

Business Plan

AUTOMAR: Station-holding, unanchored ocean observation platform

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1. Background

- The UN has proclaimed the years 2021-2030 as the decade of marine science for sustainable development. This is to support efforts to reverse the cycle of decline in marine health.
- The marine environment is absolutely crucial for the earth's climate and life on earth.
- Large parts of the ocean are now severely degraded due to pollution, global warming, noise and invasive species.
- If nothing is done, stress factors at sea will increase as the human population grows towards the expected 9 billion by 2050.
- Marine observations and scientific research are crucial for assessing measures and predicting their consequences.

There is already a lot of research going on at sea today. Thousands of anchored, drifting or propelled units are scattered throughout the oceans. Research vessels make long voyages for comprehensive measurements throughout the water column. Remote measurement from hundreds of satellites measures temperature, waves, current, algae blooms etc. Measurements taken from ships in normal traffic are added to this. The Global Ocean Observing System collects data from all of these sources and make them available free of charge to scientists worldwide.

2. Business idea and vision

Since the sea depth outside the continental shelf is several thousand meters, 4000 meters on average, it is both demanding and expensive to anchor there. Anchored buoys are therefore found, with a few exceptions, only over shallower sea areas near land. The advantage of anchored buoys is that they provide long series of measurements that give a clearer picture of changes over time than moving units can do.

Automar

Waveco will create a buoy, an unmanned vessel, which can stay in a fixed position dynamically, without anchoring, without time limit, only powered by renewable energy taken from the environment on site. We call it *Automar*. With Automars it will be possible to establish a fixed network of measuring stations across the large oceans. Regardless of current and weather conditions, sensors will take measurements from fixed position in the atmosphere and in the water column down to 100 meters, and relay the data via satellite to recipients on land, around the year.

The Automar will also be able to receive data sent acoustically from subsea units and send them on, via satellite to desktop. Researchers can thus establish real-time communication with such devices from their office.

The Automar will be able to move slowly, so that it can be deployed in a nearshore place and go autonomously to the intended position. If necessary, it can change location on command.

3. Market assessment

Meteorological and oceanic observation is a sector of considerable size. Nearly 4,000 ARGO units are in the sea at any time, and nearly 1,500 drifting buoys, in addition to > 400 anchored buoys in the Global Ocean Observing System. Hundreds of new units of ARGO profilers and drifting buoys must be deployed annually to maintain the number as they drift ashore or perish in some other way. The coverage also becomes uneven because they clump together in gyres. In addition, there is a large activity with the use of gliders, autonomous drones, research ships and civilian and military ships that make measurements along the way and send results to a global system for registration and

dissemination of data. All these in situ measurements are compared with satellite measurements to create models for ocean and atmosphere.

Numbers and prices

Costs in EUR Program-Brand	Type	Number	Costs/ Unit	Total costs	New units/yr	Total costs/yr
Global Ocean Observing System	ARGO	4000 ¹	400K ¹	1,600M	600 ¹	240M
	Drifting buoys	1250 ²	20K ³	25M	300*	60M
	Moored buoys	400 ²	300K	120M ⁴		8M ⁴
“Wave Glider”	Surface drone		>150K ⁵			
“Sail Drone”	Surface drone		500K*			
“Sail Buoy”	Surface drone		100K*			
“Slocum”	Submarin glider		100K ⁶			

Blank spaces: Unknown *Guesswork. ¹ [Argo website](#) ² Global Ocean Observing System website ³ Average. Varies from 10K to 100K depending on sensors and ship time. ⁴ Norwegian Institute of Marine Research, dialog. ⁵ [Defence News](#). The price is ex. sensors. ⁶ [WikiMilli website](#).

Competition

There is no comparable product in this market.

With a constant need to increase knowledge about the world’s oceans and a demand for real-time data streams for several uses we think there is a large global market for Automar.

4. The Product

Product description

Automar is shaped like a boat with a low freeboard and flat deck. The power for station holding, communication, and payload is delivered by Waveco’s patented turbine, the *Subwave* turbine. It hangs in a long cable from the Automar at approx. 100 meters. Here it is pulled up and sinks down when the Automar is affected by waves. The system is described in the Technical Description.

Patents

Waveco’s turbine is patented in Norway only. Patent number NO338027, dated 2016-06-25.

5. SWOT

Strength Norwegian IP protection No other known technologies is offering the same ability.	Weakness Patented in Norway only.
Opportunity High-profile sector. Opportunity to become a first mover.	Threat Copycat. Existing products prevent market penetration.

6. Business plan

The technology must be proven in a year-round open sea test. During this period, there is a need to hire a project manager. Upon completion of the test and a decision to start production must be made.

Production will take place at Måløy Verft AS. Waveco, in cooperation with Stadt Towing Tank, will focus on research and developmen, while sales, service and logistics will be carried out by a team composed of new employees with expertise in management, marketing, sales, logistics and finance.

Automar will be sold directly to the customer with telemetry and communication included, but not any other payload. The Subwave turbine will be sold separately to customers who want to use it on moored buoys with high energy demand payloads, for example wind lidar.

Price estimates are shown in the Technical Description.

7. Schedule

The table shows the expected schedule after the financing is in place.

	SUBWAVE			AUTOMAR			WAVECO
	Phase 1			Phase 2			Total
Duration	6 months	2 months	2 months	6 months	12 months	6 months	2 y 10 m
Action	Prototype	Sea test	Marketing and sales	Prototype	Sea test	Marketing, sales and recruitment	Business

8. Financing

The table shows capital requirements for two development phases and the production phase. The first phase is focused on the Subwave turbine, the second on Automar. The phases correspond to the schedule.

Cost	€ 100 000	€ 20 000	€ 60 000	€ 300 000	€ 20 000	€ 1 000 000	€ 1 500 000
- Public	€ 70 000*			€ 120 000*		€ 400 000*	€ 590 000*
= Private	€ 110 000*			€ 200 000*		€ 600 000*	€ 910 000*
Output	2.4 m turbine prototype	Test results	Product: Subwave	4 m turbine and Automar	Test results	Product: Automar	Products, premises and staff

9. Transaction

Each investment will be coupled to transaction of shares in Waveco AS in accordance with this table.

New Investor(s) / Partner(s)	20%	40%	60%
Existing shareholders	80%	60%	40%

10. Contact details

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