

Corporate Presentation



February 2017

HELLENIC CABLES S.A.
HELLENIC CABLE INDUSTRY S.A.

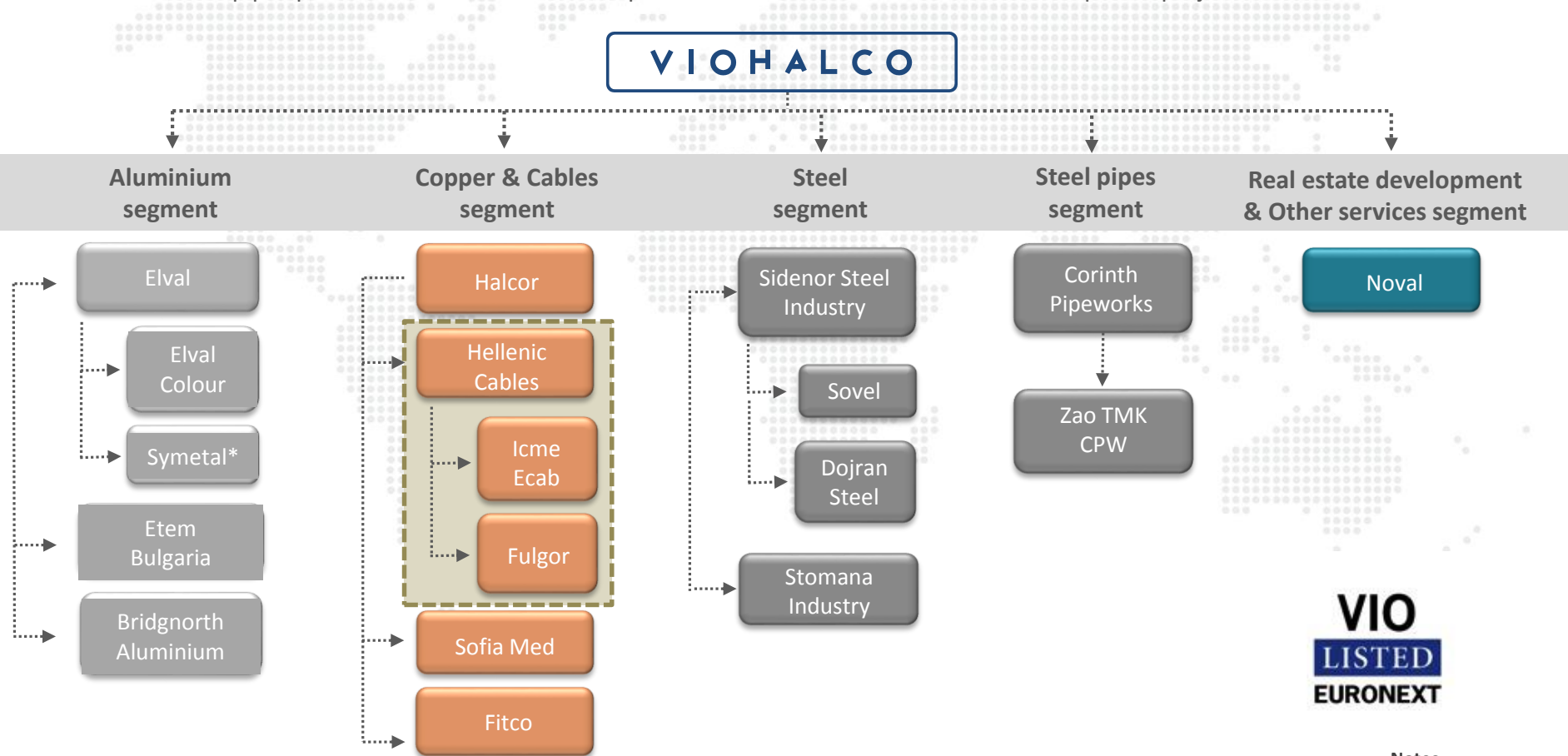
FULGOR S.A.
HELLENIC CABLE INDUSTRY

ICME ECAB S.A.
CABLE INDUSTRY

Cablel Hellenic Cables Group represents the cables manufacturing segment of



Viohalco a publicly traded company (Euronext Brussels and Athens Exchange: VIO) based in Brussels, Belgium, is the holding company of various metal processing companies in Europe. With production facilities in Greece, Bulgaria, Romania, Russia, FYROM and the United Kingdom, Viohalco's subsidiaries specialise in the manufacture of aluminium, copper and cables, and steel and steel pipes products. Viohalco and its companies are also active in real estate development projects.

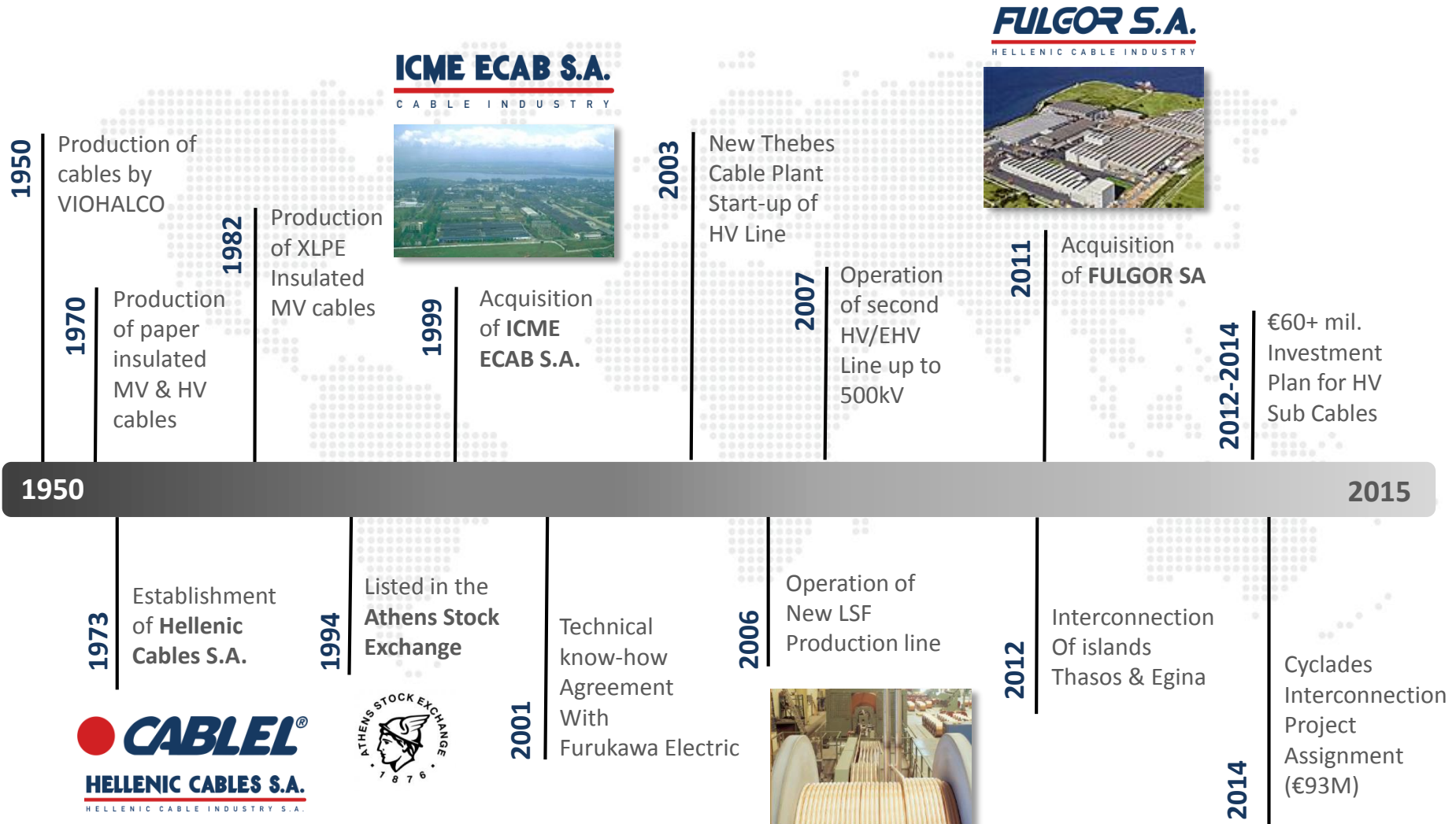


Notes

* Business Unit

- Viohalco is listed on Euronext Brussels and Athens Exchange
- Halcor, Hellenic Cables and Corinth Pipeworks are listed on Athens Exchange

A long history of successful growth





Production Facilities and Warehouses



FULGOR Cable Plant

Corinth

- Cable Producer since 1957
- Vertical Integration through production of copper and aluminium wire Rod
- Docking facilities for loading submarine cables onto cable laying vessels
- Capacity of 50,000 tons cables and 120,000 tons wire rod approximately
- 150 production personnel
- Production capabilities
 - LV power cables
 - MV power cables
 - HV cables since 1995
 - Fibre optic submarine cables since 1992
 - Submarine MV cables since 1972
 - Upgraded for HV submarine cables (AC up to 220KV / DC up to and exceeding 320kV)



Hellenic Cables Enameled Wire Plant

Livadia

- 14,000 tons capacity
- 50 production personnel
- 121,818m² land / 14,048m² industrial complex
- Production capabilities
 - Cu round and flat
 - Al round and flat



Hellenic Cables Thiva Cable Plant,

Thiva

- 60,000 tons Capacity
- 245 production personnel
- 175,082 m² land / 44,408m² industrial complex
- Production capabilities
 - LV power cables
 - MV power cables
 - HV power cables
 - EHV cables up to 500kV
 - Fiber optic cables



Hellenic Cables Compound Plant,

Oinofyta

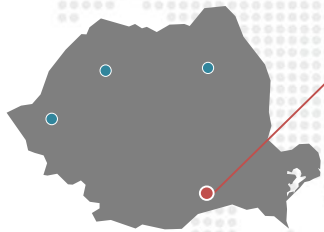
- 20,000 tons capacity
- 30 production personnel
- 21,263m² land / 6,444m² industrial complex
- Production capabilities
 - PVC compounds
 - Rubber compounds



- Production facility
- Warehouse

Production Facilities and Warehouses

ROMANIA



ICME ECAB Cable Plant
Bucharest

- Cable producer since 1949
- Acquired by Hellenic Cables in 1999
- 50,000 tons capacity
- 500 production personnel
- 268,000 m² plot of land
- Industrial complex of 70,000 m²
- Production units
 - Wire drawing
 - Power cables
 - Telecommunication cables
 - Rubber cables
 - PVC & Rubber compounds
- 550 employees
- Over 2,000 business partners

● **Production facility**
● **Warehouse**

BULGARIA



LESCO
Sofia

- Packing materials production
- Wooden drums for cables
- Scrap drums & pallets recycling



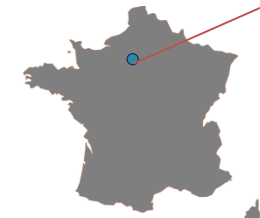
U.K.



METAL AGENCIES
London

- Cable Outlet

FRANCE.



GENECOS
Paris

- Cable Outlet



Wide Product Range

Power cables



- High and Extra-High voltage cables
- Medium voltage cables
- Low voltage cables

Markets

- Power transmission & Distribution
- Construction and infrastructure
- Renewable energy

Submarine cables



- HV & EHV submarine
- MV submarine cables
 - Paper Insulated
 - XLPE, EPR Insulated
 - Composite Power and Optical Fibre
- Optical Fibre Submarine

Markets

- Renewable energy
- Oil & Gas

Telecom cables



- Telecommunication Network Cables
- Optical Fiber Cables
- Data Transmission Signaling, Instrumentation and Control Cables

Enameled Wires



- Magnet / Enameled Wire for Transformers
- Magnet / Enameled Wire for motors
- Al and Cu Round and flat magnet Wires

Compounds



- Compounds for Cables
- Compounds for other industrial applications

Certifications

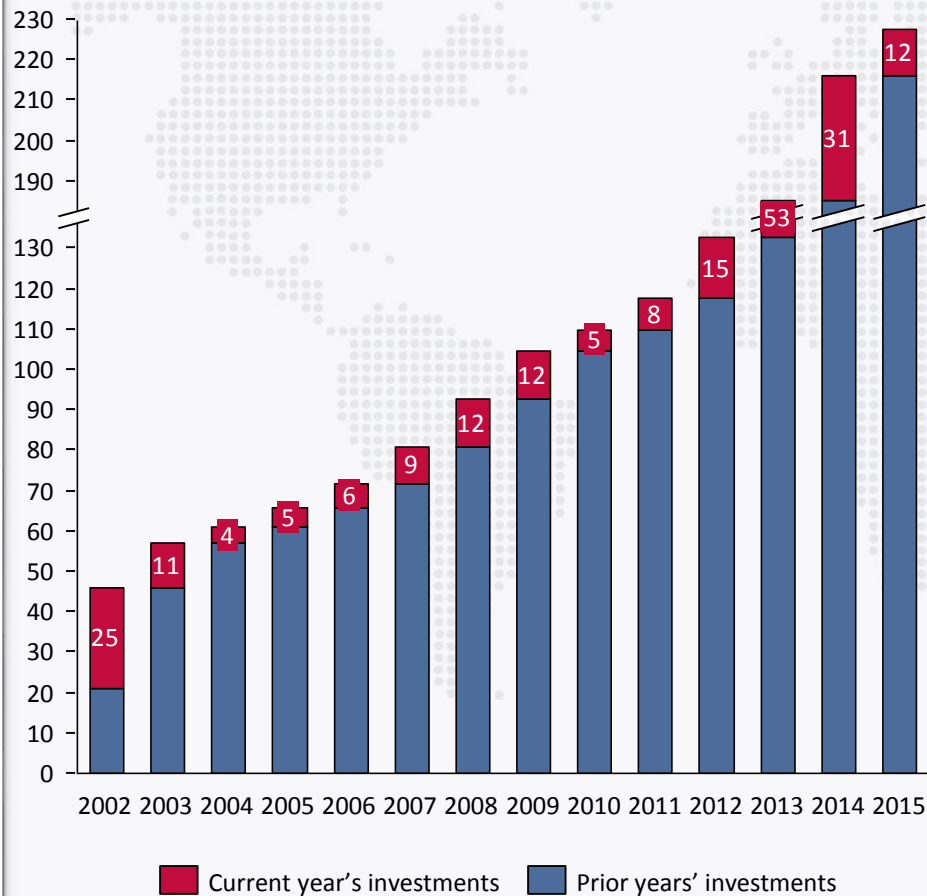


AENOR

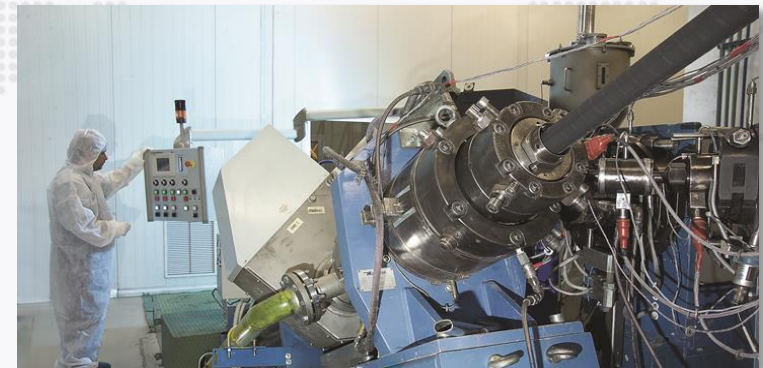


Group's expansion is fueled by ongoing CAPEX which has reached €228 mil. since 2002

Investments (Amounts in million euros)



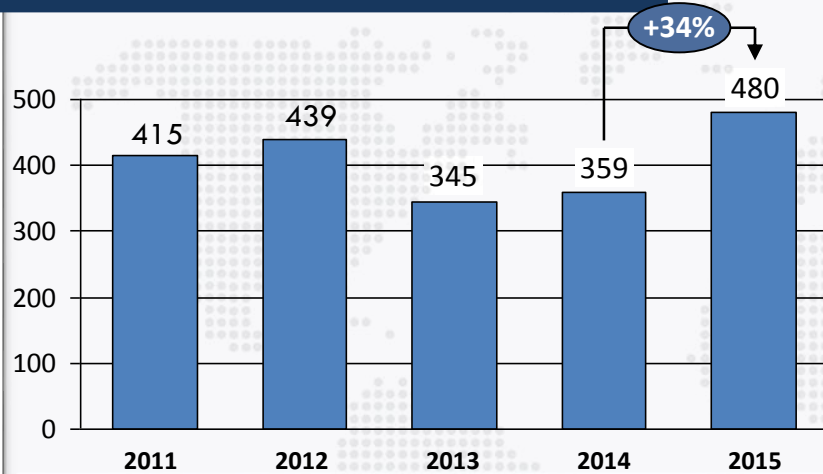
- Significant investments for the period 2002-15 focused on:
 - **productivity improvement**
 - **cost savings**
 - **capacity increase**
 - **product differentiation**
(increased production of MV cables, production of value added products such as HV/EHV cables)
- **Milestone investment for production of High Voltage Submarine Cables in FULGOR to the amount of € 65 mil.**



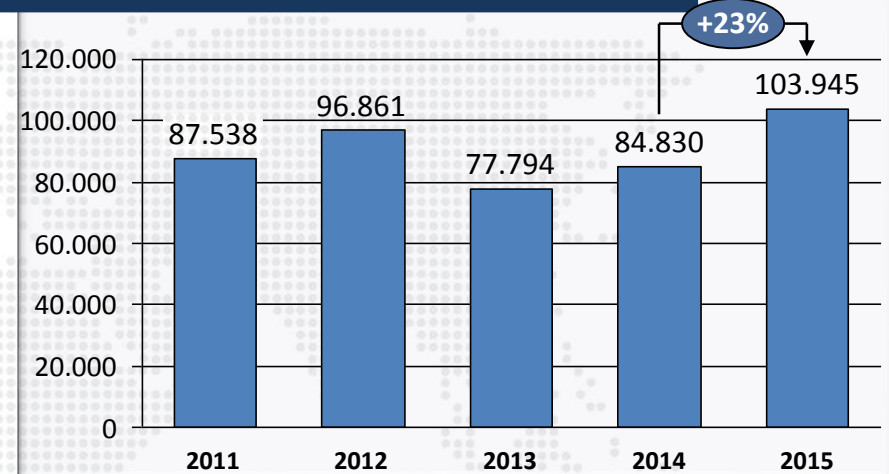
Evolution of Group Turnover

Sales Increase, driven by value added products

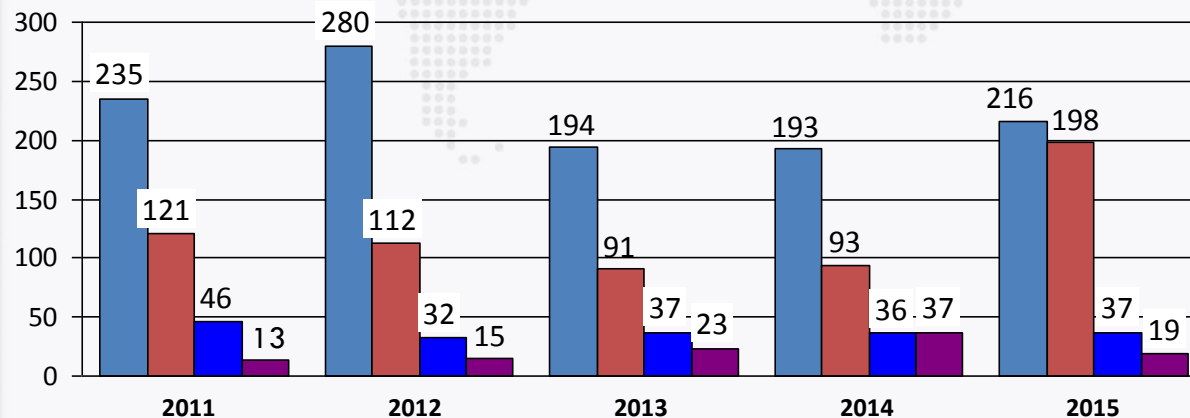
Evolution of Group Turnover (mil. €)



Evolution of Group Turnover (tons)



Evolution of Group Turnover by Market (mil. €)



Prompt Market Diversification as a response to reduction in domestic demand and market attractiveness

- EU
- Greece
- Romania
- Asia, US and Rest

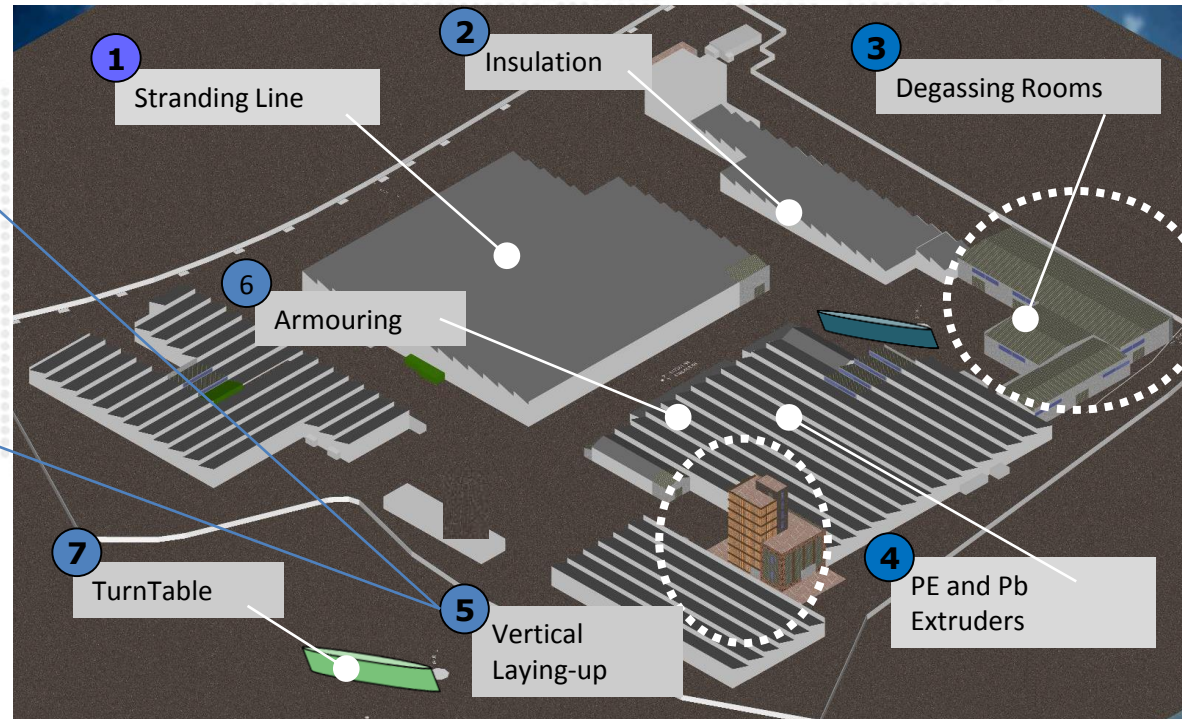
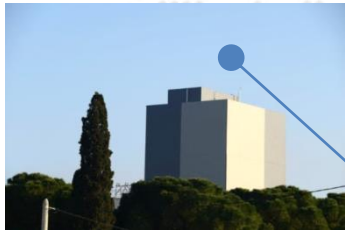
Submarine Cables up to 400 kV



After acquisition, the Group launched an extensive investment plan in order to upgrade and extend Fulgor's manufacturing and testing capacities

Production and Testing of XLPE insulated submarine cables up to:

- 400 kV for AC 1c – 3c
- 400 kV for DC



Main New Equipment / Upgrades in HV Submarine Cable Production Process



1. In-house Rod Production

- In-house continuous Cu casting for production of 8mm Cu rod
- In-house continuous Al casting for production of 9.6mm Al rod



2. Conductor Formation

- Line upgrade
- New basket take up for storage of long continuous conductor lengths before insulation



3. Insulation

- Line and quality control upgrades in both insulated lines
- New granule feeding system for extra cleanliness of insulating material with on line granule quality control

Main New Equipment / Upgrades in HV Submarine Cable Production Process



4. Degassing

- New degassing chambers
- The insulated cores are coiled on turn tables which are placed inside the degassing chambers
- During this process the chambers are heated and warm air recirculates for the time required to complete the degassing of the insulation, thus removing all gaseous by-products



5. Pb & PE Sheathing

- Upgraded sheathing lines
- After degassing, the cores are covered first with semi-conductive water blocking tapes and by a Pb alloy sheath of a suitable composition and thickness to achieve radial protection against water penetration
- The Pb sheath is applied with a continuous extrusion process. It is followed by a semi-conductive PE sheath

Main New Equipment / Upgrades in HV Submarine Cable Production Process



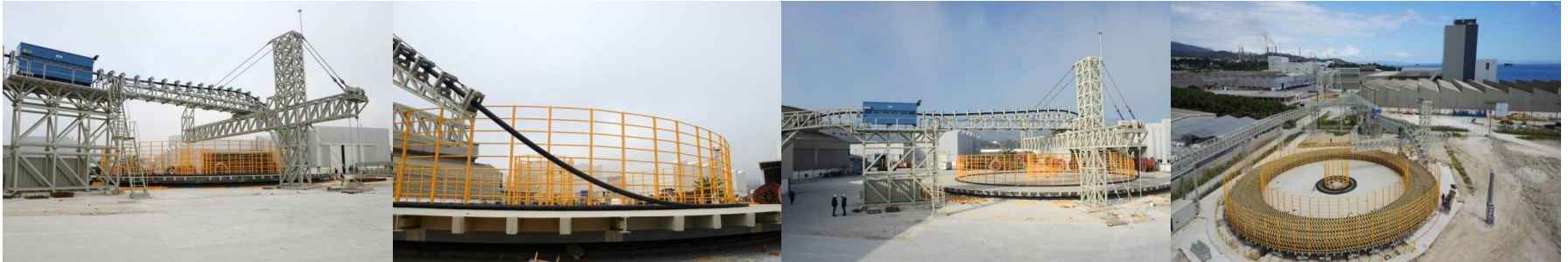
6. Vertical Laying up

- *New vertical laying up line*
- The cores which are placed on turntables are paid off upwards along the optical fibre units and control cables (If applicable), they pass through the stranding die, the capstan and the bundled cable is coiled on the intermediate turntable
- The turntables of the line have the largest capacity for carrying the maximum length of the power cores, in order to avoid or minimize the number of factory joints in the final cable
- If factory joints are required they are constructed for each core. This way one core length is jointed to the core length that follows. Jointing takes place before the standing process and until the final cable length is achieved

7. Armouring

- *New armouring line*
- After laying up, various protective layers are applied to the cable, mainly for its mechanical protection such as steel wires, bitumen, PP yarns, etc.
- All the above layers are applied at the armouring line and the finished cable is collected on the final turntable

Main New Equipment / Upgrades in HV Submarine Cable Production Process



8. Storage

- Intermediate and final storage of the HV submarine cables take place on turntables

- New intermediate and final storage turntables with highest storage capacity

- New roller ways to route WIP and finished cables to the turntables and to the loading point at Fulgor factory port

HV Submarine Cables Quality Control



9. Quality Control

- New testing facilities
- Testing takes place during all the above mentioned intermediate production phases and on the finished product

- The factory is equipped with new testing facilities in order to perform prequalification and type testing

- As there is no standard covering all tests on high voltage submarine cables, the equipment and tests are based on IEC 60840 and CIGRE recommendations / ELECTRA (No171 April 1997, No189 April 2000) or their most recent editions

Type Test Programme

EHV Qualifications:

- System PQ test at 220 kV completed in September 2016
- System type test at 220 kV completed in May 2016
- Extension PQ test at 220 kV in September 2016

HV Qualifications:

- Cable type tests at 150 kV with several cable constructions
- Continuous type testing according to specific customer requirements.

Type Test 150 kV - Completed

- A. 3x300 mm² CU/XLPE/PB/SC PE/PPY/SWA/PPY with two integrated FO units**
 - ✓ Type test included two flexible joints (two for the power cores and one for FO unit)
 - **Completed in May 2014**

- B. 3x300 mm² CU/XLPE/PB/SC PE/PPY/DWA/PPY with three integrated FO units**
 - ✓ Type test included four flexible joints (two for the power cores and two for the FO units)
 - **Completed in June 2015**

- C. 3x300 mm² CU/XLPE/PB/SC PE/PPY/DWA/PPY with three integrated FO units**
 - ✓ Type test included repair joint (active parts of the power cores from Pfisterer AG)
 - **Completed in July 2015**

All type tests were performed according to Cigre TB 490 & TB 623 and IEC 60840 standard.

Type Test 220 kV - Completed

A. 3x1600 mm² CU/XLPE/PB/SC PE/PPY/SWA/PPY with two integrated FO units

✓ Type test included three flexible joints (one for the power cores and one for FO unit)

➤ Completed in November 2015

B. 3x1600 mm² CU/XLPE/PB/SC PE/PPY/SWA/PPY with two integrated FO units

✓ Type test included repair joint (active parts of the power cores from Pfisterer AG)

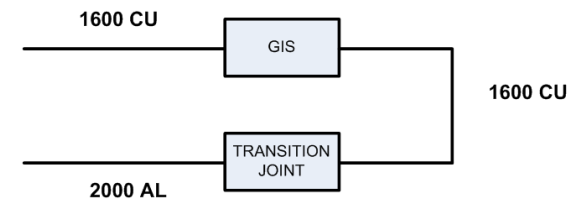
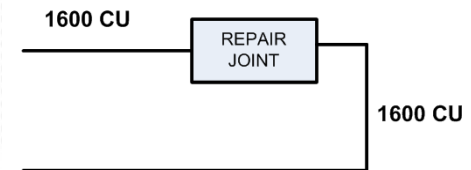
➤ Completed in July 2016

C. 3x1600 mm² CU/XLPE/PB/SC PE/PPY/SWA/PPY with two integrated FO units

✓ Type test included:

- Underground cable 1x2000 mm² AL/XLPE/CWS/HDPE
- Outdoor terminations (Pfisterer)
- Transition joint (Pfisterer)
- GIS back to back joint (Pfisterer)

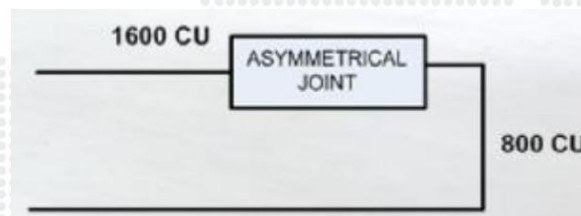
➤ Completed in July 2015



Type Test 220 kV - Completed

D. 3x1600 mm² CU/XLPE/PB/SC PE/PPY/SWA/PPY with two integrated FO units

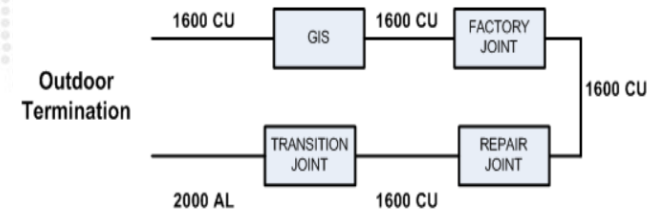
- ✓ Type test included:
 - Submarine cable 3x800 mm² CU/XLPE/PB/SC PE/PPY/SWA/PPY
 - Three asymmetric flexible joints for the power cores
- All mechanical and electrical tests (according to CIGRE TB 490 & TB 623 and IEC 62067) successfully completed in September 2016



All type tests were performed according to Cigre TB 490 & TB 623 and IEC 62067 standard.

PQ Test 220 kV - Completed

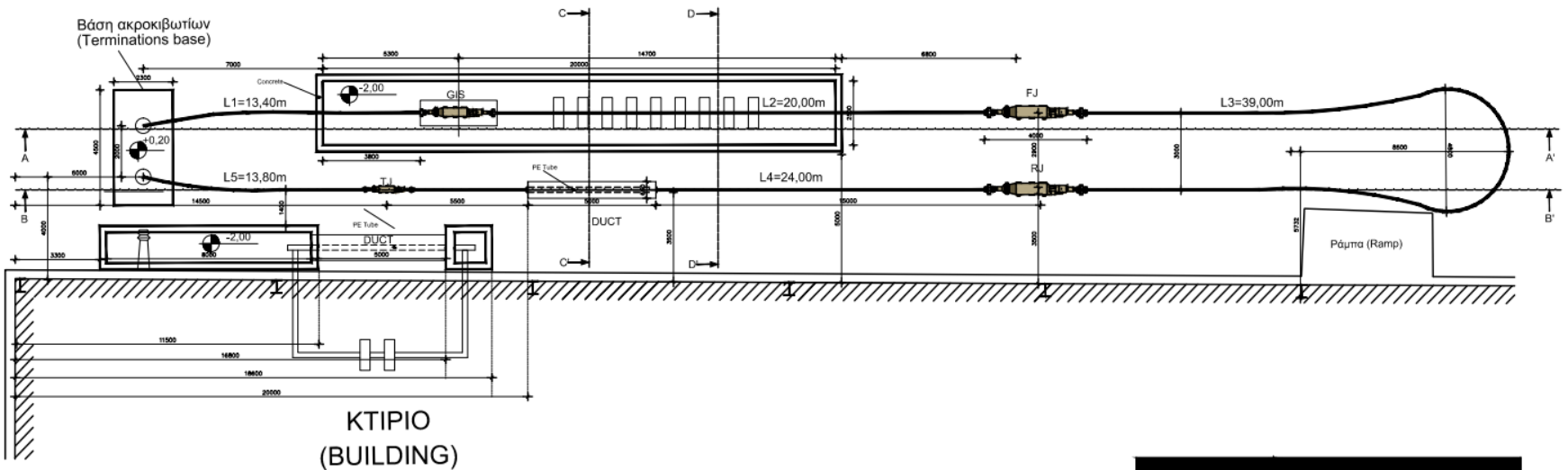
- PQ test started in August 2015 with CESI supervision
- Tested system includes:
 - ✓ Cables
 - 1x1600 mm² CU/XLPE/PB/PE and 3x1600 mm² CU/XLPE/PB/SCPE/PPY/SWA/PPY
 - 1X2000 mm² Miliken AL/XLPE/CWS/PE – Underground cable
 - ✓ Accessories
 - Transition Joint (Pfisterer)
 - GIS back to back joint (Pfisterer)
 - Outdoor terminations (Pfisterer)
 - Flexible joint (Hellenic Cables)
 - Repair joint (Hellenic Cables with active parts from Pfisterer)
- Tests performed according to Cigre TB 490 cl. 9 & IEC 62067
 - ✓ U₀=127 kV
 - ✓ Heating cycle voltage test / 1.7 U₀ for 8760 h with 180 cycles at 90-95 °C
 - ✓ Lightning impulse voltage test / 10 positive & 10 negative impulses at 90-95 90-95 °C
 - ✓ Examination of the cables system



➤ PQ test successfully completed in September 2016

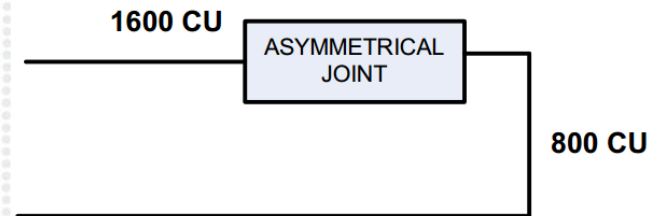
PQ Test 220 kV - Completed

ΥΠΟΜΗΜΑ CABLE LENGTHS	
Outdoor termination - GIS	=13,40m
GIS - FJ	=20,00m
FJ - RJ	=39,00m
RJ - TJ	=24,00m
TJ - Outdoor termination	=13,80m
Total cable length	=110,20m



Extension PQ Test 220 kV - Ongoing

- The extension PQ test started in June 2016 with CESI supervision
 - Tested system includes:
 - ✓ Cables
 - 1x1600 mm² CU/XLPE/PB/SCPE
 - 1x800 mm² CU/XLPE/PB/SCPE
 - ✓ Accessories
 - One assymetrical flexible joint
 - Tests performed according to Cigre TB 490 referring to IEC 62067 par. 13.3:
 - ✓ U₀=127 kV
 - ✓ Partial discharge test (completed)
 - ✓ Heating cycle test without voltage (60 cycles) (completed)
 - ✓ Tan δ measurement (to start)
 - ✓ Heating cycle voltage test (20 cycles) (already started)
 - ✓ Partial discharge test at ambient temperature and at high temperature (to start)
 - ✓ Lightning impulse voltage test followed by power frequency voltage test (to start)
 - ✓ Partial discharge test (to start)
- Extension PQ successfully completed in September 2016



Investment has been completed and provides additional distinctive capabilities...

Additional Production Capacity and Capabilities

- **Annual production capacity** for submarine cables is **200km** for **3-core HV AC** or **350km** for **single-core EHV AC** cables
- Investment **completed** and can produce HV-AC submarine cables since **Q1 2014**
- **Very long** continuous length production to **minimize** number of **factory joints** for all cable types
- Alternatively, annual production **capacity** of **medium voltage inter array** submarine cables **increased** to **700km** with the new investment

Direct Loading on Cable-laying Vessels

- The HV submarine cables will be loaded from the final storage turntables through **dedicated loading lines** on the turntables of cable-laying vessels which will arrive at **Fulgor port**
- Fulgor port is able to accommodate **all cable-laying vessels** currently in operation



Cable Supplier for HV & EHV Market

Customer	Year	Country	Quantity (km)	Cable Type
 <p>ADMHE INDEPENDENT POWER TRANSMISSION OPERATOR</p>	2015	GREECE	114	150 kV 3x630mm ² Cu/XLPE 150 kV 3x300mm ² Cu/XLPE
 <p>TERNA ENERGY G E K T E R N A G R O U P</p>	2015	GREECE	37	150 kV 3x300mm ² Cu/XLPE + 2x24 optical fibers
 <p>Enel Green Power</p>	2015	GREECE	47	150 kV 3x800mm ² Cu/XLPE +24 optical fibers(upcoming project)
 <p>NEWFOUNDLAND POWER A FORTIS COMPANY</p>	2014	CANADA	11	14.4/25 kV 3x300 mm ² Cu/XLPE (XLPE insulated lead sheathed)

Cable Supplier for HV & EHV Market

Customer	Year	Country	Quantity (km)	Cable Type
	2013	SCOTLAND	45.3	19/33 kV 3x95 mm ² Cu/XLPE 19/33 kV 3x185 mm ² Cu/XLPE 6.35/11 kV 3x95 mm ² Cu/XLPE
	2014	GREECE	19.1	12/20 kV 3x95 mm ² Cu/XLPE (XLPE insulated lead sheathed)
	2012	GREECE	25	12/20 kV 3x35 mm ² Cu/PILC 12/20 kV 3x35 mm ² Al/PILC 12/20 kV 3x150 mm ² Al/PILC
	2013	EGYPT	5	8.7/15 kV 3x120 mm ² Cu/XLPE

HV Submarine Turnkey Projects – Case Study 1

Project: St. George Wind Farm

Scope: 150 kV export cable supply & installation. Client: Terna Energy SA



Project successfully completed in June 2016, Provisional Acceptance Certificate issued in July 2016

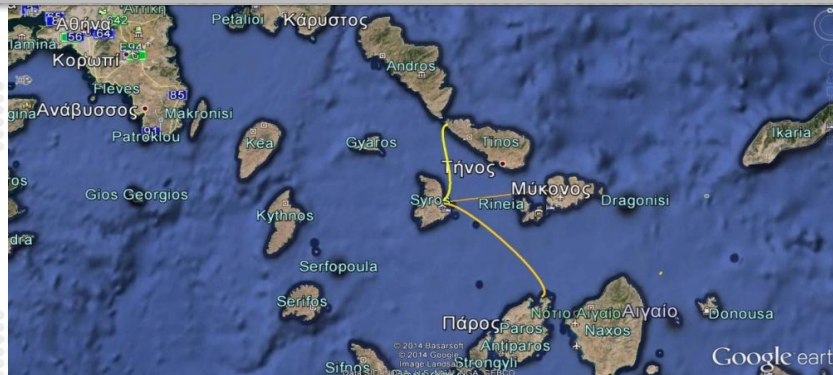
Manufacture/Supply/Installation:

- 36 km composite submarine export cable 150 kV 3x300 mm² CU/XLPE + 2x24 FO units
- Routing tests / Factory Acceptance Tests
- Loading, transportation and installation of the cables
- Protection of the submarine cable on the seabed along the whole route
- Supply and assembly on site of the transition joints between the submarine and land cables
- Supply and installation of indoor and outdoor terminations
- Supply of spares (cable, repair joints and terminations)
- Testing of cables on site and commissioning of the interconnection

HV Submarine Turnkey Projects – Case Study 2

Project: Cyclades Islands Interconnection

Scope: 150 kV submarine cable interconnections. **Client:** Independent Power Transmission Operator



All three interconnections were successfully completed and provisionally accepted in 2016

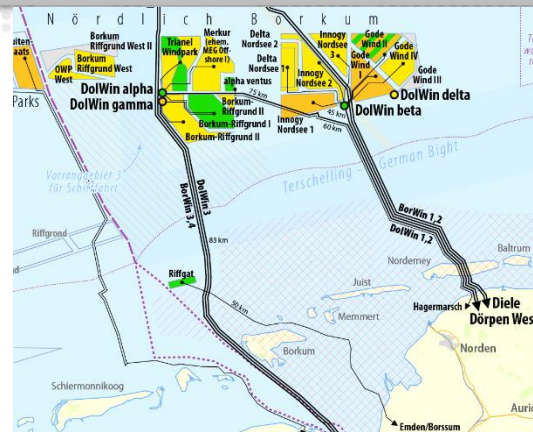
Turnkey project - including supply, transportation, installation, protection, on site testing and final commissioning - of three submarine cable interconnections between islands of the Cyclades cluster in the Aegean Sea:

- Syros-Tinos with 33 km 150 kV 3x630mm² Cu/XLPE + 24 optical fiber composite submarine cable which is installed at 200 m maximum water depth.
- Syros-Mykonos with 35 km 150 kV 3x300mm² Cu/XLPE and 35 km 24 optical fiber submarine cables which is installed at 100 m maximum water depth.
- Syros-Paros with 46 km 150 kV 3x300mm² Cu/XLPE + 24 optical fiber submarine cable which is installed at 100 m maximum water depth.

HV Submarine Turnkey Projects - Ongoing

Project: Borkum Riffgrund II OWF

Scope: 150 kV export cable supply & installation. Client: TenneT



Turnkey project for the supply, transportation and installation of two submarine export cables between the offshore HVAC substation of the Borkum Riffgrund II Offshore Wind Farm (OWF) and the DolWin gamma offshore HVDC substation to transfer the power produced by the OWF to the German transmission grid.

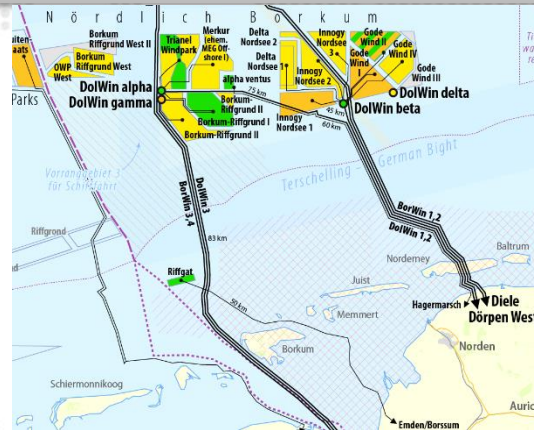
- 15.3 km composite submarine export cable 150 kV 3x1000mm² Cu/XLPE with two armoured 24 fibre optic cables integrated into the cable design, which will be installed at a burial depth of 1.5 m along the seabed section.

Current status: Project under design and engineering preparation, completion is expected in August 2018

HV Submarine Turnkey Projects - Ongoing

Project: Trianel Winpark Borkum – Phase 2 OWF

Scope: 150 kV export cable supply & installation. Client: TenneT



Turnkey project for the supply, transportation and installation of a single submarine export cable between the offshore HVAC substation of the Trianel Windpark Borkum – Phase 2 Offshore Wind Farm (OWF) and the DolWin alpha offshore HVDC substation to transfer the power produced by the OWF to the German transmission grid.

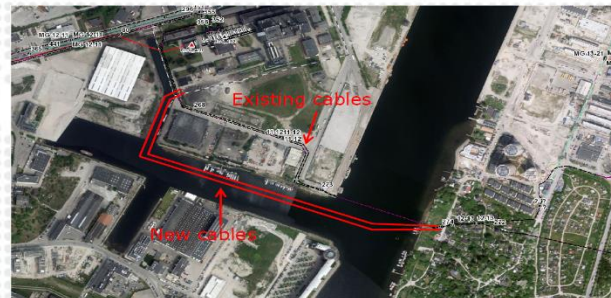
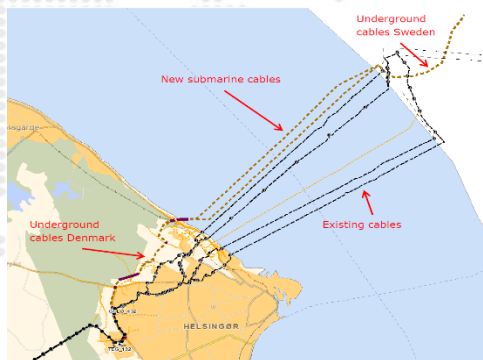
- 7.4 km composite submarine export cable 155 kV 3x800mm² Cu/XLPE with two armoured 24 fibre optic cables integrated into the cable design, which will be installed at a burial depth of 1.5 m along the seabed section.

Current status: Cable production has started, completion is expected in August 2018

HV Submarine Turnkey Projects - Ongoing

Project: Øresund 150 kV and Enghave Brygge 132 kV

Scope: 150 kV and 132 kV cables supply & installation. **Client:** Energinet.dk



Supply and supervision of installation of two circuits of 155 kV three-core submarine cables to interconnect Teglstrupgård (Denmark) and Laröd (Sweden) 155 kV substations and two circuits of 132 kV single-core submarine cables laid in close trefoil formation to be installed across a channel in Enghave Brygge area in central Copenhagen.

- 11.4 km composite submarine cables 150 kV consisting of the following sections:
3x1400mm² AL/XLPE (0.3 km) – Flexible Joint - 3x900 mm² AL/XLPE (5.1 km) – Flexible Joint - 3x1400 mm² AL/XLPE (0.3 km) + 48 optical fibers
- 4.8 km of 1x1600mm² AL/XLPE installed in close trefoil formation

Current status: 132 kV cables production completed, project completion is expected in June 2017

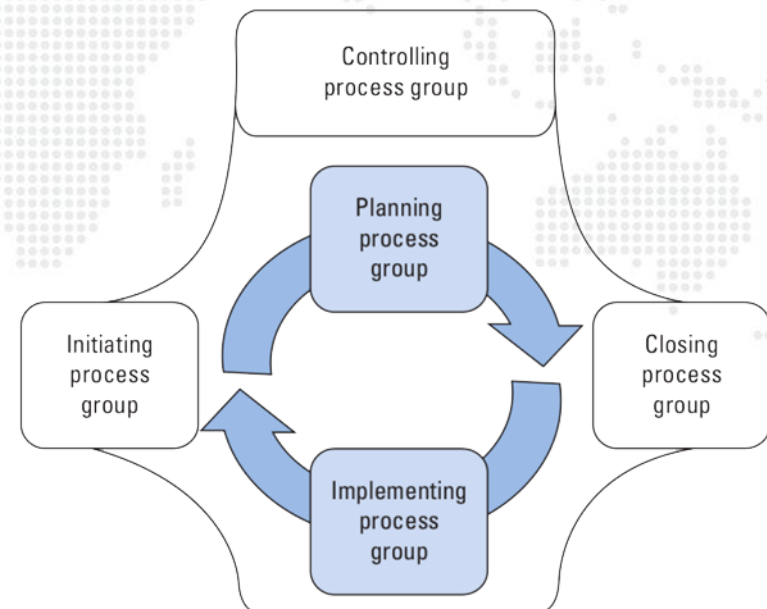
Project Management Approach

Need for a governance framework for handling projects that:

- Secure coordination between companies and departments
- Define delegation of responsibilities
- Provide smooth transition from the tender phase to the execution phase
- Identify risks and mitigate them - continuously highlights risks during the operational phase
- Ensure smooth execution and continuous monitoring
- Project Management structure according to latest ISO 21500 and PMI PMBOK guidelines

Identification of five process groups:

- Initiating
- Planning
- Implementing
- Controlling
- Closing



- Cablel Hellenic Cables Group has developed and implements across its facilities and installation sites an Integrated Health and Safety Management System in compliance with the requirements of the OHSAS 18001:2007

Hellenic Cables approach aims to:

- Ensure safety and well-being – physical and mental
- Minimize health risks
- Promote high awareness – show responsibility in relation to society and legislation
- Inform and communicate through open dialogue – to raise the standard

Environmental policy

- Cablel Hellenic Cables Group has developed and implements across its facilities and installation sites an Environmental Management System in compliance with the requirements of the ISO 14001:2004

According to our system we are achieving:

- Systematic monitoring and reporting of all environmental indices (KPIs)
- Full compliance with environmental legislation
- Recycling more than 70% of our waste via licensed recipients
- Minimization of waste produced at source



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