



# Advances in MulteFire

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# MulteFire Alliance Vision

## Extend the LTE Ecosystem

- Standalone deployment in unlicensed and shared spectrum
- Based on 3GPP specifications
- Harmonious Co-existence

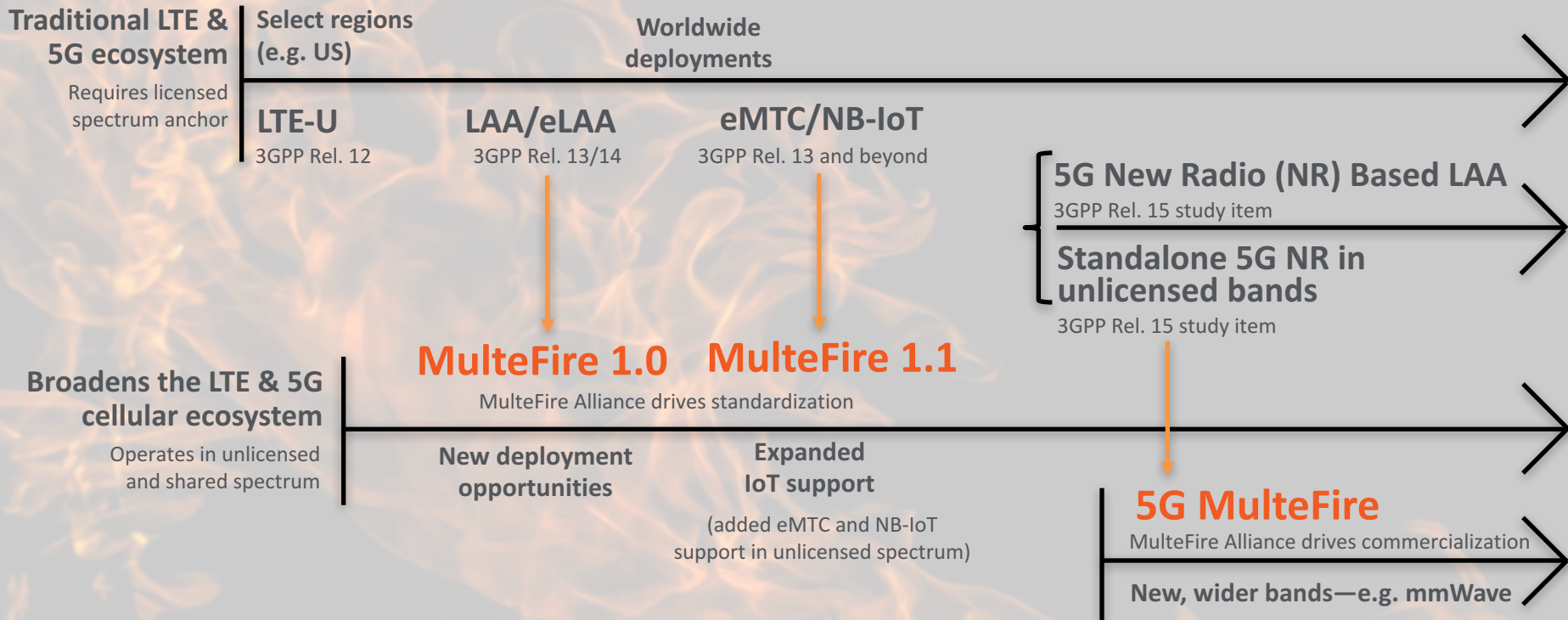
## Enable New Vertical Markets & Use Cases

- Industrial IoT
- Enterprise
- Cable Industry
- Various Verticals

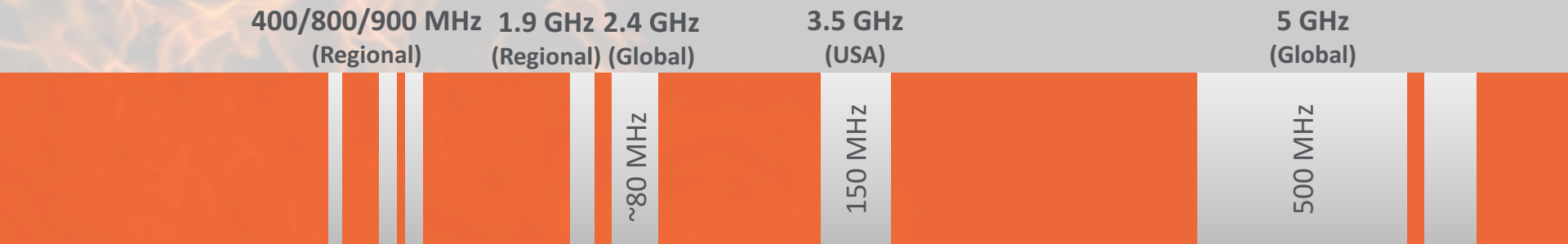
## Deliver an Interoperable Ecosystem

- Release 1.0 Publicly Available
- Certification Program Development

# MulteFire Technology Roadmap



# Standalone Deployment in Unlicensed and Shared Spectrum



## MulteFire 1.0/1.1

For mobile broadband & high-performance IoT

Carrier bandwidth: 10/20 MHz



## MulteFire 1.1 eMTC

Broadest range of IoT use cases, e.g. industrial IoT

Carrier bandwidth: 1.4 MHz



## MulteFire 1.1 NB-IoT

For low-power, wide-area (LPWA) IoT use cases

Carrier bandwidth: 200 kHz





# Growing Momentum for MulteFire Release 1.0



- Publicly available since April 2017
- Supports neutral host and private LTE deployment models
- First product built to Release 1.0 spec announced
- MulteFire 1.0 trials targeted for 2H'2018
- Certification program under development

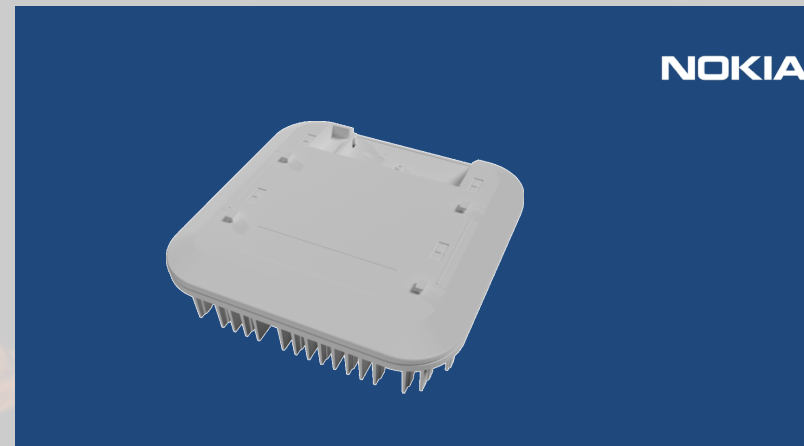


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# Nokia Launches Industry First MulteFire Small Cell

## Nokia Flexi Zone MulteFire multiband Pico BTS benefits

- Best performance and compact size
- High capacity
- Supports both Indoor & Outdoor deployments
- Carrier-grade software quality (3GPP based)
- Proven plug & play for light touch install
- Flexible backhaul, power and sync solutions



## MWC-18 Demo of Nokia Flexi Zone MulteFire multiband Pico BTS shows:

- Private LTE using MulteFire for Manufacturing and IIoT Shipping
- MulteFire Co-existence with Wi-Fi
- MulteFire advantages of Mobility, Coverage, Capacity, Neutral host



# Baicells sXGP – MulteFire

**Name: sXGP PicoCell**

- **Power : 2\*250mw**
- **Frequency: Band 39**
- **Capacity: 96 active users**
- **VoLTE Enabled**
- **LIPA & SIPTO**
- **SON Enabled**
- **Power consumption: < 14w**
- **Feature: LBT-1, LBT-2, LBT-3**





# Introducing MulteFire Release 1.1

- Optimized for IoT applications
- Expanded support for additional spectrum bands, including <1 GHz, 1.9 GHz and 2.4 GHz
- Added eMTC support for moderate data rate applications
- Added NB-IoT support for narrowband applications
- Enhanced performance of Release 1.0
- Release 1.1 spec completion targeted June 2018



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# MulteFire Release 1.1 New Features

- **Enhanced radio features**

- Improved latency and uplink performance using Grantless Uplink
- Enhanced signal link to further improve coverage outdoors – i.e. in the downlink for a shipping port
- Autonomous mobility for mobility improvements in preconfigured cells

- **End-to-end networking features**

- Device triggering for power savings
- Use of discontinued reception to save energy and identify low priority access to give space to higher priority services (such as voice)
- Courtesy access to enable access to the MulteFire network without a subscription
- Improved quality of service

- **Added SON features**

- Automatic neighbor discovery for network planning
- Mobility load balancing
- Reduced interference
- Enable key information exchange

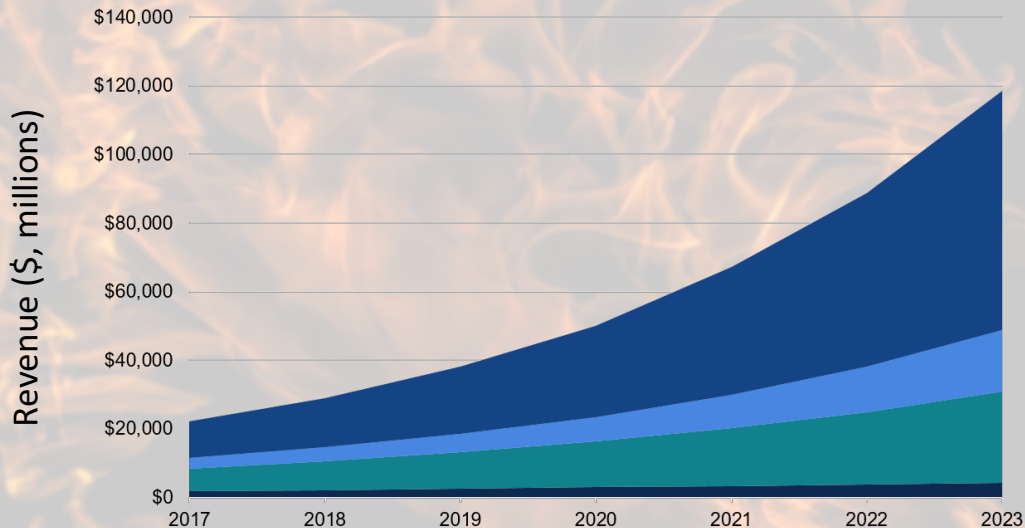


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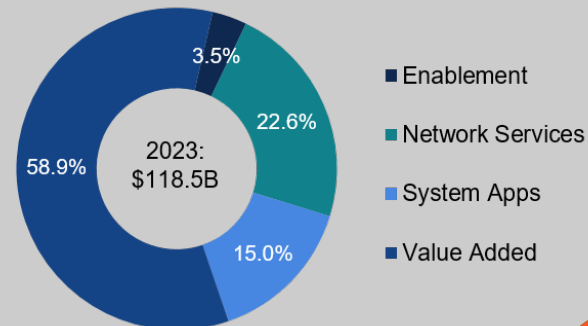
# Market Opportunity for MulteFire

The total global Smart Systems revenue for the private LTE addressable market in industrial and commercial IoT will reach \$118.5 billion in 2023.

Private LTE Addressable Smart Systems Revenue,  
Worldwide, 2017-2023 (\$, millions)



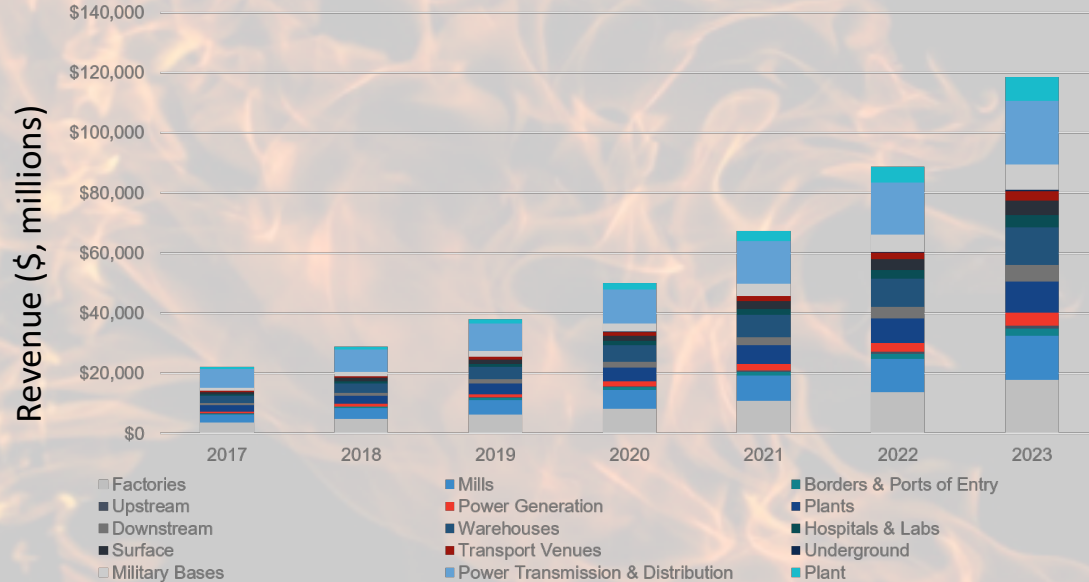
Source: Harbor Research



# Market Opportunity for MulteFire

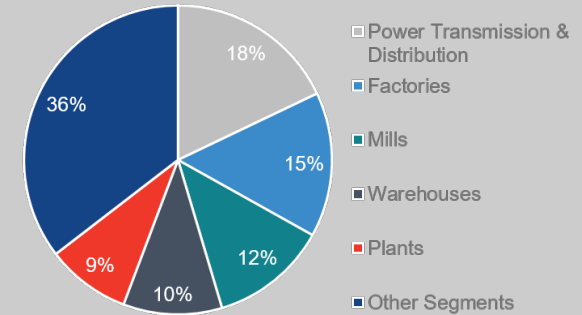
The top five markets are expected to make up roughly 65% of the value created from Private LTE enabled devices/equipment.

Private LTE Addressable Smart Systems Revenue by Segment,  
Worldwide, 2017-2023 (\$, millions)



Source: Harbor Research

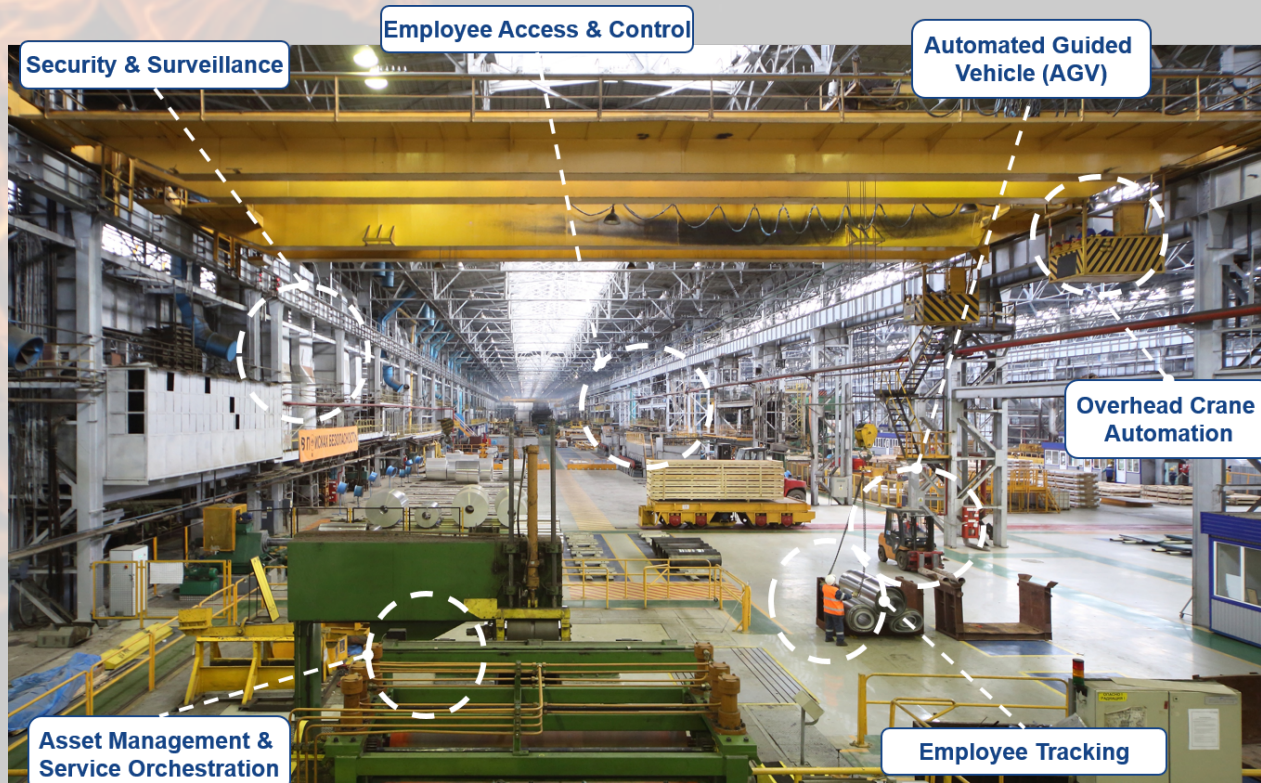
Distribution of Value:  
Top Five Segments





# IoT Case Study: Factory Private LTE Market 2023 Opportunity

Shipments: 128.6 million units; Smart Systems Revenue: \$18.3 billion



Source: Harbor Research





# Summary

- MulteFire is enabling innovation and new business models by delivering private and neutral host LTE deployment
- MulteFire is gaining momentum with first products built to Release 1.0 announced and trials planned for 2H'2018
- MulteFire Release 1.1 adds further IoT optimizations to extend the LTE ecosystem for new applications
- Let's innovate together!

