

Charting a Course to Energy Independence

**Providence, RI
August 9-12, 2009**





Security and the Evolution of Energy

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CTO/Founder

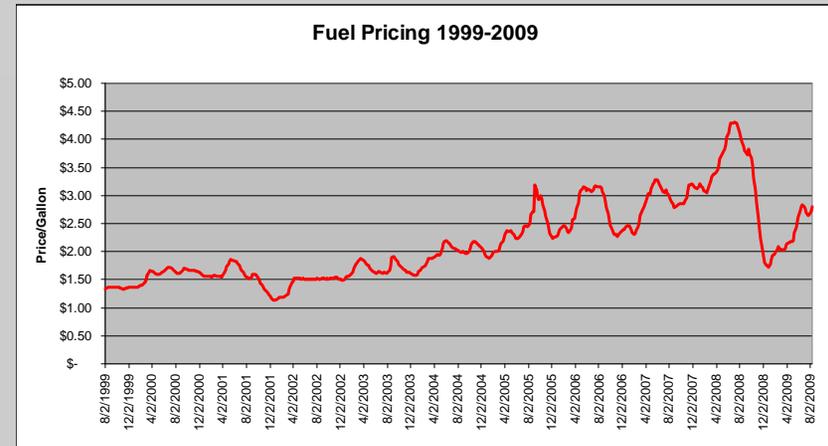
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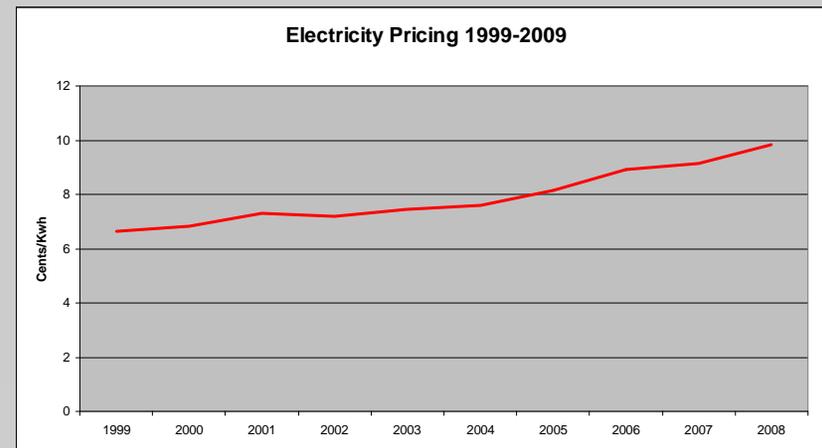


The World of Energy is Changing

- Economic, Environmental and Political Concerns
 - ☐ Unstable/Rising Pricing
 - ☐ New Regulations
 - ☐ Stimulus funding
 - ☐ International Accords
- External Threats to Energy
 - ☐ Terrorism
 - ☐ Cyber attacks
 - ☐ Political Instability
 - ☐ Increasing Supply Chain Vulnerability



Courtesy: Energy Information Administration : <http://tonto.eia.doe.gov>





The Changing Definition of Energy Security

- Supply:

A sufficient supply of energy resources across multiple types to maintain power for residential, commercial, industrial, military, and government use.

- Availability:

Robust and reliable means through which energy supplies are connected to users, within acceptable parameters for outage and resupply

NEW-ish

- Confidentiality:

Secure means through which energy is managed, transmitted, connected and billed, maintaining the privacy of both user and producer

NEW!



Increasing Breach Awareness

Mon. August 10, 2009

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BY TERRENCE O'BRIEN (RSS FEED) — MAR 19TH 2009 AT 4:32PM

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Electricity Grid in U.S. Penetrated By Spies

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Hacker Hits Nuclear Plant

Tags: Hack + Nuclear Plant + DefCon + SCADA



Valmort posted on Aug 24th 2007 8:59PM; via forbes.com/2007/08/22/scada-ha...

The first time Scott Lunsford offered to hack into a nuclear power station, he was told it would be impossible. There was no way, the plant's owners claimed, that their critical components could be accessed from the Internet. Lunsford, a researcher for IBM's Internet Security Systems, found otherwise.



"It turned out to be one of the easiest penetration tests I'd ever done," he says. "By the first day, we had penetrated the network. Within a week, we were controlling a nuclear power plant. I thought, 'Gosh. This is a big problem.'"

GovEnergy
www.govenergy.gov

Jack Danahy

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Introduction of New Areas of Risk

- New Players in the Energy Market
 - ☐ Alternative energy providers
 - ☐ Home owner generators/V2G autos
 - ☐ Storage Farms
 - ☐ Next Generation Infrastructure Component Vendors
- New Responsibilities for Providers
 - ☐ Communications for Load and Planning
 - ☐ Financial information for Rate Recovery and Usage
 - ☐ Increasing interconnectivity and interdependence



2009/2010 Governmental Action in Energy (a Subset)

- 1. [H.R.244](#) : To provide for the security of critical energy infrastructure.
 2. [H.R.513](#) : To ensure the energy independence of the United States by promoting research, development, demonstration, and commercial application of technologies through a system of grants and prizes on the scale of the original Manhattan Project.
 3. [H.R.629](#) : To provide energy and commerce provisions of the American Recovery and Reinvestment Act of 2009.
 4. [H.R.1063](#) : To repeal a requirement with respect to the procurement and acquisition of alternative fuels.
 5. [H.R.1337](#) : To amend the Internal Revenue Code of 1986 to reduce carbon dioxide emissions in the United States domestic energy supply.
 6. [H.R.1382](#) : To provide assistance for ultra efficient vehicles under the advanced technology vehicles manufacturing incentive program.
 7. [H.R.1787](#) : To amend the Clean Air Act regarding transportation fuels and establishment of a low carbon fuel standard.
 8. [H.R.1847](#) : To require the inclusion of coal-derived fuel at certain volumes in aviation fuel, motor vehicle fuel, home heating oil, and boiler fuel.
 8. [H.R.1918](#) : To permit United States companies to participate in the exploration for and the extraction of hydrocarbon resources from any portion of a foreign maritime exclusive
 10. [H.R.2120](#) : To provide for exploration, development, and production activities for mineral resources on the outer Continental Shelf, and for other purposes.
 11. [H.R.2211](#) : To facilitate planning, construction, and operation of a secure national clean energy grid.
 12. [H.R.2227](#) : To greatly enhance America's path toward energy independence and economic and national security, to conserve energy use, to promote innovation, to achieve lower emissions, cleaner air, cleaner water, and cleaner land, and for other purposes.
 13. [H.R.2234](#) : To enhance the energy security of the United States, reduce dependence on imported oil, improve the energy efficiency of the transportation sector, and reduce emissions through the expansion of grid supported transportation.
 14. [H.R.2300](#) : To provide the United States with a comprehensive energy package to place Americans on a path to a secure economic future through increased energy innovation, conservation, and production.
 15. [H.R.2371](#) : To use tradable greenhouse gas emission allowances under the American Clean Energy and Security Act of 2009 to provide assistance to residential and commercial consumers of home heating oil and propane in reducing the effective costs of such fuels through State programs to deliver cost-effective efficiency programs and other consumer assistance.
 16. [H.R.2454](#) : To create clean energy jobs, achieve energy independence, reduce global warming pollution and transition to a clean energy economy.
 17. [H.R.2539](#) : To secure unrestricted reliable energy for American consumption and transmission.
 18. [H.R.2540](#) : To set clear rules for the development of United States oil shale resources, to promote shale technology research and development, and for other purposes.
 19. [H.R.2647](#) : To authorize appropriations for fiscal year 2010 for military activities of the Department of Defense, for military construction, and for defense activities of the Department of.
- 20. [H.R.2828](#) : To provide the United States with a comprehensive energy package to place Americans on a path to a secure economic future through increased energy innovation, conservation, and production.
 21. [H.R.2998](#) : To create clean energy jobs, achieve energy independence, reduce global warming pollution and transition to a clean energy economy.
 22. [H.R.3183](#) : Making appropriations for energy and water development and related agencies for the fiscal year ending September 30, 2010, and for other purposes.
 23. [H.AMDT.13](#) to [H.R.1](#) Amendment provides that the Secretary require, as a condition for receiving funding under Title XIII of the Energy Independence and Security Act of 2007, that demonstration projects utilize Internet-based or other open protocols and standards if available and appropriate, and further, that grant recipients utilize Internet-based or other open protocols and standards.
 24. [H.AMDT.328](#) to [H.R.3183](#) An amendment numbered 9 printed in Part A of House Report 111-209 to allow national security laboratories to dedicate an additional 1% (total of 7%) of each lab's annual budget to Laboratory Directed Research and Development (LDRD). LDRD allows laboratories to pursue high-risk, high-reward research and develop innovative technologies to support energy and homeland security priorities.
 25. [S.5](#) : A bill to improve the economy and security of the United States by reducing the dependence of the United States on foreign and unsustainable energy sources and the risks of global warming, and for other purposes.
 26. [S.224](#) : A bill to promote economic recovery through green jobs and infrastructure, and for other purposes.
 27. [S.336](#) : An original bill making supplemental appropriations for job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and State and local fiscal stabilization, for the fiscal year ending September 30, 2009, and for other purposes.
 28. [S.587](#) : A bill to establish a Western Hemisphere Energy Cooperation Forum to establish partnerships with interested countries in the hemisphere to promote energy security through the accelerated development of sustainable biofuels production and energy alternatives, research, and infrastructure, and for other purposes.
 29. [S.661](#) : A bill to strengthen American manufacturing through improved industrial energy efficiency, and for other purposes.
 30. [S.774](#) : A bill to enhance the energy security of the United States by diversifying energy sources for onroad transport, increasing the supply of energy resources, and strengthening energy infrastructure, and for other purposes.
 31. [S.807](#) : A bill to reduce fuel prices and improve national energy security by increasing domestic supply, reducing excessive speculation in the markets, and promoting long-term security through alternative energy sources, and for other purposes.
 32. [S.1393](#) : An original bill to authorize appropriations for fiscal year 2010 for defense activities of the Department of Energy, and for other purposes.
 33. [S.1462](#) : An original bill to promote clean energy technology development, enhanced energy efficiency, improved energy security, and energy innovation and workforce development, and for other purposes.



Security in the Smart Grid Grant Program

Executive Summary

The overall purpose of the Smart Grid Investment Grant Program (SGIG) is to accelerate the modernization of the nation's electric transmission and distribution systems and promote investments in smart grid technologies, tools, and techniques which increase flexibility, functionality, interoperability, cyber-security, situational awareness, and operational efficiency.

The screenshot shows the U.S. Department of Energy website. The header includes navigation links for 'ABOUT DOE', 'ORGANIZATION', 'NEWS', and 'CONTACT US', along with a search bar and 'GO'. The main navigation menu lists categories: 'SCIENCE & TECHNOLOGY', 'ENERGY SOURCES', 'ENERGY EFFICIENCY', 'THE ENVIRONMENT', 'PRICES & TRENDS', 'NATIONAL SECURITY', and 'SAFETY & HEALTH'. The 'NEWS' section is active, showing a breadcrumb trail: 'You are here: DOE Home > News 2009 > Press Releases > April - June'. The article title is 'Obama Administration Announces Availability of \$3.9 Billion to Invest in Smart Grid Technologies and Electric Transmission Infrastructure'. The sub-headline is 'Recovery Act Funding Will Create Jobs, Help Modernize Nation's Electric Grid'. The article text begins with 'Washington, DC - U.S. Energy Secretary Steven Chu announced today that the Department of Energy is soliciting applications for \$3.9 billion in grants to support efforts to modernize the electric grid, allowing for greater integration of renewable energy sources while increasing the reliability, efficiency and security of the nation's transmission and distribution system, as part of the American Recovery and Reinvestment Act.'

Submitted Project Plans are also required to include a section on the technical approach to cyber security. Cyber security should be addressed in every phase of the engineering lifecycle of the project, including design and procurement, installation and commissioning, and the ability to provide ongoing maintenance and support. Cyber security solutions should be comprehensive and capable of being extended or upgraded in response to changes to the threat or technological environment. The technical approach to cyber security should include:

- A summary of the cyber security risks and how they will be mitigated at each stage of the lifecycle (focusing on vulnerabilities and impact).
- A summary of the cyber security criteria utilized for vendor and device selection.
- A summary of the relevant cyber security standards and/or best practices that will be followed.
- A summary of how the project will support emerging smart grid cyber security standards.

DOE intends to work with those selected for award but may not make an award to an otherwise meritorious application if that applicant can not provide reasonable assurance that their cyber security will provide protection against broad based systemic failures in the electric grid in the event of a cyber security breach.



Looking Forward

- Procurements are progressing for new energy technologies
 - ▣ Regulations are formulated to improve security
 - ▣ Pilot implementations may be testbeds or sacrifices
- Energy security of all varieties will drive new technologies, which in turn will drive practical energy technology security
- Improving awareness among key leaders in politics, energy, technology, and defense is growing and improving security daily



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