

Compressed Air Energy Storage (CAES) and Deepwater Offshore Wind

ElecTec10
Workshop for Power System Technology

June 11th 2010



Presentation Outline

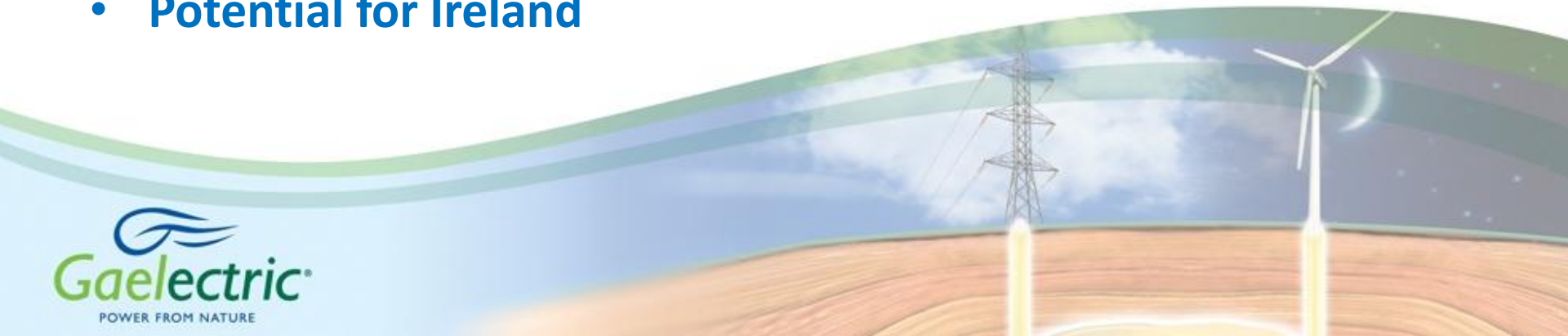
- Gaelectric Group

Compressed Air Energy Storage (CAES)

- Configuration of the Technology
- Next Generation CAES
- CAES for Ireland – Larne NI

Deepwater Offshore Wind

- Seabed Research
- 5MW Technology
- Potential for Ireland

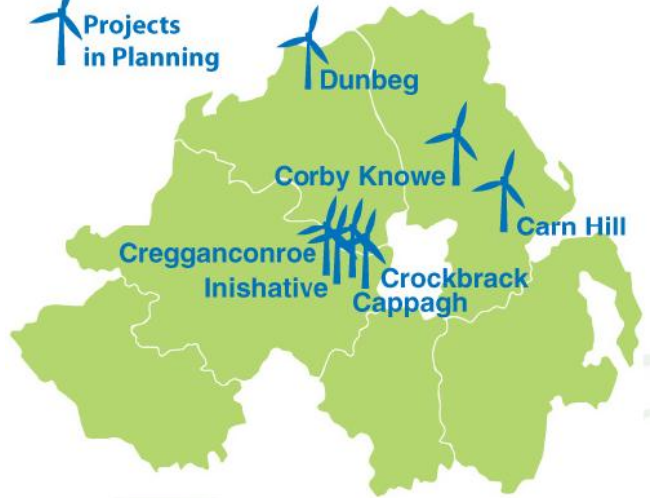


Gaelectric Group

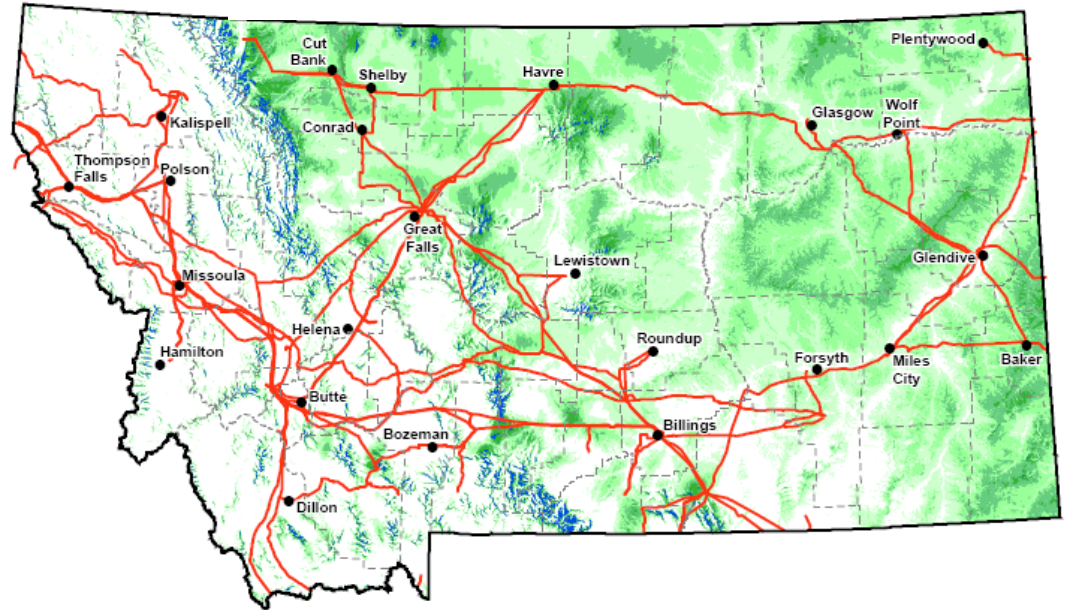


Northern Ireland

Projects
in Planning

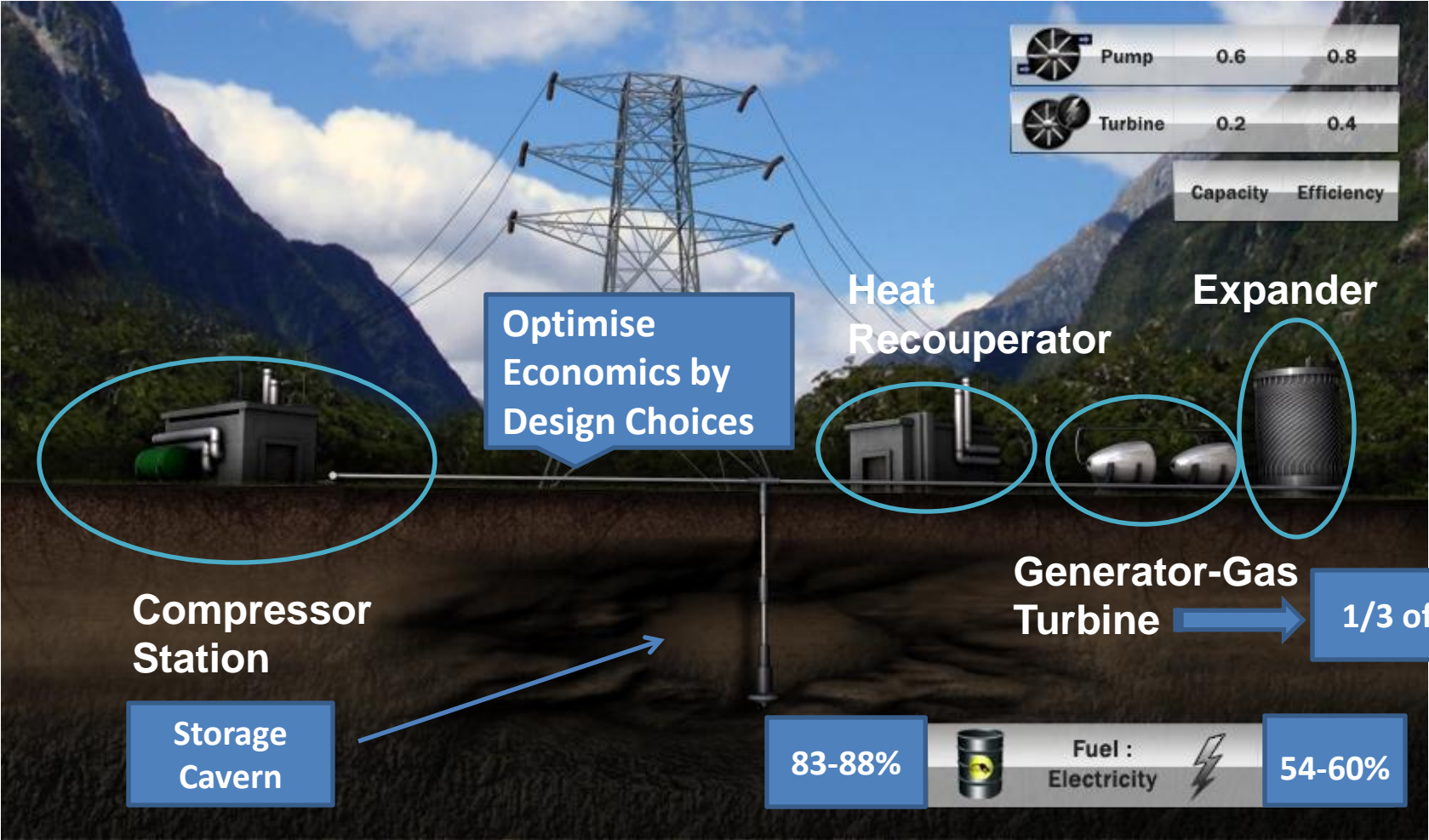


Republic of Ireland

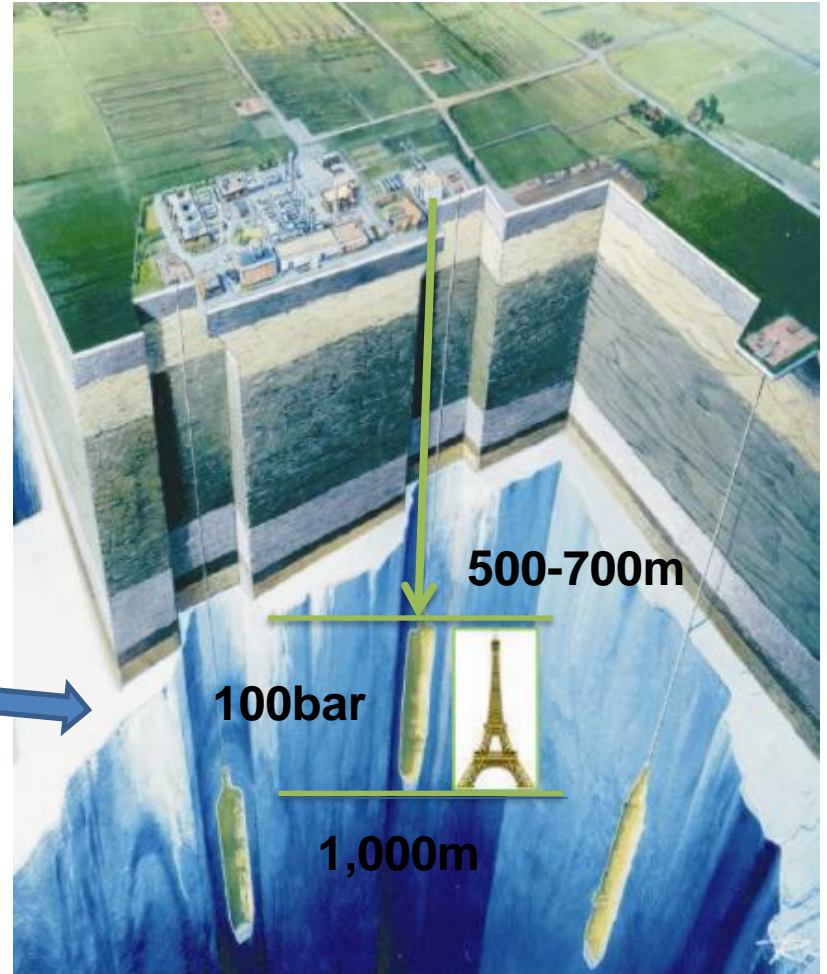
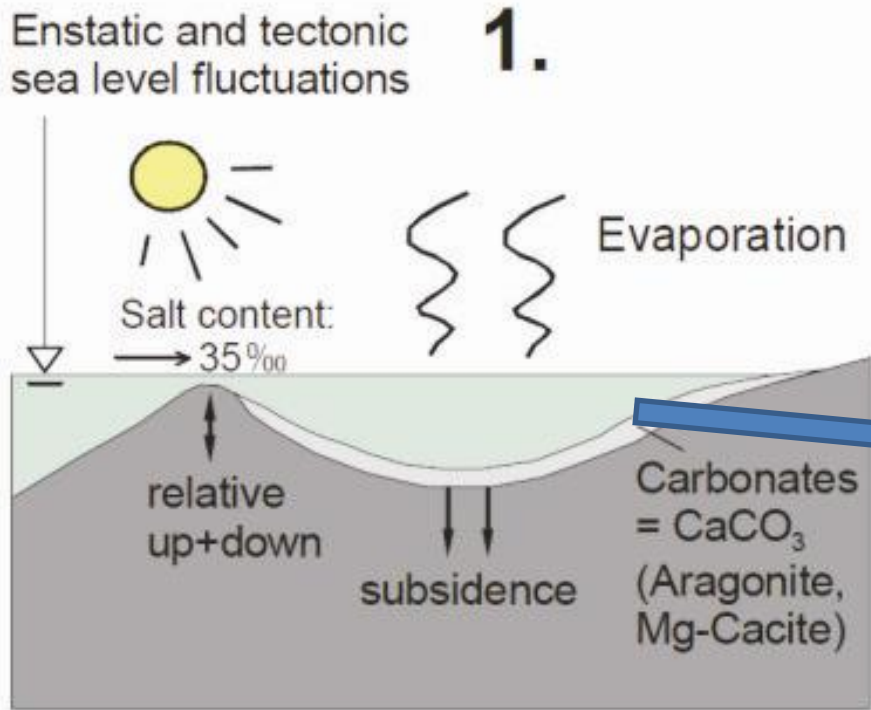


- Utilise energy storage to improve value of our wind assets
- Developing a Compressed Air Energy Storage (CAES) plant in Larne, Northern Ireland
- CAES can enable greater levels of wind penetration, reduce curtailment/congestion and facilitate carbon reduction targets for the Island of Ireland

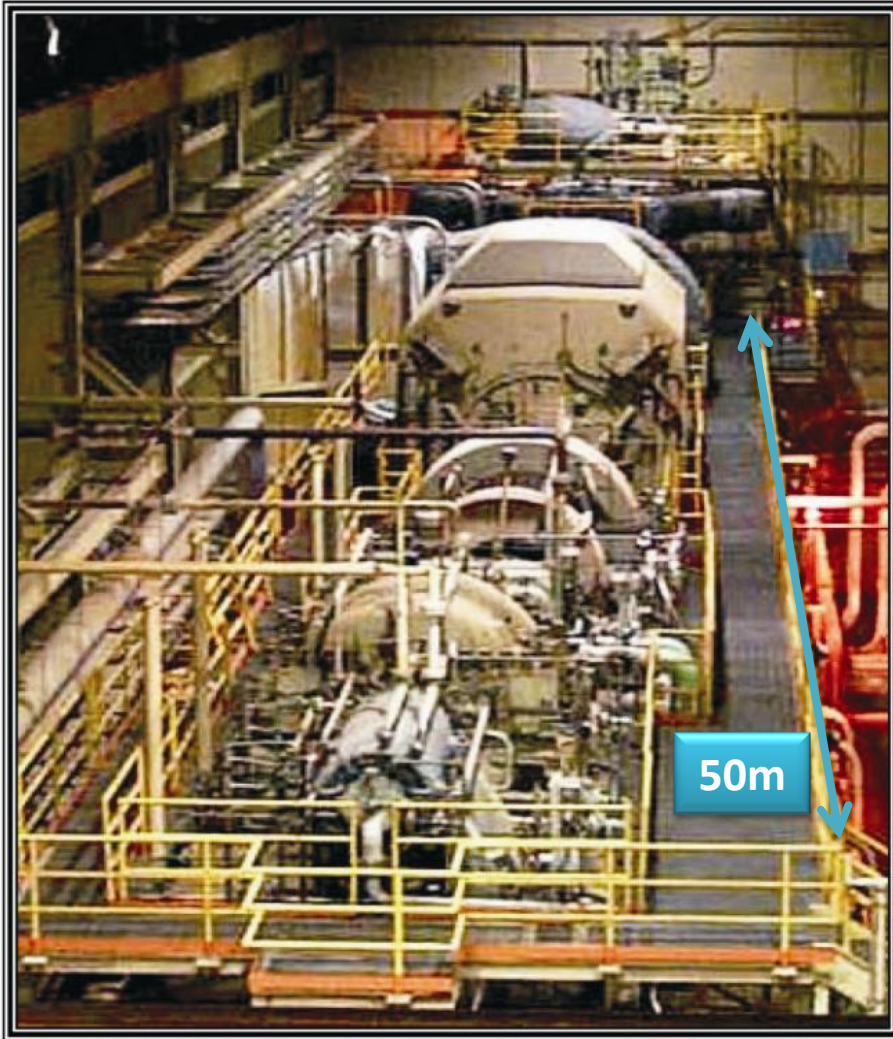
Configuration of CAES Technology



Geology Core to the Technology



Alabama Plant 110MW



} Expansion Turbines

← Clutch

← Motor-Generator

← Clutch

} Compressors

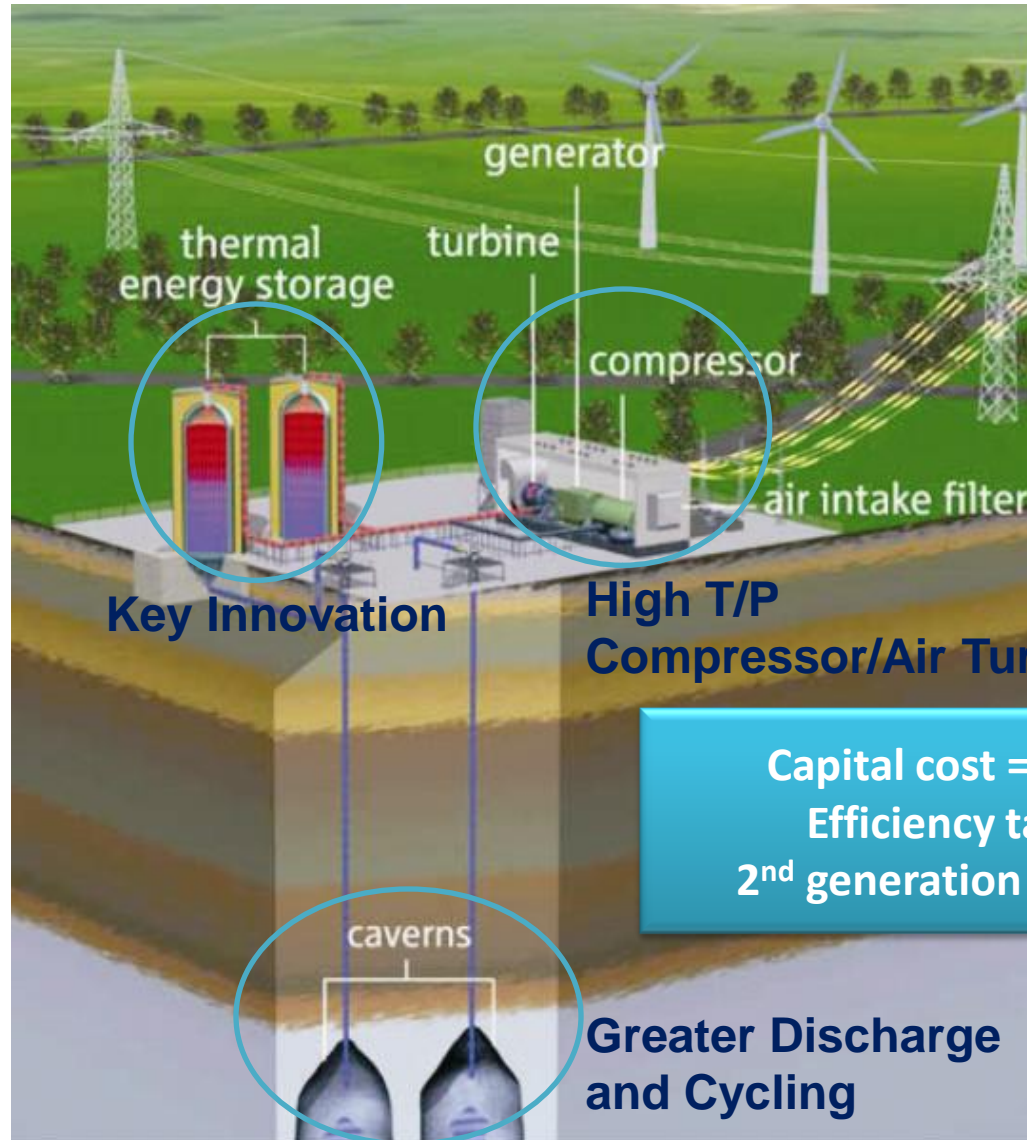
50m

Capital cost = \$750k/MW
Efficiency approx. 48%

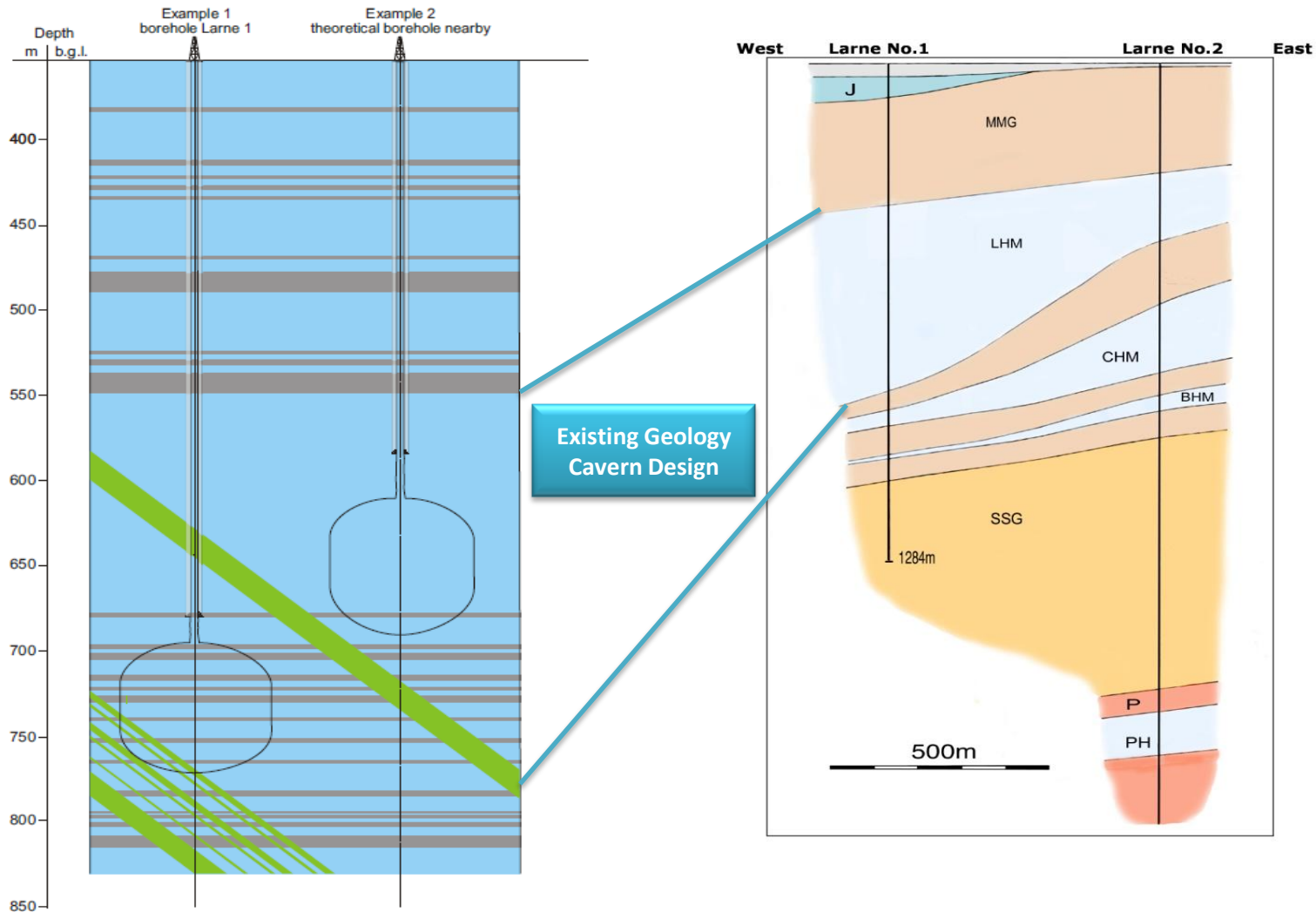
EEPRI | ELECTRIC POWER
RES

Gaelectric
POWER FROM NATURE

Adiabatic CAES – Next Generation

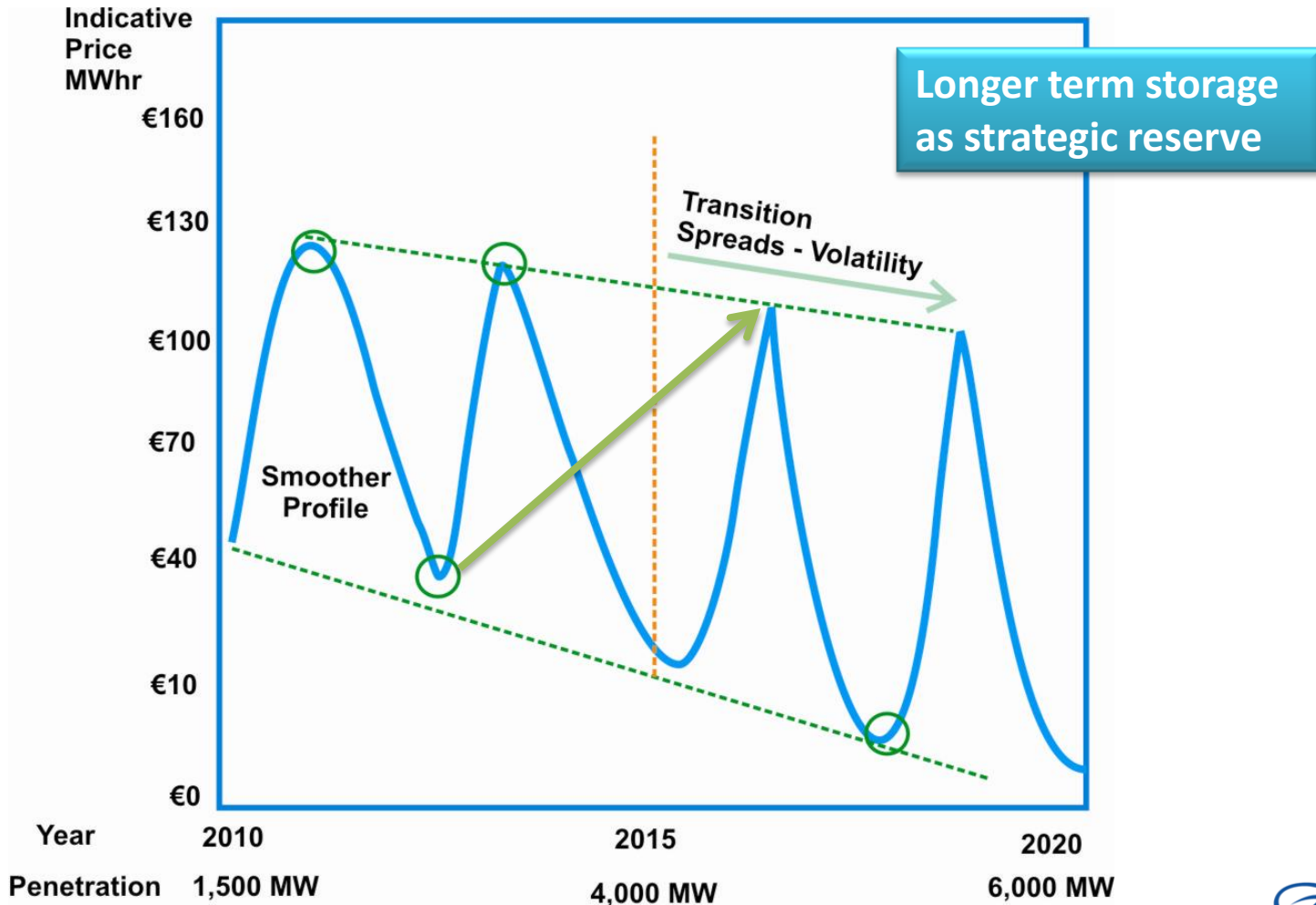


CAES for Ireland – Larne Project NI



Existing Geology
Cavern Design

All Island Grid Study Modelling



System Costs and CAES Benefits

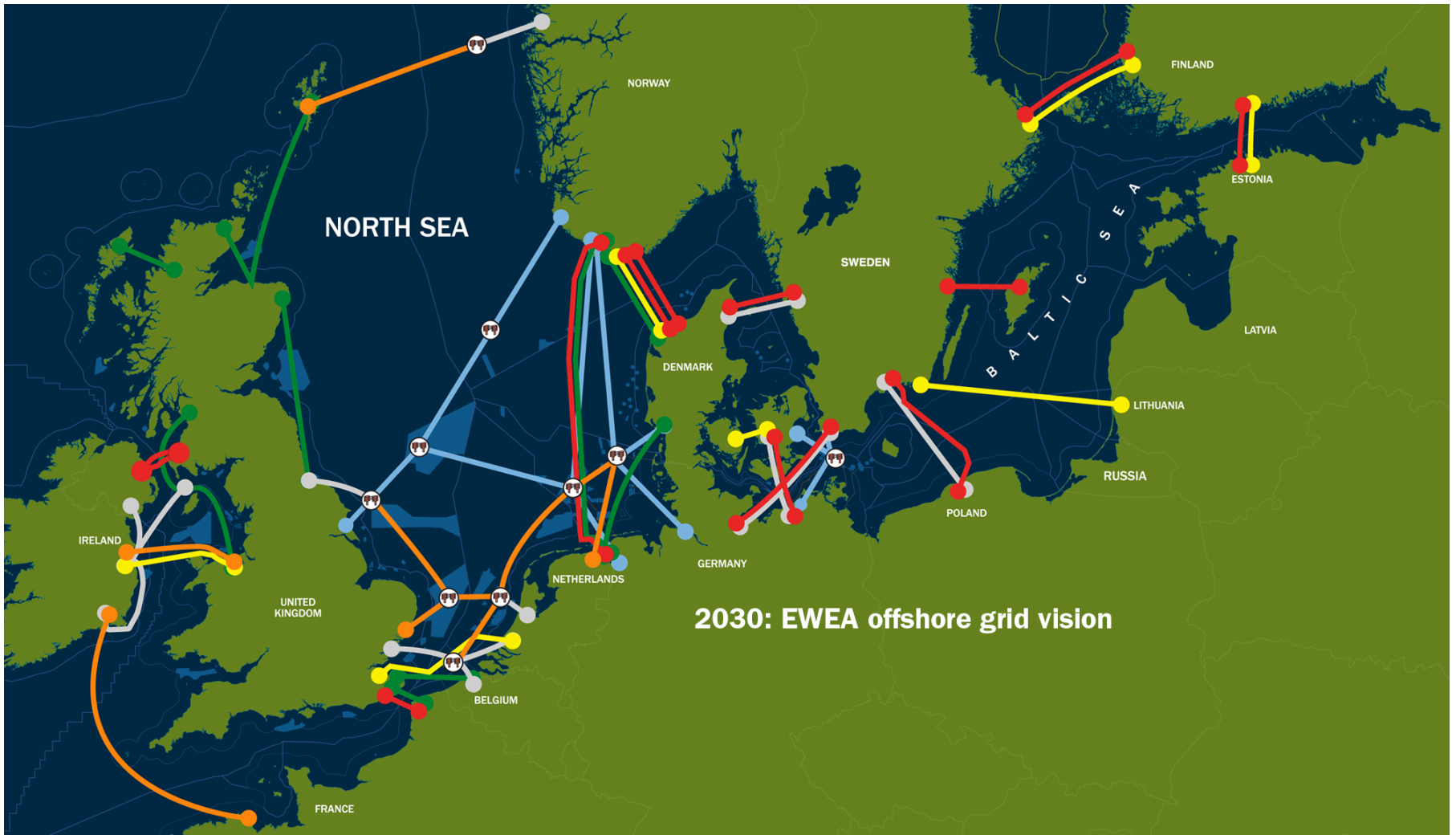
Feature	Annual Benefits 2015 to 2020 (Minimum estimates)
CAES Size	<i>150 MW</i>
Reduced System Costs	<i>€6-7mIn (€42mIn saving 2015-2020)</i>
Reduced Emissions	<i>Up to 50,000 tonnes CO2 annually</i>
Congestion/Curtailment	<i>Reduces the need to curtail wind and manage congestion</i>

CAES could represent strategic energy infrastructure for Ireland and provide an opportunity to develop a flagship demonstration project

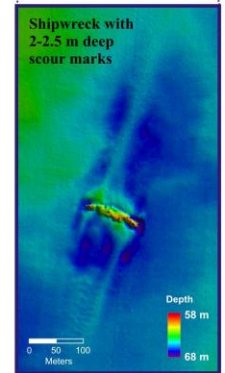
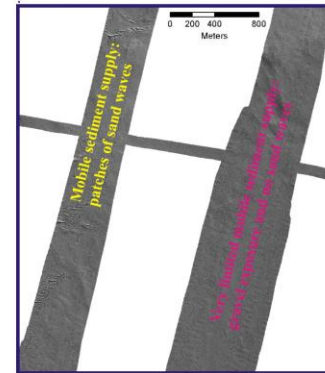
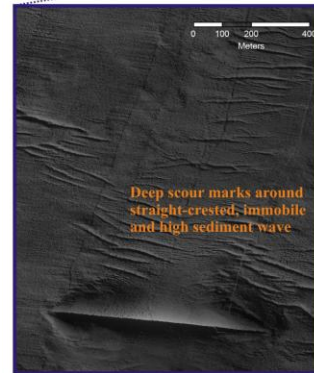
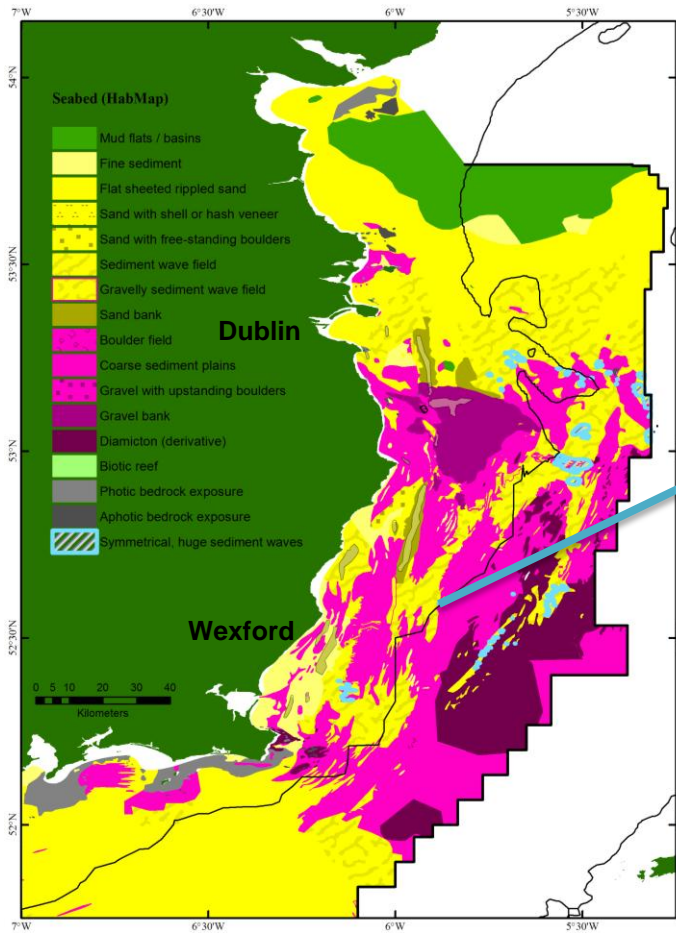
Offshore Wind – Opportunity for Ireland



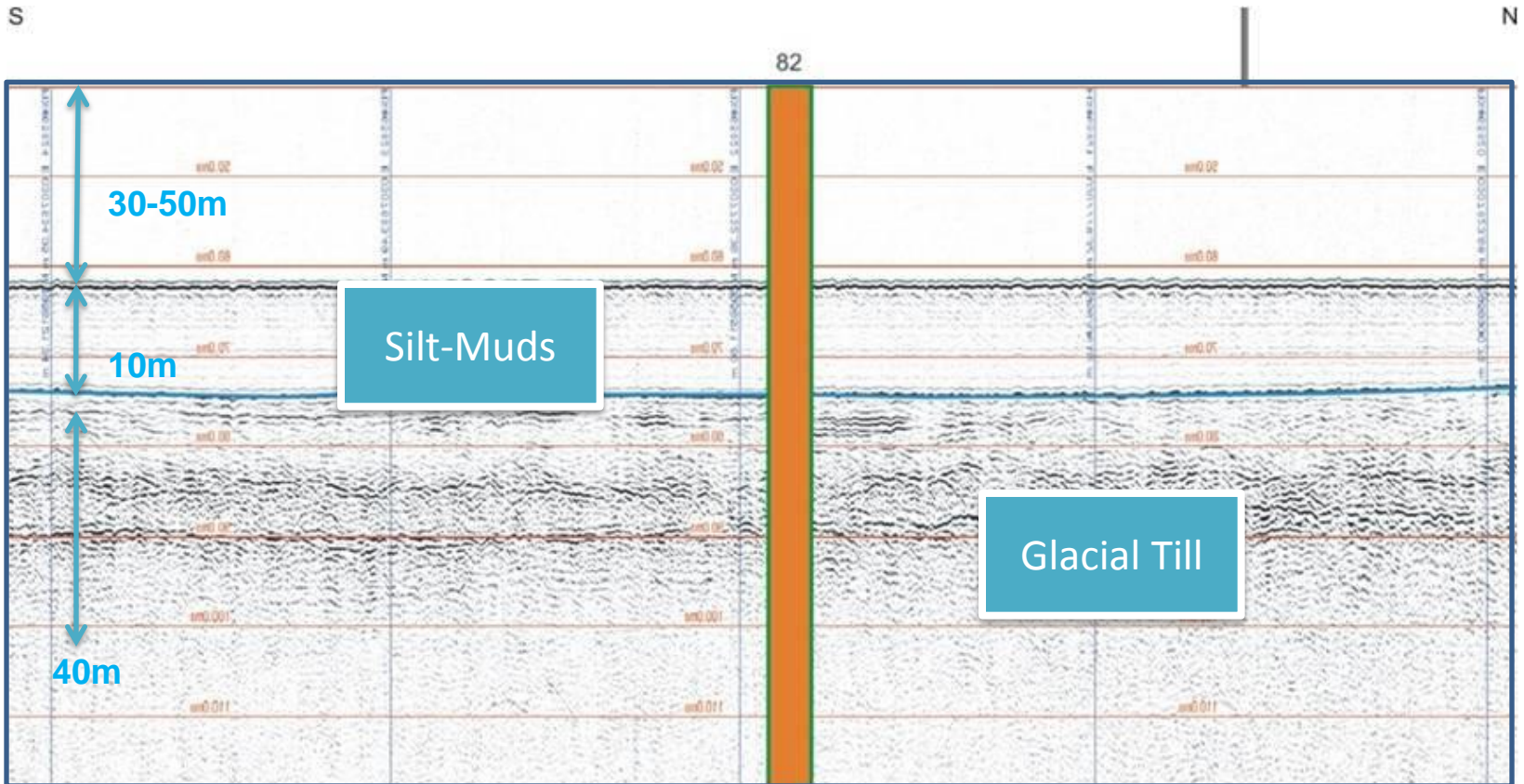
It will happen!



Seabed Research



Subsurface Geology



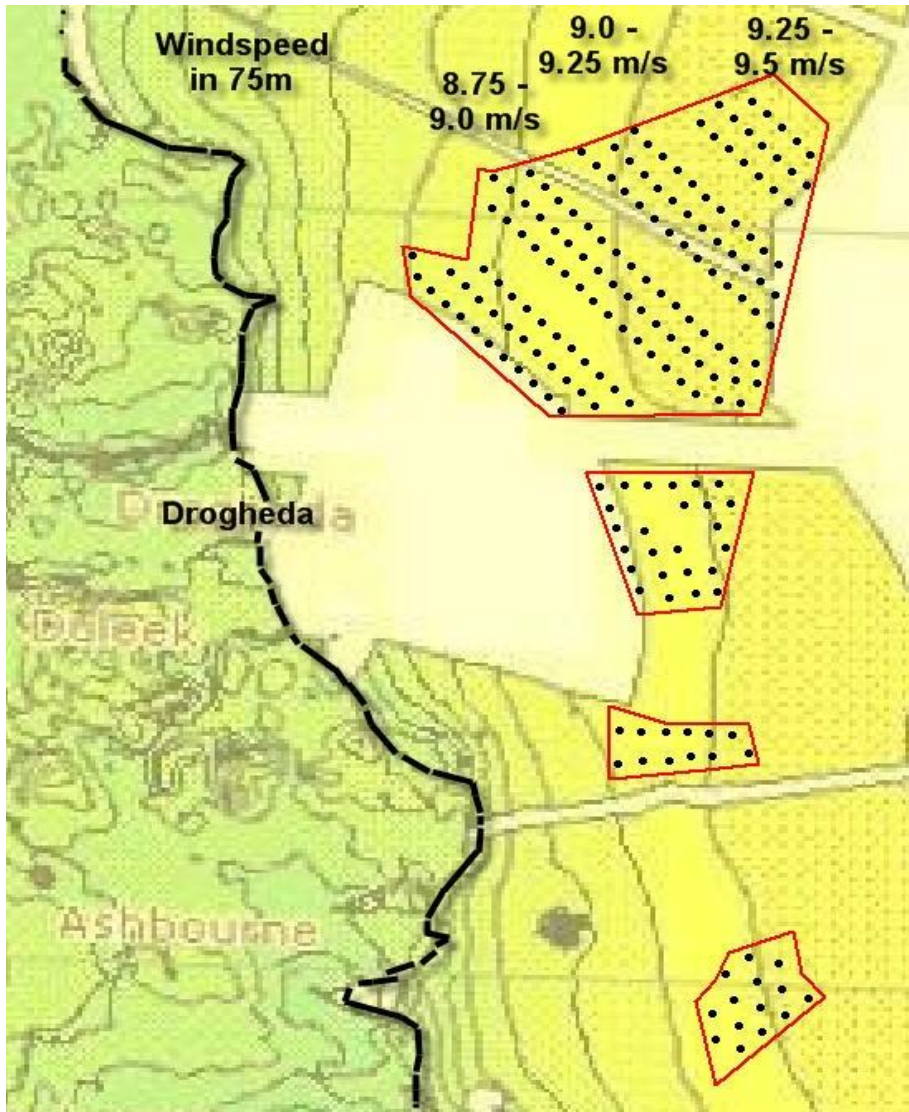
Deepwater 5MW Technology



Installation, Access and Operations



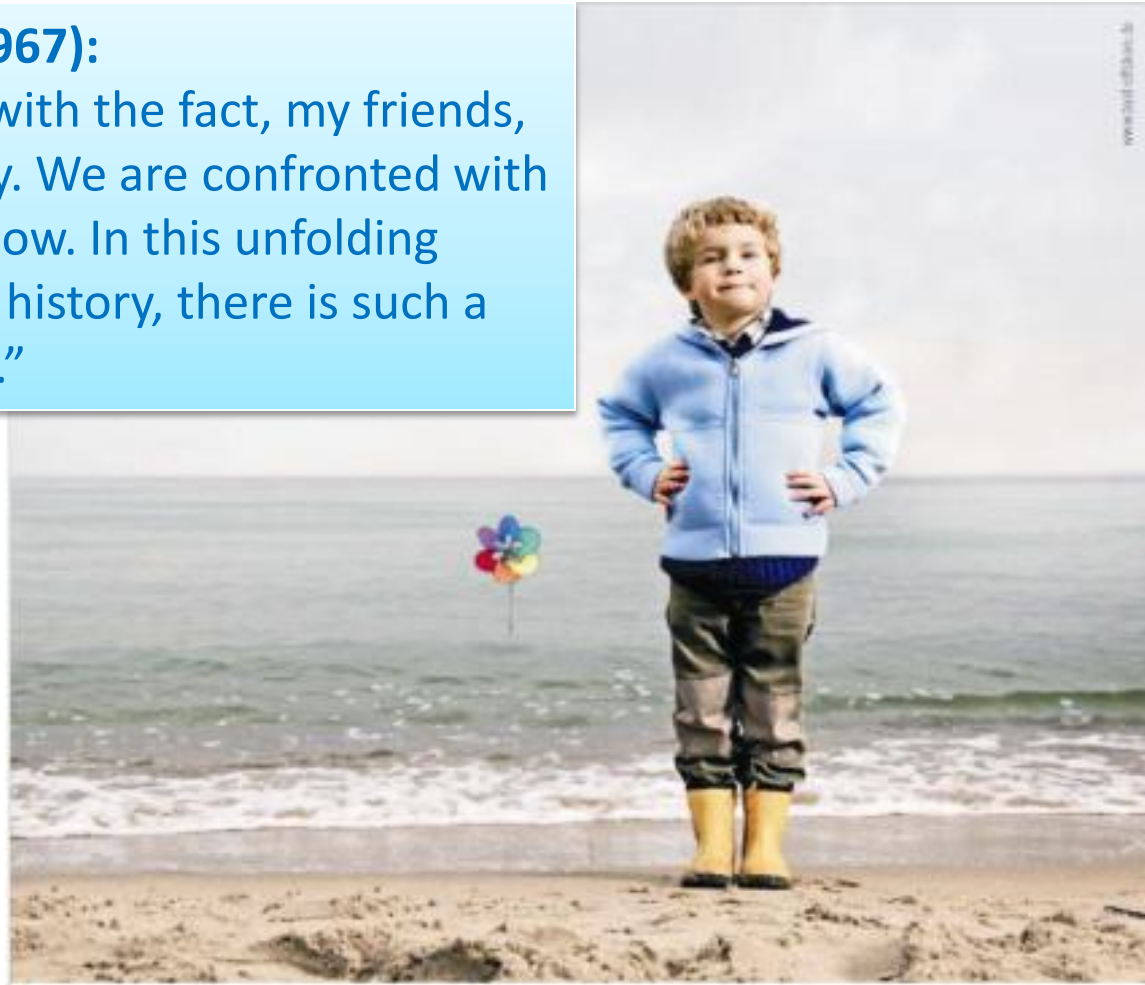
Potential for Ireland



- Geology, constraints, resource
 - 500-1,000MW potential for this technology
- Business model
 - PPA and Green Credits
 - Export Framework
 - Optionality for domestic market

Martin Luther King (1967):

“...We are now faced with the fact, my friends, that tomorrow is today. We are confronted with the fierce urgency of now. In this unfolding conundrum of life and history, there is such a thing as being too late.”



SOMEONE HAS TO BE THE FIRST.