5G promises for Broadcasting

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Brief overview of IRT

- Research and competence centre of the public broadcasting corporations in Germany (ARD, ZDF, Deutschlandradio), Austria (ORF) and Switzerland (SRG/SSR)
- IRT's mission is to adjust strategically the broadcast idea to new market environments and needs.
- Topics: new AV formats, metadata, cloud production, cross-media production technologies, all IP, IP distribution, 5G, security, regulation and network planning, multiplatform and smart data
- Location: Munich, Germany (BR TV production facility Freimann)
- Founded in 1956
- Approx. 120 employees

Our Mission & Services

Supporting Broadcasting and related services

Technical Implementation

Applied Research

Interoperability

Services

Prototyping and Pilots

Standardization

Technique Evaluation

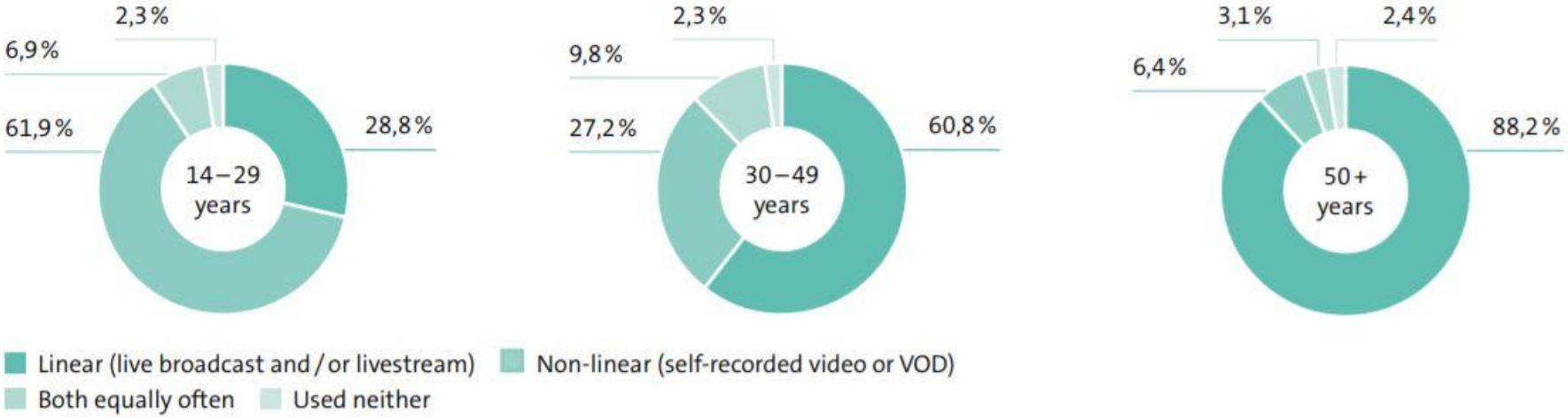
Technology Scout

Know-How Transfer

As a research and innovation center for audio-visual technology, we research, observe and develop new technologies with the aim of strategically adapting the broadcasting idea to new market environments and needs.

Why 5G is related to broadcasters?

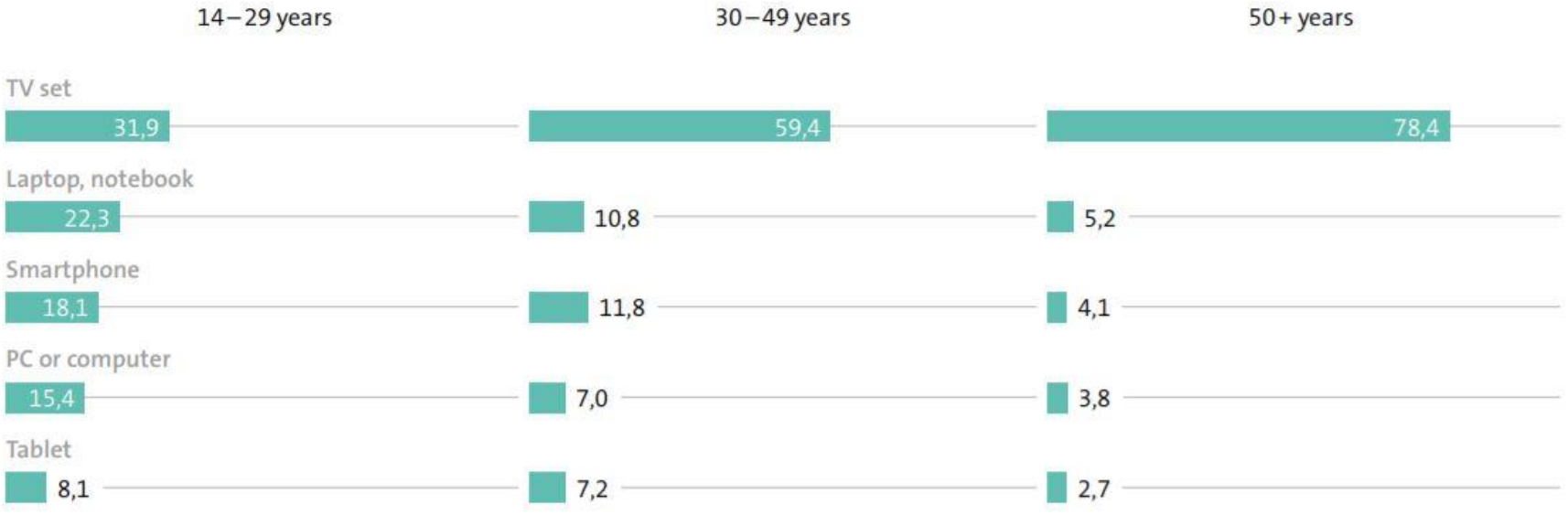
Linear vs non-linear use of video, by age cohort (in per cent)



Source: Kantar TNS; Basis: 14.580 million persons aged 14–29; 21.016 million persons aged 30–49; 34.498 million persons 50 and over.

Why 5G is related to broadcasters?

Most important device for video, by age cohort (in per cent)



Source: Kantar TNS; Basis: 14.580 million persons aged 14–29; 21.016 million persons aged 30–49; 34.498 million persons 50 and over.

Why 5G is related to broadcasters?

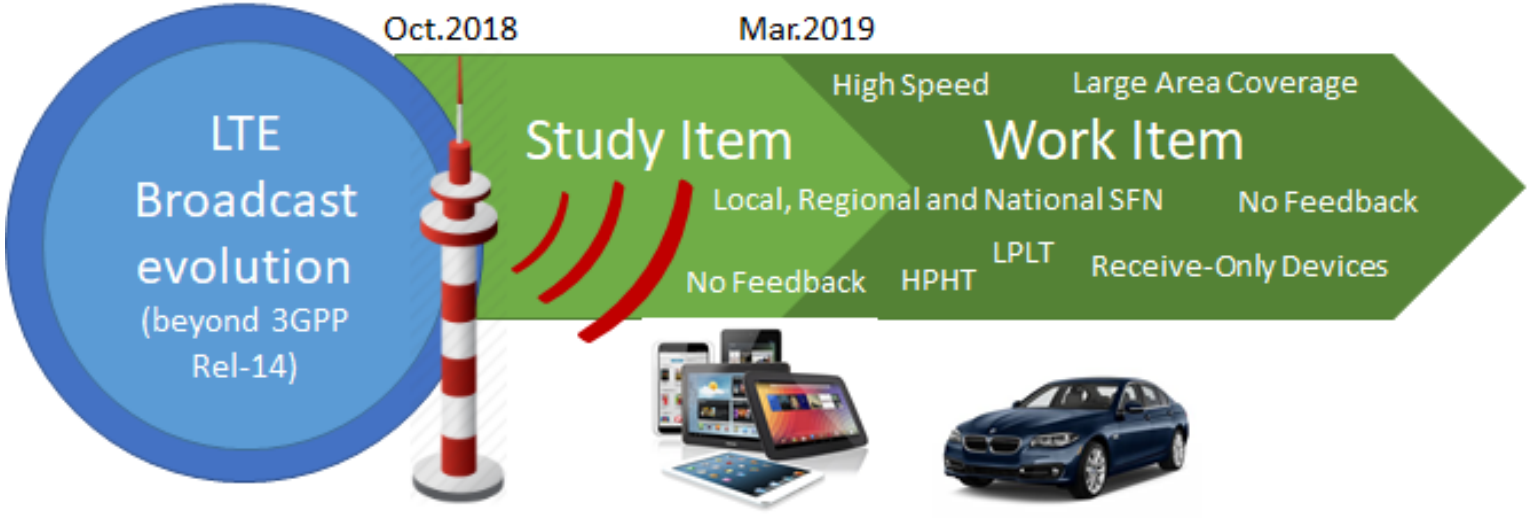
- User behavior and expectations change massively
- Video-on-demand usage is increasing significantly
- Relevance of mobile and portable devices for the use of media is increasing
- In the future: autonomous driving ... a lot of time for media
- Consequences for broadcasting:
  - everything, everywhere, always, on every device
  - Recommendations, personalization
  - Merging of linear and nonlinear
  - Access completely transparent to users

National and international research cooperations

Media Road	Network for European media industry
HRADIO	Hybrid Radio over IP
ImAc	Accessibility to immersive content
Dwerft2	Linked metadata for media
5G TODAY	**5G distribution in Bavaria**
5G XCAST	**5G in distribution**
5G Media	5G in media production
5G-VICTORI	CDN
5G-SOLUTIONS	Streaming, Local Caching
5G-VIRTUOSA	All-IP

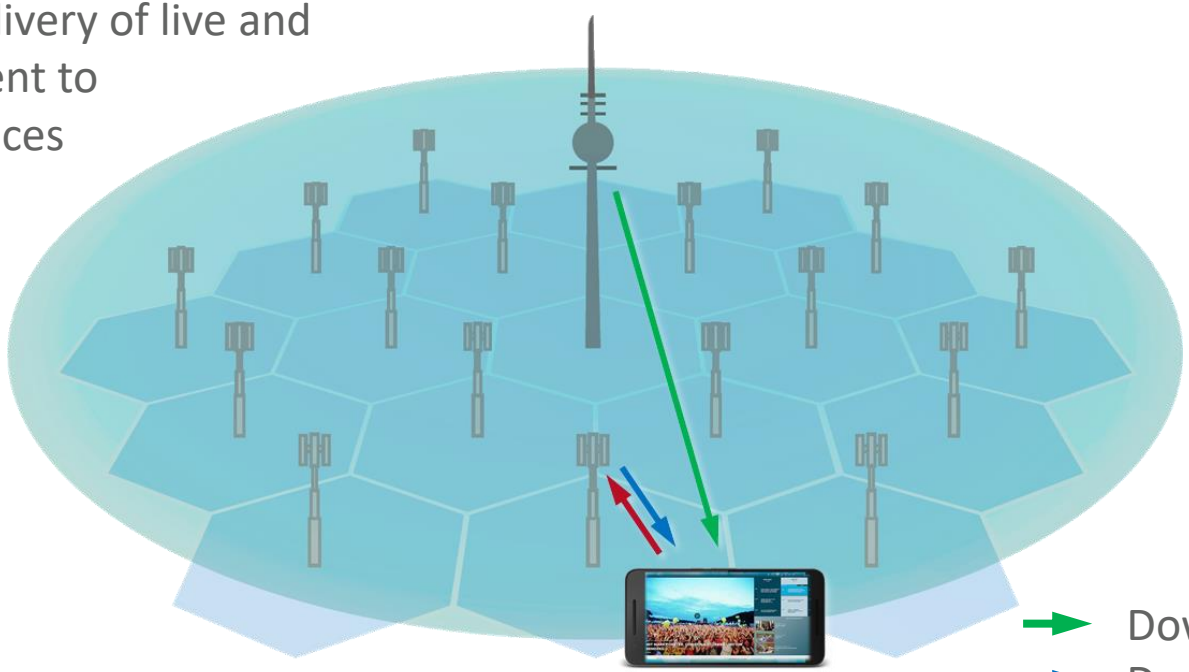
IRT contribution in 3GPP

IRT, in collaboration with the EBU, SWR and BBC, is engaged in the study to evaluate and potentially enhance LTE-based Terrestrial Broadcasting towards 5G.



Next generation of broadcast distribution

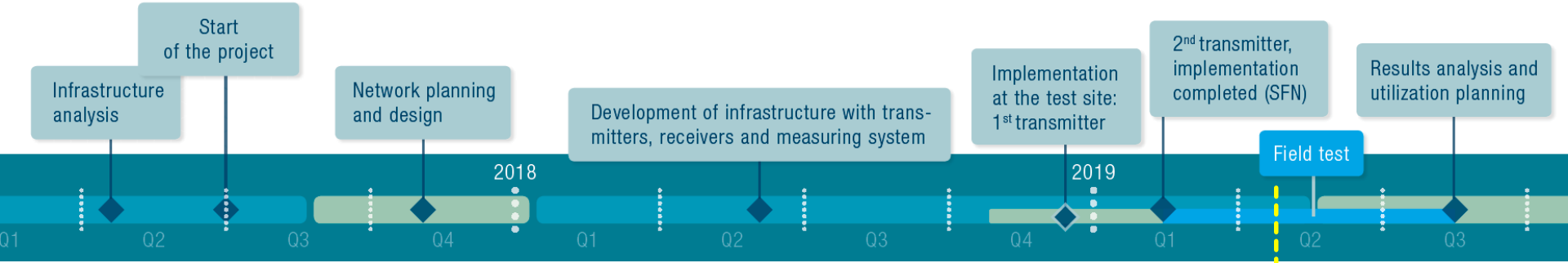
Efficient delivery of live and linear content to mobile devices



Downlink: Broadcast
Downlink: Unicast
Uplink

Introduction

- Research and implementation of the FeMBMS specification for the large-scale transmission of media content in broadcast mode based on mobile technology
- Co-funded by the Bavarian Research Foundation
- Duration 28 months (1 July 2017 to 31 October 2019)



Wendelstein

Site height: 1838 m a.s.l, ant. height 53 m

- UHF antenna covered by GRP cylinder because of extreme icing in winter
- Vertically polarized

SFN

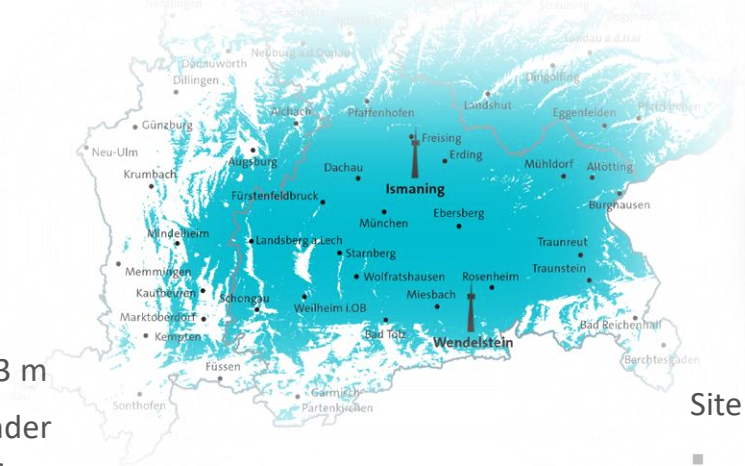
UHF Channel 56 (750 – 758 MHz)

Distance between transmitters: ca. 60 km

5 MHz Channel Width

100 kW ERP each transmitter

FeMBMS according to 3GPP Release 14



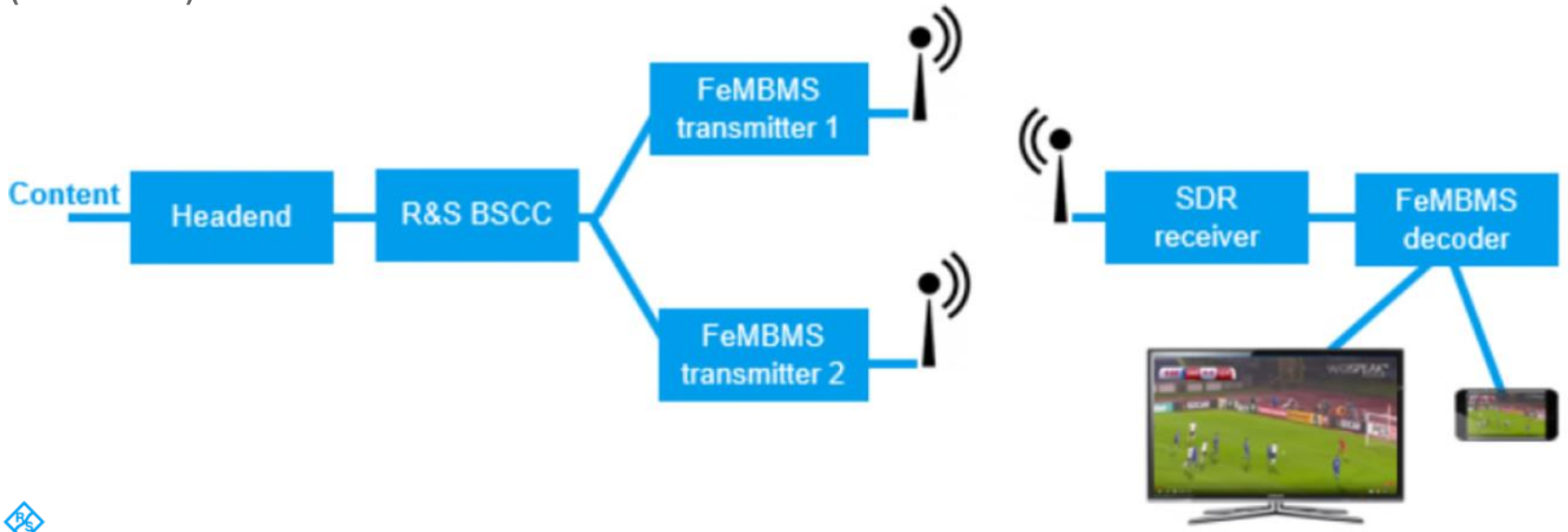
Ismaning

Site height 483 m a.s.l, ant. height 215 m

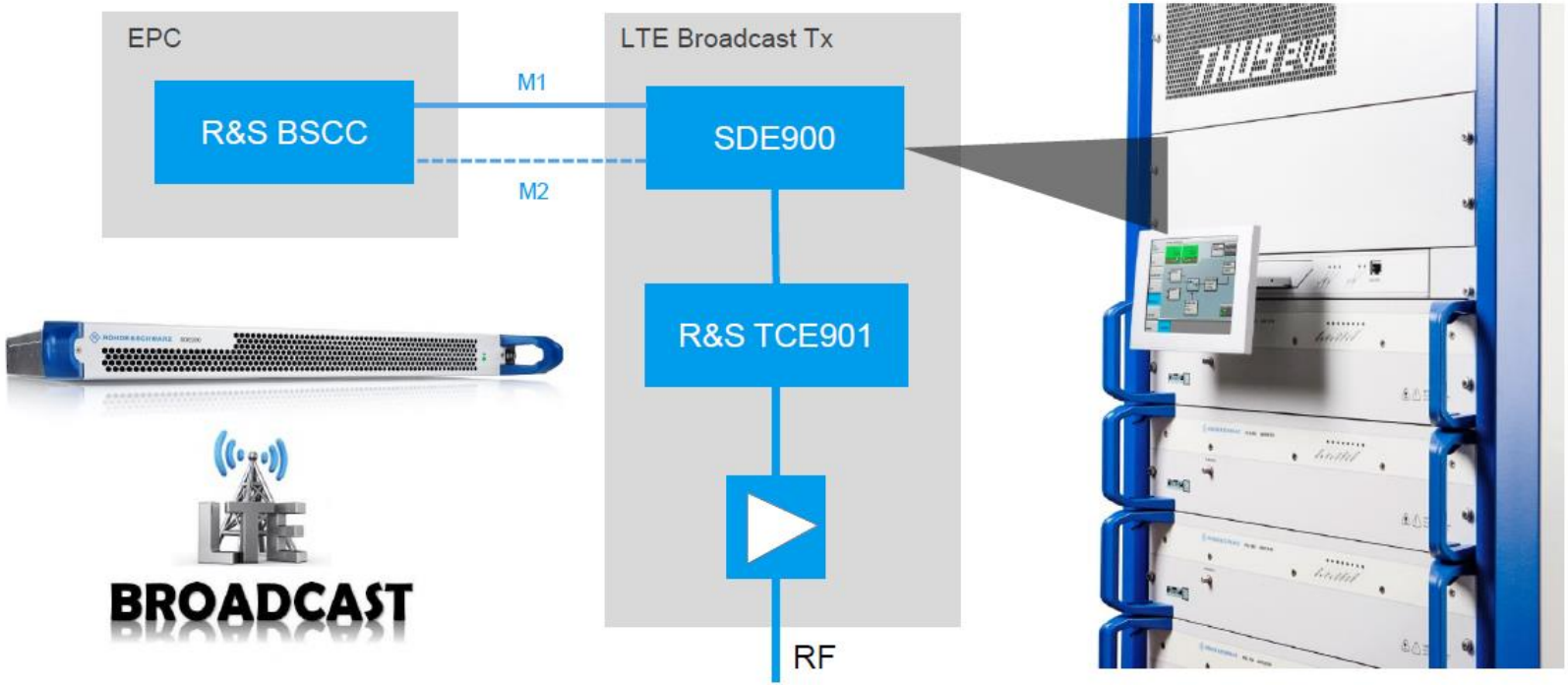
- UHF antenna on top-mount spine
- Polarisation switchable, H / V / RHC for Tx diversity trials

LTE Broadcast (FeMBMS) SFN transmission

5G Today has successfully realized the world's first dynamic single-frequency network (SFN) in combination with Further evolved Multimedia Broadcast Multicast Service (FeMBMS)



HPHT LTE Broadcast – How to make it real?



ROHDE&SCHWARZ

HPHT LTE Broadcast – How to make it real?

Ismaning 5G UHF antenna installation impressions

Polarization Switching Unit
in Tx room

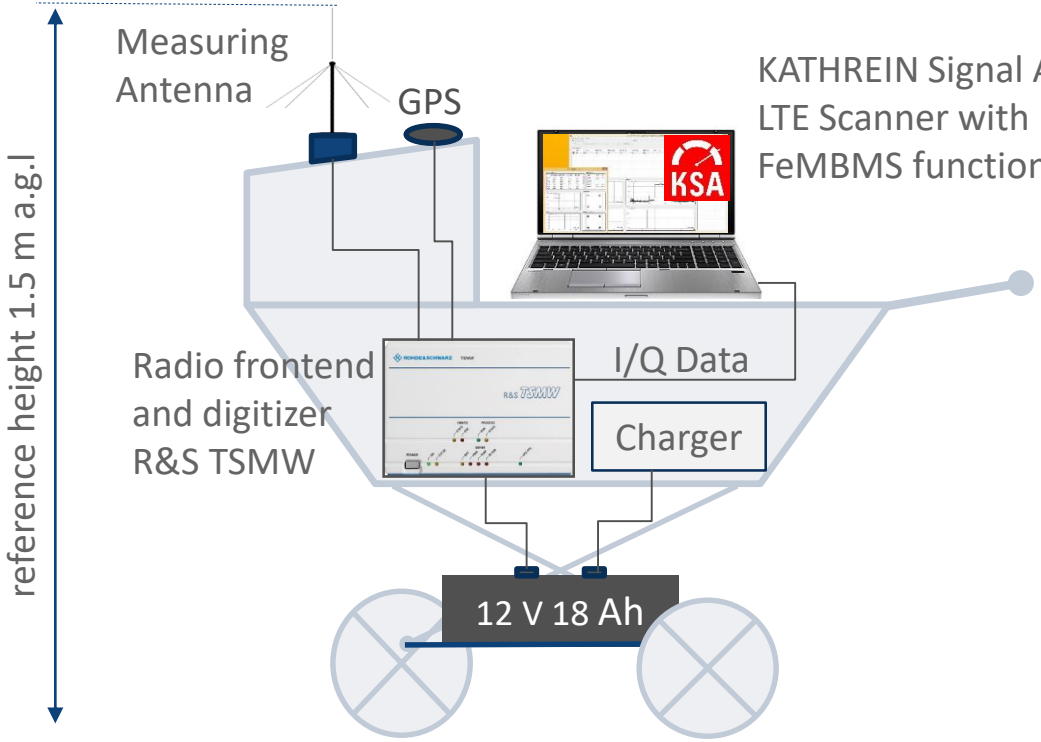
370 m of RF-cable 4“
installed in one run

New UHF Antenna System for
Tx diversity, on 215 m height a.g.l

KATHREIN

HPHT LTE Broadcast – How to make it real?

Measurement system for portable outdoor 5G Broadcast



KATHREIN

5G-Today in a nutshell

- FeMBMS becomes reality – implementation and evaluation of a new broadcast/mobile standard
- Contributions to 3GPP standardisation
- Technical studies: Broadcast coverage for smartphones and tablets
- Definition of requirements for future attractive business models for mobile and broadcasting industry as well as other verticals

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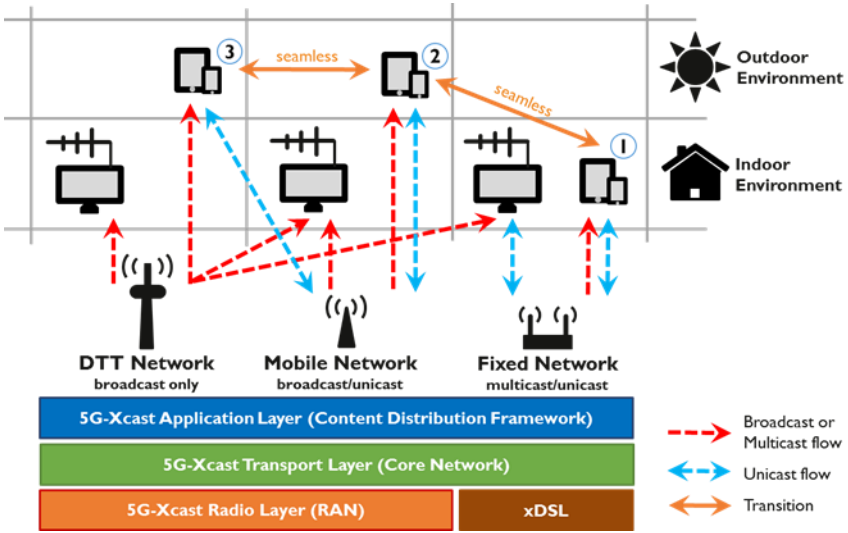
Global Media Delivery 5G Architecture

The 5G-PPP 5G-Xcast Project has designed a global approach with a converged architecture for Multicast/Broadcast and Terrestrial Broadcast



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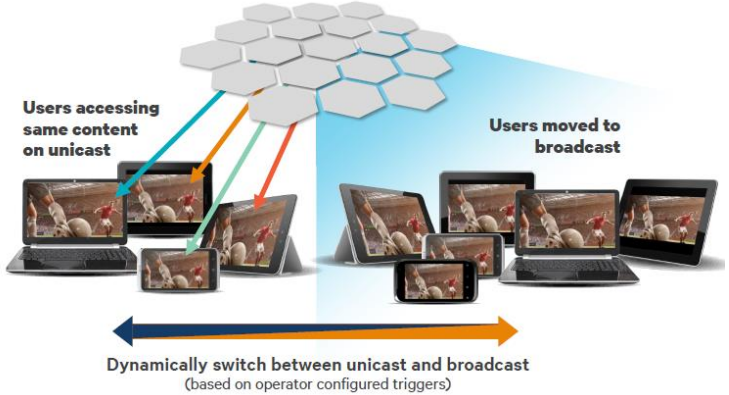
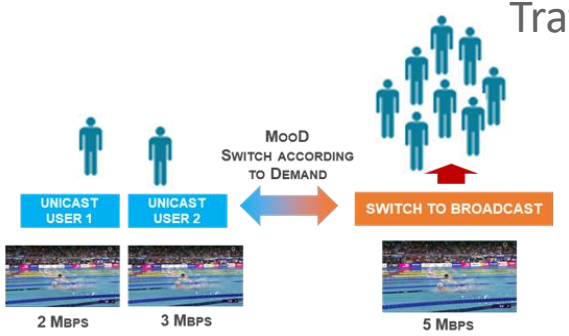
Multicast/Broadcast Mixed Mode

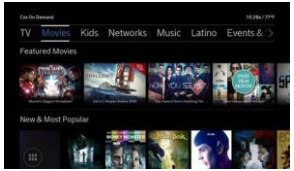
Dynamic switching between Unicast and Multicast/Broadcast



According to Network conditions
Traffic Demand



Stable Quality of Experience
Network Off-Loading



Applicability to Live Video Streaming over Mobile Networks (OTT)

Conclusion for 5G Broadcasting

- 5G and broadcast: a win-win combination
  - From 3GPP Release 16 onwards, this technology will be widely known as 5G Broadcast
- 5G Broadcast: low-cost, nationwide, perfectly suited to mobile usage
- 5G broadcast: Germany a pioneer for HPHT
- Broadcasters are interested
- Activities now required:
  - Further technical refinements and evaluation
  - Extensive field tests in various countries
  - Standardisation and regulation
  - Preservation of UHF TV broadcasting spectrum

Thank you for your attention.

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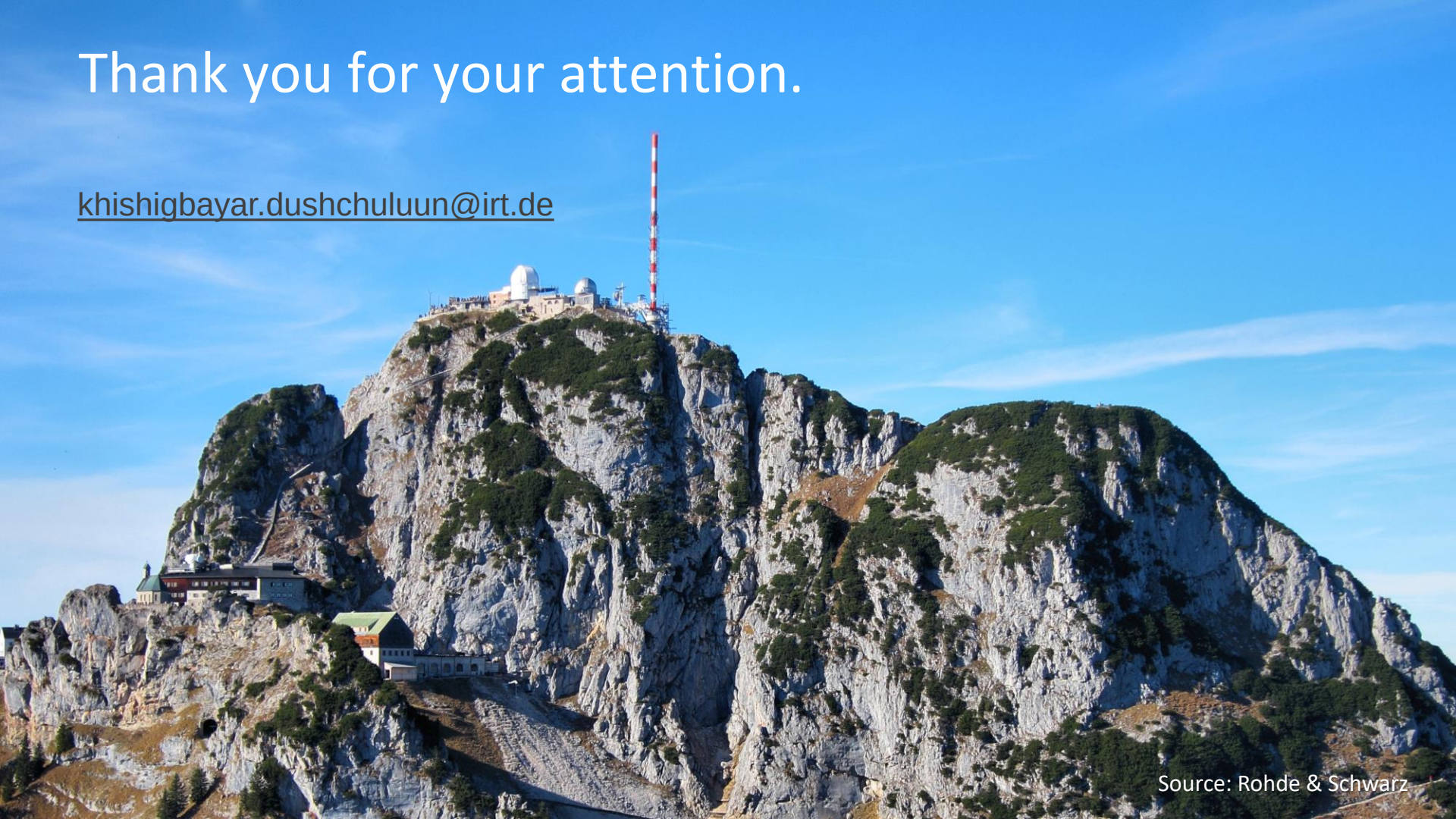

Source: Rohde & Schwarz