

Integrated Grid

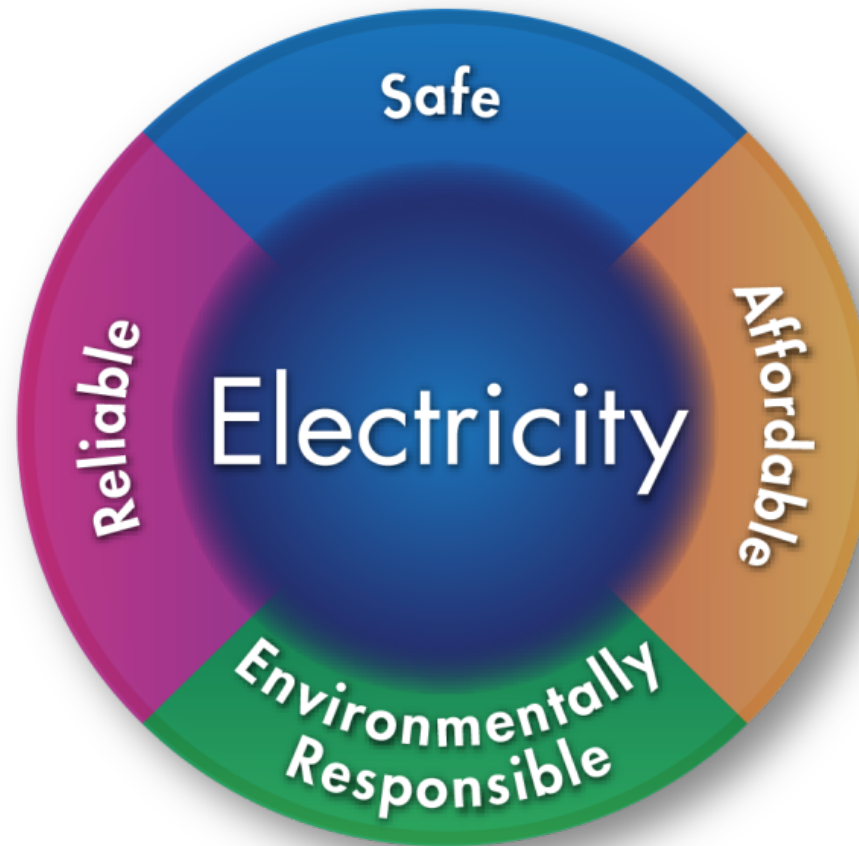


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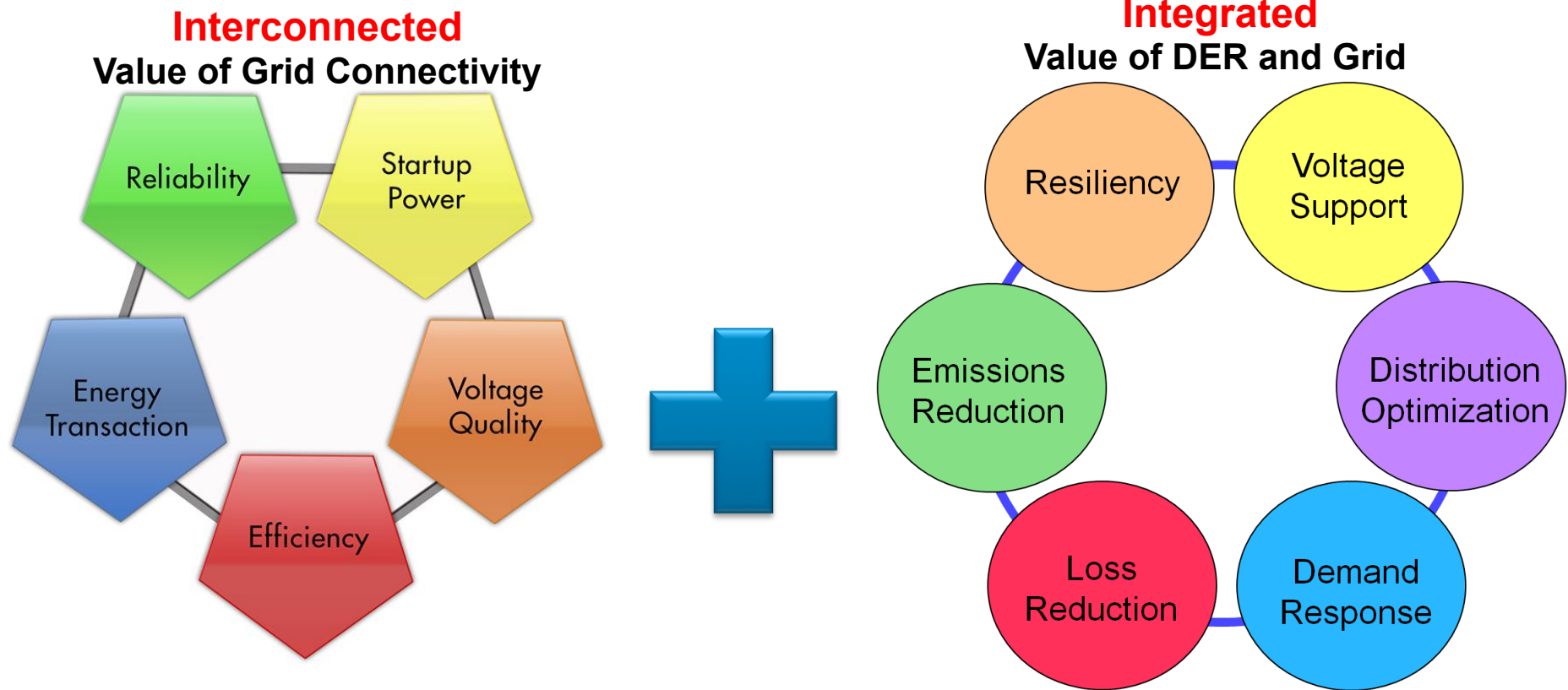
June 9, 2015

Electric Power Research Institute



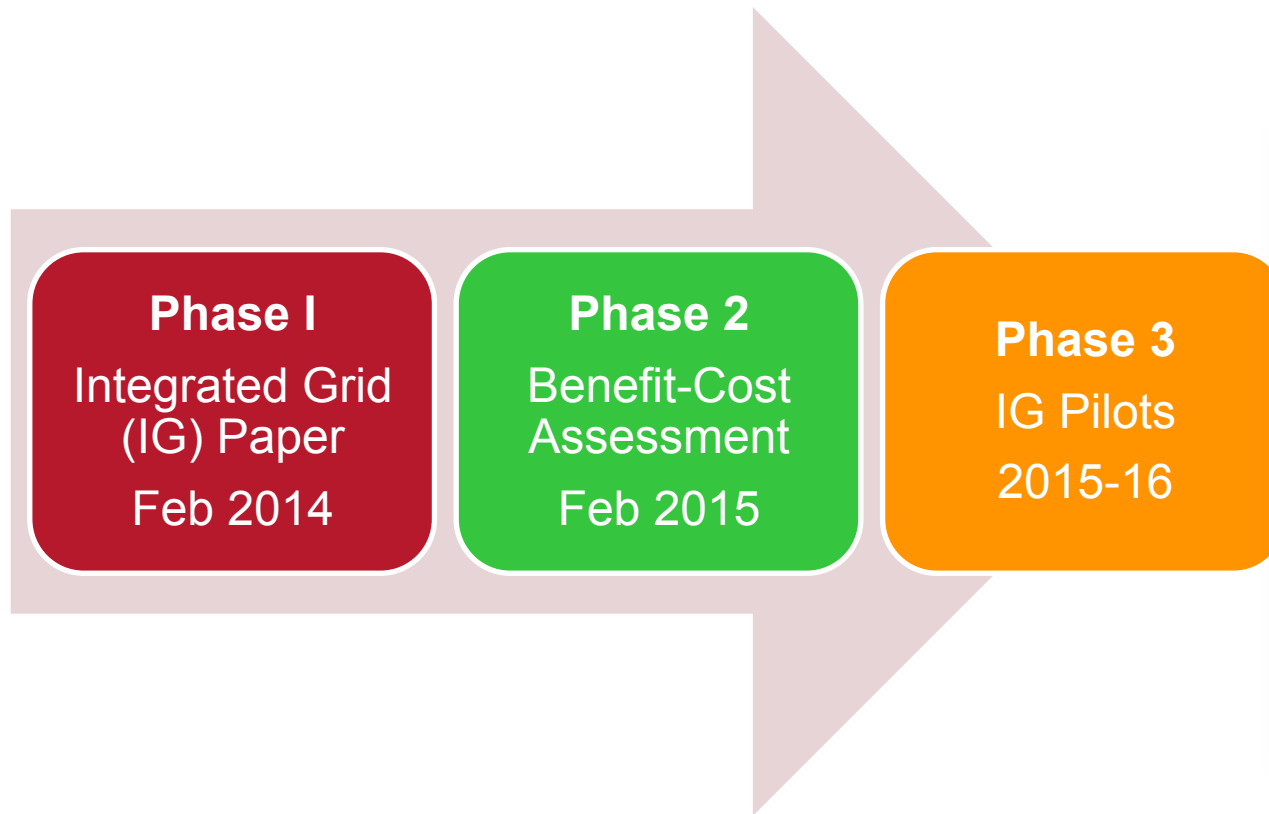
Together...Shaping the Future of Electricity

Interconnected but Not Integrated



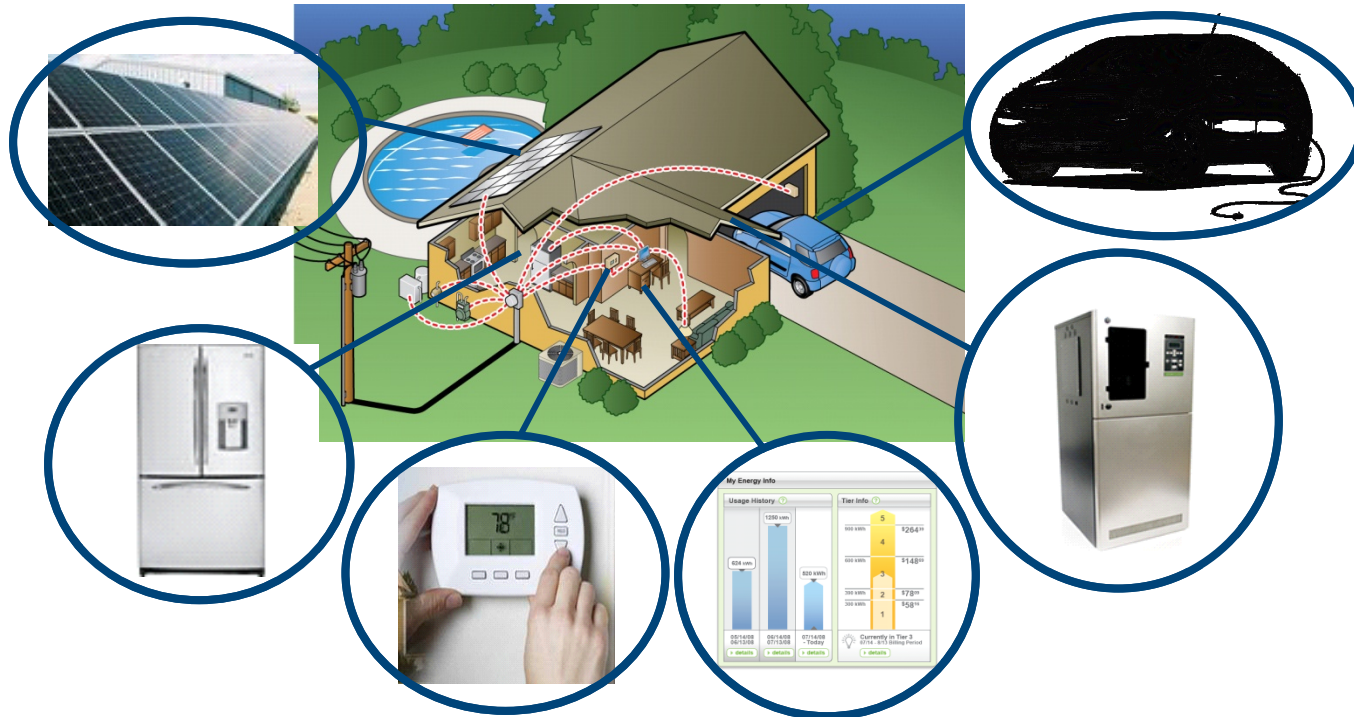
Integration Enables Values of all Resources

Integrated Grid...Timeline



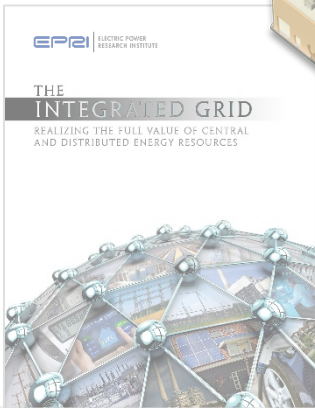
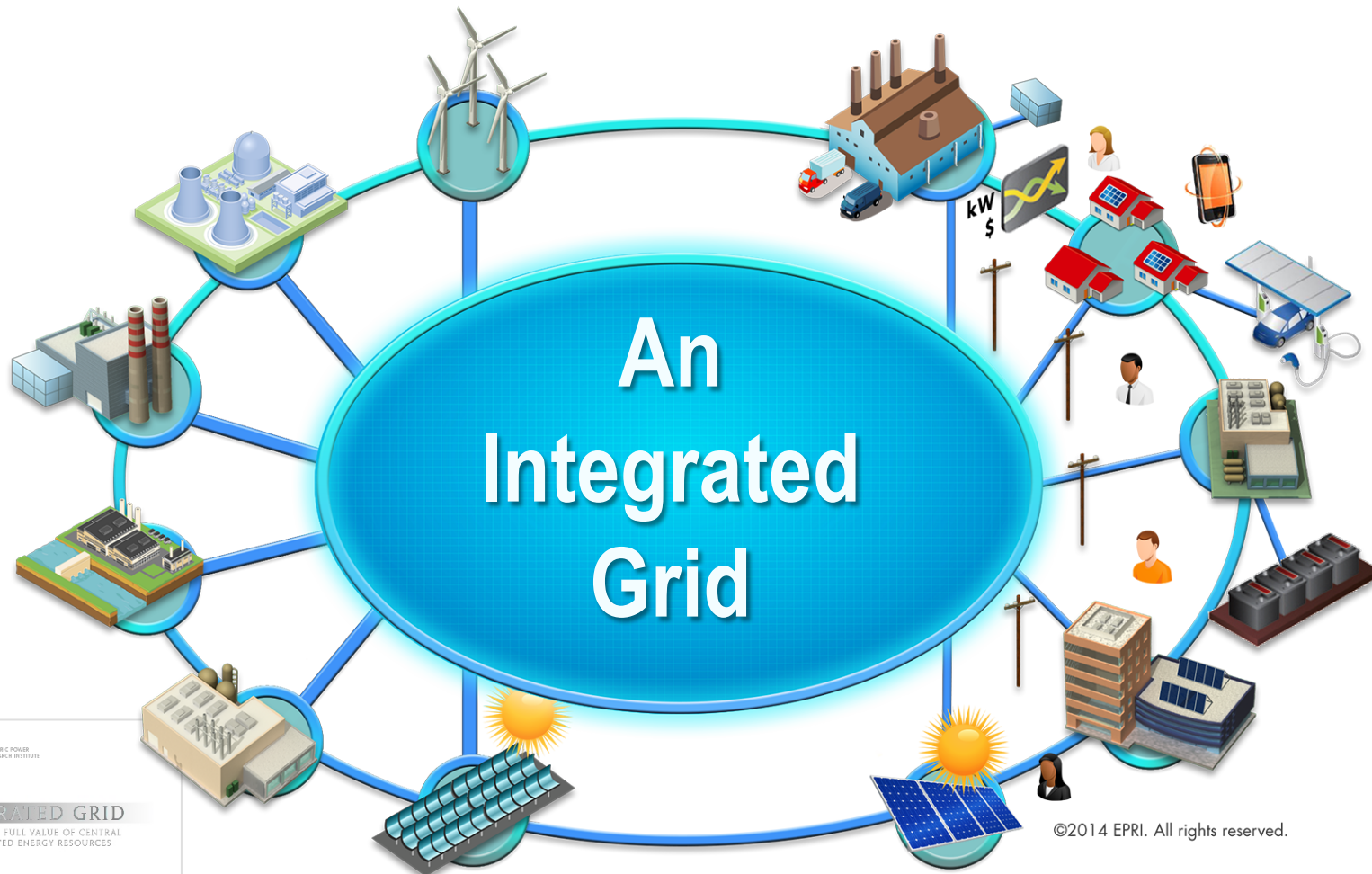
Extensive Stakeholder Coordination in All Phases

The Integrated Grid is about Enabling the Customer



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

Integrated Approach

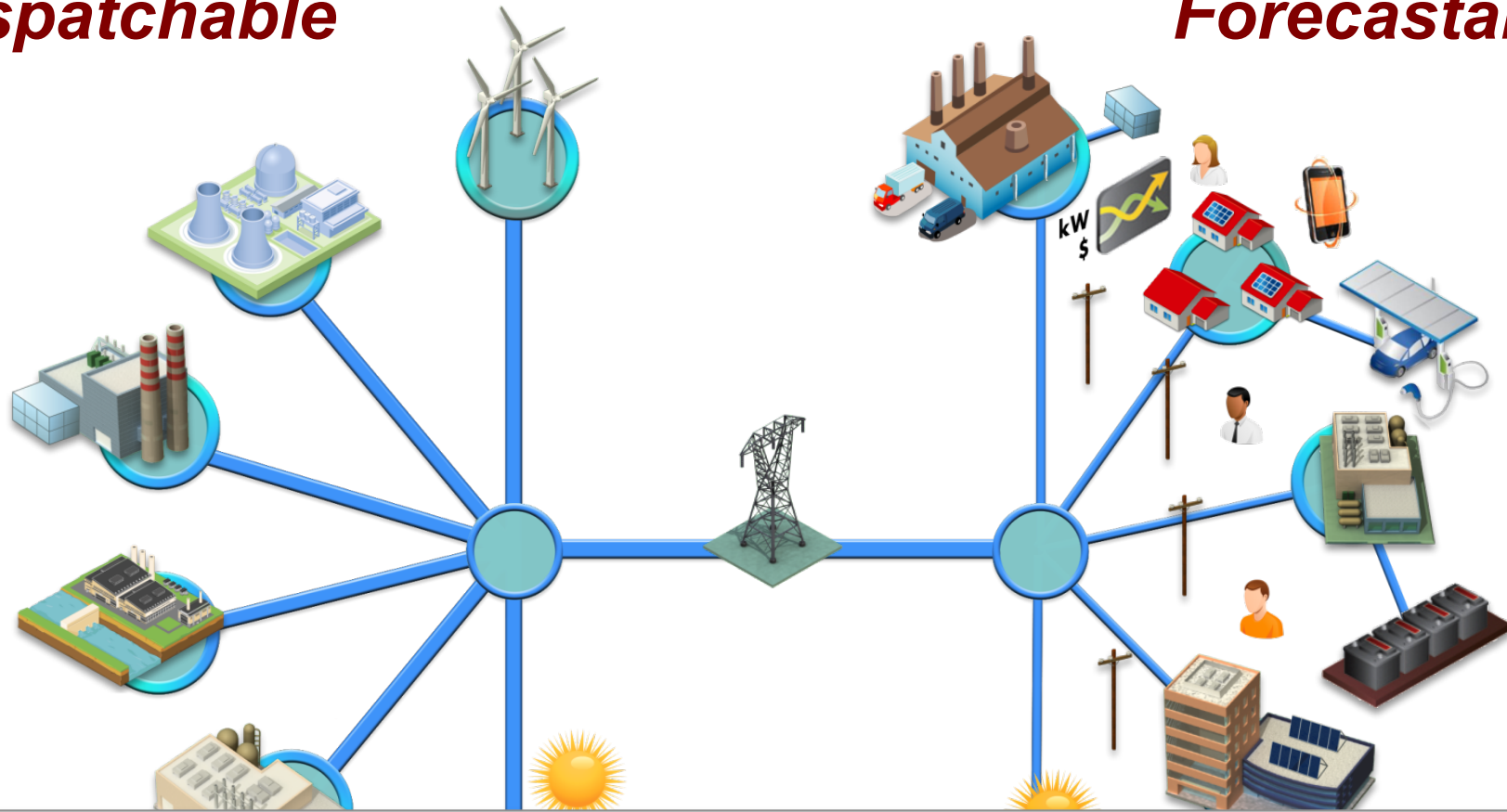


Consistent, transparent framework for assessing benefits/costs of transitioning to an Integrated Grid.

The Power System

Dispatchable

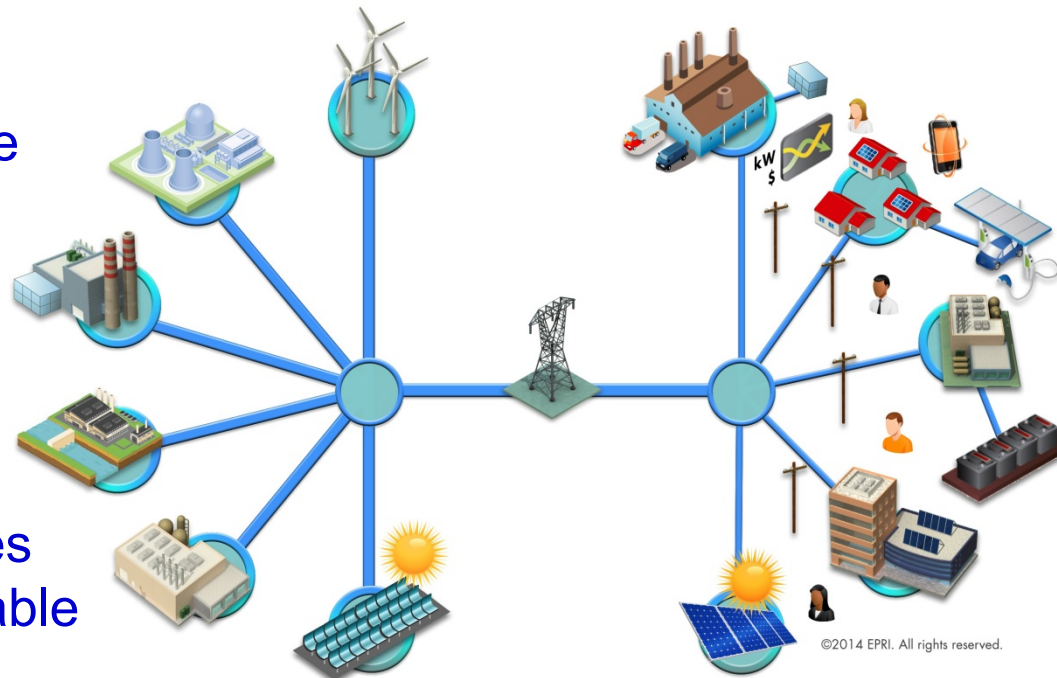
Forecastable



$$\begin{matrix} \text{Base Load} \\ \text{Generation} \end{matrix} + \begin{matrix} \text{Load Following} \\ \text{Generation} \end{matrix} +/\text{-} \begin{matrix} \text{Bulk Energy} \\ \text{Storage} \end{matrix} = \begin{matrix} \text{Customer} \\ \text{Demand} \end{matrix} - \begin{matrix} \text{Interruptible} \\ \text{Load} \end{matrix}$$

The Power System – *Looking Forward*

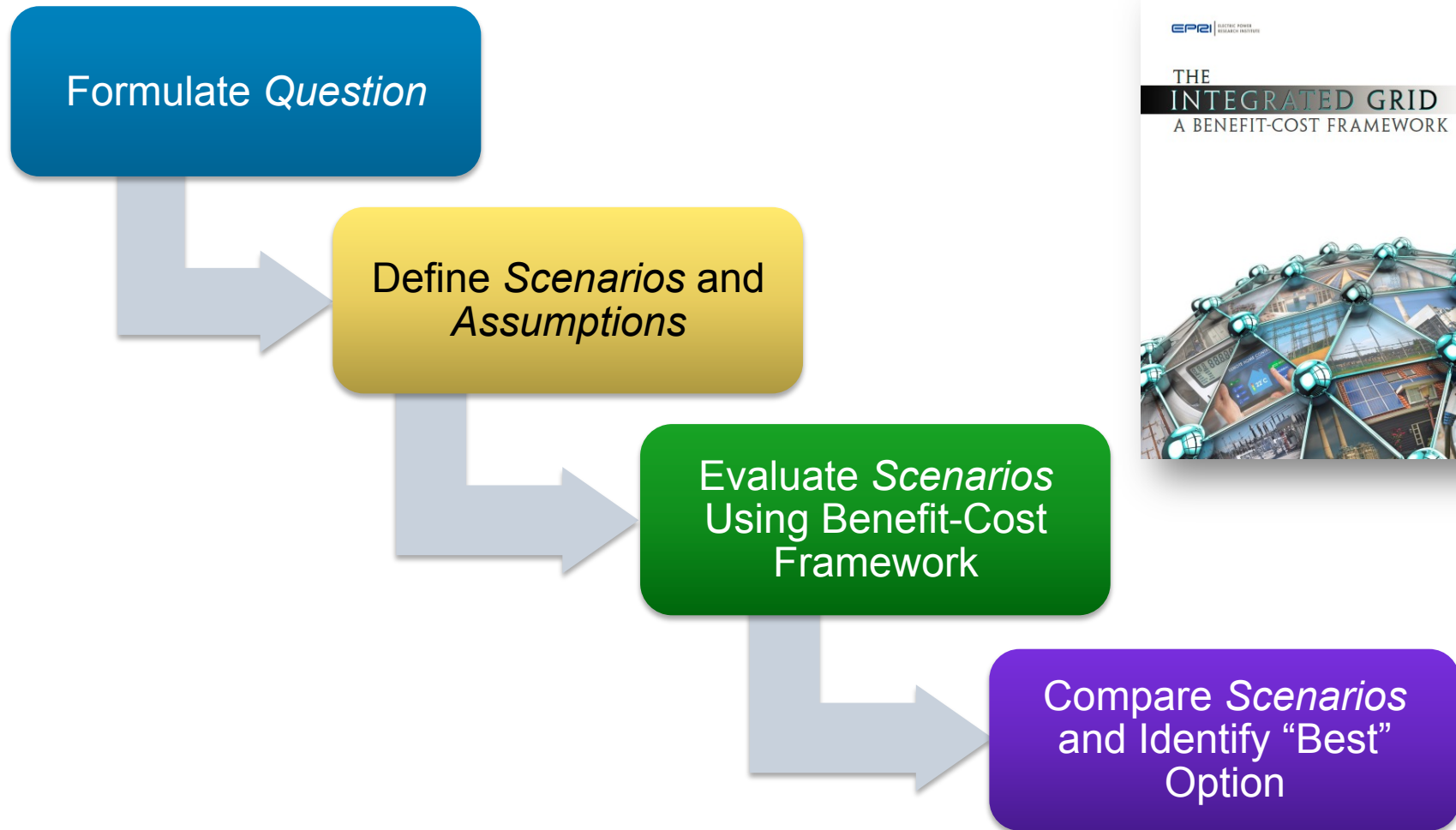
- Generation Becomes More Flexible
- T & D Becomes More Controllable and Resilient



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

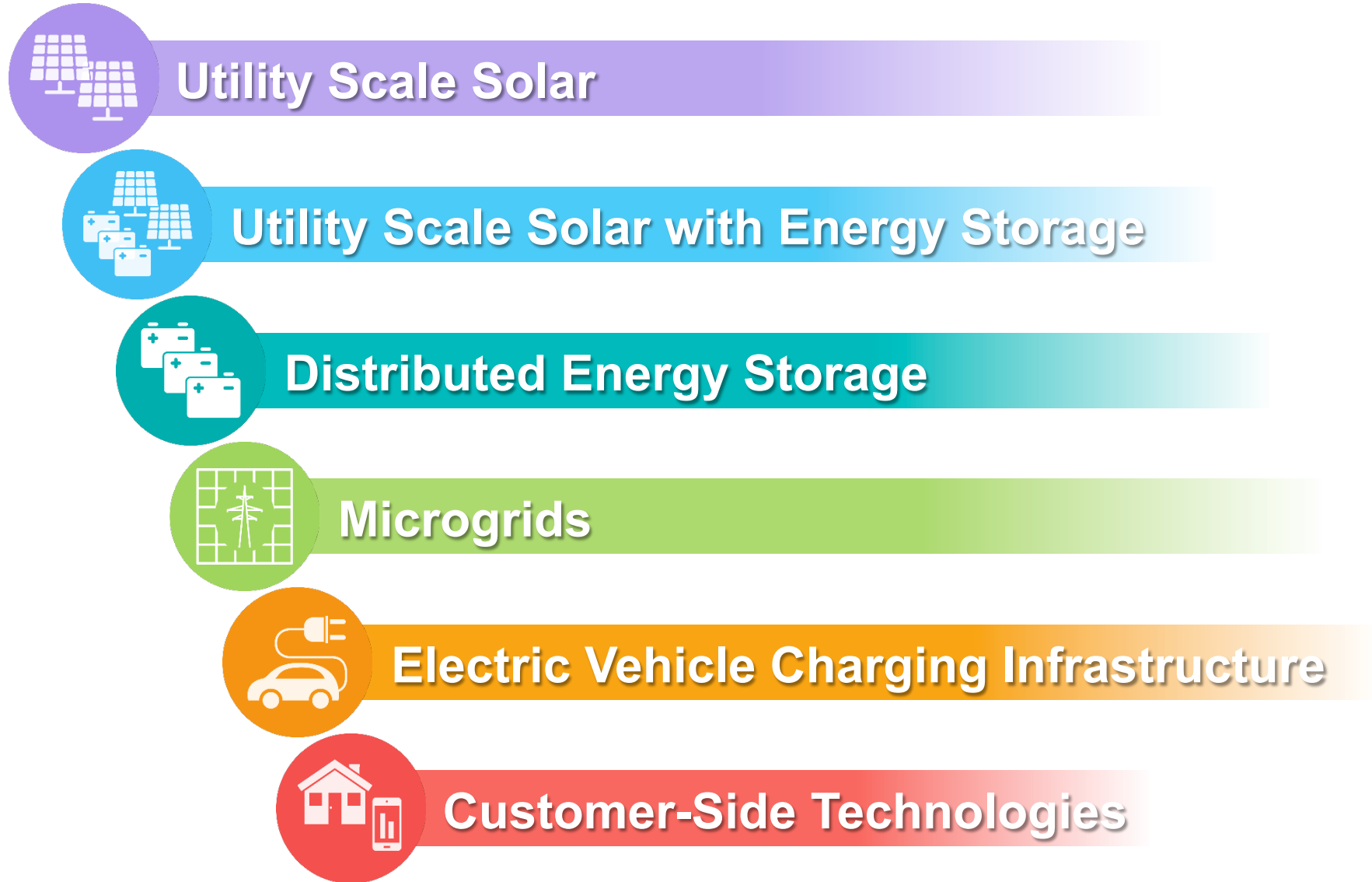
A More *Dynamic* End-to-End Power System

Steps to Apply Benefit-Cost Framework



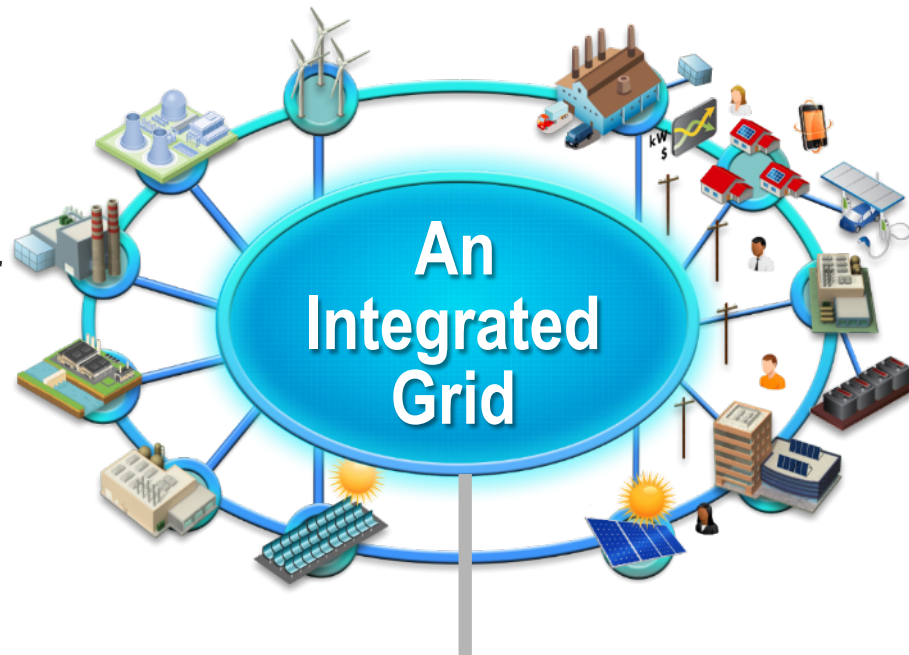
Putting IG Framework to the Test

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



Questions





Together...Shaping the Future of Electricity

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