

Nearly half of US marine energy potential is in Alaska

210 TWhr/yr Tidal, 890 TWhr/yr Wave



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Turnagain Arm Tidal Electricity Generation

TATEG; FERC P#15109



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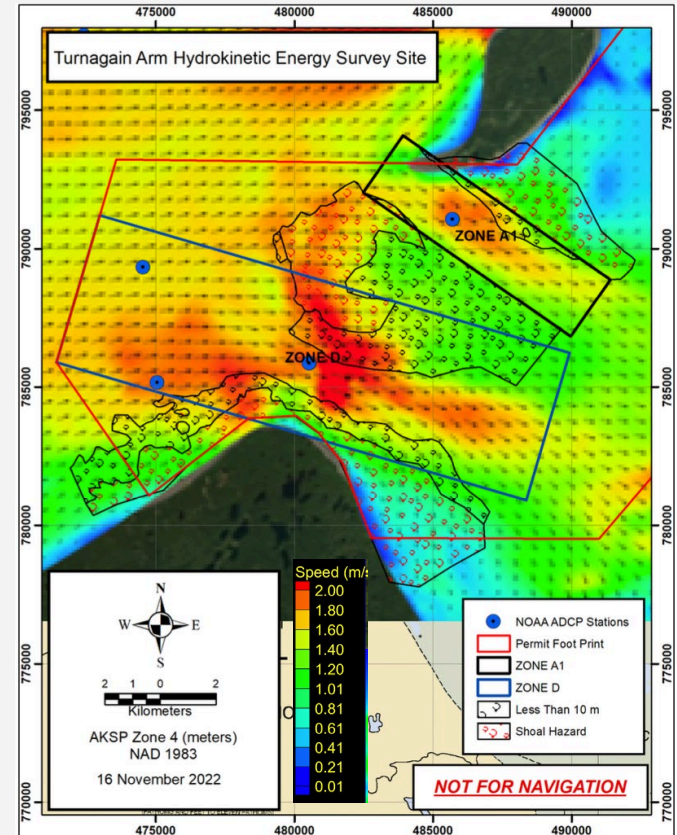
Preliminary Estimate of Tidal Power

Total potential hotspot area - 25 square km

Estimated MW installed capacity range:
 $0.125\text{MW} \times 2500 = 312\text{MW}$ to
 $0.425\text{MW} \times 2500 = 1062\text{MW}$

Average capacity using 10m rotors =
687MW installed.

Low end estimate: **547,500MWh/yr**
 High end estimate: **3,723,000MWh/yr**



PHASE 1 - 5MW PILOT

TIDAL ENERGY PILOT PROJECT - Build a 5MW tidal stream installation within the Turnagain Arm Tidal Energy Generation boundary at hot spot TBD. The project will have an energy storage (modular pressurized tanks/Battery/Other) component to keep power flowing during slack tides, and be designed to scale after 12-18 months of testing and observation into a Commercial Tidal Project.

GREEN HYDROGEN PILOT PROJECT - Build a 5MW Low temperature electrolysis/Polymer electrolyte membrane electrolysis (LTE/PEM) unit powered by the Tidal Pilot. Include hydrogen storage, compression, and accoutrements to prepare the hydrogen for shipping to off taker(s).

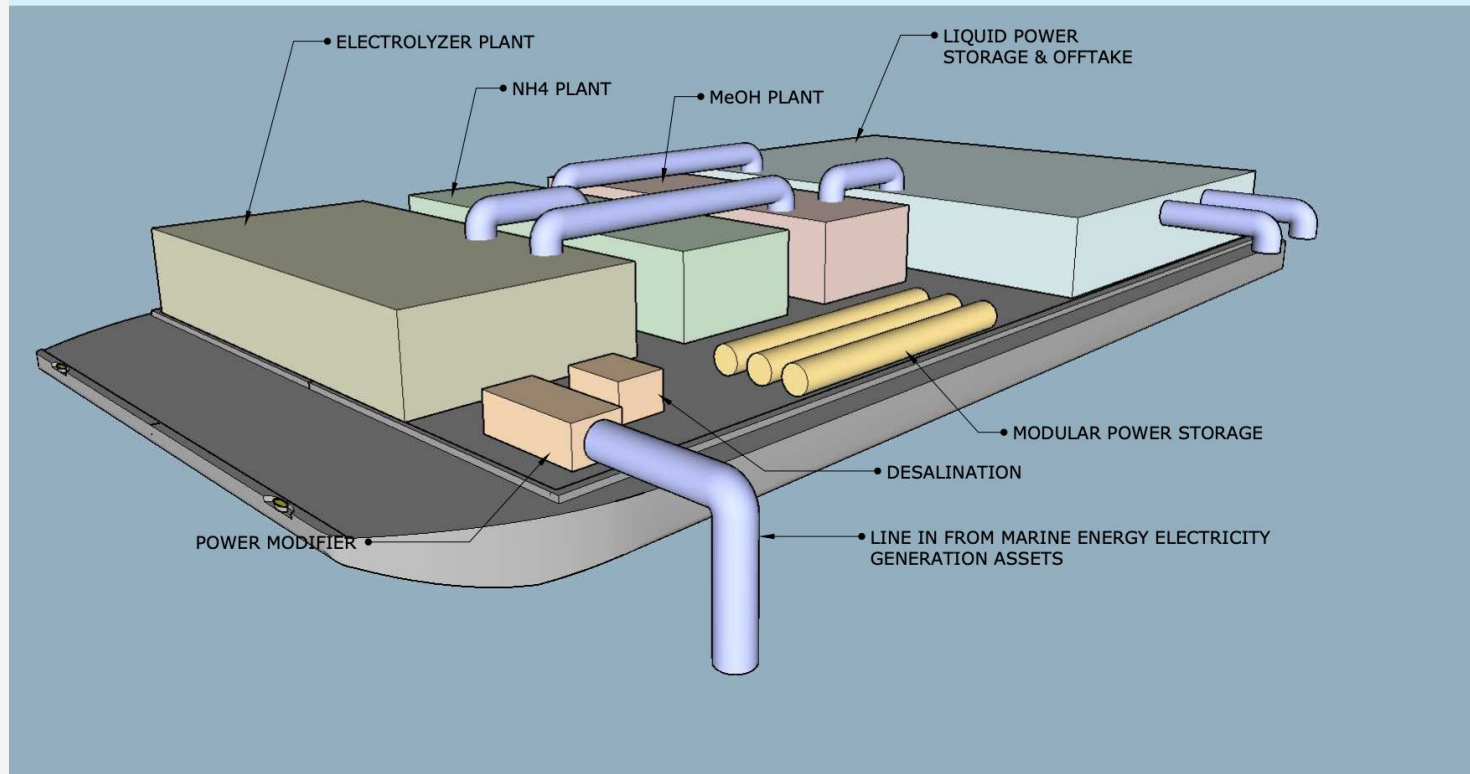
OFF-TAKERS WITH FEDERAL AND STATE OF AK SUPPORT - At this stage the hydrogen for off-takers should be used for a) Decarbonizing/electrifying a pilot Bush village in rural AK, b) Maritime/Port decarbonization, or c) entities that use the Green Hydrogen for research or early stage technology project(s) in such areas of interest as Hydrogen Vehicles, Aircraft, Ports, Infrastructure, or other.



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LIQUID POWER BARGE



50 MW COMMERCIAL DEMONSTRATION

TIDAL ENERGY 50MW COMMERCIAL DEMONSTRATION PHASE - Add 45MW of turbine capacity to the existing Tidal Pilot Project and apply for a Commercial license for the 50MW total project. Add commensurate energy storage necessary to keep the energy flowing during slack tides. Add cabling infrastructure to accommodate the larger flow of electrons including enough capacity for the next phases of scaling.

GREEN HYDROGEN 50MW COMMERCIAL DEMONSTRATION PHASE - Add 45MW of electrolyzer capacity, which can be LTE/PEM or other commercial production technique such as High Temperature Electrolysis (HTE) or Proton Solid Oxide Electrolysis Cells (P-SOEC) depending on the reliability of what is available at the time.

COMMERCIAL OFF TAKERS - Ammonium/urea production for fertilizer or other uses, synthetic fuel production, heavy industry, including steel and aluminum production, mining, construction and construction materials, hydrogen vehicles, aircraft, maritime shipping/fueling, electrification/hydrogenation of ports, along with cabling and pipeline infrastructure necessary to support these efforts.



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500 - 1,000 MW COMMERCIAL SCALED DEPLOYMENT

TIDAL ENERGY 500MW COMMERCIAL SCALING DEPLOYMENT PHASE- Add 450MW of turbine capacity to the existing 50MW. Add commensurate energy (ideally Pumped) storage necessary to keep the energy flowing during slack tides.

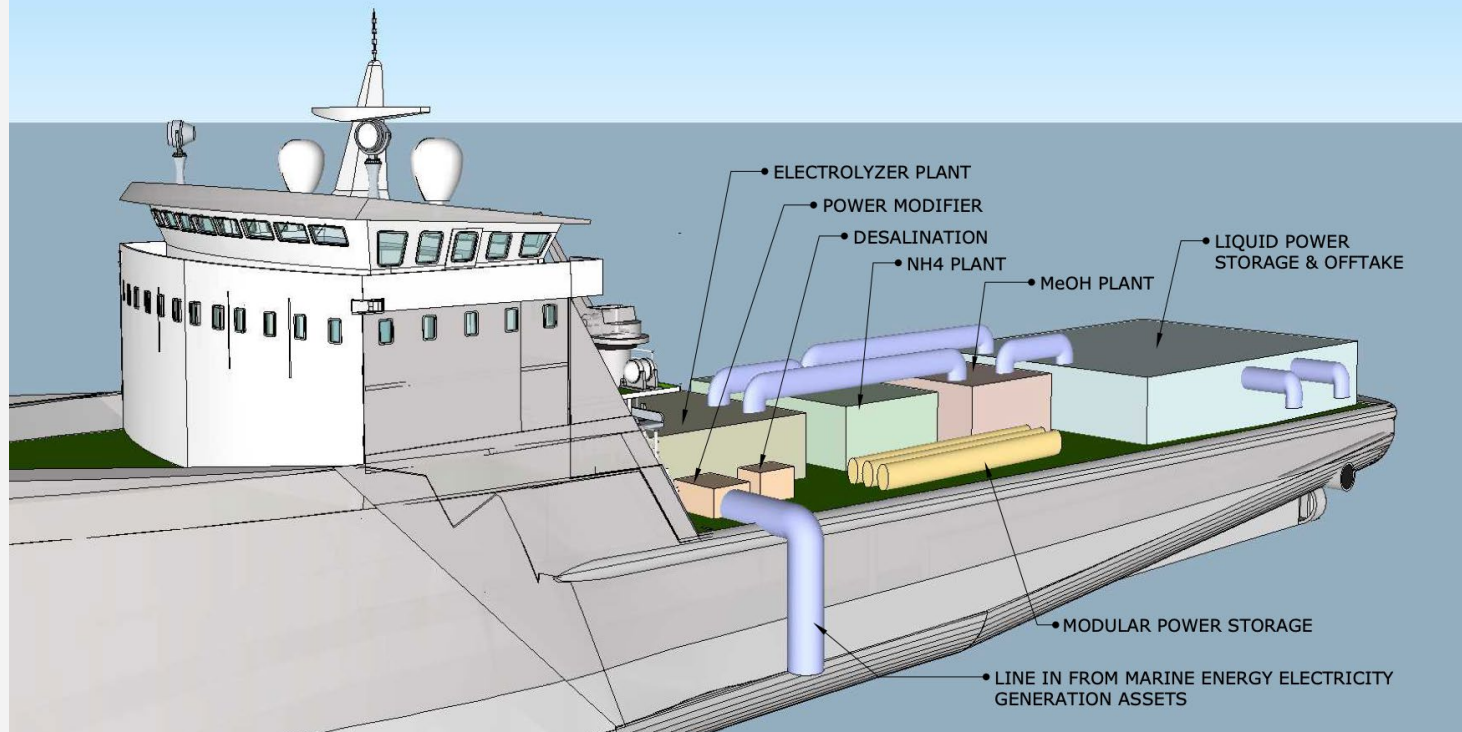
GREEN HYDROGEN 500MW COMMERCIAL SCALING DEPLOYMENT PHASE - Add 450MW of electrolyzer capacity, can be LTE/PEM or other commercial hydrogen production technique such as High Temperature Electrolysis (HTE) or Proton Solid Oxide Electrolysis Cells (P-SOEC) or other TBD, depending on the reliability of what is available at that time.

COMMERCIAL OFF TAKERS - Secure PPAs with Alaska Railbelt grid operators and ramp up production for the off-takers described in the Medium Term Objectives

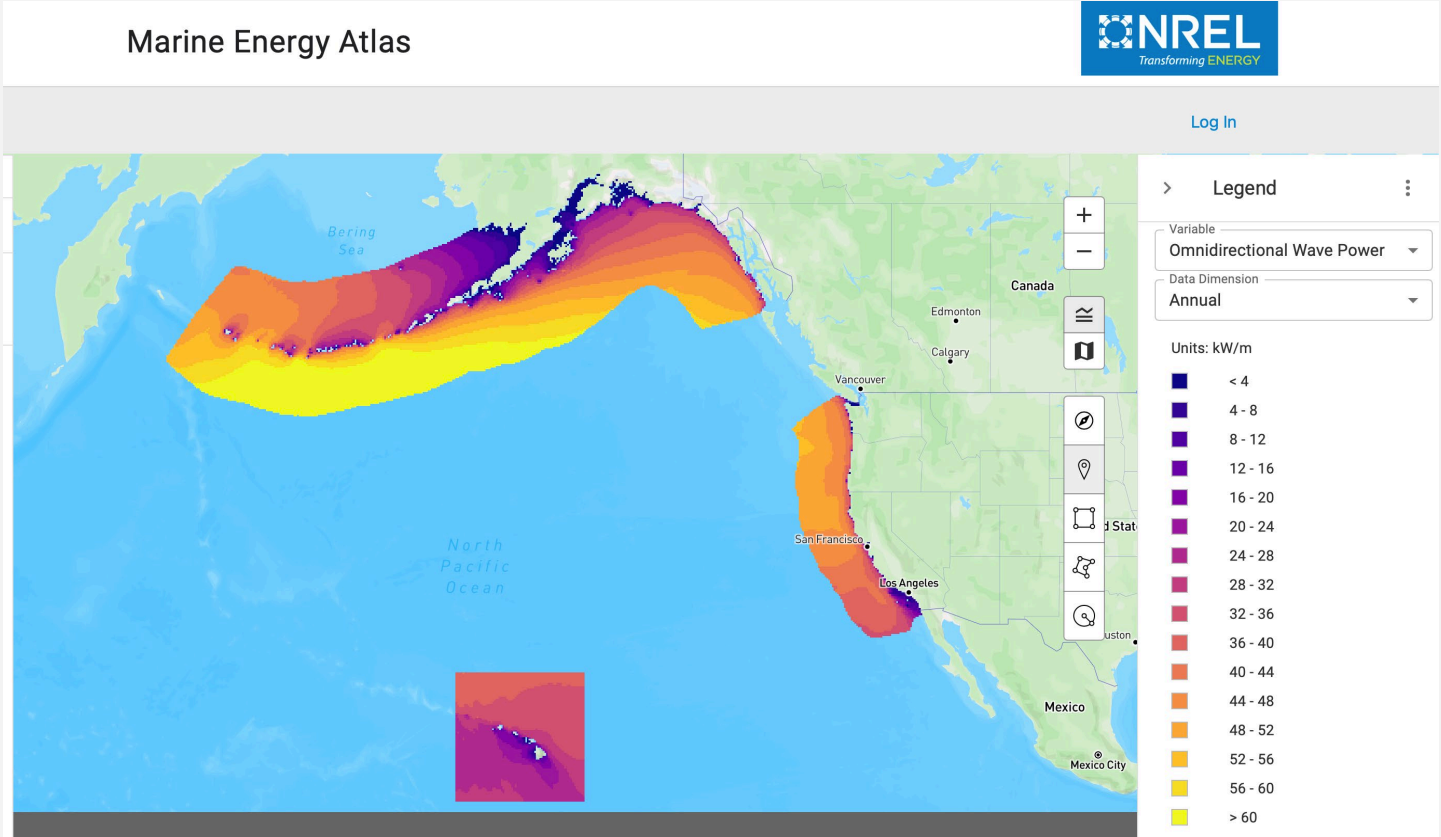


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LIQUID POWER VESSEL

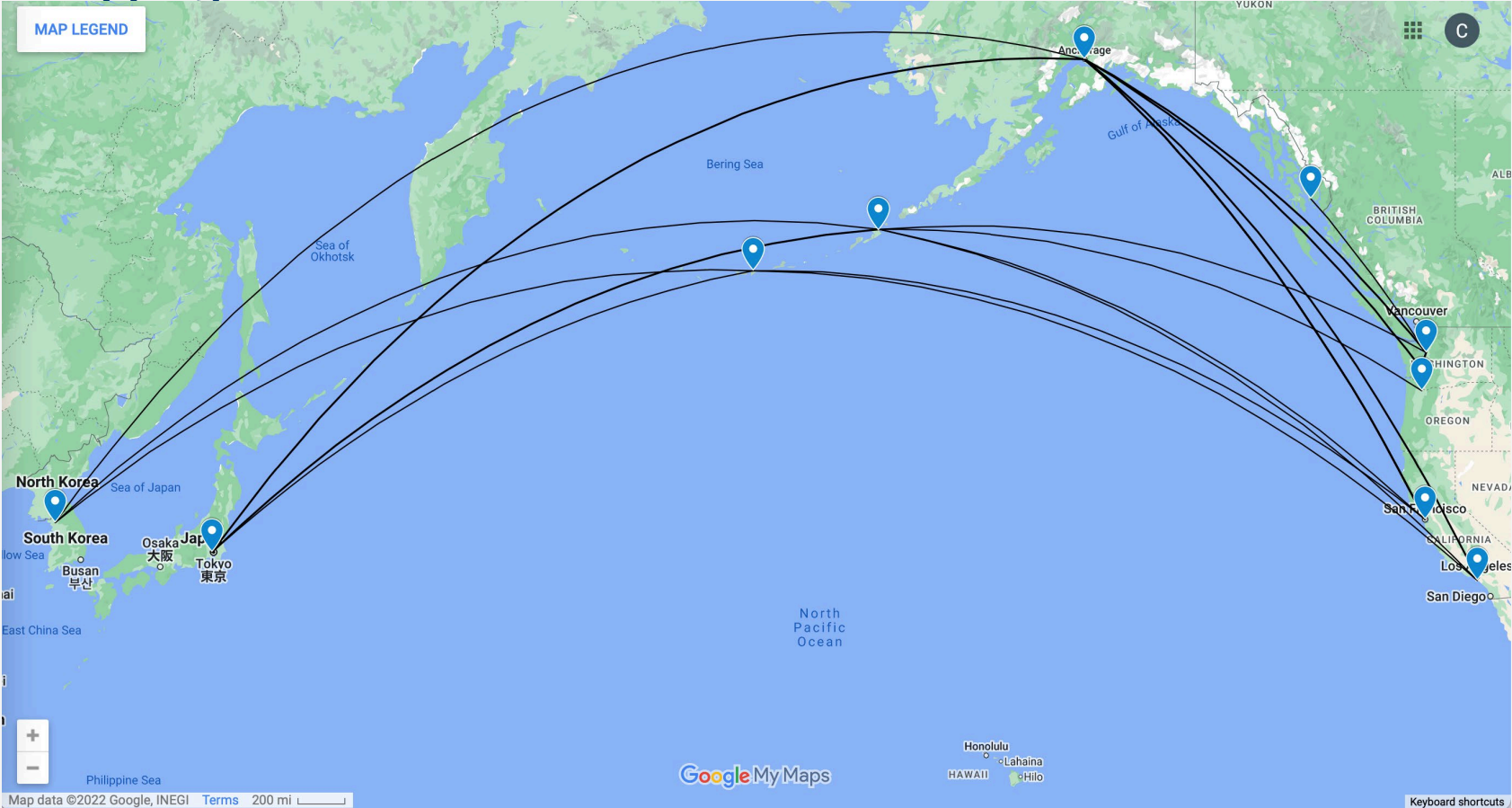


Future Wave Site Development



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Liquid Power Transpacific Shipping



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