



Decarbonizing The World Using LoRa

## one sensor at a time

Semtech's LoRa® is a widely deployed, low power wide area network (LPWAN) wireless technology designed for massive scale Internet of Things (IoT) solutions. The open LoRaWAN® standard<sup>1</sup> is officially recognized as a standard by the International Telecommunications Union (ITU) and is supported by a global ecosystem of hundreds of members spanning hyperscale Cloud providers, operators, solution providers, and systems integrators. The technical capabilities of LoRa, global adoption and rapidly growing ecosystem make it an essential component in the battle to drive global decarbonization initiatives to enable a smarter, more sustainable planet.

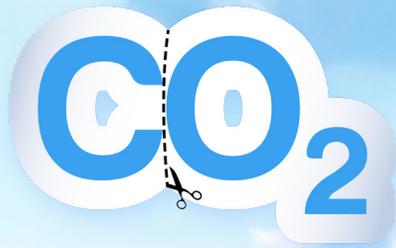


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Semtech's LoRa device-to-Cloud platform is a globally adopted long range, low power solution for IoT applications, enabling the rapid development and deployment of ultra-low power, cost efficient and long range IoT networks, gateways, sensors, module products, and IoT services worldwide. Semtech's LoRa technology provides the communication layer for the LoRaWAN® standard, which is maintained by the LoRa Alliance®, an open IoT alliance for Low Power Wide Area Network (LPWAN) applications that has been used to deploy IoT networks in over 170 countries. With the proliferation of LoRa devices and the LoRaWAN standard, the LoRa Developer Portal is a place to learn, connect, collaborate, and find resources to help accelerate your LoRa development process. Semtech is a founding member of the LoRa Alliance. To learn more about how LoRa enables IoT, visit Semtech's LoRa [site](#).

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## BACKGROUND



To manage human-caused climate change, there is an urgent need to strike a better balance between the economic goals of growing productivity and gross domestic product (GDP), and the environmental goals of reducing the environmental harm caused by that growth. Much of today's global production and distribution is inefficient and contributes directly or indirectly to the production of CO<sub>2</sub> and other greenhouse gases, either as unintended by-products or through waste or resource inefficiencies. As global GDP grows, the environmental impacts of these inefficiencies will increase, accelerating climate change, unless we identify new ways to produce “more from less” by balancing the drive for growth, with the goal of decarbonization.

The term “Internet of Things” was coined to describe solutions that use system-level data analytics and insights to improve process efficiency, increase productivity and reduce waste, to increase profitability. IoT solutions also support environmental impact monitoring as part of decarbonization regulations like carbon pricing, holding producers financially accountable for the full costs of CO<sub>2</sub> production. Both types of IoT solution are essential in striking a better balance between economic and environmental goals, enabling the production of more goods and services while driving less consumption of natural resources and producing less greenhouse gases.

Despite the importance of its role in addressing climate change, the full benefits of the IoT have yet to be realized because of the complexity that was once unavoidable in building and implementing IoT solutions. The aggregation and analysis of diverse system-level sensor data that IoT solutions rely upon is much simpler today thanks to modern Cloud-based IoT platforms. However, gathering sensor data at system-level scale in a cost-effective way remains challenging, requiring easy to install sensors (i.e., wireless and battery operated) that are low cost to operate (low cost network infrastructure and low operating cost) and low cost to maintain (i.e., ultra low power).

LoRa® solves this challenge by providing a combination of the lowest cost, lowest power, longest outdoor range, and deepest indoor coverage of any IoT wireless technology available today. These technical strengths are complemented by the open LoRaWAN standard and an extensive ecosystem of hundreds of operators, solution providers and integrators, providing “off-the-shelf” standardized solutions that enable the mass adoption of IoT solutions that will drive global decarbonization.

## CONCLUSION



The unique capabilities of LoRa and a global ecosystem have driven the rapid adoption of the technology resulting in an estimated 240 million deployed LoRa-enabled sensors and 3.2 million deployed LoRa-enabled gateways at the end of 2021<sup>2</sup>. This infrastructure provides enough capacity to support over 5 billion low power LoRa-enabled sensors. The “size of the prize” is substantial - in the energy sector alone, IoT technologies are expected to reduce global carbon emissions by up to 2 billion metric tons annually, approximately 20% of total carbon emissions<sup>3</sup>. In addition, the positive impact of smart city technologies on economic development would save more than \$20 trillion by 2026<sup>4</sup>.

LoRa will play a critical role in making this outcome a reality as ultra-low power sensor networks are essential to address climate change and support the decarbonization of our planet.

Alistair Fulton

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<sup>1</sup> LoRaWAN is an open standard supported by the LoRa Alliance®, an independent ecosystem alliance comprising hundreds of members, including many of the most influential players in the IoT today.

<sup>2</sup> Semtech FY22 Q4 earnings call.

<sup>3</sup> Samsung report revealed that ‘smart’ measures in the energy sector have been projected to result in saving more than 2 billion metric tons of carbon dioxide per annum. (Record-evolution.de)

<sup>4</sup> ABI Research indicates the positive impact of smart city technologies on economic development could see cities locking in incremental growth of over 5% and driving more than \$20 trillion in additional economic benefits by 2026. (InterDigital Smart Cities Seminar)