

# Digitalization Challenges for DISCOMs

**Presented by**  
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**Electric Power Research Institute (EPRI)**

# EPRI: Leading Collaborative Energy R&D Around the World

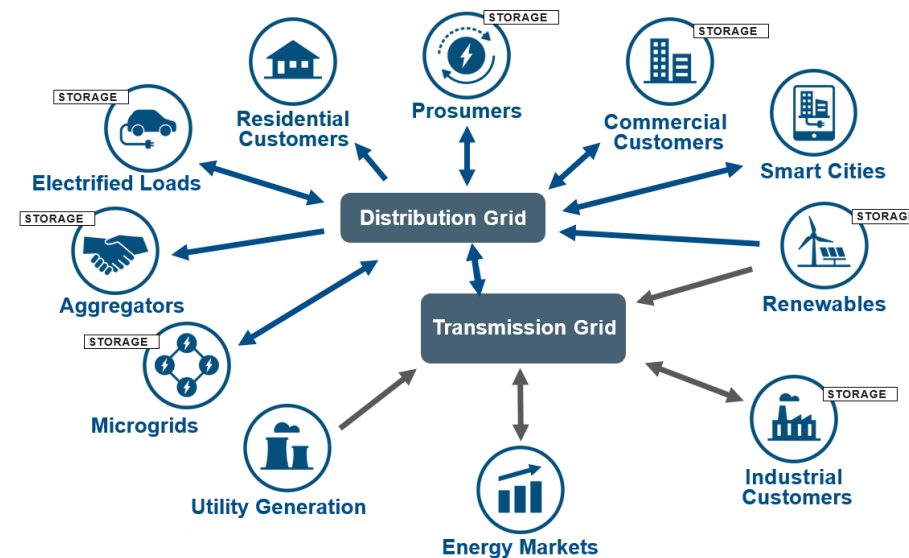


EPRI advances energy technologies and informs decision-making through ~\$420M in collaborative annual research involving nearly 400 entities in ~40 countries - spanning the generation, delivery, and use of electricity.

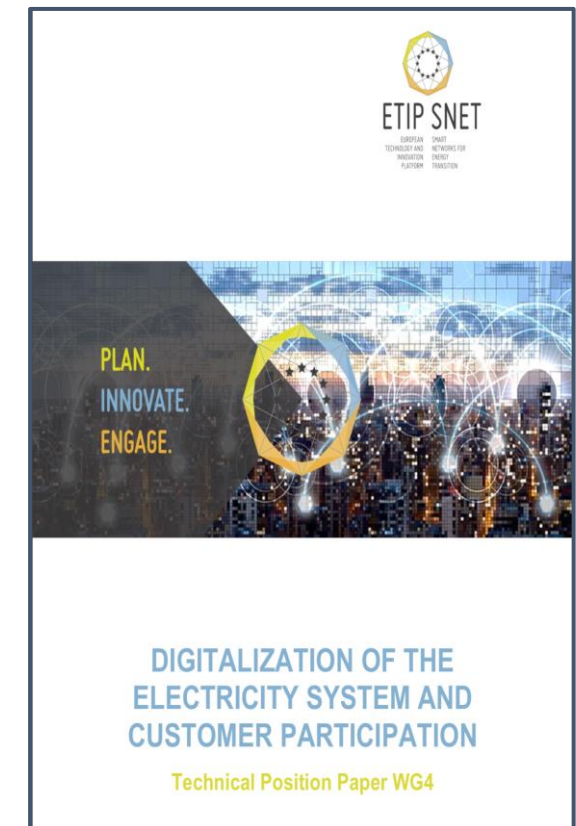
## Decarbonization



## Decentralization



## Digitalization





# Digitilization Enables the Integrated Grid

## Grid Management



## Communication

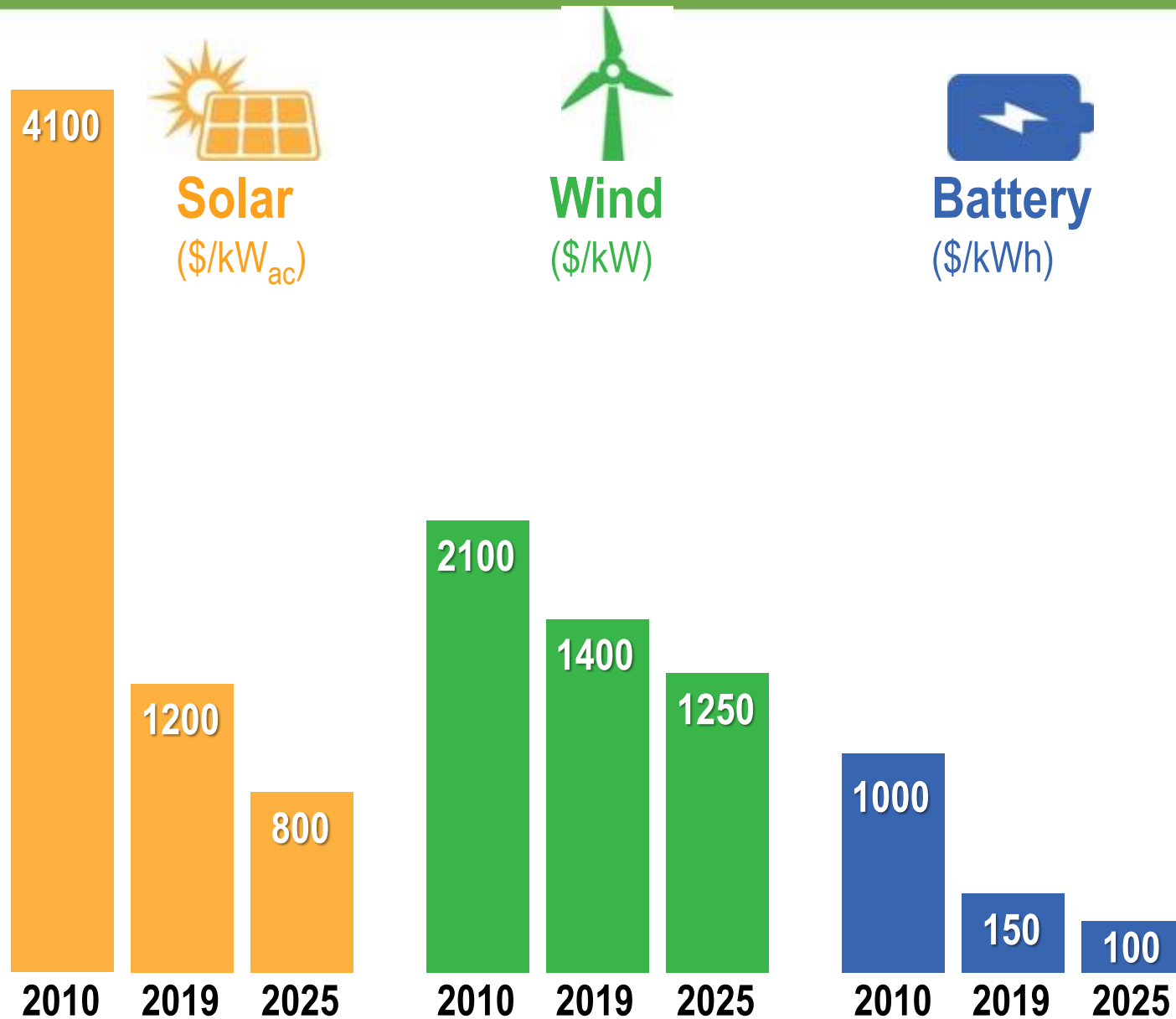


## AI/AR/VR\*



\*Artificial Intelligence / Augmented Reality / Virtual Reality

# Renewable & Battery Cost Trend: Unlocked Potential by 2025

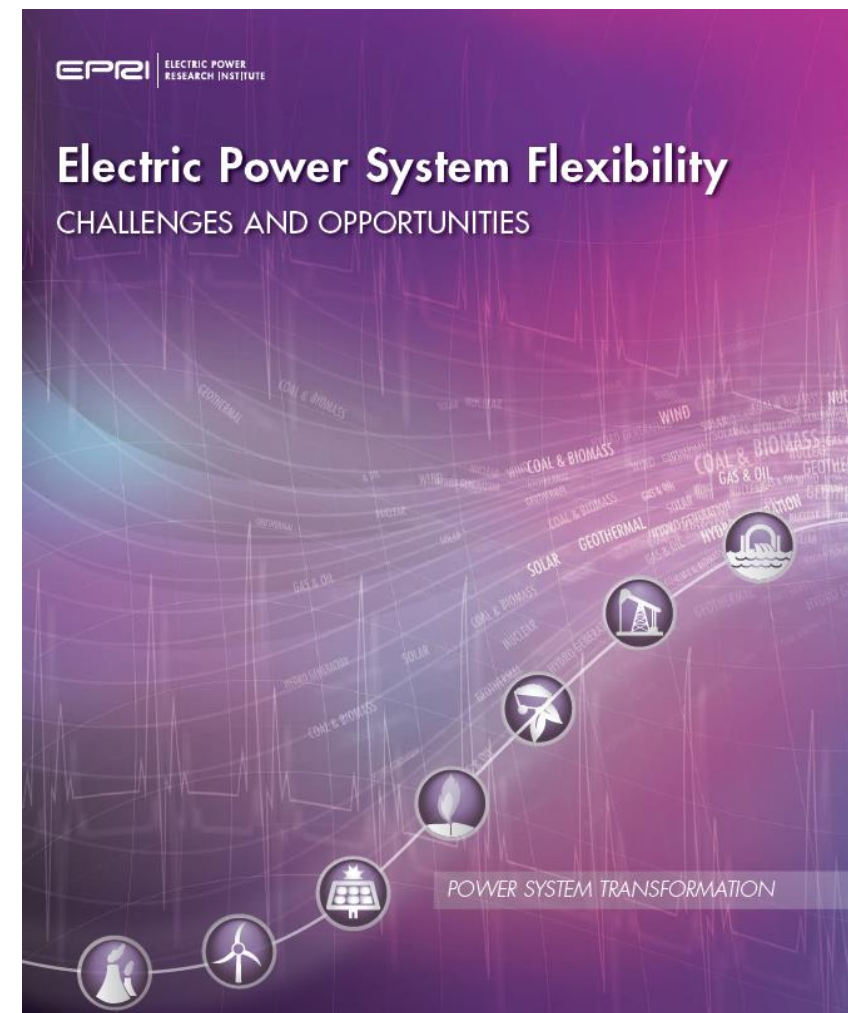
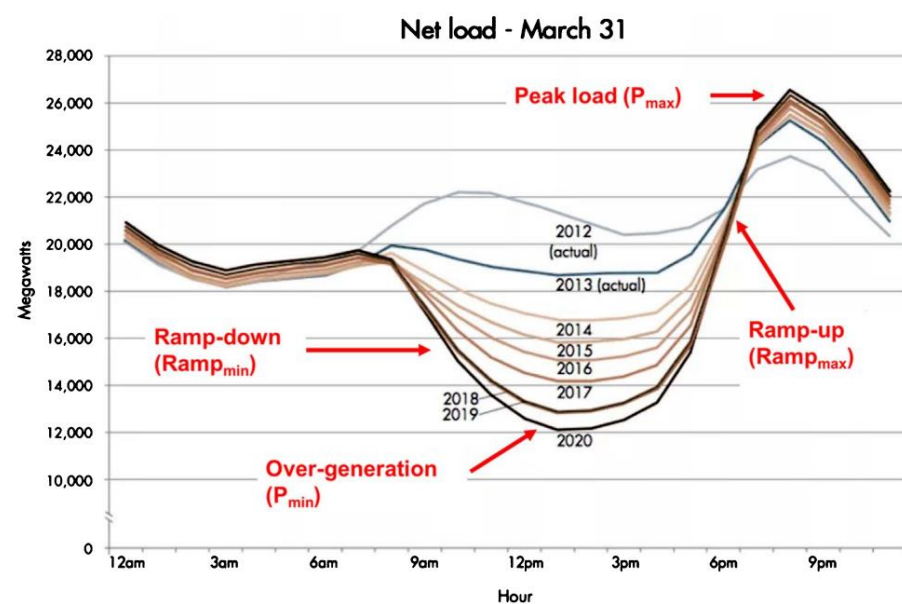
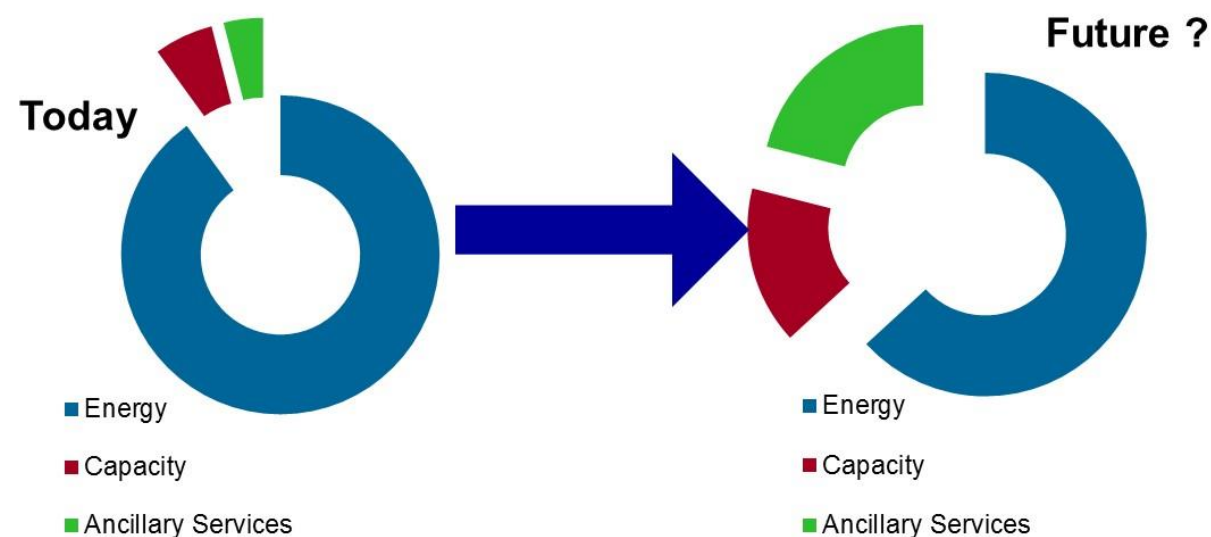


- Universal Solar PV: ~\$0.02/kWh in high solar region but still almost half the cost of rooftop solar
- Wind LCOE: ~ \$0.03/kWh in high wind region
- Electric vehicle (~300miles): ~\$7,000 decrease
- Commercial building batteries: 2-year payback
- Solar/wind + 4-6 hour storage cost = natural gas power plant

**Grid & Policy Innovation  
Unlocks Potential**



# Renewable penetration creates need for flexibility



# Active Demand and Distributed Resources Provide Flexibility

## Smart and Fast Charging of EV



## Enabling Higher Penetration of EV/Solar/DER



## Grid-Integrated Energy Storage



## Vehicle-to-Grid System Resource



## Connected, Smart, Demand-Responsive Load





# DISCOM Operations and Planning: The Foundation of Integration



**Shared  
Integrated Grid**



**Advanced  
Integrated  
Planning**



**Advanced  
Operations  
& Control**





# Digitilization supports community level coordination

**Alabama Power  
Smart  
Neighborhood  
(Birmingham)**



**ESB Networks –  
The Dingle Transition  
Initiative**



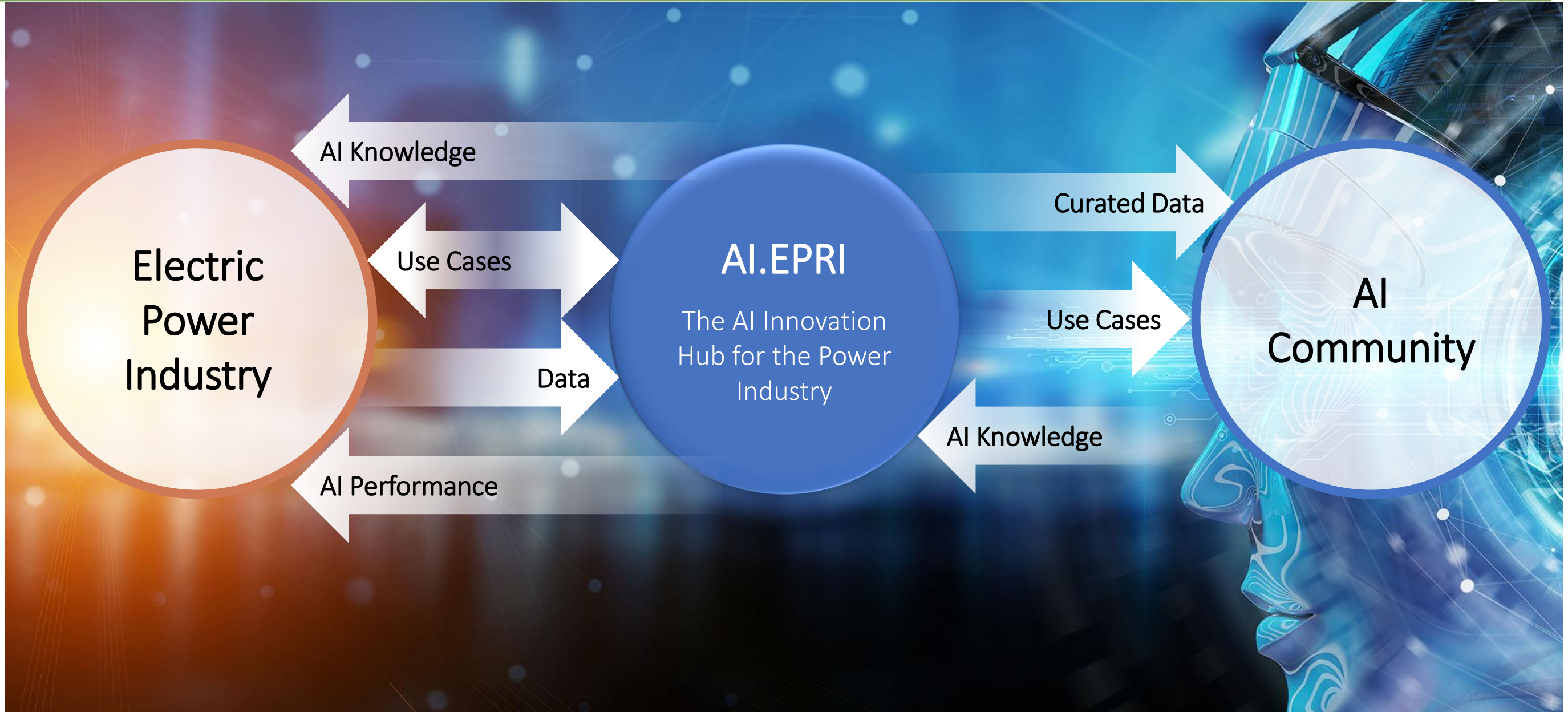
**Australian Smart Tech  
Home of the Future**

**Exelon Com Ed –  
Bronzeville Smart  
Community**





# Artificial Intelligence will support numerous applications





# Grid Modernization Roadmap defines digitalization goals

## Customer

Reliability  
Cost  
Information  
Choice  
Control  
Convenience  
Sustainability

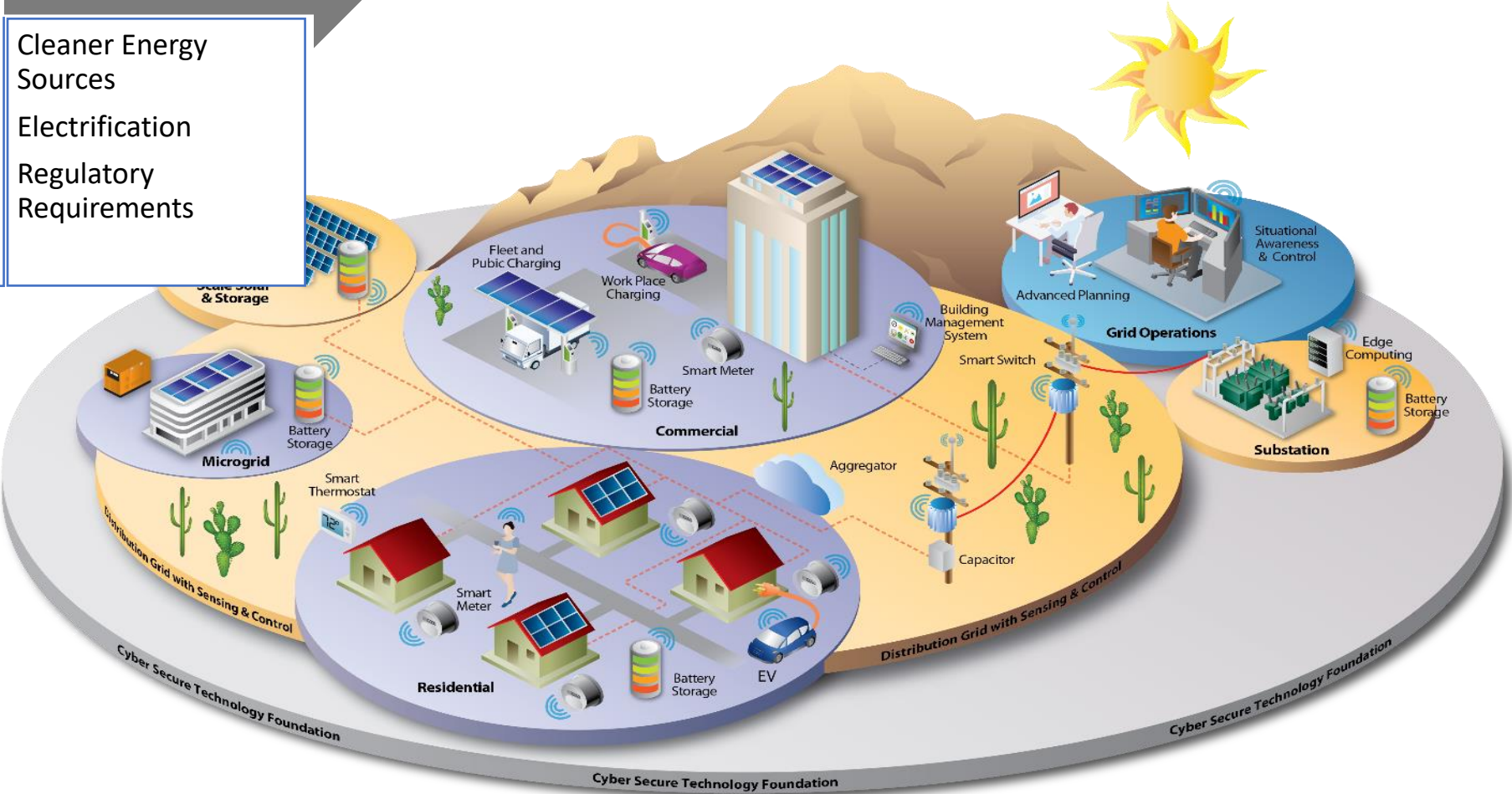
## Technology

Info Technology  
Distributed Energy  
Electric Vehicles  
Demand Response  
Security

## Sustainability

Cleaner Energy  
Sources  
Electrification  
Regulatory  
Requirements

# Integrated Grid





Together...Shaping the Future of Electricity