

## SafeShore

# Shielding our coastlines from the impact of climate change with novel shore protection technology

### In a nutshell

Climate change, exacerbated by increases in carbon emissions and deforestation, poses many threats to the environment, human health, and the economy. Average sea levels have increased over 20cm since 1880. Measurements demonstrate that sea level rise is accelerating, and our seas are projected to rise by another 30cm by 2050 and 1.5m by 2100. Even a small increase in sea level has a devastating impact on coastlines – causing erosion, flooding, saltwater intrusion, freshwater depletion, and lost habitats for humans, fish, birds, and plants. By 2100, Europe could face annual coasting flooding damage of up to €800b. Most effective ways to mitigate damage caused by coastal flooding and storm surges is the construction of barrier and armour systems. However, the traditional methods of building such shore protection, with heavy concrete caissons and large sand dikes, is proving much too slow and unsustainable to meet escalating demand. With Europe needing around 6,000km of shore protection to shield populated areas, a new faster and greener technology is needed. This is where SafeShore comes in.

### Why is our technology important?

SafeShore provides a novel way to construct barriers and armour systems – cutting construction time, environmental footprint, and complexity. Our technology is hybrid, merging techniques from two different fields – heavy concrete marine construction and lightweight composite materials. It is built based on the principle of the human body – made up of an exterior skin with an internal skeleton and a filling material. The skin is made from lightweight fibre-polymer composites, materials known for their durability and strength while being significantly lighter than concrete. These lightweight composites can be easily moved to their final place in the sea, immersed, and then filled to the right weight. SafeShore offers two products – HyWall™ and HyBlock™ – which can be used offshore or onshore, together or on their own.

- HyWall™, is a hybrid barrier system to protect from sea level rise and flooding. The skeleton is made of the same lightweight composites. The skin is filled with waste or dredged material. With HyWall™, we can build barriers much faster and with less environmental impact.
- HyBlock™ is a hybrid armour system to protect from storm surges and wave action. The composite skin is filled with pumping concrete and protects the concrete from environmental damage, enhancing its durability. HyBlock™ benefits from a novel shape which improves its ability to absorb wave energy.

SafeShore's technology offers a viable way to shield coastlines while safeguarding people, culture, and the economy against the impacts of climate change.

### The benefits of our solution

- Speed: Construction is 3-10 times faster than traditional barrier, dike and armour technology
- Environmentally friendly: By using lightweight, durable materials, we don't have to rely on concrete for barriers and heavy machinery.
- Adaptable and resilient: Our modular barrier design allows for height adjustments to account for sea level rises. Our armour system is designed to withstand the harsh marine environment, giving long-term durability and protection
- Cost-effective: Our faster construction and reduced machinery use lowers the overall cost of construction

We believe SafeShore is just the start. We can see a world where cutting edge technology allows humans to coexist in harmony with the environment around them.

### Keywords

Climate change | Coastal defence | Hybrid-composite materials | Barriers | Coastal flooding | Sea level rise | Engineering

### Founding Team

Tara Habibi, Founder: [linkedin.com/in/tarahabibi-eng](https://www.linkedin.com/in/tarahabibi-eng)

Thomas Keller, Founder : <https://people.epfl.ch/thomas.keller?lang=en>

Shahin Maghsoudi Zand, Founder : <https://www.linkedin.com/in/shahin-maghsoudi-zand>