

The Transition to the Modern Grid

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Some Key Questions

- Where do we want to be?
 - What is the difference between today's grid and tomorrow's?
 - What must we overcome?
 - How do we get there?
- *The Destination*
 - *The Gap*
 - *The Challenges*
 - *The Transition*



The Modern Grid is MORE:

- Reliable
- Secure
- Economic
- Efficient
- Environmentally friendly
- Safe

Running today's digital society through yesterday's grid is like running the Internet through an old telephone switchboard.

Reid Detchon, Energy Future Coalition



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The Modern Grid will:

- Self heal
- Motivate and include the consumer
- Resist attack
- Provide power quality for 21st century needs
- Accommodate all generation and storage options
- Enable markets
- Optimize assets and operate efficiently

More fundamental than cars, airplanes and computers, electric power is the foundation for the grand edifice of the industrial and information ages.

Duncan Watts, Six Degrees: The Science of a Connected Age, 2003



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The Gap

<i>Today</i>	<i>Characteristic</i>	<i>Tomorrow</i>
Protects assets following system faults	<i>Self Heals</i>	Prevents disruptions, minimizes consumer impact
Uninformed consumers, non participative	<i>Motivates and includes the consumer</i>	Informed, involved, active consumers
Vulnerable to terrorist acts and natural disasters	<i>Resists attack</i>	Resilient to attack and mother nature with rapid restoration capability
Focus is on outages vs. PQ issues	<i>Meets PQ needs for the 21st century</i>	PQ a priority with price points



The Gap (cont.)

<i>Today</i>	<i>Characteristic</i>	<i>Tomorrow</i>
Central generation focused, few interconnected DER	<i>Accommodates all generation and storage options</i>	Many smaller DER to complement central stations, “plug and play”
Limited wholesale markets, not well integrated	<i>Enables markets</i>	Mature wholesale markets, well integrated and robust
Little integration with Asset Management processes	<i>Optimizes assets and operates efficiently</i>	Deep integration of grid technologies and more information available



Nature of the Vision

- **National, societal perspective**
- **Long Term, Comprehensive, Integrated**
- **Independently developed by a neutral broker**
- **No single owner – Neither government nor industry can get the job done alone**
- **Depends on the independent actions of a diverse set of stakeholders with diverse agendas**

The payoff to modernizing the electric infrastructure from the resulting economic progress could easily exceed \$1T per year in additional GDP within a decade.

Galvin Electricity Initiative, 2005



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Diverse stakeholders – Diverse Agendas

- Different perspectives
- Different objectives
- Different priorities
- Different timeframes
- Different obstacles to overcome



Other Barriers we must overcome:

- Regulations that are inconsistent with the vision
- Wall Street's short term focus on profits
- Retail prices disconnected from wholesale prices
- Short term views
- Minimal R&D
- NIMBY
- Inadequate consumer education
- No “burning platform”?

Our challenge is to align under a common long term vision and make our short term investment decisions consistent with the “end in mind”



- **Recognize the MGI Vision as the end state**
- **Continue short term investments with the “end in mind”**
 - Invest in technologies that can be applied in the future to support broader and deeper integration
 - Communications and components - “Modern Grid Ready”
- **Consult with the Modern Grid Developers**
 - Stay connected with the latest
 - Work together to overcome barriers
 - Work to change regulations and attitudes
- **Work together to build an integrated transition plan forward**



A Plan for Transition

2007- 2008

Develop consensus for the vision among stakeholders

2007- 2008

Develop integrated transition plan

2008 - 2014

Deploy large scale regional demos of integrated MG systems

2010 - 2020

Create financial incentives for MG investments



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- www.TheModernGrid.org
 - Downloadable documents
 - Forums
 - Meeting announcements
- www.smartgridnews.com
 - Grid modernization columns, articles and case studies
 - Modern Grid BLOG (future)
- info@TheModernGrid.org
 - (304) 599-4273 x101



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