

SOLUTIONS FOR A SUSTAINABLE WORLD



Growth through innovation

COVID 19
"Together we have beaten it"



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

TSK



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LETTER FROM THE CHAIRMAN

Sabino García Vallina

The challenges that we are facing worldwide as a consequence of the pandemic can only be overcome by implementing our capacity for resilience, adapting with sufficient flexibility to the changes and transforming difficulties into opportunities, thus successfully overcoming this historic period that we have had to live through.

TSK has not been unaware of the impact that the pandemic has had on the health of people, the economy, society, and companies. For all this, the work and commitment shown by our almost 1,000 employees distributed all over the world, who in these complex times, have continued to work with great enthusiasm and effort, has been key. Each and every one of them deserves our most profound gratitude and sincere recognition.

VISION

The scarcity of resources and climate change make sustainability one of the main axes of our strategic plan, aimed at providing solutions for a cleaner, smarter and socially sustainable industry, a transition in which we were immersed in before the pandemic and which we must now try to accelerate.

In this annual report we present an account of all the activities carried out during the past fiscal year, in a once again com-

plex and demanding environment, especially in our sector, and where TSK has once again demonstrated its capacity to adapt. We close the 2020 financial year with a positive balance, based on the resistance of all our business lines. We have achieved sales of 586 million euros, 35% lower than the 2019 financial year, but nevertheless with an EBITDA of 65 million euros, which demonstrates our ability to adapt to complex situations.

Despite these good results, we have suffered exceptionally and non-recurrently in this fiscal year, the effect of the pandemic and the strong depreciation of the dollar and different local currencies against the euro has penalized us in a very significant way, as we have a significant cash position that has reduced our EBT to 8 million euros.

We have all been inevitably impacted by the pandemic, but as far as TSK is concerned, we have once again ended the year with a record number of new contracts, to which we have added the award of new contracts in the first quarter of 2021, which will position us with a backlog of more than 2 billion euros.

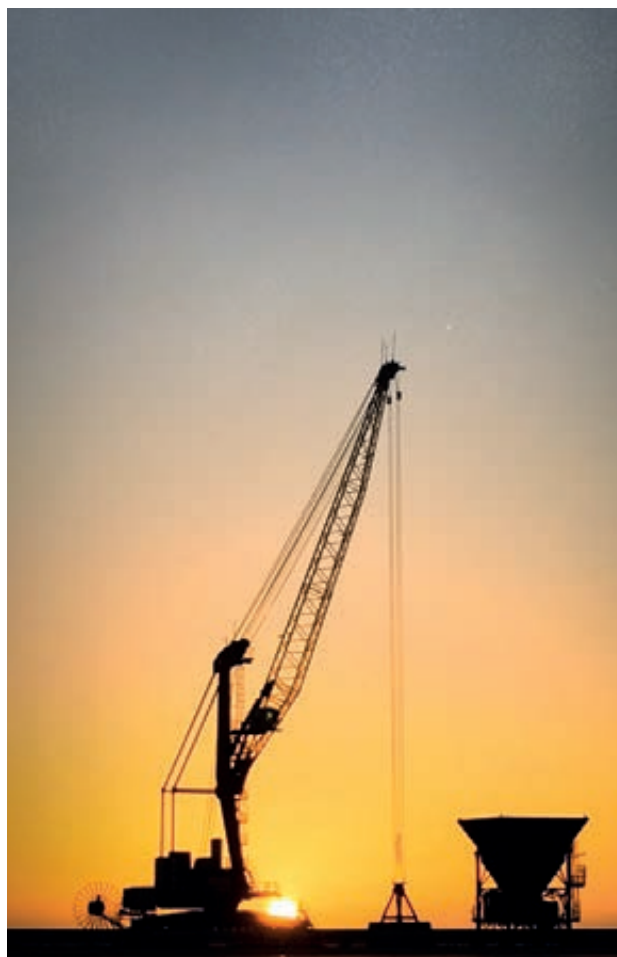
For yet another year we have also continued in our efforts to improve our good corporate governance practices and the transparency and quality of the information provided to the market,

“ We have ended the year with a record number of new contracts once again ”

and thus we have obtained the Certification of our Criminal and Anti-Bribery Compliance Management System (SGCPyA) in the UNE 19601 “Criminal Compliance Management Systems” standard, the main reference in Spain that articulates and sets the basis for criminal risk prevention systems and is fully inspired by the highest international standards in this field, as well as the UNE-ISO 37001 “Anti-bribery Management Systems” standard, the first and most demanding certifiable international standard for developing and implementing management systems in this field.

Both acknowledgements endorse the firm commitment of TSK to establish itself as a leader in its sector, both in Spain and internationally, promoting a culture of ethics and compliance, the achievement of these certifications are the result of the contribution, participation and involvement of all the workers.

In short, despite the difficulties of the pandemic, we have very good prospects for the coming years, and we are very well prepared to face the great opportunities that arise in our sector, all this with an exciting, attractive and above all profitable project, where our greatest assets are our technological knowledge, our financial capacity and above all the almost 1,000 professionals that make up TSK.



CORPORATE STRATEGY

Joaquín García Rico - CEO

2020 has been a complex year, which has been strongly affected by the COVID-19 pandemic, with a major impact on the health and economic areas. In this context, our priorities have remained clear and unchanged: to protect the health of our employees, customers, and the society in general where we operate.

During 2020 we prepared our new Strategic Plan 2021-2023, a period in which we reaffirmed our profile as a highly technological company, offering sustainable solutions for the industrial and energy sectors, with a plan that consolidates our transformation and with significant cash generation.

We will build on our existing strengths in order to add new pillars on which we will rely on in the future, such as the digitalization and sustainability of industrial processes, as well as the hybridization and storage of different energy sources, such as renewables or hydrogen.

TSK's new strategy has a high degree of flexibility according to the macroeconomic scenario. It is launched into a context of historical difficulty due to the pandemic, in which despite the difficulties TSK has responded very positively in 2020, with an EBITDA of 65 million euros and an EBT of 8 million euros despite a decrease in sales to 586 million euros, produced by the

slowdown of the activity and paralyzation of projects during 2020, as a consequence of the pandemic. It is also worth mentioning that during 2020 TSK has maintained contracting at maximum levels, exceeding 900 million euros, which allows us to have a backlog of close to 2 billion euros, with a visibility of 3 years and guaranteeing the recovery of sales in this financial year 2021. Cumulative sales for the period 2021-2023 will exceed 3 billion euros and cumulative EBITDA will reach 300 million euros.

In this complicated environment of marked uncertainty, the company has established two main areas of activity:

1. Implementation of sustainable and digital technologies in the industrial and energy fields,
2. Development of renewable energy plants and energy storage, through its subsidiary ESERSA.

Demographic pressure, climate emergency, energy transition, water scarcity, the demand for critical minerals and digitalization associated with the growth of smart cities and the efficiency in industrial processes, position TSK with a clear competitive advantage in a future full of opportunities, thanks to its leadership in renewable energies, energy storage tech-

*“During 2020
we consolidated
our leadership
in Africa”*

nologies, green hydrogen, environmental facilities, sustainable industrial technologies and industrial digitalization.

With 4 technology centers, Cologne (Germany) specialized in energy storage, Madrid specialized in energy, Vitoria specialized in biomass and waste valorization and Gijón specialized in energy, industrial processes and digitalization, we maintain a highly qualified workforce of almost 1,000 employees.

Our dedication to the transition to a zero-emission society has enabled us to position ourselves as a leader in energy solutions that resolve the intermittency of renewable energies. Years ago, we began developing technologies that allow for the hybridization of different energy sources, as well as energy storage, which resulted in the design of the most advanced hybrid solar plant in the world, combining photovoltaic, solar thermal and storage with molten salt and batteries.

In renewables we stand out with projects executed in all technologies such as solar, wind, biomass, hydraulics and geothermal, in more than 25 different countries.

Similarly, the alliance established in 2019 with the English company Highview Power, has allowed us to be awarded a liquid air energy storage plant in the United Kingdom and is

currently in the process of concluding other similar projects in the USA, UK and Spain.

Regarding hydrogen technology, we have agreements with the main hydrolyzer manufacturing technologists and with the National Hydrogen Center, and we are at a very advanced stage in several projects to generate green hydrogen from renewable sources.

In the field of waste to energy, we are working on the design of a pyrolysis plant in Australia to obtain biofuel from agricultural waste and on a plant in Ireland to obtain “syngas” from waste for use in conventional power plants.

The experience and knowledge accumulated over more than 35 years in the main technical disciplines, along with the digitalization of the facilities, has allowed us to develop innovative solutions for flexible generation plants, both renewable and conventional, in more than 50 countries. Nowadays, flexibility is the key to generating energy in a profitable way, combining gas plants with renewables and storage, providing maximum flexibility and efficiency. At TSK we have the capacity to design these solutions taking into account the customer’s requirements in terms of prioritizing base load, peak power or grid stability, offering a particular solution for each case.



Sugar Refinery YANBU. King Fahad Industrial Port (Saudi Arabia)



During 2020 we have concentrated on a new division, “Digital Innovation”, all the activities that we have been carrying out in the area of industry digitalization and where we develop high added value solutions that allow us to improve processes and optimize their performance, based on enabling technologies under the protection of Big Data, Internet of Things, Artificial Vision or Virtual Reality. Likewise, we have our own solutions that, albeit created to meet different needs of the rest of TSK’s business lines, they have become exportable solutions to other sectors, industries and clients.

Based on all this technological knowledge, we have submitted several projects in the fields of digitization of industrial processes, energy efficiency and energy storage in different parts of Spain, with an expected investment exceeding 800 million euros, to the Expression of Interest requested by the Ministry of Industry, Trade and Tourism, under the program for the Promotion of Industrial Competitiveness and Sustainability projects.

These projects are aimed at the development of a decarbonized, competitive and efficient energy sector, allowing the mobilization of significant private investment, providing certainty and a predictable regulatory framework, as well as taking advantage of the enormous renewable potential of our country and the existing value chains to strengthen competitiveness for domestic and export markets.

Regarding our subsidiary ESERSA, we have a backlog of 5,000 MW in different stages of development in countries with a great potential for growth in renewable energies such as Italy, Panama, Mexico, Colombia and Egypt.

We have before us a year in which we must shape the future without letting ourselves be conditioned by the present and where, in order to face the challenges we face, we have an excellent human team, whom I would like to thank once again for their commitment and dedication, the same gratitude that I would also like to convey to our clients for the trust they have given TSK to carry out their projects in these turbulent times.

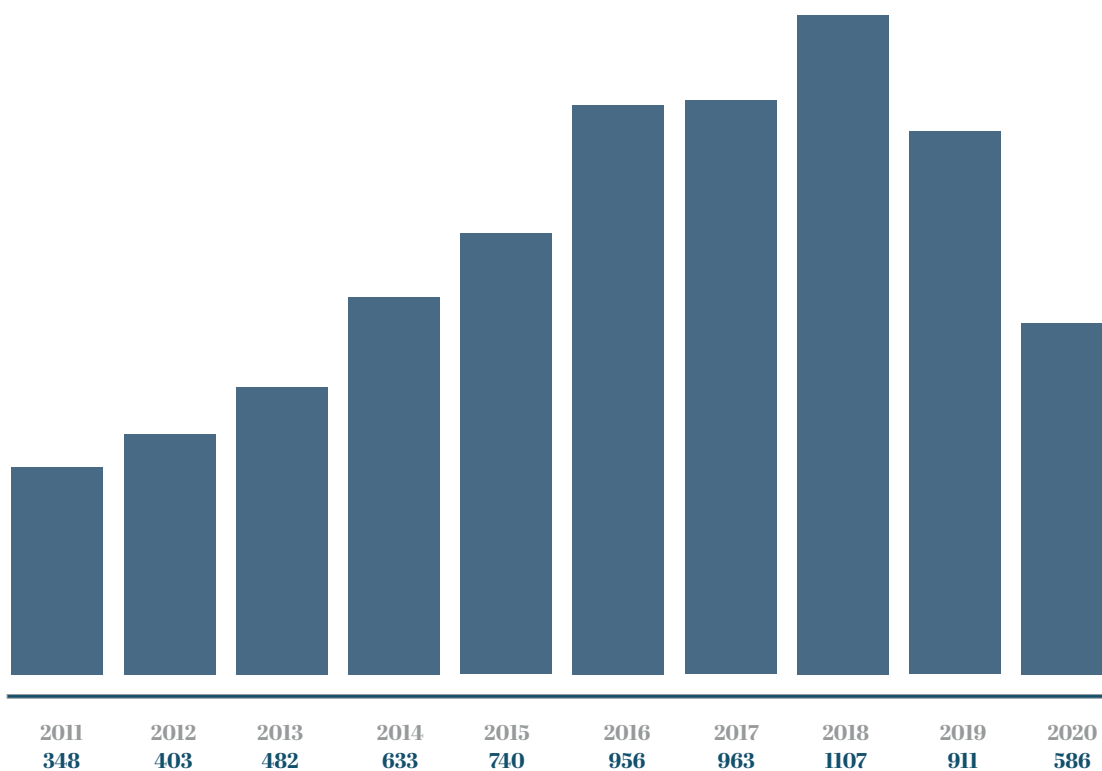


Las Animas II and Versailles de las Quatas photovoltaic plants, substations and transmission line. Durango (Mexico)

MAIN FIGURES

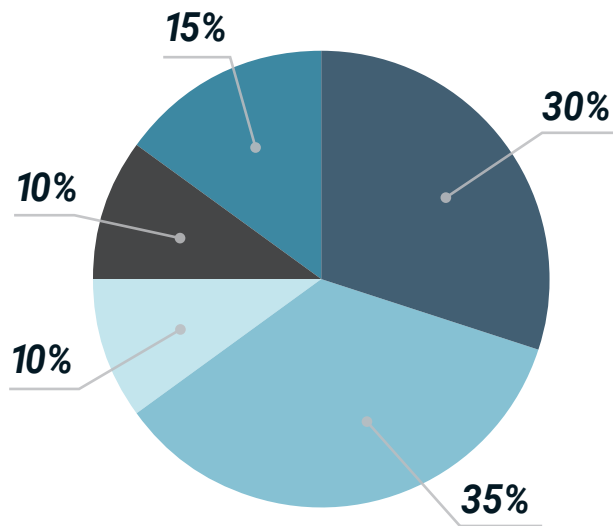
TURNOVER

Million Euros



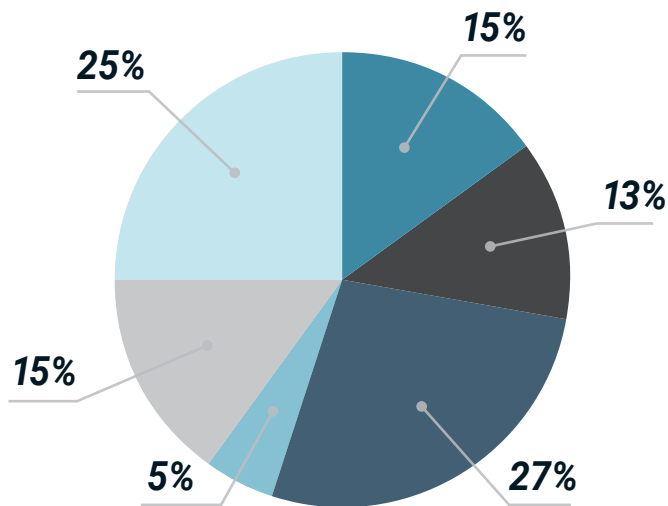
SALES BY SECTORS

- Conventional Power
- Industry
- Electrical Infrastructures
- Handling
- Renewable Energy

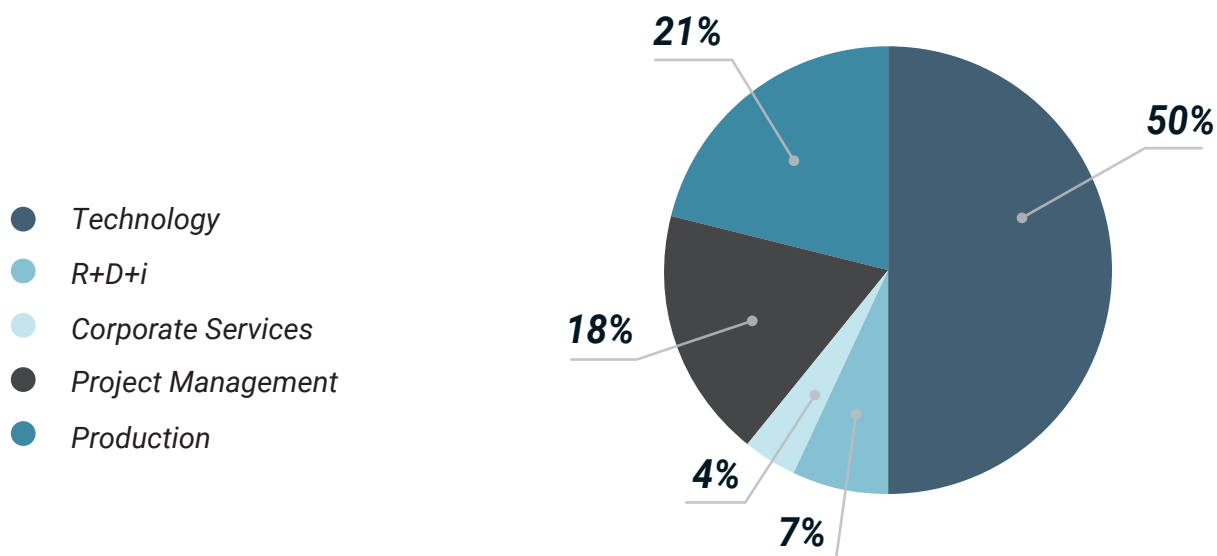


SALES BY MARKETS

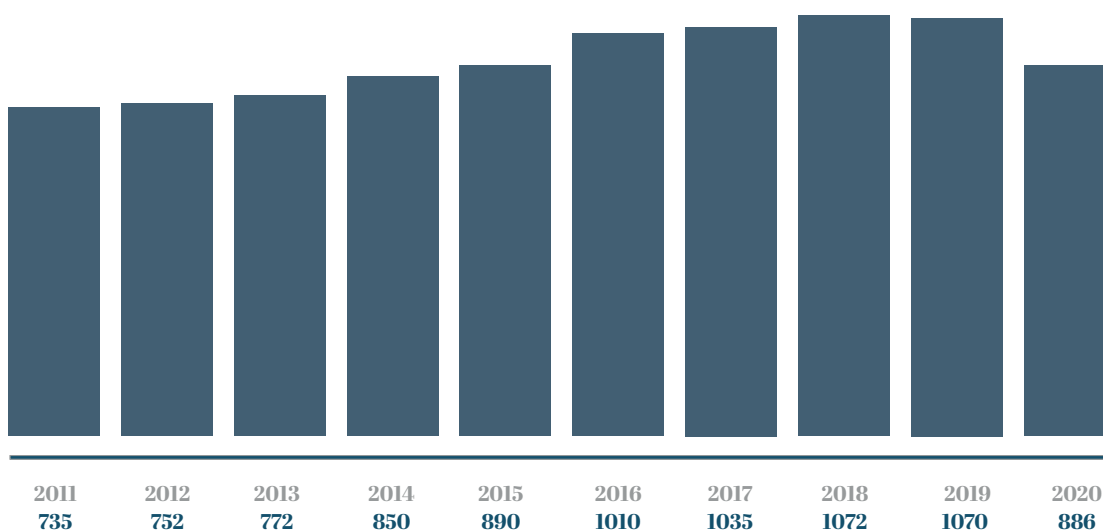
- Europe
- North America
- Latin America
- Asia
- Middle East
- Africa



DISTRIBUTION OF PERSONNEL



NUMBER OF EMPLOYEES



KEY FEATURES

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.

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



Termoeléctrica del Sur 295 MW CCGT + 80 MW Steam Tailing. (Bolivia)



Phosphates handling machines supply. El Halassa & Downstream O.C.P. (Morocco)

MOST SIGNIFICANT MILESTONES

1986

IN 1986 TSK WAS SET UP AS A COMPANY WHEN THE ELECTRIC DEPARTMENTS OF ERPO HOLDING MERGED.

1995

GERMAN COMPANY PHB WESERHÜTTE, SPECIALIZED IN THE DESIGN AND SUPPLY OF FACILITIES FOR MINERAL STORAGE AND HANDLING, WAS ACQUIRED IN 1995.

1999

THE ENVIRONMENT ACTIVITY, AIMED AT WATER TREATMENT, IS STARTED.

2000

TSK BECAME THE MAIN SHAREHOLDER IN LISTED COMPANY DURO FELGUERA WHEN IT PURCHASED 16% OF THE COMPANY IN 2000.

2003

THE FIRST INTERNATIONAL SUBSIDIARIES WERE ESTABLISHED IN MOROCCO AND VENEZUELA IN 2003 AND THE ONES IN BRAZIL, CHILE AND NICARAGUA FOLLOWED.

2006

START OF THE SOLAR PHOTOVOLTAIC ACTIVITY.

2007

THE ENGINEERING FIRMS INGEMAS AND IRELSA WERE ACQUIRED, AND THE COMPANY STEPPED DOWN FROM THE DURO FELGUERA BOARD OF DIRECTORS.

2008

ACTIVITY IN THE SOLAR FIELD IS EXPANDED TO INCLUDE SOLAR THERMAL ENERGY.

2010

EXPANSION INTO THE MIDDLE EAST AND ASIA BEGINS THIS YEAR, WITH PROJECTS IN SAUDI ARABIA, INDIA AND BANGLADESH.

2013

THE GERMAN TECHNOLOGY COMPANY FLAGSOL, WHICH SPECIALIZES IN SOLAR THERMAL ENERGY AND STORAGE, IS ACQUIRED.

2015

OMEGAENGINEERING, A COMPANY SPECIALIZED IN THE SUGAR AND ETHANOL SECTOR, IS ACQUIRED.

2016

INTECSA OIL&GAS COMPANY, WITH MORE THAN 50 YEARS OF EXPERIENCE IN THE GAS SECTOR, IS ACQUIRED.

2017

ITS SUBSIDIARY SPECIALIZED IN BIOMASS AND SOLAR THERMAL ENERGY IS ACQUIRED FROM THE INGETEAM GROUP.

2019

THE PARTNERSHIP WITH HIGHVIEW POWER AND THE DEVELOPMENT OF CLEAN TECHNOLOGY ENHANCES THE ACTIVITY IN THE ENERGY STORAGE SECTOR.

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

DIGITAL INNOVATION

POWER

INDUSTRY

ENVIRONMENT

GAS TO POWER



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
Managing Director - Audit and Project Control

Ricardo González Martínez
Managing Director - TSK Digital Innovation



KEKELI EFFICIENT POWER PLANT 65 MW Combined Cycle Power Plant. Lome (Togo)

MAIN PROJECTS IN PROGRESS



DUMAT AL JANDAL 400 MW Wind Farm. (Saudi Arabia)

SANTIBÁNEZ 500 kV Substation	ENDE TRANSMISIÓN	Bolivia
200 MW IVIRIZU Hydroelectric Power Plant	ENDE Valle Hermoso	Bolivia
SANTANASOL 65 MW PV Plant	AES DOMINICANA	Dominican Republic
ATINKOU 420MW Combined Cycle Power Plant	ERANOVE	Ivory Coast
NOOR Midelt 800 MW Hybrid Solar Power Plant	EDF - Masdar - Green of Africa	Morocco
Belt conveying system. OCP Fertilizer Plant	Jacobs	Morocco
CUAMBA 18 MW Hybrid Solar Power Plant	GLOBELEQ	Mozambique
TEMANE 450MW Combined Cycle Power Plant	GLOBELEQ-SASOL-EDM	Mozambique
Coke and sulphur handling system. Duqm Refinery	Petrofac	Oman
LAS FLORES 296,25 MW Steam Tailing	SIEMENS ENERGY Inc - KALLPA GENERACION	Peru
Mobile ship loader for sulphur pellets at Al Jubail Port	KHUSHEIM	Saudi Arabia
DUMAT AL JANDAL 400 MW Wind Farm	MASDAR	Saudi Arabia
Sist. recepción, almacenamiento, transporte y carga barco	Eiffage	Spain
KEKELI EFFICIENT POWER PLANT 65 MW CCGT	ERANOVE	Togo
Bucket wheel stacker-reclaimers for coal and coke	Tata Steel	UK



LA PUNA 208 MW Solar Park. La Puna and Altiplano PV Plants, 330 kV Substation and Transmission line. (Argentina)

MAIN PROJECTS IN PROGRESS

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 INNOVATION

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 Effi-

ciency, CMMS (Computerized Maintenance Management 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 deploy-



QUICKSTART 475 MW Multisite Engine Power Plant (Chile)

ment of structured cabling networks and wireless networks to the integration of different technologies such as unified 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 continuous 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.

GAS TO POWER

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 execute 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.



JAU and AVENTURA | 126,9 MW Wind farm and 138 kV Baixa do Feijao Substation. Río Grande Do Norte (Brazil)

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.



Triple ship loader for agri-food materials. P&H Fraser Grain Terminal, Vancouver Port (Canada)

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.

TSK'S COMMITMENT

TSK'S MISSION

TSK's mission is focused on being a highly competitive organization in the execution of technological solutions in the infrastructure, energy, industrial and environmental sectors, pursuing the satisfaction of the client and the people who make up TSK at all times, in a commitment to their personal and professional development.

TSK'S VISION

The Group's vision is to be a cutting-edge company, leader in terms of human resources, technology and profitability, in order to offer efficient solutions that contribute to a more sustainable development, ensuring the satisfaction and confidence of our customers, partners, employees and society in general.

TSK'S VALUES

COMPETITIVENESS:

As an inherent value of the company for the successful achievement of our vision.

INNOVATION:

TSK is committed to innovation in its processes and ways of working, offering the customer the most innovative services on the market. We maintain a vigilant and proactive attitude towards opportunities, in a process of continuous development.

EXCELLENCE:

Quality is an intrinsic value of the company, which aims to offer products and services that aspire to excellence. Our companies must be perceived by the customer as companies that offer solutions and installations of the highest quality.

COLLABORATION:

This value is always present in the organisation and culture of TSK, extending to daily relations with customers, suppliers, employees and society in general. Our spirit of collaboration is reflected in our daily actions.

COMMITMENT AND RESPECT:

These are values that are deeply rooted in the organisation. Commitment must be a sign of identity in all our actions, as well as respect for all groups with which we have a relationship.

FLEXIBILITY:

The activity of our companies is framed within the services to the industry, so flexibility is a fundamental factor to compete with larger companies and resources. We want to transmit this flexibility in all our companies, being able to adapt to the changes that may occur.

ENTHUSIASM AND PASSION:

Only through the enthusiasm and passion we put into our projects, behaviour and actions is it possible to achieve our common goal, to make TSK the leading company and a reference in the market..



TSK Campus at the Gijón Science and Technology Park, Asturias (Spain)



Transmission Line 230 kV PENONOME - EL COCO. Penonomé (Panama)

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 workforce average age is 44.93 years, with an average length of service in the company of around 7.98 years. Seventy-three percent 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.

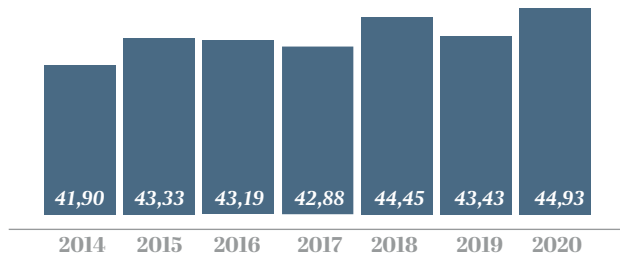
In its efforts to promote and implement equality policies in the organization, the management of TSK signed a commitment that establishes:

- Equal opportunities between men and women as a strategic principle
- The promotion and encouragement of measures to achieve effective equality.
- 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.

To do this, TSK has drawn up its Equality Plan which is intended to be the framework for establishing the strategy and lines

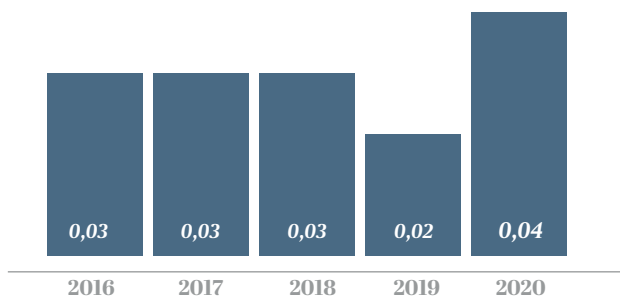
AVERAGE AGE

Years



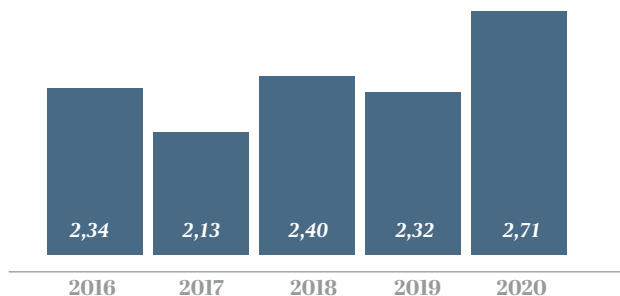
SEVERITY RATE

(Lost days / Worked hours) x 1.000



FREQUENCY RATE

(LTI / Worked hours) x 1.000.000



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.

TALENT APPEAL AND RECRUITMENT

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.

We have had an Occupational Health and Safety Management System since 2007, which we are currently certified under ISO



45001:2018, which considers all phases of the project life cycle, from design to construction and commissioning.

Our goal is always “zero accidents” and the guidelines for action are transmitted from the highest levels of the organization. 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 proce-

dures with the aim of increasing efficiency in the dissemination and assimilation of corporate policies.

Our commitment to health and wellness is a priority and one of the basic pillars of our employee value proposition. We establish programs that focus on three main 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.

TSK has an Environmental Management System implemented and certified in accordance with the ISO 14001:2015 standard, conceived to maintain an adequate level of environmental management in all our projects. In this way, we guarantee respect for the applicable environmental legislation.

I+D+i

MAIN FINANCING ENTITIES

CDTI | IDEPA | H2020 | RETOS | MINETUR_AEESD | GERMAN MINISTRY OF ECONOMY AND ENERGY



RESEARCH AND DEVELOPMENT EXPENSES

For TSK, the need to innovate in its projects, processes and services is beyond any questioning, and for this reason we set ourselves the constant challenge of improving through innovation and applied research as one of our development opportunities, in the search for greater competitiveness both nationally 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 in the main figures for investment in R&D+i projects over the last 4 years, with a total of €24,191,469:

2017: 5,838,201 €
2018: 5,428,800 €
2019: 6,637,541 €
2020: 6,286,927 €

In addition to the above figures, we must also take into account the investment in Innovation made directly in the works carried out by TSK, which means a total of 30,326,701 € in the last 4 years if we take a conservative figure for the year 2020, which is in the process of being calculated at the time of writing this report:

2017: 8,304,997 €
2018: 8,361,490 €
2019: 6,660,214 €
2020: 7,000,000 €

Our strong identity with innovation is part of our long-term strategy materialised in strong investments in R&D+i, collaborating with technology centres, universities, and companies within the framework of local, national and European programmes. The great diversity of projects and technological areas in which TSK participates obliges us to be continuously innovating and developing in the daily work of all our activities, as a very significant part of the innovations are produced as a result of the multidisciplinary nature of the projects.

Likewise, the great diversity of projects and technological areas in which TSK participates obliges the company to be continuously innovating. That is why, with a plan to bringing together all these initiatives, as well as differentiating itself in the market and placing value on innovation as a strategic line of action, TSK INNOVATION was created.

This concept encompasses all R&D+i initiatives and projects developed by the company, and incorporates actions aimed at involving all market agents in its internal innovation process, fostering knowledge management and technology transfer-

ence and establishing synergies for the identification and development of R&D+i activities.

The TSK INNOVATION ecosystem brings together all the group's innovative activity, 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 PROGRAMME

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 is evidence of TSK's strong commitment to defend and retain talent in the region, 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 business lines, of which 11 were selected for the presentation phase in front of the committee of evaluation experts.

After having selected 5 proposals as winners, three projects have been successfully completed, and the remaining two will be finalised in 2021.

1. SIMUMECAMAT_Mechanical and materials engineering. - Use of new high strength steel in the construction of TSK facilities".

2. TSC UNIOVI_Signal Theory and Communications Areas. - High precision multi-sensor positioning and anti-collision system for harsh industrial environments".

3. LEMUR_ Power Grid Management, Monitoring, Analysis and Simulation. - Real-time data monitoring and control centre for electricity grids based on web in a virtual reality environment".

4. LEMUR_ Power Grid Management, Monitoring, Analysis and Simulation.- Use of hybrid storage systems based on batteries and supercapacitors to support photovoltaic installations using weather prediction algorithms".

5. GEA_Asesoría Geológica S. Coop. Astur. - Expert system for geological-geotechnical risk management throughout the life cycle of EPC projects".

PHB

During the 2020 financial year, the research projects initiated in the R&D+i line continued to be active and were still in progress at the end of the year:

DEVELOPMENT OF A LARGE METAL SILO FOR BIOMASS EXPLOSIVE CONDITIONS (EXSILOS) _IDI-20191151

The overall objective of the project is to develop a proprietary model of a large (>10,000 m3) core flow metal silo for biomass storage that is safe from the risk of dust explosion in the absence of regulations governing the protection of biomass and which is economically efficient, i.e. uses the minimum amount of steel or metal necessary and minimises the need for venting.

INGEMAS

During the 2020 financial year, the research projects initiated in the R&D+i line continued to be active and were still in progress at the end of the year:

RESEARCH INTO THE USE OF A WASTE TREATMENT COMPLEX FOR THE PRODUCTION OF MICROALGAE FOR PHARMACEUTICAL AND AGRICULTURAL PURPOSES (LANDFILL-4HEALTH) _IDE/2017/000700

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

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



The general objective of the project is to design and model a new electric salt 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 achieve a modelling of the new heater that guarantees that it is efficient. To this end, the iterative development of the pilot plant tests with CFD modelling will be considered, in order to obtain an adjusted model that will allow subsequent extrapolation to a real-size plant. The technological leap of the project in relation to existing technology is given by the fact that the final design of the heater will guarantee the homogeneous heating of the salts, and that the maximum temperature at which the salts degrade is not exceeded under any operating assumption.

NEW EFFICIENT WATER TREATMENT SOLUTIONS USING OSMOTICALLY ASSISTED REVERSE OSMOSIS (OARO) _IDE/2019/000353

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

RESEARCH ON POLLUTANT ADSORPTION METHODS USING REGENERATED ACTIVATED CARBON AND BIOCHAR (RE-CARBON) _IDE/2019/000585

The RE-Carbon project aims to investigate innovative solutions for the decontamination of liquid and gaseous effluents, based on the use of carbonaceous materials. The research is based on three main axes: the development of dynamic adsorption units with activated carbon optimised for the adsorption of target compounds in gas and aqueous phases that incorporate sensors that allow the process to be monitored in real time, the technical and economic feasibility analysis of the use of biochar for the purification of fluids and the technical and economic feasibility analysis of the regeneration of activated carbon from the adaptation of an experimental plant for the pyrolysis of forest waste for its energy recovery, suitably modified to implement the drying and gasification stages. The ultimate aim is to take advantage of the environmental opportunity of the industrial use of activated carbon for the purification of fluids, using the competitive advantage of the regeneration of coals in environments close to their use, reducing the costs associated with transport.

NEW SAFETY SYSTEM FOR OIL LEAKAGE IN HEAT EXCHANGERS FOR HYBRID SOLAR POWER PLANTS (LEAK)_IDE/2020/000384

The aim of the project is to determine a new safety system for oil leakage in heat exchangers in photovoltaic-thermal solar hybrid plants and/or in stand-alone energy storage plants, ensuring efficient, reliable and safe energy production and storage.

TSK

During the 2020 financial year, the research projects initiated in the R&D+i line continued to be active and were still in progress at the end of the year:

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

The aim of this project, approved by the CDTI as part of the CIEN Strategic Programme call, is research into technologies for carrying out inspection and maintenance in extreme environments in an unassisted manner. The aim of this project is to boost the competitiveness of companies by promoting business innovation in the field of industrial engineering of extreme, complex and offshore installations, both in their design, manufacture and commissioning, as well as their operation and maintenance. In addition, it will reduce the costs associated with extreme operation interventions and contribute to strengthening the capacities of the business fabric that supports the industrial sector.

SOLVING WATER ISSUES FOR CSP PLANTS (SOLWARIS) _792103

The SOLWARIS project is a European project led by TSK and in cooperation with 13 other organisations that seeks to reduce water consumption in solar thermal power plants through various innovations in mirror cleaning, power cycle cooling and waste water recovery. With this project, TSK will be able to offer innovative solutions to its clients to tackle one of the recurring problems in new plants, in order to continue consolidating its position as a leader in the solar thermal sector.

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

Over the last few years, TSK has worked on monitoring 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 currently have a huge and varied volume of “plant” information which is being used for the supervision and remote monitoring of the installations. The PhotoAnalytics project arises with the aim of going deeper into this information, investigating the applicability of modern advanced analytical techniques on the wide range of IoT/BigData/I4.0 data sets.

ASSESSMENT OF AIR POLLUTION MITIGATION MEASURES AND PREDICTION OF AIR QUALITY LEVELS AT HIGH RES-

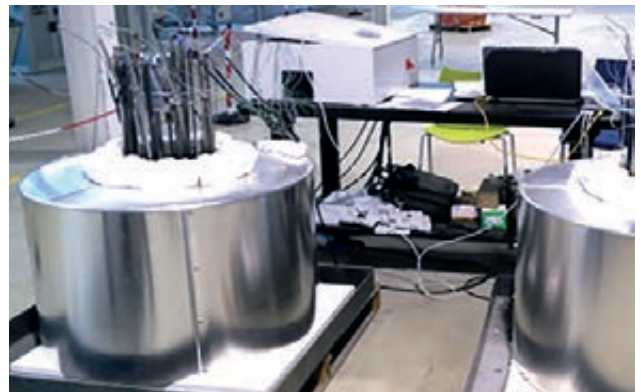
OLUTION USING A MULTI-SCALE METHODOLOGY (EVAIR) _IDE-2018-000423

The general objective 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 implementation of mitigation measures to be simulated.

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

In this project, research will be carried out into various technologies to provide a solution that allows goods to be tracked throughout their journey from origin to destination, also collecting a variety of sensor information to characterise the conditions under which the goods were during the entire journey. To this end, an IoT, sensor and processing device will be researched and built, which will be placed on the goods to be tracked, so that it will capture information from the journey - GPS, sensors: humidity, temperature, vibrations, etc. (pending research) - which will allow us to know, in real time, both the location of the goods, as well as the state of the same. To do this, the data captured by the devices will be sent to a Big Data platform where they will be analysed to extract metrics, indicators and results that will allow us to obtain analytics related to the status of the goods, their geopositioning and other information in the context of Logistics 4.0 based on all the sensors installed in the devices.

NEW HYBRID PHOTOVOLTAIC-THERMO-SOLAR SYSTEM WITH MOLTEN SALT ENERGY STORAGE (SHALTER) _IDI-20190430



The aim of the project is to develop a new photovoltaic-solar hybrid technology in large-scale power plants, which enables the generation of electricity by both technologies and implements the combined potential of both technologies to store thermal energy through the heating of molten salts, thus ensuring continuous and efficient electricity production. The main challenge of the project is to make the proposed hybrid system viable, as there are still many uncertainties regarding the components being researched. The problem of corrosion of the materials under these conditions, the integrity of the molten salts, and the strength of the welds of the equipment to be installed must be solved. The qualitative technological leap in the project regarding the 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 ON IOT TECHNOLOGIES AND BIG DATA FOR VEHICLE TRACKING AND MONITORING THROUGH LPR (SMARTTRACKER) SYSTEMS _IDI-20181257

The general objective of this project is to research into a technological solution that enables the analysis and monitoring of vehicles from distributed LPR systems based on heterogeneous and manufacturer-independent technologies. To this end, work will be carried out on IoT and Big Data technologies with four specific objectives: to integrate heterogeneous LPR systems, monitor vehicles, track vehicles and generate metrics.

RESEARCH AND DEVELOPMENT OF OPERATION AND MAINTENANCE TECHNOLOGIES FOR THE MANAGEMENT OF PHOTOVOLTAIC PLANTS (PVOLTAI4.0) _IDI-20190759

The overall objective 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 optimising its operation, which will ultimately result in an increase in the reliability and lifetime of the plant. This system will be developed according to the principles of the Industry 4.0 paradigm, especially regarding the integration of Industrial Internet of Things (IIoT), Big Data analytics and advanced visualisation.

RESEARCH IN EMERGING TECHNOLOGIES TO ACHIEVE IN-

NOVATIVE 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 way through the use of 3D Modelling and IoT technologies; as well as improving Digital Twin Asset Management through the use of Artificial Intelligence, Visualisation Technologies, Simulation Technologies in Virtual Reality and Augmented Reality and Blockchain. All of them disruptive technologies in the international and national technological panorama.

RESEARCH ON TECHNIQUES FOR DETECTION, CLASSIFICATION AND TRACKING OF OBJECTS FOR INSPECTION AND SECURITY PURPOSES IN INDUSTRIAL SCENARIOS (SISPECTION) _IDE/2019/000268

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

RESEARCH ON AUGMENTED AND VIRTUAL REALITY TECHNOLOGIES FOR ASSISTANCE IN SUPERVISION, OPERATION AND MAINTENANCE TASKS IN PHOTOVOLTAIC PLANTS (PHOTOASSISTED) _IDE/2019/000270

The overall 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 (BI-SOLARRAIL) _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.

Regarding the renewable energy application, the objective is to manufacture a flat bimetallic product resistant to the operat-

ing conditions of the salt tanks of solar thermal power plants, mainly corrosion due to exposure to molten salts, and high temperature (565°C).

DESIGN OF AN INTEGRATED RESIDENTIAL MONITORING SOLUTION FOR EFFICIENCY AND WELL-BEING (SISHOME) _IDE/2020/000326

The aim of the project is to build a modular solution that allows for the comprehensive monitoring of all existing sources of information that influence the home and that enables the extraction and definition of indicators and policies both in terms of energy efficiency and people's well-being and quality of life.

INDUSTRIAL RESEARCH STUDY FOR THE CONSTRUCTION OF RESILIENT SOLAR TRACKERS (RETRACK) _IDE/2020/000345

The aim of the project is the experimental study of various models of solar tracker such as those that TSK frequently incorporates in its plants and which are subjected to adverse weather phenomena that must be considered for their correct operation, once at the final location. Likewise, the methodologies of control and monitoring of characteristic plant parameters will be studied, seeking maximum efficiency.

TOWARDS PREDICTING THE OPERATIONAL LIFETIME OF PEROVSKITE PHOTOVOLTAIC CELLS: ACCELERATION FACTORS IN THE STUDY OF STABILITY BY APPLYING MACHINE LEARNING (PROPERPHOTOMILE) _IDI-20210171

The overall objective of the project is to develop an automated scheme to analyse the stability data of Perovskite Halide Solar Cells (PSCs) generated by standardised accelerated tests. This analysis will determine the most relevant accelerated test for normal operating conditions, as well as the acceleration factor (which relates the measured stability parameters to the operational lifetime of the PSC) and the expected lifetime.

UAVS-BASED MODULAR SOLUTION FOR DECISION MAKING AND DIAGNOSTIC TASK SUPPORT OF PHOTOVOLTAIC PLANTS USING ELECTROLUMINESCENCE IMAGING, THERMOGRAPHY AND RGB-VISION CAMERAS, ELECTRICAL ANALYSIS AND GEOVISUALISATION (AID4PV) _IDI-20210170

The AID4PV project aims to research, develop and demonstrate in an operational environment a modular solution based

on unmanned aerial vehicles (UAVs) for PV plant monitoring and advanced diagnostics. The autonomous UAV platform will capture photographic (RGB), thermographic (IRT) and electroluminescence (EL) images to enable near real-time fault detection, leading to PV plant diagnostics in time and cost.

The results will be presented in an advanced reporting and geovisualisation presentation platform including geospatial analysis and visualisation tools. Decision support capabilities will also be researched, adding the possibility to perform some kind of predefined action from the UAV platform, minimising the time from detection of an anomaly to corrective actions.

TSK FLAGSOL

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 salts as a heat transfer fluid has important advantages. The operating temperature can be increased substantially, up to 500°C, and the plant is considerably simplified, as the same fluid is used for both storage and 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 currently operated in parabolic trough solar thermal power plants and to accelerate market introduction by reducing all identified barriers. The project will consist of laboratory tests, fire evaluations and tests on the PROMETEO test loop refurbished in the SITEF project at the Plataforma Solar de Almería. A viscosity sensor suitable for these applications and temperatures will also be developed, as well as an efficient maintenance concept for separating compounds such as hydrogen, methane and silanes.

TRANSTES

The objective of TransTES is to contribute to the development of advanced salt storage tank concepts (one tank, sandwich

walled hot tank, e-TES) and to the development of heat storage concepts in chemical plants in close contact with industrial partners to develop business cases. Generally 65% of the effort is applicable to TES systems.

ELECTRICITY TO HEAT, PROCESSES AND APPLICATIONS (SWS)

The aim of the SWS project is to expand market opportunities through know-how in thermal energy storage (TES) systems. This includes combined PV-CSP plants and TES applications as a buffer in energy markets with high renewable energy (RE) rates, e.g. Spain, Italy, Germany, USA.

WOBASA

The objective of the WobasA project is the development of a satellite and camera-based forecasting system for photovoltaic and hybrid PV-CSP applications. Improvement of control strategies based on shadow information. Optimisation of pointing strategies (for towers) based on shadow information.

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 salts. 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.

AVUSPRO

The aim of this project is to achieve a system for measuring the fouling ratios of CSP and PV fields, which will be tested in two power plants.

HIGHER TEMPERATURE AND LIFE FOR NITRATE SALTS (VENITE)

TSK currently has a great deal of knowledge about the behaviour of salts at 400°C, but not at higher temperatures, so the aim is to close this gap in knowledge by means of a series of chemical tests and analyses to find out the maximum operating point for which acceptable conditions are maintained for the salts.

SUPEREAF

The objective of the project is the development of a molten salt storage system to recover heat from an electric arc furnace (EAF) and store it allowing the continuous production of superheated steam for uninterrupted electricity generation in a high efficiency steam turbine cycle while the waste heat from the EAF while operating in batch mode is only available discontinuously.

EUROPATMOS

EuroPaTMoS brings together European expertise and testing infrastructure for parabolic trough collectors (PTC) with molten salt (MS) to accelerate technology transfer from R&D to commercial deployment. Two leading European CSP companies (TSK Flaggol and Rioglass Solar) join forces with three SMEs providing risk assessment and quality assurance services (CSP Services), quality assurance equipment and measurement services (CSP Services Spain), electrical scoping and operational equipment for CSP (Ductolux) to develop a reduced risk, cost-competitive sales proposition.



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

Mexico
Cuba
Venezuela
Argentina
Chile
Colombia
Brazil
Peru
Honduras
Nicaragua
Panama
USA
Bolivia
Ecuador
Jamaica
Guatemala
El Salvador
Canada

ASIA

Bahrain
Kuwait
Jordan
Turkey
India
Iran
Saudi Arabia
Syria
Bangladesh
UAE

EUROPE

Germany
Spain
France
Italy
Portugal
Greece
Poland
UK
Romania
Holand
Finland

AFRICA

Guinea Konakri
Tanzania
Morocco
Algeria
Tunisia
Togo
Yvory coast
Egypt
Senegal
Angola
Libya
Sudan
South africa
Mozambique
Uganda



“ Projects
in 50 countries ”



CAPELLA SOLAR 140 MW Solar Park. Albireo I - II Photovoltaic Plants (El Salvador).

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 progress, environmental balance and economic growth must always go hand in hand.

Our commitment to sustainability is a commitment to our vision, mission and values, incorporating in our Corporate Social Responsibility and business policy the Sustainable Development Goals (SDGs) approved by the UN, whose purpose is to promote economic growth, work for social inclusion, fight against climate change and protect the environment.

In order to identify those SDGs that are relevant to our organization, we have conducted a materiality analysis, which takes into account both the interests of the organization and the concerns of stakeholders and the communities where we operate, identifying the targets to which we can contribute.

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:

Community Relations. We maintain a constant dialogue with authorities and community representatives during the execution of our projects.



Social impact. Although the company's impacts are mostly positive, TSK analyzes local regulations in order to offer mechanisms for information, complaints and restoration of negative social impacts.

PROJECT IMPLEMENTATION

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. In this same town, we have started to rehabilitate a small abandoned school, which will be used as a social community center as well as a small library.

COLLABORATIONS WITH OTHER ENTITIES

In TSK we consider that it is also our responsibility to support organizations that work for the improvement of society. For this reason, we collaborate with different associations and

organizations related to the environment, culture, research, education and corporate social responsibility with the aim of sharing their business experiences and acquiring the most appropriate and innovative practices. Among the most noteworthy are:

- 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 Family Business Association, Ademi, Sercobe and Prodentec.

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.

DONATIONS TO SOCIAL ACTION ENTITIES

Each year TSK allocates a portion of its budget to donations to entities that promote projects and actions related to education, health, culture, sports and international cooperation.

Among other institutions, TSK supports the Princess of Asturias Foundation, the Lo que de Verdad Importa Foundation, the Foundation for Biosanitary Research of the Principality of Asturias (FINBA), Caritas, Unicef, the Red Cross and the Global Health Institute Foundation for child vaccination.

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