

# **KINETIC HYDRO**

Clean affordable energy for communities without power

# (Almost) Zero Head Hydro

- Hydrokinetic turbines generate power from the kinetic energy in flowing water
  - Very much like wind turbines generate power from moving air
- Modern development began in late 1970s
  - First testing on River Thames by Reading University/ITDG
  - Initial projects in Sudan to irrigate crops using power of the Nile during dry seasons
  - Small electricity generating units (250-500W) used for remote communities worldwide



ITDG  
1980-82, Juba, Sudan



**Amazon Aquacharger** Marlec/Thropton  
~2000 onwards, various locations



Thropton Energy Services  
1993 onwards, various locations



# Full Stream Ahead

- Tidal stream technology development: 1990s-today



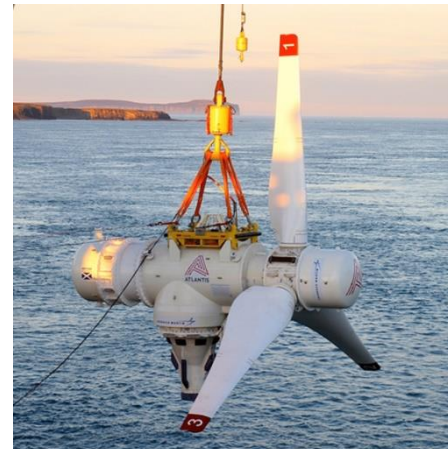
**IT Power**  
1994, Loch Linnhe, Scotland



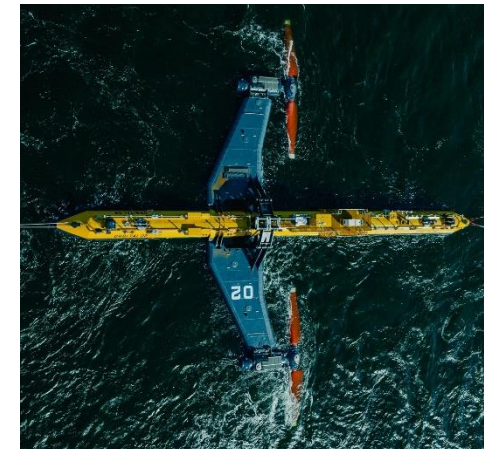
**Seaflow IT Power/MCT**  
2003, Lynmouth, England



**D10 Sabella**  
2015, Ushant, Brittany



**AR1500 Atlantis Resources**  
2016, Caithness, Scotland



**O2 Orbital Marine**  
2021, Orkney, Scotland



**SeaGen Marine Current Turbines**  
2008, Strangford Narrows, Northern Ireland



**DD100 Nova Innovation**  
2021, Shetland, Scotland



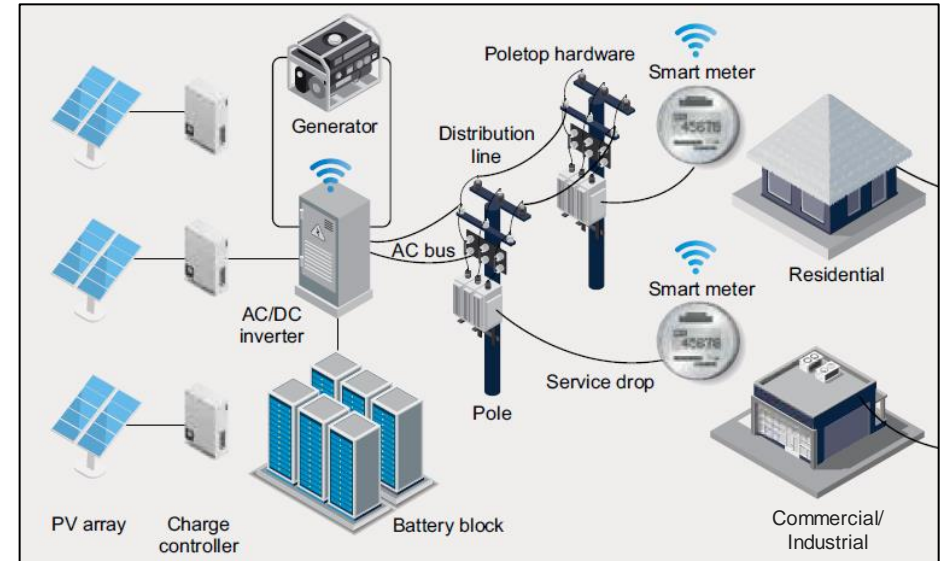
**Plat-I 6.40 Sustainable Marine**  
2022, Grand Passage, Canada



**DG100 Minesto**  
2020, Vestmannastrandur, Faroe Islands

# A Mini Grid Revolution

- In 2015 all UN member states committed to the goal of providing universal clean, modern energy access by 2030 (*SDG7*)
- 3 main methods: National grid expansion, solar home systems and *mini grids*
- The least-cost solution to reach nearly 500 million people will be to build 210,000 mini grids<sup>1</sup>
- “Typical” Mini Grid:
  - 50-100 kWp solar PV
  - 200-500 kWh battery energy storage: **largest single cost**
  - AC distribution and metering for 200-800 connections (including households and commercial/industrial users)
  - Total investment: US\$ 0.5-1.0 million



[1] ESMAP, 2019, Mini Grids for Half a Billion People, Technical Report 014/19, World Bank

[2] Garamba National Park: Community Development Project in Haut-Uélé Province, DRC, 2021 (Africa Parks)

# KH3000 Turbine

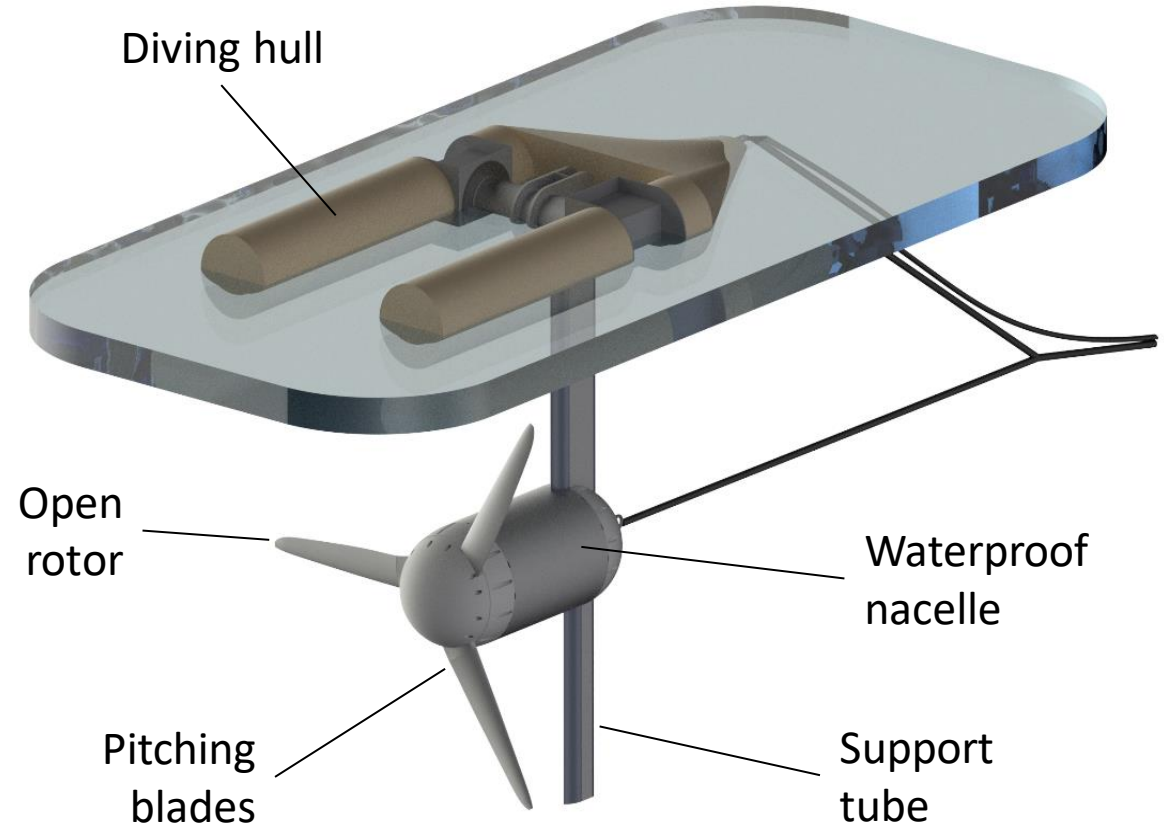
## Plug and Play integration with mini grids

- Via standard PV inverters and charge controllers

## A human-scale solution

- Transport by 4x4 or motorised canoe
- No cranes or specialist installation boats required
- Maintenance in a typical vehicle garage
- Applicable to rivers of moderate size

Turbine Characteristics	
Rated power	3 kW
Flow velocity @ rated power	2.5 ms <sup>-1</sup>
Rotor diameter	1.2 m
Overall height	1.85 m
Total mass	130 kg





# Our Journey to Commercialisation

## Where we are now:

- 2019** Company founded
- 2020** Research and prototype turbine design
- 2021** Proof of concept procurement, and preliminary testing
- 2022** Performance testing and initial integration with mini grid hardware

## Where we are going:

- 2022** Pitch system development. Full integration with PV inverters and mini grid controllers
- 2023** UK in-river trials
- 2023/4** Pilot projects overseas
- 2024+** Commercial B2B sales





# Thank You

For further information please contact:

Richard Montague  
Kinetic Hydro Ltd  
16A Glenorchy Terrace  
Edinburgh  
EH9 2DQ

Phone: +44 (0)7932 669 248

Email: [richard@kinetic-hydro.com](mailto:richard@kinetic-hydro.com)

Website: <http://www.kinetic-hydro.com>

