Good morning! I'm going to say a few words about the future of the electrical grid system.

A decade or more ago, a small "e" in front of something showed that it was new and exciting; Email, eCommerce, eHealth, eVoting.

Apple took over the letter "I", and we have iPods, iPads, iTunes, and iPhones.

Somewhere along the line, the word "smart" became the prefix of choice; SmartPhones, SmartCars, Smartcities, even Smart Yogurt!

And now, you will hear the term "SmartGrid."

It is widely used to describe the evolution and transformation that the nation's electrical system is undergoing.

It means employing modern measurement, **communication**, and computational technology to meet future needs.

The North American Electric Power Grid has been described as the "largest, most complex Machine" ever created.

Thomas Edison launched the first commercial power grid, The Pearl Street Station, in lower Manhattan in 1882, serving an initial load of 400 lamps at 82 customers.

The offices of The New York Times, one of Edison's earliest electricity customers, reported lighting provided by Pearl Street was "soft, mellow, grateful to the eye."

Fast forward to the present, and today, power is provided by 9 Federal Power Agencies, like the well known BPA and TVA, nearly 200 Investor Owned Utilities like Puget Sound Energy and Avista, nearly 900 Cooperatives like OPALCO, and over 2000 Public Owned utilities. In all, over three thousand companies delivering 3.8 trillion kWh/yr. to 150 million customers.

And I can say with some confidence that nearly every one of them is currently working on, or will be working on modernizing and upgrading their grid infrastructures in the years to come.

Why? I've had a member tell me "The grid was just fine in 1957, and we should have left it the way it was!"

The simple answer is that the grid needs to be improved for two basic reasons.

First, investments in the nationwide infrastructure haven't been as robust as they should have been from the early 70's until recently. A lot of aging infrastructure needs to be replaced.

Second, the grid needs to change, in response to the rapid adoption of renewable and distributed energy sources, and the shift away from carbon based generation, like coal and oil.

Congress passed the Energy Independence and Security Act of 2007, to move the United States toward greater energy independence and security.

Title 13 of that act describes actions in support of grid modernization. Many states have passed what are called RPS's, or Renewable Portfolio Standards, as well as Greenhouse Gas Reduction goals.

The Electric Utility Industry as a whole is responding. The details are massive and complex.

Studies and reports are being produced, conferences held, plans are being made, and projects are being implemented. You can read about it in publications from the Department of Energy, The National Renewable Energy Labs, the Electric Power Research Institute, BPA, and hundreds of other utilities and professional organizations.

So what do all these reports and plans mean?

I've tried to boil it all down to three concepts:

1) Get more out of the grid infrastructure you currently have. Run it better!
2) Integrate local renewable sources, like solar and wind, ocean and biomass, and storage.
3) Give users new ways to control their energy use.

Getting more out of what you have means being better able to **monitor and control** the generation, transmission, and distribution hardware in our grid.

"Distribution automation" means deploying "smart" devices in the grid, as older ones wear out, and connecting them to a robust **communication** network.

A "self healing grid" becomes one where the detection and restoration of outages becomes quicker, where power can be rerouted around trouble spots more rapidly.

Since Edison's Pearl Street Station, the grid has been characterized by centralized generation and one-way power flow.

The integration of local renewable resources means planning for and making changes necessary to accommodate local distributed generation and two-way power flow.

Solar and wind can lower the carbon footprint, and eventually lower cost, but their variable nature requires some engineering to make them an asset.

The grid in the future will need to manage hundreds to possibly thousands of distributed energy resources, such as solar panels, electric vehicles, and battery systems.

The cost of solar continues to drop, and in some places has reached grid parity, where it is becoming cheaper to add solar than buy more power from the major generators. Utilities leading the way in this area are demonstrating how to do this, and helping to drive standards on how these systems will connect to and **communicate** with the system controlling the grid.

Giving users new ways to control their energy means having better real time information on the cost of power, and the means to make decisions on when to use power wisely.

Think of a more intuitive, easier to employ “time of use” model.

An improved “Demand Response” capability will allow us to avoid and shift power peaks in the future, especially important as more electric vehicles start getting charged at the same time in the evenings.

The grid and devices that use power will **communicate** cooperatively to help the grid run better.

This is just a short preview of the many capabilities an improved grid will provide.

It is an “incremental revolution” that will take a number of years to implement.

There is not a “one size fits all” answer, and each utility will determine their own modernization projects. Its an important effort to secure a cleaner, more efficient energy system for the future. We’re excited about doing our part!

Stay tuned as we provide more information on this effort. And, I thank you for your time!