## Executive Summary

Ingeteam boasts a long, proven track record in the industrial and energy sectors, which stretches back to 1972. Thanks to its division-based structure - Energy, Industry, Marine, Traction, Basic Technologies, Services - and sustainable growth policy, Ingeteam enjoys a privileged, competitive position and has strongly established itself as one of the leading companies in the electronics-electro technical sector.  Ingeteam is a market leader specialized in power and control electronics (frequency converters, automation and process control), electrical equipment, generators and motors, electrical engineering and power plants.

Ingeteam is comprised of several companies which are organized into six divisions. Four of the divisions are grouped by product sector: energy, industry, marine and railway traction, whereas the Basic Technologies division focuses on R&D efforts and the Services division offers installation and maintenance services. It also has research and development laboratory facilities to complement its technology production capabilities.   Ingeteam has strengthened its position focusing on two clearly defined objectives: International expansion and  Diversification of sectors.

Ingeteam continues its intensive activity of exploring new markets and where appropriate, getting established in those countries where growth is expected in the sectors we are actively involved. On the other hand, innovation is fundamental for the company. Ingeteam applies innovation to all the sectors to improve energy efficiency, in both generation and consumption. Ingeteam is beginning to consolidate its position in sectors where considerable investments in R&D, like Smart Grids, energy efficiency, offshore wind generation, electrical mobility, etc. have been made.

As it relates to the renewable market segment, Ingeteam has around 24 GW of installed wind power capacity  worldwide  and 18  years  of  experience  in  the  wind Industry. Almost 8% of all wind turbines worldwide operate with Ingeteam technology.  In the Solar Photovoltaic sector, Ingeteam designs and manufactures grid-connected and stand-alone inverters offering his customers solutions adapted to suit their specific control and generating requirements for residential, commercial and utility-scale PV systems.

Today, Ingeteam’s worldwide accumulated capacity of installed inverters is about  4,5 GWp, credited to increased international sales outside of the European market.

Ingeteam is a world-class company, present in many different markets with its own subsidiaries. For us, it is essential to provide products and services close to our customers. We have achieved a strong and consolidated market position in many of them. In this RFP we are pleased to offer support with our own people to our customers in 20 countries throughout the five continents:

Ingeteam’s establishment in Europe’s most important countries, like Italy, Germany, Spain, France, Poland, the Czech Republic,  as well the USA, Mexico, Panama, Brazil, Chile, South Africa, China, India, Thailand, and Australia,

Central and South America, and South Africa where the forecast is for significant growth in this sector in the coming years will allow Ingeteam to keep an important position in the PV market.

Key overall company metrics include:

* 16 years of experience in the solar industry
* 4,5GWp  PV power capacity worldwide
* 4% of PV plants operating with Ingeteam technology worldwide
* 22,500 Three phase PV inverters and 47.500 single-phase inverters installed worldwide
* Single-phase PV inverters produced worldwide
* 7% annual investment of net sales in R&D
* 2,973 employees worldwide
* 3 production facilities

**PRODUCTS AND SERVICES / SOLAR PV**

With current manufacturing facilities for solar inverters in Spain, U.S.A. and Brazil, Ingeteam offers inverters with output powers ranging from 2.5kW to 1070kW for grid-connect systems and integrated stations for utility-scale projects (with MV transformer included), hybrid inverters for stand-alone systems, string boxes and a range of tools for inverter interconnection and display of the system parameters via web or PC. All these products are customized to suit the requirements of each and every customer, in line with one of Ingeteam’s core values: Customer guidance, service and adaptability.

**RESIDENTIAL SECTOR**

Ingeteam offers a wide range of single phase inverters from 2.5k w to 10 Kw within different configurations, with galvanic isolation, transformerless and compliance with the regulations of the main markets worldwide.

**COMMERCIAL SECTOR**

The offer of Ingeteam for the Commercial sector includes the latest String Inverters transformer-less (Ingecon Sun 3Play family Ranging from 10kW to 20kW / 24 KW UL), the Ingecon Sun Power models with power outputs ranging from 50 to 250 kW, and the Ingecon Sun PowerMax U with galvanic isolation up to 500 Kw.

**UTILITY SCALE SECTOR**

The line of products oriented to the Utility Scale sector is the Ingecon Sun Power Max family and the integrated MV Power Station solutions ranging from 125KW to 1070MW building blocks  The PowerMax range is available in modular version (Multi MPPT / Master Slave) and Monoblock version.  Ingeteam also offers a large variety of complete Turn Key customized solutions up to 3150 KVAs for all environmental conditions.

Ingeteam  has  developed  a  comprehensive  turnkey Medium Voltage solution that integrates  all  the  energy  conversion  equipment  up  to 3150 kW, PV inverters, LV / MV transformer,  Low  Voltage  parallel  cabinet,  auxiliary services  panel  and  monitoring  equipment that  can  be  customized  according  to  each specific user. It is supplied totally equipped with a complete integration of the enclosure, the inverters, the controls and the transformer in a single unit or platform, for its Plug & Play installation on site.

**ENERGY STORAGE SECTOR**

The INGECON SUN®  STORAGE, available in 1Play, Power and Power Max ranges, is a three phase bidirectional battery inverter that can be  used  in  both,  grid-connected  or  stand- alone  systems.  This  inverter  offers  a  high-power density in a single power block, providing different configurable operating modes.

**INGETEAM SERVICE CAPABILITIES**

Ingeteam Service currently provides operating and maintenance services to more than 90 PV generating plants, comprising a total power of more than 700 MW in a large part of the Globe including:  North America, Spain, Italy, France, Scotland, Turkey, Germany, China, Australia, Mexico, Chile, Brazil.

## Value strategy that translates directly to value for our customers :  10 key factors of strength

* (Product) High quality, competitive and reliable product

We owe the technology we use to design and manufacture our products, so we control and improve continuously the level of quality, reliability and competitiveness of our products. We have demonstrated with our sales that we are competitive in the markets we play.

* (Product) Wide portfolio of products

Our offer goes from the smallest single-phase inverter for domestic use to the biggest multi-megawatt power stations for the utility scale projects, including ancillary medium voltage equipment and control and monitoring systems.

* (Product) Strong service supplier

We have an specific business unit dedicated to service our customers, as this is a very important special chapter of our offer. They have big experience and knowledge of what does a best-in-class service.

* (References) Technology experience

Since the very beginning, Technology is a key factor of identity in our company. Ingeteam invests every year an important amount of material and human resources on R&D activities. We own the technology we use. We produce patents every year and apply them on state-of-the-art products. As we claim in our promotional campaigns, “We are ready for your challenges”.

* (References) PV track record 4GWp

As described hereunder in Capability chapter, Ingeteam has got an important book of powerful references in different sectors and all throughout the globe. Regarding PV, there is a track record of around 4GW of PV installations equipped with Ingeteam PV inverters of all the range of power. Attached to this RFP we provide a PPT of main PV references.

* (Company) World-class company

As described here-above, Ingeteam is a corporation of companies established in the five continents with its own subsidiaries covering 20 countries. This allows us to offer our products and services where the customer is, providing a real on-time service.

* (Company) Optimum size company

The size of our company is big enough to ensure the required resources and solid warranties, but not too big in order to avoid a lack of quick and flexible response time for design and supply

* (Culture) 100% Customer oriented

All the company is customer-oriented. From the R&D department to the General Management. We all are aligned towards one goal: meet our customer requirements.

* (Culture) Easy communication

This is something our customers put a lot in value. Our designers and managers are accessible to our customers, and they feel their inputs are taken into account truly.

* (Culture) Quick adapted to changes

As we owe our technology, we have an easy communication, and not a huge size, we can be flexible on the product and quickly adapt it to our customer needs.

## Quality

**ON THE PROCEDURES**

Ingeteam Quality procedures are based on the EFQM (European Foundation for Quality Management) model.  Ingeteam has made a firm commitment to the EFQM model as a competitive framework for the years to come, with the aim of offering excellence in our products and services.

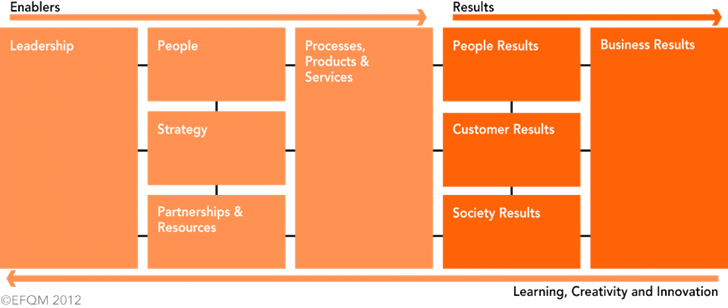
The pursuit of quality should be seen as a necessary step towards continuous improvement and competitiveness that exceeds in its formulation, means and endings the mere compliance with current regulations at all times. The culture of Quality is a strategic aspect of economic activity in any of the sectors and independent of firm size.

We understand **Quality** as they only way to achieve the **Excellence** in our Organization.

**Excellent Organizations** achieve and sustain outstanding levels of performance that meet or exceed the expectations of all their stakeholders. For us, the Fundamental Concepts of Excellence are:

* Adding Value for Customers :  Excellent organizations consistently add value for customers by understanding, anticipating and fulfilling needs, expectations and opportunities.
* Creating a Sustainable Future : Excellent  organizations have a positive impact on the world around them by enhancing their performance whilst simultaneously advancing the economic, environmental and social conditions within the communities they touch.
* Developing Organizational Capability : Excellent organizations enhance their capabilities by effectively managing change within and beyond the organizational boundaries.
* Harnessing Creativity & Innovation : Excellent organizations generate increased value and levels of performance through continual improvement and systematic innovation by harnessing the creativity of their stakeholders.
* Leading with Vision, Inspiration & Integrity : Excellent organizations have leaders who shape the future and make it happen, acting as role models for its values and ethics.
* Managing with Agility : Excellent organizations are widely recognized for their ability to identify and respond effectively and efficiently to opportunities and threats.
* Succeeding through the Talent of People : Excellent organizations value their people and create a culture of empowerment for the achievement of both organizational and personal goals.
* Sustaining Outstanding Results : Excellent organizations achieve sustained outstanding results that meet both the short and long term needs of all their stakeholders, within the context of their operating environment.

These Fundamental Concepts of Excellence form the basis for the [criteria](http://www.efqm.org/efqm-model/criteria) of the EFQM Excellence Model.



The EFQM Excellence Model is based on nine criteria.  Five of these are "[Enablers](http://www.efqm.org/efqm-model/criteria/enablers)" and four are "[Results](http://www.efqm.org/efqm-model/criteria/results)".  The "Enabler" criteria cover what an organization does and how it does it.  The "Results" criteria cover what an organization achieves.

To achieve sustained success, an organization needs strong leadership and clear strategic direction. They need to develop and improve their people, partnerships and processes to deliver value-adding products and services to their customers.  In the EFQM Excellence Model, these are called the Enablers.  If the right Enablers are effectively implemented, an organization will achieve the Results they, and their stakeholders, expect.

The Integrated Management  System of Ingeteam Energy business unit,  is  based  on  the  guidelines  set  out  in  the  Standards  in  force:  **UNE-EN  ISO  9001**  "Quality Management  Systems.  Requirements",  **UNE  EN  ISO  14001**  "Environmental  Management  Systems. Requirements  with  guidance  for  use",  Specification  **OHSAS  18001**,  "Occupational  Health  and  Safety Management  Systems”,  **UNE  166006**  "  Management  of  R&D&I:  Technological  Watch  System  and Competitive Intelligence".

Likewise,  the  ITIL  guidelines  are  also  followed  for  the  management  of  the  ICT  (information  and communication  technologies)  infrastructure  management  and  **ISO  27001**  "Integrated  Management  System for Information Security”.

**ON THE PRODUCTS**

Ingeteam endeavors to develop quality products at the forefront of the state of the art’s technology. Technology and quality excellence is our core driver to run business and is embedded in the DNA of our organization.

In that sense, at Ingeteam our products are designed and validated following the continuously improved design and industrialization procedures.

Within the process tools such as D-FMEA and P-FMEA are applied to enhance quality from the very beginning.

One of Ingeteam’s strengths is the Verification, Validation and Certification (VV&C) process, which aim is achieving a zero-defect product.

An internal PPAP is set at the end of the industrialization procedure as a gate prior to mass production start.

Once product is in the market, we count with an exhaustive follow-up of any incidence and reliability ratios.

## Brand

Ingeteam Brand definition is based on a number of factors. All are directed at supporting the projection of our brand to stakeholders.

**IMAGE**

The group's image is the expression of the plan implemented to make Ingeteam more competitive and to promote the advantages offered by coordinating the business activities of the business units grouped into the following sectors: Energy; Industry; Marine; and Rail traction.

The Design defines a simple, strong image: Ingeteam.

The image in red expresses the position of strength established in the organization as well as our ongoing quest for excellence and for leadership in technology and service for our products in those markets in which we are operating.

Ingeteam aims to ensure that the new brand is recognized, from now onwards, as synonymous with quality and service.

**OUR BRAND**

In keeping with our strategic objectives, the Ingeteam brand must maintain a unique identity, being a statement of its own clear positioning.

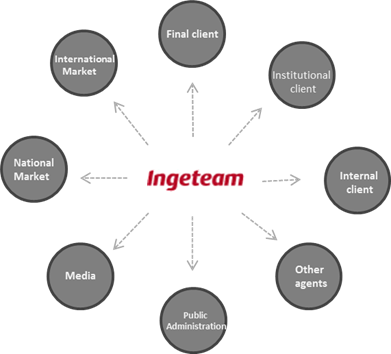
Ingeteam puts itself across to its internal and external audiences as the brand of a strong, internationally-established Group, dedicated to energy as its core business purpose, yet with emphasis on its innovative nature and customer commitment.

This positioning must be reflected in all our communications, which must all be based on a common criterion. Only in this way will we be able to project the Group's unique personality.

**OUR TARGET AUDIENCES**

Ingeteam has many target audiences, all of which are important. We have daily dealings with these groups, and they are the primary audience for our communications.

Each audience included in this graph below constitutes a group in itself and requires its own channels and message. However, all audiences must perceive Ingeteam as a unique, coherent brand with its own characteristics that set it apart from the rest.



**CORPORATE VISUAL IMAGE**

The Trademark values are contained in our style manual. The visual image reinforces Ingeteam’s market position defined in our values.

Simple solutions for complex challenges. Ingeteam takes on the technological challenges proposed by our customers, offering the most effective solution as transparently as possible.

Always close to our customers. We are distinguished by our ability to work closely together with, and attend to the needs of, those who place their trust in us. We are concerned with travelling the path that best contributes to their welfare and to that of society as a whole.

Promoting progress. A business vision underpinned by the application of engineering in research and design, in order to develop high-quality, innovative services and products. Our aim is to seek ways to promote a change from the present-day energy model to one that is committed to sustainable development.

These values and an honest relationship with business, our customers and society, have made the Ingeteam brand a benchmark in the area of technological solutions.

**OUR FORMULA   I+C   =   INNOVATION  +  COMMITMENT**



The corporate claim is the summary of our position defined under one simple statement.

Innovation: to seek the best solutions.

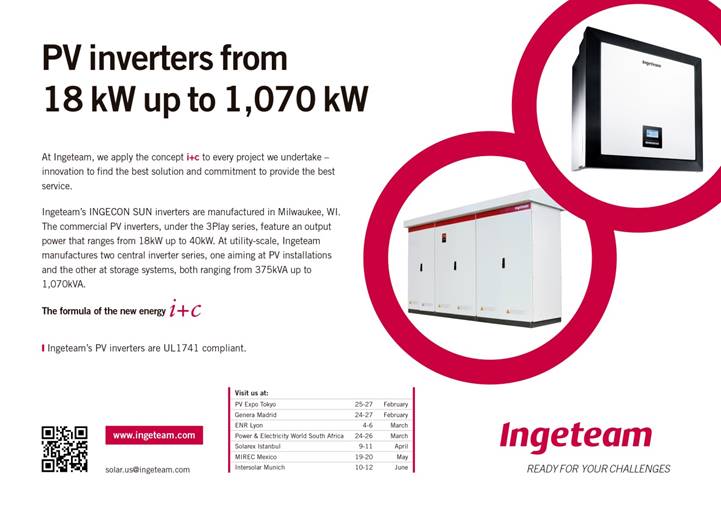
Commitment: to offer our customers the best service.

This claim has the same meaning as our company’s second claim: Ingeteam “ready for your challenges”.

- Our customers' challenges are at the heart of our innovation efforts.

- Our attitude of commitment means that we're always there for our customers.

A sample of an advertisement for this year 2015 showing the i+c concept:



The INGETEAM brand name is quite spread all throughout the world for several reasons:

* Ingeteam is a corporation of 25 companies
* The company started in 1972 so there has been 43 years of history.
* The company is active in different sectors including Industry, Energy, Marine, Railway Traction, Basic Technology and Service. This has given Ingeteam the chance to be well known in different sectors and have multiple powerful references.
* The company is present in the five continents, with its own subsidiaries.
* As stated in our vision, we aim to achieve a leading position in the markets we operate in.
* We are active in international forums and symposiums, conferences, shows and trade fairs,
* We are present in the specialized press and also appear in the general media
* We appear as well in main specialized newsletters and we have our own as well

## Technology

Technological innovation is a key factor in Ingeteam.

We are constantly focused on innovation, as part of our company positioning. This is reflected in the considerable number of R&D projects developed by Ingeteam each year, projects which then become real applications, products that meet our customers' needs and expectations.

Technology and innovation are the driving force behind our growth. 11% of Ingeteam personnel is dedicated to R&D and each year we invest more than 7% of turnover in this activity.

The importance given by Ingeteam to innovation is clearly demonstrated by the existence of a Functional Area for Technology Development, focused on encouraging our business units to pay ongoing attention to all technological innovations that could be of interest, and to channel and coordinate those actions required to successfully implement new technology.

**SOLAR PV TEECHNOLOGY**

Taking a look now just on the PV business, its R&D Department is composed by a team of 65 professionals with a high degree of qualification (Ph.D. and Electrical, Electronics and Mechanical Engineers) and experience on the field. The R&D Department is divided in three development teams: string inverters (single and three-phase), central inverters and communications accessories. There is an R&D Department Manager and Product Manager for each team.

All the inverters are completely designed by Ingeteam: power stack, filters, control boards, FW, mechanical design, etc.. This improves the quality of the products and provides a total control and knowledge of the technology and the designs.

Ingeteam uses the latest technology on its solar inverters. New semiconductor materials as Silicon Carbide (SiC), multilevel topologies or advanced control algorithms are part of these technologies.

The design roadmap for the next years includes the development of new products like:

* Three-phase transformerless wall-mounted inverter with the maximum power (100kW) and only 65kg (143lb).
* Utility-scale outdoor inverter up to 2.2MW.
* Utility-scale inverter up to 1500Vdc.
* Inverters and controllers for integrating energy storage systems on PV plants

**ALLIANCES**

Ingeteam collaborates recurrently with several Universities and Research Centers for new projects and technology development.

**R&D PROJECTS**

Every year Ingeteam is qualified as a R&D company due to the outstanding projects that are in course. Just to mention some of them active this year:

* PROINVER (2011-2013):

Development of new firmware functionalities for PV inverters located in areas with high penetration of photovoltaic. Resulting product: new firmware and hardware improvements.

* PSE SIGMAPLANTAS (2011-2013):

This project was a continuation of SIGMASOLES project. On this collaborative project, new inverter for CSPV was developed. Resulting product: INGECON SUN 3PLAY with new FW functionalities for CSPV.

* 7th Frame Program PV CROPS (2012-2015):

The main objective of this project is the development of sizing tools, control systems and inverters for PV plants and BIPV with different storage systems (Lithium-ion, Redox, batteries VE). Resulting product: New functionalities and HW and FW modifications for INGECON SUN STORAGE 1PLAY and INGECON SUN inverters. New functionalities for the residential controller EMS Manager and monitoring software EMS Tools.

* EEA GRANT SiC&GaN (2014-2015):

Develop compact and efficient PV photovoltaic solar inverters than current and with less weight and size by developing new power electronics for solar PV investment based on new semiconductor Silicon Carbide or Gallium Nitride. Resulting product: INGECON 1PLAY TL MINI.

**PATENTS**

As a result of the R&D activities Ingeteam has developed its own technology for photovoltaic systems that has been protected with several international patents. Just a few examples hereunder:

* WO2008015298A1. Single-phase inverter circuit for conditioning and converting DC to AC electrical energy. New single-phase conversion topology specially designed for transformerless systems. H6 topology.
* WO2008062076A1. Anti-theft device for solar panels.
* WO2009153360A1. Control method for a structure converting DC to AC. Control method that increases the efficiency of the inverter.
* WO2010018240A1. System and method for power management in a photovoltaic installation. System and control method for controlling the output power of a PV plant, providing and active and reactive power reserve.
* WO2012035175A1. Control method for arranging DC/AC converters in parallel. Control method that allows parallel operation of several inverters or power blocks with just on step-up transformer.
* WO2014096468. Method for power management and load control when EV charging stations are used.
* PCT/ES2013/070837. System to reduce overvoltage on semiconductor during commutations, allowing 1000Vdc operation with 1200V IGBTs.

Furthermore, Ingeteam works actively in normalization committees like IEC TC82 Solar Photovoltaic Energy Sytems where IEC standards for photovoltaic inverters are developed.

## Capability

Ingeteam is not only a solar company.  We are a technological company that applies this knowledge in different sectors where generation and consumption of energy happens, where the exchange of energy happens. Here are some examples:

* Ingeteam built the first high-power electronics and electric machines laboratory in the south of Europe. This new lab meant a turning point for research and development of in-house technology. The high-power electronic laboratory has a surface area of 13000m2 and it is focused on testing high-power converters by means of experimentation based on inductive loads and the contribution of power from the grid only for the system losses. The high-power electric machines laboratory has a surface area of 1300m2 and it is focused on the field of the electric machine converter units, assembled mechanically and connected under real electrical working conditions, being able to work with large units of up to 30MW.
* Ingeteam Power Grid Automation business unit successfully executed the installation and connection of the 220kV flow diverter for the ESPLICER project (power electronics in electric grid for the integration of renewable energy).  By modifying the line´s impedances with a Static Synchronous Series Compensator type Converter, it is possible to manage the power flow between overloaded and less loaded lines, and helps to increase renewable energy integration. This goes towards the SMART GRID concept and this is the first FACTS (Flexible Alternating Current Transmission System) of the voltage source type to be connected in series to the 220kV transmission line in Europe.
* Ingeteam Railway Traction business unit successfully developed and installed the INGEBER energy recovery systems. When installed in railway substations these units return the energy generated by traction units during braking of the grid.
* Ingeteam Railway Traction business unit successfully supplied the converters for the first high speed railway line in central Asia from Tashkent to Samarkanda. The scope of the supply included the engineering of the electrical system, the traction chain equipment, battery chargers, control systems and high voltage switchgear. The main element is the double traction converter, fully redundant, modular and based on IGBT´s of 6,5kV. It incorporates the active front rectifiers and the traction inverters, as well as auxiliary converters to feed the traction head and the passenger coaches.
* Ingeteam Marine business unit has achieved an interesting track record of more than 100 vessels equipped with Ingeteam frequency converters. They got specialized on AC propulsion equipment for silent vessels such as oceanographic research vessels. They also got specialized on suction pumps and electric drives for several big power dredgers, supplying the pumps, medium voltage frequency converters, control systems, generators and thrusters motors, all designed and manufactured at Ingeteam.
* Ingeteam Industry business unit has got an experience accumulated in many years in different industry sectors such as cement, mining or steel. In fact, the origins of the company in the early 70’s were dedicated to this activities, and Ingeteam developed an in-house technology around engines, power equipment and control systems.
* Ingeteam Energy business unit successfully developed and installed the INGEREV units. They are electric vehicle recharge systems. A complete range goes from the small AC charge units for domestic use and the outdoor units for public use, to the faster CC charge units that comply IEC and CHADEMO standards.
* Also inside the Energy business unit, Ingeteam has carried out many projects of generation plants of different technologies such as solar thermal, biomass, biodiesel, hydro-electric , wind power and solar photovoltaic. The total amount of renewable energy plants equipped with Ingeteam converters is almost close to an incredible figure of 40GW.

In our factory at Sesma in the north of Spain, we have produced solar photovoltaic inverters at a rhythm of 1000 units of single-phase inverters per week, plus 100 three-phase 100kW per week, plus 25 three-phase 1MW per week. This is not capacity, but real production already stated.

This is a real proof of Ingeteam capabilities.

## Regional

**MARKET PRESENCE AND MARKET ENTRY CAPABILITY**

As stated before, the cumulative PV power today equipped with Ingeteam PV inverters is about 4,5GWp. We have references in the five continents and not concentrated in few countries.

Ingeteam is among market leaders in PV market in several countries such as Spain, Italy, France, United Kingdom, Czech Republic, South Africa, Brazil, Chile, Peru, Uruguay, Guatemala, Panama, Mexico and Australia.

Other countries with Ingeteam PV inverters are India, China, Thailand, Vietnam, Singapore, Indonesia, Reunion Island, Morocco, Tunisia, Central Africa, Senegal, Romania, Slovakia, Greece, Cyprus, Germany, Portugal, Ecuador, El Salvador, Colombia, Dominican Republic, Martinique, Puerto Rico and Argentina.

We count with references in all these countries as it can be seen in the Reference Book attached to this RFP.

This list of references gives a good idea of our endeavors to increase our market presence not only in a few selected countries.

**LOCAL CONTENT REQUIREMENT**

Beside Europe and the US, Ingeteam is ready today to give local content in Brazil and South Africa.

In South Africa we have supplied the Sishen plant of 75MW nominal power with a minimum level committed of local content of 33%. We have also supplied the Jasper plant of 75MW nominal power with a similar level of local content of 35%. Today we are ready to reach about 45% in that country.

In Brazil there is a requirement of local content for future PV projects, and Ingeteam has already got the FINAME qualification of the production plant in Campinas that allow the PV projects equipped with our inverters to reach special financing conditions from BNDES bank.

In China we had some production some time ago but not right now, but it could be possible to restart production after some time if required.

**UNDERSTANDING OF REGIONAL REQUIREMENTS**

Ingeteam is a world-class company, and it is in its ADN to expand and give local support where the customer is. Since Ingeteam started in Spain the photovoltaic activities in 1999, the company has expanded widely and today they are present in many countries in the five continents.

Understanding the regional requirements is essential in our business model. For this purpose it is absolutely imperative to be a customer oriented company, and to be very flexible and quick adapted to changes.

We have a list of standards we have certified our products that show our endeavors to understand and comply with regional requirements.  Ingeteam inverters have been certified according to the standards for CE and UL marking (U models are ETL marked). Furthermore, Ingeteam inverters have been certified for the most important grid codes and standards around the world. All the certifications have been done by external certifications bodies.

Regarding security, performance and EMC standards for CE marking, Ingeteam inverters are certified according to:

* IEC62109-1, IEC62109-2, IEC62103, EN50178, AS3100. PV Inverter Electrical Security.
* EN 61000-6-1, EN 61000-6-2, , EN 61000-6-3, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12. EMC emission and immunity standards for residential/industrial environments (depending on the inverter).
* IEC62116 Islanding protection.
* IEC 61683 Efficiency according this standard.

Regarding security, performance and EMC standards for ETL marking (U models), Ingeteam inverters are certified according to:

* UL 1741. Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources.
* FCC Part 15
* IEEE C37.90.1
* IEEE C37.90.2

Furthermore, the inverters have been certified for the following grid codes or standards:

* IEEE1547. Standard for Interconnecting Distributed Resources with Electric Power Systems.
* NEC. National Electrical Code for United States.
* IEC61727. Grid Quality international standard for small equipments.
* VDE-AR-N4105. German guideline for connection to LV.
* VDE 0126. German standard for connection to LV compatible with VDE-AR-N4105. It has a deviation for France applicable for connection to EDF in LV.
* BDEW Guideline. German guideline for connection to MV.
* CEI 0-21. Italian standard for connection to LV grid.
* CEI 0-16. Italian standard for connection to MV grid
* G83/2 British guideline for connection till 16 A.
* G59/2 British guideline for connection till 50kW. Still required in some countries. Withdrawn in UK in December 2014.
* G59/3 British guideline for connection till 50kW. Replaces G59/2 in UK since December 2014.
* Chilean Grid code and applicable guidelines Chilean grid code for PV plants.
* ABNT NBR 16149 ABNT NBR 16150 Brazilian grid connection guideline,
* NRS097 South African standard for installations in roofs.
* South African Grid code RPPS (version 2.6) South African grid code for PV plants.
* IEC61727 with deviations of MEA and PEA Grid Quality international standard adapted for Thailand.
* IEEE 929 Grid Quality international standard.
* IEEE 929 with deviations of MEA and PEA Grid Quality international standard adapted for Thailand.
* Romanian grid code.

Please, refer to catalogue to see the applicable standards of each inverter.