



Austin Energy Smart Grid Program

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Austin Energy
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Agenda

- About Austin Energy
- About IT at AE
- What is the Smart Grid?
- Why do we need the Smart Grid?
- AE Smart Grid
- Austin Smart Premise
- AE Smart Grid Progress
- AE Enterprise Architecture
- New Integrated Applications
- New Benefits
- Summary



About Austin Energy

- 9th largest public power utility in the USA
- Over \$1.3 billion in annual revenues
- Servicing almost 410,000 premises representing around 43,000 businesses and ~1 million consumers
- Leader in conservation and renewable energy
- Leader in the use and management of distributed generation
- Leader in using the best IT solutions to deliver a fully-integrated and self-healing utility



IT at Austin Energy

- 100 projects per year
- 410,000 meters, 150 enterprise apps, 600 servers, 1700 PCs/laptops, 86,000 thermostats
- Monitoring around 220,000 devices in real-time today. Soon to be 500,000 devices by August 2009
- 440 sq miles of fiber network and 3 wireless data networks
- Over 150,000 calls per month
- 20 terabytes of annual data growing to 100 terabytes by August 09
- 500k billing transactions per month
- \$1 billion in hedging transactions per year
- \$3.5 billion in assets



What is the Smart Grid?

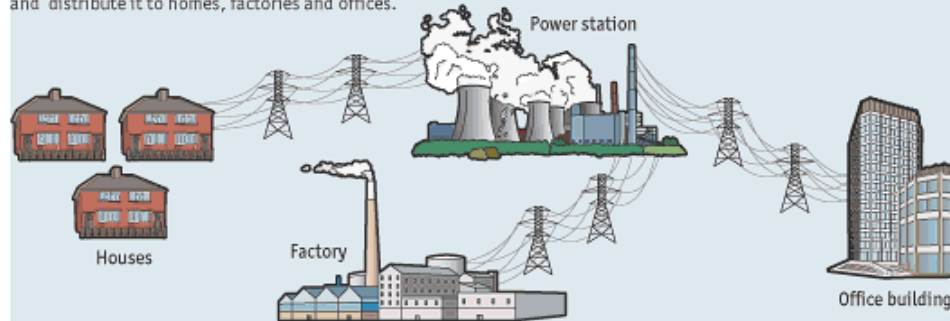
- The Smart Grid is the seamless integration of an electric grid, a communications network, and the necessary software and hardware to monitor, control and manage the generation, transmission, distribution, storage and consumption of energy by any customer type.
- The Smart Grid of the future is distributed,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

Why Do We Need the Smart Grid?

The shape of grids to come?

Conventional electrical grid

Centralised power stations generate electricity and distribute it to homes, factories and offices.

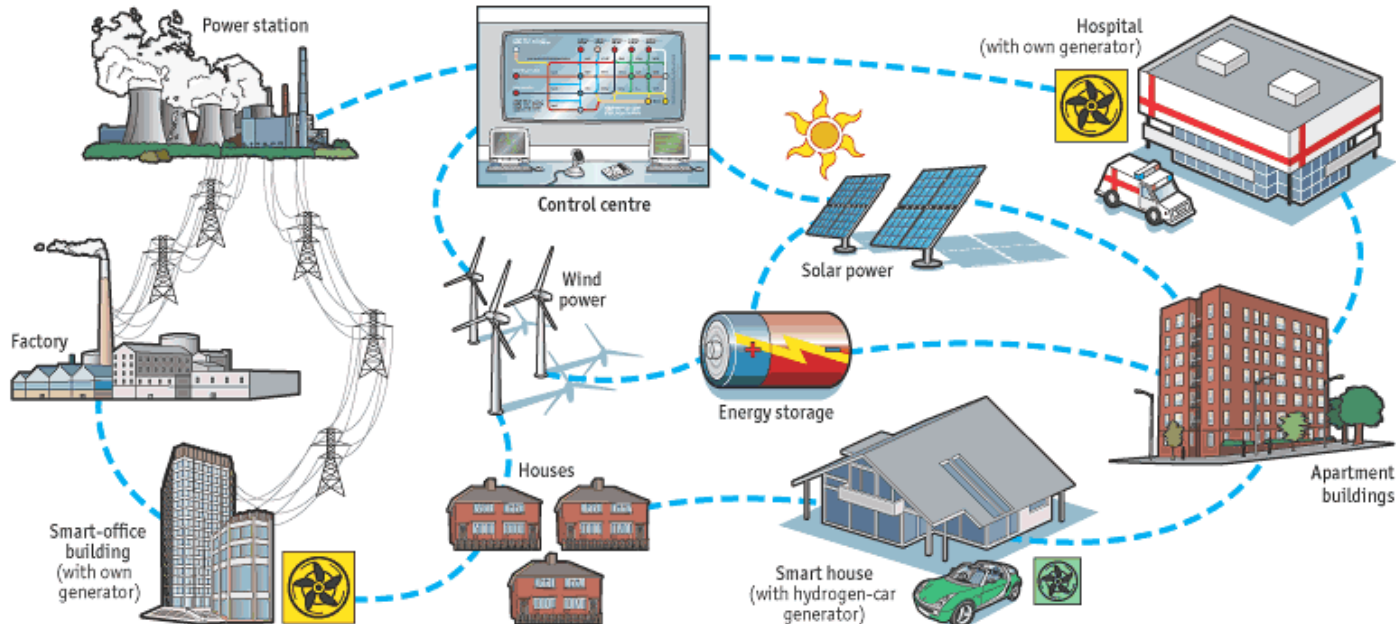


Energy internet

Many small generating facilities, including those based on alternative energy sources such as wind and solar power, are orchestrated using real-time monitoring and control systems.

Offices or hospitals generate their own power and sell the excess back to the grid. Hydrogen-powered cars can act as generators when not in use. Energy-storage technologies smooth out fluctuations in supply from wind and solar power.

Distributing power generation in this way reduces transmission losses, operating costs and the environmental impact of overhead power lines.



Current

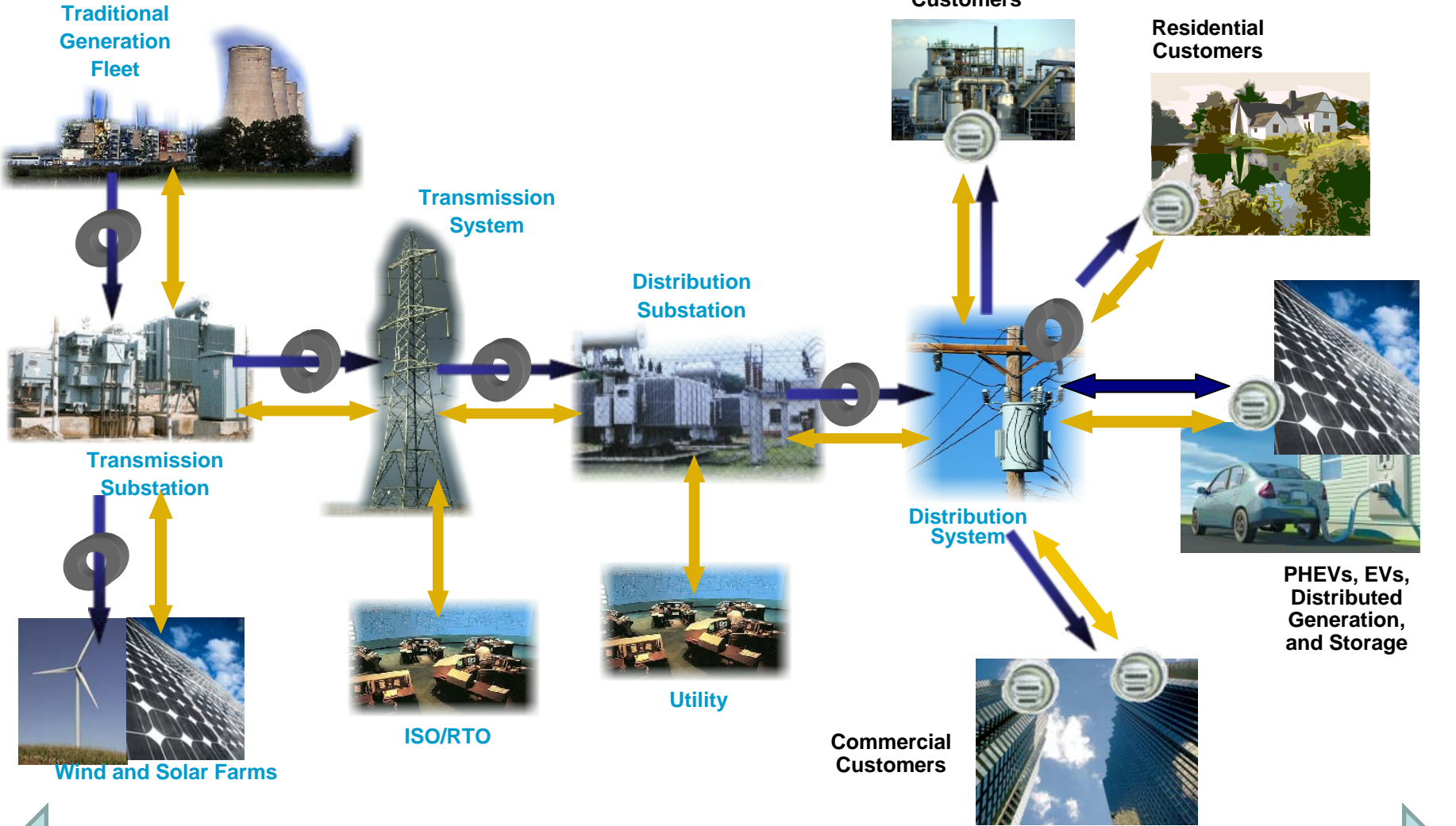
- Partial Control
- Not Integrated
- Not Optimized
- Not Interactive
- No Self-Healing
- Utility Focus

Future

- More Secure
- Total Control
- Integrated
- Optimized
- Interactive
- Self-Healing
- Customer Focus



Austin Energy Smart Grid



Central Generation

Transmission Grid (high voltage)

Distribution Grid (low voltage)

Meters and Customers

DG, Storage, Appliances, PHEVs and EVs.



AE Smart Grid Architecture



ISO/RTO



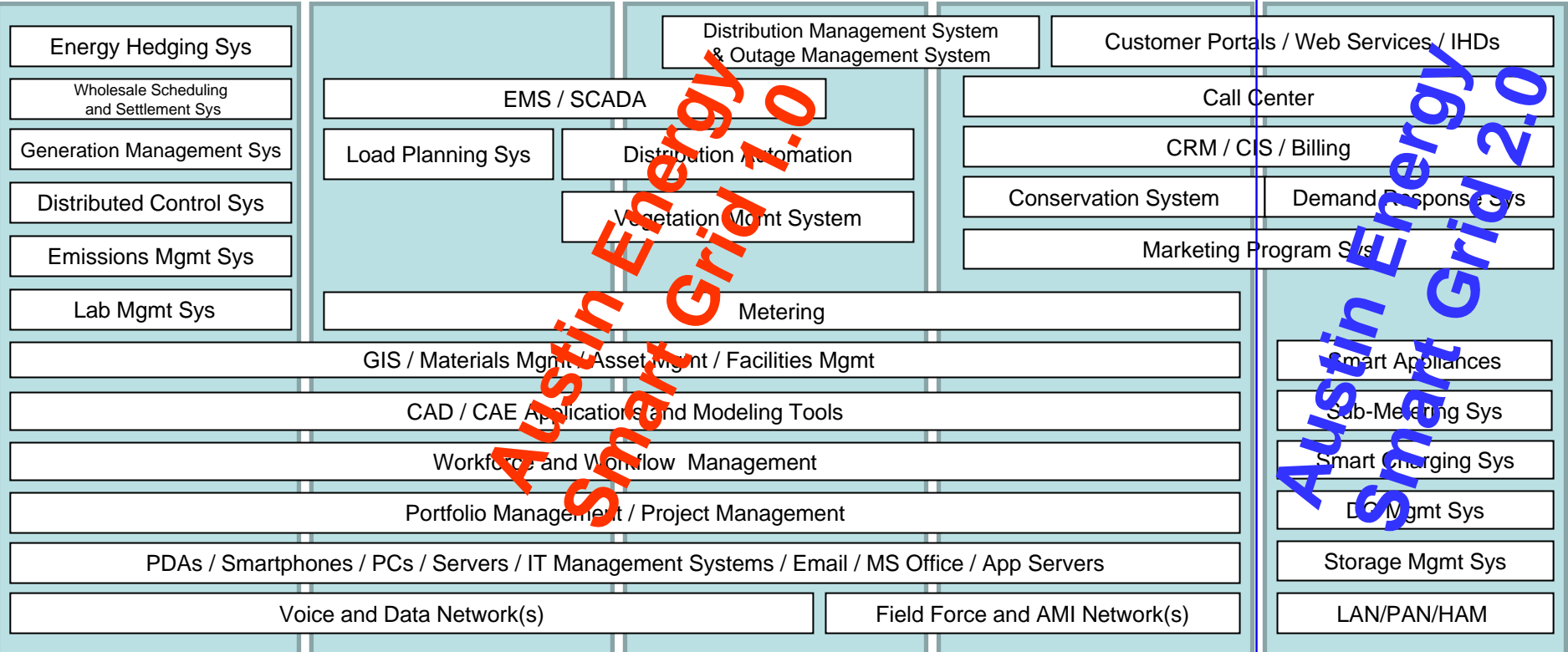
Utility



Industrial

Commercial

Residential



Austin Energy Smart Grid 1.0

Austin Energy Smart Grid 2.0



AE Smart Grid **New Systems**

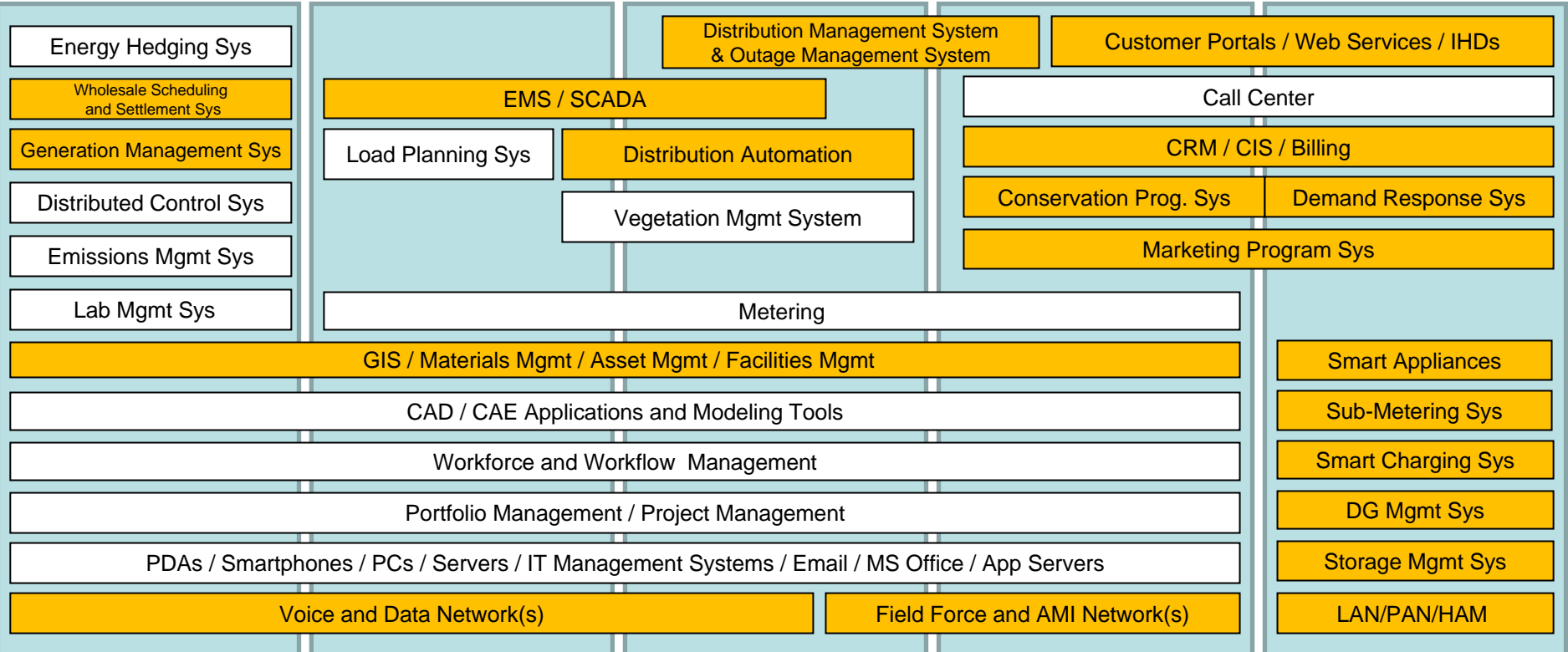


ISO/RTO

Utility

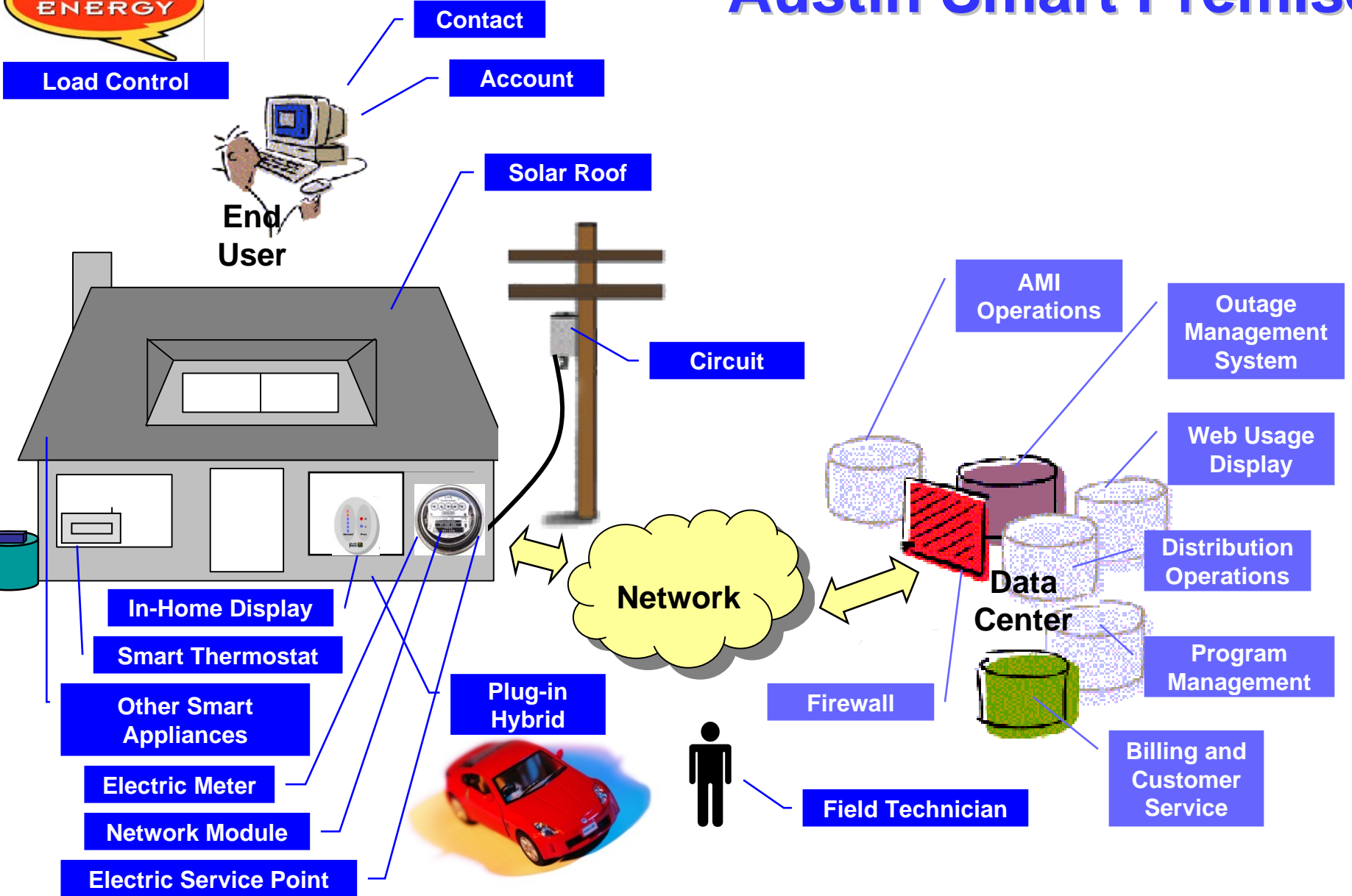
Commercial

Residential





Austin Smart Premise





AE Smart Grid Progress

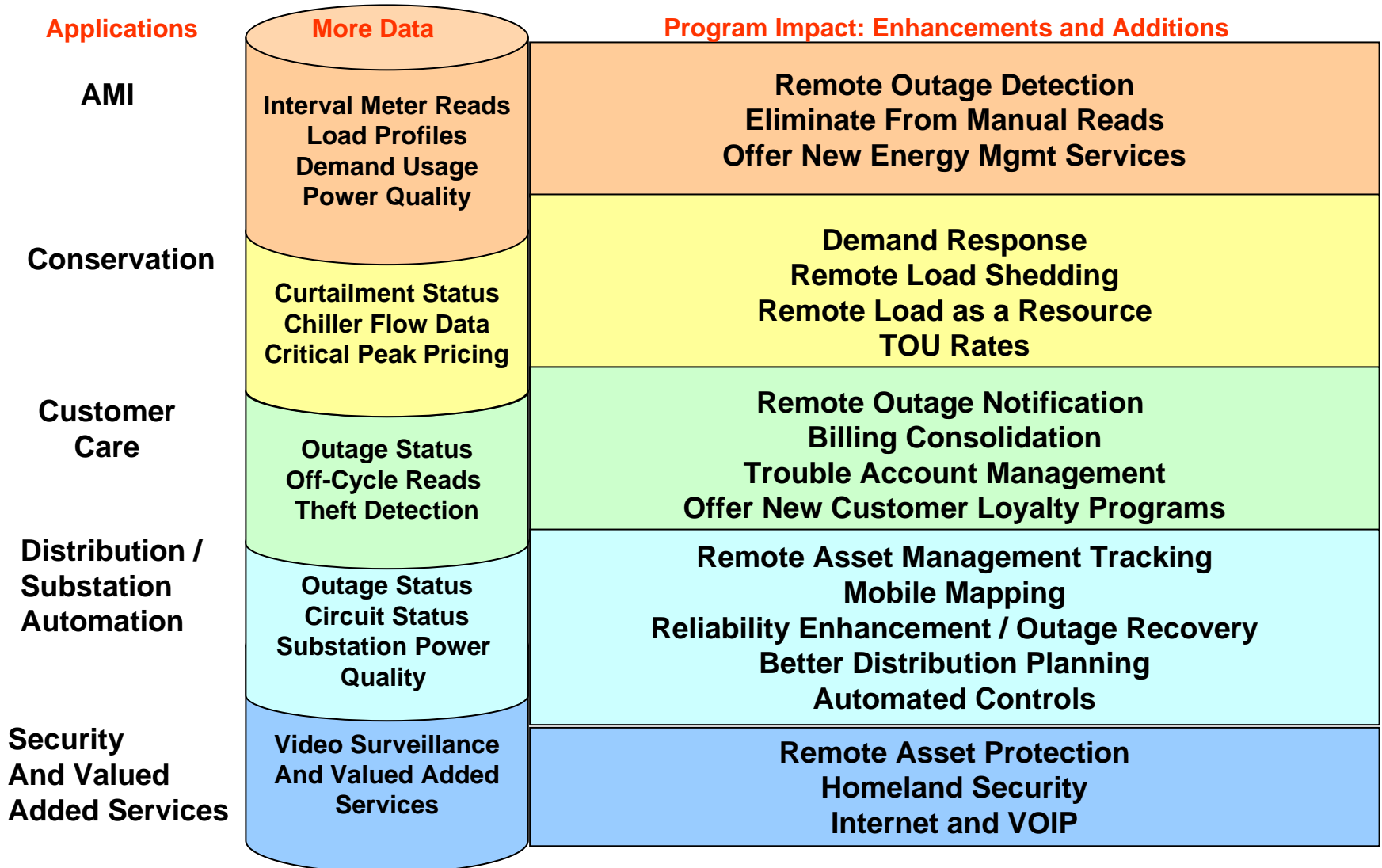
Activity

Status

- | | |
|--|--|
| 1. Build Enterprise Architecture | 1. Started in 2004. On going. |
| 2. Upgrade AMR (1 way) Network to AMI (2 way) | 2. October 2007. Done. |
| 3. Install smart meters. 130k AMR already done. 270k AMI Meters. | 3. First 130k done in 2003. Started 280k in April 2008. Expected to finish in August 2009. |
| 4. Deploy Meter Data Management (MDM) System | 4. Acquired in Sep 2008. Project started in Dec 2008. |
| 5. Deploy Distribution Management System (DMS). | 5. Acquired in Sep 2008. Pilot deployment started in Jan 2009. |
| 6. Upgrade SCADA/EMS | 6. Nov 2009. |
| 7. Upgrade Billing System | 7. Purchasing to be done in April. Project begins May 2009. |
| 8. Integrate DSM/DR devices | 8. 86k thermostats now. Evaluating other technologies. |
| 9. Integrate PHEVs | 9. Small Pilot on going. Modeling impact of 10k, 100k, and 500k units |



New Integrated Applications





New Benefits for Customers

- Faster notification and restoration times from outages
- Receive usage information to better understand and manage their bills, and ability to participate in energy efficiency and demand response programs
- Reduced inconvenience by no longer needing to unlock gates and tie up dogs for meter reads
- Improvements in timeliness and accuracy of billing, fewer estimated bills
- Remote service turn-on and shut-off
- Customer can call Utility Customer Service for real-time meter read or via data on in-home display/portal
- Customer can manage smart appliances via portal / IHD
- Ability to participate in other tariff options



New Benefits for Austin Energy

- Reduced operating costs (less truck rolls)
- Improved outage management – ability to quickly determine if power is off or on
- Reduced number of delayed and estimated bills
- Reduced energy theft
- Lower procurement costs
- Improves Load Profiler
- Improves Distribution Load Management and Planning
- Greater Historical Load and Usage Data
- Better Asset Management and Maintenance
- Time-Of-Use Pricing, pre-paid, and flat bill programs
- Reduces need for additional generation and transmission capacity
- Supports any market price-responsive tariff requirements

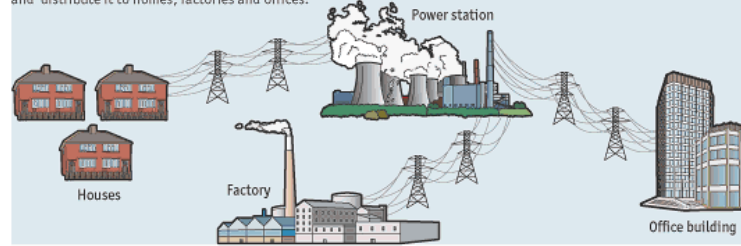


Summary: Austin Energy Smart Grid

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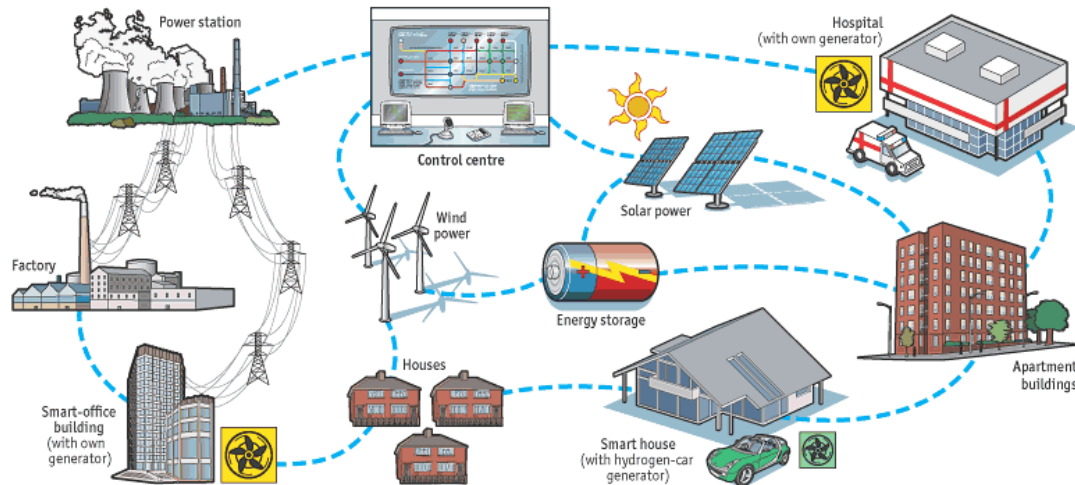


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Sources: The Economist; ABB

1. Lead transformation with Enterprise Architecture
2. Follow with AMI program to reach every meter and key assets while deploying service area network
3. Deploy new Meter Data Management System and Distribution Management System.
4. Feed Outage Management System, GIS, and Asset Management System.
5. Feed SCADA/EMS and Planning Tools as needed.
6. Feed CIS to enable new DSM/DR programs and billing rates (TOU, Net, Prepay, etc)



Any Questions???

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