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U.S. Energy Challenges for 2020

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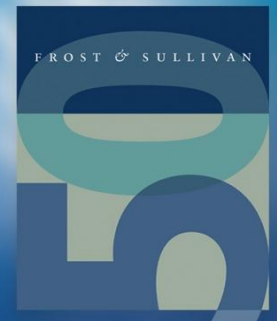
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U.S. Energy Challenges for 2020

Evaluating the problem and understanding the possible solutions

May 2012



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Energy Market Overview

- The U.S. goal of energy independence, the concern for unmet energy demand, and a growing awareness for the environmental impact of high consumption, are the leading drivers behind strengthening interests in net-zero buildings and renewable energy generation.
- A growing population and improved economic conditions in the United States will raise energy consumption during the next decade by a forecasted x.x percent from 2010 consumption levels.
- Electricity demand is expected to increase by xx percent, compared to an insufficient x percent growth of generation capacity by 2020.
- U.S. government objectives of net-zero buildings and the renewable energy generation have influenced national policy to include strict mandates to meet reduced energy consumption targets and increased renewable energy goals at the federal and state levels.
- Areas for technology development to reduce carbon dioxide emissions include coal upgrading, improved efficiency in existing power plants, integration gasification combined cycle (IGCC), and carbon capture and storage (CCS).

Energy Market Overview (continued)

- Increase in renewable energy sources for electricity, from xx.x percent in 2010 to xx.x percent in 2020, will be at the demise of oil usage, mostly due to oil price volatility and environmental concerns. Further driving renewable energy growth are financial incentives that make such technologies more affordable.
- Hydropower will continue to be the leading renewable energy source, but wind and solar are the fastest growing technologies for 2020.
- Though the United States is a leader in geothermal energy production, this source is economically unattractive to satisfy unmet energy demands.
- Coal, oil, natural gas, and nuclear fuel are the predominant traditional energy sources. Though nuclear power comprises less than xx percent of actual electricity generation, it is forecasted to be the fastest growing among conventional sources.
- U.S. policy recommendations to overcome energy challenges include a continued focus on renewable energy generation and extended energy efficiency goals to all commercial buildings, rather than the current focus on government buildings.

Evolution of the Global Energy Market

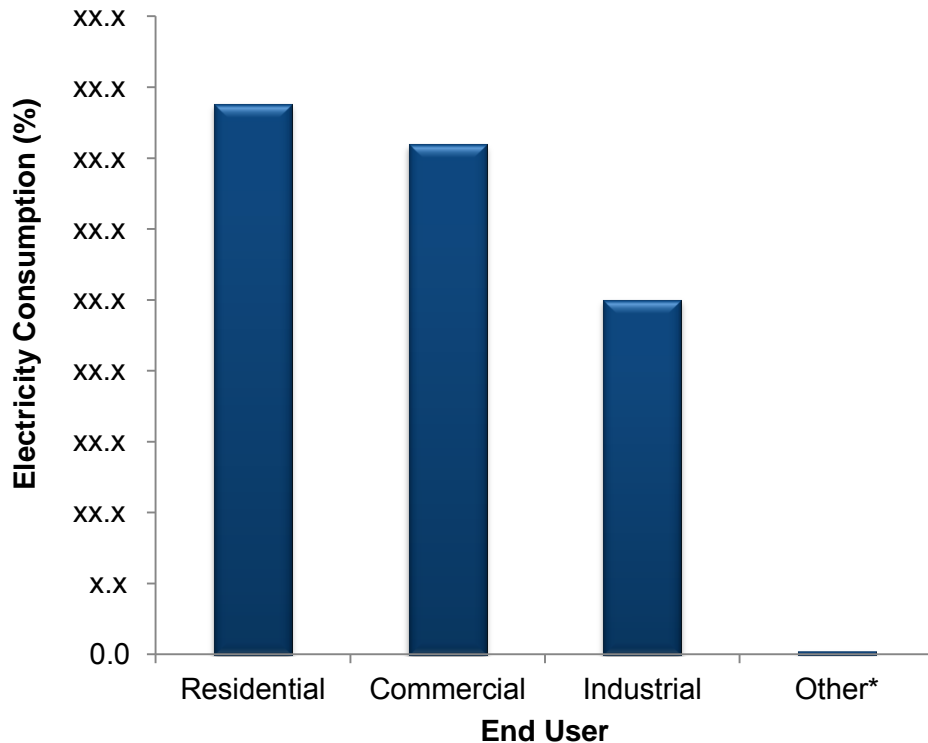
Key Takeaway: Significant increases in energy consumption and the need for improved efficiencies are global issues.

	2010	2015	2020	2025	2030
Major Issue					
Fuel Supply And Costs	Continued acceleration of coal-fired power in emerging economies Acceleration of natural gas	Demand for liquid fuel falling after 2015 Resurgence of nuclear	Energy from waste in emerging markets Growth of natural gas kept in check by high gas prices		Coal reaches nearly xx percent of energy consumption, following growth in India and China
Global Energy Demand	Growth dominated by India and China Growth resumed in all regions	Substantial investment in Russia Deceleration and maturation of European Union	Developing economies exceed xx percent of electricity demand	Electricity generation passes xx,xxx billion kWh	Global energy demand almost doubles xxxx levels
Environment Issues	China overtook the United States as the world's biggest emitter of CO2 Global renewables growth	Accelerated investment in carbon capture and storage	Renewable energy to reach xx percent in Europe	New alternative technologies enter the market to reduce emissions	Global CO2 emissions reach xx gigatons (Gt)

Electricity Consumption Breakdown

Key Takeaway: Improvements in energy efficiency, especially in space and water heating technologies, are projected to reduce the residential sector's future share of electricity consumption.

Energy Challenges: Electricity Consumption by End User, U.S., 2010



Note: *Other end users represent 0.2 percent and include the transportation sector.

Note: All figures are rounded. The base year is 2010.

- Share of Energy Consumption: xx.x%
- Trend: Decreasing

Residential



- Share of Energy Consumption: xx.x%
- Trend: Increasing

Commercial



- Share of Energy Consumption: xx.x%
- Trend: Increasing

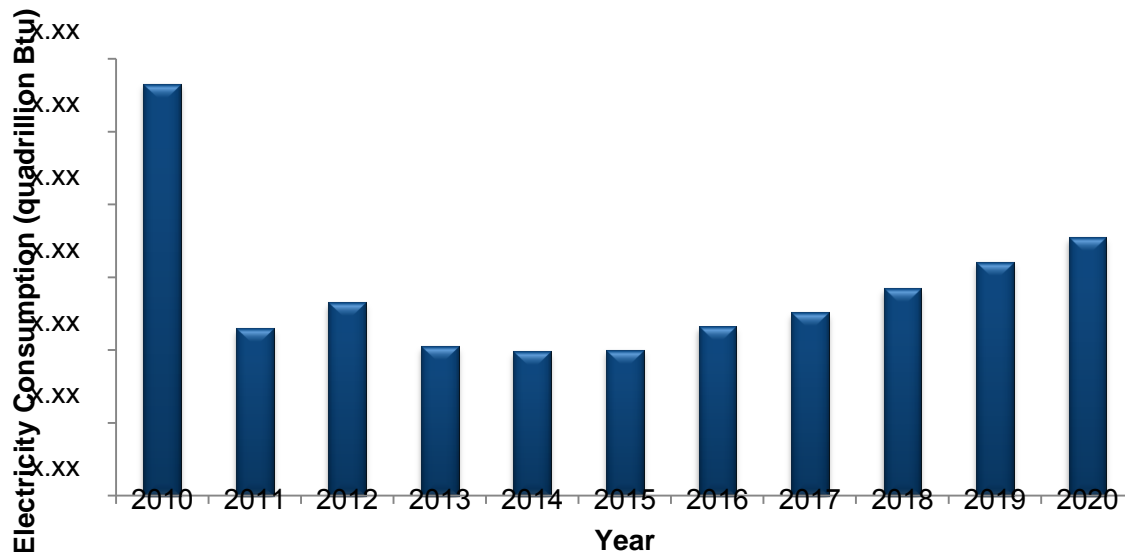
Industrial



Electricity Consumption Breakdown (continued)

Key Takeaway: Lighting and space cooling consume the greatest amount of electricity in the residential sector, and are appropriately the focus for efficiency gains.

Energy Challenges: Residential Sector Electricity Consumption Forecast, U.S., 2010-2020
CAGR: (x.x%)



- Electricity consumption by the residential sector is expected to decrease significantly from its 2010 level, despite population growth at a x.x percent CAGR, because of improved efficiency measures.
- A federal ban on inefficient incandescent lighting is among the major initiatives driving energy efficiency in this sector.