R&D Webinar - AFOSS-DC Project Outcomes

Designing the electrical substations of the future

With the financial support of:

Welcome words

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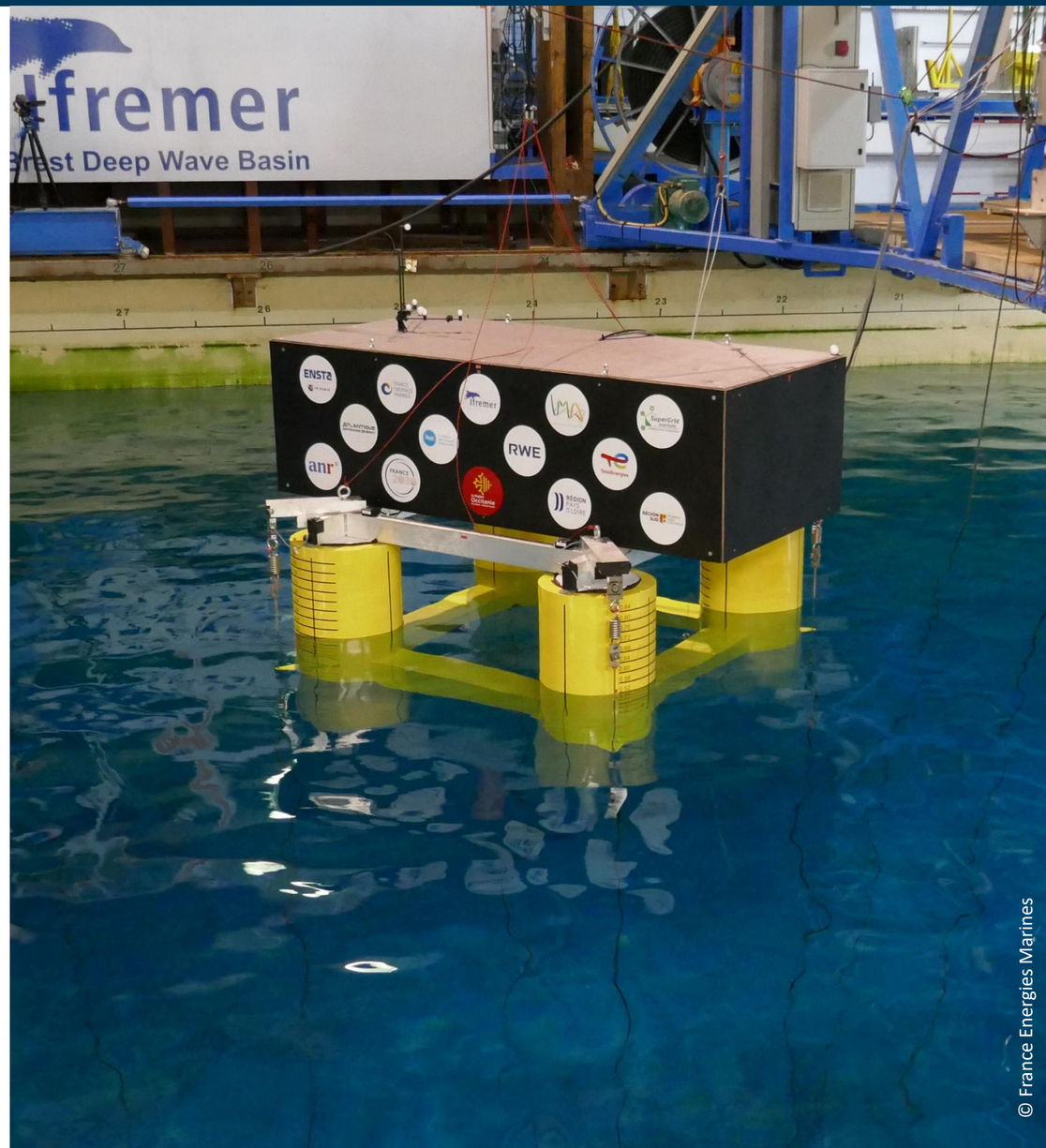
Yann GIORGIUTTI — Le réseau de transport d'électricité



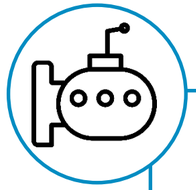
Agenda

1. Introduction and context
   France Energies Marines - 10’
2. Topside general arrangement and outcomes of the semi-submersible floater design analysis
   Chantiers de l’Atlantique - 15’
3. Using TLP technology for floating offshore substation: feedback on design and basin test campaign
   France Energies Marines - 15’
4. Floating offshore substations from the French TSO perspective
   Rte - 15’
5. Q&A Session
   30’
6. Wrap-up
   France Energies Marines - 5’

"Q&R" or "Q&A" to ask questions that will be addressed during Q&A session

Introduction and context

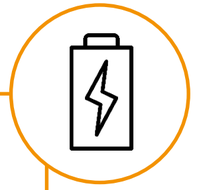
Context and R&D Needs



Installation of offshore wind farms in areas with significant water depth

Need to switch to floating substations

- **Feasibility** of such floating system, particularly in view of the constraints imposed by electrical components
- Most suitable floaters **technology**



Increasing total power of wind farms and distance from coastlines

Increasing total power of wind farms and distance from coastlines

- Significant capacitive losses in HVAC > need to increase voltage and switch to **HVDC export**
- Integration of **new components sensitive to motions or vibrations** in the topside to perform AC > DC conversion

AFOSS-DC R&D Project

3 YEARS (2022-2025)

€1.5M TOTAL BUDGET

9 PARTNERS

FRANCE ENERGIES MARINES · ATLANTIQUE OFFSHORE ENERGY · Centrale Méditerranée · ENSTA IP PARIS · Ifremer · Rte Le réseau de transport d'électricité · RWE · SuperGrid Institute Shaping power transmission · TotalEnergies

OBJECTIVE

To study the HVDC floating offshore substation as an integrated system through analyses of functional requirements, integration constraints, risk and reliability

TOPICS ADDRESSED

- **Design basis**
- **Electrical systems and topside:** functional analysis, electrical architecture definition, topside arrangement, calculation of the movements
- **Semi-submersible** platform: design, motion and vibration analysis
- **TLP** platform: advanced and comparative design, motion and vibration analysis, basin testing
- **Dynamic cables**: design of a cross section, arrangement and connection
- **Cybersecurity**
- **Risk and reliability** analysis, maintenance optimisation, OPEX calculation
- **Qualification:** validation and qualification strategy, rules and regulation gap analysis, recommendations