

GulfStream Wallet Corp.

China - Spain - Barcelona - America.

ENERGY

STUDIES AND SOLUTIONS

WE AUDIT THE NEEDS OF EACH
CLIENT, ACTING AS PROJECT
TECHNOLOGICAL CONSULTANTS,
DEVELOPING THE MOST SUITABLE
TECHNOLOGY ACCORDING TO
THEIR NEEDS

... Energy Efficiency, Industrial
Lighting, Public lighting,
Agriculture ...

POSITIONING IN ENERGY EFFICIENCY

CITIES. RURAL ZONES . ROADS . TUNNELS.
INDUSTRIAL PARKS, SHOPPING CENTERS, LARGE
FACTORIES, PARKING,

NEIGHBORHOOD COMMUNITIES, SMEs, SPORTS CLUBS, HOTELS, HYPERMARKETS, PUBLIC SECTOR, LARGE CHAINS, etc ...

Public lighting, Industrial, Decorative, Special, Exterior and interior, Efficiency





LEADING COMPANY IN THE SECTOR THAT PROVIDES COMPREHENSIVE SOLUTIONS.

ADDRESSING AND MANAGING ALL THE PHASES OF EACH PROJECT, PROVIDING EXPERIENCE AND CUTTING-EDGE TECHNOLOGY.

We provide:

MANUFACTURING

We manufacture our equipment with the best components

From the market.

(%)

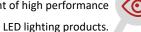
CERTIFICATIONS

Our products have International certificates c Like CE, TÜV, RoHs, NOM UL, IRAM, etc.



I + D + I

 $\label{lem:Research and development of high performance} \\$



LIGHTING AND LIGHTING

Engineering, project, monitoring, measurement.



ISO 9001: 2008 certification, Quality

controls.



Gulfstream Wallet, Corp



SUPPLY MANAGEMENT

Extensive experience both in export and import.



FINANCING

We offer the possibility of studying the financing of your operations.

BUSINESS

We provide the entire value chain to your business.

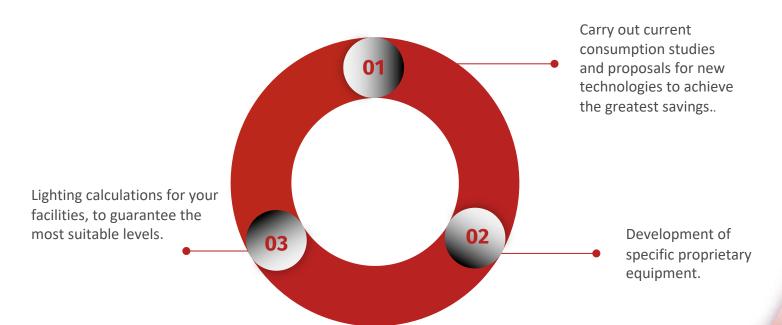


CONSUMPTION AND SAVINGS STUDIES TO OPTIMIZE YOUR INSTALLATION



Gulfstream Wallet Corp.

offers the possibility of:



STUDY SERVICES OFFERED BY SUNRISE

SOLUTIONS IN LIGHTING AND PUBLIC LIGHTING



LED ADVANTAGES AGAINST SODIUM

- Minimum maintenance, durability between 4 and 5 times greater.
- Better color rendering, white light.
- Immediate start-up, regulation capacity and remote management.
- Better use of light capacity, directing

Duración







SOLUTIONS IN LIGHTING AND PUBLIC LIGHTING

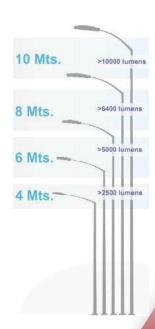


LED ADVANTAGES AGAINST SODIUM

Less power, greater savings

Tabla de equivalencia entre farolas LED y lámparas convencionales

30 vatios 60 vatios 120 vatios 180 vatios 240 vatios	Altura de la luminaria	Potencia conv.
	4,5 metros De 6 a 8 metros De 8 a 10 metros De 10 a 12 metros De 12 a 15 metros	60-70 vatios 150 vatios 250 vatios 400 vatios 500 vatios



SOLUTIONS IN LIGHTING AND PUBLIC LIGHTING



LED ADVANTAGES AGAINST SODIUM

Better resistance to temperature variations.

They are modular, they facilitate maintenance at a lower cost.

Better behavior against vibrations and impacts.

Unlimited on and off, do not affect LED equipment.

Greater light uniformity thanks to the directing of the light.

Reduction of light pollution.

They do not produce ultraviolet or infrared rays.

They are recyclable, they do not contain pollutants.

Innovative and aesthetic designs.

Lower installation costs due to reductions in the wiring section required for connections with lower power.

ENERGY EFFICIENCY



Energy Efficiency in Public Buildings:



Energy Efficiency in Private Environments



ENERGY EFFICIENCY SOLUTIONS



ENERGY AUDIT



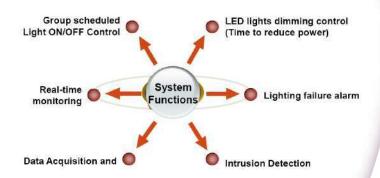


- •Complete view of the energy status of the installation.
- Inventory Energy service bills for the last few years.
- Lines of action proposed for modification.
- Sizing redesign.
- Installation of systems
 - automatic regulation and systems
 - •of Tele-management.

ENERGY EFFICIENCY OF ELECTRICAL AND ELECTRONIC SYSTEMS



- Change of traditional luminaires for LED systems
- Tele-management, automatic supervision for the realtime detection of current losses and short circuits, in the entire electrical infrastructure.
- Remote management of electrical installations on and off.
- Development of safe and efficient equipment with low consumption.

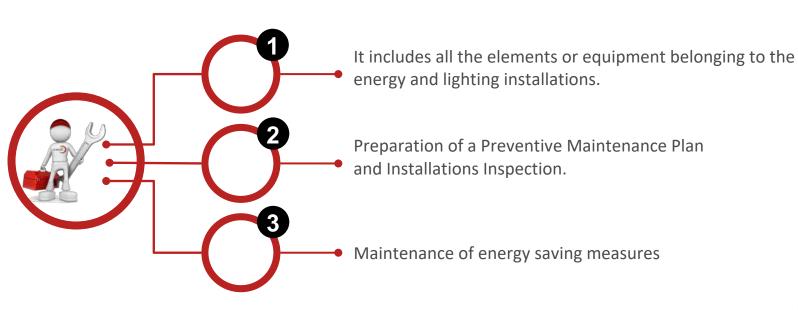


MAINTENANCE SERVICE



Gulfstream Wallet offers the possibility of:

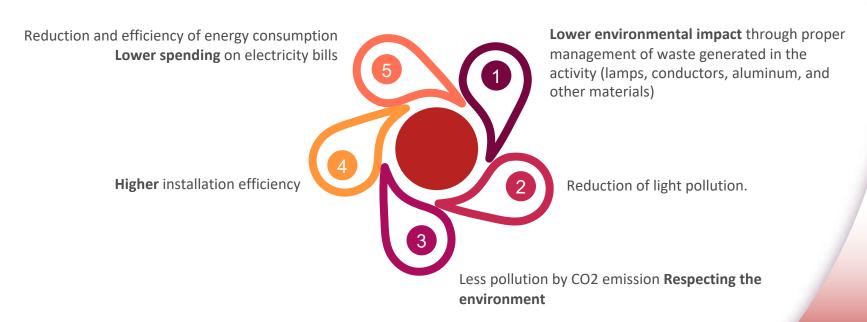
Management of the maintenance tasks of the facilities.



ECOLOGICAL IMPACT OF THE MEASURES



The implementation of the proposed measures results in an environmental benefit and in our surroundings



LIGHTING AND LIGHTING



GW Corp LED



AREA OF ACTIVITY THAT IS BORN WITH A 100% TECHNOLOGICAL VOCATION IS DEDICATED, AMONG OTHERS, TO THE STUDY, RESEARCH AND DEVELOPMENT OF LED LIGHTING.

ENGINEERING AND PREPARATION OF ENERGY EFFICIENCY PROJECTS AND STUDIES CREATION, MANUFACTURE AND IMPLEMENTATION OF LAST GENERATION LED PRODUCTS INTERNATIONAL POSITIONING WITH OFFICES IN:

HONG KONG -MADRID - BARCELONA - SHENZHEN - MEXICO AND INTERNATIONAL COMMERCIAL OPERATIONS



Our production line in the Factory





















FACTORY PRODUCED

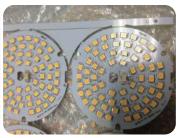


Our production line in the Factory













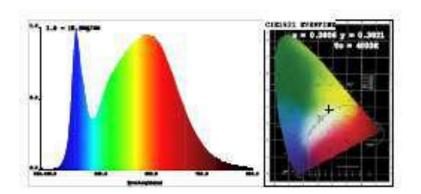






R + D + I, DESIGN, MANUFACTURE, DISTRIBUTION





ENGINEERING, PROJECTS, LIGHTING STUDIES, SOLUTIONS







LIGHTING AND LIGHTING EFFICIENCY SOLUTIONS





LED

Medium level defined by UNE-EN 12464-1: 2002 is maintained

LED example

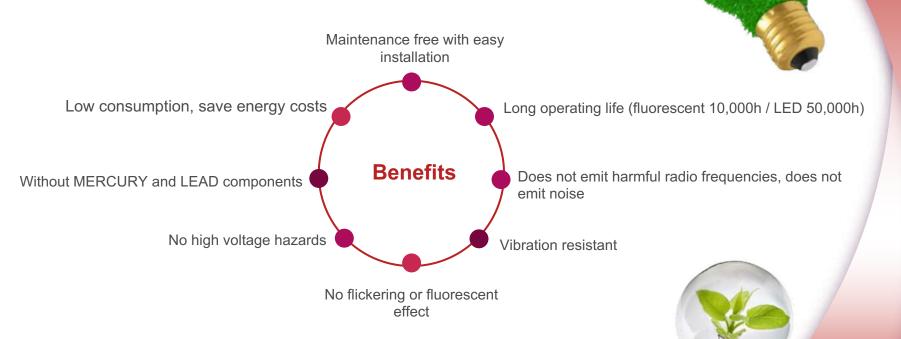
By achieving light levels over **90% of current levels**, energy savings close to **60% are obtained**.

Return on investment between 1 and 3 years

Lighting solutions

LIGHTING AND LIGHTING

REPLACEMENT OF FLUORESCENT LAMPS BY LED LAMPS



Gulfstream Wallet, Corp

LIGHTING AND LIGHTING SOLUTIONS



Lighting solutions

Adjustment of the installation to the actual occupation of each zone.

Presence detectors

Independent circuits by zone

Time switches

- •Estimated savings of 50%
- •Return on investment 1 year



LIGHTING AND LIGHTING SOLUTIONS



Lighting solutions

Use of natural light

Electronic equipment with photoelectric cells.

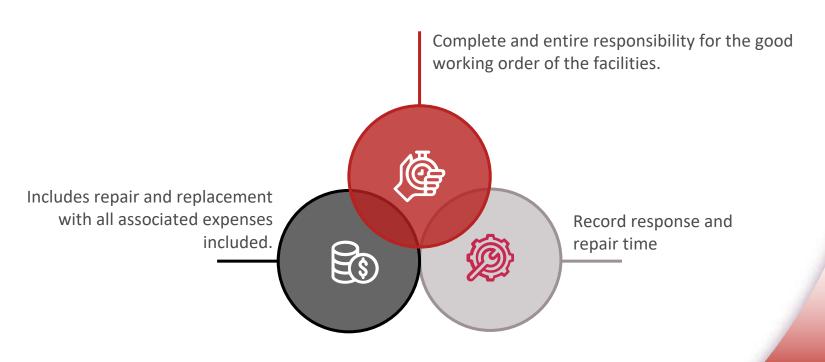
- Estimated Savings of 30%
- •Return on investment 1-3 years



TOTAL WARRANTY SERVICE



Gulfstream Wallet Corp offers the possibility of: Repair, necessary replacement of equipment.



CHANGE FROM LIGHTING TO LED IN DIA GROUP SUPERMARKETS



Replacement of fluorescent tubes to LED tubes



3000 Stores in Spain

CHANGING THE LIGHTING TO LED REPSOL SERVICE STATIONS



Supply of led equipment for service stations

Average Savings> 58%



SUPPLY FOR REPLACING TRADITIONAL TECHNOLOGY BY LED EQUIPMENT IN 3500 SERVICE STATIONS IN SPAIN

Equipment also available for ATEX normative environments



CHANGE FROM LIGHTING TO LED IN CHAMARTÍN STATION



Supply of led equipment for service stations

SAVINGS GREATER THAN 50%









SUPPLY OF LED LIGHTING FOR WALK WAY AREA

SUPPLY OF LED LIGHTING VIGO FREE ZONE



SAVINGS GREATER THAN 60%



SUPPLY OF INVETURA BRAND LED LIGHTING EQUIPMENT VIGO FREE ZONE CONSORTIUM





CHANGE FROM LIGHTING TO LED AT HEADQUARTERS IN ARTEIXO



INDITEX





SUPPLY LED LIGHTING EQUIPMENT INDITEX BUILDING IN ARTEIXO

SAVINGS GREATER
THAN 60%

Gulfstream Wallet, Corp

Stadium Monterrey Mexico



SUPPLY LED LIGHTING EQUIPMENT 500 WATT PROJECTORS



Stadium Lighting



Colombia

























New Factory Medellin 2021

SUPPLY DIFFERENTS SOLAR AL IN ONE LIGHTING EQUIPMENT



Solar lighting Solutions

Technological innovation,







Photovoltaic Solutions

Technological innovation,













Advantages of solar energy:

The main advantages of solar energy lie in the fact that it is a clean resource, that is, respectful with the environment, and inexhaustible, since its raw material is the Sun.

Gulfstream Wallet Corp

Home Office

8180 NW 36th St. Doral, Florida

Factory:

No3 Workshop, C1 District Luoshan Industrial Zone, Shanxia Comunity Pinyhu Street, Longgang District, Shenzhen, China

POTENTIAL PARTNERS & SUBCONTRACTORS



Titanium Infrastructure: Pipelines & Railways







Outline

- Who We Are
- The Technology
- Titanium's Attributes
- Environmental Benefits
- Pipelines
- Railways





We Are...

- Company Name
 - Tiller International Capital
 - TillerCapital.com
 - Amalgamated Titanium Int'l
 - AmalgamatedTi.com
- Titanium Technology Company
- We Make Titanium Products Affordable
- We Make Titanium Available
 On An Infrastructure Scale



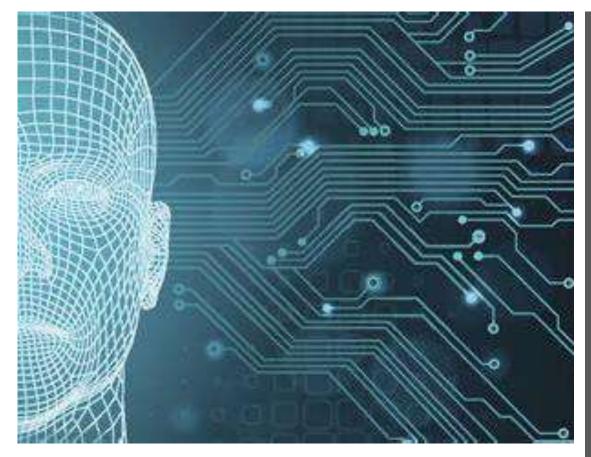
We Are Part Of...

- Tiller Formed in 1972
- 2000+ Completed Projects
- 160,000 Employees
- 76 Countries

INDUSTRIES:

- Energy
- Oil & Gas
- Pipelines
- Infrastructure
- Mining
- Rare Earth Metals
- Industrial
- Automotive
- Engineering
- Etc...





WHO DEVELOPED The Titanium Tech?

• Developed For:

DOD / NASA

• When:

During the Cold War

• Why:

• To Counter Titanium Weapons Tech

• By Whom:

- U.S. Tech & Scientific Team
- TillerATI Team

• Ownership:

• TillerATI via Space Act Agreement



The Technology

- Comprehensive Titanium
 Manufacturing Technology
- Affordable
- Mass Production Scale
- Infrastructure Scale
- Mobile Field Production
- Metallurgical Surface Treatments
 - Heat, Pressure, Galling
- Engineer to Accommodate Tech

Titanium's Attributes



- Environmentally Friendly
- 45% Lighter
- 100% Corrosion Free
- 200% Stronger
- Highest Strength-to-Weight Ratio
- Greater Durability
- Greater Yield
- Greatly Abundant
- Now Affordable

Titanium's Environmental Benefits

- Impervious-To-Corrosion
 - Even in Saltwater
 - Reusable 100%
 - No Bio-Contamination From Pipe Degradation
 - No Internal/External Contaminants Leaching Through Degraded Pipe
 - Naturally Anti-Microbial
 - Bio-Compatible With Human Body





Titanium's Environmental Benefits Continued...



- Reduced Enviro Disruption
 - Greater Life-Expectancy
 - Greater Strength
 - Reduced Cost
 - Reduced Wear From Use
 - Reduced Erosion Rates
 - Reduced Maintenance & Replacement
 - Greater Resilience vs. Natural Disasters & Accidents
- Greater Safety
- 9th Most Abundant Element In Earth's Crust
- Modernity & Visual Beauty

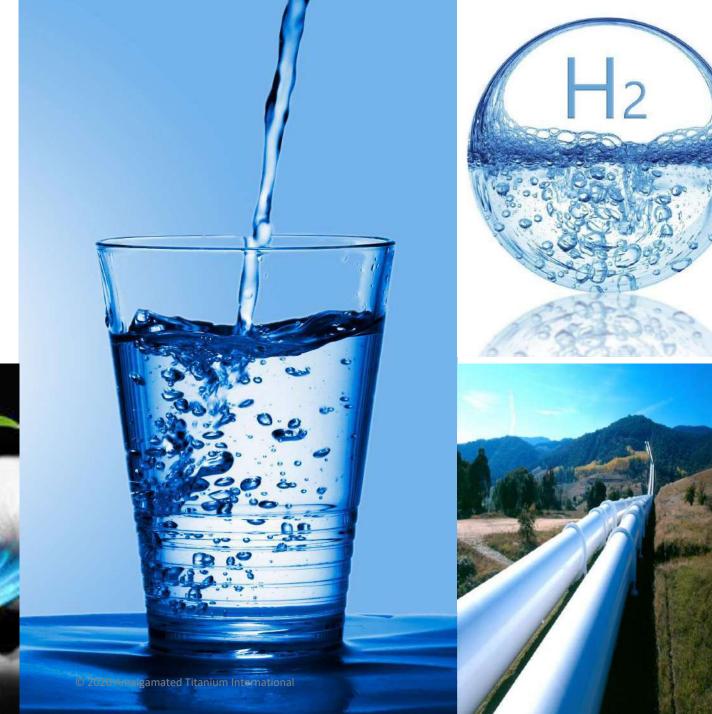




Titanium Pipelines

- Water
- Hydrogen
- Natural Gas
- Oil







Non-Corrosive Titanium Pipelines

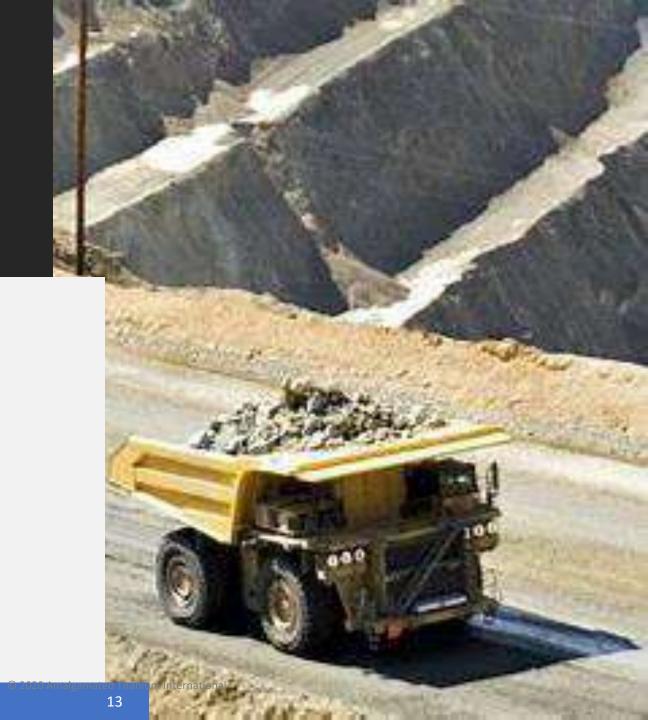
- SAFER, GREENER & CLEANER Water
 - No Leaching Contamination
 - No Corrosion Contamination
 - Anti-Microbial
 - Reduces Enviro Disruption
 - Reduces Contamination From Damage, Maintenance, Replacement
- SAFER & GREENER Hydrogen/Gas/Oil
 - No Leaching Out of Pipe
 - Reduced Enviro Disruption
 - Reduces Leaks From Damage,
 Maintenance, Replacement



Titanium Pipe Requirement 1

Extensive Supply

- Exclusive Access
- Global Expansion





Titanium Pipe Requirement 2

Technical Know-How

- Comprehensive Titanium Manufacturing Technology
- Innovation Across Many Industries
- Always Titanium Specific



MOBILE Onsite Pipe Manufacturing

- Truck/Trailer/Ship Pipe Production
 - Continuous Production & Feed
 - Select Diameter & Wall Thickness
 - Select Road Conditions



FIXED Onsite Pipe Manufacturing

- Field Flexibility
 - Staging Area
 - Custom Length Pipe
 - Standard Length Pipe
 - Length Limited By Road Accessibility

Simplified Logistics

- Eliminate Pipe Manufacturer
 - No Coatings
 - No Intermediate Transit/Storage
 - No Intermediate Costs/Profits
- Shipping Plate & Coil Vs. Pipes
 - Weight Savings 45% 87%
 - Volume Saving 50% 85%





Titanium Rails



- Problem Areas
 - Coastal Areas
 - Tunnels, Underground Railways
 - Crossings (buried foot)
 - Contamination Areas
 - Water, Mineral, Bio-Matter





Most Durable Rail

- Stronger
- Greater Life-Expectancy
- Greater Cost-Efficiency
- Reduced Wear From Use
- Reduced Maintenance
- Reduced Replacement
- No Coating
 - Penetration Risk
 - Corrosion Risk



Lightest Rail

- 45% LIGHTER
- More Cost-Efficient
 - Transport
 - Install
 - Maintenance
 - Replacement





Rail Types

- Welded Rail
 - Field Robotic Welder
 - User Friendly
 - More Cost-Efficient
 - Faster Install & Maintenance
 - Highest Quality
- Sectional Rail





yüksek mimar FURGUT UZUNOĞLU

Tarih:...../.....

İstanbul

Date: November 05, 2020

To: Pangaea Golden Qasis General Trading LLC

Attn.: Mrs. CHRYSTALLA KOUSIAKI

Ref. №: RPC/PCC/ERZURUM

The theme: On the subject of investing in the construction and commissioning of the refinery complex(PRC), petrochemical complex(PCC) and other complexes in Turkey.

Dear Madam!

We offer you to consider participation in the implementation of projects in the Republic of Turkey:

- financing, construction and operation of an oil refinery with a capacity of 6 million tons of oil per year, the approximate cost of the project is up to 8 billion USD, Erzurum region;
- financing, construction and operation of oil pipeline and product pipeline, port and terminals for storage of oil and oil products, the approximate cost of the project is 3 billion USD, Erzurum region;
- financing, construction and operation of petrochemical complex with a capacity of 6 million tons of oil per year, the approximate cost of the project is 10 billion USD, Erzurum region:
- financing, construction and operation of a gas processing complex, port and liquefied gas storage terminals, the approximate cost of the project is 6 billion USD;
- financing, construction and operation of waste processing complexes with power generation, the approximate cost of the project is 1 billion USD;
- financing, construction of a residential complex for service personnel (40,000 people), the approximate cost of the project is 1 billion USD, Erzurum region;
- financing, construction and operation of cattle-breeding complex for 50,000 head-cattle and small-horned livestock, the approximate cost of the project is 1 billion USD, Erzurum region;
- financing, construction and operation of petrol and gas stations in Turkey, the approximate cost of the project is 0.4 billion USD;
- obtaining the earth's petrothermal energy followed by using steam to generate electricity and heat/cold is 2 billion USD;
- construction of a plant for the production of electric vehicles and batteries, 2.6 billion USD.

The total amount of necessary investments is 35 billion US Dollars.

In Turkey needed the creation of a major refinery complex(PRC) and petrochemical complex(PCC) with all infrastructures in the region of Erzurum, using as raw material from Azerbaijan, Russian, Iranian and Iraqi oil and gas, near the international main oil and gas

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pipeline(existing pipeline Baku-Tbilisi-Ceyhan(BTC) and the construction of gas pipeline TANAP), the railway and the road. The construction and operation of these systems will be implemented on the system of Build-Operate-Transfer (BOT) the state with maturity in 29 years. On the return of investments the government will provide the investor a guarantee of return of invested funds, if within a specified period of investment return the investor will receive their investment back.

We have had preliminary talks with the city of Erzurum and received their full support in implementing this project in all its phases (gratuitous allocation of land for construction and providing this area with water, electricity, gas, telephone and Internet connection, training and staffing, etc.), as well as providing support for this project from the government and MPs representing the region in the Turkish Parliament.

We also held talks with the Russian engineering company JSC "NEFTECHIMPROEKT" with extensive experience in the creation of a large refinery and petrochemical complexes in Russia and other countries of the world, including the execution of complex engineering, including the design, manufacture and supply of complete plants, equipment and materials, construction and commissioning.

In order to make the rapid creation of the proposed complex (refinery & petrochemical) for deep processing of oil in Turkey, we are a group with the company «NEFTECHIMPROEKT», offer the following:

To implement the creation of data (PRC and PCC) complexes in two stages:

- I-st stage creation of the refinery complex (PRC) with the oil refining depth of 98% and produce commodity petroleum products with quality not lower than Euro-5 with a capacity of 6 million tons per year of raw material. PRC allows you to in addition to gasoline(AI-95 EURO 5 -1669,5 thousand t/year) and diesel fuel(Diesel fuel EURO 5 -2588,4 thousand t/year) quality not lower than EURO 5, jet fuel(JP A1-615,6 th. t/year), liquefied petroleum gases five fractions(244,9 thousand tons/year), calcined coke and fuel(313,2 thousand t/year, including calcined electrode coke 266,6 thousand t/year) and sulfuric acid based on 100%(213,7 kt/year).
- II-nd stage-the creation of a petrochemical complex (PCC) with a capacity of 6 million tons per year of crude oil, 600 thousand tons/year of liquefied gases (additional raw materials from Azerbaijan and/or Russia), 600 thousand tons/year for the production of polyethylene, 200 thousand tons/year polypropylene, obtaining also ethylbenzene, styrene and polystyrene. Final power for the above petrochemical product II-phase of the complex will be specified by the company JSC «NEFTECHIMPROEKT» in the Feasibility study on the creation of II-phase of the complex, which they developed after consultation with the Customer, item, quantity and composition of all raw materials and manufactured products.

In addition to the above developments, we are the group with the municipality of the city of Erzurum is also proposed at the first stage simultaneously with the construction of PRC to start thermal power plant construction (energy complex)(TEC) with power up to 1200 MW,

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the capacity of which will grow modules to 25 MW (first module will be built to provide own needs of systems, and electricity produced by other modules will be supplied to the grid of Turkey). The state gives the guarantee of purchase of electricity produced for 10 years.

In addition, we are a group of initiator's suggested that the city Council of the city of Erzurum also in the first stage:

- to build a complex of waste disposal in this region and surrounding regions and generate electricity based on combustion of gases produced by the recycling of this dust. The state gives the guarantee of purchase of produced electricity within 10 years. The municipality is currently considering this project.
- -construction of a residential complex for 30,000 apartments with all infrastructures for residence employees(around 40,000 employees) and their families during the construction of these structures and the employees(about 3,000 people) in the operation of these complexes. The constructed apartments will be sold with working condition for the deduction of payments from their wages or by getting them loans from banks in Turkey. The state does not issue a guarantee on return of investments made in the construction and to guarantee the acquisition of these apartments built. The municipality is ready to provide territory for the construction of this residential complex.

The implementation of this project and the creation of these systems (PRC and PCC), we agreed with the company «NEFTECHIMPROEKT» is proposed to be based on the following separation of the main works, supplies, services and other functions:

The company JSC «NEFTECHIMPROEKT» provides:

- 1. In the preparatory stage of the Project Development and coordination of all feasibility and design materials, including:
- Development of a Prefeasibility Study;
- Ensure procurement of all necessary Licenses and acceptance of Basic projects for processes;
- · Development of FEED project;
- The preparation and coordination of EP-Subcontracting;
- 2. On the Main stage of the Project:
- EP-a subcontractor of Turkish EPCM-Contractor of the creation of the PRC and PCC;
- Participation in the conduct of commissioning works;

Turkish Partner provides:

1. In the Preparatory stage of the Project:

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 The results of baseline data on the conditions of the construction site and all kinds of raw materials and energy

The signing of the documents, ensuring the supply of raw materials, natural gas and electricity for PRC and PCC according to the FEED project «NEFTECHIMPROEKT»;

- Obtaining permits and licenses for the construction of PRC and PCC on the basis of FEEDproject «NEFTECHIMPROEKT» on the operation of these complexes and sales of products both wholesale and retail, including obtaining licenses to establish a Turkish network of petrol stations;
- 2. On the Main stage of the Project:
- Performing the functions of EPCM-Contractor of the creation of the PRC and PCC, except the EP works and supplies «NEFTECHIMPROEKT» carried out by sub-contract with the Turkish partner;
- 3. After the launch complexes in operation:
- Ensure together with the investor of the operation of these systems;
- Ensure together with the investor sales of products both wholesale and through retail, including the creation of across the country network of filling stations;

The investor shall:

- 1. In the Preparatory stage of the Project:
- Ensuring the financing of works of the Preparatory phase;
- Ensuring funding for all organizational work, including establishing company in Istanbul and obtaining permits and licenses;
- 2. On the Main stage of the Project:
- Ensuring of financing of works the Main stages of Project implementation;
- 3. After the launch complexes in operation:
- Provide basic working capital for at least covering the three-month period of operation of all constructed systems (acquisition of raw materials, salary of employees, payment for all services, etc.)
- Ensuring, together with the Turkish partner of the operation of these systems;
- Ensuring, together with the Turkish partner sales of products both wholesale and through retail, including the creation of across the country network of filling stations.

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The implementation of other parts of the project and the creation of other systems(thermal energy complex and etc.), we also offer to carry out the exact same the above scheme of division of the main works, supplies, services and other functions in coordination with other companies of performers, including the company «NEFTECHIMPROEKT».

The estimated indicative value of the complexes of this project, the term of their construction and the payback period since the beginning of operation the following:

- 1. The refinery complex (PRC)
- 1.1. Estimated cost-up to 8(eight) billion US dollars
- 1.2. The approximate construction period -up to 3(three) years
- 1.3. Approximate payback period -up to 7(seven) years from the date of commissioning of the plant.
- 2. Petrochemical complex (PCC)
- 2.1. Estimated cost-up to 10(Ten) billion US dollars
- 2.2. The approximate construction period -up to 5(three) years
- 2.3. Approximate payback period -up to 7(seven) years since the start of exploitation of the complex
- 3. The heat and energy complex (TEC), obtaining the earth's petrothermal energy followed by using steam to generate electricity and heat/cold.
- 3.1. Estimated cost-up to 2(two) billion US dollars
- 3.2. The approximate construction period -up to 3(three) years
- 3.3. Approximate payback period -up to 5(five) years from the date of commissioning of the complex
- 4. Residential complex(RC)
- 4.1. The estimated cost of up to 1(one) billion dollars
- 4.2. The estimated construction period will be 2(two) years
- 4.3. Approximate payback period -up to 5(five) years from the date of completion of construction of residential complex
- 5. Construction and operation of a livestock complex for cattle and small cattle -1 (one) billion dollars
- 6. Construction and operation of the oil pipeline and product pipeline, port and terminals for storage of oil and oil products 3(three) billion dollars

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- 7. Construction and operation of a gas processing complex, port and liquefied gas storage terminals, 6(six) billion dollars
- 8. Construction and operation of fuel stations and gas stations, 0.2(zero point two) billion dollars
- 9. Construction and operation of waste processing complexes with power generation, 0.8(zero point eight) billion dollars
- 10. Estimated working capital, covering the three-month period of work of all systems up to 3(three) billion.

The total amount of investment required for the construction and commissioning of all complexes is about 35 billion US dollars.

We ask you to give written confirmation about your willingness to participate in this project and become an investor in these projects. Our group thanks you in advance for participating in this project and looks forward to mutually beneficial and long-term cooperation!

Best regards,

Senior Architect Turgun Uzunoğlu

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TÉCNICAS REUNIDAS IS A GLOBAL LEADER IN THE DESIGN AND BUILD OF COMPLEX INDUSTRIAL PLANTS

Tecnicas Reunidas is a company specialized in the design and management of the execution of industrial plant projects throughout the world, with almost 60 year of experience.

Tecnicas Reunidas has designed and managed the construction of more than 1,000 industrial plants in over 60 countries. Its clients include many of the major national and multinational oil companies.

60 years of continued growth

+8,000
professionals
of over 70
nationalities

60 countries where we have operated

+\$50 billion in projects in the last 10 years

More than

1,000

industrial
plants

\$4 billion per year in
purchasing and
subcontracting

≈> 133,000,000

Construction

Hour/Year

≈ > 9,000,000
Engineering
Hour/Year

Safety Performance / **Zero** Incident Target 2020
Backlog, M€ 8,300
Sales, M€ 3,521
Employees +8,000

Main Markets

Saudi Arabia, UAE, Kuwait, Bahrein, Oman, Algeria, Singapur, Indonesia, Malaysia, Turkey, Russia, Poland, Finland, UK, Azerbaijan, Peru, Chile, Mexico, Canada, US, China, Australia



WHAT WE DO

TR helps its clients to develop their projects from the initial stages to their complete execution. The services given by TR allow the project to be structured in a balanced way in all its dimensions, and with the detail and depth that they require in each stage. With its approach, TR aims to minimize development costs, to optimize the costumer's business model, to ensure project financing and to preserve maximum environmental commitment.

Full range of services

Conceptual analysis of oppotunities, pre-feasibility studies

Basic Engineering

FEED-Front End Engineering and Design

Detail Engineering

OBE- Open Book Estimate

EPC

PMC – Project Management Consultant

Construction, Assembly and Commissioning

Procurement

Collaboration in financial structuration

Quality, Environment and Safety Management

Research & Development



THE INDUSTRIAL PROPOSAL OF TÉCNICAS REUNIDAS COVERS ALMOST THE WHOLE ENERGY VALUE CHAIN

	Exploration & Production	Midstream	Transformation	Delivery
Oil	Drilling	Upgrading	Refining	Shipping
	Production	Pipeline	Petrochemicals	Pipeline
	Gathering	Shipping	Storage	Distribution
		Storage		
Natural Gas	Drilling	Separation	Fractionation	Shipping
	Production	Pipeline	Liquefaction	Storage
	Gathering	Storage	Petrochemicals	Regasification
			Fertilizers	Pipeline

Power & Water

Fuel Biomass Coal Water treatment Gas Desalination

BUSINESS AREAS







- >500 Refining Units
- >150 Petrochemical Units
- Worldwide leader in Heat Transfer,
 Nitric Acid, Ammonium Nitrate and
 Hydrometallurgy Technologies

UPSTREAM & GAS

- Oil & Gas Fields Development
- Oil & Gas Treatment
- World Leader in LNG terminals
- Pipelines & Storage
- LNG Regasification
- Gas Compression
- Liquefaction



POWER & WATER

- Thermal plants/ Combined
 - Gas Turbine
 - Conventional
- Biomass and Waste to Energy
- Nuclear Experience
- Water Desalination & Treatment





TECNICAS REUNIDAS has head offices in Madrid with over 55,000 sqm office space

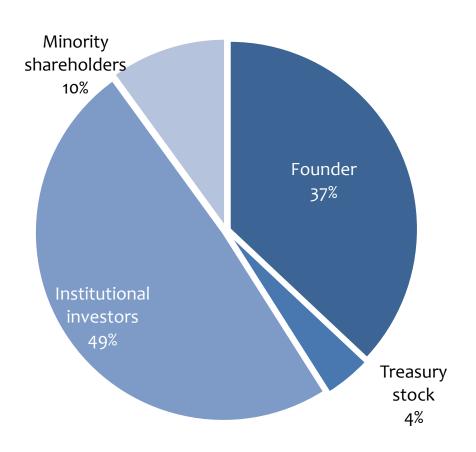


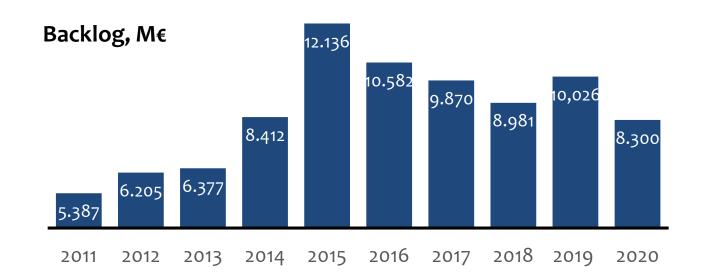
TR Team: + 8,000 professionals from 70 different nationalities





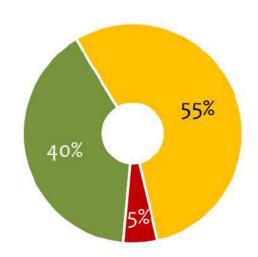
One of most important companies in the Spanish Stock Exchange











ABOUT TECNICAS REUNIDAS

HIGHLIGHTS





TR 2020 SAFETY PERFORMANCE / ZERO INCIDENT TARGET



TECNICAS REUNIDAS HAS RENOWNED & RECURRENT CLIENTS, ONGOING INVESTORS IN ENERGY INFRASTRUCTURES









Sasou













ADNOC

























WE HAVE EXECUTED SOME OF THE MOST EMBLEMATIC PROJECTS OF THE INDUSTRY

Saudi Aramco Saudi Arabia Rabigh Refinery



\$ 1,200 M

Galp Portugal Sines Refinery



\$ 1,200 M

Tüpras Turkey Izmit Refinery



\$ 2,400 M

Lukoil Russia Volgogrado Refinery



\$ 1,100 M

Socar Turkey Aegean Refinery Project



\$ 3,500 M

TouatGaz Algeria TouatGaz Gas Development



\$ 1,000 M

Petrochemistry

Natural Gas

Refining

REPSOL Spain Cartagena Refinery



\$ 1,500 M

Saudi Aramco Saudi Arabia Al Jubail Refinery



\$ 1,700 M

Saudi Aramco Saudi Arabia Jizan Refinery



\$ 900 M

Alliance Oil Company Russia Khabarovsk Refinery Expansion



\$ 900 M

SEGAS Egypt Damietta LNG Plant





\$ 1,250 M

ADCO Abu Dhabi Sahil and Shah Field



\$ 1,300 M

Saudi Kayan Saudi Arabia Phenolic Facilities



\$ 1,200 M

TECNICAS REUNIDAS

AND WE ARE CURRENTLY WORKING IN THE MOST ONGOING SIGNIFICANT PROJECTS OF THE INDUSTRY

EXXON MOBIL Singapur Refinery Expansion Project

ExonMobil

\$ 1,500 M EPC LSTK

KNPC Kuwait Al Zour Refinery



\$ 4.000 M (50% TR) EPC LSTK Saudi Aramco Saudi Arabia Ras Tanura Refinery



\$ 1.500 M EPC LSTK

Duqm Refinery Oman Duqm Refinery



\$ 2.800 M (65% TR) EPC LSTK

Saudi Aramco Saudi Arabia Fadhili



\$ 2,900 M EPC LSTK

Saudi Aramco Saudi Arabia Haradh



\$ 2,300 M EPC LSTK

Saudi Aramco Saudi Arabia Marjan



\$ 3,000 M EPC LSTK

BAPCO Bahrein Sitra Refinery



\$ 4.500 M (33% TR) EPC LSTK SUNCOR ENERGY
Canada
CBR Cogeneration



\$ 370 M (50% TR) EPC LSTK CKPC Canada Polypropylene Production Project



\$ 67 M EP ADNOC Onshore UAE Bu Hasa Field Development



\$ 1,440 M EPC LSTK ADNOC LNG UAE IGD Project - Phase 2



\$ 1,000M EPC LSTK

PERTAMINA / ROSSNEFT Indonesia FEED TUBAN



\$ 60M FEED LSTK

ROSNEFT

KNPC Kuwait Gas Train 5 at MAA Refinery



\$ 1,400M EPC LSTK





MAIN RECENT CONTRACTS



Clier	nt	Description	Scope	Value
SASA	SASA POLYESTER	New plant for production of PTA (Purified Terephtalic Acid)	EP	Confidential
CANADA KUWAIT PETROCHEMICAL 60 CORPORATION	СКРС	Polypropylene Production Project	EP	67 M\$
Termo \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	TERMOCANDELARIA SCA ESP	Termocandelaria Add-on Project	EPC	200 M\$
سوفاضراك	SONATRACH	New Refinery Hassi Messaoud	EPC	3,700 M\$
PERTAMINA	PERTAMINA/ROSNEFT	FEED TUBAN, Balongan Project (Indonesia)	FEED	60 M\$
SOCAR	SOCAR	Crude Oil Fuel Oil Tanks Project, COFOT (Turkey)	EP	37 M\$
SUNCOR	SUNCOR ENERGY	CBR Cogeneration (Canada)	EPC	370 M\$
ADMOC	ADNOC OFFSHORE	FEED Upper Zakum (UAE)	FEED	17 M\$
ADNOC أرامكو السعودية saudi aramco	SAUDI ARAMCO	Marjan Upstream Program (Saudi Arabia)	EPC	3,000 M\$
E xonMobil	EXXON MOBIL	Refinery expansion (Singapur)	EPC	1,500 M\$
(%)	GENERAL ELECTRIC	CCGT for Sumitomo & GE (UAE)	EPC	350 M\$
	ADNOC ONSHORE	Bu Hasa oil field (Abu Dhabi)	EPC	1,440 M\$
أدنــوك ADNOC	ADNOC LNG	ADGAS gas treatment plant (Abu Dhabi)	EPC	430 M\$

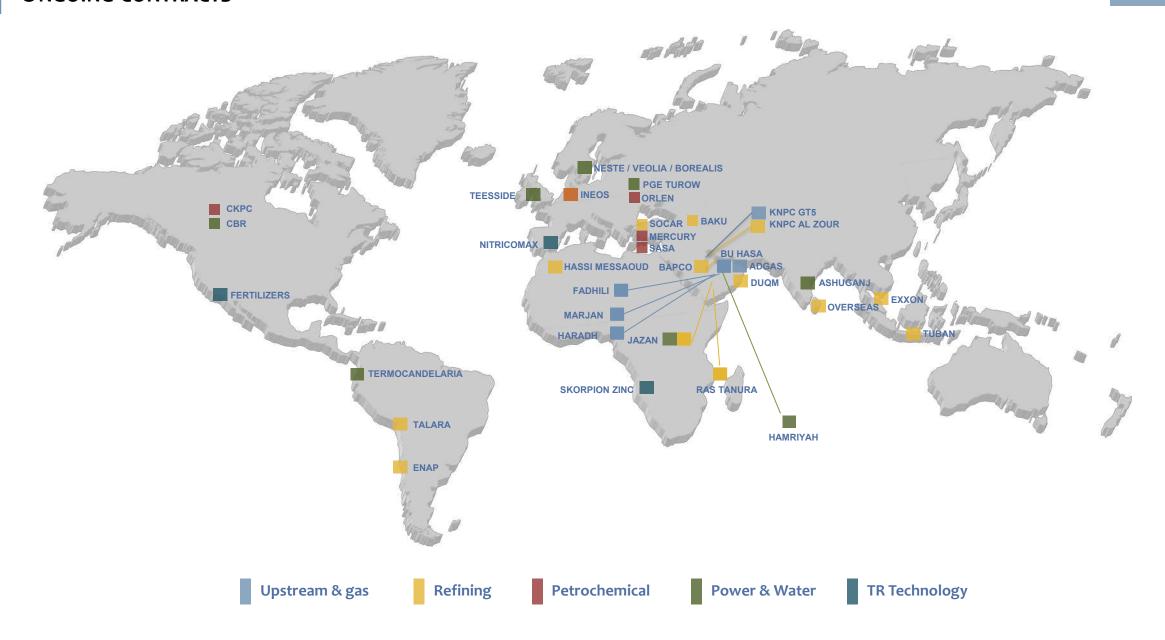
MAIN RECENT CONTRACTS



Client		Description	Scope	Value
SOCAR	SOCAR	Baku refinery (Azerbaijan)	OBE	Conf.
أرامكو السعودية saudi aramco	SAUDI ARAMCO	Haradh (Saudi Arabia)	EPC	2,300 M\$
ابکو Bapco	ВАРСО	Sitra refinery (Bahrein)	EPC	1,300 M\$
DUQM REFINERY	DRPIC	Duqm refinery (Oman)	EPC	> 1,800 M\$
NOVA Chemicals	NOVA CHEMICALS	AST2 PROJECT (Canada)	EP	55 M\$
E isterra energy	FISTERRA ENERGY	Tierra Mojada CCGT (Mexico)	EPC	> 500 M\$
أرامكو السعودية saudi aramco	SAUDI ARAMCO	Ras Tanura Clean Fuels (Saudi Arabia)	EPC	Conf.
MGT TEESSIDE	MGT Teesside Power	Teesside power plant (UK)	EPC	> 800 M\$
□ESTE	NESTE/VEOLIA/ BOREALIS	Kilpilahti power plant (Finland)	EPC	> 270 M\$
أرامكو السعودية saudi aramco	SAUDI ARAMCO	Fadhili (Saudi Arabia)	EPC	> 3,000 M\$
شركة البترول الوطنية الكويتية الببرول الوطنية الحديث الببرول الوطنية الكويتية المحدود KNPC Asbisidaryof Newat Petroleum Concorsion	KNPC	New refinery of Al-Zour (Kuwait)	EPC	> 2,000 M\$
شركة البترول الوطنية الكويتية البترول الوطنية KNPC اجسى سركات مؤسسا البتريل الكروبية A Subsidiary of Newet Petrolsum Conjoration	KNPC	5th Gas Train(GT5) and associated facilities (Kuwait)	EPC	> 1,400 M\$
PETROPERU	PETROPERU	Refinery Expansion in Talara (Peru)	OBE + EPC	> 2,700 M\$

TECNICAS REUNIDAS

ONGOING CONTRACTS



QUALITY POLICY



Quality Policy



QUALITY, HEALTH, SAFETY AND ENVIRONMENTAL POLICY

Tecnicas Reunidas offers a complete range of technical and management services, in the fields of engineering and construction.

Tecnicas Reuniclas Management Board, as a consequence of its corporate strategy regarding Sustainability, establishes as its main priorities in Quality, Health, Safety and Environment

- . To integrate the Quality, Bafety, Health and Environment issues in the decision-making of the Company's Board of Directors
- To deliver to our Clients, products and services according to their expectations, safety in their operation and maintenance as well as respectful to the environment.
- . To contribute a sustainable development through the rational use of energy and natural resources minimizing environmental impact, promoting innovation and using the best available technologies and
- . To protect the environment through a responsible environmental behavior throughout the Company's activities and to improve pollution prevention by optimizing environmental management and reducing the environmental risks.
- To preserve the Health and Safety of our employees, subcontractors and suppliers.
- To demonstrate relevant information regarding our activities, performing internal and external audits to ensure the liability and compliance for a continuous improvement plan.

Consequently, Tecnicas Reunidas Management is committed to

- . Incorporate in an efficient manner, Quality and HSE principles in their strategic business plans for all of their activities, transmitting them from the Directorate to all levels of the organization.
- Promote continuous improvement to the environment and in their work methods, implementing all activities procedures; and promoting a prevention philosophy. "Do it right the first time."
- Establishing objectives in Quality and HSE matters to be reviewed periodically.
 Satisfy all the requirements established by the Client, current legislation and applicable standards, as
- well as any further requirements that the Company may choose to endorse.

 Provide adequate and continuous training to staff and collaborators. . Conduct an Occupational Health and Safety Plan to be focused on the compliance with applicable
- legislation and the continuous improvement philosophy in these meters. Promote Quality and HSE knowledge to their staff and collaborators in order to encourage iswareness.
- · Creete lines of communication with staff and other interested parties. · Acknowledge the level of satisfaction of their Clients and implement feasible and appropriate
- improvements in each situation. . Develop monitoring channels to enhance the continuous improvement in relation to efficient use of
- energy, environmental protection, and air pollution prevention.

 Follow a philosophy of accident prevention, in order to provide each and every staff member with a
- healthy and safe working environment

 Manage risks and opportunities in Quality and Environment issues.

Tecnicas Reunidas declares that its Quality, Health, Safety and Environmental Policy is understood. implemented, continuously updated and communicated at every level of the Organization



Quality Certificate ISO 9001



CERTIFICATE

AFNOR hereby certify that the organization

TÉCNICAS REUNIDAS, S.A.

SEE ADDRESSES SPECIFIED IN ANNEX

for the following field of activities

SPECIFIED IN ANNEX TO THE CERTIFICATE

has implemented and maintains a

Quality Management System

which fulfils the requirements of the following standard

ISO 9001:2015

First issued on: 1999-08-01

Last issued: 2017-07-26

Validity date: 2020-07-26

Registration Number: ES-0101/1997

Michael Drochsel President of IQNet AENOR

2004 Partners

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Information Security Certificate ISO 27001





Certificate of Registration

INFORMATION SECURITY MANAGEMENT SYSTEM - ISO/IEC 27001:2013

This is to certify that:

Técnicas Reunidas, 5.A. C/ Arapiles, 13 Madrid Madrid 28015 Spain

Holds Certificate No:

15 576860

and operates an Information Security Management System which complies with the requirements of ISO/IEC

The management of information security in the administration, operation and maintenance processes carried out by the Information Technology and Communications Unit for the companies Técnica Reunidas S.A., BNTEC Infraestructuras S.A. and Española de Investigación y Desarrollo S.A. -Espindesa- related to following corporate applications and services provided through them: Enterprise Resource Planning (RP) or provide applications and services provided through them: Intranet portal and physical access control. In accordance with the Statement of Applicability API-001/17, dated May-2017.

For and on behalf of BSI:

Andrew Laurin, EMEA Sys Cert Oos & Compliance Director

Odolnal Registration Date: 2011-10-13 Latest Revision Date: 2017-09-01

Effective Date: 2015-09-02 Expiry Date: 2020-09-01

...making excellence a habit"

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Highlights

- TR has extensive experience in Oil Refining, with more than 500 units designed and built.
- TR is constantly improving its design in line with increasingly stringent environmental standards.
- Significant experience in working with the latest technologies of all the major licensors.
- TR uses its EPC experience to underpin FEED and Basic Design Packages.
- TR has developed close to 100 FEED's, mostly for Oil/Gas, Refining and Petrochemicals.

Refining Process Units Executed by TR

Total 526* Separation 88 Conversion & 64 bottom of barrel Quality 177 enhancement Environmental 197 auxiliary & others

Feed Contracts (last 10 years)

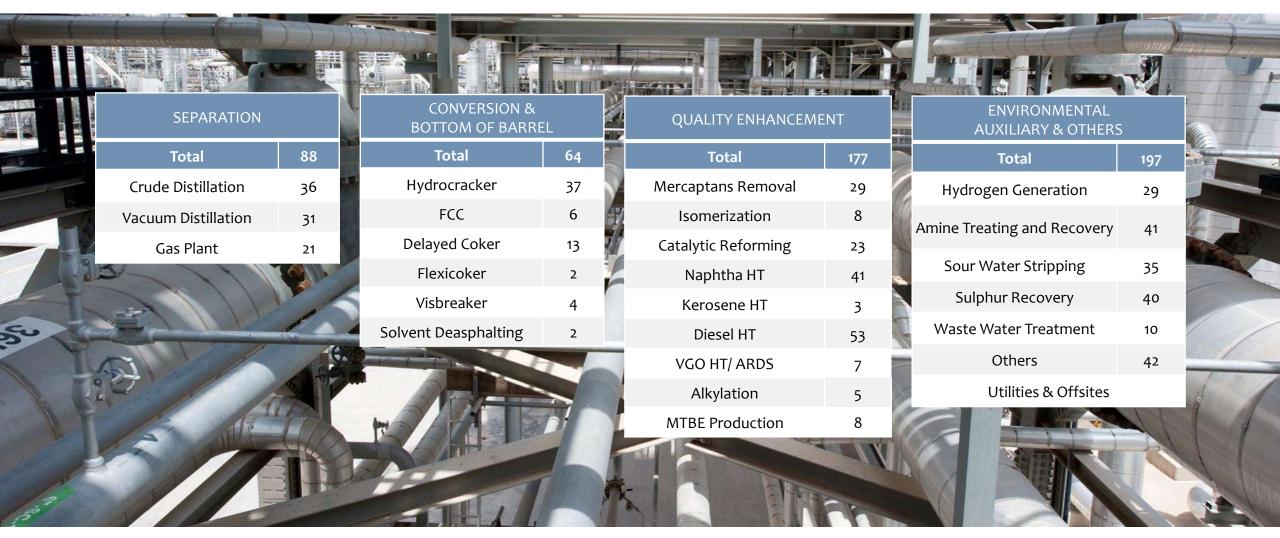
FIELD	Completed	Ongoing	Total
Oil Refining	24	2	26
Petrochemicals	4	3	7
Natural Gas & Upstream	12	-	12
Inorganic Chem.	7	-	7
Total	47	5	52

* Updated: October 2019

19

OIL REFINING





^{*} Updated: October 2019

OIL REFINING







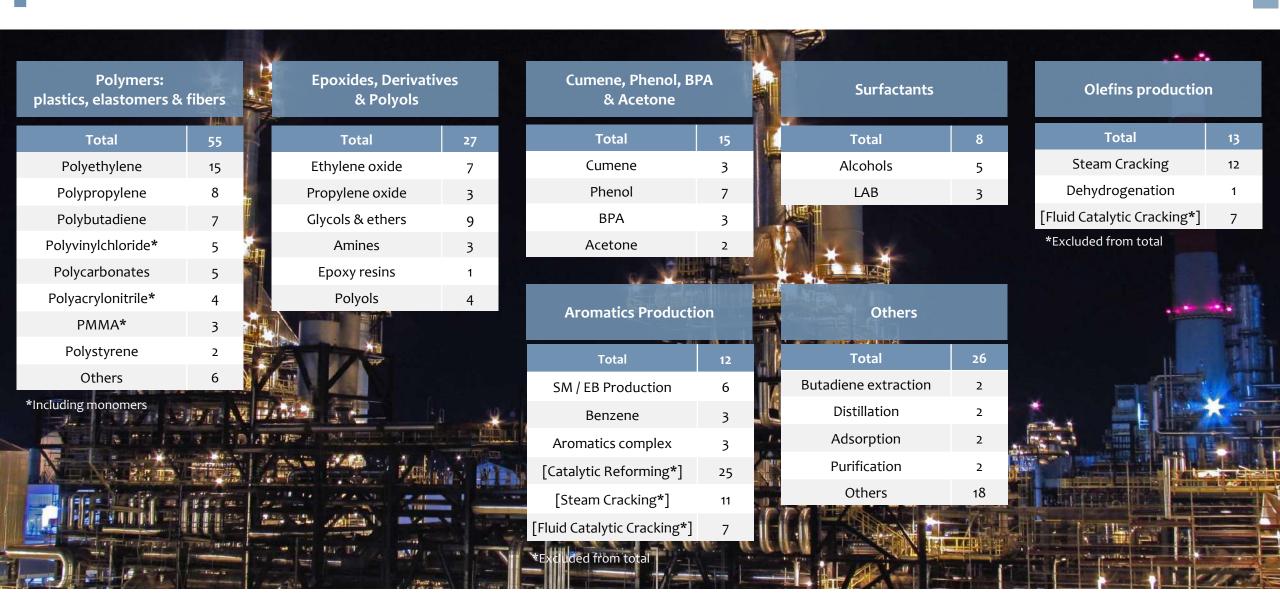
PETROCHEMICAL





PETROCHEMICAL





PETROCHEMICAL. MAIN RECENT REFERENCES



CI	IENT	DESCRIPTION	SCOPE	STATUS
SASA	SASA POLYESTER	New plant for production of PTA (Purified Terephtalic Acid) (Turkey)	Consultancy	Recently Awarded
ORLEN	ORLEN	Olefins Expansion Project (Poland)	PDP + FEED + EPCC BID	Ongoing
CANADA KUWAIT PETROCHEMICAL 60 CORPORATION	СКРС	Polypropylene Production Project (Canada)	EP	Ongoing
REPJOL	REPSOL POLÍMEROS	AURORA Project: RMF (Reduce Multiple FEED) for Polyethylene Plant /Polyethylene Unit (Portugal)	Reduced competitive FEED + EPC bid preparation	Completed
 ♦ SOCAR	SOCAR	MERCURY Project: PTA & Aromatics (Turkey)	FEED, OBE Competitive + EPC	Completed
PERTAMINA ROSNEFT	PERTAMINA ROSNEFT	Tuban Refinery and Petrochemical Complex (Indonesia)	BD, FEED	Ongoing
ADNOC	ADNOC	New Linear Alkyl Benzene Complex (UAE)	FEED	Completed
NOVA Chemicals	Nova Chemicals	AST2 Project. LLDPE: 400 kT/ y (Canada)	EP	Completed
sasol 🎎	SASOL	ETO & GUERBET (Isofol Alcohol) Plant	EP & CS	Completed
أرامكو مramco	DOW/ SAUDI ARAMCO	SADARA Petrochemical project in Jubail (Saudi Arabia) Ethylene Oxide : 360 kT/y, Propylene Glycol: 70 kT/y,Polyols. 400 kT/y,Ethanolamines : 210 kT/y, BGE: 200 kT/y	EPC	Completed
ExonMobil حيابك	EXXON MOBIL/ SABIC	Kemya Petrochemical project in Jubail (Saudi Arabia) Polybutadiene Rubber: 100 kT/y, Ethylene Propylene Diene Monomer (EPDM): 110 kT/y	EPC	Completed
<u>خولنو</u>	SABIC	Petrokemya ABS Complex (Saudi Arabia) Polybutadiene Latex: 30 kT/y, High Rubber graft: 48 kT/y, Styrene Acrylonitrile (SAN): 95 kT/y, ABS Compounding: 140 kT/Y	EPC	Completed



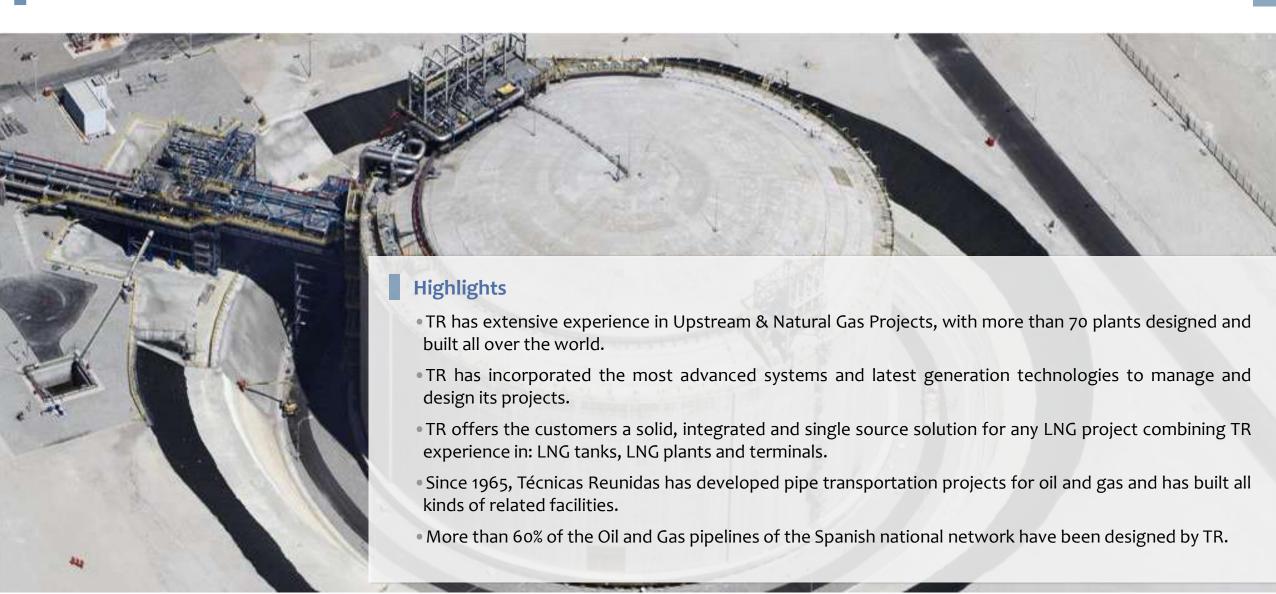
GAS REFERENCES





UPSTREAM & NATURAL GAS. MAIN RECENT REFERENCES





TECNICAS REUNIDAS

UPSTREAM & NATURAL GAS. MAIN RECENT REFERENCES

	Client	Description	Scope	Value
Šaudi Aramco	SAUDI ARAMCO	Marjan Upstream Program	EPC	3,000 M\$
أدلوك ADNOC	ADNOC ONSHORE	Bu Hasa oil field	EPC	1,440 M\$
icLeps Sonda	ADNOC LNG	ADGAS gas treatment plant	EPC	430 M\$
قيمودينا وكوايا Saudi Aramca	SAUDI ARAMCO	Haradh	EPC	2,300 M\$
Saudi Aramca	SAUDI ARAMCO	Fadhili	EPC	> 3,000 M
KAPE Institute to the Special	KNPC	5th Gas Train(GT5) and associated facilities	EPC	> 1,400 Ms
GASCO G	GASCO	Integrated Gas Development	EPC	> 700 Ms
COF LOCZ	GDF SUEZ/SONATRACH	Touatgaz Hydrocarbon Complex	EPC	> 1,000 Ms
Abu Ohabi Oli Co., Ud (nemi	ADOC	Development of the Hail field	EPC	> 300 M\$
Soudi Aramco	SAUDI ARAMCO	Jazan IGCC	EPC	> 1,700 M\$
REPROS Eni	CARDON IV	PERLA Field Early Production Offshore Development	EPC	> 400 N
A STORY	ADCO	Shah and Sahil Oil Field Development	EPC	> 1,300 M
ALEMAN S	ADNOC	Shah Gas Gathering System	EPC	> 400 N
<\PF€>	YPFB	Gran Chaco Liquid Separation Plant	EPC	> 500 N
REPIOL P	REPSOL YPF E&P BOLIVIA S.A.	CPF for Margarita development Project Phase 1	EPC	> 200 N
REPIOL P	REPSOL YPF E&P BOLIVIA S.A.	CPF for Margarita development Project Phase 2	EPC	> 100 N
āpgemil gSolji Soudi Aramca	SAUDI ARAMCO	Hawiyah Gas Fractionation Plant	EPC	> 500 N
Špogeniji Solji Saudi Aramca	SAUDI ARAMCO	Ju'aymah Gas Fractionation Plant	EPC	> 300 N

UPSTREAM & NATURAL GAS. MAIN RECENT REFERENCES



	Client	Description	Scope	Value
Canadian Natural	CANADIAN NATURAL RESOURCES LTD.	VDU, DRU & HSU Project for Horizon Upgrader Phase II	EPC	> 800 M\$
PDO ®	PDO	Saih Rawl Gas Compression Expansion Project	EPC	> 500 M\$
MEDGAZ	MEDGAZ	Onshore Facilities for subsea pipeline connecting Spain and Algeria	EPC	> 150 M\$
CEPER Sonatrach	SONATRACH - CEPSA – ANADARKO - CONOCOPHILLIPS	Ourhoud Field Development	EPC	> 800 M\$
gasNatural fenosa	SEGAS	Damietta Natural Gas Liquefaction Plant	EPC	> 1,250 M\$
C	CNOOC	Zhuhai 3 LNG Tanks and LNG Terminal	EPC	> 150 M\$
GOF SURE CODELCO	LNG MEJILLONES (CODELCO & SUEZ)	LNG Tank for Mejillones Terminal	EPC	> 150 M\$
GOF SVEZ CODELCO	LNG MEJILLONES (CODELCO & SUEZ)	Regasification Terminal for Mejillones Project	EPC	> 250 M\$





+30 GW in Fired Power Plant Projects (gas, coal, fuel, biomass)

+55 Cogeneration Projects

+45 Years of experience in Power Plants





Power and Water





Power. Main recent references



Client	Description	Scope
TERMOCANDELARIA SCA ESP	Termocandelaria Add-on Project	EPC
GENERAL ELECTRIC	CCGT for Sumitomo & GE EFS (UAE)	EPC
FISTERRA ENERGY	875 MW Tierra Mojada CCGT (Mexico)	EPC
MGT TEESSIDE POWER	299 MW Teesside power plant (UK)	EPC
NESTE/VEOLIA/ BOREALIS	600t/h 40 MW Kilpilahti cogeneration plant (Finland)	EPC
FORT HILLS ENERGY	170 MW Cogeneration plant (Canada)	EPC
PGE	450 MW Turow power plant (Poland)	EPC
ASHUGANJ NORTH LTD	380 MW Ashuganj CCGT (Bangladesh)	EPC
AES	324 MW Los Mina power plant conversion CCGT (Dominican Republic)	EPC
ENERSUR	670 MW Ilo Power Plant - Nodo Energético del Sur (Peru)	EPC
TÜPRAS	120 MW Cogeneration Power Plant (Turkey)	EPC
SAUDI ARAMCO	440 MW Combined Cycle (Saudi Arabia)	EPC

WATER. MAIN RECENT REFERENCES.



Client	Location	Description	Scope
SOCAR	Aliaga, Turkey	WWTP Star Project	PDE, DE
Haya Water	Darsait, Oman	Sea outfalls of new Darsait sewage treatment plant and Auzaibah CPS	EPC
Saudi Aramco	Jizan, KSA	Reverse Osmosis Units	EPC
MAJIS	Sohar, Oman	Seawater Pumping Station	EPC
WATER CORPORATION	Perth,Australia	SSWA Desalination Plant	EPC + O&M
EPSAR	Valencia, Spain	Perelló WWTP	EPC
ACUAMED	Castellón, Spain	Oropesa SWRO Desalination Plant	EPC
CANAL DE ISABEL II	Madrid. Spain	La Pinilla DWTP	EPC
REGION DE MURCIA	Murcia, Spain	Torres de Cotillas WWTP	EPC
REGION DE MURCIA	Murcia, Spain	Librilla WWTP	EPC
JUNTA DE ANDALUCÍA	Almería, Spain	Rambla Morales SWRO Desalination Plant	EPC + O&M



FERTILIZERS-NITRIC ACID



TR/ESPINDESA PROPRIETARY TECHNOLOGY.







TECNICAS REUNIDAS

TR/ESPINDESA PROPRIETARY TECHNOLOGY. MAIN RECENT REFERENCES

Client	Location	Description	Scope
NITRICOMAX (MAXAM)	Tarragona, Spain	Ammonia Oxidation Reactor (Nitric Acid Plant)	EPC
Petrovietnam Ca Mau Fertilizer Co	Ca Mau, Vietnam	NPK Fertilizer Plant	BE, FEED
YARA	Heroya, Norway	Nitric Acid Plant	EPC
YARA	Burrup, Australia	Nitric Acid and Ammonium Nitrate Plants	EPC
GSFC	Sikka, India	DAP/NPK Plant	Basic Design
Incitec/Dyno Nobel	Newcastle, Australia	Nitric Acid and Ammonium Nitrate Plants	FEED
Nitratos del Peru	Pisco, Peru	Ammonia, Nitric Acid and Ammonium Nitrate	FEED
EUROCHEM	Novomoskov, Rusia	Ammonium Nitrate Plant	Basic Design
JIANFENG	Chongqing, China	Nitric Acid Plant	EP
CuvenPeq	Cienfuegos, Cuba	Ammonia Urea Plant	PMT Services
Sadara (Dow-Aramco)	Al Jubail, Arabia	Nitric Acid	Basic Design
YARA	Tertre, Belgium	Nitric Acid Revamp	Conceptual
JPMC	Aqaba, Jordan	DAP Plant	Basic Design
YARA	Posgrunn, Norway	Nitric Acid Revamp	Basic Design
ENAEX	Mejillones, Chile	Nitric Acid and Ammonium Nitrate Plants	EPCM





HYDROMETALLURGY PROPRIETARY TECHNOLOGY DEVELOPMENT. MAIN RECENT REFERENCES

Hydrometallurgy & electrochemistry
TR worldwide leader in Zn solvent extraction

ZINCEXTM based TechnologiesPb/Ag Recovery TechnologiesNon Ferrous Metals Recovery Processes

Main current or recently completed projects

Client	Location	Description	Scope
VEDANTA	Skorpion (Namibia)	Revamping for new raw material and Upgrading to 200,000 tpa SHG Zinc	Technology Package (*)
HORSEHEAD	Forest City (USA)	Smelting plant with a production capacity of 135,000 tpa SHG Zinc, 6,400 tpa Lead, 17 tpa Silver	Technology Package (*)
GLENCORE	Portovesme (Italy)	Smelting plant with a production capacity of 52,500 tpa SHG Zinc	Technology Package (*)
DOWA	Akita (Japan)	Smelting plant with a production capacity of 20,000 tpa SHG Zinc	Technology Package (*)
VEDANTA	Skorpion (Namibia)	Smelting plant with a production capacity of 150,000 tpa SHG Zinc	Technology Package (*)
PILAGEST	Pont de Vilomara (Spain)	Industrial plant to treat 2,000 tpa spent domestic batteries (equiv. to 400 tpa Zn)	Technology Package (*)

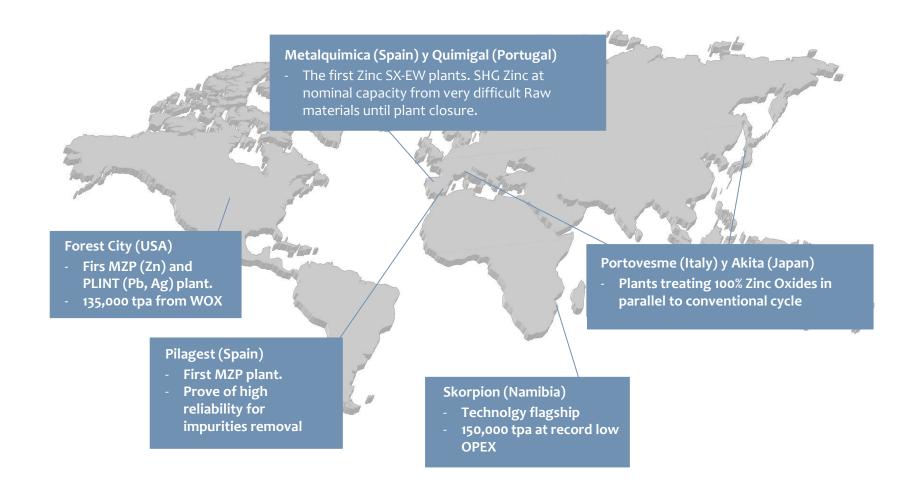
^(*) Technology Package includes: Technology License, Basic/Front-End Enginering, Proprietary Equipment and Technical Assistance.

TECNICAS REUNIDAS

HYDROMETALLURGY PROPRIETARY TECHNOLOGY DEVELOPMENT

TR worldwide leader in Zinc Solvent Extraction

More than 350,000 tpa worlwide are produced under TR ZincexTM license





POSCO GROUP 2021

POSCO PRESENTATION

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POSCO Group

POSCO Group at a Glance

POSCO Group

No. of Employees

63,000

Korea 35,000 | Overseas 28,000

Revenue(KRW, trillion)

57.793

Global Infra

49%

New Growth

2%

* Total sales figure

Operating Profit(KRW, billion)

2,403

(in 2020)



No. of Employees

Revenue(KRW, trillion)

36,124

26,509

A history of passion and challenge

Milestones

1960s

1968. 4. 1

Founded Pohang Iron and Steel Co., Ltd.

1970s

1970. 4. 1

Began the construction of Pohang Works Phase 1

1973. 6. 9

Performed first tapping from Pohang Blast Furnace No. 1

1980s

1981, 2, 18

Completed the construction of Pohang Works Phase 4

1987. 5. 7

Completed the construction of Gwangyang Works Phase 1

1988. 6. 10

Listed on Korean stock market (First National Stock)

1990s

1992, 10, 2

Completed the integrated construction in time to celebrate the quarter-century of Pohang Iron and Steel Co., Ltd.

1994, 10, 14

Became the first Korean company to be listed on New York Stock Exchange

2000s

2000, 10, 4

Completed the company's privatization

2002. 3. 15

Changed the company name to POSCO

2007. 5. 30

Completed the construction of the world's first commercialized FINEX facility

2010s

2019. 7. 1

Became the first Korean company to be selected as "Lighthouse Factory" by World Economic Forum (WEF)

2019. 7. 25

Proclaimed the POSCO Charter of Corporate Citizenship

2020s

2020, 10, 28

Selected as the most competitive steelmaker in the world for 11 consecutive years by World Steel Dynamics (WSD)

· 2021, 2, 18

Launched ESG Committee

Five major group affiliates established and launched

1971. 5. 13

Established POSCO CHEMICAL (formerly) Pohang Industrial Furnace Co., Ltd. 1994, 12, 1

Established POSCO E&C (formerly) POSCO Development . 2005. 9. 9

(formerly) KYUNG-IN ENERGY

. 2010, 1, 22

Established POSCO ICT

2019, 10, 3

Reached 1 billion t in cumulative steel production

• 2010, 11, 1

Established POSCO INTERNATIONAL (formerly) DAEWOO INDUSTRY Co., Ltd.





Established POSCO ENERGY Development Co., Ltd.







A record of endless change and innovation

POSCO Highlights



The most competitive steelmaker in the world

11 consecutive years

World Steel Dynamics (WSD) 2010–2020



Annual steel production

40,580,000 tons > 6th in the world

World Steel Association (WSA) 2020



Global Metals Awards

Winner in Steel Industry Leadership

S&P Global Platts 2020



An innovator of global manufacturing's future

Selected as "Lighthouse Factory"

World Economic Forum (WEF) 2019



High ranks by major ESG evaluators

A

Bronze

BBB

Korea Corporate Governance Service (KCGS) Dow Jones Sustainability Indices (DJSI) Morgan Stanley Capital International (MSCI)

POSCO Vision

Management Philosophy

POSCO Charter of Corporate Citizenship

Five POSCO Corporate Citizenship Brands Safety Management

Environmental Management

POSCO Group Vision

POSCO

Core

Values

Safety

Management Philosophy

Building a Better Future Together

Building a Better Future Together



Code of Conduct

Shiljil Shilhaeng Shilli Substance Execution Practicality

Win-Win

Talents with the mindset of action,

Ethics

Creativity

POSCO Business

Kev Activities

POSCO Affiliates

POSCO Charter of Corporate Citizenship

POSCO Charter of Corporate Citizenship

POSCO Charter of Corporate Citizenship

Companies achieve lasting growth and sustainability by pursuing harmony within the society where businesses operate.

As a member of the social community, companies who have benefited from resources provided by the society should look beyond profit, engage in addressing social issues, and contribute to the prosperity of mankind and to making the world a better place.

We believe that this is the right way to move forward.

POSCO, Under its management philosophy of "Corporate Citizenship: Building a Better Future Together," POSCO will engage and communicate with all stakeholders, including customers, employees, and shareholders, and continually seek changes and innovation in pursuit of sustainability by ultimately creating greater value for the company.

Accordingly, POSCO, that embraces Corporate Citizenship, complies with the following principles when conducting business.



We nurture a robust business ecosystem with business partners.

- We practice the values of fairness, transparency, and ethics across all business activities.
- We pursue collaboration and mutual growth with partners and suppliers based on a culture of consideration and respect.
- We support customer success by providing the finest products and services.



We are at the forefront in addressing social issues and making society better.

- We take a leading role in confronting social challenges at the corporate level with a sense of empathy.
- We carry out activities for the common good for the development of local communities and environmental protection.
- We actively participate in philanthropy as part of our commitment to sharing with our neighbors and the society.



We foster a happy and fulfilling workplace by creating a corporate culture based on trust and creativity.

- We create a safe and pleasant working environment to promote the health and well-being of our employees.
- We pioneer a corporate culture of trust and harmony through fair HR management practices and stable labor relations.
- We create a great workplace where diversity is respected and a healthy work-life balance can be realized.

^{*} Charter of Corporate Citizenship Proclamation: July 25, 2019

Five POSCO Corporate Citizenship Brands

A Company You Want to Be With

Five POSCO Corporate Citizenship Brands

We are engaging in five brand activities for corporate citizenship that all interested parties sympathize with to realize corporate citizenship management philosophy. Our goal is to grow as a respected company everyone wants to work with and a 100-year company by participating in resolving our current social issues and seeking and carrying out our corporate role to better society.











Kev Activities

POSCO Affiliates

Safety Management

Top Priority in Management Activities

Top Priority in Management Activities: Safety

Organization

Operate an emergency safety response improvement group

Examination of production process and intensive identification of risk

Investment

KRW 1 trillion by 2023

Full examination of risky and outdated facilities, additional CCTV installation, and establishment of training infrastructure

nt

Safety training for all employees

Safety Competence

Specialized training for each task group and position, and fostering the experts in process safety management



| Six Intensive Measures for Stronger Safety Management

From "priority in production" to "priority in safety!"



Corporate management paradigm shift An exclusive provision for the right to refuse unsafe work



Worker rights guaranteed

Anonymous safety report system



A report system for employees and staff

Safety smart infrastructure



Smart safety equipment distributed and applied

Strengthened safety management support for partner companies

Priority Management, "Safety"

We seek to examine our safety measures at the very source and

intensive measures to create a workplace where everyone is safe

establish a special measure for safety management and six

and an environment where everyone can be happy.



Dedicated support for partner company safety management established

Enhanced employee safety training



A systematic safety training infrastructure built

Key Activities

POSCO Affiliates

Environmental Management

Top Priority in Management Activities

Top Priority in Management Activities: Environment

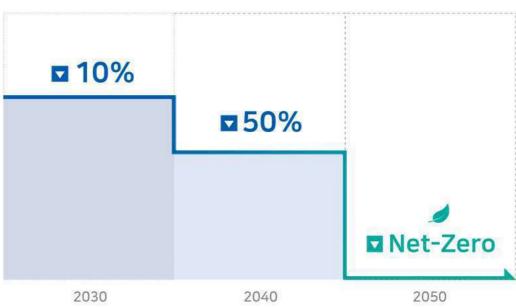


POSCO's 2050 Carbon Neutrality Declaration

In December 2020, POSCO declared its commitment to become carbon neutral by 2050. We are proactively responding to climate change.

Based on hydrogen reduction steelmaking technology, POSCO's carbon net-zero roadmap at operation sites aims to reduce emissions in phases: 10% by 2030, 50% by 2040, and net-zero by 2050.

In parallel with work site carbon abatement efforts, we have set a goal to achieve avoided emissions (10% by 2030) by introducing low-carbon alternatives and recycling manufacturing by-products.



^{*} Reduction against the average operation site emissions (78.8 MtCO2) in 2017-2019

POSCO Business

Key Activities

POSCO Affiliates

POSCO Group Vision

Leading Change with an Innovative and Creative Mindset

A Leader in Environmentally Friendly Materials

Steel

A challenge that overcomes all limits



Group Business Structure Reorganization

At the transitory point toward the megatrend of low-carbon, environmental business, POSCO Group seeks to take the step beyond steelmaking to reorganize its business structure around Green & Mobility industries and take the leap toward leading an environmentally friendly industry.

Green & Mobility

New changes for future growth



The greatest premium steel products in the world

The most competitive steelmaker in the world



EV materials & components

Leader of the Green & Mobility industries, e Autopos



Green energy materials

Materials for Wind, photovoltaic, LNG, and hydrogen service



Lithium-ion battery materials

A value chain from the raw materials to Lithium Ion battery materials



Hydrogen business

Intensive group-wide focus on new growth engine industry

POSCO Business

Steel

Mobility Materials
Construction Materials
Green Energy Materials
Smart Factory

Global Infra

LNG Business
Agro-Resources Business
Construction Business

New Growth

Lithium-ion Battery Materials Business Hydrogen Business Steel • Mobility Materials

Mobility Materials

Evolution of Steel, e Autopos which leads the World in Green & Mobility

As a well-prepared player for the green mobility era, POSCO group provides steel products and battery materials for EV along with customized application technologies under its green mobility product and solution brand "e Autopos" and plays an important role in the future market of electric vehicles.

e Autopos

The name of POSCO's electrification solution and the leading force in green mobility through eco-friendly focus, cooperative synergy, and future-oriented innovation







Synergic



Mobility Materials

e Autopos Integrated Solution

Automotive Steel for BIW & Chassis

Utilization of Giga Steel

Maximized mileage and performance of EV with an optimal lightweight BIW and Chassis

Hyper NO for Traction Motor

Self-bonding,

laminated motor core technology

Reduce noise and vibration and increase a mileage by minimizing power loss



Materials for Battery Pack

Giga steel frame battery housing

Maximized battery capacity with increased strength and minimized weight.

Fuel Cell Electric Vehicle Bipolar Plate

Bipolar plate for FCEV

High efficiency and high performance bipolar plate with excellent corrosion resistance and electric conductivity

Battery Material

Cathode and anode materials

Use green materials to provide high-quality battery materials for greater efficiency

Steel • Construction Materials

Construction Materials

Lead the future of innovation with premium construction steel

INNOVILT is a premium brand of steel products for construction certified by POSCO.

It is a new paradigm that leads the innovation in construction industry based on synergistic cooperation between POSCO and its clients.

From builders to end-users, INNOVILT provides trustworthy solutions backed by the excellence of POSCO premium steel.

INNOVILT

A premium construction material brand based on innovative technology and the environmentally friendly, future-oriented value of steel



Hi - Tech



Creativity



Sustainability



Partnership



Construction Materials

INNOVILT Leads Innovation

Structural Performance and Cost Efficiency

World best built-up H-beam

Pos-H



Inverted triangular deep deck plate

D-Deck



Fire and Earthquake Safety

Semi-slim concrete-filled steel composite beam with reduced depth

AU-Beam



Concrete-Filled Tube column system for reduced time and cost

ES-Column



Flexibility and Adaptability

Slim and strong profiles for irregular-shaped buildings

Steel Curtain Wall



Freeform space-frame structure system

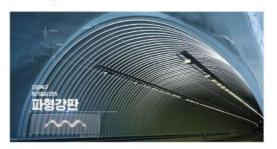
PoSPACEs



High Performance and Sustainability

Fast installation and economically efficient

Corrugated Steel Plate



Lightweight steel pipe truss soundproof tunnel

PosLST



Steel • Green Energy Materials

Green Energy Materials

Multicore Profit Basis with Green Energy Materials

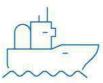
POSCO Group is stepping up its efforts to develop green steel and hydrogen material solutions to secure its leadership in new and emerging green markets.

We have established a renewable energy cluster and a distinguished environmentally friendly solution to consolidate our competitive advantage in the steel industry of the future.

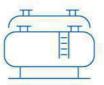
Materials for Wind and Photovoltaic Power Generation



Materials for LNG Industries



Materials for Hydrogen Service





Green Energy Materials

Green Energy Materials

Materials for Wind and Photovoltaic Power Generation



Materials for LNG Industries

Transportation and Fuel Vessel



- · Cryogenic steel for LNG tanks (High-Mn, 9% Ni, STS)
- · Shipbuilding structural steel (plate)

LNG Terminal



- · Cryogenic steel and high-strength cable/ piping for LNG storage tanks
- · Seawater corrosion resistance steel for berthing facilities

Materials for Hydrogen Service

Transportation and Storage



- Steel for high pressure gaseous hydrogen (Resistance to hydrogen embrittlement)
- · Steel for liquid hydrogen (Low temperature toughness),
- · Steel for aqueous hydrogen compound (Corrosion resistance)

Fuel Cell Electric Vehicles



 High-conductivity and corrosion-resistant STS for fuel cell separators Steel • Smart Factory

Smart Factory

Innovative Futuristic Steelworks Smart Factory

POSCO was chosen by the World Economic Forum to be the first Korean "Lighthouse Factory" manufactuer in July 2019, in recognition of its successful implementation of the smart factory. POSCO is implementing a smart production system that collects field data with IoT technology, analyzes and predicts processes based on big data, and automatically controls processes using artificial intelligence technology.

What is a Lighthouse Factory?

A factory that is leading the future of manufacturing innovatively like a lighthouse that guides ships in the dark at night by actively incorporating core technologies of the Fourth Industrial Revolution, such as the Internet of Things, artificial intelligence, and big data.



Smart Factory

Smart Factory Vision

POSCO's Smart Factory continues to innovate with the goal of building an eco-friendly steel mill, creating a safe workplace, and growing together with customers beyond improving its own productivity.

Smart Factory

Maximizing Productivity and Efficiency

Improving molten iron production Reducing main process time Improving quality and reducing costs

Smart Energy

Eco-friendly Steelworks

Reducing the amount of environmental pollutants

Pre-control and reduction of NOx emission



Management B&C

Creating Value for Customers and Partners

Supporting smart factory construction Providing high-quality steel materials and solutions

Contributing toward the growth of industrial ecosystem and creating jobs

Smart B&C

Realizing Smart Safety Creative Workplace

Smart watch for real-time detection of worker's physical abnormalities

Introduction of facility inspection drones and fire detection robots

Smart CCTV for detecting dangerous behavior of workers

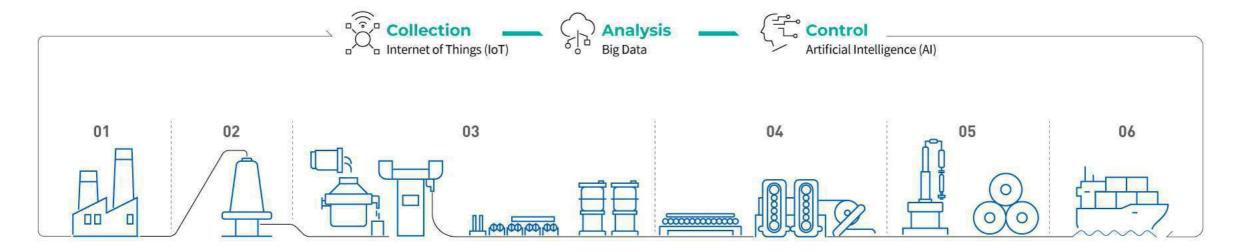
Steel • Smart Factory

Smart Factory

AI Smart Steelworks

POSCO is expanding its smartization to entire value chain based on the results of smart technology development for unit processes and facilities.

Pushing for platform-based connectivity from customer orders to delivery, POSCO improves the efficiency of the entire process and creates a safe artificial intelligence workplace.



01

Production plan

Automatic design of small lot orders Reduction in process time 02

Iron-making

Increasing molten iron using AI blast furnace

03

Steel-making

Automated and intelligent application of high-quality molten steel production

04

Rolling

Establishment of world's first hot-rolling smart integrated workroom

05

Plating

Ultra-precision coating weight control and remote control of overseas businesses 06

Delivery

Data-driven inventory forecasting to ensure timely delively Global Infra • LNG Business

LNG Business

Preparing for Net Zero 2050 through Green LNG Solution

POSCO Group has selected the liquefied natural gas (LNG) industry as a core growth engine for the group because LNG is considered an alternative energy for coal and sought to reorganize its business structure and increase its investments thereto.

From exploration and production to shipping, trading, and power generation, we aim to expand our business area and the gas value chain globally.

POSCO Group LNG Business

POSCO INTERNATIONAL POSCO ENERGY LNG Exploration & Trading + Bunkering Production (E&P) LNG Fower Generation



Global Infra • LNG Business

LNG Business

Completing the Gas Value Chain from Production to Generation

UPSTREAM MIDSTREAM DOWNSTREAM

Exploration & Production



Myanmar Gas Field Korea's largest overseas E&P operator

Liquefaction



Participation in Oman LNG Liquefaction Plant

Shipping



Korea's Top LNG Trader (2.8 million Ton, 2020)

Vaporization



Gwangyang LNG Terminal
(Korea's first private
LNG Terminal, 730,000 kl storage capacity),
Bunkering Facility (planned)

Transportation (Pipeline)



Myanmar-China Gas Pipeline (903 km)

Power Generation



Korea's first & largest
Incheon LNG Combined Cycle
Power Plant
(Capacity: 3,412 MW)

Grain Trading and Agro-Resources Development

Global Grain Trader Agro-Resources Business

POSCO Group has selected the agro-resources business as one of the growth engines of the group because the business has the potential for expansion in demand and trade as a result of global population increase and economic development, and has expanded the investment and infrastructure in this field.

As one of the largest Korean trading companies involved in the agro-resources business, we seek to develop our public-private partnership to expand the domestic market and contribute toward Korea's food security, and utilize our expertise to expand our value chain and thereby expand our size and profitability at the same time.

POSCO Group Food Businesses Around the World





Global Infra · Agro-Resources Business

Grain Trading and Agro-Resources Development

Constructing a Global Grain Value Chain



Plantation-Based Value Chain



Oil Palm Plantation in Indonesia

A sustainable oil palm plantation with crude palm oil (CPO)
mills located at Papua Province, Indonesia,
serving the domestic and export markets
of CPO that is widely used for food products, biofuel, and other
industrial purposes



Processing-Based Value Chain



Rice Processing Plant in Myanmar

A processing plant and a core component of POSCO rice value chain that handles storage, selection, and polishing of rice produced in Myanmar



Distribution-Based Value Chain



Grain Export Terminal in Ukraine

An export facility handling nearly 2.5 million tons of grains from Ukraine, one of the foremost new exporters of grain in the world, that controls grain qualities and provides service for prompt transshipment.

Global Infra · Construction Business

Construction Business

Building Value and Innovation Together Smart Constructions

POSCO Group's global top-tier steelwork plant technology gives it a significant edge in energy, environment, and other areas. Based on our expertise, we build relationships of trust with our clients in various fields, including residence and skyscraper construction and urban development. By realizing a system of smart construction, where AI technology is applied to all processes involved, we bring a future where our workers can work in safety and our customers get their satisfaction into reality.

Major Businesses in Construction Industry

Plant

Infrastructure











Construction Business

Future Values through Smart Construction

Plant



CSP Integrated Steel Plant

(Brazil)

Facility Capacity

3 million tons/year



Colon Combined Cycle Power Plant & LNG Terminal

(Panama)

Facility Capacity

Power plant 391 мw LNG terminal 180,000 m3

Infrastructure



Jido-Imja Road (Korea)

Construction Scale

Length 4.99 km (Cable-stayed bridge 1.9 km)



Krakow Waste-to-Energy **Plant**

(Poland)

Production & Processing Capacity

10.7_{MWh/year} 220,000 tons/year

Urban Development & Architecture



Songdo International **Business District Urban Development**

(Korea)

Land Size

5.8 million m (Public, business & commercial,

residential, education, athletics facilities etc.)



Haeundae LCT

(Korea)

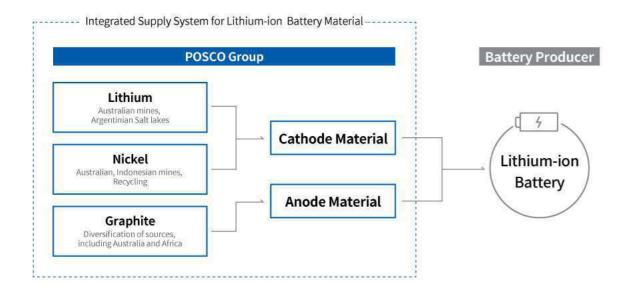
Construction Scale

5 stories underground and 101 stories aboveground

Lithium-ion Battery Material Business

The Engine of POSCO's Future, Lithium-ion Battery Material Business

Faced with the megatrends of low-carbon and green technologies, POSCO Group seeks to become a leading company in the green industries, such as Lithium-ion battery materials and hydrogen cells, beyond the steelworks. As a supplier of materials used for Lithium-ion batteries, POSCO completed the world's only integrated supply system for Lithium-ion batteries in conjunction with POSCO CHEMICAL, thereby establishing a powerful engine for its growth in the future.





Lithium-ion Battery Material Business

Lithium-ion Battery Material Value Chain

2030



The world's only company that has completed a value chain, producing from raw materials to cathode, anode materials

POSCO

Lithium 220,000 t per year, nickel 100,000 t per year

POSCO Chemical

Cathode materials 400,000 t per year, Anode materials 260,000 t per year

Global Market Share



20%

Annual Sales(KRW)



23 trillio

2018



Acquired Argentina's salt lake, Salar del Hombre Muerto

Total content 13.5 million t

- Total value amounting to KRW 35 trilliona (in March 2021 market prices)
- One of the highest lithium concentration In the world (921 mg/L)

2019



Constructed Gwangyang Cathode Plant (5,000 t)

Expanded Sejong Natural Graphite Anode Plant (20,000 t)

Reached the natural graphite production capacity of 44,000 t

Established POSCO Group Lithium-ion battery material research center

Joint venture between POSCO - RIST POSCO CHEMICAL

2020



Entered into the battery recycling business

Nickel, lithium, and cobalt extraction contributes to the environmentally friendly resource cycle

Expanded Gwangyang Cathode Plant (25,000 t)

Started the expansion of Sejong Natural Graphite Anode Plant (15,000 t) and the contruction of Pohang Artificial Graphite Plant (8,000 t)

2021



Entered into the lithium extraction business

Started the construction of Gwangyang Hardrock Lithium and Argentina brine Lithium Plant

Secured natural graphite for anode production

Acquired 15% share in Black Rock Mining Ltd, a mining company owning graphite mines in Tanzania

Secured nickel materials for Cathode production

Acquired 30% share in Ravensthorpe Nickel Operation, Australia

Changes made to SNNC facilities will allow annual Nickel Sulphate production of 20,000 t per year

New Growth • Hydrogen Business

Hydrogen Business

The Next-Generation Green Energy Source Hydrogen Business

POSCO Group seeks to focus the group's capabilities toward the development of its hydrogen business as the premier green energy source of the future in accordance with its 2050 Carbon Neutrality Declaration.

To that end, the group is now expanding its business to encompass hydrogen value chains in its bid to become a leading enterprise in the new hydrogen economy. We at POSCO Group plan to realize the idea of a green hydrogen-based HyREX system in our steel business by the year 2050, thus opening the door for the age of post-carbon hydrogen in steelmaking and fostering the growth of the hydrogen ecosystem across our entire value chain.

POSCO Group Green Hydrogen Business Model

# 25	Pr	oduction	1			Transportation	on	& Storage	2	Utiliz	at	ion
Photovoltaic		Electrol	500	Ammonia	0	The management (1)			1257	Ammonia reform-based	>	Hydrogen station
& wind power generation	>	ysis	>	synthesis	>	Transportation	>	Storage	>	Hydrogen production	\	Hydrogen-based power generation HyREX



New Growth · Hydrogen Business

Hydrogen Business

Hydrogen Business Vision

2050



Nurture hydrogen business as the core business of the group's future



Production(ton)

5_{Million}



Sales(KRW)

30 trillion



Domestic Market Share

30%



- · Changing group vehicles to hydrogen power
- · Changing steel logistics vehicles to hydrogen power
- · Operation of byproduct hydrogen station

Hydrogen Power Generation

- Early transition to green/blue hydrogen
- · Fuel cell, ammonia/hydrogen co-firing

Hydrogen Reduction (HyREX)

Transition to HyREX process

Stage 3

Stage 1

Byproduct hydrogen production

70,000 ton

2025

CO2 free hydrogen production

500,000 ton

2030

Green hydrogen supply

2 million ton

122

Stage 2

2040

Key Activities

BusinessWith POSCO

Venture Platform Shared Growth

Society With POSCO

Social Contribution POSCO 1% Sharing Foundation People With POSCO

Recruitment

Talents

Organizational Culture

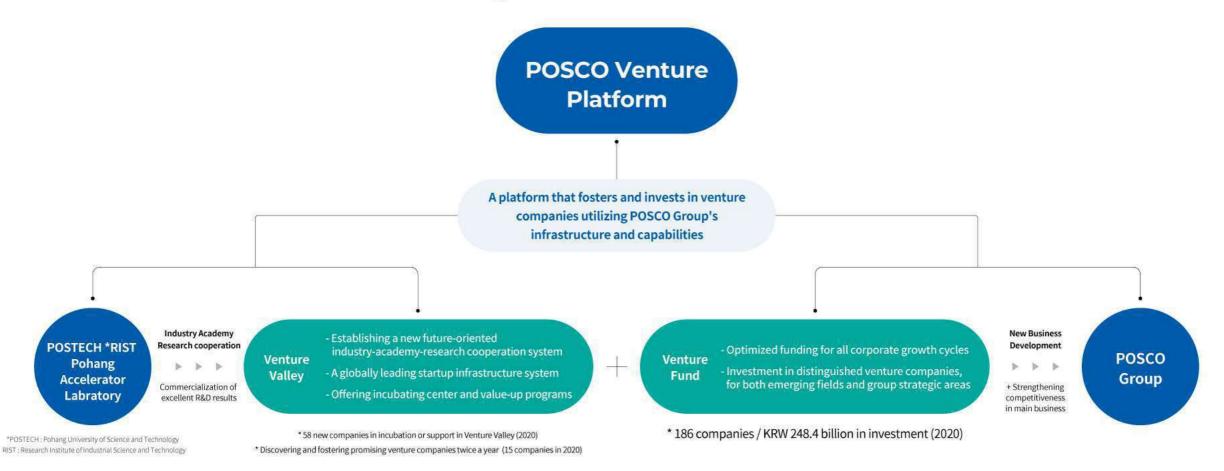


Venture Platform

A Venture Platform to Discover New Growth Engines

POSCO established the venture platform, a venture valley based on robust industryacademy-research infrastructure, and venture fund to respond to the rapidly changing environment and acquire new engines of growth in future.

This is intended to lead the innovation and growth of POSCO Group.



Shared Growth

Growing Together with POSCO

To respond to the heightened expectations of the society and to the changes in the management environment POSCO has established seven signature programs to develop new values of win-win growth with our partners and establish a robust ecosystem of a virtuous cycle between economic and social values.

Open&Fair

Providing a fair opportunity trade Establishing practices of fair trade

Innovation

Taking safety and environment as priority in supporting innovative growth

Community

Participating in solving community problems through shared growth activities

7 Signature Programs

Open Sourcing



e-Catalog System

New and alternative products promoted through online platform

Fair, Timely Payment



Establishing a fair trade culture



Subcontract win-win payment system and fair trade-focused bidding system

Benefit Sharing



Supporting improvement of technical capabilities



5,108 projects KRW 601.9 billion in achievement reward (cumulative result, 2004–2020)

POSCO-Type Productivity Innovation



Supporting smart systems in small and medium enterprises (SMES)



KRW 20 billion budget assigned over 5 year period, 2019–2023

Shared Growth Support Group



Providing POSCO expertise and knowledge



ESG specialized consulting programs

POSCO Youth Dream Job Matching



Creating jobs for youths

V

Recruitment of outstanding personnel in POSCO SME partners: 200 per year

Corporate Citizen Friends



Contributing to community problem-solving

M. J.

Overcoming COVID-19 improving safety and environment

Social Contribution

POSCO Grows Together with the Community

We at POSCO recognize our social responsibility as growing together with our community. To that end, we seek to present a more systematic and strategic solution to the problems faced by the community as our members work together as members of corporate citizenship in social contribution activities.

Local Communities

Establishing sustainable local communities

Future Generations & Vulnerable Groups

Providing high-quality education, financial independence support, and job opportunities

Executive & Employee Participants

Participating in voluntary contribution activities by creating and managing social projects

Member talent volunteering

Volunteer activities that utilize the members talents and work at POSCO



80 talent volunteer groups in 2020 16,202 participants / 68,261 hours

Supporting cultural activities and public art

Providing high-quality cultural events and community promotion to offer diverse cultural contents



POSCO Corporate Citizenship Cultural Concert 32,593 participants in 2019

Establishing a sustainable community

Operating a free soup kitchens and rural village renewal projects to bridge the urban and rural areas



A total of 2,600 recipients in Pohang and Gwangyang offered with lunch boxes 3 times a week

Society with POSCO • POSCO 1% Sharing Foundation

POSCO 1% Sharing Poscofoundation

Together with POSCO 1% Sharing Foundation

The POSCO 1% Sharing Foundation is a non-profit public foundation established in 2013 with donations from the POSCO Group and partner company executives and employees through a voluntary 1% deduction from their salaries, along with the POSCO Group's Matching Grant. As of 2020, 98% of all POSCO Group executives and employees are participating in the program.

Member Participation Rate

98.7%

No. of Contributors



Cumulative Donations (since 2013 / KRW)



No. of Recipients (since 2013 / members)



(in 2020)

Main Activities of POSCO 1% Sharing Foundation

POSCO

1% Sharing

Foundation

Supporting Self-Sufficiency in Future Generation

- 1% Sharing Art School (art and cultural education in children's welfare centers)
- Sangsang Isang Science Camp (basic science education for middle schoolers)
- Dream School (1:1 online learning support for community youth)
- Do-Dream (self-sufficiency programs for young adults who exited from foster care)

Supporting the Self-Reliance of Multicultural Families

- Marriage Migrant Women Job Training (high school diploma and IT education)
- Multicultural Youth Academic Support (career consultation, scholarships for excellent students)



- Hope Wings (assistive device support)
- Hope Space (disability welfare facility improvement)
- Assist Devices for Persons of National Merit, etc.

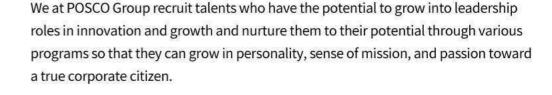
Supporting Culture and Arts for the Underprivileged

CollaboArtion(Collaboration + Art) (popularization project for artists with disabilities)

Recruitment

Nurturing Specialized Talents for Corporate Citizenship

POSCO Talent













Nurturing Talent

Development Through Work

Project/Problem-based Learning Courses (Problem-solving techniques based on project links)
Practice Feedforward
PosTube(videos)
(Job know-how sharing)
Ongoing Work Support
(Telephone-based coaching for field, customized learning, etc.)





People with POSCO . Talents

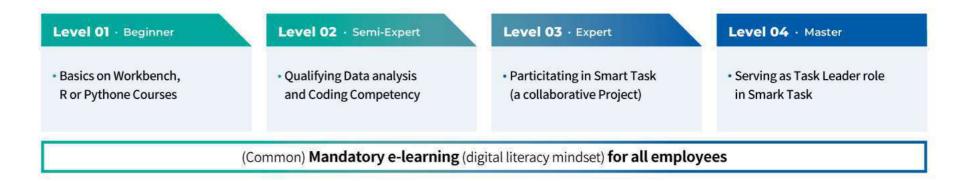
Talent

Training Field-Oriented Experts for the Digital Age

POSCO Group seeks to train competitive talents for the future by using IT technologies to improve task structures and nurture the expertise of the members, including digital competence, and thereby establish the competitiveness of POSCO in the future in advance.

New collar level certification

A 4-stage certification on data analysis and utilization with online and off-line training programs



Development of Field-oriented Technical Professionals

"POSCO Master's System" and "Technician Level (TL) System" are used to train our world-class field technicians



Organizational Culture

Creating a Corporate Culture of Trust and Creativity

Improving Member Improvement

An annual "Great Work Place" (P-GWP) survey implemented for all members to diagnose and improve the corporate culture of the group

The results of P-GWP survey that consists of five areas are delivered to each department to allow the members to shape their own "great work place" by themselves.



The Young Board members are selected among office / engineer / field technician positions to facilitate communication with the millennials and the field.

Various ideas of improvement and opinions are delivered to the highest-level management.

Young Board activity results are used to strengthen steelworks safety, knowledge transference between groups, and other communication activities.

POSCO seeks to establish a corporate culture where all members can voice their opinions freely, and the diversity and cultural differences among the members are respected. We oppose any discrimination based on gender, nationality, race, or disability.



Various cooperative work systems are operated to improve communication and harmony between organizations.

Executive Cooperation KPI

The Marketing - Research, Production - Marketing, and other inter-organizational goals that require inter-organizational cooperation are supported.

Cooperation Point

Gratitude between members in cooperation are relayed.



The national-first to introduce a special Work Form Home (WFH) system for employees taking leaves of absence for childcare and family life

Childcare WFH Program

All members with children under the age of 8 can apply for work from home expansion underway for 15 group affiliates (February 2021)

Pregnancy WFH

Expanded to employees under fertility treatment

POSCO Affiliates

POSCO INTERNATIONAL

www.poscointl.com

Beyond Trade, Pursuing FUTURE BUSINESS

Business Area _ Trade, resource development, infrastructure development and operation

*in 2020





Operating Profit

4/O.4



No. of Employees

9,330 members



History



"Globally integrated corporation" that creates the new future business

POSCO INTERNATIONAL is the no. 1 general trading corporation in Korea, with a global marketing competence and 80 global networks worldwide. It is engaged in international trade in steel, automobile components, agricultural products, and investment business, building a value chain from resources development to the construction of power plants.

1983	Passed USD 500 million monthly export mark for the first time in Korea
2004	Discovered Myanmar A-1 offshore gas field / Reported sales over KRW 5 trillion
2011	Launched the palm oil plantation business in Indonesia
2013	Started Commercial Production at the Myanmar Gas Field
2017	Launched Rice Processing Complex in Myanmar
	Completed the construction of Combined Cycle Power Plants (CCPP) in Talimarjan,
	Uzbekistan / Passed KRW 20 trillion mark in sales
2019	Completed the construction of a grain terminal in Ukraine (capacity 2.5 million ton per year)
2020	Won the A+ rating at the Excellent ESG Company Awards, hosted by Korea
	Corporate Governance Service, for the second consecutive year

POSCO E&C

www.poscoenc.com

Smart Player in Steel Construction & Concession

Business Area _ Steelworks, environment, energy plants and new town, skyscraper, SOC development

*in 2020



Sales

7,794.4



Opera

379.7



No. of Employees

3,695

Building a Better Future with Smart Construction

POSCO E&C is based on a global top-tier steelwork plant technology with an expertise in building steel / environmental / energy plants, and is now growing into a global engineering and construction company through SOC projects and new town developments, skyscraper construction, and all other areas of construction across the world.



History

1994	Founded as POSCO Development Co., Ltd.
2002	Renamed POSCO Engineering & Construction Co., Ltd. Announced The #(The Sharp) apartment brand
2003	Songdo International City project launched
2010	Company relocated to Songdo International City
2013	Reached USD 10 billion in Latin America sales
2017	Merged with POSCO Engineering Co., Ltd.
2020	Ranked 5th in construction capabilities in Korea

2006	Won contract for Ventanas coal-fired power plant in Chile (the first Korean construction company to enter Latin American market)
2013	Completed Krakatau Integrated Steel Plant (Indonesia)
2016	Completed Krakow Waste-to-Energy Plant (Poland)
2017	Completed CSP Integrated Steel Plant (Brazil)
2019	Completed the Haeundae LCT The Sharp project (Korea)
	Won contract for the Sinansan line double track construction /
	(Korea) Seobu Inland Expressway projects
2020	Completed the Yeouido Parc 1 Project (Korea)
	Completed the Nampula-Nametil road construction project (Mozambique)
	Started the Sinbanpo 21st reconstruction project

POSCO CHEMICAL

www.poscochemical.com

Global Chemical & Energy Materials Leader

Business Area _ Energy materials (cathode and anode materials), Refractories (production, furnace lining, repairs), chemical (lime, Coke)

*in 2020



Sales

1,566.2



Operating Profit

60.3



No. of Employees

1,796
members



History

• 1963	Founded Samhwa Hwasung Co., Ltd.
1971	Founded Pohang Industrial Furnace Co., Ltd.
2001	Renamed POSREC Co., Ltd., listed on KOSDAQ
• 2010	Renamed POSCO Chemtech Co., Ltd.
2019	Renamed POSCO CHEMICAL

A global leading company in chemical and energy materials

POSCO CHEMICAL creates market-leading products and services in chemical and material business, steadily establishing itself as Korea's foremost refractory and furnace lining company. Based on these achievements, the company is now branching into leadership in energy material business, including anode and cathode material production.

2008	Commenced leasing operation of POSCO Lime business
2010	Acquired the anode material business / Entered the coal chemical business
2015	First commercial production of needle cokes
2019	Merger with POSCO ESM, group energy material business consolidated
	Completed the 1st stage of Sejong Anode Plant 2 project
	(annual production system of 44,000 tons)
2020	Completed the 2nd stage of Gwangyang Cathode Plant project
	(annual production system of 40,000 tons)
	Started the construction of artificial graphite anode material plant
	Established the P&O Chemical (subsidiary specializing in Hydrogen Peroxide)

POSCO ENERGY

www.poscoenergy.com

Global Comprehensive Energy Company Focused on Gas & Power

Business Area _ Power generation, gas, new renewable energy, resource circulation

*in 2020



Sales

1,516.6



Operating Profit

241.0



No. of Employees

495 members



History

1969 Established Kyung-In Energy Development Co., Ltd.
 2005 Renamed as POSCO POWER Co., Ltd.
 2012 Renamed as POSCO ENERGY Co., Ltd.
 2019 Launched new fuel cell corporation named "Korea Fuel Cell"
Started operations in Gwangyang LNG Terminal

Providing a cleaner energy for a brighter future

POSCO ENERGY has served as a provider of stable electric power to metropolitan areas for more than 50 years, becoming Korea's largest independent power producer through the operation of our off-gas combined cycle power plants as well as a coal-fired thermal power plant. We are further expanding into gas power businesses through the direct importation of LNG and smart solutions.

1968	Became the first company to acquire private energy generation permit in Korea
2010	Completed Gwangyang Off-Gas Combined Cycle Power Plant
2011	Completed Units 5 and 6 at Incheon LNG Combined Cycle Power Plant
2013	Completed the construction of Busan Solid Refuse Fuel (SRF) Power Plant
2014	Completed the entire Shinan Photovoltaic Power Complex
	Completed Tancheon Used Water Heat Energy Utilization Facility
2015	Completed Units 7,8 and 9 of Incheon LNG Combined Cycle Power Plant
2016	Recognized with presidential citation, "Government Award for Beloved Enterprise"
2019	Started operations in Gwangyang LNG Terminal

POSCO ICT

www.poscoict.com

Digital Transformation Leading Company

Business Area _ Smart factory, smart IT, EIC, industry convergence

*in 2020



Sales

964.2



Operating Profit

26.1



No. of Employees

1,877
members



History



Leading the Fourth Industrial Revolution with ICT

POSCO ICT leads in "smartization" efforts by applying premier technology such as IoT, big data, AI, and block chain to existing industries such as steel, construction, and energy. Its cooperation with POSCO on smart factory technologies resulted in the world's first successful attempt to integrate smart applications within the steel industry, which has formed the basis of the company's entrance into the Smart Factory business.

2013	Developed the world's 1st BC-PC Integrated System for steelworks
2014	Established the Electronic Toll Collection System (Hi-Pass) for 16 highways nationwide
2017	Launched the Baggage Handling System (BHS) for Incheonn International Airport Terminal 2
2018	Commercialized AI-based interactive Smart Home system
2020	Cooperation agreement with Hyosung Group in the field of Smart Factory, supplied Smart Factory system for LS Nikko Copper Selected for Hanjin Group's Megahub Logistics Center project

SNNC

www.snnc.co.kr

The World's Best SNNC is a Global Leader in the Nickel Industry

Business Area _ Production and sales of ferronickel products and byproducts

*in 2020



Sales

698.7



Operating Profit

40.5



No. of Employees

311 members



History

2006	Established via POSCO-SMSP Joint Venture Agreement (JVA)
2008	Initiated the first tapping from the electric furnace No.1
2011	Signed the Investment Agreement on Construction of the 2nd Nickel Refining Facility
• 2014	Initiated the first tapping from the electric furnace No.2.
2015	Completed Ferronickel Plant No. 2

Lead the world's nickel industry with our technological excellence & knowledge!

SNNC is the proud owner of the world's largest electric furnace in single-unit production capacity and the emerging giant of global Fe-Ni manufacturing. As the first company in Korea to produce and manufacture Fe-Ni products, it is a contributor of the state's effort to secure strategic minerals.

2008	Received Knowledge Economy Minister Commendation for the facilitation of free economic zone
2009	Reached normal production capacity only 11 months after completion Received Prime Minister Award on "2009 Foreign Companies" Day
2014	Completion of Ferronickel Plant No. 2, increasing the ratio of domestic supply in nickel alloy Received Strategy and Finance Minister Award on Taxpayer's Day
2019	Acquired Best Family Friendly Management Certification Received Grand Prize in "POSCO Family Safety Awards" and "POSCO Family QSS Awards"

POSCO C&C

www.poscocnc.com

Steel Design Solution Global Top Company

Business Area _ Production of coated and colored steel

*in 2020



Sales

907.3



Operating Profit

16.9



No. of Employees

415 members



History

1988 Originally established as Pohang Coated Steel Co. Ltd.
 2004 Completed No. 2 Plating CGL
 2008 Renamed POSCO C&C
 2018 Completed Premium CCL (No. 4)
 2019 Completed PosART Factory

A distinguished steel design solution based on superlative coating technology

Originally formed as a coated steel manufacturer of galvanized and aluminized steel sheets in Pohang Steel Complex, POSCO C&C is one of the most well-regarded producers of zinc-coated, aluminum-coated, and colored steel products in the world.

2002	Listed on stock exchange
2007	Reached a cumulative production of 10 million tons
2011	Awarded with the Export Tower Award for USD 400 million in export
2013	ALCOSTA product line certified by the Ministry of Trade, Industry and Energy as a Global Product of Excellence
2019	Developed fire-resistant colored steel
2020	POSCO antibacterial colored steel received Hohenstein Quality Label

POSCO M-TECH

www.poscomtech.com

Create New Value of Steel with Packaging and Materials

Business Area _ Steel product packaging, facility engineering, byproduct production

*in 2020



Sales

255.4 billion KRW



Operating Profit

11.6 billion KRW



No. of Employees

1,023

포스모엘렉

History

1973 Originally established as SAMJUNG Steel Company
 2001 Renamed SAMJUNG P&A
 2005 Officially joined POSCO Group as a subsidiary
 2011 Renamed POSCO M-TECH Co., Ltd.

A happy company for workers, a dear partner for customers

Over the last 30 years, the company has advanced in all areas related to raw steel material supply and steel packaging for POSCO and overseas steel mills. Since then, it is expanding to material businesses as well. POSCO M-TECH creates a synergistic effect between steel industries and leads the resource recycling business of the group.

1977	Completed the construction of aluminum plant (supplier of aluminum deoxidize
2007	The first company in Korean steelmaking to implement four-team double shift Selected as "Company of Excellence in Labor Culture" by the Ministry of Labor
2009	Developed the first robotized strapping system in the world (POSCO StrapMaster)
2016	Commencement of consignment operation for POSCO's FeMn business

POSCO TERMINAL

www.poscoterminal.com

The Most Respected and Professional Logistics Company in North-East Asia

Business Area _ CTS, loading, storage, unloading, and marine and inland transportation

*in 2020



Sales

146.5



Operating Profit

15.8



No. of Employees

50 members



History

1984	Started CTS business (POSCO)
2003	Established POSCO Terminal (joint venture between POSCO and Mitsui)
2005	Gwangyang CTS facility completed
• 2008	Expanded CTS business to Pohang
2018	Signed the 2nd joint venture contract

Delivering happiness for our customers

POSCO TERMINAL provides logistical services for delivering bulk cargo to customers via large vessels via Central Terminal System (CTS) bases in Gwangyang and Pohang, delivering coal and raw materials from international sites to Korea.

2009	Awarded with the Export Tower Award for achieving USD 20 million in exports
2011	Awarded Grand Prize by Korea Financial Administration in Small Business Category Acquired the ISO 14001 certification
2017	Reached 100 million ton of total sales volume / Completed the construction of 4 Silos in Gwangyang
2018	Started the lease and operation of #7 berths from SNNC
2020	Acquired #7 berths from SNNC / Started the consignment operation of CTS Loading Berth in Gwangyang

POSCO CAPITAL

www.poscocapital.com

We are the Best Financial Company Business Area _ Venture/CVC

*in 2020



Sales

102.5



Operating Profit

47.7



No. of Employees

48 members

Finance which generates sustainable values

POSCO CAPITAL is a stable shareholder-based financial company focusing on new technology, composed of POSCO and POSTECH. It was founded to discover and foster promising new technology companies and venture companies to lead the future paradigm of innovation.



History

Originally established as POSTECH Technology Investment (Registered as a small business startup investment company)

Launched Seoul Office (15th floor of West POSCO Center)

Registered as a credit finance company in new technology financial business

Renamed POSCO CAPITAL

Awarded with New Technology Financial Business Excellent Investor citation

1999	Established 1st POSTECH Venture Fund Investment Association (KRW 9 billion)
2010	Established POSCO Family Strategy Fund (KRW 80 billion)
2015	Established Growth Ladder POSCO K-Growth Global Fund (KRW 66 billion)
2017	Established PCC Amberstone 1 Private Equity Fund (KRW 100 billion)
2019	Reached KRW 2.3 trillion in AUM, operating profit of KRW 47.7 billion

PNR

www.p-nr.com

Global Leading Company in Iron Waste Recycling

Business Area _ DRI/HBI/MP production and sales using by-products from iron manufacturing

*in 2020



Sales



Operating Profit



No. of Employees

History



Awarded with USD 10 million Export Tower award

Established PNR Co. Ltd.

Recognized as Excellent Workplace for Risk Assessment

Awarded with provincial governor's citation for environment

Recognized as a family-friendly enterprise

Global Leader for the recycling of wastes from iron manufacturing

PNR is a company growing into the leadership role in low-carbon green growth by recycling steelmaking byproducts into DRI, HBI, and MP products to be supplied to POSCO steelworks in Pohang and Gwangyang.

2009	RHF plant completed in Pohang and Gwangyang
2011	Acquired the ISO 14001 certification (Environmental Management System)
2012	Acquired the ISO 9001 certification
2014	Awarded with the Excellence Award in POSCO Family Environmental Management Awards
2015	Acquired ILS certification and MP patents for RHF plants in Pohang and Gwangyang
2020	Pohang RHF plant awarded with Pohang mayor's citation in Environmental Management

RIST (Research Institute of Industrial Science & Technology)

www.rist.re.kr

Future Technology Research Institute for Industrial Applications
Business Area _ R&D, analysis, evaluation

*in 2020



Sales

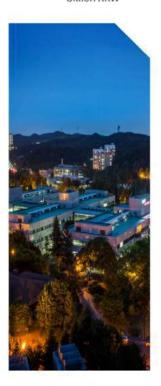
91.33



No. of Employees

370





•	1987	Originally established as an industrial science and technological research center (fully funded by POSCO)
•	1995	Designated as the nation's first authority for internationally accredited test by KOLAS in the field of metals
•	1996	Renamed as Research Institute of Industrial Science & Technology (RIST)
•	1999	Selected as an operator of the Business Incubator Center (first case in private research sector) by the Small & Medium Business Administration
•	2007	Founded subsidiary RISTecBiz (1st company specializing in new technology startups)
•	2009	Declared vision of the world's top commercialization research institute
•	2017	Founded subsidiary RISTVENTURE (new technology startup)
•	2019	Established Particulate Matter Research Center Established POSCO Group's Lithium-ion battery material research center

A research institute for innovative technologies, the leader of POSCO Group's growth, and the engine of national development

From environmental research in industrial utilization of carbon dioxide to slag recycling to renewable energy, smart grid, and other energy-related research, Research Institute of Industrial Science & Technology (RIST) is now concentrating its capabilities toward developing innovative technologies. It is also working on material research, such as lithium and Lithium-ion fuel cell materials.

1990	Developed next-generation steel technologies, FINEX and Strip-Casting
1993	Developed variable nozzle-type air knife
2003	Developed Korea's first aseismatic reinforcing device
2008	Developed the world's first segment roll adjustment robot for casting plant & 5kW SOFC fuel cell stack production technology
2012	Developed Korea's first mass-production technology for high formability titanium sheet for plate heat exchanger (PHE)
2014	Applied the RIST's NFP to POSCO
2017	Commercialized the World's First Concentration Gradient NCM811 Cathode Material
2018	Sold subsidiary RISTecBiz to SIMPAC Holdings (KRW 16.2 billion)
2020	Implemented Ulleung-gun Sea Forest Establishment Project

POSCO RESEARCH INSTITUTE

www.posri.re.kr

Creative Think Leader in Steel and Beyond

Business Area _ Research in steel, industry, management, future growth, and corporate citizenship

*in 2020



Sales



Operating Profit



No. of Employees

History



POSRI delivers best research with its creative collective intelligence, contributing to the growth of POSCO Group and development of a society.

POSCO Research Institute (POSRI) is a research institute specialized in steel, business and other research areas, which conducts best research that leads the trend and future. With its capabilities for global-level research and consulting, POSRI delivers creative and practical research outcomes, contributing to the growth of POSCO Group and development of a society.

2001	Founded POSRI management research journal
2006	Founded CHINDIA Journal
2007	Jointly hosted POSCO Asia Forum (with POSCO TJ Park Foundation)
2009	Ranked 8th out of 100 top think tanks in Korea
2012	Opened the POSCO Family information platform (GIH)
2016	Founded Asian Steel Watch journal

POSCO GROUP UNIVERSITY

https://lp.posco.co.kr

Fostering POSCO Group's Talent to Implement Corporate Citizenship

Business Area _ Establishing HRD strategy, talent promotion, field consulting, and safety training

*in 2020



Sales

39.2



Operating Profit

0.18



No. of Employees

152



History

1968	Installed the production training body
1969	Established the Steel Training Center
1974	Opened the job training facility
1993	Renamed to Talent Development Center
2010	Renamed to Future Creation Academy
2015	POSCO GROUP UNIVERSITY established as an incorporated entity Registered as vocational training and development center
2019	Registered as a lifelong education center

Promoting talents with a mindset of action, consideration, and creativity, capable of leading the future of POSCO Group and realizing the idea of corporate citizenship

POSCO GROUP UNIVERSITY was launched as a comprehensive human resources development organization that integrated all the educational functions of POSCO Group. It utilizes its HRD knowledge, accumulated from its beginnings as the group's Steel Training Center, to build group cohesion, leadership at all stages, and an organizational culture of trust.

2004	Selected as a supervising organization for small and medium business consortium
2007	Awarded with the presidential citation for Job Training Development
2008	Selected as an organization of excellence in e-learning (for 6 consecutive years)
2015	Established an integrated talent promotion system for POSCO Group
2019	Established POSCO Group Corporate Citizenship projects, such as youth employment and startup support "Youth Dream Job (POSCO Youth Dream)" and cultural concert for community members
2021	Opened a new AI-based POSCO Group Learning Platform (LP) Expanded group affiliate and partner safety training

POSCO HUMANS

www.poscohumans.com

To realize self-supporting business environment Business Area _ Office, IT, cleaning, and other supporting work

*in 2020



Sales



Operating Profit



No. of Employees

657 members



History

2007	Originally established as POSWITH * A subsidiary-type standardized workplace for workers with disabilities
2009	Established Poseco Housing * A social enterprise
2013	Launched POSCO HUMANS * Merger between POSWITH and Poseco Housing
• 2021	Designated as a training organization for the improvement of public awareness on workers with disabilities in the workplace

Priority to the people, together with neighbors

This is the first corporate subsidiary in Korea established as a standard workplace for the employment of workers with disabilities, established. It offers employment for workers with various disabilities, from developmental to visual and hearing impairment, and promotes the competitiveness of its business areas from office work to cleaning, IT, and vehicle support.

2009	Recognized with presidential citation for the promotion of vocational training for workers with disabilities
2012	Awarded with prime minister's citation for the promotion of vocational training for workers with disabilities
2013	Awarded with prime ministerial citation for excellence in gender equal employment
2014	Acquired family-friendly enterprise certification and awarded with ministerial citation for Gender Equality and Family
2016	Selected as a business of excellence for the employment of workers with disabilities *2nd consecutive year (October 2019)
2018	Awarded with presidential citation for job creation

POSCO RTECH

www.poscortech.com

Intellectual Property Total Solution Provider

Business Area _ Intellectual property services, technological information research, technological business consulting

*in 2020



Sales

3.6 billion KRW



Operating Profit



00

No. of Employees

23 members



History

2016	Established the patent business group (incubating group under POSCO GROUP UNIVERSITY)	
	Started handling patent services (Patent work for POSCO Group, patent training)	
	Started operating the patent consulting center and offering patent diagnosis for 13 group affiliates	
2017	POSCO RTECH established as a corporation specializing in patents	
2018	Started patent analysis and technology information research	
2019	Started retention project for retired technical workers in POSCO	
• 2020	Introduced R&D service Expanded technology information research business to encompass outside requests (introduction of technical advisor system)	

A specialist for intellectual property total solution

As the intellectual property expert wing of POSCO Group, POSCO RTECH shares its expert insights with its customers through expert technological information research and analysis. It also maximizes the value of intellectual assets with intellectual property protection and patenting support services, positioning itself as a one-stop provider for intellectual asset management solutions.

2016	Established the patent management system and reorganized policy and management structures
2017	Expanded the POSCO patent service, started patent training for POSCO affiliates
2018	Started preparatory survey activities for potential patent conflicts and patent issue consulting service for POSCO affiliates
2019	Opened "Again With POSCO" web page and started job matching services for retired POSCO workers
2020	Acquired Research and Development Service Company certification from the Ministry of Science and Technology Information and Communication Strengthened business areas for technical information survey Expanded group affiliate IP strategy support services & took part in government task for the domestic establishment of steel material component sector

Busan E&E

www.busanene.co.kr

Waste to Energy, Unlimited

Business Area _ Producing new renewable energy through waste resources

*in 2020



Sales

21.9



Operating Profit

0.8



No. of Employees

57 members



History

• 2013

2009	Agreement signed between POSCO and Busan Metropolitan City
2010	Established Busan Environment & Energy (E&E)
• 2010	Started the construction of Busan Combined Heat and Power Plant

Completed the Busan Combined Heat and Power Plant

Sustainable energy through green power generation technology

Busan Environment & Energy (Busan E&E) is Korea's largest combined heat and power plant that turns domestic waste, hitherto simply incinerated, as flammable solid fuel to generate electric power, heat, and alternative energy source for the community.

The company will continue to transform itself as the global no. 1 enterprise in utilization of waste products as energy source.

2013	Started the commercial operation of Busan Combined Heat and Power Plant (900 ton, 24.8 MW)				
2017	Started heat supply to Busan Waste Sludge Treatment Facility (95,904Gcal)				
2020	Selected as a facility of excellence in waste treatment facility installation and operation assessment				

POTENTIAL PARTNERS & SUBCONTRACTORS



Infrastructure 2.0

Enabling 100% clean renewable power, ultrahigh-speed Internet, pure water, more...

EarthGrid

underground super-grid for power, fiber, water, waste, green hydrogen & e-commerce parcel delivery.

Troy Helming
Founder & CEO



Problem

Overhead utility lines are unsightly, dangerous & unreliable.







....they ignite fires that kill people & destroy homes.



Solution

Underground real estate.

Build, own, operate & maintain (BOOM) utility tunnels for broadband, clean energy, etc.

✓ Environmentally safe ✓ Tight turns ✓ No sinkholes

√ Long distance, deep underground



Video of operational robot, boring a tunnel, available upon request with NDA.

Images include actual prototype boring thru hard limestone & digital renderings (courtesy of Red Gopher Corporation).





EarthGrid is raising capital to bore its own network of tunnels, leasing space to investment-grade utilities



Advantage

Lowers tunnel costs by up to 95% & 100x faster.

From this

\$18,000

per meter

\$9 mil.

per kilometer

10 meters/day To this

<\$300

per meter

\$450,000

per kilometer

Up to 1,000 meters/day

100× faster

90%

less

95%

less

Why EarthGrid?



Superior, low-cost tunneling

The plasma tunnel-boring robot invented & patented by founder Troy Helming decreases costs & increase speed.



Proprietary, patented IP

The plasma tunnel-boring robot invented & patented by founder Troy Helming decreases costs & increase speed.



First-to-market + ideal timing

Now is the time for undergrounding, and EarthGrid has the key innovations to execute effectively on the opportunity.



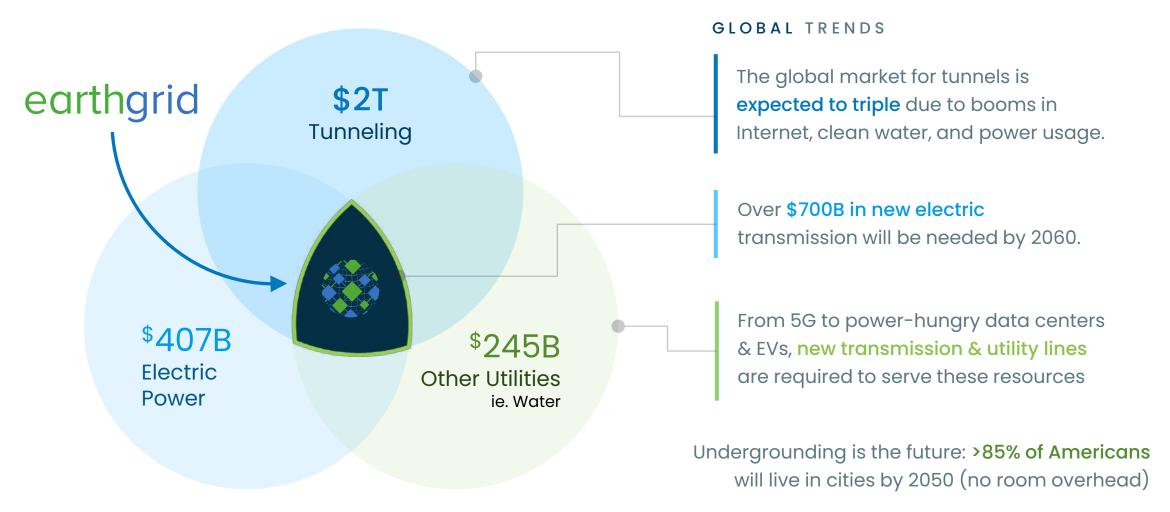
Founder expertise & early traction

Expertly-designed technology for rapid, low-cost, clean, state-of-the-art All-Underground infrastructure



Market

Disrupting a growing trillion-dollar market.



Figures above are for the US only.



Why now?

Until now, tunneling was expensive:

BEFORE

\$18,000 per meter

<\$300→ per meter

AFTER

QUARTZ

Why Tunnels in the US cost much more — "Building tunnels in the US is more expensive than anywhere else by a huge margin"

Bloomberg



How Bad is America's
Infrastructure? — "invest
\$1.2 trillion over the next 8
years...from replacing water
pipes to charging EV's"

The Washington Post

Longer, more frequent outages afflict the U.S. power grid as states fail to prepare for climate change..."5 disasters in 4 years (...\$13 Billion cost)"













Traction Milestones achieved:



20

Patent innovation claims filed



Patent (3 innovation claims) Number 11,136,886-B1, published Oct 5, 2021 4+

years testing plasma tunnel boring robots

1st

July 2021, 4 more pending

Customer project completed Oct 2021: (4) utilities in Richmond, CA 100km+

Letters of intent signed (TX, CA)

19

Signed Contracts w customers (>\$6M of contracted revenue)

90%

Positive response from 200+ utility exec interviews

EARLY PARTNERS



PIPEDREAM





Water, Wastewater, Green H2: 0.2 - 1.2 m



Superconducting HVDC or HVAC: 0.2m



HVDC or HVAC: 0.15m



Medium Voltage Distribution: 0.15m



Fiber (288 strands/conduit): 0.1m



Commercial AC service 3Ø 480v: 0.1m



Commercial DC service 1,500v: 0.1m



Cart track for installation & maintenance:
Self-propelled electric carts w trailer, inductive charging pads

Patent pending tunnel geometry: More useable space w arch shape vs typical TBM or HDD circle shape.

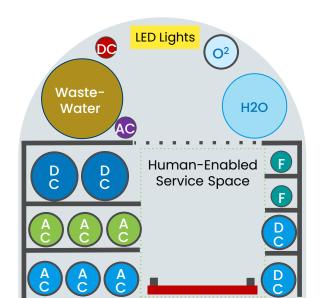
How it works

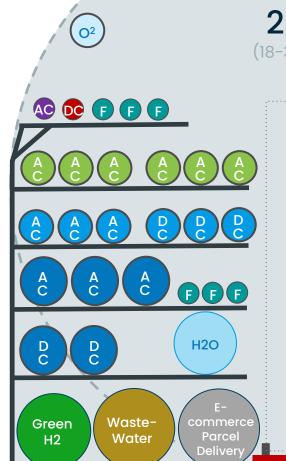
Co-locating utilities in arch-shaped tunnels

Market Size: \$400B

tunnels
1-10 km

1.5_m (7-15 MW)





Market Size: \$2T

Regional tunnels
>10 km

LED Lights

2.5_m

(18-39 MW)

Human-Enabled Service Space

Rollout strategy

\$100k

Pristine Sun Fund 5, LLC – solar farms owned by New Island Capital

PO Signed

- 1. 1-meter diameter, 75m long, \$12k / year Toll revenue, Stroing solar farm
- 2. 1-meter diameter, 60m long, \$23k / year Toll revenue, Buzzelle solar farm
- 3. 1-meter diameter, 100m long, \$35k / year Toll revenue, Fitzjarrell solar farm
- 4. 1-meter diameter, 250m long, \$35k / year Toll revenue, Jarvis solar farm

\$48M

Utility & transportation tunnels – for business parks, communities, solar + storage

- 5. 1.5-meter diameter, 13 km long, \$452k / year Toll revenue: wastewater, water, Internet, power
- 6. 1.5-meter diameter, 5 km long, \$916k / year Toll revenue: wastewater, water, Internet
- 7. 1-meter diameter, 100 km long, \$2.5 MM / year Toll revenue: "Middle Mile" fiber for Internet
- 8. 1-meter diameter, 200 km long, \$1.5 MM / year Toll revenue: "Middle Mile" fiber for Internet
- 9. 1-meter diameter, 50 km long, \$1 MM / year parcel & goods pneumatic delivery revenue
- 10. Twin 7-meter diameter vehicle tunnels (Teton Pass WY), 15 km long, \$22 MM / year Toll incl. utilities

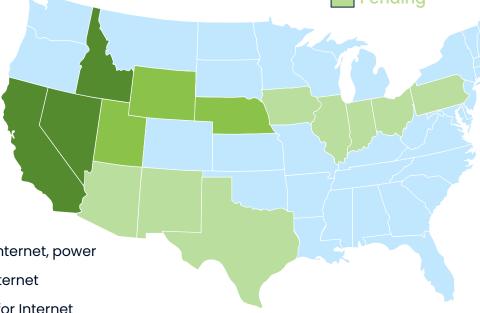
\$337M

LOI Signed

- Transmission Lines Connect SF Bay Area (NP15 PG&E) <> SoCal (SP15 LADWP) & BPA:
- 11. 2.5-meter diameter, 690 km long, \$59 MM / year Toll revenue @ \$7/MWH: Richmond CA to Hesperia, CA
- 12. 2.5-meter diameter, 440 km long, \$15 MM / year Toll revenue @ \$7/MWH: Richmond to Reno to Lassen
- 13. 2.5-meter diameter, 1,030 km long, \$70 MM / year Toll revenue, @ \$7/MWH: Richmond to BPA in OR
- 14. 2.5-meter diameter, 1,700 km long, \$180 MM / year Toll revenue, @ \$10/MWH: Reno to Sidney NE (DC Tie)

EarthGrid has been awarded Utility Status (via CPCN) in several states, more filed & pending





NPV of Toll Revenue

\$5.5B

at 6% DR, 30yrs. of tolls



Team leadership



Troy Helming - CEO & Founder

Linked in

Troy Helming is a visionary entrepreneur, innovator and clean energy pioneer. As a creator, he's founded companies that have generated more than \$10 Billion of economic impact to date and invented 2 technologies that have led to over 40 clean energy patent claims.

Troy was the founder & CEO of two impactful clean energy companies: **TradeWind Energy**, which he founded in 1998 & sold in 2004 (\$15 Billion of wind projects were built by the company he founded since then, and was the #1 Wind Developer in the USA in 2017) and then **Pristine Sun**: >350 solar projects built so far totaling \$1 Billion in market value (including projects sold to other companies such as Renesola (NYSE: SOL) & Enerparc) and many high profile projects including the largest floating solar project award in North America & the largest community solar projects in both Vermont and Wisconsin. He's the author of the 2005 book **The Clean Power Revolution**, co-inventor of *FloatoRack* (an innovative floating solar system with multiple patents pending).



Scott Lane - coo & Co-Founder

Linked in

25+ years Senior Advisor and executive in the renewable energy and telecommunications/fiber industries. With over 25 years and over **7,000 MW's** of experience in the Renewable Energy, Construction Industry and Communications Industry, Scott brings operational as well as planning and implementation skill sets that have been acquired and tested throughout North, Central and South America as well as the Caribbean. Executive roles at: **Centauri Energy, Parsons Engineering, EDF Renewable Energy, enXco, Alcoa Wireless, American Tower**. With a track record of creative and synergistic problem solving and planning, many of today's systems and operational processes can be traced to a solution that Scott was instrumental in developing and implementing by adapting new tech and new processes to meet the emerging grid management issues with large scale generation interconnections.



Craig Wiesner – CTO (TBR) & Co-Founder Linked in

25+ years as a hardware leader at **Lockheed Martin**. Has managed teams of 5 to 100 people. A talented & creative mechanical engineer with extensive design background, he's designed & built numerous satellites that must operate – without any human repair or recovery – in what is arguably the harshest environment we are aware of: outer space. Mr. Wiesner was instrumental in the research, design, development & assembly of the Alpha & Beta prototypes of Mr. Helming's patented Red Gopher.





Curt
Hebert, J.D.
Former FERC Chairman &
Commissioner, U.S. House of
Representatives, PUC Chair

Linked in



Dr. Daniel Kammen

UC Berkeley Professor (Founder, RAEL & SWITCH lab), Science Envoy for US State Dept, U.N. IGPCC author, etc.

Linked in



Rachelle Chong

Former FCC and California PUC Commissioner, regulatory consultant to Lyft, Comcast's VP Government Affairs

Linked in



George O'Connor, J.D.

Former U.S. Senate & FERC energy attorney

Linked in



Roadmap & history

2015

2016

2017

2018

Idea inspired by a former Navy Seal working as a solar GIS engineer for Troy Helming (CEO of Pristine Sun at the time) telling a "bad-ass" plasma torch story Hired leading plasma engineering firm Pyrogenesis (ticker "PYRNF") to complete a **feasibility study**. Formed predecessor company, Red Gopher Cooperative PBC on 9-23-2016. Filed **1st patent** application 15/814,311

Built 1st Prototype (max power 125 kW), hired early team, raised \$650k in F&F Round \$500k from founder Troy Helming, built a lab in a warehouse in Oakland CA.

Agreed to sell IP that is not needed by EarthGrid to a newly formed company, ArcByt, which is focused on a different strategy than EarthGrid.

2019

•

Moved to larger facility with more power in Richmond CA, built 2nd Prototype (max power 1,500 kW), tested extensively in many different geologies, bored tunnels of up to 0.5m diameter, 2m long.

2020

2021

power)

in 2021.

Filed CPCN with CA
CPUC to become a
utility in Dec 2020, to
get preferred ROW
along state roads.

- Completed test case project
 with 4 utilities (water, sewer, fiber,
- Awarded CPCNs in 3 states, 10 more applications submitted, expect at least 5 more CPCNs
- √ Filed 2nd patent application 17/248,177 with much improved design. 3 patent claims approved & published October 5, 2021; more claims pending.
- √ Began long-term contract negotiations & discussions with potential investment-grade customers.
- √ Created 1st draft tunnel route planning & network design (along ROW we believe we can obtain).



Investment

Up to \$100 million—use of funds:

Funds Needed	\$10M	\$20M [USA]	\$20M [EU]	\$50M
Diameter	Small*	Medium 2.5m	Medium 2.5m	Large 8m
Use Case [cumulative]	Fiber, e-commerce, Power Distribution	+ Power Transmission, + Pipeline(s)	+ Power Transmission, + Pipeline(s)	+ Transportation (rail, toll roads, Hyperloop)
Equipment Case Robot bill of materials, balance of plant	\$7M	\$15M	\$15M	\$40M
Overhead	\$3M	\$5M	\$5M	\$10M
ARR Annual recurring revenue in Y1-Y2	\$20M+	\$200M+	\$200M+	\$500M+



Long-term Income-producing asset growth.

INITIAL PROJECTS

Partner with IPPs, solar & wind project developers, utilities, ISPs & communities to build tunnel segments in key geographical areas to solve problems

ie. grid congestion, prohibitive interconnection costs, "middle mile" fiber access, etc.

\$250M asset value

REGIONAL GRIDS

Methodically connect Initial
Projects to create regional
subterranean tunnel network.

Capture network effects by boring tunnels larger than needed at a small incremental cost to add substantial value to serve additional customers in the region via in the pre-existing tunnel.

\$10B asset value

SUPERGRIDS

Connect Regional Grids to form continental – and eventually intercontinental – SuperGrids containing infrastructure for power,

fiber, water, transportation,

and more, all REIT-eligible.

\$1T asset value

We enable clean energy developers & utilities to connect to earthgrid with simple, rapid interconnection, exclusively available in our network.

POTENTIAL PARTNERS & SUBCONTRACTORS





IMPORTANT NOTICE

This presentation includes certain "forward-looking statements" including, without limitation, statements regarding the Company's expectations about future financial performance and market position that are subject to risks, uncertainties and other factors that could cause actual results or outcomes to differ materially from those contemplated by the forward-looking statements. These forward-looking statements include, but are not limited to, plans, objectives, expectations and intentions and other statements contained in this presentation that are not historical facts. These statements are sometimes identified by words such as "believe", "project", "expect", "forecast" or words of similar meaning. These statements are based on our current beliefs or expectations, and there are a number of important factors that could cause the actual results or outcomes to differ materially from those indicated by these forward-looking statements, including, without limitation, change in economic conditions in the United States, changes in laws and regulations governing applicable tax credit programs and the installation and operation of solar power projects, changes in interest rates, and general economic factors. These and other risk factors will be set forth in definitive transaction documents prior to closing any investment. The Company expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements contained herein as a result of new information, future events or otherwise.

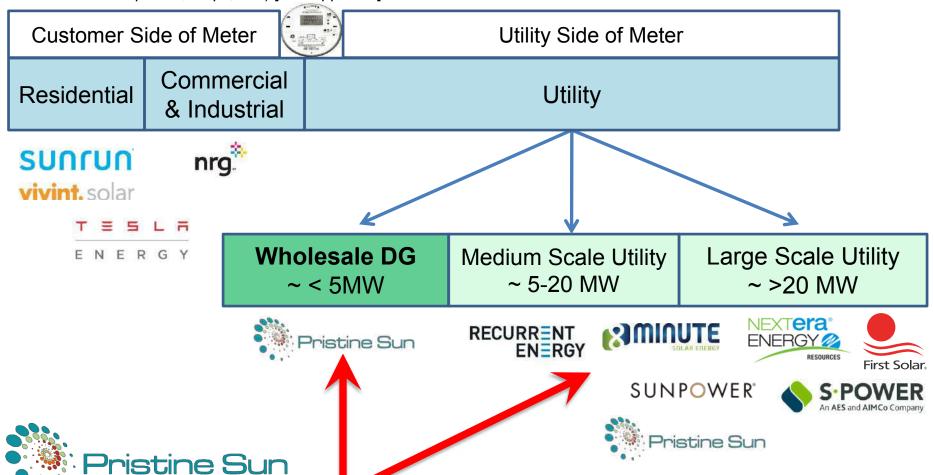
This presentation is not an offer for sale of securities or a solicitation of an offer for sale of securities.

What We Do

- 1. Lease rural land & commercial/industrial rooftops & parking lots
- 2. Obtain permits and grid connection agreements
- 3. Build, own, and operate solar power plants
 - a) Wholesale Distribution Generation (fewer competitors)
 - b) Customers have low credit risk (utilities & large corporate buyers)
 - c) Scalable, standardized development process
 - d) Incorporate sustainability, including "**Agrivoltaics**" (sheep grazing, bee apiaries, crops, etc.) [See Appendix]

Elevator Pitch:

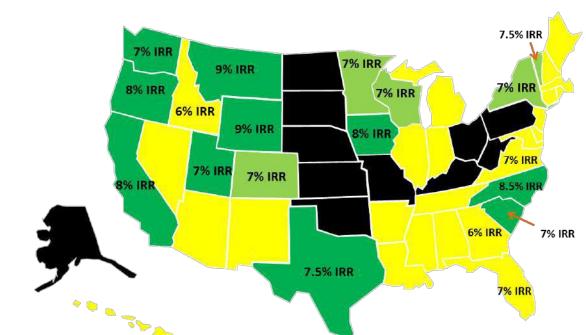
"We develop, own & operate solar power plants & sell electricity to investment-grade utilities with ~20-year contracts."



Market

- 1. 48,000 substations. Each can accommodate up to ~4 MW+.
- 2. 48 GW. Discounting by 75% for geography & capacity (RDG), our niche market size is 48 GW (~\$96B).
- 3. Growth. Solar growth = 83.9% / year¹ (2014 = 7 GW / \$15B). Add 1,000 GW = ~15% of today's US power demand.
- **4. Predictability.** Few moving parts, low maintenance, 25-year panel performance warranties, steady cashflow, no need to look for customers (inject into the grid), etc.

Legend						
Color Priority		PPA rate				
	Go Fast	Fixed				
	Go	Fixed or Variable				
	Pending/Monitor	Fixed or Variable				
	Less active	NA				





Competition

- 1. Natural Gas
- 2. Wind energy
- 3. Fragmented, regional solar developers (few retain projects):
 - a. SunEdison (mostly larger projects)
 - b. Heliosage (folded after all projects acquired by Coronal)
 - c. Ignite (remaining projects acquired by Pristine Sun)
 - d. Strata, FLS, Cypress Creek (NC focus)
 - e. Ecoplexus, ImMODO, Ecos, etc.
- Keys to competition:
 - a. Focus on WDG niche
 - b. Tie up ideal sites near substations nationwide; and
 - c. Enter the utility interconnection "queue" to lock up capacity





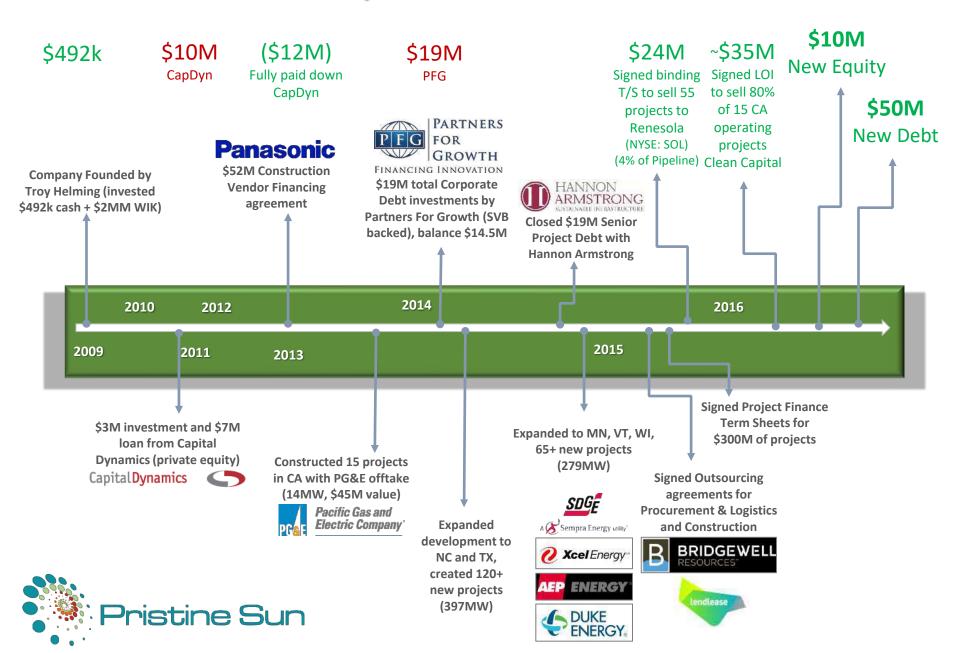








Corporate Evolution



In 4Q 2015, a third party appraiser valued Pristine Sun's projects at a fair market value between \$475 to \$543 Million on an "As Complete" (258 MW installed & operational) basis. This excludes any value earned by Pristine Sun for "installing" the projects.

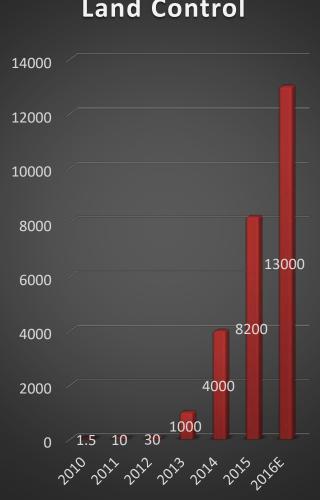
Track Record

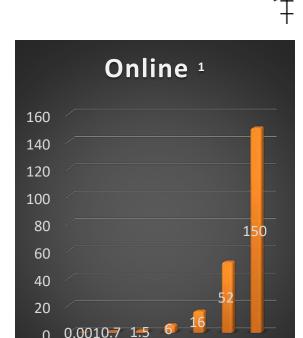
(in MWs DC)

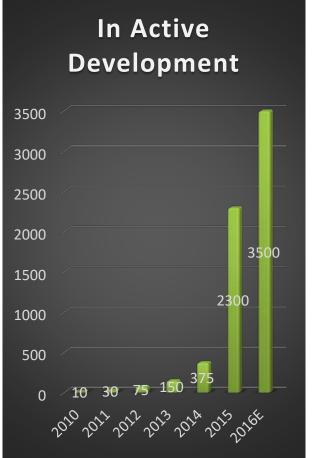
20x

4x









¹ Online or under construction / pre-construction

2013



2014

2016E

Traction

- 1. Achieved first net profit (\$3.7 Million) for year 2013. DECEMBER, 2013
- 2. Awarded 25-year power contract for largest floating (water-based) solar project in North America, located Sonoma County CA, 13 MW \$40M value. MARCH, 2015
- Awarded the largest solar project in Vermont, by city municipal organization Windham Solid Waste Management District: 5 MW \$20M project. AUGUST, 2015
- 4. Awarded joint grant from US Department of Energy & Israeli Dept of Energy to accelerate development of proprietary floating solar technology. DECEMBER, 2015
- 5. Approved for the first solar farm ever in Glenn County California, a 2 MW \$6 Million project. Then won 2 more projects totaling \$7M more. JULY, 2015
- 6. Signed a JV agreement with Sky Solar (SKYS: NASDAQ) to build, own (retain 25% ownership) & operate 300 MW (\$600MM) of solar power plants. NOVEMBER, 2015
- 7. Signed a \$14 Million EPC contract w/Metropolis Capital to construct 6 utility-scale solar power plants in California (we retain 21% ownership). JANUARY, 2016
- 8. Signed a binding term sheet to sell 88 MW of projects to Renesola (NYSE: SOL) for \$24 Million (29 cents/wdc). This is expected to lead to strong EBITDA & profit for 2016. APRIL 2016.
- 9. Signed LOI to sell 80% of fifteen of Pristine's operating projects for \$35 Million. This should push 2016 revenue above \$60 Million. MAY 2016.
- 10. On track for \$60 Million + Sales in 2016 thanks to #7-9 (assuming #9 above closes).



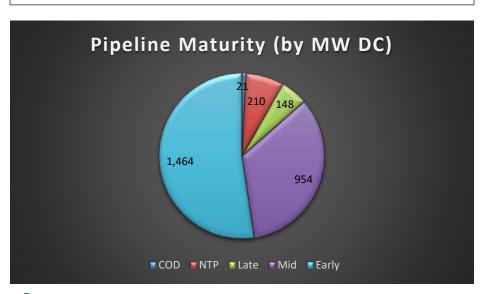
Our Development Assets

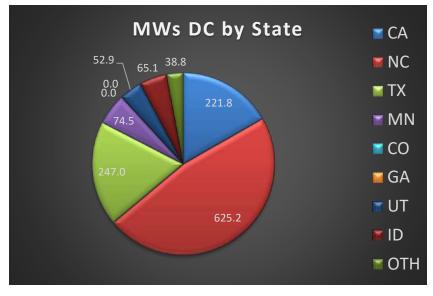
(GAAP forbids projects in development to be assets on the Balance Sheet)

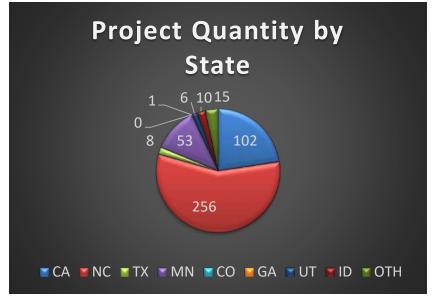
In 2Q 2016, we sold development assets (projects not yet built with some level of development completed such as PPA, permits & grid studies) at <u>29</u> <u>cents</u> per watt. They were a mixture of mid & late stage.

Pristine Sun has ~1,237 MW DC of mid & late stage projects remaining, and ~1,464 MW DC of early stage projects. Using 29 and 3 cents per watt DC respectively, this suggest a pipeline value of perhaps \$402.7 MM (\$358.8MM + \$43.9MM respectively). This excludes any value from our operating projects.

Note: developing the 1,464 MW of early stage projects to mid & late stage would add \$380.7MM of new additional value (going from 3 to 29 cents could add 26 cents/wdc)

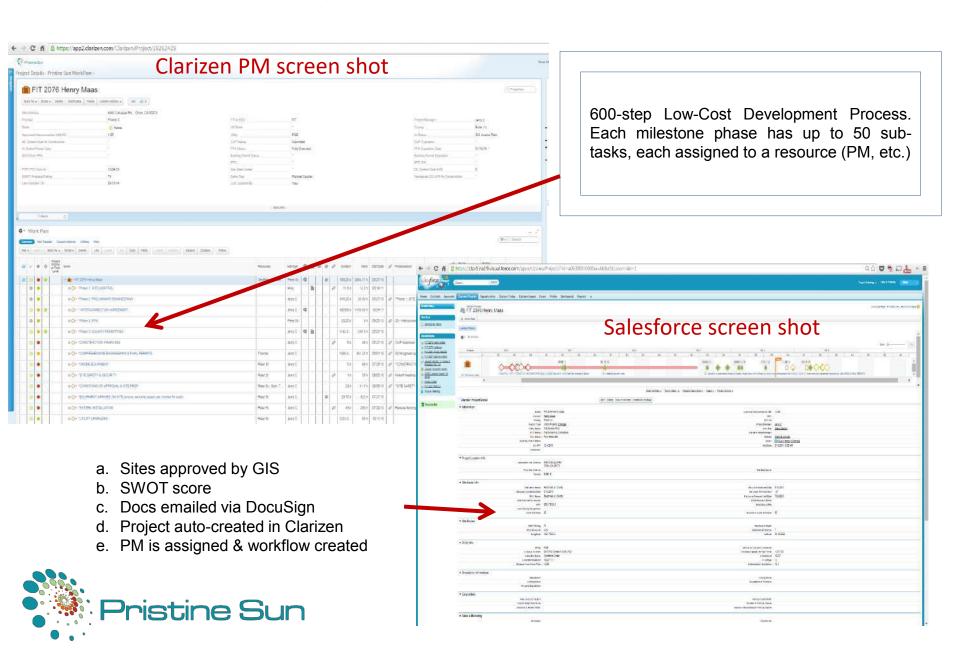








Scalable, Cloud-Based Processes



Management Team



Troy Helming – Chief Executive Officer Linked in

Mr. Helming has been in solar since 1980 (**41 years!**) and served as CEO of Pristine since he co-founded the Company in 2009. Prior to co-founding Pristine, Mr. Helming was CEO of Pristine Power Corporation, a renewable energy consulting firm and its affiliate KC Biofuels LLC. Mr. Helming successfully founded TradeWind Energy (which later become the #1 wind developers in the USA in 2017, 15 GW and counting) and served as CEO through 2004, developing over 2 GW of wind energy before Tradewind was acquired by Enel Green Power and became their largest portfolio company by GW's of capacity.



Mike Altman – Chief Development Officer Linked in

Mike Altman, most recently the Director of Development at **Brightmark**, was a Project Director Development at **NexteraEnergy** Resources (aka NEER) and Senior Commercial Project Development Manager, Agricultural & Water Operations at **Tesla Energy** (formerly SolarCity). Mr. Altman, is an **Olympic athlete** turned energy business development professional. Cross-functional problem-solver who can 'connect the dots' between energy markets, tariff structures, regulatory bodies, incentive programs, emerging technologies and operational usage profiles to identify opportunities and deliver solutions. Comfortable negotiating contract terms with all types of load serving entities, energy consumers, stakeholders and ecosystem vendors. Contracting experience includes:• Energy supply and power purchase agreements• Demand response capacity agreements• Gas transportation agreements• Gas/electric utility interconnection agreements• Renewable energy credit (REC) contracts• Engineering and permitting services.



Scott Lane – Chief Operating Officer Linked in

25 years Senior Advisor and executive in the renewable energy and telecommunications/fiber industries. With over 25 years and over 7,000 MW's of experience in the Renewable Energy, Construction Industry and Communications Industry, Scott brings operational as well as planning and implementation skill sets that have been acquired and tested throughout North, Central and South America as well as the Caribbean. Project development experience roles include senior-level positions at **enXco**, **EDF Renewable** Energy & **Centauri Energy**. With a track record of creative and synergistic problem solving and planning, many of today's systems & operational processes can be traced to a solution that Scott was instrumental in developing and implementing by adapting new tech & new processes to meet the emerging grid management issues with large scale generation interconnections. Scott's background contains Wind, Solar, Biomass, Biogas energy storage as well as satellite earth stations, microwave, fiber and cellular projects.

Jeff Irvine Linked in Senior Project Developer











Appendix





AgriVoltaics

Sustainable Multi-use solar parks.

- 1. We drill a well to access water using an all-electric, solar powered pump.
- 2. Install commercial irrigation sprinklers to provide water for the following: a) regular cleaning of solar panels on trackers, b) agriculture (lavender, herbs & greens like cabbage), c) apiculture wildflowers, and d) native grasses for sheep (livestock). The irrigation system includes a water line running along the back (underneath) side of each long row of solar panels on trackers to cool the panels during the day to increase solar output using a proprietary system we've developed, and the water is then cooled via a ground source loop in a closed loop system with a water tank on site. The water is then used that night in the sprinkler system.
- 3. Plant native, drought-tolerant wildflowers and grasses between the rows of trackers (each row is separated by about 3.5 meters (15').
- 4. Plant crops (lavender, herbs & greens like cabbage) that thrive with 2-3 hours of shade per day in rows just at the westernmost edge of where the solar panels will be at the end of the day (when the panel rinsing occurs just after sunset).
- 5. Run the sprinklers at or after dusk. The water that lands on the solar panels will be collected over the surface area of the rows of panels and will drip down into the row of the crops.
- 6. For crops that are edible to sheep, install sheep guard mesh around the crops under the solar panel trackers. For other crops (e.g. lavender), no action required in this step.
- 7. Install 2 water troughs and 2 salt blocks for sheep on the site, connected to the water pump to keep the water troughs full at all times (with a float stopper).
- 8. Bring a herd of sheep and at least 2 donkeys (for protection from dogs & coyotes) to the site.
- 9. Occasionally add liquid probiotics in a diluted mixture to the sprinkler system, so that the water delivers probiotics (cultured from strains beneficial to the crops being grown) to eliminate the need for fertilizers.
- 10. Hand weeding & maintenance of the crop rows, as needed (jobs!).

The system will utilize the existing high-definition video cameras with pan, tilt & zoom capability (which we're already using for monitoring vegetation growth and panel soiling, in conjunction with our soiling sensors) to monitor the crop growth, grass height, sheep water troughs, etc. We have technicians monitoring these sites 24/7 already, so this additional data would be added to their mandate.

This solution generates the following:

- a) Solar electricity
- b) Sheep grazing (adds weight to the sheep, for lamb production & wool production)
- c) Honey from the Apiculture (e.g. lavender honey, basil honey, blends of both, etc.)
- d) Crops: lavender, herbs, fresh greens for local restaurants & grocery stores

Note: we own & operate dozens of solar farms / solar projects. We have successfully grazed sheep at 8 solar farm sites in California already, and have planted native wildflowers for pollinators at 4 additional solar farm sites in California.



Sample projects developed & built by Pristine



Stroing Bee Farm project, 1 MW, Tehama County CA (built 2013, value \$4MM)



Cotton Ranch project, 1.3 MW, Butte County CA (built 2013, value \$5MM)





Terzian Sheep Ranch project, 1.6 MW, Fresno County CA (2014, value \$6MM)



1 of 200+ commercial & industrial installations (22 states). This is ~400 kW in Richmond, CA (Phase 1 of 3 of 3 MW)





Desarrollo de proyectos solares y soluciones solares integradas

www.linksunrise.com





Sunrise HK International Corp. Ltd.

DESDE 2001

Sistemas Solares
Suplementarios

Proyectos de Integración Solar

Construcción de Grandes Plantas Solares

Negocios en China y la región de Asia

Debido a la buena reputación de la empresa, hemos ganado la confianza de clientes nacionales y extranjeros, manteniendo estrechas relaciones comerciales en varios países y regiones.





Sunrise HK International Corp. Ltd.

El modelo de negocio único de nuestra compañía brinda un contacto cercano a los fabricantes de integración de sistemas de energía solar domésticos proporcionando a los clientes las mejores soluciones de sistemas de energía solar.



Porqué SOLAR - Abundante Accesible Asequible

- Suficiente luz solar llega a la tierra en una hora para alimentar al mundo durante todo un año.
- A diferencia de los recursos y el capitales necesarios para extraer y quemar combustibles fósiles, cualquiera puede comprar e instalar paneles solares para aprovechar la abundancia de luz solar.
- Lo mejor de todo es que la energía solar genera importantes ahorros a largo plazo en las facturas de electricidad.



Ahorre en facturas de electricidad



La instalación de paneles solares reduce significativamente las facturas de electricidad mensuales y la dependencia de la red eléctrica. Esta independencia energética protege contra el aumento de los costos de la electricidad y la volatilidad de los precios del combustible.



Con analistas pronosticando aumentos continuos en las tarifas eléctricas:

La energía solar sigue siendo una solución rentable

Inversión a largo plazo en el futuro

Incrementar el valor de la propiedad





Los estudios han demostrado que las propiedades con sistemas solares se venden hasta un 20 por ciento más rápido.



Con una prima del 17 por ciento en comparación con los hogares sin tales sistemas.



Una instalación solar hace que su propiedad sea más atractiva para los compradores, aumentando su valor de reventa.

Reduzca su huella de carbono

A diferencia de la energía generada por combustibles fósiles, la energía solar no libera emisiones dañinas de dióxido de carbono (CO2).

Las soluciones energéticas sostenibles sin carbono, como la solar, son cruciales para:



Ralentizar el ritmo del cambio climático



Prevención de mayores daños al medio ambiente

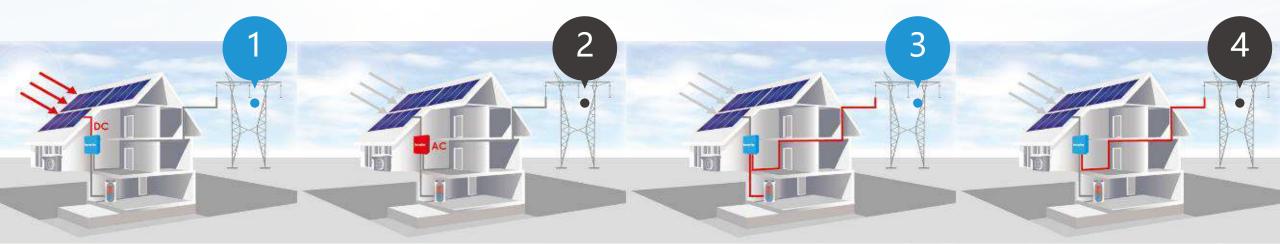






Sunrise HK International Corp. Ltd.

La energía solar es una energía renovable o "verde" alimentada íntegramente por el sol. Pero, ¿cómo los paneles solares fotovoltaicos convierten la luz solar en electricidad?

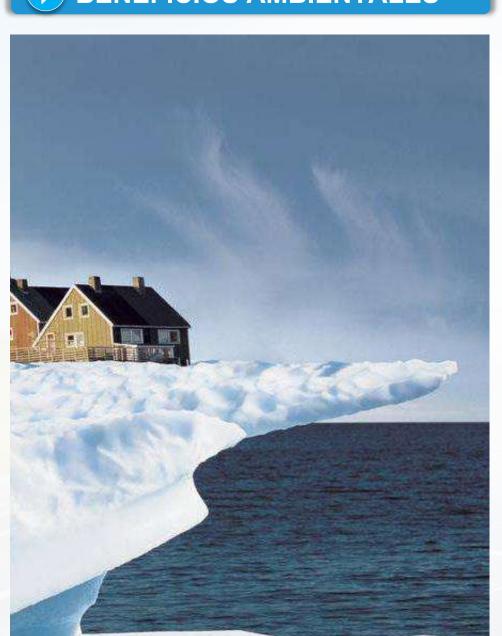


Los paneles solares fotovoltaicos capturan la luz solar, lo que hace que los electrones de las células de silicio del panel liberen energía que se convierte en electricidad de corriente continua (CC).

Un inversor convierte la CC en electricidad de corriente alterna (CA), lo que la hace utilizable para hogares y empresas.

El exceso de electricidad puede almacenarse en una batería o reintegrarse a la red eléctrica.

Se puede extraer electricidad adicional de la red si necesita más energía de la que pueden generar sus paneles solares.





La energía solar no produce contaminación por CO2



El uso continuado de combustibles fósiles genera altos niveles de dióxido de carbono y contaminación del aire. La contaminación del aire causa problemas de salud nocivos y las emisiones de CO2 contribuyen al cambio climático.







CO2 tiene un impacto nocivo en nuestro medio ambiente al alterar los patrones climáticos, el aumento del nivel del mar y el aumento del daño ecológico.

Tipos de paneles solares



Dado que cada instalación solar debe abordar numerosas limitaciones de espacio y sombra, no existe una solución solar única para todos. Sunrise ofrece una gama de diferentes paneles solares y soluciones para satisfacer las diversas necesidades de proyectos de servicios públicos residenciales, comerciales y a gran escala.

Hay dos tipos principales de paneles solares fotovoltaicos que se utilizan en los sistemas solares:



Módulo fotovoltaico solar de silicio monocristalino

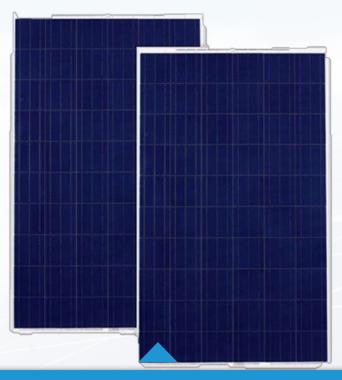
5 - 360w

Menor atenuación de funciones, costo del sistema Mayor confiabilidad y rendimiento de costos





Sunrise HK International Corp. Ltd.



Módulo fotovoltaico solar de polisilicio

5-335w

Rendimiento de alto costo y buena sensibilidad a radiación débil .Tablero blanco y negro, borde plateado y negro opcionales

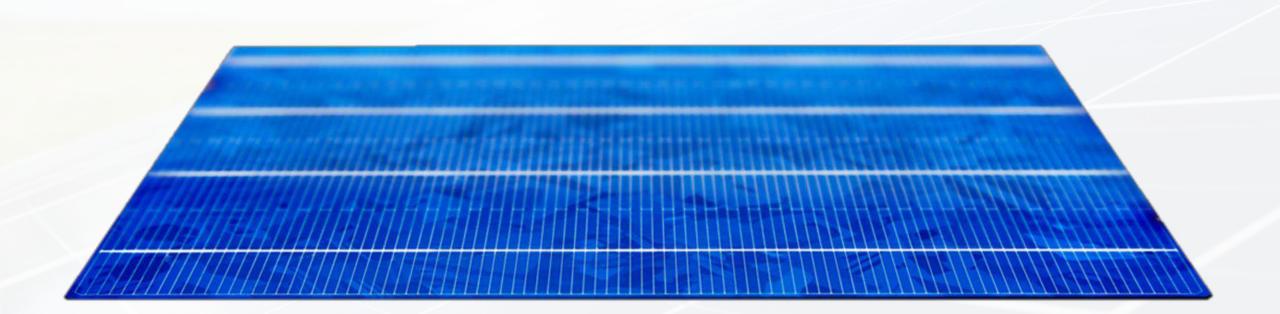


Hoja de batería

Exquisita artesanía de Shu Wang

Garantiza una capacidad de conversión

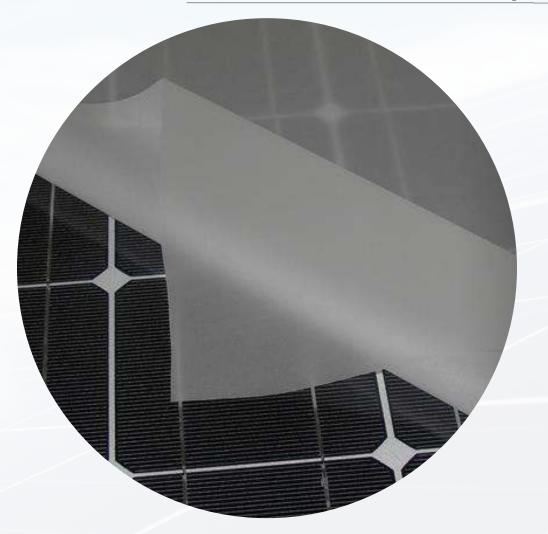
fotoeléctrica eficiente





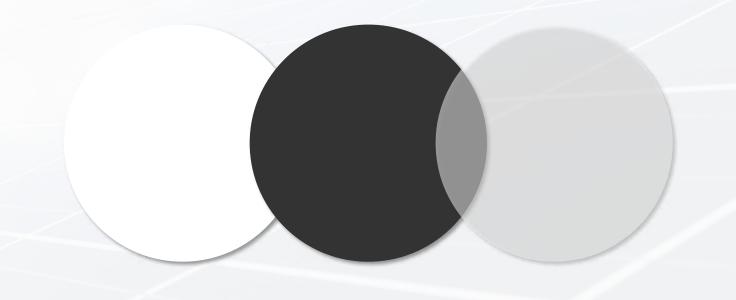
EVA

La combinación perfecta de película EVA altamente transparente y película EVA de corte UV, mejora en gran medida la potencia del componente. Buen rendimiento óptico, transmisión de luz (380-1100 mm)> 91% Excelente compatibilidad de materiales, buena adherencia a materiales como vidrio, metal, tablero y mantenimiento a largo plazo. La mejor operatividad, fácil apilado, corto tiempo laminación y alta eficiencia.



Toda la placa trasera revestida importada

La opción Blanco / Negro / transparente es que el PET se utiliza como material base intermedio, y la permeabilidad al vapor de agua del PET se mejora en más de 2 veces la del PET ordinario. Ambos lados son revestimiento EVA y revestimiento fluorado, respectivamente. Alta reflectividad y fuerte cohesión de las máscaras de EVA El revestimiento fluorado tiene un fuerte bloqueo de los rayos UV y tiene una excelente resistencia a la intemperie a largo plazo.











Caja de conexiones

Capacidad de alta corriente y alto voltaje Protección de menor resistencia de contacto a IP67 Excelente alta y baja temperatura, resistente al agua, anti ultravioleta y otras propiedades. Adecuado para uso prolongado en exteriores Vida útil prolongada





Solución para el sistema de seguimiento



El sistema de seguimiento Sunrise permite que el módulo fotovoltaico siga al sol con ángulos óptimos para recibir la máxima luz solar y obtener hasta un 25% adicional de generación de energía. Esta solución tiene un nivel de retorno financiero más alto y más rápido en comparación con las soluciones solares fotovoltaicas tradicionales.

Solución para sistema flotante



La solución flotante Sunrise utiliza la estación de energía fotovoltaica dentro de un recurso hídrico, lo que reduce el costo de desarrollo del proyecto. Dado que el agua tiene un efecto de enfriamiento en los módulos fotovoltaicos, la solución flotante reduce las temperaturas ambiente y de la superficie, lo que resulta en una mayor potencia de salida.











Central eléctrica de montaje en tierra

Esto permite que el tiempo total requerido para este tipo de proyectos de infrastuctura se reduzca significativamente.

Sistema fotovoltaico comercial e industrial en azoteas

Los propietarios de negocios pueden instalar los sistemas de generación de energía fotovoltaica de Sunrise en sus techos diseñados para su propia demanda, y el resto se alimenta a la red eléctrica. El precio de la electricidad industrial y comercial es alto, por lo que el rendimiento de la generación de electricidad es aún más atractivo.



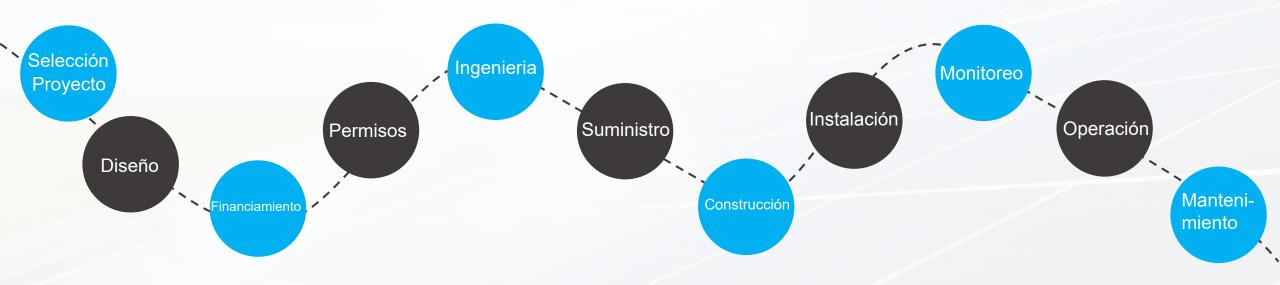


Sistema fotovoltaico de azotea residencial

Los sistemas de generación de energía fotovoltaica residencial de Sunrise proporcionan un canal importante para la inversión. Con un sistema fotovoltaico para el hogar, la azotea se convierte en un activo que paga intereses.



El segmento de negocios de proyectos de Sunrise y sus aliados diseña, construye, opera y vende proyectos de energía solar en China, el Reino Unido, los EE. UU. Y otros paises europeos y asiáticos. Participamos en el ciclo de vida completo del desarrollo de proyectos solares, que incluyen:



Vendemos proyectos solares terminados a compradores externos, los operamos bajo PPA o establecemos otros acuerdos contractuales con operadores de redes o servicios públicos.



Sunrise HK International Corp. Ltd.



Central eléctrica de distribución en la azotea de 3MW de Universidad de Yarmouk

Tipo de proyecto: Otro;

Capacidad total: 3MW



43MW Ground-Mount Power Station in Karnataka, India

Tipo de proyecto: Central elétrica de montaje en tierra a gran escala Capacidad total: 43MW

Central eléctrica de montaje en tierra de 60 MW en Bole Bortala, Mongolia

Tipo de proyecto: Central elétrica de montaje en tierra a gran escala ;

Capacidad total: 60MW atractivo.





Control de calidad en cada etapa de desarrollo



Los controles de calidad de Sunrise cubren todas las etapas del desarrollo del proyecto, desde la debida diligencia hasta la identificación de proyectos solares con tasas internas de retorno de grado de inversión.



Nos aseguramos de que todos los proyectos cumplan con las exigentes especificaciones técnicas y de calidad de Sunrise.



Equipo experimentado de ingeniería solar

El equipo de diseño de Sunrise se enorgullece de tener una rica historia de innovación y diseño. Nuestro equipo de diseño utiliza herramientas energéticas inteligentes para crear los proyectos más eficientes posibles.

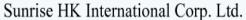




Cadena de suministro vertical integrada

Sunrise es una empresa totalmente integrada verticalmente. Esto reduce los costos de producción y mejora en gran medida la competitividad de un proyecto.







Modelo de negocio robusto

Sunrise tiene un modelo de negocio flexible y avanzado para el desarrollo de proyectos fotovoltaicos, que es administrado por un equipo de gestión de proyectos experimentado y reforzado por importantes procesos de control de calidad.

Capacidad para financiar proyectos

Sunrise tiene una amplia gama de sólidas relaciones de cooperación con muchos bancos globales y hemos recibido un fuerte apoyo financiero de los bancos estatales chinos.





SERVICIO AL CLIENTE

Sunrise se ha enfocado en brindar un servicio globalizado para nuestros clientes, para establecer un grupo de servicio rápido y eficiente con múltiples niveles y canales.



"Proyecto de energia limpia en Panama capcidad 64 Mega Watt".

Energia Magnetica

"ENERGIA VERDES - MAGNETICA".

- Tecnología (Energía Magnética 100 % limpia)
- Costo promedio por Mega Watt = USD \$ 1,500,000 dólares
- ·Espacio que ocupa un modulo de I Mega Watt = Un contendor de 40 pie.
- ·Costo estimado de 64 Mega Watt = USD \$ 96,000,000 de dólares. (Costo estimado).
- ·Costo fijo estimado de mantenimiento y Royalty USD \$ 0.02 centavos de dólar.

Opciones de negocio que podemos analizar con el cliente:

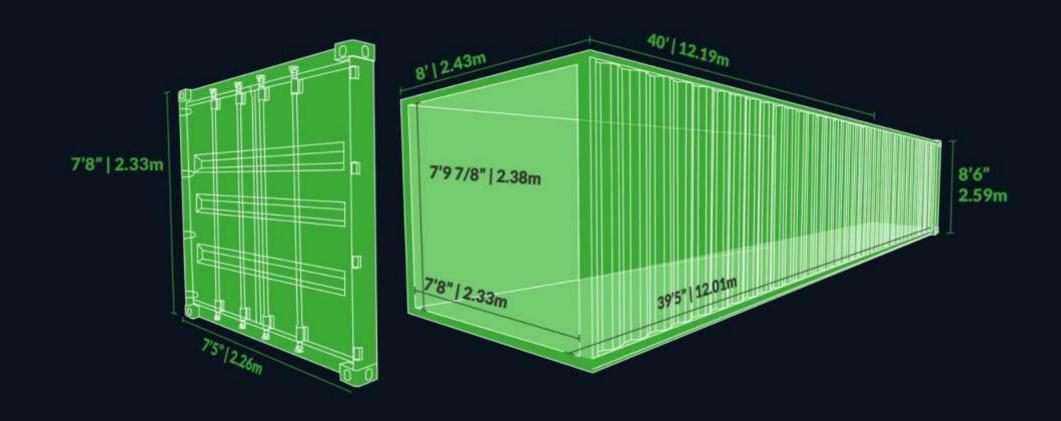
- I-El cliente pago el derecho de uso de la tecnología y pago un fee fijo de mantenimiento y Royalty.
- 2-El cliente obtiene un financiamiento a través de un Leasing. En esta opción el cliente pago una cuota fija por kilovatio horas consumido durante el tiempo del Leasing.
- 3-Si el cliente Ya tiene un PPA final emitido, donde se indique a como pagaran el kilovatio hora y el tiempo de vigencia. Se le puede presentar una opción de alianza tipo Revenue Sharing.

.

"ENERGIA VERDES - MAGNETICA".

Nota: Este es un precio estimado el cual está sujeto a discusión con el cliente para ser mejorado. También estamos trabajando para enviarle los detalles de la opción 2 del leasing. Para presentar una propuesta en base a la opción 3 cuando se tiene el PPA debemos tener una copia del PPA para poder ver los términos y condiciones del mismo, para responder con una oferta formal.

"Ejemplo de una imagen de un contenedor de 40 pie espacio promedio que ocupa l Mega Watt de energía magnética.







CAMBIANDO EL MUNDO

- No solo queremos crear soluciones ecológicas que sean más asequibles, queríamos convertirlas en la mejor opción medioambiental y económica.
- Nuestra misión es promover la tecnología que ayudará al mundo y a la humanidad.
- Nuestro plan es ayudar a llevar energía a los países en desarrollo y aldeas remotas y reducir las emisiones de carbono del mundo ayudando a las empresas más grandes a convertirse en carbono neutral.
- Estamos decididos a hacer de nuestra tecnología la mejor opción posible, financiera, ambiental y tecnológicamente.

10KW - 1MW

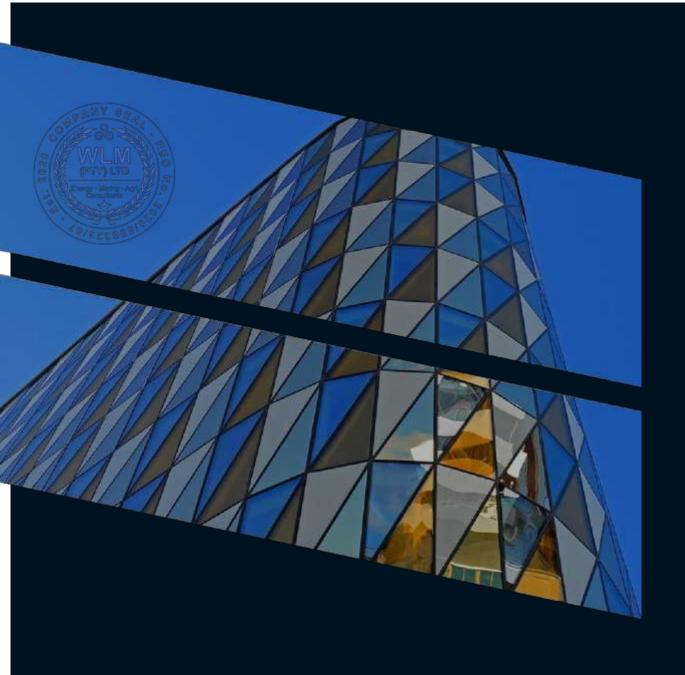
ENERGÍA PARA CUALQUIER NECESIDAD

PERSONALIZADA PARA USTED

El futuro del poder

El sistema MAGNATRON es completamente VERDE y NO libera emisiones de carbono, tiene una huella de carbono casi CERO y quema CERO combustibles fósiles, todo mientras proporciona energía 24 horas al día, 7 días a la semana con una eficiencia del 99%. de energía y hacer que su negocio, vecindario o ciudad sea neutral en carbono.





MAGNATRON

Es el primer generador que funciona con energía de circuito cerrado, 100% libre de combustibles fósiles.

- Lo que significa que puede funcionar 24 horas al día, 7 días a la semana sin necesidad de gas, combustibles fósiles o energía de nada. Constantemente sigue produciendo energía.
- MAGNATRON está "cautivando" al mercado y nos da la capacidad de finalmente irnos completamente libres de carbono y es la clave para el poder independiente.
- Con los precios del gas y los combustibles fósiles por las nubes y la red no puede proporcionarle la energía que necesita, esta es su solución.
- MAGNATRON se utilizará para impulsar ciudades, grandes bases militares, negocios, establecimientos de comida rápida, vecindarios y mucho más, incluso en los lugares más remotos.

ESPECIFICACIONES





	GNATRON	
) KW GENSET	
Motor	MNF. BALDOR	
HP.	60	
Duty	Continuous	
RPM	1780	
Phase	3	
Weight	92 lb	
FL Efficiency	96.5	
Explosion Proof		
Voltage	460/480	
Generator	MNF ROC	
KW	100	
Duty	Continuous	
Phase	3	
RPM	1800	
Efficiency	99	
Weight	175	
Control System	MNF ROC	
Built In	Scada	
	em Integration	
Phase	3	
	g & Data Collection (Remote)	
FL Efficiency	965	
Remote O	perating & Security	



ENTRADA DC	
Para permitir una potencia cuadrada máxima de v	vDC (kW) 300
Voltaje de entrada máximo (vDC)	180 - 300
Corriente de entrada máxima (A)	100
Rango de MSED (vDC)MSED Range (vDC)	180 - 300
Ondulación de voltaie DC	Vpp < 10%

EL AC	
Método de aislamiento	Sin aislamiento de transformador
Tasa de potencia de salida de CA (kW)	500
Clasificación de voltaje de la red eléctrica (vAc)	220/280/480/690
Rango de voltaje de la red (vAc)	220-690
Frecuencia de red (Hz)	50
Corriente armónica total	< 3%
Factor de potencia	Precisión 0,16 (potencia nominal)
Precisión MPPT	99%
Compatibilidad electromagnética	IEC61000-6-2/-4
Perturbación de la red	IEC61000-3-2/-3
Prueba de red de bajo voltaje	De acuerdo con VDE0126-1-1: 10
Operación de sobrecarga	Ajustar automáticamente el pico
Estándar europeo	98,60%
Eficiencia	99,20%
Función de protección	
Monitoreo remoto de fallas	Si
Monitoreo remoto de la red	Si
Contraataque lateral de entrada	Si
Tecnología de circuito abierto del lado de salida	Opcional
Protección contra sobretensión de CC	Si
Protección contra sobretensión de CA	Si
Monitoreo de aislamiento	Si
Protección en isla	Opción vAC / Fac

DATOS CONVENCIONALES Modo de visualización

Wodo de Visualización	LED
Interfaz de comunicación (remota)	RS232 / Ethernet / Fibra
Consumo de energía en modo nocturno/en espera	< 80 W
Grado de protección	IP20 (interior)
Sistema de refrigeración	Refrigeración por aire forzado
Temperatura de funcionamiento	-20 ° C to 55 ° C (>50 ° C)
Humedad ambiental	Sin condensación de 0 a 95%
Permitir la altitud (m)	6000m - 3000m > Comenzaron a fallar







ENTRADA DC	
Para permitir una potencia cuadrada máxima de vC	
Voltaje de entrada máximo (vDC)	550 - 3750
Corriente de entrada máxima (A)	200
Rango de MSED (vDC)	500 - 768
Ondulación de voltaje DC	Vpp < 10%
EL AC	
Método de aislamiento	Sin aislamiento de transformador
Tasa de potencia de salida de CA (kW)	1000
Clasificación de voltaje de la red eléctrica (vAc)	480/3690/411 kVa/633 kVa
Rango de voltaje de la red (vAc)	400-33kVa
Frecuencia de red (Hz)	50
Corriente armónica total	< 3%
Factor de potencia	Precisión 0,16 (potencia nominal)
Precisión MPPT	99%
Compatibilidad electromagnética	IEC61000-6-2/-4
Perturbación de la red	IEC61000-3-2/-3
Prueba de red de bajo voltaje	De acuerdo con VDE0126-1-1:10
Operación de sobrecarga	Ajustar automáticamente el pico
Estándar europeo	98,60%
Eficiencia	99,20%
Función de protección	
Monitoreo remoto de fallas	Si
Monitoreo remoto de la red	Si
Contraataque lateral de entrada	Si
Tecnología de circuito abierto del lado de salida	Opcional
Protección contra sobretensión de CC	Si
Protección contra sobretensión de CA	Si
Monitoreo de aislamiento	Si
Protección en isla	Opción vAC / Fac
DATOS CONVENCIONALES	
Modo de visualización	LED
Interfaz de comunicación (remota)	RS232 / Ethernet / Fibra
Consumo de energía en modo nocturno/en espera	
Grado de protección	IP20 (interior)
Sistema de refrigeración	Refrigeración por aire forzado
Temperatura de funcionamiento	-20 ° C to 55 ° C (>50 ° C)
Humedad ambiental	Sin condensación de 0 a 95%
Permitir la altitud (m)	6000m – 3000m > Comenzó a fallar



CONTROL FUERA DE SITIO Y GESTIÓN

PONIENDO EL PODER EN TUS MANOS





BEHIND THE SCENES



Technology

The technology behind our power sources is unlike anything you have experienced.



Offsite Trouble Shooting

Our systems are directly monitored, to ensure adequate power during peak times.



Secure

Our systems are secure and will provide a warning notice to your phone if any problems are detected.



Independent Power

Independent prime power prevents power loss associated with traditional grid energy.



Life Span

Our products are built to last and is set to last 40 years but if your generator stops working we will replace it



Sleek Design

All of our products are designed for eye appeal. We even provide for color options for you to select or they can just be turned off.

MERCADO

El siguiente es el mercado en el que estamos actualmente mantenimiento con la unidad de 100 KW.

Legislación vigente en materia de Producción,
Distribución, venta de energía es jurisdicción
Se anima al dependiente y al arrendatario a comprobar
dentro de sus propios países en cuanto a cuáles son los términos y
Las condiciones son las establecidas por su correspondiente Energía.
Cuerpos reguladores.

- o Tiendas de comida rápida
- o Pequeños centros comerciales
- Urbanizaciones, complejos de casas adosadas, bloques de apartamentos
- o Mini Fábricas y Almacenes
- o B & B's, Lodges, Moteles y Hoteles
- o Centros deportivos, gimnasios y clubes de salud
- o Bloques de oficinas y parques de oficinas
- o Restaurantes, bares y discotecas
- o Clínicas y Hospitales
- o Sitios remotos, torres de celdas, instalaciones, etc.

Despliegue

Como atualmente solo tenemos la unidad de 100 KW disponible para su implementación, estos se pueden implementar como una sola unidad que da servicio a 100 KW a la vez o se pueden implementar en bancos de múltiplos que aumentan en 100 KW a la vez.

Por ejemplo, un solo KFC, MacDonald's, Steers o similar, tiene una capacidad de carga máxima de cerca de 100 kWh, mientras que una estacióndecombustibletradicionalconunaexplanadapuedetenerun requerimientodeenergíade200kWh.Unpequeñocentrocomercial puedetenerunrequerimientode500kWhyunapequeñaurbanización de 1,000 kWh (1 MW).



Solar, requiere un mínimo de 2 Hapor 1 MW. El viento requiere 0,70 Ha porturbina de 1 MW. En el caso de l Magnatron, se requeriría espacio de en ergíaren o vable. Un despliegue de 100 MW, cabría 200 m2/MW. Esto no tiene precedentes en la comodidad de 3 campos de fútbol, incluidos BoP y BoS.

VENTAJAS

Las siguientes son las principales desventajas de otros formas de generación de energía, renovables y no renovable.

Solar

- o Utiliza una gran cantidad de tierras de primera calidad: 5,5 Ha por 1 MW.
- o Depende del clima, la ubicación, el tiempo y la temporada.
- o Requiere sistemas de almacenamiento masivos y costosos.
- o Alto costo de instalación y largo ROI.
- o Riesgo de daños por tormentas (granizo, viento fuerte, lluvia intensa, etc.)

Viento

- o Utiliza una gran cantidad de tierras de primera calidad: 0,8 Ha por 1 MW.
- o Depende del clima, la ubicación, el tiempo y la temporada.
- o Propenso a la salida de alto ruido.
- o Alto impacto visual y puede afectar a la población local de aves.
- o Alto costo de instalación y largo ROI.
- o Riesgo de daños por tormentas (granizo fuerte, viento huracanado, etc.)

Generadores de combustibles fósiles: descarga de carga

- o Alto costo de diesel / gasolina
- o Huella de Carbono Masiva por Emisiones.
- o Propenso a la salida de alto ruido.

EL MAGNETRON

➤ Tiene una huella muy pequeña. Cada magnatrón es del tamaño de un Contenedor de envío estándar de 20 "

- ▶ 1 MW occupies 0.140 Ha (140 m²). 100 MW will occupy less than 1.5 Ha. They can be racked and stacked up to 3 Containers high, meaning 100 MW can infact fit into 0.5 Ha.
- From completion of Civils, BoS (Balance of Site) to deployment of 100 MW = 6 months.
- Can be broken into various size energy parks. 100 MW can be split over 5 areas of an estate of 20 MW each.
- ► 100% scalable.
- Require **ZERO** battery Storage, but can be a bouquet alongwith our SuperGreen 1 MW Battery Generators and or TESS Thermal Generator Systems.
- Can be part of the Landscape. The units can be placed in underground bunkers, similar to parking areas.
- Easily interchangeable for scheduled maintenance or breakdowns.
- Has a 99% EFFICIENCY rating.
- NO annual CPI increase to lessee.
- Remote analytics and monitoring of each unit. Can be controlled "live" from a control room anywhere in the world.
- Has a **ZERO** Carbon footprint.
- Is 100% GREEN and 100% Fossil Fuel Free.





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Reynaldo A. Santana, Principal



Revnaldo Santana & Steve Wozniak, Co-Founder of Apple

Reynaldo is the Principal Managing Partner at Santana Capital Group, a smart real estate company primarily focused on deploying emerging technologies into the real estate sector such as 3D Printing, Virtual Reality and Augmented Reality. Reynaldo partners with investors and together works with the most vulnerable in our communities to solve the problems of Green Affordable Housing. Reynaldo Santana manages this venture to not only provide housing, but also invests in communities by providing them the tools and the resources needed to sustain and thrive in the communities in which they live. In addition, Reynaldo serves as President to a non-profit he founded named ESG Housing In, where his mission is to build world-wide affordable, sustainable, self-sufficient communities protected from future pandemics, including a tenant/landlord protection fund to protect them from financial risks. Reynaldo has earned a Commercial Real Estate Analysis and Investment certificate from Massachusetts Institute of Technology (MIT) and Alternative Investments certificate from Harvard Business School. He holds a FINRA Series 63 securities license and Massachusetts Real Estate License. Reynaldo has a proven track record of delivering projects on budget, on schedule and at the highest quality standards. He is a technology former executive whose 10-year career spanned several of the world's largest military/government agencies, leading award-winning projects for clients including Lockheed Martin, U.S Navy, U.S Air Force, Disney, NASA, and BMW.

His Core Philosophy: No challenge is too big to overcome if you build a great team, tackle the obstacles with enthusiasm, and persevere until you reach your goal.

In his free time, you can catch Reynaldo at Karaoke Bars singing Frank Sinatra songs or performing as a Trumpeter.

Victor De Las Casas, Principal



Mr. De Las Casas is a co-founder and Chief Growth Officer for Al Lean, a Boston based artificial intelligence driven company disrupting the self storage industry. Victor leverages his diverse entrepreneurial background in the private, corporate and non-profit sector to bring innovative cutting edge technology in the property technology space reducing cost, increasing operational efficiency and excellence and revenue optimization.

As a Google sponsored entrepreneur Victor seeks to solve the global housing shortage through 3D printed technology while pursuing to promote stat zero goals via patented renewable energy solutions. Victor's investment interests and entrepreneurial experience are in Al, blockchain, consumer, e-commerce, machine learning, and mobile start-ups. Prior to co-founding Al Lean, Victor co-founded and served as President, Chief Operating Officer, and of Golden Castle Real Estate, a high-end luxury development company in countries like Dominican Republic, Mexico and Costa Rica. He also served as co-founder to IndusPad, a 650,000 sq. ft. facility repurposed to nurture industrial startups. Additionally he has worked on real estate related projects with companies such as Amazon and Wayfair. Victor is also an active member at an educational non-profit, Andover Breadloaf, which uses a variety of art modalities and uses lessons of history to encourage urban teachers and students to leverage their collective voices to stand up for educational inequalities. Victor

Our Advisors

Deep Industry Expertise

Real Estate Advisors

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Commercial Real Estate Strategic Planning & Investments Consultant, Managing Director at TRC, former CBRE Senior Manager

Sydney Phillips

Real Estate Investor, Tech & Social Entrepreneur. Futurist. Inventor. Author. Public Speaker. The Pink Suit Podcast Host. Forbes Under 30 Nominee.

Ignacio Mariategui, M.B.A

Founder of FIBRA Prime, Established the first REIT in Lima Peru

Jean Yang, BSBS, MS

3D Printing Expert, Engineer & Computational AI Designer















Technology Advisors

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Jeremy Schreiber

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Harald Quintus-Bosz. MSC

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Business Advisors

Ricardo Godinez, Ph.D

CEO of Quattrocero, Founder of MIT Enterprise Forum Mexico

Clifton Dawson, M.B.A CEO, Greenlight Insights, Harvard Business School Graduate



Pliř



₩ HBS



Stanford Belwesity



HARVARD





COMBINED ACCOMPLISHMENTS

70 years of joint experience creating technology in both developed & developing countries

28 years developing advanced technologies for the developed world. 60+ patent and inventions

13 years of experience teaching how to design and scale up technology for the developing world at MIT

10 years building high performance teams for startups and organizations

30 years commercializing devices and developing business through recruiting distributors worldwide



















Various organizations





In essence, 3D construction printing will follow the evolution of housing using disruptive technologies

1900's Today



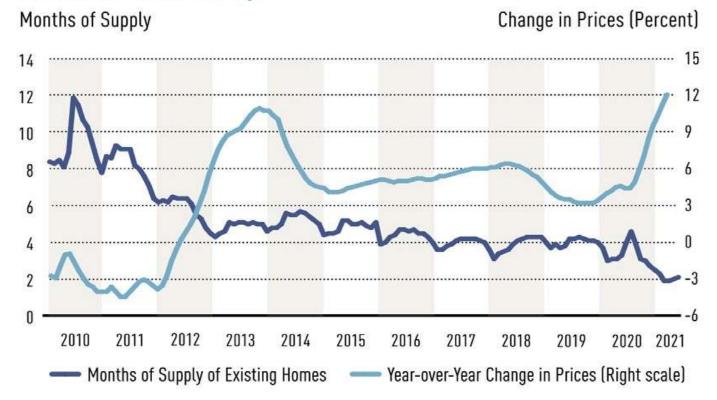






PROBLEMS with the US Housing Market

With Inventories at Record Lows, Existing Home Prices Continue to Head Up



Note: Months of supply measures how long it would take the number of homes on the market to sell at the current rate, where six months is typically considered a balanced market.

Source: JCHS tabulations of National Association of Realtors (NAR), Existing Home Sales; S&P CoreLogic Case-Shiller US National Home Price Index.

Affordable Housing Shortage Crisis



Cost-Burdened Households at Record Highs



Construction
Industry High Cost
& Labor Shortage







Residents return to collapsed coastal homes after Hurricane Irma passed the area in VilanoBeach,

WOOD FRAME HOUSE





HEAT LOSS

Poor building envelope system, Thermal Bridges, a thermal difference of 3 degrees will cause thermal discomfort



POOR VENTILATION

HVAC system in a house is usually not well designed, principals of natural ventilation design strategy is not considered. Poor ventilation is a common cause for mould



INCONSISTENT HUMIDITY

A relative healthy and comfort humidity is about 40-50%. And for winter RH should be controlled to avoid condensation.



POOR ACOUSTICS

Acoustic piracy is very poor with wood frame houses, a gypsum partition wall has a STC rating of only 30.

SANTANA

3D PRINTING IN CONSTRUCTION (Quote from Deloitte study):



80%

CHEAPER

50-80 percent lower labor cost. Less wastage of material as it is an additive process, and potentially lower financing cost due to shorter execution time.

70%

FASTER

50-70 percent reduction in construction time based on increased automation.

60%

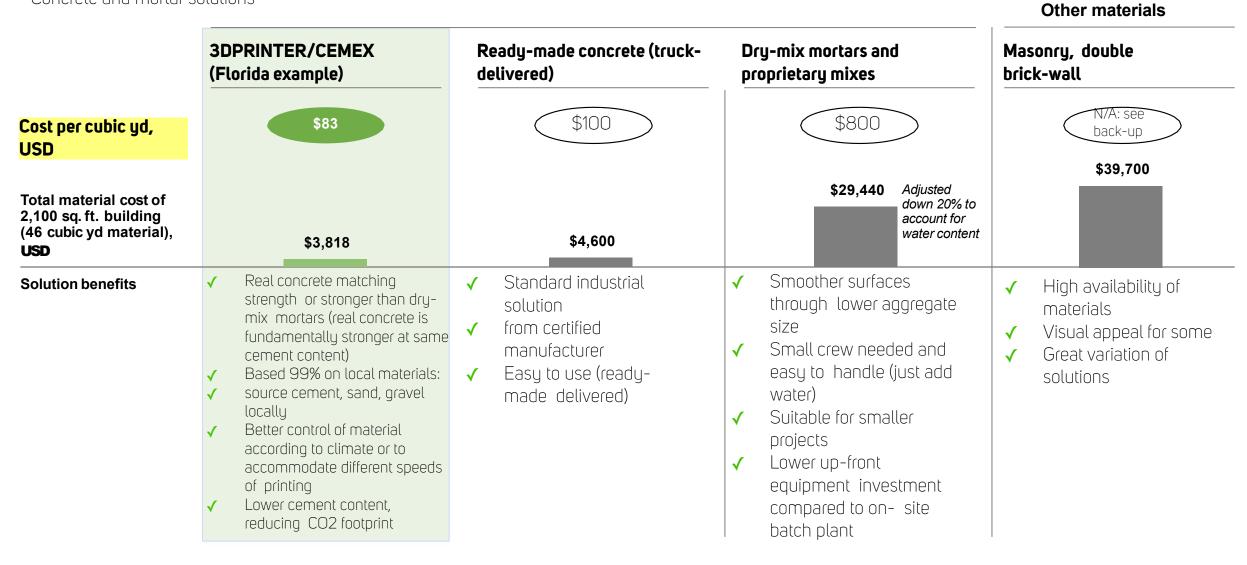
INNOVATIVE

Customized and intricate design, inbuilt insulation in 3D printed walls and a higher sustainability footprint due to the use of recycled waste as part of the raw material and concrete.

Mixing 3D-printable concrete at the same or lower cost as conventional concrete



Comparison of various construction materials Concrete and mortar solutions



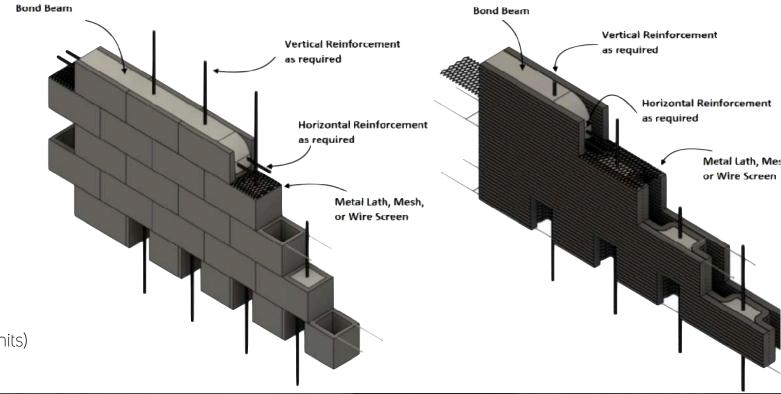
How it differs to traditional construction



	Light Frame Construction	3D Printed House
Energy Efficiency	National Standard	Up to 60% Energy Saving per year
Acoustic	Poor to Standard Exterior Wall: STC53 Interior Wall: STC 30	Superior (concrete + hollow structure) Exterior Wall: STC 70 Interior Wall: STC 45
Structural	Standard 400 (perpendicular) -5000 psi	Better 4000-7000 psi
Fire Safety	Combustible Fire resistance rely on drywall, wood framing has high fire spread rate	Concrete is Non-combustible
Tornado	Prone to tornado Resistup to F1 (Fujita Scale)	Much better Resist up to F4 (Fujita Scale)
Hurricane	Resist up to 100-120 mph Does not stand Hurricane	Resist up to 210 mph Withstand Hurricane
Earthquake	Resistup to M7 in general	Resist up to M8-9 with engineering

3D PRINTER WALLS INTEGRITY

To achieve structural integrity and seismic resilience, we introduce a special configuration of 3D printed structures, comparable to the well-documented and accepted method of reinforced concrete masonry unit (CMU) construction. By comparing 3D walls to masonry unit (CMU) wall we can ensure 3D printed walls meet existing building standards by mimicking the characteristics of the CMU wall.





3D Printed wall structure as comparable to CMU (masonry units)



HOW WE WILL DO THIS TWO MAJOR METHODS





PREFAB
Print in Factory, assemble on Site







PRINT ON SITE

Move printer to site & Print

Supports open-source materials via either a concrete batch plant or a dry-mix mortar silo system

Concrete: Mini-batch plant

Description /illustration

- To mix the concrete, two silos (one for sand/gravel and one for cement) feeds into a mixer chamber, where water is added along with and additive solution to make the concrete 3D-printable
- ✓ The piston pump feeds the real concrete into the machine's printhead via a hose



Dry-mix mortar: Silo and mixer-pump

- To mix the mortar, a dry-mix solution is fed from a silo into an
- ✓ M-tech mixer-pump, where water is added
- The M-tech feeds mortar the machine's printhead via a hose



Mortar silo not illustrated

Solution benefits

- ✓ Material 5-10x cheaper than mortar, making it the best option financially, when printing several structures
- Better material control in regions with "extreme" temperatures
- ✓ Ability to mix and test own concrete materials mix real concrete stronger than dry-mix mortars

- ✓ Lower upfront investment in equipment
- ✓ Smoother surfaces of prints
- Easier mixing process and for testing purposes in
- ✓ controlled environments

Dfab Magic Mix is an unmatched solution to make 3D- printable concrete globally at an unprecedented low cost



Dfab overview

✓ CEMEX (global top-5 cement/concrete producer) have developed a 3D printable concrete solution to reduce material costs and unlock widespread and large-scale application of multi-unit projects.

Dfab comes with multiple benefits:

- ✓ Real concrete matching strength or stronger than dry-mix mortars
- ✓ (real concrete is fundamentally stronger at same cement content)
- ✓ 5-10x lower cost vs dry-mix mortars (EUR 50-80 vs EUR 600-800 per metric ton), and comparable to ready-made concrete
- ✓ Based 99% on local materials source cement, sand, gravel locally
- ✓ Better control of material according to climate or to accommodate different speeds of printing
- ✓ Lower cement content, reducing CO2 footprint

In 2021, Dfab has already been successfully used on 3 continents and been mentioned by prominent media players:



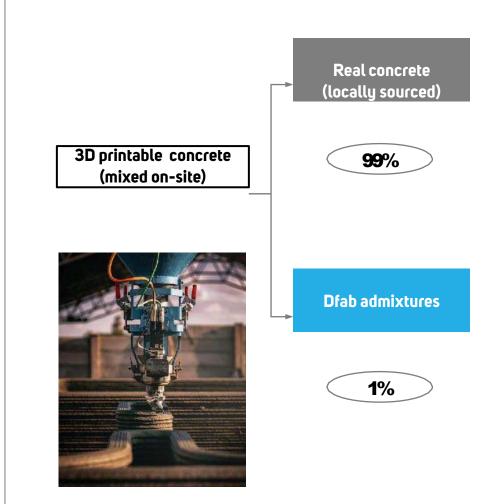






Components break-down







HOUSING DESIGNS







HOUSING DESIGNS







Project overview



 $\frac{160 \text{ m2 } (\sim 1,700 \text{ sq ft}) \text{ in}}{2 \text{ floors}}$



Print time: 36 days

- Ground floor: 28d
- Top floor: 8d
- Includes loadbearing and nonload-bearing walls



Fully permitted buyers moved in Q3
2021







Project overview



380 m2 (~4,100 sq ft) in 3 floors



Print time: 21 days

- 7 days per story
- Includes loadbearing and nonload-bearing walls



Fully permitted buyers moved in Q2 2021



3D PRINTER MACHINE (est. Costs)



Straight Purchase of 3D Printing

\$550-800k Free 5-day training at the facility 3-day training on your site

Short term rentals:

12 – 72 weeks \$30K per 4 weeks + material (based upon one NC1G base printer, mixer and pump only, this will be adjusted for additional items) Up to 50% Credit of the rental amount may be applied towards Rental Purchase Option (RPO) Startups and existing businesses. No underwriting if you pre-pay the rental amount in full upfront.

Financing (Lease/Loan):

24 – 84 Months
Fixed Monthly Payment
FMV, Dollar Buyout
Excellent rates for well qualified . SBA options available too.
Startups considered





MOST COMMON FAQ



What is the cost effectiveness using your printer?

The cost advantage mainly comes from the lower labor usage and the faster completion of the project.

Would we get a quote for the machines?

At this time, we aren't selling machines. We are fulfilling orders to help developers adopt this technology and learn from the experience for a later purchase of a 3D Printing machine.

What is the cost to print per square meter?

It is impossible for us to give a general amount as it depends on the design that you choose, location, local materials costs, cost of people who are overseeing the print, etc. Ranges from 60-150 sq ft. Depends on Location.

What other materials are used for the printer?

We usually print mortar or concrete, but there is no specific mix design/recipe which needs to be applied. We are open sourced. If materials are printable, they can be applied. Recipes will be made based on local available materials.

What is the cost of materials?

The cost of the materials depends on your local prices on concrete, aggregates, sand, and other chemicals like accelerators. This is depending on your concrete mix design that you want to apply for your projects.

What is the optimal printing environment?

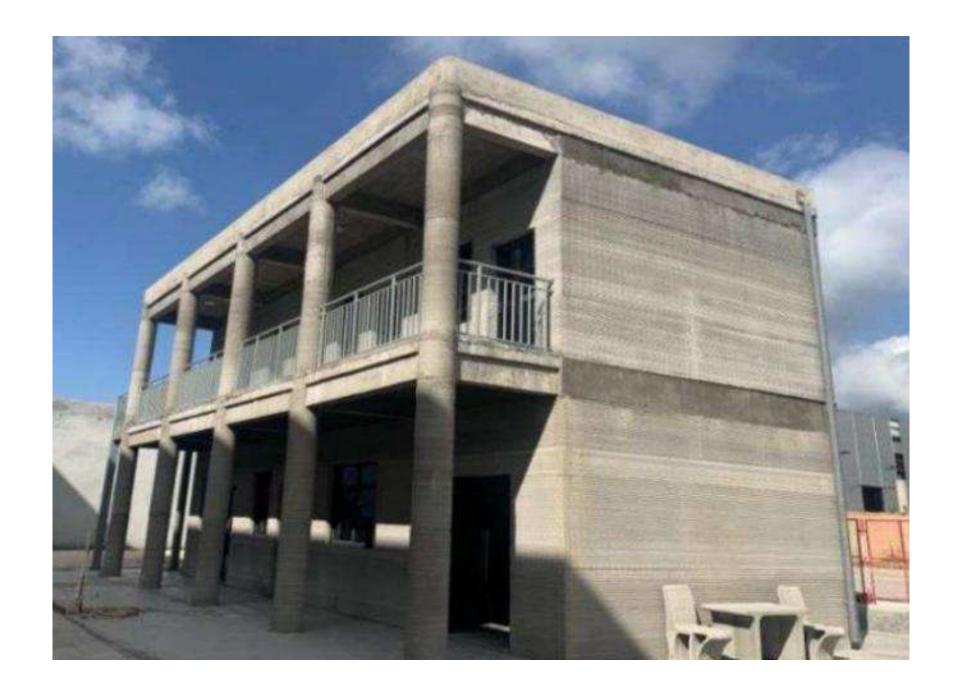
The printer can handle a lot of variance in the environment, and is safe to operate in rainy conditions, as all cables etc. are made according to the IP67 standards. However, printing in rain is generally not recommended, as the rain will ruin the concrete extruded. Rain and high wind speeds can also break down the fresh printed concrete, so in regions where this type of weather is normal, some type of climate protection is recommended. It could be in the form of a tent or some simple cover.

Can the foundation be printed?

Yes, in many cases it makes sense to print at least the outline of the foundation to ensure that it fits perfectly to the printed house. Afterwards it can be reinforced, filled and cast according to local code.



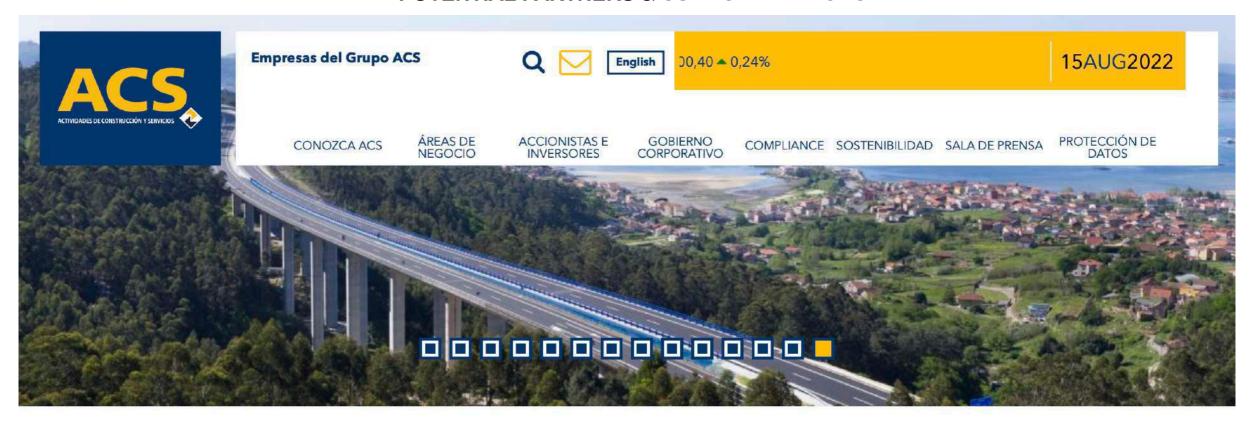
THANK YOU AND LET'S INNOVATE THE WAY WE
CONSTRUCT TOGETHER







POTENTIAL PARTNERS & SUBCONTRACTORS





UN LÍDER GLOBAL DE INFRAESTRUCTURAS Y SERVICIOS

El Grupo ACS es una referencia mundial en las actividades de construcción y servicios, formado por compañías líderes en su sector, cada vez más competitivo, exigente y global.