



Solutions, skills and talent development for Ocean and Waters

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combining scientific excellence with commercial relevance

Planetary Boundary Update 2022

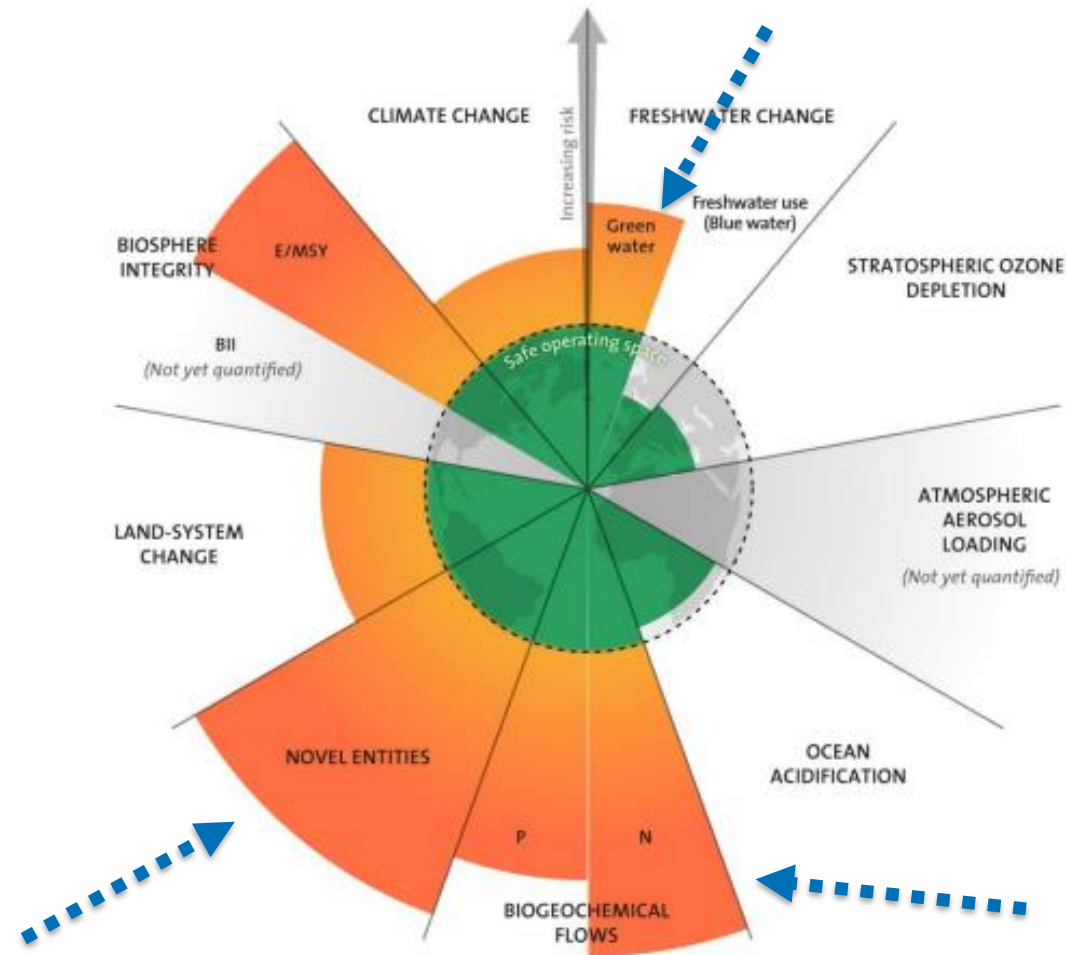


Figure 1. Planetary boundaries as summarized by the Stockholm Resilience Centre (Steffen et al. 2015; Stockholm Resilience Centre, 2022).

Challenges and Opportunities



UN
2023 WATER
CONFERENCE

NEW YORK
22-24
MARCH
2023

Targets:

- Reduce by at least 50% plastic litter at sea.
- Reduce by at least 30% microplastics released into the environment.
- Reduce by at least 50% nutrient losses, the use and risk of chemical pesticides.

Main challenge in Baltic Sea is **Eutrophication**. Which causes toxic algae blooms, anoxic zones and dead fish.

1st Baltic Sea Regional Lighthouse Call: Sustainable increase of aquaculture production, particularly of algae;

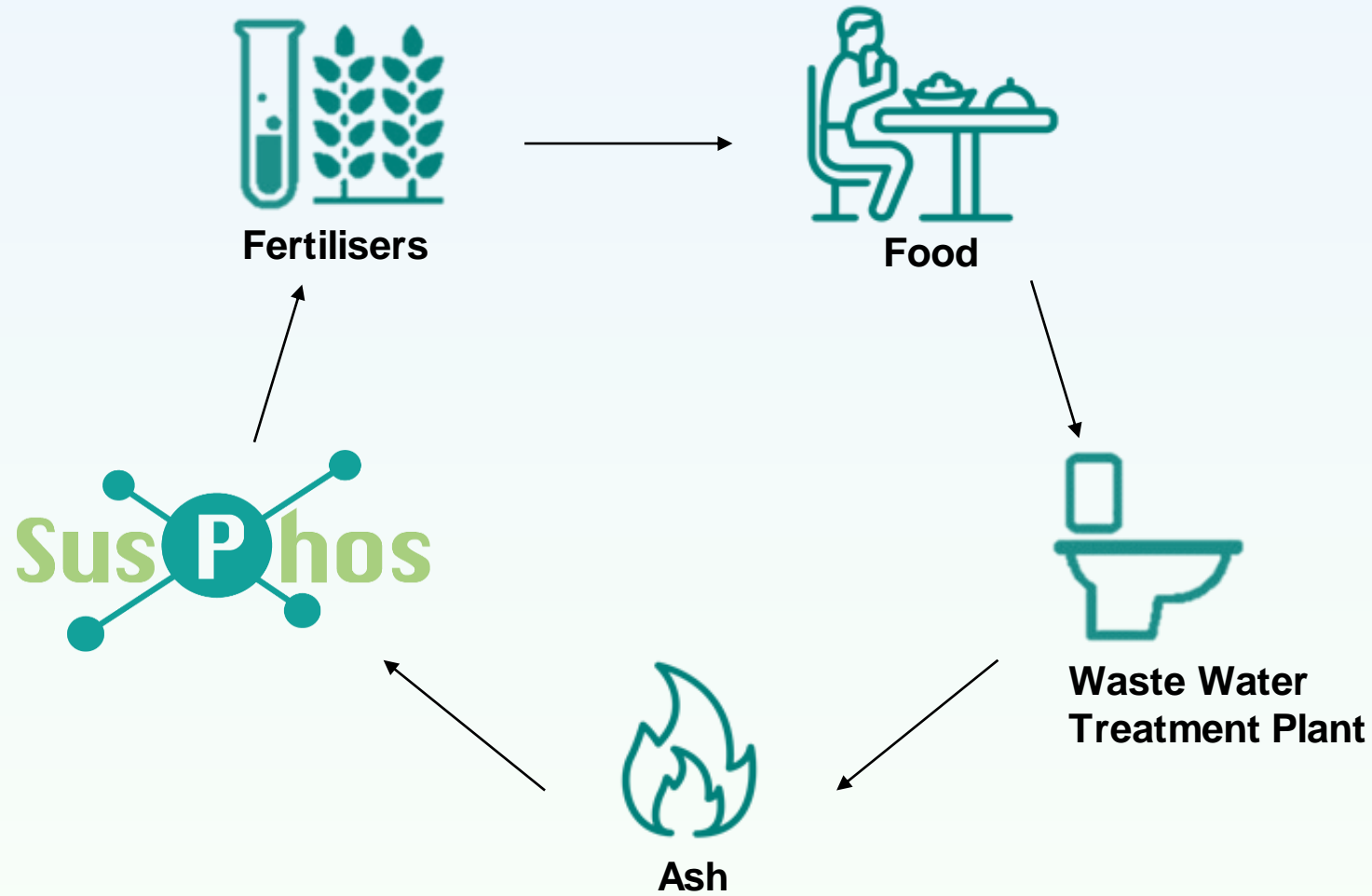
→ The **Fresh water dimension** is currently under represented in the Mission calls

Better balance needed between marine waters and fresh water

Our regional innovation ecosystem can address many of the challenges that the Mission describes. Much of the pollution and solutions can come from the land and inland waters. This connection needs to be made better to benefit from the opportunities this mission could offer.



Breakthrough for upcycling phosphate waste



Crop production



Polymer coated fertilizer
PE, EVA, LDPE, cellulose

Fertilizer sacks PP

Flexible intermediate bulk
containers, PP



Seedling plug trays
PP, PE, EPS

Nursery pot trays
PP, PE

Mulching films
LDPE, PVC, PLA/PHA

Forestry



Tree guards
PP

Chainsaw fuel container
HDPE, PP

Tree labels and support ties
PVC and synthetic rubber

Fisheries and aquaculture



Insulating crates
EPS, Expanded PE and PP

Ropes
PE, PP

Fishing nets
PE, nylon

Table 6: Priority and representative products selected for assessment

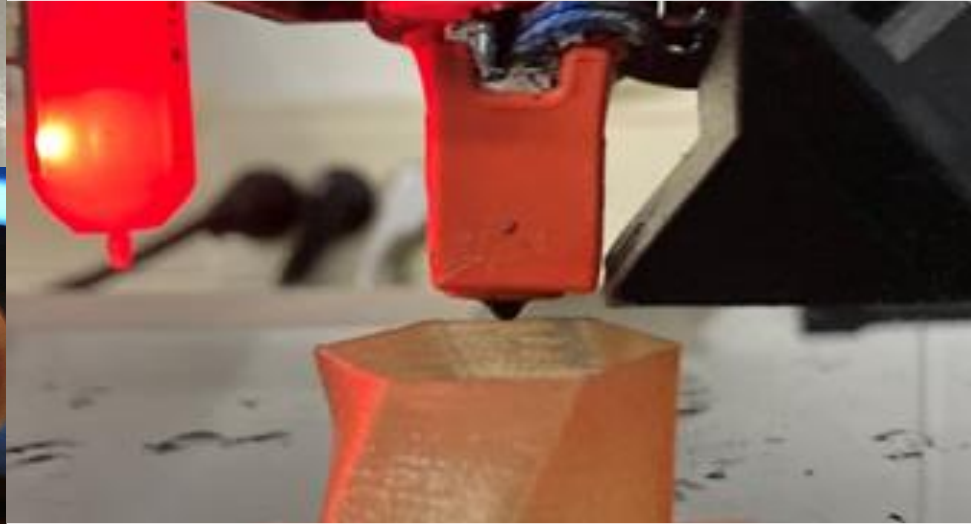
Product	Priority/ Representative	Relative risk score	Value chain	Durability
Polymer coated slow release fertilizer	Priority	10,5	Food crop Non-food crop	Single-use
Mulching films	Priority	9,8	Food crops Non-food crops	Single-use
Pesticide containers	Priority	9,5	Food crops; Non-food crops Livestock; Fisheries; Forestry	Single-use
Bale films and nets	Priority	9,3	Non-food crops	Single-use
EPS boxes	Priority	9,0	Fisheries	Single-use
Irrigation drip tape (single-use, on-soil applications)	Priority	8,8	Food crops Non-food crops	Single-use
Fishing nets and ropes	Priority	8,7	Fisheries	Durable
Cages	Priority	8,7	Fisheries	Durable
Plastic bags (bananas)	Priority	8,7	Food crop	Single-use
Net float	Priority	8,5	Fisheries	Durable
Fertilizer containers – bags and rigid	Representative	7,8	Food crops Non-food crops	Single-use
Plant pots, seedling plugs	Representative	7,8	Food crops Non-food crops	Single-use
Plastic ties, ropes, twines	Representative	7,5	Livestock, fisheries	Single-use
Bags for feed	Representative	7,5	Food crops Non-food crops; Forestry	Single-use
Bale twine	Representative	7,4	Food crops Non-food crops	Single-use
Silage clamp films	Representative	6,8	Food crops Non-food crops	Durable
Greenhouse films	Representative	6,7	Food crops Non-food crops	Durable
Tree guards	Representative	6,4	Food crops; Non-food crops Forestry	Durable
Pond liners	Representative	6,4	Food crops Non-food crops	Durable
Irrigation tubes and drips (semi-permanent)	Representative	5,8	Food crops Non-food crops	Durable
Ear tags	Representative	5,1	Livestock	Durable
Crates for harvesting	Representative	4,9	Food crops Non-food crops	Durable





Caleyda

made by nature



With all the advantages of plastic, but without its disadvantages.

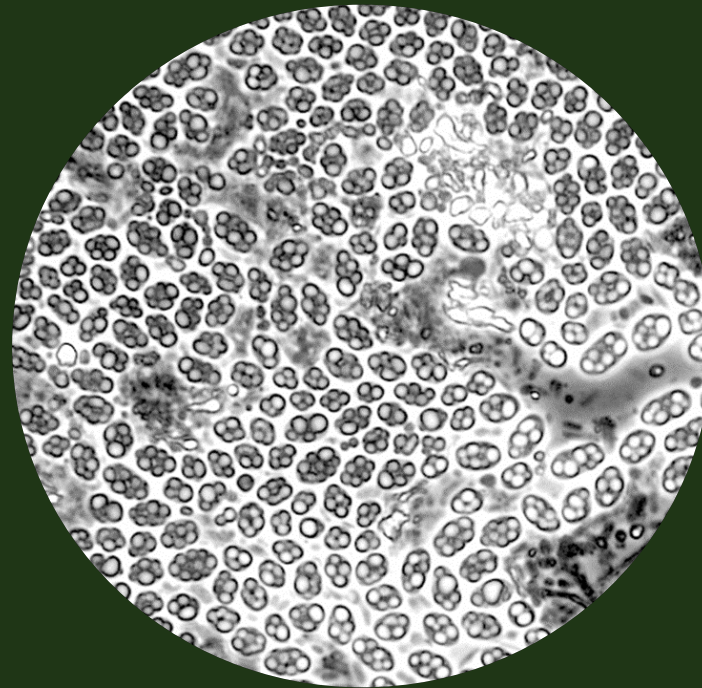
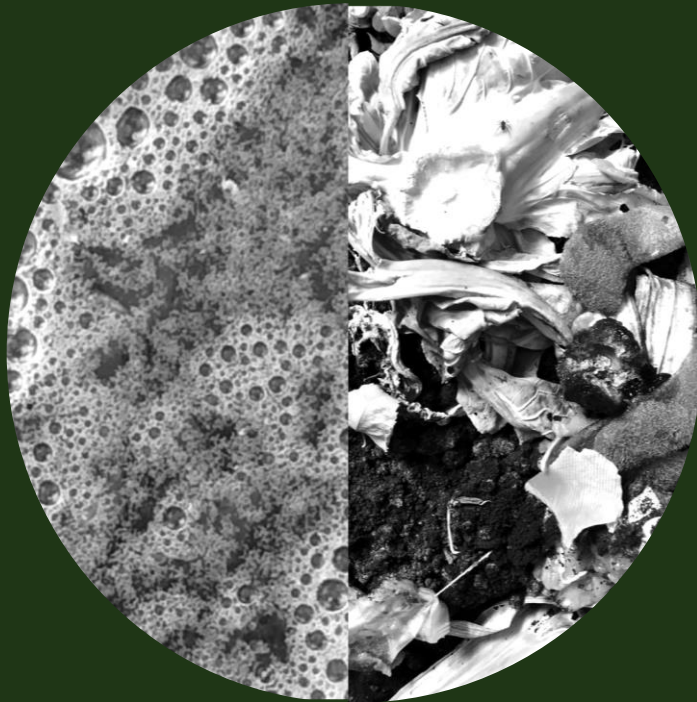



PAQUES
biomaterials

Circular

Natural

Valuable



Make use of **Caleyda** where biodegradability makes sense!

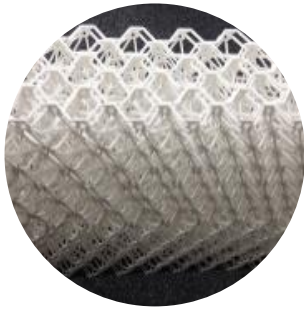
Controlled release fertilizers



Seed coatings



Ecosystem restoration



Plant clips and labels



Plant growth media



Cardboard transport packaging



Plant plugs



Mulch films

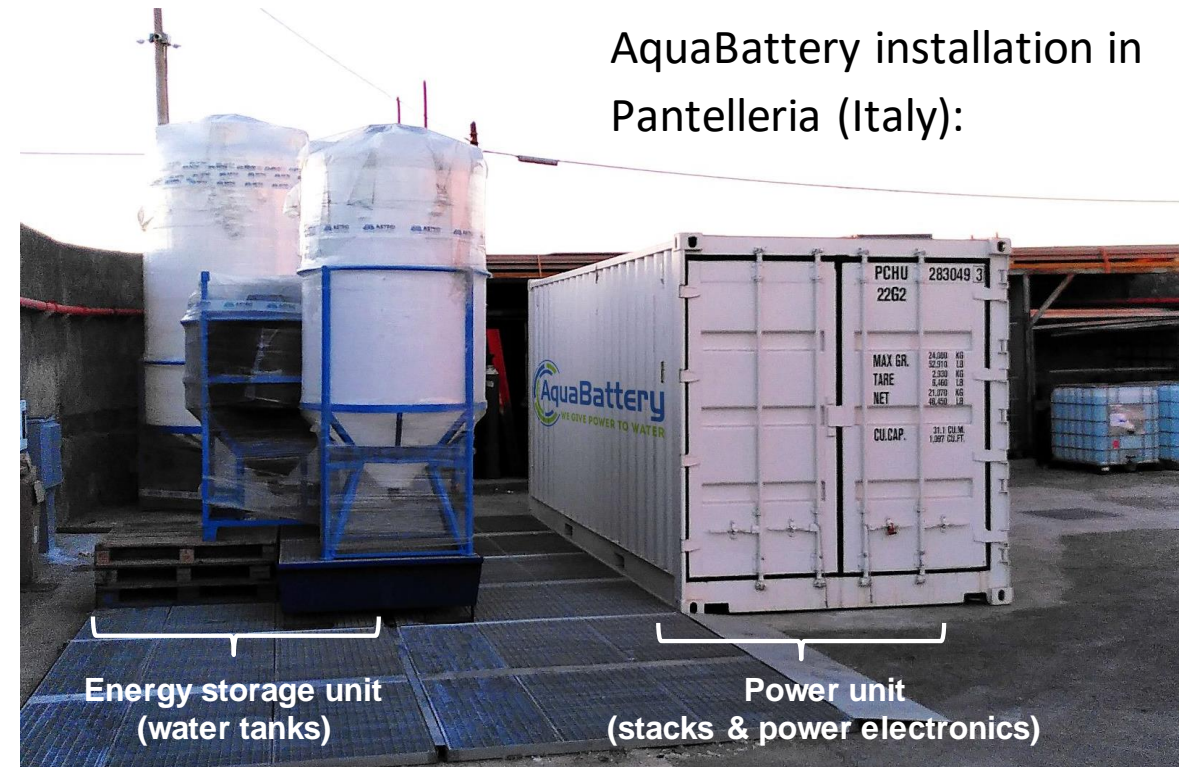


For grid infrastructure to handle this PV and wind energy influx and have 24/7 supply, long-duration electricity storage (LDES) solutions will be crucial.

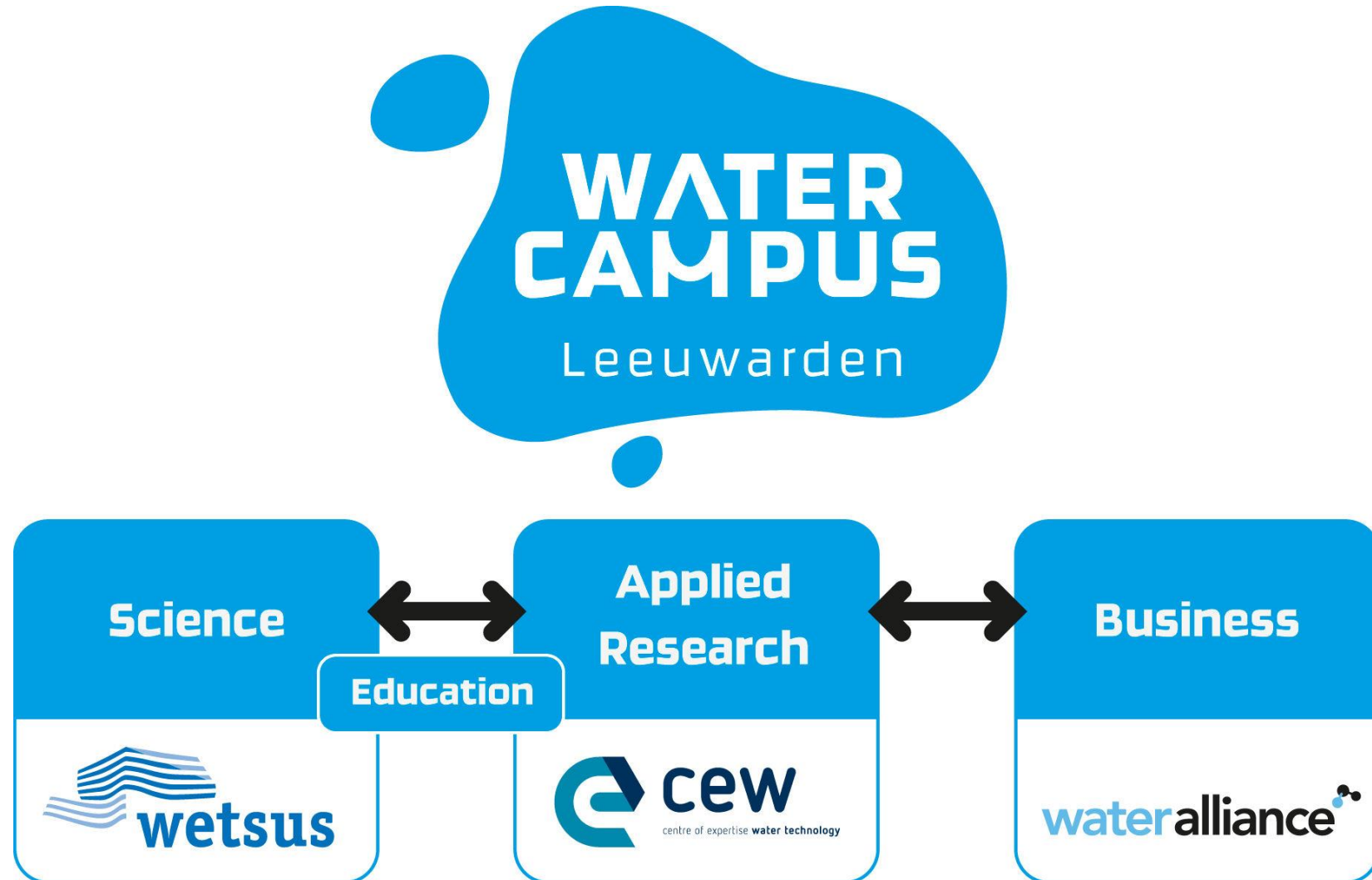
Our solution: **Create the world's most scalable LDES technology, which stores electricity using saltwater.**

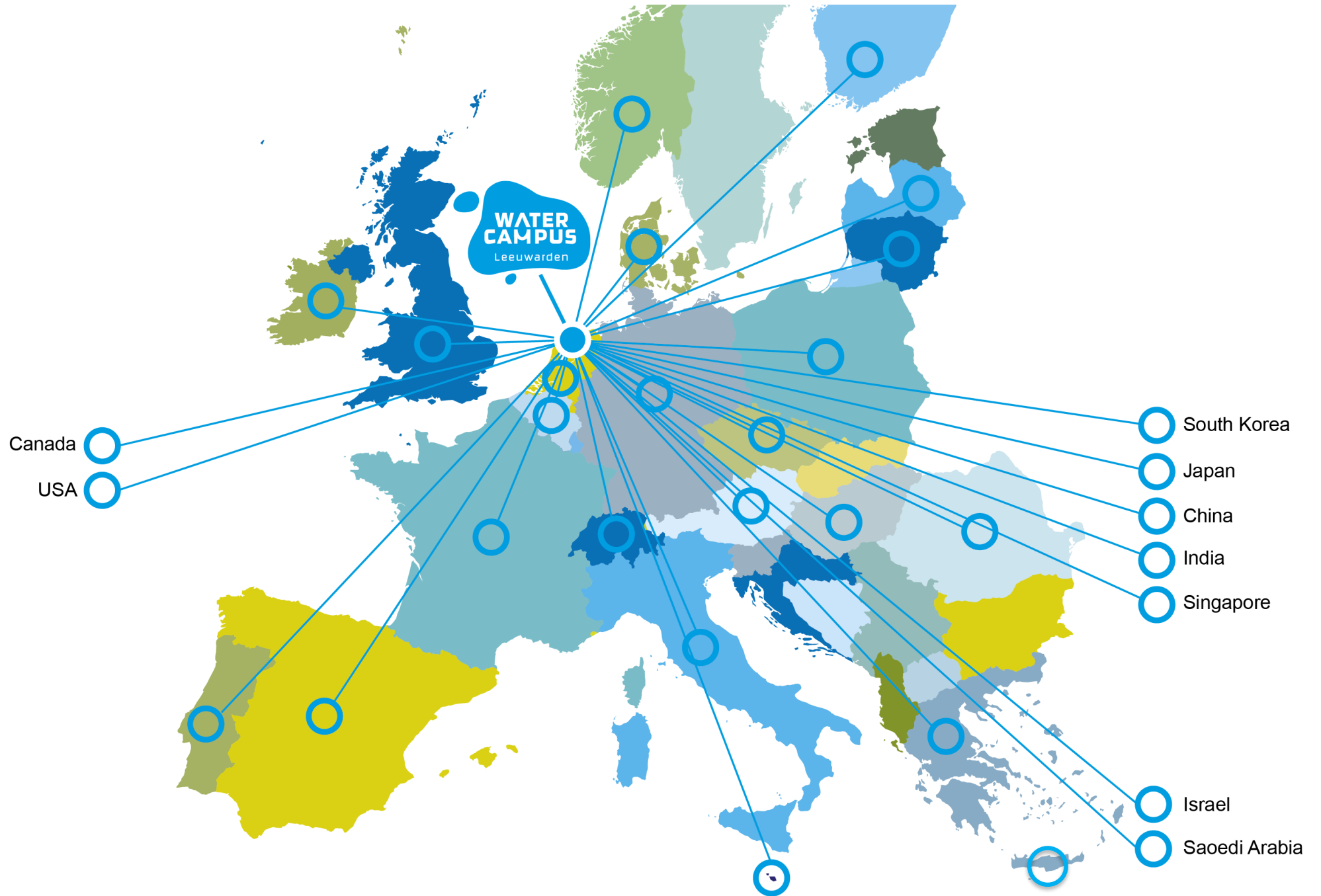
- Modular power and storage capacity
- Use of salt water (local resource)
- Low-cost

AquaBattery installation in Pantelleria (Italy):



Innovation Ecosystem





Water Technology Education



European Partnership Water4All



Full Integration of Place-Based Innovation Ecosystem:

1. **Water Alliance**, Entrepreneurship and Trade Fairs
2. **Wetsus**, PHD Schemes
3. **CEW**, Demonstration sites and vouchers
4. **CIV-Water**, Centers of Vocational Excellence
5. **Province of Friesland**, Public Innovation Support, Synergies
6. **City of Leeuwarden**, Public Innovation Support, Synergies



Water4All member countries



Topics for collaboration:

1. Water for Hydrogen, eco-friendly desalination technologies/ direct use of seawater for hydrogen
2. Ocean and Water Literacy and Awareness raising of school children
3. Nutrient recovery
4. Fully Bio-degradable Bio-Plastics
5. Micro- and nano-plastics removal
6. Removal and destruction of pharmaceuticals, personal care products, endocrine disruptors, antibiotic resistance, phytosanitary products, PFAS, ...
7. KIC Water Marine and Maritime

www.wetsus.eu

www.wateralliance.nl

www.cew-leeuwarden.nl

www.watercampus.nl

WaterCampus is co-funded by

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Climate Policy of the Netherlands

