



Statement of

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on behalf of the

National Electrical Manufacturers Association

and the

Industrial Energy Efficiency Coalition

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Committee on Energy & Commerce

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### Statement Summary

1. Energy efficiency is the cheapest, cleanest alternative fuel. It drives competition and industrial success.
2. Proven, commercially available energy efficiency technologies are already having an impact, particularly in the highly energy-intensive industrial sectors.
3. Manufacturing executives understand of the importance of energy efficiency, but there are impediments to its use.
  - Companies base their energy efficiency investment decisions primarily on:
    - cost-benefit analyses (59%), and
    - the price of energy (58%).
    - Regulatory compliance is a distant third consideration (27%)
4. The gap between awareness of the need and taking action has three main causes:
  - Lack of a clear business case for investment (42%)
  - Inadequate funds or financing (28%)
  - Lack of information on efficiency options (27%)
5. There is a need for further education on available technologies, their return on investment, and access to funding or financing to enable investments.
6. Both industry and government have a role.
  - Industry must continue to educate on available technologies, provide reliable costs benefit analyses and provide financing.
  - Government can -
    - provide visibility
    - encourage energy efficiency investment through tax policy and other incentives
    - support the basic science and energy research
    - establish electric grid investment expensing policies and incentives to enable deployment of more efficient and reliability enhancing technologies

Chairman Whitfield, Ranking Member Rush, I would like to thank you and the members of the subcommittee for inviting me to testify on the private sector's successes and opportunities for energy efficient technologies in the industrial sector.

I am Kevin Kosisko, Vice President of Services for ABB North America. In addition to directing lifecycle services for products and systems, I oversee consulting services for asset management, process safety and industrial energy efficiency, as well as maintenance operations for ABB in the U.S., Canada and Mexico.

By way of background, ABB is a Fortune 500 producer of power and automation products and services for utilities, industry and government. With advanced global research and design and local manufacturing, we employ 147,000 people in over 100 countries. We work to provide energy efficient solutions to meet our utility and industrial customers' needs today and for the future.

I am honored to be here representing the National Electrical Manufacturers Association (NEMA) and the Industrial Energy Efficiency Coalition (IEEC).

NEMA is the trade association of electrical equipment and medical imaging manufacturers. Its member companies produce the full range of electric products from power transmission and distribution equipment to lighting systems, factory automation and controls and medical diagnostic imaging systems. Worldwide annual sales of NEMA-scope products exceed \$120 billion.

The Industrial Energy Efficiency Coalition is a coalition of six of the largest global industrial automation and control systems companies. We are the technology providers that manufacturers and others in the industrial sector use to make their processes more energy efficient, reduce costs and increase competitiveness.

Like other members of NEMA and the IEEC, ABB is bullish on America. In fact, the U.S. is ABB's largest growth market. Through organic growth and recent investments, ABB's U.S. employment has increased from under 10,000 in 2009 to nearly 20,000 today. We are leaders in

grid and industrial efficiency, as well as energy application research and development. We offer a diverse portfolio of equipment, software and services to support utilities, infrastructure and industrial automation.

### Energy Efficiency is Driving America's Future

At ABB we recognize that energy efficiency is the cheapest, cleanest alternative fuel. Conservation has long been touted as win-win, yielding benefits in the form of both lower costs and reduced environmental impact. But those benefits are just the beginning. Reliability is critical to business success, and conservation and reliability are frequently linked.

As reported in research by my panel colleagues at the American Council for an Energy-Efficient Economy (ACEEE) regarding energy efficiency improvements, "we typically see non-energy savings benefits being three to five times the value of energy savings."

The good news is that there are myriad technologies—proven and commercially available—which are already having a significant impact. The following are examples of projects that have led to industrial energy efficiency improvements and cost savings.

### Examples of Industry Investments in Energy Efficiency

1. Mr. Chairman, you probably know of Arkema, a world-class producer of industrial chemicals with global processing facilities. Their Calvert City, Kentucky processing plant recognized the need to improve its boiler operations and lower its energy use. Arkema sought our help in conducting an assessment to diagnose their system inefficiencies. The resulting sustainable improvements ABB implemented on four industrial boilers have lowered the facility's energy costs by \$300,000 per year.
2. A major pulp and paper mill in South Carolina needed to upgrade its manufacturing. Their decision to install quality and distributed control systems and to replace the

steambox on a corrugated cardboard processing machine resulted in the company's lowering its steam consumption by 40 percent and lowering its energy costs by \$672,000 per year. The success of that effort led the company to recently invest in a new \$75 million biomass/cogeneration boiler which will produce 16 MW when it becomes operational in the fourth quarter of 2013.

3. A cold food storage customer was looking to increase energy efficiency of their refrigerated warehouses. After assessing their needs, we installed variable speed drives to their compressors and fans. The result was 35 percent energy cost savings and more precise control over the company's ability to cool or thaw products, enhancing their product quality. The investment payback, as is typical for industrial drives, was just six months.
  
4. The Dow Chemical Company has made energy efficiency investments that have contributed to total cost savings of well over \$9 billion in the past decade. As Dow's Vice President of Energy and Climate Change notes, "Energy efficiency is a gift that keeps on giving." In addition to saving energy and lowering fuel costs, Dow reports a variety of benefits from its investments including:
  - lower plant downtime and longer maintenance cycles
  - improved productivity
  - better product quality
  - compliance with building and environmental codes
  - improved employee health and safety; and
  - benefits around research and innovation

5. New sensors, processes and controls are remaking the energy-intensive data center industry. Advanced technology helps data centers actively monitor their energy use and automatically respond to potential increased charges. By reducing load to avoid establishing a new peak, shifting load to other locations or complying with demand-response requests, we save both energy and money. These same control systems allow operators to monitor and manage asset health to improve center performance and reduce maintenance and replacement costs.

And this technology is not limited to data centers. Similar distributed control and energy management systems can be applied in manufacturing, mining, utilities and other industries, allowing them to capture energy savings and enhance operations.

The list goes on. But industry is not alone in benefitting from current technology.

- The Southeastern Pennsylvania Transportation Authority (SEPTA), the nation's sixth largest public transit organization, is deploying a software optimization system that will allow SEPTA to recycle the energy created from the regenerative braking of trains and trolleys at a high use substation in Philadelphia. This innovative demonstration of waste energy will in turn improve power quality, produce energy savings and generate revenues for the transit authority.
- The Beloit Water Pollution Control Facility in Wisconsin was worried about the energy drain from aeration blowers at its waste water treatment plant. Their decision to upgrade operations through installation of a variable speed drive has lowered energy use by 1 million kilowatt hours a year – a reduction of more than 30 percent, saving the city utility \$75,000 a year.

- The University of Illinois wanted to reduce the operating costs of its coal-fired power plant. The University's plant operator decided to replace inefficient inlet vanes with a new pump drive system that resulted in energy savings of 25 percent and reduced maintenance costs by \$10,000 per year. This new system provides 98.5% efficiency and full payback on the investment took under a year.
- The ABB Azipod is a unique family of electric propulsion systems that are fixed to the outside of ships to provide both thrust and steering functions. By dual purposing the ships' electric system, we increase its energy efficiency, maneuverability and the space available on board. The Azipod is now system of choice in the cruise industry, has been utilized by the U.S. Coast Guard, and is under review by the U.S. Navy.
- Similarly, our breakthrough Direct Current (DC) electric ship technology is changing marine power. In traditional electrical propulsion vessels, multiple DC connections are made to thrusters and propulsion drives from an alternating current (AC) circuit. This accounts for more than 80 percent of the ship's electrical power consumption. Our Onboard DC Grid represents a step forward in optimized propulsion by distributing power through a single DC circuit to provide significant power savings.
- Technologies to manage and improve our electric grid are well known and widely adopted. Although many identify the smart grid with demand response capabilities, it is much more. Volt/VAr optimization, which uses sensors and controls to narrow the variance in energy flow across transmission and distribution lines, reduces line losses by up to 10 percent solely through automated utility controls – no user engagement is required. In addition to increasing line capacity, Volt/VAr systems improve grid reliability. And with tighter tolerances on nominal voltages, the operation of inductive loads is

enhanced to provide further energy savings and operational enhancements – this time to end users.

Attached to my testimony are more industrial energy efficiency case studies from each member of the IEEC, including Eaton Corporation, GE, Rockwell Automation, Schneider Electric, and Siemens.

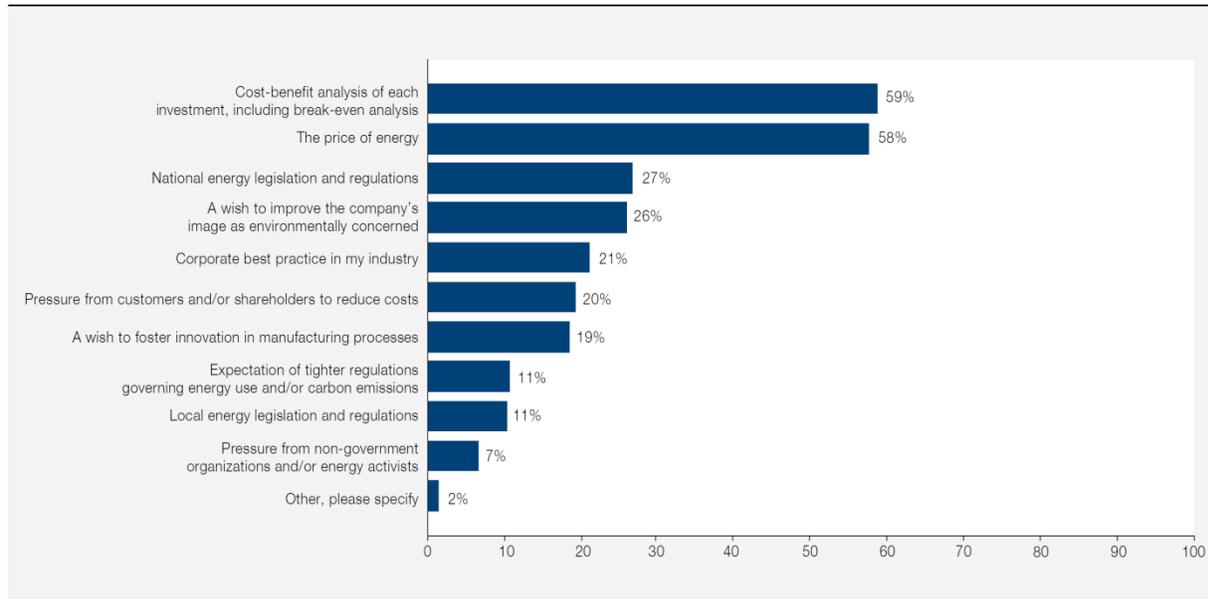
Given all these innovations and their benefits, efficiency upgrades should be widely adopted. But there are challenges to securing the improvements needed to advance our nation's energy efficiency and industrial competitiveness.

### The Challenge to Efficiency

According to a 2011 survey conducted by the Economist Business Intelligence Unit, corporations are well aware of the importance of energy efficiency. Fully 88 percent of corporate executives recognize it as a critical success factor for their business over the next 20 years.

Most survey respondents focused on cost savings and “remaining competitive” as drivers for improving fuel efficiency. They based their efficiency investments on cost-benefit analyses (59 percent) and the price of energy (58 percent) far more than other considerations. Regulatory compliance was a distant third at 27 percent.

Figure 2: What are the main factors that will influence your company's investment in industrial energy efficiency over the next three years, in your view? Select up to three.

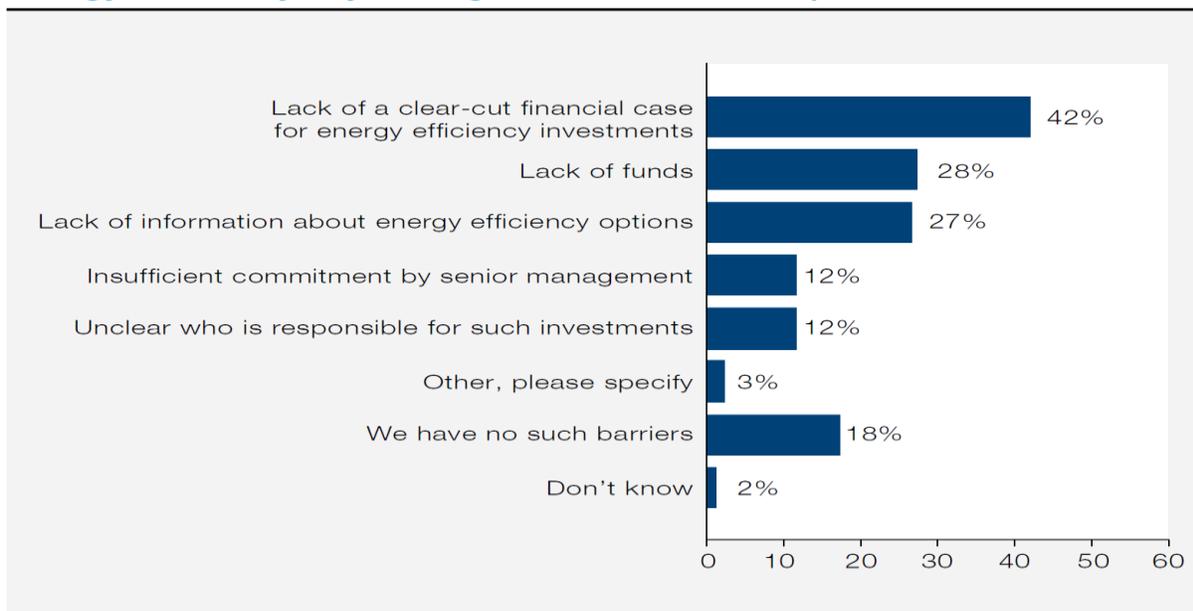


Those decision dynamics may partially explain why, despite its many benefits, industry has not yet embraced energy efficiency on a widespread basis. Fewer than 40 percent of the companies surveyed had invested in efficiency within the past three years. Only half had energy management systems in place, and just over a third had ever conducted a company-wide energy audit.

In the U.S., the situation is even starker with only 21 percent of companies having invested in equipment to improve energy efficiency in the past three years, the majority of those in the highly energy-intensive manufacturing industries such as mining, metals and chemical production and petroleum refining.

This gap between awareness and action is attributed to three primary factors. The largest group of survey respondents (42 percent) cited the lack of a clear business case as reason for inaction. Twenty-eight percent identified inadequate funds or financing as a critical barrier. A lack of adequate information on efficiency options was reported as the third greatest obstacle by 27 percent of surveyed executives.

**Figure 6: What, if any, are the main barriers to investment in industrial energy efficiency in your organization? Select up to two.**



These responses point to a need for further education, benchmarking and identification of available technologies and their application, and to the importance of access to funding or financing to enable investments.

### Motivating Action

Encouraging the efficiency enhancements necessary to advance manufacturing and industrial success will require industry and government to address these gaps. We must supply the missing information and provide the needed funding. We at ABB, at NEMA, and at the IEEC, are striving to do just that.

We work continually to educate manufacturers on available technologies and industry best practices. We train engineers, assessors and finance teams to provide accurate, reliable energy audits and estimates of return on investment. We provide directly, or assist in securing, necessary financing. And we invest in ongoing research and development to continue the innovation of better technologies.

There is also a role for government. Historically for industrial energy efficiency, that effort has centered on reducing consumption in power-intensive industries. While these industries represent a major portion of potential (and realized) energy savings, the public sector has the ability to expand the visibility of conservation opportunities to industrial players large and small.

The federal government has demonstrated leadership in the development of voluntary programs that helped industry benchmark energy use by industrial process or factory type. This visibility and awareness has been a key factor in the reduction of energy use and the overall competitiveness of many of our energy intensive industries. To achieve the next level of efficiency and competitiveness we need to encourage all manufacturing facilities to instill continuous improvement programs focused on energy management. This is similar to what was done with quality in the 1980's. The federal government can play a strong role by encouraging all their manufacturing and supply chain partners to establish these types of continuous improvement programs. They could also provide assistance to the industry through training, education, and regional pilot programs.

Tax policies and other incentives can also encourage investment in energy savings. While the basic efficiency tool of a variable speed drive has a standard pay-back of less than one year, advanced systems that employ networks of sensors, controls and automation to achieve much deeper energy efficiency can benefit from incentives to provide a quicker return on investment.

Government is unique in its ability to support the basic science and energy research that industry then transforms into the technology of tomorrow.

And the federal and state governments have the principal role in setting grid investment expensing policies and utility rate structures to enable—or hinder--the deployment of critical line loss reduction, power quality management and grid reliability technologies like Volt/VAr controls.

In closing, let me reiterate our confidence in the ability of U.S. industry to compete and succeed. America's competitive edge is the high-level of productivity of our workers and the technologies and processes we deploy to provide greater output from fewer resources – including energy. At ABB, at NEMA, and at the IEEC we work daily to support that effort.