



6G FOR A SUSTAINABLE FUTURE

Dr. Patrick Waldemar, Vice President Telenor Research

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170m
subscribers

166
years



8
markets

Research in Telenor


- *To help Telenor be prepared for and leverage emerging technologies, customer, organisational and regulatory trends.*
- *To challenge and support Group and BUs in decision-making and technology-choice.*
- *To help solve some of the most intricate problems facing the company, where a science based approach is optimal.*
- *To be an active contributor to Telenor's fulfilment of its vision of empowering society and in strengthening Telenor's Brand position.*

50 YEARS OF TELENOR RESEARCH

Some milestones from an exciting journey



1967 **Digitalization**
Scientists at Telenor Research begin digitalization of the telecommunication network – piloting early data communication.



1976 **Network in the sky**
A satellite, connecting oil platforms in the North Sea, is used in a national telecommunications network for one of the first times in history.




1980 **GSM**
Development of the GSM and SMS standard benefits by contributions from Telenor Research scientists.



1987 **VIDEO STAR**
Algorithms contributed by Telenor Research go towards developing the international video standard known today as MPEG4.


1988 **HEAR, HEAR**
Development begins of a technology which enables machines to understand sounds and words.




1990 **The right medicine**
Telenor Research initiates work with telemedicine, resulting in a National Center at the University Hospital of North Norway



1995 **Birth of a Browser**
With technology originally developed by Telenor Research, the Opera Software ASA launches the eponymous Opera browser.



2005 **Considering the Consequences**
Telenor Research colleagues carry out research into the Social Consequences of Mobile Communication



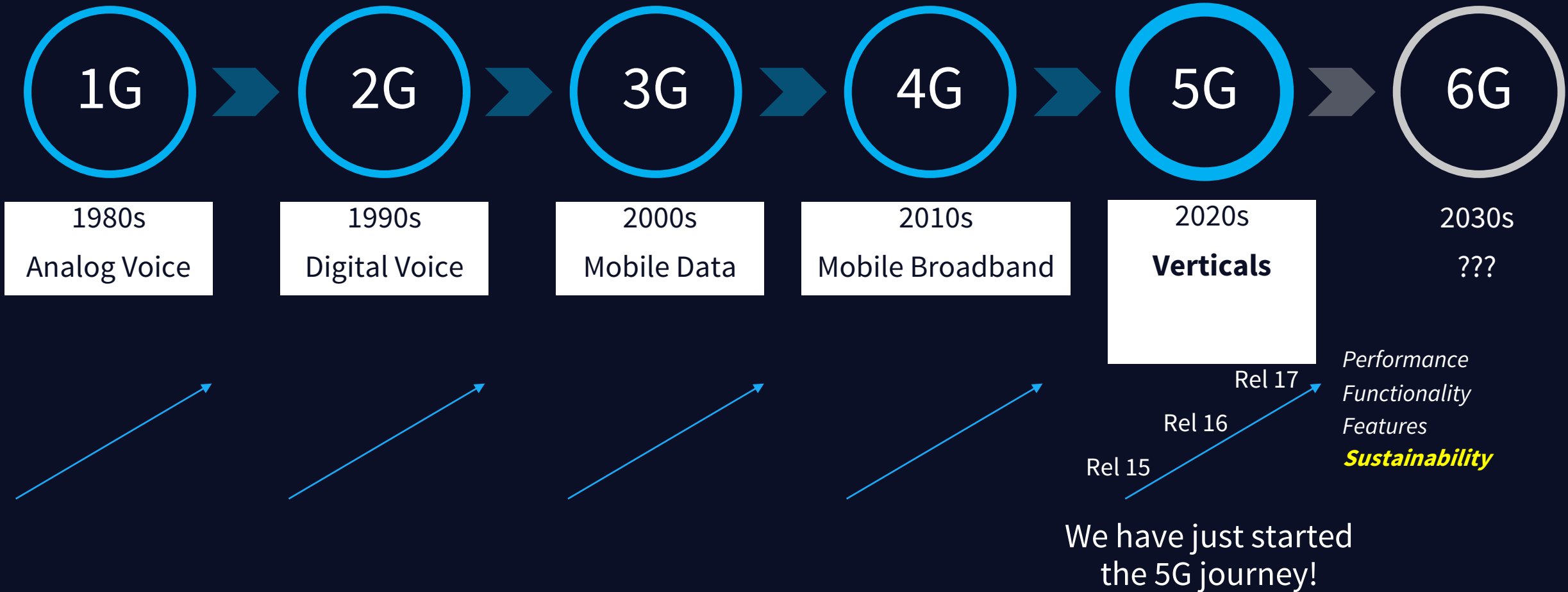
2013 **Data vs. dengue**
Telenor Research scientists use mobility analytics and big data to understand the spread of dengue virus in Pakistan.



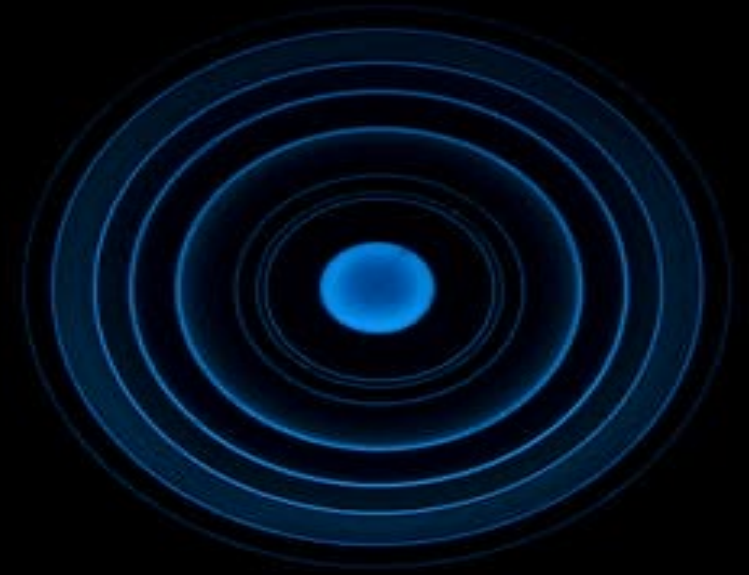
2017 **AI Think, therefore I am**
Telenor Research and Telenor Group opens an AI Lab in Trondheim, the first of its kind in Norway.



What is the 5G shift within mobile communications?



6G for a Sustainable Future



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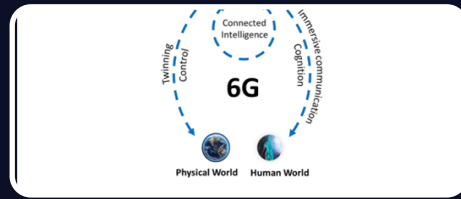
6G Visions



- Resource usage
- Empowering society
- Open innovation



Whitepapers outlining 6G visions



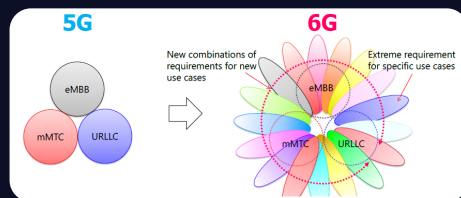
«In the coming decade, 6G will bring a new era in which billions of things, humans, and connected vehicles, robots and drones will generate Zettabytes of digital information»

• «*European vision for the 6G network ecosystem*», 5G IA Vision paper, June 2021



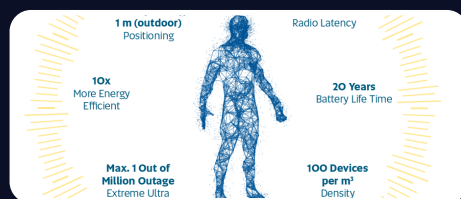
«We expect that 6G will provide ultimate experience for all through hyper-connectivity involving humans and everything»

• «*6G. The Next Hyper-Connected Experience for All*», Samsung White paper



«It is anticipated that new use cases will appear, demanding a combination of requirements that cannot be covered by the 3 categories of 5G»

• «*5G Evolution and 6G*», NTT DoCoMo White Paper, February 2021



«Our future society will be increasingly digitized, hyper-connected and globally data-driven»

• «*Key drivers and research challenges for 6G ubiquitous wireless intelligence*», 6G Research Visions 1, 6G Flagship project, Sept 2019



6G for a Sustainable Future

Challenges



- Support UN SDGs
- Security, Trust & Resilience
- Super-flexibility



6G supporting UN Sustainability Development Goals



9
INDUSTRY, INNOVATION
AND INFRASTRUCTURE



BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

10
REDUCED
INEQUALITIES



REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

13
CLIMATE
ACTION



TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS



6G for a Sustainable Future

Research directions



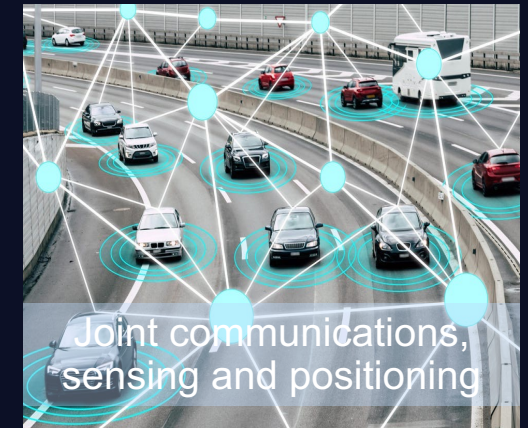
- Enabling Technologies
- Consumers and verticals
- 6G ecosystems



Research directions on enabling technologies

Evolutions

New and radical



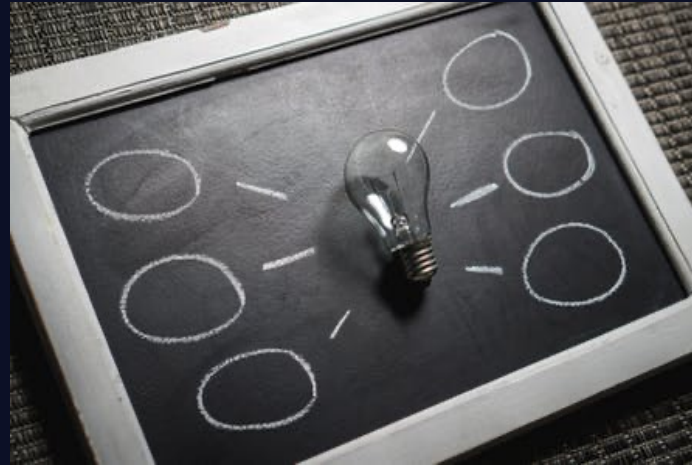
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Questions?

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