Exploring Synergies Between Wind and Offshore Oil and Gas

Copenhagen Offshore Wind

George Sgouros

Renewables & Hydrogen

Health Safety and Environment

- Oil and gas has a record of improving HSE performance over time. For example offshore construction contractors in the US GoM have improved their safety incident rates by a factor of ten over the last ten years. Wind can benefit from this experience by:
  - Adopting similar HSE standards and procedures
  - Developing and enforcing personnel HSE competency profiles
  - Utilizing industry forums and associations to standardize, share learnings and disseminate best practices.
- Wind can facilitate permits by using EIAs already performed by oil and gas, such as the effects of offshore structures in bird flight patterns.

Learnings on Development and Operating Costs

- Use lifecycle cost mentality. Avoid the temptation to lower CAPEX to get the project approved at the expense of OPEX.
- Equipment reliability is even more valuable offshore where access is more difficult and intervention costs higher.
- Use oil and gas historical cost data to validate weather, intervention and other contingencies in project economics.

Contracting Approach

- Ideally, risks should be allocated to the entity better able to handle it and this should dictate the appropriate contracting approach. In reality, financing and other business constraints dictate the contracting strategy. This issue should be revisited on every project.

- Consider contractors (esp. the equipment manufacturer, the engineering and the installation contractors) members of the project team. Get them involved early, ideally in the FEED stage.

- Consider the use of performance incentives to reinforce alignment of the extended project team.

Technology

- Technical innovation is a necessary enabler for offshore developments.
- Balance simple extrapolation from onshore with measured innovation. Consider the effects of innovation on reliability and project schedule.
- Do not underestimate the ergonomic issues. Avoid costly offshore retrofits.
- Capitalize on oil and gas analysis tools, design and contruction standards and practices and QA methods.
- Utilize demonstration projects to prove technology and validate costs (Blyth, Egmond aan Zee).

Sharing of Infrastructure and Resources

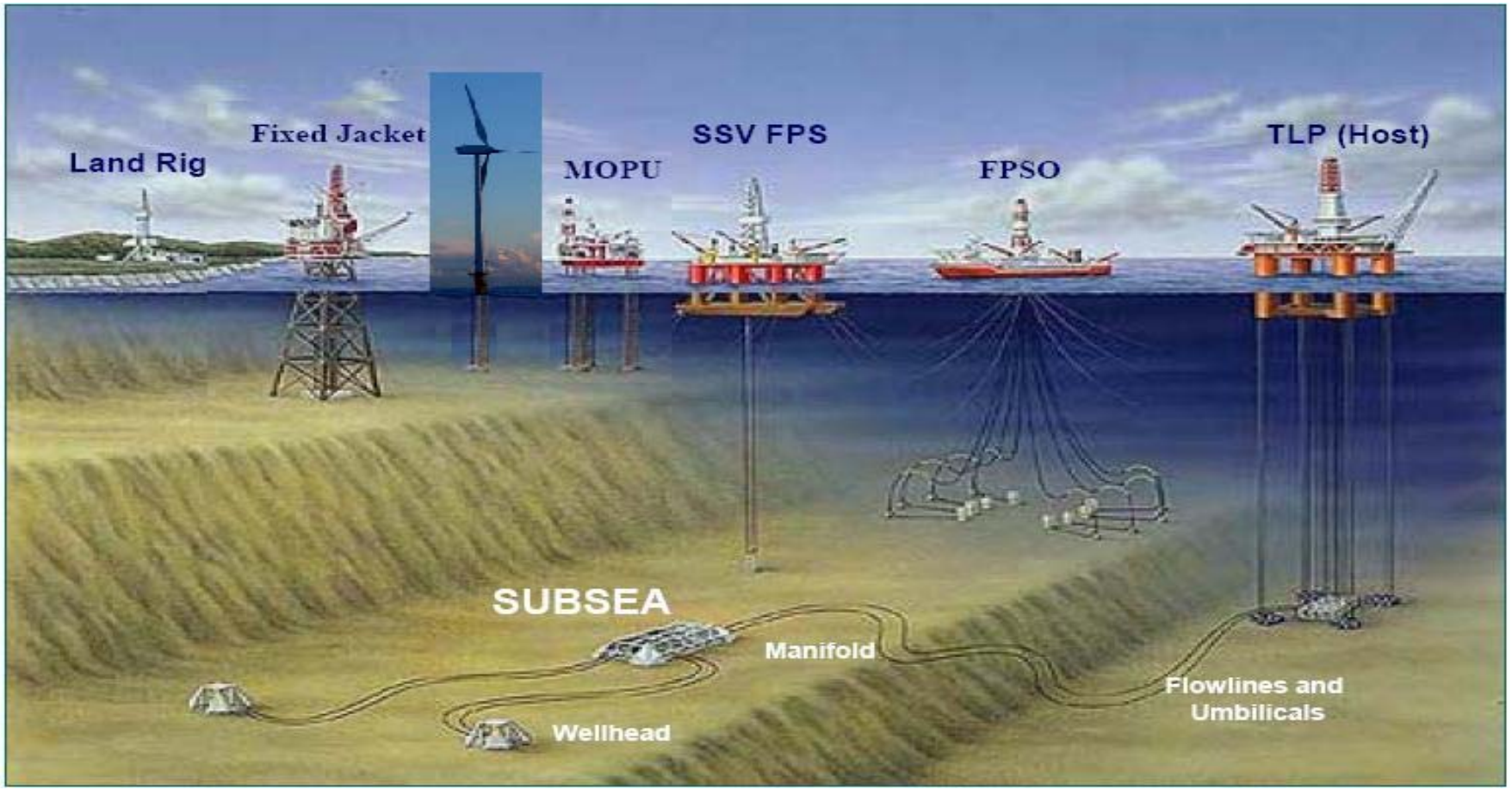
- Potential use of offshore oil and gas sites for locating turbines and substations can help with gas deficiencies and emissions to air. This also has implications for the abandonment of the oil and gas structures.

- Sharing of engineering and operating personnel, vessels, equipment, facilities, contractors.

Summary of main areas of synergy between offshore oil and gas and wind

- HSE
- Cost Estimating Reality Check
- Contracting Approach
- Technology
- Sharing of Infrastructure and Resources

50 years for oil and gas



15 years for offshore wind (so far)…..