BES EXPO 2018
Non-Linear Broadcasting-Technology
& Business Models

And the Disruption of 5G in Broadcasting

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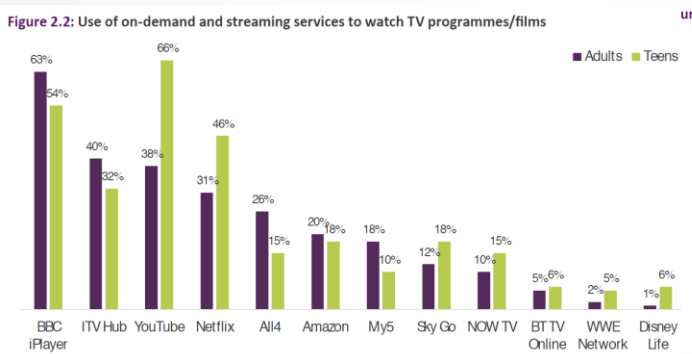
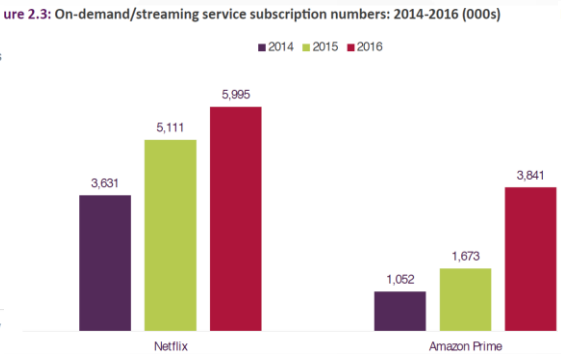
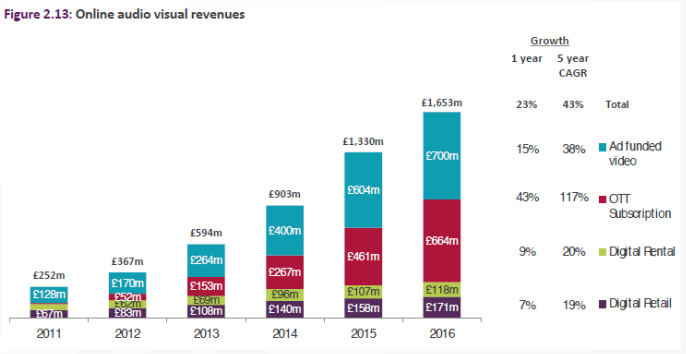
Non-Linear Broadcasting

- **Linear TV audiences are decreasing**
  - Younger audiences shifting to online demand
    - Time spent by 16-24 years old on BBC linear channels fell by 32% from 2012 - EBU Forecast 2017
  - Subscriptions to online TV platforms increasing, both premium and free content



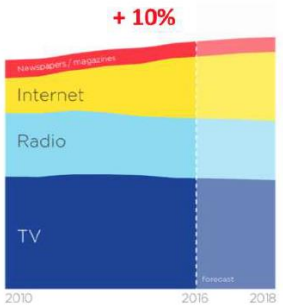


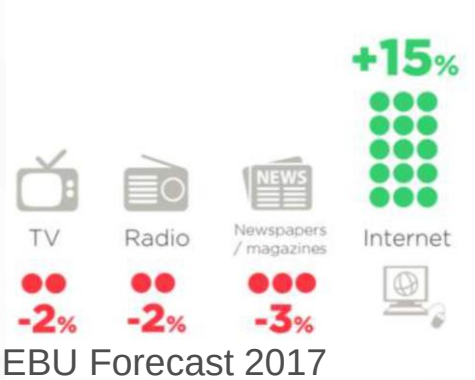


Ofcom, Communications Market Report 2017
https://www.ofcom.org.uk/__data/assets/pdf_file/0017/105074/cmr-2017-uk.pdf

Linear TV remains Relevant

- **The shift to online TV is happening slowly**
  - People are spending more and more time on media
  - The growth of Internet time has limited impact on media consumption
- **Online viewers are "live TV hungry"**
  - Netflix users dedicate two thirds on their daily viewing to linear TV
- **Particularly important for Public Service Media with coverage and cultural obligations**
- **Major sport events strong use case**





P. MacAvoc, EBU Forecast 2017

TV User Experience

- **TV marketplace is actually thriving and user experience is continuously evolving thanks to new technology improvements and online Internet delivery**
  - QoS/QoE better than ever and improving
  - Choice of content largest than ever and increasing
    - More money than ever spent on Premium content (10M$/h)
  - Personalization: right content for the right person at the rigth moment and the right device

- **Changing user habits and expectations**
  - Quality, Variety and Interactivity while user having the Control

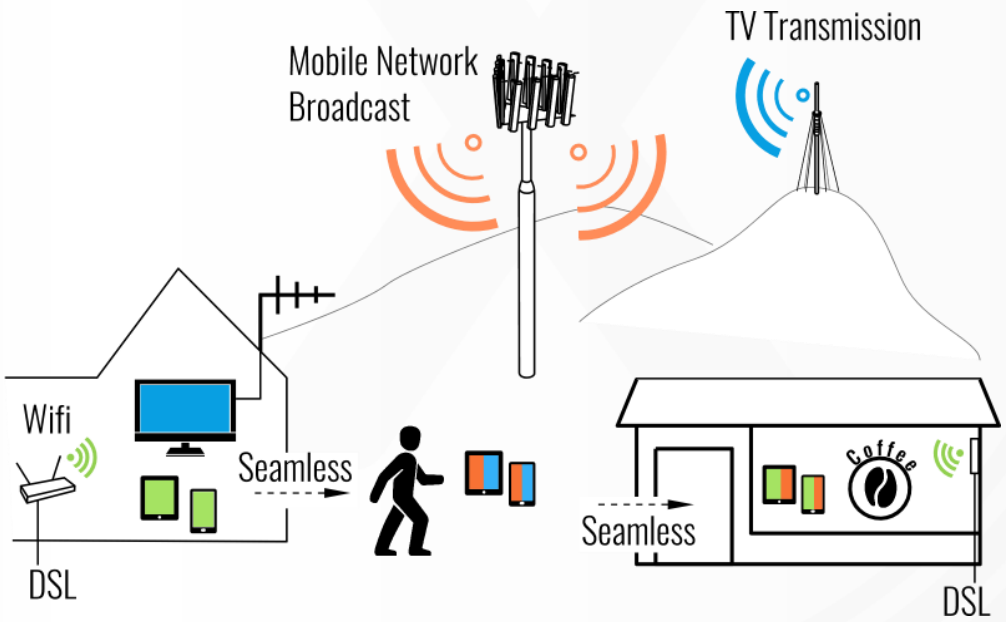
Technology Trends Online TV

- **Main Technology Trends**
  - Internet infrastructure enhancing – both at home and mobile
  - Over-the-top (OTT) content increasing
  - Ability to tailor audience experiences
  - Online Tech-Giants
    - with very different business models
  - User-generated content increasing and improving

- **Enabling technologies:**
  - UHD (4k/8k), HFR/HDR/WCG, AR/VR, 360º, H266, immersive audio, object-based broadcasting, …
  - **What about distribution technologies? And convergence?**

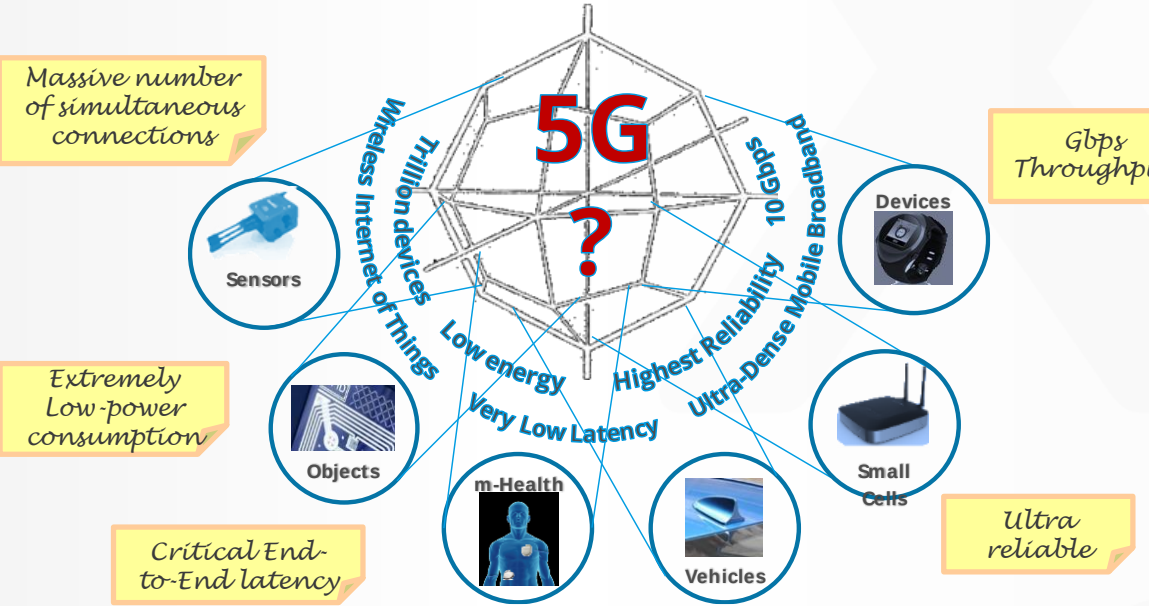
Future Media Convergence Scenario

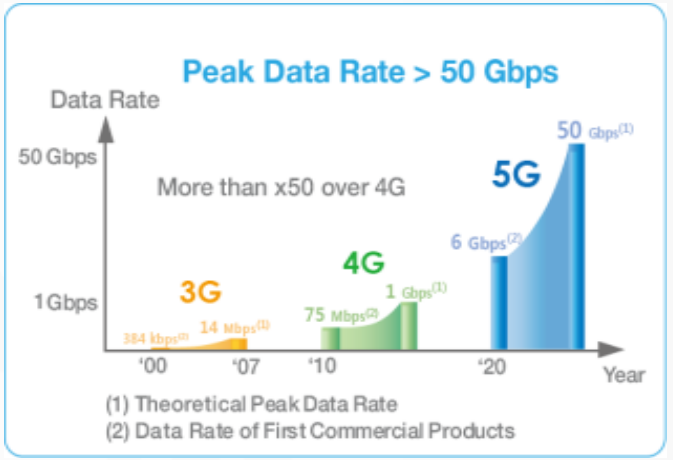
- **Users do not care about distribution technologies!**
  - They care about a seamless experience – new generation wireless systems



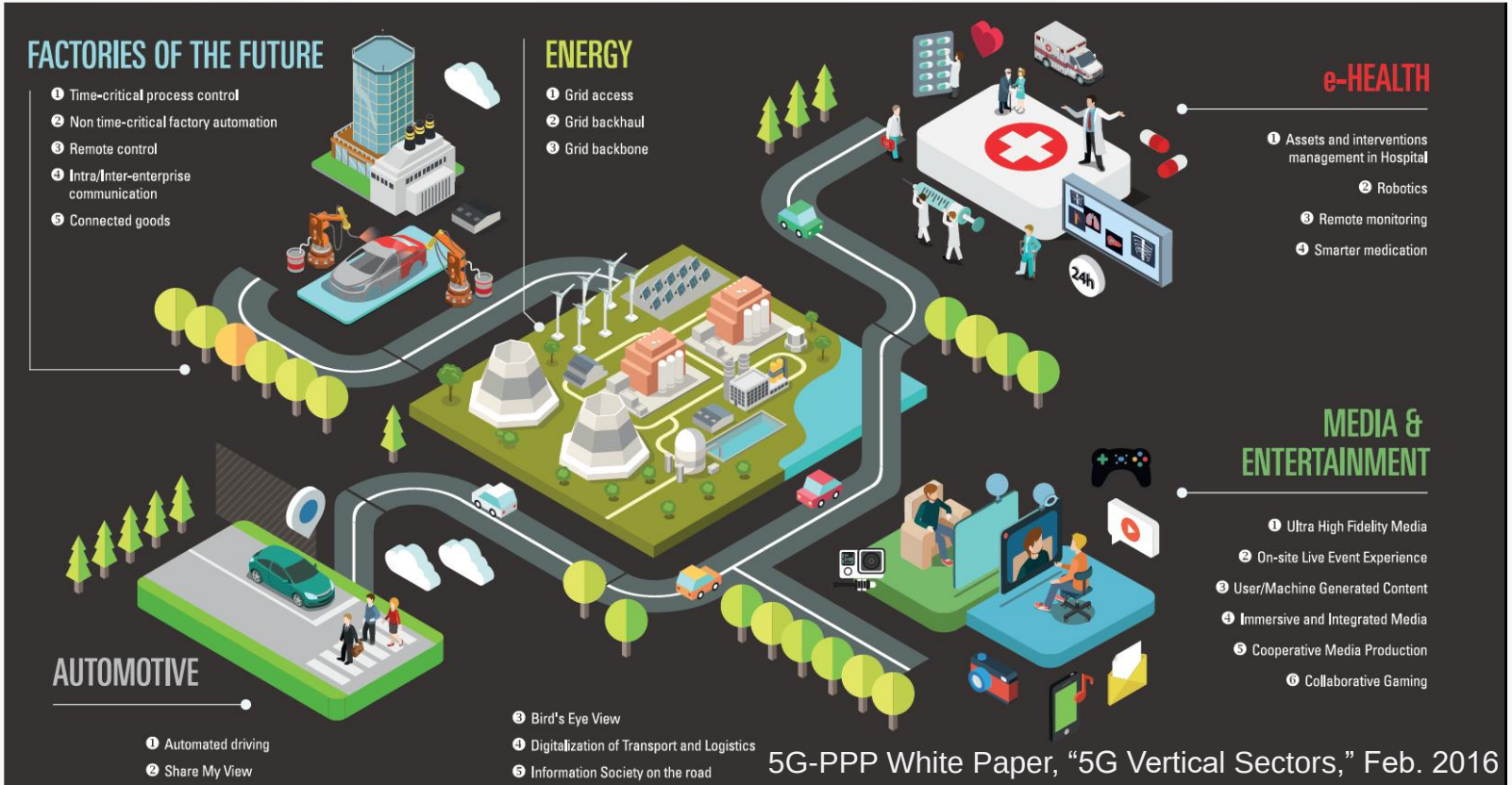
What will 5G bring?

- 5G will **not only** provide **one order of magnitude increase** in **peak data rates**
- It is being designed to meet very challenging technical requirements to support **new use cases** derived from several **vertical industries**, **not just for mobile broadband**





5G Driven by New Use Cases and Designed for New Vertical Industries



5G-PPP White Paper, "5G Vertical Sectors," Feb. 2016

Broadcast in 5G

Broadcast/Multicast Point-to-Multipoint (PTM) transmissions are key in many 5G use cases, but they have not been considered in the first release of 5G (Rel'15)

MULTIMEDIA & ENTERTAINMENT

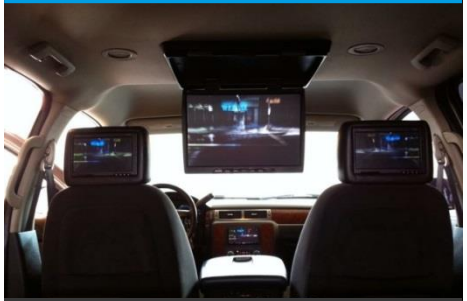
UHDTV delivery

VR, AR, 360° video

Content prepositioning

Push to X (talk/video)

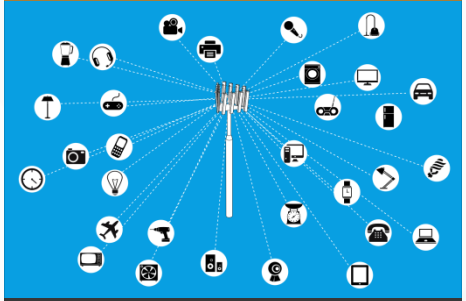
CONNECTED AUTOMOTIVE



Autonomous driving information, Infotainment

Safety applications, Signage information

INTERNET OF THINGS



Software Updates

Common Control Messages

PUBLIC WARNING AND SAFETY

Disaster alerts (e.g. tsunami, earthquake)

Emergency alerts (e.g. hazar, amber alerts)

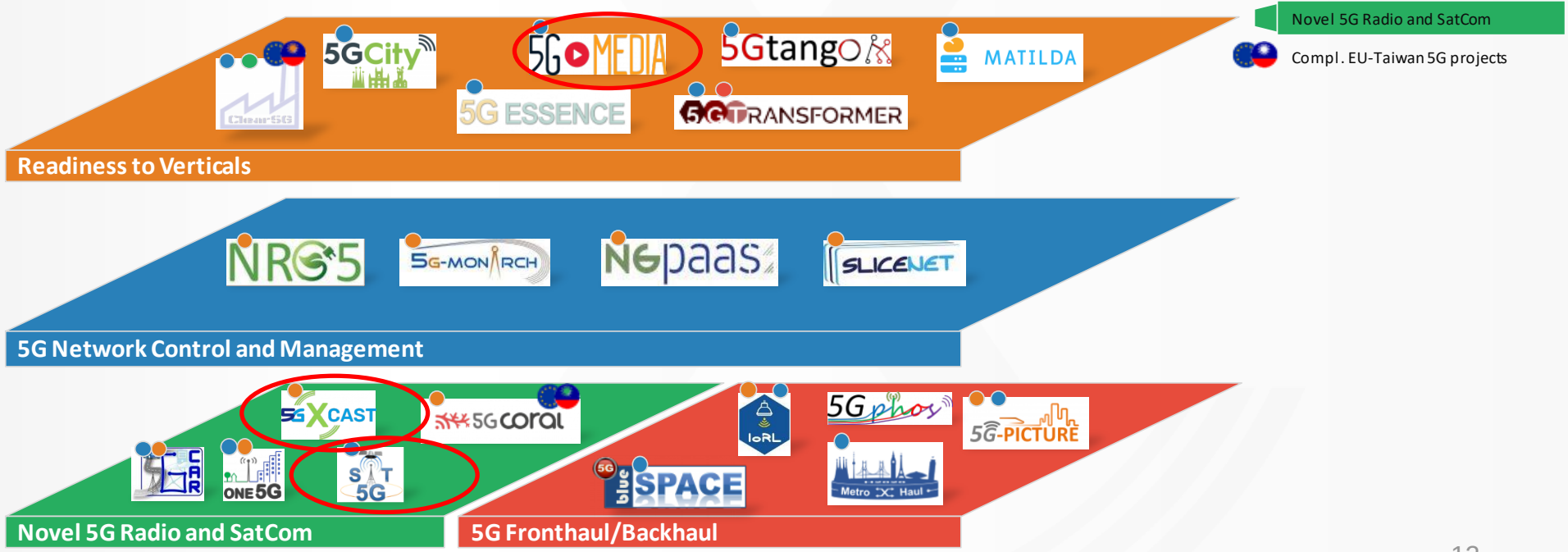
5G PPP
The 5G Infrastructure Public Private Partnership

5G XCAST

- **5G PPP is a research program in Horizon 2020 of the EU dedicated to 5G system research**
  - https://ec.europa.eu/programmes/horizon2020/en/h2020-section/future-internet
  - https://5g-ppp.eu/
- **Budget for 2014 –2020 time frame**
  - Up to **700 million € public funding**
  - Matched by private side including leveraging factor 5 of additional private investment results in private value of about **3.5 billion €**
- **Research program is addressing all building blocks of a future communication network and a huge number of vertical use cases**
- **5G Infrastructure Association vision paper**
  - http://5g-ppp.eu/wp-content/uploads/2015/02/5G-Vision-Brochure-v1.pdf
- **5G Infrastructure Association paper on vertical sectors**
  - https://5g-ppp.eu/wp-content/uploads/2016/02/BROCHURE_5PPP_BAT2_PL.pdf
- **5G Infrastructure Association paper on innovations**
  - https://5g-ppp.eu/wp-content/uploads/2017/01/5GPPP-brochure-MWC17.pdf
- **Phase 1 projects completed (started on July 2015)**
- **Phase 2 projects on-going (started on June 2017)**
- **Joint programs with US, Korea, Japan, China, Taiwan and Brazil**

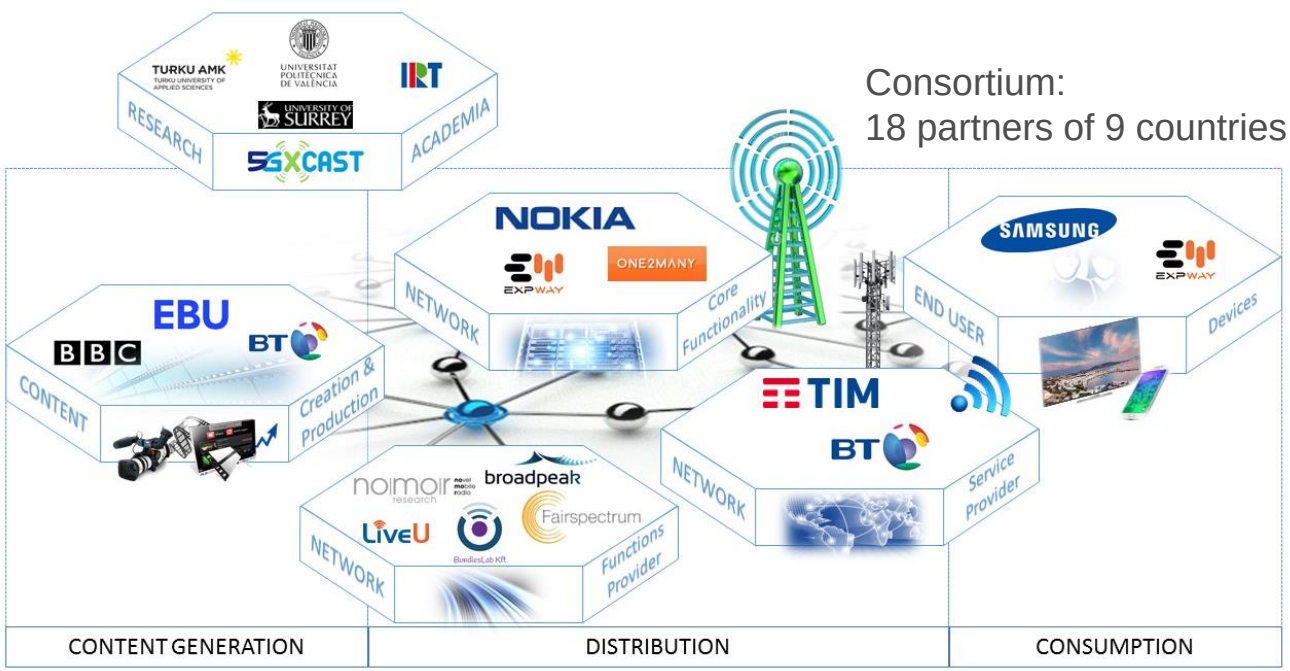
5G-PPP Phase-2 Projects

- https://5g-ppp.eu/5g-ppp-phase-2-projects/



Basic Information about 5G-Xcast

- **Broadcast and Multicast Communication Enablers for the Fifth-Generation of Wireless Systems (5G-Xcast)**
  - **Starting and end date:** June 2017 – May 2019 (24 months)
  - Call H2020-ICT-2016-2 call, grant number 761498



Consortium:
18 partners of 9 countries

Website: www.5g-xcast.eu

UNPRECEDENT COMMUNICATION CAPABILITIES

OPPORTUNITY FOR THE CONVERGENCE OF FIXED, MOBILE AND BROADCAST NETWORKS

5G XCAST

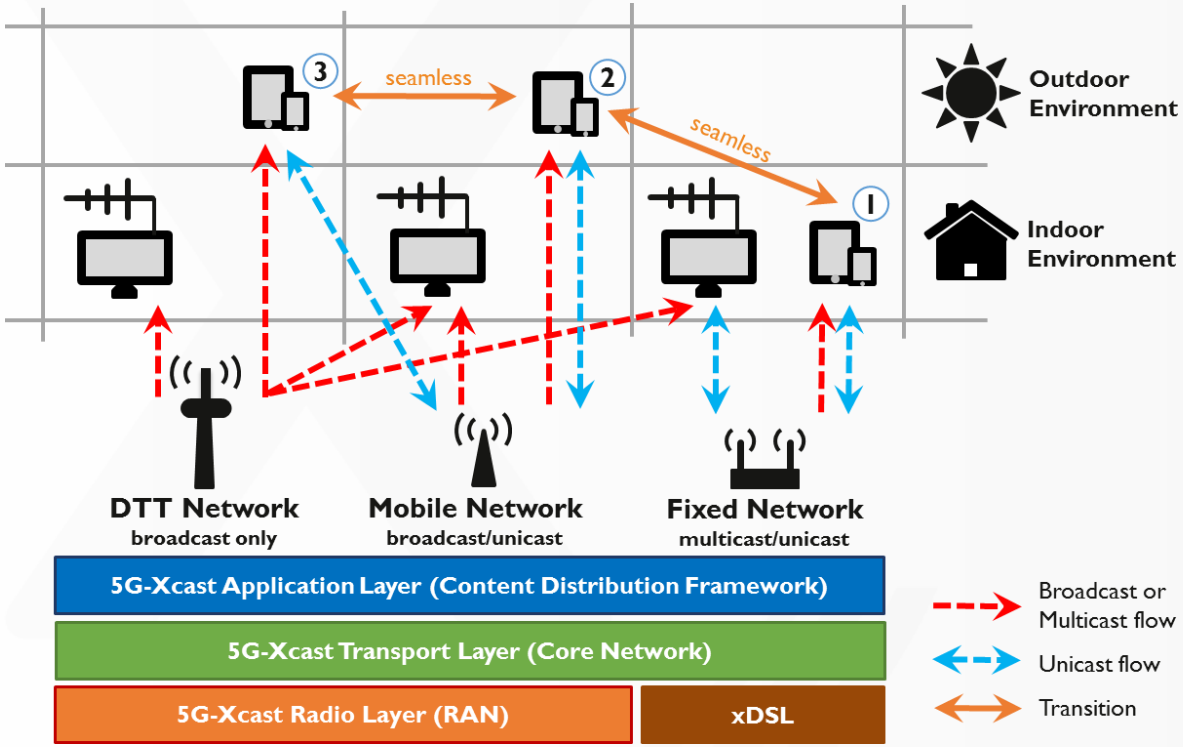
5G Broadcast Vision

PTM AND CACHING AS BUILT-IN NETWORK DELIVERY OPTIMISATIONS, NOT AS A SERVICE, FOR ALL VERTICALS

NETWORK SLICING FOR BROADCAST SERVICES

5G XCAST Convergence Vision

The **converged media delivery architecture of 5G-Xcast over fixed broadband, mobile broadband and terrestrial broadcast networks** allows a **seamless, uninterrupted service** to be offered to the users as they move.

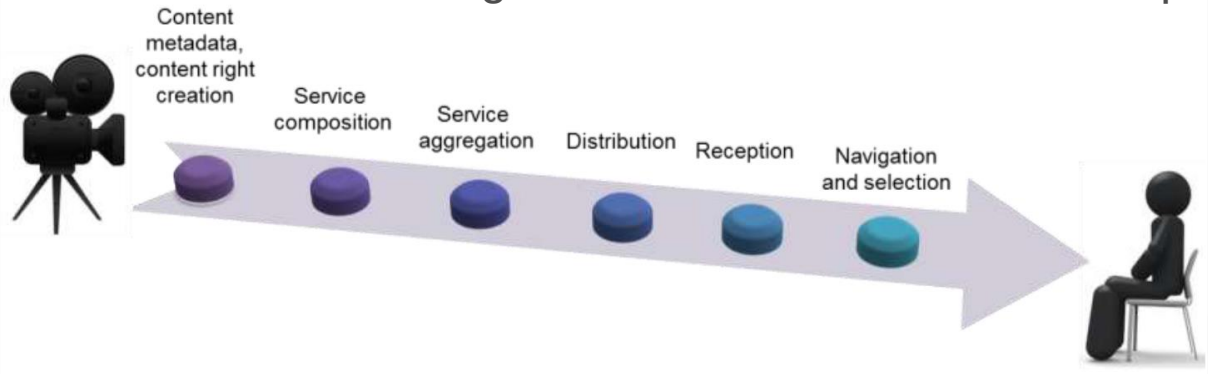


Business Models

- **New digital industries embracing 5G infrastructure means**
  - new markets
  - new customers
  - new requirements
  - new business arrangements
  - Role of stakeholders likely to change, in particular MNOs

Will 5G create a disruption in broadcasting?

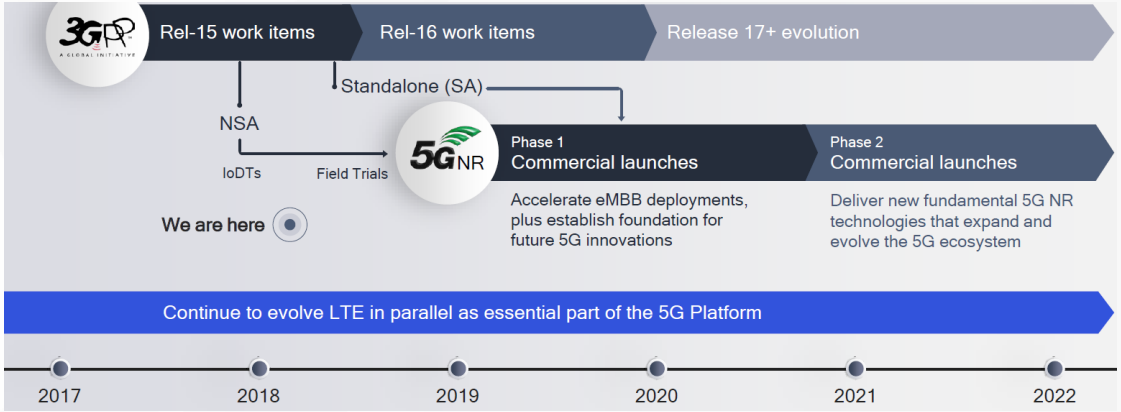
- **Likely yes, since the relevance of mobile/personal devices is increasing for consumption of media services**
  - TV wireless production is also a very good use case for 5G
  - Role of stakeholders along the broadcast value chain will probably change

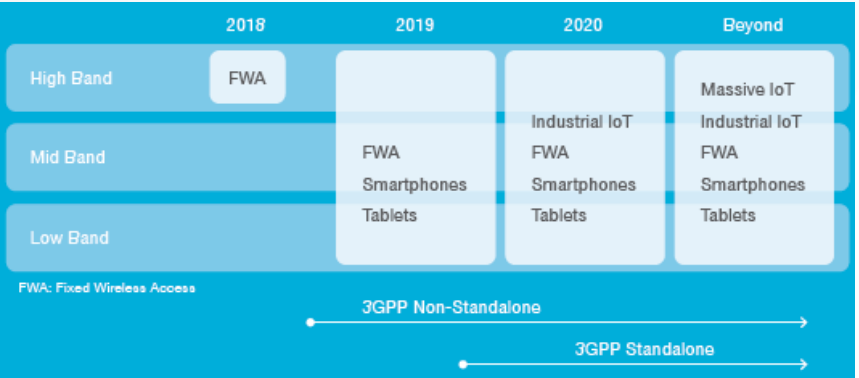


- **Will digital terrestrial TV continue being an appealing platform by itself?**
  - New win-win business arrangements and regulations needed for a commercial success of new convergence scenarios

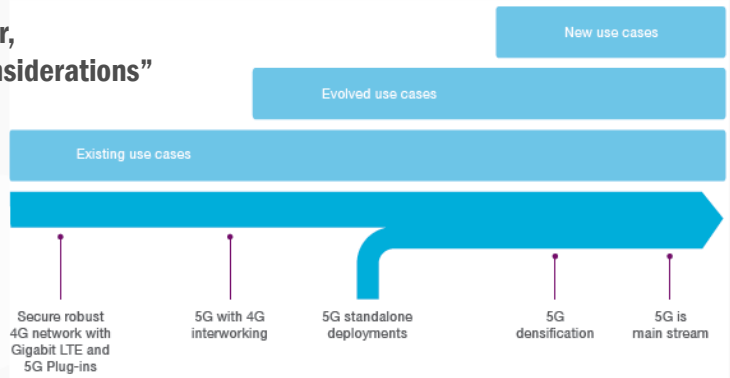
5G Progress and Outlook

- **First phase of 5G under standardization (3GPP Rel'15)**
  - First deployments for fixed wireless access
- **A lot of work still to do to fulfill the 5G vision in next 3GPP releases!**
  - E.g. definition of 5G Broadcast





Ericsson white paper, "5G deployment considerations" Feb. 2018



Public deliverables, scientific papers, presentations:
http://5g-xcast.eu/documents/

Website:
www.5g-xcast.eu

Twitter:
@5Gxcast

LinkedIn:
https://uk.linkedin.com/company/5g-xcast

Thank You

Videos:
https://www.youtube.com/channel/UCCl2iSgTDx42UiLoRcDyDBg
https://youtu.be/daFOf30NG2U