



Panel Discussion : PHM for Electric Grids

Sameer Vittal (GE Power)

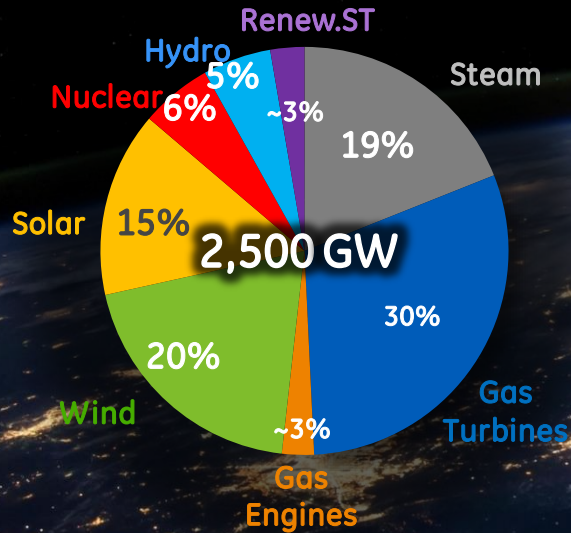
October 03, 2017

Presented at the PHM2017 Conference in St. Petersburg, FL (USA)

[Imagination at work](#)

WORLD POWER ... THE NEXT 10 YEARS

New Equipment, 2015-2024



*Excludes 700 GW of non-grid connected capacity additions

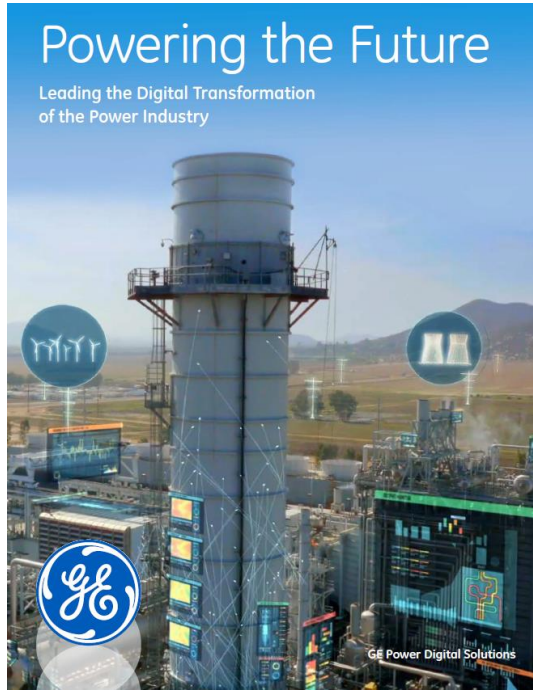
Source: GE Power estimates, McCoy, UDI Platts

- Centralized power
Still ~75% of orders
- Emerging markets drive growth
~75% of orders
- Renewables becoming mainstream
Solar up ~200% vs. last 10 years

Making power more reliable, affordable, and sustainable



Our Perspective On the Future of the Power Sector



“... The future of the power sector is a **new value chain augmented and interconnected by digital technologies** — one where both power and information flow in multiple directions; all actors add value; and the overall efficiency, cost-effectiveness, resilience, and sustainability of the system are enhanced through information sharing, openness, collaboration, and coordination between stakeholders through the right set of incentives.

It will encompass **three key elements**:

- (1) a digital centralized generation pillar**, relying on a mix of fossil fuel and renewable sources;
- (2) a digital grid**, connecting generation and consumption, and enabling the multidirectional flows of energy and information
- (3) a digital consumption pillar**, improving consumption patterns along with distributed generation and storage capacity.”

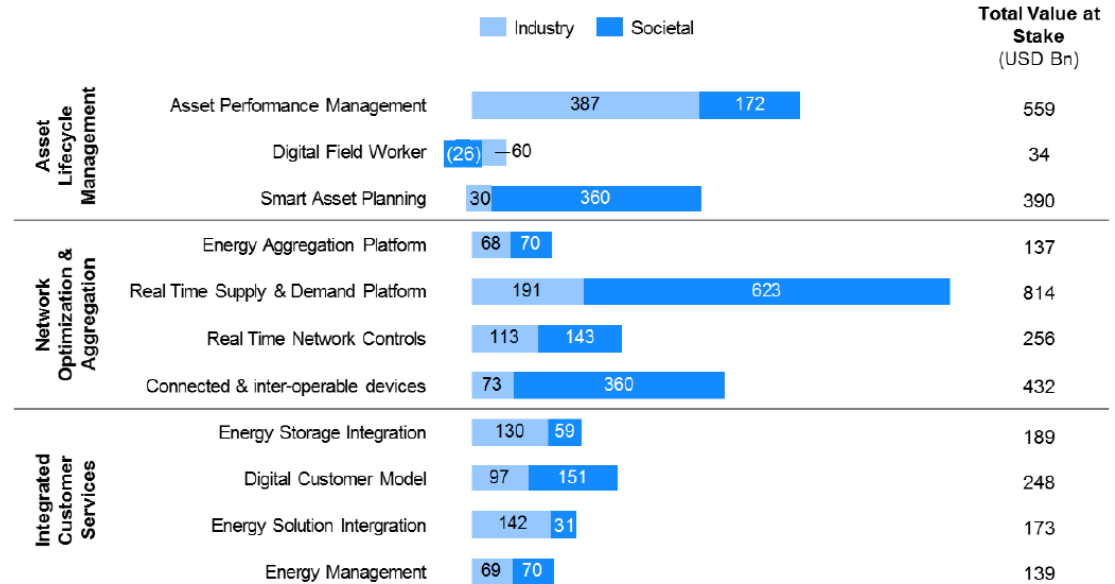


Reference: Powering the Future: Leading the Digital Transformation of the Power Industry, Authors: Marco Annunziata, Ganesh Bell (2016)

Additional Perspectives ...



Figure 3: Value at stake for digital initiatives

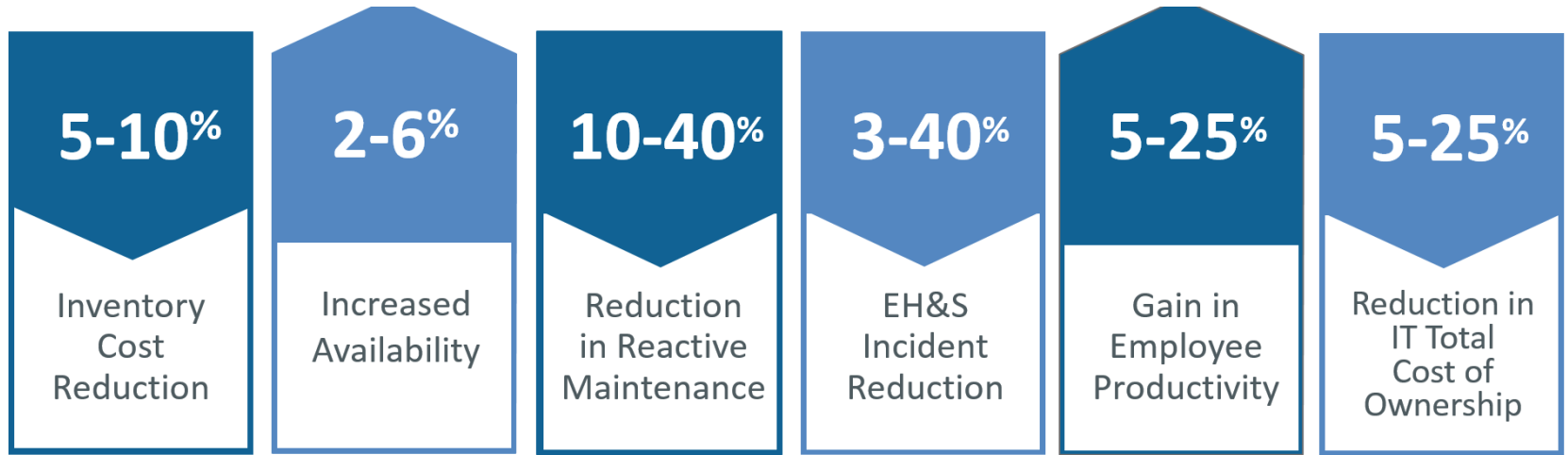


Source: Accenture research for the Digital Transformation of Industries project

Reference: World Economic Forum White Paper, Digital Transformation of Industrial : Electricity (January 2016)



APM – Typical Business Benefits



PHM = Prognostics & Health Management

APM = Asset Performance Management, that includes PHM as part of a larger enterprise IT solution



Suite Overview | APM Offerings

APM Solution Map

GE Digital's APM is a full end-to-end suite that is comprised of four modules designed to increase asset reliability and availability, while simultaneously reducing cost and risk



Reliability Management

Achieve less unplanned downtime by predicting equipment issues before they occur.

- Predictive analytics
- Case and collaboration management
- Knowledge management
- Root cause analysis
- Reliability analysis



Compliance and Integrity Management

Ensure asset integrity and compliance by monitoring changing risk conditions.

- Hazard analysis
- Safety lifecycle management
- Risk based inspection
- Inspection management
- Thickness monitoring



Asset Strategy Optimization

Optimize across availability, reliability, risk, and costs through intelligent asset strategies.

- Reliability centered maintenance
- Failure mode and effects analysis
- Strategy management
- Strategy library
- Lifecycle cost analysis
- Financial and risk simulation



Machine and Equipment Health

Anytime, anywhere, unified view of your assets' current state and health.

- Connectivity
- Data management
- EAM integration
- Condition monitoring
- Data analysis and visualization
- Criticality analysis
- Event management
- Recommendation management
- Benchmarking



Typical APM Time to Value

