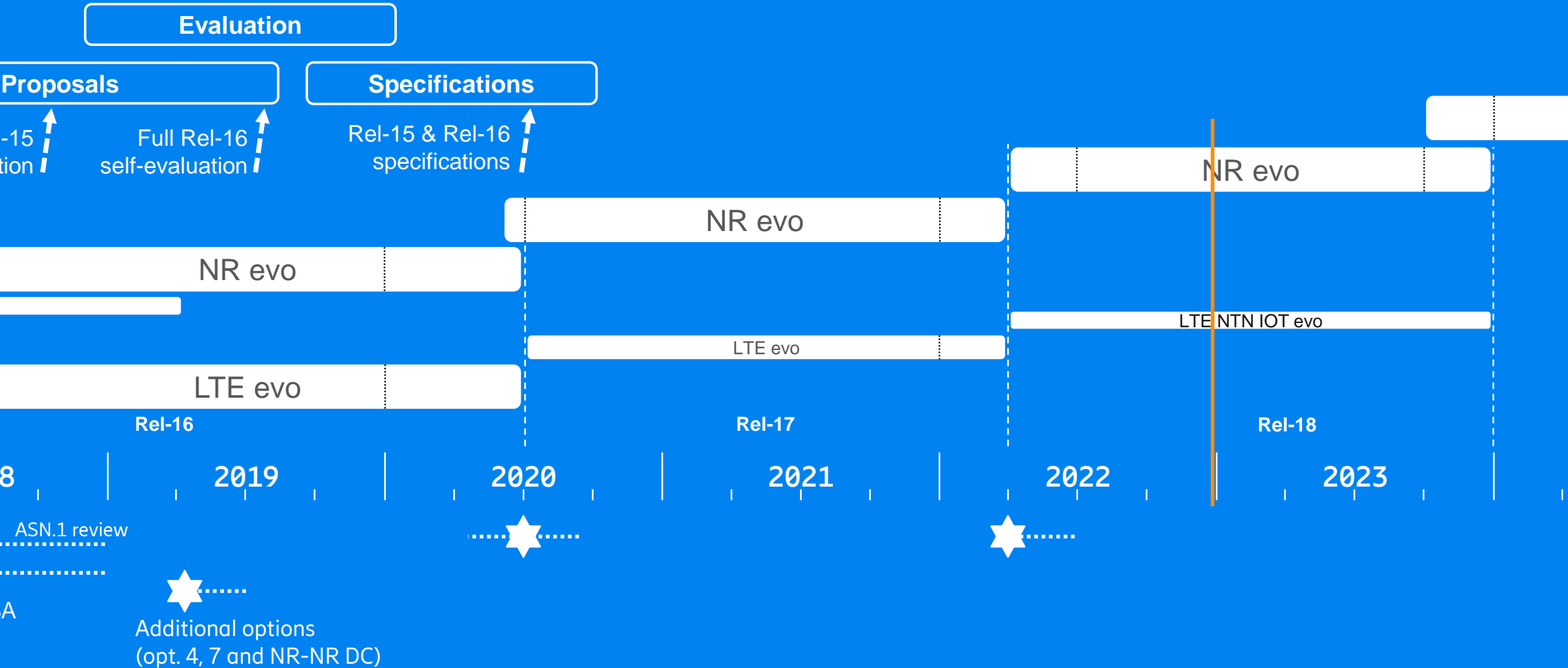




3GPP RAN STATUS

Before RAN#98e

5G timeplan – IMT-2020 and 3GPP RAN



Discussion topics

miscellaneous



ITU

- Updates of Rec. IMT-Advanced and IMT-2020 according to R17
- ITU-R WP4B IMT-2020 SAT
 - RAN SI to submit NR NTN into the IMT-2020 SAT process ([RP-223190](#), [RP-223191](#))

Improved sustainable e-meetings ([RP-222973](#))

- Replace email discussions with GTW
 - More technical conversations through longer GTW sessions, e.g., by 1h
 - More parallel GTW sessions (for official and „offline“ discussions)
 - Selected agenda items
 - No email discussions

Release 19 planning ([RP-222970](#))

- Keep R18 completion dates, delay R19 start by 1 quarter
 - RAN1: 23Q4 / 24Q1; Rest 24Q1 / 2Q42
- Jun.: RAN workshop co-sited with RAN plenary
 - Presentations, discussions and initial grouping can be done in e-meeting
- Sep.: Scoping discussions at RAN plenary
 - Should be F2F, extend plenary to 5 days
- Dec.: Final scoping and package approval
 - Should be F2F, extend plenary to 5 days
- No official email discussion in between
 - Q&A can be done with bilateral emails

Discussion topics

miscellaneous



Rel-17

— General

- Few NBC CRs still (MIMO, >71GHz)

— RAN1

- BWP without restrictions ([RP-223366](#))
 - Existing specs and existing features (still sufficient)

UE capabilities

- Exception for 2 Rx for XR devices on any NR band

Rel-18 SIs transforming to WIs

- Positioning ([RP-223286](#)), especially incl.
 - Hybrid SL+Uu based positioning
 - RAT dependent integrity
 - Enh. for Redcap devices
 - BW aggregation
 - GNSS integrity (LOS information) (WID or TEI)([RP-223278](#), [RP-223281](#))
- NW Energy Savings ([RP-223188](#))
 - CSI-RS measurements and reporting enhancements for dynamic antenna adaptation
 - L1/L2 adaptation of power offset values for dynamic power adaptation
 - Dynamic adaptation of PRACH occasions
 - NW DTX/DRX
- XR ([RP-223367](#)), especially incl.
 - Configured Grant (CG) & BSR enh.
 - DRX enh. (non-integer periodicities)
 - PDCP dropping (of PDU sets)
 - XR awareness & power saving

Discussion topics

Rel-18



RAN1

- RedCap
 - RAN check on ([RP-222828](#), [RP-222829](#)):
 - UE peak data rate reduction and UE BB bandwidth reduction: One should be a prerequisite for the other or both bundled together.
 - Separate early indication for Rel-18 should be supported
 - Support for an additional separate initial BWP for Rel-18 UEs is not needed.
 - Add MBS support for RedCap devices ([RP-223015](#))
- Multicarrier enhancements
 - Work on single-DCI much behind schedule
- Subband full duplex
 - Consider energy efficiency ([RP-223283](#))
 - Consider also other aspects impacting site deployment, e.g., BS size/weight, operator/sector isolation, multi-carrier/band operation, etc.
- Sidelink ([RP-222986](#))
 - Continue to evolve (dynamic) LTE / NR coexistence
 - Start FR2 as SI only in Rel-18
 - Keep CA on hold

RAN2

- UAV ([RP-223253](#))
 - Enhance CHO for drones and add a prohibit timer for measurement reports
 - Control amount of measurement reports
 - UAV identification via PC5

RAN4

- Irregular BW ([RP-223273](#))
 - Deadlock on flexibility to put the NR channel on PRB granularity, i.e., fundamental understanding of SIB1

New Rel-18 Work/Study Items

1/4



RAN1		
— RP-222983	Expanded and Improved NR Positioning	Intel, CATT, Ericsson
— RP-223183	Expanded and Improved NR positioning	CATT
— RP-223278	Positioning integrity related objective for new WID on positioning	Vodafone, Spirent, Ericsson
— RP-223003	Network energy savings for NR (phase 1)	Huawei
Rel-19		
— RP-223118	Study on Channel Modeling design for Sensing Analysis	Nokia
— RP-222953	Integrating sensing with communication in NR	China Telecom
— RP-223114	Study on Integrated Sensing and Communication for NR	vivo
RAN2		
— RP-222936	XR Enhancements for NR	Nokia, Qualcomm
— RP-223022	RAN work related to R18 SA3 WI of RRCResumeRequest protection	Apple, Ericsson, Xiaomi

New Rel-18 Work/Study Items

2/4



RAN3		
— RP-222950	Further Enhancement of Private Network Support for NG-RAN	China Telecom
— RP-223001	NR Timing Resiliency and URLLC enhancements	Nokia
— RP-223268	Further enhancement of RAN Slicing	ZTE
RAN4 (non spectrum)		
— RP-222668	Enhancement of MIMO OTA requirement for NR UEs	CAICT et al.
— RP-222669	Enh. of UE TRP and TRS req. and test methodologies	vivo
LTE		
— RP-223277	Maximum Power Reduction Requirements for LTE Intra-band CA with a CC gap larger than 35 MHz	Vodafone
— RP-223365	MPR requirements for LTE intraband CA with >35 MHz CC gap	Vodafone

New Rel-18 Work/Study Items

3/4



RAN4 - Spectrum

- [RP-223029](#) Low band enhancement for handheld UE OPPO, et al.
- New NR bands
- [RP-222734](#) 900_MHz_LTE_Band Anterix
- [RP-222735](#) 900_MHz_NR_Band Anterix
- [RP-222992](#) Introduction of NR TDD band in 1670 – 1675 MHz Ligado
- [RP-222997](#) Introduction of the Satellite L-/S-Band Globalstar, Apple
- NR baskets
- [RP-223075](#) NR CA band combinations with dual SUL bands CMCC
- [RP-223260](#) 4Rx support for NR FR1 bands ZTE
- [RP-223362](#) HPUE with simultaneous 2Tx and 3Tx Apple
- LTE basket
- [RP-222824](#) LTE bands for UE category M1&M2 and/or NB1&NB2 in Rel-18 Ericsson

New Work/Study Items

4/4



RAN5

- [RP-222948](#) DL interruption for NR and EN-DC band combos to conduct dynamic Tx Switching in UL
- [RP-223064](#) NB-IoT/eMTC core & performance requirements for NTN
- [RP-223246](#) NR and MR-DC measurement gap enhancements
- [RP-223387](#) Increasing UE power high limit for CA and DC

China Telecom
CMCC, MediaTek Inc.
MediaTek Inc.
Qualcomm



NR



NR Rel-18 Work/Study Items



RAN

2022

2023

2024

Q2

Q3

Q4

Q1

Q2

Q3

Q4

Q1

Q2

Q3

Q4

RAN#96

RAN#97

RAN#98

RAN#99

RAN#100

RAN#101

RAN#102

RAN#103

RAN#104

RAN#105

RAN#106

100%

40%

NTN NR – SI on req. for NW-verified UE location

UE support of regionally-defined subsets of an NR band

Ambient IoT

NR Rel-18 Work/Study Items

RAN

- SIs
 - UE support of regionally-defined subsets of an NR band
 - Ambient IoT



NR Rel-17 Work/Study Items



RAN1

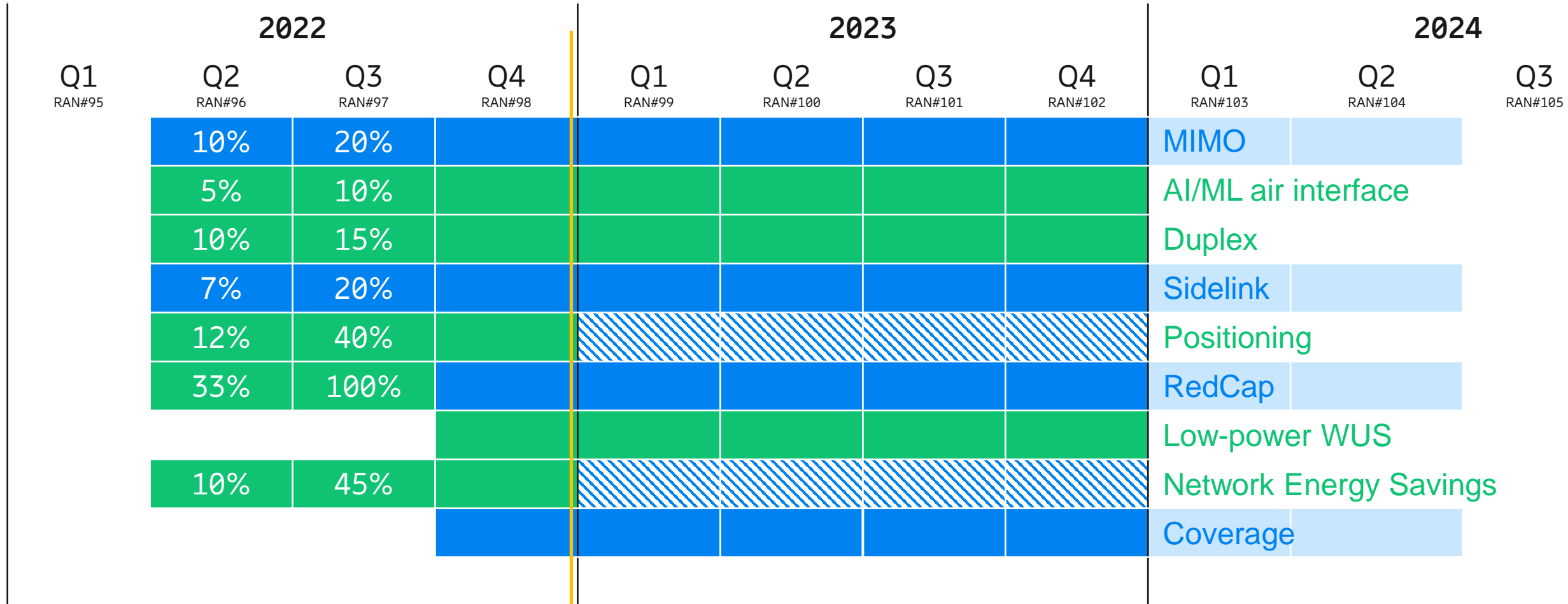
2021			2022				2023		
Q2 RAN#92	Q3 RAN#93	Q4 RAN#94	Q1 RAN#95	Q2 RAN#96	Q3 RAN#97	Q4 RAN#98	Q1 RAN#99	Q2 RAN#100	Q3 RAN#101
50%	70%	80% / 0%	100% / 25%	100% / 60%	100% / 85%		MIMO enh.		
50%	65%	90%	100%				DSS enh.		
45%	63%	80% / 0%	100% / 10%	100% / 95%	100% / 100%		Sidelink enh.		
25%	45%	75% / 0%	90% / 25%	95% / 25%	100% / 60%		NR 52.6 > x > 71 GHz		
35%	50%	75% / 0%	90% / 25%	100% / 50%	100% / 75%		Reduced capability NR devices		
25%	55%	75% / 0%	100% / 0%	100% / 40%	100% / 100%		Positioning enh.		
40%	60%	85% / 0%	100% / 35%	100% / 60%	100% / 90%		Coverage enh.		
60%	70%	100%					XR		

NR Rel-18 Work/Study Items

1/2



RAN1



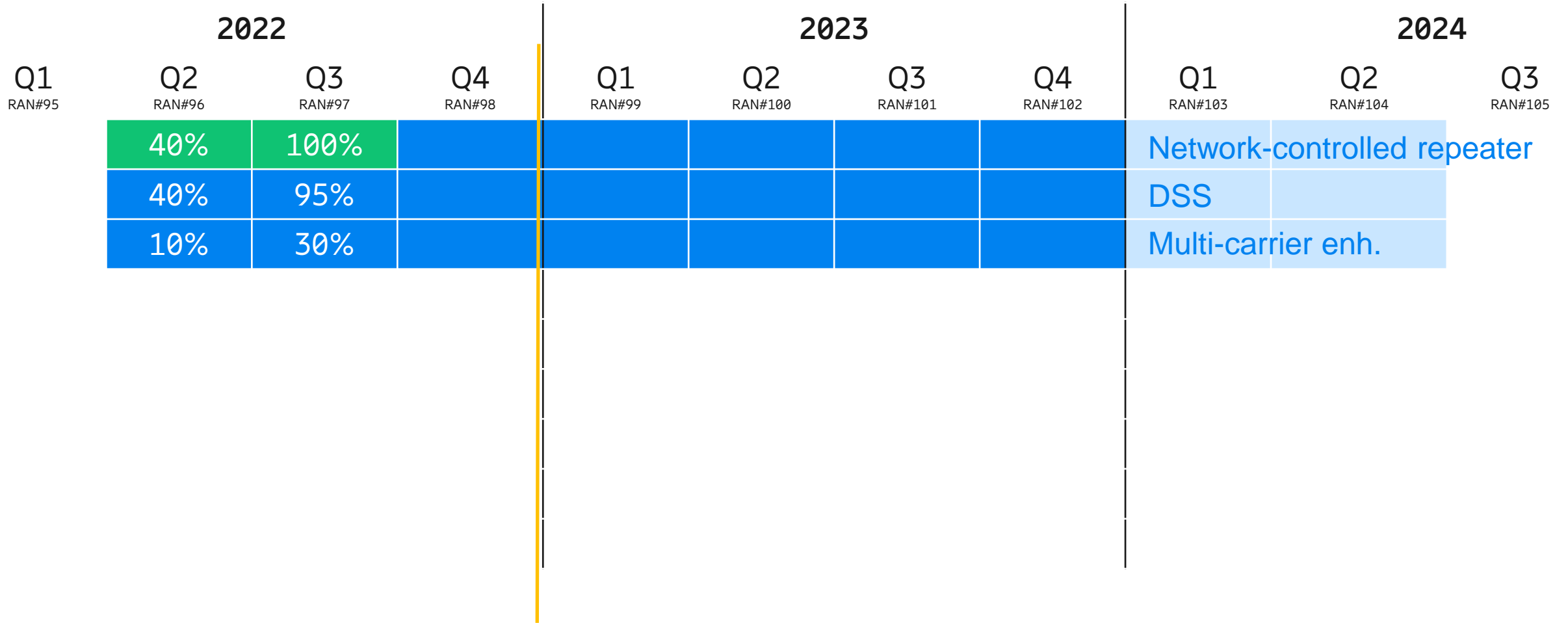
Legend: ■ X% = core/perf WI ■ X% = Study Item ■ X% = on hold
■ X% = perf. WI ▨ = expected WI

NR Rel-18 Work/Study Items

2/2



RAN1



RAN1-led NR Work/Study Items



- SIs (Rel-18)
 - Study on expanded and improved NR positioning
 - Study on evolution of NR duplex operation
 - Study on network energy savings for NR
 - Study on AI/ML for NR air interface
 - Study on low-power wake-up signal and receiver
- WIs (Rel-18)
 - Enh. of NR Dynamic spectrum sharing (DSS)
 - Multi-carrier enhancements for NR
 - Further NR coverage enhancements
 - NR MIMO evolution for downlink and uplink
 - Further enhancements for NR sidelink
 - Enhanced support of RedCap devices
 - Network-controlled Repeaters

NR Rel-17 Work/Study Items



RAN2

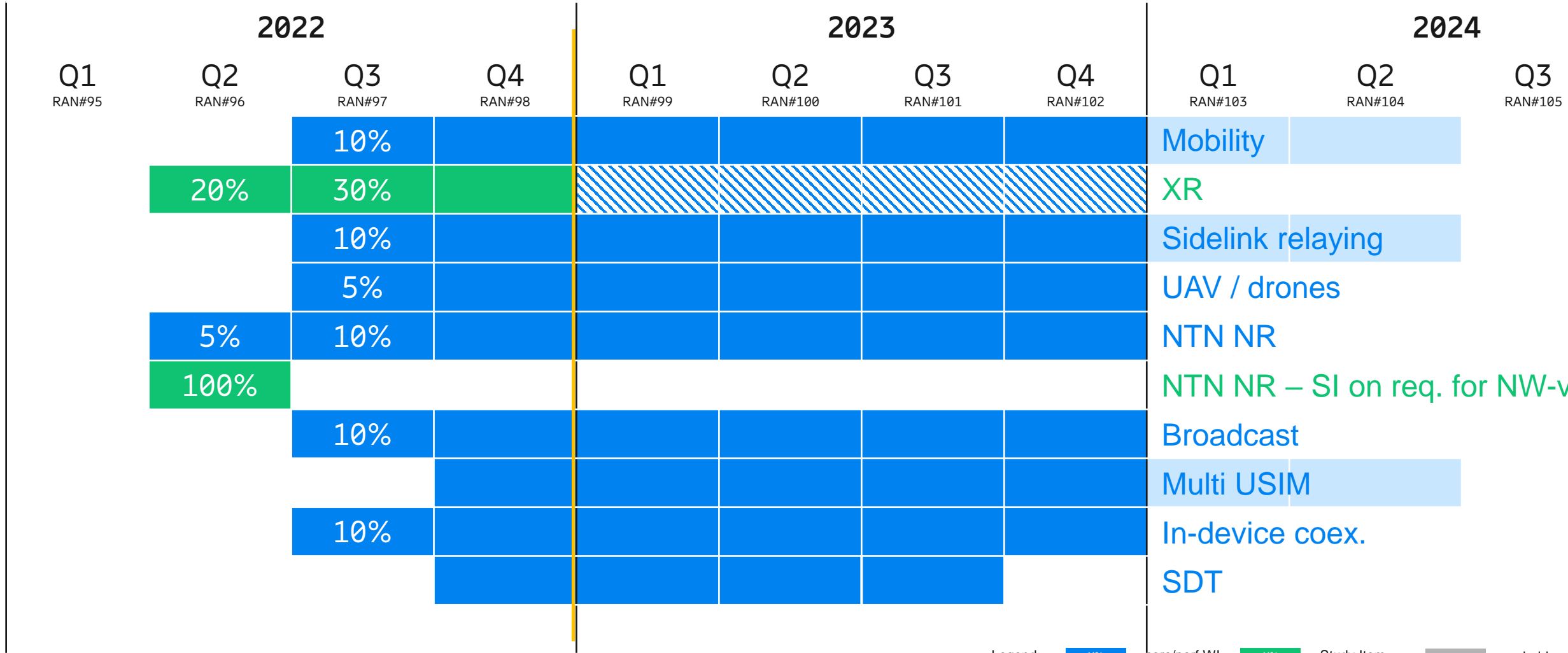
	2021		2022				2023			
	Q3 RAN#93	Q4 RAN#94	Q1 RAN#95	Q2 RAN#96	Q3 RAN#97	Q4 RAN#98	Q1 RAN#99	Q2 RAN#100	Q3 RAN#101	Q4 RAN#102
	60%	80%	100%							
	65%	80% / 0%	100% / 0%	100% / 30%	100% / 100%					
	65%	75% / 0%	90% / 0%	100% / 20%	100% / 35%					
	70%	85% / 0%	100% / 35%	100% / 65%	100% / 100%					
	55%	65% / 0%	100% / 0%	100% / 50%	100% / 85%					
	55%	75%	100%							
	41%	65% / 0%	95% / 20%	100% / 40%	100% / 100%					
	50%	60% / 0%	100% / 0%	100% / 35%	100% / 70%					
	55%	70% / 0%	100% / 0%	100% / 95%	100% / 100%					
	50%	65%	95%	100%						
	0%	0%	100%							

- Multicast and Broadcast Services
- Multi-Radio DC enh.
- Non-terrestrial networks
- UE power saving enh.
- IIoT and URLLC enh.
- Multi SIM
- IAB enh.
- Small Data transmission
- Sidelink relaying
- RAN slicing
- UDC

Legend: X% = core/perf WI X% = Study Item X% = on hold
X% = perf. WI X% = expceted WI

NR Rel-18 Work/Study Items

RAN2



Legend: ■ X% = core/perf WI ■ X% = Study Item ■ X% = on hold
■ X% = perf. WI ▨ = expceted WI

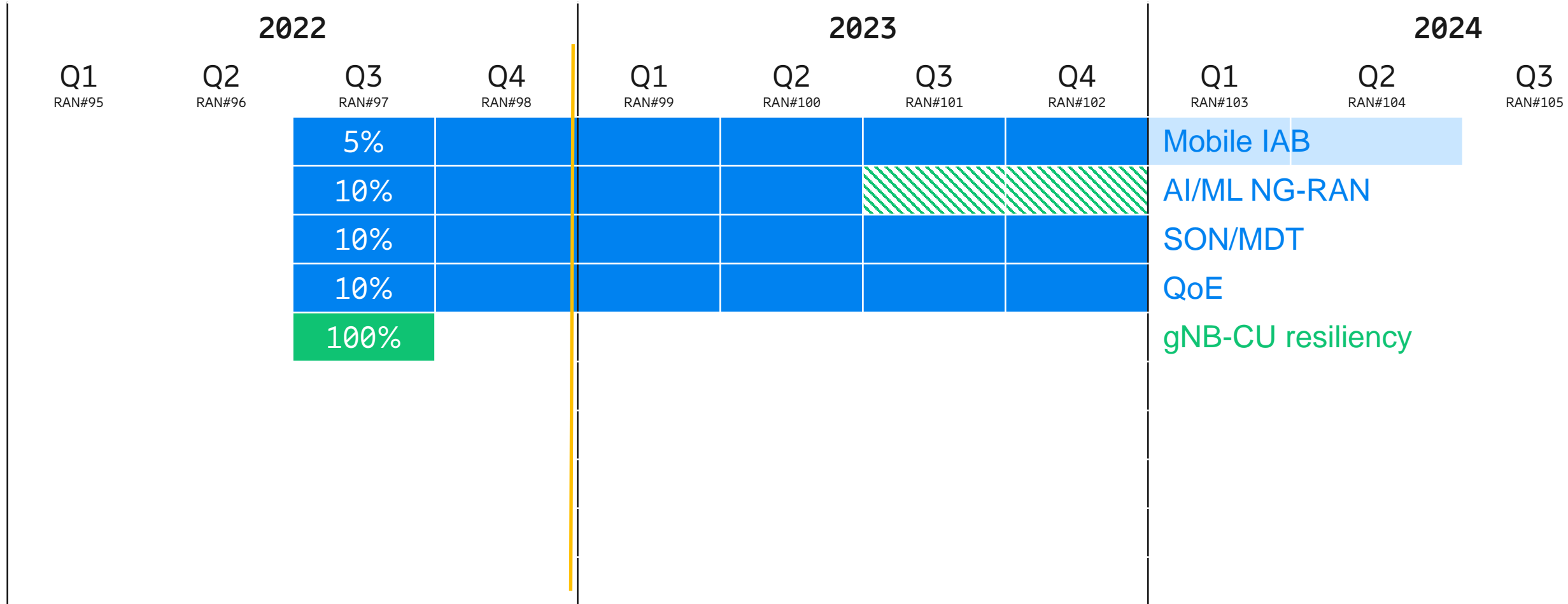
RAN2-led NR Work/Study Items



- SIs (Rel-18)
 - Study on XR (Extended Reality) enh. for NR
- WIs (Rel-18)
 - Further NR mobility enhancements
 - Enh. of NR Multicast and Broadcast Services
 - Mobile Terminated Small Data Transmission
 - Dual Tx/Rx Multi-SIM for NR
 - Enhanced NR Sidelink Relay
 - In-Device Co-existence enh. for NR / MR-DC
 - NR support for UAV
 - NR NTN enhancements

NR Rel-18 Work/Study Items

RAN3



RAN3-led NR Work/Study Items



- WIs (Rel-18)
 - Further enh. of data collection for SON/MDT in NR and EN-DC
 - Enh. on NR QoE management and optimizations for diverse services
 - Mobile IAB for NR
 - AI/ML for NG-RAN

NR Rel-17 Work/Study Items

1/2



RAN4

2022					
Q3 RAN#93	Q4 RAN#94	Q1 RAN#95	Q2 RAN#96	Q3 RAN#97	Q4 RAN#98
100%	75%	90%	100%		
100% / 20%	90% / 25%	95% / 35%	100% / 55%	100% / 100%	
100%	80% / 0%	100% / 0%	100% / 90%	100% / 100%	
100% / 25%	75% / 25%	75% / 25%	100% / 80%	100% / 100%	
100%	75% / 0%	100% / 0%	100% / 50%	100% / 100%	
100%	65% / 0%	100% / 0%	100% / 40%	100% / 100%	
105%	60%	60%** / 85%	100% / 95%	100% / 100%	
100% / 50%	85% / 60%	100% / 70%	100% / 85%	100% / 100%	
100% / 20%	70% / 30%	100% / 50%	100% / 80%	100% / 100%	
100%	99% / 30%	100% / 70%	100% / 100%		
100%	75% / 0%	100% / 0%	100% / 30%	100% / 80%	

- Enhanced test methods for FR2*
- MIMO OTA req. for NR UEs
- RF FR1 enh.
- RF FR2 enh.
- Further RRM enh.
- Measurement gap enh.
- Demod enh.
- NR high speed train enh. FR1
- NR high speed train enh. FR2
- DL 1024QAM for FR1
- NR repeaters

Legend: X% = core/perf WI X% = Study Item X% = on hold
X% = perf. WI X% = expceted WI

NR Rel-17 Work/Study Items 2/2



RAN4

2022					
Q3 RAN#93	Q4 RAN#94	Q1 RAN#95	Q2 RAN#96	Q3 RAN#97	Q4 RAN#98
75%	85%	90%	100%		
20%	40% / 0%	100% / 20%	100% / 65%	100% / 100%	
30%	50%	100%			
50% / 10%	65% / 50%	100% / 100%			

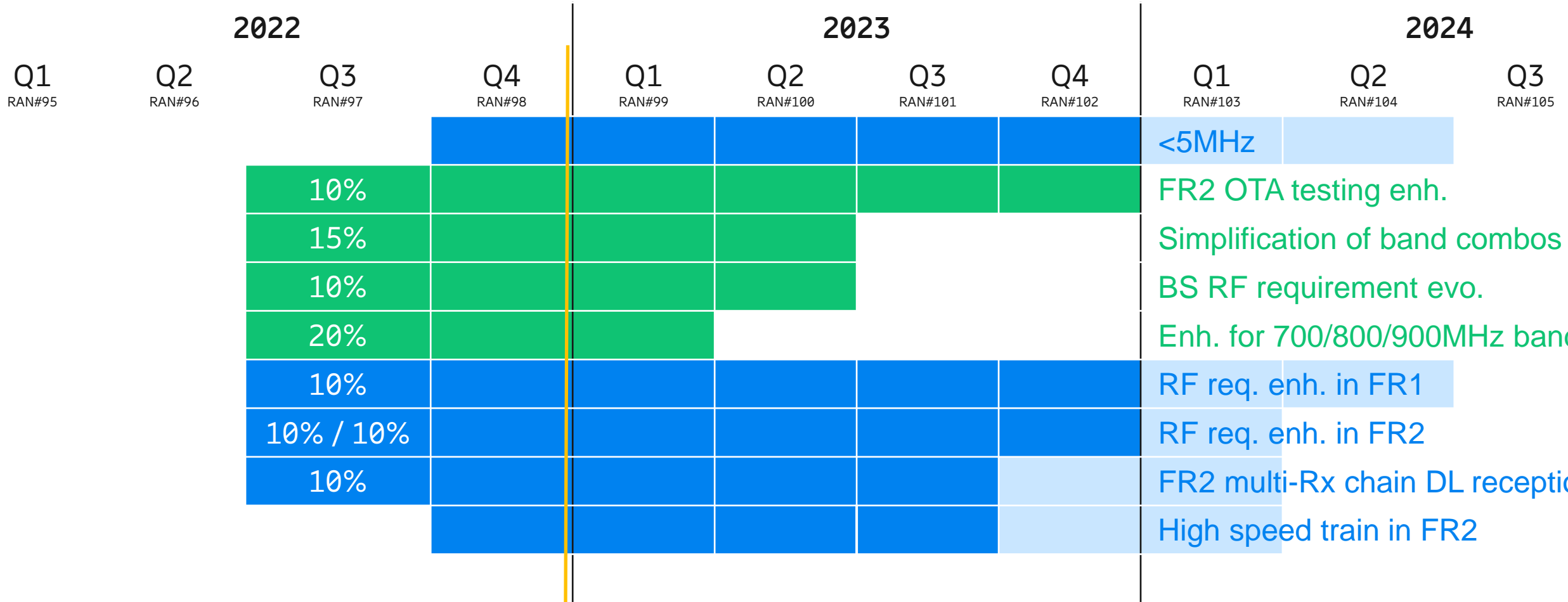
Bandwidth combination set 4 (BCS4)
 TRP and TRS for FR1
 pi/2 BPSK
 UE RF req. for TxD for NR

NR Rel-18 Work/Study Items

1/2



RAN4

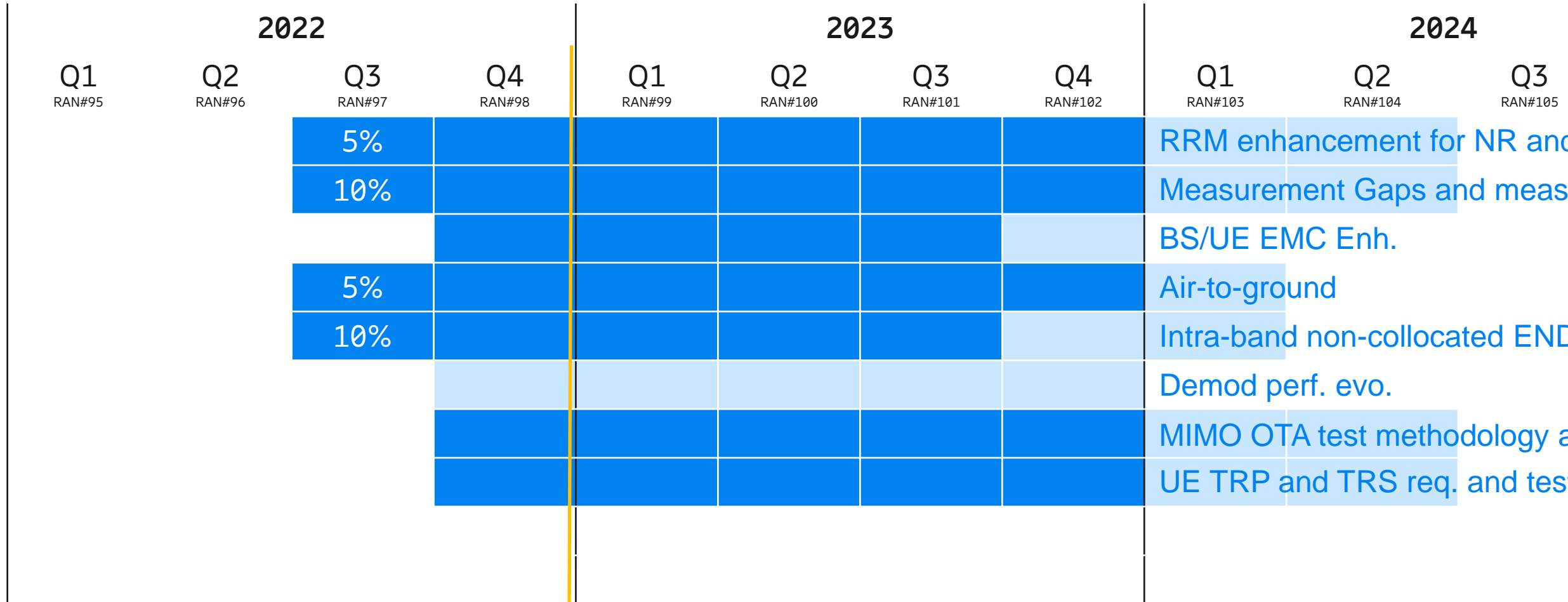


NR Rel-18 Work/Study Items

2/2



RAN4



RRM enhancement for NR and
 Measurement Gaps and meas
 BS/UE EMC Enh.
 Air-to-ground
 Intra-band non-collocated EN
 Demod perf. evo.
 MIMO OTA test methodology a
 UE TRP and TRS req. and tes

RAN4-led NR Work/Study Items



- SI (Rel-18)
 - Study on NR FR2 OTA testing enhancements
 - Study on simplification of band combination specification for NR and LTE
 - Study on NR base station (BS) RF requirement evolution
 - Study on enhancement for 700/800/900MHz band combos
- WIs (Rel-18)
 - NR support for dedicated spectrum less than 5MHz for FR1
 - RF requirements enhancement for NR and EN-DC in FR1
 - RF requirements enhancement for FR2, Phase 3
 - Requirement for NR FR2 multi-Rx chain DL reception
- WIs (Rel-18) cont'd
 - Enhanced NR support for high-speed train scenario in FR2
 - Even Further RRM enhancement for NR and MR-DC
 - Further enhancements on NR and MR-DC measurement gaps and measurements without gaps
 - BS/UE EMC enhancements for NR and LTE
 - Air-to-ground network for NR
 - Support of intra-band non-collocated EN-DC/NR-CA deployment
 - NR demodulation perf. evolution
 - MIMO OTA test methodology and req.
 - Enh. of UE TRP and TRS req. and test methodologies



LTE



LTE Rel-17 Work/Study Items

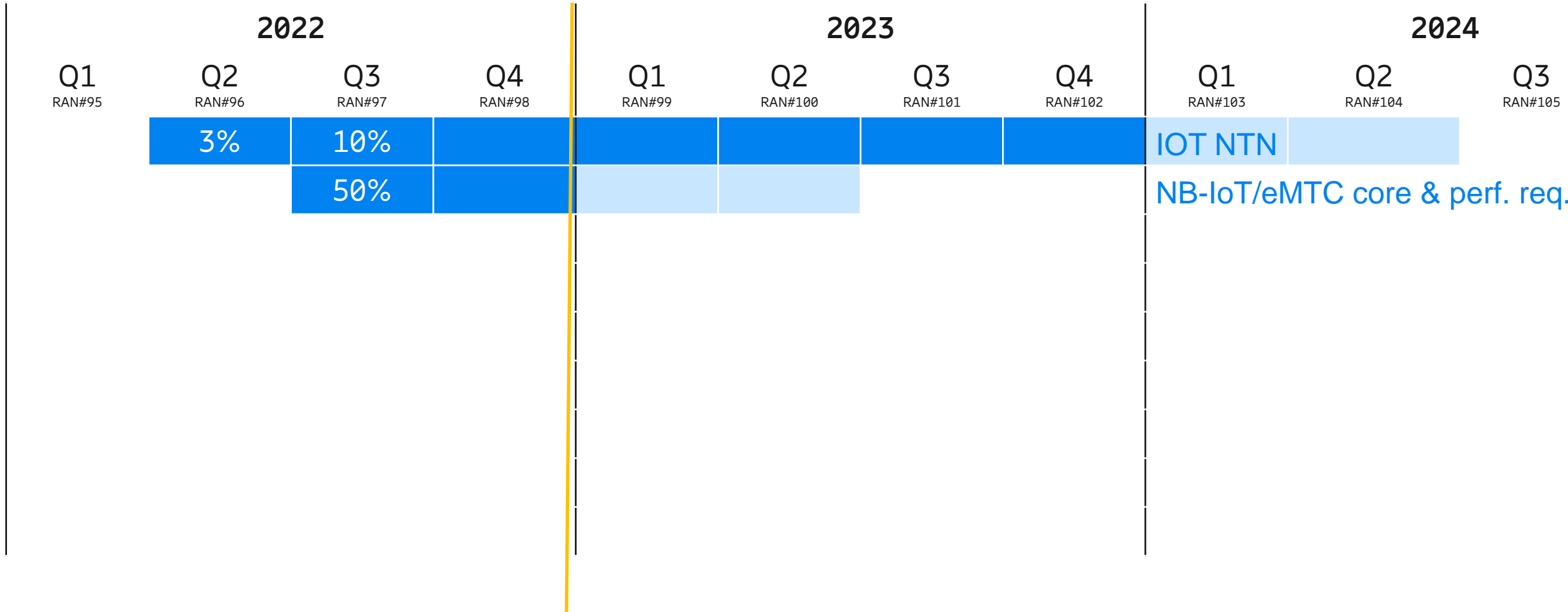
RAN1/RAN2/RAN3/RAN4



2021			2022				
Q2 RAN#92	Q3 RAN#93	Q4 RAN#94	Q1 RAN#95	Q2 RAN#96	Q3 RAN#97	Q4 RAN#98	
55%	65%	85% / 0%	100% / 30%	100% / 70%	100% / 100%	Enh. for NB-IoT and LTE-M NB-IOT/eMTC over NTN Enh. eNB architecture evo. LTE based 5G broadcast – part 1	
100%	30%	75%	99%	100%			
60%	99%	99%	100%				
0%	90%	90%	100%				

LTE Rel-18 Work/Study Items

RAN2/RAN4



LTE Work/Study Items



RAN2

- IoT NTN enhancements

RAN4

- NB-IoT/eMTC core & perf. requirements for NTN



HSPA & GSM



HSPA & GSM

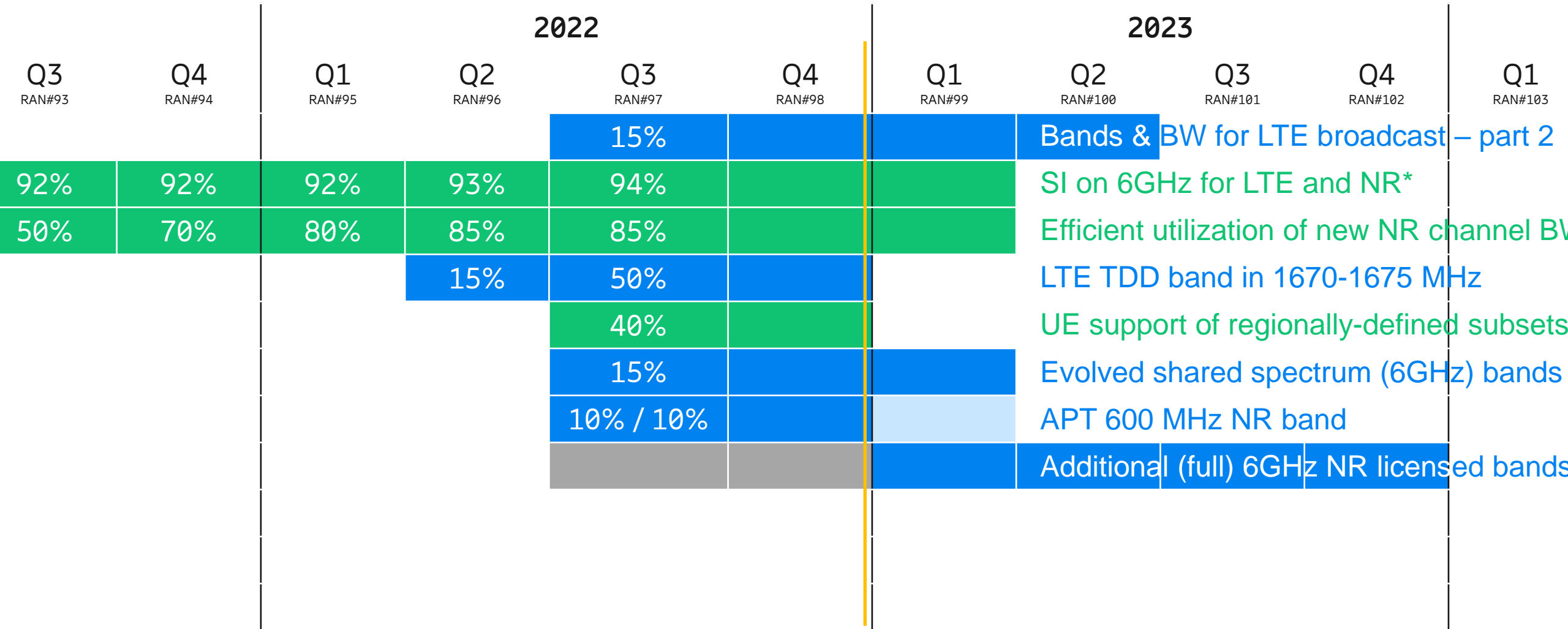


- No new or ongoing Work or Study Items
- No tdocs



Spectrum

Spectrum related (Rel-18)



Spectrum related Work/Study Items

RAN4



- SIs (Rel-18)
 - Study on 6 GHz for LTE and NR (RAN led SI)
 - Efficient utilization of new NR channel BWs
- WI (Rel-18)
 - New bands and bandwidth allocation for LTE based 5G terrestrial broadcast – part 2
 - Intro. of LTE TDD band in 1670-1675 MHz
 - Intro. of evolved shared spectrum bands
 - APT 600 MHz NR band
 - Intro. of additional 6GHz NR licensed bands



www.ericsson.com