

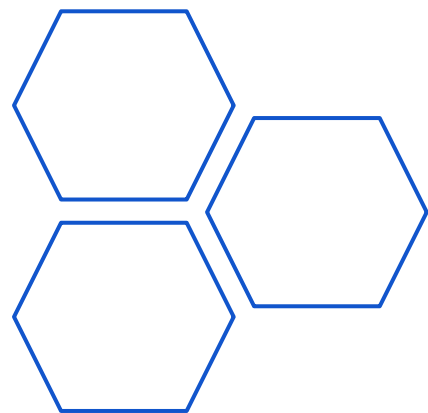
AquaLumi™

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This deck holds a description of a novel *technology concept* related to mariculture and marine biodiversity. The technology/product described in this deck as **AquaLumi™**. The description and slides given in this deck are confidential, any third party involvement needs to be requested and approved before the content can be shared as such.





Value

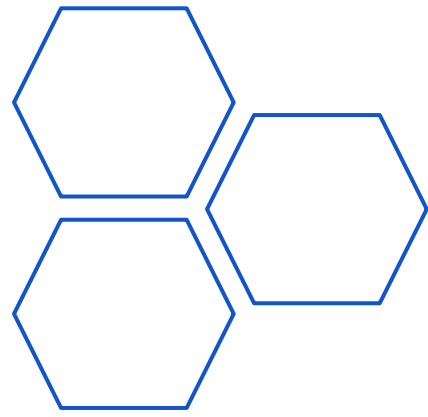
AquaLumi has potential to complement or support the following practices on environmental and economic levels:

- Sustainable *Marine Aquaculture*
- Sustainable *Catch Fishery* practices
- *Marine Reserve* practices

In the following ways:

- Illuminate **Marine Reserve** areas
- Support **Natural Feeding** of fish
- Boost **Biodiversity**
- **Reduce** or possibly eliminate the use of fish meal and fish oils from by-catch
- **Support** the transition to plant-based feed
- **Mitigate nutrient loading** (nutrient pollution)
- Help **prevent algal blooms & eutrophication**





Studies

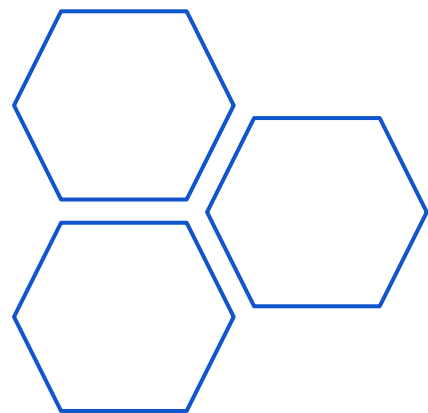
One-third of the world's ocean fish catch is ground up for animal feed, a potential problem for marine ecosystems. Ninety percent of that so-called forage fish catch is turned into fish meal or fish oil, most of which is used as agricultural and aquacultural feed. Forage fish are near the base of the marine food web, nourishing larger fish, ocean-dwelling marine mammals and sea birds. On average, it takes three to five pounds (1.36 to 2.27 kg) of fishmeal to produce one pound (0.45 kg) of farm-raised fish.

Reuters Environment, oct 2008, One-third of world fish catch used for animal feed, by: Deborah Zabarenko, Environment Correspondent

Asian aquaculture – apart from the intensive culture of marine shrimp – still largely depends upon “trash fish” and farm-made diets due to their availability and low cost, characteristics which are considered by farmers to outweigh their poor growth and environmental performance.

FAO - ‘Fish as feed inputs for aquaculture – practices, sustainability and implications: a global synthesis’, by: Tim Huntington & Mohammad R. Hasan





Technology Concept

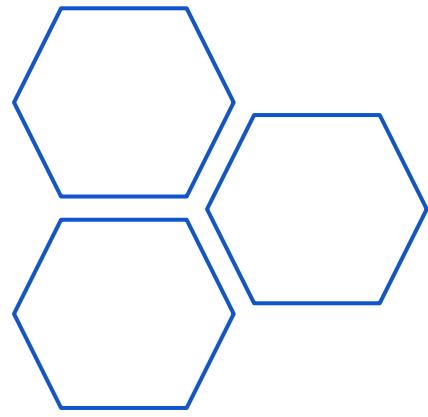
AquaLumi™ makes use of non-toxic luminescent chemicals, to store energy of the sun and emit light (at specific wavelengths) during the night. This light will attract local krill that can enter the cages/nets and function as live feed for a variety of fish species used in Marine Cage Aquaculture.

Making use of plant-based feeds in combination with **live feed** may be an alternative to fish meal and fish oil created from by-catch, for **marine cage aquaculture**.

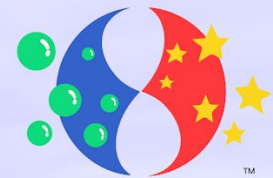
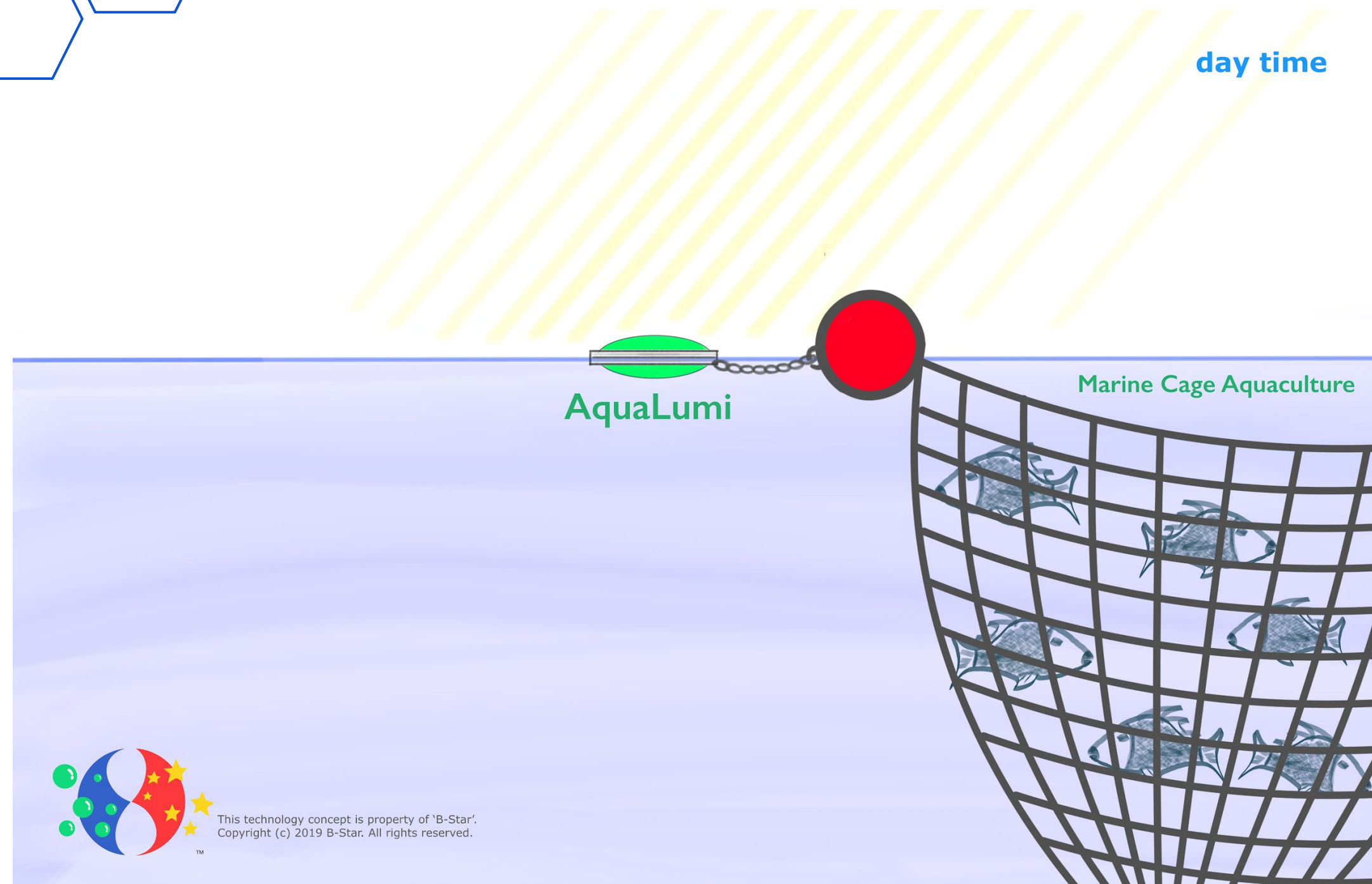
Other potential uses of **AquaLumi™**

- (1) Revitalize coastal marine habitats by illuminating “reserve” spots in the evening so commercial fisheries know to stay away and the small fishermen know where they can and cannot fish (TURF + Reserve system)
- (2) Support night fishing practices for small-scale fishing communities, lowering destructive use of bleach, hairline fishnets (cantrang), explosives or other environmentally destructive practices.





Product Features

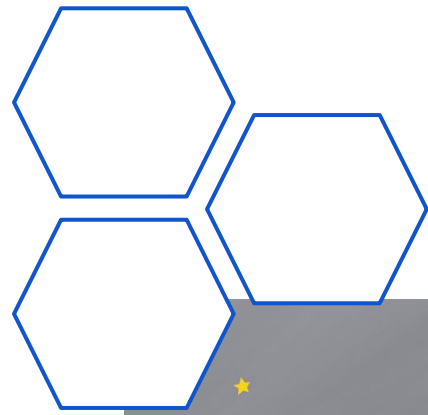


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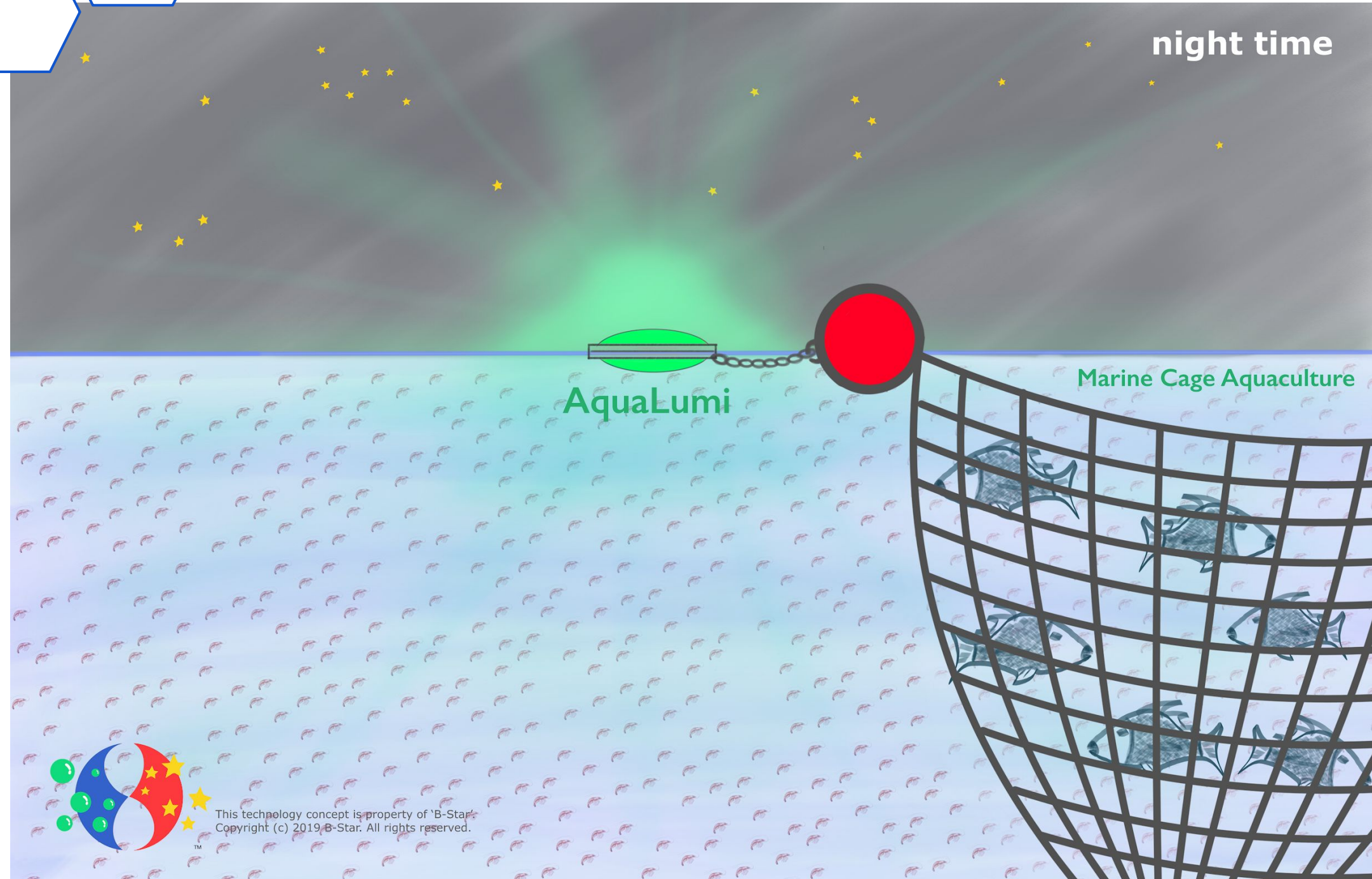
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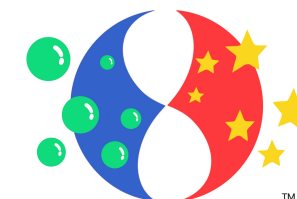


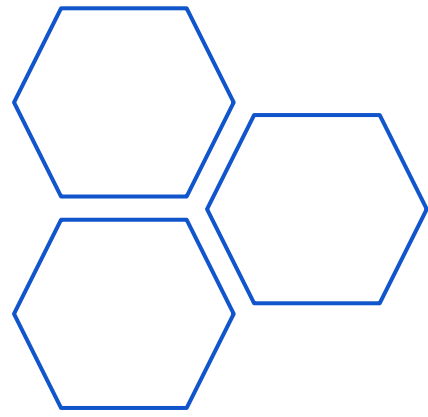
Product Features



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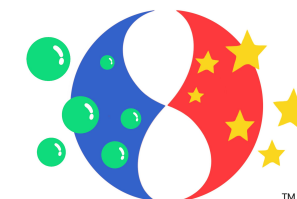


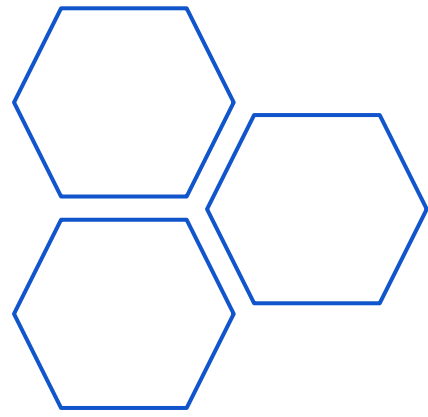


Product Features

AquaLumi :

- Allows for remote setup & operation, without need for specialised training.
- Can easily be attached to open aquaculture systems or anchors with rope/chain and carabiners.
- Is easy to transport making sizable deployment fast and cheap.





Approach

Through B-Star we aim to deliver and kickstart a ‘Collaborative Research Design Project’ with the right mix of partners in order to support the development of a technology focussed on sustainable fishing practices.

With a prototype design in place, we currently seek validation, through Collaborative Research and on-site testing of the **AquaLumi** concept.

In terms of **Collaborative Research**, we are looking for:

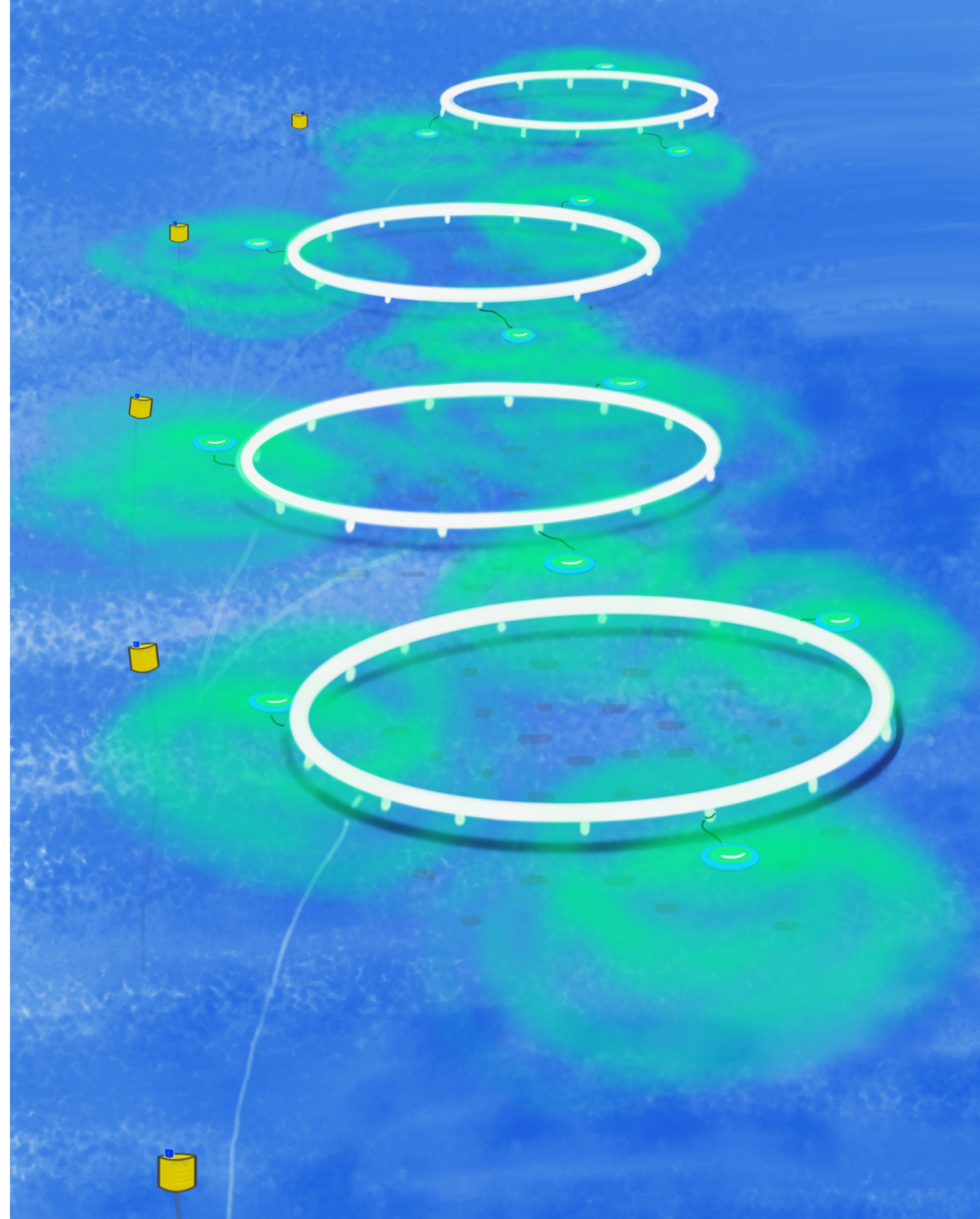
Partners that:

- > Have resources to support the execution of research and potential validation of proclaimed workings
- > Are working to boost marine biodiversity and support sustainable marine resources extraction



Technology implementation

1. Passive attraction of krill.
2. Marine reserve marking.
3. Boost local biodiversity.
4. Determine av. Live feed intake (Cage Aquaculture).
5. Generate algorithm for supplementary plant-based feed (Cage Aquaculture)



Real-time measured Variables

- Krill/fish density at different sub-levels (sonar/camera)
- Light intensity (LUX)
- Turbidity
- Weather conditions

