

# MOWT – Mass of Water Turbine

---

STUART MOIR, ENGINEER

# What is MOWT?

---

Mass of Water Turbine (MOWT)

Hydrokinetic turbine designed to generate power from slow flowing water

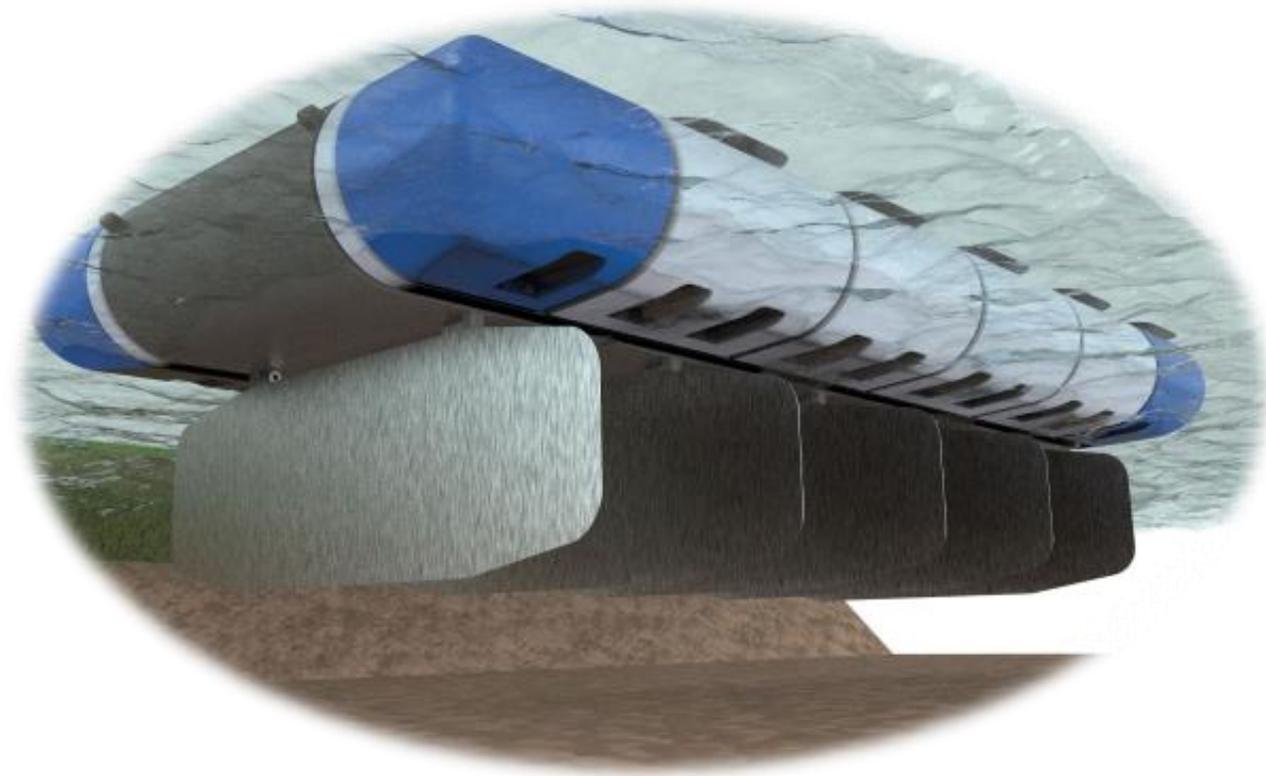
Designed as a high torque, low rpm device – targets large mass, not high velocity

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, “v<sup>2</sup>” part of the equation

We are focusing on the mass, “m”

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

$$\text{Energy} = \frac{1}{2} \times \underbrace{100,000,000,000,000,000 \text{kg}}_{\text{MOWT targets this number}} \times \underbrace{16}_{\text{Other devices target this number}}$$

MOWT targets  
this number

Other devices  
target this number

# Why not a standard waterwheel?

Which is more powerful?



2 oars in the water

OR



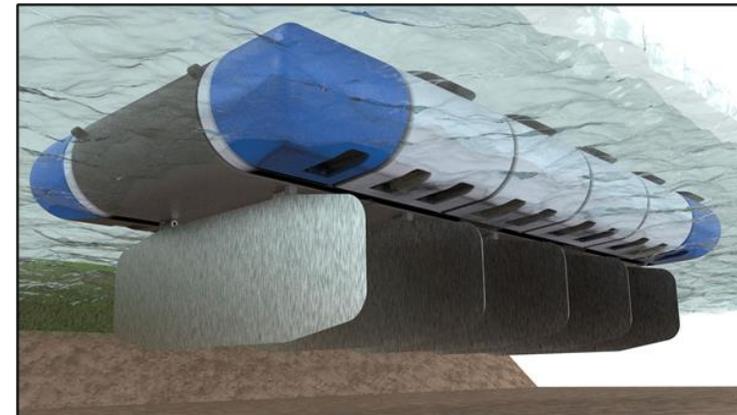
8 oars in the water

Therefore,



1 – 2 partially submerged paddles

OR

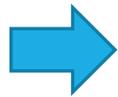


5 fully submerged paddles

# Development to date

---

Idea creation



Proof of concept



Prototype

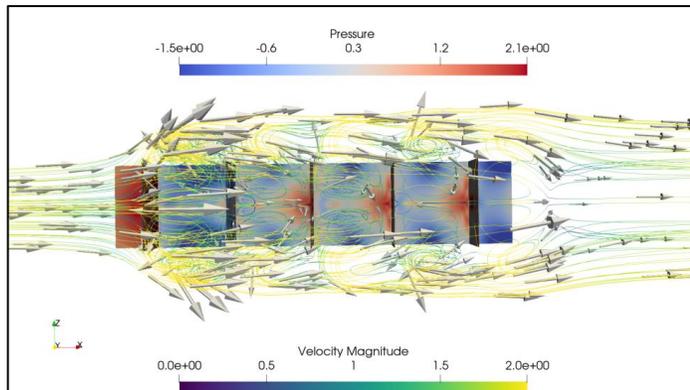


# 10kW Prototype

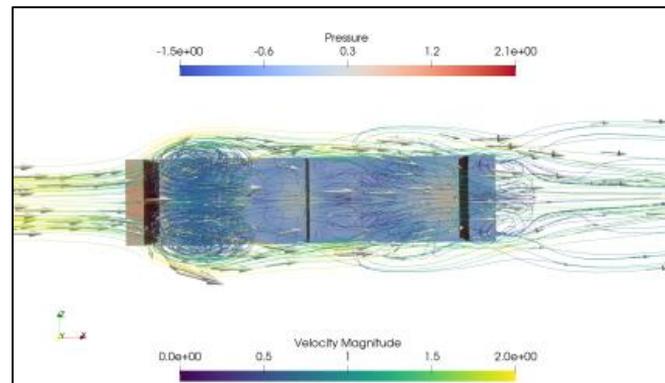
---



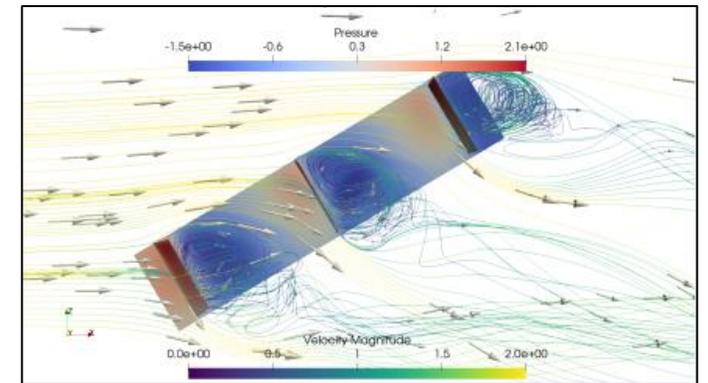
# Development (cont.)



Base case – 5 paddles, parallel flow  
F= 1477N



Test case – 3 paddles, parallel flow  
F= 1985N



Test case – 3 paddles, 30 deg yaw  
F= 4412N

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

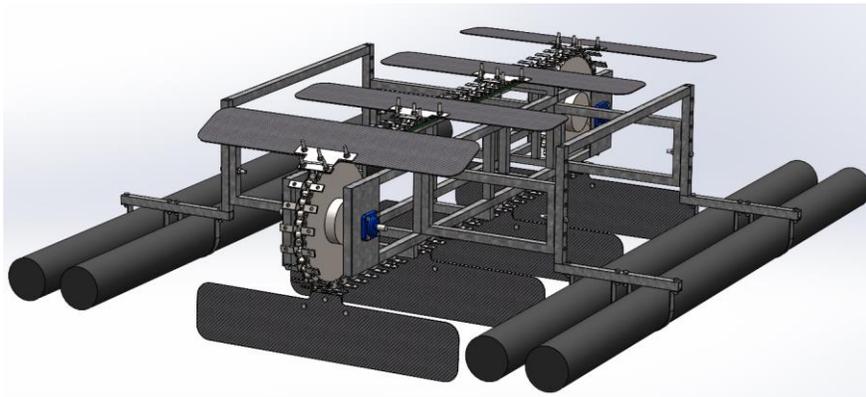


Commercialise MOWT MK2

# 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

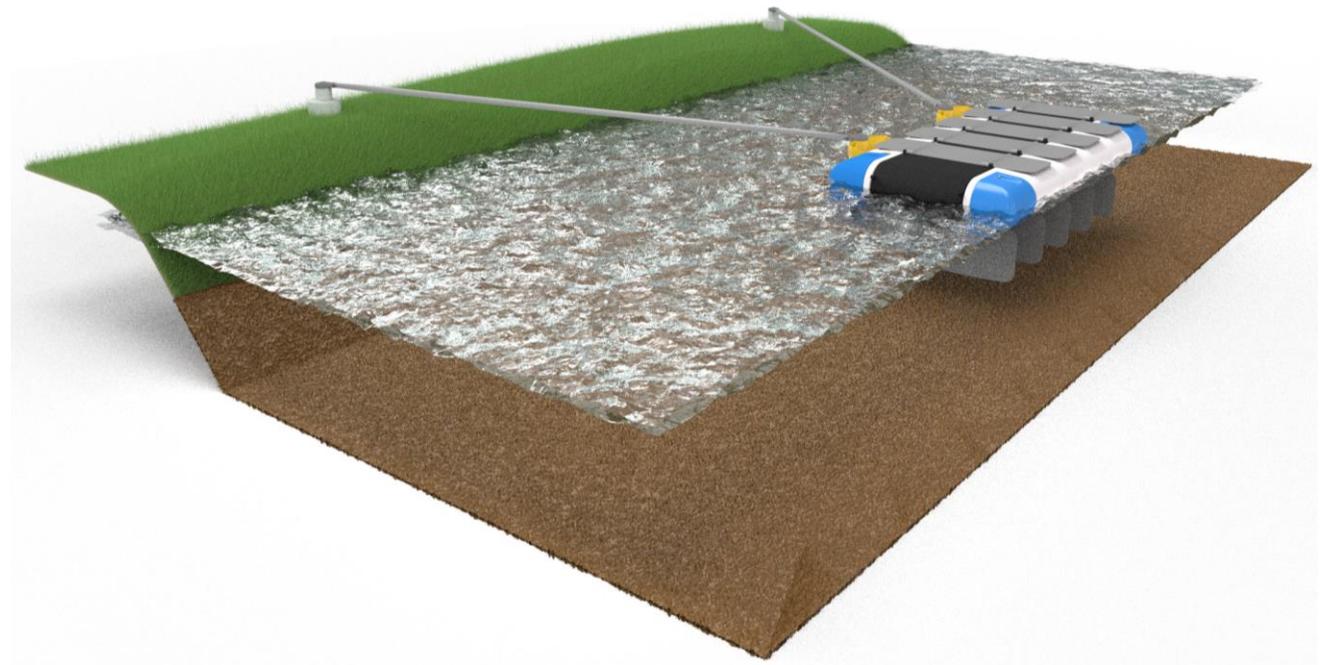
- Standalone or tidal farm

500kW – MW scale devices

- Large scale grid production

Direct mechanical power

Remote subsea power



Thank you for listening!

Contact info:

Email: [stuart@mw-consult.co.uk](mailto:stuart@mw-consult.co.uk)

Phone: 01330 826888

Website: [mw-consult.co.uk](http://mw-consult.co.uk)