



# IMT and spectrum for mobile broadband wireless access

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# IMT - International Mobile Telecommunications

- ITU has a rich history in the development of radio interface standards for mobile communications. The framework of standards for International Mobile Telecommunications (IMT) encompasses both IMT-2000 and IMT-Advanced systems.
- IMT is an essential foundation of modern society - a truly global force for change and empowerment - and is increasingly becoming *the* principal means of accessing communication, information, and entertainment.
- IMT contributes significantly to national economies & jobs, and continues to grow at unprecedented rates - supporting connectivity, applications, and services that were not envisioned even a few years ago.
- With the approval of Recommendation ITU-R M.1457, ITU established the detailed specifications for IMT-2000 and the first "3G" deployments commenced around the year 2000.



# IMT-Advanced

- In January 2012, ITU defined the next big leap forward in wireless cellular technology – ‘IMT-Advanced’ – as detailed in Rec. ITU-R M.2012.
- **LTE-Advanced** and **WirelessMAN-Advanced** were the two technologies assessed as being able to meet the stringent performance requirements specified by ITU.
- IMT-Advanced provides the global platform on which to build the next generations of mobile services – fast data access, unified messaging and broadband multimedia
- IMT-Advanced brings major improvements over IMT-2000, including significantly increased radio frequency spectrum efficiency allowing for more users at higher data rates



# Additional spectrum

- We are witnessing a very rapid increase in the volume of mobile data traffic, spurred on by the introduction of a growing array of advanced multimedia devices and applications.
- The substantially increased spectrum efficiency provided by IMT-Advanced will go some way towards meeting this demand, but this alone will not be sufficient – additional radio frequency spectrum will be required.
- Studies are currently underway within the ITU to determine the amount of additional spectrum required, the frequency bands that may be considered and the potential impact on other existing radio services.
- The issue of additional spectrum for mobile broadband wireless access will be addressed at the World Radiocommunication Conference scheduled to be held on 2-27 November 2015.

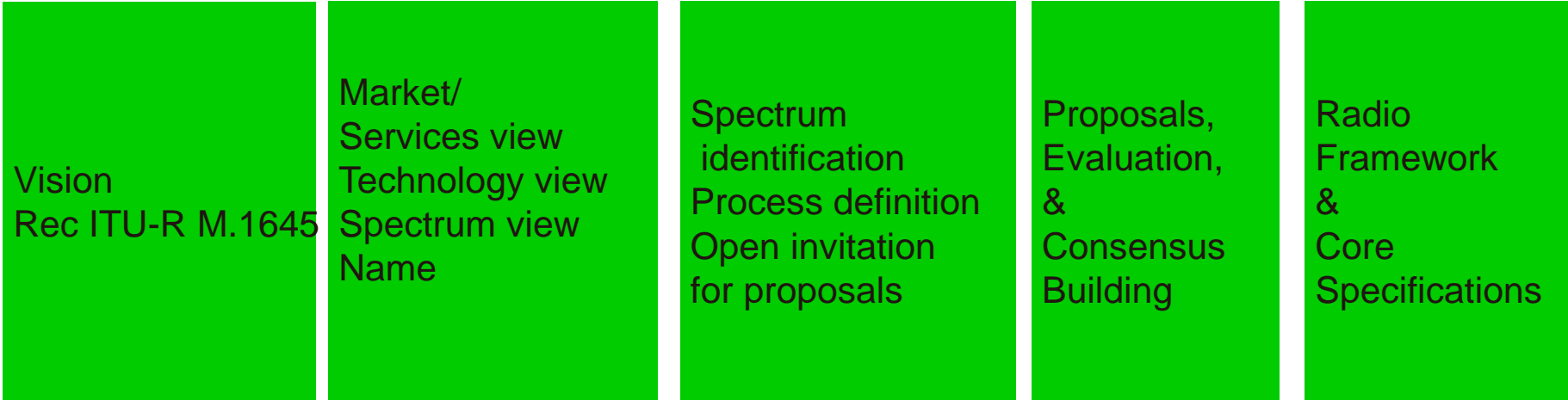


# Technology evolution

- **IMT** systems, technologies, and architectures supporting mobile broadband have continued to evolve to improve on spectrum efficiency & utilization.
- They may be approaching theoretical limits in the ability to find significant additional gains in spectrum capability through technology alone.
- Adopting new deployment architectures can help, but this is not the total solution.
- **IMT** must continue to seek new ways to advance the capabilities and push out the boundaries of the technology.



# The Overall Process: IMT-Advanced



2002-2003

2005-2007

2006-2008

2008-2010

2010-2011

Q. 229-2/5  
2000-2003-2008

Setting the stage for the future:  
Vision, spectrum, and technology views

Defining the  
technology

# 3G/4G

- While there are no formal definitions of these terms, the term 3G has commonly been applied to initial deployments of IMT-2000 systems.
- Systems that are currently being marketed as '4G' all offer a performance improvement over those that were marketed as '3G'
- IMT-Advanced systems offer the highest level of performance
- IMT-Advanced networks are now starting to be deployed in countries such as Korea, USA, Japan, Sweden and others.



# 5G

- With IMT-Advanced systems now starting to be deployed, the buzz in the industry on future steps in mobile technology — “5G” — has seen a sharp increase.
- Attention is now focused on enabling a seamlessly connected society in the 2020 timeframe that brings together people along with things, data, applications, transport systems and cities in a smart networked communications environment.
- In early 2012, ITU-R embarked on a programme to develop “IMT for 2020 and beyond”, setting the stage for “5G” research activities that are emerging around the world.
- ITU-R Working Party 5D is the ITU-R group responsible for IMT studies



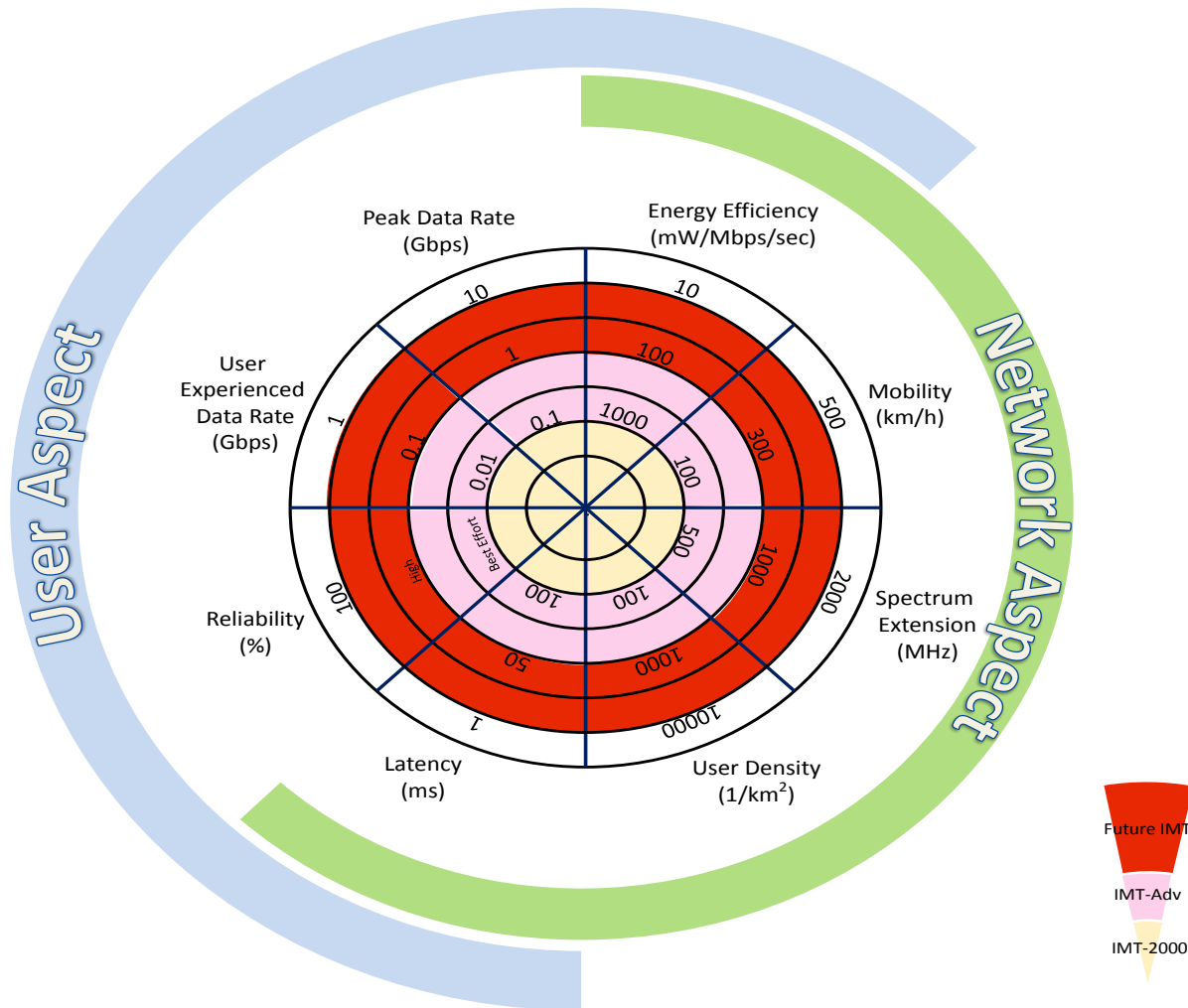


# High level requirements

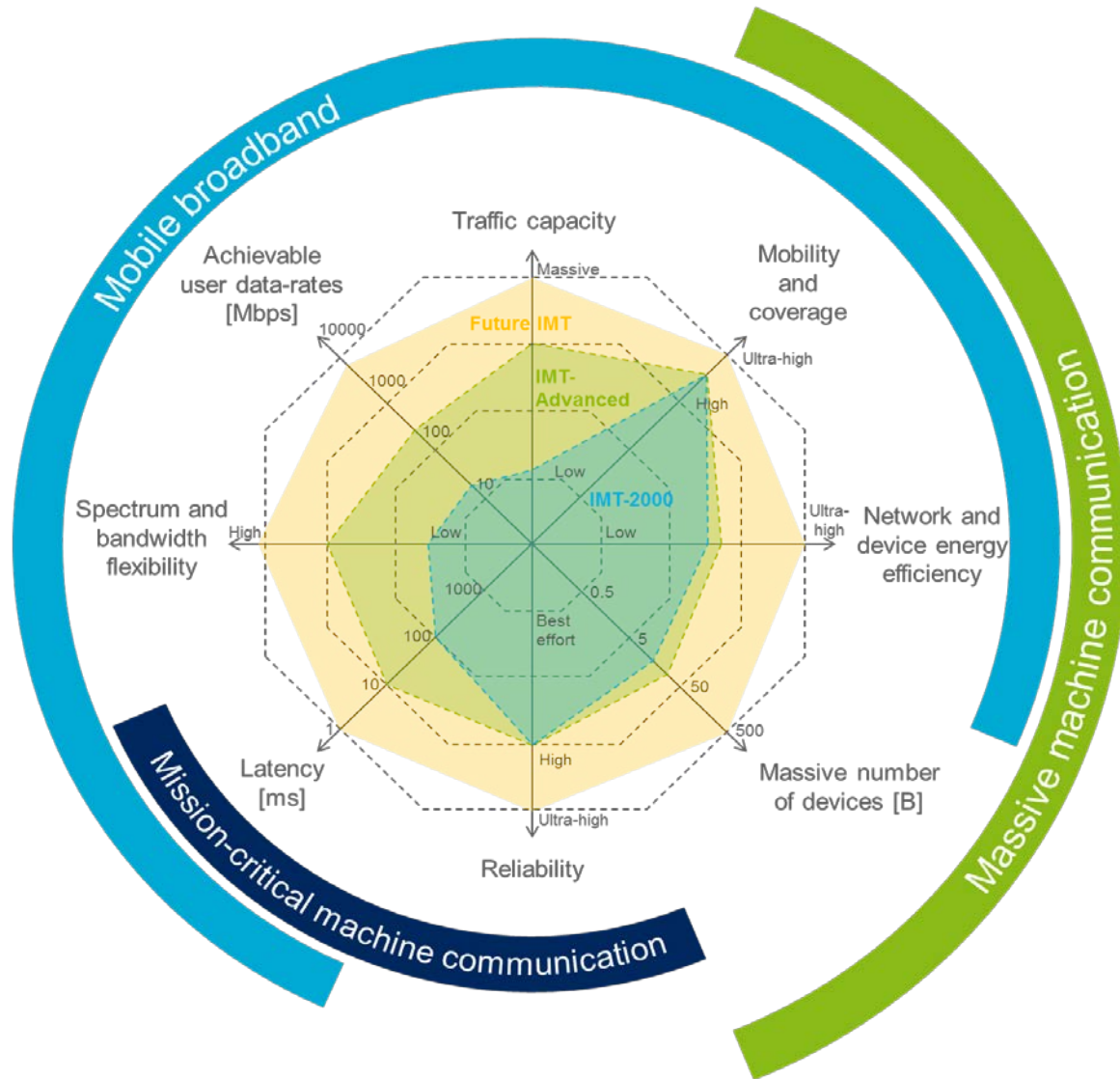
- – very high system capacity
- – extremely high data rates
- – Support of massive deployment of ubiquitous machine-type devices connectivity
- – Support for a variety of applications and environments
- – Reduced cost, energy saving and system robustness
- – high-level of security
- – Support of more efficient spectrum utilization
- – enhanced self-awareness and self-adaptability
- – very high mobility with a high level of user experience
- – very low latency and higher reliability



# The capabilities of Future IMT and previous IMT systems



# Key improvements



# Future development of IMT for 2020 and beyond

- The detailed investigation of the key elements of “5G” are already well underway, once again using the highly successful partnership ITU-R has with the mobile broadband industry and the wide range of stakeholders in the “5G” community.
- ITU expects to finalize the “Framework and overall objectives of the future development of IMT for 2020 and beyond” by the end of 2015.





Thank you

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