Presents: Michele Ferrazzini
(CEO)

POWERING TOGETHER A BETTER TOMORROW

ENGINEERING SERVICES FOR ENERGY

ESE is an Italian engineering and consulting company operating worldwide in the power generation, hydrogen and storage industry

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Offshore HV Substations

ESE offers **engineering** and **consultancy support** for innovative solutions, such as **offshore substations**, which ESE designs in partnership with **Tecon** – a Company with proven capabilities in the design of **offshore platforms**.

ESE has expertise in the design of **AIS** and **GIS** for different plant sizes, up to 400 kV, drawing from its 30-years experience in the field of power generation.

ESE is now approaching offshore solutions to support **renewable solutions**. As an example, ESE will provide support for the design of the offshore substation of the *Barium Bay* project, consisting of a 1,2 GW **offshore wind farm**, aiming at the production of green hydrogen.

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SELECTED CASE STUDIES

Offshore HV Substation
Design of a 525 MW offshore GIS

WIND

Engineering and Advanced engineering

Country	**ITALY**
Client	**HOPE s.r.l.**
From / To (month/year)	**From: 07/2022 To: 12/2022**
Value of the contract	**€ 64.500**
Status of the project	**Under environmental permit**

Preliminary design of a **380 kV offshore GIS** located in the Apulian Adriatic sea, Italy for a **525 MW wind power plant**, in partnership with **Tecon.** The wind plant generators are connected to the main GIS through 7 connections of 66 kV.
The study aims at the **EIA preparation** to obtain the permits for plant construction.

Main Tasks:

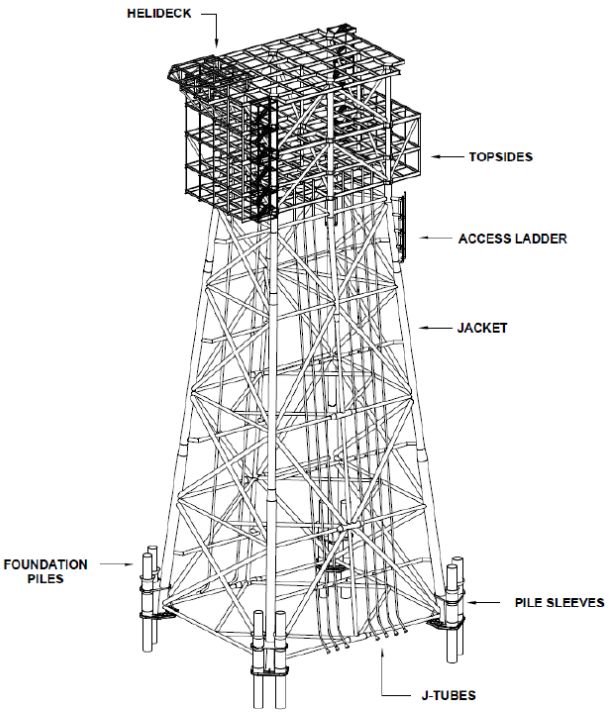
- **Preliminary sizing** of electrical substation and BOP assessment
- **Datasheet preparation** for 66 kV and 400 kV GIS, Step-up transformers, shunt
- **Preliminary layout** and definition of best platform configuration (with Tecon)
- Substation and platform **cost estimation**
- **EIA documentation preparation**

Offshore HV Substation Feasibility study for 525 MW

WIND

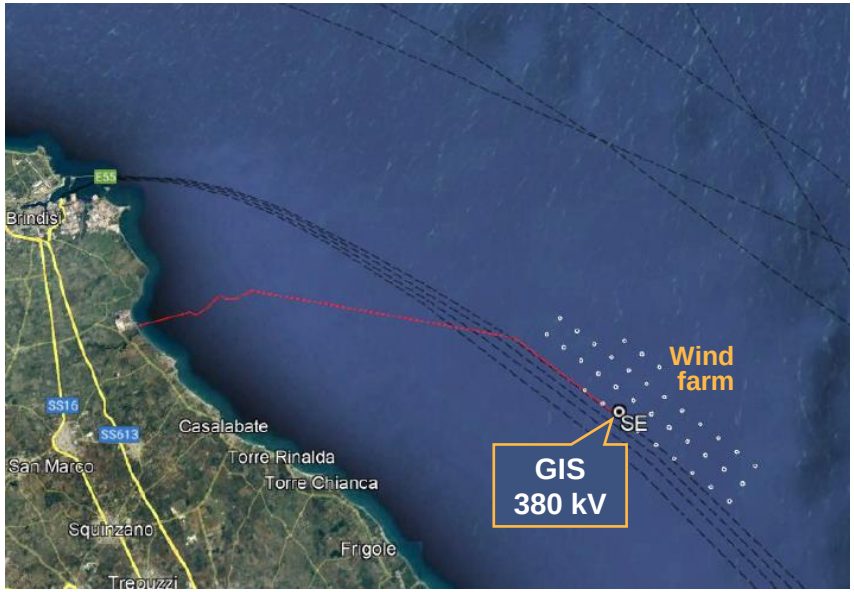
Engineering and Advanced engineering

Platform and substation



TECON

Plant location and connection



An **anchored platform** has been preferred to a floating one, to eliminate the need of dynamic cables – at the present state of the art, they allow to reach a maximum voltage of 66 kV.
It is then possible to adopt a **single HV cable** for onshore connection rather than 7 x 66 kV cables, **reducing CAPEX and energy losses of the plant**.

Selected references

YEAR	PROJECT
2023	Environmental Impact Assessment technical documentation for the offshore substation (380/66kV – 170m sea depth) related to a **945MW** offshore wind farm named Nemetun – *ongoing* Location, Italy Client, Hope Srl
2023	Environmental Impact Assessment technical documentation for the offshore substation (380/66kV – 140m sea depth) related to a **675MW** offshore wind farm named Eureka – *ongoing* Location, Italy Client, Hope Srl
2023	Environmental Impact Assessment technical documentation for two offshore substations (380/66kV – 130m and 150m sea depth) related to a **1110MW** offshore wind farm named Barium Bay. Location, Italy Client, Hope Srl
2022	Environmental Impact Assessment technical documentation for the offshore substation (380/66kV – 105m sea depth) related to a **525MW** offshore wind farm named Lupiae Maris. Location, Italy Client, Hope Srl

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THANK YOU!

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