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Atle Midttun

Presentation at the Salzburg Energy Seminar 3 September 2015

Business Model Canvas – (Ostervalder)
Pressures for Change

- Diminishing energy use in mature economies reinforced by economic slowdown
- Climate policy and demand for sustainability in the energy system
- IT Facilitation of new system integration and decomposition
- Radical deregulation & reduced barriers to change

Transformative Dynamics
Two Dimensions of Transition

Green energy transition (supply side)

Disruptive to conventional generation

Disruptive to the value chain

Digital reconfiguration (demand side)
Business Models – A Schematic Overview

Busines sector
Upstream
Downstream
Customer Interface/ Retailing
Traditional Business Models: The Electricity Company

- Building Sector
  - Conventional Generation
  - Transmission & Distribution
  - Customer Interface/Retailing

- Engineering/Sector
  - Retailing Cars
  - Retailing
  - Upstream
  - Downstream

- ICT Telecom Industry

- Telecom Industry

- Network Infrastructure

- Water/Sewage & Waste Industry

- Transmission & Distribution

- Conventional Generation

- Customer Interface/Retailing

- Building Sector

- Automotive Industry

- Petroleum Business

- Electricity
Traditional Business Models: The Integrated Energy Company

- Electricity Business
  - Conventional Generation
  - Transmission & Distribution
- Building Sector
  - Customer Interface/Retailing
- Engineering/Sector
- Automotive Industry
- Petroleum Business
- ICT Telecom Industry
- Water/Sewage & Waste Industry
- Network Infrastructure

Traditional Business Models: The Multiutility Company

- Building Sector
- Electricity Business
- Transmission & Distribution
- Conventional Generation
- Customer Interface/Retailing
- Retailing Cars
- Engineering/Sector
- Petroleum Industry
- Automotive Industry
- Water/Sewage & Waste Industry
- Network Infrastructure
- ICT Telecom Industry
- Gas
- Oil
- Upstream
- Downstream
- Multiutility
Traditional Business Models: The Infrastructure Company

- Electricity Business
- Conventional Generation
- Transmission & Distribution
- Customer Interface/Retailing
- Retailing Cars
- Building Sector
- Network Infrastructure
- Water/Sewage & Waste Industry
- ICT Telecom Industry
- Petroleum Business
- Automotive Industry
- Engineering/Sector
- Upstream
- Downstream
- Gas
- Oil
- Infrastructure
General Stock Index as a Benchmark

FINANCIAL TIMES
Dow Jones Industrial Average DJIA
01/03/2000 - 08/31/2015 Monthly data interval

DJ EURO STOXX 50 EUR Price
GERMAN SE XETRA DAX INDEX


+50%
0%
-50%
The Golden Age of European Electricity (2003-2007)

RWE has two types of share traded in the stock market, which are common share and preferred share. Of the total outstanding stock 614,745 thousand shares, the common share accounts for approximately 94%, while the preferred share represents 6%. We have used the price development of RWE’s common share is used in this analysis.
Multi-Energy and Multi-Utility Business Models
Source-Mix in the Golden Age – E.ON

**E.ON 2000**
Total production 124.50 TWh

- Hard coal and Lignite: 45%
- Gas/Oil: 7%
- Nuclear: 4%
- Hydro: 0.4%
- Wind: 44%

**E.ON 2007**
Total production 257.10 TWh

- Hard coal and Lignite: 30%
- Gas/Oil: 8%
- Nuclear: 16%
- Hydro: 3%
- Wind: 43%
- Other renewables: 8%

*Other renewables include renewable energy sources such as solar, geothermal, and biomass.*
Source Mix in the Golden Age RWE

RWE 2000
Total production 113.90 TWh

RWE 2007
Total production 216.10 TWh

- Coal
- Lignite
- Nuclear
- Gas
- Pumped storage, oil, other
- Renewables

Coal: 15%, Lignite: 33%, Nuclear: 14%, Gas: 2%, Pumped storage, oil, other: 1%, Renewables: 5%

FINANCIAL TIMES

E.ON SE  EOAX.N:GER

01/01/2008 – 09/01/2015: Monthly data interval

RWE AG  GERMAN SE XETRA DAX INDEX


+25%

-25%

-50%

-75%

0%

NORWEGIAN BUSINESS SCHOOL
Monthly spot prices for Electricity

Source NordPool Spot
RWE Source Mix

RWE 2008
Total production 224.10 TWh

- Coal: 33%
- Lignite: 22%
- Nuclear: 14%
- Gas: 1%
- Pumped storage, oil, other: 2%
- Renewables: 28%

RWE 2014
Total production 208.30 TWh

- Coal: 37%
- Lignite: 19%
- Nuclear: 15%
- Gas: 5%
- Pumped storage, oil, other: 1%
- Renewables: 23%
Other Problem Cases I

FINANCIAL TIMES

E.ON SE  EOAX.N:GER

01/03/2000 - 09/01/2015: Monthly data interval

Electricité de France SA  Verbund AG
Other Problem Cases II

FINANCIAL TIMES

E.ON SE  EOAX.N:GER

12/01/2005 - 09/01/2015: Monthly data interval

Electricité de France SA  Verbund AG

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+150%
+100%
+50%
0%
-50%
EDF Source Mix

**EDF 2003**
Total production[^3] 490.90 TWh

- Nuclear: 86%
- Hydro: 5%
- Fossil-fired (Coal, Oil): 9%

**EDF 2014**
Total production 623.50 TWh

- Nuclear: 77%
- Hydro: 7%
- Fossil-fired (Coal, Oil): 6%
- Combined Cycle and Cogeneration: 2%
- Renewables (mainly wind): 8%

[^3]: Production data from 2003.
Incumbent Winners

FINANCIAL TIMES

E.ON SE EOAX.N:GER

01/01/2000 - 09/01/2015: Monthly data interval

Iberdrola SA Fortum SSE PLC
Fortum Source Mix

Fortum 2001
Total production 46.50 TWh
- Hydro: 44%
- Nuclear: 19%
- Thermal (mainly natural Gas): 37%

Fortum 2014
Total production 73.40 TWh
- Hydro: 37%
- Nuclear: 33%
- Thermal (mainly natural Gas): 30%
SSE Source Mix

Since production figures were not available, we have used installed capacity for SSE.
The Green Spin-off Winners

FINANCIAL TIMES

E.ON SE  EOAX.N:GER

12/01/2010 - 09/01/2015: Monthly data interval

Edp Renováveis SA  Enel Green Power SpA

|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|

NORWEGIAN BUSINESS SCHOOL

[Enel Green Power logo]
Green Technology Suppliers
The Green Suppliers
Petroleum industry

Exxon Mobil Corp (XOM:NYQ)

01/03/2000 - 05/19/2015. Monthly data interval

Statoil ASA Royal Dutch Shell PLC BP PLC

Petro-Strategies

Exxon
BP
Shell
Statoil

Full-chain
Upstream only

Petroleum-focused rhetoric
Broader energy and climate rhetoric

+150%
+100%
+50%
+9%
Green energy transition (supply side)

Disruptive to conventional generation

Disruptive to the value chain

Digital reconfiguration (demand side)
Qivicon is an initiative of Deutsche Telekom partnering with a number of leading German and international companies and brands in all sectors that want to join a smart home via a single open platform.

Qivicon offers a partnership that enables its members to overcome bottlenecks in the development of new business models in their portfolio, and not only an automation gateway in itself. Qivicon has connected to a large amount of well-known white goods producers for installing devices that communicates with the Qivicon platform, making the platform into a market place where the consumer meets the providers of different components and appliances.

Qivicon’s competitive landscape is dominated by ABB Group, Robert Bosch GmbH, and Cisco Systems Inc which have said they plan to establish a joint-venture company to develop and operate an open software platform for smart-home equipment and applications (Dec 2014).
Sungevity is a global based company focused on making it easy and affordable for the consumer, mainly homeowners, to benefit from solar power. Sungevity provide access to qualified team of designers to develop the solar system. The financing can be done either through leasing or by providing loans; hence the business model contains financing of the product for the customer.

The company has a community focus and aim to connect everyone under the sun with a new purpose: cleaner, safer, lower-cost energy for a brighter world. Founded in 2007, it was the first American solar company to design residential solar energy systems remotely over the Internet, using satellite imagery.

By leveraging proprietary remote solar design technology, Sungevity can deliver a firm quote including financing instantly without a home visit (Remote Solar Design (RSD) strategy).

Sungevity provide access to qualified team of designers to develop the solar system. The financing can be done either through leasing or by providing loans; hence the business model contains financing of the product for the customer.

Sungevity has risen $129.6M in 8 rounds. The latest round was in 2014. Some of Sungevity’s investors include E.ON, GE Ventures and Brightpath Capital Partners. Sungevity’s latest acquisition was Zonline. The companies Co-Founder & CEO, Andrew
New Business Models: Supply Side and Demand Side Green Electricity

- Conventional Generation
- ICT Telecom Industry
- Building Sector
- Network Infrastructure
- Transmission & Distribution
- Retailing Cars
- Customer Interface/Retailing
- Gas
- Oil
- Petroleum Business
- Water/Sewage & Waste Industry
- Automotive Industry

Green el I
Green el II
New Business Models; ICT Based System Integration
New Business Models: Systemic Integration Through Extended Property Management

Business sector
Upstream

Water/Sewage & Waste Industry

Downstream

Automotive Industry

Business sector
Upstream

Construction Sector

Communication (ICT)

Networking Infrastructure

Electricity Generation

Retailing

Customer Interface/Retailing

Retailing Cars

Transmission & Distribution

Conventional Generation

Upstream

Green Engineering

Network Planning/Design

Green Electricity

Downstream

Oil

Gas

Petroleum Business

ICT based Systemic integration I
Extended property Management
New Business Models: Systemic Integration Under Extended IT& Telecom control

- Electricity Business
  - Conventional Generation
  - Transmission & Distribution
  - Retailing

- Building Sector
  - Customer Interface/Retailing
  - Retailing Cars

- Water/Sewage & Waste Industry

- Automotive Industry

- Petroleum Business

- ICT based Systemic integration II Extended Telecom/ICT Management

- Engineering/Sector
  - Network Infrastructure
  - Green Engineering
  - Green Electricity

- Telecom/ICT
  - Coordination
  - Comfort-Mgmt.

- Zero emission housing
Business Model Canvas – (Osterwalder)