LSA facilitates national spectrum access to globally harmonized IMT spectrum

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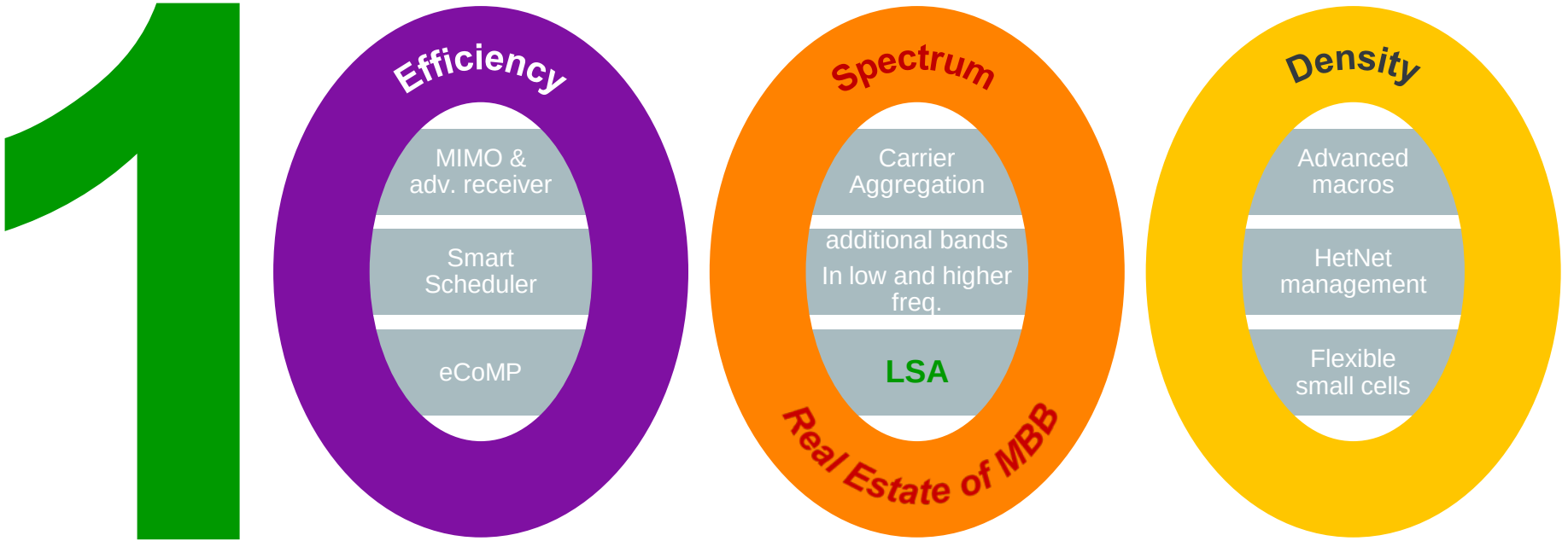
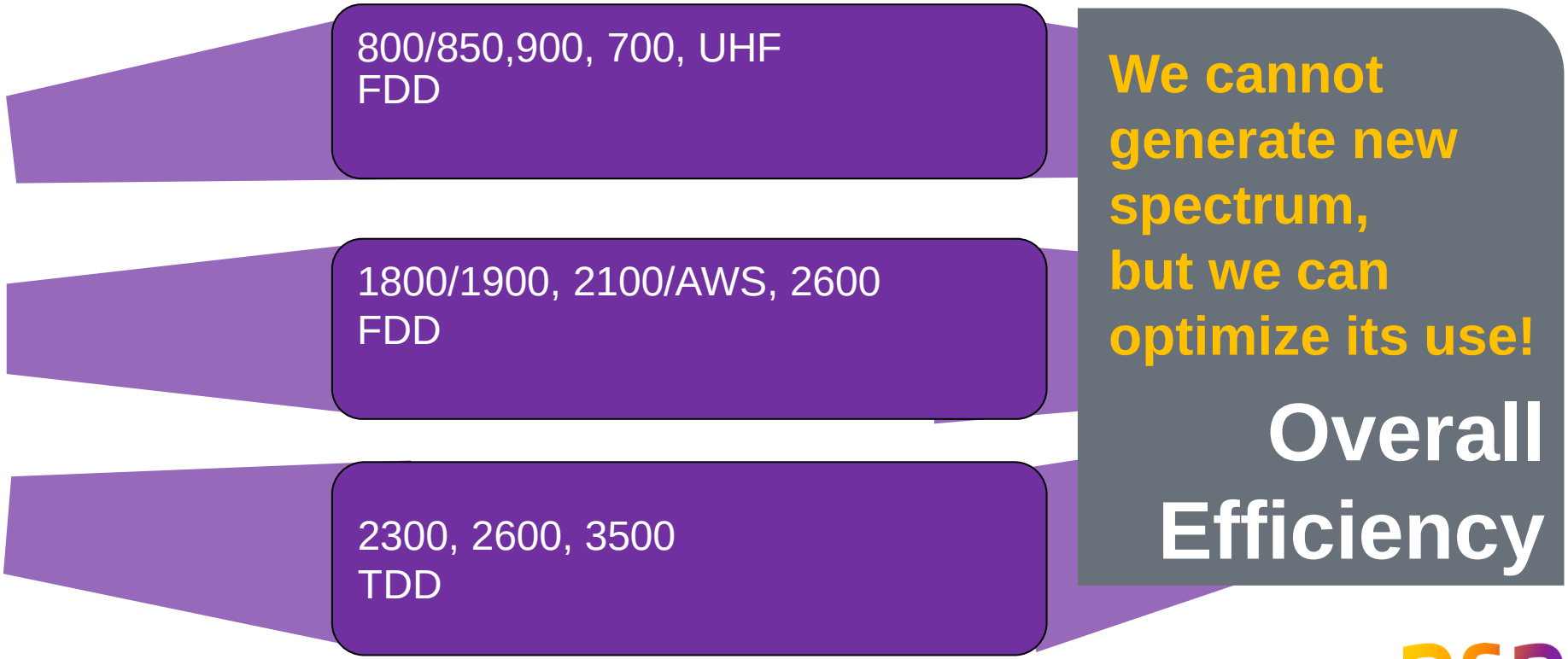
Industry Complementary Solutions to support up to …



… times more capacity

Spectrum *the* “real estate” for Mobile Broadband

Global identified IMT bands



A new way of licensing spectrum
Licensed Shared Access (LSA)

Mainstream Approach
Auctions
of Cleared Spectrum

Dedicated Use
Ensures Quality of Service

Complementary License Model
Licensed Shared Access

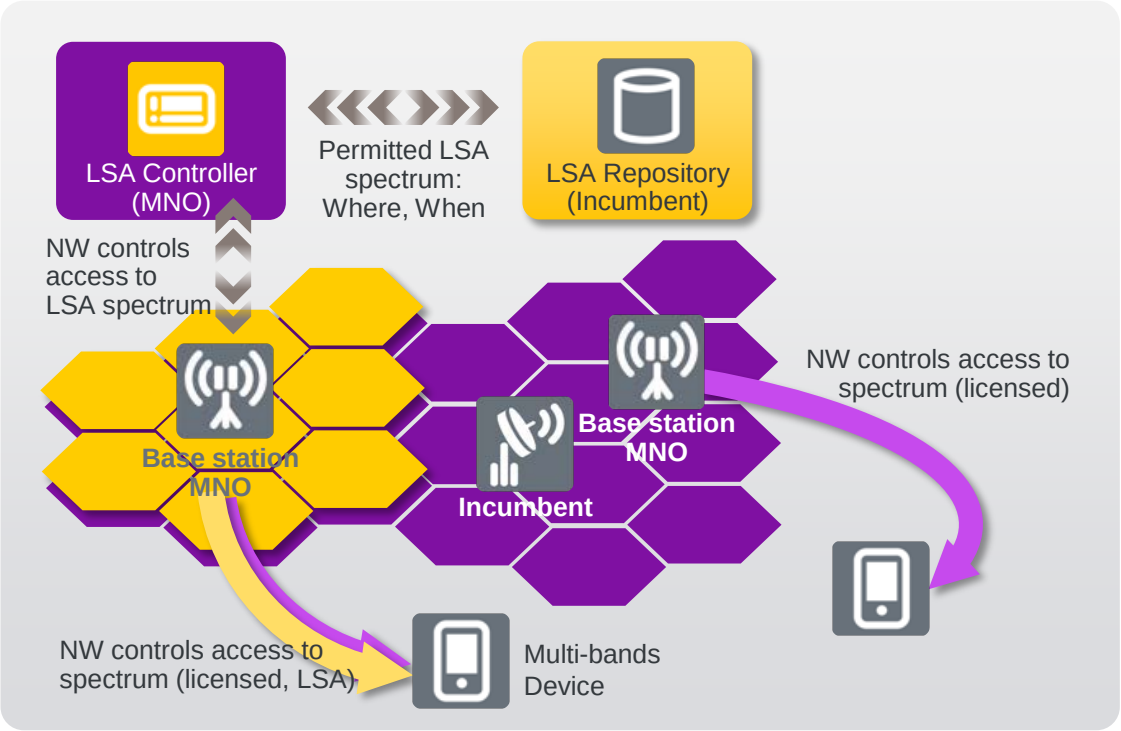
Licensed Shared Use
Binary sharing with Incumbent
(government, defence, etc.)
in Time, Location, and/or Frequency
Maintains Quality of Service

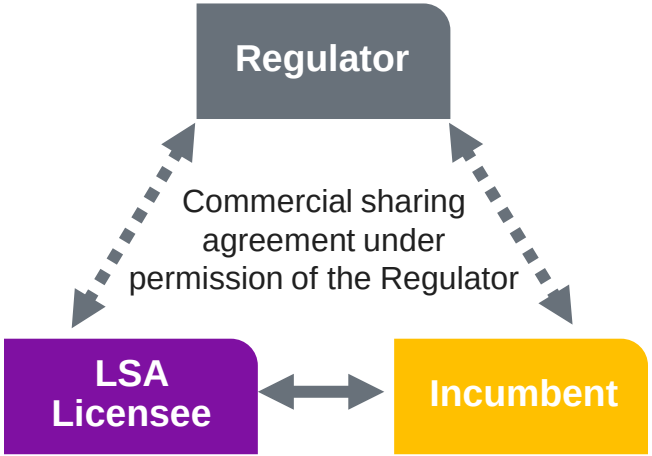
License exempted Approach

Shared Use
Unpredictable
Quality of Service

Harmonization and Global Standards Drive Economies of Scale

Licensed Shared Access Concept





Licensed Shared Access approach

It is a complementary licensing method not a sharing technique

Complementary

Allows semi-static use of spectrum when/where not occupied by incumbent users

Vertical Sharing

Timely availability and licensed use of harmonized spectrum with predictable QoS

LSA

Enables new business models: new spectrum, monetization

business innovation

Leverages globally available mobile technologies, such as LTE, to ensure economies of scale

Harmonized

LSA – main regulatory features

- **Binary and exclusive access to spectrum**
- **Compatible with existing regulatory frameworks on the use of spectrum***
- **Vertical sharing between incumbent and LSA Licensees**
- **Targets bands with significant potential for global harmonisation and supported by appropriate standardisation.**
- **Voluntary and incentive based cooperation model**
- **Controlled environment for predictable quality of service**

* Ref: ECC Report 205

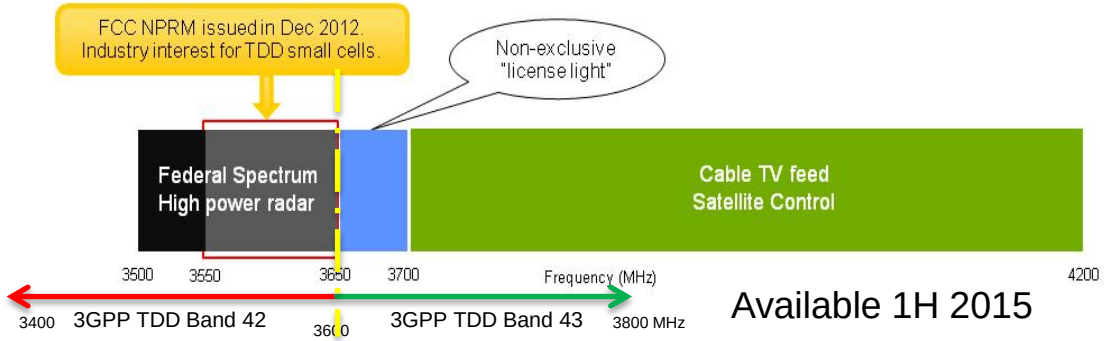
LSA in 2.3 GHz in Europe- Case study*

- The 2.3 GHz band cannot be released across Europe on an dedicate basis for mobile broadband because of incumbent use (especially defence and PMSE)
- The net economic benefit of opening the 2.3 GHz band in Europe is ranging from €6.5bn to €22bn, these benefits are enabled by:
  - Access to the current IMT harmonized band
  - Reduced costs of network deployment
  - Opportunity to generate additional revenue
- Without LSA relatively little and fragmented spectrum will be available, i.e. only a minority of countries in Europe will be able to offer access to the 2.3 GHz band

Hence LSA at 2.3 GHz is required to create sufficient scale to allow Europe-wide use of the band for mobile broadband

* Plum Consulting study for Ericsson, NSN and Qualcomm : "*the economic benefits of LSA in 2.3 GHz in Europe" , December 2013*

LSA in 3.5 GHz - USA Case Study (1/2)



Available 1H 2015

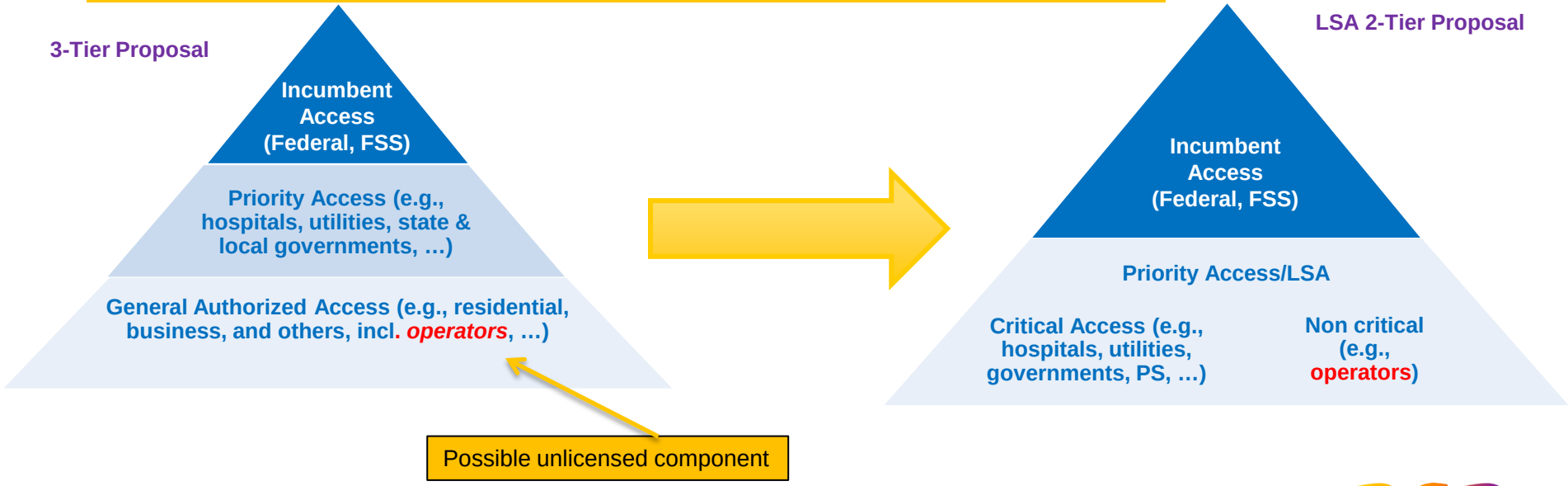
NTIA Fast-Track Report, Figure 5-3. Composite Depiction of Exclusion Zone Distances, Shipborne Radar Systems

- Sharing Spectrum with Radar and Fixed Satellite Systems

- Exclusion zones for Macro/Navy radar systems
- Exclusion zones for small cells/Navy radar systems TBD
- Small cells along with LSA to enable access to spectrum

LSA in 3.5 GHz - USA Case Study (2/2)

- Proposal to add non critical users like Operators to Priority Access Users.
- For 3550-3650MHz LSA approach can be applied



Summary

LSA is being identified as one of the tools to overcome the spectrum challenges

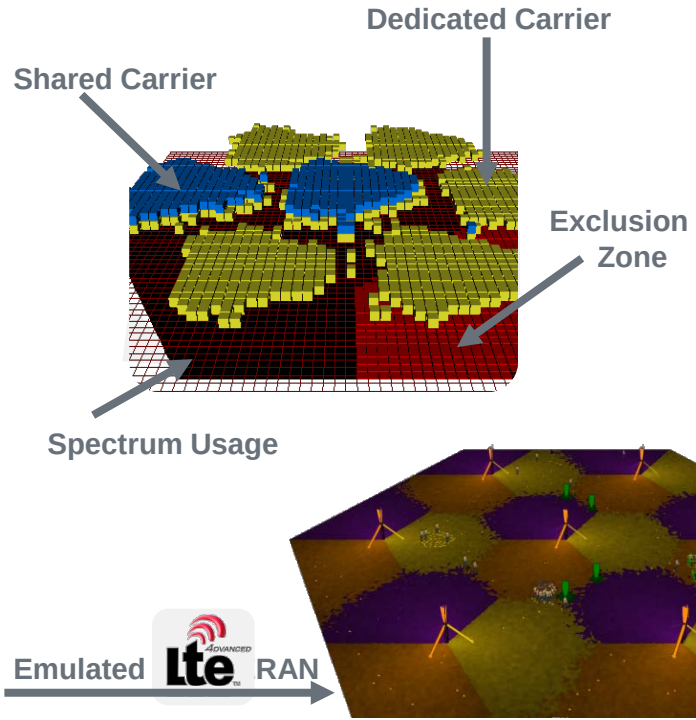
LSA is a complementary solution for mobile network operators to access spectrum when critical incumbent uses cannot be vacated from a frequency band

LSA is dedicated for unlocking bands in a harmonized manner while maintaining flexibility at national level

Thank you

Background material

NSN's LSA demonstration at MWC-2013



François Rancy
– Director of the ITU-R –

- Joint demo with Qualcomm
- Huge attention from all stakeholders

Key players

Demo tool for real time radio access network emulation

SEASON

World 1st on-air LSA at 2.3 GHz trial

Trials built on NSN Flexi (TD-LTE 2.3 GHz) and NetAct core assets

Flexi & NetAct

Trial included full LSA ecosystem in Finland, joint work with TEKES Trial program

LSA Ecosystem

Trial Cost-Terra LSA workshop in Helsinki, Sept. 3rd