



**Connecting
Globally**

LEADING MANUFACTURER OF CABLES AND WIRES

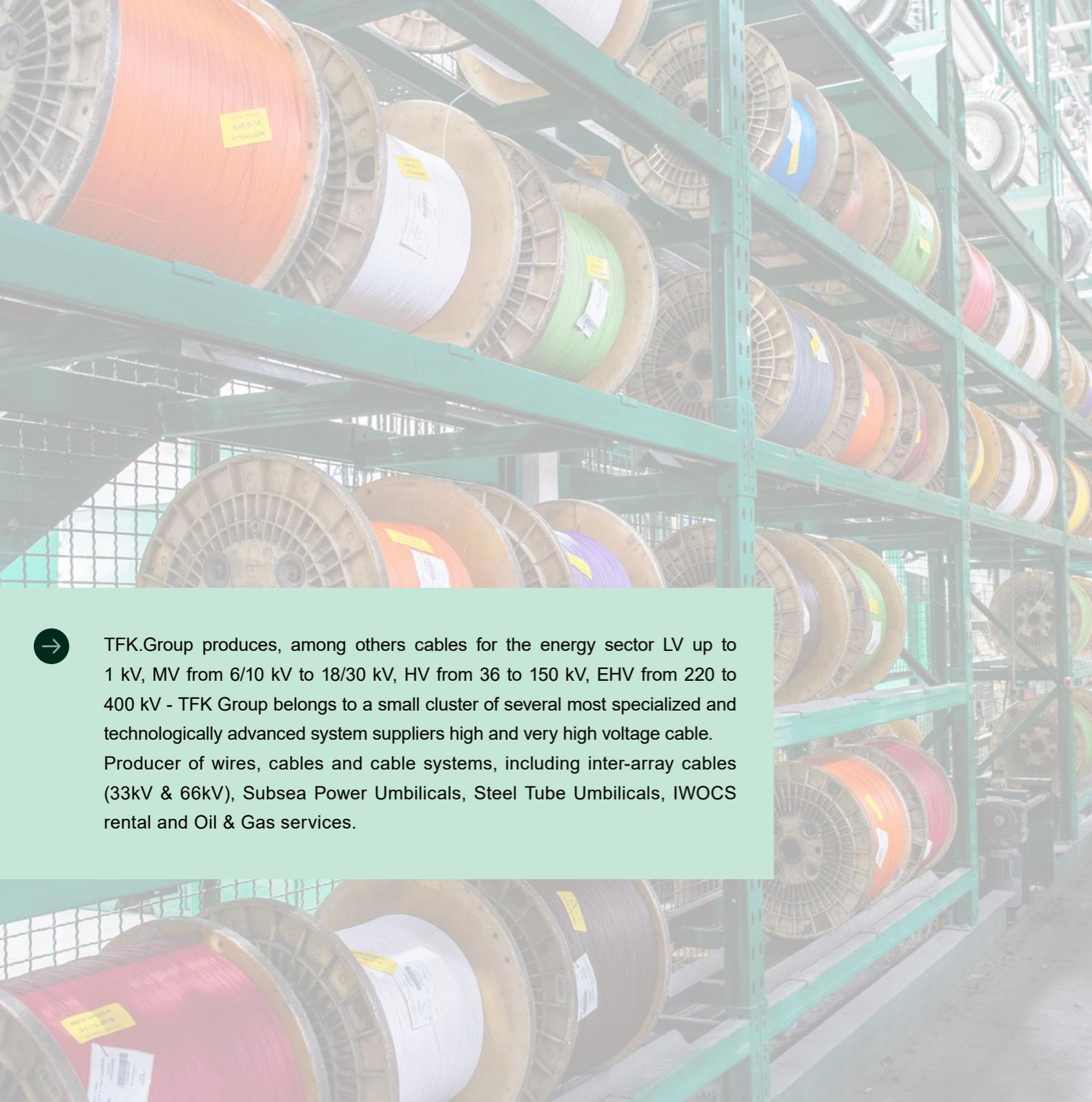


Leading manufacturer of cables and wires

TFK.Group is one of the global market leaders of wires and cable systems, with numerous trading companies and production plants located in many countries, as well as service units and research and development centers. In August 2017, TFK.Group acquired the British company JDR Cable Systems - a leading manufacturer of submarine cables and provider of offshore and onshore services for the global wind energy industry.

The portfolio of TFK.Group includes many specialized cables: copper and fiber optic, telecommunications, rubber-insulated, including mining and crane, and control cables for data transmission and for security. As well as umbilicals and IWOCS systems, subsea power cables, inter-array, dynamic and export cables, which are used in the construction and operation of offshore and onshore wind farms. The maintenance and control services provided by TFK.Group are dedicated to oil and gas and renewable energy extraction systems subsea and on land. In addition, the extensive infrastructure of research and development centers allows for qualification tests, routine tests, technological tests and fire tests. Our experience is confirmed not only by continuous supplies to electricity distribution network operators or as part of ongoing investment projects for conventional and wind farms, but also by positive results of production process audits carried out by the most renowned certification bodies.

JDR Cable Systems is a global leader in subsea production umbilicals, subsea power cables and Intervention Workover Control Systems for the offshore oil and gas industry. JDR operates in harsh, dynamic, subsea environments and is a pioneer in the development of cutting-edge inter-array power cables for offshore wind, wave and tidal energy projects.



→ TFK.Group produces, among others cables for the energy sector LV up to 1 kV, MV from 6/10 kV to 18/30 kV, HV from 36 to 150 kV, EHV from 220 to 400 kV - TFK Group belongs to a small cluster of several most specialized and technologically advanced system suppliers high and very high voltage cable. Producer of wires, cables and cable systems, including inter-array cables (33kV & 66kV), Subsea Power Umbilicals, Steel Tube Umbilicals, IWOCS rental and Oil & Gas services.



→ **100 years of the Bydgoszcz Plant, TFK.Group 1920-2020**

On 11 November 1920, the cornerstone laying ceremony for the Bydgoska Fabryka Kabli “Kabel Bydgoszcz” was held on a plot located between the Bydgoszcz-Fordon road and the Brda River which commenced the history of one of the most recognizable cable factories in Poland.

In June 1923, the plant made its first production of 200 km of cables and 30 km of various conductors. A year later, the factory was already producing power 1 kV and 6 kV cables with paper insulation, and telephone cables. Over the next decades the plant has been increasing its product range, introducing numerous innovations and following the market trends, providing power cables to such projects as Heathrow Airport, Channel Tunnel, Wembley Stadium, mines in Peru and Chile and the National Stadium in Warsaw.

Learn more:
bydgoszcz.tfkable.com
[#100YearsOfTheBydgoszczPlant](https://twitter.com/100YearsOfTheBydgoszczPlant)



Key data & facts

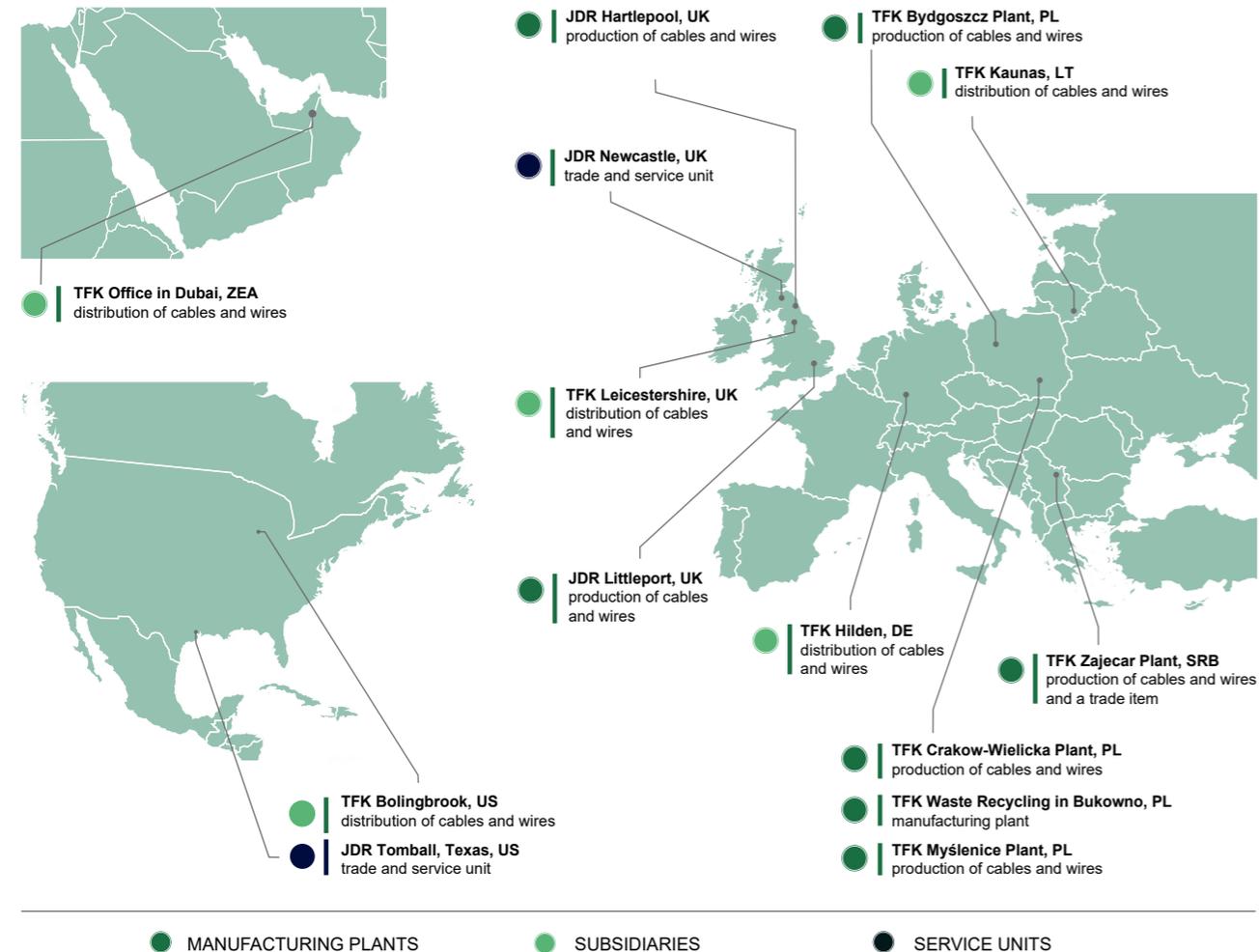
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|---|--|--|
| 100% Polish capital | over +25,000 types of wires and cables | 40%* market share in Poland |
| 8 manufacturing plants 6 trading companies 2 service units | No 1 the largest cables and wires manufacturer in Eastern Europe | > 500 production lines |
| 4.* place on the European market Among technologically advanced cables and wires manufacturers | almost 1 bn € annual revenue | 5.* place among rubber cables manufacturers in the world |
| Present in more than 80 countries | 359 international certificates | One of the top 25 Polish exporters |

* management estimations

Production & distribution

– locations

global relations



Kraków - Wielicka Plant, Poland

one of the biggest cable factories in Poland. It manufactures power cables and wires, including rubber insulated cables and wires applicable in the mining industry and in the offshore and onshore wind farms. As one of the few European manufacturers, the plant is a supplier for mines located in the US, Canada, South America, and Africa. Its offer also includes specialized cables for applications in the railway and shipbuilding industry.

Bydgoszcz Plant, Poland

the oldest cable and wire factory in Poland and the biggest production center of medium, high and extra-high voltage cables in Europe. Together with the plants in Littleport and Hartlepool, it belongs to the elite group of direct suppliers of complete solutions for the offshore electricity industry.

Myślenice Plant, Poland

production of fiber optic and telecommunication cables, computer cables and car cables.

Zajecar Plant, Serbia

production of Al and Cu wires, low and middle voltage cables, signaling and control cables, telecommunication cables, as well as halogen-free cables and wires and car cables.

Waste Recycling Facility in Bukowno, Poland

it has the recycling capacity of approx. 10 thousand tons of cable waste per year. This allows for the recovery of fractions from individual materials with purity of over 99.5%

Littleport Plant, UK

design and engineering services, IWOC, Subsea Production Umbilicals and Power Cables up to 100 t production. The plant has specialized research facilities.

Hartlepool Plant, Victoria Dock, UK

the biggest JDR production plant with specialized designed teams. Strategically located on the quay, next to the port on the North Sea. A plant with an area of 20,000 m², commissioned in 2009, supplying and producing Subsea Production Umbilicals, Subsea Power Cables and Inter-array Cables. Modern infrastructure of the machine park provides flexibility of the large-size cables production process.

28th September 2021, JDR has confirmed its intention has plans to open a new state-of-the-art subsea cable manufacturing facility in Cambois, near Blyth, Northumberland, with construction expected to begin in 2022 ahead of a 2024 opening, creating 170 high-quality local jobs in the UK. The initial project investment will be part-funded by a grant from the BEIS Offshore Wind Manufacturing Investment Support (OWMIS) scheme.

The new facility is the first stage of JDR's plans to expand its product portfolio to support the growing global renewable energy market, adding high voltage export and long length array cables to its existing capacity and product capabilities. When complete, the facility will include a new catenary continuous vulcanization (CCV) line, making it the only facility in the UK capable of full start-to-finish manufacturing of high voltage subsea cables for offshore wind farms to support the growing global.

We provide innovative and safe solutions for industry

TFKable manufactures:



low voltage cables



electroinstallation wires



fibre optic wires



medium voltage cables



signalling (controlling) cables



rubber cables and wires



high and extra-high voltage cables

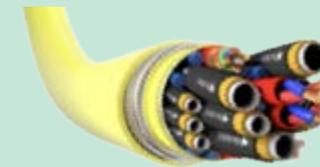


copper telecommunication cables

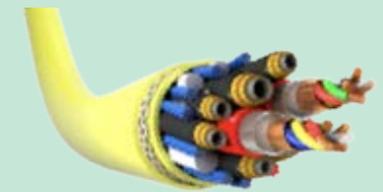
JDR's cable production covers:



subsea power cables
used in offshore wind farms



subsea production umbilicals
used in the oil & gas industry



Intervention Workover Control Systems (IWOCs)
offshore services in oil & gas and renewable energy sectors

TFK.Group's innovative solutions



FLAMEBLOCKER 750V HDX(P)

is a product that meets the fire safety requirements in compliance with the EN 50575 standard with a positive fire reaction test result within the Dca-s2,d1,a1 class, in compliance with the CPR Regulation. The material used to manufacture the LSOH (Low Smoke Zero Halogen) coating guarantees limited smoke emission during fires and a low corrosive gas emission rate, above 4.3 pH.



TYPE THOF ENHANCED

the shore-to-ship power cable is a solution that provides safe mooring for ships in the port. In this way, it reduces exhaust emissions, enabling engines to be shut down, while maintaining business continuity through a portable power system.



FLAMEBLOCKER N2XH

is a zero halogen power cable, from the FLAMEBLOCKER product line. It is a non-fire spreading, with low emission of toxic, aggressive and corrosive gases and limits the emission thick smoke in the event of a fire in cable installation locations. In case of N2XH cables, cross-linked polyethylene (XLPE) was used as conductor insulation and a halogenfree thermoplastic (LSOH) as outer sheath material. As a result, N2XH is designed for installation in buildings specifying the highest fire-protection standards, especially where the safety of people and property is the critical requirement.

66 kV (72.5 kV) cable development

66 kV cable technology is critical to support the offshore wind industry as it moves to increased power transmission between turbines at higher capacity offshore windfarms. Such 66kV cables have already been supplied by JDR and TFKable and deployed on projects such as East Anglia One (the world's first commercial application of 66kV cable technology) and Windfloat. They are now becoming standard in the next generation of wind farms.

Damped AC test unit

this new technology is added to our range of capabilities to support the high voltage power cable market. This unit will shortly be making its way offshore to test substation interconnector cables on a large Scottish offshore wind farm.



Electric Down Line (EDL)

equipment is used primarily for subsea testing on new subsea installations and older assets, checking for insulation resistance and electrical fault finding. We have added this new equipment to our rental fleet.



High Voltage Cable Repair Jointing Habitat

is designed for providing a clean environment for critical high voltage jointing operations. It can be configured as a pair or singularly on the vessel back deck to minimise the need for hazardous cable movements by allowing the container to be placed on top of the cable being repaired, creating a clean and stable environment.



In 2021, a research and development project, conducted at the Kraków-Wielicka Plant since 2018 in cooperation with the West Pomeranian University of Technology, will end. The project was aimed at implementing the production of improved flame retardant cables, manufactured with the use of a new type of halogen-free materials with advanced properties. The results achieved in the form of fire-resistant cables manufactured with the use of LSOH compounds using the synergy of hallosite fillers (nanotubes), layered aluminosilicates, and metal hydroxides and oxides meets the requirements of the CPR and international standards, such as the range of the highest B2ca, s1, d0, a1 class.

Research & Development facilities and service units

→ Fire Test Laboratory in the Krakow-Wielicka Plant, Poland

equipped with apparatus that enables conducting research ranging from basic tests of flame spreading on individual samples to flame spreading tests on bundles. Furthermore, it is equipped for testing density of emitted fumes and emission of corrosive gases.

→ Extra High Voltage Laboratories at the Bydgoszcz Plant, Poland

equipped with 5 Faraday cages for routine testing, type testing and cable systems testing) along with an impulse generator and its own prequalification (PQ) tests field with 500 kV test system and sets of 5000 A heating transformers.

→ Tomball Service Center, TX, US

assembly, integration and testing of umbilicals, reelers and associated packages. The unit provides technical support for projects mainly in the Gulf of Mexico, and for offshore commissioning, testing and repair work at sea.

→ Newcastle Service Center, UK

the multi-functional research and development center includes workshop and warehouse. The unit also serves as the central one base for JDR's service activities in Europe and the Asia region and the Pacific.



Sales sectors

Unique features of the TFK.Group's products

Mining

- safe and reliable operation in a challenging environment
- resistant to high temperature, humidity, UV radiation
- resistant to tearing and abrasion, twisting, bending, water, oils and other chemical substances
- flame retardant
- ensuring the continuity of underground work and on the surface
- visible from a considerable distance (reflective cables)



High voltage

- security
- error-free energy transmission
- reliable water blocking design, sealing
- meeting the requirements of high current carrying capacity



Telecommunication

- wide application - to be installed in cable ducts or directly in the ground
- reinforced construction preventing mechanical damage
- high-performance
- durable
- resistant to flame spreading



Construction

- flexible
- non-spreading flames, gases and fumes
- very good identification (spatial-graphic marking)
- easy to process - separating thread
- durable - high-quality insulation
- anti-rodent barrier
- torsion resistant and able to work in low temperatures



Energy and Railway

- durable
- resistant to extreme working conditions
- guaranteeing safe operation
- resistant to mechanical damage
- resistant to flame spreading and gas emissions



Key offshore and onshore projects 2019-2020

Realized

Changhua, Tajwan

At the end of March, JDR, together with TFKable, completed the delivery of 2020 submarine power cables and for Jan De Nul Group for the Taiwan Power Company's Offshore Wind Farm Phase 1 (Changhua) project.



Anyala & Madu, Nigeria

ANYALA & MADU PROJECT, launched in 2019 at plants in Littleport, Hartlepool and Bydgoszcz, at the end of April 2020, allowed for the safe loading of 23.7 km of umbilical cables to five oil wells in Nigeria



Kriegers Flak, Dania

At the beginning of 2021, the production and delivery of 170 km of 33 kV inter-array cables with an aluminum core and JDR accessories for the Kriegers Flak wind farm project will be completed. Additionally, TFKable will provide cores for inter-array cables with an aluminum core - production at the Bydgoszcz Plant began in October 2019.



Running

Moray East, Szkocja

Contract with Boskalis to provide termination and testing of 100 array cables and two cables connecting marine substations. This is an additional order of 200 km of 66 kV cable and a range of termination accessories that are currently manufactured by JDR.



The Elgood Field, Wielka Brytania

JDR will provide 9.3km production and control umbilicals, topside equipment and submarine termination for Elgood Field on the UK continental shelf.



Azeri Central East (ACE), Azerbejdżan

JDR will manufacture and supply 5.5 km of 33kV fiber optic power cable and steel tube subsea isolation valve (SSIV) umbilical for the platform project off the coast of Azerbaijan.



Selected key projects in 2020

One of the three key areas of our activity is the implementation of onshore and offshore projects.

The development of the offshore and renewable energy sector, focusing on the international market of alternative and renewable energy is one of the priorities of TFK.Group. This is in line with the implementation of the Sustainable Development Goals (SDG) and the goal of the European Climate Policy, which assumes a reduction in greenhouse gas emissions by 40% by 2030 (compared to the 1990 level) and ensuring at least 27% the share of renewable energy in the EU.



Since 2008 we completed:

42 projects in renewables sector

9,330 km of cables.

- A** Kajave Stromsö-project
390km utility cables (Finland)
- B** Wind Parks Dębsk, Dobrzyca and Biały Bór
5 540km of MV cables and 45km of 110kV cables (Poland)
- C** Wind Parks Dunowo
230km of MV cables and 100km of 110kV cables (Poland)
- D** Project Stadi Domnesti
110kV cables and accessories (Romania)
- E** Projekt Pivdennyi Elektrotekhnichniy Zavod
MV cables (Ukraine)
- F** Vareo Towar office building complex
Flameblocker cables (Poland)
- A** Kriegers Flak
70 km of 33kV cables (Denmark)
- B** Moray East
196 km of 66kV cables (Scotland)
- C** MERMAID & SEASTAR OWF
78 km of 66kV cables (Belgium)
- D** London Array
32 km of 33kV cables (Great Britain)

* according to internal data

We provide reliability through demanded quality



The only modern **Polish Fire Test Laboratory** that allows conducting tests of flammability for cables and wires.



ERCONET Media Management System that enables the analysis and effective management of energy utilities



Circular economy at the Recycling Department Cable Waste in Bukowno, Poland, thanks to which we recover fractions with a purity of over 99.5%.



Modern Quality Control Laboratories equipped with specialized control and measurement devices.



Fully automatic **Im320 E mixer** designed for the production of rubber compounds.



Usage of 80% of waste heat from the operation of compressors for hot water heating.



Introducing plastic tape into multi-core cable constructions – limiting particle emissions during multi-core cable production.



Withdrawal of paper insulation cables and lead coating – elimination of lead emissions and reducing the amount of hazardous lead waste.



Introducing single-phase mixes – a decrease in energy costs, a decrease in rubber mix waste by 50%, a decrease in fuel use, and fuel emissions.



Withdrawal of ETU from polychloroprene mixes – introduction of compounds without this harmful substance.



THINK SAFETY and THINK SAFETY programs assuring the highest risk management standards concerning health, safety and environment.



TFKable Academy – training programs for employees and external specialists. In 2019 we trained nearly 2100 people.



KAIZEN, TPM, SMED, 5s (6s) - implemented tools for continuous improvement of operational processes. In 2019, more than 300 improvements were reported, increasing production safety and quality.

THINK SAFETY

THINK QUALITY



TFKable products meet 100% of the CPR requirements

| | | |
|---|---|--|
|  <p>Declaration of Performance (DoP) compliance with all the CPR regulations</p> |  <p>Successful passing of all the required production process audits</p> |  <p>Implementation of new labels in accordance with the requirements of the CPR Directive</p> |
|  <p>Implementation of CE marking on products</p> |  <p>Over several hundred flammability tests at the Fire Test Laboratory</p> |  <p>Reduction in use of PVC material in higher class products</p> |
|  <p>Introduction of a uniform classification of cables and wires produced by TFKable</p> <p>    </p> |  <p>Introduction of full range of products in various classes of reaction to fire</p> | |

We have appointed a team of specialists, who will provide the necessary explanations and answer any questions that may arise in connection with the changes resulting from the CPR regulation. More information: cpr@tfkable.com

Since 2019, TFKable, together with members associated in Europacable, is leading an educational and information campaign "Fire safety is our responsibility. Yours Too!" related to the Construction Products Regulation (CPR). In the summer of 2020, another edition of the campaign began - "Inside CPR". In addition to educational resources the site at cpr.europacable.eu/pl also contains a free training program "My CPR coach"

Quality connects us



We have 359 quality certificates granted by 42 certification centers from around the world.

On a yearly basis our Technology Department

| | | |
|---|---|--|
| conducts  30 development projects related to new product groups | creates  2000 indexes | conducts  1000 trial productions |
|---|---|--|

*according to internal data

We provide innovative and safe solutions for industry on the local and international markets.

We cooperate with significant industrial and scientific partners – with their help we provide reliability.

Europacable, BCA, ICF, PSEW, CIGRE, PIGE EDA, BSI, CMPS, LEA, ACI, PPC, PTMEW

Environmental protection



ISO 14001

standard implemented
at TFKable and JDR



9,300+km

of sealed cables delivered to
offshore wind farms



6,131.2 tCO₂e

Total Scope 1 GHG emissions
at TFKable



966,260 kgCO₂e

Total Scope 1 GHG emissions
at JDR



1,11 MWh/tonne

TFKable energy intensity
indicator



6,847%

percentage of water reused at
TFKable



Recycling

key disposal method
at TFK.Group



More than

45%

of new suppliers audited

*according to internal data