

5 Green IoT innovations championing sustainability



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Key Points

- The Internet of Things (IoT) is one of the fastest-growing technology sectors, with global markets being driven by increasing demand for the solutions and services these devices provide.
- However, significant market growth also comes at a cost to people and the planet, e.g. land degradation, resource depletion, electronic waste pollution, global warming
- Green IoT (GloT) is an energy-efficient approach to technology that's ecologically responsible, sustainable and designed to reduce power consumption, greenhouse gasses, and environmental pollution
- GloT innovations highlight that low-cost, practical, and efficient solutions to sustainability challenges are possible
- These include circular computing, algae-powered computers, portable devices that transform salt water into electricity, plastic-eating microbots, and green cloud computing

Is your business ready to harness the potential of IoT? Our expert team can help design and implement bespoke IoT solutions. Reach out to us now to kick-start your IoT journey.

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Sustainability is a must for every high-tech organisation. Not only in light of the current [sustainable design challenges](#) we all face but to help ensure that future generations will have everything they need to take innovation to even greater heights. While it often seems like the climate crisis and environmental concerns are filled with doom and gloom, these 5 green IoT (GloT) eco-innovations paint a different picture!

Social and environmental challenges are untapped market opportunities for new products and services. For product developers and engineers, this swot analysis is a simple but highly effective tool that helps to reveal business opportunities, [develops your competitive advantage](#), and sparks ideation which could lead to your next product innovation!

1. Circular computing
2. Algae batteries
3. E-Dina 'WaterLight'
4. Plastic eating microbots
5. Green cloud computing

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Why does IoT need to go green?

The Internet of Things (IoT) refers to a system of interrelated computing, mechanical, digital, sensing, or wearable devices – connected over a network with the ability to share information, communicate, and facilitate decision-making in almost real time. How these technologies are being applied – and the [IoT trends for the future](#) – have transformed just about every industry, from manufacturing and healthcare to transportation and security. So much so that rising global demand for the solutions and services these devices bring will drive market growth from an [estimated USD 662.21 billion in 2023](#) to a projected USD 3,352.97 billion by 2030.

However, market growth comes at an additional cost to people and the environment (e.g. increased CO2 emissions and energy consumption, land degradation, and electronic waste pollution). Meaning that the same economic forecast becomes uncertain if the resources needed to procure and ensure it (e.g. raw materials, labour, and water) are no longer available, scarce, or contaminated.

[Green IoT \(GloT\)](#) is a term used to describe the application of IoT technology in an ecologically responsible and sustainable way. It's an energy-efficient approach that reduces power consumption, greenhouse effects, and environmental pollution by applying a circular process that spans the entire product life cycle:

- Green design: designing cooling equipment, servers, computers, and energy-efficient components
- Green production: producing computers, electronic components, and other associated subsystems sustainably
- Green utilisation: keeping computer and other information systems' power usage to a minimum
- Green disposal/recycling: computers and other electronic equipment that are no longer

in use are recycled

Eco-technologies and smart cities

One application where IoT will be invaluable is in [smart cities](#), where traditional networks and services are made more efficient using digital solutions and sensor technologies to benefit inhabitants and businesses. [Applications include](#):

- IoT-based systems that [reduce energy consumption in homes](#) and businesses e.g. heat and lighting
- Creating safer public spaces when integrated with other digital technologies such as computer vision, and artificial intelligence
- Devices that improve water and air quality
- IoT sensors that promote sustainable transportation and mobility, e.g. smart cars
- Smart solutions for waste management
- Improved security for smart buildings
- Remote healthcare systems in the homes of elderly and vulnerable people

By applying IoT design principles to the technologies used to power smart cities, more ecologically responsible and sustainable development goals can be achieved.

5 inspirational Green IoT innovations and eco-solutions

1. Circular Computing™

The world's first remanufactured laptop designed to create a more ethical, sustainable, and socially responsible way to buy enterprise-grade IT – "[because IT shouldn't cost the Earth](#)". Their remanufactured premium brand HP, Dell, and Lenovo second-user deliver a product with the performance of a new model and is BSI Kitemark certified (UK product and service quality certification).

Better still, Circular Computing significantly reduces CO2 emissions; saves thousands of litres of water from being used for extraction, refining, and production; prevents the consumption of additional resources; avoids electronic waste, and is a certified [Carbon Neutral Plus Product](#).

2. Algae power computing

[Scientists at the University of Cambridge](#) have created a reliable and renewable biological photovoltaic cell using a species of blue-green algae capable of powering a microprocessor for a year. The system is comparable to an AA battery and contains a non-toxic type of algae that naturally

harvests energy from the sun using photosynthesis.

The system is made using common, inexpensive, and largely recyclable materials and can be easily replicated to power a large number of small devices which make up an IoT system. It doesn't run down the way a battery does because it uses light as its energy source; the algae doesn't need to be fed because it creates its own food as it photosynthesises, and continues producing power even when there's no light.

Green IoT doesn't get much greener than this. While it's still in its research and development phase, we're excited to see where this technology will go – primarily as it could provide a sustainable, ethical, and environmentally safer alternative to lithium-ion batteries.

3. E-Dina 'WaterLight'

A revolutionary portable device that transforms [salt water into electrical power](#). With the global electricity demand expected to increase by 70% by 2035 and our current fossil fuel reserves [estimated to run out](#) in the next 57 years, a low-cost and viable solution that's accessible to the planet's most vulnerable populations (e.g. rural communities in developing countries that don't have electricity) is urgently needed.

The WaterLight is a portable device capable of turning half a litre of salt water into 45 days of light, and it also has a USB port that can charge small appliances. Assembled with 100% recyclable materials, and outdoor water resistant, this is a clear example of what renewable, accessible, and clean energy looks like. We're looking forward to seeing what this technology will inspire once it becomes available on the mass market!

4. Plastic-eating microbots

[Self-propelled microbots](#) (no bigger than the tip of a sharpened pencil) that can swim and are coated with a material that attracts microplastics like a magnet. The microbots break down the material bonding the plastic together, theoretically reducing it to a natural material that can decompose. These [nanobots can potentially be used to remove other pollutants](#) from the water supply, but researchers have a long way to go.

This project is still in its proof of concept stage, and while encouraging results have been observed at a small scale, a lot of testing needs to be done to show that they're safe in open waterways. That being said, plastic pollution is a major problem worldwide, and initiatives like this merit keeping an eye on!

5. Green cloud computing

This refers to the potential environmental benefits [green IT services](#) delivered over the Internet can offer companies and society. Not to be confused with cloud computing in general (which [MIT College of Computing](#) estimates has a larger carbon footprint than the airline industry), the green alternative addresses the environmental challenges associated with the former's data centres.

Multiple strategies can be used to make data centres greener: using renewable energy sources, ensuring facilities are energy efficient (e.g. water cooling systems to handle equipment generated heat), optimising hardware and software infrastructure to consume less energy, and employing strategies that optimise IT workflows (e.g. modifying applications to reduce network traffic).

A final word on GloT

While some of the GloT innovations and solutions we looked at are still in their early development phases or are yet to be available on the mass market, they highlight that sustainable solutions for the tech industry – while challenging – are undoubtedly possible.

Please get in touch with us if you're as passionate about developing sustainable technologies as we are. Our multi-skilled and highly experienced team will take your project idea to next-level innovation and help you design products that stand out.

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sustainably.

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