Deploying Private LTE in Operational Telecom Networks

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AGENDA

1. Benefits of Smart Autonomous Operations
2. LTE/5G role in Industry 5.0 and IIOT
3. LTE/5G future shaping features
4. Smart operations
5. Advance RAN.
6. LTE with Lorawan and IIOT
7. 4G/5G pivotal role in AI
8. Private LTE in Oil and Gas Case Study
   RAN Configs – Site Solutions
   Solution Snaps
9. Spectrum Options
10. Important Upcoming ACMA Events
11. Summary

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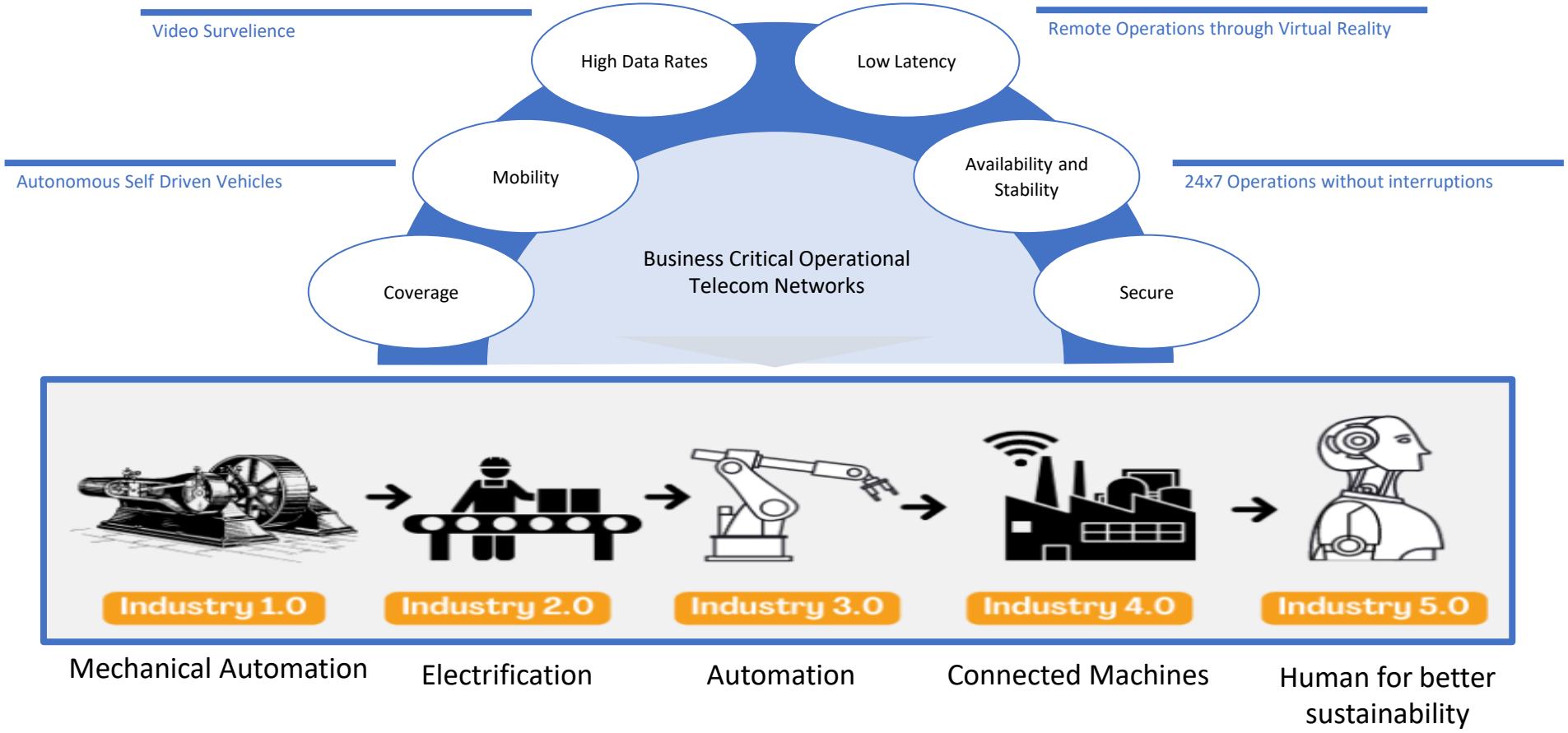
Benefits of Smart Autonomous Operations

Better Operational Productivity	Better Availability	Lower Opex
Minimizing human exposure	Minimizing Environmental effects	Better Predictive analysis

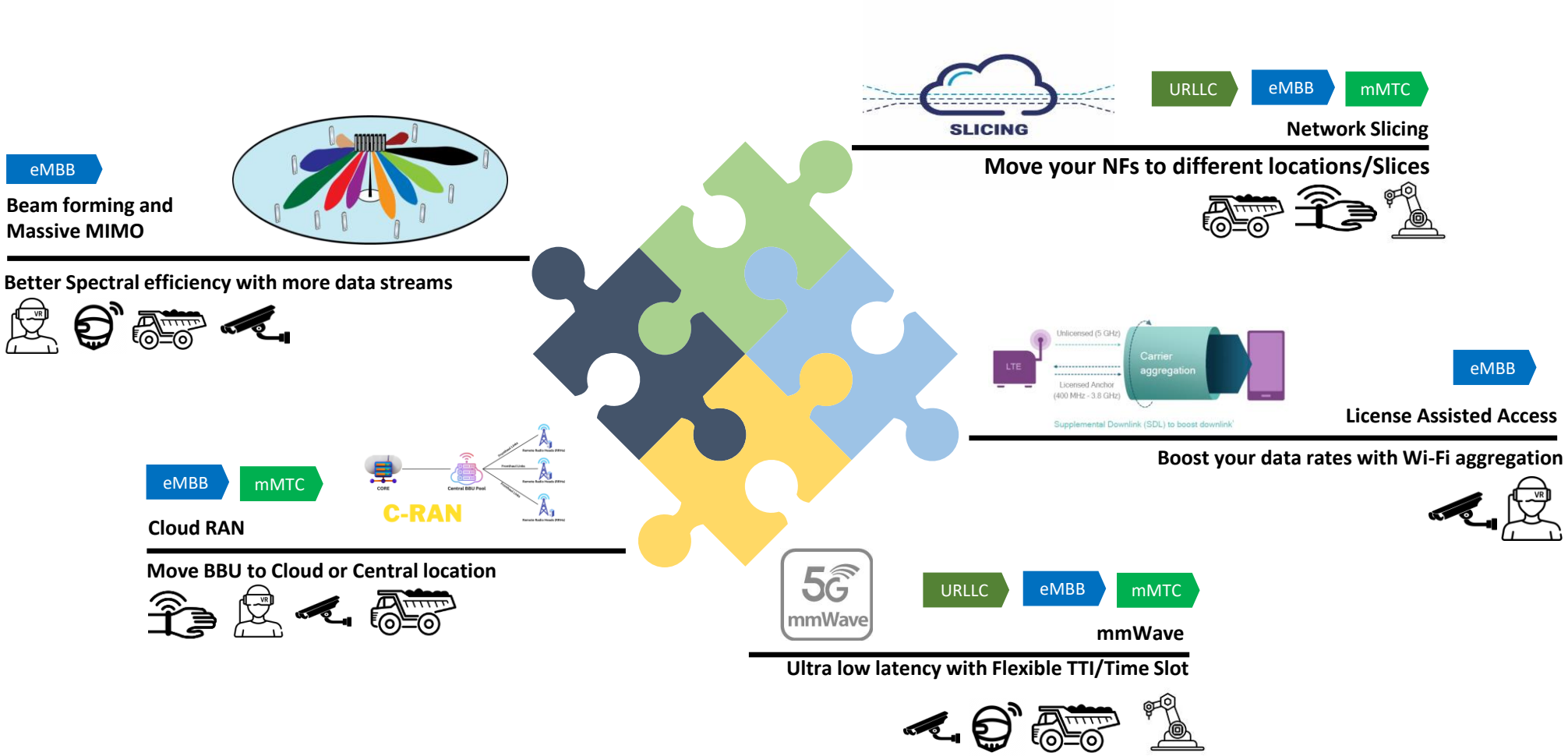
Courtesy : Immersive tech

LTE/5G are key enabler for Industry 5.0 and IIOT Applications

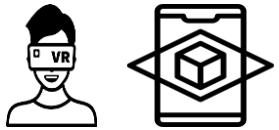


LTE not only improves safety and operational efficiency but acts as an enabler for Industry 5.0 and IIoT applications

LTE/5G future shaping features



Smart Operations

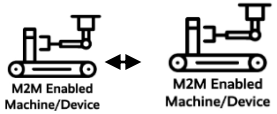


Remote Operations

- Augmented Reality
- Virtual Reality
- Video Analytics
- Fault detection

Autonomous Operations

- Cobots
- Robots
- Decision



Machine to Machine Comms

- Collision detection
- Wearables to Machines & Vehicles

Automation

- Automated Guided Vehicles
- Autonomous mobile vehicles

Applications

Machine Vision

- Defect monitoring
- Better production

Digital Wearables

- Better safety and connectivity of personnel's
- Better resource utilization
- Improves field response time

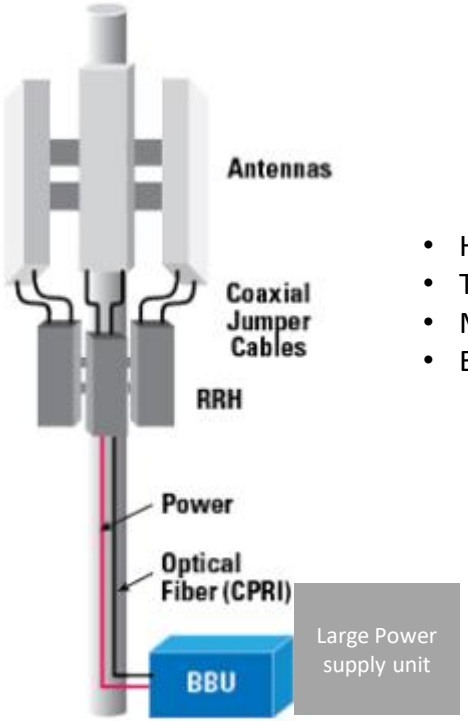
Digital Geo logical data

- Environment monitoring
- Accurate resource modelling for planning

Geo Fencing

- Access Control
- Tracking real time assets
- Safety of Personnel's

Advance RAN



- High Power consumption
- Time taking deployment
- More tower loading
- Expensive to maintain

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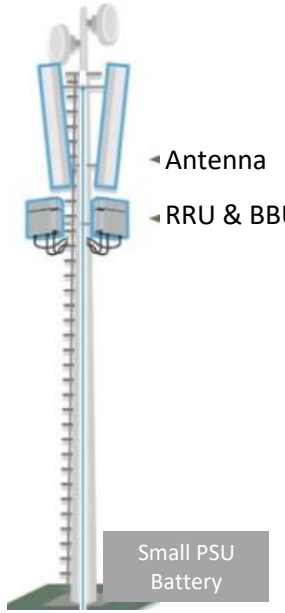

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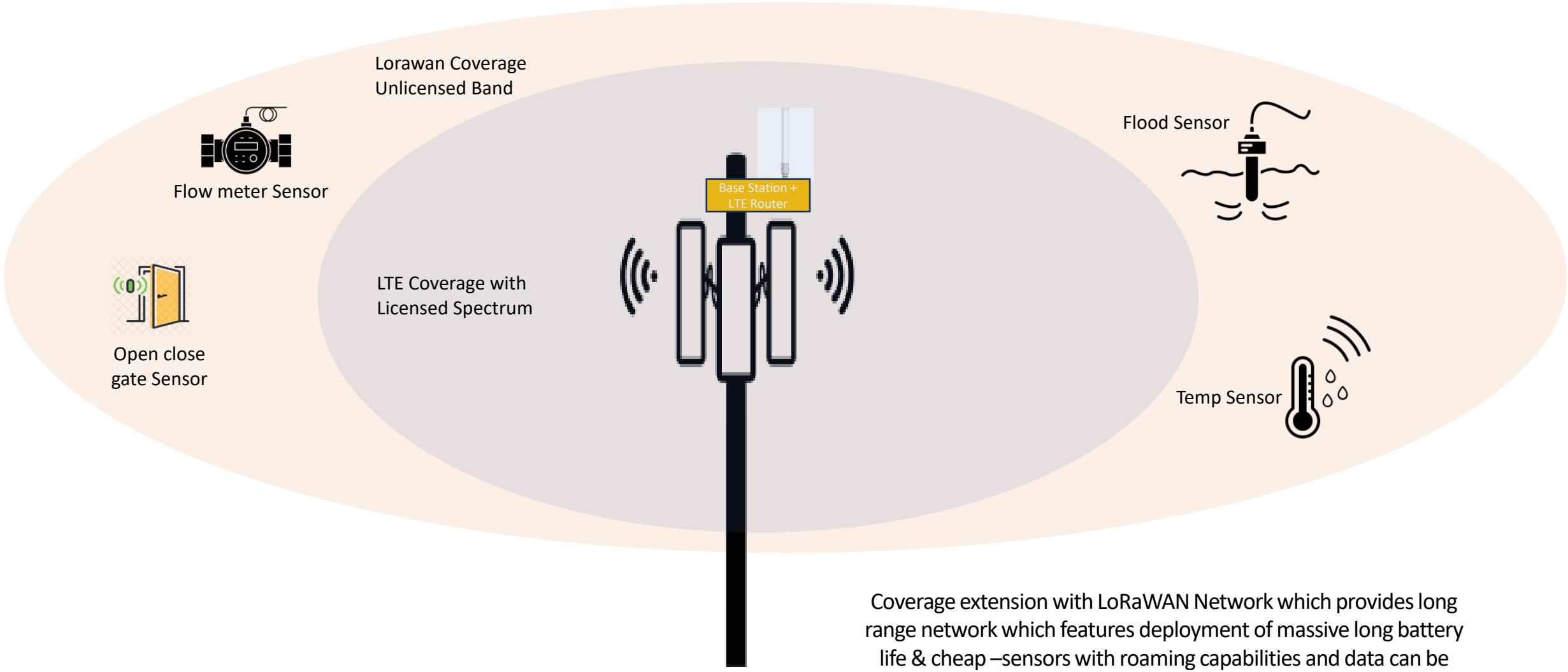
Quick deployment, Easy to manage and operate, lower power consumption, lesser RF losses better EIRP better coverage and specially meant for Private LTE

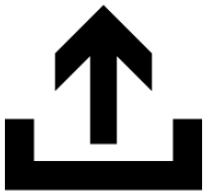
LTE/5G with Low power wide area network (Lorawan)

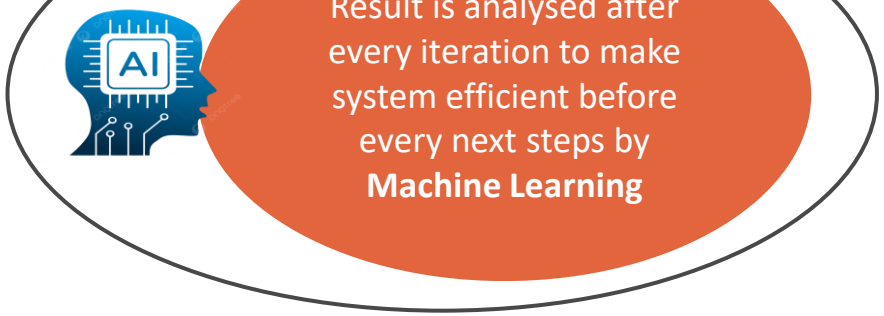


Coverage extension with LoRaWAN Network which provides long range network which features deployment of massive long battery life & cheap –sensors with roaming capabilities and data can be backhauled to **LTE network** with LTE router/module

4G/5G playing pivotal role in AI

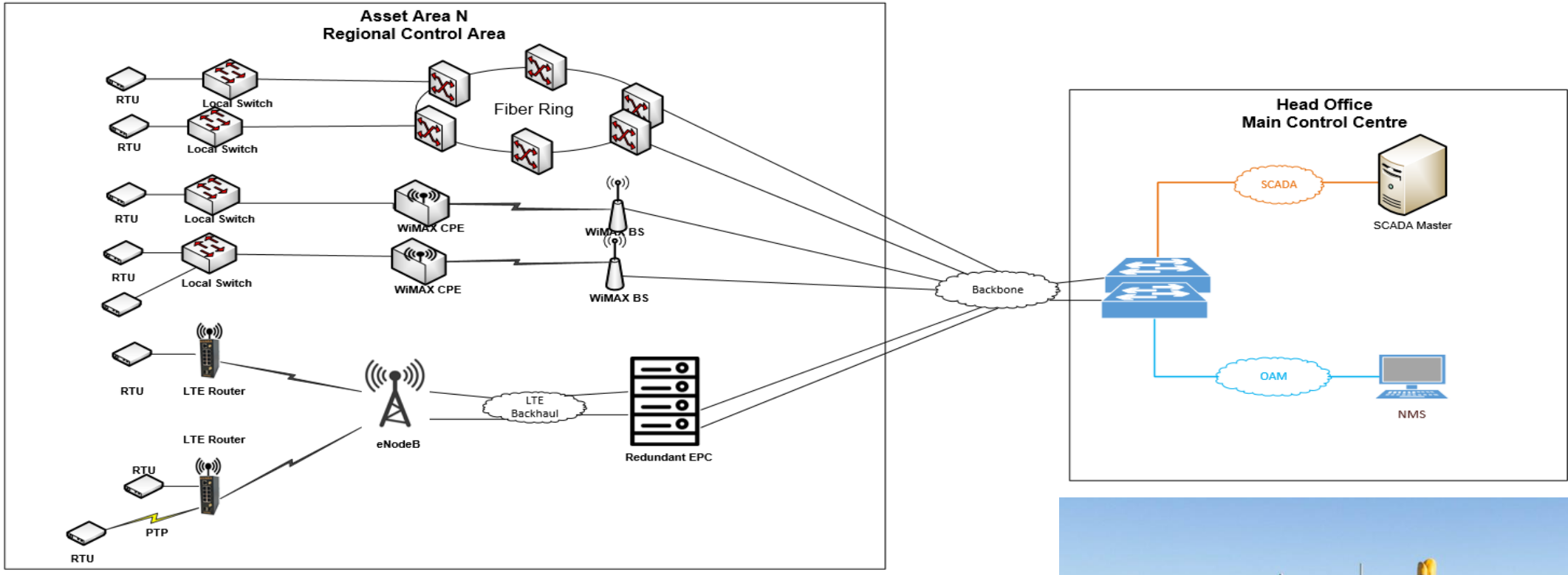
1. Extensive real-time data collection and analysis
2. Identifies patterns and trends, and enables informed decisions
3. Monitor and Data-driven decision-making.
4. Control energy consumption, water usage and waste production
6.
   - Operational efficiency
   - sustainability with
   - enhance safety measures
   - Optimize resource management
   - promote environmental stewardship





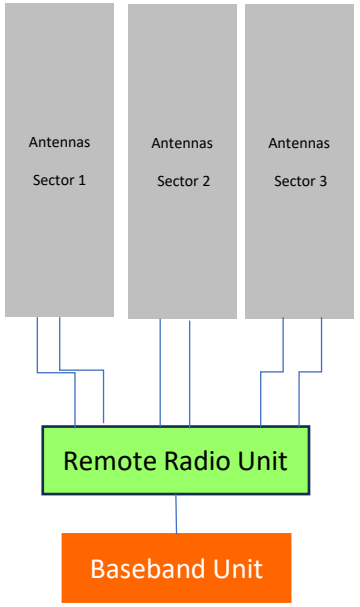
Private LTE in Oil and Gas Case Study

Commtel executed turnkey project which includes design, installation, commissioning and support for 17x EnodeB to cover more than 200+ gas wells (On-going) for one of the Oil and Gas customer in Queensland.



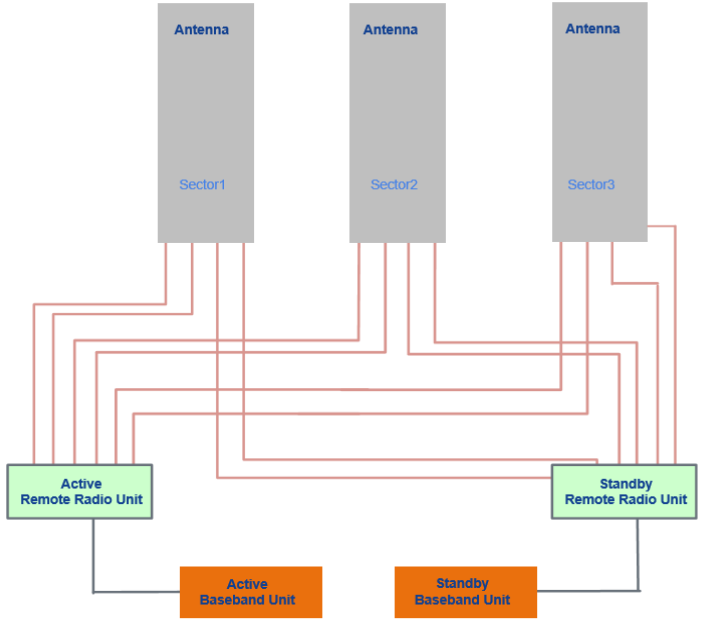
RAN Configurations – Site Solutions Deployed

Commtel delivered custom designed solution to meet business critical performance targets and deployment challenges for different regions within the same LTE network.



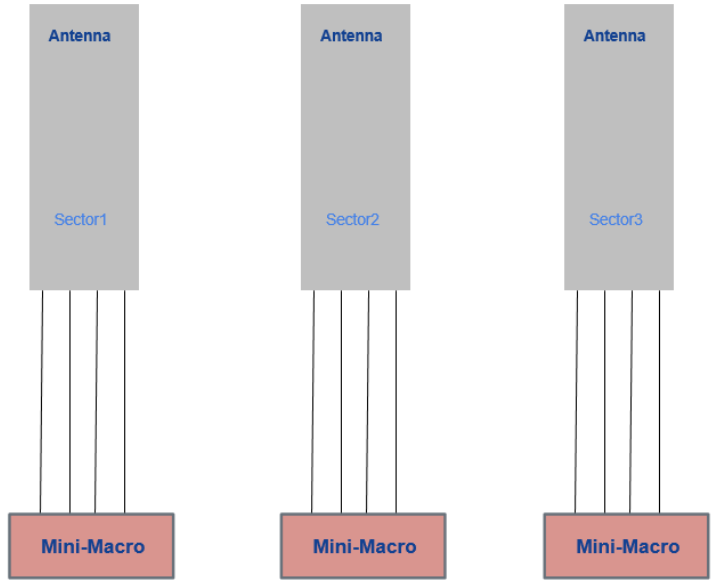
Macro Site
2x60W RRH & Separate BBU

Macro Cell



1+1 Redundant RAN solution with Active and Standby RRH and BBU

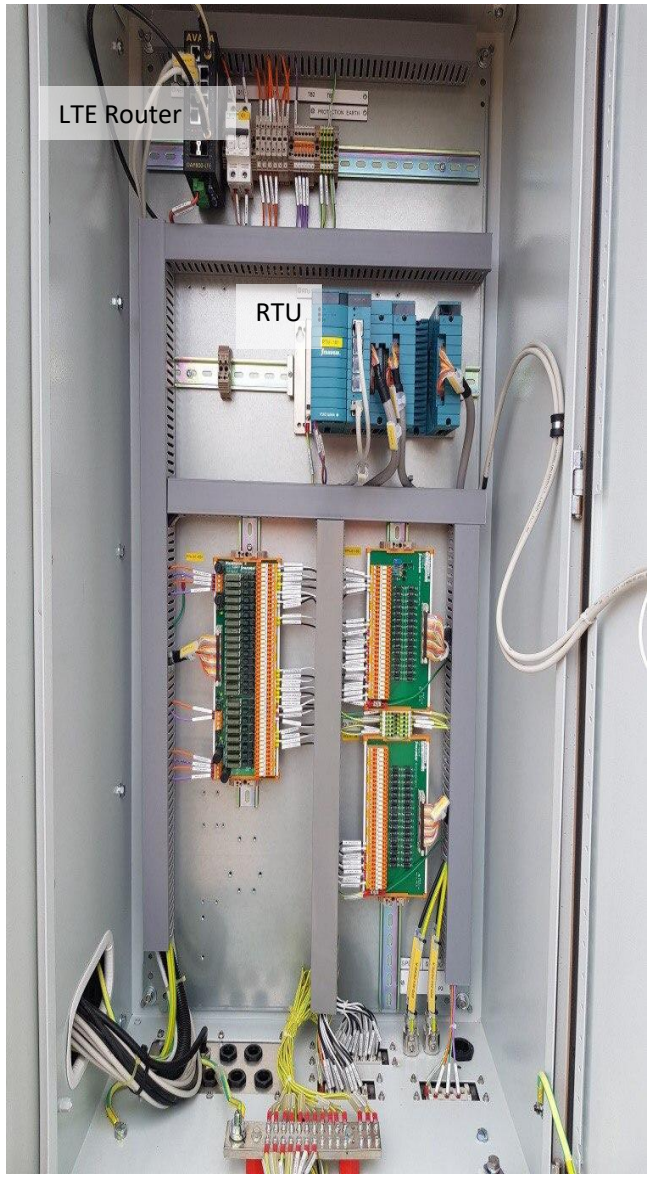
High Availability



Mini Macro Site
2x20W RRH & BBU in one-box

Macro cell with Mini BTS

Solution Snaps



Collecting all data and Scada Telemetry from Gas wells from Remote Terminal Unit connecting to LTE router and sending the data to LTE network and backhauling to Data center.

Spectrum Options

Band	Apparatus License Type	Applicable Area
1900-1920 MHz	PMP	**Regional and Remote**
1920-1980 MHz/ 2110-2170 MHz	PTS	**Regional** (part band only) **and remote** (entire band)
3400–3475 MHz	Arrangements under development	Urban excise area
3400-4000 MHz	AWL	**Remote**
3750-3950 MHz	AWL (Detailed allocation arrangements under development)	New arrangements being developed for metro and **regional**
3950–4000 MHz	Arrangements under development	Metro and **regional**

ACMA is optimizing the options for spectrum availability and making regulatory arrangement so that business critical operational networks can be modernized with LTE and 5G networks.

Upcoming ACMA Events for Spectrum allocation in 3.4Ghz to 4Ghz

	Spectrum to be allocated	Allocation and licence type	Timing
1	3.4–4.0 GHz band, remote areas	Administrative allocation of area-wide licences (AWLs)	Q3 2023 (updated)
Completed	• June 2023: The relevant regulatory and technical instruments were made and the final applicant information package (AIP) released. We consulted on the pricing and technical frameworks and AIP in 2022. • The application window for AWLs in the 3.4–4.0 GHz band in remote areas opened at 10 am Australian eastern standard time (AEST) on Monday 17 July 2023 and closed 5 pm AEST on Monday 31 July 2023. • The ACMA's Register of Radiocommunications Licences has been updated with the details of licences issued as the apparatus licence tax and other charges associated with the licence are paid by the applicant.		
2	3.4 GHz and 3.7 GHz bands, metropolitan and regional areas	Direct allocation and auction of spectrum licences	Q4 2023
Completed	• The 3.7 GHz band auction commenced on 24 October 2023. The 3.4 GHz auction was completed on 21 November 2023. • See the 3.4/3.7 GHz bands allocation summary for more information.		
3	3800–3950 MHz, metropolitan and regional areas 3750–3950 MHz, rural areas	Administrative allocation of AWLs	Q1 2024 (updated)
Next steps	• February 2024: The relevant regulatory and technical instruments were made and the AIP released. • The application window for AWLs in the 3.8 GHz band in metropolitan, regional and rural areas opens at 10 am (AEDT) Thursday 28 March 2024 and closes 2 pm (AEST) Thursday 2 May 2024. • For details on how to apply, see the application page.		
4	3.95–4.0 GHz band, regional and metropolitan areas 3.4–3.475 GHz band, 'urban excise' areas	Restricted cell apparatus licences/ Apparatus licences	TBD
Next steps	• Q4 2023: a technical liaison group was convened to help develop the technical arrangements that support licensing and use of this spectrum. • Q1 2024: consult on technical and licensing arrangements (contingent on TLG timing). • Subject to the completion of these processes, plan to issue licences in calendar year 2024.		

As initial process is completed, applications for AWLs will be accepted on a **first-in-time basis for remaining spectrum in the 3.4-4.0 GHz band in remote areas. As per ACMA they will start this process in March-April 2024**

There will be options available for 3750-3950 Mhz for rural

Summary

01

LTE/5G delivers all types KPIs
Ultra-low latency, Enhanced Data Rates Massive Machine to Machine Comms & Mission Critical comms.

02

Network Operations
Quick, easy to deployable solution with better power efficiency

03

Advance RAN
All outdoor integrated Antenna integrated Radios with BBU in Cloud

04

Advance Features & functionality
MIMO, Beamforming, RAN Virtualisation mmWave, SDN, License assisted Access

05

Heterogenenous Networks
heterogenous networks in future with LTE+5G(NSA), Lorawan, NBIOT, Cat M1

06

Spectrum Outlook
Govt. regulatory authorities coming with more easy and accessible spectrum policies

LTE is only network which can provide coverage and capacity as umbrella wireless network to all types of operational applications

Q & A