Reliable innovation for the LNG value chain

Safe. Reliable. Efficient

GE's Power Conversion business: Innovative technology to help maximise LNG production and optimize lifecycle costs.
Facts & Figures

INDUSTRY

1/4  Natural gas accounts for 1/4 of global energy demand

-160°C  Natural gas is cooled to -160°C to form Liquified Natural Gas

~3500  ~3500 billion cubic metres of natural gas in 2014

33  By the end of 2015 the number of international importers rose to 33 countries.

4%+  Global demand for LNG is expected to rise on average by 4-6% p.a until 2030

1912  The first liquefied natural gas plant was built in West Virginia in 1912.

GE

117  $ 117 B Revenue in 2015

300+  300 k+ Employees

170+  Active in 170+ countries

120+  120+ years experience in energy

25+  More than 25 years global experience in LNG projects

75 MW  World’s highest power synchronous motor in operation at LNG mega project

Natural gas accounts for 1/4 of global energy demand

~Natural gas is cooled to -160°C to form Liquified Natural Gas

~3500 billion cubic metres of natural gas in 2014

By the end of 2015 the number of international importers rose to 33 countries.

Global demand for LNG is expected to rise on average by 4-6% p.a until 2030

The first liquefied natural gas plant was built in West Virginia in 1912. The first commercial liquefaction plant was built in Cleveland, Ohio, in 1941.
LNG Industry Overview

Demand for natural gas grows

THE RISE OF LIQUEIFIED NATURAL GAS
Natural gas is one of the cleanest-burning hydrocarbons and plays a big part in the global energy mix. When cooled, it forms a liquid which enables larger volumes to be stored and transported around the world. Liquefied Natural Gas (LNG) was first patented more than one hundred years ago, and has seen accelerated adoption in recent years.

Global energy use is expected to grow by 36% by 2040, with the majority of the increased demand attributed to developing economies including China and India. These countries alone are expected to have the top growth rates for LNG imports through to 2030, attributing to more than 30% of the global demand. Developing countries have an immense geographic footprint, large populations and limited pipeline infrastructures.

SHARES OF PRIMARY ENERGY

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Days are based on BP data. 2018

GAS TRADE AS SHARE OF GLOBAL CONSUMPTION

Over the past decade, the LNG market has steadily expanded: from approximately 210 billion cubic metres of natural gas (bcm) in 2006 to 350 bcm in 2014. Natural gas accounts for around 1/4 of global energy demand, of which 10% is supplied in the form of LNG. This compares to just 4% in 1990. LNG supply has grown faster than any other source of gas – at an average 7% per year since 2000 – and is poised to expand its share of the gas market to 2020.

As the importance of gas grows to fulfill global energy needs, so too will the need for LNG transportation to reach these far-flung requirements in both developing markets, and beyond. In this context, it is evident that gas will be crucial part of the energy mix in meeting the world’s energy demands in the years ahead.

LNG Production and Consumption by Region (2014)

World natural gas production increased by 1.6% in 2014, four times the growth rate of global consumption (+0.4%). Production growth was below average in all regions except North America. The US (+6.3%) recorded the largest growth increment while Russia had the largest decline (-4.3%). Consumption growth was below average in all regions except North America and the Middle East. The US (+2.9%) recorded the largest growth in consumption in the world while the EU had the biggest decline on record (-11.6%).

LNG Outlook

Short term challenges, long term growth

In the short term, gas markets will struggle to cope with an abundance of new LNG supplies, as many large scale LNG projects start to come online. LNG export capacity is set to increase by more than 40% by 2020, with the majority of additions contributed to Australia and the US. This over-supply comes at a time when northeast Asian demand is weakening, and spot prices have fallen. With the influx of more supplies, the market is expected to see a change in trade patterns.

The US is likely to become a net exporter of gas by the end of the decade, and Australian supplies to the Asian market will increase. Qatar, among other producers, will be forced to shift more volumes to the European gas market. Europe is set to offer an important outlet, with imports set to double by 2020.

The number of importers is expected to continue to soar past the number of exporters. Seven new markets currently have regasification terminals under construction, while an additional two are expected to add LNG import capacity by 2020. By 2020, 42 countries are expected to have existing regasification capacity, an increase of 39% over 2015.

Twenty-nine countries imported LNG from the global market in 2014. Europe had the world’s only new importer, Lithuania. However, four new countries – Jordan, Egypt, Pakistan and Poland – are expected to join the LNG market in 2015, bringing the number of international importers to 33.

The over-supply will see a slowdown in Final Investment decisions (FIDs) on large-scale LNG projects for the next 5 years, driven by the increased oversupply.

The longer term outlook looks much more promising for LNG as demand in emerging markets will continue to strengthen and global demand is expected to rise on average by 4-6% p.a until 2030. Given this long-term demand outlook, the market needs to take FIDs on a further ~20mtpa of capacity in the next ~2.5 years to bring it to market by 2023, and a further 45mtpa by the end of the decade so that it is ready for 2025.

MAJOR LNG PLAYERS

East meets west

MAJOR INTERNATIONAL OIL COMPANIES (IOCs)

- ExxonMobil
- Royal Dutch Shell
- BP
- BG Group
- Chevron

NATIONAL OIL COMPANIES (NOCs)

- Gazprom
- Qatar Petroleum
- Pertamina
- Petronas
- Sonatrach

Key Differentiators

Adding value to LNG operations

**Extended System Focus for Best Technology Selection**

- **VARIABLE SPEED DRIVE - CUSTOMIZED SOLUTIONS**
  - Conventional speed & medium power applications
  - High speed applications up to 20000rpm
  - High power applications up to 100MW
  - Transformer-less solutions

- **ADVANCED TECHNOLOGY BRINGING VALUE TO OPERATIONS**
  - CAPEX savings of up to 10% with induction + Voltage Source Inverter(VSI)
  - Integrated and optimized equipment packages and reference designs lower overall project cost and risk
  - Design and delivery of full electrical drive train and electrical management solutions

- **PROVEN MOTORS PORTFOLIO**
  - OPEX savings with up to 5+ years operation and higher reliability
  - Up to 36% more power density at same footprint
  - Synchronous and induction machines portfolio
  - Higher reliability through lower part count
  - Extensive test facilities

**Customized Life-Cycle Services**

- Extended global footprint and service capabilities with customized offerings
- Local services offering at global GE quality
- Cloud based prognostics & predictive maintenance based on GE’s Predix platform

**Stabilizing Power to the Grid**

- 20+ years proven grid integration capability
- Meeting grid codes under harsh conditions
- Advisory Services for grid integration
- Advanced grid integration studies and modelling

**Overall System Analysis & Optimization**

- Worldwide manufacturing locations to meet lead time, cost, local content requirements
- Extensive network of engineers, scientists, and researchers

**Global Partner**

- 20+ years proven grid integration capability
- Meeting grid codes under harsh conditions
- Advisory Services for grid integration
- Advanced grid integration studies and modelling

**Experts in LNG Electrification**

With our considerable expertise in electrification, exhaustive knowledge of LNG processes, and strong capabilities in high-power systems, GE is driving the development of high-reliability technologies to help meet LNG operator requirements.

Our integrated solutions are designed and manufactured to operate efficiently in a technologically complex and regulated environment where reliability, availability, and ease of maintenance are critical. Our engineering expertise and understanding of the complete process, complimented by our grid integration studies and overall process knowledge, means that you can benefit from an overall enhanced, total system for compressor train processes enabling larger speed ranges delivered by smaller, less power-hungry compressors.

**As Your Preferred LNG Supplier We Offer:**

- The convenience of one point of contact
- Direct, easy access to both electrical and mechanical expertise
- Tailor-made support to reduce complexity and optimize solutions
- Simpler, faster integration
- Proven, trusted systems – fully tested in demanding environments
- Reduced risk – adding more value to your operations

**Systems Expertise**

- WINNING TOGETHER THROUGH EARLY ENGAGEMENT AND SYSTEMS EXPERTISE
- Quantum leap in technology, costs, and performance
- Improved operations, reliability, and downtime

**Technology Leadership**

- ONE STOP SHOP
- Systems expertise
- Technology leadership

**GE's LNG Expertise**

Complete scope of supply

- GE's extended electrical package for LNG operations includes low and medium voltage motors up to 100MW, generators, HV distribution, switchgear, transformers, UPS, MCC, harmonic filters, e-house and power cables.

**Extended System Focus for Best Technology Selection**

- **LIQUEFACTION**
  - Concept
  - FEED
  - Engineering
  - Construction
  - Installation
  - Operation

- **TRANSPORTATION**
  - Frequency Converter
  - Harmonic Filter
  - EHOuse & EBOp

- **REGASIFICATION**
  - Cooling System

**Extended global footprint and service capabilities with customized offerings**

- Local services offering at global GE quality
- Cloud based prognostics & predictive maintenance based on GE’s Predix platform

**20+ years proven grid integration capability**

- Meeting grid codes under harsh conditions
- Advisory Services for grid integration
- Advanced grid integration studies and modelling

**Worldwide manufacturing locations to meet lead time, cost, local content requirements**

- Extensive network of engineers, scientists, and researchers
LNG Solutions

Innovative technology to help maximise LNG production and optimize lifecycle costs.

RELIABLE INNOVATION FOR THE ENTIRE LNG VALUE CHAIN:
- MV7 Series Medium Voltage Drive ................................................................. 14
- Rotating Machines.......................................................................................... 16
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78% EFFICIENCY
COMPRESSOR + AUX.

>98% EFFICIENCY
ELECTRIC MOTOR
PAGE 16-17

98% EFFICIENCY
VARIABLE FREQUENCY DRIVE
PAGE 14-15

99% EFFICIENCY
TRANSFORMER

99% EFFICIENCY
SUBSTATION TRANSFORMER

99% EFFICIENCY
TRANSMISSION

DISTRIBUTION & ELECTRICAL BALANCE OF PLANT (EBOP)
PAGE 20-21
LNG Process: a systems approach
Optimized from grid connection to the compressor flow

Flexible Offering for LNG Operations
Fully integrated electro mechanical systems for LNG

Managing technical risk and ensuring a proper balance between different technical solutions for LNG operations can be tough and a big pain point for LNG projects – and by not mitigating these risks, there can be a big impact in terms of project timings and costs. The critical relationships of the mechanical and electrical equipment are complex involving multi-dimensional harmonics, rotor dynamics, fluid dynamics on the compressor side which can feed back to the driver, engineering to avoid surge risks, etc. Addressing all these pain points is where GE’s expertise and detailed knowledge of LNG operations enables us to offer the right solution. We have expertise in LNG. We can tailor our solutions by partnering with our customers early in the project (FEED/Pre FEED) and at the very beginning of the process, evaluating the complete system and completing the network analysis to help deliver better solutions. Our planning, design and engineering experience spans the entire LNG value chain – and so does our portfolio of equipment and support capabilities. Since every LNG facility has unique characteristics and operational objectives, we are committed to solutions that are customized and configured to each customer’s specific needs.

FIRST LEVEL RISK MITIGATION
POWER PLANT
POWER DISTRIBUTION
SYSTEM INTEGRATION & OPTIMIZATION

PRE-EXISTING NETWORK INTERACTION AND LOCAL GENERATION
Sub Synchronous Toroidal Interactions evaluation and risk mitigation

SYSTEM PERFORMANCES STUDIES (POWER VS SPEED / TORQUE VS SPEED)
Torque pulsations on the load machine due to switching inverter characteristics

DATA FOR SHAFT LINE TORSIONAL ANALYSIS ARE GIVEN TO THE OEM

EARTHING STUDIES
ROTOR DYNAMIC ANALYSIS

STARTER HELPER FUNCTION
The use of electric motors to start or help the main turbine power supply allows the gas turbine to always perform at its optimal operating point. This in turn allows for optimal energy balance, continuous operation and stability of the whole system in possibly any situation. GE can offer gas turbines of up to 160 MW (ISO) as main drives with starter/helper motor of 10 to 45MW package.

FULL ELECTRIC SOLUTION FOR REFRIGERANT COMPRESSION
“eLNG” electrified LNG - is the liquefied natural gas supply chain enabled through full electric motor driven compression technology in the processing, transport and distribution network for LNG. This is an alternative process to traditional mechanically driven devices, powered by gas itself or other fossil fuels. We offer a complete solution to drive the main refrigerant compressors using electrical motors (synchronous or induction) powered by high-power drives based on thyristor technology (for LCI) or IGBT technology (for VSI).

• 5+ years operation – low maintenance
• 99%+ availability + reliability
• 97% efficiency
• NOx/CO2 free

SUPPORT SERVICES
Fixed-speed motor or variable-speed drive systems (VSDS) up to 15 MW for CO2 reinjection or boil-off gas.
Fixed-speed motor or variable-speed drive systems (VSDS) up to 40 MW for End Flash Gas and Booster / Fuel Gas.

FULL ELECTRIC SOLUTION FOR REFRIGERATION TECHNOLOGY

• Stability of the whole system in any situation
• Higher availability due to simpler rotor technology

Solutions from the GE Store
• Heavy frame industrial type Gas Turbines
• HP/PR Centrifugal Compressors for the LNG plant
• Drivers and compressors for upstream facilities
• World-class full load testing
• Turn-key systems integration and project execution

KEY DIFFERENTIATOR | SYSTEMS EXPERTISE

SHUNT LINE SELECTION
CLOSED LOOP ANALYSIS
SYSTEMS DESIGN

SYSTEM INTEGRATION & OPTIMIZATION
MV7 Series
Advanced VSI medium voltage drive technology

GE’s latest multi-level technology added to the proven MV7000 medium-voltage drive range, eliminates requirements for bulky filters, ultimately reducing the size of the drive. This proven technology delivers efficient and flexible control of electric power to a wide range of driven equipment in a smaller, more economical footprint.

CONTINUOUS DRIVE EVOLUTION
Introducing the next evolution in MV7-Series with ultimate waveform multi-level high power drive technology. Our range of electrical drives can substantially improve the quality and efficiency of your process or production. Ensuring increased power output through a ‘clean’ energy supply and high power quality grid performance. Enhanced control performances and advanced power conversion architecture can be combined to achieve higher power quality and efficiency than used in the past.

LESS IS MORE. UP TO 25% FOOTPRINT SAVINGS WITH 30% LESS PARTS
- Up to 25% footprint reduction allowing valuable space savings
- High reliability with up to 30% less part counts
- Improved power quality for extended motor and power cable life
- Increased efficiency by reducing current harmonic content in the motor and reducing the need for input or output filters with up to 30% reduction of losses
- Reduced maintenance with front access and modular building blocks

UP TO 40 MW / 13.8 kV WITH A SINGLE THREAD: LOW PART COUNT FOR HIGH RELIABILITY
The Variable Frequency Drive (VFD) is a core component in an electrical driven train. GE’s latest multi-level technology uses a single thread to achieve 9-level voltage up to 40 MW, dramatically reducing the scope of required associated equipment.

- Minimize footprint & weight: single thread offering up to 60MW whilst other solutions require two threads in parallel. Up to 30% less parts for better reliability
- Increased Efficiency: reducing current harmonic content in the motor with up to 30% lower harmonic losses
- Increase Availability: lower maintenance requirements, extended operation

SAVE SPACE WITH TRANSFORMER-LESS DESIGN
This latest development in variable frequency drive technology allows the removal of the transformer for voltage up to 13.8kV. This has added benefits for offshore operations by minimizing footprint requirements and allowing easier maintenance. It also enables better power output by ensuring a ‘clean’ energy supply and high power quality grid performance.

- Reduce size & weight... minimizing the associated capex expenditure for installation. Up to 40% footprint reduction allowing valuable space savings
- Increase uptime... availability up to 99.9% with offshore solution based on proven technology. Removal of the transformer allows significant reduction in meantime to repair.
Experts in Rotating Machines
Reliable innovation for over 125 years

Induction Motor Technology
Smaller, lighter, more reliable.

KEY DIFFERENTIATOR | TECHNOLOGY LEADERSHIP

WE CONTINUE TO INNOVATE WITH PRODUCT QUALITY
GE has been setting the standard in manufacturing rotating machines for over 125 years. GE manufactured motors for some of the first commercial and industrial electrical applications. We continue to deliver innovative mechanical power solutions to the world. Motors are designed and manufactured to operate efficiently and reliably in challenging applications and severe environments where reliability and ease of maintenance is critical.

HIGH SPEED MACHINES
With over 120 machines in our reference list, GE is one of the leading supplier of high speed motors. We have 20 years of experience with high speed machine designs and are constantly improving it to ensure reliable performance for this demanding application.

Our third generation MGV induction range is based on a reliable ‘stiff-shaft’ design. Available with a Class H insulation system, sleeve, tilting pad or active magnetic bearings, we offer a flexible design suitable for a broad range of applications.

Synchronous Motors

STATOR FRAME AND MAGNETIC CORE
• Low loss core design
• Easy Access for routine maintenance
• Low vibration long life
• Pin Vent technology reduces hot-spot compared to I-beams technology

INSULATION SYSTEM
• Vacuum Pressure Impregnation (VPI) process for added protection and rigidity
• Thermal capability and high dielectric strength

ROTOR
• The shaft is single piece, solid forging
• All rotor are carefully balanced to comply with standards requirements

WE CONTINUE TO INNOVATE WITH PRODUCT QUALITY

* comparison based on equivalent power GE synchronous motor and average maintenance cycles. Source: GE study
** estimate from comparison between global system efficiency of Freeport project – induction vs synchronous

80 MW HIGH POWER INDUCTION MOTOR

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<th>Voltage</th>
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Energy Output
System Cost
Operation & Maintenance Cost
Power Management System

Uninterrupted electrical power distribution

GE’s Power Management System (PMS) provides real-time automation to manage the electrical power availability of industrial plants and reduce production losses and safety concerns. Acting as an ‘anti blackout’ system for islanded plants (FLNG, FPSO, and platform) and plants connected to non-reliable grids, GE’s Power Management System helps to ensure excellent optimal load balancing at any time and under any circumstances.

PMS is a hot redundant and integrated system for the full management of:
- Power generation coordination, with load sharing between running generators, even if heterogeneous (gas turbine, diesel, waste heat recovery unit)
- Power distribution and control, with high-speed load shedding response time regardless of load number and location
- Supervision and data logging, with real-time handling for troubleshooting analysis efficiency
- Communication gateway between all external interface devices
- Reducing Mean Time To Repair (MTTR) in case of electrical device failure.

REAL TIME ELECTRICAL POWER AVAILABILITY

HIGH PERFORMANCE
- Fast Load Shedding < 60 ms / All Automation fcts < 60 ms / Stamping at source 1 ms
- Proven full hot standby redundancy
- Time stamping at source, 1 ms / RT handling
- Proven full hot standby redundancy
- Self-healing networks at segregated data flux

OPEN-ENDED & MODULAR ARCHITECTURE
- Ability to communicate with main brands devices
- Decentralized while keeping performance
- Synchronizing system of energized bus-bars
- Simulator unit

Technology Validation

Reducing risk through full load, and back-to-back testing facilities

GE’s Power Management System (PMS) provides real-time automation to manage the electrical power availability of industrial plants and reduce production losses and safety concerns. Acting as an ‘anti blackout’ system for islanded plants (FLNG, FPSO, and platform) and plants connected to non-reliable grids, GE’s Power Management System helps to ensure excellent optimal load balancing at any time and under any circumstances.

40 MW FULL LOAD CAPABILITY
Full load capability for frequency from 5Hz up to 300 Hz, and a 60MW loading induction machine, capable of an alternative method on induction forced cooled motors up to 50MW. The test bench is capable of a full load combined test up to 60MW on a back-to-back configuration comprising transformer, drive and motor.
- Ensure machine quality with full load test validation of electrical and mechanical parameters
- Complete system set-up with project transformer and drive
- Commissioning lead time reduction on site due to equipment fittings and fine-tuning during test

REAL TIME APPLICATION SIMULATION SOFTWARE DESIGNED TO HELP MAXIMIZE SYSTEM UPTIME
Integrated electrical and gas process dynamics simulations allow for technology and equipment validation prior to project execution, and help with overall system optimisation.
- Job-specific software validation
- Risk management on new solutions
- Application and technology validation
- System tuning
- Certifications
- Fast commissioning

61 MW VARIABLE SPEED DRIVE SYSTEM FOR LNG TRAIN CENTRIFUGAL GAS COMPRESSOR FULL LOAD TEST - GE O&G, MASSA, ITALY

61 MW VARIABLE SPEED DRIVE SYSTEM FOR TEST BENCH
GE’s Variable-Speed Drive System at GE’s testing facility in Massa, Italy has been specifically designed to test LNG train centrifugal gas compressor units at full load and under extreme speed, torque and dynamic response conditions.
- Proven solution for 61MW electrical driven LNG train
- Full-load tested reference providing higher flexibility & environmental benefits
- Low operating cost by the elimination of power filtering systems due to VSI technology

61 MW VARIABLE SPEED DRIVE SYSTEM FOR LNG TRAIN CENTRIFUGAL GAS COMPRESSOR FULL LOAD TEST - GE O&G, MASSA, ITALY
**Electrical Balance of Plant (eBOP)**
Committed to delivering safe, reliable, and efficient power

**Key Benefits**
- Reduces inefficiencies, due to system planning and design
- Improves configuration of the substation consistent with customer requirements resulting from rigorous and accurate scoping
- Reduces costs, increases flexibility and provides standardization by utilizing industry leading design tools for ease-of-integration in design, procurement and installation
- Reduces testing, commissioning and maintenance actions, due to modular system design

**Increasing Customer Readiness**
GE’s Electrical Balance of Plant is a scalable and flexible system that is modular and pre-designed with rapid cycle execution capabilities subject to customer readiness.

The system includes elements from power distribution to high voltage grid connection. The eBOP system can be delivered as a fully engineered equipment package, procured and constructed solution, or supplied as individual components to meet specific requirements.

Our Balance of Plant technology provides innovative and flexible solutions to optimize your assets and constantly improve productivity and efficiency.

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**eHouse**
Plug & play solutions enabling cost and time savings

**DELIVERING VALUE WITH MODULAR SOLUTIONS**
Electrical & Control Modules, E-houses, or Shelters are pre-fabricated, walk-in modular enclosures that house and protect critical power and electrical equipment. Designed for both on and offshore installations and suitable for a wide range of conditions - both hazardous and non-hazardous - electrical & control modules are particularly beneficial when project space is limited, where pre-existing buildings are not available or in remote locations. This optimization of space and design allows for faster delivery and installation times, labour cost savings and project simplification with less risk.

**PLUG & PLAY:** Delivered to site, pre-fabricated and fully pre-commissioned to enable quick and easy plug and play installation.

**FASTER INSTALLATION TIMES:** Modular electrical and control units are faster and easier to install. From experience, the site time for installation of an electrical and control module vs a traditional concrete building can be reduced by up to a factor of 2/3.

**COSt EFFECTIvE:** Standardized designs allow for robust and low cost solutions with reduced engineering and project logistics costs due to single deliverable (i.e. e-house plus system).

**SPEED, RESPONSIVENESS AND PERFORMANCE**
- Proven reference designs facilitate rapid quote response
- Available Subject Matter Experts for near real-time communications
- 99% record of on-time installation during project execution, with 50% fewer change orders than industry average

**EASE OF CONTRACTING; SINGLE POINT OF ACCOUNTABILITY**
- Single, local point-of-contact with global coordination for full EBoP scope
- Minimized contracting time and cost
- Simplification of project coordination

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**ONE STOP SHOP**
For over a century, the electrical grid has served its purpose, delivering power when and where it is needed. In recent years, several factors have converged that have heightened attention on the reliability and functionality of electric grids.

Utilizing the power of software, power systems, machine learning, and other advanced analytics and next-generation design and visualization techniques, GE is using its extensive knowledge of the grid to develop new solutions that will help utilities predict and prevent potential failures before they happen. GE’s portfolio of power-grid-based technologies enables the use of real-time information to improve the operation of the grid.

Our dedicated expert group of engineers and business experts is specialized in complete power system analysis and simulation. Cross-business teams work to analyze and help to ensure the compliance of power plant integration to the grid, keeping GE and its customers ahead of grid interconnection challenges.

The Global Power Projects team is made up of a core group of leading technical and business experts from GE who use cross-company resources to help you solve your most difficult challenges. Our team can help you with your power integration and application issues, and we also can perform grid code testing of power generation equipment and sub-synchronous torsional interaction analysis and risk mitigation. Additionally, we have expertise in power system stabilizer application issues as well as utility IT and grid modernization projects.

Grid Integration & Energy Consulting
Grid integration analysis, power systems operation & planning

Become a Digital Industrial Company
Working closely with our customers, GE has developed a wide range of services to improve the performance of all our plant equipment – ranging from specific maintenance methodologies that shorten planned maintenance site activities, through to taking full responsibility for the ongoing performance and availability of the equipment under Contractual Service Agreements.

By injecting our latest technologies into existing installations, we are able to extend maintenance intervals and component life. We also provide advanced machine monitoring and diagnostics – with a variety of on-site and remote system options – ensuring that each piece of equipment is running to its potential, and making the necessary contribution to plant performance.

MEETING THE NEEDS OF YOUR OPERATIONAL MODEL
GE offers customized services to meet the needs of customers’ individual operational and maintenance models (from daily operation, routine & scheduled maintenance, to outage services) comprising:
- Remote monitoring & diagnostics
- Maintenance
- Spare parts & obsolescence management

• Warranty extensions
• Response time guarantees
• Availability guarantees as risk sharing mechanisms.

FLEET DATA ANALYTICS AND PREDICTIVE MAINTENANCE
Through advanced digital platforms, we deliver expert onsite and remote 24/7 support, emergency interventions and all customized to meet unique customer requirements.

LONG TERM & LOCAL SUPPORT
With over 1,000 field service engineers, and operating in more than 170 countries, GE has the organization to support customers wherever they may be.

ENHANCING ENERGY HARVEST ACROSS PROJECT LIFE-CYCLE
GE’s services help to support continuous plant operation, giving higher energy yield and therefore higher return on investment across life-cycle.

REDUCING RISK, ENHANCING PRODUCTIVITY
GE offers services that address a broad range of activities that are necessary for LNG operators to protect assets, keep critical processes running, to help decrease risk and enhance productivity.

GE’s offers cover at each step of your project, namely conceptual design, engineering, manufacturing, equipment transportation and commissioning of the plant. We will accompany you from the initial talks and sales pitches to the handover of the commissioned plant.

GE can draw on a rich experience in LNG that can help to enable a straightforward design and construction planning of your plant. From our perspective, experienced project managers and a single point of contact are key to success – collaborating with the individual contractors, to help predict potential challenges and manage them in a structured and well-organized manner.

PHASES OF PROJECT MANAGEMENT

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<td>Manufacturing &amp; transport to site</td>
</tr>
<tr>
<td>Engineering</td>
<td>Construction</td>
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</tbody>
</table>

Inquiry to order → Order to remittance

Working closely with our customers, GE has developed a wide range of services to improve the performance of all our plant equipment – ranging from specific maintenance methodologies that shorten planned maintenance site activities, through to taking full responsibility for the ongoing performance and availability of the equipment under Contractual Service Agreements.

By injecting our latest technologies into existing installations, we are able to extend maintenance intervals and component life. We also provide advanced machine monitoring and diagnostics – with a variety of on-site and remote system options – ensuring that each piece of equipment is running to its potential, and making the necessary contribution to plant performance.

MEETING THE NEEDS OF YOUR OPERATIONAL MODEL
GE offers customized services to meet the needs of customers’ individual operational and maintenance models (from daily operation, routine & scheduled maintenance, to outage services) comprising:
- Remote monitoring & diagnostics
- Maintenance
- Spare parts & obsolescence management

• Warranty extensions
• Response time guarantees
• Availability guarantees as risk sharing mechanisms.

FLEET DATA ANALYTICS AND PREDICTIVE MAINTENANCE
Through advanced digital platforms, we deliver expert onsite and remote 24/7 support, emergency interventions and all customized to meet unique customer requirements.

LONG TERM & LOCAL SUPPORT
With over 1,000 field service engineers, and operating in more than 170 countries, GE has the organization to support customers wherever they may be.

ENHANCING ENERGY HARVEST ACROSS PROJECT LIFE-CYCLE
GE’s services help to support continuous plant operation, giving higher energy yield and therefore higher return on investment across life-cycle.

REDUCING RISK, ENHANCING PRODUCTIVITY
GE offers services that address a broad range of activities that are necessary for LNG operators to protect assets, keep critical processes running, to help decrease risk and enhance productivity.
LNG is the industry’s most volume-intensive process, with success hinging on a balance of critical aspects – both technological and organizational. With over 25 years of proven experience in this field, GE continues developing innovative solutions that help customers achieve their objectives at many of the largest processing facilities in the world.

75 MW 61 MW
World’s largest eLNG project with synchronous motor Largest VSI + synchronous motor
The GE Store

DRIVING COMPETITIVE ADVANTAGE ACROSS OUR BUSINESSES

We drive enterprise advantages that benefit the entire company, through what we call the “GE Store”. It means that every business in GE can share and access the same technology, markets, structure and intellect. No other company has the ability to transfer intellect and technology as we can through the GE Store.