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| Land and sea use change | Resource exploitation | Climate change | Pollution | Invasive alien species |
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# ECONcrete Harbors Sealife on Critical Marine Structures

Part of the ['Opportunity Blossoms'](#) series on real economy investments in nature

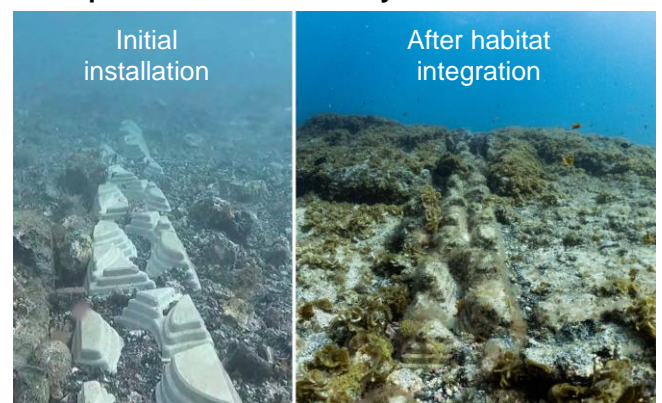
Concrete is the most widely used material in coastal and marine infrastructure, on account of its versatility, durability and cost-effectiveness. However, concrete installations reduce biodiversity in local ecosystems as they replace natural substrata with artificial structures that are less able to support life, while their high-pH composition impedes organisms on the water's surface. Producing concrete also accounts for around 4% of global carbon dioxide emissions.

Israeli-founded ECONcrete redresses much of conventional marine concrete's nature impact. Marine infrastructure companies employ its patented admixture, texture agents and mold designs to produce materials with a significantly lower environmental footprint for public and private developments. As of October 2024, ECONcrete's technology has facilitated the delivery of materials for 40 shoreline armoring and seaport construction projects, tapping into a market worth \$178 billion in 2023 and raising \$21 million from 21 investors, including a grant from the European Innovation Council's Accelerator.

## The nature-friendly product

Established in 2012 by two marine biologists with expertise in ecological engineering, ECONcrete produces technology enabling the manufacture of concrete products for use in coastal and marine infrastructure projects. To achieve a lower biodiversity footprint relative to conventional concrete, the company developed a proprietary admix – a substance added to a concrete mixture to alter its properties. This comprises 10% of the final material, reducing its pH and the amount of cement required. The concrete is then shaped to form ecological niches and a complex surface texture, which encourages biodiversity uplift by replicating the conditions of undisturbed marine habitats. This process is an example of biomimicry – the imitation of natural phenomena in human inventions – which has led to technological improvements in many products, including Velcro, trains, wind turbines and architecture.

## ECONcrete technology deployed for submarine cable protection in the Canary Islands

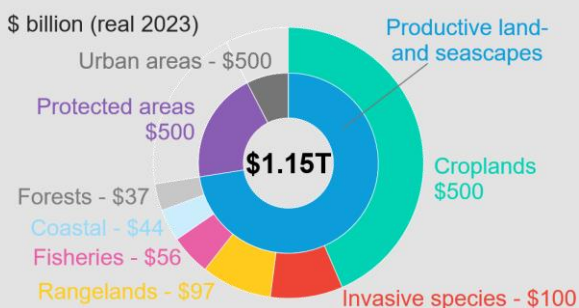


Source: ECONcrete. Note: Images taken in May 2022 and March 2023, between Lanzarote and Fuerteventura.

The creation of more hospitable habitats for marine life offers several benefits to customers, which ECONcrete

### Mitigating nature loss

Biodiversity finance has to rise to an annual \$1.15 trillion by 2030. Marine infrastructure providers such as ECONcrete mitigate coastal biodiversity loss.



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asserts justifies the 10-15% price premium over conventional concrete. The decreased environmental impact reduces costs incurred from possible environmental penalties, shortens project permitting time and cuts maintenance. As organisms grow on the material's surface, their combined biomass adds weight and increases the stability of the marine structure, also providing defense against chloride penetration and boosting the concrete's compressive strength.

ECONcrete's products vary in form and function, including articulated concrete mattresses, erosion control structures, cabling protection and tide pools, while deployment is typically in conjunction with governments seeking to replace existing marine infrastructure. Several notable examples from across the company's 40-strong project portfolio include:

- Living Breakwaters: A large-scale application of ECONcrete in the construction of eight breakwaters protecting New York and Long Island after Hurricane Sandy (2021-2024).
- Supplying ecologically engineered subsea cable protection mattresses for a US-based 800-megawatt offshore wind farm (2024).
- Protection of a 132 kilovolt submarine high-voltage cable running 14.5 kilometers between the Canary Islands (2023).
- Port of Cala Ratjada, Spain: Ecologically enhanced breakwater (2022).

### Biodiversity benefit of ECONcrete

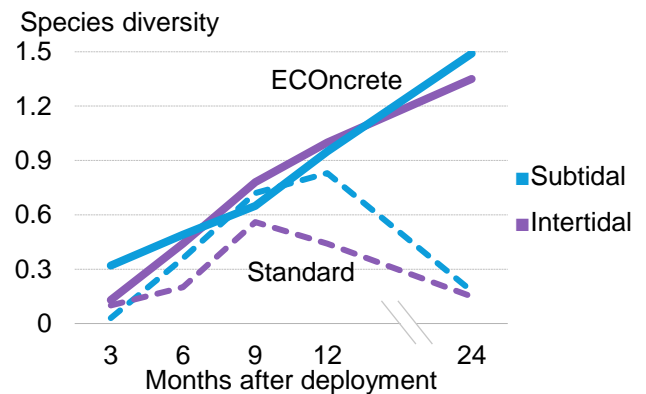
Conventional concrete typically comprises 10-15% Portland cement, 15-20% water, and aggregates such as gravel, sand or crushed stone, with the mixture cast into the requisite form and then cured. The surface of the final product is usually designed to be as slick as possible, aiding water flow and reducing the potential for residue build up, but creating a less hospitable environment for organisms.

Products comprising ECONcrete's technologies do the opposite. Each is specifically designed for the marine environment where it is deployed, cast to form niches

for endangered species or nurseries for local fauna. For instance, the company's coastline barriers are shaped to allow pools to naturally form, providing a habitat for crabs, starfish and sea anemones. The concrete is also finished with a complex surface texture to mimic natural rocks and encourage biogenic growth. As calcium carbonate accumulates in the exoskeletons of calcitic species growing on this surface, it creates a barrier preventing the release of harmful chemicals from the concrete and enhancing the strength and durability of the structure.

Projects using ECONcrete technologies typically see substantial biodiversity uplift relative to conventional concrete installations. In the first 12 months following deployment, the two are comparable. But beyond this, species diversity and richness are considerably higher for ECONcrete in both subtidal and intertidal environments.

### Biodiversity on ECONcrete blocks relative to standard concrete



Source: *Integrated Environmental Assessment and Management, Vol. 18, BloombergNEF*. Note: Species diversity calculated using the Shannon-Weiner Index.

The company's production methods also mitigate climate impacts – another driver of nature loss. By encouraging the formation of a biological crust on the products, it prevents some carbon dioxide from being released into the atmosphere. For every kilogram of calcium carbonate created by the marine organisms, 120 grams of CO<sub>2</sub> are captured, which ECONcrete says is equivalent to the carbon sequestration of 100 adult trees for one kilometer of its seven-meter-high

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seawall. This is in addition to the emissions savings from the use of an admix that uses ‘supplementary cementitious materials’ (SCMs) such as by-products and recycled materials in place of Portland cement.

## Financial performance

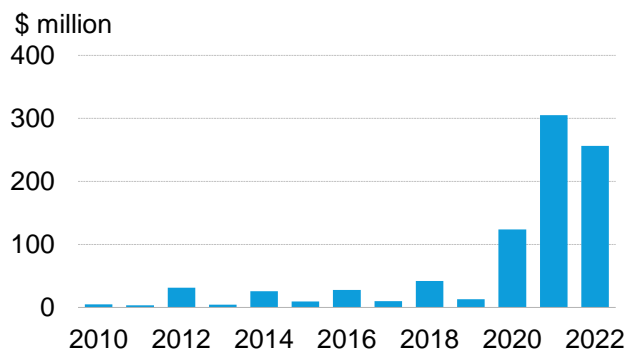
Since being established in 2012, ECONcrete has raised approximately \$21 million from 21 investors, according to PitchBook data. This includes €2.5 million (\$2.7 million) from the European Union’s Horizon 2020 SME Instrument, with other notable investments made through Barclays’ Sustainable Impact Capital, Bridges Israel, and a North American family office with an interest in ocean health.

The company has yet to disclose its revenue, although confirmed to BNEF it earns \$3 million to \$5 million for larger projects. Several venture capital and private equity research houses estimate the firm’s revenue is in the mid-single-million dollars, while the increasing number of projects it has undertaken in recent years implies a robust compound annual growth rate.

## Broader opportunities within the sector

The number of companies developing cement with lower emissions or a reduced biodiversity impact is growing, as is investor interest in the sector. Low-carbon cement companies tracked by BNEF have raised over \$900 million since 2010.

### Investments and grants in low-carbon cement companies



Source: BloombergNEF, PitchBook, company reports.

The challenges of decarbonizing the production of one of the highest emitting materials are manifold, likely

requiring a stack of solutions. Three ‘sustainable’ cement and concrete producers are profiled below.

### Leading sustainable concrete companies

| Company          | Description   | Funding   |
|------------------|---|---|
| <b>Betolar</b>   | Finnish pre-cast concrete startup that uses fly ash and slag instead of cement. Its Geoprime product emits 80% less CO2 than conventional concrete.     | Raised \$55 million and listed on the Helsinki Nasdaq, reaching a valuation of \$25.2 million as of October 2024.                             |
| <b>Brimstone</b> | US-based company replaces limestone calcination by leaching calcium silicate rock and also yields SCMs and magnesium byproduct that absorbs CO2.        | Raised \$62 million from investors including Breakthrough Energy. <u>Awarded</u> up to \$189 million grant from US Department of Energy.      |
| <b>Biomason</b>  | Produces ‘biocement’ by combining calcium and CO2 with bacteria. Recycled aggregate is added to make tiles. Requires less energy and is carbon neutral. | Raised \$97 million, including a \$64 million Series C led by 2015 and supported by investors including Celesta Capital and Hartree Partners. |

Source: BloombergNEF, companies’ websites, Pitchbook.

## Analyst take

Concrete companies are increasingly unlocking value from sustainable product portfolios. The Global Cement and Concrete Association, which represents 80% of the global cement industry by volume outside of China, recommends its members adopt specific water and biodiversity policies. Concrete can offer both climate adaptation and mitigation services through the manner of its production and deployment of infrastructure. ECONcrete does so while also reducing additional direct drivers of biodiversity loss.

### More from BNEF:

*Tech Radar: Low-Carbon Cement* ([web](#) | [terminal](#))

*Industry Decarbonization Market Outlook 1H 2024* ([web](#) | [terminal](#))

Note: ECONcrete was one of 12 startups chosen as winners in BNEF’s 2021 Pioneers competition.

Nature-loss drivers addressed:

Land and sea  
use change

Resource  
exploitation

Climate  
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Pollution

Invasive alien  
species

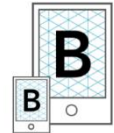
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