Power Sector Report Volume 2: Generation - Infrastructure, Capex, Equipment Markets

Description: Chapter Overview:

1. Introduction To The Power Sector: The scale of the power sector is outlined as an introduction, in capacity and $ value with commentary on its composition by the constituent sectors - generation, transmission and distribution (GTD).

2. Utility Sectors: The 135,000 electricity, gas and water & waste utilities are shown regionally on a global map and the 11,000 electrical utilities are analysed by region and major country, with a breakdown of public/private ownership. A table summarises the electrical utility sector in every country.

3. Other Utility Sectors, As Generators And Consumers: The other utilities are identified - oil, gas, water & waste, telecoms, railways - they are large generators and consumers of electricity, and some have transmission and distribution networks.

4. Industrial And Captive Generation: Industry is a significant generator of power and an even larger consumer, drawing from the grid more than it supplies in most but not all countries. Industry is an important owner of transmission and distribution assets such as transformers. “Hidden power”, mostly private generators under 1 MW, is a segment attracting increasing attention and has been underestimated in the past.

5. The Use Of Electricity By Sector: Use by end-sector, with further analysis by type of industrial use and purpose of use.

6. The Development Of Installed Generating Capacity In The Power Sector: The development of generating capacity is charted from 1900 to the present day and forecast to 2050. It is tabulated at six ten year intervals from 1980 to 2030 in the PDF report, with annual figures provided in the Excel database. This analysis is provided globally, regionally and for 184 countries.


8. Annual Demand For Generating Capacity In The Power Sector, Additions And Replacement: Global installed capacity and annual demand is charted annually from 1900 to 2015 and forecast to 2050. Demand is analysed by new and replacement installations globally, by regions and for 184 countries, in five year segments from 2016-2020 to 2031-2035. Demand is also shown with replacement as a % of total demand.

9. Distributed Generation: The status of distributed power is outlined together with captive power, cogeneration and “hidden power”, together with analysis of the impact on the retail cost of electricity.

10. Capital Expenditure: Capex is plotted globally from 2000 to 2015 and forecast to 2020, with analysis by segment; generation, transmission and distribution and summarised with analysis by energy source from 2000 to 2020; coal, gas, oil, nuclear, wind, utility solar PV, rooftop solar PV, bioenergy. The recent rapid growth of small solar PV is demonstrated. The composition of capex is analysed.

11. Generation Capex By Energy Source/Technology: Generating capex is analysed by energy source (see previous chapter details) for the world, 7 regions and 11 major countries, at eight intervals in the PDF - 1990, 2000 and annually from 2015 to 2020 - and in the Excel database annually from 1980 to 2020. The current status and prospects for each energy source are discussed.

12. Definition Of The Power Sector Equipment Market: The power sector is defined, with broad parameters to include electrical utilities, IPPS, industrial captive generation and small scale distributed generation. In the generating sector it is important to understand the overlap of mechanical equipment, which constitutes over
¾ of equipment expenditure in the power generation sector, between electrical uses and mechanical uses, such as heat and steam output in district heating and industrial process. Plants such as industrial boilers are a large component in fossil fuel power generation but they have even larger applications in other industries.

13. Generation Technologies: The composition of plant in the various generating technologies is outlined and analysed by share of cost, for the following technologies: coal fired plants, gas turbine simple cycle (OCGT), gas turbine combined cycle (CCGT), oil-fired steam turbine plant, diesel engine-generator, wind turbine, solar photovoltaic, hydropower and nuclear power.


15. Sales Of Generation Plant By Region: The generating equipment markets are analysed by market, in value in the PDF for 1990, 2000 and annually from 2015 to 2020 - and in the Excel database annually from 1980 to 2020 for the world, 7 regions and 11 major countries. Generation products include: boilers, steam turbines, gas turbines, HRSG (Heat recovery steam generators), diesel & HFO engines, wind turbines, hydro turbines, solar PV modules, solar PV inverters, FGD (Flue gas desulphurisation), SCR/SNCR (selective catalytic reduction/selective non-catalytic reduction), PM (particulate removal; ESP, scrubbers, fabric filters/baghouses), CPP (coal preparation plant), fly ash handling plant, insulated cable, compressors, piping, instruments and control equipment, GSU generator transformers, GCB (generator circuit breakers), switchgear and power plant automation. Vendor shares or rankings are provided for the individual categories/products and sections have marketing and technical commentary. Where available these have been supplemented with extracts from dedicated StatPlan product marketing reports, with higher levels of detail.

16. The Value Chain - From Materials To Capex: The cost of any product can be measured at various stages, from being a piece of unworked metal, to its installation in working order and finally as a marked-up share of capital expenditure. Different price levels apply through the supply chain, and the point of interest in the chain depends on the business to which the value is being applied. The report analyses the value chain at 6 levels, from BOM (bill of materials) to capex, with all mark-ups included. In using the market information in this and other reports it is essential to specify which point in the value chain is being used. Capex can be 2½ times the factory gate price, over 3 times manufacturing cost and 5 times materials cost.

17. Price Trends And Factors Driving Prices: In recent years the prices of electro-technical products have been volatile due to variations in many factors which affect them. Price trends are reviewed with commentary on PPI - Producer Price Index, industry trends, production capacity, and the manufacturing input cost composition.

18. N-1 Standard, N-2, 2N, Redundancy And Replacement: Redundancy is a crucial consideration in infrastructure design and has major implications for market size calculations. The following factors are reviewed: the impact of network failure, transformer failure, industrial reliability, network reliability, N-1 and the networks, contingency planning for network failure and electricity distribution.

19. The Environmental Equation: Environmental emissions will be reduced with a combination of measures and policies instituted by the power generation industry and industry in general. Renewables can deliver a saving in carbon of 21%, CCS (carbon capture and storage) in both industry and the generating sector can deliver one fifth (19%) of GHG reductions by 2050. The other reductions will be attributed to efficiency in end-use (12%), fuel efficiency (24%), switching of fuel for end-use (11%), power generation efficiency and fuel saving (7%), and nuclear power (6%).

20. AQCS - Air Quality Control Systems: Emissions consist of two categories, GHGs or greenhouse gases, and air pollutants. This chapter outlines the sources of emissions, supply side measures to reduce them, and end-of-pipe control measures for the principal air pollutants SO2, NOx and PM, particulate matter. The development and penetration of AQCS (air quality control systems) technologies for SO2, NOx and PM are tabulated - FGD, SCR, LNB, ESP, fabric filters, HED - for the major emitting countries.

21. CCS - Carbon Capture And Storage: The carbon cycle, climate change and greenhouse gases are outlined. The current status of carbon capture and storage (CCS) and enhanced oil recovery (EOR) is outlined with an assessment of progress in industry and the generating sector.

22. Electrification: The impact of increased electrification on future markets is described with its advantages in terms of electrical goods and aspirations, which vary according to the sophistication of the electrical
market in a country. Factors driving the increase in numbers of electrical connections are assessed with tables of electrification levels for every country, from 1950 to 2050.

23. Currents, Circuits And Phases: Currents - AC and DC, circuits, and an overview of infrastructure.

Contents:

Executive Summary
The Power Sector
Infrastructure
Supply Side Measures to Reduce Man Made Emissions
Emission Types And End-Of-Pipe Control Measures
Cost Reductions And the Learning Rate for CCS

The Power Sector Report

The Structure of this Report

1. Introduction to the Power Sector
   The Scale of the Power Sector
   The Participants in the Power Sector

2. Utility Sectors

3. Other Utility Sectors, As Generators And Consumers

4. Industrial And Captive Generation

5. The Use of Electricity By Sector

6. The Development of Installed Generating Capacity in the Power Sector

7. Installed Generating Capacity By Energy Source, 1990 to 2020

8. Annual Demand for Generating Capacity in the Power Sector, Additions And Replacement

9. Distributed Generation

10. Capital Expenditure
    Generation, Transmission And Distribution

11. Generation Capex By Energy Source

12. Definition of the Power Sector Equipment Market

13. Generation Technologies
    Coal Fired Plants
    Gas Turbine Simple Cycle (Ocgt)
    Gas Turbine Combined Cycle (Ccgt)
    Oil-Fired Steam Turbine Plant
    Diesel Engine-Generator
    Wind Turbine
    Solar Photovoltaic
    Hydropower
    Nuclear Power

14. Regional And National Equipment Markets
    Generation Plant, World
    Generation Plant, United States
    Generation Plant, Europe
    Generation Plant, France
    Generation Plant, Germany
    Generation Plant, Italy
    Generation Plant, Spain
15. Sales of Generation Plant By Region
The Total Generating Equipment Market
Vendors
Boilers
Steam Turbines
Gas Turbines
Hrsg, Heat Recovery Steam Generators
Diesel & Hfo Engines
Wind Turbines
Hydro Turbines
Solar Pv Modules
Solar Pv Inverters
Fgd Flue Gas Desulphurisation
Scr, Selective Catalytic Reduction/Scnr Selective Non-Catalytic Reduction
Pm, Particulate Removal; Esp, scrubbers, Fabric Filters/Baghouses
Cpp, Coal Preparation Plant
Fly Ash Handling Plant
Insulated Cable
Compressors
Piping
Instruments And Control Equipment
Gsu Generator Transformers
Gcb Generator Circuit Breakers
Switchgear
Power Plant Automation

16. The Value Chain - from Materials to Capex
The Value Chain at 6 Levels

17. Price Trends And Factors Driving Prices
Price Trends
Ppi - Producer Price Index
Industry
Production Capacity
Manufacturing Input Cost Composition

18. N-1 Standard, N-2, 2N, Redundancy And Replacement
Network Failure
Transformer Failure
Industrial Reliability
Network Reliability
N-1 And the Networks
Contingency Planning for Network Failure
Electricity Distribution

19. The Environmental Equation

20. Aqcs - Air Quality Control Systems
Ghgs, Greenhouse Gases
Air Pollutants
Sources of Emissions
Air Pollutants
Supply Side Measures to Reduce Man Made Emissions
Emission Types And End-Of-Pipe Control Measures
Particulate Matter
Heavy Metals - Lead, Mercury, Cadmium
The Development And Penetration of Aqcs Technology

21.Ccs - Carbon Capture And Storage
The Carbon Cycle, Climate Change And Greenhouse Gases
Carbon Capture And Storage (Ccs) - Current Status
Eor, Enhanced Oil Recovery.

22.Electrification
The Impact of Increased Electrification On Future Markets
Electrical Goods And Aspirations: the Household Electrification Wheel
Factors Driving the Increase in Numbers of Electrical Connections

23.CURRENTS, CIRCUITS AND PHASES
Currents - Ac And Dc
Circuits
Overview of Infrastructure

Methodology
Market Sizing And Bottom Up Forecasting
The Sanity Check And Validation

Figures
Figure 1: the Global Utility Landscape
Figure 2: Industry Uses of Different Energy Sources in the Us
Figure 3: Energy Use By Type of Industry in the Us (All Types of Energy)
Figure 4: % of Total Machine Drive Electricity Used in Manufacturing in the Us
Figure 5: Machine Drive Electricity Use As a Percentage of Total Delivered Energy Use By Each Industry in the Us
Figure 6: World Generating Capacity in Gw, Development from 1900 to 2050
Figure 7: World Generating Capacity in Gw, Development By Region from 1980 to 2030
Figure 8: Installed Capacity By Fuel in Gw, 1990 to 2020
Figure 9: Installed Capacity And Annual Demand for Generating Capacity in Gw, 1900 to 2050
Figure 10: Cumulative New And Replacement Demand for Generating Capacity in Gw, 1900 to 2050
Figure 11: New And Replacement Demand for Generating Capacity in Gw Unstacked, 1900 to 2050
Figure 12: Replacement Capacity As a % of Total Annual Demand 5 Year Totals, 2016-2050
Figure 13: Composition of the Retail Cost of Electricity
Figure 14: Total Global Capital Expenditure On Generation, Transmission And Distribution, Nominal $ Billion 2000 to 2020
Figure 15: Comparison of Expenditure On Generation, Transmission And Distribution in Real ($2015) And Nominal Values, 2000 to 2020
Figure 16: Global Capital Expenditure Broken By Generation, Transmission And Distribution, Nominal $ Billion, 2000 to 2020
Figure 17: Total Capex in Generation, Transmission And Distribution 2000-2010 Compared With 2010-2020.
Figure 18: Investment Surges 1900 To2015
Figure 19: Total Capital Expenditure On Generation, Transmission And Distribution By Region in 2016
Figure 20: Capital Expenditure On Generation By Energy Source, Nominal $ Billion2000 to 2020,
Figure 21: Total Capital Expenditure On Generation, Transmission And Distribution By Region And Year, Nominal $ Billion, 2000, 2010, 2020
Figure 22: Composition of Global Capital Expenditure Generation, Transmission And Distribution, 2015
Figure 23: Commodity Price Index 1996 to 2016
Figure 24: Industrial Metals Prices 2007 to 2016
Figure 25: Labour Compensation Cost, Including Direct Pay, Social Insurance Expenditures, And Labour-Related Taxes (Us = 100).
Figure 26: Labour Costs Including Wages And Salaries, Social Insurance And Labour-Related Taxes
Figure 27: Minimum Wages in China in Yuan Per Month 1995 to 2012
Figure 28: a High Voltage Substation With Four Transformers, Three Active And One Redundant
Figure 29: Possible Reductions in Ghg Emissions By 2050
Figure 30: Beijing After Rain And On a Day With Smog
Figure 31: Sources of Emissions
Figure 32: Countries Responsible for Emissions
Figure 33: the Carbon Cycle And Storage
Figure 34: % of Carbon Emissions from Heat And Power Generation, 2014
Figure 35: % of Carbon Emission from the World Coal-Fired Fleet, 2014
Figure 36: Actual And Expected Operation Dates for Large-Scale Ccs Projects in the Pipeline, By Region And Lifecycle Stage.
Figure 37: Technological Learning Rates of Selected Energy Related Technologies
Figure 38: Additions of Electrified Households Between 2015 And 2050 By Region
Figure 39: Countries With Greatest Population Declines By 2050
Figure 40: the Household Electrification Wheel
Figure 41: Population Growth % in Each Decade By Region
Figure 42: Average Household Size, World, 1900 to 2050
Figure 43: World Electrification - % of Households With Electricity, 1900-2050
Figure 44: World Electrification - Number of Households With And Without Electricity, 1900-2050
Figure 45: Share of People Without Electricity Access for Developing Countries, 2008
Figure 46: Regional Totals of Electrified Households 2010 to 2050
Figure 47: Selected Major Countries - % of Households With Electricity, 1900-2050
Figure 48: Single Phase Power
Figure 49: Three Phase Power
Figure 50: the Composition of Annual Demand for Capacity, New Plus Replacement

Tables
Table 1: Ownership of Assets in the Power Sector By Owner Type
Table 2: the World’S Electrical Utility Landscape
Table 3: Infrastructure of Utilities
Table 4: Indian Utilities' Generating Capacity 1947 -2015 By Fuel
Table 5: Indian Captive Power Plant Generating Capacity 1947 -2015 By Fuel
Table 6: Sale of Diesel Gensets in India By International Manufacturers > 1 Mw from 1990 to 2004
Table 7: Installed Generating Capacity in Mw, 1980 to 2030, Europe
Table 8: Installed Generating Capacity in Mw, 1980 to 2030, Cis
Table 9: Installed Generating Capacity in Mw, 1980 to 2030, Mena
Table 10: Installed Generating Capacity in Mw, 1980 to 2030, Sub-Saharan Africa
Table 11: Installed Generating Capacity in Mw, 1980 to 2030, Asia Pacific
Table 12: Installed Generating Capacity in Mw, 1980 to 2030, the Americas
Table 13: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, World
Table 14: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, Europe
Table 15: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, Cis
Table 16: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, Middle East
Table 17: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, North Africa
Table 18: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, Sub-Saharan Africa
Table 19: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, Asia Pacific
Table 20: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, Lac
Table 21: Installed Generating Capacity Mw By Fuel Type 1990 to 2020, North America
Table 22: New And Replacement Demand for Generating Capacity, Mw, 2016 to 2035
Table 23: Total Demand for Generating Capacity, Mw, 2016 to 2050
Table 24: New And Replacement Demand in 5 Year Segments By Country in Mw, 2015 to 2030, Europe
Table 25: Total New And Replacement Demand in 5 Year Segments in Gw And % of Replacement, 2015 to 2050, Europe
Table 26: New And Replacement Demand in 5 Year Segments By Country in Mw, 2015 to 2030, Cis
Table 27: Total New And Replacement Demand in 5 Year Segments in Gw And % of Replacement, 2015 to 2050, Cis
Table 28: New And Replacement Demand in 5 Year Segments By Country in Mw, 2015 to 2030, Mena
Table 29: Total New And Replacement Demand in 5 Year Segments in Gw And % of Replacement, 2015 to 2050, Mena
Table 30: New And Replacement Demand in 5 Year Segments By Country in Mw, 2015 to 2030, Sub-Saharan Africa
Table 31: Total New And Replacement Demand in 5 Year Segments in Gw And % of Replacement, 2015 to 2050, Sub-Saharan Africa
Table 32: New And Replacement Demand in 5 Year Segments By Country in Mw, 2015 to 2030, Asia Pacific
Table 33: Total New And Replacement Demand in 5 Year Segments in Gw And % of Replacement, 2015 to 2050, Asia Pacific
Table 34: New And Replacement Demand in 5 Year Segments By Country in Mw, 2015 to 2030, the Americas
Table 35: Total New And Replacement Demand in 5 Year Segments in Gw And % of Replacement, 2015 to 2050, Americas
Table 36: World - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 37: Usa - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 38: Europe - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 39: France - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 40: Germany - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 41: Italy - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 42: Spain - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 43: United Kingdom - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 44: Cis - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 45: Russia - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 46: Asia Pacific - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 47: Japan - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 48: China - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 49: India - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 50: Korea, Australasia - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 51: South East Asia - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 52: Middle East - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 53: Africa - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 54: Lac - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 55: Brazil - Generation Capex By Technology, Nominal $ Million, 2000 to 2020
Table 56: Composition of Generation Capex Over All Technologies, 2000 And 2015
Table 57: Some Principal Cost Components of Generating Capex
Table 58: Cost Breakdown of Capex in Construction of a Coal Fired Plant (Equipment at Installed Cost)
Table 59: Cost Breakdown of Capex in Construction of Gas-Fired Ocgt Or Ccgt Plant (Equipment Costs at Installed Cost)
Table 60: Cost Breakdown of Capex in Construction of An Oil-Fired Steam Turbine Plant (Equipment Costs at Installed Cost)
Table 61: Cost Breakdown of Capex in Construction of a Diesel Or Fuel Oil Reciprocating Engine Plant (Equipment Costs at Installed Cost)
Table 62: Cost Breakdown of Capex in Construction of a Wind Turbine (Equipment Costs at Installed Cost)
Table 63: Cost Breakdown of Capex in Construction of a Solar Pv Plant (Equipment Costs at Installed Cost)
Table 64: Cost Breakdown of Capex in Construction of a Hydropower Plant (Equipment Costs at Installed Cost)
Table 65: Cost Breakdown of Capex in Construction of a Nuclear Power Plant (Equipment Costs at Installed Cost)
Table 66: Generation Equipment Cost in Nominal $ Million, at Purchase Price, at Installed Cost And
Table 67: Ratio of Sales of Mechanical And Electrical Equipment in Generation And T&D, 2000 to 2020
Table 68: Generation Equipment Cost at Purchase Price in Nominal $ Million, World, 2000 to 2020
Table 69: Generation Equipment Cost in Nominal $ Million, at Purchase Price, at Installed Cost And % Share of Capex, Europe, 2000 to 2020
Table 70: Generation Equipment Cost at Purchase Price in Nominal $ Million, United States, 2000 to 2020
Table 71: Generation Equipment Cost in Nominal $ Million, at Purchase Price, at Installed Cost And % Share of Capex, Germany, 2000 to 2020
Table 72: Generation Equipment Cost at Purchase Price in Nominal $ Million, Italy, 2000 to 2020
Table 73: Generation Equipment Cost in Nominal $ Million, at Purchase Price, at Installed Cost And % Share of Capex, Spain, 2000 to 2020
Table 74: Generation Equipment Cost at Purchase Price in Nominal $ Million, France, 2000 to 2020
Table 75: Generation Equipment Cost in Nominal $ Million, at Purchase Price, at Installed Cost And % Share of Capex, Cis, 2000 to 2020
Table 76: Generation Equipment Cost at Purchase Price in Nominal $ Million, United Kingdom, 2000 to 2020
Table 77: Generation Equipment Cost in Nominal $ Million, at Purchase Price, at Installed Cost And % Share of Capex, 2000 to 2020
Table 78: Generation Equipment Cost at Purchase Price in Nominal $ Million, Cis, 2000 to 2020
Table 129: Sales of Scr Selective Catalytic Reduction at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 130: Top Scr Vendors
Table 131: Sales of Particulate Removal (Esp, Scrubbers, Baghouse) at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 132: Top Pm Removal Vendors
Table 133: Sales of Cpp Coal Preparation Plant at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 134: Sales of Fly Ash Handling Plant at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 135: Top Pm Removal Vendors
Table 136: Sales of Insulated Cable at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 137: the Top Global Cable Manufacturers By Industry
Table 138: Cable Manufacturers Global Market Shares By Country
Table 139: Sales of Compressors at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 140: Compressor Manufacturers
Table 141: Sales of Piping at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 142: Piping Companies/Installers Market Share in China
Table 143: Sales of Instruments And Control Equipment at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 144: Sales of Gsu Generator Transformers at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 145: Gsu Generator Transformer Market Shares
Table 146: Sales of Gcb Generator Circuit Breakers at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 147: Sales of Other Switchgear at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 148: Gcb Circuit Breakers And Switchgear Market Shares
Table 149: Sales of Utility Automation at Purchase Price By Region And Country in Nominal $ Million, 2000 to 2020
Table 150: Costs And Mark-Up from Bill of Materials to Capex
Table 151: Prices of Copper And Aluminium 1960-2014
Table 152: Reductions in Emissions By the Main Aqcs Technologies
Table 153: Penetration of End-Of-Pipe Aqcs Measures
Table 154: The Global Coal-Fired Generating Fleet 2015
Table 155: Levelised Cost of Electricity for New-Build Power Plants With And Without Ccs
Table 156: Electrification in North America - % of Households With Access to Electricity, 1950 to 2050
Table 157: Electrification in Europe - % of Households With Access to Electricity, 1950 to 2050
Table 158: Electrification in the Cis - % of Households With Access to Electricity, 1950 to 2050
Table 159: Electrification in Mena - % of Households With Access to Electricity, 1950 to 2050
Table 160: Electrification in S-S Africa - % of Households With Access to Electricity, 1950 to 2050
Table 161: Electrification in Asia - % of Households With Access to Electricity, 1950 to 2050
Table 162: Electrification in the Pacific - % of Households With Access to Electricity, 1950 to 2050
Table 163: Electrification in Latin America - % of Households With Access to Electricity, 1950 to 2050
Table 164: Products And Technologies Used in Generating Plants
Table 165: Products And Technologies Used in Transmission
Table 166: Products And Technologies Used in Distribution

Ordering:
Order Online - http://www.researchandmarkets.com/reports/3788077/
Order by Fax - using the form below
Order by Post - print the order form below and send to

Research and Markets,
Guinness Centre,
Taylors Lane,
Dublin 8,
Ireland.
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct and select the format(s) you require.

Product Name: Power Sector Report Volume 2: Generation - Infrastructure, Capex, Equipment Markets
Web Address: http://www.researchandmarkets.com/reports/3788077/
Office Code: SCBRGFE8

Product Formats
Please select the product formats and quantity you require:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDF and Excel - Single User:</td>
<td>USD 5235</td>
</tr>
<tr>
<td>PDF and Excel - 1 - 20 Users:</td>
<td>USD 9162</td>
</tr>
<tr>
<td>PDF and Excel - Enterprisewide:</td>
<td>USD 13089</td>
</tr>
</tbody>
</table>

Contact Information
Please enter all the information below in BLOCK CAPITALS

<table>
<thead>
<tr>
<th>Title:</th>
<th>Mr ☐ Mrs ☐ Dr ☐ Miss ☐ Ms ☐ Prof ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name:</td>
<td>___________________________</td>
</tr>
<tr>
<td>Email Address: *</td>
<td>___________________________________</td>
</tr>
<tr>
<td>Job Title:</td>
<td>___________________________________</td>
</tr>
<tr>
<td>Organisation:</td>
<td>___________________________________</td>
</tr>
<tr>
<td>Address:</td>
<td>___________________________________</td>
</tr>
<tr>
<td>City:</td>
<td>___________________________________</td>
</tr>
<tr>
<td>Postal / Zip Code:</td>
<td>___________________________________</td>
</tr>
<tr>
<td>Country:</td>
<td>___________________________________</td>
</tr>
<tr>
<td>Phone Number:</td>
<td>___________________________________</td>
</tr>
<tr>
<td>Fax Number:</td>
<td>___________________________________</td>
</tr>
</tbody>
</table>

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:
Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer: Please transfer funds to:
Account number 833 130 83
Sort code 98-53-30
Swift code ULSBIE2D
IBAN number IE78ULSB98533083313083
Bank Address Ulster Bank,
27-35 Main Street,
Blackrock,
Co. Dublin,
Ireland.

If you have a Marketing Code please enter it below:

Marketing Code: ____________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp

Please fax this form to:
(646) 607-1907 or (646) 964-6609 - From USA
+353-1-481-1716 or +353-1-653-1571 - From Rest of World