

# ENVIRONMENTAL SYNOPSIS

## The Chairman's Corner

Sen. Scott E. Hutchinson, Chairman



As a Pennsylvanian, you are entitled to select your electric power supplier. And, you may switch change your electric supplier (pursuant to the contract if any – you have entered into) when you wish.

While many Pennsylvanians are aware of their rights in this regard, I'm sure there are still some who are unaware of the flexibility afforded them and of the opportunities to seek out better deals to purchase electricity.

The most recent "ABACCUS" (*Annual Baseline Assessment of Choice in Canada and the United States*) report – also known as the *2012 Scorecard for Retail Electricity Consumer Choice* – takes a look at the progress made in electricity consumer choice, not only in Pennsylvania but also nationwide. ABACCUS is intended as a scorecard that tracks what U.S. states and some Canadian provinces are doing in pursuing the restructuring of electricity markets. It provides some interesting data.

Generally speaking, the first conclusion of the report is that retail energy providers in North America are not backing off on offerings to consumers, but are continuing to roll out more new service options to residential consumers. The report also states that in many areas, the number of active retailers is rising.

The report lists what it calls the four benefits of electricity restructuring. They are:

- engaging consumers with innovative choices;
- growing the local economy;
- supporting businesses in global markets; and
- reinvigorating the regulatory compact.

First, by way of some historical perspective, the Electricity Generation Customer Choice and Competition Act was enacted in Pennsylvania in December 1996. A pilot phase began in late 1997 and a year by year phase in of customers followed. Since that time, the Pennsylvania Public Utility Commission (PUC) has continued to study and work with Pennsylvania's choice programs. PUC Chairman Robert Powelson has been quoted as saying, "The commission's goal is to make Pennsylvania the most competitive electricity market in the country."

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# NOTES FROM THE DIRECTOR

CRAIG D. BROOKS, EXECUTIVE DIRECTOR



The Environmental Protection Agency (EPA) released an updated draft report in December 2012 outlining ongoing and potential new activities to redevelop petroleum contaminated brownfields sites. One possibility the draft explores is how their use can address community needs for access to health care.

Another potential new project in *"Petroleum Brownfields 2013 Opportunities for Action"* includes developing and putting in place cleanup strategies that focus on a connection between brownfields grant programs and cleaning up underground storage tank releases. The draft report

continues the discussion on EPA's priorities for cleanup and use of contaminated properties and its use is being strongly encouraged by the National Association of Local Government Environmental Professionals (NALGEP).

The report suggests that access to health care could be improved by developing brownfields into medical clinics, open space for recreation or farmer's markets for fresh produce. Other potential new activities include helping interested parties articulate the return on investments for cleaning up and reusing petroleum brownfields and assisting area wide planning grantees in developing voluntary inventories of petroleum brownfields.

EPA's petroleum brownfields redevelopment program is not regulatory, but more of an outreach program that provides tools and expertise to help redevelop the contaminated sites. The efforts are coordinated by the federal offices of Brownfields and Land Revitalization and Underground Storage Tanks.

The majority of petroleum contaminated sites are abandoned gas stations and often pose three major development challenges. First, because most of the

sites are former gas stations, these smaller sites may not be the most marketable. Second, environmental programs tend to focus on high risk sites that are not eligible for brownfields funds. And third, coordination across brownfields programs can be difficult.

In an effort to address some of these challenges, EPA has developed an action plan to foster the cleanup and reuse of petroleum contaminated sites, and announced

a series of grants that may be used by communities in developing area-wide plans for brownfields assessment and development. Each grant is funded up to \$200,000 for two years.

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## **An EPA draft report examines potential reuse possibilities for petroleum contaminated brownfields sites**

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EPA is also announcing \$5 million in grants, specifically geared toward underserved, rural, small communities to provide technical assistance for cleaning up and redeveloping these small sites.

EPA's other efforts include:

- a workbook to guide communities in addressing petroleum brownfield sites;
- mapping of potential sites for cleanup and reuse;
- targeting geographic corridors to develop petroleum brownfield sites in defined areas; and
- exploring the use of these sites for renewable energy projects.

EPA's *"RE-Powering America's Land"* initiative continues to collaborate on a study that explores the feasibility of siting alternative fueling stations at former gas stations or petroleum brownfields sites.

More information on the brownfields program is available at: <http://www.epa.gov/oust/petroleum-brownfields/index.htm>.

# RESEARCH BRIEFS

Each month, the committee's staff researches and prepares a number of "briefs" on several topics relevant to the Joint Conservation Committee's mission.

Very often, these briefs include references to reports and further research on the topics so that readers may pursue issues on their own.

*Please Note: The information and opinions expressed in the Research Brief articles do not necessarily represent the opinions or positions of the Joint Legislative Air and Water Pollution Control and Conservation Committee, nor those of the Pennsylvania General Assembly.*

## U.S. Critical Infrastructure Sees Spike in Cyber Threats

-- Tony M. Guerrieri, Research Analyst

Because of its advanced industrial base and large number of computer controlled machines connected to the Internet, the U.S. is thought to be highly vulnerable to a cyber attack on its infrastructure. According to a report by the U.S. Department of Homeland Security's Industrial Control System Cyber Emergency Response Team (ICS-CERT), utilities and private companies that operate computerized industrial control systems associated with critical infrastructure have experienced a spike in what the organization calls "cyber incidents" in recent years.

The ICS-CERT was established as a means of enhancing government collaboration with companies that control critical components of national infrastructure, including power grids, water systems and nuclear plants. The report, "*ICS-CERT Incident Response Summary Report*", provides a summary of the cyber incidents, onsite deployments and associated findings from the time ICS-CERT was established in 2009 through the end of 2011.

The first relevant information is how the number of potential attacks on critical infrastructure has skyrocketed. The report indicates the number of cyber incidents increased more than 20-fold between 2009 and 2011. In 2009, ICS-CERT received nine incident reports; that number jumped to 41 in 2010 and 198 in 2011.

On its launch in 2009, ICS-CERT received nine incident reports during the final two months of the year. Not all reports were actually cyber attacks, and only a handful of reported incidents required on-site response from ICS-CERT. For example, in 2009, two incidents resulted in sending out onsite response teams, while two others ended up being treated remotely. The 2009 incidents were reported in only four sectors (energy, water, dams and a cross-sector).

Moving into 2010, ICS-CERT received 41 reports of incidents impacting organizations that owned and operated control systems associated with critical infrastructure. Of the 41 incidents reported, eight resulted in use of onsite response teams, while an additional seven incidents involved remote analysis, according to the report. The industries involved also grew, to include energy, water, dams, nuclear, chemical, government, critical infrastructure and a cross-sector.

**Since research into potential cyber attacks on computerized industrial control systems associated with critical infrastructure began in 2009, "cyber incidents" have increased each year through 2011**

A large number of incidents involved "sophisticated and targeted spear-phishing emails" that open the door to theft and further network infiltration, according to the report. Phishing attacks are similar to online banking scams, in which respondents are sent emails asking them to enter their identification code and password on a rogue Web site.

In 2011, ICS-CERT received 198 incident reports. Of those, seven resulted in deployment of onsite incident response teams. However, two took place within government facilities, with one event resulting in the temporary loss of backup power. An additional 21 incidents involved remote analysis efforts to identify malware and techniques used by attackers.

In addition, even more sectors were part of the attack scenario in 2011. Sectors involved included energy, water, dams, nuclear, chemical, government, critical infrastructure, cross-sector, communications, transportation and information technology.

In 2009 and 2010, the energy sector was the target of the most incidents, accounting for a third of all reports in 2009 and for 44 percent in 2010. In 2011, water treat-

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ment systems saw 41 percent of the incidents reported to ICS-CERT, and attacks on multiple sectors made up 25 percent.

Incidents specific to the water sector, when added to those that impacted multiple sectors, accounted for over half of the 2011 incidents due to a large number of Internet facing control system devices reported by independent researchers, the report noted.

The report says that in the 17 onsite assessments ICS-CERT officials had to perform during the 2009-2011 period – that is, in the most serious incidents – implementing best practices such as login limitation and segmenting networks with properly configured firewalls, could have deterred the attacks, significantly reduced the time it would have taken to detect an attack or at least minimized the impact of the incident.

These incidents highlight the activity of sophisticated threat actors and their ability to gain access to system networks, avoid detection, use advanced techniques to maintain a presence, and exfiltrate data, the report stated. The ICS-CERT also collaborated with the international cyber security community working with over 30 different countries and, in most cases, interfacing directly with the international Computer Emergency Response Teams to coordinate responses and reach out to affected organizations and vendors.

The 17-page “ICS-CERT Incident Response Summary Report” is available for download at: [http://www.us-cert.gov/control\\_systems/pdf/ICS-CERT\\_Incident\\_Response\\_Summary\\_Report\\_09\\_11.pdf](http://www.us-cert.gov/control_systems/pdf/ICS-CERT_Incident_Response_Summary_Report_09_11.pdf).

## Report Says United States Shale Development Should Serve as a Model for Other Countries

-- Craig D. Brooks, Executive Director

A new report suggests that oil and gas producers should use the U.S. experience in natural gas development as a model for developing shale gas in countries with varying geologic and water conditions. Released in December 2012, the report says that oil and gas producers should apply lessons learned in the United States to other countries, such as China.

According to the report, “One key opportunity for new geographies, where infrastructure is a challenge to explore, is to explore sharing the development of infrastructure, water treatment, facilities and the development of the local supply market.”

The report, “*Water and Shale Gas Development: Leveraging the U.S. Experience in New Shale Developments*”, notes that shale development is a highly water-intensive process, with a typical well requiring around 5 million gallons of water to drill and fracture, depending on the basin and geological formation. Most of the water is used during the fracturing process, with large amounts being pumped into the well with sand and chemicals used to facilitate the extraction of gas. Water is also used during the drilling stage when it is mixed with lubricating fluids.

Although an increasing amount of water is being recycled and reused, fresh water is still required in large quantities for drilling operations because brackish water is more likely to damage equipment and result in formation damage that reduces the chance of a successful well. The United States is the world’s top natural gas producer and together with Canada, accounts for more than 25 percent of global production.

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### The report examines the complex relationship between shale gas drilling and water use

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The report notes that the rapid expansion in shale gas production has given rise to concerns about the impact of operations in areas such as water, roads, air quality, seismic and greenhouse gas emissions. The report acknowledges that countries will have different issues, options and solutions to water challenges and environmental concerns, depending on the geology of the shale and the particular regional characteristics.

In particular, the report looks at how countries with proven reserves such as Argentina, China, Poland and South Africa can use U.S. lessons and trends in water movement to develop shale gas reserves economically and sustainably. For instance, the report says that the U.S. experience would work well in Argentina but not in China. The reason is that the shale seams in Argentina, like most of those in the United States, are found at depths of less than 3,000 meters. However, the shale-bearing layers in many Chinese formations are between 3,000 and 5,000 meters deep. Therefore, U.S. shale development models cannot be simply replicated in China, and the complex geological conditions will increase the cost of drilling wells.

The report contains several suggestions about lessons that operators and regulators can learn from the U.S. experience, including:

- Data collection and management is critical and needs to be planned early;

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– There needs to be a balance between standard national legislation and regulation optimized for local characteristics of the shale;

– Proactive engagement by regulators with operators in developing regulations will help implementation of effective solutions and reduce costs of compliance;

– Geographies will have different issues and solutions, depending on the shale and particular regional characteristics, and solutions should be sought to share knowledge among operators; and

– Investing in creative water management options, particularly water treatment solutions, is worthwhile.

The report is available at: <http://accenture.com/SiteCollectionDocuments/PDF/Accenture-Water-And-Shale-Gas-Development.pdf>.

## Project Compiles Great Lakes Stress Maps

-- Tony M. Guerrieri, Research Analyst

As the federal government builds on its \$1 billion investment to clean up and restore the Great Lakes, an international consortium has developed innovative new maps showing both environmental threats and benefits to help guide cost-effective approaches to environmental remediation of the world's largest fresh water resource.

The maps, developed during the past three years by the Great Lakes Environmental Assessment and Mapping (GLEAM) research team, show the mix of environmental stresses and the ecological services provided by the five lakes.

The Great Lakes basin, home to more than 30 million people, provides drinking water and recreation for millions of people in both the United States and Canada. In addition, the lakes support a host of environmental services ranging from fishing and boating to beachcombing to birding, with economic values estimated in the tens of billions of dollars annually.

The lakes are under severe environmental stress from decades of urban, industrial and agricultural runoff pollution, as well as a continuing onslaught of invasive species, climate change and other stressors delineated in the series of maps.

The Great Lake stress maps were produced over a three year period. They provide an overall index of 34 environmental stressors (broken out into seven categories) affecting the lakes. Among the biggest threats: invasive mussels and lamprey that threaten the food chain; climate change that can affect water temperature and water

levels; ballast water from ships that may introduce more uninvited species; a buildup of urban areas along the coast that sweeps auto and human waste into the waters during rainfall; and a continual runoff of phosphorous from farmlands.

The maps account for the impact level of each stressor, which was estimated by surveying 161 researchers and resource managers from across the Great Lakes region. They were asked to assess the relative impact of different stressors to one another in particular areas of the basin. That information was plotted as data layers on the maps.

The result is new maps that not only show individual threats to the Great Lakes, but also how different types of pollution, invasive species, climate change, and other threats can be weighted and combined to stress parts of the lakes.

Multi-colored maps show the mix of environmental threats to the Great Lakes. Red highlights areas of the lakes facing a multiplicity of problems and blue in which few threats exist.

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### **The Great Lakes stress maps can help one to learn more about the areas most under stress and those providing the most environmental services**

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According to the analysis, places such as southern Lake Michigan, the bay of Green Bay, Lake Erie and Lake Ontario appear in blazing red. The map shows Lake Ontario as the most threatened because of widespread mercury and PCB pollution and problems stemming from invasive sea lampreys and zebra and quagga mussels.

Lake Erie appears to lead other lakes in sediment problems from erosion, in invasive shoreline reeds called phragmites and the round goby fish, according to the map. The round goby is an aggressive bottom-dwelling species that spawns several times each season and can dominate the waters. They prey on the eggs of other fish.

In contrast, offshore areas of Lake Superior and Huron, where human population and development are not as concentrated, have pockets of red but are mostly represented by a deep blue.

The maps also assessed areas of the lakes most heavily used by humans for their "environmental services" – activities such as boating, fishing, swimming and bird watching. The maps show that areas of high contamination were also the areas that provided the largest amount of services to people, meaning that the places that people value the most are also most at risk.

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Often restoration efforts focus on one key stressor at a time. A principal goal of the effort was to help lawmakers and natural resource managers better plan Great Lakes-area investments, such as those under the Great Lakes Restoration Initiative, a federal effort that is funding hundreds of projects at sites where ecosystem stress is very high. The 2009 initiative is the largest investment in the Great Lakes in two decades. Eleven federal agencies developed an action plan to implement the initiative through 2014.

Technically, the maps are known as high-resolution spatial analysis. The maps offer details as small as just a half mile long and can be found at [www.greatlakesmapping.org](http://www.greatlakesmapping.org).

## **International Market for Scrap Commodities is Booming, Steel Recycling Rate Increases**

**-- Craig D. Brooks, Executive Director**

**U**.S. scrap commodity exports grew from 45.3 million metric tons in 2010 to 51.7 million metric tons in 2011, according to a report by the Institute of Scrap Recycling (ISRI).

The Washington, D.C.-based ISRI represents 1,700 member companies that process, broker and consume scrap metals, paper, glass electronics, textiles, tires and rubber materials.

The value of scrap exports expanded from \$29.6 billion in 2010 to \$39.2 billion in 2011. In 2011, more than 135 million metric tons of scrap materials, valued at \$100 billion, were recycled into specification-grade commodities and feedstock materials that were used in countries around the world.

The scrap materials covered in the report include metal, paper, plastic, glass, textiles, rubber and electronics. ISRI also said that the scrap recycling industry directly employed 138,000 people in 2011.

According to the report, as society increasingly focuses on the need to protect our natural resources and reduce greenhouse gas emissions, the scrap industry is recognized as one of the world's first green industries while serving as an economic leader, job creator, major exporter and environmental steward.

ISRI says that major international markets for recycled scrap materials from the United States include China (\$11.5 billion), Canada (\$3.7 billion), Turkey (\$2.4 billion), South Korea (\$2.1 billion) and Taiwan (\$1.9 billion).

Among the scrap materials most in demand is ferrous scrap, an important raw material in the production of new steel and cast iron products and among the most recycled products around the world.

The report describes rapid growth in U.S. exports of ferrous scrap to China (31.5 percent), Turkey (29.2 percent), Taiwan (25.6 percent) and India (23.6 percent) between 2010 and 2011.

Meanwhile, U.S. exports of aluminum scrap grew from 1.5 million tons in 2007 to 2.1 million tons in 2011. Americans recycled 65.1 percent of aluminum cans or a total of 61 billion cans in 2011, an increase of seven percent from the previous year.

According to the Steel Recycling Institute (SRI), the recycling rate for steel increased to 92 percent in 2011, up from the previous year when 88 percent of steel produced was recycled. Steelmaking furnaces used nearly 10 million more net tons of steel scrap from 2010 to 2011, bringing the total amount recycled to an all-time high of more than 85 million tons.

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### **Scrap commodity exports in the United States showed consistent growth in recent years**

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Steel, North America's most recycled material, beats the recycling rate each year for paper, aluminum, plastic and glass combined, according to SRI. For the past two decades, steel's recycling rates have been generally increasing. In 2009, the steel recycling rate peaked at 103 percent, an unusually high figure that the institute attributed to poor economic conditions that depressed steel production in the United States. That year, 65.7 million tons of scrap steel were recycled, while only 63.6 million tons of new steel were produced.

The recycling rate for steel packaging also reached an all-time high of 70.8 percent in 2011, according to SRI. Meanwhile, the rate for automobile recycling continued a slight decline to reach 94.5 percent in 2011, after spending 10 years above 100 percent, as there were more cars coming off the road than new ones entering the U.S. vehicle fleet.

Appliances maintained a seven-year recycling rate of 90 percent, while rates of recycling structural steel and reinforcement steel remained flat.

The "ISRI Scrap Yearbook 2012", is available at: <http://op.bna.com/env.nsf/r?Open=aada-92xrq3>, and the SRI report is available at: <http://op.bna.com/env.nsf/r?Open=avio-927n2u>.

# ON THE HORIZON...

A LOOK AT UPCOMING EVENTS

✓ **Monday, February 11, 2013, 12 noon, Room G-50, K. Leroy Irvis Building, Capitol complex, Harrisburg, PA – Environmental Issues Forum.**

The February 2013 forum will feature a presentation by a new business partnership of two Pennsylvania companies who have begun a new venture to collect and recycle plastic well pad liners from Marcellus shale gas drilling sites. The guest speakers - David La Fiura, vice-president of Ultra-Poly Corporation, Portland, PA; and Scott Fought, vice-president of Operations of WellSpring Environmental Services, Orwigsburg, PA - will describe the opportunities presented by the partnership, the economic and environmental impact of the process, and future plans.

The partnership was facilitated by the PA Recycling Markets Center, Inc. (RMC). Both companies are members of the RMC's Center of Excellence, a network of recycled materials processors and end users of recycled materials.

✓ **Monday, April 8, 2013, 12 noon, Meeting room to be determined, Capitol complex, Harrisburg, PA – Environmental Issues Forum.**

At the April 2013 forum, the PA American Water Company of Hershey, PA, Rentricity, Inc. of New York, and the Westmoreland (PA) County Municipal Authority will make a presentation on a new technology that has been implemented at two energy recovery demonstration projects in western Pennsylvania. The turbine generator system installed at the sites by Rentricity, an in-pipe hydro-renewable energy recovery company, captures the hydrokinetic energy created when water flows through pipes from the water sources to the treatment plants, reducing electricity demand and cutting down on greenhouse gas emissions.

Please e-mail Geoff MacLaughlin in the committee office at [gmaclaughlin@jcc.legis.state.pa.us](mailto:gmaclaughlin@jcc.legis.state.pa.us) or call Geoff at 717-787-7570 if you plan to attend either or both of the Environmental Issues Forums.

## Don't forget to Visit Our Website

Learn More at  
<http://jcc.legis.state.pa.us>

To learn more about the Joint Legislative Air and Water Pollution Control and Conservation Committee, simply pay a visit to our website.

Website visitors will find information such as the Environmental Issues Forums schedule; the *Environmental Synopsis* monthly newsletter; committee members; current events; committee reports; staff contact information; committee history and mission; and links to other helpful sites.

The website address is <http://jcc.legis.state.pa.us>. Stop by the website often to keep up with committee information and events.



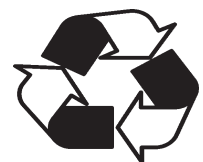
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In terms of the progress being made in the U.S., Pennsylvania achieves high marks in the latest ABACCUS report. According to ABACCUS, Pennsylvania continues to make progress in both residential market offerings and commercial and industrial (C & I) markets. While Texas has been the competitive residential electricity market leader for six consecutive years (including 2012), Pennsylvania, in the words of the report, is one of nine states that "...have achieved significant levels of market activity and switching in the residential sector."

Pennsylvania ranks third nationwide in terms of its score and ranking in providing electricity choices for residential customers. Only Texas and Alberta, Canada outrank Pennsylvania. Pennsylvania was also third in 2011 and improved by two ranking points in 2012.

The state received an "outlook positive" assessment from ABACCUS in regard to the number of retail energy suppliers for residential electricity. As a matter of fact, Pennsylvania leads the nation in the number of retail suppliers making offers to residential customers with 47 such suppliers – one more than New York and three more than Texas. Pennsylvania ranks third in the number of different products available to residential customers with 59, behind only Texas (264) and New York (88).

The report also ranks states in regard to their levels of residential customer switching. In that category, Pennsylvania ranks fifth at 31.5 percent.

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**To learn more about electricity choices in Pennsylvania,  
visit the Pennsylvania Public Utility Commission website**

[www.papowerswitch.com](http://www.papowerswitch.com)

**And to view the ABACCUS 2012 report, visit**  
[www.competecoalition.com/files/ABACCUS-2012.pdf](http://www.competecoalition.com/files/ABACCUS-2012.pdf)

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In the C & I market, the report states that a number of other states – Pennsylvania included – have closed the gap on Texas, which again is the market leader for the sixth consecutive year. The report cites Pennsylvania for having a strong C & I score and for having achieved significant levels of switching.

The report ranks Pennsylvania fourth in the nation and gives the state a "good" assessment. The commonwealth ranked the same in 2011 with the same assessment. Only Texas achieved an assessment ranking of "excellent". The report also gives Pennsylvania an "outlook positive" assessment in the C & I market for the future.

Regarding net switching and customer choice rates for C & I customers, Pennsylvania ranks third in the nation at 95 percent for large customers and sixth in the country for medium size customers at 73.3 percent. The report attributes high rankings generally to large numbers of retail energy suppliers, sophistication of large customers and customized contract offerings.

Electricity customers interested in learning their options about switching may visit the Pennsylvania PUC's website dedicated to electricity choice: [www.papowerswitch.com](http://www.papowerswitch.com). It is a good primer on how to navigate the electricity market and suppliers that are out there, and offers good tips on things to look for and avoid. Take a few moments to check it out and see what your choices are.

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