

EPRI

ELECTRIC POWER
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The Smart Grid and the Consumer

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**Innovative Smart Grid Technology
Conference**

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What Consumers want from Electricity Sector Investments

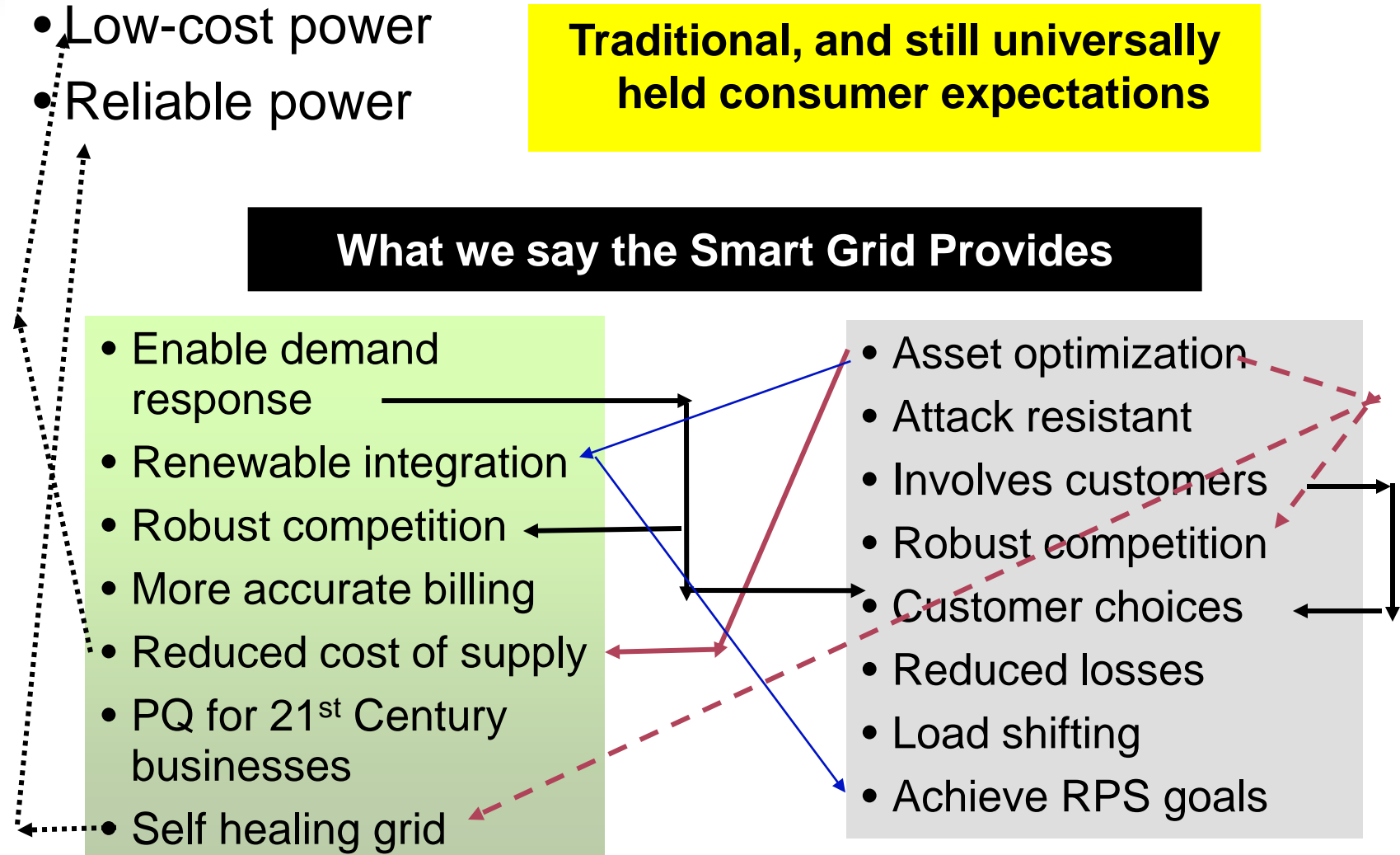
- Low-cost power
- Reliable power

Traditional, and still universally held consumer expectations

What we say the Smart Grid Provides

- Enable demand response
- Renewable integration
- Robust competition
- More accurate billing
- Reduced cost of supply
- PQ for 21st Century businesses
- Self healing grid

- Asset optimization
- Attack resistant
- Involves customers
- Robust competition
- Customer choices
- Reduced losses
- Load shifting
- Achieve RPS goals



Shopping for Smart Grid Benefits

1. Utility Cost Savings
2. Energy and Demand Conservation
3. Improved Reliability
4. Improved Power Quality
5. Environmental Improvements
6. National Security
7. Sustainable Economic Prosperity



Utility Cost Savings

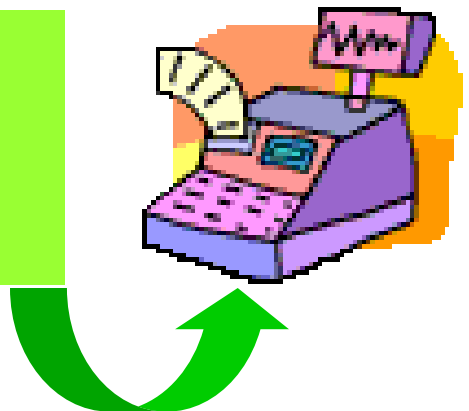
Shop

- Lower operating O&M costs (non-generation)
- Added revenues from increased sales and services



CheckOut

- **Attributed book or marginal costs**
- **Net revenues from new services sales**

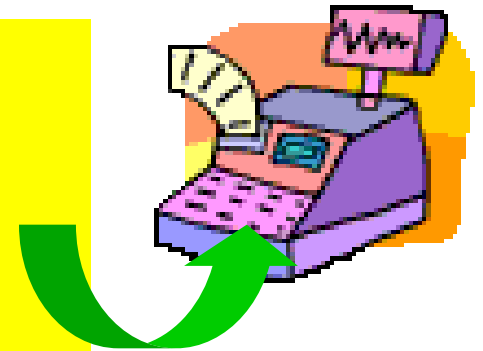


Energy and Demand Conservation

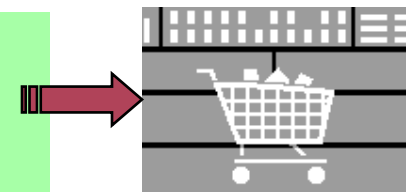
- Energy (KWH) reduction
- Lower capacity (kW) requirements
- Cost-reducing portfolio reconfiguration



- **Avoided capital costs**
- **Avoided energy generation costs**
- **Lower T&D losses**



What about collateral externality benefits attributable to conservation??

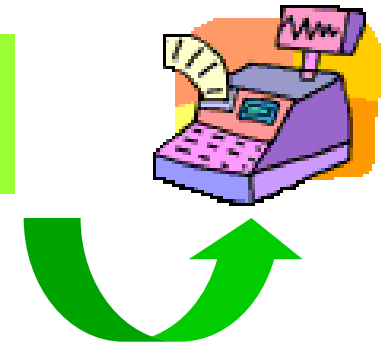


Improved Reliability

- Few outages
- Shorter outages
- Better conveyance of outage state information to consumers



- Value of lost load

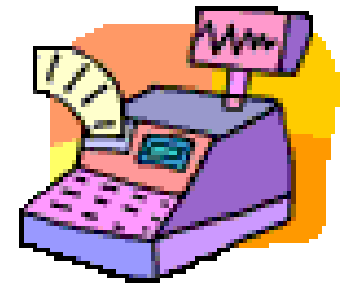


Improved Power Quality

- Reduced sags and spikes
- Fewer harmonic disturbances



- **Reduced household inconvenience**
- **Reduced business losses**

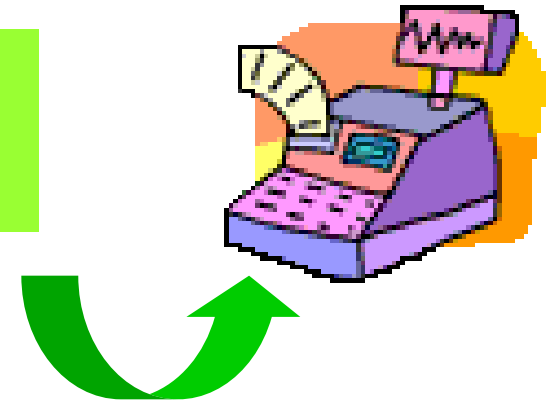
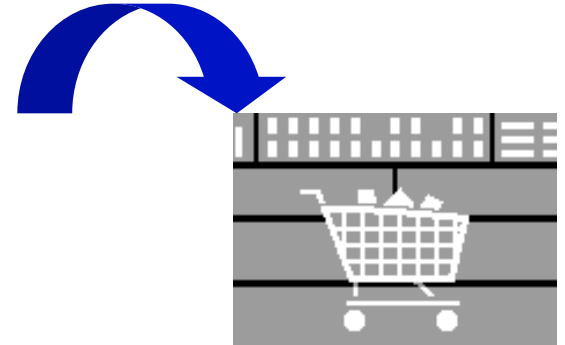


Environmental Improvements

- Reduced Carbon emissions
- Reduced air bourn particulates

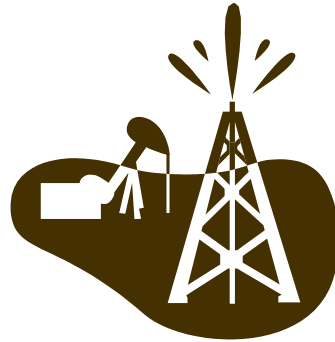


- **Reduced medical costs**
- **Lower morbidity and mortality**

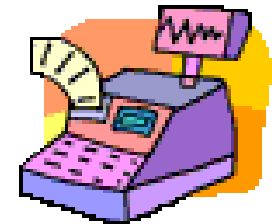


National Security

- Reduced generation from imported oil

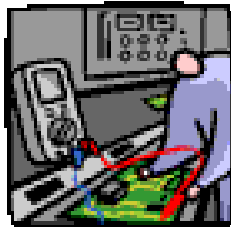


- Value of security to the country and its citizens

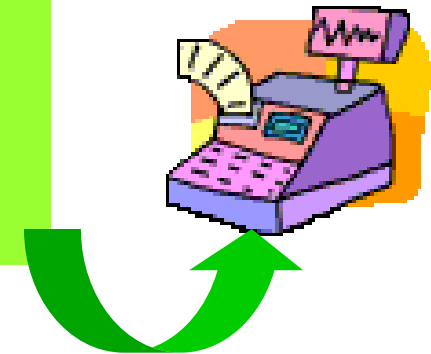


Sustainable Economic Prosperity

- More jobs
- Better jobs
- Business expansion



- Higher household income
- More even income distribution
- Expanded GNP, trade balance



Consumer Perceptions and Attitudes about Smart Grid Benefits

Utility Cost Savings

kWhs and kW reductions

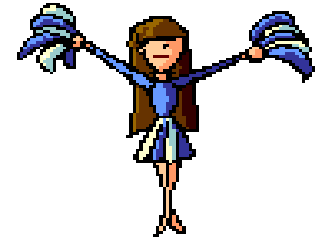
Environmental Improvements

Power Quality

Improved Reliability

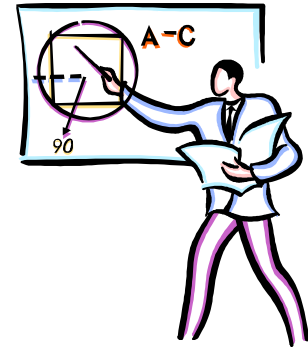
National Security

Sustainable Economic Prosperity



Selling the Smart Grid

- Collaborate to establish robust protocols for estimating Smart Grid benefits
- Use the protocols
- Articulate the benefits in ways that customers can understand and buy into
- Be prepared to demonstrate that the benefits were indeed delivered



Together...Shaping the Future of Electricity

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