

Interconnection of electricity networks between regions and continents

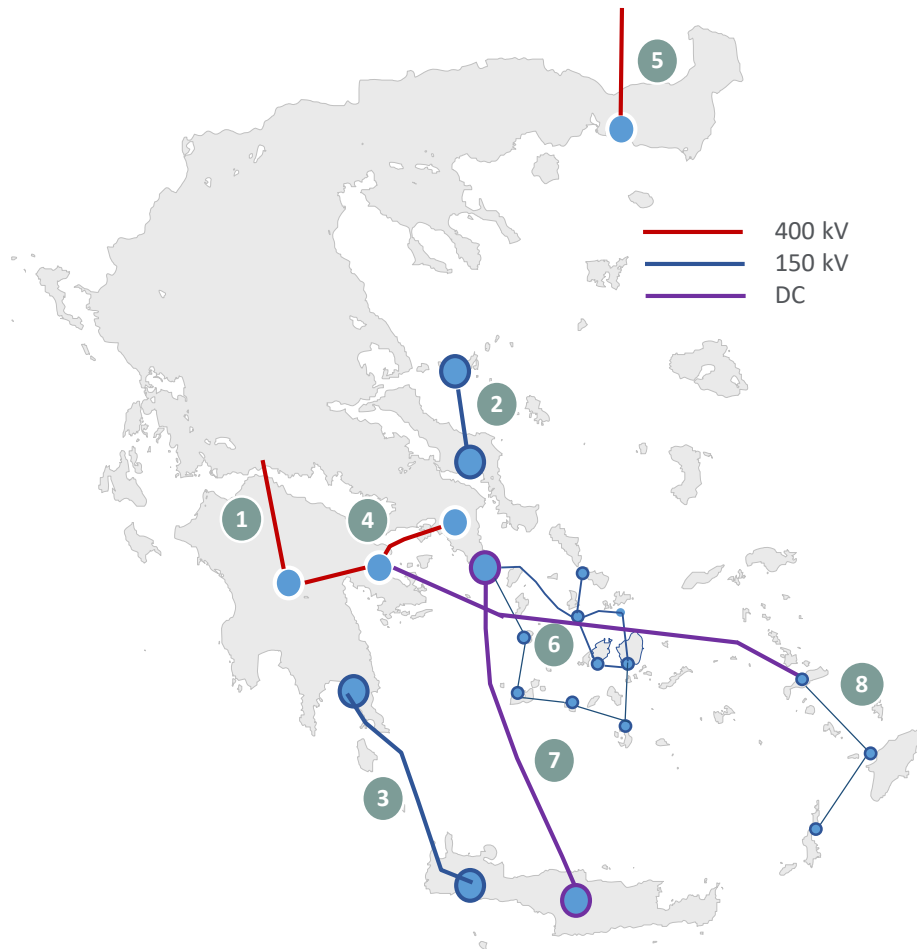
TGEG'19 27 June 2019

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ADMIE Major Projects

Major Project Locations



ID	Project description	Expected commissioning year
1	First 400 kV branch to Peloponnese (OHL Megalopoli – Patras – Acheloos)	2019
2	Skiathos island interconnection	2021
3	Crete interconnection (Phase I)	2020
4	Second 400 kV branch to Peloponnese (OHL Megalopoli – Korinthos – Koumoundouros)	2024
5	New 400 kV interconnector to Bulgaria N. Santa (GR) – Maritsa (BG)	2023
6	Cycladic Islands interconnection (Phases B', C' and D')	2024 (2019 for Phase B', 2020 for Phace C' and 2024 for Phase D')
7	Crete interconnection (Phase II)	2022
8	Dodecanese Interconnection	2027

Source: TYNDP 2020 – 2029 (under public consultation)

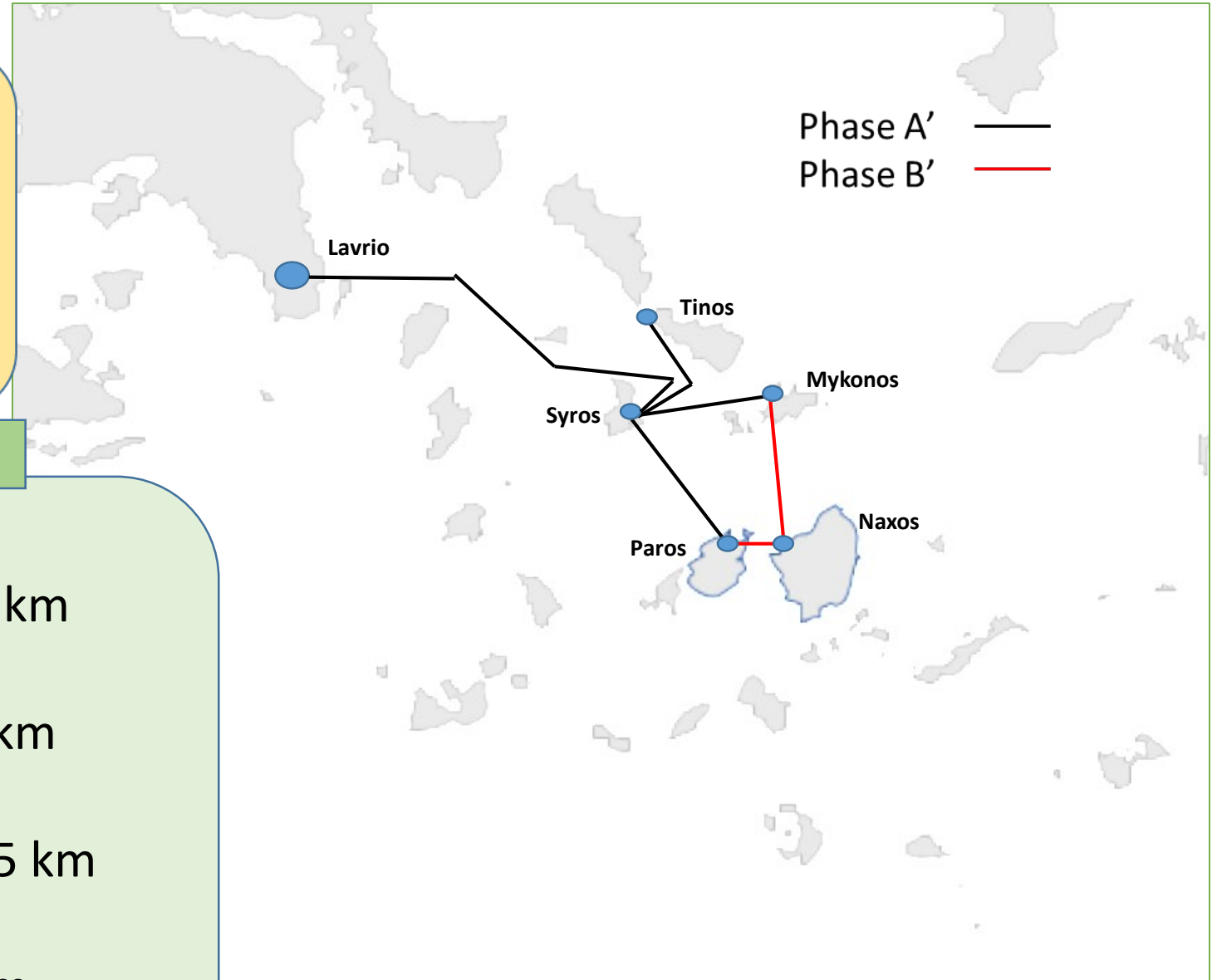
Cycladic Islands Interconnection Phase B'

Project Identity

- Contracts signed: Summer 2018
- Participants: CABLEL, FULGOR, PRYSMIAN, NARI GROUP
- Budget: ~70 Million Euros
- Completion by: end 2019

Technical Characteristics

- Paros – Naxos:
AC XLPE cable, 150 kV, 140 MVA, 7.6 km
- Naxos – Mykonos:
AC XLPE cable, 150 kV, 140 MVA, 40 km
- Livadi – Andros (Upgrade):
AC XLPE cable, 150 kV, 200 MVA, 14.5 km
- Tinos – Livadi (Upgrade):
AC XLPE cable, 150 kV, 200 MVA, 4 km
- 1 GIS Substation at Naxos



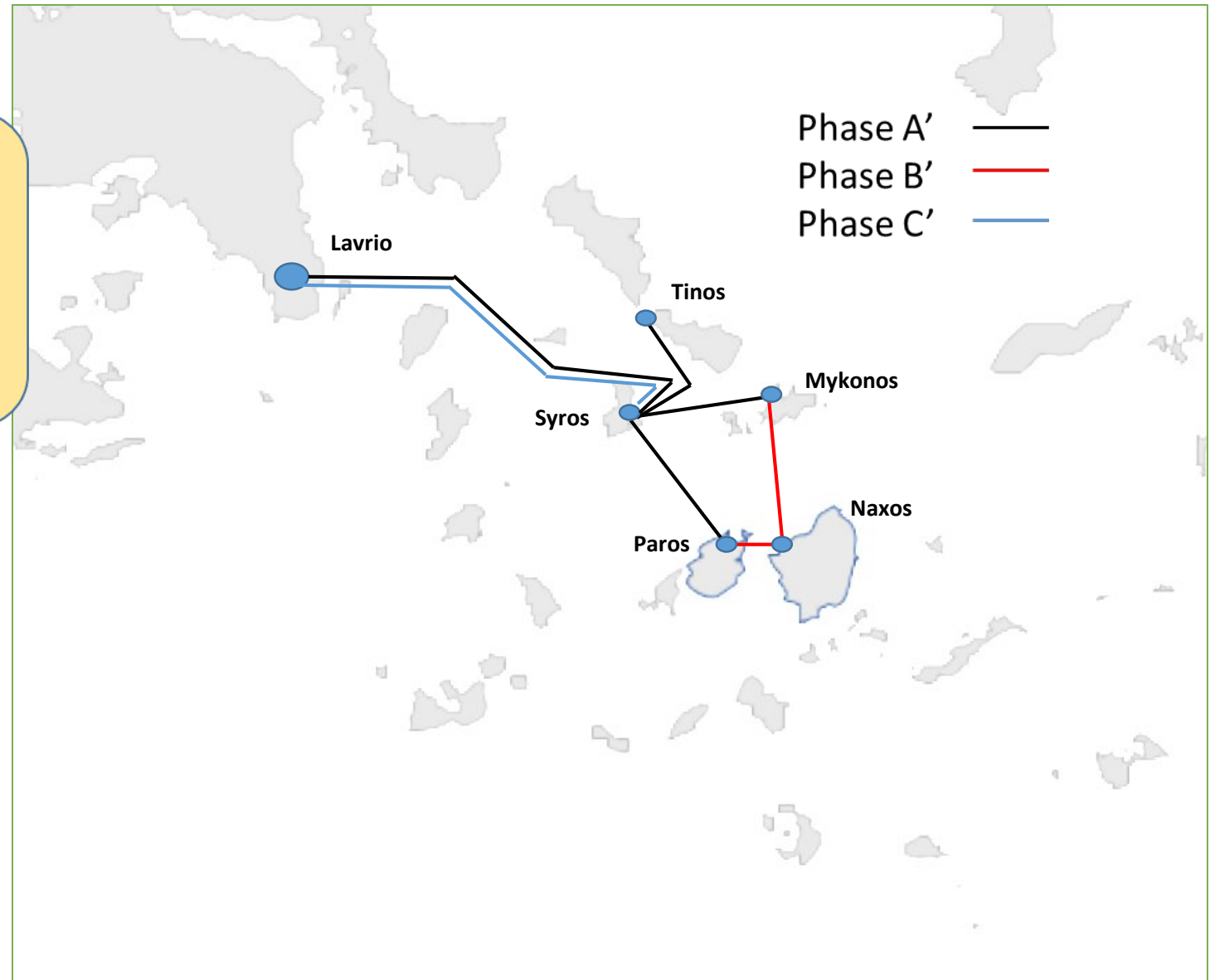
Cycladic Islands Interconnection Phase C'

Project Identity

- Contracts signed: December 2018
- Participants: NEXANS
- Budget: ~115 Million Euros
- Completion by: end 2020

Technical Characteristics

- Lavrio – Syros (2nd cable)
- Voltage: 150 kV
- Capacity: 200 MVA
- Cable technology: XLPE
- Maximum depth: ~300 m
- Cable length: 108 km



Cycladic Islands Interconnections Phase D'

Project Identity

- Budget: 390 MEuros
- Start by: 2021
- Completion by: 2024

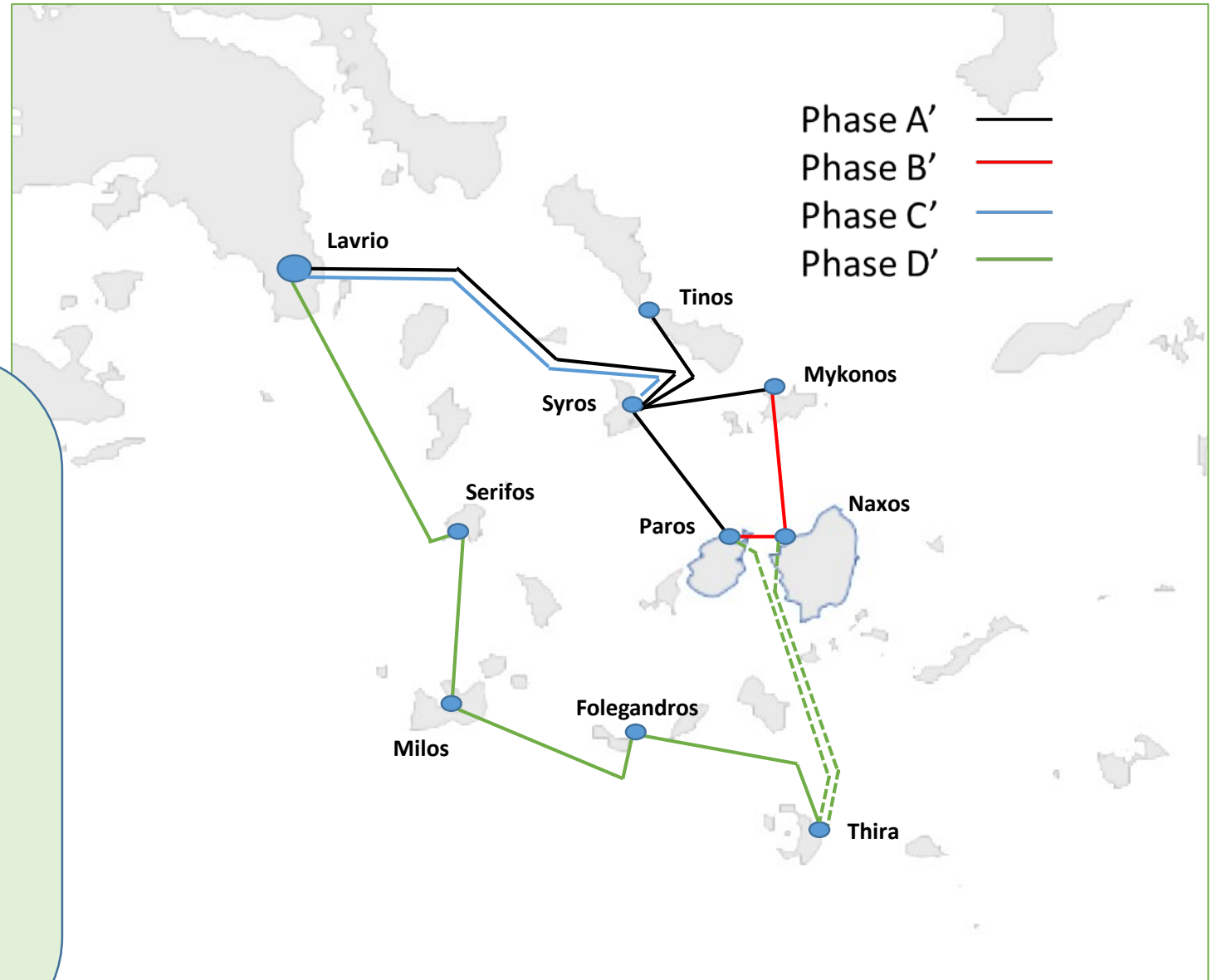
Technical Characteristics

**AC XLPE cables 150 kV, 200 MVA,
total length ~ 340 km**

- Naxos – Thira **or** Paros – Thira
- Thira – Folegandros
- Folegandros – Milos
- Milos – Serifos
- Serifos – Lavrio

4 GIS Substations

- Thira
- Folegandros
- Milos
- Serifos



Crete Interconnection – Phase I

The longest AC underground-submarine interconnection includes the upgrade of the Peloponnese transmission system



Project Identity

- Contracts signed: November 2018
- Participants: CABLEL, FULGOR, NEXANS, TERNA ENERGY
- Budget: :~330 Million Euros
- Completion by: mid 2020

Technical Characteristics

- Voltage: 150 kV AC
- 2 GIS Substations
- Capacity: 2 x 200 MVA
- Cable technology: XLPE
- Maximum depth: ~980 m
- Cable length: 2 x 135 km

Crete Interconnection – Phase II (IPTO / Ariadne Interconnection)

Project Identity

- Tender expected: 2019, Q2
- Budget: <1 Billion Euros
- Completion by: 2022, Q3



Technical Characteristics

- VSC MMC Converters
- Voltage: ~500kV
- Bipolar Configuration
- Link Capacity: 2 x 500 MW
- Maximum depth: ~1250m
- Cable length: 2 x 330 km

Similar Projects in Europe

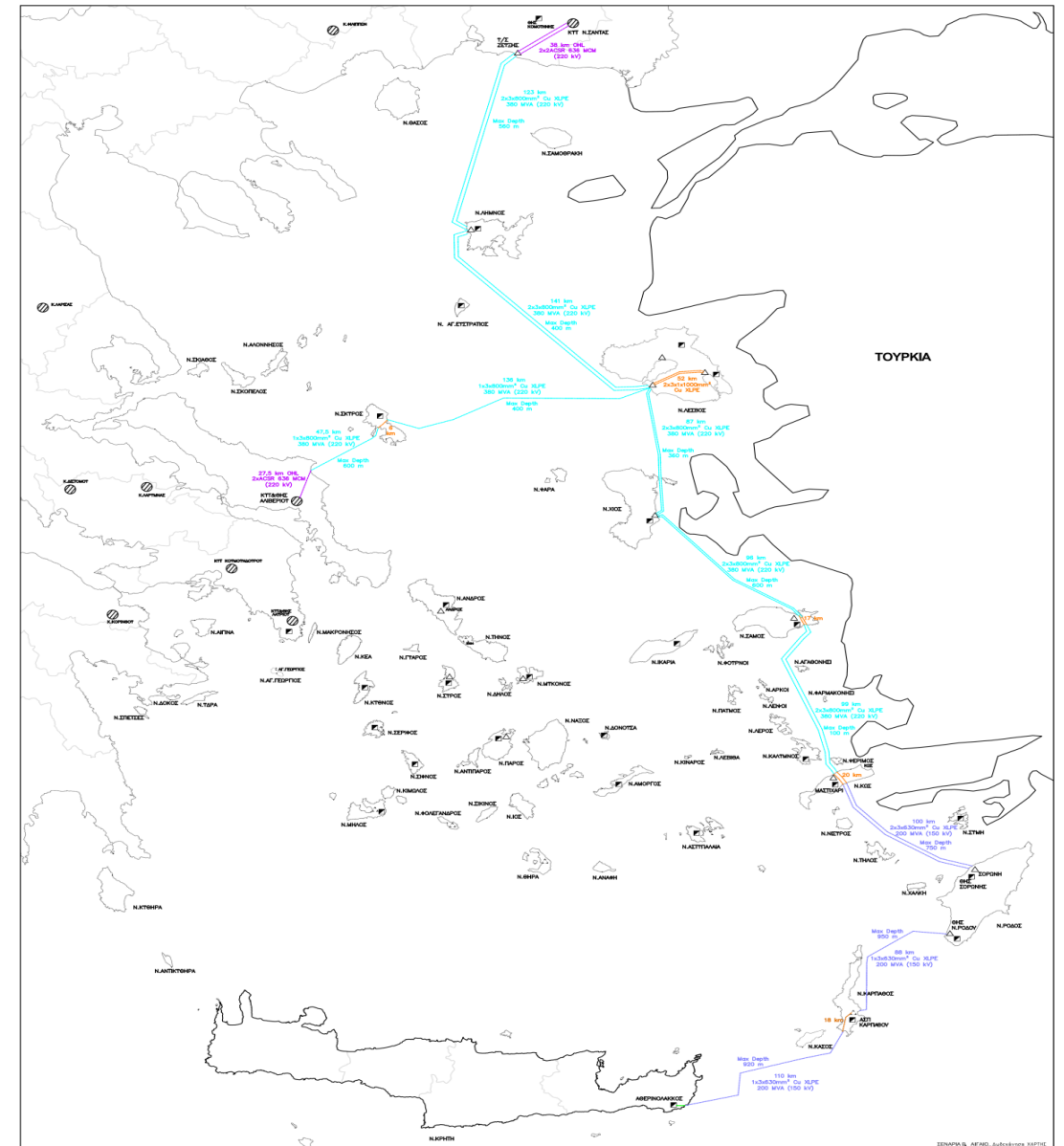
- SAPEI: Sardinia-Italy, 1000 MW, 500 kV, LCC, depth 1650 m, 420 km long
- MONITA: Italy-Montenegro, 1000 MW, 500 kV, LCC, depth 1200 m, 415 km long
- SKAGERRAK IV: Denmark-Norway, 700 MW, 500 kV, VSC, depth 550 m, 137 km long
- NORD.LINK: Germany-Norway, 1400 MW, 525 kV, VSC, depth 230 m, 623 km long
- NSL: UK-Norway, 1400 MW, 525 kV, VSC, depth 600 m, 730 km long



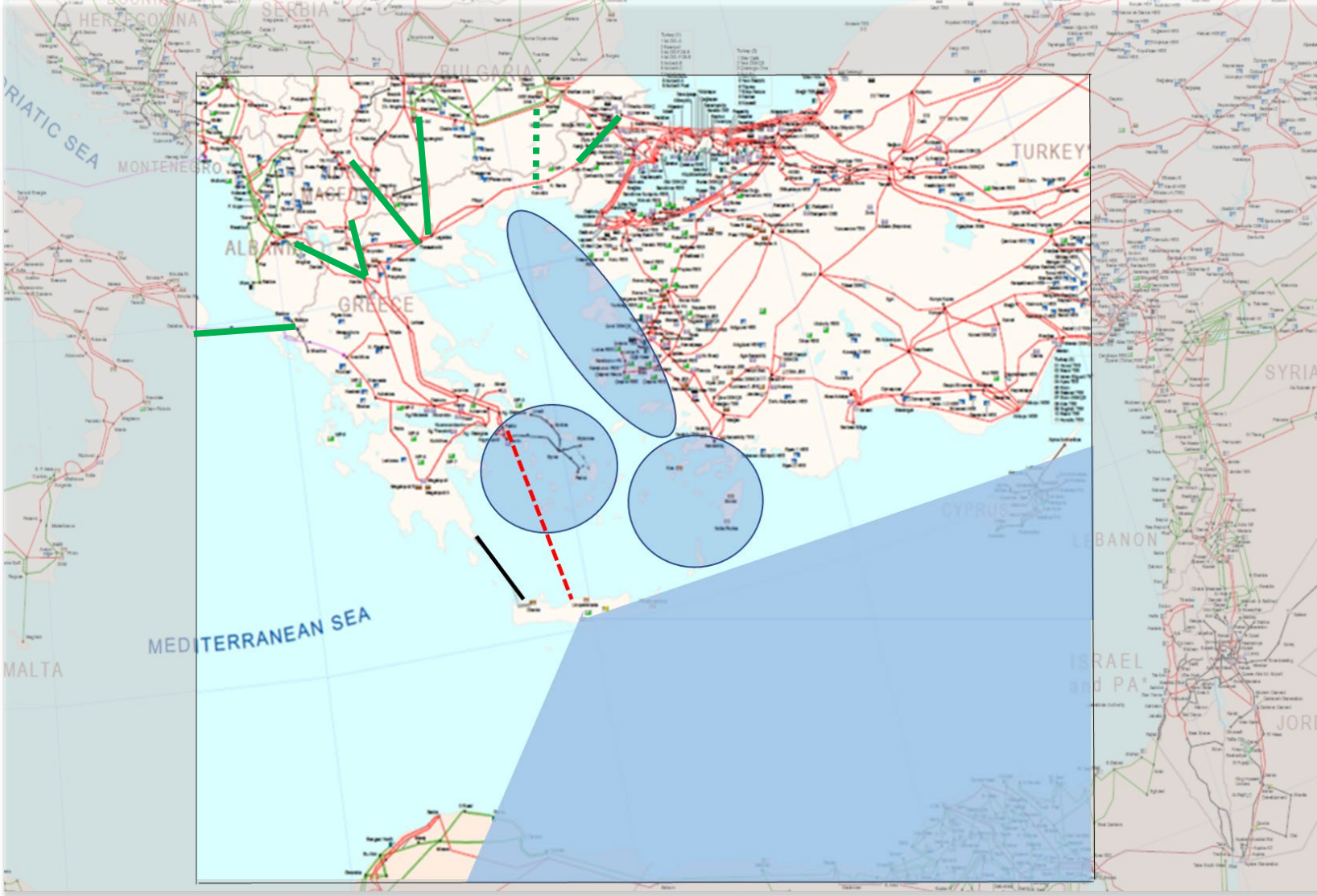
Dodecanese & North Aegean Interconnection – 2nd Scenario

Technical Characteristics

- Double HVAC link at 220 kV Limnos – Lesvos – Chios – Samos – Kos (2x380 MVA)
- New GIS 220 kV S/S at these islands
- Coupling 220/150 kV at Kos
- Double HVAC link at 150 Kos – Rodos (2x200 MVA)
- Connection to Crete through Karpathos island (1x200 MVA)
- Lesvos – Skyros – Aliveri connection (1x380 MVA)
- STATCOM at Lesvos, Kos and Rodos



SuperGrid in the Mediterranean



Actors-Factors-Sectors

- **Technology challenges:** deep sea, long lengths, infrastructure requirements in the continental parts
- **Market challenges:** reliable assessment of interconnections' impact in a changing electricity and energy market environment
- **Geopolitical risks:** transmission infrastructure requires long-term financial-political-social stability
- **TSOs-ENTSO-E:** leadership role in the future development of interconnections' infrastructure
- **Internal – International – Intercontinental:** steps and enablers