

MOWT – Mass of Water Turbine

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What is MOWT?

Mass of Water Turbine (MOWT)

Hydrokinetic turbine designed to generate power from slow flowing water

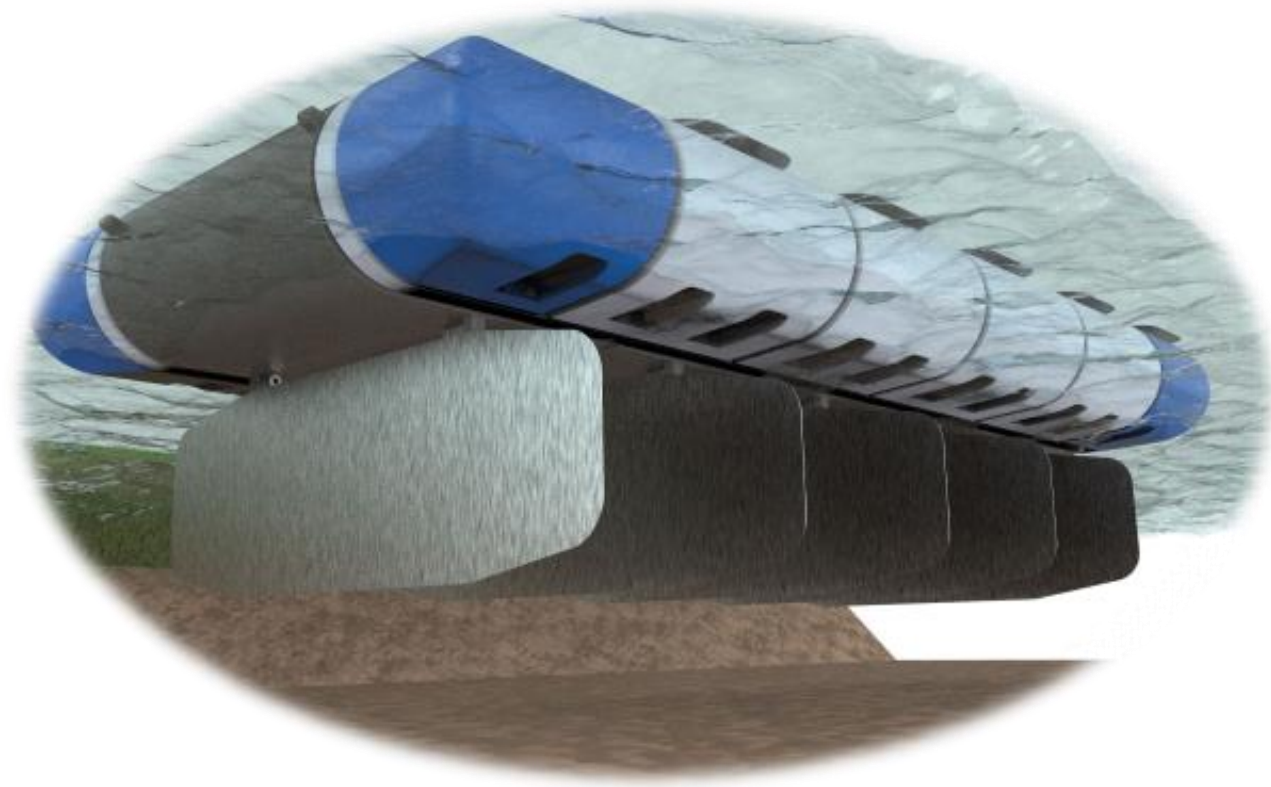
Designed as a high torque, low rpm device – targets large mass, not high velocity

Conveyor based turbine system – paddles driven by flow of water

Optimised for low flow speed

Scalable from kW to MW

Simple to install & maintain



Why mass over speed?

$$E = \frac{1}{2}mv^2$$

The Bay of Fundy (Canada) has the highest tides on earth – well known for turbine development

The tides in the Bay flow at around 4-5 m/s

During each tide around 100 billion tonnes of water flows in/ out of the Bay

Most marine turbine developers target the velocity, “v²” part of the equation

We are focusing on the mass, “m”

$$E = \frac{1}{2} \times 100 \text{ billion tonnes} \times 4^2$$

$$\text{Energy} = \frac{1}{2} \times 100,000,000,000,000,000 \text{ kg} \times 16$$

MOWT targets
this number

Other devices
target this number

Why not a standard waterwheel?

Which is more powerful?



2 oars in the water

OR



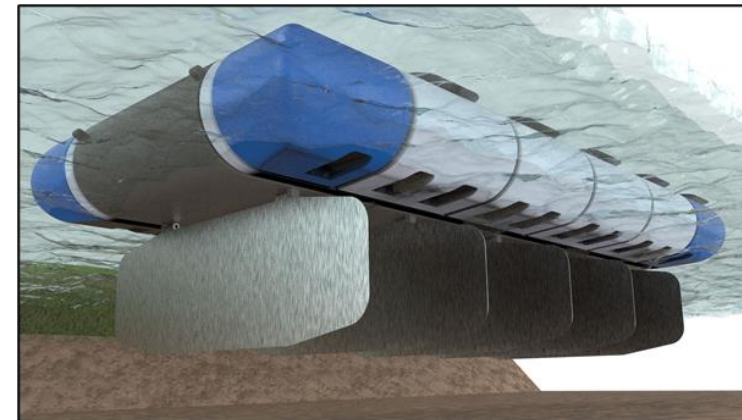
8 oars in the water

Therefore,



1 – 2 partially submerged paddles

OR



5 fully submerged paddles

Development to date

Idea creation



Proof of concept



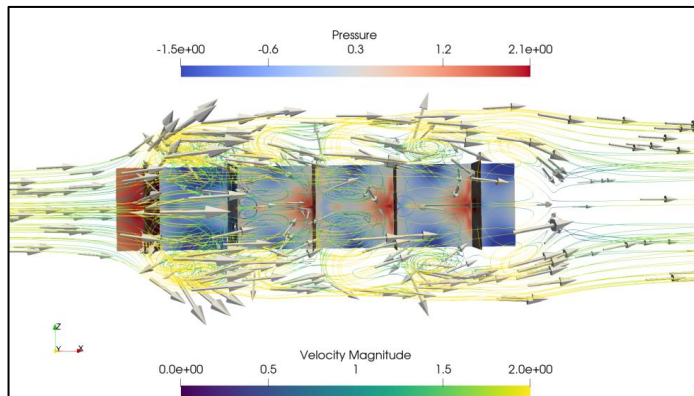
Prototype



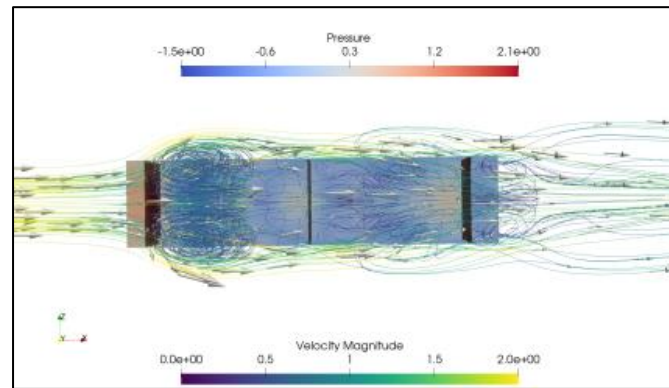
10kW Prototype



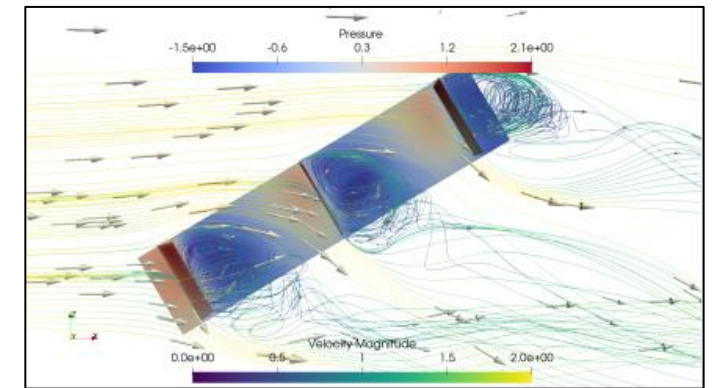
Development (cont.)



Base case – 5 paddles, parallel flow
 $F = 1477\text{N}$



Test case – 3 paddles, parallel flow
 $F = 1985\text{N}$



Test case – 3 paddles, 30 deg yaw
 $F = 4412\text{N}$

Next stage of development:
incorporate CFD optimisations
into MOWT design and build
and test MOWT MK2

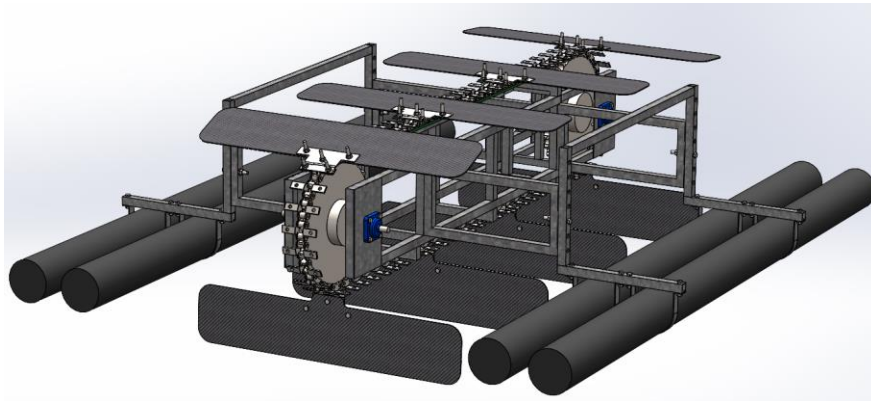


Commercialise MOWT MK2

Initial Offering

M1

- Produce 1kW in 1 m/s flow
- Higher output at higher flow speeds
- Aimed at charging battery banks/ single property use



M10

- Produces 10kW in 1 m/s flow
- Higher output at higher flow speeds
- Aimed at large properties/ small businesses. E.g. hotels, distilleries



Future Offering

20+kW device

- Isolated communities – diesel generator replacement

100-250kW device

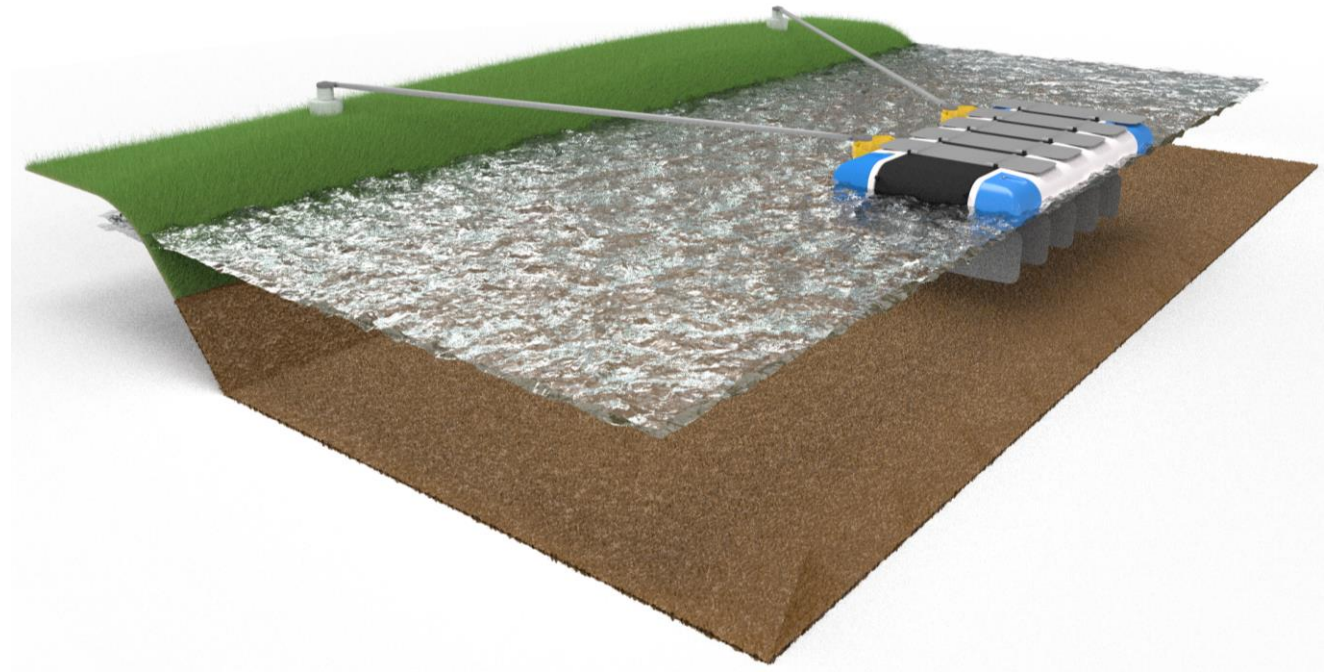
- Standalone or tidal farm

500kW – MW scale devices

- Large scale grid production

Direct mechanical power

Remote subsea power



Thank you for listening!

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