Offshore Renewable Energy and Coastal Energy Hubs to Support Deployment of Green Hydrogen and Development of Future Technologies

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Economy Wide Decarbonization & Just Energy Transition

What is needed from the grid:

- Unprecedented buildout of renewables and bulk electric grid expansion.
- Support for direct electrification across the board.
- Investment in storage and clean firm power generation to allow retirement of remaining fossil generation.

Beyond the Grid:

- “Hard to decarbonize” industrial processes.
- Transportation:
  - Aviation
  - Long Haul Trucking
  - Maritime
- Building heat that is not electrified.

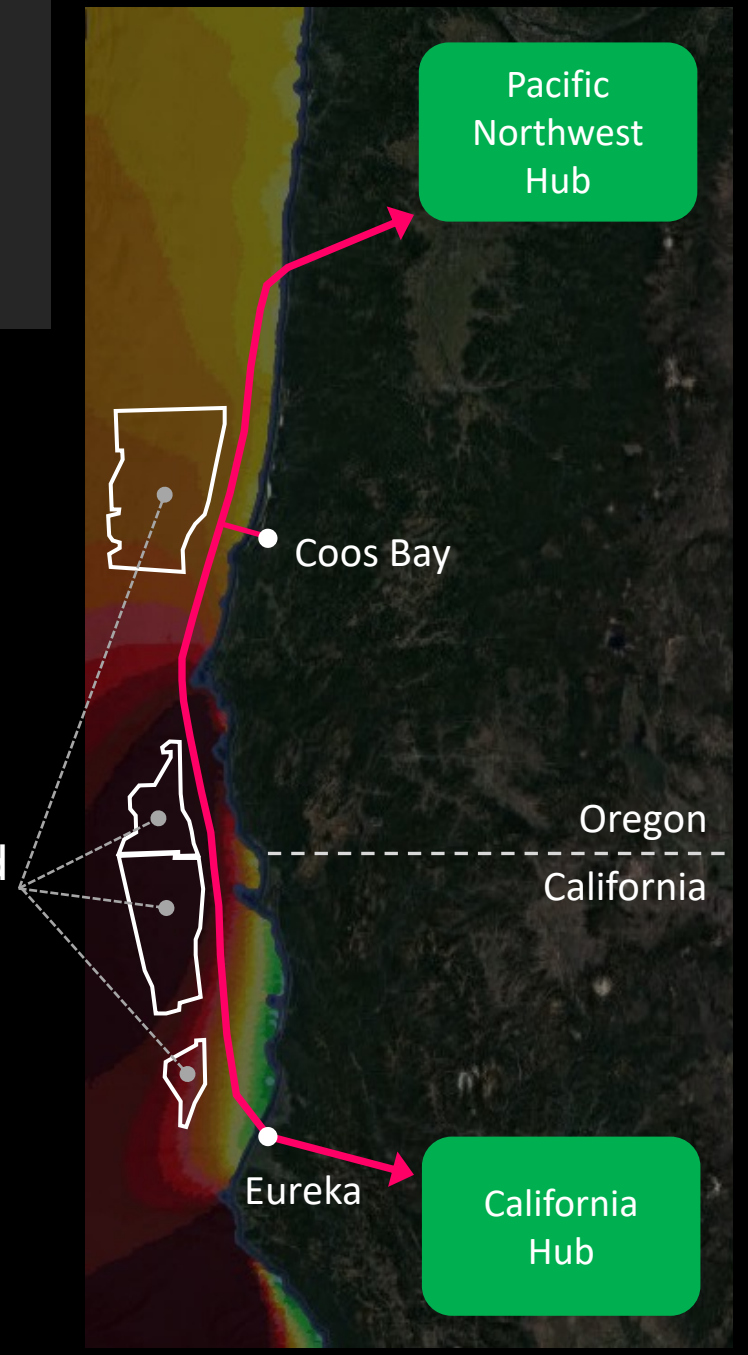
Offshore Renewable Energy on the West Coast and Pacific Northwest: A Scalable Climate Solution

Features to be aware of:

- Floating offshore wind and potentially other complimentary ocean energy or climate technology deployment opportunity, including hydrogen.
- Approx. 500m – 1,300m water depth

Challenges:

- Coexistence with ocean users and local communities.
- Limited existing infrastructure will require a comprehensive planning initiative.
  - Multi-sector: Grid, Hydrogen, Clean Fuels, etc.



Map Source: NREL Wind Prospector

Hydrogen Use Cases For Deep Decarbonization

Coastal Energy Hub Concept

Coastal industrial areas where offshore renewable energy infrastructure development may become concentrated, with excellent access to energy to support hydrogen related, and other energy-intensive businesses

Existing Technologies

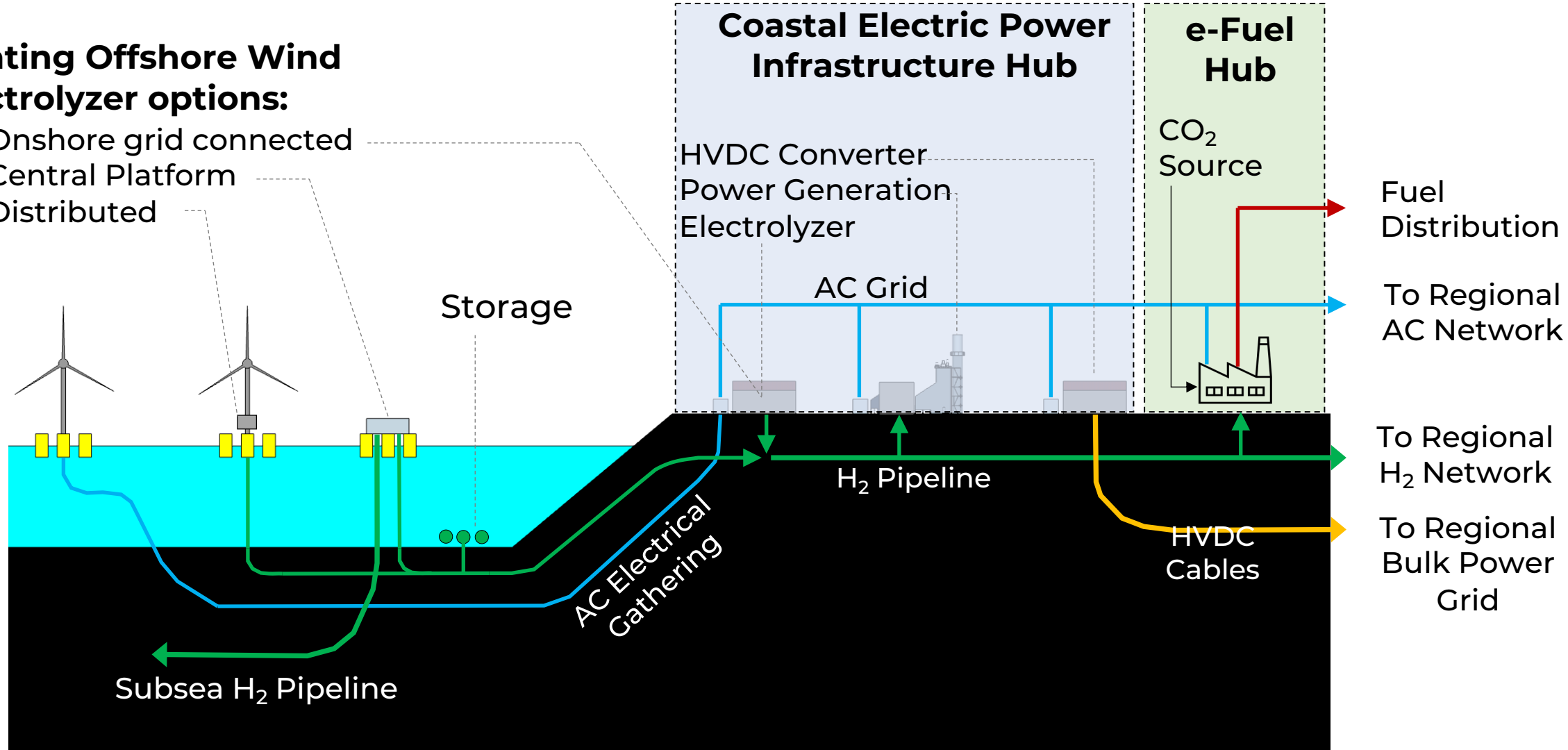
Deployment possible 2030 - 2035

Challenge:

- Multi-sector shared infrastructure planning
- Commercial structures to support financing

Floating Offshore Wind Electrolyzer options:

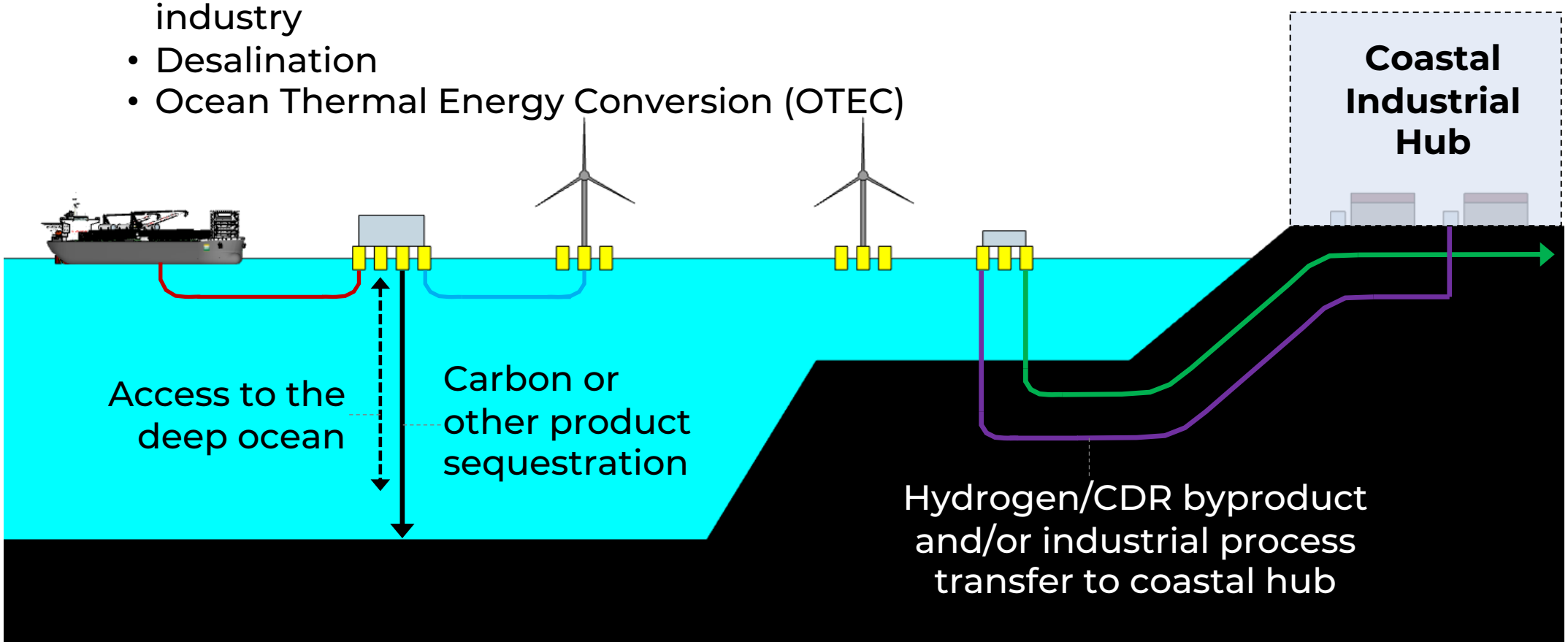
- Onshore grid connected
- Central Platform
- Distributed



Future Technologies

Research & Testing 2030 - 2035

Challenge:

- Research coordination & testing infrastructure
- Measurement, Reporting, & Verification
- Equitable and responsible technology use

- H_2 shipping & e-Fuel Production & Export
- Electrochemical Ocean-Based CO_2 Removal (CDR)
- Sector Coupling of offshore H_2 production with symbiotic industry
- Desalination
- Ocean Thermal Energy Conversion (OTEC)