Standards Alliance Workshop
Accra, Ghana

March 31, 2017
A DIGITAL INDUSTRIAL COMPANY

$124B Revenue  350,000+ people  >180 countries

2015 Revenues

POWER  ENERGY CONNECTIONS  RENEWABLE ENERGY  OIL & GAS  AVIATION  TRANS.  HEALTH CARE

$30B  $8B  $6B  $16B  $25B  $6B  $18B

Leading the Digital Transformation of All Industries, Including Power
GE POWER

~$30B revenue ~100,000 employees >150 countries

GAS POWER SYSTEMS

POWER SERVICES

STEAM POWER SYSTEMS

WATER & DISTRIBUTED POWER

GE HITACHI NUCLEAR ENERGY

POWER DIGITAL SOLUTIONS

Schenectady, NY, USA

Baden, Switzerland

Baden, Switzerland

Trevose, PA, USA

Wilmington, NC, USA

San Ramon, CA, USA

FUNCTIONAL EXPERTISE

OPERATIONAL EXCELLENCE

DIGITAL CAPABILITY

GE Ghana ... Our growth story so far

- **2014**: GE moves to new Accra office.
- **2015**: GE Gas Turbines installed on FPSO Kwame Nkrumah.
- **2018**: GE adopts Village of Hope Orphanage.
- **2014**: GE Oil & Gas Opens New Deepwater Service Center.
- **2016**: P&W sets SSA hub in Ghana.

**Past Projects**

- **2010**: GE opens office in Accra.
- **1960 – 2000’s**: T’di 1, Tdi 2, Tema 1, Tema 2 Thermal power plant.
- **2014**: GE Gas Turbines installed on FPSO Kwame Nkrumah.
- **2011**: GE moves to new Accra office.
- **2014**: GE Oil & Gas Opens New Deepwater Service Center.
- **2016**: P&W sets SSA hub in Ghana.

**Future Projects**

- **2020**: Akosombo Dam.
Ghana Power Landscape

Electricity Supply Value Chain

- Generation
- Transmission
- Distribution
- End customer

GE Power + IPPs

GE Energy Connections

Fuel Type/Quality/Price
Technology Efficiency
Emmissions

Grid Stability / Frequency support
Transmission Losses
Spinning Reserve

Distribution Losses
Efficient control Systems

Energy Efficient Appliances
Cost Reflective Tariffs
Peak power pricing

Safety is the ultimate standard: “Nothing is so important that it cannot be done safely”
## Typically regulated pollutants

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Health Concerns</th>
<th>Gas Turbine Control Technology</th>
<th>Plant Control Technology</th>
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<tbody>
<tr>
<td>Nitrogen Oxides (NOx)</td>
<td>Respiratory Effects</td>
<td>Dry Low NOx Water Injection</td>
<td>Selective Catalytic Reduction (SCR)</td>
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<td>Carbon Monoxide (CO)</td>
<td>Reduce Oxygen Absorption</td>
<td>Complete Combustion</td>
<td>Oxidation Catalyst</td>
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<tr>
<td>Volatile Organic Compounds (VOC)</td>
<td>NOx and VOC form Smog</td>
<td>Complete Combustion</td>
<td>Oxidation Catalyst</td>
</tr>
<tr>
<td>Particulate Matter (PM)</td>
<td>Respiratory Effects</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfur Oxides (SOx)</td>
<td>Respiratory Effects/ Acid Rain</td>
<td></td>
<td>Low Sulfur Fuels</td>
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<tr>
<td>Carbon Dioxide (CO2)</td>
<td>Greenhouse Gas</td>
<td></td>
<td>Efficient operation</td>
</tr>
</tbody>
</table>
Global NOx Emission Requirements*

Emission requirements influence product, bid, and operating strategy.

World Bank Standard
Natural gas: 25 PPM
Liquid Fuel: 74 PPM

*Emission values for natural gas firing, differing levels are established for other fuels.
Questions?