NRG Expert
Smart Technology Report

Market Intelligence

What are the leading causes of today's energy shortages? What role does energy security play? Are new developments in energy efficiency and energy storage the answer? This report reviews these issues and discusses some of the emerging smart technologies that will address generation capacity shortfalls.

Energy security can be defined as the role of affordable, reliable sources of energy in the overall national security of a given country. As demand rises and reserves become costlier, governments will increasingly find energy security to be a challenging goal. Political factors (both domestic and foreign), and environmental concerns provide further complications. Trends to date indicate that if solutions to these problems are found they will likely be a networked basket of diverse, non-centralized "smart tech" approaches. This report frames the state of energy generation today and discusses some of the likely candidate technologies that will form the solution. These include new developments in energy storage and energy efficiency.

Primary Focus

This report provides essential insight into the reasons for power generation shortfalls and detailed intelligence on the technologies that may address them. Major topics covered include:

- **Energy Security**
  - A briefing on the factors that effect a state's capacity to ensure energy security
- **Power Generation Capacity**
  - Including an analysis of current global capacity and future forecasts
- **Fuel Reserves**
  - With a look at global supplies of oil, natural gas, coal, biomass, hydro and uranium
- **Today's Power Grid**
  - Information on the composition of the modern grid
- **Renewable Energy**
  - Including the challenges of integrating renewable energy into the grid
- **Energy Storage**
  - A briefing on the major companies and technologies
- **Energy Efficiency Products**
  - A briefing on the major companies and technologies

Reasons to Purchase Smart Technology Report

- Gain an in-depth understanding of the crucial issues surrounding energy security
- Gain insight into current and future global power generation capacity
- Access data on global fuel reserves
- Understand the composition of the modern power grid
- Understand the challenges associated with integrating renewable energy into the grid
- Be briefed on new developments in storage technology and the major companies involved
- Be briefed on new developments in energy efficiency products and the major companies involved

Report Highlights

Typically, discussions of energy security focus on reserves of oil and gas. "Peak oil" (or the point at which oil production will begin to decline) does not appear to have occurred yet, with actual reserves of oil and gas expected to last another 46 and 59 years respectively based on current rates of consumption. This is in part due to new discoveries and advancements in technology that makes the extraction of known but challenging reserves cost-effective. However, companies are growing more reluctant to explore and develop new reserves due to volatile prices and uncertainty over future demand. Geopolitical risk can influence prices as well, with events in unstable regions rippling outwards to affect other nations.

Advancements in energy storage technologies could mean better integration of intermittent renewable energy into the grid. Modern grid systems require predicable and controllable flows of energy that cannot be provided by renewable sources unless the intermittent generation was stored for later use. In addition, storage technologies could allow delay in the production of additional generating capacity, mitigating the need for expensive "peaking" plants to meet spikes in demand.

Energy efficiency, particularly regarding power generation, industrial demand, transportation and the residential or commercial sector can also help address these issues. The reuse of waste heat in power generation and industrial facilities, micro hybrid vehicles equipped with stop/start technology, advances in conventional vehicle engines, advances in lighting and re-evaluations of indoor climate control practices are just some of the up-and-coming developments that may be major players in the future.

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