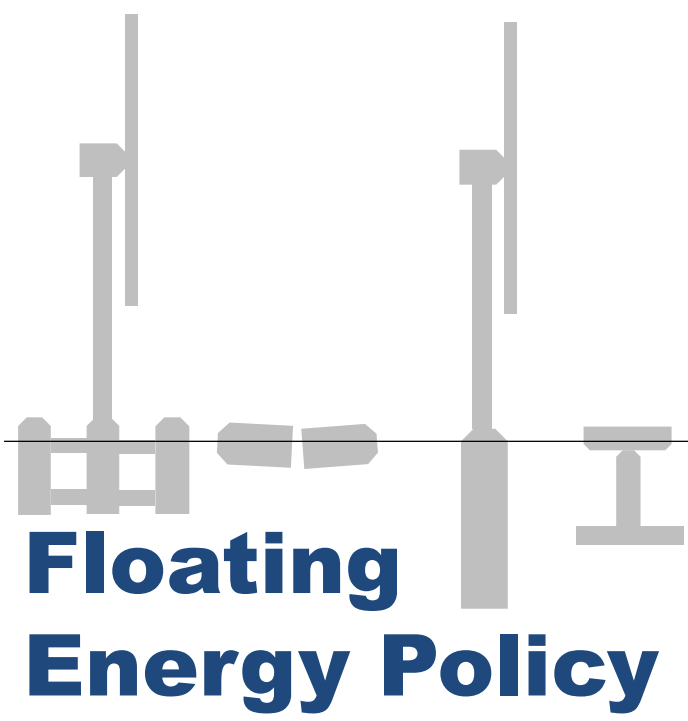
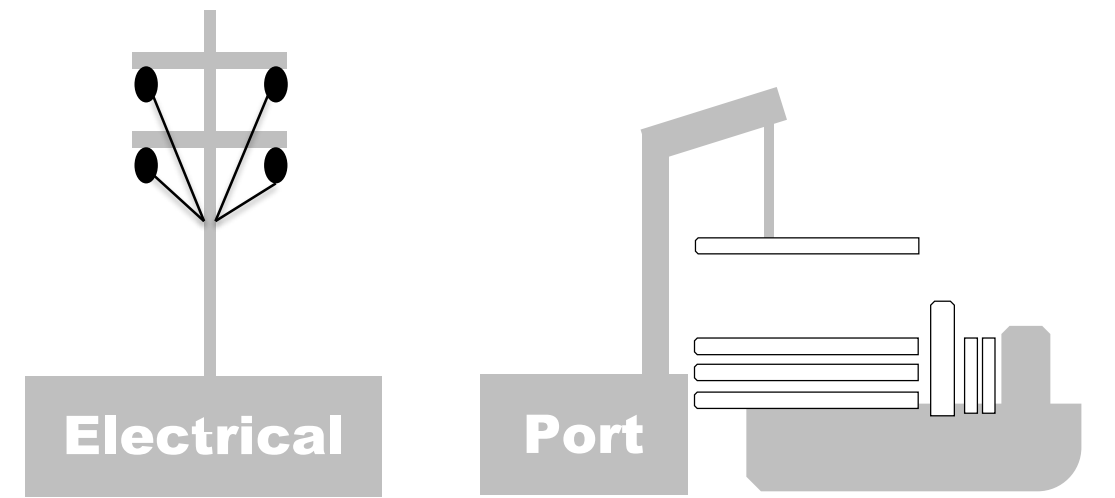


Floating Wind and Wave Energy in Western Europe

A tool kit to develop targeted policy and infrastructure analysis to support future sector growth.



If these energies are to play a significant role in the future European mix the dichotomy in policy and potential lack of suitable infrastructure must be addressed now.



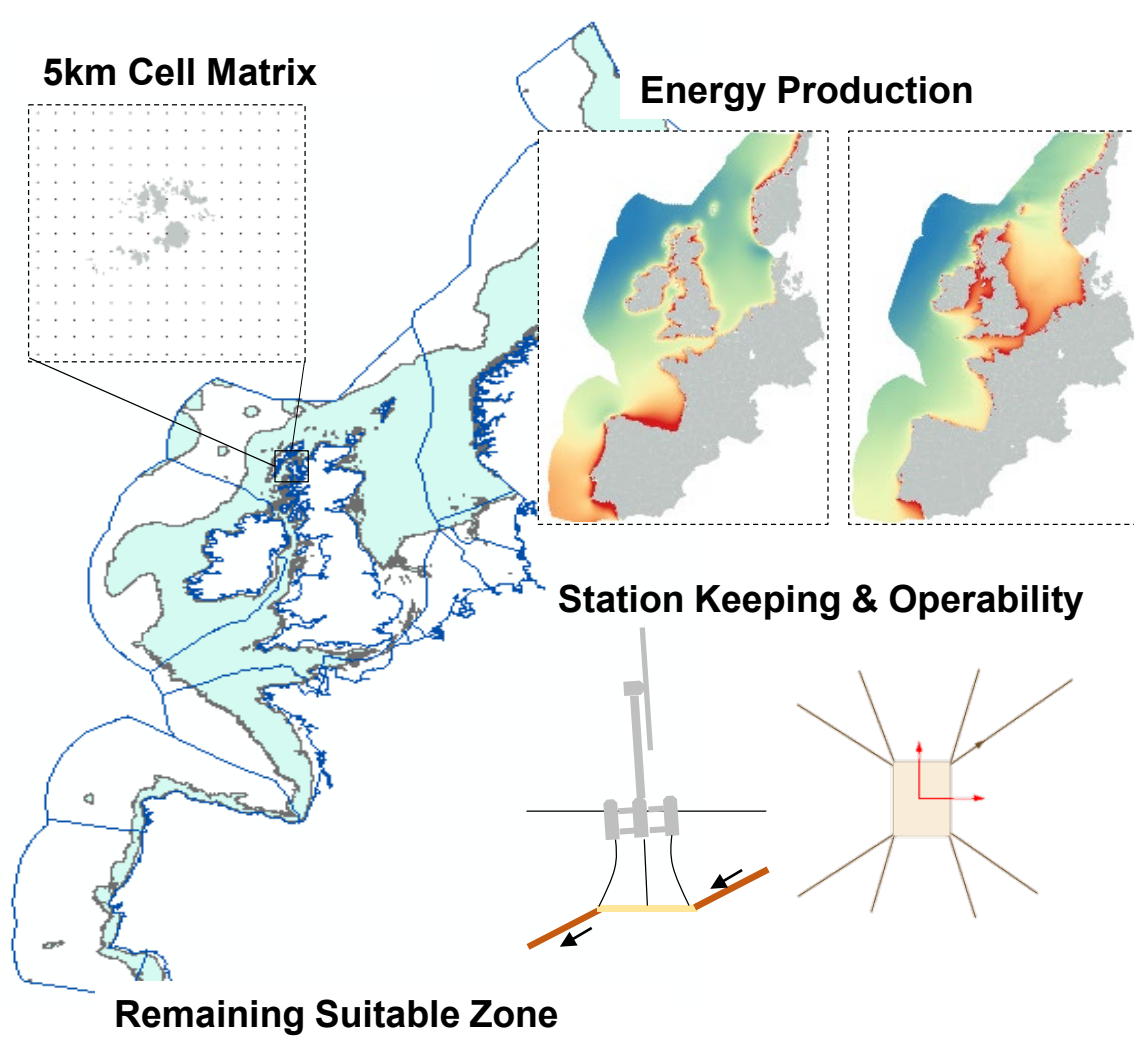
Research Questions

- 1) Where are potential sites? 2) What is the spatial conflict caused by sector growth? 3) How adequate is current infrastructure for sector growth? 4) Where should upgrades occur to allow for sector growth?

Infrastructure Development

1. Site Potential

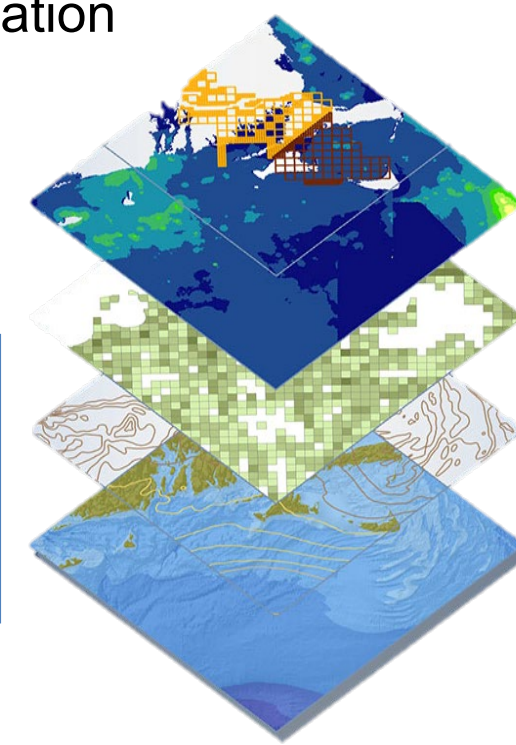
- Cell evaluation for site feasibility parameters of geotechnical and met ocean conditions.
- Installation feasibility. Subsequent site driven cost per cell
- Cell Cost functions incorporate these features as well as distance to suitable infrastructure.



2. Spatial Conflict

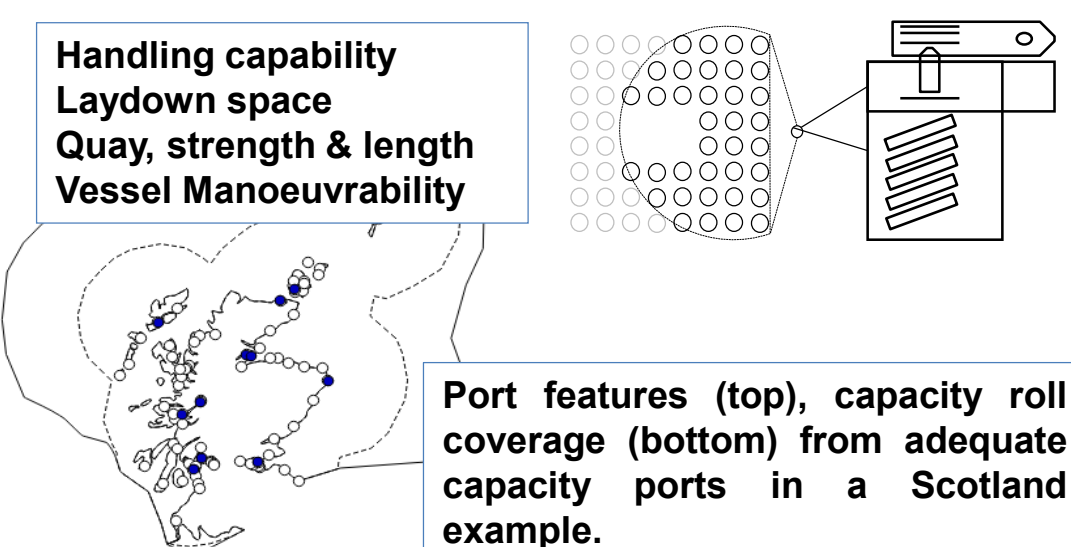
- Spatial competition requires targeted policy
- Marine stakeholder valuation
- National Weightings of industry significance

AIS satellite tracking analysis for vessel types. Oil and gas licences/fields/well. Fish stock population zones. Environmental classification/benthic ecology



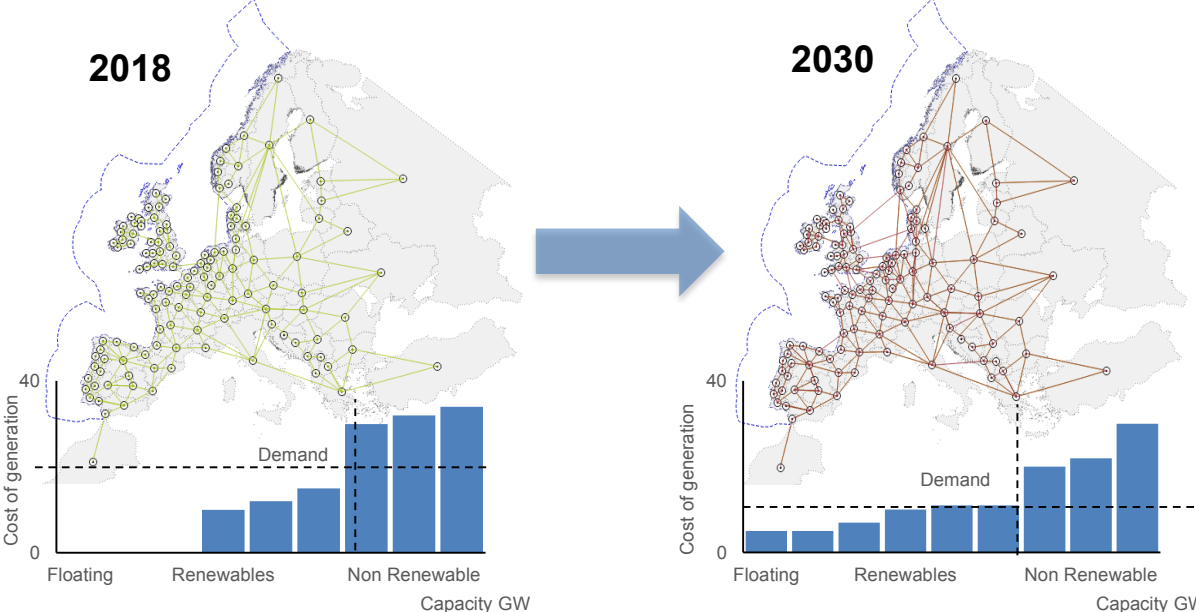
3.B Ports Suitability

- Port Role Identification
- Upgrading ports to increase suitability
- Competition for operations measured against, other users crucially, fixed wind.



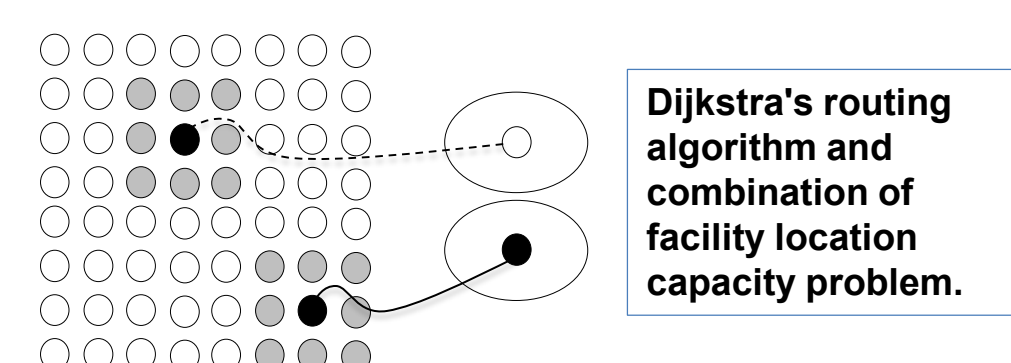
3.A Electrical Connection

- European HV Network focussing granularity coastal regions.
- Energy scenarios and topologies explored in economic dispatch models.
- Grid investment vs technology cost.



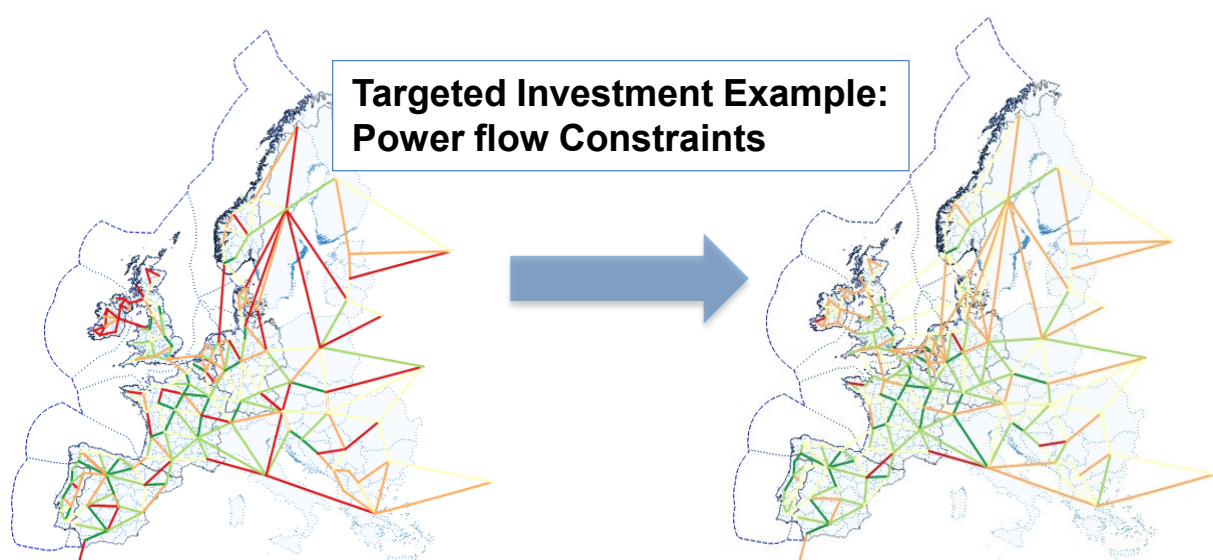
3. Infrastructure Allocation

- Energy production and device n is allocated infrastructure.
- Distribution based on mean hotspot of energy production and conflict.
- Potential Iterations of substations and cable compositions.



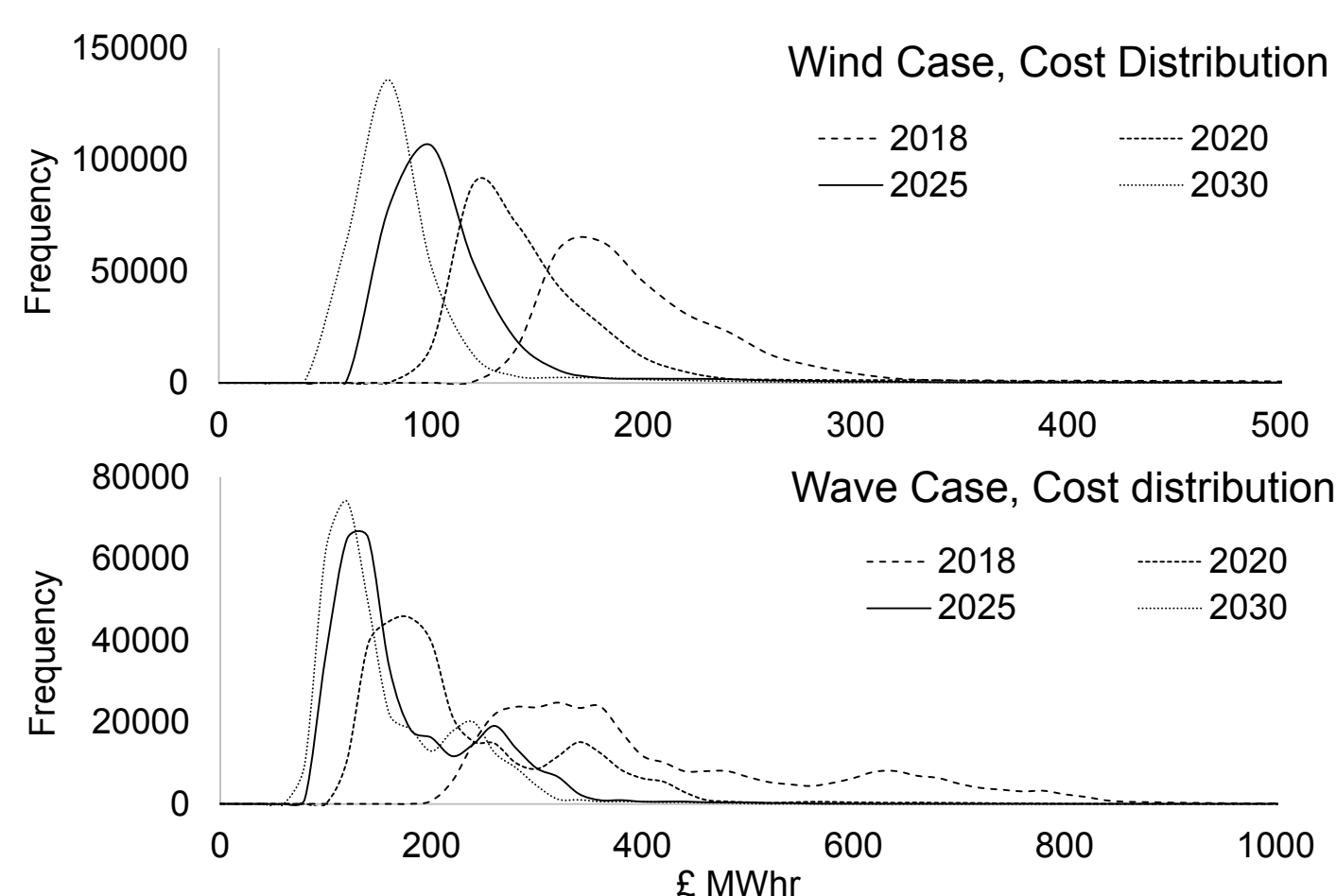
4. Targeted Investment

- Infrastructure varies greatly.
- Identifying areas over 2018 / 2020 / 2025 / 2030 are chose to maximise suitability.
- Ireland and Norway have a suitable grid capacity to accept large scale float injection after upgrades.
- The UK however has adequate port facilities to cover Ireland.



Preliminary Results

- Primary models of site suitability demonstrate a convergence and reduction cost over time.



Conclusions

- **Station keeping** and **operability** parameters of floating technology **eliminates** vast swathes of the marine zone.
- Marine **conflict** levels determined that Ireland, Portugal, The UK and Norway have **suitable space** for consenting.
- **Without focussed** assessments, the development of blanket EU wide policies will have **little impact** on sector growth.
- **Cooperative policy** for sector growth must be aimed at attributes in **selected** countries.

By establishing targeted investment a direct cost against industry success can be measured.