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Analyzing Renewable Energy in the United States

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Abstracts

There is no doubt that the United States is a torch bearer in the renewable energy industry. In fact, 11.14 percent of the electricity produced in the US in the first six months of 2010, came from renewable energy resources itself. The US was the largest producer of electricity from wind power, solar power and geothermal sources in 2009, coming in second to China in the overall production of renewable energy.

The US has one of the largest wind power installed capacities in the world, enough to provide nearly 10 million households across the country. Following wind, solar power also has a major share to contribute to the total electricity produced from renewable energy sources in the US.

President Obama has called for doubling the amount of renewable energy being used in the next three years particularly in order to meet the challenges of climate change and energy security.

In this industry scenario, Aruvians Rsearch carries out an in-depth analysis of the renewable energy sector in the United States.

Aruvians research report analyzes the following renewable energy segments in the US - wind power, solar power, biomass power, biofuels, fuel cells, geothermal power, hydropower, distributed generation technologies, microgrids, combined heat and power/cogeneration, waste-to-energy, waste management, and the smart grid.

The report begins with an overview of the global energy industry in order to give the reader an idea of why the world requires renewable energy. An introduction to the US renewable energy industry includes an overview of the market, market trends, integration of renewable energy, and an analysis of the challenges facing the US energy industry as well as the factors driving the industry. The impact of the Gulf of Mexico oil

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spill is discussed amongst the impacts on the industry.

We also include an analysis on why the US needs renewable energy.

Moving on, we analyze the competition in the industry, policy resolutions to the US energy crisis, and many other points that will give the reader an idea of the entire landscape of the US energy and renewable energy industry.

The report analyzes the US renewable energy market in a SWOT framework analysis and also undertakes a SWOT framework analysis of the leading five renewable energy technogies in the US including wind power, solar power, geother energy, biomass power, and small hydropower.

The regulatory framework in place for promoting renewable energy resources in the US is analyzed in-depth along with their impact on the renewable energy sector. Some of the regulations analyzed in this report include state-wise analysis of feed-in tariffs, renewable portfolio standards, the DOE Wind Program, Fuel Cell initiatives, the Energy Policy Act of 1992 and 2005, the California Solar Initiative, the Solar America Initiative, and the most recent American Recovery and Reinvestment Act of 2009. We also analyze the provisions and impact of this Act on the energy industry.

Some of the major players in the renewable energy industry having presence across sectors are analyzed, such as GE ENergy, Bosch, Sharp Corporation, Shell Renewables, Iberdrola Renovables, and others.

Moving on the Section 2 of the research report, we carry out an in-depth analysis of the wind power market in the United States.

This section includes a market profile, market statistics, wind power generation by state, installed capacity growth, analysis of wind resources in the US, and many other points that are important for investors looking to invest in the US wind power sector.

This section also undertakes a cost analysis of wind power in the US, along with an analysis of the major market trends and challenges facing the industry.

The small wind turbines market in the US is analyzed comprehensively under this section as well and includes a market profile, market statistics, the emergence and importance of hybrid small wind turbines, very small wind turbines, wind-diesel hybrid turbine systems, and the economics of small wind turbines. The section also covers the

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various factors that have an impact on the US SWT market, regulations pertaining to the small wind turbine market, and market trends.

We analyze the market for micro wind generation in the US as well. This brief section includes a technical analysis of micro wind generation in the US.

Following the analysis of the overall US wind power market, we move on to analyze wind power markets in the US on a state level. States analyzed in this section include Arizona, California, Colorado, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Minnesota, Montana, New Hampshire, New York, Ohio, Oregon, Pennsylvania, Texas, Vermont, Washington, and Wyoming.

Major wind farms in the US such as the Biglow Canyon wind farm, the Brazos wind ranch, the Fenton wind farm, and many others are also analyzed, along with an in-depth market outlook for the wind power sector in the US.

Major players in the US wind power industry including both domestic and foreign players are analyzed. Companies analyzed include Acciona SA, Airtricity, Clipper Windpower, Blue H Group Technologies, E.ON, Iberdrola, Mitsubishi Heaby Industries, REpower AG, Suzlon, Vestas, and many more.

Wrapping up the section on wind power, we move to section 3, an analysis of solar power in the United States. This section covers the solar power market starting with an analysis of solar resources in the US, growth of the industry, the impact of solar energy on the consumer energy market, etc.

A detailed analysis of the emerging technologies in the solar power market in the US is undertaken in Aruvians report. Some of the technologies analyzed include carbon nanotubes, flexible solar cells, hybrid solar cells, holographics solar concentrator technology, miniature solar cells, nanowire solar cells, organic photovoltaics, and many more.

Incentives provided for solar power in the US such as federal tax credits, feed-in tariffs, state-level incentives, the Solar America Initiative, and solar renewable energy certificates are analyzed in section 3 of the report dealing with solar power. Federal/state programs promoting solar power is also analyzed. These include the US DOE SunShot Initiative, the US DOE Solar Decathlon, the Open PV Mapping Project, amongst others.

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Following on, we analyze the solar power market by states. Solar power in the following states are analyzed: Arizona, California, Hawaii, Nevada, New Jersey, New Mexico, and Oregon.

An analysis of the solar thermal power plants in the US includes the profiles of the Blythe solar power project, the Calico solar energy project, Fort Irwin project, Ivanpah solar power facility, the Keahole solar power project, the Kimberlina solar thermal energy plant, the Martin Next Generation Solar Energy Center, and many others.

A section that stands out in Aruvians report is the invest know-how segement about the US solar power industry. This section covers what every investor needs to know before investing in the US solar power industry.

Market outlook for the US solar power market and an analysis of the leading companies in this market complete this analysis of the US solar power market.

Moving on to section 4, we analysis briefly the US biomass power market. This section begins with a definition of biomass to clearly distinguish the biomass market from the biofuels market. A technical analysis of biomass and the challenges facing this industry adds to the market profile. Cost analysis and the market outlook for this renewable energy segment completes this brief profile of the US biomass power market.

Section 5 of the report Analyzing Renewable Energy in the United States analyzes the US biofuels market.

Part A of section 5 begins with an analysis of the overall biofuel market in the US. This includes production and capacity installation data for ethanol and biodiesel, the industry structure. market opportunities and issues, as well as government funding trends.

We then analyze the US ethanol market in which we undertake an analysis of the tax incentives, regulatory framework, ethanol by-products, and a market outlook of the US ethanol industry.

A brief analysis of the US biodiesel market, US methanol fuel market, and the US butanol fuel market is also included.

Ethanol and Biodiesel subsidies are analyzed along with a market outlook for the US biofuels market. Major players in the industry such as Abengoa Bioenergy, Allegro Biodiesel, American AgFuels, and many others are analyzed in the section.

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Moving on to section 6 of the report, we analyze the fuel cells market in the US.

The analysis of the fuel cells market in the US includes a basic analysis of fuel cell design and technologies along with the investment profile of the industry as well. The various types of fuel cells such as alkaline, direct borohydride fuel cells, direct methanol, direct ethanol, formic acid fuel cells, and many others are profiled comprehensively in the report.

The challenges facing the US fuel cells market such as design issues, cost issues, and many other problems are analyzed, followed by an analysis of fuel cell initiatives by state.

Market outlook for the sector and an analysis of the major players in the market such as Altergy, Astris Energi, Canon, Casio, Eneos, Entegris, Cellex Power, Jadoo Power, P21, Plug Power, and many others wrap up the section on fuel cells.

Section 7 analyzes the geothermal energy industry in the US. The market is analyzed taking into account an analysis of The Geysers, the biggest geothermal energy resource in the US. Installed geothermal capacity, environmental impact of geothermal power, regulatory framework, and the management of carbon emissions from geothermal power in the US are analyzed in this section.

Market outlook and an analysis of the major players in the industry completes the section on geothermal power in the US. Some of the major players analyzed include Calpine Corporation, Enel Green Power, US Geothermal Inc, Ormat International, amongst others.

Coming to section 8 of the report, we analyze the emerging sector of hydropower in the US. The market is analyzed in terms of hydroelectric power plants int he US, US hydropower production, baseload power from hydropower, the economics of hydropower for the US, and a market outlook of this renewable energy sector.

Section 9 covers the lucrative segment of distributed generation technologies in the US as well as the emergence of Microgrids in the country.

We begin with a definition of distributed generation, and move on to the analysis the various technologies involved in the industry. We look at the importance of microturbines, PV systems, reciprocating engines, and small-scale wind power systems

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in generating power. Nuclear power, underwater power systems, electric vehicles, and other applications of stirling engines are also analyzed.

The relation between distributed generation and renewable energy is analyzed strategically, along with an analysis of economic dispatch.

The emergence of microgrids in the US is of great importance to the renewable energy industry and we look at the microgrids phenomenon in the following sections of this report. We analyze the many designs of microgrids in the US, the operations of a microgrid, integration of microgrids with photovoltaics, fuel cells, and energy efficiency is also discussed.

Ownership models of microgrids in the US and the relation between microgrids and the US smart grid is analyzed in-depth in this section.

The role of integrated demand side management, distributed generation, renewable energy sources, and energy storage plays an important part in the renewable energy industry and we analyze this through an understanding of the integration of DER with smart meter deployment and other business models.

Market outlook for distributed energy technologies in the US market completes this section.

Section 10 is also related to the above section as we undertake an analysis of combined heat and power in the US.

In the analysis of the CHP market in the US, we cover the analysis of CHP systems in the US such as steam turbines, gas turbines, reciprocating internal combustion engines, microturbines, and fuels cells. We also undertake an analysis of the market profile, market challenges, regulatory framework, role of CHP in district energy and district heating, and the role CHP plays in the energy situation in the US. This section takes a look at factors such as growing energy demand, climate change, restratints on existing energy sources, and others, and how CHP technologies can help in this scenario.

Mini and Micro gas turbines for CHP in the US is analyzed including the pros and cons of microturbines and CHP, the market for microturbines in the US, and others. The Market Mechanism for Energy Allocation in Micro-CHP Grids in the US is an important analysis included in this section and takes a look at the application for a market-based micro CHP grid in the US.

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Emissions trading in the US and role of CHP is discussed along with why CHP is a competitive solution for the US. This includes an analysis of the economic benefits for the US, local energy issues, modernized infrastructre requirements, and other factors. CHP Regulatoions in the US and the impact they have on the overall market is also analyzed, followed by an analysis of energy portfolio standards and CHP experience by states. States analyzed in this section include Washington, New York, Pennsylvania, Nevada, Minnesota, California, Connecticut, Hawaii, and Maine.

Market outlook and an analysis of the major players in the industry such as Acumentrics, Energetix, Yanmar America, Plug Power, Husky Energy, Cogeneration Planners, and others, complete this section.

Moving to section 11, we cover the waste-to-energy market in the US. We begin with a debate on whether waste-to-energy is a source of renewable energy or not, and proceed to analyze the market including the various technologies in use, environmental regulations in the US impacting this industry, market trends, and some case studies to establish the importance of waste-to-energy technologies in the reneawble energy sector.

Major players such as Babcock Power, Covanta Energy, Interstate Waste Technologies, and others are analyzed, along with an industry outlook.

Section 12 deals with a similar segment as we briefly analyze the waste management sector in the US. The US waste management sector is analyzed through a market profile, concepts of waste management in use in the US, solid waste management techniques in the US, etc.

Section 13 of the report looks at the integration of renewable electricity on to the US Smart Grid. The section covers renewable electricity integration on the US smart grid, energy storage at the grid level in the US, transmission of renewable energy over long distances in the US, issues facing the industry and the major players in the US smart grid industry.

From section 14, we focus on the regulatory initiatives and incentives provided in the US for the growth of the renewable energy market. Under this section we analyze the federal and state-level investment incentives, the role of the Energy Policy Act of 2005 in promoting the renewable energy market, financial incentives for renewable energy by state, federal financial incentives for renewable energy, renewable energy regulations

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and policies by state, and federal regulations and policies for renewable energy in the US.

Section 15 analyzes the outlook for the US renewable energy industry through various viewpoints. We undertake an analysis of the following: government and institutional outlook, outlook by trade associations, outlook for the investing potential of the industry, outlook for technological innovation, long-term energy projections, wind power market outlook, solar power outlook, hydropower market outlook, geothermal energy market outlook, biomass market outlook, biodiesel and ethanol market outlook, and the future prospects for the US energy and renewable energy industry.

In conclusion, Aruvians Rsearch's report on the Renewable Energy Industry in the United States is the most comprehensive resource available on this market that undertakes a strategic and analytical view of the US renewable energy industry.

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