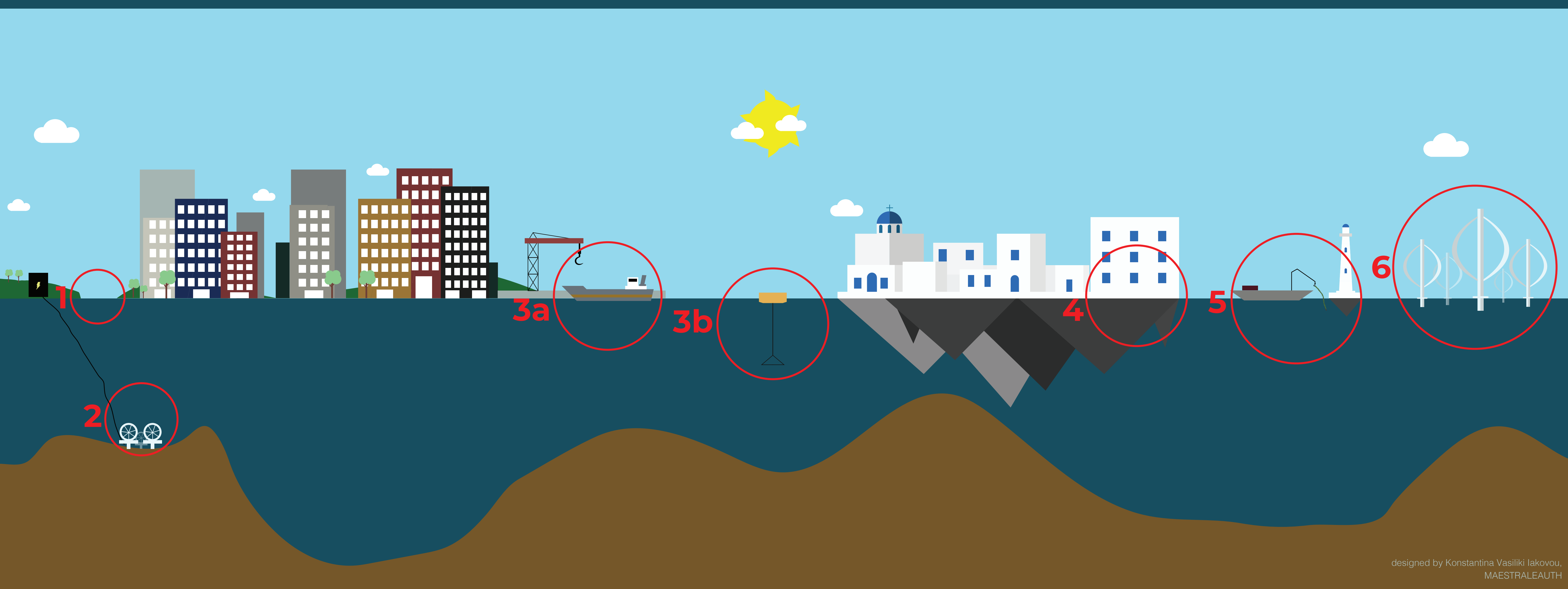
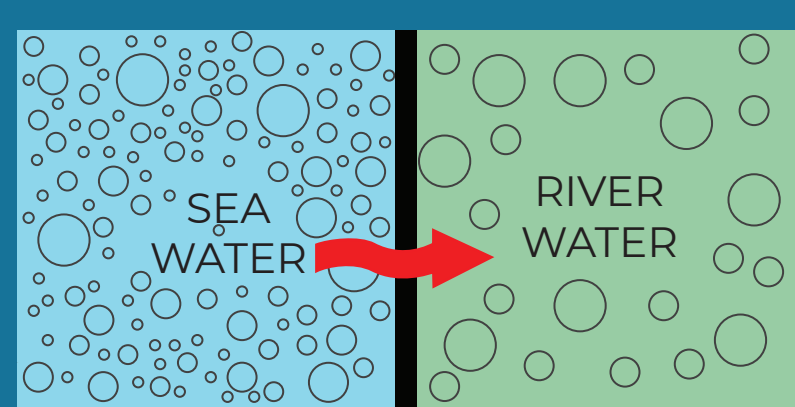


BLUE ENERGY TECHNOLOGIES

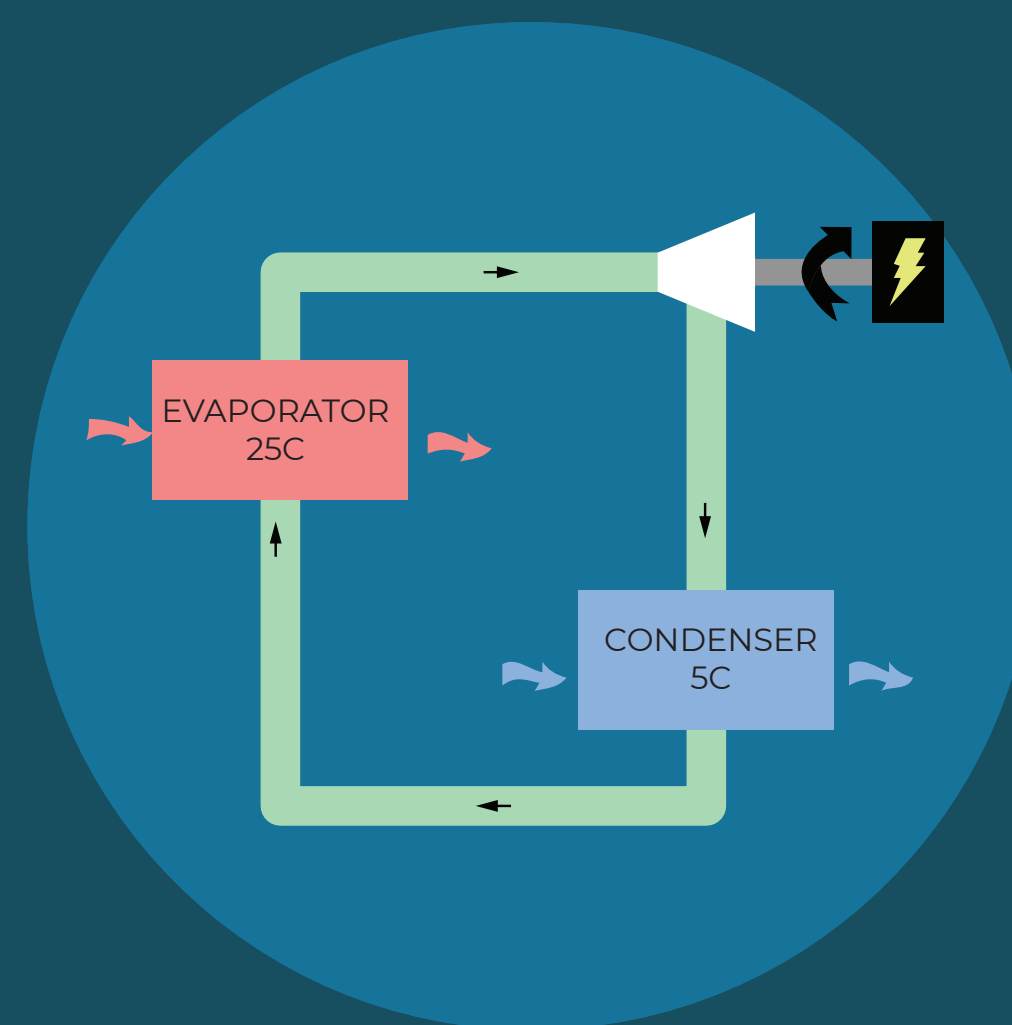


designed by Konstantina Vasiliaki Iakovou,
MAESTRALEAUTH



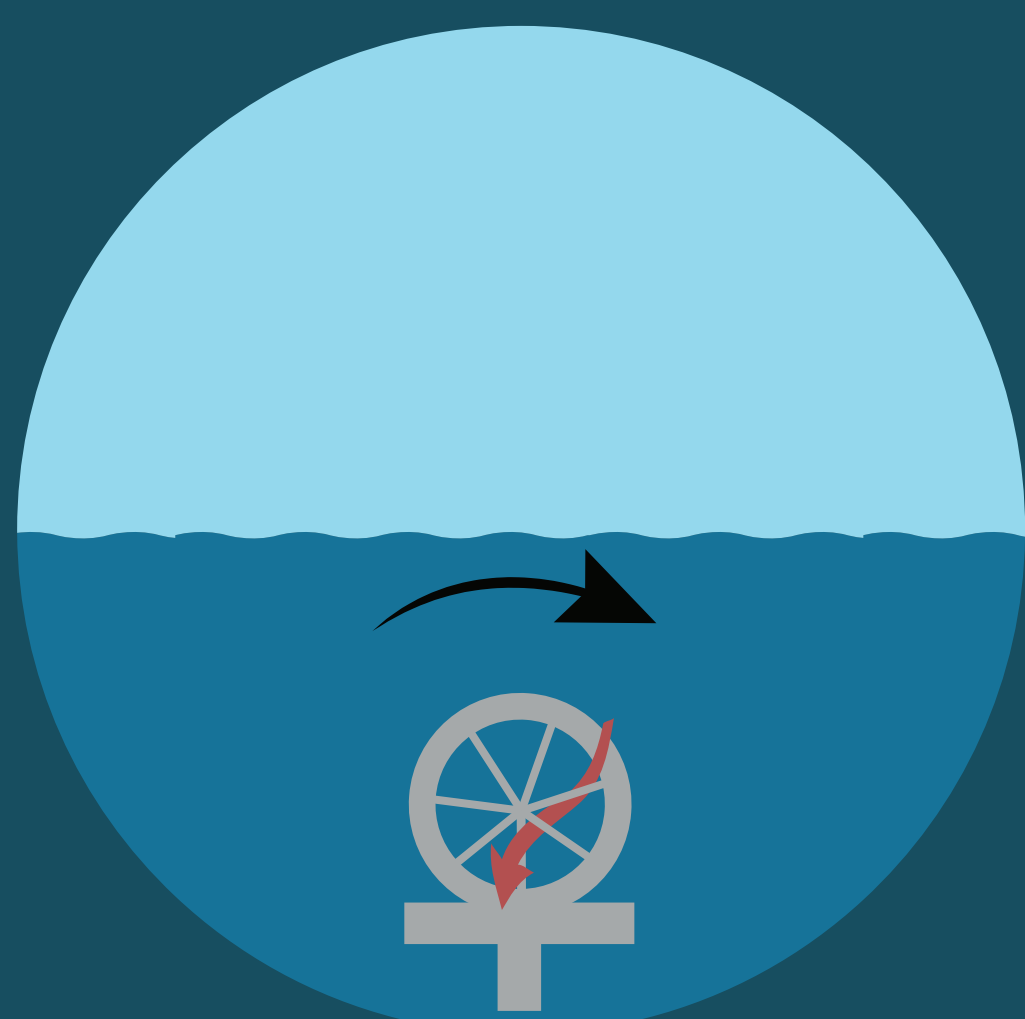
1. Salinity gradient (osmosis)

Based on semipermeable membranes between salty (seawater) and freshwater (e.g. river, lagoon), the different concentration of ions allows pressure to raise and water flow into reservoirs to spin hydraulic turbines.



4. Ocean thermal energy

Gradients of temperature between seawater and the external air can provide a renewable source for heat pumps or heat-cold exchangers to supply building/district heating/cooling systems.



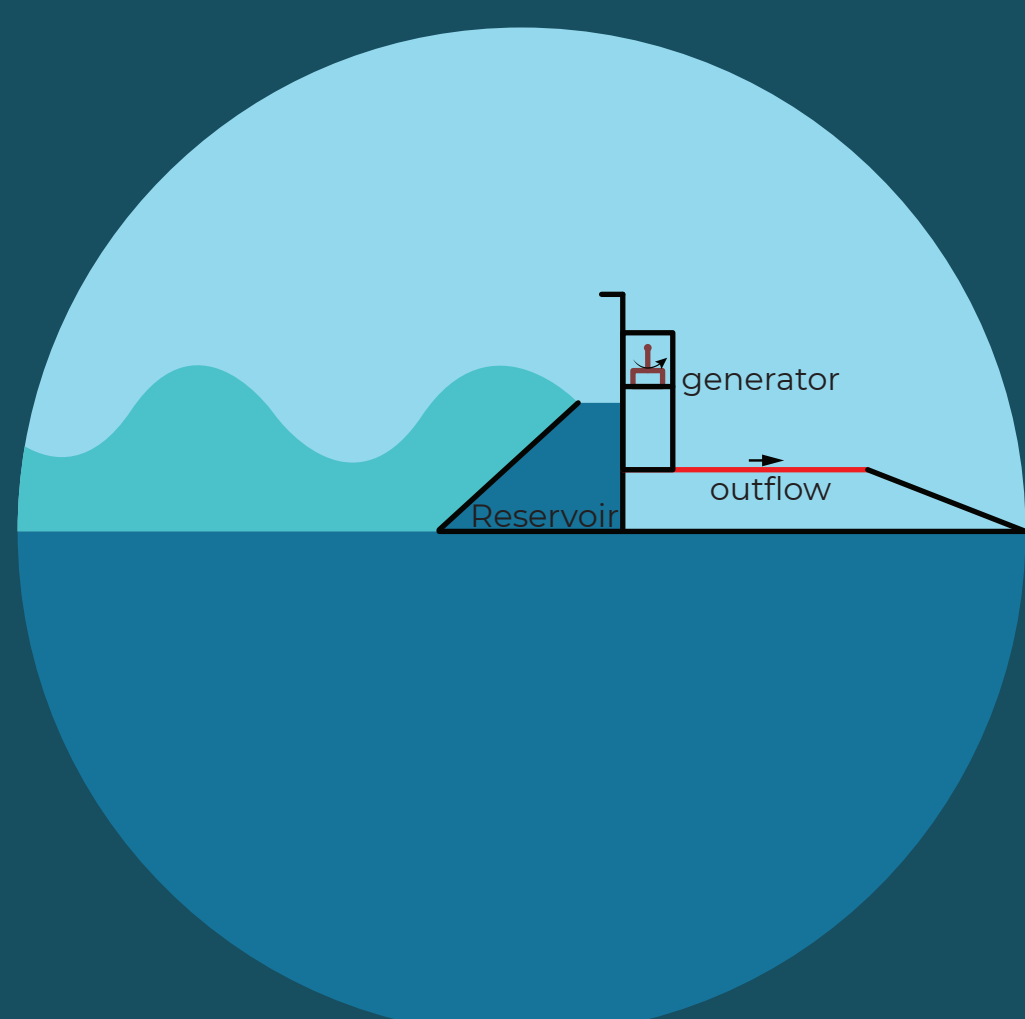
2. Marine current

Sea current is drawn into submerged turbines to convert water flow into electricity. Devices can be secured on a flat seabed, float or act as diving kites with specific mooring systems, depending on sea-depth. Current technologies can start operating at 2 m/s or, in some cases, even less.



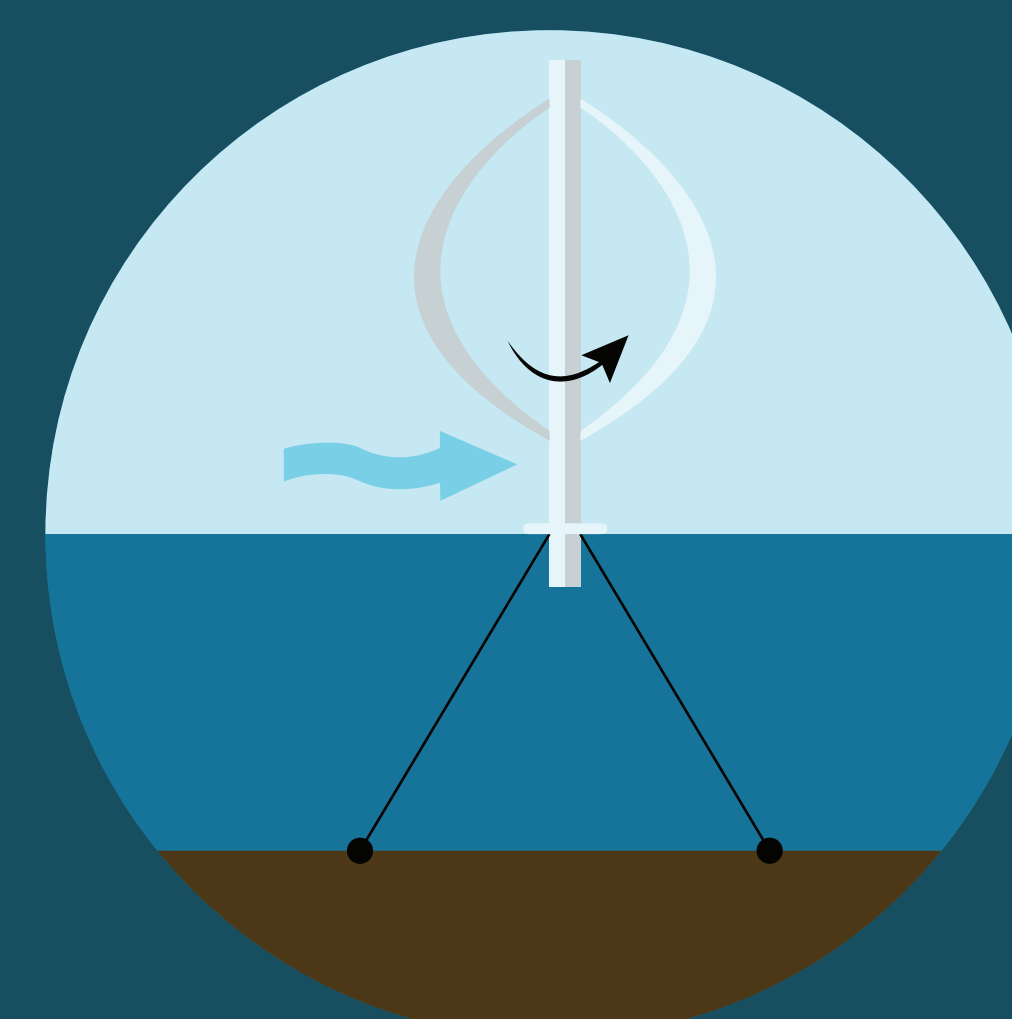
5. Marine biomass

Seaweed farms in coastal areas, whether combined or not with aquaculture, can withdraw nutrients from water and produce biomass for energy use. Using photosynthesis, macro-algae quickly increase their mass and can be treated in bio-refineries to produce biodegradable, non toxic and sulphur-free biofuels, such as bioethanol, or biogas.



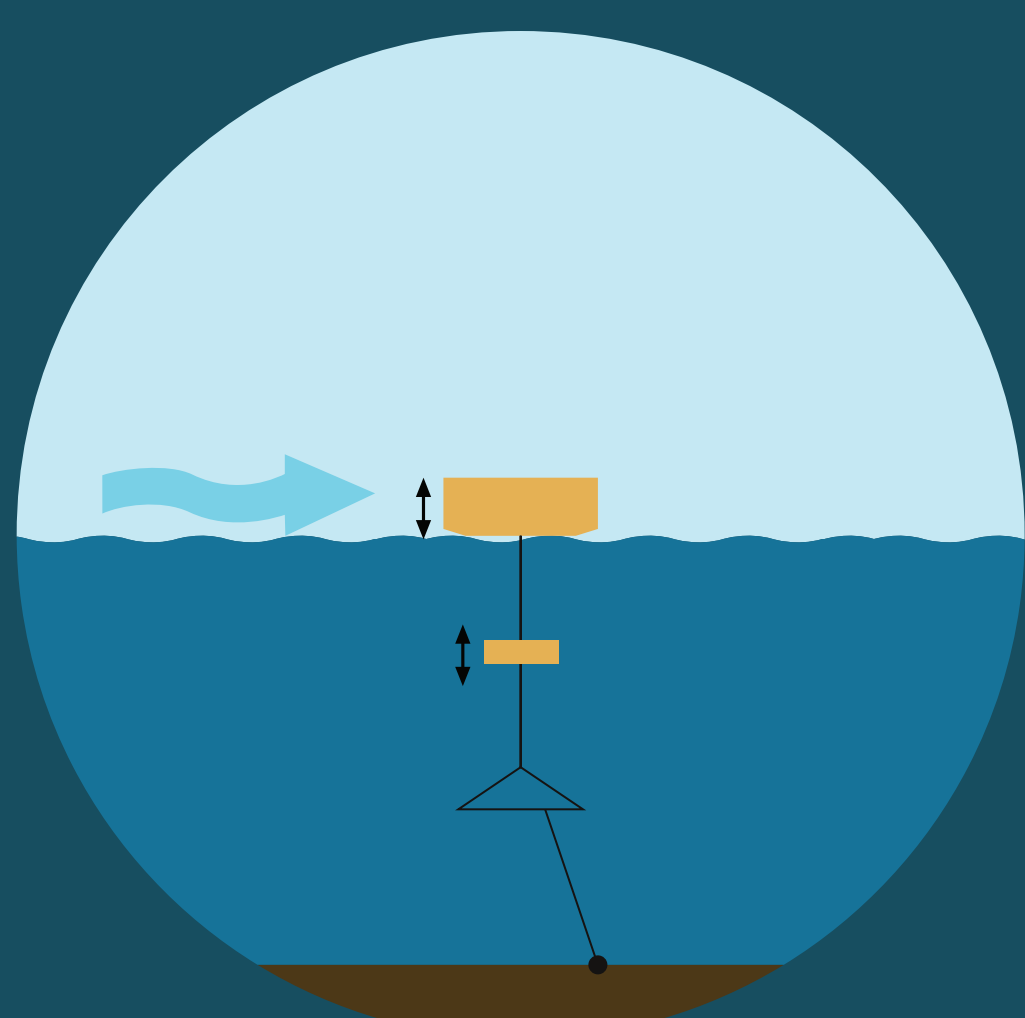
3a. Onshore wave energy

Wave energy converters can be embedded in docks and breakwaters and include systems such as oscillating water columns, that exploit vertical water motion within a chamber to spin turbines by water/air pressure, and overtopping technologies, that gather seawater on a top reservoir and let it flows down through conventional hydro turbines.



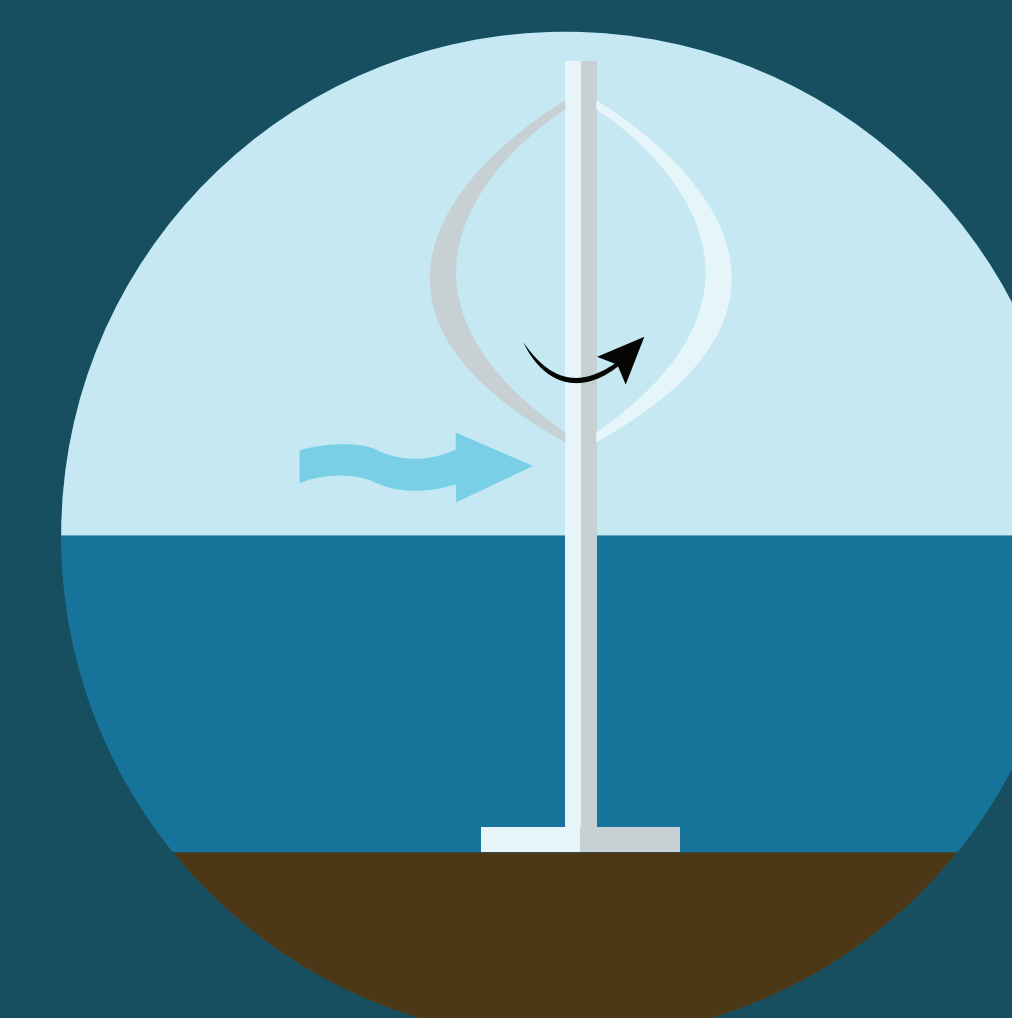
6. Offshore wind farms (floating)

Blades of the wind turbines convert wind energy into mechanical power by rotating around a rotor connected to a shaft which spins an electricity generator. Offshore wind turbines can be floating devices fixed by mooring on dead weights. Their efficiency rapidly increases with size.



3b. Offshore wave energy

Wave energy converters can be integrated in floating buoys that exploit the motion of oscillating bodies to push and pull pistons or drive mechanical gears. Electricity is generated through turbines or magnets within floating or under-water devices.



6. Offshore wind farms (stable)

Stable foundations are limited to depth and seabed conditions.