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The ISLES Project



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ISLES – Irish-Scottish Links on Energy Study

Strategic collaboration between governments of Scotland, Ireland and N. Ireland to facilitate the development and export of offshore renewables across three jurisdictions

Project is essentially a feasibility study

Project supported by EU's INTERREG IVA Programme and co-funded by the three administrations

Consortium led by RPS Group

Due to be completed by Q3 2011





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INTERREG IVA Eligible Area



**Structural Funds 2007 - 2013: Cross-border Cooperation
Northern Ireland, the Border Region of Ireland and Western Scotland**

- Cooperation areas
- Adjacent cooperation areas





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**Aim: develop concept and present business case for a
offshore interconnected transmission network - via subsea
electricity grid - off west coast of Scotland and Irish Sea,
linking offshore renewable energy sites**



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POLICY CONTEXT

- **NI - Strategic Energy Framework focus: maximise renewable energy - 40% renewable electricity by 2020**
- **IRL – Nat. Renewable Energy Action Plan – target of 40% renewable electricity by 2020, 10% electric cars by 2020**
- **NI–IRL All-island Energy Market Framework – remove barriers for mutual benefit**
- **Grid infrastructure updating: NI- £1b, ROI– €4.5b**
- **NI - 600MW offshore wind and 300MW tidal energy by 2020.**
- **IRL - Significant investment, including c. 800MW offshore wind for Gate 3**
- **Scot. - renewable sources to generate equivalent of 80% of annual electricity consumption by 2020, with 31% by 2011.**
- **Scot. - 21.5 GW of commercial capacity could be harnessed from the waters around Scotland.**



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ISLES Renewables Resource Potential (RPS figures)				
	Offshore Wind (GW)	Wave (GW)	Tidal (GW)	Total (GW)
Scotland (west coast)	6.4	1.6	0.9	8.9
Republic of Ireland	4.8	1.1	0.2	6.1
Northern Ireland	0.9	-	0.6	1.5
Totals	12.1	2.7	1.7	16.5
Electricity Demand (peak)				
				Total (GW)
Scotland				6.0
SEM (Island of Ireland)				7.0
Total (GW)				13.0

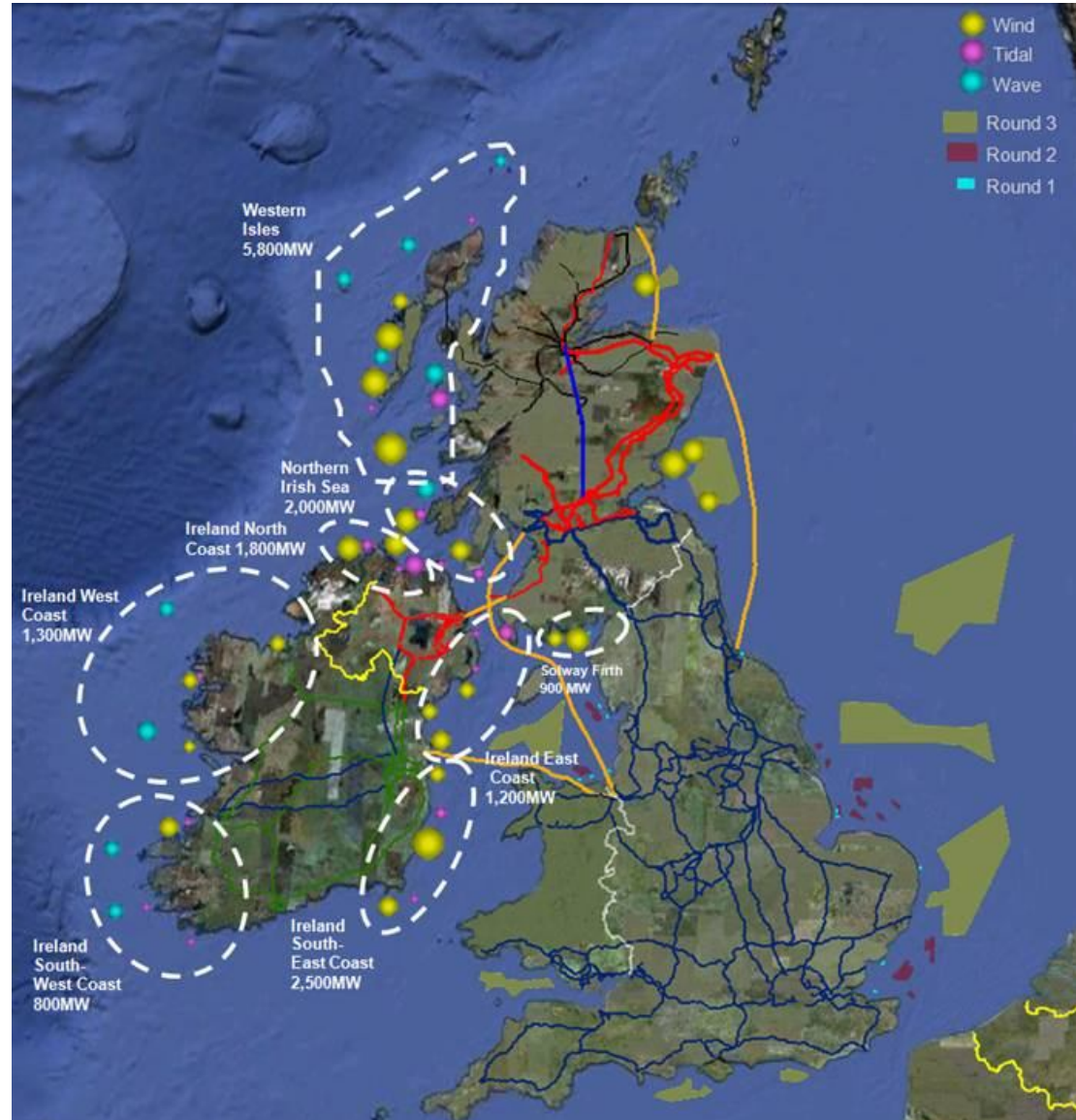
ISLES Project: Feasibility Study Workstreams

<i>Activity</i>	<i>What does this involve?</i>	<i>Lead Consultant</i>
1. Project Management	- communications and publicity	RPS
2. Regulatory and finance	- funding options, network charges, - economic viability and - cross-border regulatory models	PPA
3. Technology and infrastructure	- best practice for grid connection and interconnectors; - sites to be connected; - transmission capacity and technologies; cable design and onshore constraints; - grid construction alongside other services (telecoms) - grid storage and technology solutions	TNEI
4. Environmental and planning	- environmental constraints to development; - planning challenges; - EU, national and regional policies	RPS
5. Construction and deployment	- technology options and capacity, - connection sites, - manufacturing capacity, - onshore / offshore construction techniques; - future expansion and maintenance requirements	TNEI (onshore); IHC Engineering (offshore)
6. Cost-benefit	- Costs and benefits of an offshore grid;	PPA

ISLES Resource Assessment

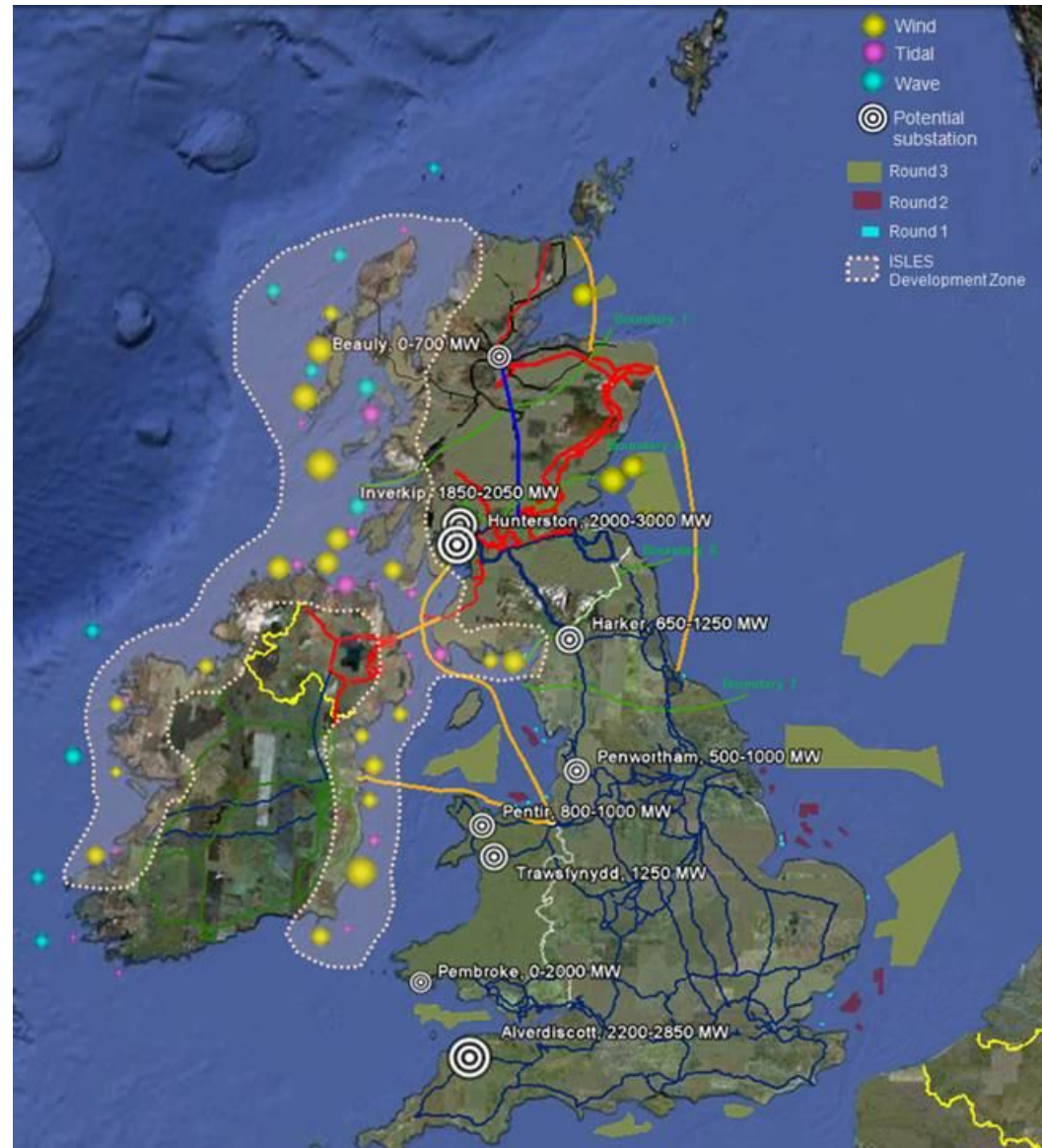
- assessment based on best available data; continually being updated as SEA¹ data released
- covers west coast of Scotland and all of Ireland

1: Strategic Environmental Assessment



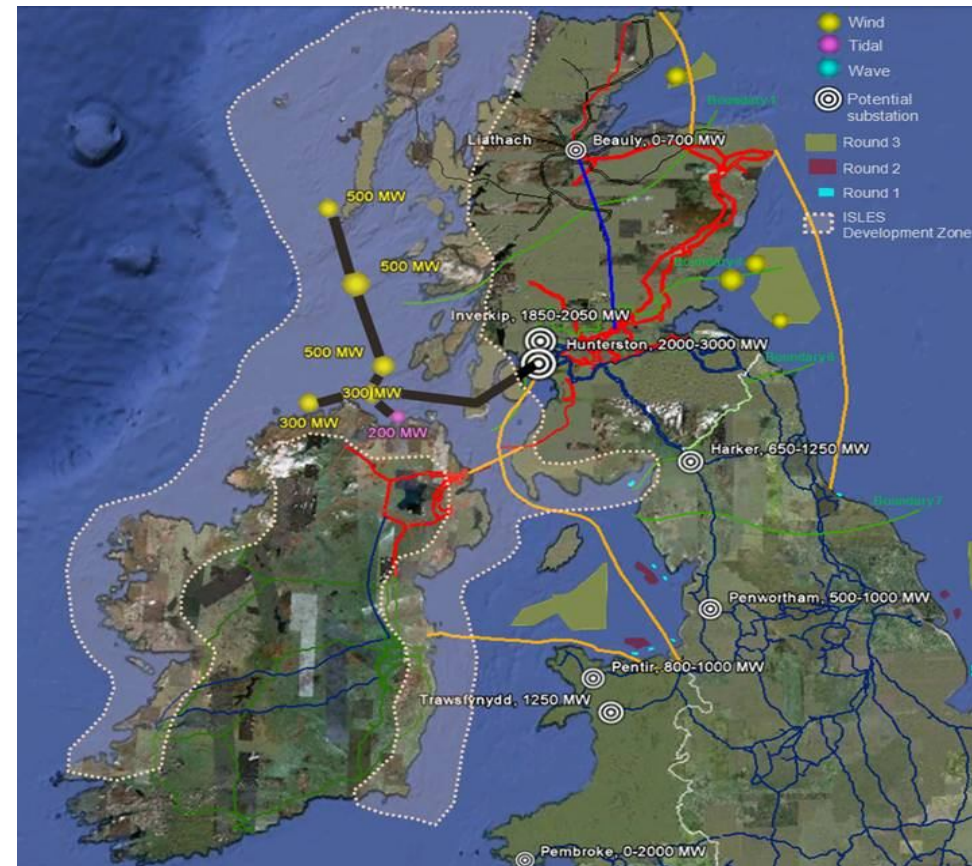
ISLES Connection Capacity

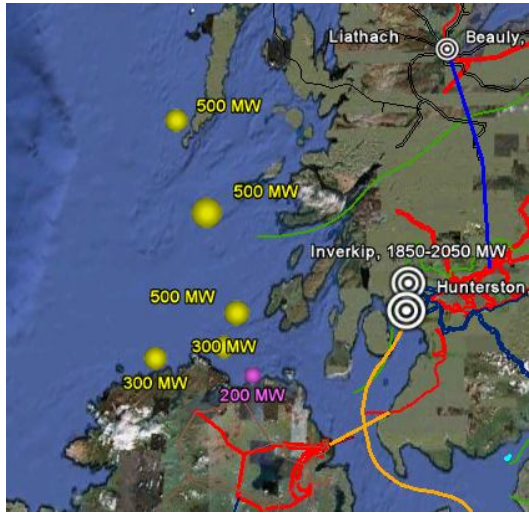
- Opportunity for multi-GW connection capacity in Scotland and Ireland is limited
- Hunterston area provides potential for 2-3 GW dependent on other developments.
- Alternatively need to look south, either to:
 - North England/North Wales
 - South Wales/South England



ISLES North Concept

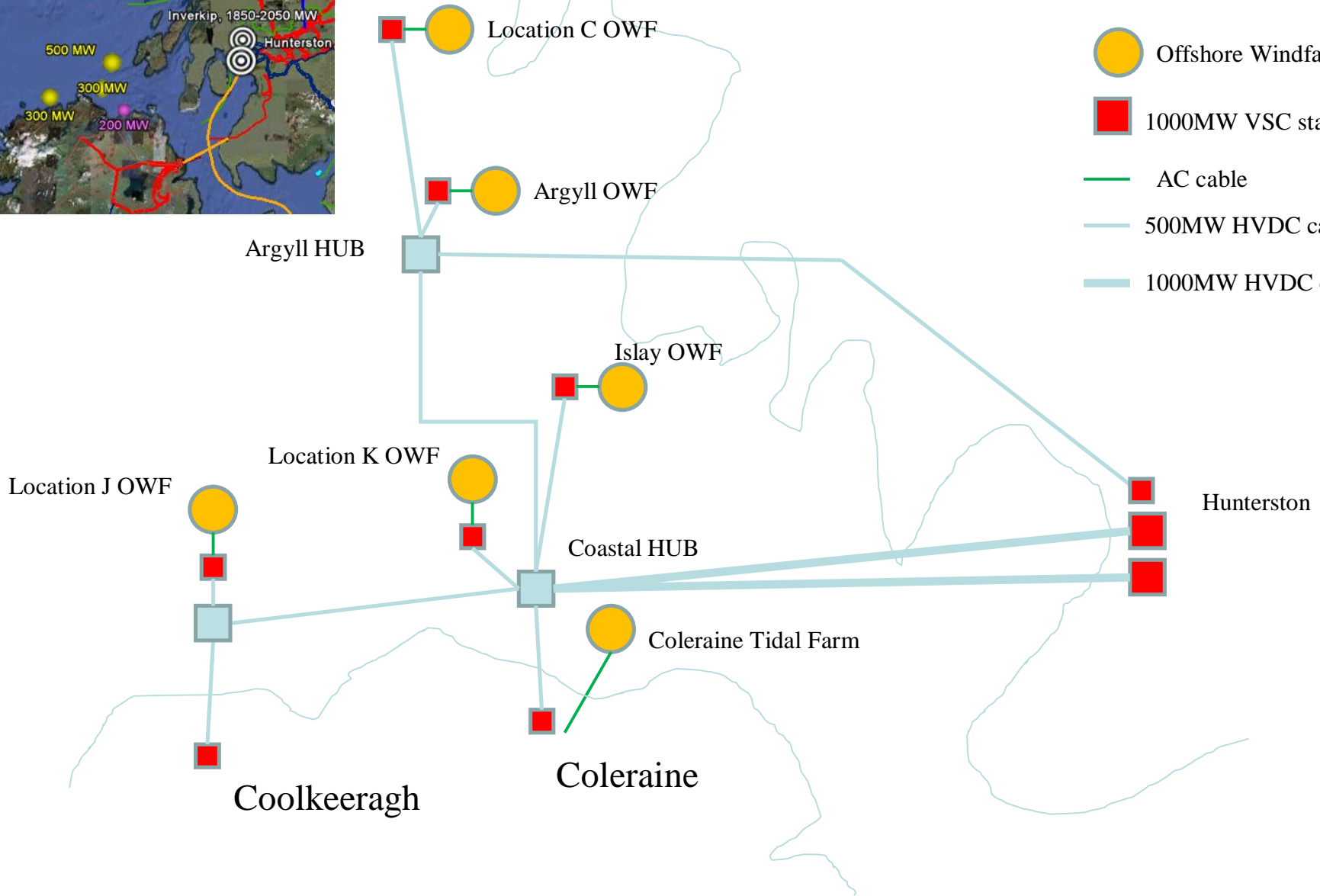
- Circa 7.8 GW of potential marine resources
- 2.5 – 3.0 GW presents ambitious scale for North Concept with ‘available’ connection capacity
- Incorporates 500 MW of potential Interconnection capacity to test market benefit
- Technology requirements at this level are non-trivial
- Satisfies all key objectives





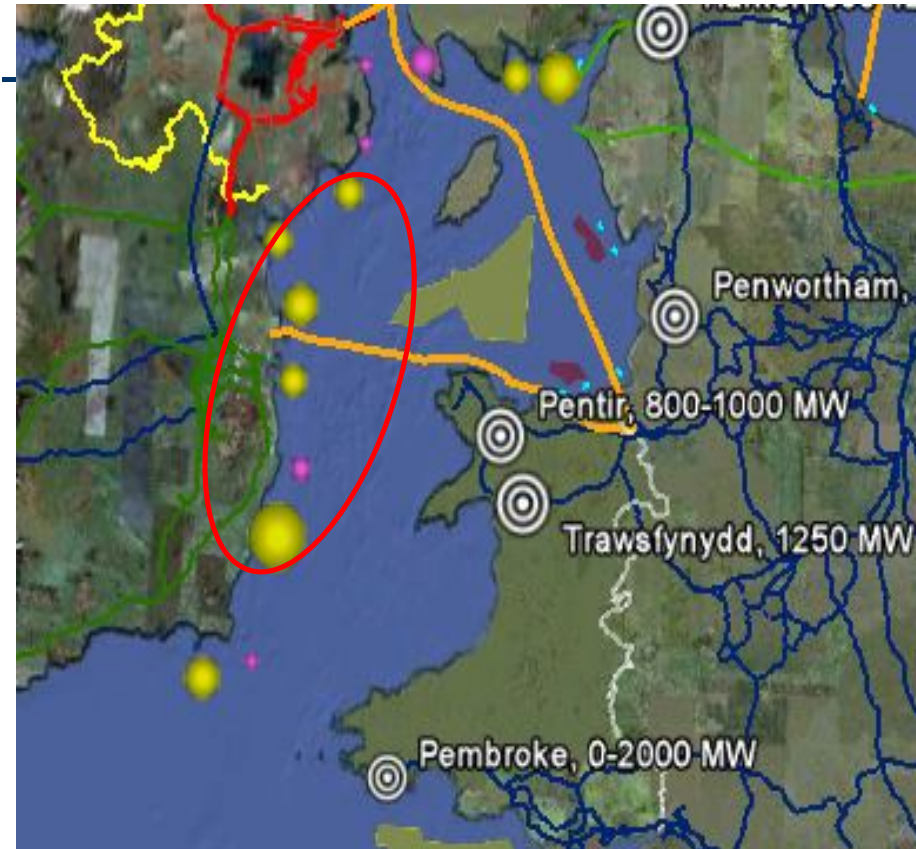
ISLES North Concept

- 500MW VSC station
- HVDC Platform HUB
- Offshore Windfarm
- 1000MW VSC station
- AC cable
- 500MW HVDC cable
- 1000MW HVDC cable

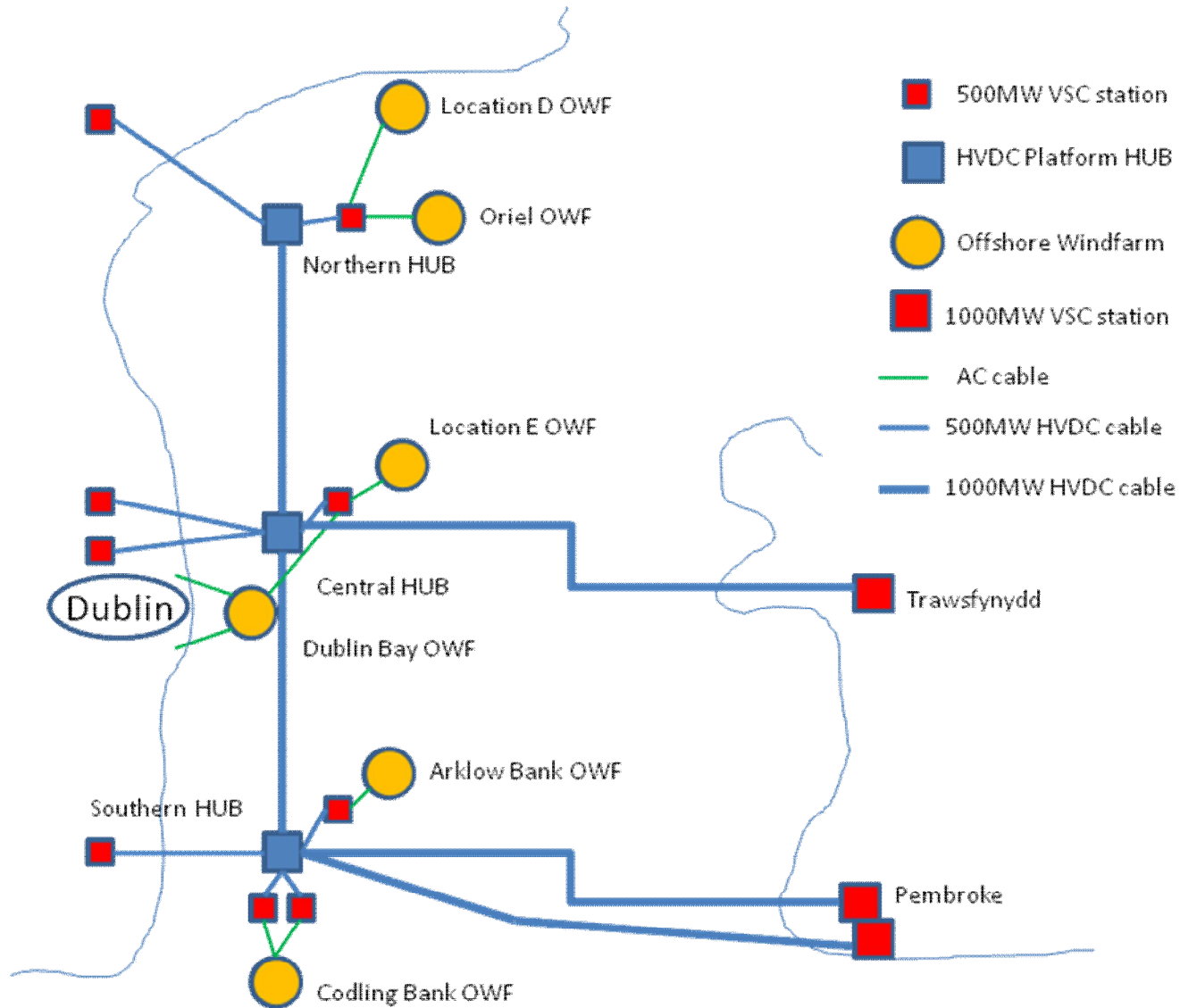


ISLES South Concept

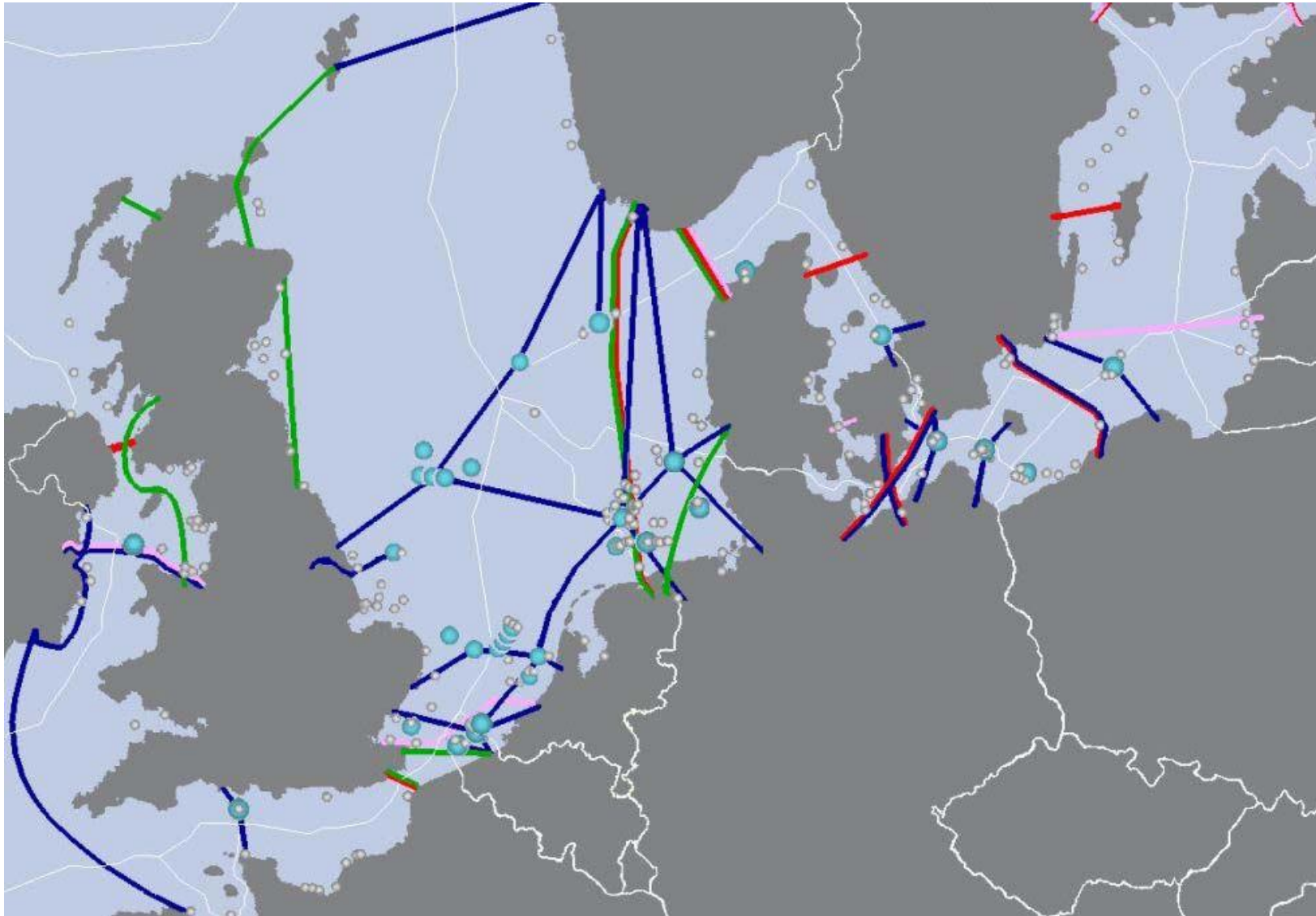
- Circa 3.4 GW of potential marine resources of East Coast All Ireland - similar scale to North Concept
- Incorporates 3000 MW of potential Interconnection capacity
- Enhanced transfer capacity and reinforcement across all Ireland
- Hybrid Technology solution incorporating DC and AC mix
- 3 x 1000 MW links to Wales
- Final configuration / development route(s) to be explored



ISLES South Concept



North Seas Interconnection Model



EU Infrastructure Package



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ISLES - EU Strategic Fit

- **free movement of energy in Northern Seas;**
- **integration of electricity grids - fit for purpose**
- **remove isolation of periphery Member States**
- **support Market integration – SEM > BETTA**
- **aiming for $\frac{2}{3}$ of electricity from low carbon by early 2020s**
- **ISLES > EU North Seas Countries Offshore Grid Initiative – priority energy corridor**
- **ISLES - transferable value across EU**



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ECONOMIC OPPORTUNITIES

- **opens up marine renewable development opportunities as technologies improve**
- **access to onshore networks for offshore renewables and interconnects markets**
- **'bankability' of renewable generation capacity and network capacity by facilitating access to multiple markets and maximising utilisation of expensive infrastructure**
- **could contribute towards management of variability and uncertainty of renewables - sharing reserves over larger areas.**
- **economic development, supply chain opportunities - cabling, support vessels, crews, machinery**



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CHALLENGES

- **big regulatory, jurisdictional and political hurdles;**
- **cost recovery and charging mechanisms**
- **access to support incentives across national borders**
- **cost - multi-billion £/€ - Who pays?**
- **technical challenges, e.g. supply-chain, capacity - onshore grid 'full up'?**
- **Will it be built? > 2020-2030?**





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ISLES (Irish-Scottish Links on Energy Study)

INTERIM CONCLUSIONS

- **This thing IS feasible – technically, regulatory**
- **Issues on economics remain**
- **will inform governments and industry on what is feasible - e.g. modular approach to develop network capacity**
- **publish / conference on results late 2011**