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Title of Presentation	Assessing the dynamic performance provision of a VSC-HVDC Interconnector on the Frequency and Angle Stability of a Low Inertia Isolated Power System
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Scope of this research work is to study the immense benefits achieved through the introduction of the EuroAsia Interconnector [1] transmission corridor on the low-inertia isolated power grid of Cyprus. The proposed VSC-HVDC link is expected to assist, beyond energy exchange between the three countries, into primary frequency support and transient stability performance improvement of the islanded power system. The EuroAsia Interconnector project is planned to interconnect the Cypriot, Israeli and Greek power grids via the world’s longest submarine power cable spanning a total of 1,208 km and utilizing a VSC-HVDC bipolar transmission technology (± 500 kV) with nominal capacity of 2000 MW (1000 MW in phase 1). Figure 1 shown bellow illustrates the designed path of the bulk power transmission.

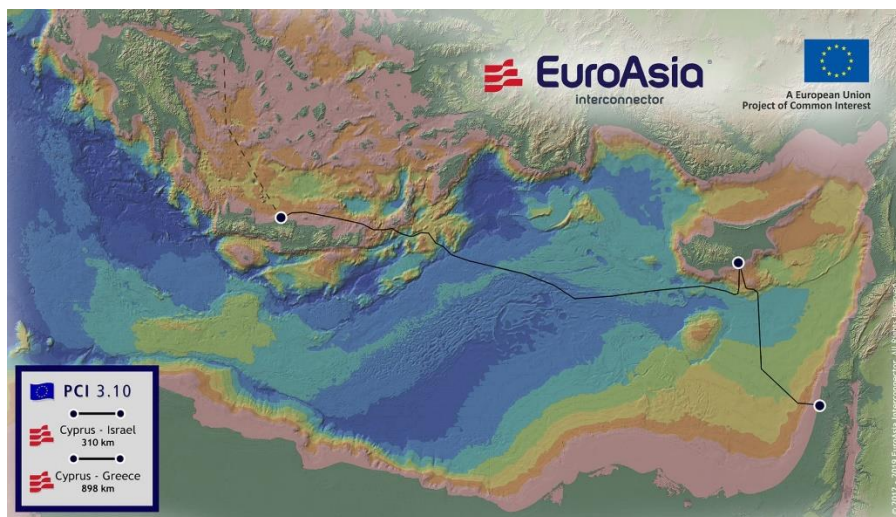


Figure 1: Map of the EuroAsia Interconnector [1]

In the proposed full paper, the authors utilize high-fidelity models of Cyprus transmission system and the facilitated VSC-HVDC link technology to perform a rich set of simulation studies highlighting the significant contributions obtained from the EuroAsia Interconnector as concerned the primary frequency support and transient stability performance of Cypriot power system. The frequency stability is evaluated through aggregated load disconnection studies (over-frequency scenario) and emergency tripping of large generation units (under-frequency scenario). On the other hand, rotor angle stability is assessed through short circuit fault scenarios both on the transmission lines and the transmission substations (transient stability evaluation). All simulation studies considered are performed using DigSILENT PowerFactory simulation environment [2].

Figure 2 presented below showcases the single line diagram of the proposed EuroAsia Interconnection transmission corridor, that will realize bulk power exchange amongst Cyprus, Greece and Israel, as well as dynamic stability provision between the countries during urgent operating conditions.

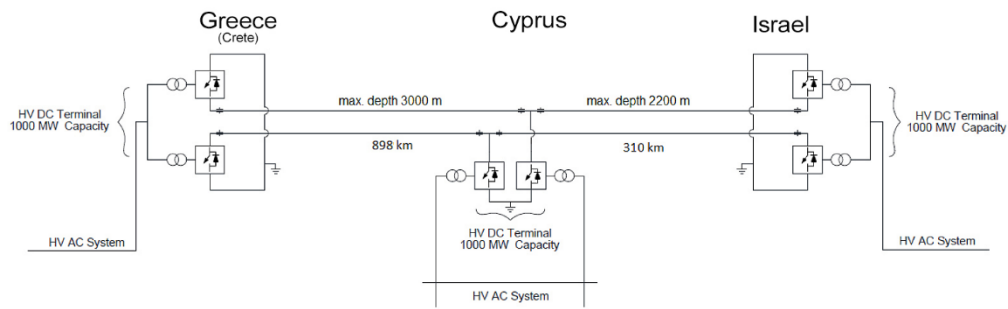


Figure 2: Single line configuration of the proposed EuroAsia Interconnector

Significant simulation results obtained from this paper highlight the importance of the EuroAsia Interconnector having an active role on the dynamic stability provision to the interconnected countries. This will establish enhanced resilience and improved safety margins of the power grids. This is achieved through deployment of dedicated control schemes on the converter stations of the EuroAsia VSC-HVDC link implementing advanced control actions on the HVDC link (fast injection/absorption of active power) during emergency conditions in order to fast recover stability (frequency/rotor angle) of the interconnected systems, as it will be thoroughly demonstrated in the full paper.

- [1] EuroAsia Interconnector, Technical Report, last accessed 02/July/2023 [Online]. Available: <https://euroasia-interconnector.com/>
- [2] DlgSILENT PowerFactory User Manual 2022, DlgSILENT GmbH