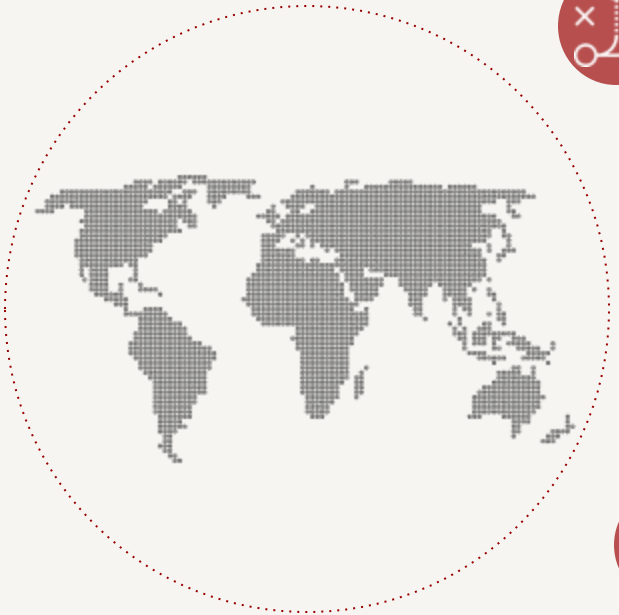
CORPORATE PROFILE

“We design, manufacture and deliver proprietary solar and Storage Solutions”

CORPORATE PRESENTATION

INDEX



ABOUT GROUP GRANSOLAR

BUSINESS STRATEGY

ENGINEERING

TRACKERS & SCADA

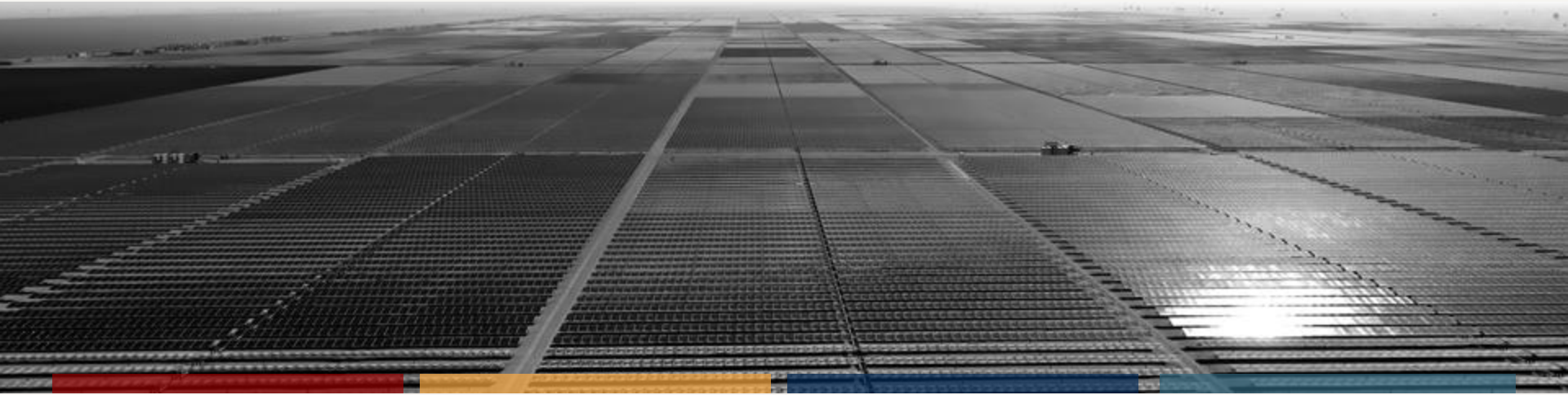
REFERENCES

CONTACT

ABOUT GROUP GRANSOLAR

Group Gransolar is an energy company with a strong technological base, a solid manufacturing capacity, and the competences required to provide turnkey energy solutions on a constantly changing environment.

Vertically integrated company, covering all activities in the PV Solar downstream value chain:



- Development
- EPC
- O&M

- Engineering Design
- Quality Control
- Commissioning

- Manufacturing & Design
- Assembly & Installation
- SCADA

- Manufacturing
- Power Electronics
- EMS

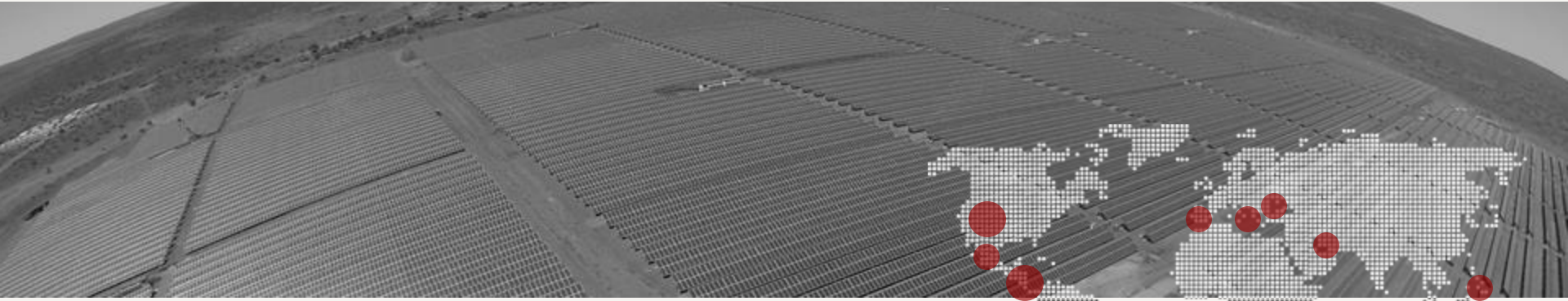
CERTIFICATES

UNE-EN-ISO 9001:2015
Quality Management System

UNE-EN-ISO 14001:2015
Environmental Management System

OHSAS 18001
Management System

IN FIGURES



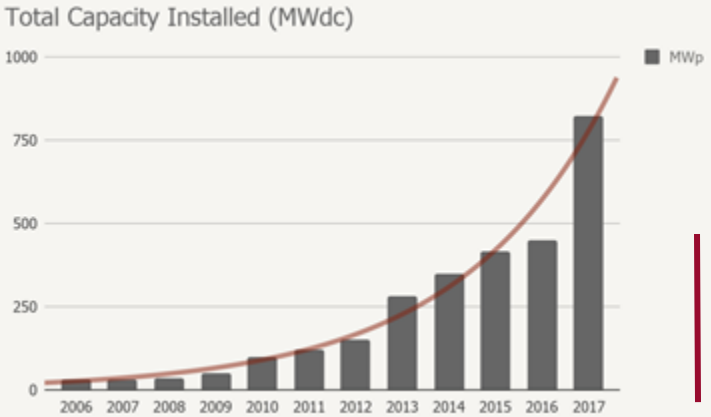
COMPLETE PLANTS
94

COUNTRIES
17

EMPLOYEES
+370

M€ 2017 TURNOVER
200

MWdc CAPACITY
+1041



INTERNATIONAL PRESENCE

Spain, Italy, Portugal, Bulgaria, South Africa, Mauritius, United States, Brazil, United Arab Emirates, Guatemala, El Salvador, Honduras, Colombia, Panama, Mexico, Philippines and Australia.

IN FIGURES

The company has experienced **strong growth rates** with an average **EBITDA CAGR 2013-17 of c.22%** for its industrial business.

REVENUE 2013-2017[1] (€ MM)

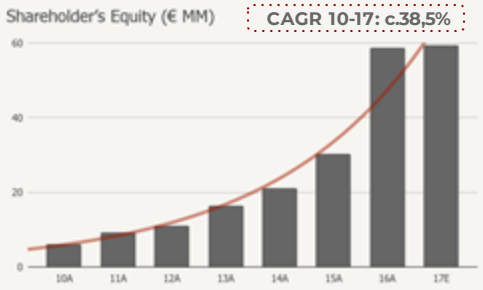
CAGR 13-17E	
INDUSTRIAL	34.9%
TOTAL	30.3%

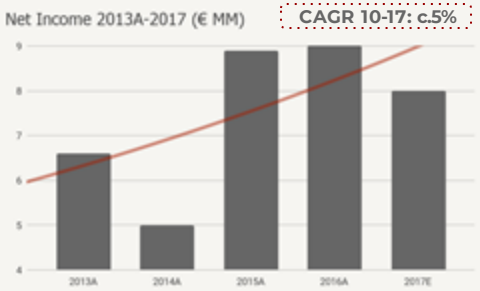
ADJUSTED EBITDA[1] 2013-2017 (€MM)

CAGR 13-17E	
INDUSTRIAL	21.9%
TOTAL	11.8%

Profitability has increased *due to gradually implementing subsequent phases in the PV value chain and thus becoming an integrated operator.*

Shareholder's Equity has constantly increased over the last 5 years, with an **2017 year end balance of c.€59,5 MM.**





[1] Investment revenues include attributable figures. Industrial revenues represent consolidated revenues minus consolidated revenues from investments. Adjusted EBITDA is equal to Industrial EBITDA plus attributable net income from investments.
Source: Annual Accounts and Management information

IN FIGURES

2005

Founding of
GROUP GRANSOLAR

2006-2007

Construction of the first 10 PV plants in Spain
Business Development Line Start
Incorporation of our engineering team

2008

O&M business line start
Incorporation of
Gransolar-Ghella in Italy

2009

Development
70 MW in Italy
2 new plants in Spain

2010

30 MW installed in Italy
and US 10 MW PV Plant
Constructed in Portugal

2011

32 MW installed in Italy
Solar tracking team incorporated in
the US
Incorporation of Hypesolar to develop
12 MW in Portugal

2012

Award Lesedi and Letsatsi
(150 MW) projects in South Africa
Incorporation of ISE South Africa
Construction of Bailadero
(10 MW) in Spain

2013

Construction of 12 MW in Portugal
Construction of 150 MW in South Africa
Incorporation of GRS
Central America

2014

Incorporation of GRS
in Mexico to develop 100 MW
Construction of 6 MW Sibo (Guatemala)
Award of 25 MW in New Mexico (US)

2015

60 MW PPA awarded in auction process in Brazil
50 MW in Philippines
(Project management and supplier)

2016

CAPITAL INCREASE

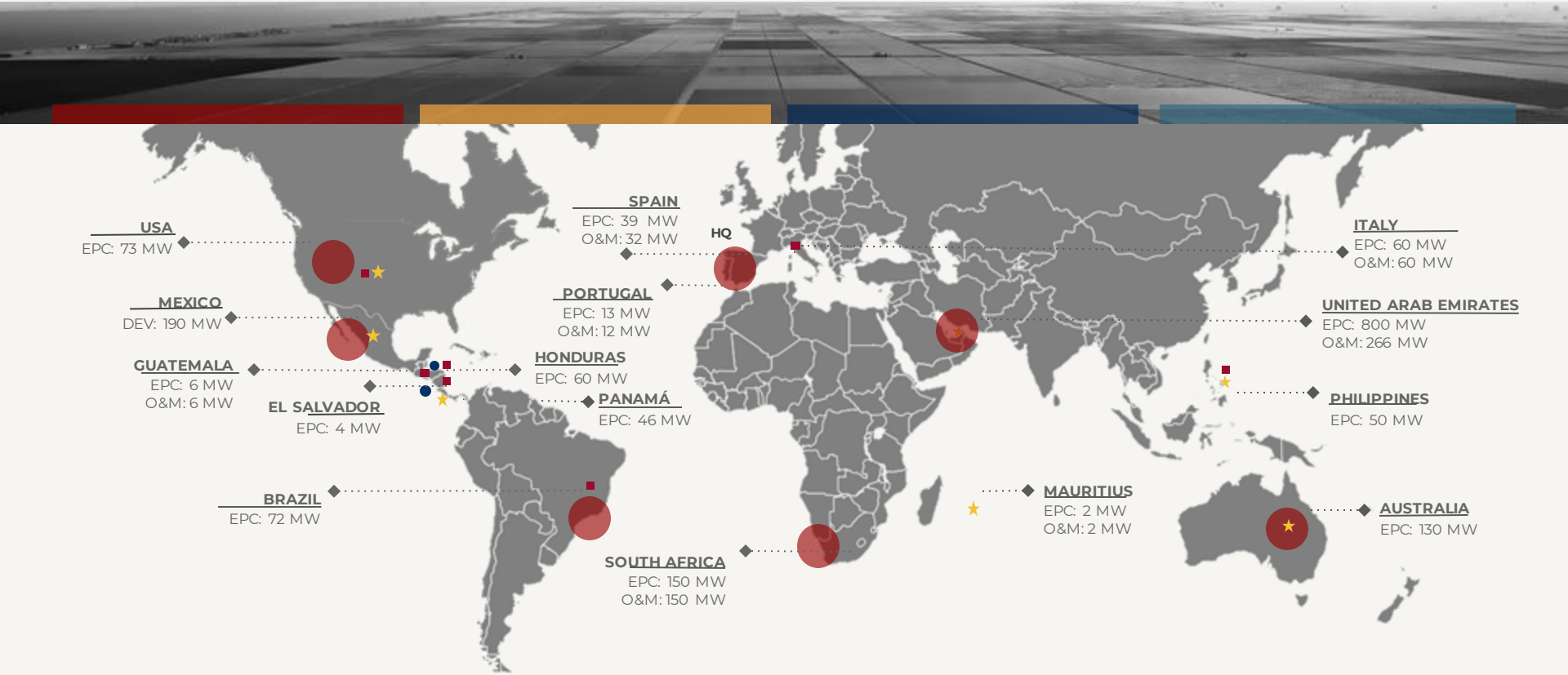
dianacapital

1GW awarded in UAE
43 MW awarded in USA
120 MW awarded in Chile
Construction of El Paseo and Cangrejera (El Salvador)
Construction of Camargo (Mexico)
Construction of Mont Choisy (Mauritius)

2017

Construction of 60 MW in Brasil
Sobral & Sertao
264 MW under construction in UAE
125 MW awarded in Australia Lilyvale

INTERNATIONAL SCOPE



CORPORATE STRUCTURE

The company's organization structure follows its integration business model combining flexibility and efficiency. A group of 370 professionals, one of the largest teams specialized in solar.

16 DEVELOPMENT & STRATEGY	45 OPERATIONS	137 SOLAR TRACKERS & SCADA	53 CORPORATE SERVICES	15 ASSET MANAGEMENT / O&M	66 ENGINEERING	38 ENERGY STORAGE
M&A |Project Finance	Purchase & Logistics	Manufacturing	Ecofin	Adm. Management	Engineering	EMS
Project Development	Construction Management	Software	General Services	O&M	Quality Control	POWER ELECTRONICS
Commercial Department	Contract Management	Installation and commissioning	Legal	Operation	Commissioning	Manufacturing
Business Development	Project Management		HHRR	Maintenance		

BUSINESS STRATEGY

All companies are **VERTICALLY INTEGRATED**, covering all activities in the PV Solar downstream value chain.

	PROJECT EXECUTION	ORGANIZATION	PROJECT DEVELOPMENT	TECHNOLOGY DEFINITION	CONSTRUCTION	OPERATION
GRS		DEVELOPMENT			EPC	O&M
Engineering		ENGINEERING	COMMISSIONING	QUALITY TESTING		DESIGN & PERFORMANCE
Trackers and SCADA			MANUFACTURING	ASSEMBLY INSTALLATION		SCADA
Energy Storage		POWER ELECTRONICS		MANUFACTURING		EMS

PV SPECIALIZED own engineering, maintenance, hardware, software companies > in house know-how

CREATE OUR OWN DEMAND invest on development.

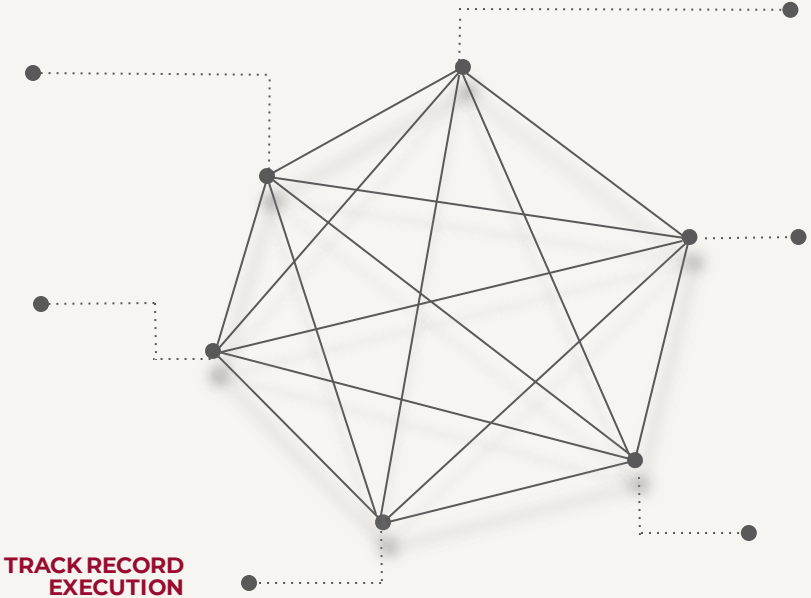
INTERNATIONAL focus

BUSINESS STRATEGY

HIGHLY- QUALIFIED EMPLOYEES
Highly ENGAGED TEAM with a profound expertise and technological hedge.

SOUND DEVELOPMENT AND CONSTRUCTION PIPELINE
EPC Backlog & Pipeline : 1,3GW
Development Pipeline: 1,2 GW
Product Backlog: 1,5 GW
*31/12/2017

SOLID TRACK RECORD EXECUTION
Unmatched project execution references within deadline and performance guarantees



STRONG INDUSTRY FUNDAMENTALS
SOLAR AND STORAGE energy are leading GROWTH in global energy market

INTEGRATED BUSINESS MODEL
Operating Margins through synergies among development, construction, operation and hardware activities.

INTERNATIONAL DNA
Presence in 8 countries (5 continents) with projects executed in 15 countries

BUSINESS STRATEGY

SERVICES

- Engineering Design
- Quality control & testing
- EPC Construction
- Operation and Maintenance
- Commissioning

PRODUCTS

- Design & manufacture of solar trackers and racking
- Installation and Commissioning
- Scada Software Solutions
- Drivers and Controllers

SOLUTIONS

- Integration of storage and hybrid (solar + storage) solutions,
- Energy provider
- Power electronic Solutions and
- Energy Management Systems

We offer engineering and consultancy services for every stage of photovoltaic plant projects. We have an extensive experience as technical advisors to both developers and financial institutions.

ENGINEERING AND CONSULTANCY SERVICES

We have provided technical support in projects which sums up a total power of over 23GW, all around the world in large-scale projects and rooftop installations.

We perform conceptual and basic engineering, preparation of budget and documentation for detailed engineering of the PV plant and its construction, commissioning and module quality control, technical assistance on-site during construction works for the PV plant, technical support in EPC contracts and in supply contracts and technical assistance and as built documentation Works in tenders.

ENGINEERING

DESIGN & PERFORMANCE

COMMISSIONING

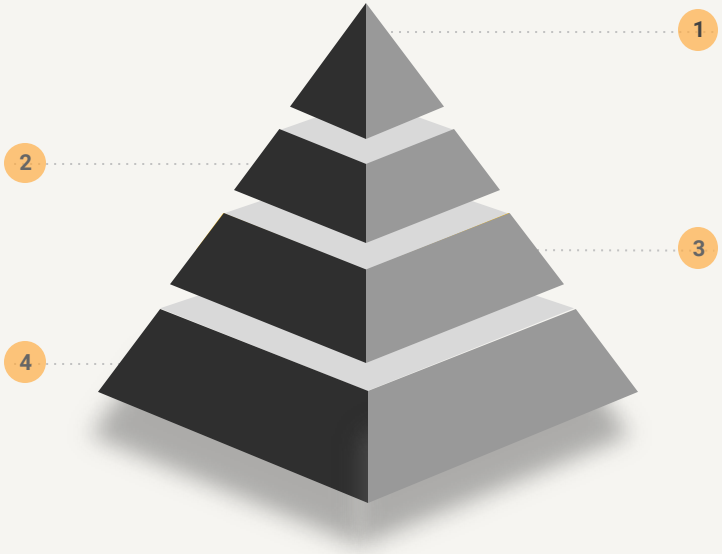
QUALITY LAB

STORAGE

ENGINEERING AND CONSULTANCY SERVICES

VALUES
Professionalism, acknowledged experience, Independence and commitment.
Workload capacity, quality and quick service.

LOCATION
Madrid, Almería - **SPAIN**
San Francisco - **USA**
Johannesburg, Bloemfontein - **SOUTH AFRICA**



1 TEAM
Consists off highly-qualified experts, researchers and technicians, with recognized international experience.

3 SERVICES
A complete and customer oriented service which covers all áreas of your Project. Adjusting our service to the demands of each particular Project, making sure you get precisely what you need.

ENGINEERING

Technical assistance on-site during construction works for the PV plant

As built documentation

Technical support in EPC contracts and in supply contracts

Preparation of budget for detailed engineering, technical assistance and as built documentation Works in tenders

DESIGN & PERFORMANCE

Our engineers assess the solar resource and electricity production using databases, local meteorological stations and using Pvsyst software to optimize yield and LCOE projects for a particular site. Identifying the technological components, modules, inverters, structures and materials most appropriate to the project.

Yield Assessment and PR estimation for the following Project's phases:	Design of PV plants including:	Technical support in the following activities:
➔ Development	➔ DC/AC ratio optimization in order to decrease as much as possible LCOE of projects	➔ EPC and O&M contracts
➔ EPC Tenders and proposals	➔ Nominal AC power considering Grid Code requirements	➔ Supply contracts
➔ Construction	➔ Module/Inverter configuration	➔ Marketing and Commercial
➔ Commissioning and start-up		➔ Inverter and module manufactures evaluation
➔ Operation and maintenance		

COMMISSIONING

The **COMMISSIONING ASSISTANCE** in photovoltaic plants projects, as well as quality control of PV plants, are essential for keeping the efficiency of energetic production as high as possible during the life-time of the plant. It is fundamental to inspect the PV plant and check its performance.

Our **COMMISSIONING** services have a pioneering system in implementation of advanced systems to acquire geospatial data using drones. Therefore, it has a team of highly qualified professionals and accredited by the State Air Safety Agency.

In addition, we are registered as a remotely piloted aircraft system operator (RPAS). Performing thermographic inspections, visual reconnaissance flights, photogrammetry, photo-video reports.

QUALIFIED PERSONNEL

- Technical support in EPC contracts
- Preparation of budget for commissioning works in tenders
- Start-up of the PV plant
- Cold and hot commissioning
- Mechanical and Electrical supervision

QUALITY

Specialized in quality control of PV modules in an independent laboratory accredited by **ENAC**, with accreditation number **581/LE 1535**, as well as in on-site and performance test inspections of PV Plants.

More than 175 facilities inspections and equipment quality control have been conducted in more than 20 countries.

LABORATORY TEST

- Quality control of photovoltaic modules.
- Manufacturing audits.
- Audit in production lines.
- Audit in packaging, sealing and shipment
- Technical support in EPC and PV modules supply contracts.
- Preparation of budget for quality and testing works in tenders.

ON SITE TEST

- Visual inspection for major defects
- Thermographic inspection for hot spots or cell cracks
- Insulation resistance test
- Peak power determination

QUALITY

OUR LABORATORY is capable of testing 250 PV modules per week. The laboratory can easily coordinate the receipt, storage and transfer of large PV panels from multiple clients, suppliers and locations.

INSPECTION AND TEST IN LAB

- Visual Inspection: IEC 61215/10.1
- Determination of Maximum Power IEC 61215/10.2
- Insulation tests: IEC 61215/10.3
- Thermographic inspections: : Internal procedures
- Electroluminescence: IEC 62804
- Control of degradation of the modules according to manufacturer's warranties
- ISO 14001/ OHSAS 18001

ENAC
Entidad Nacional de Acreditación
E N S A Y O S
Nº 851/LE1535

Visual inspection
(acc. to IEC 61215)

Insulation Test
(acc. to IEC 61215)

Thermographic Inspection
(acc. to internal procedure)

Determination of Maximum Power
(acc. to IEC 61215)

We provide innovative solar tracking solutions for the global utility-scale solar market. Our product lines are designed and engineered by leading industry professionals to deliver the lowest total cost of installation while providing unparalleled customer service and support during all phases of the project.

SOLAR TRACKERS

We have two factories in Valencia (Spain) dedicated to Solar Tracker and Fixed-Tilt Racking production with more than 190 employees and a production capacity of 3.5GW per year.

Optimal organization of the production activities allows us to achieve efficient and functional results in record time.
The production is subjected to quality controls so that all products are fabricated according to the specifications of the client.

This quality control is carried out through the **Factory Acceptance Testing (FAT).**

EUROPEAN MANUFACTURING
Everything is manufactured in Valencia
(except Slew Drives)

MATERIAL IN STOCK
80,000 Tons

We are certified by the European Quality Assurance for the **UNE-EN-ISO 9001:2015** and the **UNE-EN-ISO 14001:2015** as the Quality Management System and the Environmental Management.

ADDED VALUE SERVICES

LOGISTIC

We coordinate the delivery of materials according to the client's requirements, making organized deliveries to facilitate the construction.

MANUFACTURING

We have invested in a state-of-the-art to ensure competitive prices, as well as provide stricter quality and manufacturing controls.

ASSISTANCE

In addition to the usual supply of trackers, we offer integral services (complete, technical solutions, etc.) of construction that cover foundations, tracker assembly and mechanical assembly of trackers.

STRUCTURAL ENGINEERING FOR THIRD PARTIES AND QUALITY CONTROL

Associations with different structural engineering companies to ensure compliance with local codes.

INTEGRAL ENGINEERING SERVICES AND SUPPORT SYSTEMS

Site design, geotechnical evaluation and foundation design, permits, on-site construction and start-up support.

BANKABILITY

We have technical due diligence reports available from Black & Veatch and Vector Cuatro that validate the methodologies, technologies and fundable organization.

TRACKERS ADDED VALUES

LOW PROFILE

The Axone's single module in portrait configuration with shorter rows reduces drive arm torsion.

STEADIER UPTIME

Tracker designed for 90 mph at 45° without relying on stow, resulting in higher overall solar energy generation due to minimal downtime.

NO MAINTENANCE

Self-lubricating, UV-protected polymeric bearings allow for grade and foundation plumb tolerance, and long term serviceability.

SMART COMPONENT CRITERIA

Premium components such as HDG structural & fasteners, polymeric bearings, and industrial AC motors equate to low maintenance requirements.

INDUSTRIAL CONTROLLER

Off-the-shelf industrial controller components include Siemens PLC, VFD, plug-and-play with quick disconnects, and touchscreen interface.

PRACTICAL PANEL ATTACHMENT

PV modules are directly attached to rigid steel panel rails, eliminating Vibratory and thermal expansion and over- torquing risks associated with aluminum sandwich clamps.

CONSERVATIVE ENGINEERING

Code-based ASCE 7-05/10 approach integrates over fifty years of wind tunnel data.

CENTRALIZED MOTOR ARCHITECTURE

Linear, pendulum-style driveline and just 2-3 motors per MW means virtually no motor operation and maintenance costs.

BACKTRACKING

On-board algorithm adjusts module positions during periods of low solar height, lessening the effect of shadows on solar cells.

COMMERCIAL COMPONENTS

SLEW DRIVES

It is the only piece that has not been manufactured in Europe. Even so, we have tested the quality and reliability of our supplier on many occasions. In addition, having the crowns separated from the engine, we make it easier and cheaper to change the parts in case of wear or malfunction.

STEEL

All our components are made with steel produced in Europe, and with the anti-corrosion guarantee of Magnelis.

ENGINE & DRIVERS

All our engines are manufactured and assembled in our facilities in Valencia, as well as the drivers who ensure its correct operation.

PV CLEANER

The cleaning of solar panels is essential, that's why we give our clients a solution prepared for the cleaning of large-scale photovoltaic plants, that allows to improve the productivity of plants by up to 30% with our PV CLEANER.

- **Tested in desert areas under real conditions**
- **Water-free**
- **No additional rail to move along the panels (jumps from one panel to another within the same row)**
- **Manual row change**
- **Easy handling and durability in the most extreme conditions**
- **Eliminates the accumulation of dirt on PV panels**
- **Avoids the reduction of useful life of the solar panel**
- **Avoids the appearance of hot spots that reduce its efficiency**

PV CLEANER has been verified and tested by TUV and meets safety and quality standards.

MONITORING

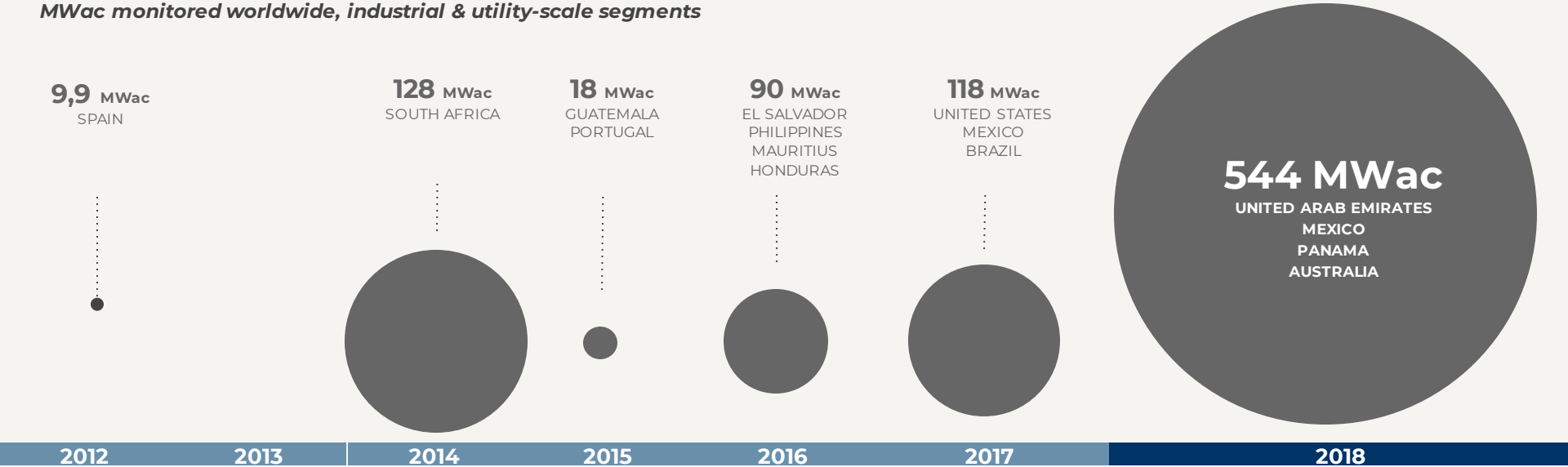
We provide products and services required for monitoring and the control of utility-scale PV power plants.
We also design customized SCADA solutions that suit our customer's needs.

We deliver turnkey projects which includes the following key activities:

- **Project management and supervision**
- **Project design**
- **Supply material and equipment**
- **Shipment of materials to site**
- **Software development**
- **Installation and commissioning works**
- **Personnel training**
- **Plant Operations and Maintenance**

FLEET MONITORED WORLDWIDE

MWac monitored worldwide, industrial & utility-scale segments



Monitored fleet

>360 MW monitored until Q4 2017

Ongoing Projects

>540 MW in development in 2018

PV PERFORMANCE CONTROL ®

PVPC Performance Control
We can coordinate delivery of materials according to client's requirements, making rolling deliveries which are organized to facilitate construction.

Control Centers
Centralized management of geographically distributed solar plants through a common web-based monitoring system.

Maintenance Management
Ticketing, generation of work orders, and schedule preventive and corrective
maintenance.

Power Plant Controller
The PPC allows the regulation of active and reactive power, power factor and up/down ramp and voltage at the Interconnection Point.

Monitoring String Boxes
String - level monitoring for PV solar plants.

Design
Engineering design of monitoring system, and project management and supervision.

Commissioning
Configuration and commissioning works for supplied equipment (meteorological stations and rack cable connections).

Training
On-site training for O&M personnel. SCADA system, common problems and troubleshooting.

Cloud-based SCADA
Private cloud-based SCADA Central Server. Cloud plant performance historical data back-up.

Technical Support
Remote technical support by phone or email during business hours, and on-site technical assistance.

Some of the main references in which Group Gransolar has been in charge of the EPC project

LESEDI

(South Africa)

80.51 MWp

38,112
HOMES

97,644
CO2 TONS AVOIDED

6,510
TREES EQUIVALENCE

21,699
CARS EQUIVALENCE

LETSATSI

(Sudáfrica)

80.51 MWp

36,849
HOMES

94,409
CO2 TONS AVOIDED

6,249
TREES EQUIVALENCE

20,980
CARS EQUIVALENCE

MOHAMMED BIN RASHID AL MAKTOUM

(PHASE A)

Dubái

(UAE)

1 of 3 PHASES Built
2 Under Construction
COD: April 2020 (last phase)

266.3 MWp

140,259
HOMES

359,349
CO2 TONS AVOIDED

23,957
TREES EQUIVALENCE

79,855
CARS EQUIVALENCE

LILYVALE

Queensland (Australia)

2018

126.20 MWp

70,503
HOMES

180,630
CO2 TONS AVOIDED

12,042
TREES EQUIVALENCE

40,140
CARS EQUIVALENCE

SOBRAL

(Brazil)
In Operation

34.74 MWp

20,097
HOMES

51,489
CO2 TONS AVOIDED

3,433
TREES EQUIVALENCE

11,442
CARS EQUIVALENCE

SERTAO

(Brazil)
In Operation

34.74 MWp

20,057
HOMES

51,386
CO2 TONS AVOIDED

3,426
TREES EQUIVALENCE

11,419
CARS EQUIVALENCE

AGUA FRÍA

(Honduras)

60 MWp

25,826
HOMES

66,167
CO2 TONS AVOIDED

4,411
TREES EQUIVALENCE

14,704
CARS EQUIVALENCE

IS31

North Carolina
(USA)

43.12 MWp

19,363
HOMES

49,607
CO2 TONS AVOIDED

3,307
TREES EQUIVALENCE

11,024
CARS EQUIVALENCE

CAMARGO

(Mexico)

35.45 MWp

20,706
HOMES

53,049
CO2 TONS AVOIDED

3,537
TREES EQUIVALENCE

11,789
CARS EQUIVALENCE

BAILADERO

Tenerife
(Spain)

10.63 MWp

4,494
HOMES

11,513
CO2 TONS AVOIDED

768
TREES EQUIVALENCE

2,558
CARS EQUIVALENCE

SIBO

(Guatemala)

6.096 MWp

3,045
HOMES

7,801
CO2 TONS AVOIDED

520
TREES EQUIVALENCE

1,733
CARS EQUIVALENCE

CISTERNA

(Italy)

4.894 MWp

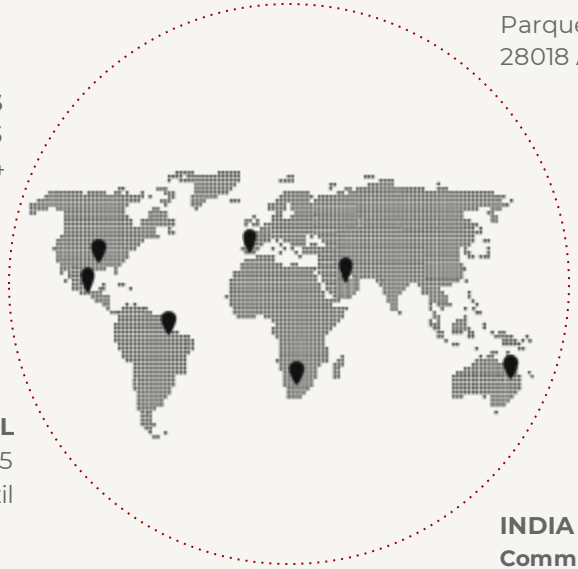
1,670
HOMES

4,277
CO2 TONS AVOIDED

285
TREES EQUIVALENCE

951
CARS EQUIVALENCE

GROUP GRANSOLAR
GLOBAL



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