

Integrated Grid



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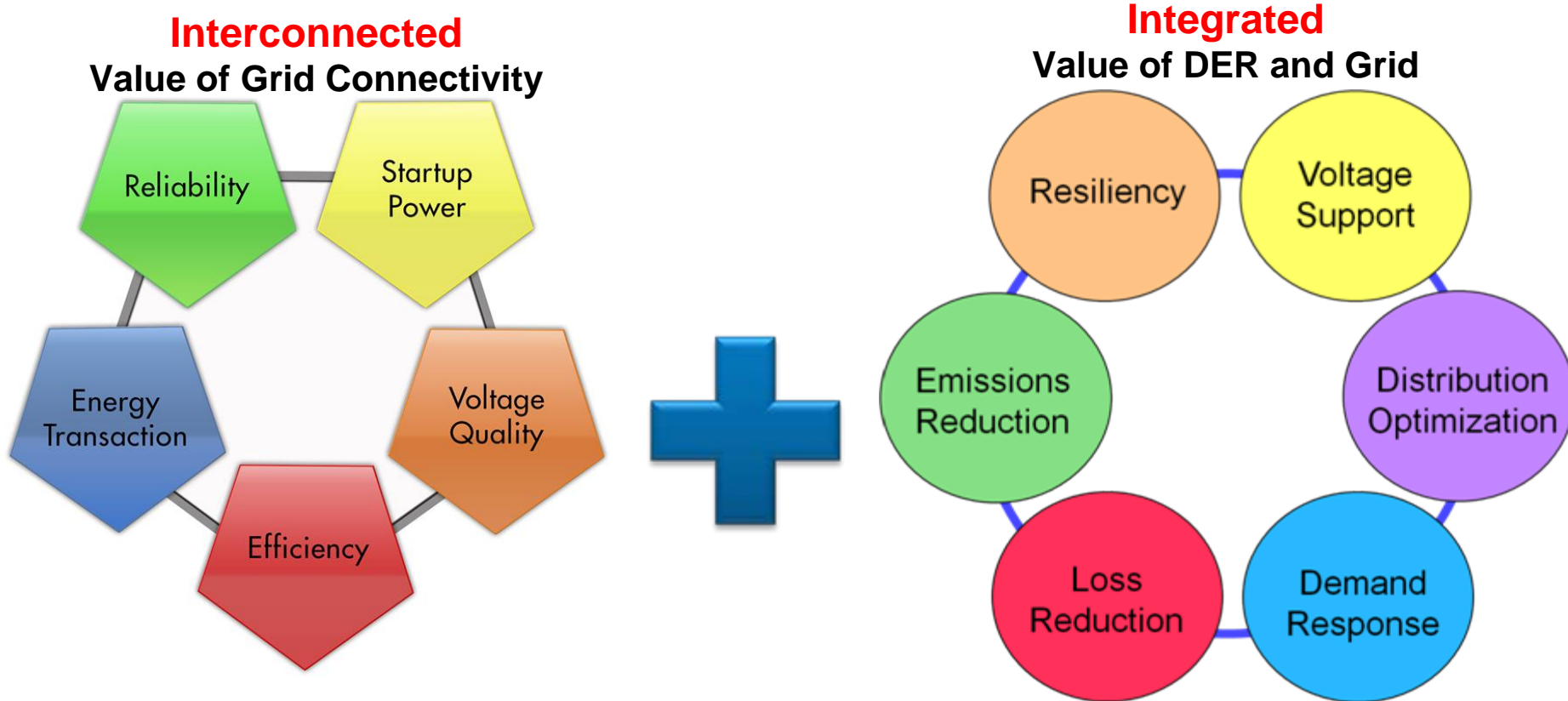
July, 2015

Electric Power Research Institute



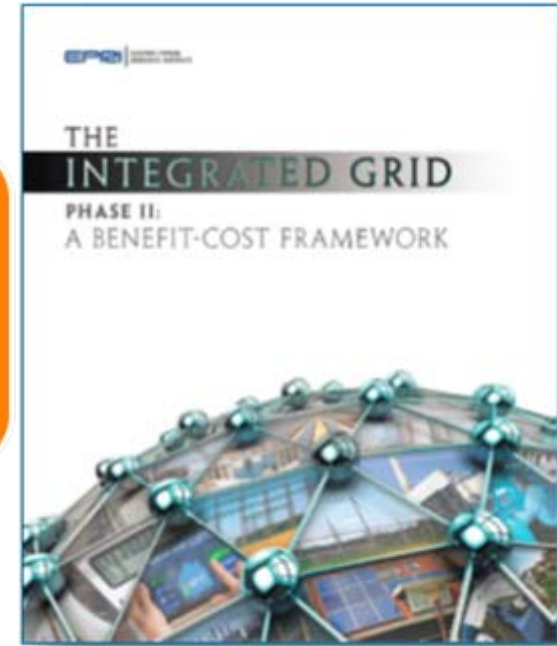
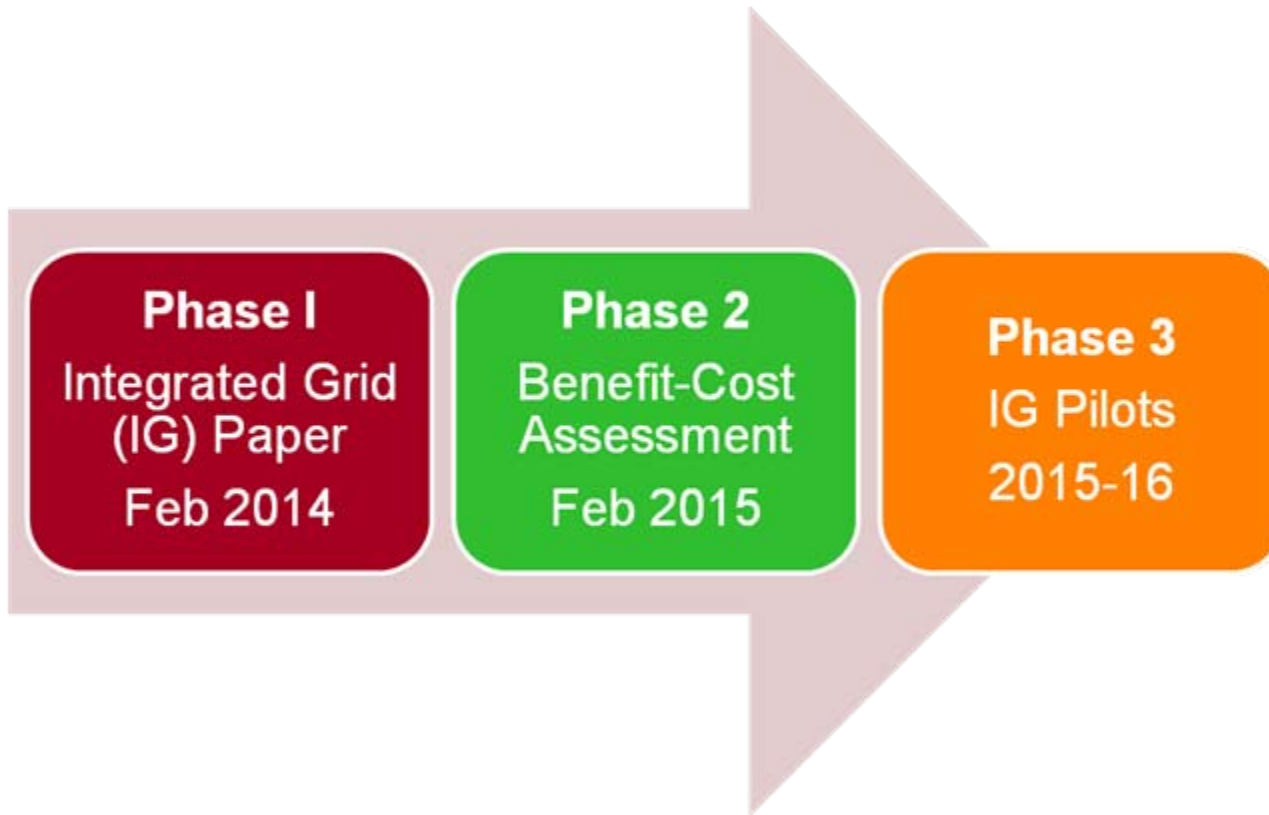
Together...Shaping the Future of Electricity

Interconnected but Not Integrated



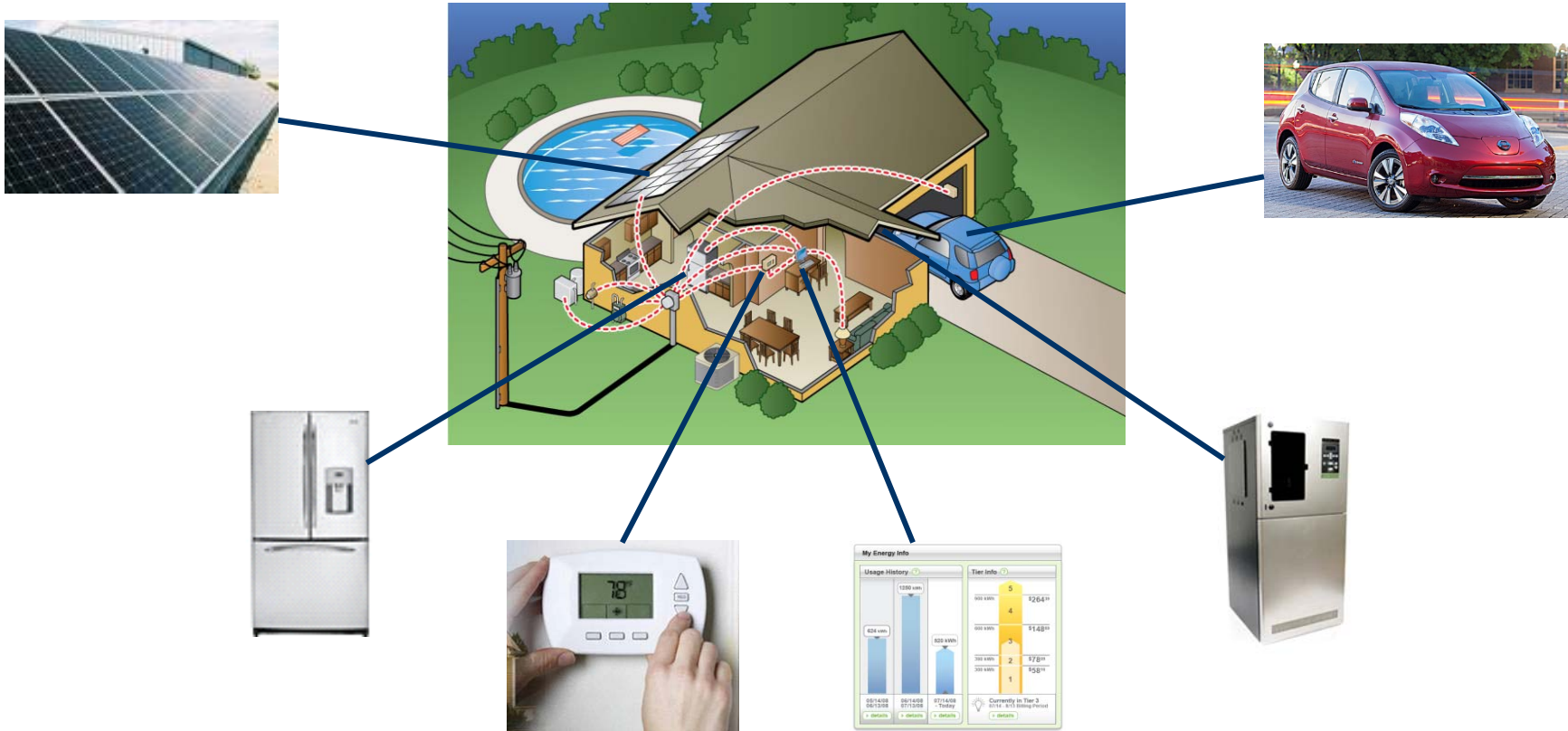
Integration Enables Values of all Resources

Integrated Grid...Timeline



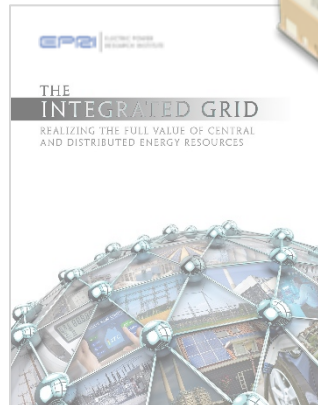
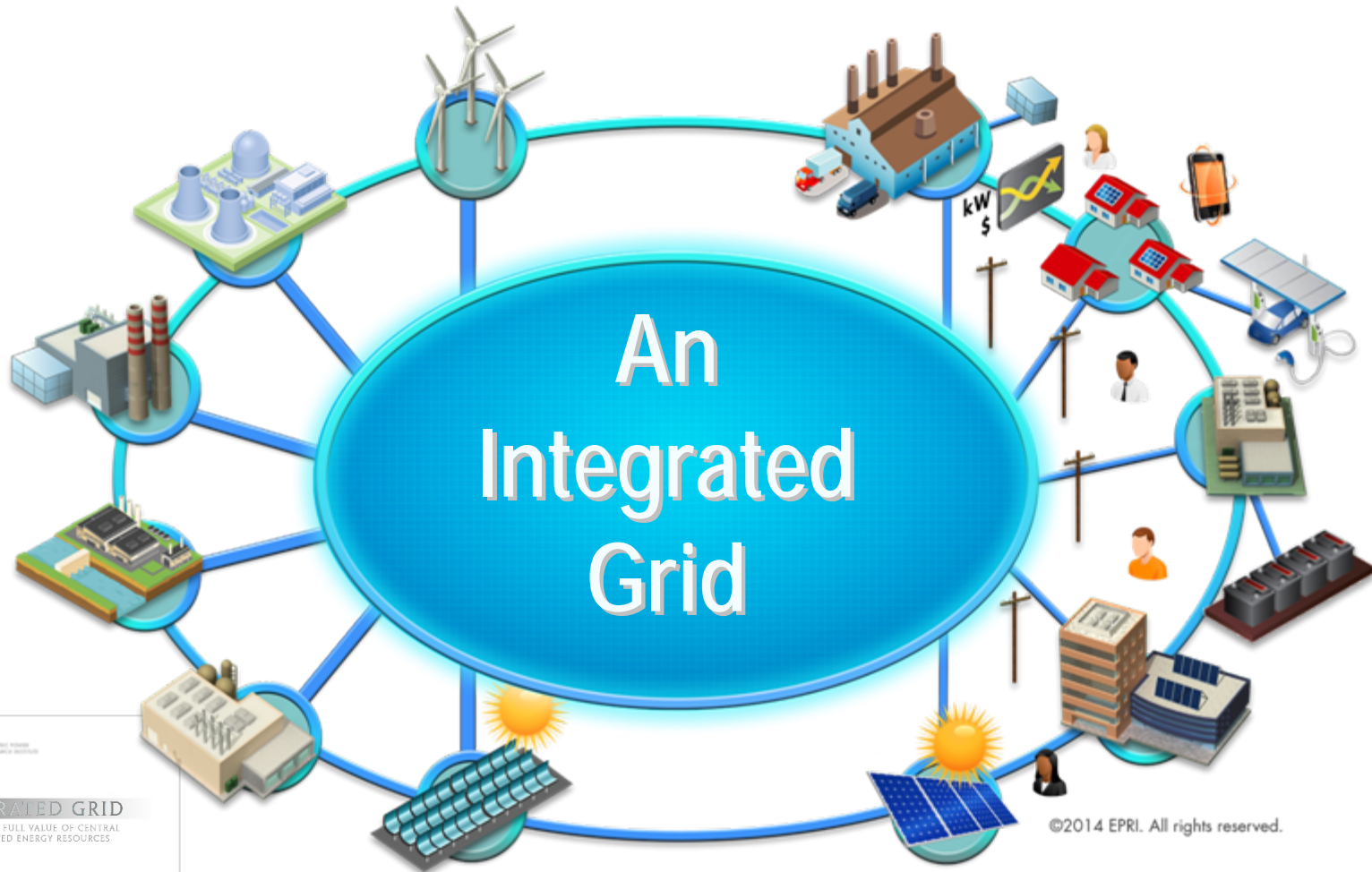
**Extensive Stakeholder Coordination in
All Phases**

The Integrated Grid is About Enabling the Customer



The integrated grid allows **Local Energy Optimization** to become part of **Global Energy Optimization**.

Integrated Approach



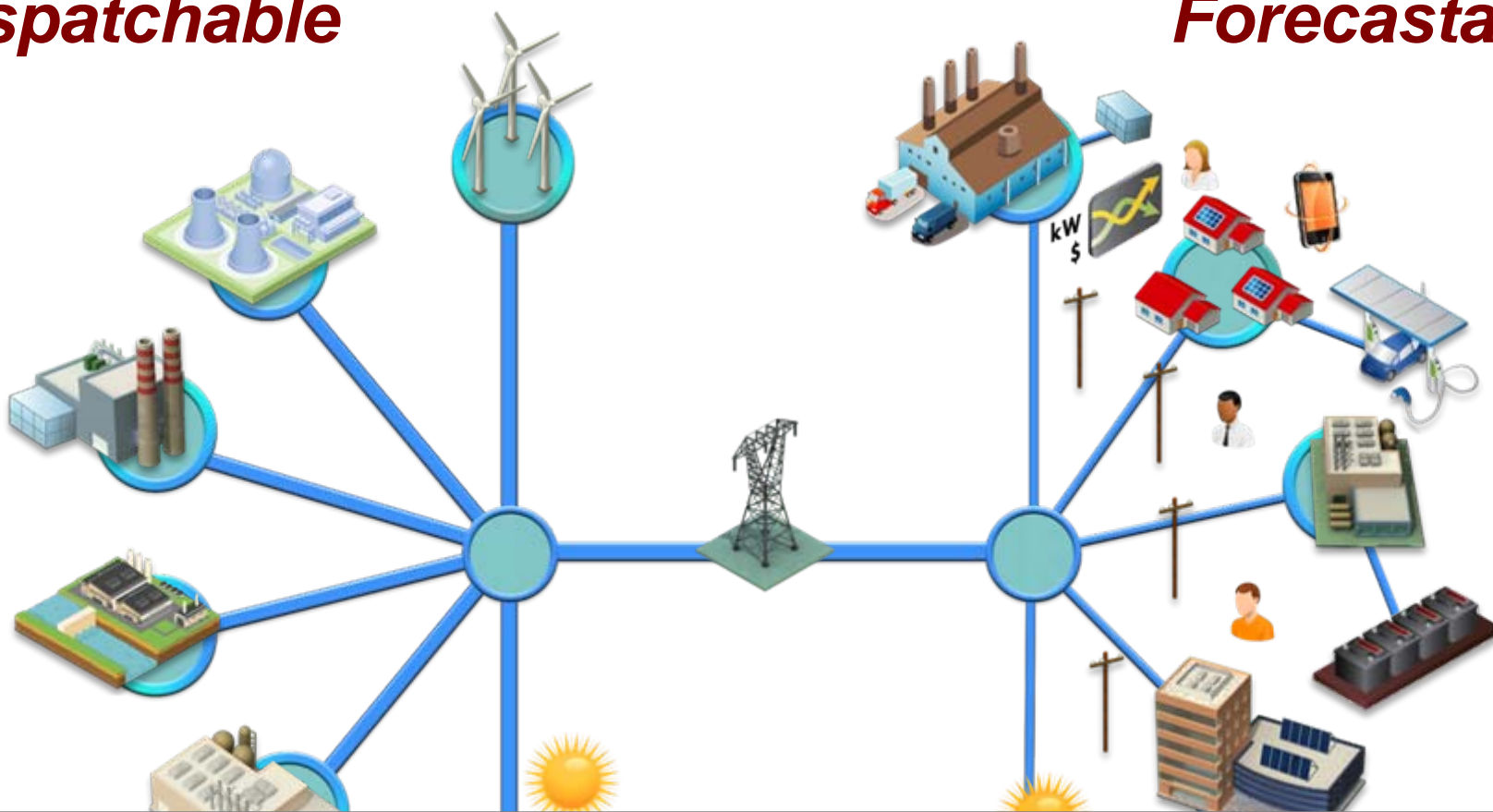
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Consistent, transparent framework for assessing benefits/costs of transitioning to an Integrated Grid.

The Power System

Dispatchable

Forecastable



Base Load
Generation

+

Load Following
Generation

+/-

Bulk Energy
Storage

=

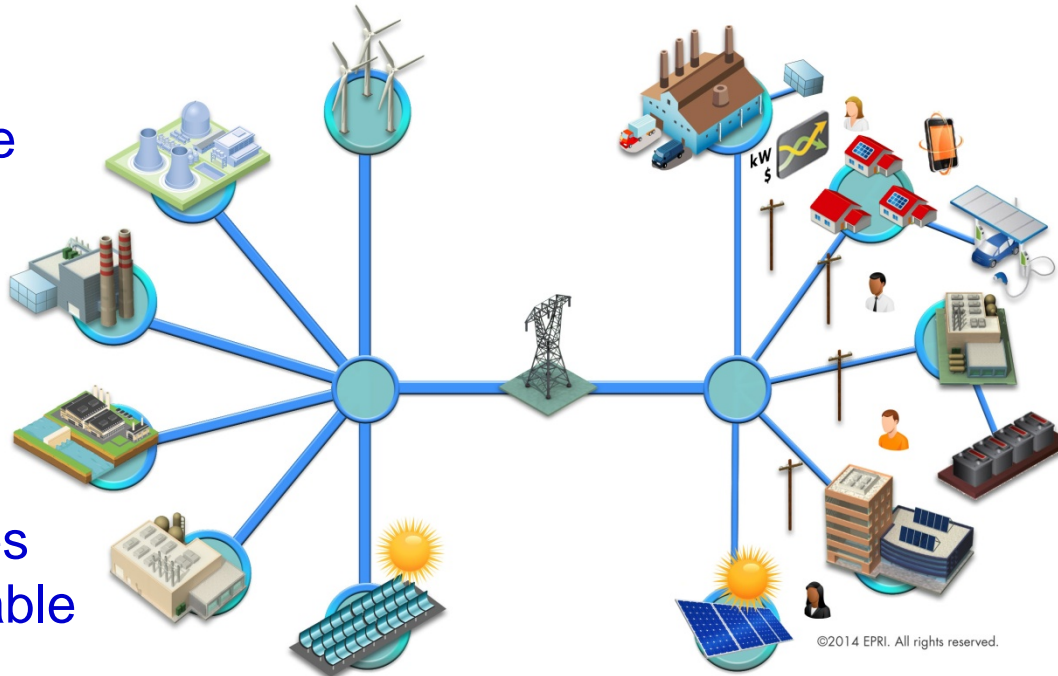
Customer
Demand

-

Interruptible
Load

The Power System – *Looking Forward*

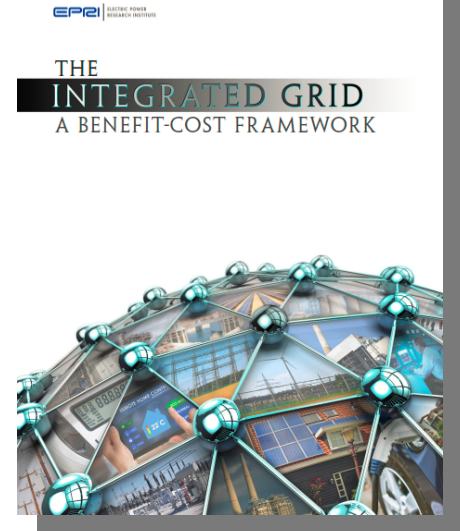
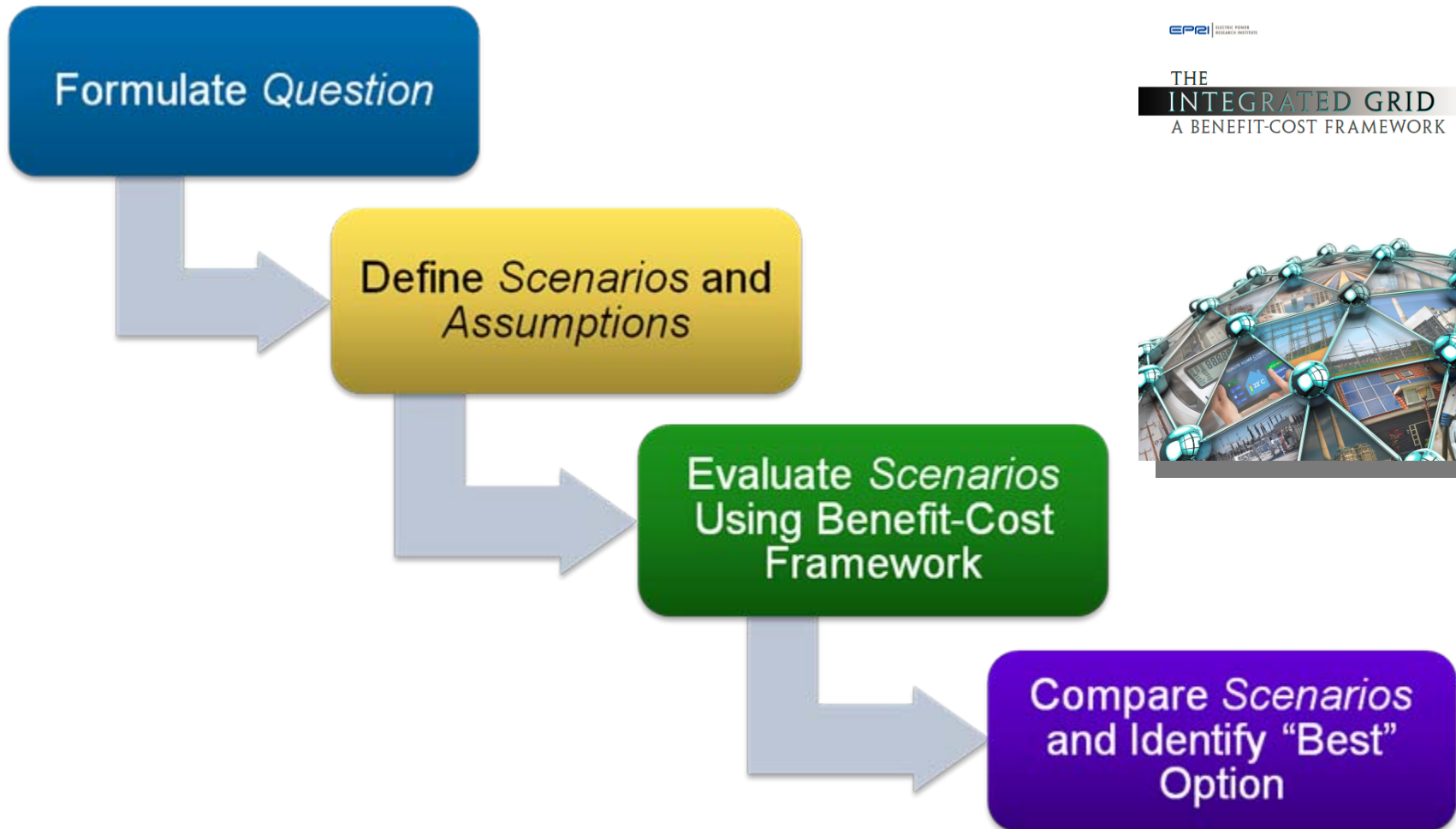
- Generation Becomes More Flexible
- T & D Becomes More Controllable and Resilient



- Consumers Become Energy Producers
- Loads Become More Interactive and Dynamic

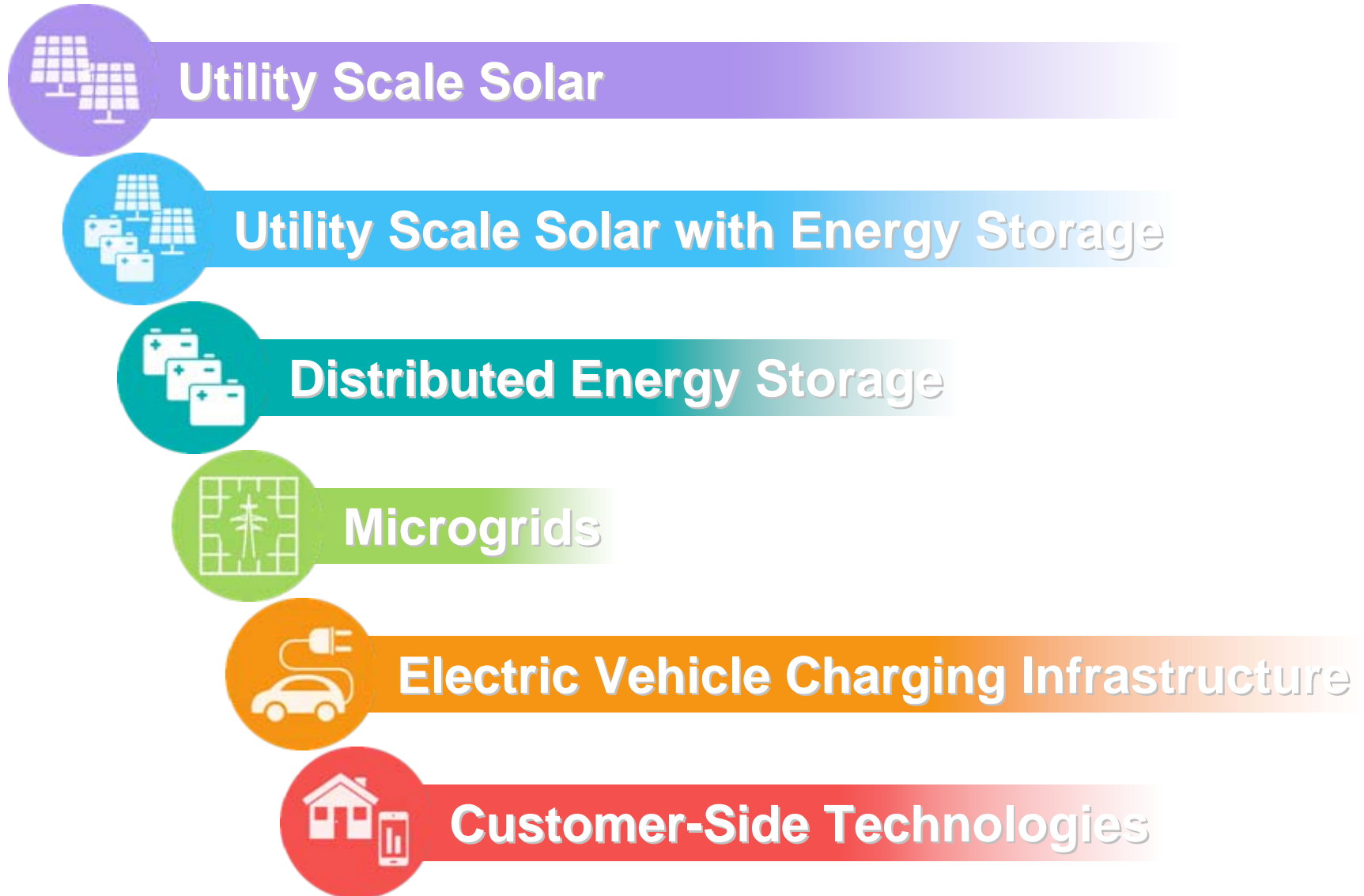
A More *Dynamic* End-to-End Power System

Steps to Apply Benefit-Cost Framework



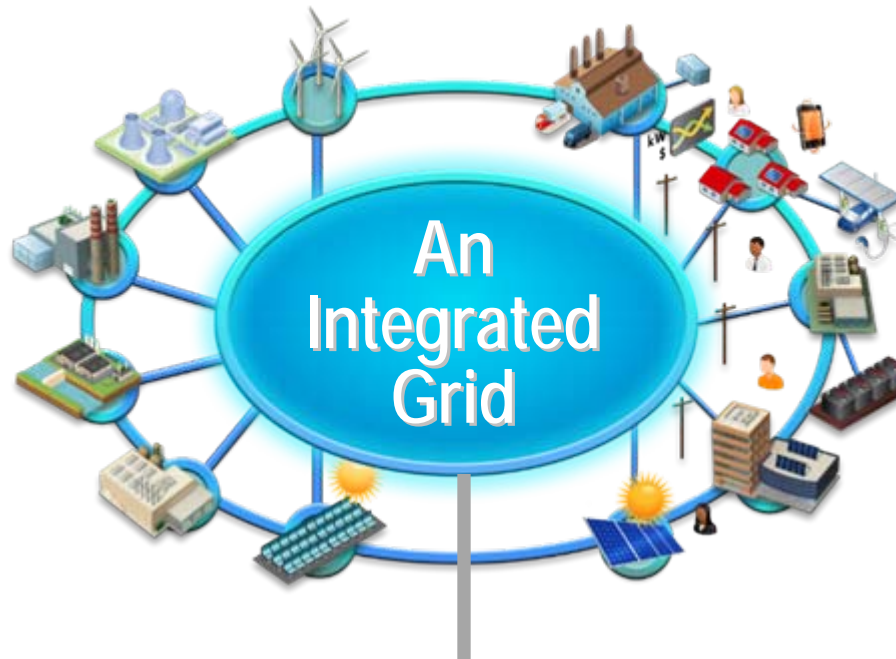
Putting IG Framework to the Test

Demonstration Pilots



Outcome of Integrated Grid Technology Pilots

Technology pilots demonstrate the value to all stakeholders of an integrated approach



Expected Learnings

- Consumer behavior and acceptance
- Technology performance and life cycle costs
- Installation, O&M costs
- Grid integration and architecture
- Benefit/cost assessment
- End-of-life environmental impact assessment



Integrated Grid Success

Wide Coordination is Crucial



2015 State Engagement

- **State Utility Commissions: North Carolina, Wisconsin**
- **NASUCA Energy Committee**
- **NASEO / ASERTTI Annual Meeting**
- **National Governors Association Best Practices**
- **Energy Council**
- **Council of State Governments**



UN Climate Summit



DOE Quadrennial Energy Review



New Source Performance Standards– CO2

Greenhouse Gas Emissions NSPS

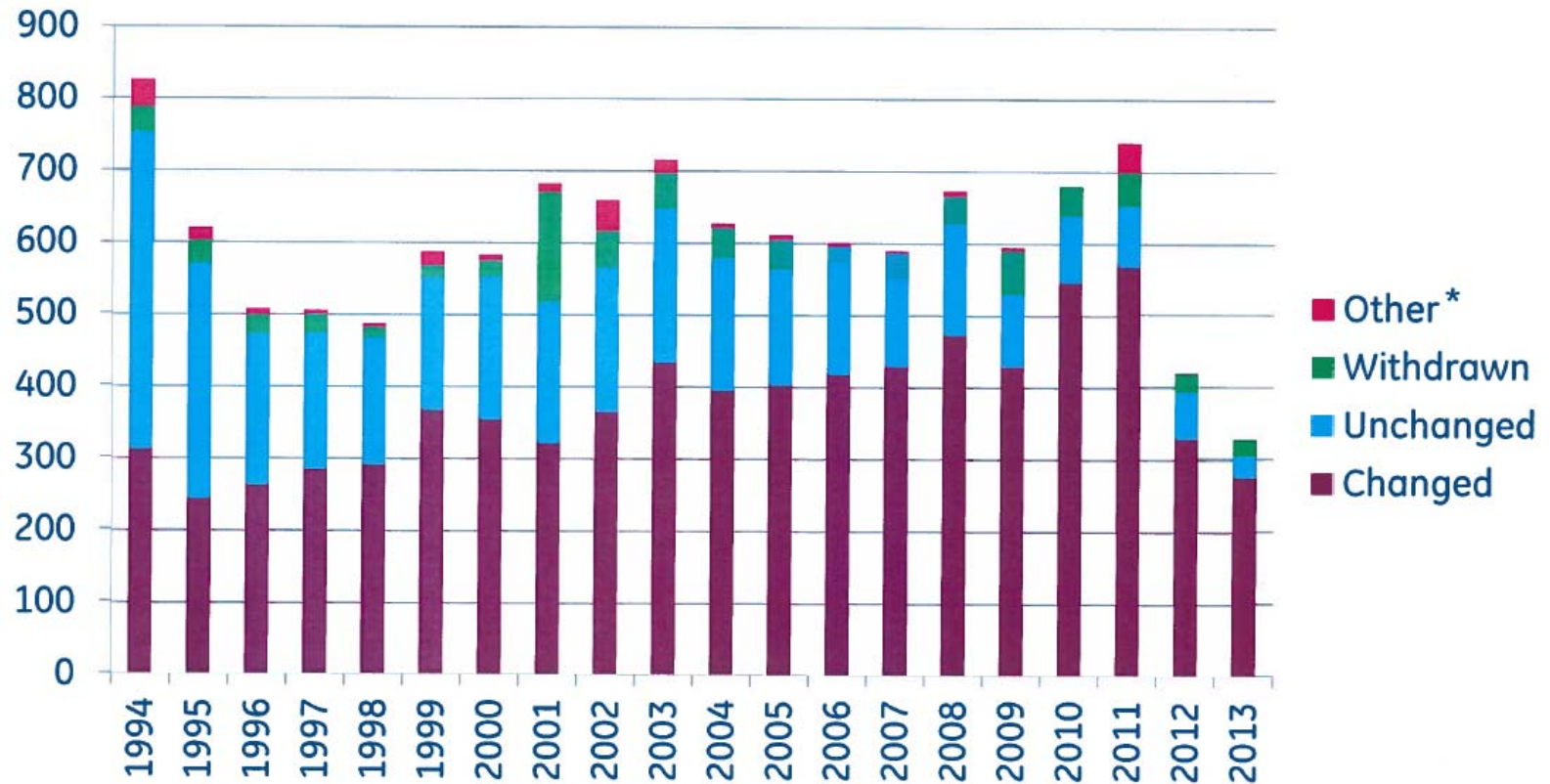
- Section 111 (b): New Sources– proposed 4/12 re-proposed: 9/20/13; draft rule: 1/9/14
- Section 111 (d): Existing Sources: June 2014
- Federal Implementation Plan



Office of Information & Regulatory Affairs

OIRA Actions by Calendar Year

Number of "changed" rules increasing over time



Source: Reginfo.gov

*Other includes returned, improperly submitted, emergency, statutory or judicial deadline



114th Congress

1st Session

- 54 Republican – 46 Democrat (incl. 2 Independents)
- 245 Republican – 188 Democrat (two vacancies)
- *Largest Republican Congressional majority since 1929*

▪ Energy

- ✓ Comprehensive Energy Policy

▪ Tax

- ✓ Energy Tax Credits





Together...Shaping the Future of Electricity

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