

Grid Architecture and V2G



Energy and Transportation Convergence:
Challenges and Opportunities for Electric Grid Modernization
Chicago, Illinois
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About Austin Energy

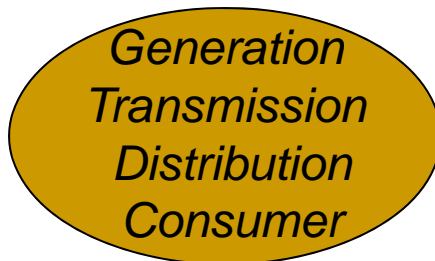
- 9th largest public power utility in the US
- Over \$1.2 billion in annual revenues
- Servicing almost 400,000 premises representing around 43,000 businesses and ~1 M population
- Leader in conservation and energy efficiency
- Leader in the use and management of distributed generation
- Leader in PEV



What is the Smart Grid?

- The Smart Grid is the **seamless integration** of an electric grid, a communications network, and the necessary software and hardware to monitor, control and manage the generation, transmission, distribution, storage and consumption of energy by any customer type.
- The Smart Grid of the future is distributed, interactive, self-healing and **reaches every device**.

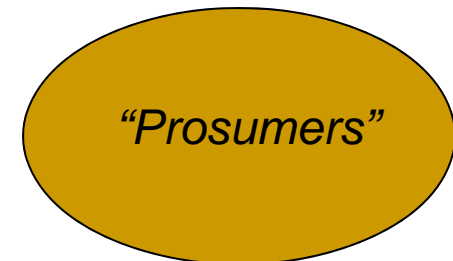
TRADITIONAL



**CHANGING ENERGY
BUSINESS MODEL**



FUTURE

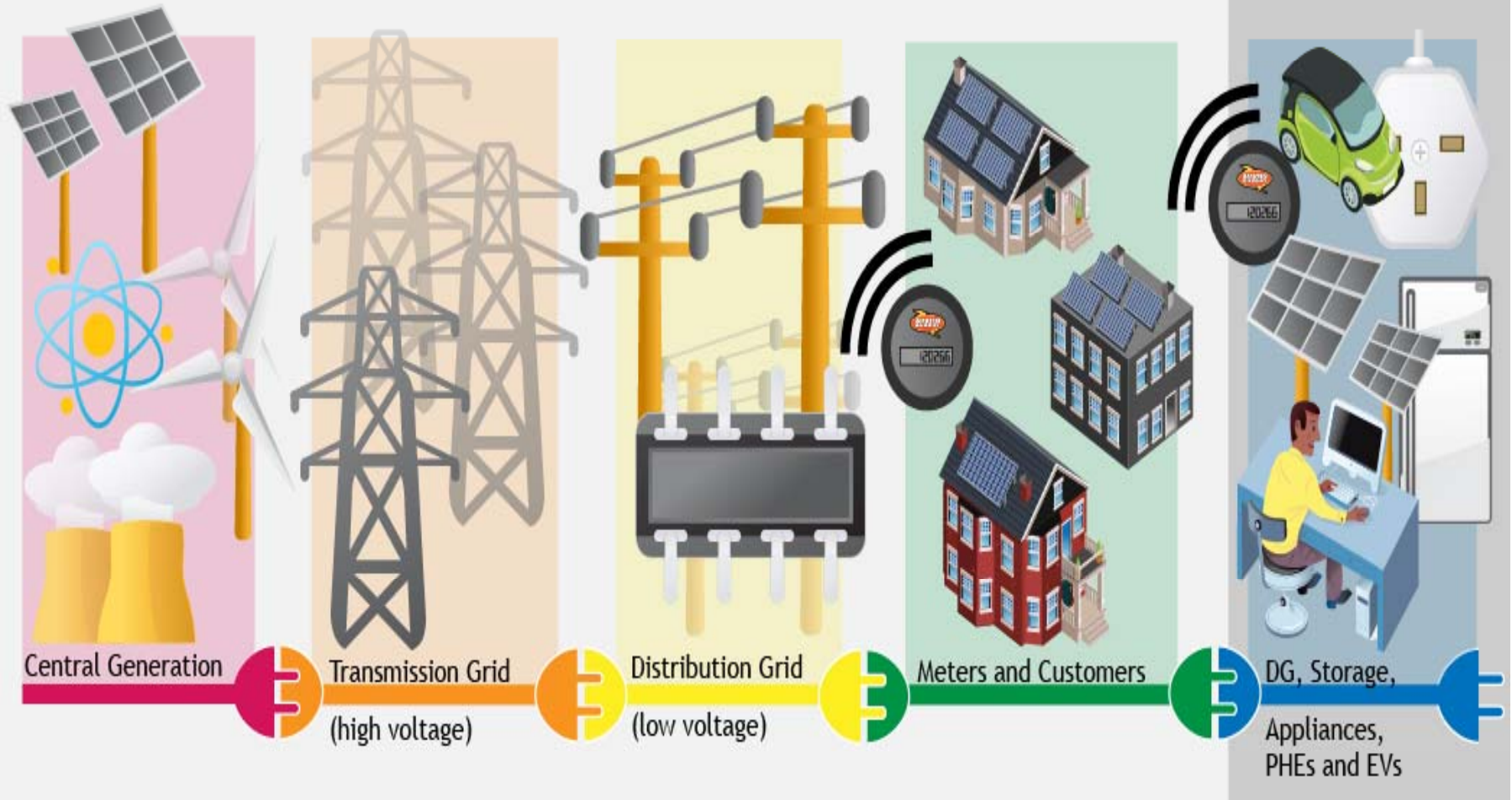




Austin Energy Smart Grid

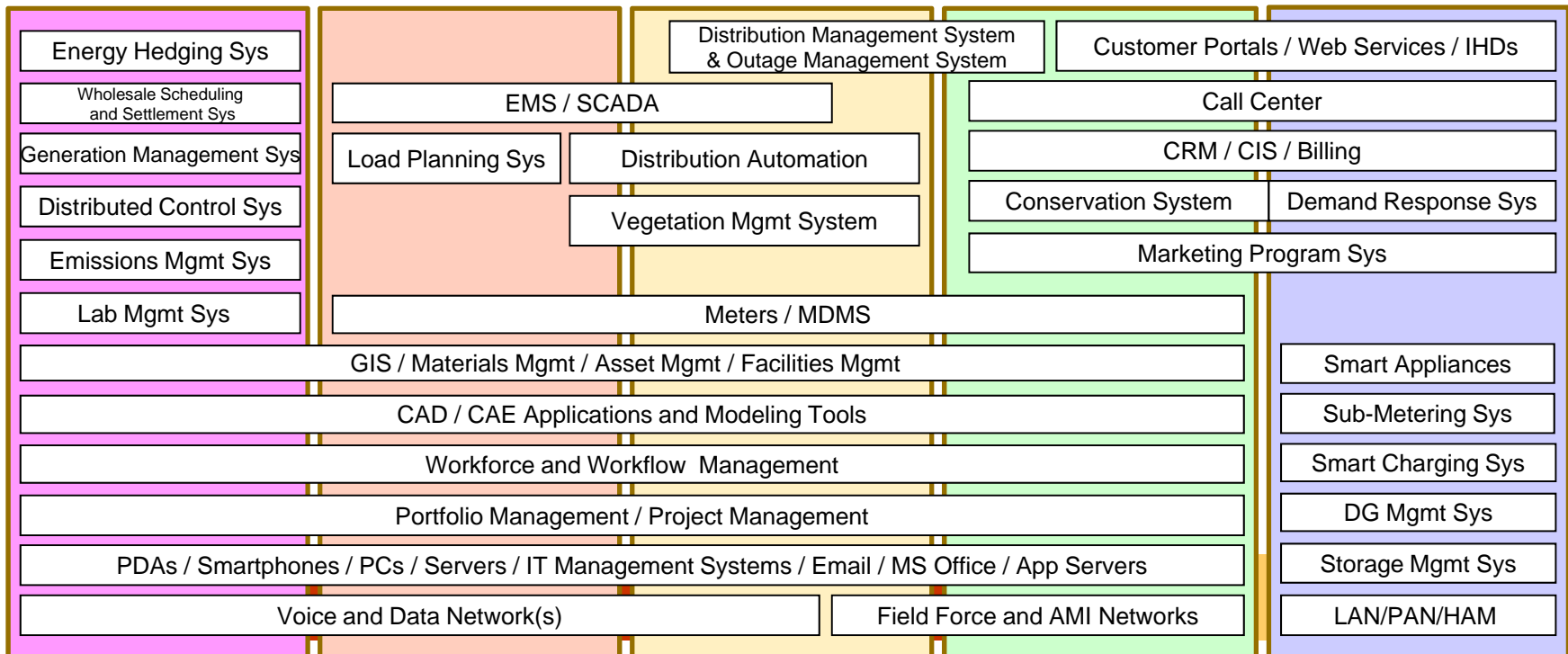
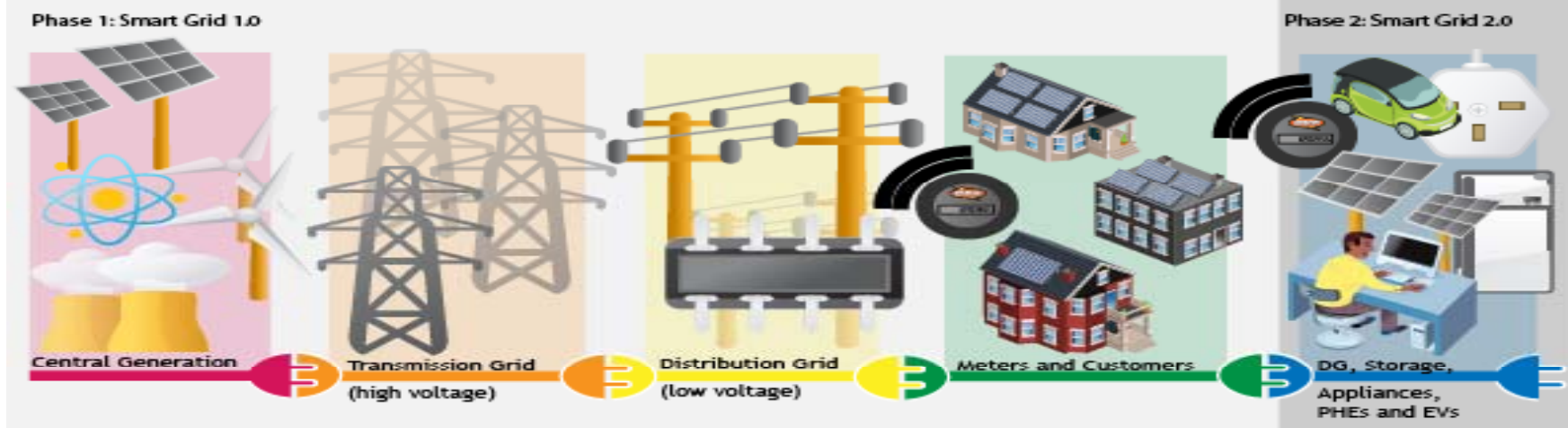
Phase 1: Smart Grid 1.0

Phase 2: Smart Grid 2.0



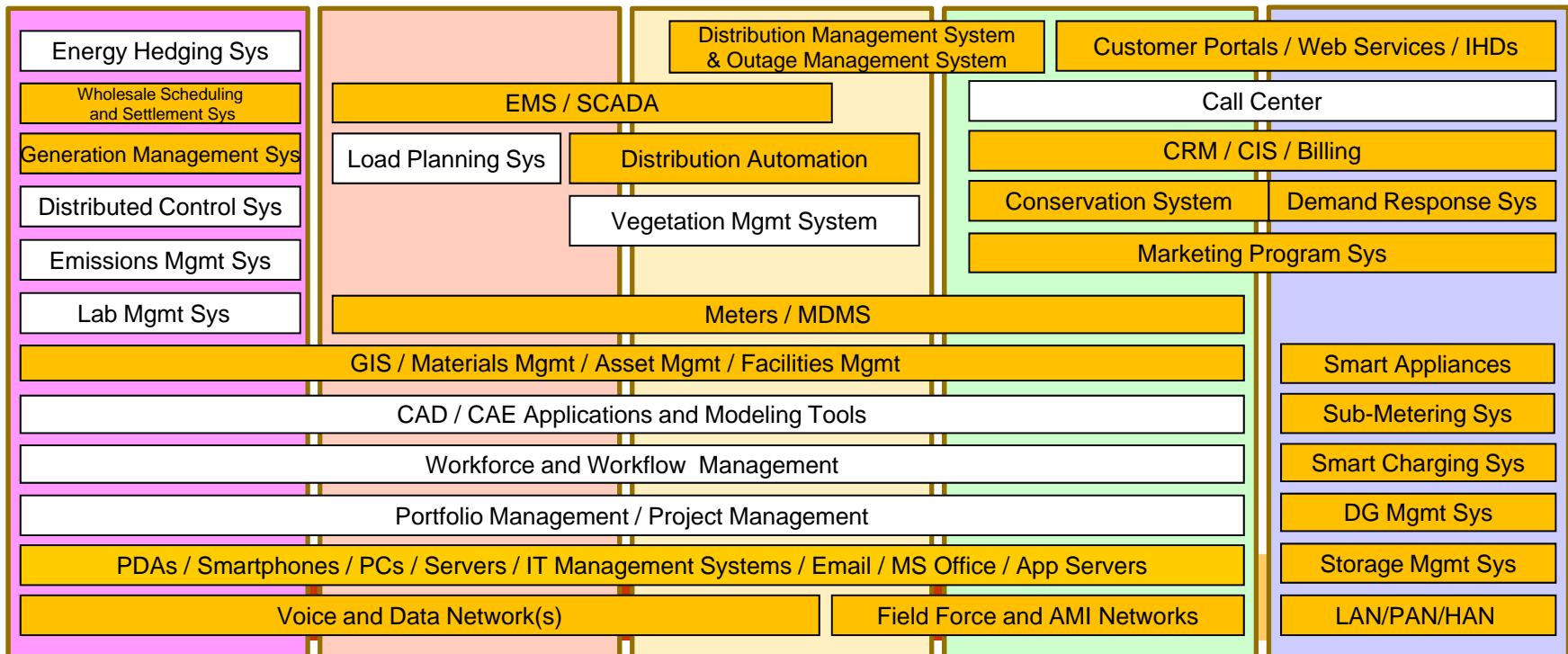
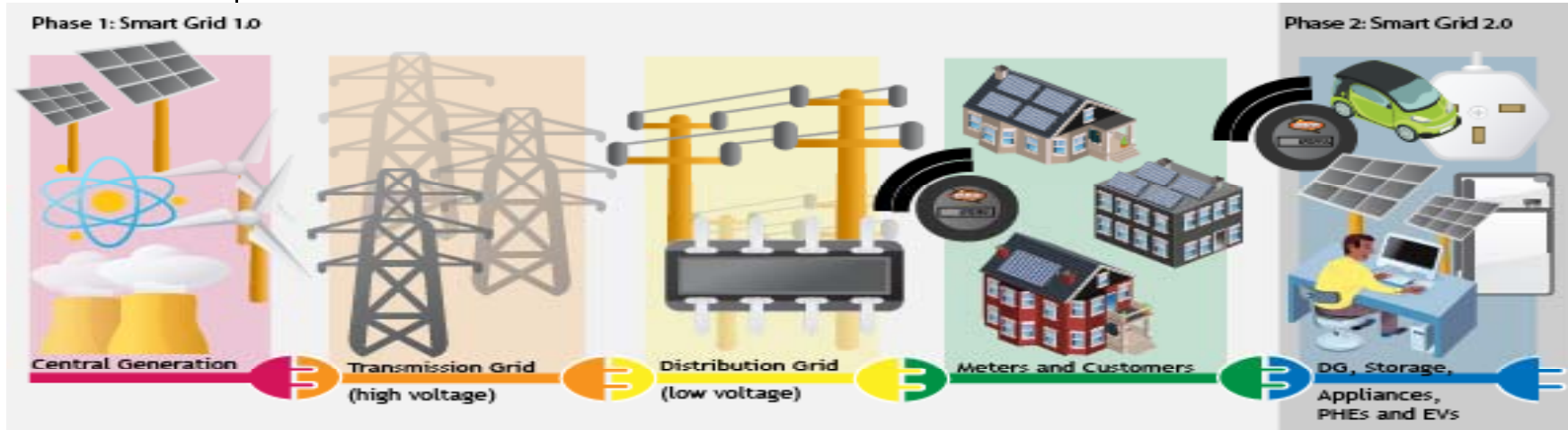


AE Smart Grid Architecture





AE Smart Grid *New Systems*



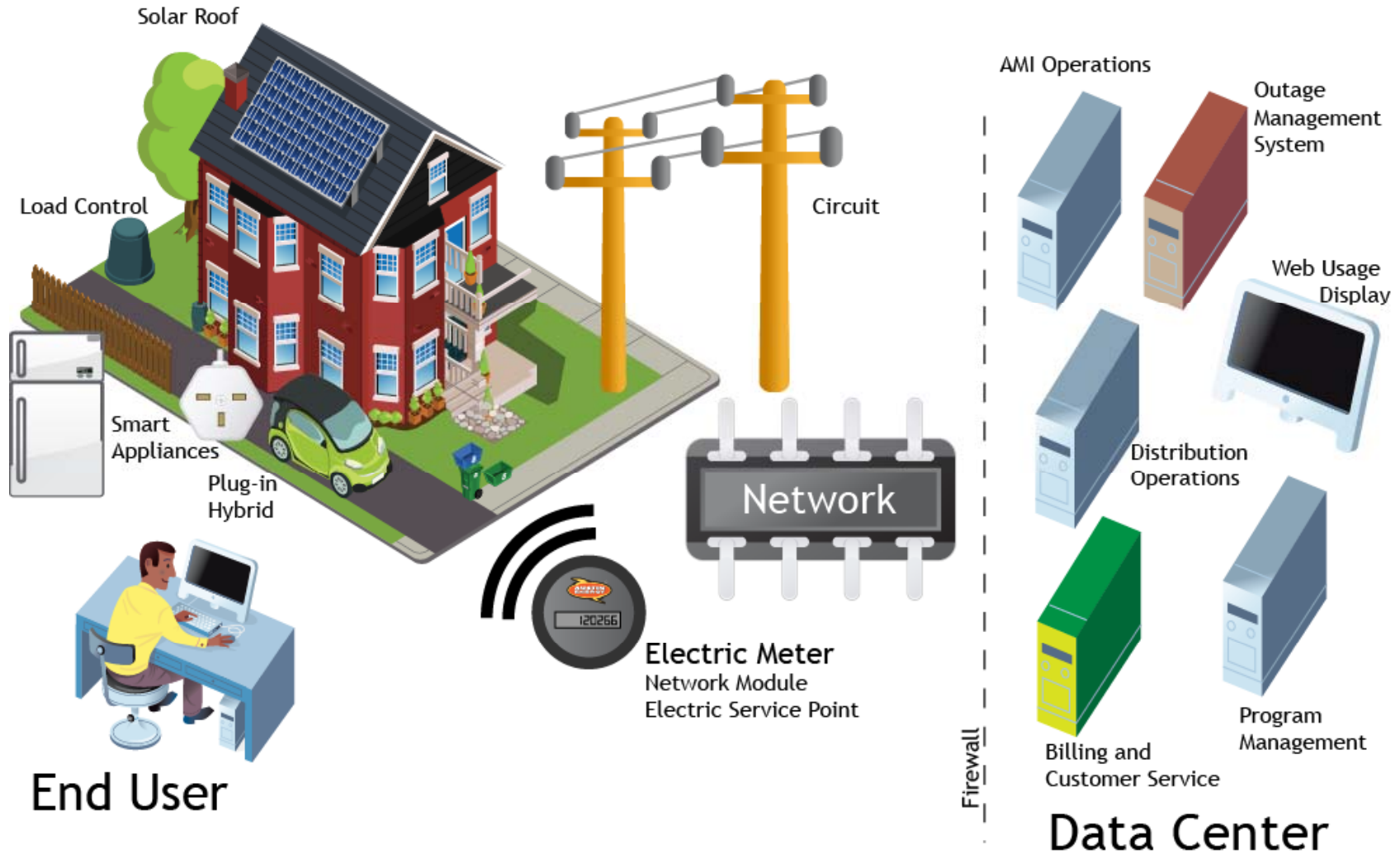


AE Smart Grid 1.0 Program Status

- Enterprise Architecture deployed in 2006
 - Portal, Enterprise Service Bus, Data Warehouse, Business Intelligence, Cyber Security, IT Management Tools, Fiber backbone
- 2-way RF network upgraded in 2007
 - One way RF network built in 2003
- Nodal Market Tools deployed in 2008
 - New Generation Management System, New Network Model, SCADA/EMS Upgrades, Maximo / Power Plant for Generation
- All 410,000 smart meters installed in 2009
 - First deployment of 127,000 smart meters in 2003
- New Meter Data Management System deployed in 2009
- 86,000 smart thermostats installed (22% of homes in Austin)
 - Started in 2003, 80k residential, 6k commercial, double by 2015
- New Billing System replacement in progress (mid 2011)
 - RT/TOU Pricing, Pre-pay, Web2.0, TXT/SMS, Self-service
- New Distribution Management System in progress (mid 2011)
 - Piloting now with 2,500 sensors

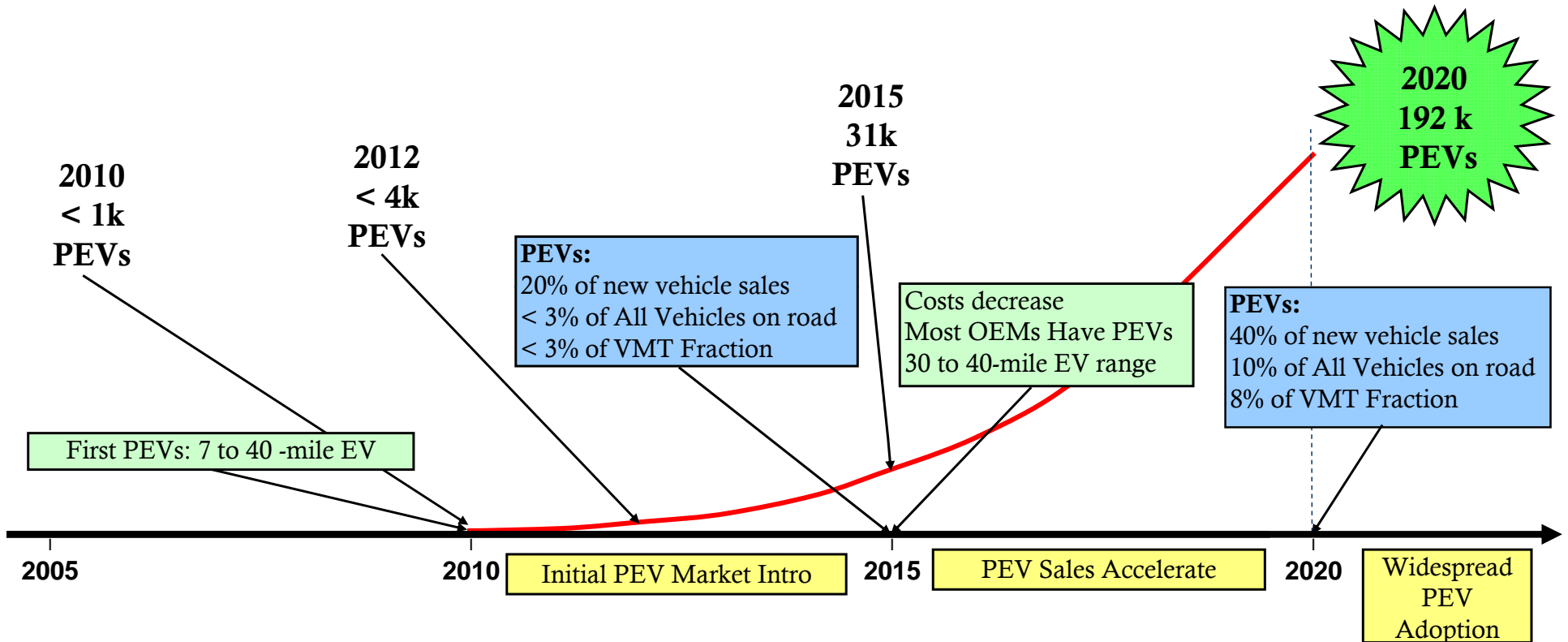


AE Smart Grid 2.0 at the Premise





PEV at AE When and How Many?



V2G When and How Many?



Thank You

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