E.ON Business Deep Dive - Renewables

December, 2015
Agenda

- E.ON Renewables Position
- E.ON Renewables Business Approach
- Market Trends
E.ON Renewables highlights

- 4.5 GW diversified portfolio (average age of 8 years) across Europe & US\(^1\)
- Global #2 in offshore wind
- Global #12 in onshore wind
- Multi-technology developer, constructor, operator and asset partner with broad international footprint
- 12.3 TWh electricity produced in 2014
- € 823 m EBITDA generated in 2014

1. Owned portfolio, forecasted 2015 FY pro-rata share (includes Humber + Amrumbank both at 100%)

Since 2007 E.ON has built a top-tier renewables player
We own a diversified renewables portfolio of 4.5 GW across Europe and US

1. Forecasted 2015 FY pro-rata share (includes Humber + Amrumbank both at 100%)
Investments in renewables

**Key facts**

- Total investments of ~11bn (gross) in new capacity since inception of EC&R
- In the first four years focus largely on onshore wind, since then an increased share in offshore wind
- Portfolio has grown 10 times since July 2007, despite recently tighter capex situation
- Strict investment discipline applied with IRRs exceeding WACC by more than a defined minimum hurdle
- 1.4 GW disposed through capital rotation and strategic country exits

**E.ON has a proven track-record based on > €10bn successful investments since setup of EC&R in 2007**

1. Including equity and debt for the acquisitions of E2i and Airtricity
Track-record

**Key facts**

- 5.9 GW of capacity built since 2007
- Extensive construction expertise
  - > 50 projects delivered
  - > 90% of projects delivered in budget and on time
- 2 offshore projects constructed in parallel (CODs in 2015)
- Grandview I (211 MW US onshore wind) completed within 180 days (FID to COD)
- Competitive edge in development: top-class site assessment
- In-house O&M workforce trained to industry standards

→ Excellent execution capabilities on back of continuous development of new projects

**Project examples**

- **London Array**, the world’s largest offshore wind farm
  - COD: Q2 2013
  - Capex\(^1\): € 2400m
  - E.ON share: 30%
  - Capacity: 630 MW

- **Grandview I**, onshore wind farm in Panhandle, Texas
  - COD: Q4 2014
  - Capex\(^1\): € 331m
  - E.ON share: 50%
  - Capacity: 211 MW

- **Maricopa West**, PV park in Kern County, California
  - COD: Q4 2015
  - Capex\(^1\): € 55 m
  - E.ON share: 100%
  - Capacity\(^2\): 28 MW

We deliver outstanding performance based on our expertise and capabilities
Earnings

EBITDA Development (€bn)

- EBITDA growing since inception with a CAGR of 33%
- Growth pace fastest in the phase 2007-2010
- Since then capital rotation and disposals slightly impacted earnings development
- Strong capex focus on offshore in 2013-2015
- Majority of earnings supported by regulated / long-term contracted revenues ~60%
- ~25% of 2015 EBITDA in US onshore, ~40% in Europe offshore and rest in Europe onshore

Revenue Mix 2015

- US
- UK
- Continental Europe

Merchant
Regulated / long-term contracted

Earnings have grown continuously over past 7 years
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### E.ON Key Success Factors in Renewables

- **Access to premium sites**
- **Cost competitiveness and end-to-end process excellence**
- **Scale advantage**  
  (supported by partnering and capital rotation)

### E.ON Portfolio Approach in Renewables

- **Focus on attractive technologies**
- **Capture attractive remuneration schemes across different markets in stable countries**
- **Prudent and disciplined capital allocation**

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We have a holistic and value creating approach to renewables
Site selection

Examples – offshore wind

- Start with near shore, shallow water projects before moving to deeper water, far shore projects
- Examples: offshore wind
  - Rampion
  - London Array
  - Kårehamn
  - Humber Gateway

Water depth [m]

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<th>Distance to shore [km]</th>
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Example – Grandview (Texas, US)

- Grandview secured by early analysis of the grid expansion program in Texas in 2010
- Potential size of the site: ~ 1.0 GW (211 MW already built and 200 MW under construction)
- Avg. load factor: >50%

Attractive site selection with improved economics

1. Source: Renewables UK, 4COffshore
Current regulatory regimes and frameworks

Attractive regulatory regimes and policy support still prevailing in our core markets

Remuneration scheme by geography

E.ON Market Highlights

**US:**
- Tax Credits (PTC and ITC)
- Accelerated Depreciation (MACRS)
- Renewable Portfolio Standards (RPS)
- Expected positive impact from Clean Power Plan

**UK:**
- Renewable Obligation Certificates (ROC)
- Contract for differences (CfD)
- Levy Exemption Certificates (LEC) have fallen away (Aug 2015)

**Germany:**
- Feed-in tariff (FIT) for German offshore (“Stauchungsmodell”)

Source: Bloomberg
As markets mature and competitiveness increases, operational excellence will remain key for sustainable, profitable growth.
LCOE development trends

**LCOE key drivers**

- CAPEX and OPEX Reduction
- Output Optimization

**LCOE global trend**

- Offshore Wind
- Coal
- Onshore Wind
- Gas

(€/MWh)

- 2013
- 2017
- 2020
- 2023

1. Assumed conversion rate €/$ = 1.12. Average of China, India, US and Europe
Source: Stiftung (Offshore Wind), Bloomberg New Energy Finance (Onshore Wind, Coal, Gas)

Wind LCOE competitive with other technologies
LCOE development at E.ON

Cost Structure – Example of onshore wind

E.ON project LCOE examples (€/MWh)¹

Offshore

-22%

100%
2011 (Humber)

78%
2015 (Rampion)

Onshore

-40%

100%
2009 (Pyron)

60%
2015 (Colbeck’s Corner)

-10% CAPEX reduction equates to ~110 bps IRR increase

¹ At final investment decision (FID).
We continuously drive down required capital by optimizing design, procurement and construction.
Operation & maintenance as key lever for OPEX reduction

O&M cost containment – Onshore

2011 baseline for 2015

-18%

O&M Contracting

Spares concept & contracting

CMS/ Smart Maintenance

Other initiatives

Additional cost reduction

Estimation YE 2015

82%

O&M levers

O&M improvement measures

- O&M contracting and concept: Roll-out of self-perform and mixed team sites; break-out of full service contracts into standard contract modules

- Spares concept and contracting: Application of global framework for major components and own purchase of consumables

- Smart Maintenance: Retrofit with Condition Monitoring System and development of a predictive maintenance strategy

- Other initiatives

Additional potential due to active asset management concepts by

- Further contract re-negotiation

- Other initiatives

1. Based on portfolio as per 2011 baseline for 2015.
Load factor and availability

We have excellent performances in terms of both availability and load factors.

1. COD in 2009-2010;
2. COD in 2011-2012 (onshore) and in 2013 (offshore)
3. Offshore: Ambrumbank West; Onshore: Grandview 1 and Colbeck’s Corner
IRR vs WACC spreads examples

Attractive returns above WACC plus hurdle
## Additional value creation

### Partnering
- Third party investors, especially in large-scale projects, increase flexibility and support a diversified portfolio development.
- Partnering supports economies of scale and further development of E.ON capabilities while at the same time developing relationships with long-term valuable partners.
- Partnering allows for shared construction & operational risks and smother earnings profile.
- E.ON generates additional income as construction manager and operator of the sites.
- Strategic partners offer complementary capabilities, allowing to reduce LCOE and risks as well as enhancing success rate in tenders.

### Third Party Services
- Offering full scale operations, maintenance, asset & energy mgmt. services to third party asset owners.
- Unique value proposition towards customers as E.ON’s experience and capabilities in building & operating renewable farms is strong.
- Emergence of new financial players as well as small/ midsized wind farm owners without in-house technical competencies seeking steady cash flow and lower risk profile.
- Leveraging global experience and portfolio allows E.ON to takeover and manage risks on customer’s behalf.
- Asset-light business model and economies of scale (e.g. technical support, procurement) by increasing operational portfolio with customer sites.
- Natural and complementary business model to partnering.

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**Partnering & Third Party Services allow risk diversification and further leveraging our capabilities**
Capital recycling

<table>
<thead>
<tr>
<th>Transaction type</th>
<th>Main rationale</th>
<th>Past transactions</th>
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<tbody>
<tr>
<td>Partnering</td>
<td>• Reduce exposure to cluster and regulatory risks of large projects&lt;br&gt;• Increase flexibility and support a diversified portfolio development&lt;br&gt;• Additional value from Third Party Services</td>
<td>Rampion (Offshore)</td>
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<td>Cap: 400 MW&lt;br&gt;Sold: 49.9%&lt;br&gt;Year: 2015</td>
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<tr>
<td>Build to sell</td>
<td>• Lock-in value upside especially from US PV&lt;br&gt;• Rapid monetization of created value</td>
<td>Alamo (PV)</td>
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<td>Cap: 24 MW&lt;br&gt;Sold: 100%&lt;br&gt;Year: 2015</td>
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<tr>
<td>Capital rotation</td>
<td>• Advance monetization of value from existing projects to fund new ones&lt;br&gt;• Additional value from Third Party Services</td>
<td>US Onshore  &lt;br&gt;Rödsand (Offshore) &lt;br&gt;US Onshore</td>
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<td>of operational assets</td>
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<td>Cap: 433 MW&lt;br&gt;Sold: 50%&lt;br&gt;Year: 2012&lt;br&gt;Cap: 207 MW&lt;br&gt;Sold: 80%&lt;br&gt;Year: 2013&lt;br&gt;Cap: 406 MW&lt;br&gt;Sold: 80%&lt;br&gt;Year: 2014</td>
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</table>

1. PV capacity figures in MW DC (Direct Current)

Successful capital recycling has contributed to E.ON’s renewables development in the past
PV projects & initiatives

Key facts

- PV project delivery experience of >150 MW (14 projects), including development and construction
- Current geographical focus in US
- ~90% of the projects delivered on time and on budget
- In the past, focus on build to sell
- Highly standardized development and engineering to ensure end-to-end process excellence and off-the-shelf PV project delivery
- Professional Energy Marketing enables participation in tenders and RFPs

Capacity built\(^1\) (MW)

<table>
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<tr>
<th>Country</th>
<th>MW</th>
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<tr>
<td>US</td>
<td>92</td>
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<tr>
<td>Italy</td>
<td>49</td>
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<td>France</td>
<td>11</td>
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<td>Total</td>
<td>152</td>
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Recent projects\(^1\) (built & sold)

- **Alamo**
  - Size: 24 MW
  - COD: May ’15
  - Buyer: Dominion

- **Maricopa West**
  - Size: 28 MW
  - COD: Nov ’15
  - Buyer: Dominion

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1. Until end 2015. All capacity figures in MW DC (Direct Current)

E.ON can rely on existing capabilities and experience also in solar PV
Agenda

E.ON Renewables Position

E.ON Renewables Business Approach

Market Trends
Market trends – renewable capacity growth

Recent market development
- Wind & Solar cover largest share of capacity additions with focus on emerging markets
- Largest markets for Wind & Solar until 2020: China, India, United States, Germany, Japan

Investments in Solar and Wind
- > $300bn of global renewable investments per annum expected for the next 25 years

Key drivers for future growth
- Competitiveness: Renewables cost decreasing
- Security of supply: Fuel independence
- Industrial policy: Local content requirements
- Climate change: Low-carbon generation
- Competitiveness of storage

Renewables energy market growing fast, especially in Wind and Solar PV
E.ON key strengths

- Proven track record in the most attractive technologies across different markets
- Cost competitiveness & process excellence as well as best site selection and scale
- Solid position and grow path in core markets

Well positioned to further benefit from continuous growth in renewables
Agenda

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- Appendix
### Current regulatory regimes and frameworks (cont’d)

<table>
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<th><strong>UK</strong></th>
<th><strong>Germany</strong></th>
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<tr>
<td><strong>Offshore</strong></td>
<td><strong>Offshore</strong></td>
<td><strong>Onshore</strong></td>
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<tr>
<td>• ROC per MW</td>
<td>• FIT with direct marketing obligation</td>
<td>• Remuneration based wholesale market or PPA, plus certain incentive features</td>
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<tr>
<td>• Term: 20 years</td>
<td>• Remuneration (EEG 14):</td>
<td>• Production Tax Credit ($23/MWh) or Investment Tax Credit (30% of investment) in place for projects completed by 2016</td>
</tr>
<tr>
<td>• Remuneration: Wholesale price plus 1.8-2.0 ROC/MWh based on COD</td>
<td>- Initial tariff: 154 €/MWh for 12 years (standard) or 194 €/MWh for 8 years (accelerated model)</td>
<td>• Renewable Energy Certificate (driven by state-level Renewables Portfolio Standards (RPS))</td>
</tr>
<tr>
<td>• Applicable for all E.ON offshore parks in UK¹</td>
<td>- Base tariff: 39 €/MWh</td>
<td>• Accelerated Depreciation for tax equity investors and developers (MACRS)</td>
</tr>
<tr>
<td>• From 2014 move to CfD system (strike price in first auction £114.39-119.89/MWh)</td>
<td>- Initial tariff extended for deep waters/distance to shore</td>
<td><strong>Solar</strong></td>
</tr>
<tr>
<td><strong>Onshore</strong></td>
<td><strong>Onshore</strong></td>
<td><strong>Renewable Energy Certificate</strong> (driven by state-level Renewables Portfolio Standards (RPS))</td>
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<td>• Wholesale price plus ROC (valid until 2016)</td>
<td>• FIT with direct marketing obligation</td>
<td>• Remuneration based PPA plus certain incentive features</td>
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<tr>
<td>• Term: 20 years</td>
<td>• Term: 20 years plus the year of start of operation (initial tariff for min 5 years followed by base tariff)</td>
<td>• Investment Tax Credit (30% of investment) in place for projects completed by 2016 – after drops to 10%</td>
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<tr>
<td>• Remuneration: 0.9 ROC</td>
<td>• Remuneration (EEG 14):</td>
<td>• Renewable Energy Certificate (driven by state-level Renewables Portfolio Standards (RPS))</td>
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<td>• Applicable for all E.ON onshore parks</td>
<td>- Initial tariff: 89 €/MWh</td>
<td><strong>Solar</strong></td>
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<td>• From Feb. 2015, CfD system (strike price in first auction £79.23-82.50/MWh)</td>
<td>- Base tariff: 49.5 €/MWh</td>
<td>• Remuneration based PPA plus certain incentive features</td>
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<td>- From 2016: ~0.4% quarterly digression</td>
<td>• Investment Tax Credit (30% of investment) in place for projects completed by 2016 – after drops to 10%</td>
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<td>• Applicable for all E.ON offshore parks in Germany²</td>
<td>• Renewable Energy Certificate (driven by state-level Renewables Portfolio Standards (RPS))</td>
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1. Including Rampion
2. Including Amrumbank and Alpha Ventus
3. Base on reference turbine

**ROC**: Renewables Obligation Certificate; **CfD**: Contract for Difference; **FIT**: Feed-In-Tariff

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Capturing attractive regulatory remuneration schemes
E.ON project examples

- **Rampion (COD ´18)**
  - 400 MW
  - 20 years ROC scheme
  - 75% share

- **Amrumbank (COD ´15)**
  - 288 MW
  - FIT („Stauchungsmodell“)
  - 100% share

- **Maricopa West¹ (COD ´15)**
  - 28 MW
  - 100% share
  - To be disposed in ´15

- **Colbeck's Corner (COD ´16)**
  - 200 MW
  - Merchant
  - 100% share

- **Rampion (COD ´18)**
  - 400 MW
  - 20 years ROC scheme
  - 75% share

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1. PV capacity in MW DC (Direct Current)

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E.ON has diversified portfolio of projects under construction
Disclaimer

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