



Renewable Generation Strategies of Europe's Utilities, 2006–2011

March 2006

Study Highlights:

Strategy Profiles of Europe's Utilities

In-depth analysis of utility renewable generation strategies in the context of their overall generation portfolios, cross-border market strategies, and competitive drivers.

Utilities profiled include:

- DONG/Elsam
- Energi E2
- EDF
- Edison
- EDP
- Electrabel
- Endesa
- Enel
- E.ON
- Essent
- Fortum
- Iberdrola
- Nuon
- RWE
- ScottishPower
- Scottish & Southern
- Statkraft
- Vattenfall
- Verbund

Generation and Project Data

Up-to-date analysis of utility generation portfolios by technology, investment plans, and project by project status.

- Utility investment plans by renewable technology, including:
 - Wind projects and pipelines
 - Biopower projects and pipelines
 - Wave and tidal pilot projects
 - Solar PV and CSP activities
- Utility by utility generation data including comparative analysis of renewable, nuclear, and thermal capacity

Regulatory and Carbon Policies

Comparative analysis of renewables targets, feed-in and quota policies, and ETS implementation.

- Impact of country-specific carbon and renewables policies on utility strategies
- Utility strategies for addressing carbon allocations
- Impact of deregulation on renewables investment

Competitive Analysis

Analysis of competition amongst utilities in regional markets and Europe-wide, including the role of renewables.

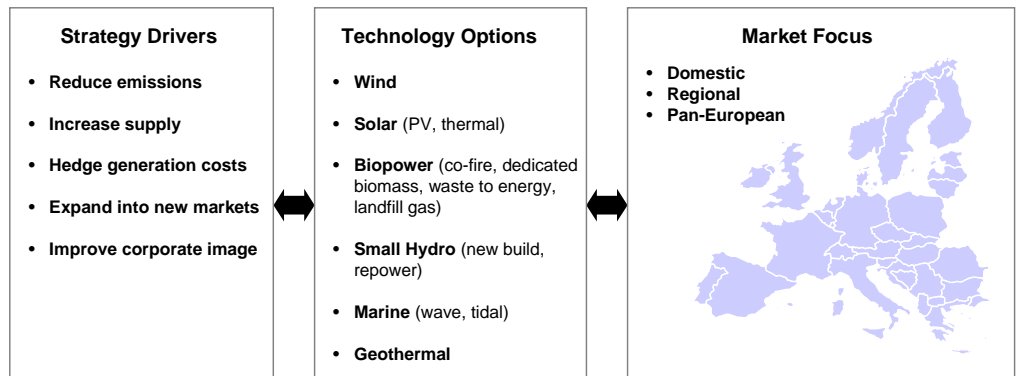
- Renewable M&A activity
- JV and partnerships
- Value chain analysis

Over 270 pages and more than 200 exhibits of comprehensive benchmark analysis with a European focus.

Environmental issues are increasingly driving power generation investments in Europe. Challenged by the EU and Kyoto-driven national policies to produce cleaner power, Europe's utilities are adding renewables to their generation portfolios at a faster pace than ever before. While wind power has been the dominant renewable power source added this decade, utilities are now broadening their search for clean power alternatives to include scalable biopower, small hydro, solar, and ocean power.

But building out renewable generation to meet EU targets is only a small part of the story. In the broader context of electricity deregulation, fuel supply interruptions, skyrocketing energy prices, and industry consolidation, renewable energy strategies have become key to building competitive advantage among Europe's utilities.

Renewable Generation Strategies of Europe's Utilities, 2006–2011, a new study by Emerging Energy Research, carefully analyzes the strategies of Europe's largest utilities in the areas of wind power, biopower, solar PV, solar CSP, wave and tidal energy, small hydro power, and geothermal. The study compares strategy drivers, technology options, and market focus.



Renewables are becoming key components of Europe's utility strategy portfolios. EER's new study details how and why:

- Renewables are evolving as a strategic imperatives for utilities aiming to expand into new generation markets while fulfilling environmental obligations. Which utilities are leveraging renewables experience to enter new markets and broaden their European presence?
- To date, wind has been the most scalable option, with projects reaching up to 160 MW. Which technologies will follow? How far off is tidal and solar CSP? Which utilities have achieved competitive business models in biopower?
- Europe's emissions regulations vary widely by region, giving rise to different approaches among Northern, Southern, and Central European utilities. What are the implications for your business?

Whether Europe's utilities are your customers, your competitors or your suppliers, **Renewable Generation Strategies of Europe's Utilities, 2005–2010** provides a wealth of project data, business intelligence, and strategic analysis to help you succeed in renewable energy markets.



TABLE OF CONTENTS

Section 1. Executive Summary

- 1.1 Regulatory Drivers Behind Renewable Generation in Europe
 - Focus on power sector emissions
 - Renewable energy targets in Europe
 - National renewable energy incentives in Europe
- 1.2 Renewable Generation in European Power Markets
 - Generation mix of Europe's top-20 utilities
 - Sizing up emissions exposure
 - Nuclear power policy environment
 - Renewable generation portfolios
- 1.3 Renewable Generation Rankings
 - Utility investments in renewables on the rise
- 1.4 Utility Strategies in Renewable Generation
 - Charting renewables on the utility value chain
 - Scaling renewables
 - Europe's mega-utilities begin to take renewables seriously
 - UK and Northern European utilities seek regional leadership
 - Southern European utilities target wind and sun
- 1.5 Outlook

Section 2. Renewable Energy Policies in Europe

- 2.1 Kyoto, Emissions and the European Union
- 2.2 EU Emissions Trading and NAPs
 - 2.2.1 ETS Framework
 - National allocation plans
 - The value of EUAs
 - ETS Phase I: 2005–2007
 - ETS Phase II: 2008–2012
 - 2.2.2 Compliance Strategies for the Power Sector
- 2.3 Renewable Energy Targets in Europe
 - 2.3.1 Wind Energy Targets
 - 2.3.2 Small Hydropower
 - 2.3.3 Biomass and Biogas Targets
 - 2.3.4 Other
- 2.4 National Renewable Energy Incentives in Europe
 - 2.4.1 Fixed Feed-In Tariffs
 - Germany as the pioneer with REFITS
 - Following success onshore, Germany shifts wind emphasis to offshore
 - Despite some utility opposition REFITS continue for PV
 - Spain adopts a flexible feed-in regime
 - Spain supports stabilising measures for wind energy
 - Solar thermal, PV and biomass look to follow in the footsteps of wind in the Spanish market
 - Denmark targets repowering and offshore
 - Portugal steps up measures
 - France pursues fixed feed-in tariffs, but limits size
 - The Netherlands switches to feed-in tariffs
 - 2.4.2 Quota Model in Transition
 - UK ROCs
 - Italy's green certificate programme
 - Sweden institutes supplier quotas
 - Uncertainty ahead for SHP in Sweden
 - 2.4.3 Other Countries Display Mix of Models
 - EFTA and EU-15
 - Renewables policies in EU ascension countries

Section 3. Renewable Energy and European Power Markets

- 3.1 Liberalisation of European Power Markets
 - 3.1.1 Unbundling of the Value Chain in National Markets
 - 3.1.2 Liberalisation of National Supply Markets
 - 3.1.3 Evolution of Regional Markets
 - 3.1.4 Privatisation of Generation Assets
 - 3.1.5 Power-Gas Mergers
- 3.2 Utility Strategies in European Power Market
 - 3.2.1 Regional Strategy Groupings
 - 3.2.2 Carbon Offset Strategies
- 3.3 Generation Portfolio Analysis
 - 3.3.1 Generation Mix
 - Nuclear power policy environment
 - Coal generation and emissions
 - Large hydro
 - 3.3.2 Utilities Build Renewables Portfolio
 - Renewable energy obligations
 - Renewable energy contribution to generation portfolios
 - Ownership of renewable energy capacity
 - RE capacity additions in 2005
- 3.4 Forecast of Renewable Energy in Europe 2006–2011
 - 3.4.1 Wind Capacity Growth

- 3.4.2 Increase in the Use of Biomass at Centralised Facilities is Steady
- 3.4.3 Concentrated Solar Power Forecasted to Grow
- 3.4.4 Forecast of Marine Energy Capacity
- 3.4.5 SHP Growth

Section 4. Utility Generation Strategies in Renewables

- 4.1 Technology Options: Scaling Up with Wind, Others to Follow
 - 4.1.1 Germany, Spain, Nordic Region Serve as Base for European Expansion
- 4.2 Charting Renewables on the Utility Value Chain
- 4.3 Scaling Renewables
 - 4.3.1 Technology Drivers
 - Maximising economies of plant and production scale
 - 4.3.2 Renewable Energy Development
 - 4.3.3 Renewable Energy Financing
- 4.4 Utility Strategies in Renewable Energy Market Segments
 - 4.4.1 Wind Power Generation Leads Utility Investments
 - 4.4.2 Utility Co-Firing Leads European Bioenergy Market
 - Co-combustion leads the way
 - Barriers to growth: Weak regulatory support and uncertain fuel supplies
 - Potential sources of growth in biopower vary across Europe
 - Northern Europeans harness local resources for major installations
 - Central Europeans trying to duplicate Nordic model
 - Southern Europeans await market improvement
 - Biopower outlook: Challenging market with regional growth pockets
 - 4.4.3 Small Hydro Tapping Out, Moving East
 - Institutional and environmental constraints limit further investment
 - Norway, Nordic region a final frontier for new build, repowering
 - Where new build restricted, focus on hydro repowering
 - Looking east for new opportunities
 - Outlook: Three fronts for development
 - 4.4.4 European Utilities Add Solar to Green CV
 - Germany sets pace for PV support, Europe focused on small scale
 - Utilities go green as solar PV distribution channels R&D and manufacturing ventures to understand and capture technology profits
 - Immature market for utility-scale, centralised solar PV generation
 - Outlook: Going green with installation, with eyes on generation
 - 4.4.5 Solar CSP Gains Momentum Among Southern European Utilities
 - Iberdrola targets solar to bolster renewables portfolio
 - Parabolic trough technology gets initial nod
 - Acciona entry expected in Spain
 - Other Southern European activities
 - 4.4.6 Wave Power Drawing Greater Interest
 - UK, Portugal, Spain lead the way with regulatory support
 - Utilities, renewables players and industrial powerhouses drive wave energy pilots
 - 4.4.7 Tidal Power
 - Partners key, from pioneering to producing
 - 4.4.8 Geothermal Power

Section 5. Strategy Profiles: Europe's Mega-Utilities

- 5.1 EDF
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - SHP strategy review
 - Solar PV strategy review
 - Bioenergy strategy review
 - Marine Energy Strategy
- 5.2 E.ON
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - Bioenergy strategy review
 - SHP strategy review
 - Solar PV strategy review
- 5.3 RWE
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - Bioenergy strategy review

- SHP strategy review
- Solar PV strategy review
- Fuel cell strategy

Section 6. Strategy Profiles: UK and Northern European Utilities

- 6.1 Electabel
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - Bioenergy strategy review
 - SHP strategy review
 - Solar PV strategy review
- 6.2 DONG/Elsam/Energi E2
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - SHP strategy review
 - Bioenergy strategy review
- 6.3 ScottishPower
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - Marine energy strategy review
 - SHP strategy review
 - Bioenergy strategy review
- 6.4 Scottish and Southern Energy
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - SHP strategy review
 - Marine energy strategy review
 - Bioenergy strategy review
 - Solar PV strategy review
- 6.5 Nuon
 - Background
 - Renewable energy generation strategy overview, YE 2005
 - Wind strategy review
 - Bioenergy strategy review
 - SHP strategy review
 - Solar PV strategy review
- 6.6 Essent
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - Bioenergy strategy review
 - Solar PV strategy review
- 6.7 Statkraft
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - SHP strategy review
 - Marine energy strategy review
 - Bioenergy strategy review
- 6.8 Vattenfall
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - Bioenergy strategy review
 - SHP strategy review
- 6.9 Verbund
 - Background
 - Renewable energy regeneration strategy overview
 - Wind strategy review
 - SHP strategy review
 - Bioenergy strategy review
- 6.10 Fortum
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - SHP strategy review
 - Bioenergy strategy review

Section 7. Strategy Profiles: Southern European Utilities

- 7.1 EDP
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - Bioenergy strategy review
 - SHP strategy review
 - Solar power strategy review
 - Marine energy strategy review
- 7.2 Edison
 - Background
 - Renewable energy generation strategy overview
 - Wind strategy review
 - SHP strategy review
 - Bioenergy strategy review

