell on) for each MWh of eligible electricity generated.

### Renewables Obligation (RO)

- Electricity suppliers are obliged to redeem ROCs or pay the buy-out price for a pro-portion of their supply (12.4% in 2011/12). A buy-out fee is payable for any shortfall.

- Most suppliers purchase ROCs from their generation assets or enter into long-term purchase agreements with independent generators.

- In 2010, new RO legislation created a mini-mum fixed headroom of 10% between ROC generation and suppliers’ MWh obligation.

---

1) Buy-out price is updated each year by Ofgem to reflect changes in Retail Prices Index (RPI).

2) Since the size of the buy-out fund is dependent on the volume MWh’s for which suppliers fail to redeem ROCs, this value depends upon the obligation target being greater than the available renewables obligation certificates (in 2007/08 the compliance ratio amounted to 64% of the total obligation target).
The renewables support framework in Germany is based on fixed feed-in tariffs

### Feed-in tariff by selected technologies (in €/MWh)

#### Existing regime EEG January 2009

<table>
<thead>
<tr>
<th>Technology</th>
<th>Remuneration range</th>
<th>Bonus dependent on use of specific technologies/materials or date of installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Hydro (&gt; 5 MW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onshore Wind</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offshore Wind</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Hydro (up to 5 MW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geothermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar PV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Renewables support in Germany

<table>
<thead>
<tr>
<th>Legal framework</th>
<th>Feed-in tariff system described in Renewable Energy Act (Erneuerbare Energien Gesetz EEG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price mechanism</td>
<td>Regressive, guaranteed feed-in tariff (fixed once installation is commissioned)</td>
</tr>
<tr>
<td>Length of mechanism</td>
<td>Tariffs guaranteed up to 20 years</td>
</tr>
<tr>
<td>Value of mechanism</td>
<td>Varying tariffs depending on technology, capacity and location</td>
</tr>
<tr>
<td>Other earnings captured</td>
<td>None</td>
</tr>
<tr>
<td>CO₂ hedge effectiveness</td>
<td>No – tariff not linked to power price</td>
</tr>
<tr>
<td>Legislation</td>
<td>EEG 01/01/2009</td>
</tr>
</tbody>
</table>

Source: RWE on the basis of EEG 2009 – BMU; ¹ Only in case of modernisation and only payment for the capacity increase (from 2009: for a period of 15 years); ² 5 €/MWh bonus for installations prior to January 2014; ³ Starting fee of 130 €/MWh for first 12 years and 150 €/MWh for installations prior to 12/31/2015; ⁴ Up to 70 €/MWh bonus for combination with heat usage and use of petrothermal technology; additional 40 €/MWh for plants commissioned before December 31, 2015; ⁵ Low end for waste wood, biomass, high end for biogas; ⁶ 13%, 12% or 8% reduction, depending on installation, on 1st July 2010 and an additional reduction of 3% for all installations on 1st October 2010.
Germany:
Wind power support mechanism

Onshore
- Basis tariff of 5.02 c/kWh\(^1\) for a maximum of 20 years plus year of commissioning
- Increased tariff of 9.20 c/kWh\(^1\) for first 5 years for assets achieving at least 150% of reference yield\(^2\), additional 0.5 c/kWh for assets commissioned before January 1, 2014
- Tariff levels reduce by 1% p.a.

Offshore
- Basis tariff of 3.50 c/kWh\(^1\)
- Increased tariff of 15.00 c/kWh for 12 years (13.00 c/kWh for installations after December 31, 2015)
- This 12-year period is prolonged by 0.5 months for every nautical mile increase in range above 12 nautical miles and it is prolonged by 1.7 months for every metre in water depth in excess of 20 metres
- Tariff levels reduce by 5% p.a. from 2015

---

1) The reference yield is a yield generated by the reference installation. It is a wind energy converter of a specific type for which a yield at the target installation can be compared on the basis of a P-V curve (power-wind speed curve), measured by an authorised institution (Fördergesellschaft Windenergie e.V.).

2) For assets commissioned in 2009.
The renewables support framework in Spain offers two alternative schemes

### Renewables support in Spain

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price mechanism</td>
<td>Choice between:&lt;br&gt;– Market price plus premium (&quot;Variable tariff&quot;) including cap and floor&lt;br&gt;– Feed-in-tariff (&quot;Fixed tariff&quot;)</td>
</tr>
<tr>
<td>Length of mechanism</td>
<td>Period of 15 – 25 years depending on technology&lt;br&gt;For certain technologies prices also regulated for years after initial period</td>
</tr>
<tr>
<td>Value of mechanism</td>
<td>Variable tariff: Premium as well as upper and lower limits fixed for first period of 15 – 25 years&lt;br&gt;Fixed tariff: Tariffs fixed for first period and years thereafter&lt;br&gt;Regular revisions and updates of tariffs based on an adjusted consumer price index</td>
</tr>
<tr>
<td>Other earnings captured</td>
<td>Variable tariff: Power price&lt;br&gt;Additional compensation under both regimes such as an efficiency allowance, voltage gap allowance and a reactive energy allowance for certain technologies</td>
</tr>
<tr>
<td>CO₂ hedge effectiveness</td>
<td>Variable tariff: Yes – from power price earnings (within upper and lower limits)&lt;br&gt;Fixed tariff: No – tariff not linked to power price</td>
</tr>
<tr>
<td>Future legislation changes</td>
<td>Regulations of the Royal Decree 661/2007 will be reviewed every four years&lt;br&gt;The reviews will not affect plants which are awarded the start-up certificate before January 1 of the second year after the year in which the review is carried out</td>
</tr>
</tbody>
</table>
Spain: Onshore wind power support mechanism

<table>
<thead>
<tr>
<th>Example wind power(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed tariff</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>First 20 Years</strong></td>
</tr>
<tr>
<td>79.08 €/MWh</td>
</tr>
<tr>
<td><strong>Afterwards</strong></td>
</tr>
<tr>
<td>64.75 €/MWh</td>
</tr>
<tr>
<td><strong>Variable tariff</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>First 20 Years</strong></td>
</tr>
<tr>
<td>Upper Cap: 91.737 €/MWh</td>
</tr>
<tr>
<td>Premium: 76.975 €/MWh</td>
</tr>
<tr>
<td>Premium: 20.142 €/MWh</td>
</tr>
<tr>
<td><strong>Afterwards</strong></td>
</tr>
</tbody>
</table>

> The revenue per MWh is a fixed amount independent of the current pool price
> The tariff is annually updated based on the consumer price index change
> After initial period the reference price is lowered

> Within limits, the revenue is given by the sum of pool price and premium
> The floor is the guaranteed minimum price
> If market prices exceed upper cap, the price becomes equal to the market price but no additional premium
> After initial period no premium is paid

\(^1\) Tariffs as described in Royal Decree 661/2007.
The renewables support framework in Italy

### Renewables support in Italy

<table>
<thead>
<tr>
<th>Legal framework</th>
<th>&gt; Green Certificates (GC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price mechanism</td>
<td>&gt; Certificate-based, indirect variable subsidy</td>
</tr>
<tr>
<td>Length of mechanism</td>
<td>&gt; 15 years; refurbishment qualifies for prolongation, e.g. wind on-shore additional 15 years with co-efficient 0.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value of mechanism</th>
<th>&gt; Green Certificate (GC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– Guaranteed GSE price for 2011: 84.58 €/MWh (GC generated in 2010)</td>
</tr>
<tr>
<td></td>
<td>– Weighted medium exchange price for certificates 2011: 82.57€/MWh</td>
</tr>
<tr>
<td></td>
<td>&gt; Annual adjustment of certificate value (GSE: average exchange price for certificates of last years)</td>
</tr>
<tr>
<td>Other earnings captured</td>
<td>&gt; Power price</td>
</tr>
<tr>
<td>CO₂ hedge effectiveness</td>
<td>&gt; Yes – from power price earnings (but to limited extent as certificate value is updated and adjusted to the power price every year)</td>
</tr>
<tr>
<td>Future legislation changes</td>
<td>&gt; Last effective change in legislation in March 2010, future changes may occur after 2011-2012</td>
</tr>
</tbody>
</table>

### GCs by technology (Legge Finanziaria no. 244, 2008)

<table>
<thead>
<tr>
<th>Coefficient (GC/MWh)</th>
<th>Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Onshore wind (plants of more than 200 kW)</td>
</tr>
<tr>
<td>1.5</td>
<td>Offshore wind</td>
</tr>
<tr>
<td>1.0</td>
<td>Hydro</td>
</tr>
<tr>
<td>0.9</td>
<td>Geothermal plants</td>
</tr>
<tr>
<td>1.8</td>
<td>Waves and tidal</td>
</tr>
</tbody>
</table>

**Conto Energia**

<table>
<thead>
<tr>
<th>Coefficient (GC/MWh)</th>
<th>Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>Biodegradable waste and biomass (other than the one indicated in the following point)</td>
</tr>
<tr>
<td>1.8</td>
<td>Biomass and biogases obtained from agriculture, animal husbandry and forestry on a short supply-line basis; co-generation</td>
</tr>
<tr>
<td>0.8</td>
<td>Landfill gas, sewage treatment plant gas and biogases (other than the ones indicated in the previous point)</td>
</tr>
</tbody>
</table>

---

1) Remuneration for electricity generation from photovoltaic plants is regulated by art. 7 del D.Lgs. 387/03 (the so-called “Conto Energia”). Depending on capacity and type of the individual plant tariffs vary from 280 to 440 €/MWh for 2011 and will be reduced by 6% for 2012 and 2013. Italy has implemented a cap for installed capacity of 3,000 MW.


3) Price as of April 13th, 2011.
Italy: Revenues from renewable energy combine market price and green certificate value

Green Certificates

> Distributors are issued Green Certificates (GCs) by the Energy System Authority (Gestore del Sistema Elettrico or GSE) for each MWh of eligible electricity generated.

> The sale of the certificates can be performed either directly to another company (agreed price) or via the green certificates market place at the Italian energy exchange managed by GME (Gestore del Mercato Elettrico), whereas the price is determined by supply and demand.

> In addition, GSE is obliged to take back GCs in excess on the market. The take back price is determined by the average price of the exchange price for certificates (GME) of the last year.

---

Support mechanism GME (stock exchange) and GSE – VAT excluded

- **Average weighted exchange price for certificates 2011 (VAT excluded) registered by the GME.**
  - $82.57 \text{ €/MWh}^1$

- **GME average weighted GC's for 2011**
- **GSE guarantees a take back of GC's. The price is determined by the average exchange price for certificates of the last year.**

- **GSE Value of GC for 2011 regarding average price for certificates (GME) of 2010**
  - $84.58 \text{ €/MWh}$

Practically, the GSE take back price can be seen for energy generators from renewable sources as minimum price for GC's in Italy.

---

1) Price as of April 13th, 2011.
Renewables support frameworks in France

Renewables support in France

Legal framework
- Order of 17/11/2008 completed by the order of 23/12/2008 (Order of 08/06/2001) – legislative framework constrains retailers to sign a purchase contract for electricity produced from renewable energies

Price mechanism
- Guaranteed feed-in tariffs for each renewable energy source

Length of mechanism
- Tariffs guaranteed up to 20 years for offshore wind and up to 15 years for onshore wind

Value of mechanism
- Tariffs fixed for first ten years then re-evaluated according to full power equivalent hours recorded during the first ten years of operation
- Currently up to 81.89 €/MWh for onshore and 129.83 €/MWh for offshore (2011 contract)

Other earnings captured
- None

CO₂ hedge effectiveness
- No – tariff not linked to power price

Future legislation changes
- No changes visible so far

Feed-in tariff by selected technologies

### France: On- and offshore wind power support mechanism

#### Onshore wind (current situation)

- The power purchase contract for onshore wind is entered into for a period of 15 years from the beginning of commercial operation.
- The tariff for onshore facilities is 82 €/MWh for the first ten years.
- For the following five years the tariff is between 82 and 28 €/MWh in relation to the number of full power equivalent hours recorded during the first ten years of operation. The tariff is linearly interpolated between the base values:
  - 82 €/MWh for 2,400 hours or less,
  - 68 €/MWh for 2,800 hours and
  - 28 €/MWh for 3,600 hours or more
- The base year for the fixed tariffs is 2006. A weighted average of several published indices is to cover inflation (K- and L-index).
- Costs of connection to the grid have to be paid by the wind power producer.
- No additional costs for balancing power for the wind power producer.
- Applications for wind farm building permits filed after July 13, 2007 have to be located in Wind Power Development Areas – these areas are defined taking into account:
  - wind power potential of the area,
  - ease of connection to the grid,
  - landscape protection, biodiversity, safety.

#### Offshore wind (current situation)

- The power purchase contract for offshore wind is entered into for a period of 20 years from the beginning of commercial operation.
- The tariff for offshore facilities is 130 €/MWh for the first ten years.
- For the following ten years the tariff is between 130 and 30 €/MWh depending on the number of full power equivalent hours recorded during the first ten years of operation. The tariff is linearly interpolated between the base values:
  - 130 €/MWh for 2,800 hours or less,
  - 90 €/MWh for 3,200 hours and
  - 30 €/MWh for 3,900 hours or more
- The base year for the fixed tariffs is 2006. A weighted average of several published indices is to cover inflation (K- and L-index).

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1) Order of November 17, 2008.