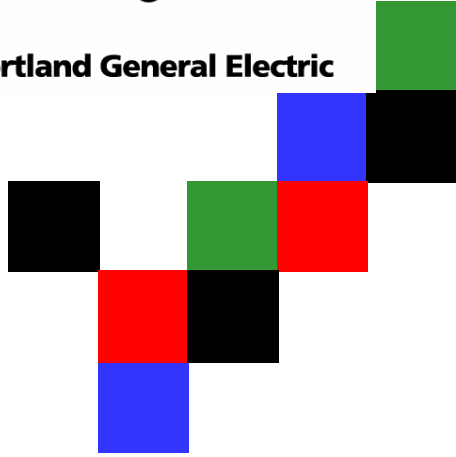




Portland General Electric



Advanced Metering Activity

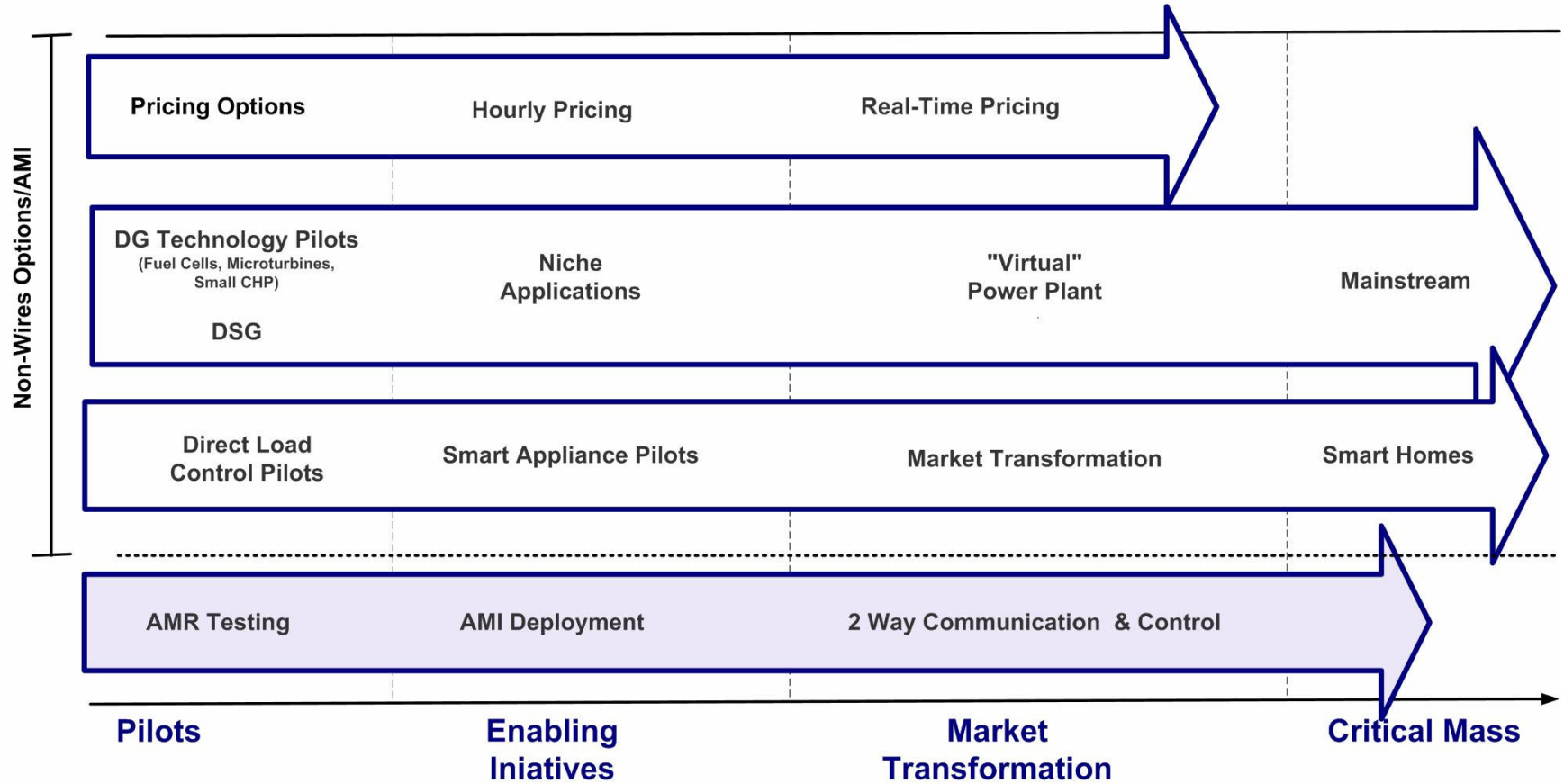
Oregon Public Utility Commission Workshop

Bruce Carpenter, General Manager Revenue Operations

January 6, 2005



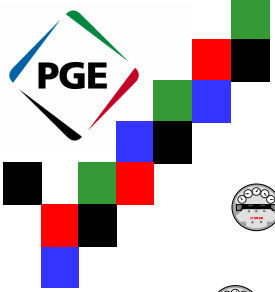
Evolution of Non-Wires Options/AMI



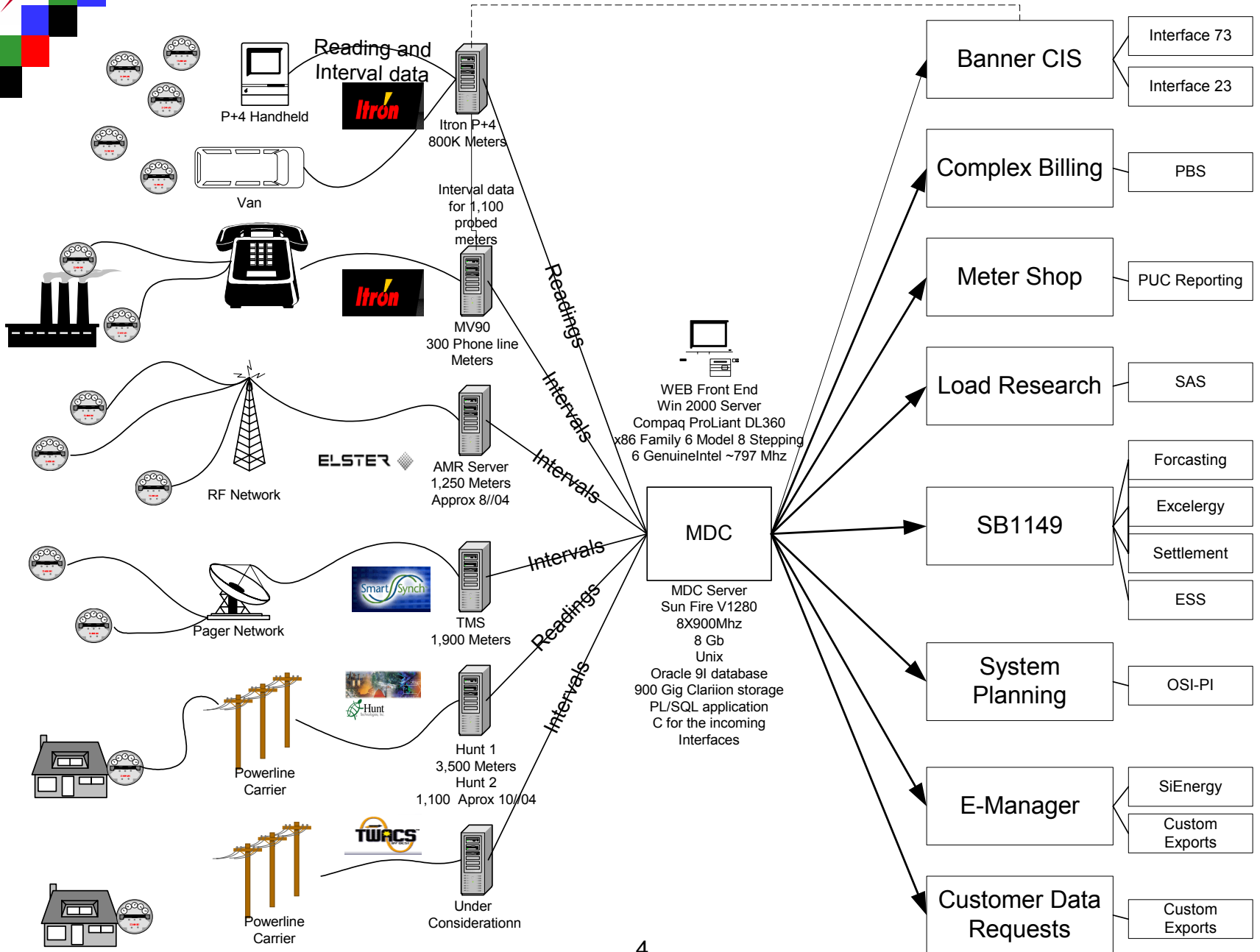


Background

- Mid 1990's - Tested and evaluated one-way and two-way metering systems
- 1999 - Selected two technologies to support Direct Access requirement
- 2004 - Completed the Business Case on Advanced Metering



PGE Technology Approach

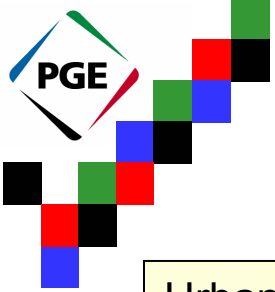




NMR Vision

Design, construct, and operate a cost-effective, two-way NMR network that provides a communication and control platform for Company process efficiencies and valued customer service.

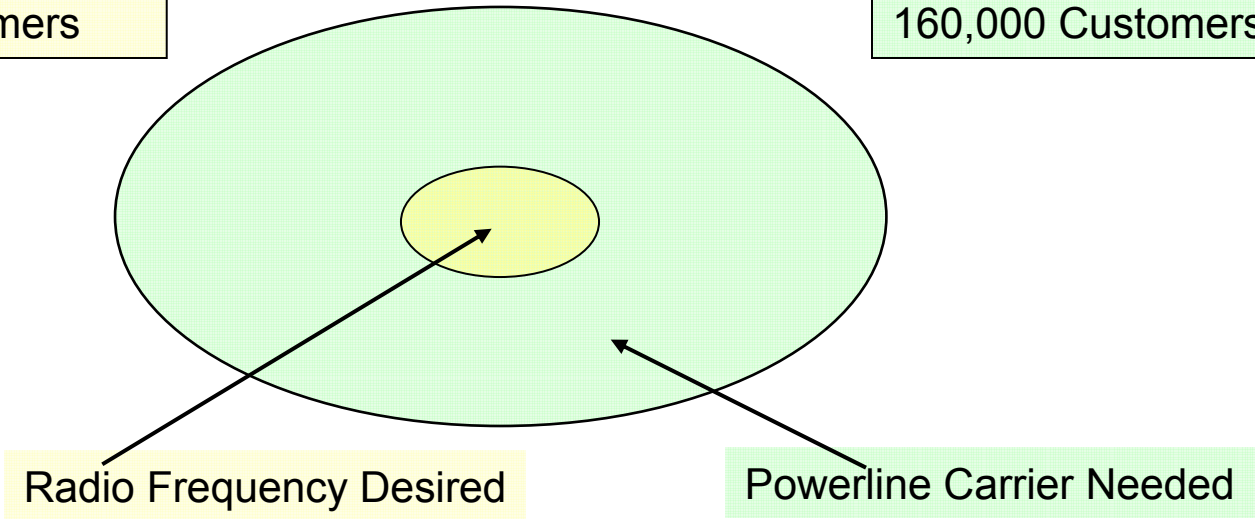
- Two-way: allows either the central office or the end point device to initiate the communications
- Communications: typically data, either meter usage data or control commands
- Control: facilitates control commands to turn on/off equipment or meters



PGE'S Service Area

Urban/Suburban 13%
of area 80% of meters
Avg. meter density
1600 meters/sq. mi.
640,000 Customers

Rural 87% of area
20% of meters
Avg. meter density
60 meters/sq. mi.
160,000 Customers



Phone expected to fill holes about 1% of the time.

Conclusion: Two technologies minimize cost of investment.



Benefits

Customer

- Customer Selected due date
- Reduced access/private property issues
- Improved outage/restoration information

Company

- Complete open/close orders on first call
- Reduced field activity
- Remote disconnect capabilities



Enables

- Web access to usage information
- Demand Response - 2 way communication
- Time Variable Pricing Options