THE CONTEXT OF OFFSHORE WINDFARM PRODUCTION

FLOATING ENERGY SYSTEMS

Current fixed bottom offshore windfarm sizes:

- Dogger Bank: 3 phases each 1.2 GW. Total = 3.6 GW
- East Anglia: One = 714MW; Two = 900 MW; Three = 1400MW. Total = 3 GW

Reasonable target size for floating wind farm:

- 450 MW each phase over 6 years = Total 2.7 GW

Constraints:

- Temperate latitude installation season: March to Oct = 8 x 30.5 days = 244 days
- turbine availability: 16MW units by 2024

Target Installation Rate:

- 450MW / 16 MW = 28 floating units installed each season
- 244 day / 28 units = 8.7 days for each floating unit

Target Production Rate over 6 years:

- 350 days / 28 units = 12.5 days/floating unit (foundation + turbine + pre-com)
- Build buffer of 10 off season (Nov-Feb)
- Build remaining 18 during season (Mar-Oct)

HOW TO ACHIEVE EFFICIENT MULTI-UNIT PRODUCTIVITY

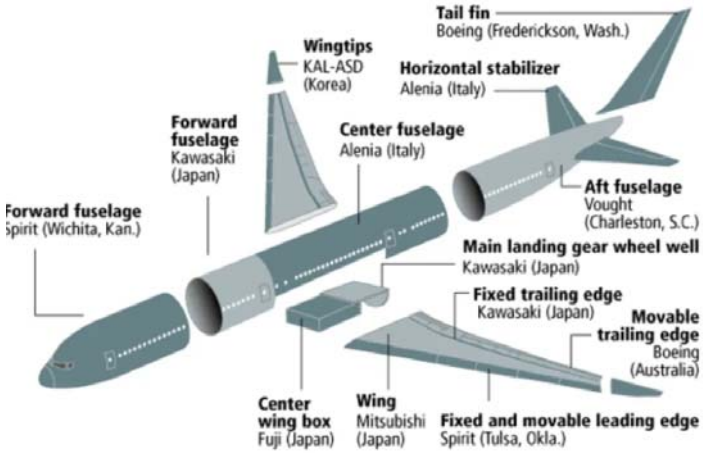
FLOATING ENERGY SYSTEMS

Modularity

components built off site and delivered to a final assembly yard

Distributed supply chain

Different contractors able to deliver same component



Throughput:

- Avoid inter-related tasks at production line stations
- Maximise automated production indoors
- Minimise manual production outdoors

Simplicity:

- Eliminate unnecessary complexity before production (Ockham's Razor)
- Maximise use of standard components
- Minimise the number of different components
- Minimise assembly site capital costs (to replicate site at multiple locations)

Proven Models

- Far East shipbuilding practices from late 1960s
- Wide body aircraft