

Startups applying high tech solutions to our worst environmental problems

As the climate crisis continues to worsen it's becoming clear that the solution will come from high-tech startups rather than government policy.

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Recent years have seen a remarkable increase in start-ups and innovations related to renewable energy, from Australia's audacious plan to pump solar power to Singapore via undersea cables to scientists transforming sea water into hydrogen power.

Businesses have launched thousands of new enviro-friendly consumer products, from off-grid tiny homes to mobile platforms that allow users to trade on "green" financial instruments like alternative energy stocks.

Despite all the progress and interest, the science is increasingly clear: without additional and immediate action we are in serious risk of hitting one of the nine key climate tipping points.

Governments are taking action but in reality, cutting carbon alone won't cut it. We desperately need new technologies to improve our efficiency and help reverse some of the damage already done. This is where start-ups come in.

The challenge of climate change is a complicated multifaceted topic. In this article, we look at three pressing problems, their origins, and what

startups are doing in order to enable significant progress.

Solving the Renewables Base Load Problem

Around 27% of carbon emissions come from energy production. This means that it is important to improve energy production. The transition to Net Zero energy production is accelerating but the base load problem remains vexing.

Every power grid has a minimum amount of energy required to ensure that it can deliver energy around the clock without black-outs. The problem with many renewables is that they generate more energy at certain times of the day, or have an inconsistent output. This means that power plants that can be ramped up or down, such as coal, gas, or nuclear, are still an integral component of our energy grid.

While better batteries can help solve this problem, the technology needs further development. However there has been a significant increase in the number of low-voltage local network solutions using renewable energy.

Electron: decentralised energy markets

UK startup Electron is working to connect these decentralised assets with its platform ElectronConnect. This smart platform is designed for all market participants. Its goal: solving for market inefficiencies. Local energy assets can be used to store excess renewable power that would otherwise be wasted, boosting exports and energy available for consumption.

The company has begun projects all over the world. For example, the company worked with the City of Coventry to construct an energy system that combines smart infrastructure with the local government and provide

local price and value signals in near real time.

Rather than simply waiting for better battery technology, Electron's solutions could help to optimise existing renewables power networks. By doing so this could help Britain reach Net Zero significantly faster than estimated and help to combat one of the key causes of climate change.

Improving energy efficiency

While clean energy production is important, the other side of the coin is energy efficiency. The less energy we use the easier it is to optimise our output.

Igloo Energy: go green and save

Unfortunately it is difficult for consumers to discover how and why they're "losing" energy and that is where companies like Igloo Energy come in.

The company works with customers to help them understand the many energy leak points their home may have, from poor insulation to inefficient light bulbs. They even help customers take advantage of the UK government's Green Home Grant to improve the energy efficiency of where they live.

The company's ethos is focused on empowering individuals to reduce the amount of energy they use. This has the obvious effect of reducing a customer's bill but also reducing their impact on the energy grid. In turn, this will help to improve the impact of ventures like Electron's.

Fixing our food supply chain

Setting energy aside for a moment, another major challenge we face is optimising our food supply chain. Food waste costs around \$750B per

year to the global economy and the increased costs related to food inefficiency make up to 11% of the food industry's greenhouse gas emission. This problem will only get worse as climate change makes more land unsuitable for agriculture. Better control over our food supply chains will be key.

SmartChain: better decision-making

This is one obvious area where blockchain technology can play an important role. Projects like SmartChain are working on solutions that could significantly improve supply tracking. The aim is to connect all areas of the food supply chain together and provide an integrated data solution. This kind of decentralised data sharing could help to break down the information silos that currently cause many of the inefficiencies that currently plague the food logistics sector.

Biokind: supporting aquaculture

Another example is Biokind. This startup is seeking to cut down on the environmental impact of aquaculture, which will become a key source of food in the next century. They are producing BioKind protein which is created via natural fermentation and is designed to be a sustainable and traceable source of food for aquaculture, livestock, and pets. The company hopes to reduce the impact on both fish farming and also the impact of creating feed necessary to sustain large aquaculture operations.

Reducing food waste, and the land required to feed people, will be key if we want to minimise the impact of climate change and reduce our contribution to it. Additionally the less land we use for agriculture, the more we can set aside for re-wilding projects and reforestation, which is crucial in combating local climate change and also increasing natural carbon capture.

Startups lead the way

The lesson here is that while government intervention will help push institutions in the right direction to fight climate change, it is startups that will build the technology we need.

Such innovations can also serve to draw more government and institutional investment into the sector.



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