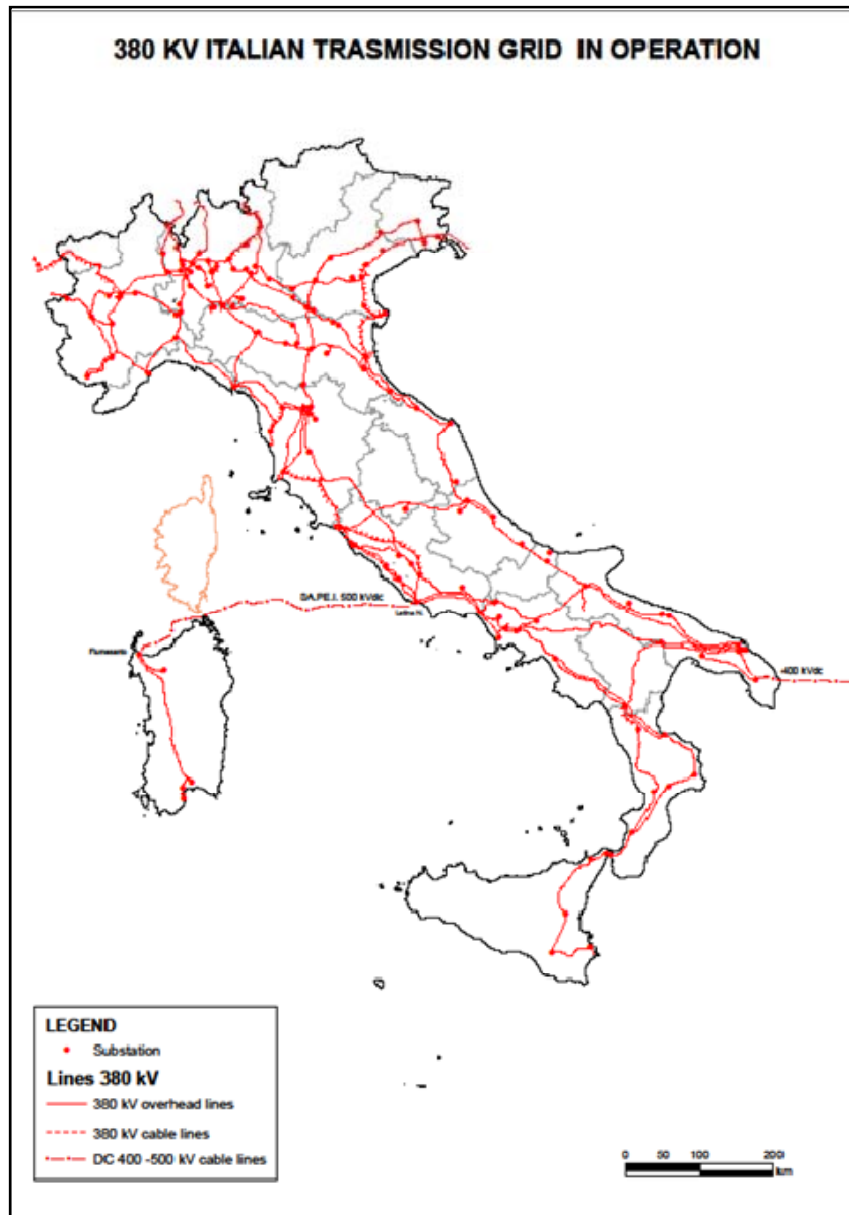


## Outlook on UGCL in Italy



### ITALIAN TRASMISSION GRID 380 KV

- 380 kV<sub>ca</sub> OHL: 9599,2 km
- 380 kV<sub>ca</sub> UGCL: 22,9 km
- 380 kV<sub>ca</sub> submarine cable lines: 6,5 km
- 500 kV<sub>dc</sub> land cable lines 28,7 km
- 500 kV<sub>dc</sub> submarine cable lines 890 km
- 400 kV<sub>dc</sub> land cable lines: 43,5 km
- 400 kV<sub>dc</sub> submarine cable lines: 163 km

## HVDC LINKS in Italy

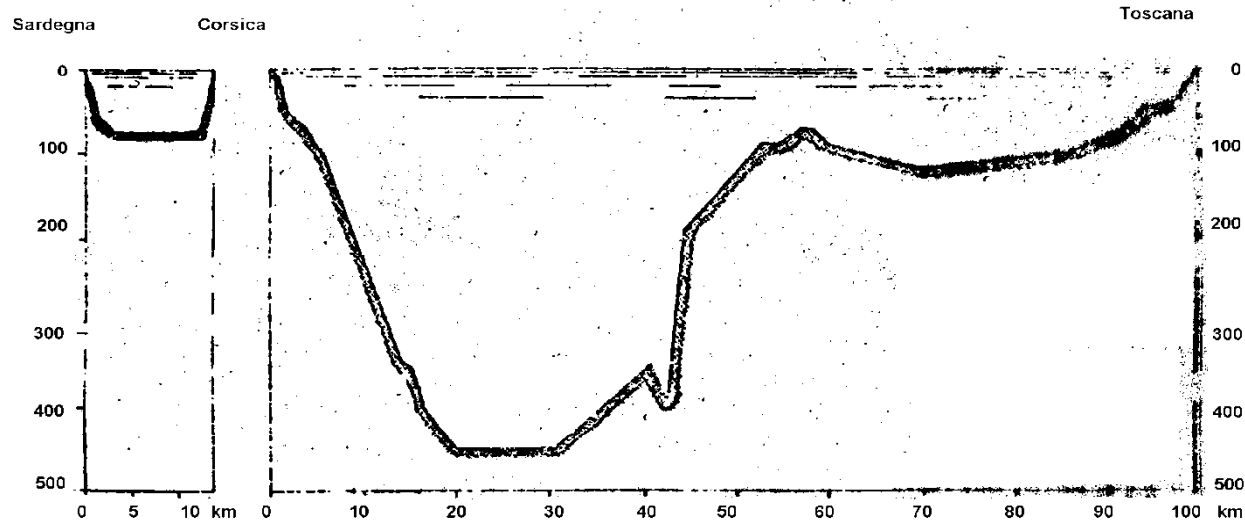


SA.CO.I. - 1967  
200 kV dc – 300 MW - monopolare  
(Sardegna – Corsica – Italia continentale)

SA.PE.I. - 2010  
500 kV dc – 1000 MW - bipolare  
(Sardegna – Lazio)

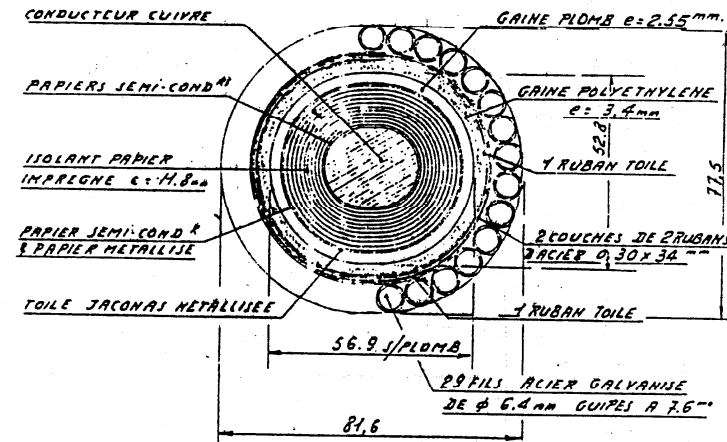
ITALIA- GRECIA - 2001  
400 kV dc – 500 MW - monopolare  
(Italia – Grecia)

## SACOI – Route section



Nominal voltage	200 kV
Nominale current	1500 A
Nominale power	300 MW
Min. Power	30 MW

Monopolar – 2 cables



# Italy – Greece route section

Max depth Record for an energy cable 400 kVdc (1000 m)

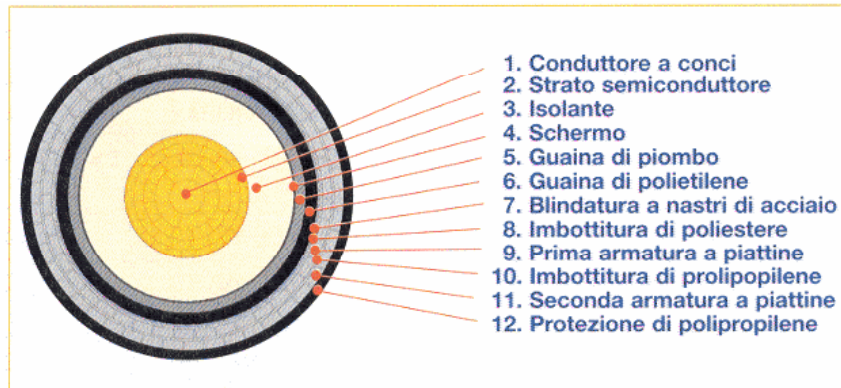
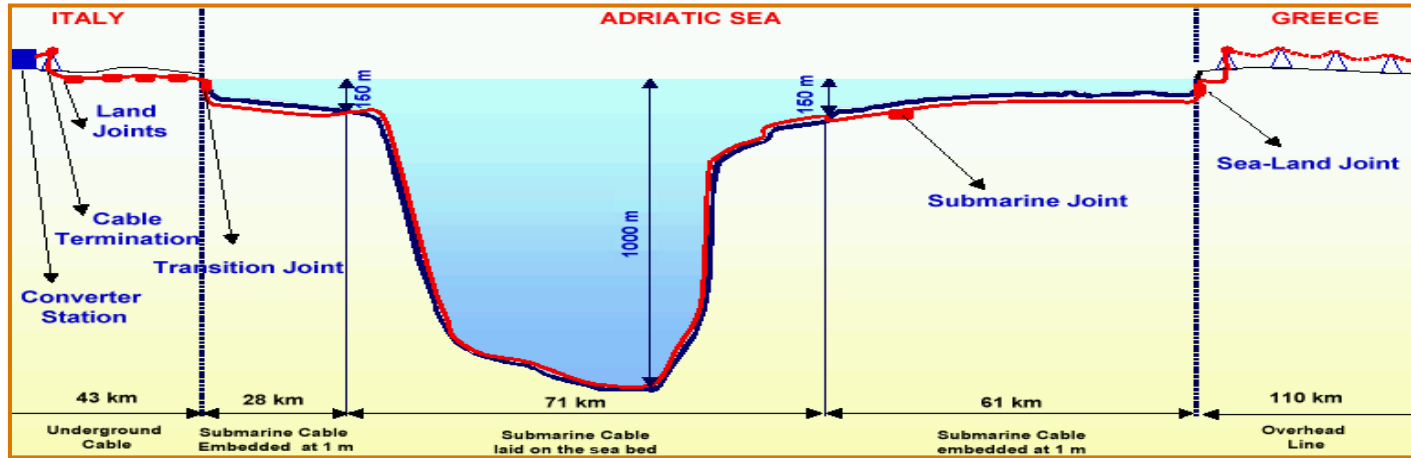


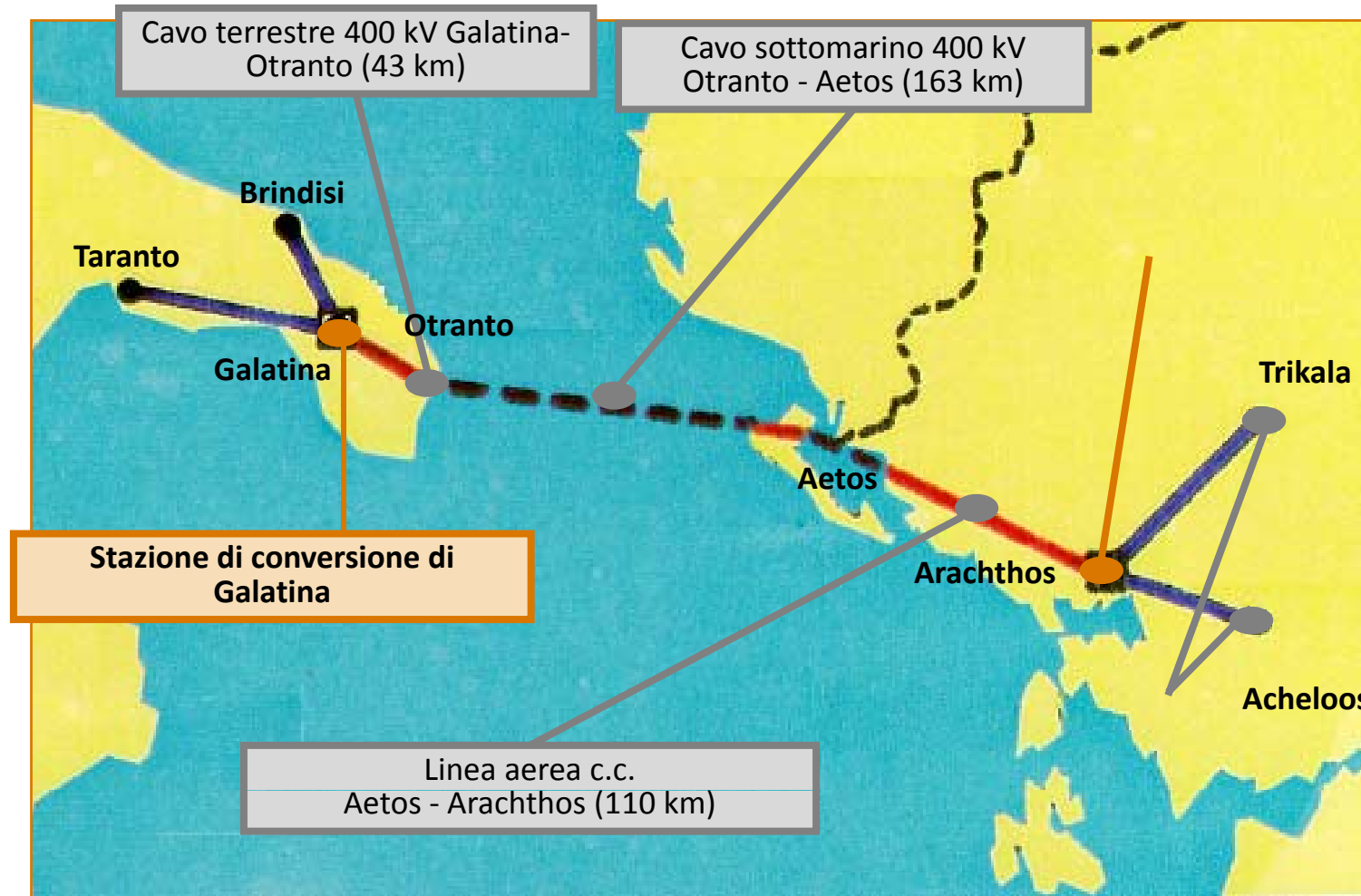
Figura 4 Sezione trasversale del cavo sottomarino.

- Nominal Voltage 400 kV
- Nominal Current 1250 A
- Nominal power 500 MW
- Min power 50 MW
- Put on service 2001

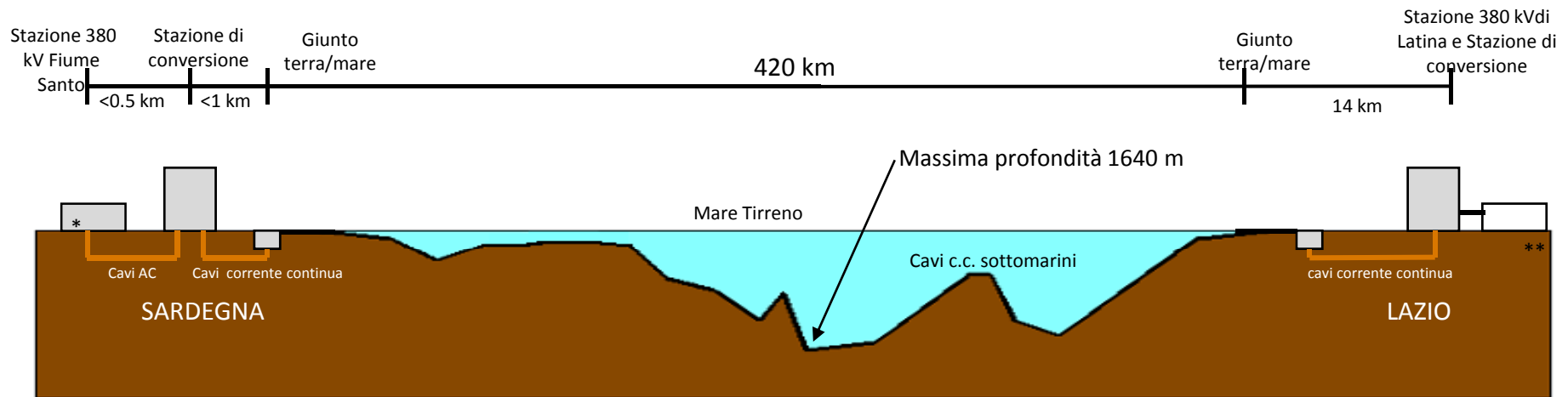
Monopolar – 1 cable

# Close and Return

Engineering and Grid Development Direction



## SAPEI – route section

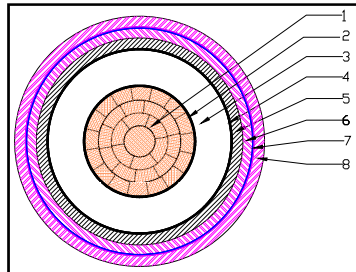


\* Stazione in SF6

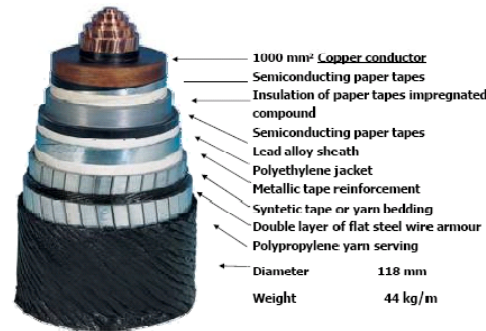
- **Nominal Voltage** 500 kV
- **Nominal Current** 1000 A
- **Nominal Power** 1000 MW
- **Min Power** 50 MW
- **Put on service** 2010

\*\* Stazione in aria

Terrestrial pole cable Copper 1x1400 sqmm



1	
2	
3	
4	
5	solamento in strati di carta impregnato di miscela ad alta viscosità
6	
7	
8	



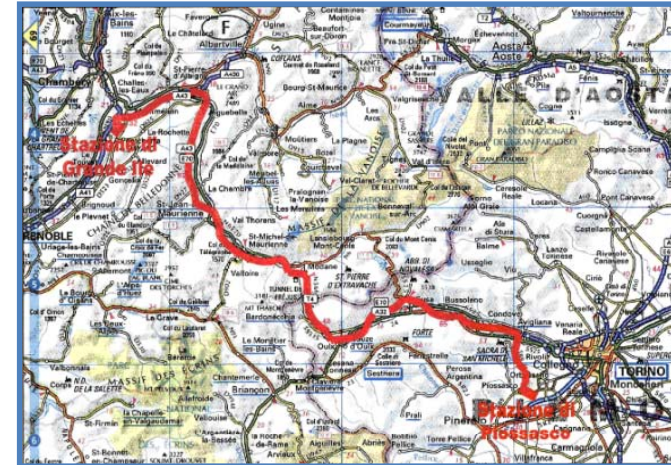
- 1000 mm<sup>2</sup> Copper conductor
- Semiconducting paper tapes
- Insulation of paper tapes impregnated with compound
- Semiconducting paper tapes
- Lead alloy sheath
- Polyethylene jacket
- Metallic tape reinforcement
- Synthetic tape or yarn bedding
- Double layer of flat steel wire armour
- Polypropylene yarn serving
- Diameter 118 mm
- Weight 44 kg/m



- 1150 mm<sup>2</sup> Aluminium conductor
- Semiconducting paper tapes
- Insulation of paper tapes impregnated with viscous compound
- Semiconducting paper tapes
- Lead alloy sheath
- Polyethylene jacket
- Metallic tape reinforcement
- Synthetic tape or yarn bedding
- Double layer of flat steel wire armour
- Polypropylene yarn serving
- Diameter 120 mm
- Weight 37 kg/m

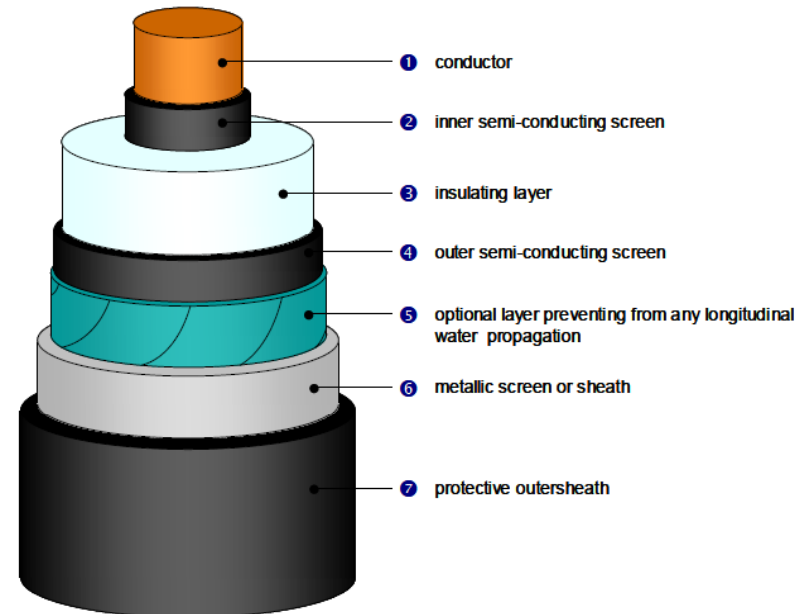
## HVDC ITALY – FRANCE 1200 MW

- Terrestrial cables XLPE  $\pm 320$  kV - 2500 mm<sup>2</sup> Aluminium
- Route length: around 200 km (13 km inside the future Frejus Safety Gallery)
- The route from the existing Electrical Substation of Piossasco (TO) follows urban and extra-urban roads and the highway (A32) to reach the Frejus Tunnel; here it should prosecute inside the future security gallery which will be built in parallel to the existing highway tunnel. In the French side the cables follow the existent highway route (A43) and arrives into the Electrical Substation of Grande-Ile



- **Nominal voltage** 320 kV
- **Nominal Current** 1000 A
- **Nominal power** 1200 MW
- **Min power** 50 MW
- **Coming on service** 2017

XLPE Cable Aluminium 1x2500 sqmm



## HVDC ITALIA-MONTENEGRO (MONITA) 1000 MW



### Technical characteristics:

- HVDC bidirectional, LCC/VSC technology
- Nominal voltage 500 kV
- Nominal current 1000 A
- Nominal Power 2x500 MW
- 390 km submarine cable
- 2 converting substation (Villanova and Tivat/Kotor)
- 15 km terrestrial cable in Italy + 10 km in Montenegro