

ANNUAL
REPORT
2019



Growth through innovation



COVID-19

"Together we will defeat it"







***“Where people,
knowledge and experience
form a perfect
combination”***

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CORPORATE SOCIAL
RESPONSIBILITY

Sabino García Vallina

LETTER FROM THE CHAIRMAN

In my role as President of TSK, it is my pleasure to present the 2019 Annual Report, which includes a summary of our activities, business, strategies and corporate policies during the last fiscal year, giving thanks once again for the recognition and trust of our customers, partners, suppliers and collaborators.

Unfortunately I am writing these words in the midst of the pandemic caused by the coronavirus COVID 19, a global health crisis that is resulting in an unprecedented economic and social crisis, so I want to convey my deepest sympathy to all the families who have lost a loved one in this health tragedy and my support and that of the entire team of TSK to health professionals and all those who are watching over us in these difficult days.

Since the beginning of this unprecedented situation, we at TSK have taken the decision to implement a series of measures to stop the spread of the virus, including teleworking by our employees at our corporate centres both in Spain and abroad. We are proud of how in a very short time we have been able to react and anticipate events and thus be ready to follow the indications of the Government, deploying all the necessary infrastructure to be able to carry out the work from our homes and continue to perform our work in a rigorous and

professional manner, so that the progress of our projects is not affected and we can continue to meet our contractual obligations.

It is also very important to remember and recognize the effort of all our colleagues who have had to stay expatriated in the different countries where we are currently executing projects, ensuring that the different activities in the works are not affected.

At this time of both personal and professional reflection, we must also remember that our future is founded on our past, as we can see from our historical figures. If we consider our journey over the last ten years TSK's sales total 7,000 million euros, reaching today's equity of 322 million euros.

Figures achieved thanks to the trust of our clients and the more than one thousand projects executed in more than 50 countries since the very beginning.

With regard to the 2019 financial year, we closed with sales of 911 million euros, obtaining an adjusted net profit of 23 million euros. This result has been impacted by two extraordinary and non-recurring adjustments which are very significant for our company, such as the impairment caused by the entry

“At the end of 2019, we have equity of over 300 million euros and a robust, healthy and diversified backlog of work to be carried out”

into liquidation of the listed company SNIACE, where TSK was a shareholder with 30% of the capital, and the negative adjustment arising from the minutes in accordance with the tax inspection, in respect of the application of tax exemptions for international projects through joint ventures.

It is also important to note that at the end of 2019 we had a robust, healthy and diversified backlog of work pending execution that exceeds 2 billion euros, which allows us to have a visibility of more than two years of activity and to face this crisis with the necessary confidence and strength to continue being a reference in the industrial engineering and construction market.

I would like to end by reiterating that, in this unprecedented situation, we will continue to do everything we can to support our customers, suppliers, employees and the communities in which we are present, and I do so with a message of confidence, as I have no doubt that we will overcome this crisis as we have the best team to face this situation and continue to build our future.

Sabino García Vallina

CHAIRMAN



Joaquín García Rico

CORPORATE STRATEGY

“In renewables, TSK has become a major player in the implementation of complex projects”

The spread of the Coronavirus COVID-19, which has been classified as a pandemic by the World Health Organization since March 11, has forced us to revise our Strategic Plan 2019-2021, drawing up a new one for the period 2020-2022, in which we have had to adapt our objectives and policies to ensure the best future for the company and all its employees.

The record number of contracts awarded in 2019, which reached 1,161 million euros and the more than 250 million euros awarded in the first quarter of 2020, places us in a strong position as we have a heavy workload in the engineering and procurement management areas and a lighter workload in the construction and assembly areas.

However, at the same time we have also received the temporary suspension of several contracts, as well as the halting of the entry into force of the contract for the construction of a sugar plant in Tanzania, which will undoubtedly impact our activity in 2020 with a drop in sales.

Among the main projects awarded during 2019 we can mention:

- The bottoming cycle of the Las Flores Thermal Power Plant, located in the town of Chilca, 80 km south of Lima for SIEMENS. The plant, which currently operates in open cycle gen-

erating 197.5 MW, after the bottoming cycle it will generate a total of 296.25 MW.

The owner of the plant, KALLPA GENERACION, is one of the main generators in Peru, with whom TSK hopes to continue working on future projects. The project execution period is 30 months.

- Turnkey contract for the development of the material handling system in the new 1,000 MW thermal power plant, belonging to the ELEKTROWNIA OSTROLEKA SA group, and located in Ostroleka, Poland, for GENERAL ELECTRIC.

- 400 MW wind farm in Dumat Al Jandal in the Al Jouf region of northwest Saudi Arabia for EDF Renewables in a consortium with Masdar. This is the first wind project in the country and the largest of its kind in the Middle East.

- PV-CSP hybrid plant with 800 MW of power for the consortium made up by the French electricity company EDF, the Abu Dhabi company Masdar and the Moroccan company Green of Africa. This plant, designed entirely by TSK, will be the first in the world to integrate the two technologies in a single hybrid installation, taking advantage of the benefits that each one has. On the one hand, the main advantage of thermosolar technology that we can outline allows for the generation of electricity at any time of the day in a manageable way due to having the



Albireo I y II. 100 MW PV Plants. Usulután (El Salvador)

capacity to store energy on a large scale. On the other hand, the main advantage of photovoltaic technology is its competitiveness when referring to investment and maintenance cost. With this type of technology a plant can be designed that can generate electricity from the sun for 24 hours a day at a cost that allows to compete with conventional energies from fossil fuels. The execution period is 32 months.

The project will rely on the funding agencies like the German Development Bank KfW, the World Bank, the African Development Bank, the European Investment Bank (EIB), the French Development Agency, the European Commission and the Clean Technology Fund.

With regard to corporate operations, it should be noted that in 2019 TSK decided to incorporate to its subsidiary Estudios y Energías Renovables, S.A. (ESERSA) part of its renewable assets with the aim of a potential IPO or sale to third parties, an operation that continues to be evaluated and it estimates that it could be concluded during the second quarter of 2020. TSK has extensive experience in green technologies, as demonstrated by its participation in pioneering and emblematic projects at an international level.

In recent years, TSK has dedicated significant resources to diversifying its activity, investing in new renewable projects

and technological innovation, which has allowed it to continue to advance in a sustainable manner. In this way, we have invested more than 250 million euros of our own resources in the development of different renewable energy projects, the acquisition of 8 companies with different specialities, as well as the investment in innovation projects and the development of new technologies in different fields.

In conclusion, I would like to thank all the people that make up TSK for their efforts and know-how in response to the challenges that the Company has faced this year. Because of their dedication and professionalism TSK has become one of the most important engineering companies at an international level.

And of course I cannot end without also thanking the professional and extraordinary work the health professionals around the world are doing, especially doctors and nurses, as well as public employees, law enforcement and volunteers from civil society, in addition to all those who continue doing their jobs to make economic recovery faster.

To all of them, our acknowledgement and appreciation.

Joaquín García Rico

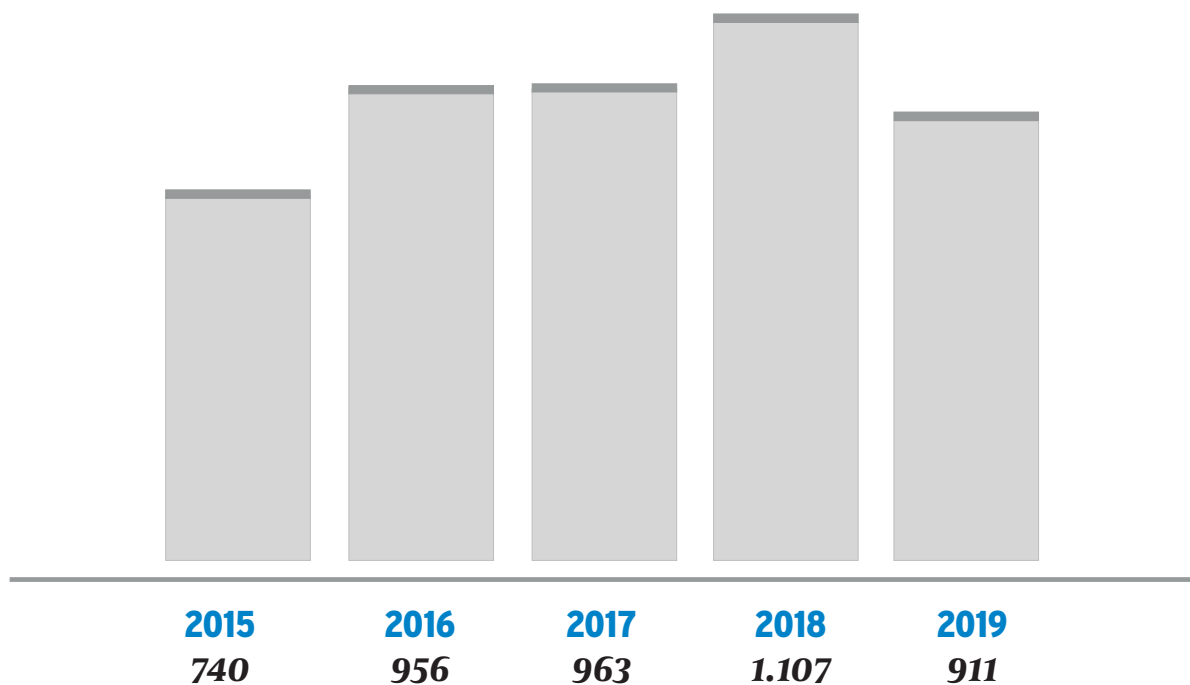
CEO



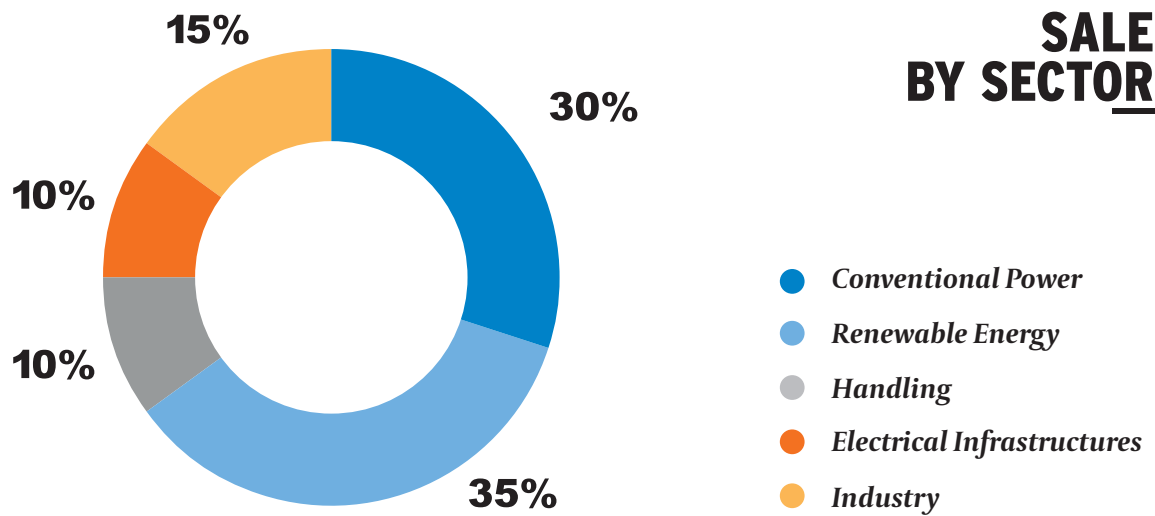
MAIN FIGURES

TURNOVER

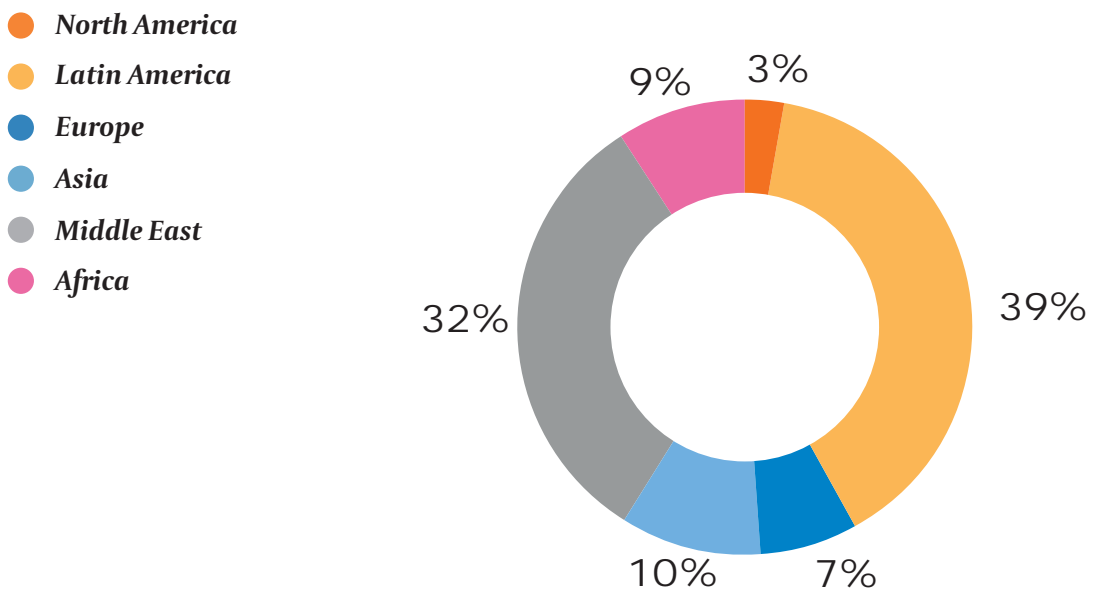
#MILLION EUROS



SALES BY SECTORS

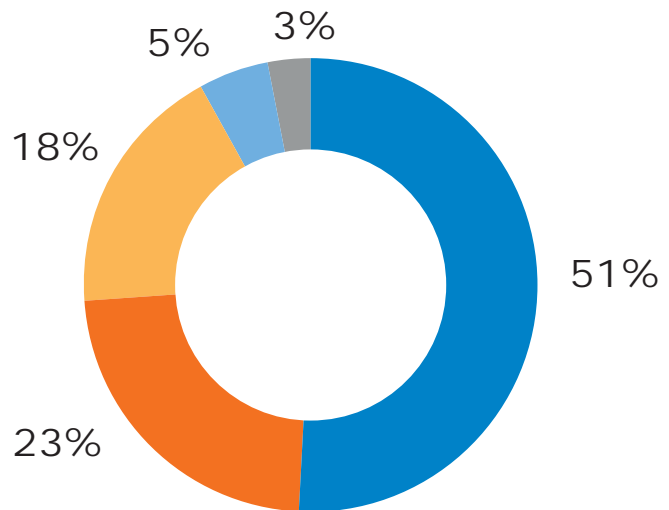


SALES BY MARKETS

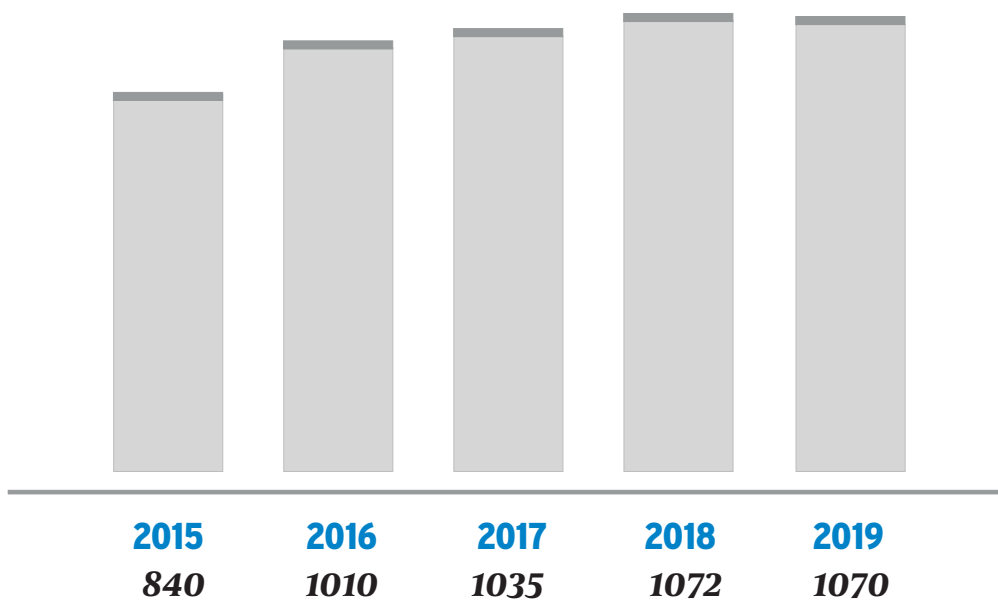


DISTRIBUTION OF PERSONNEL

- *Engineering*
- *Project Management*
- *Erection & Maintenance*
- *Corporate Services*
- *Electrical Workshop*



NUMBER OF EMPLOYEES



KEY FEATURES

OUR MANAGEMENT'S ESSENTIAL IDEAS



Customer oriented and focussed

Management Commitment and Leadership

Personal development of our employees

Strategic planning

Personnel involvement

Health and Safety at work

R&D+i

Knowledge management

Respect for the
environment

Commitment to quality



CONTINUOUS IMPROVEMENT

Over 35 years of experience in the industrial and energy sector.

One of the Spanish companies with more references in EPC projects in energy, industrial, handling and environment sectors.

One of the top 5 national companies in Engineering and Industrial Construction (EPC) in Spain.

Greater control and guarantee of deadlines by using own personnel to carry out engineering activities (civil, mechanical, processes, electrical, automation and control), manufacture of electrical switchboards, electrical assembly and commissioning of the installations.

Adequate financial capacity to handle large EPC projects.

Proven technical capacity and highly qualified personnel.

Proven experience in O & M. (Operations and Maintenance) of industrial and energy plants.

Balanced growth and compensation between business lines.

Agreements with the leading industrial technologists.

Own technology in various fields.

MOST SIGNIFICANT MILESTONES



1986

TSK starts as a Company when the electric departments of Erpo Holding merged.

1995

PHB Weserhütte, a Company specialised in Handling and Mining was acquired.

2003

The first international subsidiaries were established in Morocco and Venezuela, and the ones in Brazil, Chile and Nicaragua followed.



2006

The activity in the Solar Photovoltaic field begins.

2007

The engineering firms Ingemas and Irelsa were acquired.



2008

The activity in the Thermosolar sector begins

2010

Expansion to Middle East and Asia began.
Projects in Saudi Arabia, India and Bangladesh

2013

Flagsol is acquired, a German engineering company specialized in the solar thermal sector.



2015

Omega is acquired, an engineering company specialized in Sugar and Ethanol sector.

2016

Intecsa Oil&Gas is acquired, an engineering company specialized in the gas sector.



2017

Ingeteam's Group Power Engineering subsidiary, was acquired.

2019

Strategic alliance with Highview Power, a British company with own cryogenic energy storage technology.

CORPORATE STRUCTURE



CORPORATE SERVICES

Finance
Human Resources and Management Systems
Legal Services
Information Technology
Sales
R&D+i
Purchasing and Subcontracting
Corporate Development

ELECTRICAL INFRASTRUCTURES INDUSTRY 4.0 AND DIGITALIZATION

POWER
INDUSTRY
OIL&GAS
ENVIRONMENT



HANDLING



RENEWABLE ENERGY GENERATION



MANAGEMENT COMMITTEE

Sabino García Vallina

Chairman

Joaquín García Rico

TSK CEO

Francisco Martín Morales de Castilla

Managing Director - Power and Industrial Plants

Carlos Ruiz Manso

Managing Director - Electrical Infrastructures

Arturo Betegón Biempica

PHB Weserhütte CEO

Beatriz García Rico

Managing Director - Finance

Santiago del Valle

Managing Director - Corporate Business Development

Alfonso Targhetta Codes

Managing Director - Purchasing and Subcontracting

José María González Fernández

Managing Director - Chairman's Office

Sara Fernández - Ahuja

Managing Director-RRHH and Management Systems

Ana Isabel Bernardo Pérez

Audit and Project Control Director



Renaissance Project. 190 MW Combined Cycle Power Plant. Old Harbour Bay (Jamaica)

Substation 400 / 220 kV	Sonelgaz.....	Algeria
208 MW Altiplano PV Plant	Neoen.....	Argentina
300 MW La Puna Substation, 345/33 KV.....	Neoen	Argentina
Coke Handling System.....	Fluor	Belgium
292 MW Ivirizu Hydroelectric Power Plant	ENDE.....	Bolivia
100 MW Oruro PV Plant.....	ENDE.....	Bolivia
500 kV Carrasco Substation.....	ENDE.....	Bolivia
500 kV Santobañez Substation	ENDE.....	Bolivia
Agri-food Product Management System.....	FWS - P&H	Canada
475 MW Multisite Engine Power Plant	Prime Energía.....	Chile
60 MW PV Plant.....	AES.....	Dominican Republic
230 kV HV Transmission Line	CELEC	Ecuador
138 kV Substation.....	CELEC	Ecuador

MAIN PROJECTS IN PROGRESS

26 MW Kom Ombo PV Plant.....	NREA	Egypt
138 kV Substation.....	ENEE.....	Honduras
300 MW Combined Cycle Power Plant	ERANOVE	Ivory Coast
140 MW Versailles PV Plant.....	EOSOL	Mexico
Limestone Handling System	Cruz Azul	Mexico
Coke Handling System.....	Ica Fluor	Mexico
Sulfur Handling System	OCP.....	Morocco
Phosphates Handling System	OCP.....	Morocco
800 MW Hybrid Solar Thermal-Photovoltaic Plant.....	EDF-MASDAR.....	Morocco
Wastewater Treatment Plant	Enacal.....	Nicaragua
Coke and Sulphur Handling System	Petrofac - Quqm Refinery	Oman
Gabbro Handling system	Alsarh JV - QPMC.....	Oman
Copper Concentrate Handling System	First Quantum Minerals	Panama
200 MW Combined Cycle Power Plant	SIEMENS	Peru
Sugar Refinery	Durrah Advanced Development Company Co.	Saudi Arabia
Complete Green Coke Handling System.....	Khusheim - Aramco	Saudi Arabia
400 MW Wind Farm	EDF-MASDAR.....	Saudi Arabia
Boil-Off Gas Compressor	Enagás.....	Spain
Construction Materials Handling System.....	Eiffage	Spain
Sugar Plant	MG Sugar	Sri Lanka
65 MW Combined Cycle Power Plant	ERANOVE	Togo
Coke and Coal Handling System	Tata Steel	UK
Biomass Handling System	Técnicas Reunidas - Samsung C&T	UK



100 MW PV Plant. Oruro (Bolivia)

BUSINESS LINES

ELECTRICAL INFRASTRUCTURES

With a track record of over 35 years, TSK has become a leading company in the engineering and electrical equipment sector.

We develop power and control projects associated with new industrial installations, as well as innovations in existing installations.

Throughout all these years we have accumulated proven experience in the development of turnkey electrical projects in the sectors of power, telecommunications, iron and steel, metallurgy, food, paper, petrochemicals, cement, environment, fertilizers, ports and industrial plants in general.

The combination of quality, technical capacity and dedication to our customers has allowed us to achieve a leading position in all sectors in which we are present. We have a large number of highly qualified professionals and are equipped with the most advanced technical means for the design, calculation, assembly and commissioning of all types of electrical installations.

INTEGRATED MANAGEMENT OF ELECTRICAL PROJECTS

Design and engineering, planning, procurement management, manufacturing and supply of equipment, installation and assembly, quality control, training, commissioning and operation and maintenance

- Transformer substations up to 500 kV.
- Electrical installations for thermal power stations, solar plants, wind farms, cogeneration and industrial plants in general.
- Automation of industrial installations, control and regulation of processes.
- Environment and waste treatment facilities.
- Infrastructure and building.

ENGINEERING

- H.V., M.V. AND L.V. Electrical Engineering
- Automation, control and regulation of processes.

ASSEMBLY

- H.V., M.V. and L.V. Electrical assemblies.
- Instrumentation.
- Assembly supervision.
- Testing and commissioning.

MANUFACTURING

- M.V. Cells.
- L.V. distribution panels.
- Motor control centers.
- Automation and control panels.

OPERATIONS AND MAINTENANCE

- Corrective, preventive, predictive, condition-based and/or risk-based maintenance.
- Plant optimization.
- Personnel training.
- Technical assistance.
- Operation.

DIGITAL TRANSFORMATION AND INDUSTRY 4.0

We are increasingly aware of the need to digitally transform the industrial processes that our clients manage and, as TSK is well aware of the enabling technologies and solutions for this purpose, the undertaking has been clear and decisive. Thus, a new specialized department has been created, capable of designing, proposing and carrying out projects of this nature that allow our clients to reduce their operating costs and therefore improve their performance.

From TSK we take our experience to other industrial sectors to help our customers be more efficient in their production processes. This work ranges from the digitalization of the client's assets to the digital transformation of the productive processes that use those assets. Through new processes, we manage to reduce losses, production times, energy consumption, minimise stoppages, increase the life of the assets, as well as to ensure the traceability and quality flows of the manufactured products.

In order to do so, we rely on two lines of work:

- Service projects: where, as a result of industrial process consultancy, the best technological solutions are designed and proposed to enable the improvement of processes that directly affect our clients' profit and loss accounts. For this purpose, solutions of the MES (Manufacturing Executing Systems), MOM (Manufacturing Operations Management), Energy Efficiency, CMMS (Computerized Maintenance Man-

agement System), BPM (Business Process Management), BI (business intelligence) type are implemented, which allow and address the digital transformation of the entire Operation and Maintenance process of the plants.

- Solutions: where we make available to our customers the set of tools that our R+D+i teams have been developing and testing in our own plants and where we can find today packaged solutions such as:

SISREM: Remote monitoring system for industrial plants. Solution that allows optimizing the supervision of industrial plants through a unified technological architecture and a web platform for remote visualization.

SISDRON: Aerial system for the supervision of industrial plants. Through aerial missions carried out automatically by means of drones and intelligent algorithms for image and data analysis, specific inspection tasks can be carried out.

SISTER: Electrical substation busbar supervision system based on automatic thermography analysis. By means of real time thermographic analysis, the supervision and monitoring of the state of electrical substations is carried out.

SISMETER: Analogue sensor digitizing system based on automatic image analysis. This tool is specifically designed for the digitalization, supervision and monitoring of analogical sensors of diverse nature existing in any industrial installation.

SIXPERIENCE: Intelligent supervision and training system based on virtual and/or augmented reality. This new set of technologies is used to create immersive virtual and augmented reality experiences from which to carry out everything from training and coaching tasks to the operation of the plant itself.

IP INFRASTRUCTURES

From the Information Technology project team, we have specialized in the design and implementation of technological solutions that respond to the contractual technical requirements of our clients. Our experience backs us up as specialists in the execution of turnkey projects that range from the deployment of structured cabling networks and wireless networks to the integration of different technologies such as uni-



fied communications systems, public address and industrial intercom systems, VMS (Virtual Management System) solutions for the monitoring and control of production processes, access control systems for people or vehicles, and acoustic warning systems for the population for the sounding of areas affected by disasters.

At the same time, and pursuing a cycle of continuous improvement that responds to the current demand of the industrial technology market, we have specialized in the design, implementation and maintenance of perimeter security systems based on thermal vision technology and temperature control in critical equipment with thermographic vision technology.

It is also important to note that for this type of project, not only do we undertake the design, execution and start-up phases, but we also have a specific area to offer operation and maintenance services.

CYBER SECURITY

All these new challenges mentioned imply functional, technical, regulatory and even physical protection requirements, but it is worth highlighting a new challenge that concerns all of them in a transversal way and that is none other than the

safeguarding of the data in terms of its confidentiality, integrity and availability.

The current reality of the union of the worlds of Information Technology and Operation Technology implies new risks and given the context in which they occur, such as the industry, with a specific and different need and way of addressing them.

The Information Technology team of TSK has been actively participating for several years in pioneering work groups in industrial cyber security, carrying out cyber security assessments in industrial infrastructures and of course attending to our own needs. Cybersecurity has become part of the DNA of the business, both out of conviction and obligation, in order to be able to continue executing our projects with excellence as an objective.

We model cybersecurity from the gestation of the projects, including and / or responding to their requirements from the base design, detail, procurement process, engineering, testing, etc. Likewise, we are continuously improving the state of existing plants in terms of cyber security, auditing them and applying measures and procedures aligned with our continu-

ous improvement processes, which in no other technique are as important as in cyber security, where going one step behind can be an unbearable risk.

DATA ANALYTICS

As we face new technological challenges, we are also confronted with the constant, growing and inevitable need to work with heterogeneous data sources, as well as the integration of process and business information that, among other things, will make it possible to optimize costs, improve processes, extend the useful life of industrial plants, and even make them safer.

Using all the enabling technologies that we know for this purpose, we are able to execute data and image analysis projects by means of technologies or concepts, such as: big data, machine learning, deep learning, edge computing, virtual reality, augmented reality or digital twin, which together offer our customers dashboards and solutions that accompany them throughout the entire life cycle.

POWER AND INDUSTRIAL PLANTS

As an industrial engineering and construction company, TSK offers a comprehensive technical service that ranges from consulting and design activities to the construction and commissioning of turnkey installations for different sectors such as:

POWER

The experience acquired in the variety of projects in which TSK has participated, as main contractor or in consortium with the most prestigious technologists in the world, allows us to offer the most appropriate technical, economic and financial solution for each client.

- Coal-fired power plants.
- Gas-fired power plants (simple or combined cycle).
- Cogeneration plants
- Incineration plants
- Biomass
- Waste
- Wind energy



- Solar energy
- Biofuels
- Hydraulic energy

INDUSTRIAL PLANTS

The experience and knowledge accumulated during all these years in the most varied technical disciplines (civil works, structural, mechanical, electrical, instrumentation,...), together with the use of the most advanced computer support, allows TSK to tackle industrial projects from process engineering to the construction and commissioning of the different process plants in the Food, Paper, Mining, Steelworks and Cement sectors.

From storage and transport equipment and facilities to the turnkey execution of complete plants, in collaboration with the world's leading technologists, TSK has been offering innovative solutions for industry for over 30 years.

OIL&GAS

After the purchase of Intecsa Oil&Gas engineering, with more than 50 years of experience, TSK has acquired the necessary experience and references in the oil and gas sector to ex-



Termoelectrica del Sur, Warnes y Entre Ríos. 1,2 GW Combined Cycle Power Plants. (Bolivia)

ecute projects from conceptual engineering to construction and commissioning of complete plants.

- Oil pipelines and gas pipelines.
- Collectors and distribution networks for oil and gas.
- Oil pumping stations.
- Gas compression stations.
- Metering stations (oil and gas)

Of particular note are the references in compression stations where, in Spain, it has participated in more than 70% of the stations currently in operation and in more than 4,000 km of gas and oil pipelines.

TSK develops complete projects of hydrocarbon storage terminals, in addition to their corresponding oil tanker berthing terminals and the port-refinery interconnections. Likewise, it has the necessary knowledge and experience to design both LNG tanks and regasification terminals.

TSK's references include, for example, the port facilities for berthing methane carriers at the LNG plant in the port of Barcelona, the expansion of the LNG Quintero regasification

plant in Chile, the storage tank for Skangas in Finland or the Yela underground gas storage in Guadalajara.

- Oil and gas reception and loading terminals
- Underground gas storage.
- LNG tanks and regasification plants
- Hydrocarbon storage plants.

In order to unify our brands, from 2017 Intecsa Oil&Gas has been renamed TSK Oil&Gas Engineering.

ENVIRONMENT

TSK is aware that society demands, with increasing insistence, a better quality of life and, therefore, the conservation and preservation of the multiple and valuable natural resources of our planet.

We are convinced that the protection and investment in the environment, water, air and soil, is not a hinderance on development, but the best strategy to achieve economic and social growth in a sustainable way by ensuring the conservation of the most valuable heritage of humanity: Planet Earth.

For various reasons (scarcity of economic resources, water shortages, disasters, etc.), many populations lack clean water to cover their basic needs, which has a serious impact on the population's own health. Aware of this problem, TSK has a series of products of its own which, based on various treatment technologies, make it possible to cover the needs of drinking water supply to populations.

- **Containerized DWTPs (Drinking Water Treatment Plants)**
With a flow rate of up to 200 m³/h and a surface area of 200 m², they are capable of supplying towns of more than 25,000 inhabitants. Its design in containerized structures allows the installation of several DWTPs together. Easy to transport, install and operate, they are the ideal solution for the urgent supply or for the supply of drinking water to populations with various problems.

- **Modular DWTPs**
For flows of up to 10,000 m³/h, designed for minimum civil works requirements, they are suitable for the supply of drinking water to medium and large populations that, due to various circumstances, cannot carry out civil works.

- **Conventional DWTPs**
Designed in civil works, they are the most widely used water treatment plants to date, given the lack of other satisfactory technical alternatives.

- **Upgrade DWTPs**
These are redesigns of existing water treatment plants, in which, with minimal modifications, it is possible to extend the treatment flows or improve the quality of the treated water if it is insufficient.

- **TSK containerized WWTPs (Waste Water Treatment Plants)**
They are included in containment structures, aimed at the treatment of domestic or urban wastewater from population centres of up to approximately 5,000 inhabitants or equivalent wastewater flows.

- **Modular WWTPS**
They are designed with prefabricated tanks and minimum civil works requirements, aimed at population centres of

up to around 100,000 inhabitants or equivalent industrial wastewater flows.

- **Conventional WWTPs**
They are designed in civil works for the treatment of wastewater from large population centres.

- **Upgrade WWTPs**
This is an application of great interest for existing WWTPs which, for various reasons, function incorrectly, not achieving the results in terms of treated water quality for which they were designed (increase in flow, increase in polluting water, etc.). With the moving bed technology and with the introduction of small modifications it is possible to tune these WWTPs.

Water supply and purification facilities are common elements of any production process. Therefore, the sludge generated in these processes are only by-products of these production cycles. Sludge is not, however, a non-valuable by-product; on the contrary, properly treated and following the well-known and current policy of the 3Rs on waste (Reduction, Recycling and Reuse), sludge is a recoverable by-product in today's society.

HANDLING & MINING

In 1980 PHB, A.G. and Weserhütte A.G. reach a merger agreement in Germany forming the PHB Weserhütte A.G. Group or PWH. That same year PHB, S.A. and Weserhütte S.A. also merged in Spain, forming PHB Weserhütte S.A.

In 1988 the parent company is taken over by another German industrial group which modifies the structure of PHB Weserhütte A.G., leading to the independence of the Spanish subsidiary, which retains all the technology, references and brand of the German group, remaining a Spanish-German company with a majority of Spanish capital.

In 1995, TSK acquired all the shares of PHB Weserhütte S.A., leaving the latter integrated in this group.



High capacity ship loader with telescoping boom. FIRST QUANTUM MINERAL. Punta Rincón (Panama)

As port system specialists, our facilities operate with the highest degree of efficiency in many ports around the world, handling all types of solid bulks, such as coal, iron ore, bauxite, fertilizers, clinker, cement and cereals, offering different solutions for sea or river ports.

- Terminals for storage and handling of bulk solids.
- Unloaders.
- Loaders.
- Cranes.
- Ecological hoppers.

In PHB Weserhütte we also design circular or longitudinal storage yards with a wide range of collecting and combining machines that allow a high degree of homogenization in any type of solid bulk.

- Longitudinal and Circular Stockyards.
- Stackers.
- Scrapers.
- Blenders.
- Bucket Wheel Stacker-reclaimers.
- Conveyors.



Sugar Refinery. King Fahad Industrial Port, Yanbú. (Saudi Arabia)

ACTIVITY BY BUSINESS LINES

#INDUSTRY

In 2019, the important Yanbu project for the construction of a white sugar refinery with a production capacity of 750 t/h, in the industrial area within the industrial port of Yanbu (King Fahad) in Saudi Arabia, was completed. The main phases of the project correspond to the unloading of ships, packaging

and storage of final product were completed; and the steam turbine was put into operation.

The first of the areas consists of a ship unloading crane with a capacity of 1,250 t/h, a mobile hopper system and material



Sumbagut 2 Peaker. 250 MW Gas Engine Power Plant. Lhokseumawe, Aceh (Indonesia)

transfer belts; and, a linear storage park 225 meters long, 120 meters wide and 50 meters high, which is one of the largest in the world of its kind to date. It is expected to be commissioned and transferred during January 2020.

The second area consists of the transfer conveyor system, a 40,000 ton ageing dome for the final product, a multi-purpose packaging building (in bags from 1 to 1,250 kilograms), material dispatch by truck and storage with a capacity of 20,000 tons of refined sugar.

The 12 MW steam turbine ensures the facility's energy independence from the local power grid.

Finally, the refinery building is well advanced, with the pipeline pressure tests being carried out, as well as the latest electrical and instrumentation installations, with commissioning and sugar production planned for April/May 2020.

Also during the first quarter of 2019, work was carried out on the reformation project for the tinplate 3 line located at the ArcelorMittal plant in Aviles, with the aim of meeting the requirements demanded by the European Union regarding the prohibition of the use of chrome compounds in the food industry. Thus, it was necessary to modify the current line to adapt it to the new chemical treatment process, consisting of applying a finishing primer of Granodine® compound on the tinplate. The start-up of the new industrial solution took place during the first fortnight of March, meeting the assembly and start-up deadlines during the scheduled shutdown of the installation and obtaining results of higher than expected quality of the primer.

OIL&GAS

Within this sector, in 2019 TSK continued to develop the engineering and procurement management of the contract with Enagas for the renewal of the BOG (BOIL OFF GAS) treatment of Enagás' regasification plant in Barcelona. The project aims to replace a non-cryogenic compressor with a new cryogenic compressor from the supplier IHI together with all the equipment and auxiliary elements. With the modification to be car-

ried out, there will be an energy savings of 535,500 KWh/year and a reduction in natural gas consumption of 171,500 m³/year. The supply of the compressor is planned for May 2020, and the construction phase will be carried out over a period of 6 months.

POWER

During 2019, the QUICKSTART project in Chile continued in EPC mode for PRIME ENERGIA, forming a consortium with the Rolls Royce group's engine company MTU. It consists of five backup electricity generation plants with a total nominal power of 475 MW.

The facilities are spread out over five sites and cover a total of 265 MTU diesel engines, as well as the auxiliary facilities for fuel storage and distribution, engine cooling and electrical installation, including within the EPC one electrical substation per plant. The planned date for the projects to enter the network is 2020.

Throughout 2019, construction and start-up work was carried out on the 100 MW Jamalco CCHP project, located within the Jamalco alumina refinery facilities in Clarendon, Jamaica. The project, classified as being of national importance, comprises the construction and installation of two power trains with their respective recovery boilers in a 1x1 configuration. The turbines are manufactured by Siemens, model SGT-800 with a gross power of 50.5 MW each and the boilers are of the HRSG type and include a bypass chimney, manufactured by Vogt. The plant has dual capacity, being natural gas the main fuel having three diesel tanks as backup fuel in order to guarantee the production of the plant in case of emergencies and eventualities.

The scope of the project also included the construction of the substation for the plant and a 3 km transmission line, which integrates the plant into Jamaica's national electricity grid.

The plant produces 100 MW of net power (with natural gas) which is exported entirely to the network managed by the local JPS, while the steam, 140 tn/h, is delivered to the refinery



JAMALCO. Cogeneration Plant. Clarendon (Jamaica)

for its industrial process covering 40% of the refinery's steam demand.

The plant was delivered in December 2019, 4.5 months ahead of schedule. With its entry into operation, the costs of the national generation system have been reduced, improving the competitiveness of local industry.

Also during 2019, provisional acceptance was achieved for the Renaissance 195 MW project in Old Harbour Bay, Jamaica. The Combined Cycle built by TSK has been in commercial operation since December, greatly improving the stability of the national electricity grid and the total generation capacity of the island, of which it represents 20% of the total. The first dual Combined Cycle in operation in Jamaica has ended the usual blackouts and supply restrictions that Jamaica had been suffering in recent years.

During 2019, the construction work associated with the Sumbagut II power plant in northern Sumatra, Indonesia, was completed. The plant, with a generation capacity of 250 MW from the combustion of natural gas, will be in the full start-up phase of all systems by 2020, having already carried out performance and reliability tests on the first generation blocks. When the plant is completed, it will enable the increase of the generation capacity of the Aceh region, which is highly affected by really difficult geographical and social conditions. It is estimated that the delivery of the EPC project will take place during the first half of 2020, thus maintaining the commitments acquired with our customer, the national electricity company PLN Persero.

In the area of renewable energies, TSK has completed the project called 327 CG Los Azufres III phase II, with the aim of installing a geothermal power plant with a guaranteed net ca-



Los Azufres III. 25 MW Geothermal Power Plant (Mexico)

capacity of 25 MW for the Federal Electricity Commission (CFE) in the Mexican state of Michoacán de Ocampo. During this year, work was completed on the plant's different facilities: 25 MW turbogenerator (Unit 18), BOP and evacuation infrastructure (booster substation and associated 115 kV line). During the last months of 2019, the plant's commissioning stage began, and the booster substation was energized through the National Electric System (115 KV line) in June 2019. The first turbine wheeled, synchronization, operation and performance tests were carried out in order to deliver the unit to the client in October 2019. The performance tests were carried out in a very satisfactory manner, with a net power generated exceeding 25 MW guaranteed and an operation test of 15 consecutive days at full load. It is currently under a one-year guarantee period, with an availability factor of 99.9%, which demonstrates its great robustness.

Also in the past year 2019, the Basic Engineering was completed and the Detailed Engineering of the Project Group 3 Lot 1 of the Ivirizu Hydroelectric Project began to be developed. The contracts were closed and the follow-up of engineering

and manufacturing of the Main Equipment was done: Turbines and Generators. In addition, plans were prepared and implemented prior to commencement of work on the site: Hygiene, Safety, Occupational Health and Welfare, Environmental and Archaeological Diagnosis; as well as Rescue, Relocation and Flora and Fauna Monitoring tasks. Finally, once there was access to the Powerhouse sites, the Topographic and Geotechnical Studies were carried out.

In Ressano Garcia (Mozambique), the fourth year of operation and maintenance of the plant has been completed during 2019, with a contractual availability of 99.42%. The total energy produced during this year was 873,964 MW/h. From August onwards, maintenance over 30,000 hours has been carried out, which involves dismantling and reassembling the engines entirely with own resources. The progress of the maintenance has been good and is allowing us to improve the reliability of the engines. At the same time, the Mozambican personnel training plan is progressing well and is allowing us to increase the number of local personnel in the plant. As far as health and safety is concerned, once again this year, as has been the



26 MW PV Plant, Kom Ombo (Egypt)

case for the last four years, no accidents have been recorded, thus meeting our objectives.

In February 2019, the Shagaya Solar Thermal Power Plant in Kuwait began commercial operation. This 50 MW plant has a 206-loop solar field with parabolic trough collectors, a 9-hour thermal storage system and a maximum electricity production capacity of 180 GWh-year, and has been exclusively and entirely designed, built, commissioned and commercially operated by TSK.

In the photovoltaic sector, various plants have been built and commissioned, including energy evacuation and connection to the national grid. The following plants stand out due to their size:

- Versailles Las Cuatas and TAI V and VI Photovoltaic Plants, for Eosol, all located in Durango (Mexico), with a total installed capacity of 146.5 MWp, in fixed structure. The evacuation of the different plants has required intervention at up to 6 locations, carrying out extensions to existing 34.5 kV installations,

34.5/115 kV booster substations, the construction of a 115 kV transmission line, as well as the necessary extensions to CFE substations. The project was completed on schedule, with the first plants being connected by the end of 2019 and the last ones currently being tested with CFE.

- Capella Solar Photovoltaic Plant in El Salvador, for Neoen, with a peak power of 140.3 MWp installed, with single-axis solar trackers. The evacuation facilities included a 34.5/115 kV, 120 MVA booster station, a 34.5/46 kV, 25 MVA booster station, the construction of a 9.3 km transmission line with 115 kV and 46 kV circuits, as well as the extensions to the corresponding bays at the 115 kV and 46 kV Ozatlan substation owned by ETESAL. The project was completed on schedule, entering into commercial operation in January 2020.

- Oruro Photovoltaic Plant in Bolivia, for ENDE, with an installed peak power of 100 MWp, in fixed structure. This plant is located at an altitude of 3,742 m, which is an additional requirement in terms of equipment design and performance. The project is being carried out in two phases, the first of which,

with a power of 50 MWp and a 33/115 kV booster substation, has been completed and is now in commercial operation. The second phase, with 50 MWp and a similar configuration to the first, is underway and is expected to be completed in 2020.

- Kom Ombo Photovoltaic Plant in Egypt, for NREA, with an installed peak power of 26 MWp, in fixed structure. The project has been completed and, after satisfactory performance testing, is currently in commercial operation.

- Penonomé Photovoltaic Plant in Panama, for Avanzalia with an installed peak power of 160 MWp, in fixed structure. Both the photovoltaic plant and the 34.5/115 kV booster substation and the 115 kV transmission line have been completed, and the expansion of a bay at the El Coco substation is underway. Commissioning is scheduled for early 2020.

Among the photovoltaic projects currently underway, the following should be highlighted:

- La Puna and Altiplano Solar Photovoltaic Plant for Neoen, in Argentina, with a peak power of 208 MWp installed, with single-axis solar trackers. The project is located at an altitude of 4,200 m, in the Argentine Altiplano. It includes the necessary facilities for interconnection, such as the construction of a 345 kV GIS substation. The interconnection facilities are expected to be completed in the first half of 2020, at which time commissioning and performance tests will begin.

- Bayasol Photovoltaic Plant for AES, in the Dominican Republic, with a peak power of 60 MWp installed, with a fixed structure. The project is underway and is expected to be completed in the third quarter of 2020.

In terms of wind energy, our activity has been developed in Saudi Arabia, with the construction of the 400 MW Dumat El-Jandal Wind Farm, including the civil work and installations of medium voltage interconnection and 115 kV transmission line.

Also, within the photovoltaic generation plant activity, operation and maintenance work has been carried out in Spain, Italy, France, Puerto Rico, Jordan and Kuwait, with a total power of around 150 MW.



#ELECTRICAL INFRASTRUCTURES

From the area of High Voltage and Electrical Substations, projects have been developed from two perspectives: for external clients in the form of EPCs and for internal energy projects of the company as an integral part thereof in evacuation. The most significant external EPC projects are as follows:

- Carrasco Substation in Bolivia, for ENDE Transmision, which is the first 550 kV substation of the grid, one and a half breaker scheme for 550 kV and single busbar for 230 kV with two 150 MVA autotransformers.

- Santivañez Substation also in Bolivia, for ENDE Transmision, second 550 kV substation, one and a half breaker scheme for 550kV.

- The latest modifications to the 138 kV Cañaveral and Río Lindo (Honduras) Substations are being put into service, with the installation of two 20 MVA and two 30 MVA transformers, respectively. Client: ENEE.



Sumbagut II/ Arun II / 275 kV Substation. Lhokseumawe, Aceh (Indonesia)

We have also carried out the following digital transformation projects:

- Communications system of the Warnes, Sur and Entre Ríos C.C.s (Bolivia): Intercommunication of the multiservice networks of the three combined cycles. Client: Ende Andina
 - Perimeter Security System PV Oruro (Bolivia): Vision and people detection system through intelligent thermal image analysis. Client: Ende Andina
 - Los Azufres Thermal Power Plant Communications System: Unified communications system, intercom and voice industries and redundancy between plants. Client: CFE
 - Renaissance Combined Cycle Communications System (Jamaica): Communications, access control and perimeter security system. Client: SJPC
 - Cargo terminal security system in the port of Algeciras: Monitoring and management of the CCTV system and integration with the port's public address and access control system. Client: VOPAK.
 - Perimeter Security System PV Abeso / Aeso (Egypt): Vision and people detection system through intelligent thermal image analysis. Client: Access Power.
 - Perimeter Security System PV Potosi (Mexico): Vision and people detection system through intelligent thermal image analysis. Client: FRV.
 - Perimeter Security System PV Safawi (Jordan): Vision and people detection system through intelligent thermal image analysis. Client: FRV.
 - Maintenance and evolution of acoustic warning systems to population and video operation of hydraulic power plants (Spain): Client: Endesa.
- In the area of Digital and Industrial Transformation 4.0, we highlight the following projects:

- Installation of the AvantisPRO CMMS solution in the Sumbagut II Plant, to optimize corrective and preventive maintenance tasks of the plant, increasing the life of the assets, and helping to reduce downtime, as well as the management of spare parts for these assets. It is currently in the start-up phase. Client: Sewatama

- Installation of the AvantisPRO CMMS solution to manage and optimize corrective and preventive maintenance tasks at the Shagaya solar thermal plant.

- Design and implementation of the necessary network infrastructure for the control of the plant according to international and local cyber security standards, as well as the supervision and control systems (SCADA) in the 50MW photovoltaic plant located in Oruro (Bolivia). Client: ENDE Guaracachi

- Design and implementation of the necessary network infrastructure for the control of the plant according to international and local cyber security standards, as well as the supervision and control systems (SCADA) in the 150MW photovoltaic plant located in Penonomé (Panama). Pending commissioning: Client: Avanzalia

- Design and implementation of an analogical sensor digitalization system based on automatic image analysis for Mini Hydraulic Power Plants (Spain) Client: Endesa.

In the area of Cybersecurity, we have designed and implemented the necessary communication infrastructures for the control of the photovoltaic plants in accordance with the ISA62443 standard, the good practices defined in the NIST framework and the local cybersecurity regulations (diversity of countries and customers)

ENVIRONMENT

In San Andrés (Colombia), the project for the construction of the sewage network, wastewater pumping station and discharge drive was finally completed in its entirety, except for the connection of the system to the existing outfall, which was not initially planned and was awarded to TSK in March 2019. After the design and permit process, which was carried out

by the contractor, the task was authorized by the INVIAS entity (since a road under national jurisdiction is affected) for execution in early December 2019. During the work, a problem of compatibility with the existing pipeline was encountered, which made it necessary to manufacture and supply two special transition pieces on the island. The connection is scheduled to be completed and put into service in February 2020, with only minor finishing work remaining on painting and development details, and commissioning of the system.

In Nicaragua and in the city of Masaya a WWTP is being developed, for which, during the past year, the execution of the civil work was almost completed, beginning the manufacture of the most complex equipment, such as the gas extractor hoods, the main part of the UASB (Upflow Anaerobic Sludge Blanket). It is expected that by the year 2020, water without toxins will be discharged with a totally complete primary treatment.

HANDLING AND MINING

In fiscal year 2019, PHB Weserhütte reached a record number of contracts exceeding 100 million euros, which has allowed it to recover backlog figures that guarantee full activity for fiscal years 2020 and 2021.

The main projects contracted are as follows:

- Petrofac Samsung (Oman). Coke and sulphur management system, 12 million
- Project in Ostroleka (Poland). Thermal power station, 64 million
- Langosteira Terminal (Galicia). Cereal imports, 13 million

The turnkey contracting of the coal, gypsum and slag handling systems of the Ostroleka Coal Plant in Poland for General Electric was very important. During 2019, the basic and detailed engineering and the necessary documentation for the construction permits were developed.

It is also important to highlight the improvement of the market in Spain with the construction of port terminals for the import



Bucket wheel stacker-reclaimer. Port Talbot Steel Making Plant. Wales, (UK)

and export of various bulk materials, of which we were awarded one in Galicia and another in Almería.

Sales in 2019 exceeded 70 million euros and the company has returned to the path of profit, recovering from the problems of some works, mainly the project in Jordan, which weighed down the results of 2018.

The AQABA Port Terminal in Jordan, (a 50% joint venture with Técnicas Reunidas), is now fully operational on both import and export lines. The ship loader for 2000 t/h and the conveyor belts, supplied by PHB, are already operational.

The Teeside project, in the UK, for the biomass handling installation, has completed the mechanical assembly

phase, and the electrical and auxiliary installations have already begun. Commissioning will take place in 2020. The novelty and complexity of this facility, which is the largest biomass energy production plant in the world, is noteworthy.

In Morocco, for OCP, several previous works have been concluded and the Beni Amir connection belt project was completed, and progress continues on the sulphur management project in the port of Jorf Lasfar.

The project of the coal park for the ONEE, also in Jorf Lasfar, has resumed the activity when the problems of expropriation faced by the Client were solved. The civil works have advanced considerably, the engineering was completed and manufacturing has begun.



Sulfur, Potash and Fertilizer Handling System. Aqaba Port (Jordan)

The supply and assembly of the coke handling and grinding plant for NIS in Serbia has also been completed. In the same situation is the 2000 t/h mobile loader for Saudi Aramco for sulphur pellets. Both installations are to be commissioned in 2020.

Two projects have been completed for Arcelor Mittal: The second drum reclaimer for the Aboño coal yard in Gijón and the front reclaimer for the Bremen plant. Both machines are already in full production.

The two Bucket Wheel stacker-reclaimers for Tata Steel, at its plant in Port Talbot in Wales - UK, are in the process of being assembled. Their capacity will be 3200 t/h for coal and coke, and will be fully automated so that they can work without operators. This has been one of the key projects of the year, together with the three-arm ship loader for different types of

grain, with a capacity of 2000 t/h, which will be transported, already assembled and tested, for installation in the Port of Vancouver - Canada. During this exercise, the design and advanced manufacturing was completed.

For Cementos Cruz Azul in Mexico, the equipment for the circular limestone park has been designed, manufactured and shipped.

In Saudi Arabia, the transporters corresponding to the import of material from the Yanbú sugar plant have been started up, and the commissioning of the 1000 t/h sulphur handling system at the Jazan refinery for Aramco has begun.

For Petrofac at DQUM's refinery in Oman, the engineering and procurement of a sulphur and coke handling system has been developed and will be commissioned during 2020.



Benban Solar Park 1,8 GW . ATEN, HORUS, DELTA, AESSI, ABESO and AESO PV Plants. Asuan (Egypt)

Mision, Vision and Values

TSK'S COMMITMENT



TSK'S MISSION

To be a competitive organization carrying out engineering and equipment projects in the industrial, energy, environmental and infrastructures sectors, achieving at all times the satisfaction of customers and of the people who form TSK, in a commitment to their personal and professional development.

TSK'S VISION

To be a cutting edge company and leader in terms of human and technological resources and profitability, to offer efficient solutions in the field of engineering and equipment which contribute to sustainable development, both nationally

and internationally, ensuring the satisfaction and trust of our customers.

TSK'S VALUES

COMPETITIVENESS:

A value inherent in the company for the successful achievement of our vision.

INNOVATION:

TSK places a stake on innovation in its processes and the way it works, offering the customer the most innovative services on the market. We remain alert and proactive to any opportunity, in a process of ongoing development.



TSK Campus, Gijón (Spain)

EXCELLENCE:

Quality is a value inherent to the company and our aim is always to offer products and services which aspire to excellence. Our companies must be considered by the customer as companies offering solutions and installations of the highest quality.

COOPERATION:

This is a value which is very present in the organization and the culture of TSK, as can be seen in our daily relations with customers, suppliers, employees and society in general. Our spirit of cooperation must be reflected in our daily actions.

COMMITMENT AND RESPECT:

These are deeply held in our organization. Commitment

must be a trademark of all our actions, as well as respect towards all the groups we relate with.

FLEXIBILITY:

Our companies' activity forms part of services to industry, which means that flexibility is essential if we are to compete with larger companies with more resources.

We must transmit this flexibility in all our companies, and be ready to adapt to any changes which might arise.

EXCITEMENT AND PASSION:

We must transmit excitement and passion in our projects, attitude and actions; only by doing this will we achieve the common goal of making TSK a benchmark company that leads the way in the market.



Barrel Reclaimers adaptation. Aboño Steel Making Plant. Asturias (Spain)

HUMAN RESOURCES AND MANAGEMENT SYSTEMS

HUMAN RESOURCES, KEY TO OUR GROWTH

The most important aspect about a company with our history is the people who make it up. For this reason, people management has been, and always will be, a key aspect of our business strategy.

TSK considers people as the fundamental pillar of its development and therefore implements policies to promote employment stability and equality policies, career plans and social benefits.

TSK has the best professionals in the sector, with levels of qualification and specialization of recognized prestige. At the end of 2019, TSK had more than 1000 employees. An important group within this staff is the expatriate professionals in the projects; ensuring their commitment and maintaining the sense of belonging is a key aspect for TSK. The company extends to these professionals all the measures it implements in terms of human resources.

The average age of the staff is 43.43 years, with an average seniority in the company of around 7.98 years. 73% of employees have a permanent contract, 81% are men and 19% are women.

DIVERSITY AND EQUAL OPPORTUNITIES

At TSK we promote a working environment that allows equal opportunities and the possibility of making the professional and personal lives of our staff compatible. TSK has established an Equality Committee in order to ensure respect for diversity and equality.

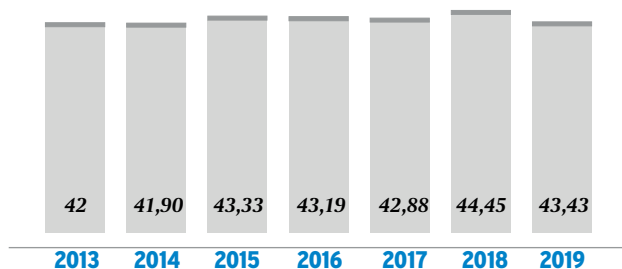
TSK has an Equality policy which reflects the clear commitment of the organisation to the people who work for TSK and with society.

In its efforts to promote and implement equality policies in the organization, the management of TSK signed a commitment that establishes:

- Equal opportunities between men and women as a strategic principle
- The promotion and encouragement of measures to achieve effective equality.
- Pay special attention to situations of indirect discrimination that may occur through the management of human resources policies.
- The projection of a company image in line with this commitment.

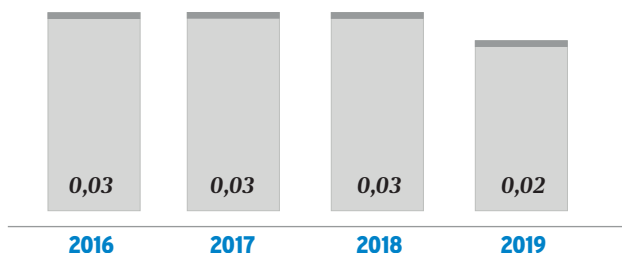
AVERAGE AGE

Years



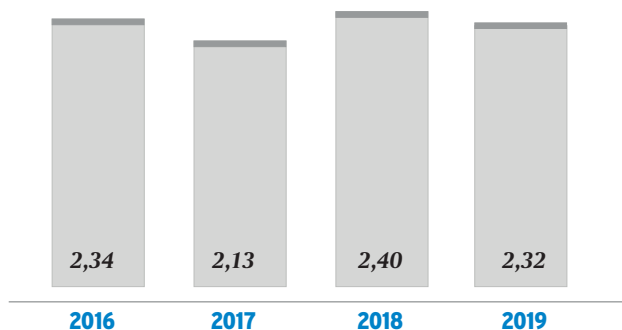
SEVERITY RATE

(Lost Days/Worked Hours) x 1.000



FREQUENCY RATE

#(LTI/ Worked Hours) x 1.000.000



To do this, TSK has drawn up its Equality Plan which is intended to be the framework for establishing the strategy and lines of work of the organisation where positive actions aimed at ensuring effective equality between men and women are included.

TALENT MANAGEMENT AND CONSERVATION

In the current context, the human resources function needs to be flexible, adaptable and capable of driving change, and it must provide a rapid and efficient response to business needs and priorities.

TSK promotes the professional and human development of its staff and encourages the exchange of ideas at a global level, with the conviction that this way new concepts are created, especially when professionals from different disciplines and with different backgrounds meet. This unity, guarantees the long term success as the best team, counting on the potentials of each one of the different members of the team.

Another key aspect of preserving and improving the company's human capital is to provide professionals with the necessary training resources and knowledge.

KNOWLEDGE MANAGEMENT AND DISSEMINATION

TSK has different tools for information management that facilitate internal communication and the exchange of knowledge and experiences:

- Project database, which makes information and documents on TSK projects available to employees
- Document management tools that allow the coordination of independent working groups for projects. Thanks to these tools it is possible to store and manage documentation, establish permissions, control the versions of documents and allow the immediate use or consultation of them, in the appropriate safety conditions.
- Requesting services through the intranet. This tool allows requests to be made regardless of where people are physically located, such as requests for holidays, permits, advances, computer equipment, incidents or other general services.

Regarding training, at TSK we have training programs to cover the needs of employees:

- Technical training, provided by external suppliers or by

company specialists, who transmit knowledge and experience to the team.

- Language training -English, French, German and Italian- through free programs
- Training in management skills.
- Training in information technology with the aim of improving knowledge of computer tools, both generic and specific to the company.

ATTRACTING AND SELECTING TALENT

The objective in terms of attracting talent and selecting personnel is to identify and incorporate the best talent available, both great professionals committed to the TSK project who have the necessary skills, and young talent with development potential.

We want to be an attractive company for our employees and we compete for the most qualified, offering a wide range of incentives. The key to success is attractive benefits, performance-related pay and opportunities for international development. We give particular importance to a company culture that is oriented towards dialogue and teamwork.

Our selection processes are carried out according to the following criteria: equal opportunities and non-discrimination, respect for the person, honesty, professional ethics and confidentiality.

The TSK wage system includes fixed and variable components. On the other hand, we encourage mobility and promote the filling of vacancies through internal promotion, facilitating the voluntary movement of staff to enhance the development of their professional careers, talent management and the better matching of people to positions. This process allows employees to apply for those positions they find attractive, advising and supporting candidates who show interest in a particular position.

In relation to social benefits, TSK is committed to the continuous improvement of the quality of life of its employees. It makes a special effort to ensure and guarantee their lives, support the integration of the disabled and implement best practices to facilitate the combination of professional and personal life, such as flexible working hours, splitting of holiday periods and reduction of working hours, amongst others.

MANAGEMENT SYSTEMS

At TSK we define ourselves as a company committed to Occupational Health and Safety, Quality and the Environment. In accordance with our strategic framework, we have evolved based on a process of continuous improvement in all areas of our activity, paying special attention to people's safety, the quality of projects and the protection and conservation of the environment.

This commitment has materialized in our Integrated Management System, which is externally certified under the ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO/IEC 27001:2013 and UNE 166002:2014 standards and which covers all phases of the project life cycle, extending to our suppliers and subcontractors.

Regarding the current management structure and organization, TSK has a management systems department that designs, measures and evaluates the different process indicators; manages an integrated quality, environmental, occupational health and safety, information security and R&D&I system; and maintains and complies with the legal and regulatory requirements of each project.

In TSK we ensure Quality in the execution of our own projects as well as those of suppliers and subcontractors, which allows customers to have full guarantee of the proper functioning of their plants in accordance with regulatory and contractual requirements.

TSK has an excellent team that allows the Company to overcome the challenges it faces and achieve its objectives in a sustainable, responsible manner and with the quality standards required by the market.

OUR PRIORITY: HEALTH AND SAFETY MANAGEMENT

At TSK we understand that health and safety is a fundamental and priority issue due to the nature of the activity we develop and therefore we work to maximize health and safety throughout the life cycle of our projects.

Our goal is always "zero accidents" and the guidelines for action are transmitted from the highest levels of the organiza-



tion. This objective is applicable to all the people involved in our projects (employees and subcontractors), collaborators, suppliers and visitors to our facilities and projects.

TSK has a preventive organisation based on a joint prevention service - made up of professionals covering the preventive specialities of safety in the workplace, industrial hygiene and ergonomics and applied psychosociology - complemented by an external prevention service covering health surveillance. Workers who travel from Spain to international projects are given the necessary medical examinations, explorations and actions.

Within the preventive organisation of TSK, the prevention delegates of the different companies of the group are effectively integrated in representation of the workers, and a health and safety committee has been set up to provide information, participation and consultation on all matters relating to health and safety.

As part of our management system, TSK prepares specific health and safety plans in which the scope of work and the necessary preventive measures in the projects are defined.

So that safety is fully implemented in all our projects, from TSK we work for the standardization of health and safety procedures with the aim of increasing efficiency in the dissemination and assimilation of corporate policies.

Our commitment to health and well-being is a priority and one of the basic pillars of our employee value proposition. We establish programs that are aimed at three areas of action: physical activity, emotional well-being and healthy habits and diet.

ENVIRONMENT

TSK, aware of the responsibility we have with the environment, contributes to sustainable development and to the prevention and protection of the environment. This is a priority integrated in the strategy marked by the Management.

In TSK we offer our clients our technical capacity and know-how to include sustainability criteria in the design, construction and operation of projects.

TSK's environmental strategy is structured around a commitment to combating climate change, the responsible use of resources, effective waste management, pollution prevention and the protection of the natural environment and biodiversity.

All TSK projects comply with applicable environmental legislation, both of the country where the project is located, as well as the contractual requirements with our clients. TSK prepares for each project an environmental management plan that provides answers and allows the monitoring of the compliance with the environmental requirements.



R&D+i

It is beyond a doubt the necessity for TSK to innovate its projects, processes and services, and that is why we are constantly challenged to improve through innovation and applied research as one of our development opportunities, in the search for greater competitiveness both at national level and in the global market, where innovation is the differentiating factor that allows us to provide greater added value to everything we do.

This is reflected by the main figures of investment in R+D+i projects during the last 4 years, which represents a total of 24,409,902 euros:

2016: 3,925,757.00 €

2017: 5,838,201.00 €

2018: 5,428,800.00 €

2019: 6,637,541.00 €

In addition to the above figures, we must also take into account the investment in innovation made directly in the works developed by TSK, which amounts to a total of almost 31,000,000 euros in the last 4 years if we take a conservative figure for 2019, which is in the process of calculation at the time of writing this report:

2016: 6,132,789.00 €

2017: 8,304,997.05 €

2018: 8,361,489.86 €

2019: 8,000,000.00 €

Our deep identity with innovation is part of our long-term strategy which is materialized in strong investments in R&D&I, collaborating with technology centers, universities and companies in the framework of local, national and European programs. The great diversity of projects and technological areas in which TSK participates, forces us to be continuously innovating and developing in the daily work of all our activities, since a very significant part of the innovations are produced as a result of the multidisciplinary nature of its projects.

Likewise, the great diversity of projects and technological areas in which TSK participates forces the company to be continuously innovating. That is why TSK INNOVATION was created with the aim of bringing together all these initiatives, as well as differentiating itself in the market and adding value to innovation as a strategic line of action. This concept encompasses all the initiatives and R+D+i projects developed by the company, and incorporates actions aimed at involving all the market agents in its internal innovation process, promoting knowledge management and technology transfer and establishing synergies for the identification and development of R+D+i actions.

The TSK INNOVATION ecosystem brings together all the innovative activity of the group, made up of 4 major initiatives: Industry 4.0, Open Innovation Programme, R+D+i projects and innovation applied to projects under development.

OPEN INNOVATION PROGRAM

With this initiative, TSK aims to promote and support projects proposed by SMEs, Startups and Technology Centres with work centres in Asturias, as well as research groups from the University of Oviedo. This action shows TSK's strong commitment to defend and retain the region's talent by serving as a driving force for other companies that are committed to innovation as a strategy for growth and consolidation. In its first call, a total of 32 applications were received for the technological challenges posed in the different lines of business, of which 11 were selected for the presentation phase before the committee of evaluators.

Having selected 5 proposals as winners, and made an investment of 271,875.00 euros, these are the projects that are in the development phase:

SIMUMECAMAT: Mechanical engineering and materials. "Use of new high-strength steels in TSK plant construction"

TSC UNIOVI: Areas of Signal Theory and Communications "High precision multisensorial positioning and anti-collision system for hostile industrial environments"

LEMUR: Management, Monitoring, Analysis and Simulation of Electrical Networks. "Real time data control and monitoring centre for electrical networks based on web in a virtual reality environment"

LEMUR: Management, Monitoring, Analysis and Simulation of Electrical Networks. "Use of hybrid storage systems based on batteries and supercapacitors to support photovoltaic installations by means of weather forecasting algorithms"

GEA: Asesoría Geológica S. Coop. "Expert system for the management of the geological-geotechnical risk along the life cycle of EPC projects"

INDUSTRY 4.0

In TSK we are aware that we have to anticipate and actively participate in the digital transformation that we are currently experiencing, and therefore we have a strategic objective to position ourselves as a reference within our sector in this fourth industrial revolution (Industry 4.0).

We have started to offer our customers the integration of enabling technologies such as the Internet of things, big data, cyber security, artificial intelligence or simulation, in order to achieve more intelligent, cyber secure and flexible installations, which will allow our customers to optimize their processes, reduce costs and make decisions more quickly and with maximum efficiency. Thanks to our knowledge and experience in all these technologies, we can offer plants that integrate 4.0 solutions, which provides our customers with great differential value, both in the critical infrastructure sector and in the industrial plant sector.

R+D+I PROJECTS

As a result of this intense R&D&I activity, the following projects have been implemented during 2019:

PROJECTS CO-FINANCED BY THE MINISTRY OF SCIENCE, INNOVATION AND UNIVERSITIES, AND THE EUROPEAN UNION THROUGH THE ERDF



ENERGY EFFICIENCY THROUGH REHABILITATION, SUN AND GEOTHERMAL (REHABILITAGEOSOL) _ RTC-2016-5004-3

Started in 2016, this project arises from the need to have effective design tools that are easy to access and use, which make it possible to implement energy saving measures, use of renewable energies and clean, safe and efficient heating and cooling sources in the different Autonomous Communities of Spain and of the companies that make up this "Reha-

bilitaGeoSol", and to obtain a "marketable end product" that can be exported to other Autonomous Communities, as well as to different countries, making the internationalization of the companies and organizations involved viable, allowing a great technological and business development for this Consortium, and consequently for the economy of the regions and the country. The Project "REHABILITAGEOSOL. Energy efficiency through rehabilitation, sun and geothermal energy" (RTC-2016-5004-3) is a project financed by the State Programme for Research, Development and Innovation geared to the Challenges of Society, within the framework of the State Plan for Scientific and Technical Research and Innovation 2013-2016 of the State Research Agency (Ministry of Economy, Industry and Competitiveness), co-financed with ERDF funds.

PROJECTS CO-FINANCED BY THE CDTI AND THE EUROPEAN UNION THROUGH THE ERDF



OPERATIONAL MONITORING AND FORECASTING SYSTEM FOR RESILIENCE OF AGRICULTURE AND FORESTRY UNDER INTENSIFICATION OF THE WATER CYCLE: A BIG DATA APPROACH (FORWARD)_SERA-20171010

The purpose of this project is to develop and implement an innovative technological tool and a framework that allows to know the real-time status and predictions related to water resources. This tool will be used for the support and promotion of actions related to effective decision-making leading to sustainable water resources management in the agricultural and forestry sectors.

SUPERVISION OF INDUSTRIAL AND ENERGY SYSTEMS BASED ON CLOUD COMPUTING (SISCLOUD) _IDI-20160691

SISCLOUD is a project whose objective is the development of a unified monitoring and analysis tool that allows the remote supervision of renewable energy sources. This tool will be designed and developed based on independent modular components built on "on cloud" technologies, facilitating integration with third parties and ensuring its flexibility

and adaptability. The solution will incorporate real-time data processing (CEP system) combined with advanced machine-learning and historical data processing techniques. It will also have interactive visualization and analysis utilities such as real-time dashboards.

Last but not least, all solution services (ingest, storage, processing, visualization, etc.) are individually secured and monitored ensuring data traceability and service agreement levels (SLA). The inclusion of information technologies within the industrial world implies the development and application of new functionalities at various levels.

AUTOMATION PLATFORM FOR SOLAR COLLECTOR ASSEMBLY LINES IN REAL TIME AND ESTIMATION OF REJECTS (SIGMA) _ IDI-20170751

The SIGMA project aims to develop a computer platform that will allow automation of the processing and interpretation of large volumes of information during the assembly process of the collectors (SCE) of parabolic trough solar thermal plants, so as to allow both correct prior estimation of rejects on the assembly lines and facilitate efficient decision-making during the assembly phase itself of the SCE that make up the solar field based on monitoring of the information, as well as the subsequent obtaining of conclusions on the level of efficiency achieved and deviations from the initial planning.

NEW DESIGN OF THE HCE SUPPORTS IN PARABOLIC TROUGH SOLAR THERMAL PLANTS (DAHCE) _ IDI-20171059

In the DAHCE project, a new model of HCEs (Heat Collector Element) support is being developed for the parabolic trough collectors of solar thermal plants, which will include a new concept of the pipe support clamp that prevents the metal pipe from breaking both during installation and throughout its useful life. This new support will allow the use of thinner HCEs tubes with the consequent increase in heat transmission.

INDUSTRIAL INSPECTION AND MAINTENANCE OF COMPLEX OR UNATTENDED FACILITIES (INSPECTOR) _ IDI-20170947

The purpose of this project, approved by the CDTI within the CIEN Strategic Programme call, is research into technologies for carrying out inspection and maintenance in extreme environments in an unassisted manner. This project aims to boost the competitiveness of companies through the promotion of

business innovation in the field of industrial engineering of extreme, complex and offshore installations, both in their design, manufacture and implementation, as well as in their operation and maintenance. In addition, the costs associated with extreme operating interventions will be reduced and a contribution will be made to strengthening the capacities of the business community that supports the industrial sector.

RESEARCH IN IOT AND BIG DATA TECHNOLOGIES FOR TRACKING AND MONITORING VEHICLES THROUGH LPR (SMARTTRACKER)_IDI-20181257

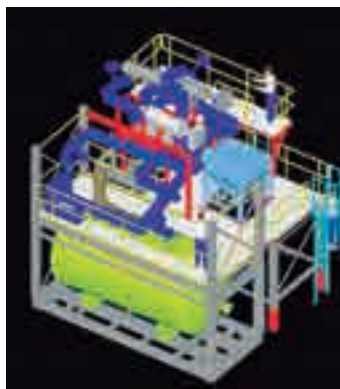
The general purpose of this project is research into a technological solution that will enable the analysis and monitoring of vehicles using distributed LPR systems based on heterogeneous and manufacturer-independent technologies. To do so, work will be done on IoT and Big Data technologies with four specific objectives: to integrate heterogeneous LPR systems, to monitor vehicles, to track vehicles and to generate metrics.

DEVELOPMENT OF LARGE METAL SILOS IN RESPONSE TO THE EXPLOSIVE CONDITIONS OF BIOMASS (EX-SILOS) _ IDI-20191151

The general purpose of the project is the development of an in-house model of a large (>10,000 m³) tubular flow (core flow) metal silo for the storage of biomass in which its safety against the risk of dust explosion can be guaranteed, in the absence of regulations governing dust protection and which is efficient from the economic point of view; in other words, it uses the minimum amount of steel or metal necessary and reduces the need for venting to a minimum.

DEVELOPMENT OF EFFICIENT SALT HEATER IN SOLAR HYBRID TECHNOLOGY (BELENOS) _IDI-20190681

The general purpose of the project is to design and model a new salt electric heater system for hybrid solar technology power plants, as well as to propose an efficient layout of the heaters in the configuration of these plants, depending on their size. The main technological challenge of the BELENOS project will be to model the new heater to ensure that it is efficient. To do this, the iterative development of the pilot plant tests with CFD modelling will be considered, so as to obtain an adjusted model that allows subsequent extrapolation to a real-size plant. The technological leap of the project with respect to existing technology is given by



the fact that the final design of the heater will guarantee homogeneous heating of the salts, and that the maximum temperature from which the salts are degraded is not exceeded in any operating scenario.

NEW PHOTOVOLTAIC-THERMOSOLAR HYBRID SYSTEM WITH ENERGY STORAGE IN MOLTEN SALT (SHALTER) _IDI-20190430

The purpose of the project is to develop a new hybrid photovoltaic-thermal technology in large power plants, which will make it possible to generate electricity using both technologies and implement the joint potential of both to store thermal energy through the heating of molten salts, thus ensuring the continuous and efficient production of electricity. The main challenge of the project is to make the proposed hybrid system viable, as there are still many uncertainties regarding the components to be investigated. It is necessary to solve the problem of corrosion of the materials in these conditions, the integrity of the molten salts, or the resistance of the welds of the equipment to be installed. The qualitative technological leap of the project with respect to existing technology is due to the fact that it involves the joint use of the two technologies, photovoltaic, at a very low cost, and solar thermal, with its thermal storage capacity, to generate electricity.

RESEARCH AND DEVELOPMENT OF OPERATION AND MAINTENANCE TECHNOLOGIES FOR THE MANAGEMENT OF PHOTOVOLTAIC PLANTS (PVOLTAI 4.0) _IDI-20190759

The general purpose of the PVoltai4.0 project is to design and develop an advanced system to assist the operation and maintenance tasks of a photovoltaic plant with the ultimate goal of improving its performance and optimizing its operation, which will ultimately translate into an increase in

the reliability and useful life of the plant. This system will be developed according to the principles of the Industry 4.0 paradigm, especially with regard to the integration of Industrial Internet of Things (IIoT), Big Data analysis and advanced visualization.

RESEARCH IN EMERGING TECHNOLOGIES TO ACHIEVE INNOVATIVE SOLUTIONS FOR DIGITAL TWINS (READY TWIN) _IDI-20190974

The READY TWIN project will facilitate the adoption of technological solutions capable of generating accurate Digital Twins in an automated manner through the use of 3D and IoT modelling technologies; as well as improving Digital Twin Asset Management through the use of Artificial Intelligence, Visualisation Technologies, Virtual Reality and Augmented Reality Simulation Technologies and Blockchain. All of them are disruptive technologies in the international and national technological panorama.

PROJECTS FINANCED BY MINETUR AND THE EU



RESEARCH AND DEVELOPMENT OF ADVANCED INFORMATION TECHNOLOGIES FOR CYBER-SECURITY IN INDUSTRY 4.0 (CS4) _TSI-100200-2017-9

CS4 has the ambitious objective of developing a tool that will allow the centralization and improvement of cyber security in Industry 4.0, allowing the incorporation and access in real time and in an agile way. To this end, a cybersecurity ecosystem/architecture will be created to cover all sources of possible vulnerability to which the digital developments of Industry 4.0 are exposed and which are currently being neglected. The new cybersecurity model to be developed during the execution of this project will be based on technologies for the security of big data and IoT enabling technologies, as well as DevOps microservices and infrastructure structures, based on the design and construction of a flexible, modular and extensible hardware and software that allows its adaptation to possible technological changes and that substantially increases the levels of effectiveness and efficiency of the security of Industry 4.0. This project

is financed by the European Regional Development Fund (ERDF) through the "Multi-regional Operational Programme for Intelligent Growth 2014-2020" and the Ministry of Energy, Tourism and the Digital Agenda, within the 2013-2016 Scientific and Technical Research and Innovation Plan within the framework of the Strategic Action for the Digital Economy and Society (SAESD).

PROJECTS CO-FINANCED BY THE GOVERNMENT OF THE PRINCIPALITY OF ASTURIAS THROUGH IDEPA AND THE PLAN FOR SCIENCE, TECHNOLOGY AND INNOVATION (PCTI), AND THE EUROPEAN UNION THROUGH THE ERDF FUNDS



TECHNICAL 4.0 IN THE FOURTH INDUSTRIAL REVOLUTION: AN ENHANCED, VIRTUAL AND SECURE ENVIRONMENT _IDE/2016/000834

The general purpose of the project is the use of new technologies to improve the work of the technician 4.0 will be investigated in the development of innovative tools of support and assistance that allow to improve the execution of its work guaranteeing its security. To do this, research will be carried out into the creation of an increased, virtual and secure environment throughout the industry's value chain.

NEW ENVIRONMENTALLY SUSTAINABLE SYSTEM FOR THE TREATMENT OF VINASSE BY DIRECT OSMOSIS IN THE SUGAR-ALCOHOL INDUSTRY (BIOETHANOL) _IDE/2016/000182

The general purpose of the BIOETHANOL project is the development of technological solutions capable of industrial scale-up for the treatment of the vinasse generated in the sugar-alcohol industry by concentration, as well as the rest of the waste generated in the treatment, based on an innovative process based on the complementarity of direct osmosis with other treatment alternatives, such as reverse osmosis, forced evaporation and discharge of the diluted brine into the sea in coastal areas.

RESEARCH FOR THE USAGE OF A WASTE TREATMENT COMPLEX FOR THE PRODUCTION OF MICROALGAE FOR PHARMACEUTICAL AND AGRI-

CULTURAL PURPOSES (LANDFILL4HEALTH) _IDE/2017/000700

The overall objective of the Landfill4Health project is to research and demonstrate the use of a non-hazardous waste landfill and its complementary facilities to house an industrial microalgae culture to produce high-value active ingredients in the field of nutraceuticals, health and cosmetics. To do this, INGEMAS will be in charge of the design and development of the pilot plant.

RESEARCH AND DESIGN OF A NEW METHODOLOGY FOR THE DESIGN, DEVELOPMENT AND DEPLOYMENT OF BIG DATA ANALYSIS TECHNIQUES ORIENTED TO PHOTOVOLTAIC PLANTS (PHOTOANALYTICS) _IDE/2017/000709

During the last years, TSK has worked on the monitoring of its photovoltaic plants through the use of technologies characteristic of the Internet of things and big data paradigms. This commitment, aligned with the Industry 4.0 initiative, allows TSK to have at its disposal a huge and varied volume of "plant" information that is being used for the remote supervision and monitoring of the installations. The PhotoAnalytics project arises with the objective of deepening this information, investigating the applicability of modern advanced analytical techniques on the large sets of IoT/BigData/I4.0 data.

EVALUATION OF AIR POLLUTION MITIGATION MEASURES AND PREDICTION OF HIGH-RESOLUTION AIR QUALITY LEVELS USING A MULTISCALE METHODOLOGY (EVAIR) _IDE/2018/000423

The general purpose of this project is the design of a methodology for the evaluation of the dispersion of atmospheric pollutants in areas close to industrial environments that integrates different spatial scales of analysis and allows the simulation of the implementation of mitigation measures.

FRAMEWORK FOR ANALOG METERS DIGITALIZER USING COMPUTER VISION TECHNIQUES BASED ON A IIOT APPROACH IN THE CONTEXT OF INDUSTRY 4.0 (FRAME) _IDE/2018/000268

The purpose of this project is to convert any analog device into an IoT device by means of a framework that combines artificial intelligence techniques and IoT/IIoT standards to capture all the information from the analog device and display it in a standard way through various communication mechanisms in the IoT/IIoT world to be chosen at will according to the requirements of the application. This is where

the term "IoTizar" is first coined, since it converts or transforms an analog device to the world of IoT/IIoT, presenting the following innovative features: abstraction layer in image acquisition, image processing framework, generation of alerts based on programmable logic and information export according to IoT/IIoT interoperability standards.

AUTOMATIC EMERGENCY HYDRAULIC SYSTEM FOR SOLAR THERMAL PLANTS (HIDRA) _IDE/2017/000705

The purpose of the HIDRA project is the development of an automatic hydraulic emergency system that performs the defocusing of the collectors of a thermosolar plant. The HIDRA system would make it possible to eliminate the UPS from the solar thermal plant, with the consequent cost savings.



RESEARCH ON IOT AND BIG DATA TECHNOLOGIES FOR MONITORING AND TRACKING MATERIALS IN THE CONTEXT OF LOGISTICS 4.0 (LOGOS) _IDE/2018/000427

In this project, research will be carried out on different technologies to provide a solution that allows the tracking of goods during the entire journey from origin to destination, collecting, in addition, various sensor information to characterize the conditions under which the goods were during the entire journey. For this purpose, an IoT, sensor and processing device will be researched and built to be placed on the goods to be tracked, so that it will capture information about the route - GPS, sensor: humidity, temperature, vibrations, etc (pending research) - that will make it possible to know, in real time, both the location of the goods and their status. For this purpose, the data captured by the devices will be sent to a Big Data platform where they will be analyzed to extract

metrics, indicators and results that will allow to obtain analytics related to the state of the goods, their geopositioning and other information in the context of Logistics 4.0 based on all the sensors installed in the devices.

RECOVERY OF ORGANIC WASTE (FRUITS AND VEGETABLES) IN THE FORM OF FERMENTABLE SUGARS FOR INDUSTRIAL BIOPROCESSES (FRUVERAZ) _ IDE/2018/000378

Food waste that is generated is a major global problem, not only for economic but also for environmental reasons. An alternative for minimising the amount of waste sent to landfill is to use it as a raw material in transformation processes to obtain value-added products. Specifically, one of the possible options for the revaluation of organic waste containing carbohydrates is to use it as a substrate for obtaining biofuels such as bioethanol or biobutanol. These fuels represent a renewable alternative to the use of fossil fuels, it is of great interest the development of processes that allow them to be obtained from waste materials such as those proposed here.

NEW EFFICIENT WATER TREATMENT SOLUTIONS USING OSMOTIC ASSISTED REVERSE OSMOSIS (OARO) _ IDE/2019/000353

The OARO project arises in response to the current limitations detected in the field of brine regeneration and in water desalination processes using Reverse Osmosis (RO). These limitations are the maximum concentration admitted by the membranes and the high pressure required for their operation.

INVESTIGATION OF METHODS OF ADSORPTION OF POLLUTANTS BY REGENERATED ACTIVATED CARBON AND BIOCHAR (RE-CARBON) _ IDE/2019/000585

The RE-Carbon project seeks to investigate innovative solutions for the decontamination of liquid and gaseous effluents, based on the use of carbonaceous materials. The research is developed around three main axes: the development of dynamic units of adsorption with activated carbon optimized for the adsorption of target compounds in gas phase and aqueous phase that incorporate sensors that allow the monitoring of the process in real time, the analysis of technical and economic viability of the use of biochar for the purification of fluids and the analysis of technical and economic viability of the regeneration of activated carbon from the adap-

tation of an experimental plant of pyrolysis of forest residues for its energetic recovery, suitably modified to implement the stages of drying and gasification. The ultimate aim is to take advantage of the environmental opportunity that the industrial use of activated carbon for fluid purification represents, using the competitive advantage that the regeneration of coals in environments close to their use, reducing the costs associated with transport.

RESEARCH INTO TECHNIQUES FOR THE DETECTION, CLASSIFICATION AND MONITORING OF OBJECTS FOR INSPECTION AND SECURITY PURPOSES IN INDUSTRIAL SETTINGS (SISPECTION) _ IDE/2019/000268

The general objective of the project is to research in Artificial Intelligence (AI) algorithms to process images, in a flexible processing architecture, and adding a layer of interoperability, achieving a significant advance in the state of the art of object detection, recognition and tracking systems in industrial scenarios with the ultimate aim of improving security.

RESEARCH IN AUGMENTED AND VIRTUAL REALITY TECHNOLOGIES FOR MONITORING, OPERATION AND MAINTENANCE ASSISTANCE IN PHOTOVOLTAIC PLANTS (PHOTOASSISTED) _ IDE/2019/000270

The general objective of this project is to research and develop a monitoring, operation and maintenance assistance tool based on augmented reality and virtual reality systems specifically designed for application in a photovoltaic scenario.

DEVELOPMENT OF DISRUPTIVE MULTI-METAL PRODUCTS FOR THE RAILWAY AND SOLAR THERMAL INDUSTRY (BISOLRRAIL) _ IDE/2019/000582

The main objective of the project is to explore the feasibility of developing new bimetallic products processed by hot rolling, for specific applications with high corrosion and wear resistance requirements, in the energy and transport sectors, respectively, with lower manufacturing, installation, maintenance and/or improved properties costs.

With regard to the application of renewable energy, the objective is to manufacture a flat bimetallic product resistant to the operating conditions of salt tanks in solar thermal power plants, mainly corrosion due to exposure to molten salts, and high temperature (565°C).

PROJECTS FINANCED BY THE GERMAN MINISTRY OF ECONOMY AND ENERGY (BMWi)



DEMONSTRATION OF A SOLAR THERMAL PARABOLIC TROUGH POWER PLANT AND STEAM GENERATION SYSTEM USING MOLTEN SALT AS THE HEAT TRANSFER FLUID (HPS-2)

The use of molten salt as a fluid carrier has important advantages. The operating temperature can be substantially increased, up to 500°C, and the plant is considerably simplified, as the same fluid is used for storage and as a heat transfer fluid. To validate the technology and identify possible problems during operation, a test loop will be built in Évora (Portugal), where the collector developed by TSK-FLAGSOL Heliotrough 2.0 will be installed.

SILICONE FLUID MAINTENANCE AND OPERATION (SIMON)

The purpose of SIMON is to test the applicability of new silicon-based heat transfer fluids at higher temperatures than those currently operated in parabolic trough technology solar thermal power plants and to accelerate market introduction by reducing all the obstacles that have been identified. The project will consist of laboratory tests, fire assessments and tests on the reconditioned PROMETEO test loop in the SITEF project at the Solar platform of Almería. A viscosity sensor suitable for these applications and temperatures will also be developed, as well as an efficient maintenance concept to separate compounds such as hydrogen, methane and silanes.

MOLTEN SALT LOOP OPERATION (MSOPERA)

This project arises from the need to gain experience in the operation of the loops of a solar field with salt. The aim is to gain experience in the drainage system, improvement of the operating system and the collectors.

MOVING BARRIER THERMOCLINE (MOBACLIN)

The aim of this project is to study the use of a single tank for energy storage in solar thermal plants.

PROJECTS FINANCED BY THE BASQUE GOVERNMENT WITHIN THE 2018 CALL OF THE HAZITEK PROGRAM



OPTIMISATION OF BIOMASS ENERGY RECOVERY PLANTS

The objective of the OPTIMAS project is the combination of complementary solutions that allow the construction of optimized biomass plants that are more robust, resistant and require less maintenance, are more efficient in terms of the use of resources and have a lower environmental impact, due to the valorization of the by-products generated. Being able to offer more competitive integral solutions in biomass energy generation plants.

PROJECTS FINANCED BY THE EUROPEAN UNION (H2020)



COMPETITIVE SOLAR POWER TOWERS (CAPTURE)

The main objective of the CAPTURE project is to reduce the costs of solar thermal power plants by implementing an innovative plant configuration. The configuration is based on several independent towers that operate with air at 1100 °C, each one coupled to a Brayton cycle. The waste heat from these cycles is used to store thermal energy, which will feed a Rankine cycle. A prototype will be built at the Solar Platform of Almería to test the validity of the system. Throughout the project, all the components required to operate the plant will be developed: receiver, regenerators and heliostat.

SOLVING WATER ISSUES FOR CSP (SOLWARIS)

The SOLWARIS project is a European project led by TSK and in cooperation with 13 other organizations that seeks to reduce water consumption in solar thermal power plants through various innovations in mirror cleaning, power cycle cooling and wastewater recovery. With this project, TSK will be able to offer innovative solutions to its clients to face one of the recurrent problems in new plants, in order to continue consolidating itself as a leader in the solar thermal sector.
www.solwatt.eu (Nº Exp. 792103)

Projects in 50 countries

INTERNATIONAL EXPERIENCE

The knowledge acquired in the wide variety of projects carried out in more than 50 countries allows us to adapt to the technical and cultural features of each country and successfully complete our international projects.

Our international strategy is based on close cooperation with local companies, enabling us to add value for all the countries in which we work, combining technology, experience and resources.

AMERICA

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VENEZUELA
ARGENTINA
CHILE
COLOMBIA
BRAZIL
PERU
HONDURAS
NICARAGUA
PANAMA
USA
BOLIVIA
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INDIA
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SAUDI ARABIA
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BANGLADESH
UAE

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SPAIN
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ITALY
PORTUGAL
GREECE
POLAND
UK
ROMANIA
HOLAND
FINLAND

AFRICA

MOROCCO
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YVORY COAST
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MOZAMBIQUE
UGANDA





Complete White and Raw Sugar Handling System, Sugar Refinery, Yambu (Saudi Arabia)

CORPORATE SOCIAL RESPONSIBILITY

In TSK we wanted to take a further step in integrating the criteria of social responsibility, both economic, environmental, social, ethical management, good governance and transparency, through the development and implementation of a Management System based on the standard IQNET SR10.

This System helps us to systematize, and integrate with other systems in our organization, the criteria and requirements contained in this standard, as well as those contained in the international standard ISO 26000, a guide that provides guidance on the principles underlying social responsibility, recognition of social responsibility and stakeholder involvement,

identification of risks and material aspects, and how to integrate socially responsible behavior in the organization, emphasizing the importance of results and improvements in the performance of social responsibility.

Key actions such as the identification, prioritisation and advanced dialogue with our Stakeholders, the identification of our sustainability risks, in the areas of ethics, the community, the environment or people, have allowed us to draw up a Policy, a Code of Ethics, and a Plan of Objectives and Actions, coherent and aligned with our priorities and with the concerns of our stakeholders, aimed at improving our social, economic and environmental performance.



SOCIAL ACTION

At TSK we are convinced that social commitment is inherent in business activity, to which the growing level of prosperity and well-being of society is largely attributable. Our main responsibility is to be able to provide a better service to our customers every day. This is what allows us to create value, generate quality jobs, invest in research and development and get involved in activities that benefit society.

Within this social management, we highlight the following activities:

- Relationship with the Community. The project director is responsible for maintaining a constant dialogue with authorities and community representatives during implementation.
- Social impact. Although the company's impacts are mostly positive, TSK analyses local regulations in order to provide mechanisms for reporting, reclaiming and restoring negative social impacts.

DONATIONS TO SOCIAL ACTION ENTITIES

Every year TSK allocates an item of its budget for donations to entities that promote projects and actions related to education, health, culture, sport and international cooperation.

Among other institutions, TSK supports the Princess of Asturias Foundation, What Really Matters Foundation, Foundation for Biosanitary Research of the Principality of Asturias (FIN-BA), Cáritas, Unicef, Red Cross and Global Health Institute Foundation for child immunization.

This year has also seen the start of collaboration with the AYM Foundation, an organization dedicated to children in Haiti.

IMPLEMENTATION OF PROJECTS

Depending on the needs and expectations of the community where we are, we offer the possibility of carrying out projects to support it.

During the past year we have developed a local project for the improvement of the indigenous community in Ancotanga (Bolivia), located near Oruro, where we have developed a

photovoltaic plant. This is a community with very few houses and minimal resources, and several premises abandoned by the migration of the population to the cities. TSK installed a photovoltaic system for pumping water to achieve an efficient irrigation system. This mechanism was also used to place a domestic water supply connection. In this same village, we have started to rehabilitate a small abandoned school, which will be used as a community social centre as well as a small library.

COLLABORATIONS WITH OTHER ENTITIES

At TSK we believe that it is also our responsibility to support organizations that work for the improvement of society. In this sense, we support those who work in the cultural and scientific fields, in international cooperation and solidarity and in the promotion of business and entrepreneurial activity.

- Sponsorship of cultural exhibitions.
- Collaboration with the University of Oviedo
- Commitment to Asturian industry and the development of the region.
- Collaboration with the Asturian Quality Club, Asturian Innovation Club, Femetal, Asturian Association of Family Businesses, Ademi, Sercobe and Prointec.

SPONSORSHIPS

TSK has sponsored the TSK Roces Sports Club for over twelve years, with a group of over 500 children. In addition, every year TSK sponsors various events and sports clubs, in order to promote sport among the youngest and employees of TSK.



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