The 3ʳᵈ Generation Partnership Project – 3GPP™

What is 3GPP?

- A collaborative standardization activity between ETSI (Europe) and the following Partners
  - ARIB (Japan-radio)
  - TTC (Japan-network)
  - TTA (Republic of Korea)
  - CCSA (Peoples' Republic of China)
  - ATIS (North America)

- Founded in December 1998

- A "Brand" that is well known and highly regarded
  - Significant presence in press and web based media interested in mobile telecommunications technology evolution
  - Significant presence in telecoms conferences, workshops, webinars, etc on mobile telecommunications technology evolution
  - Recognised by companies, engineers, students, etc, involved in mobile telecommunications technology evolution

What does 3GPP do?

- 3GPP prepares complete sets of specifications for mobile radio systems

- GSM, GPRS, EDGE, W-CDMA, HSPA and LTE
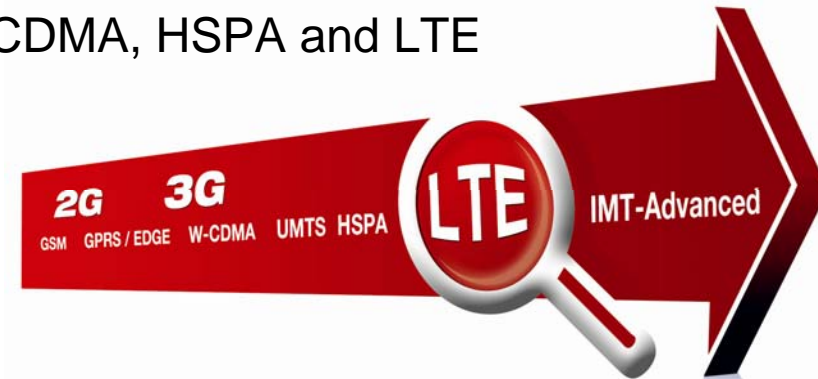
- About half of the population of the world are using systems based on 3GPP specifications
  - More than 3 billion subscribers
  - The world population is 6,6 billion people
  - …so we still have a way to go yet

- 3GPP works with Market Representative Partners to promote the features that are specified in the project

Organizational Partners

Market Representation Partners

Observers

3GPP currently has three Observers:

- Telecommunications Industries Association (TIA)

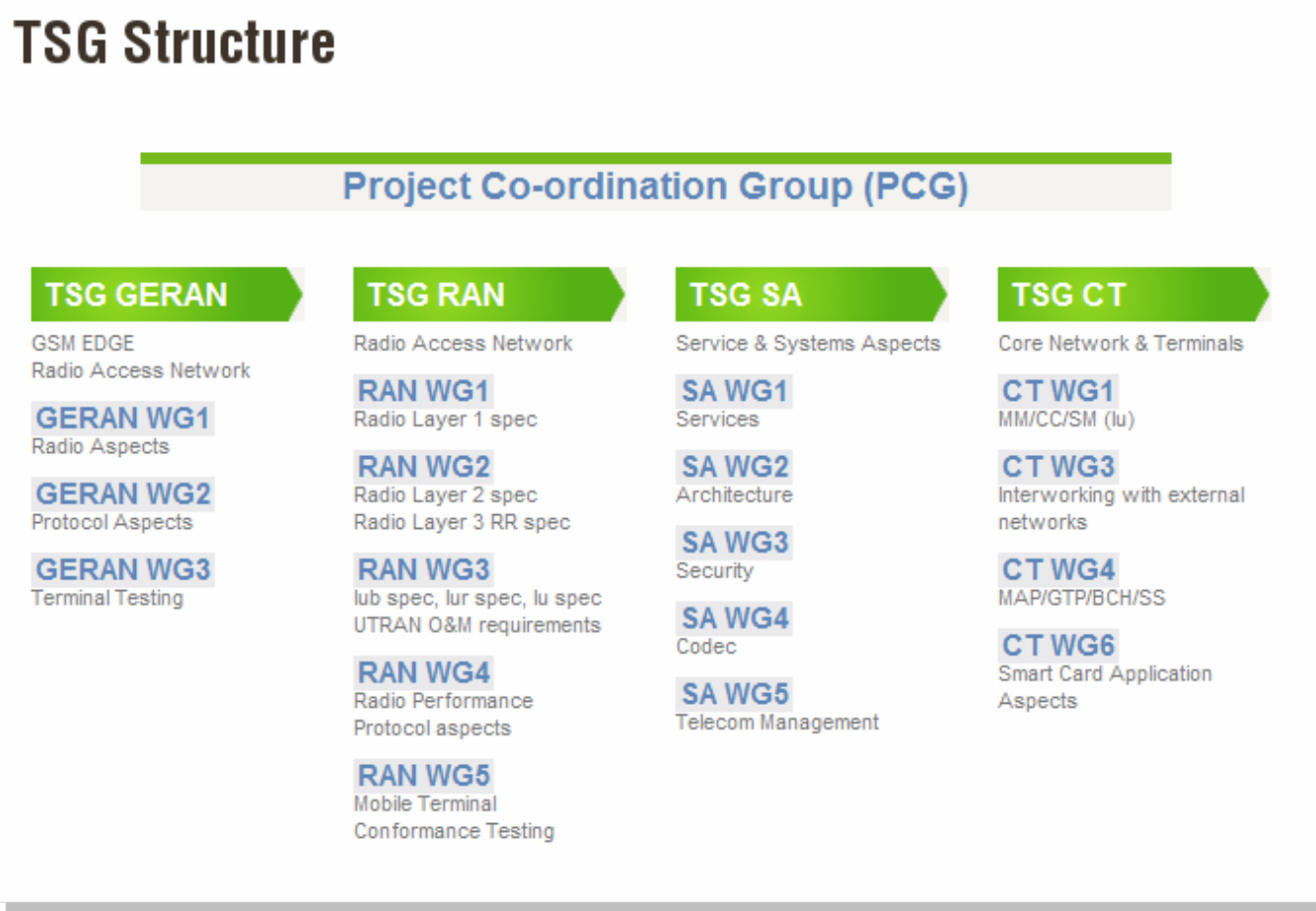- Information and Communications Technology Standards Advisory Council of Canada (ISACC)

- Communications Alliance (Australia)

How does 3GPP do it?

Like most standardization activities it is comprised of a number of committees

TSG Structure

Project Co-ordination Group (PCG)

TSG GERAN
GSM EDGE
Radio Access Network

GERAN WG1
Radio Aspects

GERAN WG2
Protocol Aspects

GERAN WG3
Terminal Testing

TSG RAN
Radio Access Network

RAN WG1
Radio Layer 1 spec

RAN WG2
Radio Layer 2 spec
Radio Layer 3 RR spec

RAN WG3
Iub spec, Iur spec, Iu spec
UTRAN O&M requirements

RAN WG4
Radio Performance
Protocol aspects

RAN WG5
Mobile Terminal
Conformance Testing

TSG SA
Service & Systems Aspects

SA WG1
Services

SA WG2
Architecture

SA WG3
Security

SA WG4
Codec

SA WG5
Telecom Management

TSG CT
Core Network & Terminals

CT WG1
MM/CC/SM (Iu)

CT WG3
Interworking with external
networks

CT WG4
MAP/GTP/BCH/SS

CT WG6
Smart Card Application
Aspects

How does 3GPP do it?

- These committees hold a total of approximately _185 meetings_ per year (including their sub committees)

- Many of those meetings take place at ETSI

- They vary in size from the smallest (roughly 25 delegates) to the largest (over 200 delegates)

- Some committees co-locate their meetings, so the combined number of delegates can reach roughly 600

- The busiest committees are faced with roughly _1000 documents_ during a one week meeting.

How does 3GPP do it?

🔊 3GPP uses a "Change Control" process, where one version of a specification is upgraded to the next version by incorporating changes agreed during a meeting. This allows full traceability of the changes made. The changes may be simple or complex.

v3.1.0   v3.2.0   v3.3.0
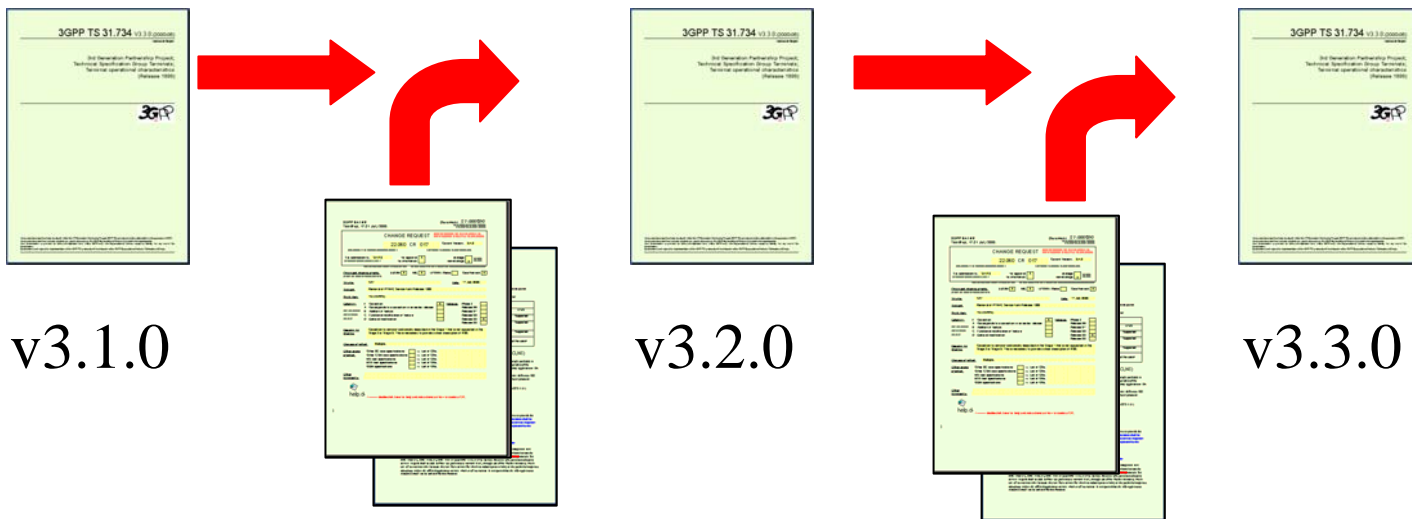
🔊 3GPP produces approximately 5000 "Change Requests" per year

3GPP support team

Comprehensive project support to 3GPP is provided by a team based at the ETSI HQ - the Mobile Competence Centre

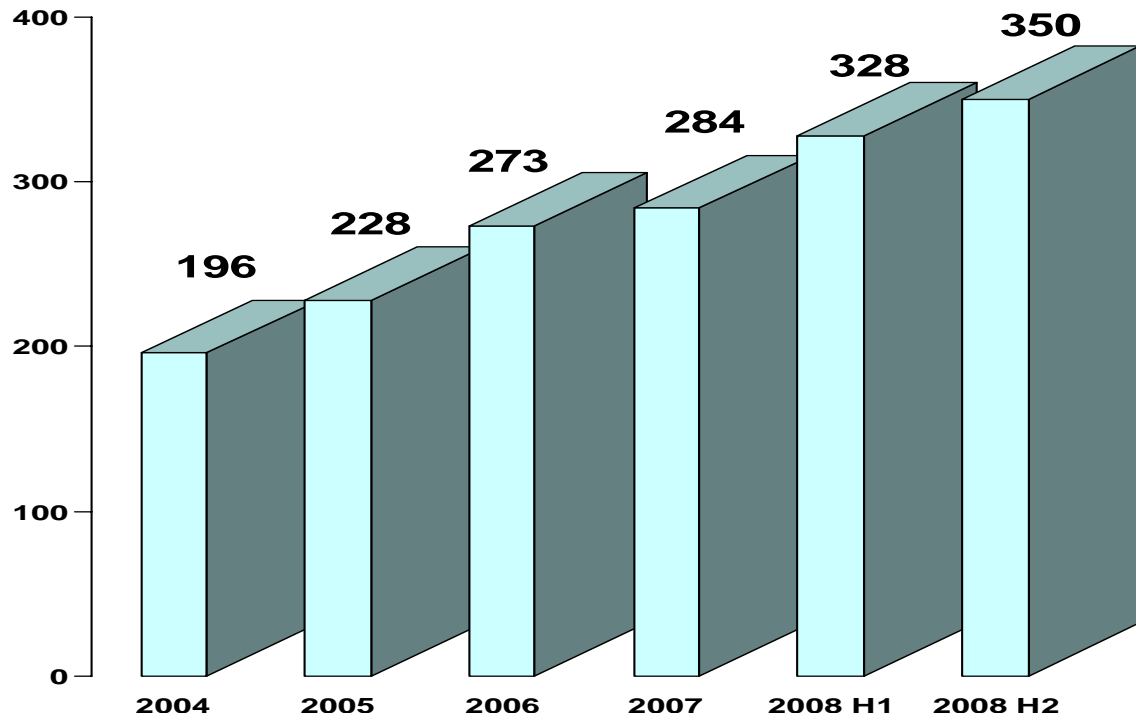http://www.3gpp.org/mobile-competence-centre

http://www.3gpp.org/people

How does 3GPP do it?

- Companies participate in 3GPP through their Partner Organization (e.g. ETSI)
- Currently, 350 companies participate in 3GPP and that number is growing fast
- Currently, 266 ETSI Member companies participate in 3GPP

Number of Individual Members in 3GPP

How does 3GPP do it?

- The real work is done by the meeting delegates
- In the last 12 months, there have been a total of 11 698 delegates at 3GPP meetings (cumulative figure)
- The regional split shows a healthy spread of participants from each of the partners'

3 - Asia

2 - Americas

1 - Europe
ME&A
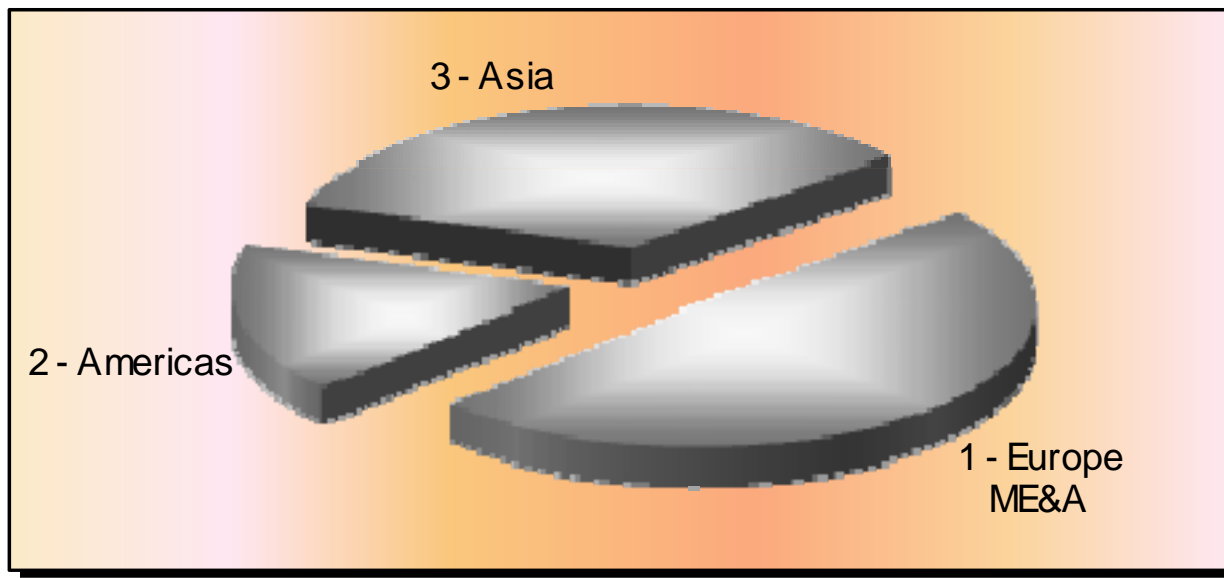
body	Total attendance	regional split		
		1	2	3
C1	703	361	141	201
C3	320	158	86	76
C4	430	207	87	136
C5	38	27	3	8
C6	103	85	7	11
CP	327	183	78	66
G1	269	164	37	68
G2	345	169	61	115
G3new	93	66	16	11
GP	484	295	83	106
R1	1352	497	197	658
R2	1539	667	197	675
R3	577	268	68	241
R4	789	379	122	288
R5	422	259	44	119
RP	824	387	131	306
S1	504	279	98	127
S2	1331	597	304	430
S3	245	152	40	53
S4	151	93	33	25
S5	274	144	24	106
SP	578	290	123	165
all	11698	5727	1980	3991
		49%	17%	34%

3GPP Releases – principal features

- Release '99
  - The basis for early 3G deployment
- Release 4
  - First steps towards IP-based operation
  - Also defines the low chip rate TDD mode (TD-SCDMA)
- Release 5
  - IMS - IP-based Multimedia Services
  - HSDPA - High Speed Downlink Packet Access
- Release 6
  - 2nd phase of IMS
  - High Speed Uplink
- Release 7
  - Enhanced uplink
  - Other spectrum
  - Multiple input multiple output antennas (MIMO)
- Release 8
  - Long Term Evolution (LTE) and System Architecture Evolution (SAE)
- Release 9
  - Enhancement of Release 8 features
  - Refinement of LTE
  - Preliminary studies into LTE Advanced
- Release 10
  - LTE Advanced

ITU referencing of 3GPP results

- 3GPP does not contribute directly to the ITU
- Formal contributions to ITU Study Groups are made by ITU members using existing national/regional processes
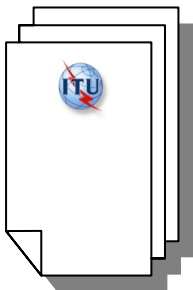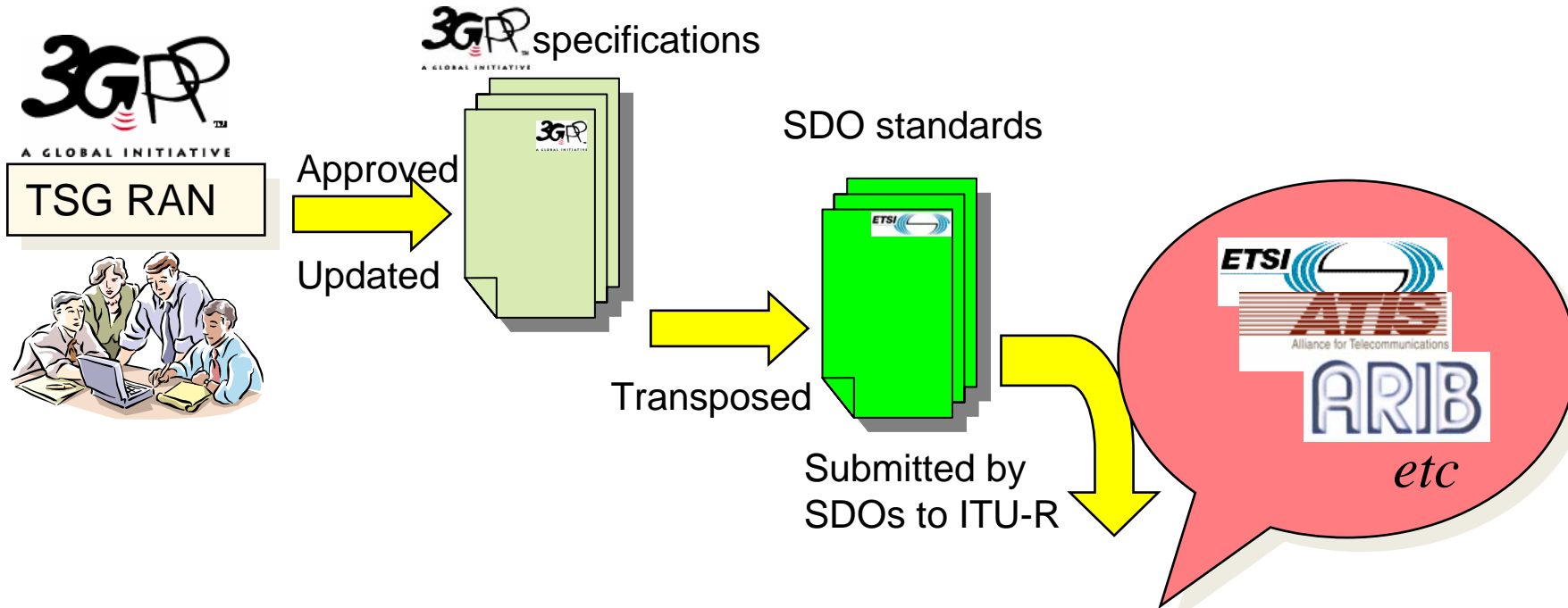
- ITU - R
  - Regular updates submitted to ITU-R Recommendation M.1457
    - High level description of IMT-2000 air interfaces
- ITU - T
  - Collaboration with ITU-T Study Group 19
  - Regular updates submitted to ITU-T Recommendation Q.1741
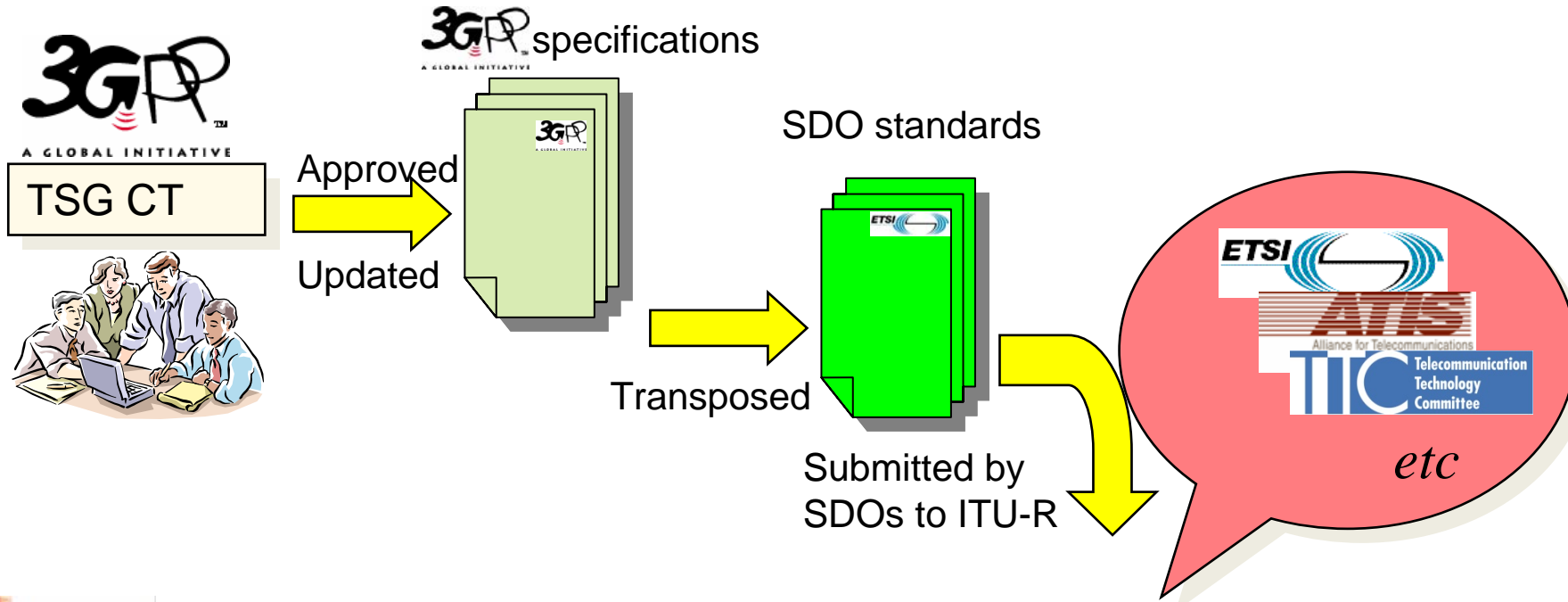   - Framework for IMT-2000 networks

ITU-R Working Party 5D

Rec M.1457

- **High level description of air interfaces**
- **Refers out to the SDOs' standards (ETSI, ATIS, etc.)**

ITU-T Study Group 19

Approved

Updated

3GPP specifications

SDO standards

TSG CT

Transposed

Submitted by
SDOs to ITU-R

ETSI
ATIS
Alliance for Telecommunications
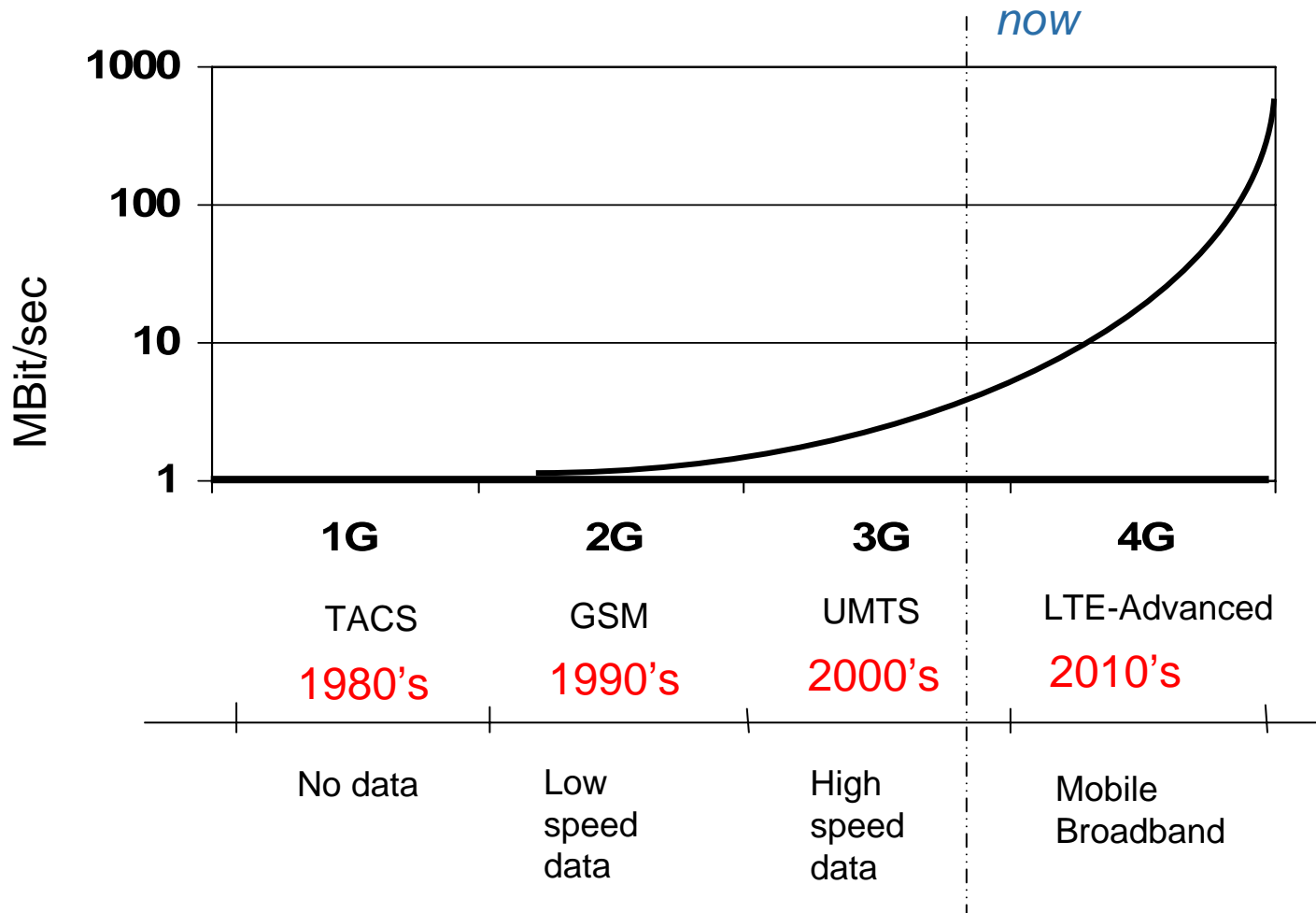TTC Telecommunication Technology Committee

etc

Rec Q.1741

– **3G road map**

– **Refers out to the SDOs' standards (ETSI, ATIS, etc.)**

The Generation Game

Evolution of data rates over time

now

1 Generation per decade seems to be quite enough

	1G	2G	3G	4G
	TACS	GSM	UMTS	LTE-Advanced
	1980's	1990's	2000's	2010's
	No data	Low speed data	High speed data	Mobile Broadband

MBit/sec axis: 1000, 100, 10, 1

LTE: what's all the fuss about?

- The next step in the evolution of 3GPP radio interfaces to deliver "Global Mobile Broadband"

- A plan first conceived in 2004

- Standardization based on clearly defined:

  - performance targets
  - economic targets
  - improved radio spectrum efficiency
  - simplified system design

- LTE (and SAE) form the basis of 3GPP Release 8, functionally frozen in December 2008.

LTE-Advanced

LTE

HSPA

W-CDMA

EDGE

GPRS

GSM

2G | 2.5G | 3G / IMT2000 | 3.5G | 4G / IMT-Advanced

Basic criteria of LTE

- Demand for higher data rates
- Expectations of additional 3G spectrum allocations
- Greater flexibility in frequency allocations
- Continued cost reduction
- Keeping up with other (unlicensed) technologies (eg WiMAX)

- Growing experience with the take-up of 3G is helping to clarify the likely requirements of users, operators and service providers in the longer term

LTE: 3G or 4G?

- LTE specifications have already been submitted to the ITU
  - They are already incorporated in the update of the IMT 2000 family
  - They formally become part of the **3G** family (though some might say LTE is really 3,9G)
- The ITU has started the IMT-Advanced process
  - LTE-Advanced "Early Submission" made to ITU-R for inclusion within the IMT Advanced (aka **4G**) family
  - "Final submission" to ITU-R   - Oct 2009
  - Completion of LTE-Advanced specifications by 3GPP   - 2010 / 11

- But who cares?
  - Users have no interest in whether they have a 2G, 3G or 4G device
  - They only care about what the device can do, and how much it will cost (not necessarily in that order!)

What does the future hold?

a new mark has been launched to identify LTE and LTE-Advanced Standards:

For more information about 3GPP

please visit

http://www.3gpp.org

or contact

3GPPContact@etsi.org