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Load Management Standards Workshop on
Smart Grid Activities and Technology

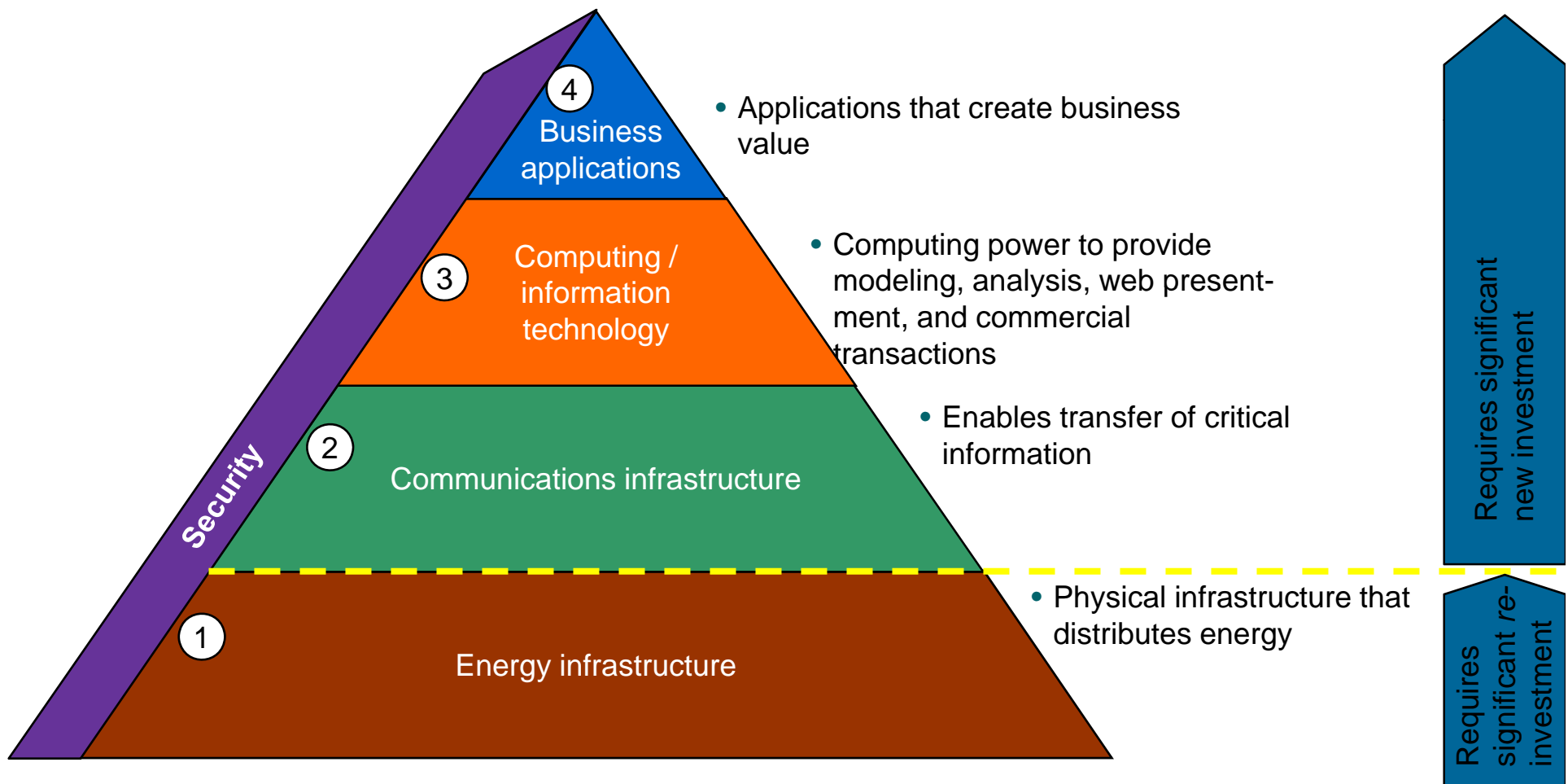
PG&E's Smart Grid Vision

Andrew Tang
Senior Director
Smart Energy Web
April 29 2008

Smart Grid Framework

The Smart Grid integrates energy infrastructure with communications and computing technologies to enable a wide range of customer offerings and grid benefits.

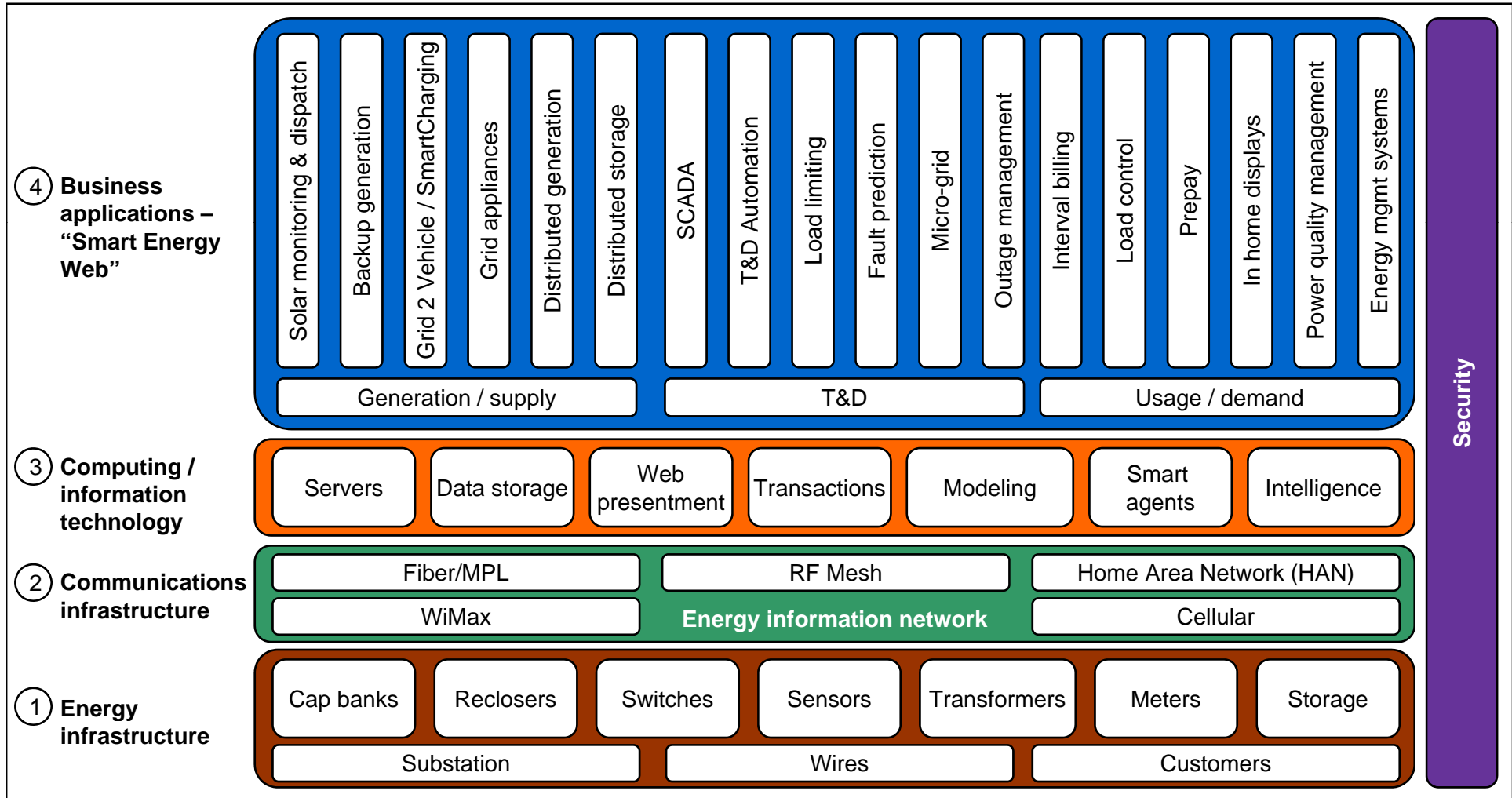
Smart Grid framework



Smart Grid Components

DRAFT

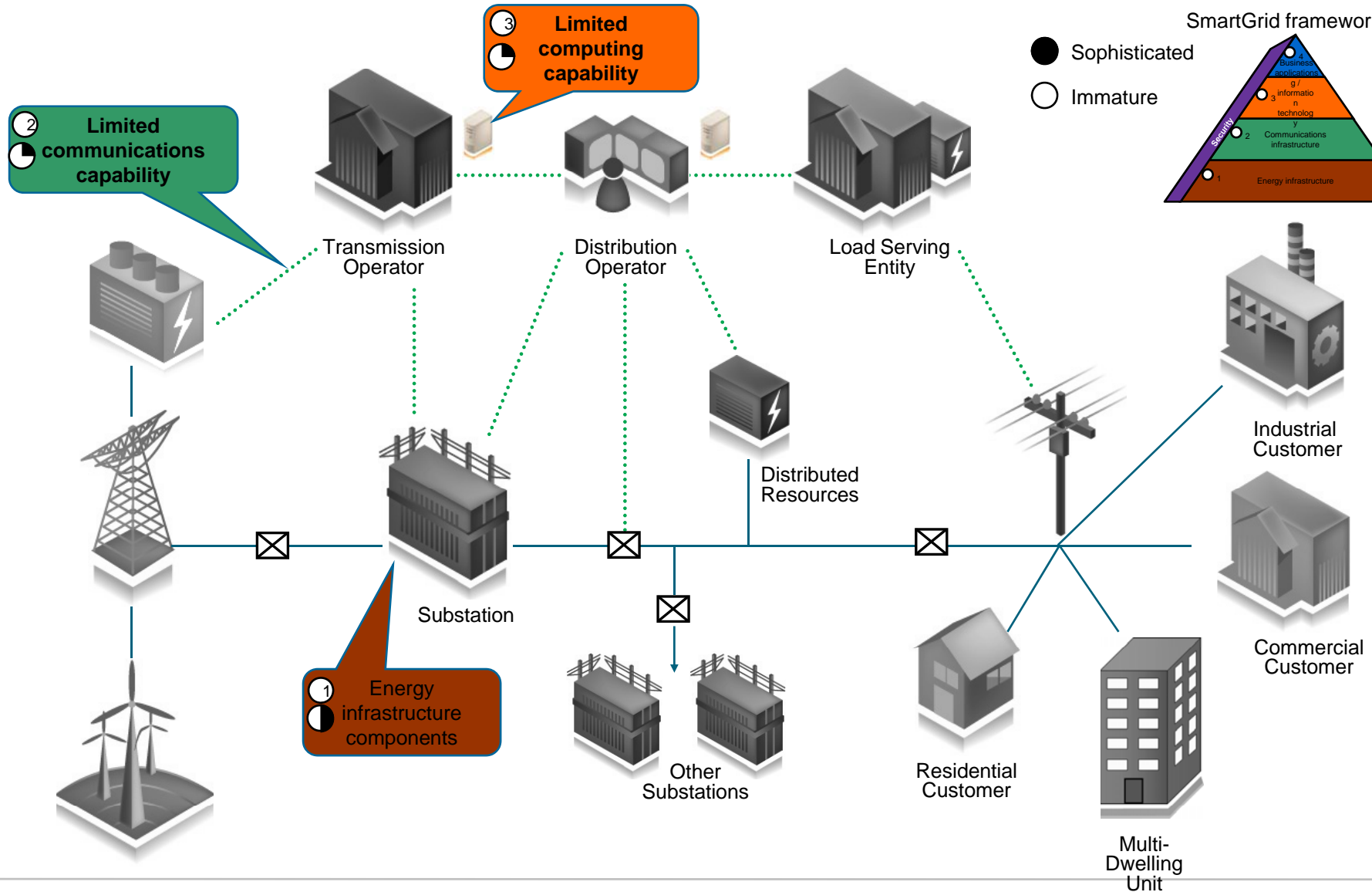
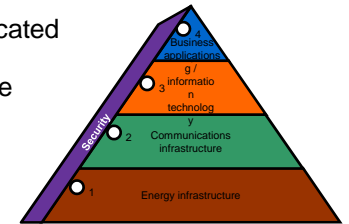
Drill down on SmartGrid components



Today's Grid

SmartGrid framework

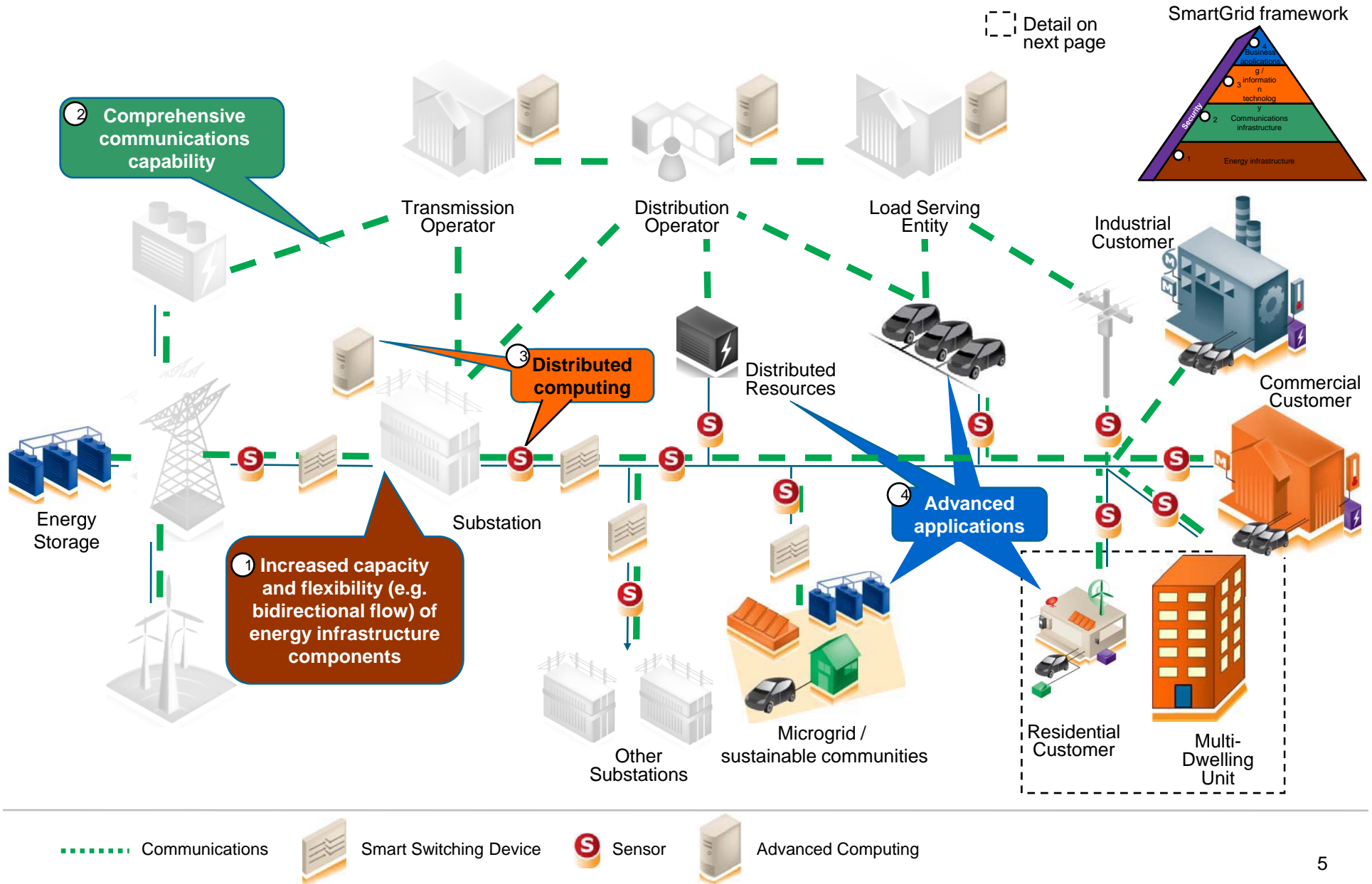
- Sophisticated
- Immature



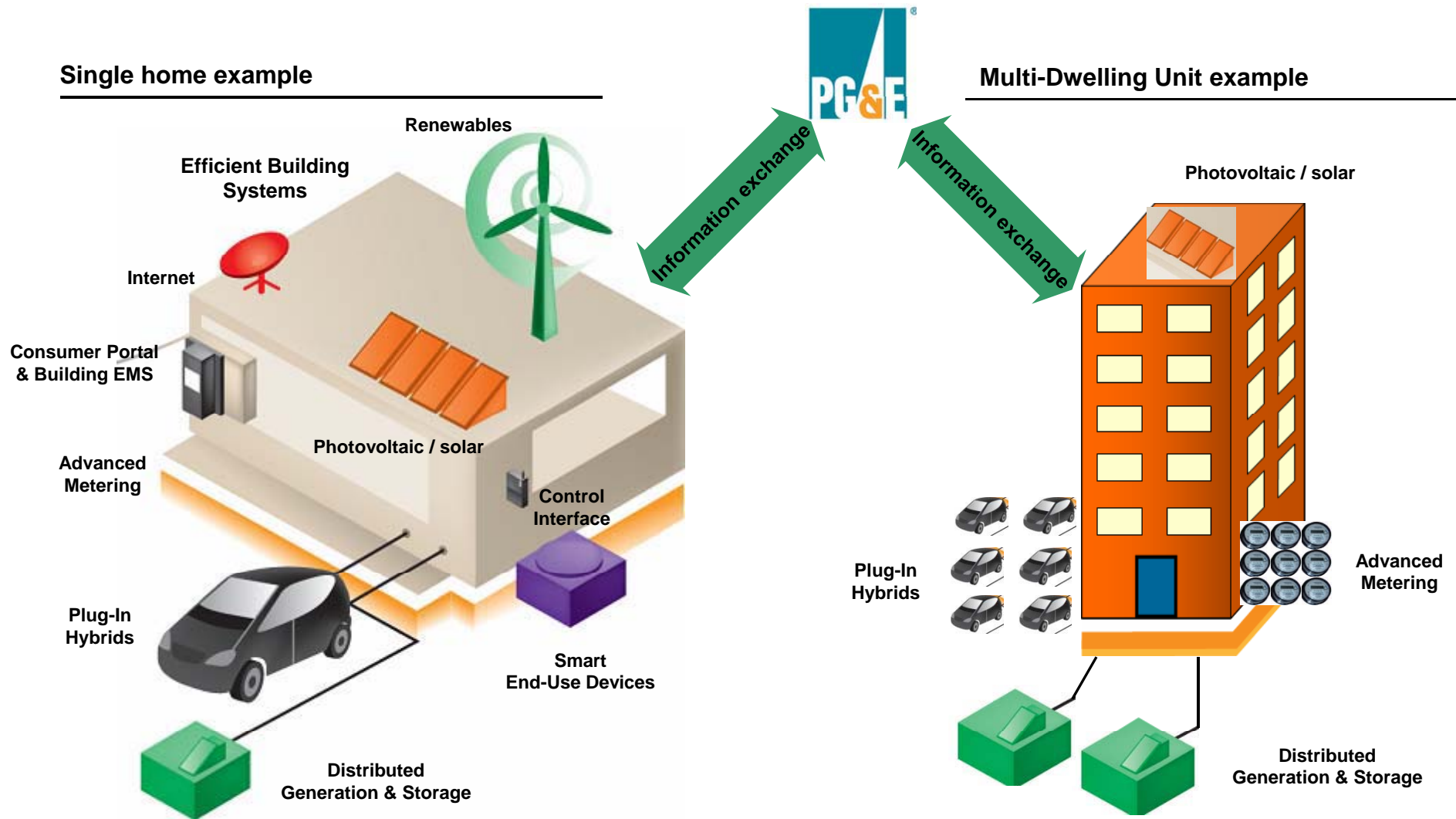
..... Communications

⊠ Switching Device

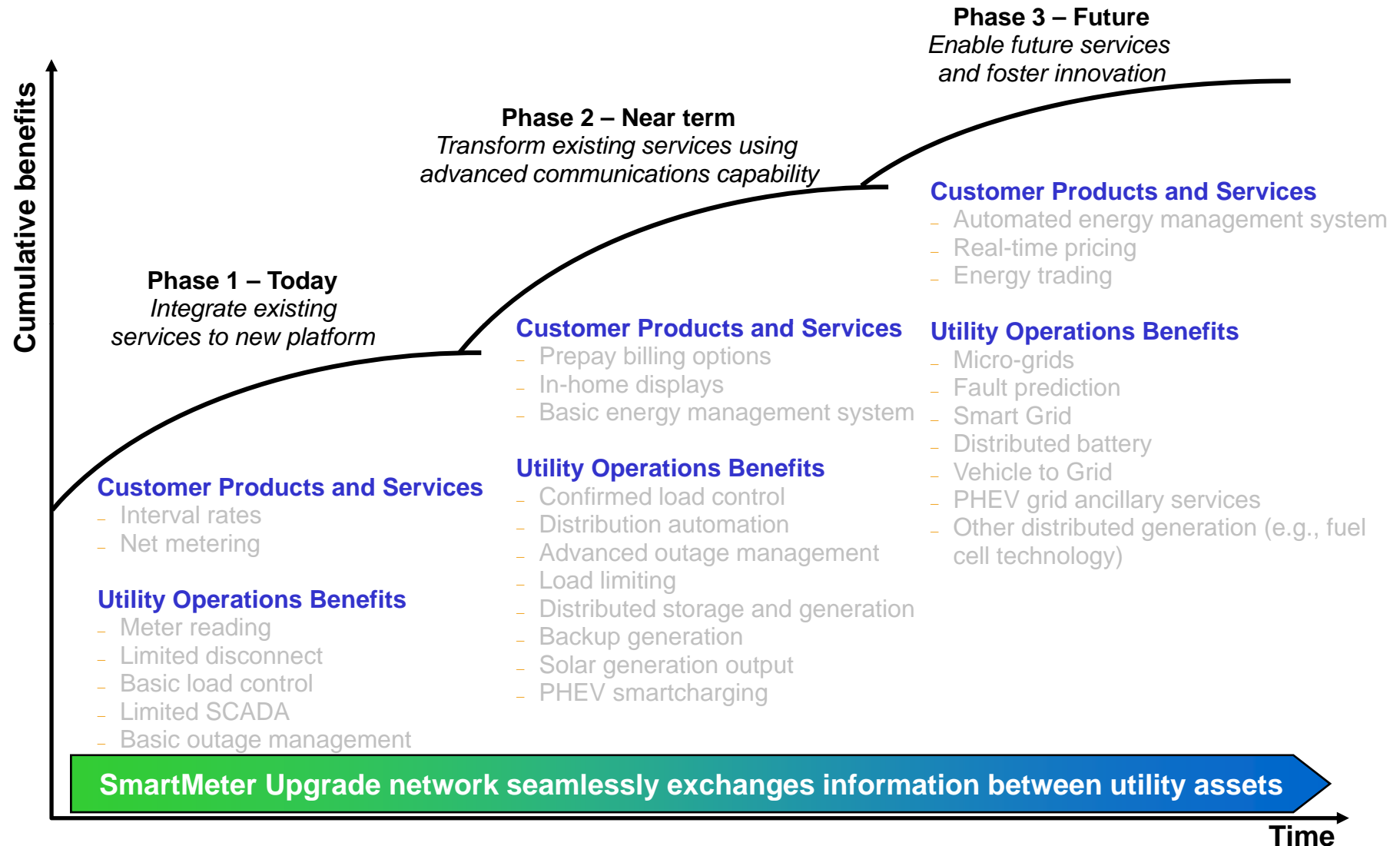
Future Smart Grid



Smart Grid Customer Opportunities



AMI Provides Enabling Communications Layer



Why pursue the Smart Grid?

A Smart Grid can enable:

Customer benefits

- Improved service reliability
- Increased power quality management capabilities
- Improved ability to manage customers' total energy costs
- Improved energy efficiency
- Improved distributed and renewable resource and storage integration
- Enables SmartCharging and Grid to Vehicle (G2V)
- Enhanced product pricing options

System benefits

- Improved system reliability
- Improved system efficiency
- Reduced congestion costs
- More effective planning capability
- Enhanced power management
- Continued safety improvements
- Improved integration of renewable and other distributed resources
- Integrated customer products and grid operations – “future-proof system”
- Effective integration of microgrids and “sustainable” communities