

**#IRENAinsights**

WEBINAR SERIES



# Oceans powering the energy transition: Progress through innovative business models and revenue supports

**Judit Hecke & Alessandra Salgado**

Innovation team, IRENA

**Rémi Gruet**

CEO, Ocean Energy Europe

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**TUESDAY, 12 MAY 2020 • 10:00AM – 10:30AM CET**

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### TechTips

- **Ask the Question**

- Select “Question” feature on the webinar panel and type in your question

- **Technical difficulties**

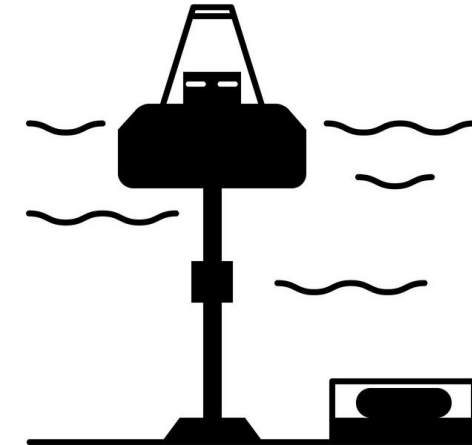
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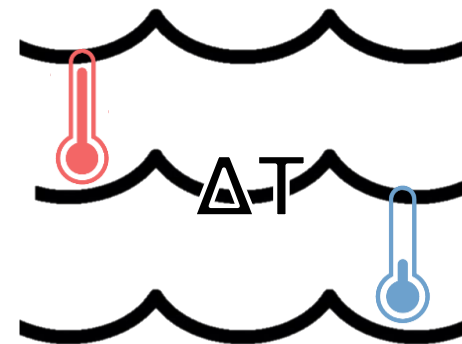
## Marine Energy



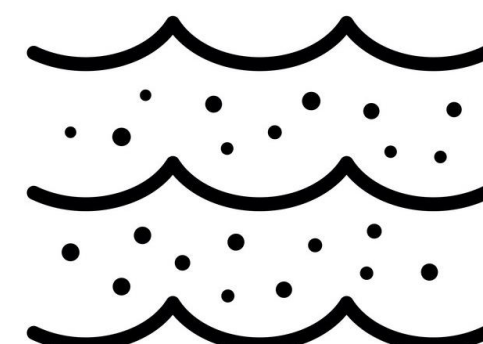
Tidal Energy



Wave Energy



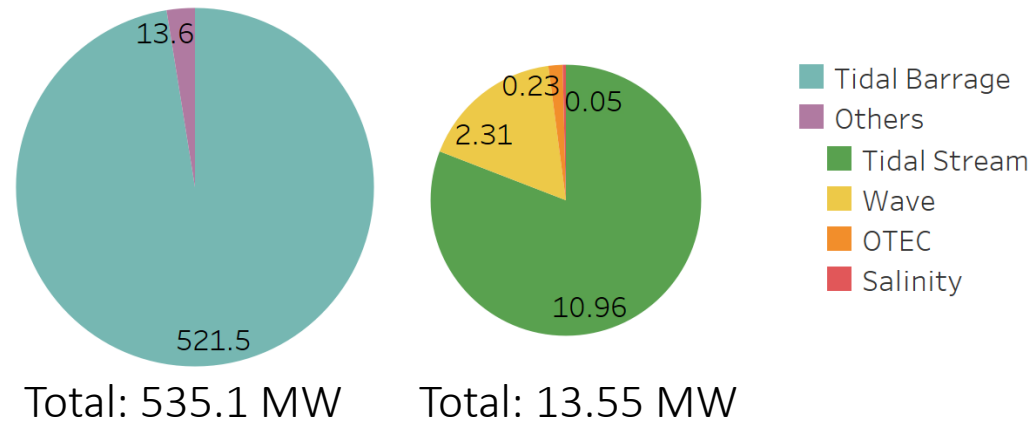
Ocean Thermal Energy Conversion (OTEC)



Salinity Gradient

# Current Deployment and Outlook

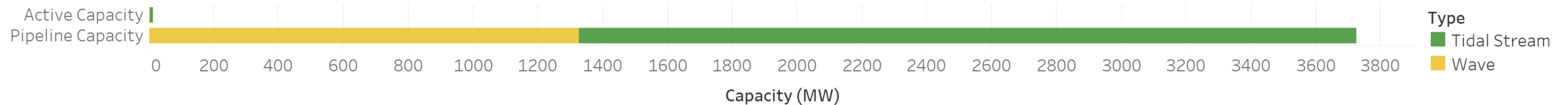
## Current Deployment (MW):



## Ocean Energy Forecast (GW)

IRENA REmap forecast 10 GW of installed capacity by 2030

## Ocean Energy Pipeline Capacity (MW)

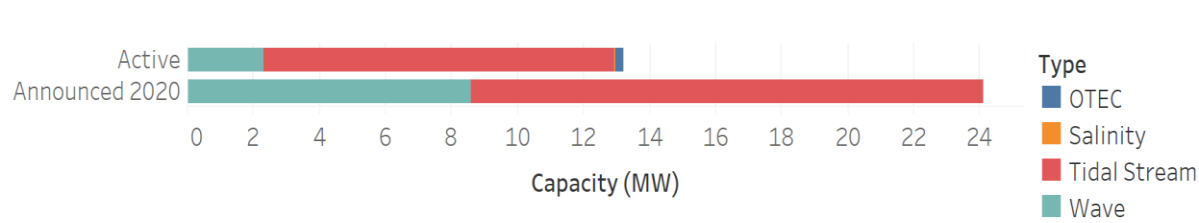


# IRENA Analysis for Upcoming Report

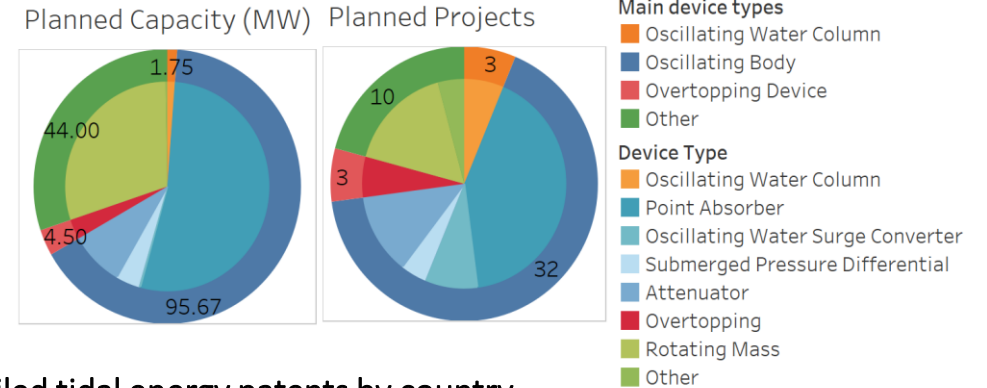
Mapping deployed and planned projects, visualizing by technology, country, capacity, etc.

Examples:

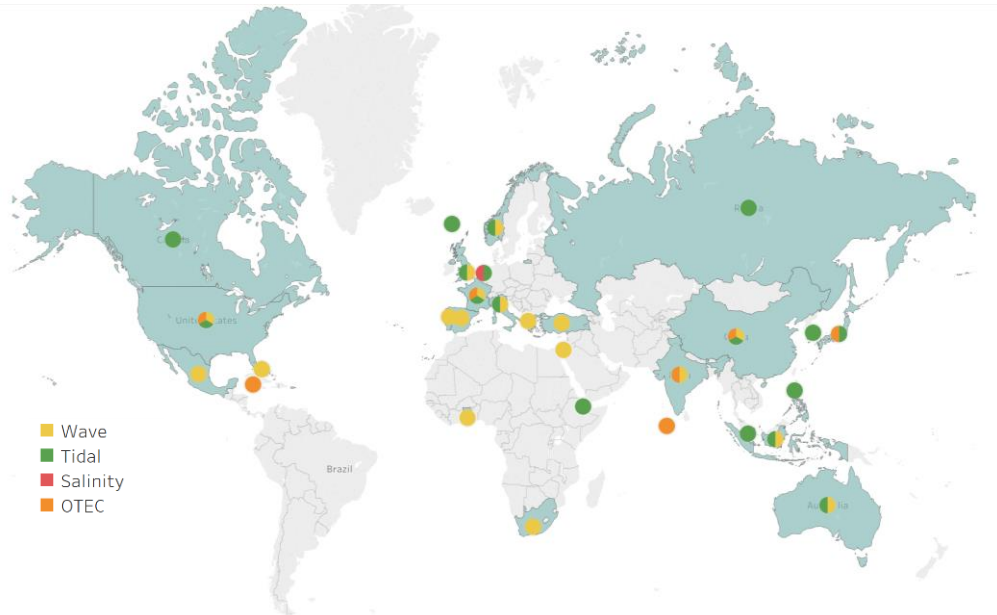
Announced ocean energy additions by technology in 2020



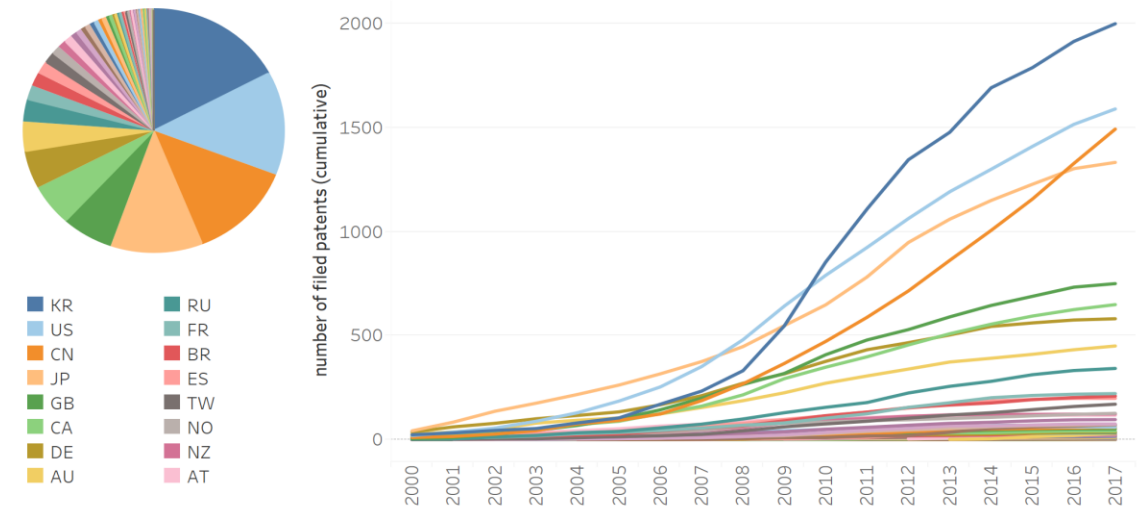
Announced wave energy capacity and projects by device type

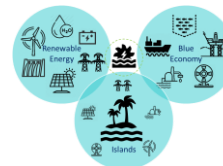


Countries in ocean energy market (deployed and / or pipeline projects)



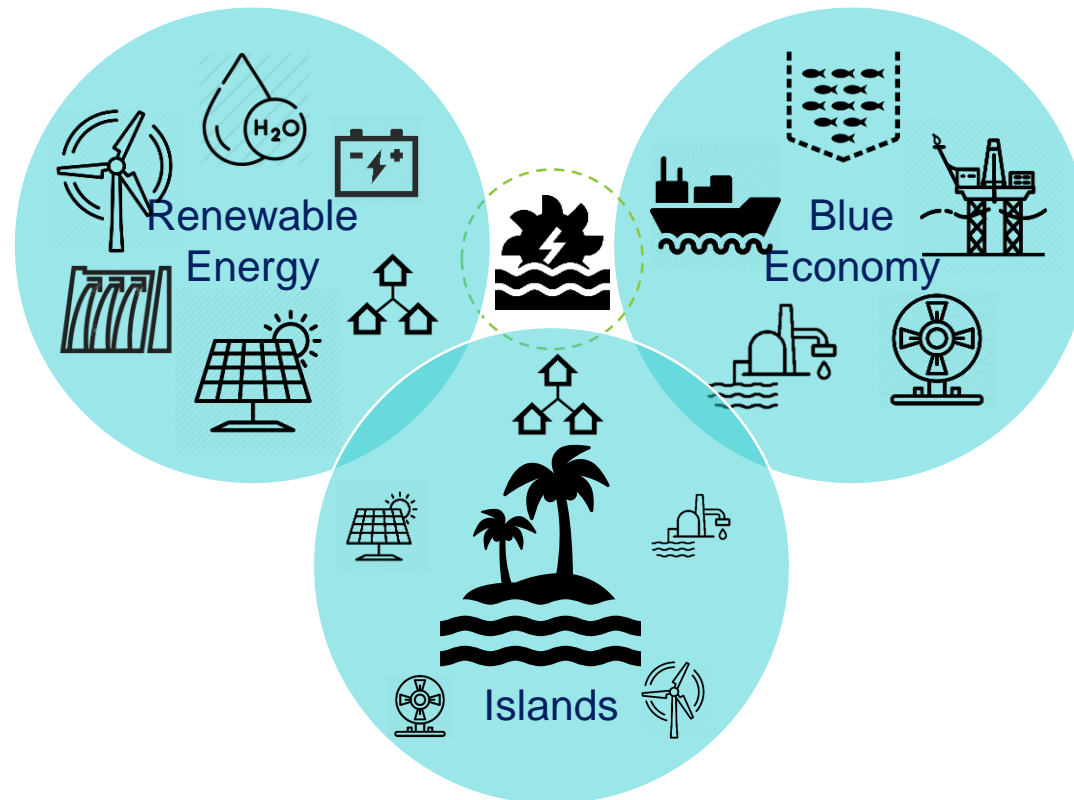
Filed tidal energy patents by country





## Coupling with other Renewable Energy Sources

Create hybrid energy systems with other offshore energy sources to complement each other, create hybrid energy sources and/or benefit from synergies



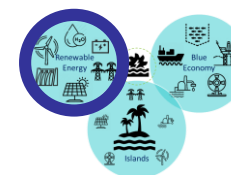
## Coupling with other Offshore Sectors

Positions ocean energy as a source to power other sectors

**Apply both on Islands**

Benefit from the ideal preconditions on islands as market entry

# Innovative Business Models: System Coupling

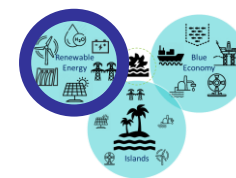


## Coupling Renewable Energy Technologies

	Solar	Wind	Floating Wind	Pumped Hydro	Storage	Microgrid	Hydrogen	Examples	Country	Status
Tidal								Surf'n'Turf Orkney	Scotland	In operation
Tidal								Bluemull Sound Shetland	Scotland	In operation
Tidal								San Antonio	Philippines	R&D
Tidal								PHARES Ushant Island	France	Planning
Tidal								KIOST	South Korea	R&D
Tidal								KIOST	South Korea	R&D
Tidal								Dent Island	Canada	Test Completed
Wave								King Island	Australia	Planning
Wave								Garden Island	Australia	Planning
Wave								KIOST	South Korea	R&D
Wave								Canary Islands	Spain	R&D
Salinity								REDstack	Netherlands	Planning



# Innovative Business Models: System Coupling



## Example: PHARES (Progressive Hybrid Architecture for Renewable Energy Solutions in Insular Systems)

Renewable energy provider AUKO Energy and tidal developer Sabella (horizontal axis turbines) have joined forces to develop a multi-energy project to replace the high carbon energy carriers (now 100%) and substitute it by a hybrid renewable power scheme. It will showcase the integration of variable resources with OE in an island setting on Ushant Island in the French Channel Islands, where ideal topographic and bathymetric preconditions for tidal energy are available.

### Key Features:



1 MW tidal power (2 x 500 kW Sabella D12)



0.9 MW wind power (1 x 0.9 MW)



0.5 MW solar PV power



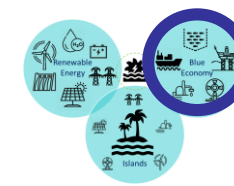
energy storage system (EDF SEI)



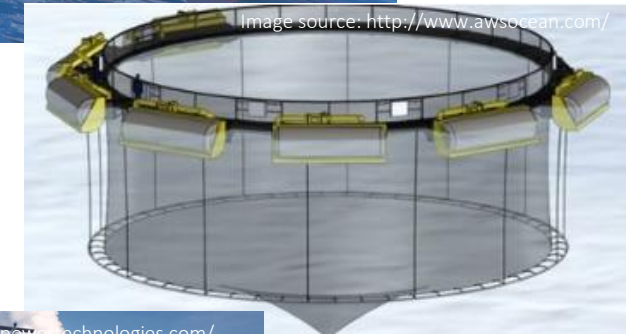
minigrid



# Innovative Business Models: Blue Economy



	Power	Desalination	Cooling (SWAC)	Oil and Gas	Aquaculture	Shipping/Port	AUV charging	Developer
Wave								SINN Power; AWS Ocean Energy; WavEC; Albatern; Aqua Power Technologies; GIEC; Japanese Consortium
Tidal								Sustainable Marine Energy
Wave								Ocean Harvesting
Wave								Wave for Energy; Hann Ocean; Floating Power Plant
Wave								OPT Ocean Power Technologies;
Wave								Resolute Marine; GIEC; Carnegie Clean Energy; Wavpiston
Wave								ATMOCEAN; NREL
Tidal								EMEC (through hydrogen)
OTEC								Bardot Ocean; Bluerise
OTEC								NIOT
OTEC								MAKAI
Other								GEPS



# Key Messages

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## Technology and Market

- Convergence in technology
- Taking up speed: 25 MW new ocean energy deployments in 2020, pipeline capacity almost 4 GW

## Commercialisation

- More attention on the enhancement of the business case
- Unlock the synergies between the blue economy and Ocean Energies for islands



## Support and Policies

- Resource assessment and planning is crucial
- Policy and revenue support are needed
- International cooperation continues to be critical. IRENA is strengthening the work in ocean energy. [Reach out to IRENA!](#)

## Questions & Answers

Please use the 'Questions' feature on the webinar panel

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