



# SMART GRID

CONNECTING WONDERFUL LIFE WITH OPTIC-ELECTRIC NETWORK



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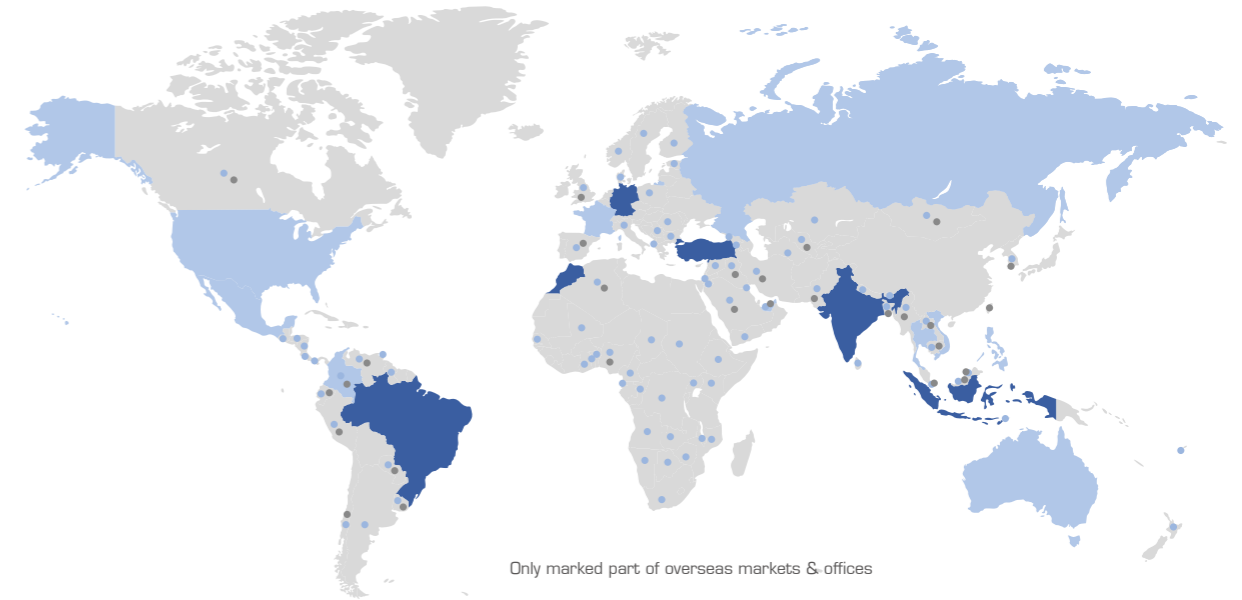
# FOSTERING CLEANER PRODUCTION AND ACCELERATING GREEN AND LOW-CARBON DEVELOPMENT

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## ABOUT US

Established in 1992, ZTT started from optical fiber communications and was listed on Shanghai Stock Exchange (SSE) in 2002 (Stock Code in SSE: 600522). ZTT has pictured a diversified industrial portfolio for marine equipment, renewable energy, new materials, smart grid, optical communications and other industrial products. ZTT follows the new economic model of fostering cleaner production and accelerating green and low-carbon development, works hard to serve as the pioneer of persistent endeavor to achieve national goal involving carbon dioxide emissions peaking by 2030 and carbon neutrality by 2060, emerging as a green manufacturing technology group assuming regional economy.



1992 Established    160 Global Markets    16,000<sup>+</sup> Employees

54 Branch Offices    80<sup>+</sup> Registered Subsidiaries    5 Overseas Plants

2,500<sup>+</sup> Patents    Top-500 Enterprise in China    \$13.4 Billion Revenue 2022

### Overseas Plants





# OUR STORY

## 1992

- ZTT entered the field of optical communications.

## 1995

- ZTT succeeded in researching and developing the underwater cable.

## 1997

- ZTT was identified as the national key high-tech enterprise.
- ZTT 960 core optical fiber ribbon cable passed the national identification.

## 1999

- ZTT entered the field of Marine Equipment.

## 2000

- ZTT entered the field of power transmission.

## 2002

- ZTT A shares listed and issued on the Shanghai stock exchange.
- Zhongtian Technology Optic Fiber Co., Ltd. was established.

## 2004

- ZTT achieved the acquisition of Shanghai Aluminum Factory and then founded Shanghai Zhongtian Aluminum Wire Co., Ltd.

## 2008

- ZTT established the national post-doctoral scientific research workstation.
- ZTT Research Institute was established.
- ZTT up-rating conductor passed the national certification.

## 2009

- ZTT was selected into the Top 100 of china science and technology.

## 2010

- ZTT entered the field of manufacturing and accurate crafts.

## 2012

- Zhongtian Photovoltaic Technology Co., Ltd., Zhongtian Photovoltaic Material Co., Ltd., Zhongtian Energy Storage Technology Co., Ltd., and Zhongtian New Energy Residential Technology Co., Ltd. were founded.
- ZTT India Private Limited was established.

## 2013

- ZTT was recognized as national enterprise technology center.
- ZTT do Brasil Ltda was established.

## 2014

- ZTT successfully developed China's first  $\pm 320\text{kV}$  high-voltage DC cable.
- ZTT was awarded the excellent award of corporate social responsibility in China communication industry annual list.

## 2015

- ZTT Brazil factory held opening ceremony.
- ZTT Solar achieved international automobile permitting qualification.

## 2016

- Jiangsu Zhongtian Bright Transformer Co., Ltd & ZTT Marine Systems Co., Ltd. were established.

## 2017

- ZTT Indonesia and ZTT Morocco were established; ZTT Hong Kong Co., Ltd. began operating.
- ZTT successfully developed the first flexible DC cable with largest capacity  $\pm 525\text{kV}$  passing through the identification in China and the world.

## 2018

- ZTT Morocco started construction.
- ZTT Indonesia held opening ceremony.
- ZTT completed acquisition of Demirer Kablo strategically deploying itself on the global market for UHV cable.

## 2019

- ZTT won "China Quality Award".
- ZTT Morocco and ZTT Europe went into operation.

## 2020

- ZTT was awarded the 6th "China Grand Awards for Industry".
- ZTT was selected as a pilot enterprise for industrial worker team construction reform.
- ZTT's "High Performance Aluminum (Alloy) Conductor Series" was recognized by Ministry of Industry and Information Technology of the People's Republic of China [MIIT].

## 2021

- ZTT set up the "ZTT Scholarship", which was selected as an excellent case of social responsibility of Chinese private enterprises.
- ZTT released the plan of "green and low-carbon manufacturing", and the production energy consumption of the group decreased by 10% in the fourth quarter.

## 2022

- ZTT CE HYDROGEN CO.,LTD. was established.

1992

2008

2014

2019



# FIELD

## Information & Communication

ZTT provides cables, components, devices, antenna feeders and other infrastructure services for multi-dimensional network construction. The products include types of preforms, optical fibers, optical cables, ODN, antennas and RF cables, active terminals, optical transceivers, data centers, high-performance raw materials and other products for telecom infrastructure network, as well as engineering consulting, design, construction and integration services.



## Smart Grid

Focusing on the development of power grid, ZTT is committed to building the whole product chain of power equipment products, and aims to the safety, energy conservation, environmental protection and intelligence, provides first-class system solutions for power transmission and distribution, receiving great praise with "ZTT Serves Power Grid, Power Grid Trusts ZTT" in the industry.



## New Energy

Led with power station construction, featured with distributed photovoltaic, centered on microgrid technology, taking key materials as a breakthrough, and highlighted with large-scale energy storage system, renewable energy industry has gradually grown into a new growth pole of ZTT.



## Marine Equipment

ZTT tightly grasps the development opportunities for submarine economy involving island development, marine new energy development, undersea observation network, marine resources exploration, and marine engineering equipment, adheres to the principle of equal emphasis on offshore & onshore resources and optoelectronic integration, provides overall solutions for marine equipment, and serves the construction of Chinese maritime power.



## Intelligent Manufacturing

Adhering to the high starting point and standard positioning, ZTT not only produced high-end equipment for spare cables, optical fiber cables, wires and cables to meet domestic and overseas market demands, but also set up ZTT intelligent manufacturing alliance to deliver the "strongest brain" and optimal solutions for the enterprise's data-oriented processing, information and intelligent construction.



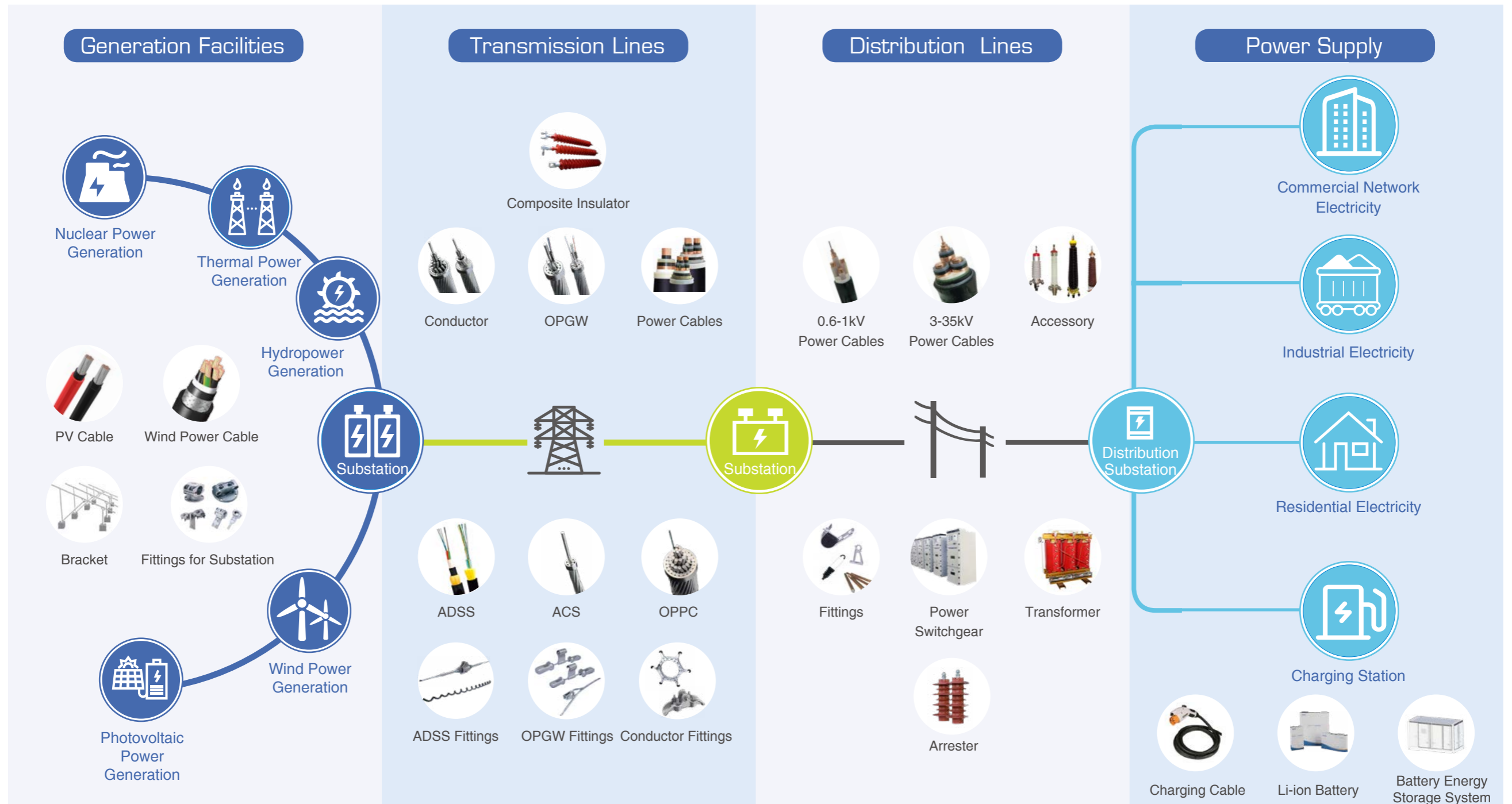
## EPC

ZTT now extends its service to Finance, Design, Supply, Installation, Testing and Maintenance, and offers EPC, EPC+F, BOO/BOT solutions.



# SMART GRID SOLUTIONS

ZTT focuses on the development of the power grid, is committed to building a whole products chain of power equipment, and aims to the safety, energy conservation, environmental protection, and intelligence, provides first-class system solutions for power transmission and distribution, and the fame titled "ZTT serving the power grid, power grid trusting ZTT" was highly rated in the industry.





# POWER TRANSMISSION LINE SOLUTION

ZTT is committed to providing power grid customers with a full range of product solutions, and actively participates in the construction of UHV projects. Among them, OPGW runs 650,000 km online. The rich product series provide you with capacity increase, energy saving and other needs. ZTT electrical fittings, optical fiber cable fittings, communication products, special electrical fittings and special optical fiber cable fittings have been widely used in more than 106 countries.



1

## Conductor



It is mainly used in overhead transmission lines, playing the essential role of electricity carrying and transmission.

3

## OPGW



It is mainly used in transmission lines, which combines the functions of grounding and communications.

5

## OPPC



It is mainly used in transmission lines, which combines the functions of phase conductor and communications.

7

## Fittings for Substation



It is mainly used in substation, and primarily used to fix conductors to equipment.

2

## Conductor Fittings and Link Fittings



The hardware fittings and accessories are designed as the connection among the conductor, tower and insulators. It can carry the mechanical and electric load.

4

## Insulator



It is mainly used in overhead transmission lines and substation, playing the role of electrical insulation and mechanical support.

6

## OPGW Fittings



The Hardware Fittings and Accessories are designed as the connection among the OPGW and tower. It can carry the mechanical and lightning load.

8

## Power Switchgear



ZTT power switchgear is a kind of electrical equipment, mainly used in power systems for power generation, transmission, distribution and power conversion process, with the function of open and close, control and protection of electrical equipment.



# DISTRIBUTION LINE SOLUTION

ZTT is committed to building a whole industry chain of power equipment products, and with the goal of safety, energy saving, environmental protection and intelligence, providing first-class system solutions for power distribution customers.




**1** **Transformer**




ZTT is an experienced and reliable manufacturer of distribution transformer. ZTT transformers always play a key role in the reliable transmission and distribution of power.

**2** **Arrester**



ZTT is an experienced and reliable manufacturer and supplier of arresters and satisfies different customers' requirements with quickest delivery time.

**3** **Fittings**



Mainly used for overhead distribution lines with voltage levels below 10kV and spans below 100 meters. This product has the advantages of simple installation, low cost, sufficient material supply, convenient branching and maintenance, and easy troubleshooting.

**4** **LV/MV Power Cables**

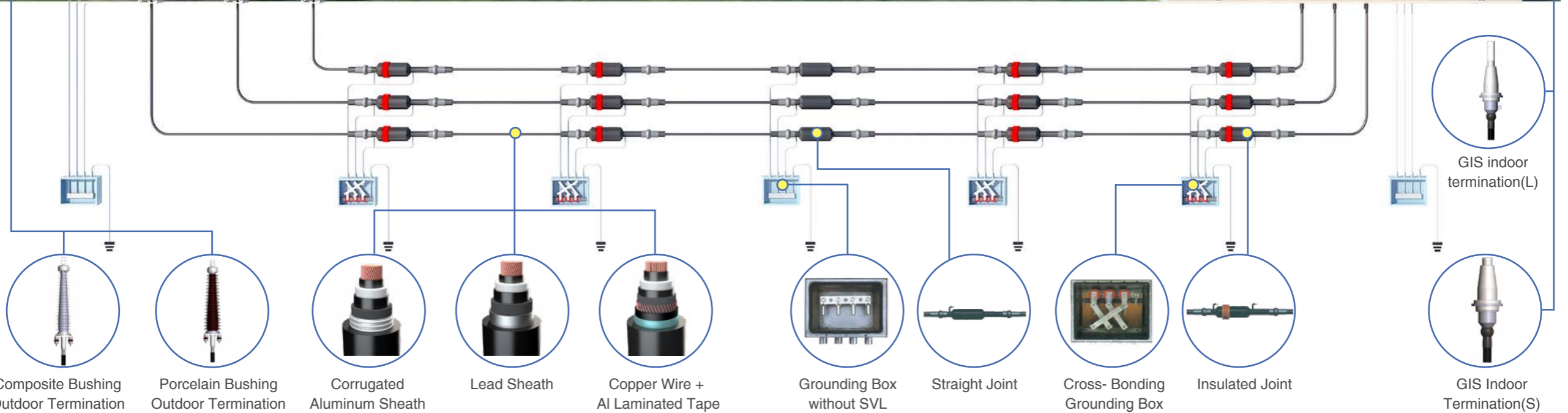


ZTT products meet the international standards of IEC series and can be manufactured according to customers' requirements of standards such as ICEA, AS, BS, DIN/VDE, etc. ZTT can also produce XLPE insulated cable with special requirements including waterproofing, anti-termites, anti-rodents, river crossing, etc.



# HV POWER CABLE SYSTEM SOLUTION

ZTT can provide 66kV ~ 500kV power system in package. The whole system includes XLPE cables, terminals, connectors and other related products. Therefore, our company has more significant advantages in 220kV and higher voltage systems.



## HV/EHV XLPE Cable

The HV cable (66kV~500kV) has the construction of a conductor (copper or aluminum, max. cross section:3500mm<sup>2</sup>) insulated with the cross-linked polyethylene(provide superior heat resistance 90℃), shielded with metallic screen (Lead sheath, Aluminum sheath or wire plus laminated tape) according to requirements, finally to be covered by extruded PVC (ST2), PE (ST7) or halogen free (ST12) sheath for anti-corrosion.

## Accessory


ZTT specializes in the design, research and development, production, supporting and construction services of cable accessories and power fittings. The product range covers up to 35kV Low voltage and medium voltage distribution networks, 66kV—220kV high voltage transmission and transformation projects, and provides comprehensive and professional services for power transmission and distribution systems.





# MARINE AND OFFSHORE SOLUTION


ZTT is an experienced and reliable manufacturer and supplier of marine and offshore cable. It has become a professional company with an annual output of about 15,000 kilometers of marine and offshore cables, and satisfies different customers' requirements with the fastest delivery time.





**1**  **Marine and Offshore LV Power Cable**  
Designed for power, circuits & control system. Suitable for use in commercial marine & offshore applications. Maximum conductor temperature is 90°C.

**2**  **Marine and Offshore MV Power Cable**  
Designed for power, circuits system. Suitable for use in commercial marine & offshore applications. Maximum conductor temperature is 90°C.

**3**  **Marine and Offshore Instrument Cable**  
Designed for instrument & control system. Suitable for use in commercial marine & offshore applications. Maximum conductor temperature is 90°C.

**4**  **Marine and Offshore VFD Power Cable**  
Designed for VFD power driver system. Suitable for use in commercial marine & offshore applications. Maximum conductor temperature is 90°C.

**5**  **Submarine Composite Cable**  
Submarine power cable are used for interconnection of offshore power fields, tidal wave locale, wind mill and offshore oil & gas platforms and also islands. The voltage for such application are usually less than 36kV AC type and typically uses the 3cores XLPE cables.

**6**  **UG Cable**  
ZTT is an experienced and reliable manufacturer and supplier of power cable. It forms about 10,000 kilometers of medium voltage power cables annual output.



# NEW ENERGY SOLUTION

ZTT is a PV system integration service provider. We provide consultation, design, system integration, EPC, O&M service and etc. for different PV system like large and media level grid tied PV plant, small on/off grid PV power system, BIPV and etc. We also provide design, manufacturing and supply the high quality facilities of PV power plant.



1

## PV Bracket



Provides various types of fixed and tracking photovoltaic brackets, which can be customized for the specific conditions of each project.

2

## PV Cable



PV cables have superior UV resistance, cold resistance, ozone resistance, hydrolysis resistance, acid resistance, salt resistance, damp heat resistance, alkali resistance, superior all-weather ability.

3

## High And Low Voltage Power Distribution Equipment



The backbone enterprise of complete sets of electrical equipment mainly produces series of products such as high and low voltage switch cabinets, communication boxes, cable trays, and bus ducts.

4

## Wind Power Cable



ZTT wind power cable meets the technical specifications (GB/T 29631-2013) of national electric wire & cable quality inspection center, which is mainly for the wind turbine generator with  $\leq 1.8/3kV$ .

5

## Lithium Ion Battery



Specially designed long-life and high-safety batteries for large-scale energy storage products, which can meet the 10-year test life of large-scale energy storage systems.

6

## Battery Energy Storage System



ZEST MUSE 1.0 Liquid Cooling System -- Mature, Universal, Safety, and Efficient four in one, brings customers more flexible and innovative energy storage solutions.

7

## 48V Battery Pack for Telecom Station



Cost effective; Long life cycle; Environmentally friendly; Easy O&M  
Main supplier of operators at home and abroad.



# EPC SOLUTION

Based on the ability of precision manufacturing for years, we extend our services to Investment, Financing, Design, Supply, Installation, Testing and Maintenance.

Now we are specializing in providing EPC,EPC+F,BOO/BOT solutions to client.



ZTT has full products chain to support the EPC project, which makes us have better ability to ensure the products cost, quality, and delivery time, etc.

ZTT has strong financing channel in China with full experience of financing, and has established stable cooperation relationship with Sinosure, banks and funds. We are glad to provide financing solution for our customers & partners.

ZTT has its own engineering and construction company, and has signed strategy cooperation agreement with different public institutes to work together for HV system engineering work. During past years, we have completed numbers of domestic and international projects.

## Typical Cases



• 230kV&115kV Transmission Line for EDC in Cambodia



• 230kV&132kV Transmission Line for PGCB in Bangladesh



• Mongolian 80MW/200MWh Battery Energy Storage System



• Engineering, Procurement, and Construction of 20MW BESS Pilot Project in Pakistan



• 155kV Submarine Cable Turnkey Work for Offshore Windfarm in Germany



• 132kV CTEB-ET Dique-ET Tolosa Underground Cable Project in Argentina



• Rudong 110 MW Photovoltaic Power Plant(BOO) in Nantong



• Philippines Telecom EPC Project



# MAIN PRODUCTS

## SPECIAL CONDUCTOR



ZTT special conductors are widely used in national key projects such as UHV, large spans, and ice zones, and are exported to more than 112 countries including the United States, Britain, India, Poland, and Turkey. ZTT special wire products have accumulated more than hundreds of thousands of kilometers overseas and have a leading global market share.

### Up-rating Conductors(HTLS conductors)

- INVAR Conductor (Patent)
- GAP Conductor (Patent)
- ACSS Conductor (Patent)
- Thermal Resistant Aluminum Alloy Conductors, Steel reinforced- TACSR

### Energy Saving Conductors

- Aluminum Conductors, Aluminum Alloy Reinforced-ACAR
- All Aluminum Alloy Conductors-AAAC (6201, 1120 Alloy Type)
- Aluminum Conductors, Steel Supported-ACSS(Patent)
- All Aluminum Conductors-AAC
- Large Cross Section Area Conductor

### Weather Resistant Conductors

- Low Noise Conductor
- Low Wind Pressure Conductor (Patent)
- Center Enlarged Conductor
- ACSR, TACSR (Shaped Outer Layer)
- Non-Specular Conductor
- Anti-corrosion Conductor
- Self-damping Conductor



## OPGW/OPPC/ADSS



ZTT Power Optical Cable is known for its high quality and excellent performance. Its products are exported to more than 140 countries and regions at home and abroad, with an online operation of 700,000 km and a leading market share.

### OPGW

It is widely used in UHV, large span, heavily ice, high altitude areas, lightning resistance, corrosion resistance, ultra-cold resistant, low loss, large capacity and other projects.

### OPPC

It is suitable for communication transformation and intelligent monitoring of lines in urban and rural networks such as 10~110kV; it can also be used for communication transformation and optical fiber monitoring of 220kV and 500kV transmission lines.

### ADSS

It is suitable for built high-voltage transmission lines, because it saves comprehensive investment, reduces man-made damage to optical cables, has high safety, has no electromagnetic/strong electric interference, and has a large span. It is favored by the majority of power system users. It is popular in the power system city network. It has been widely used in the communication construction of transformation and rural network transformation.



As one of the IEEE members, ZTT is participating in the revision of IEEE 1138 OPGW standard, and also is the drafter of IEEE 1595 OPPC standard.



## POWER CABLE

ZTT manufactures power cables and cable accessories up to 500 kV, and can provide LV, MV, HV, EHV cable solutions. Cable systems are certified through type and prequalification tests by KEMA, CESI and similar international institutions.

In 2018, ZTT successfully acquired DEMIRER KABLO factory from Turkey. DEMIRER KABLO is mainly engaged in HV and EHV power cables and accessories. As a global turnkey project contractor, ZTT can also provide laying, jointing, terminating, testing, supervision and commissioning services.



## FITTINGS/COMPOSITE INSULATOR/ARRESTER

ZTT hardware fittings and accessories has been operated online over 600,000 km in more than 100 countries up to 1000kV/±1100kV. There are 2 fittings factories in China and India. ZTT composite insulator passed the 5,000 hour test in STL laboratory. ZTT is the drafter of IEEE 1591.4 (OPPC fittings standard) and IEC 62005-9-5 (Reliability qualification for optical fibre closures /protective housing).

Hardware Fittings for OHTL (up to 1000kV/±1100kV)		Fittings for Rural Power Grid
Fittings and Accessories for ADSS/OPGW/OPPC/OFC		Composite Insulators (up to 1000kV/±1100kV)
Hardware Fittings for Substation		Surge Arresters (Up to 500kV)

ZTT got the Certification for Fittings, Insulator and Arresters:



## TYPICAL PROJECTS

ZTT takes serving the power grid as its mission, has formed a complete industry chain of power transmission and distribution, actively participates in the construction of UHV power grids and smart grids.



### OPGW

Global online operation  
≥ 700,000 km

### Conductor

Global online operation  
≥ 1,800,000 tons

### Fittings

Global online operation  
≥ 600,000 km OHL

### Power Cable

Global online operation  
≥ 50,000 km

- 1000kV Huainan to Shanghai UHV Transmission Demonstration Project (Conductor, OPGW, Fittings)
- ±1100kV Changji to Guquan UHV DC Transmission Project (Conductor, OPGW, Fittings)
- 220kV Zhoushan to the Mainland Networking Project-Crossing Sea (Conductor, OPGW, Fittings)
- EETC 500kV transmission line project in EGYPT(Conductor, OPGW, Fittings)
- 345 kV Canso Strait Crossing in Canada-Crossing Sea
- River Crossing and Anchor Towers for Haldia TPP-Subhasgram 400kV D/C Line in India (OPGW)
- 500kV Yacyreta-Ayolas-Villa Hayes Project (Fittings)
- Xiamen ± 320kV flexible HVDC system demonstration project
- Turkish Electricity Davutpasa GIS S/S – Yıldıztepe S/S 380kV Underground Cable Connection Project
- Nanjing Power Supply Company 220kV Qiteng - Gaowang line project
- Turkish Electricity Davutpasa S/S – Topkapi S/S 154kV Underground Cable Connection Project
- Interconnection of Dique substation and Tolosa substation with 132kV U/G cable project in Argentina
- ±660kV HVDC Project from Matiari to Lahore in Pakistan



# SOCIAL RESPONSIBILITY

ZTT is well aware of the significance of "Gratitude for the Source of Benefit", and is always devoted itself to public welfare, shares warmth with the community, and jointly benefits from development achievements with the society, and every action reflects the love and affection of ZTT' s people for the society.



ZTT environmental friendly green manufacturing adheres to the sustainable development strategy. In practice of corporate social responsibility, ZTT regards green manufacturing and sustainable development as the value orientation of enterprise's contribution to the society, realizes resources conservation and environment friendliness, releases the first corporate social responsibility report in the industry, and is successfully selected as the social responsibility benchmarking enterprise of communication industry in China.



## Employee Care

ZTT first established the working mechanism of "spiritual mentor for employees", which embodies the scientific management principle of "always putting people first" and gives full humanistic care to our employees.



## Charity Activities

While developing steadily, ZTT has set up a "ZTT charity fund" to actively participate in social charities, respond to natural disasters immediately. ZTT donated money and materials in the fight against snow disasters, earthquakes and other disasters, and organized engineers to provide technical assistance and support for communication power restoration.



## Gender Equality

ZTT is committed to gender equality, and understand that diversity leads to better business outcomes. We are working towards achieving gender equality in our business by creating a gender-inclusive and equitable work environment; making progress on a gender-balanced workforce, and establishing an inclusive and unbiased culture.



## Cultural Diversity

ZTT, as an international company, has been recruiting international employees from different cultural background, and implemented local construction according to the development and cultural traditions of different countries, and is committed to becoming a part of its community, earning the recognition of natives.

<p>In recent years, ZTT has been actively studying the use of renewable energy, and reducing the self-carbon footprint while reducing operating costs, realizing the goal that 20% of office energy consumption is provided by means of clean energy so far.</p> <p><b>40%</b> ↓ office power consumption supplied by solar energy</p>	<p>ZTT promotes the construction of solar photovoltaic power station, and improves the proportion of clean energy use, reducing carbon emissions to the greatest extent. Annual power generation of ZTT' s photovoltaic power stations connected to the grid has hit 447 million on average by now, the annual emission of greenhouse gas CO<sub>2</sub> can be reduced by approximate 507000 tons compared to coal-fired power stations, being equivalent to 830000 Mus of afforestation.</p> <p>Equivalent to <b>5,892,000</b> acres of afforestation</p>
<p>In the past three years, ZTT has invested 10 million USD in environmental protection.</p> <p><b>\$10</b> million investment plan for environmental protection</p>	<p>ZTT attached great importance to the protection of water resources, developed water-saving objectives, tightened the water consumption management, and improved the utilization rate of water by adjusting water consumption structure and improving water use method, avoiding the waste of water resources. In 2020, ZTT has saved 50,000 tons of water.</p> <p><b>70,000</b> cubic tons water saved annually</p>

## Charity Activities



ZTT Hope Primary School



ZTT Indonesian employees donated materials to the victims



ZTT donated power supplies for the construction of Fangcang Hospital during COVID-19 pandemic



ZTT India donated anti-epidemic funds to AP State Government Epidemic Prevention Foundation

## UN Sustainable Development Goals Addressed

