

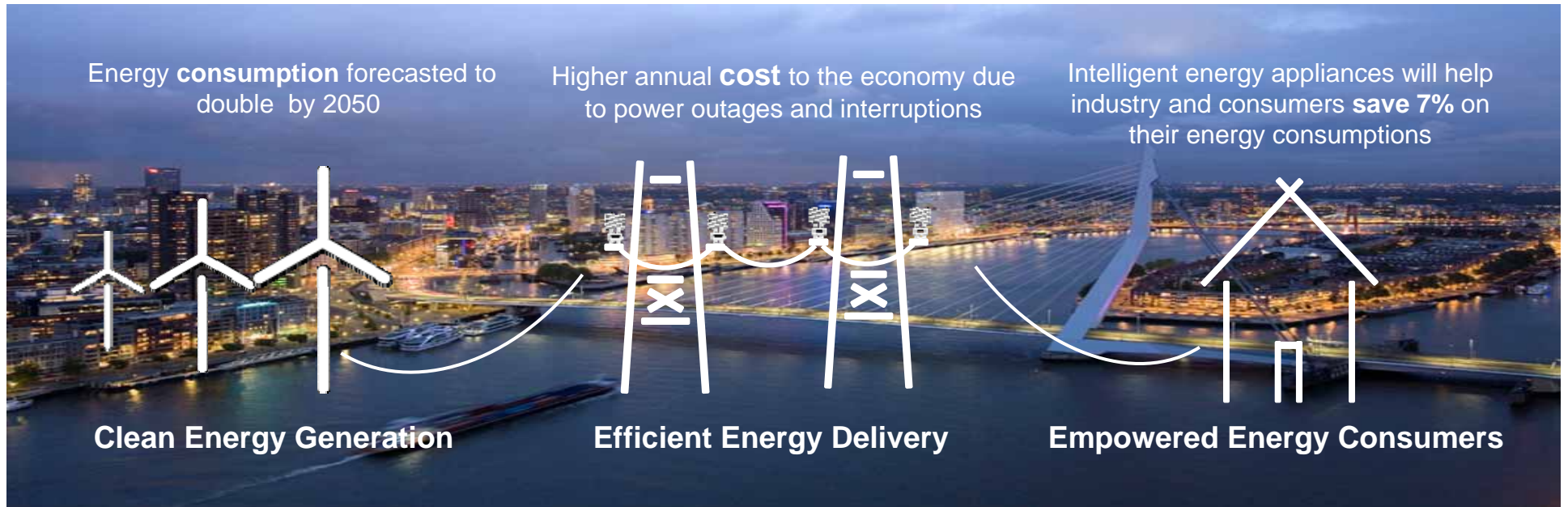
# Smart Grid



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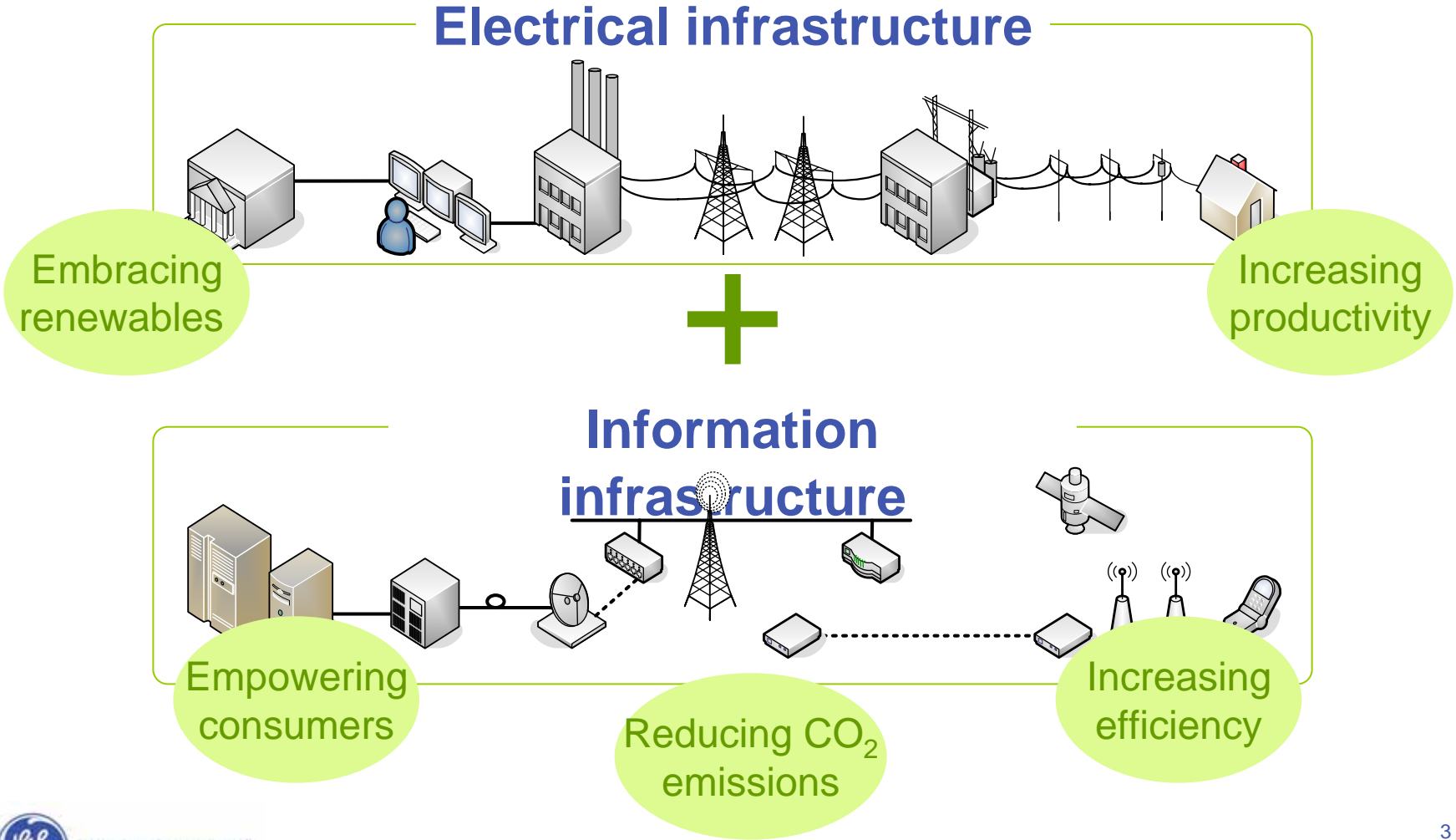
# Smart Grid Drivers



- Long-term energy demand increasing
- High penetration of Renewables
- Aging infrastructure and restricted asset investment
- Importance of reliability & quality

# A smarter grid

The integration of two infrastructures ... securely ...



# The Smart Grid

Smart grid marries automation and information technologies with current electrical infrastructure to support our 21st Century society energy needs.

Acting as an “energy internet,” the smart grid delivers real-time energy information and knowledge, empowering smarter energy choices.

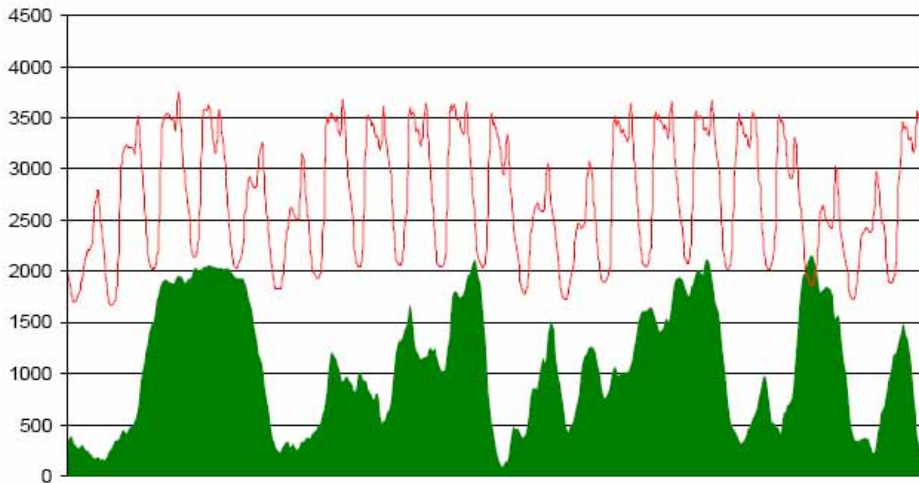
A smarter grid:

- enables **integration of more clean, domestic energy sources** (such as wind, solar, biogas) and plug-in electric vehicles
- **increases energy and operational efficiencies and reliability** to deliver greater productivity
- **empowers consumers with information** to manage their energy usage and save money without compromising their lifestyle

GE is uniquely positioned with a broad range of products and solutions – from wind turbines to smart appliances – to help transform the way we power the world.

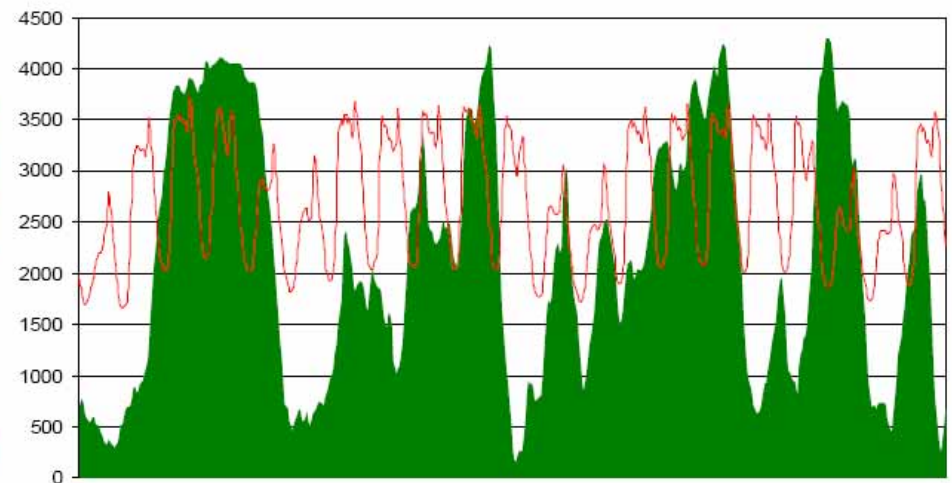
# Integration of Renewables and Demand Side Management

DK Vest, January 2008, Demand and Wind power



Wind power Demand

January 2008 + 3,000 MW



Wind power Demand



# Capacity, Storage & Demand

- Reduce thermal plant peaks
- Ensure no wastage of renewable energy (“free” wind/solar)

## Means to Reduce Volatility:

- Interconnection
- Storage
  - Pumped Water
  - Compressed Air
  - Flywheel
  - Super Capacitor
  - Batteries (inc. PH-EV)
- Demand Side Management (DMS)
  - Time of Use (TOU) tariffs
  - Maximum Demand Schemes
  - Direct Load Control (DLC)



# Conclusions:

- Technically viable today
- Requires
  - ✓ Consumer engagement
  - ✓ Smart grid
  - ✓ Upfront investment
  - ✓ Regulatory reform
- We need to start now...

[www.Itsyoursmartgrid.com](http://www.Itsyoursmartgrid.com)