



Electricity Value Network

Digital Transformation with GE Solutions

\$1.3T

Industry Value from:
Service platforms
Smart devices
The 'cloud'
Advanced analytics

\$387B

Asset Performance Management Value from:
Lower repair & maintenance costs
Lower downtime of assets
Fewer critical breakdowns

\$2+T

Societal Benefits from:
Reduction in carbon emissions
Net new job creation
Value creation for consumers

Source: World Economic Forum White Paper Digital Transformation of Industries: Electricity Industry, January 2016

Fossil

Gas

Customer Results:

- Load ramping at up to **±50 MW/min, 2.5 X** normal rate
- **2% increased** fuel efficiency
- **2.5% increase** in peak output to meet short term demands
- **\$2.5MM** cost reduction & avoidance over first year
- Reduction in insurance cost **~ \$8.8MM per year**
- **NERC CIP** Compliance

Solutions:

- Provides early warning prior production failure with predictive maintenance
- Helps plant management understand how to engage control software using analytic software
- Provides visibility into power production for plant managers and traders for real-time decisioning
- Enables rapid turn-up, manages fuel variability and maintaining emissions level with advanced analytics
- Identifies vulnerabilities and ongoing threats with intrusion detection

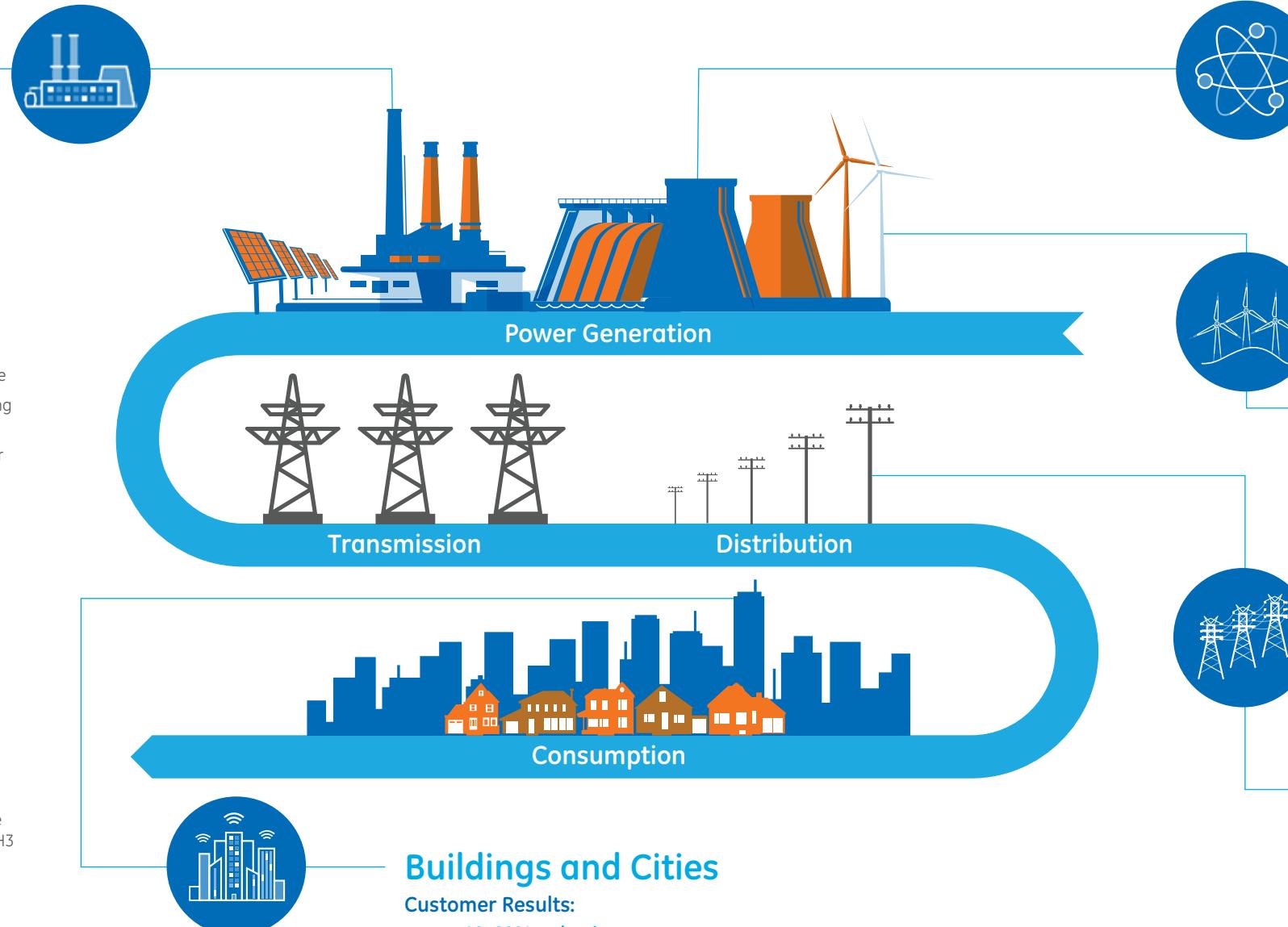
Coal

Customer Results:

- **10-15%** NOx reduction
- **0.5-1%** heat rate improvement
- **15-30%** less overall soot blowing
- **ROI < 1 year**

Solutions:

- Maintains "sweet-spot" operations while optimizing the boiler performance across multiple objectives: NOx, heat rate, steam temperatures, CO, LOI, NH3
- Improves soot blower control
- Provides plant flexibility by revealing operating options/trade-offs
- Frees operators to focus on higher level issues



Buildings and Cities

Customer Results:

- Up to **10-20% reduction** overall energy consumption
- Up to **50% reduction** in lighting costs

Solutions:

- Reduces energy costs and consumption by adopting energy-saving technologies such as LEDs
- Enables energy independence, resiliency and environmental responsibility by adopting on-site generation technologies (i.e. solar and combined heat and power)
- Reduces energy cost, consumption and carbon footprint by leveraging energy storage, EV charging and demand response
- Improves energy performance and creates new value streams with data and analytics

current
powered by GE

Nuclear

Customer Results:

- **>10 curies reduction** in transported source term
- **30% dose rate reduction** in affected areas
- **5 person-rem reduction** for plant

Solutions:

- Allows reactor operator to manage steam moisture content to better balance total efficiency of the plant
- Delivers prediction models that enhance operating designs
- Allows moisture carryover targets to be strategically planned to meet business needs

Wind Farm

Customer Results:

- **10% reduction** in maintenance cost
- **1% increase** in production based on availability
- Up to **10%** annual Energy Production
- **1-3% increase** in Revenue

Solutions:

- Provides fleet-wide view of turbines' state, status and health with remote turbine control
- Enables smart maintenance decisions and forecast of useful life
- Improves turbine performance with farm level optimization
- Provides models for day-ahead and real time weather forecasting

Grid

Customer Results:

- Up to **\$3M Opex saving** in 1st year
- Improved reliability by reducing system interruption by **33%**
- **30% reduction** in storm response costs
- **20%+ increased** carrying capacity of existing networks
- Up to **5x faster** work completion
- Up to **30-60%** improvement in forecast accuracy for power restoration

Solutions:

- Identifies disruption location and reroutes distribution to restore power to customers
- Manages utilities restoration workforce and equips the field workers with actionable data
- Monitors, controls and regulates the power line assets that optimize power flow

