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**“Innovation: The Future of Energy”**  
**2008 CEO Innovation Lecture**  
**Silberman College of Business and Rothman Institute of Entrepreneurial Studies**  
**Fairleigh Dickinson University**  
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Introduction:

Yesterday, we were blue and red states.

Now, we have to come together and build a green nation.

We are in the immediate aftermath of a momentous U.S. Presidential election. During the campaign, energy moved to the front of our national conversation.

Both major party candidates made energy a key issue. Both emphasized the importance of new approaches to energy policy.

Now comes the hard part of translating the desire for change into the bold strategy and actions that make a profound difference for people across our nation and the planet.

Much will depend on whether we seize this moment for fundamental, far-reaching changes in the energy area...to achieve vital goals such as U.S. energy independence, get the economy growing again, and above all, meet the challenge of climate change.

Energy can be a big part of the solution, but we need to get it right by truly encouraging innovation, not simply tinkering around the edges.

This will involve putting in place a new policy and business framework that accelerates investment, innovation and job creation to build a sustainable future with green energy and green jobs.

This will also involve new, stronger partnerships...across party lines, across states and regions, across many different sectors of society.

Not least, it will involve new thinking.

We are very fortunate to have in New Jersey a world-class academic and R&D complex that fosters innovation and attracts the best and brightest to our state.

I would like to thank Fairleigh Dickinson University, the Silberman College of Business and the Rothman Institute of Entrepreneurial Studies for providing this forum to discuss innovation in energy.

Some background about PSEG:

An electric and gas utility as a force for innovation may seem surprising at first glance, perhaps even startling to some of you.

Our customers care most about reliability, 365/24/7.

Part of our success is being invisible....a measure of the extent to which some of life's necessities are taken for granted.

No one wakes up in the morning thinking, "I want to use some kilowatts of electricity." We do not expect our customers to think about us when they toast bread in the morning or turn on the TV at night to watch their favorite show.

Yet in fact, innovation is woven into our company's history. This has been true since the days when Thomas Edison's electric bulb brought light where there was darkness to make life better.

By the way, Thomas Edison was keenly interested in our company's development and attended the 1926 dedication of our Kearny generating station.

Our company is proud to be associated with many industry innovations over the years.

- Eighty years ago, we helped establish one of the nation's first regional power grids, PJM. Today, PJM administers the wholesale electricity market and coordinates the flow of power to ensure reliability over a large multi-state region containing about a quarter of the U.S. population.

- Other innovations, like better safety gloves, might seem small but have had a huge impact – They have improved reliability and saved many lives.
- More recently, on the spectacular side, we developed the industry standard for performing maintenance on high voltage lines while keeping the power on. We have specially trained crews who do this work with the aid of helicopters. You may have seen a recent TV show about their work. It is not for the faint of heart.

Innovations have come in many different shapes and sizes over the course of our 105-year history. But behind each innovation is a common desire: to continually improve and achieve at a higher level to the benefit of our stakeholders and the larger society.

Our business strategy emphasizes the importance of operational excellence as the foundation for financial strength, making it possible for us to keep our promises and keep growing through disciplined investment. Behind the strategy is the ongoing commitment and hard work of our 10,000 employees, and I cannot say enough about them.

We intend to stick with these fundamentals because they work, time and again, in producing strong results...across many key parameters:

- Safety: We regularly score in the industry's top ten percent for safety.
- Reliability: In 3 of the last 4 years, including this year, we were recognized as the nation's most reliable electric utility.
- Improved operations, including record electricity production.
- Financial strength, enabling us to continue rewarding our shareholders.
- We have paid dividends annually for more than 100 consecutive years.

Staying strong and reliable provides us with a platform for stepping up to new challenges....and step up we must.

Climate Change:

Climate change is the preeminent issue with the power to transform the future, not only for our company and industry, but also society.

Climate change is real.

While all of us have been watching an economic meltdown unfold in recent months, another large meltdown was occurring...the meltdown of polar ice over an area larger than the state of Alaska into which about 100 New Jerseys could fit.

There is a scientific consensus that to get on a sustainable course will require reducing greenhouse gases in the range of 80 percent by the year 2050.

Electricity generation and transportation are the two largest sources of greenhouse gas emissions.

- Electricity generation is responsible for about a third of carbon dioxide emissions across our country.
- Transportation is responsible for about 28 percent.

To bring down greenhouse gases substantially will require at least two heroic changes:

- First, to de-carbonize electricity.
- Second, as we continue to clean up energy, switch to electricity as the fuel for transportation.

Adapting to a carbon-constrained world will not be easy.

But if we approach this challenge not with one tool alone, but with a comprehensive array of tools, then it becomes feasible to achieve very aggressive carbon reduction targets.

These tools include:

- Energy efficiency improvements that promote conservation and thus lower bills;
- Renewable energy sources;

- Nuclear;
- Advanced coal generation – ultimately finding ways to store carbon; and
- Plug-in hybrid electric vehicles – and ultimately, all-electric vehicles.

Looking at how these tools could be rolled out over time...

Conservation is first. Many energy efficiency improvements are possible right now that are proven energy savers and can lower bills.

The best power plant is one that is not needed because energy is being saved.

There are a couple of keys ways to promote conservation:

- One is with rules for tougher building codes and tougher appliance standards;
- The second is with investments in more efficient lighting, in weatherized windows and doors, and improved heating and cooling systems.

Renewables such as solar, wind, biomass and geothermal energy are another key priority.

Renewables mean energy that is not only carbon free, but pollution free: No nitrogen oxide, no sulfur dioxide, no mercury, period!

Renewables are expanding rapidly from a small base and can be expected to have a larger impact over the intermediate term and beyond. They must.

Nuclear has advantages that are too important to overlook as a proven source of clean energy. Nuclear power generation produces no greenhouse gas emissions. Nuclear is the source of 20 percent of the electricity our nation uses each year and about half of the electricity in NJ.

New clean fossil fuel generation with carbon storage is in an early stage of development, but has the potential to be a critically important technology. Coal is the fuel behind about half of the nation's electricity today.

The electrification of transportation is vital if the U.S. is to kick our gasoline habit and stabilize greenhouse gases at sustainable levels.

If we did not fill up our cars at the gas station, but plugged them into a wall outlet, we could cut gasoline consumption by about 70 percent.

Imagine what this could mean in terms of better ensuring our nation's security, improving the balance of payments, reducing fuel costs and cleaning the air.

Electrifying transportation is one of the best opportunities we have to revolutionize life for the better.

It will require a much smarter grid, which is why advanced metering technologies need to be the wave of the future.

People will need to be encouraged to plug in their cars at times when electricity use is low. Ultimately, a smart grid may allow people to sell the power from their car batteries back to the grid as an alternative to firing up more power plants on hot summer days.

We have done some advanced metering technology pilots, with promising results in terms of changing consumer behavior. But we have a long road to travel.

Let's turn from the long-term future to what our company is doing in the here and now to green it.

We have a three-fold strategy to address New Jersey's climate and energy challenges.

In a nutshell, the three prongs of our green strategy are energy efficiency, renewables and nuclear.

First, energy efficiency:

New Jersey has 3.7 million buildings. Almost all could benefit from energy-efficiency improvements that can reduce greenhouse gases and help lower bills.

Which leads to the question, who will invest in these improvements?

To date, individuals and businesses haven't done this on anything like the scale needed.

Enter your public utility – a company like ours with 10,000 dedicated employees, trusted relationships with millions of customers and a history of deploying capital to achieve societal benefits.

Energy utilities like PSEG are in a unique position to help with investments providing universal access to energy efficiency and renewables, as we have long provided for electricity and gas.

We have proposed programs to our regulators to allow us to invest in energy-saving equipment on behalf of our customers. We hope to be doing this work soon, starting in our cities. It can generate a lot of jobs.

We are active in the renewable energy area, too.

We have a \$100 million solar program to expedite solar installations with financing that makes solar more affordable. It enables participating customers to repay their loans with credits from the energy produced by their solar panels – ideally, requiring no cash for repayment.

Our solar program has attracted strong interest, toward an initial goal of 30 megawatts of solar.

Also, we are excited to have won a bid to develop NJ's first large offshore wind farm. As planned, this project would be built 16 to 20 miles out in the ocean and barely visible from the South Jersey coast.

We are investing in new technologies that could be an important enhancement of renewable energy sources.

The wind doesn't always blow, but electricity is always needed. That is why we are exploring technologies like compressed-air storage. This involves storing wind energy for release during peak times of electricity use. It can be a game changer as our nation looks to harness more wind power.

The third part of our strategy is new nuclear. We are exploring it but it is a much longer-term proposition because of issues of cost and complexity.

In summary, we have a long way to go, but the clean energy future can happen. Some states will be leaders. They will gain first-mover advantage. This is an important area for New Jersey to be a leader for the sake of our economy and environment.

Our state government recognizes this. New Jersey has some of the most aggressive goals of any state for reducing greenhouse gases.

But we need to move from setting goals to taking action:

The clean energy transformation will not happen without a major mobilization of resources, society-wide.

What would really help energy innovation take off?

A prime ingredient is a supportive policy and business framework to encourage more investment in energy efficiency, wind, solar and nuclear rather than oil and gas.

- Price signals are critically important. Indeed, putting a price on carbon is the single most important thing needed for an energy innovation takeoff.
- Preferably, this would be accomplished with a mechanism called cap and trade, by which you set limits on carbon that get lower over time, and you charge polluters for the carbon they emit.

Second, a new regulatory compact is needed to encourage the flow of dollars into green-energy investments. The current rules do not encourage investments in energy-saving equipment, but in a number of ways actually discourage them. This needs to change.

Also, massive investments will be needed to de-carbonize energy generation and switch to electricity as the fuel for transportation...not to mention the large sums that must continue to be invested to ensure reliability.

A new regulatory compact can establish a more predictable environment for energy investments in our state, especially in a time of financial uncertainty.

This can be done in ways that fully protect consumers while enabling utilities to raise and invest capital with greater business certainty to the benefit of everyone.

Third, we need to invest not only to rebuild our physical infrastructure, but to develop our human infrastructure, the ultimate source of innovation.

At the national level, this will require greater investment in areas such as education, science and technology, and health care.

In our industry, it will require expanding the pool of skilled workers able to do green energy jobs and traditional energy jobs.

Workforce development is one of our most important priorities.

We have partnerships with several NJ community colleges that have strengthened our pipeline of diverse, entry-level employees.

We are building on efforts like this, expanding them to the high school level and introducing students to courses in green energy.

Last week we launched a Green Energy Academy at Bloomfield Tech...a partnership with the Essex County Technical and Vocational School System.

This is only the beginning. Nationwide, there is the potential for millions of environmentally friendly green jobs over the next three decades, as described in a recent report by the U.S. Conference of Mayors. This could be one of the fastest, if not the fastest growing segments of the economy for a long time.

We will need many more people – scientists, engineers, people in the skilled trades, you name it.

We see an exciting future for our company – continuing to grow while providing universal access for our customers to the benefits of safe, reliable, economic and clean energy.

That said, I want to stress the importance of partnerships.

No one can solve climate change on their own. All of us need to play a part and work more closely together -- educational institutions, government, labor, businesses, communities and individuals.

All of us need to think about new ways and new things we can do to save energy. Even small steps add up.

And we need to stick with it. We cannot let up as we did a generation ago after an earlier energy crisis had seemingly passed.

I hope in future years people will look back at our time and say they stuck with it, turned things around, restored confidence and laid the foundations for a new flourishing, sustainable and green economy.

In the final analysis, it is up to us.

Innovation begins with people who are curious about the world around them, who are deeply involved in their chosen field and who are able not only to imagine something new and better, but work with others to make it happen.

Stay curious...stay involved...and together, we can make it happen.

Thank you.