IoT-Enabled Green Technology

The IoT Provides Always/Everywhere Connectivity and Intelligence for Green and Sustainable Solutions

Green Tech Innovation Starts with IoT

Green Technology, or "Green Tech" is seeing massive growth due to environmental concerns and the availability of enabling technologies.

From agriculture and energy to transportation and smart cities, the Internet of Things (IoT) is paving the way for organizations and municipalities to embrace green practices and stewardship. In fact, an Intel study found that 64% of business decision-makers believe the IoT can help solve long-standing environmental challenges.

In addition to concerns for the environment, organizations worldwide have a clear set of business reasons to deploy IoT-enabled technologies:

- Tedious, manual processes are both costly and resource-intensive
- Traditional service models that require on-site visits from service personnel for everything from routine status logs to rebooting hardware are not sustainable or scalable
- Organizations want fast, real-time insights into potential equipment failures for predictive maintenance
- Automated processes — such as using sensors to detect and adjust lighting based on conditions — can save massive amounts of energy and impact the bottom line

With its ability to deliver secure connectivity and local intelligence through ruggedized system-on-module (SOM) computers, edge compute-capable radio frequency modules and high-performance cellular routers, the IoT plays a central role in countless applications — from green energy and electric vehicles to lighting controls and water management. Here are just some of the ways the IoT is making an impact on sustainability issues.

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Smart Agriculture

A variety of factors — such as population growth, pollution, and soil fatigue — make it increasingly challenging to maximize crop production. IoT applications can monitor crop growth, soil conditions, pesticide usage, irrigation cycles, weather patterns, and fertilizer coverage to identify optimal irrigation patterns, minimize pesticide usage, and maximize yields — even as available land decreases.

Air Quality

According to the World Health Organization, many cities around the world fall short of air quality recommendations — leading to elevated risks of stroke, heart disease, lung cancer, and chronic and acute respiratory diseases, such as asthma. IoT solutions can monitor air quality in a variety of ways, including traffic emissions (using mobile pollution sensors in densely populated cities), improve fuel efficiency of autonomous vehicles, streamline vehicle flows via smart traffic lights, and more. In less populated regions, IoT sensors and networks can monitor methane pipelines to promptly identify harmful leaks and emissions.

Biodiversity and Habitat Monitoring

Conservationists and zoologists who are intent on preserving threatened and endangered species need accurate data. Using cameras, sensors, and cellular communications, IoT solutions can be deployed in the remotest of locations to help study animal behaviors and habits in a non-invasive manner and collect actionable data. Lakes and waterways can be monitored for invasive species, and Green Tech also supports remediation measures.

Clean Energy

From smart-grid solutions like solar panels and wind turbines to smart metering solutions that improve energy efficiency, the IoT provides real-time monitoring of electricity generation, distribution, and usage across homes, offices, and public spaces to reduce carbon footprint. As renewable energy continues to grow in importance, the IoT will play a pivotal role.

Clean Water

We can improve water quality and increase water conservation with smart applications of IoT technology. This includes applications that improve the efficiency of water/wastewater treatment plants, detect water leaks and monitor water quality.

Industrial Monitoring

The IoT helps drillers and refineries optimize their output while minimizing any potential environmental impact, such as chemical spills or leaks. Lower pipeline losses improve the environment and the bottom line. Remote monitoring and alerts can support predictive maintenance, which minimizes truck rolls and site visits, and helps to prevent critical failures of industrial tanks, as well as ships and vehicle fleets transporting chemicals.

Smart Home/Smart Building

The IoT has already played a strong role in residences, creating "smart homes" that use sensors and edge intelligence to reduce consumption, maximize the use of alternative energy, improve comfort, and lower utility bills. In the past 10 years, these IoT devices have saved billions in KwH. Smart buildings incorporate green tech to reduce energy usage, convert to solar, use more efficient HVAC technology and more.

Transportation

From public transit to electric and autonomous vehicles, IoT devices are changing the nature of vehicles and transportation. The range of use cases includes smart city buses, adaptive control to optimize traffic flow on city streets, and fleet monitoring technology to report on engine and driver analytics — all of which can reduce emissions.

Smart Cities

More cities are turning to IoT solutions to optimize operations in everything from city lighting to municipal water systems and wastewater management — improving the bottom line, while reducing resource use.

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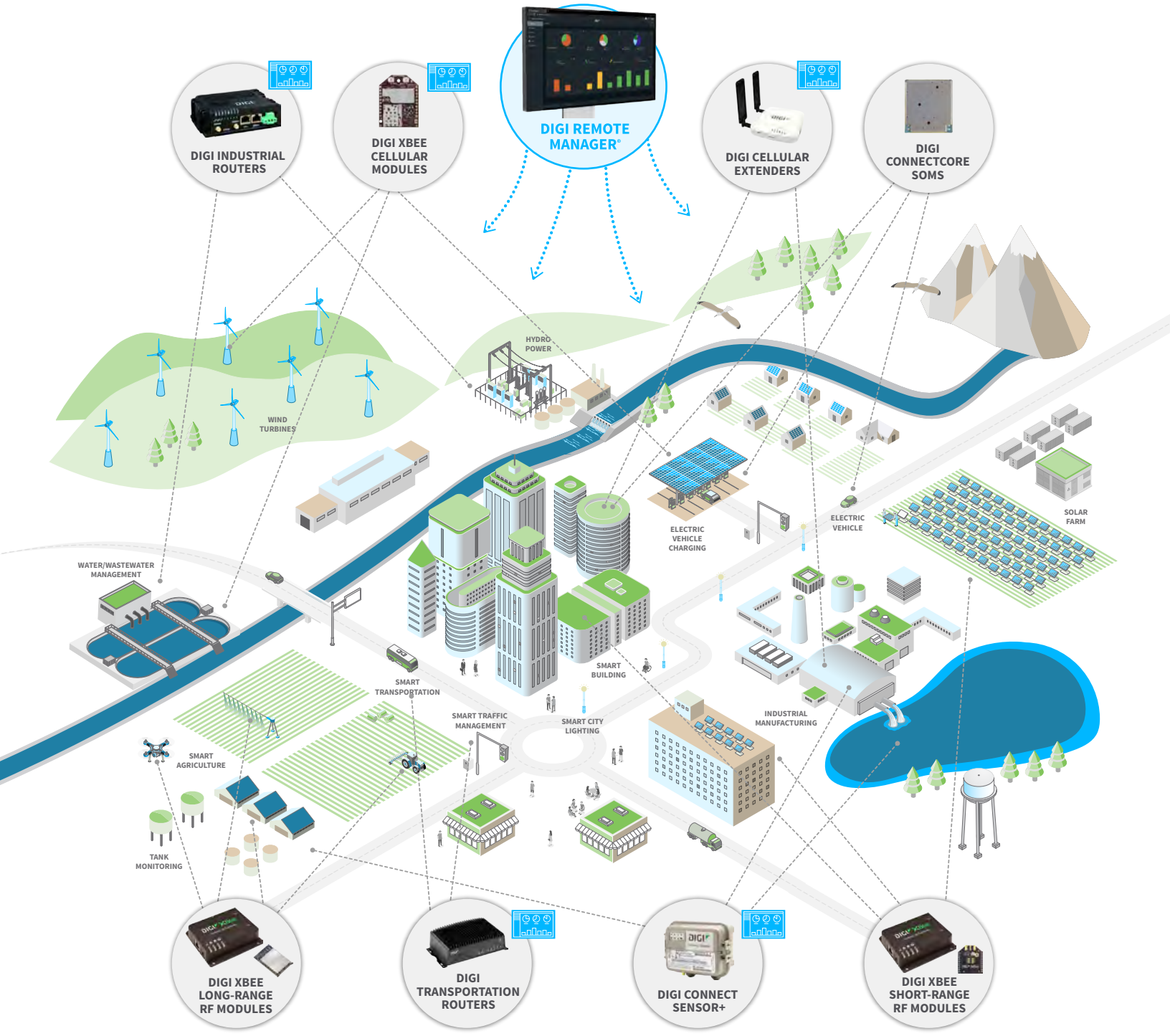
Digi IoT Solutions in Green Technologies

Digi solutions support connectivity, data routing and device management for the full range of Green Tech initiatives - from wind and solar to smart buildings and smart agriculture.



Configure, deploy and manage your devices through Digi Remote Manger

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Digi Customers Innovate in Green Tech

Digi customers are innovating in many ways across multiple industries, by developing and deploying products that support environmental responsibility. Take a tour through some of the many examples of Green Tech built and deployed with Digi solutions.

Green Vehicle Technology

Taiga Motors: Rethinking power sports vehicles with electric motors

Whether it's venturing down a snow-covered slope or blazing across open water, Taiga Motors is aiming to redefine power sports equipment with its new lines of electric-powered snow-mobiles and personal watercraft. With the Digi ConnectCore® 6 single-board computer (SBC) and the Digi XBee® 3 Cellular LTE Cat 1 modem, Taiga's innovative vehicles offer game-changing features, reliability and connectivity, but without either "sound pollution" or the environmental impact of gas-powered vehicles.

Reborn Electric: Retrofitting buses with electric power to reduce pollution

Reborn Electric converts diesel-engine buses to zero-emission electric-powered vehicles, greatly extending the service life of these vehicles and helping improve air quality. To provide an interface and the telemetry needed to monitor vehicle routes and performance, Reborn chose the Digi ConnectCore 6® single board computer (SBC), helping their customers gain the maximum value for their investment in these "reborn" vehicles.

Smart City Lighting

Owlet Nightshift: Outdoor lighting company helps cities save energy and reduce costs

Owlet Nightshift, developed by Schréder and headquartered in Mainz, Germany, supplies intelligent tele-management systems for monitoring and controlling outdoor and roadside lighting. They offer one of the simplest mast-to-bulb systems on the market as well as a range of services from planning, training and design to installation, setup, and turnkey solutions — all based on Digi XBee modules and gateways for connectivity.

Enlight: Creating smarter, safer, and more cost-efficient lighting environments

Portugal-based Enlight designs and deploys sophisticated urban lighting solutions around the world — devices that are designed to promote efficiency through automation. Enlight developed their own controller with Digi XBee modules and gateways as well as smart sensors. The smart controller helps them to analyze data, spot trends and identify ways to improve performance.

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Renewable Energy/Smart Grid

Big Belly Solar: Smarter waste and recycling solutions

Big Belly customers can monitor their trash and recycling stations from any computer or smartphone to save time and fuel and optimize collection activity, eliminate unnecessary truck rolls, and free workers from on-street status checks. It also improves public health by reducing overflows and safety issues, reducing fuel waste and CO2 emissions. It's all based on solar-powered trash and recycling compactor units with embedded Digi connectivity devices.

New Sun Road: Connecting Uganda to clean and reliable energy

New Sun Road is committed to implementing solutions for climate change and global energy, as the standard power grid and infrastructure for delivering electricity does not exist in many remote and developing communities. For Uganda, the team was able to replace pollution-causing diesel generators with an efficient solar-powered grid. Their system, which uses Digi cellular routers, enables them to remotely manage the grid's performance.

Environmental Monitoring and Management

Summit Envirosolutions: Improving groundwater protection

Summit Envirosolutions uses sophisticated information systems to gather and evaluate environmental data and provide recommendations to clients for storage-tank management and lead reclamation as well as other environmental remediations. Those data-collection processes are driven by Digi Connect® Sensor+, which wirelessly sends data from the groundwater site to central servers where sophisticated analytics paint a vivid picture of what's going on underground.

AFCEC: Cellular communications for system monitoring and control at a Superfund site

At Joint Base Cape Cod, a 22,000-acre Superfund cleanup site, the switch from landlines to Digi cellular modems is optimizing efficiency as AFCEC cleans up the sole-source aquifer that provides drinking water to the residents of the Upper Cape. Today, extraction wells and treatment sites are connected wirelessly. The system achieved a six-month payback — with another 20 years of remediation work still to come.

Nobel Systems: Supporting critical water conservation

Nobel Systems delivers geospatial and visualization solutions that help utilities and water districts efficiently manage their infrastructures. Digi Connect® Sensor+ and Digi Remote Manager® play a key role in its flagship solution that enables customers to centrally orchestrate and monitor water systems, prevent water leaks and achieve a compelling ROI.

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Smart Home/Smart Building

WATER SECURITY SYSTEM

Enolgas USA: Reducing costs and water consumption from leakage

Enolgas developed a patented flow-based device and application that monitors an entire residence or apartment building's actual water consumption and patterns and detects leaks or unusual water flows. Additionally, the system remotely shuts off water sources on demand, and notifies the property owner or manager via email or text message. The Digi XBee S2C 802.15.4 RF module makes it all happen with easy, low-cost connectivity between the water sensor and the cloud.

Infinitum electric

Infinitum Electric: Improving building energy use with smart motors

Building managers today are seeking ways to dramatically reduce energy usage in buildings. Infinitum Electric developed a highly efficient HVAC motor, using the Digi XBee 3 Cellular LTE-M/NB-IoT, with Digi Remote Manager for rapid provisioning. Infinitum's patented PCB stator technology creates smarter, lighter, quieter and more environmentally responsible electric motors and generators that offer superior efficiency and durability.

Smart Agriculture

WiseConn

WiseConn: Improving agricultural efficiency with precise irrigation

The cost and environmental impact of excess water use are important factors in agricultural operations. WiseConn's acclaimed DropControl helps farmers optimize their irrigation use by carefully and precisely monitoring soil moisture, wells, valves, weather stations, and more. Using Digi XBee-PRO® radios in a mesh network, WiseConn's solution captures data from low-power sensors and transmits it back to the farmer's control station for optimal irrigation control.

cropx

CropX: Optimizing agriculture water use

CropX set out to create a system that could make a positive impact on water conservation. The company built Digi XBee modules and industrial gateways into their system, which reduces water and energy usage and increases farm yields by optimizing irrigation. The system "listens to the ground" and provides exactly the right amount of water, when and where needed, and uses Digi Remote Manager to send actionable data between the system and the CropX web app and mobile devices.

DIGI CAN SUPPORT YOUR GREEN TECH IOT PROJECT — FROM PROTOTYPING TO DEVELOPMENT AND DEPLOYMENT. CONTACT US TO START THE CONVERSATION.

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