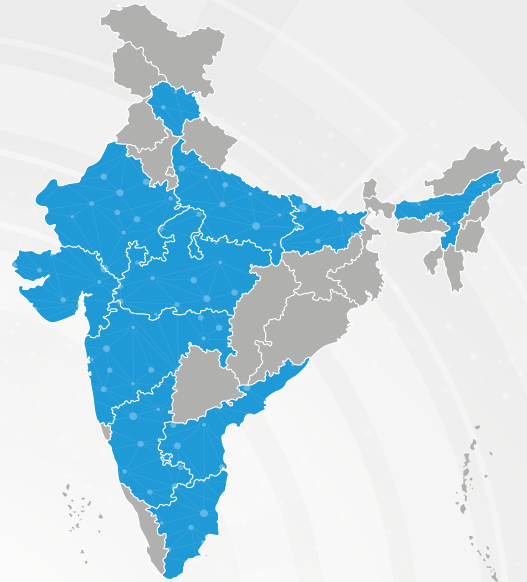


## Omnimesh Long-range Radio

### About CyanConnode

CyanConnode is the largest private provider of Smart IoT Communication solutions for Advanced Metering Infrastructure (AMI) in India. Its Omnimesh network is designed for rapid deployment, delivering exceptional performance and a competitive total cost of ownership. Operating in India since 2009, CyanConnode executed its first Smart Metering project in 2014. Today, the company is active in 11 states, working with 16 utilities, and has successfully deployed ~2.5 million nodes.



Map not to scale

### Need for Long-Range RF in India

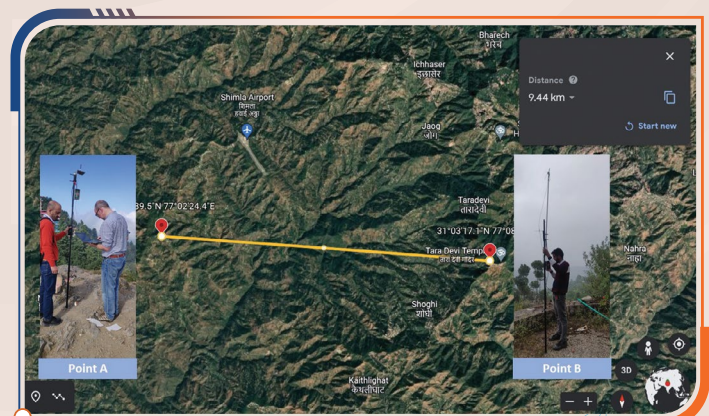
India faces significant challenges in deploying cellular-based smart metering solutions in rural and remote regions. Sparse population density, coupled with difficult terrains like valleys, agricultural fields, and islands, makes cellular connectivity unreliable and expensive. High operational costs, dependency on SIM cards, and frequent network outages further complicate deployments. These issues underline the urgent need for a resilient and cost-effective communication solution to extend smart grid infrastructure to hard-to-reach locations.

### CyanConnode's Long-Range RF Solution

CyanConnode's Long-Range RF solution, powered by the Omnimesh platform, effectively addresses these challenges. Built on narrowband RF mesh technology, it provides communication coverage of up to 10 kilometers (LoS) per link in semi-urban and rural areas. The solution complies with Bureau of Indian Standards IS 18010-4/5 and leverages IPv6 and 6LoWPAN standards, ensuring scalability, security, and resilience. Its modular design supports rapid deployment while maintaining exceptional performance and a low total cost of ownership.

### Pilot in India: Shimla

CyanConnode's Long-Range RF solution was successfully piloted in Shimla (achieved a distance of ~9.5 km on a single link), demonstrating its exceptional performance in hilly terrain. The pilot highlighted the solution's reliability, with seamless communication over long distances and minimal infrastructure requirements.



## Salient Features

- **Long-Distance Communication:** Up to 10 km per link with line-of-sight, ensuring connectivity in challenging terrains.
- **Self-Forming, Self-Healing Network:** Automatically establishes and maintains connectivity, ensuring uninterrupted performance even during network disruptions.
- **Small Form Factor:** Compact design compatible with a wide range of smart meter manufacturers.
- **Integration-Friendly:** Seamlessly integrates with various smart meter makes for flexible deployments.
- **Standards Compliant:** Adheres to IS 18010-4/5, IPv6, and 6LoWPAN standards.
- **WPC ETA Certified:** Fully compliant with regulatory approvals for Indian wireless operations.
- **Complete AMI Functionality:** Includes RC/DC, load curtailment, net metering, ToU, schedule reading, FOTA and meter configuration capabilities.
- **Modular Design:** Simplifies incremental expansion and supports diverse deployment needs.
- **Resilient Performance:** Ideal for remote locations with minimal infrastructure.

## Use Cases

- **Agriculture:** Reliable connectivity for remote and scattered agricultural areas enables accurate energy monitoring and billing and ensures reliable communication for irrigation systems and pumps in locations where cellular connectivity is unreliable or unavailable.
- **Scattered Meter Index:** Efficient data aggregation from meters dispersed across rural, semi-urban, and hard-to-reach areas.
- **Street Light Monitoring:** Real-time control and monitoring of street lighting systems, enhancing energy efficiency.
- **Isolated Buildings and Industries:** Seamless connectivity for standalone factories, warehouses, buildings & Villas, and industrial setups in areas with poor cellular connectivity.
- **Difficult Terrains:** Robust communication networks in challenging geographies such as mountainous regions, valleys, and deserts.
- **Cut-Off Locations:** Reliable operations in scattered or isolated areas, including islands and other remote locations.

## Benefits

Feature	Long Range radio	Cellular Communication
<b>Cost</b>	Lower CapEx and operational costs	Higher operational costs
<b>Reliability</b>	High (self-forming, self-healing mesh network)	Moderate (dependent on cellular network stability)
<b>Power Consumption</b>	Low (optimized RF transmission)	Higher (constant cellular connectivity)
<b>Scalability</b>	High (modular and incremental deployment)	Moderate (dependent on cellular infrastructure)
<b>Latency</b>	Low (efficient RF communication)	Variable (depends on network load)
<b>O&amp;M Costs</b>	Low	High

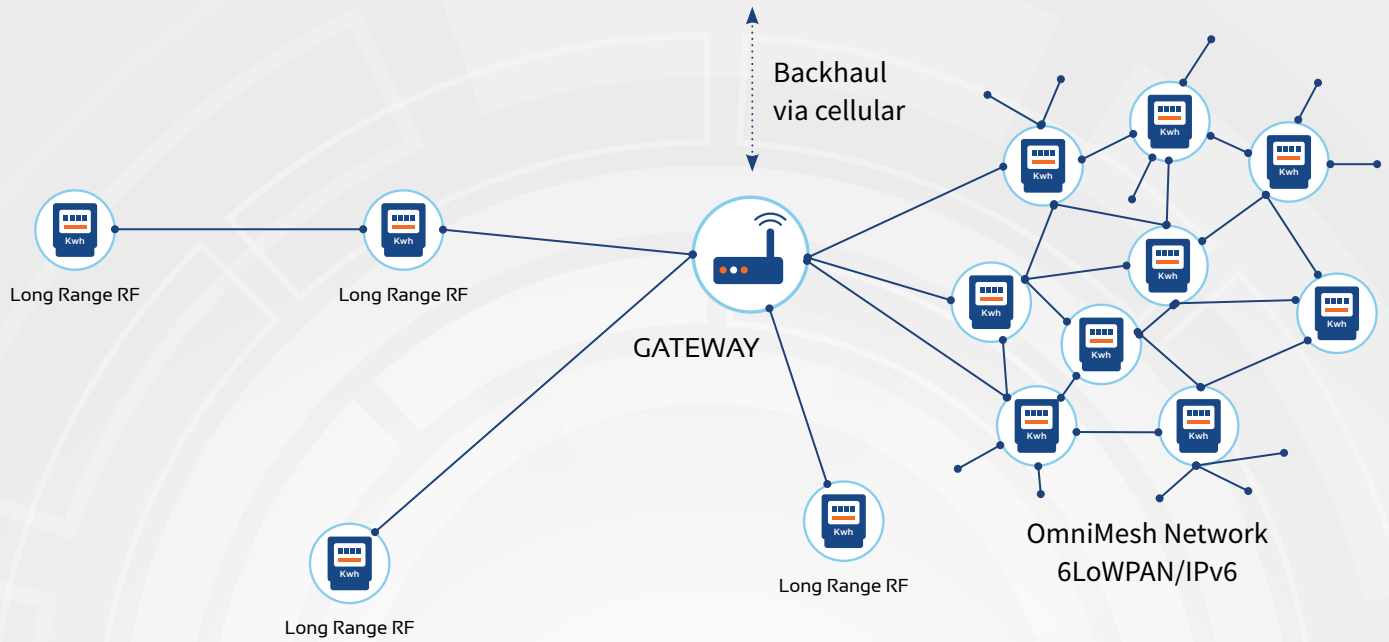
## Technical Specifications

Parameter	Range
<b>Tx (Transmission) Power</b>	Up to 500mW (-14 to +27dBm)
<b>Frequency</b>	865 – 868 MHz
<b>Operating Temperature</b>	-22 °C to +60 °C
<b>Relative Humidity in non-condensing condition</b>	Up to 90%

# Architectural Diagram

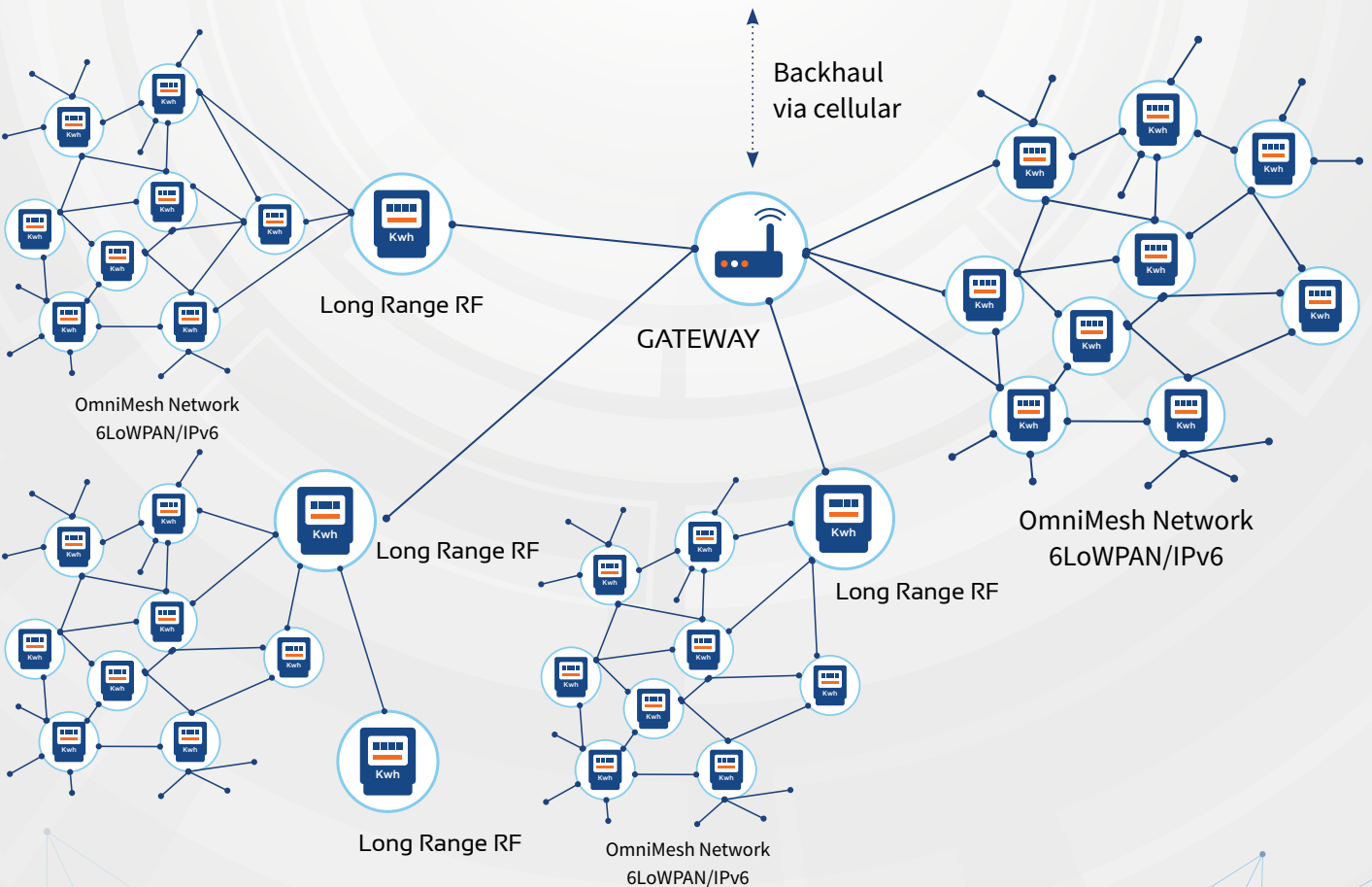
## Long Range Radio - Architecture 1

Minimising Cellular costs massively by reducing dependency on cellular



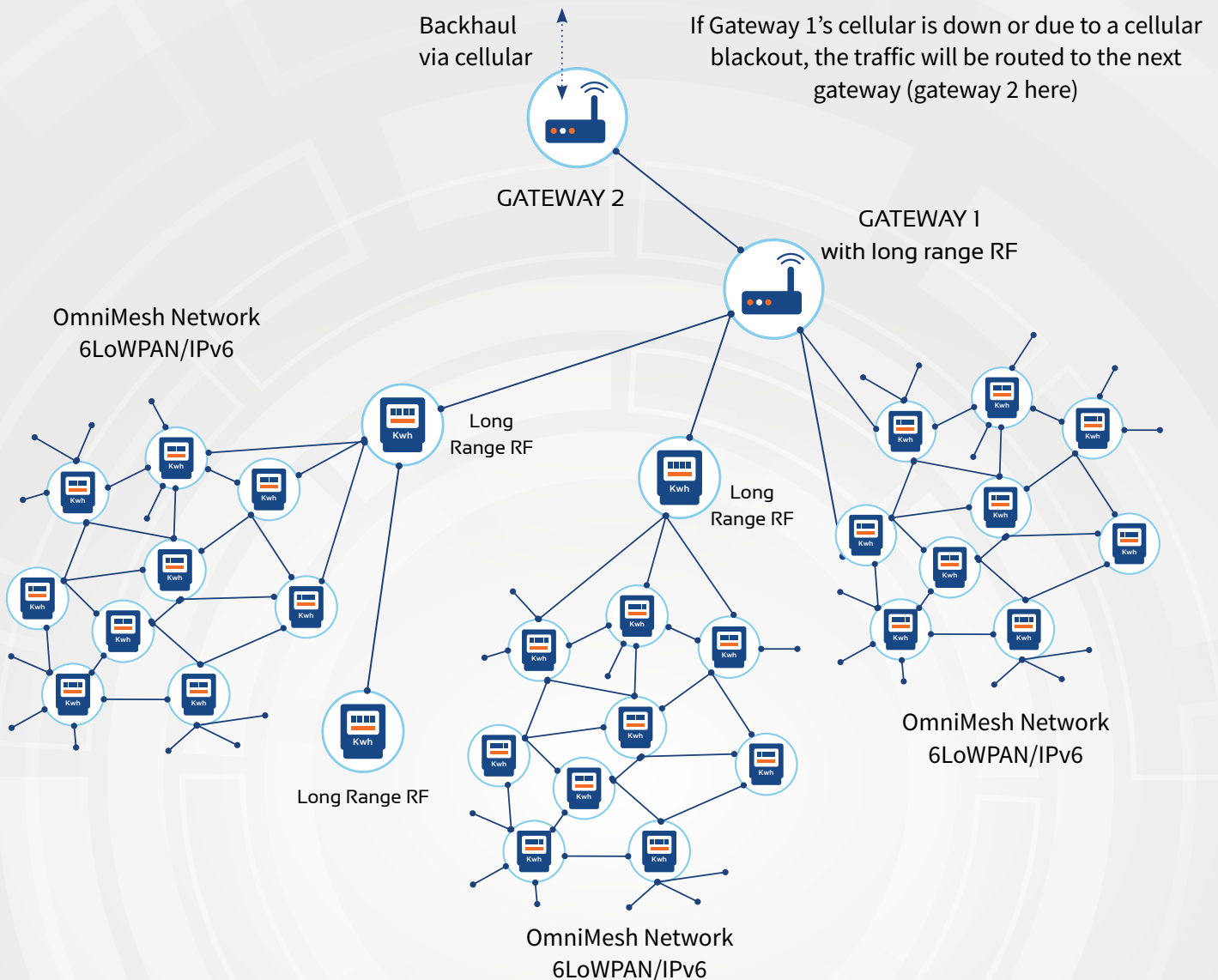
## Long Range Radio - Architecture 2

Minimising Cellular connectivity costs



## Long Range Radio - Architecture 3

Resiliency and robustness that exceeds any known cellular and non-cellular communications



## Way Forward

CyanConnode aims to leverage the proven success of its Long-Range RF solution to explore additional pilots across diverse terrains and applications. Potential pilots could include challenging geographies such as mountainous regions, islands, and sparsely populated rural areas, where traditional cellular networks face significant limitations.

Additionally, the solution holds immense potential for agricultural metering, enabling utilities to monitor energy consumption for irrigation systems and pumps in remote and scattered areas. These pilots will serve as a foundation for scaling up operations, demonstrating the scalability and cost-efficiency of Long-Range RF for both utilities and other stakeholders. CyanConnode remains committed to collaborating with partners to enhance smart grid infrastructure while addressing the unique challenges of India's diverse landscape.

For enquiries, please mail to  
✉ [sales@cyanconnode.com](mailto:sales@cyanconnode.com)

For more information visit  
🌐 [www.cyanconnode.com](http://www.cyanconnode.com)

Or scan  
QR code

