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Extension to the range of SI Prefixes: Update to the CCU

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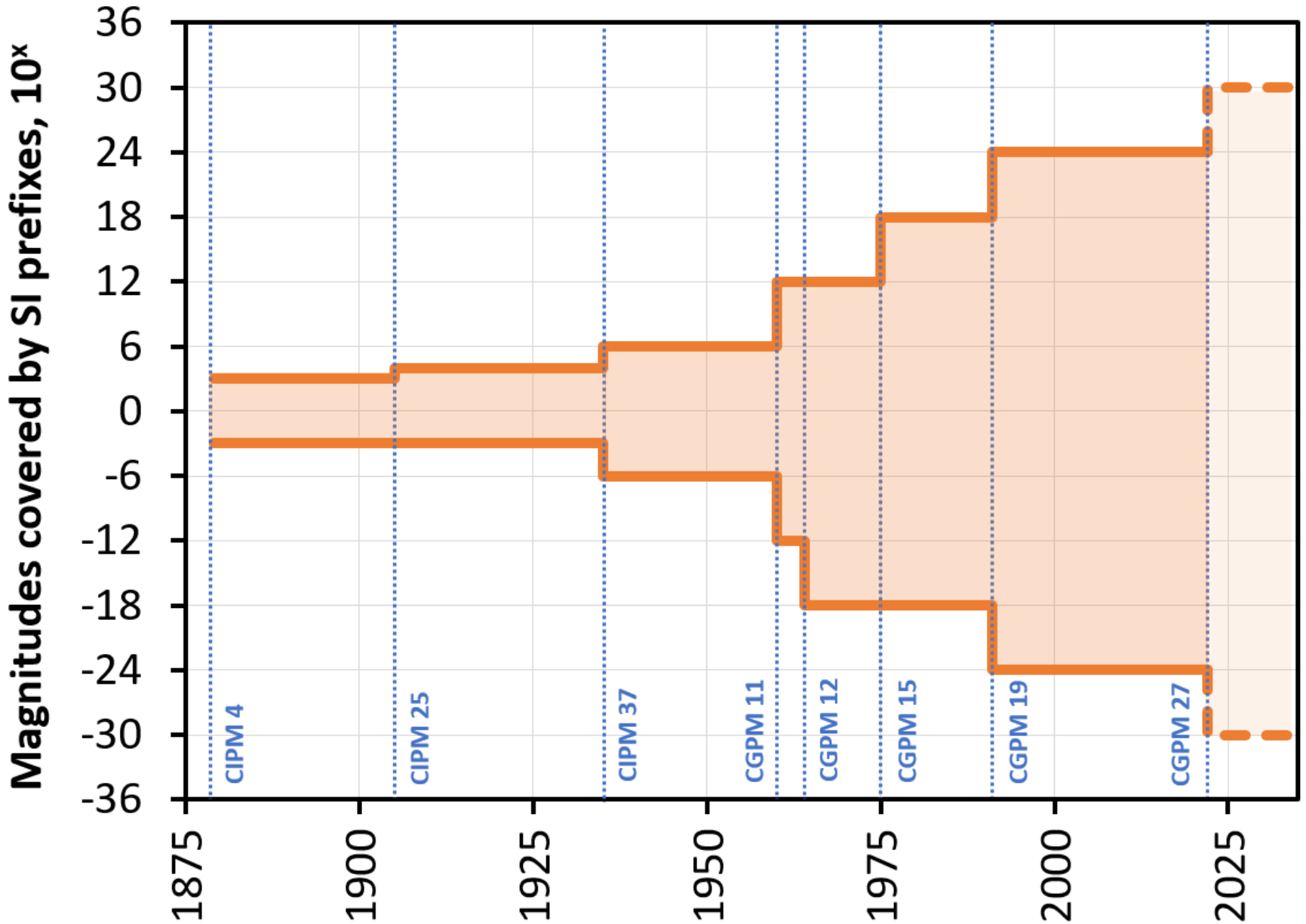
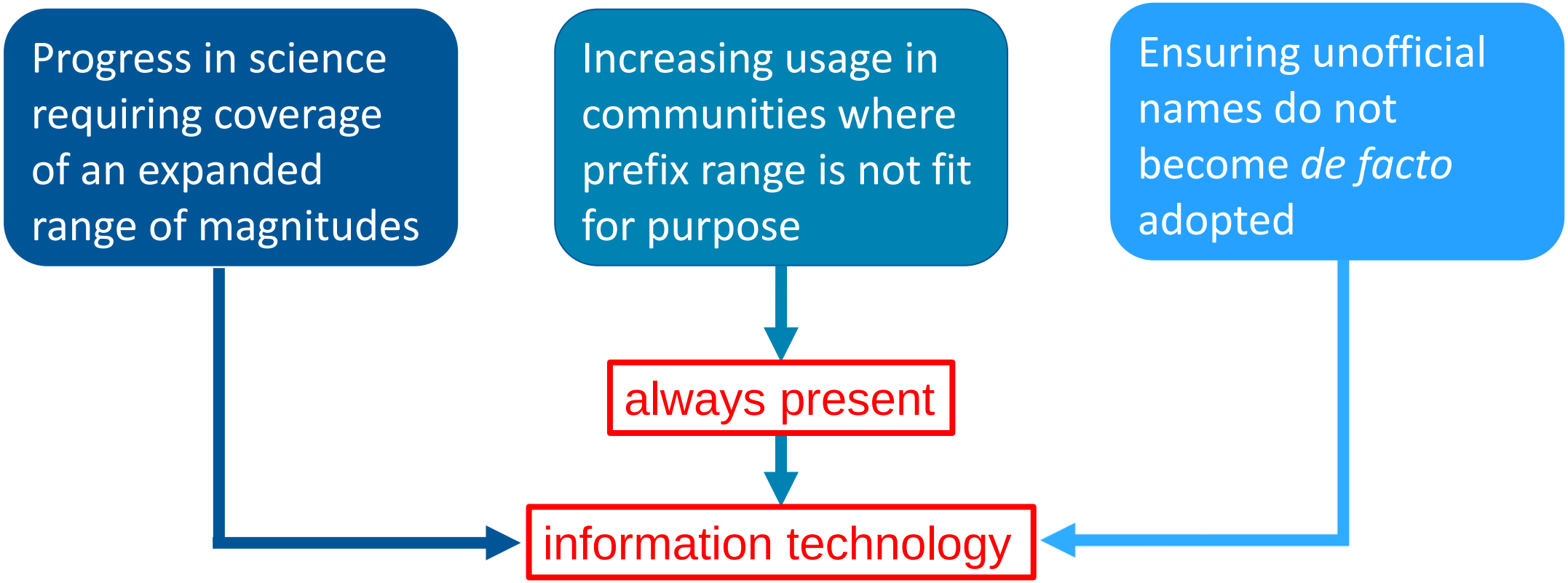
History of (SI) prefix coverage



Drivers for extending the range of SI prefixes



Information technology

- Data storage – and the non-SI units ‘byte’, ‘bit’, etc – need prefixes in excess of 10^{24}, especially with the advent of quantum computing

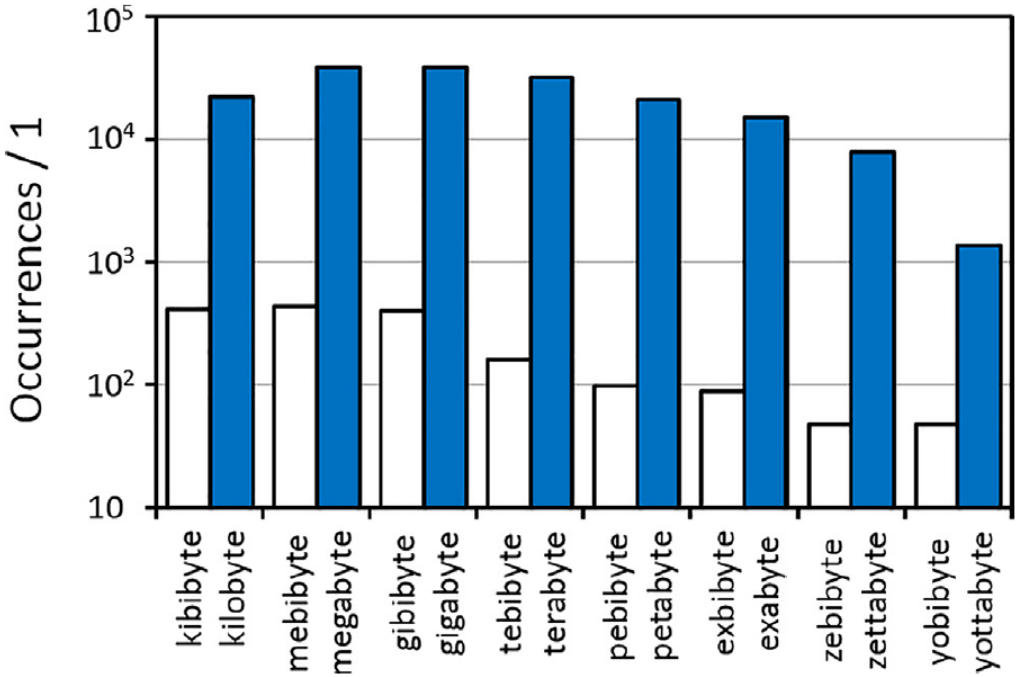
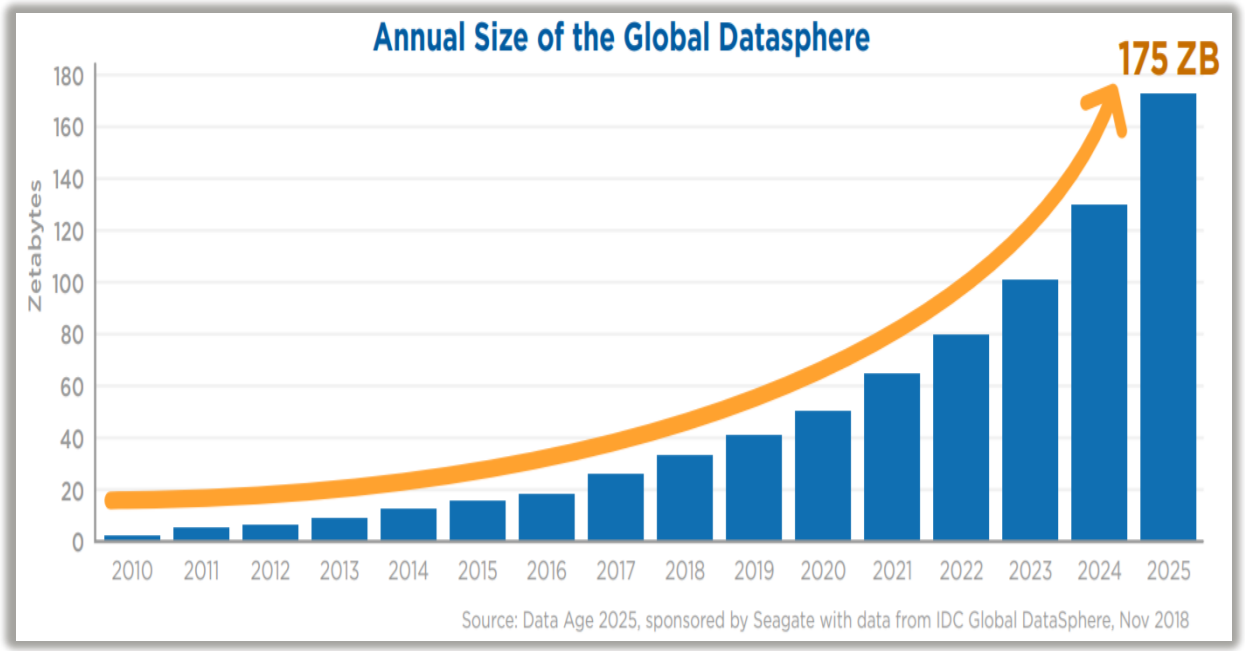
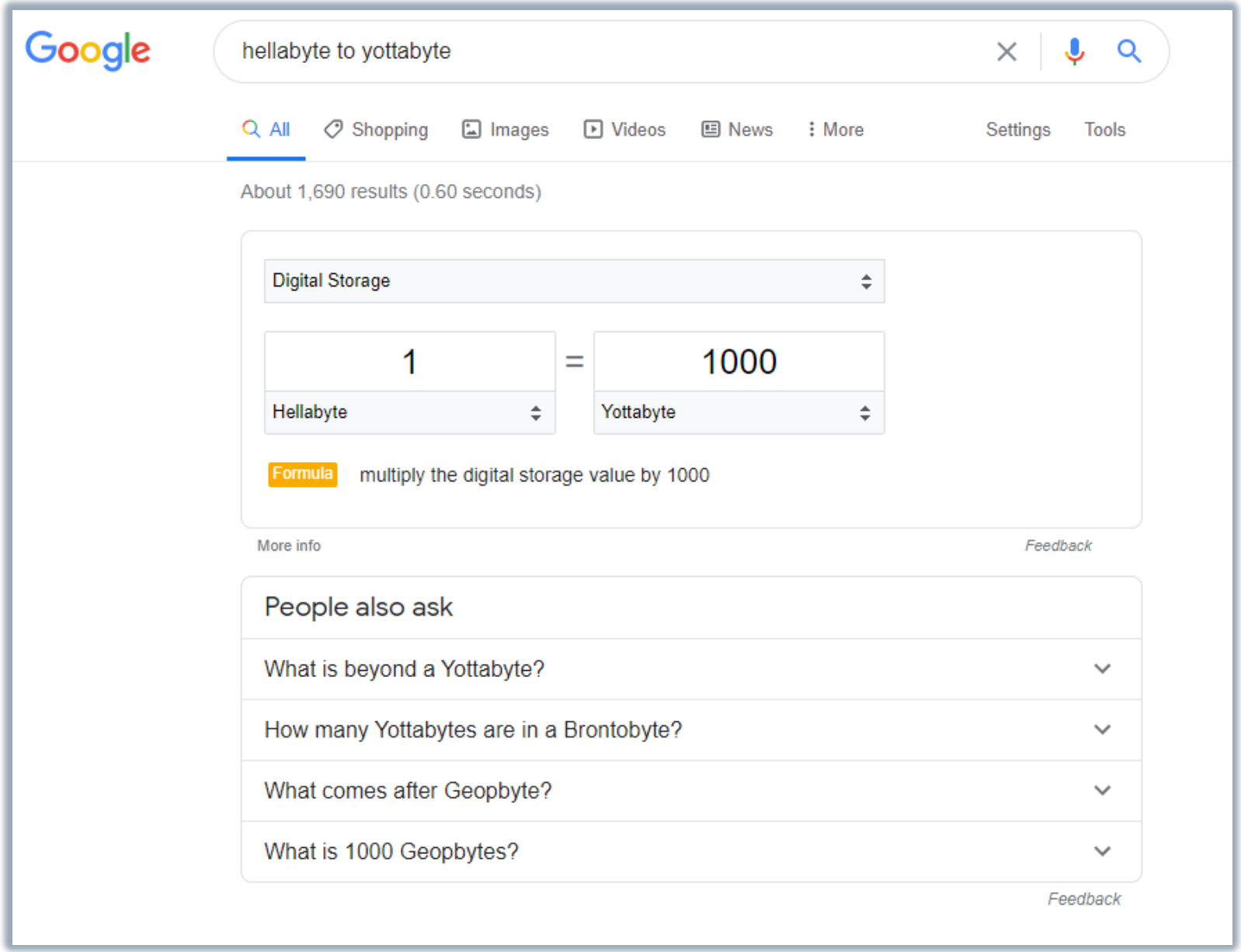


Fig. 1. Approximate number of times prefixes combined with ‘bytes’ or ‘byte’ appear on Google Scholar between 1992 and 2017 (inclusive, not including patents or citations); IEC prefixes (empty bars) and SI prefixes (shaded bars).



- An area where the popular science media is active
- Yottabyte(s) (412k Google hits), Brontobyte(s) (114k), Geopbyte(s) (60k), Hellabyte(s) (76k)
- IEC prefixes are used significantly less

Google’s conversion calculator



- Google is already using ‘hellabyte’ for digital storage

Proposal to extend the range of SI prefixes

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Multiplying factor	SI prefix name	SI prefix symbol
10^{27}	ronna	R
10^{-27}	ronto	r
10^{30}	quetta	Q
10^{-30}	quecto	q

CCU Consultation: 23 March to 20 November 2020

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- Document pack circulated, containing:
  - Draft CCU Recommendation to the CIPM
  - Explanatory position paper (with Annexes)
  - Roadmap
- Circulated to CCU members, representatives of liaison organizations and guests

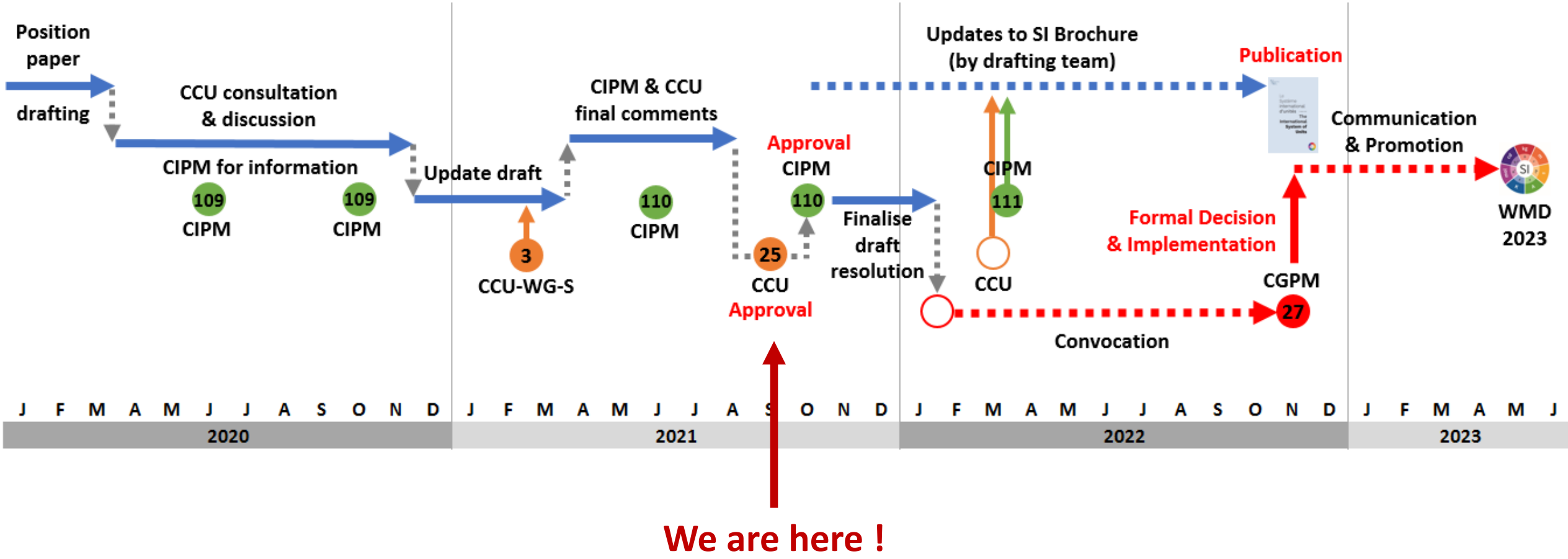
- LNE, CEM, NMIJ, NPL, PTB, IFCC and IUPAP responded
- All replies were positive and supportive of the proposals without change

- Bill Phillips, NIST: *"I think you have done a thorough job in describing the needs and the arguments for this extension, as well as the limitations. I am in favor of these modifications. I am particularly happy to see the practice of capital letters for positive powers of ten and lower case for negative powers is being consistently continued. The inconsistent practice for the earlier prefixes is a constant source of irritation. Thanks for the work that you and your colleagues put into this."*

Progress with what has been agreed

- ✓ There is consensus that an extension to the range of SI prefixes is now appropriate
- ✓ It is sensible to use the remaining available letters in the alphabet before considering compound prefixes (which remain a future option)
- ✓ The approach to producing the names and symbols is consistent with recent precedent
- ✓ It is prudent to act now and put this decision to the 27th CGPM in 2022
- ✓ A draft CGPM resolution was reviewed by CIPM in June 2021 and feedback was received and acted upon (see: CCU/2021-07)

CCU Roadmap to extend the range of SI prefixes



Next steps from the Roadmap

- Approval of the draft CGPM resolution at the 25th CCU meeting in September 2021
- Final approval of the draft CGPM resolution by the CIPM in October 2021
- Voting on the resolution at the 27th CGPM in November 2022
- If the vote is positive, implementation in the SI Brochure, communication and promotion