Sustainable Energy Security and Energy Independence

By Charles W. Newton

We have all seen the headlines that appeared recently with the signing into legislation of the **Energy Independence and Security Act of 2007**. While many of us are still confronting the realities of the Energy Policy Act of 2005, this new legislation has an even more important impact on the electric power community.

The headlines that emerged from the enactment of the new legislation revolved around mandates for improvements in automobile mileage, more use of ethanol, efficient light bulbs and efficient buildings. That is all well and good and represents meaningful progress toward at least a measure of energy independence. However, little attention was given to Title Nine, hidden in the latter sections of the 300-plus page bill, signed into law in December, 2007. This new legislation includes some notable and progressive items including a statement of purposes for the Energy Independence Act as set forth in the preamble:

To move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government, and for other purposes.

The White House summarized the benefits of this bi-partisan legislation as follows:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuels in 2022.

- Reducing U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020 – which will increase fuel economy standards by 40 percent and save billions of gallons of fuel. The bill will require all general purpose lighting in Federal buildings to use Energy Star® products or products designated under the Energy Department's Federal Energy Management Program (FEMP) by the end of Fiscal Year 2013.

- The bill will update the Energy Policy and Conservation Act to set new appliance efficiency standards that will save Americans money and energy.

- The bill will establish an Office of High-Performance Green Buildings (OHPGB) in the U.S. General Services Administration.

Taken together, all of these measures could reduce projected CO2 emissions by billions of metric tons, according to the White House.

However, it takes wading through some 300 pages of the act's somewhat tedious – but comprehensive - text to get to the gist of what the enactment of this legislation will mean to the electric power industry, especially the T&D side of the industry in the United States. **Title Nineteen** is totally focused on the "Smart Grid." **Section 1301** of Title Nineteen provides a national policy statement unlike anything we have seen before.

"It is the policy of the United States to support the modernization of the Nation's electricity transmission and distribution system to maintain a reliable and secure electricity infrastructure that can meet future demand growth and to achieve each of the following, which together characterize a Smart Grid:
(1) Increased use of digital information and controls technology to improve reliability, security, and efficiency of the electric grid.
(2) Dynamic optimization of grid operations and resources, with full cyber-security.
(3) Deployment and integration of distributed resources and generation, including renewable resources.
(4) Development and incorporation of demand response, demand-side resources, and energy-efficiency resources.
(5) Deployment of ''smart'' technologies (real-time, automated, interactive technologies that optimize the physical operation of appliances and consumer devices) for metering, communications concerning grid operations and status, and distribution automation.
(6) Integration of ''smart'' appliances and consumer devices.
(7) Deployment and integration of advanced electricity storage and peak-shaving technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air conditioning.
(8) Provision to consumers of timely information and control options.
(9) Development of standards for communication and interoperability of appliances and equipment connected to the electric grid, including the infrastructure serving the grid.
(10) Identification and lowering of unreasonable or unnecessary barriers to adoption of smart grid technologies, practices, and services.

Highlights from these sections include:

- Appointment of a smart grid advisory committee and smart grid task force comprised largely of technical representatives from the Department of Energy.

- The US government will rebate 20% of the cost to a utility of purchases made directly to support smart grid initiatives.

Now may be a good time to try to better understand the ramifications of EISA 2007. Are the rebates going to be relegated to only demand response initiatives, and if so, who will decide whether the investment is primarily for Demand Response and results from implementing advanced metering infrastructure, the enabling technology required for demand response. What if a utility instead upgrades its control center, or automates portions of the transmission grid or its distribution operations? Do these investments

count for a 20% rebate? Clearly, these actions are part and parcel of a smart grid investment.

Further, the EISA calls for the Department of Energy to oversee the development of the Smart Grid. What if the next administration decides there are other priorities? Will this cause a policy discontinuity?

Our firm's international clients cannot believe the market descriptive information we have to relay to them concerning the "51 different playing fields" we have come to deal with just in the U.S (and another ten or so in Canada) when it comes to issues/market developments such as performance-based rate structures, demand response programs, AMR/AMI developments, state-level reliability measurement variances, transmission siting issues, EPACT 2005, EISA 2007, NERC CIPS, and so forth.

NERC and CIPs Compliance Issues:

The NERC CIPs directives on the drawing board since early 2002, are now coming into active use, with FERC's approval. While we do know that any entity concerned with bulk power electricity transmission is affected immediately and directly, it is unclear (at least to us) just how far down the "food chain" of the 3,000 or so distribution utilities which do not have transmission lines the rulings apply. NERC can't seem to decide who or how many electric distribution utilities are really affected by the now-mandated CIPs at this late date. The reply is *". . . if they deliver bulk power, they must comply. ."* Well, here is the current "official" NERC position on bulk power as defined on the NERC website:

What is the "bulk power system" or "bulk electric system"?

There is no one definition, but NERC defines the bulk power system as the electric power generation facilities combined with the high-voltage transmission system, which together create and transport electricity around the continent. Put another way, the bulk power system is the continent's electricity system except for the local electricity facilities you see in your town or city. NERC does not deliver power directly to homes and businesses. That service usually is provided by a local utility of some kind. Local delivery is under the jurisdiction of state, provincial or local utility regulatory agencies.

So, in the end, our question is this: Do NERC CIPs apply or not to the 3,000 electric utilities in our nation and in Canada that do not transmit bulk power? What is the "test" for whether a small-to-mid-size distribution entity must comply? The official NERC definition seems to imply that compliance is not mandated.

Problems with Energy-Related Legislative Follow-Through?:

After the quick summaries of EISA and NERC CIPs in this article, it seems that the country could do a better job with following up on Congressional legislation.

Newton-Evans regularly conducts research with hundreds of utilities here and abroad concerning their plans for the future, on topics ranging from smart grids, operational control systems, protection and coordination, to transmission and distribution networks and about infrastructure. Each American electric power utility does indeed have some type of technology adoption plans for the near-term and longer range, and most have their own strategic initiatives. However, many are struggling with key issues and investment strategies, waiting for the government to take action on many fronts regarding energy policy formulation with which they can live. We continue to look for clearly stated and well-defined guidance to help interpret recently enacted legislation (EISA) and mandated directives (NERC CIPs).

Federal Government Involvement: Needed for the Lead Role:

We are not likely to be able to forge a still-needed cohesive, long-term national energy policy without leadership (or at least active involvement) from the federal government. To have high level government officials state that they will rely on the private sector for solutions and roadmaps is asking for more of the same which means little federal guidance, formulation of policies that are not coherent, often short-term focused, and sometimes misguided. Special interests will grab at such opportunities and each of these interests will try to wrest the mantle of energy industry thought leadership from one another.

> *As an aside, last summer, during one of the Smart Grid discussions sponsored by General Electric Company, at which the author spoke on the development of the Smart Grid, a person in the audience posed the question* ***"Who, if anyone, is looking out for the energy future of the U.S.?"*** *I replied that I thought it was the responsibility of two organizations, the U.S. Department of Energy and EPRI. Later, at break time, I walked up to this questioner, and he introduced himself as a DoE employee. Talk about becoming a little nervous over our energy future that did it for me! I guess I was wrong, but then….*

What we are confronted with today is 51 different playing fields in the energy sector at the state/district level and another overlying level with FERC, NERC, DoE and DoC. In order to get the country moving toward the formulation of a coherent national energy policy we may need to de-politicize the upper levels of both the Energy Departments and the Commerce Department for the benefit of the public and for the well-being of the nation.

In our company's 30 years of work with domestic and international clients, the officials from these largely industrial firms, which serve global energy infrastructure and automation markets, are often befuddled by the lack of homogeneity and the temporary nature of some of the United States' energy policies, provisions, rate structures, and energy-related incentives and disincentives.

I am just happy that our company has stayed "outside the beltway" for these 30 years in business as energy industry researcher. I think this has kept us closer to the real world of

the electric power industry at least for trying to gain an understanding of the myriad of operational issues and tactical options facing the industry and about which electrical equipment manufacturers, control systems integrators and software developers have done a yeoman's work in spite of it all, including the myriad state variations in energy policies regarding restructuring, deregulation, utility operational practices, methods and procedures, and the disparate energy regulations at the federal, state and local levels.

At one of the early 2008 Washington energy conferences, when I raised the issue of not hearing any of the Presidential candidates appearing to want to speak clearly on the future of energy policy, some of the "energy advocacy community" attendees guffawed in my direction, wondering where in heaven's name I had come from, and suggested that any "hard choice" discussions of energy policy will ensure that the candidate will not get elected. Such difficult discussions seem to be "…better left to closed-door congressional committees to ponder…"

In conclusion, I believe we need a *John Kennedy-like* mission statement and a champion who will lead us to a clear energy policy statement with understanding and stay the course with the inevitable much-needed and long-term oriented follow-through. As a nation, we owe it to our citizens to come together to develop a coherent, long-term, adaptive strategy for energy sustenance, security and reliability. This undertaking will be among the most challenging of tasks for this nation to undertake in this still-new century. However, to delay much longer will be viewed as criminal by succeeding generations of Americans. We cannot afford to be asleep at the energy wheel.