



## The Future U.S. Energy Picture?

*In March, at a workshop convened by Sandia National Laboratories and the University of California, San Diego, leaders from academia, government, and the private sector gathered to discuss key energy policy issues.*

*At the workshop, attendees were asked a question about what the future U.S. energy picture might look like.*

*Below is R. James Woolsey's response to the question. Mr. Woolsey was Director of the Central Intelligence Agency and is Chairman of the Advisory Board of the Clean Fuels Foundation.*

**"Imagine it is ten years from now. U.S. energy policy has changed dramatically for the better in response to the intersecting priorities of economic security, environmental and climate security, and national security. Describe the underlying principles and long-term goals that drove that change. What does the U.S. and the world energy picture look like as a result?"**

### Report of March 2019: The 2009 Plan for a "Smart" Electricity Grid

#### Plans had been completed

ten years ago—in March 2009—for hundreds of billions of dollars in investment to make the electricity grid smarter and more capable of carrying the stranded electricity, produced by solar plants in the southwest and wind farms in the Great Plains, to population centers on the coasts. Central control of electricity demand was to be a major aspect of this new grid, and there were to be a great many other "smart" improvements.

By September 2009, however, a series of cyber attacks on the grid during the summer had a devastating effect, creating dozens of serious regional electricity brownouts and blackouts. For some weeks, authorities were certain the sophisticated attacks had come from, at first, China, then Russia, then Hezbollah cyber-cells in Lebanon.

In September, however, an eighth-grader in Burbank, California, confessed that he and a group of friends had grown bored with video games during the summer and had decided to bring down major parts of the grid for various periods of time. Under questioning by authorities, the group protested that it would have been easy for them to have taken the grid down for months, and that "you guys" should feel lucky they had only taken portions down for days.

The eighth-grader added that the Supervisory Control and Data Acquisition

(SCADA) systems that control the grid, using commercial off-the-shelf software over the Internet, were so easy to hack that he and his friends soon got bored with that as well, and several new, more challenging video games had temporarily led them to set aside their grid shutdowns.

The young witness said to his astonished interrogators, "If you dorks can't even deal with us, how are you going to deal with Chinese, Russian, or Hezbollah cyber-dudes? You aren't building a smart grid. It's headed towards being an ODAV grid—we normally don't spell that out for the rents and other old peeps, but it stands for 'Ostrich-Designed, Awesomely Vulnerable.'" (Editor's Note: 'rents' is slang for parents and 'peeps' is slang for people.)

An urgent national re-evaluation of the planning for the smart grid project followed.

The administration learned that the combined incentives of electricity deregulation and electricity companies' consequent total focus on the quarterly bottom line—together with utilities' lawyers' warnings that they risked liability if they acknowledged any security problem that they didn't fix immediately—had destroyed most of the incentives to make the grid secure.

It was also a classic tragedy-of-the-commons problem: if any utility spent the money to fix vulnerabilities, chances were that the blackout of a still-vulnerable

neighbor utility—if the neighbor were taken down by cyber or other attacks (e.g. on transformers)—would black them out as well.

When the utility executives were asked why they had fought so hard in the summer of 2008 against increased authority for the Federal Energy Regulatory Commission to be enabled to order security improvements that would apply to all utilities, they looked guiltily at one another—and shrugged.

As a result of these events, the administration re-structured the smart grid program to emphasize security as well as renewables and distributed generation, including co-generation. They also adopted a feed-in-tariff. Consequently, over the last decade the rapid growth of clean, distributed, secure electricity and the accelerating move, led by battery improvements, in the electrification of transportation and in electricity storage has brought the U.S. to a position of world leadership in bringing about far greener, and far more resilient, energy systems.

Rumor has it that most of the former Burbank eighth-graders now work for a highly-classified office within the U.S. National Security Agency with two responsibilities: designing U.S. retaliatory steps to deal with any attempted foreign cyber-attacks and periodically functioning as a Red Team to keep U.S. utilities on their toes.

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