



Smart Grid Panel

Nebraska Power Association

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Smart Grid



- Concept of the Smart Grid crystallized in the 2003 blackout:
 - Lack of knowledge about system conditions among operators
 - Goal was to make the transmission system more secure by collecting more data faster to provide better status of the system to operators
 - Take many decisions out of operator realm and move to computer controls
- Expanded in the 2007 Energy Independence and Security Act to include:
 - Customer centric features like load management
 - Integration of renewable and traditional distributed generation
 - Distribution system optimization
 - Numerous other considerations to make the system more efficient and avoid additional investment

From the 2007 Energy Independence and Security Act



It is the policy of the United States to support the modernization of the Nation's electricity transmission and distribution system and to achieve each of the following, which together characterize a Smart Grid:

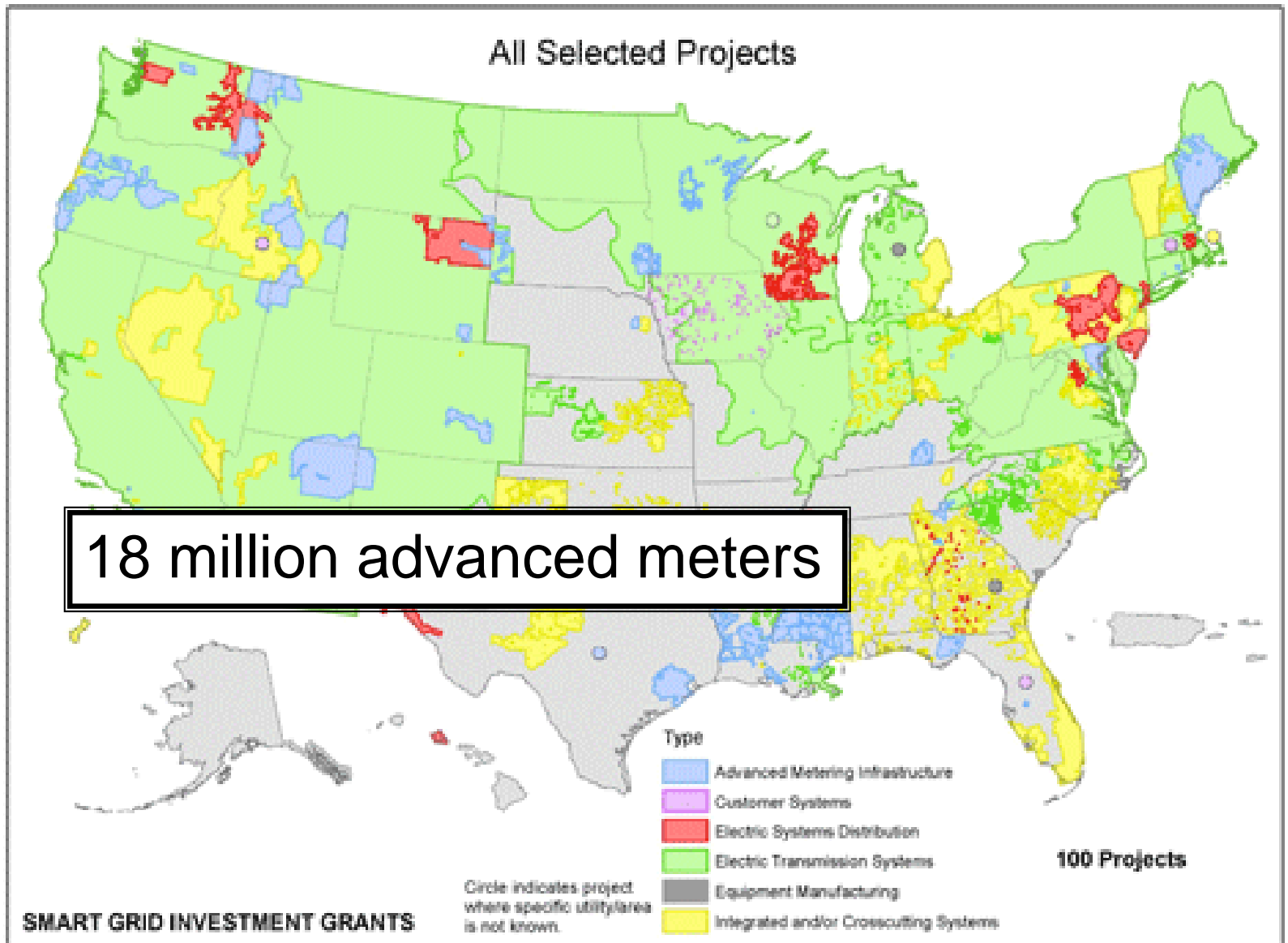
- Increased use of digital information and controls technology
- Dynamic optimization of grid operations and resources
- Deployment and integration of distributed resources, including renewable
- Development and incorporation of demand response, demand-side resources, and energy-efficiency resources
- Deployment and integration 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
- Deployment and integration of advanced electricity storage and peak-shaving technologies
- Provision to consumers of timely information and control options
- Development of standards

Major Steps in the SG Space



- 2007 Energy Independence and Security Act calls out Smart Grid
 - States to assess ability to support smart grid
 - California moves to require smart meters
- Xcel Energy creates Smart City in Boulder, CO
 - Consortium of several players (IBM, Accenture)
 - \$100 million investment
- Major program to assess SynchroPhasors on the transmission system
- Smart Grid Investment Grants
 - \$4.15 Billion
 - \$200 Million to several large utilities
 - Majority of money to Advanced Metering Infrastructure
- Standards being developed with IEEE, NIST, NEMA, etc. EPRI leading effort with DOE.
- Manufacturers getting into the SG space

Investment Grant Results



Some Concerns...



- California consumers blame smart meters for cost increases.
 - Points out the issues of education, timing and move to time varying pricing.
- Boulder costs and lack of progress
 - Underestimate the cost/extent of the effort-Management
 - Over promised and under delivered (Not a good place to be for a service provider!)
- Investment Grants
 - Some held up due to contract issues
 - Slow down at Duke Indiana, Progress Energy, Dominion over benefits
- Consumers' uncertainty
 - About access to lifestyle data/security
 - What is it really going to do for me?
- Cost recovery from regulators not a sure thing

Some momentum...



- GreenTech Media reports (Feb 10, 2010)
 - 70% of utilities see Smart Grid as a key part of business plan
 - 77% list distribution automation as most important aspect
- Standards are progressing
 - Appliances
 - Meters
 - North American SynchroPhasor Initiative
- New technologies are advancing
 - PJM paying \$5 to \$10 per day to University of Delaware for vehicle to grid frequency control per car.
 - iPhone apps tied to Insteon, X10
 - Whirlpool 1 million SG ready dryers by 2011
 - Google and others developing internet based services

So, right now for SG



- Advanced meters and distribution systems are where the majority of money is being funneled.
- Consumer products and appliances are getting better for home area networks.
- Internet providers may move more quickly than utilities to get in to consumer space (Google becomes a power marketer??)
- Ancillary service market is being tested for vehicle to grid.