VERY VERY GOOD IOT

Teppo Hemiä, CEO

teppo.hemia@wirepas.com

Wirepas

Simply the best wireless connectivity for massive IoT.

wirepas.com

WIREPAS

IoT Mastery Made Affordable

We believe in infinitely scalable connectivity software that never fails. And we concentrate on large industrial applications.

We are the first mover of non-cellular 5G standard, and we aim to be the winner of the largest multi-billion wireless market to come.

Straight up facts

- SW company, B2B, direct and in-direct sales, sustainability handprint impact (UN SDGs 8,9,10,11,12,13).
- Founded 2010 as a spinoff from Tampere University
- Turnaround and strategy change for SW IP licensing 2014
- 70 employees, >1600 developers in the ecosystem
- 93 patents and 32 pending approval, global leader in de-centralized networking
- HQ in Tampere with branches in Asia, Australia, Europe, US
- 200+ partner companies, 300+ products in fast growing ecosystem

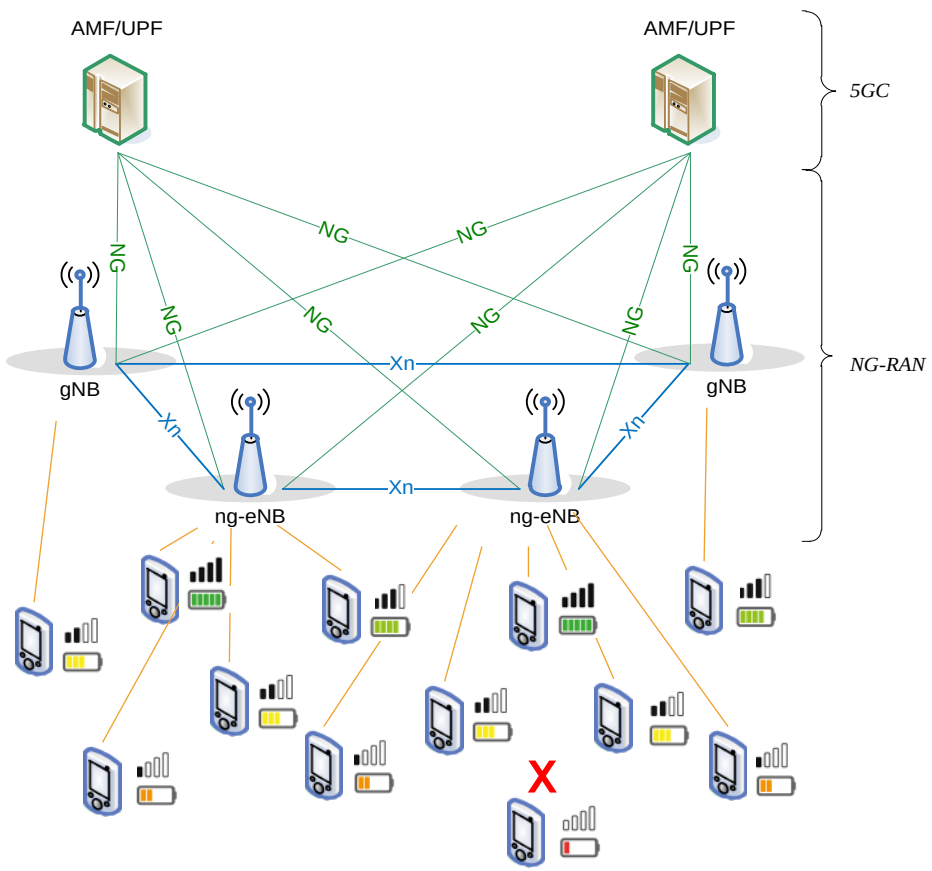
IOT MASTERY MADE AFFORDABLE

NEPs and MNOs invested billions for a decade to solve the problem of IoT connectivity, in a cellular way. The result are limited, NB-IoT. No real improvement seen in 3GPP where the focus is on mobile broadband applications.

We took a different approach. By de-centralizing IoT networks by SW, we eliminate the need of heavy and rigid infrastructure and mobile operators' one purpose solution. As a result, the market fit is much more elastic, the use is more democratic, and the CO2 footprint and price is one tenth of cellular.

Non-cellular 5G is here for the billions of devices market to drive the sustainability handprint.

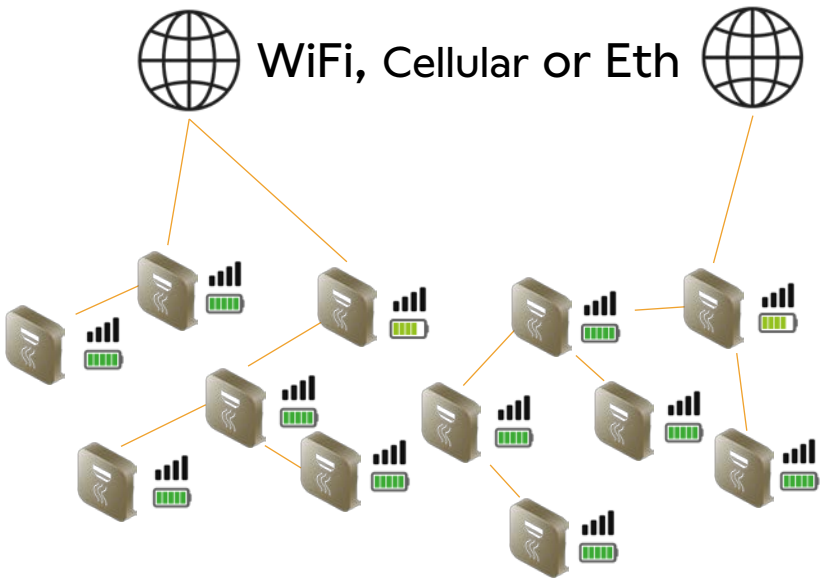
Cellular 5G vs Non-cellular 5G



CAPEX
Virtually zero

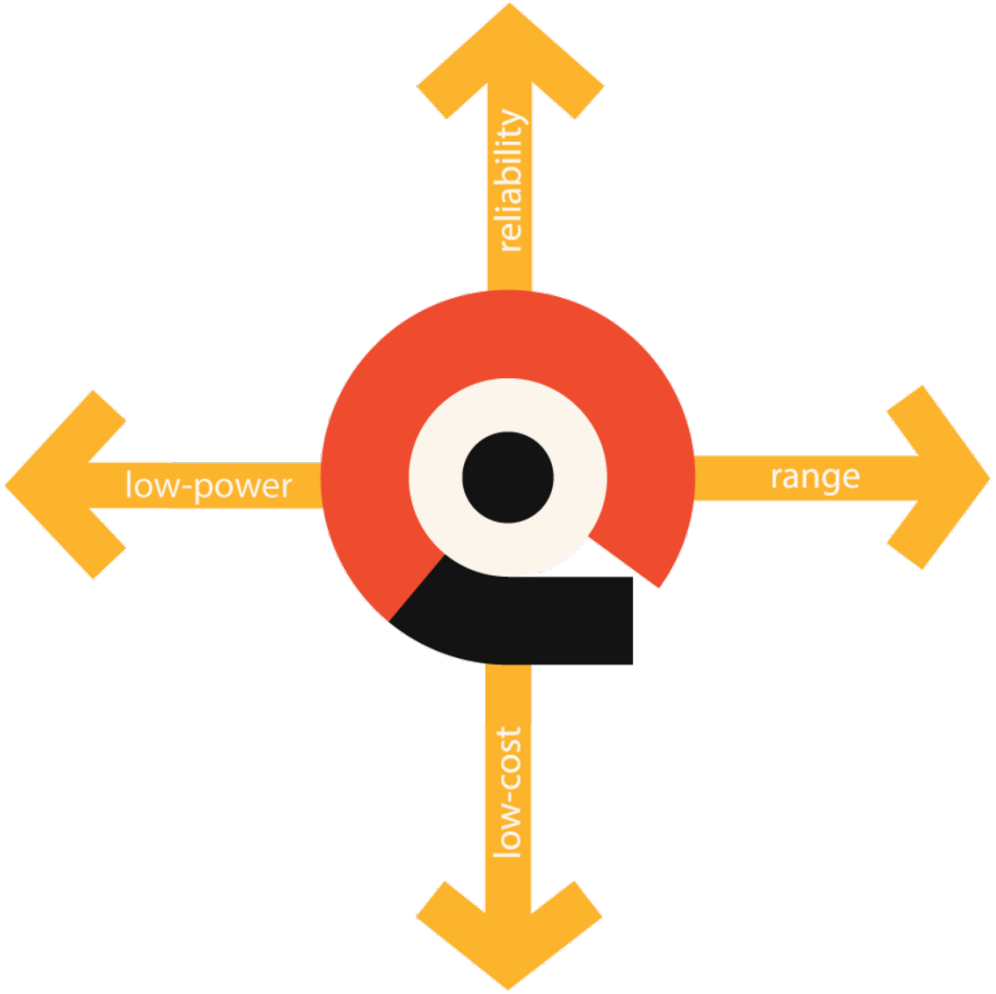
OPEX
0€/month ->

Wireless network infrastructure
de-centralized by end-device SW



Total mobile telecom service revenue 1 T$
(statista)

Versatility with one connectivity suite

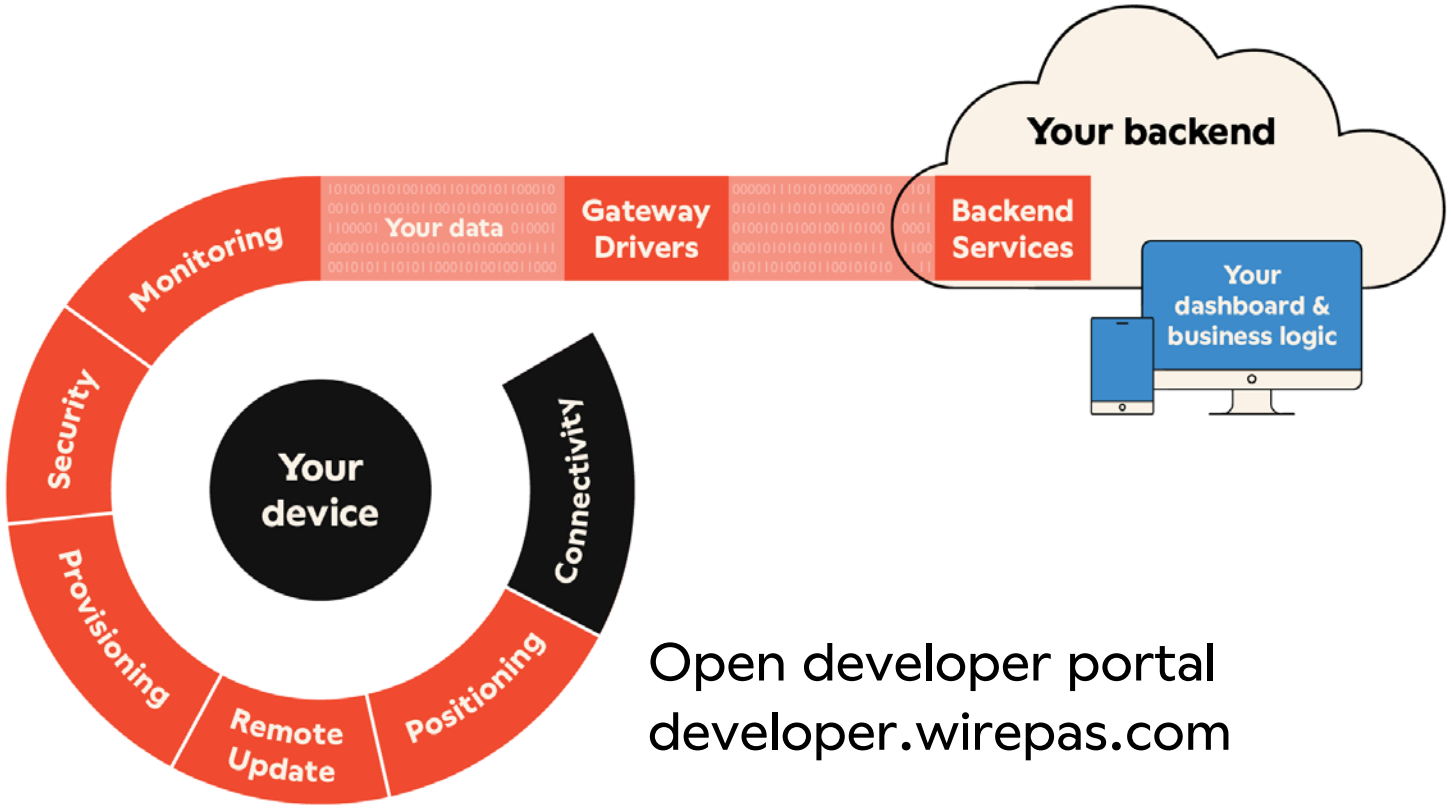


5G Mesh uses ultra reliable OFDM/HARQ radio with dedicated spectrum at 1.9 GHz. Range up to 3 kms

Mesh 2.4 GHz operates in the 2.4 GHz spectrum and relies on low cost BLE physical layer. Ultra low power with tens of meters of range.

Mesh Sub-GHz profiles are designed for affordable, low bandwidth, long-range mains-powered IoT applications.

We offer full HW and Backend agnostic connectivity suite SW
Any cloud to any silicon vision
Solves the market elasticity requirement and TTM



Open developer portal
developer.wirepas.com

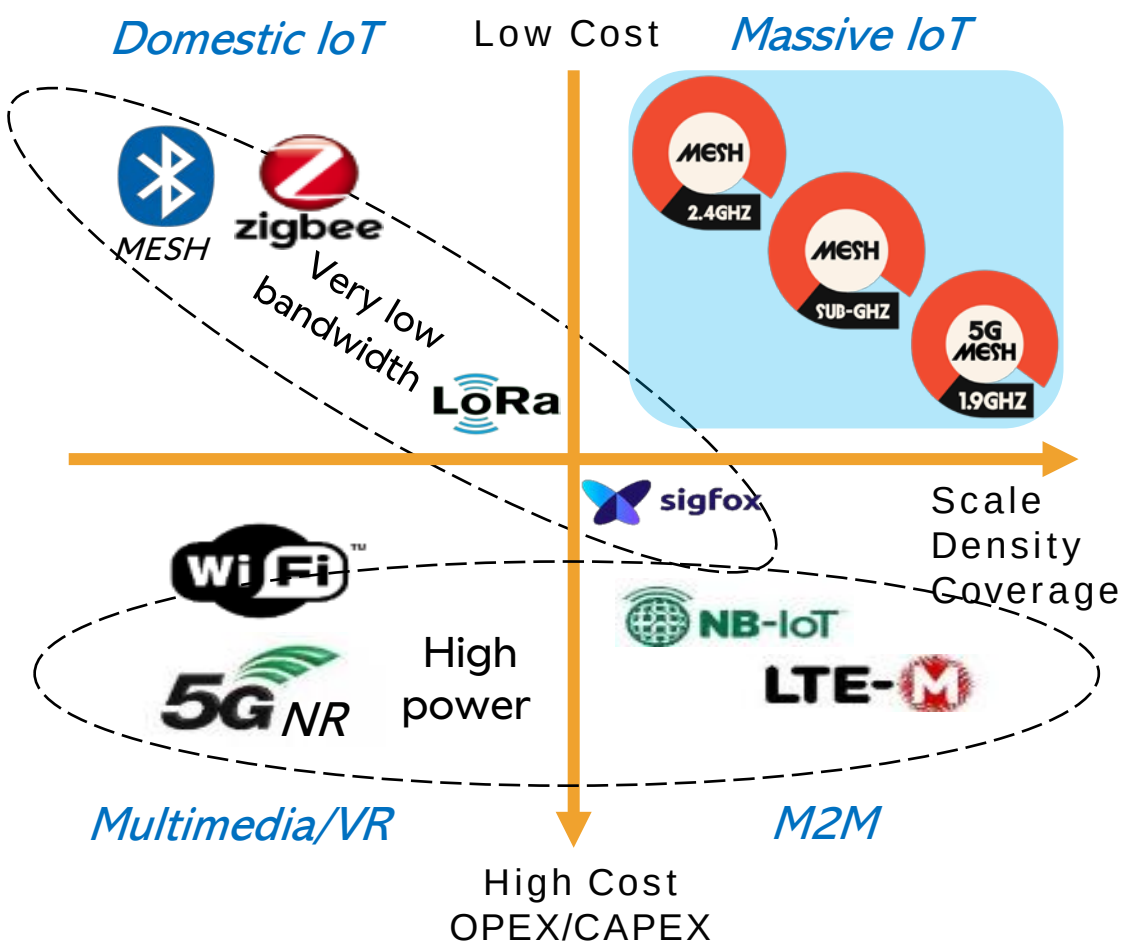
One connectivity and SDK
- Any cloud or on-premise backend
- Any silicon, no supply lock-in in the ecosystem

Built-in
- Security
- Provisioning
- Remote updates
- Positioning
- Monitoring

Strong, clear positioning

Throughput,
Scale and
Reliability barriers

- Unlimited scale and density
- Great radio throughput (>1 Mbit)
- Coherent global radio regulation



- Low cost HW
- No data subscription
- Anywhere, any time, by anyone
- Easy deployment, no middlemen
- Low power, incl. infra

Power,

Price &

Privacy barriers

WHERE TO PLAY?

Wirepas

SMART TRACKING

PROLOGIS

Warehouses

Prologis is the world's biggest logistic warehouse owner with an appr 100 million m^2 footprint in 5000 warehouses.

What they want to connect?

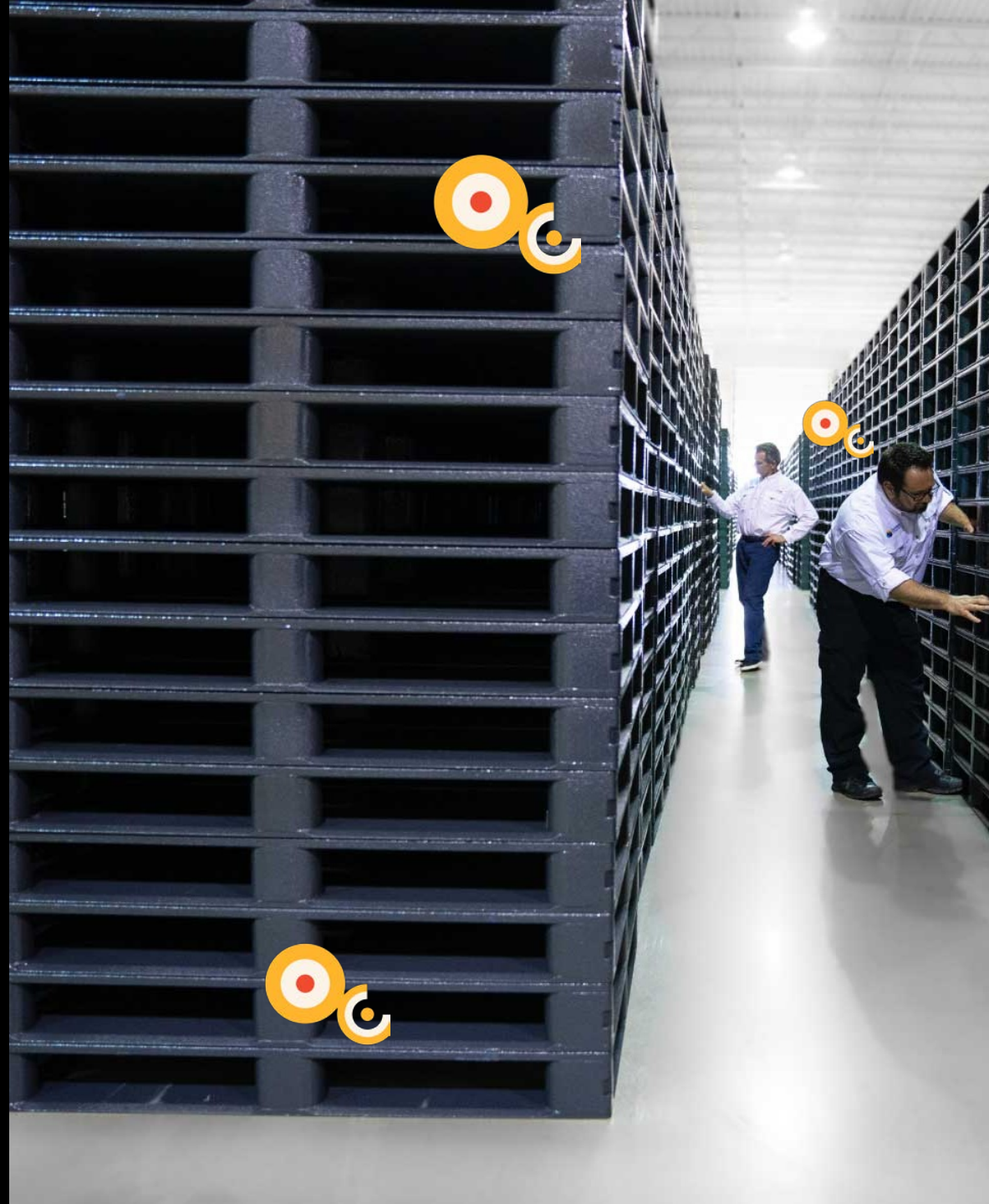
- Real estate condition monitoring
- Lighting control and energy saving
- Asset tracking
- Goods in, goods out identification service for their tenants.

Wirepas can offer single connectivity technology to connect multitudes of use cases.

PALLET TRACKING

Several partners

- Goal: preventing food spoilage & waste with enhanced logistics visibility
- Challenge: Connectivity from farmer to retail. Up to 100,000 pallets per service center
  - Shake, shock, tilt, temperature and humidity of food and goods.
  - Efficiency improvements, longer sales time of fresh food at stores, reverse logistics for pallets
- Wirepas connectivity provides continuous sensor data:
  - Wirepas tracks pallet location and condition and provides large scale inventory at Service Centers

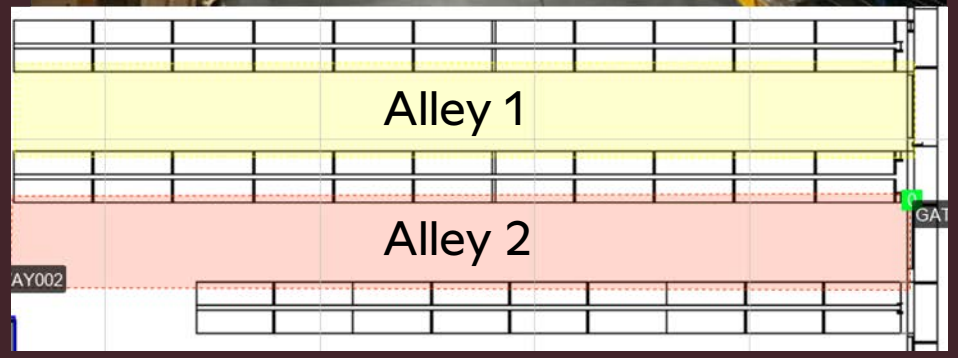


orange™ Business Services

Indoor positioning / Asset Tracking

The Orange Business Services smart tracking offer uses Wirepas Massive, a mesh technology-based scalable connectivity software for massive IoT.

Orange Business Services benefits from the large Wirepas ecosystem that meets the diverse demands for hardware, from the most basic to the most specific. Thanks to the large selection, integrating Wirepas technology makes the devices not only traceable but also capable of inter-communication.



SMART BUILDING

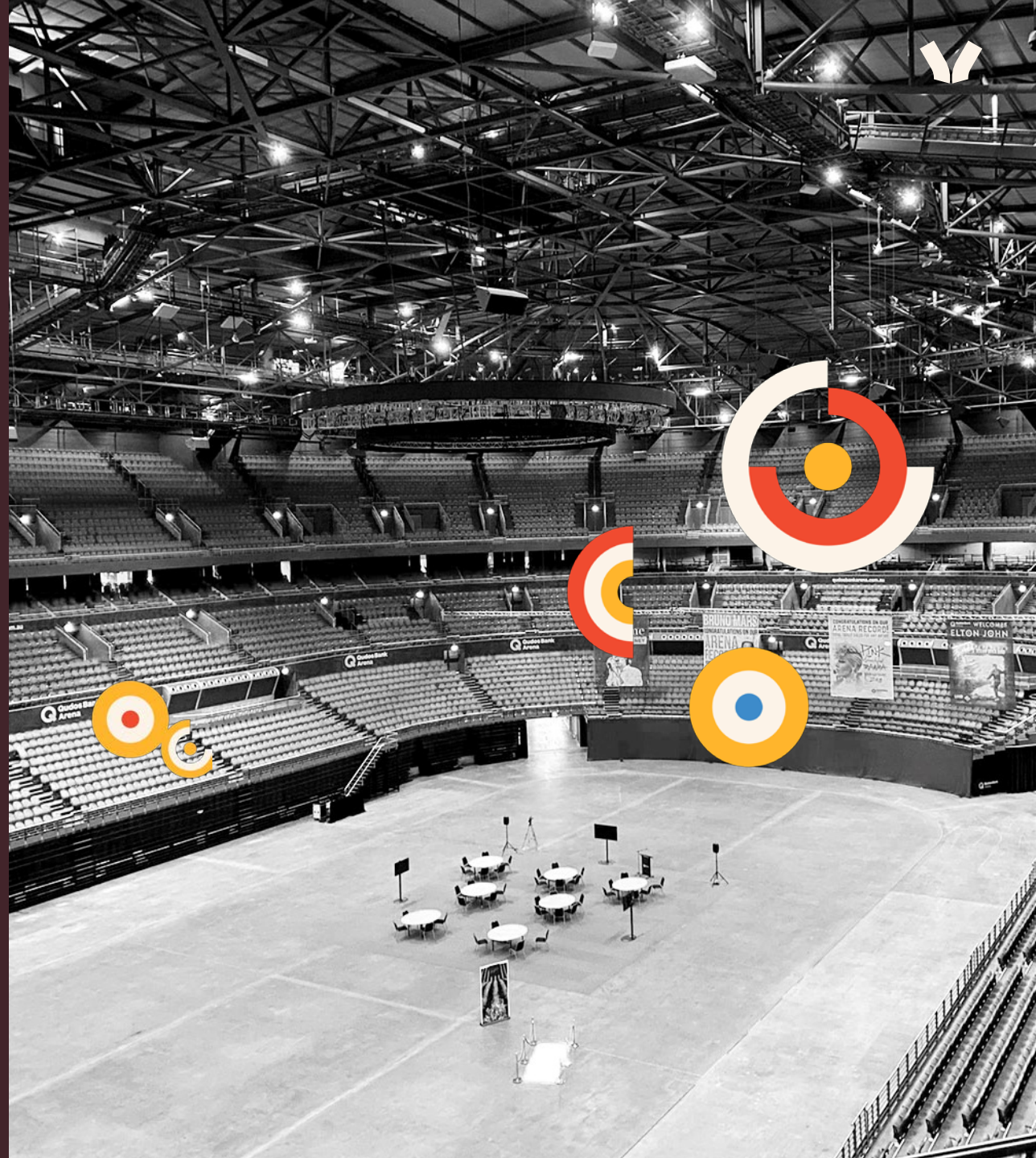
CLEVERTRONICS

Emergency Lighting

Challenge: connect emergency lighting affordably and easily from tens to thousands per building.

Example: Qudos Bank Arena in Sydney: 2500 upgraded emergency lighting luminaires.

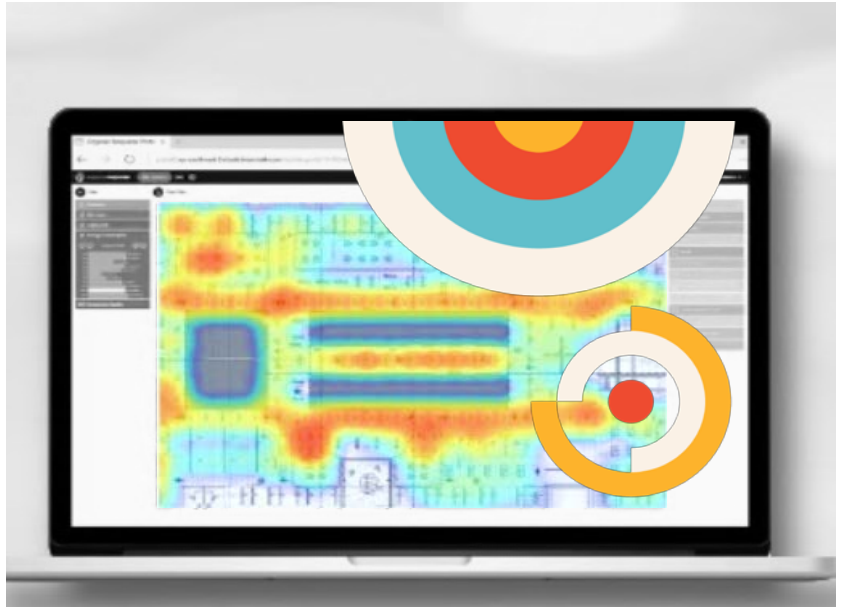
Wirepas enables build of massive-scale, low cost smart emergency lighting solutions. Seamless communication across a wireless dynamic self-managed network.



FAGERHULT

Heat mapping in office and shopping centers.

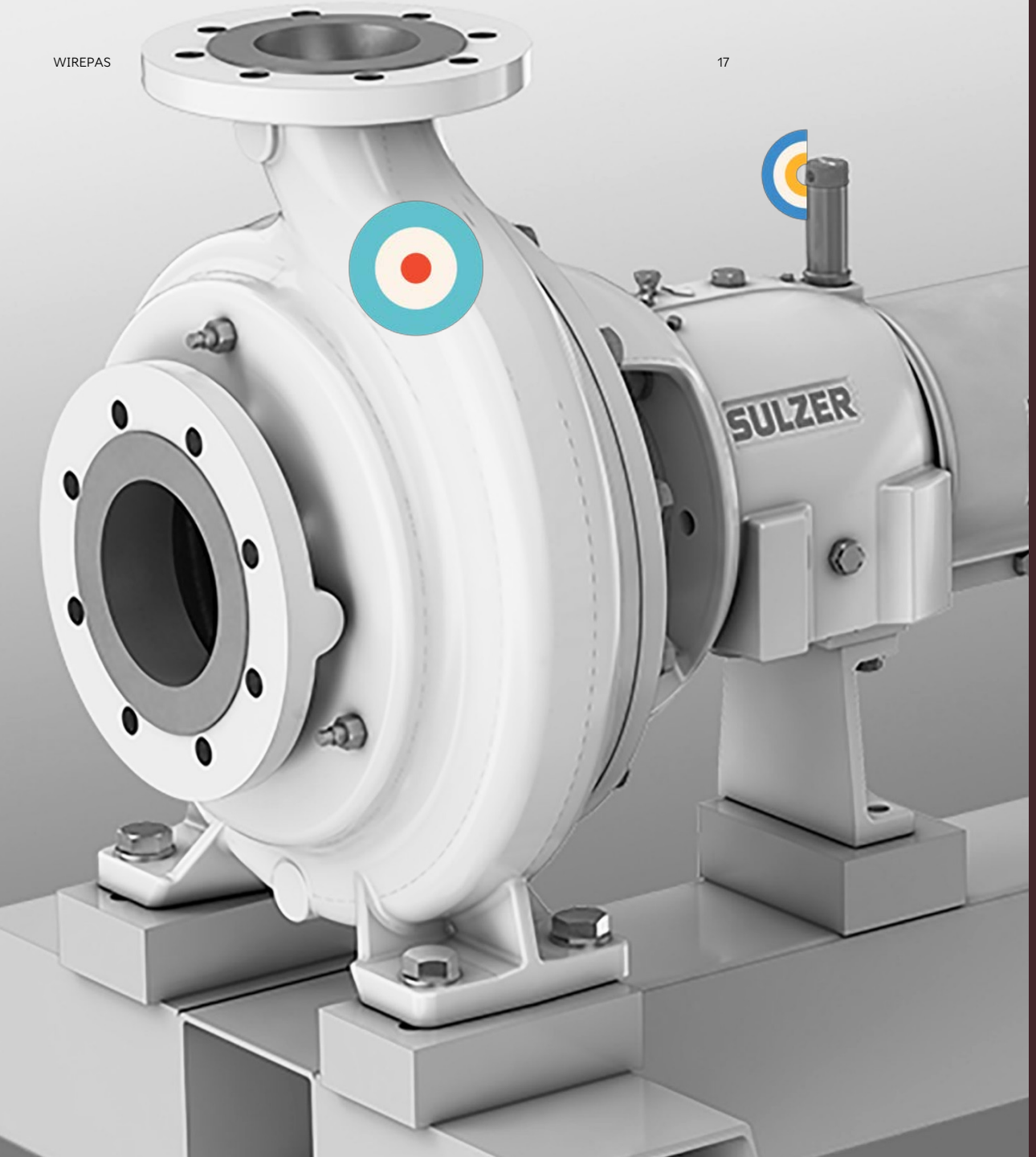
- Goal: measure and analyze occupancy
- Challenge: dense deployment of sensors, continuous streaming of data, low cost
- Using Wirepas connectivity over the lighting system to monitor space utilization.
  - Heat mapping
  - Occupancy sensor data collection to cloud



SONY

Also part of Sony's Nimway solution

SMART FACTORY



SULZER

Wireless condition monitoring system

- Sulzer is the largest pump maker in the world.
- Sulzer uses Wirepas to connect pump sensors to cloud.
- Thanks to easy installation, maintenance personnel can retrofit to existing pumps on the field.
- TREON has designed the industrial sensor and end-to-end monitoring system.

SCHAEFFLER

Wireless condition monitoring system with the largest ball bearing company.

Schaeffler Optime is a cloud based IoT solution for machine condition monitoring.

Reasons Schaeffler chose Wirepas as their partner:

1. Wirepas and its ecosystem were able to support Schaeffler to create a total solution with fast time-to-market.

2. Wirepas Massive enables multiple use cases beyond condition monitoring making it flexible and future proof.

3. Wirepas Massive is a field proven technology for scale, density and low-power in demanding environments.

“OPTIME project has been a great success and the rapid time-to-market has been strongly supported by Wirepas’ state-of-the-art technology, ecosystem and professional support.”, comments Rauli Hantikainen, SVP, Head of Strategic Business Field Industry 4.0 at Schaeffler Technologies AG & Co. KG”

WAKECAP

Safe construction

- WakeCap is an enterprise solution to improve construction safety & productivity through technology.
- By using Wirepas Connectivity, Wakecap has been able to cut their development time to come up with their sensors and app in record time.
- Other benefits of choosing Wirepas include affordable deployment, extremely easy on-site installation and long battery life.

COOLON

Smart industrial lighting

Mines and construction.

Evacuation: Efficiently verify occupancy on every level across the building and safely deploy the rescue to where it is needed.

Security: Identify intruders (via motion outside of b/hours) and unauthorized personnel (via motion without a tag).

Asset/material tracking: Materials arrive on time and at the right place. Efficiently locate equipment and materials across all sites.

Personnel efficiency tracking: via Wirepas ecosystem partner WakeCap.

SMART METERING

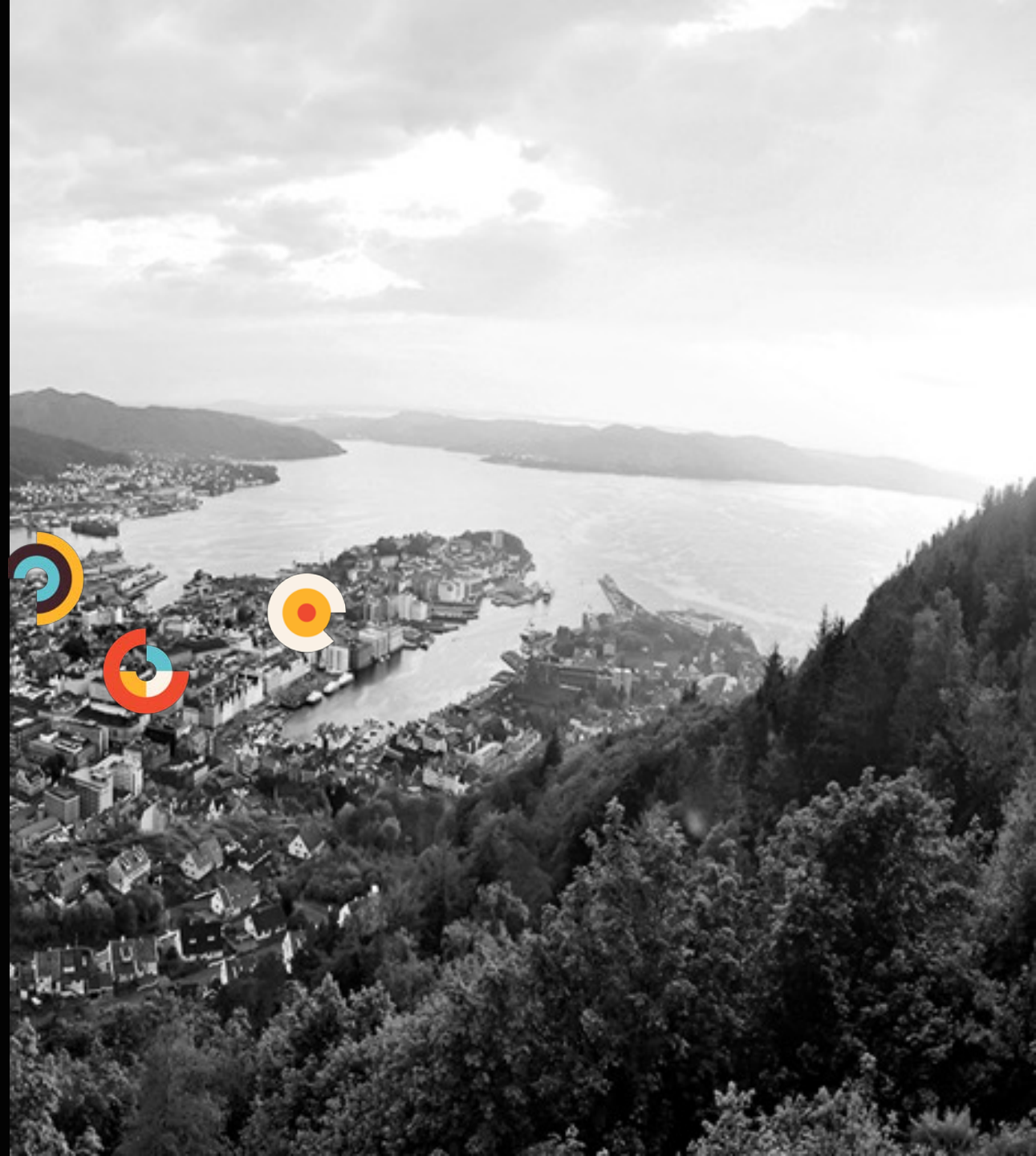
ELVIA (EX HAFSLUND NETT)

Smart meters

920 000 electricity meters in a single Wirepas Massive network in the greater Oslo area. World record in mesh size (x1000). Benefits for the utility:

- 100% coverage without base stations, repeaters or antennas.
- SLA >99.9%, higher than cellular networks.
- Future proven, over the air updates.
- >99% data free, only 1 out of 300 meters have a cellular modem for back haul.

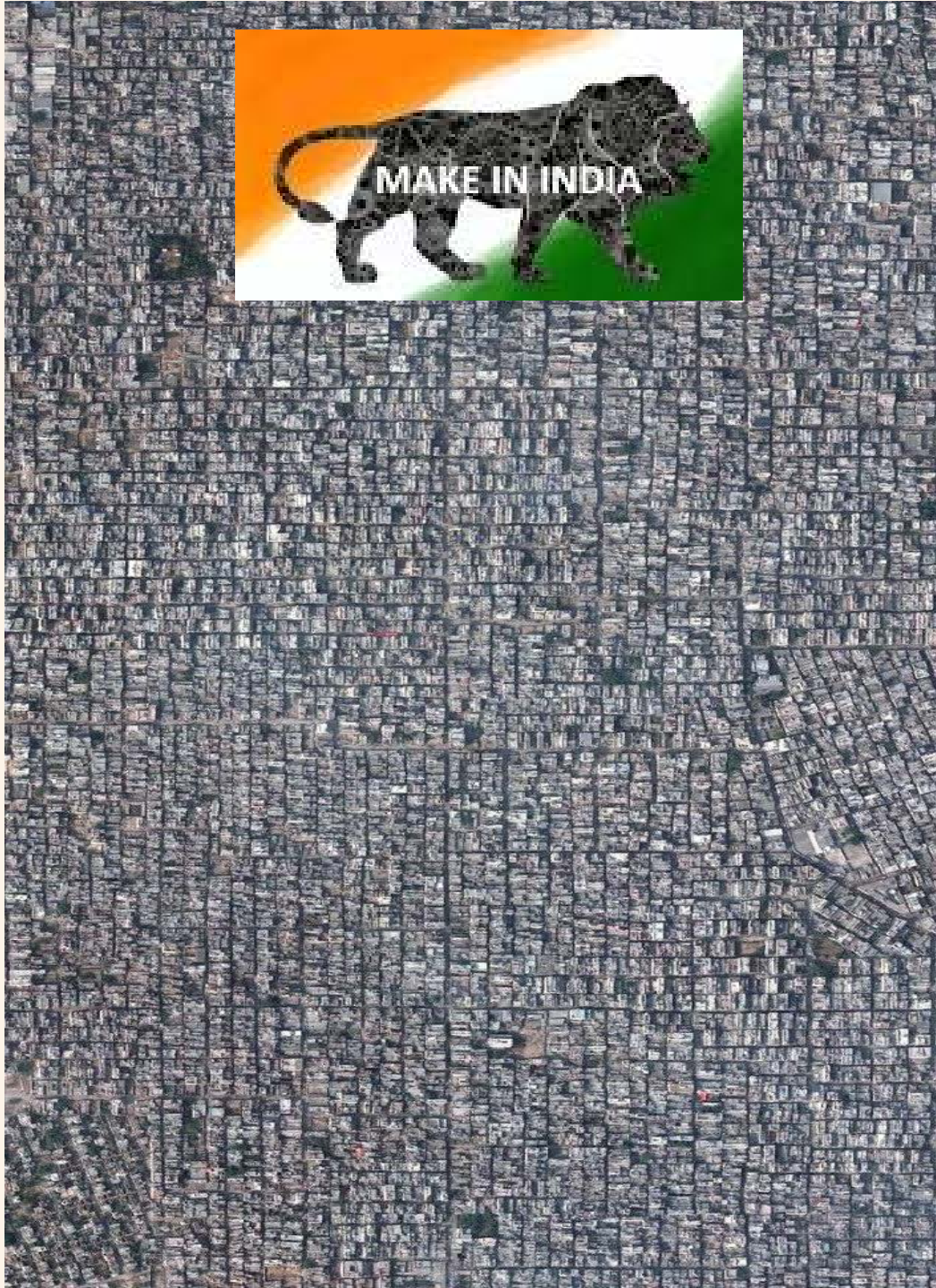
Wirepas is market leader in Nordics with more than three million meters connected.



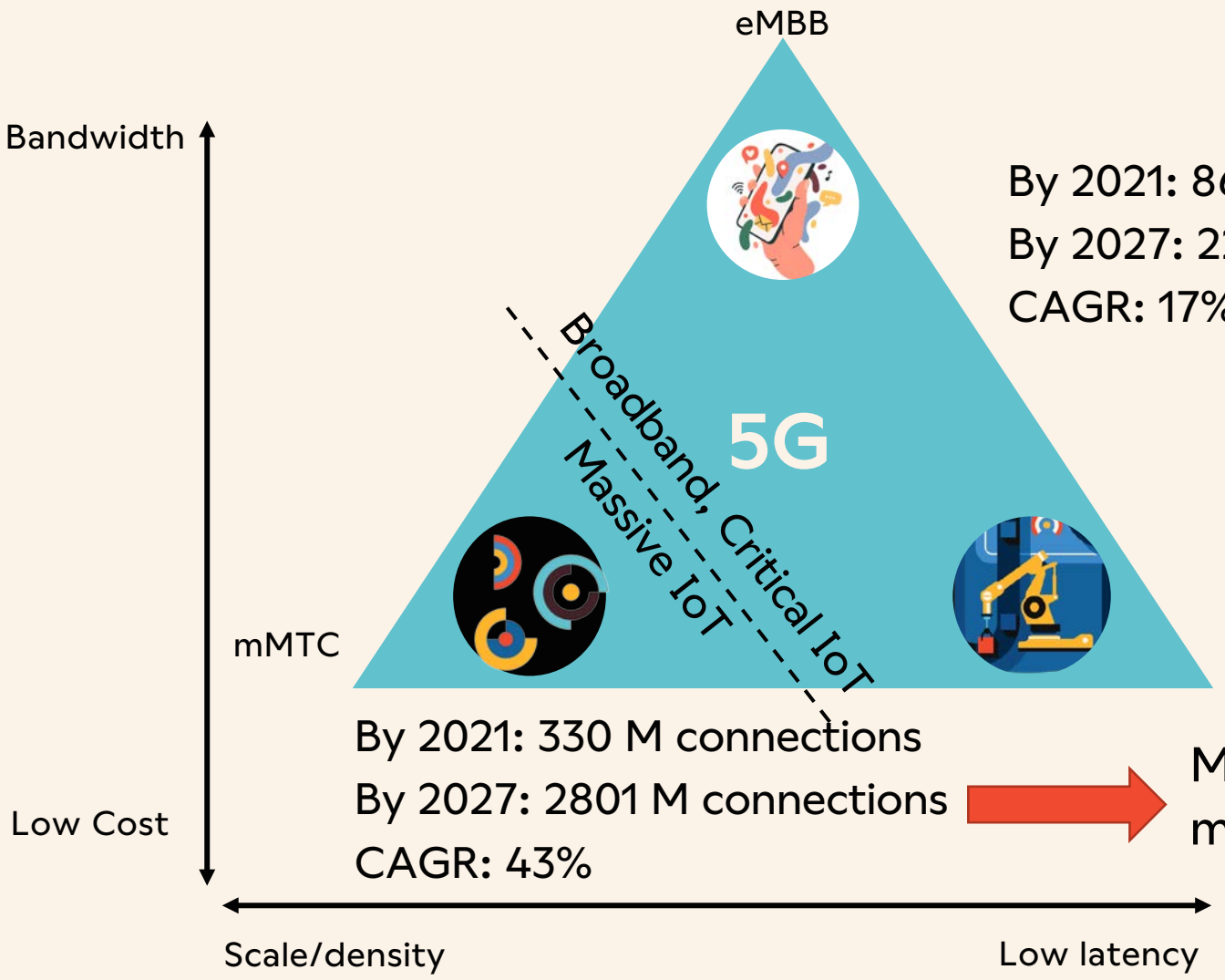
INDIA

The biggest smart meter deployment in the world in the next five years

- India had only reached a penetration of less than 5% to date. India's smart meter rollout – 250 million smart meters by 2025 is the ambitious target.
- The most scalable, affordable and reliable solution required.
- Wirepas is enabling the local ecosystems to help them offering AMI/NIC solutions to the market by licensing our SW. That fits with India’s agenda of manufacturing locally.
- Wirepas has already won tenders of millions of meters, like Adani, India’s largest private power company.
- Our target is to be the leader in the wireless connectivity for RF Mesh.



Cellular IoT Market Size – Ericsson Mobility Report 2022

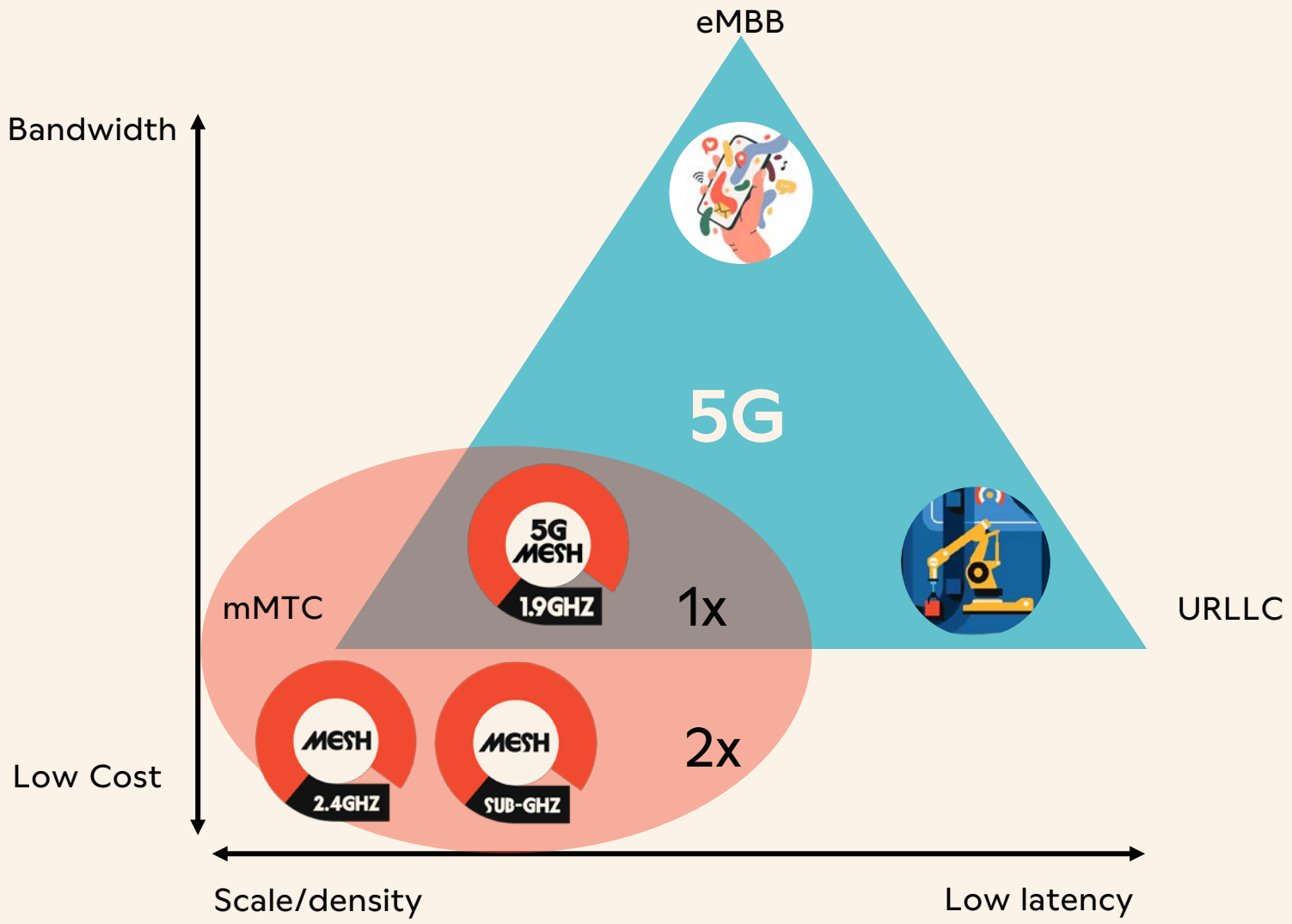


By 2021: 866 M connections
By 2027: 2208 M connections
CAGR: 17%

By 2021: 330 M connections
By 2027: 2801 M connections
CAGR: 43%

Massive IoT is fastest growing wireless market, billion devices annually by 2027

Wirepas offering covers broadest IoT network market



- Wirepas *5G Mesh* provides amazing performance in unseen cost point for mMTC.
  - No high cost of infrastructure like in cellular
  - Has dedicated free to operate 1.9 GHz frequency band
  - Uses robust OFDM + HARQ radios
- Wirepas *Mesh 2.4 GHz and Sub-GHz* are great fit to even more cost sensitive applications.
  - Based on the same SW
  - Use of low-cost commodity Bluetooth and Sub-GHz chips

THANK YOU!