The Consultative Committee for Units (CCU) deals with the central goal and most important task of the Metre Convention:

- It advises the Comité International des Poids et Mesures (CIPM) in all matters concerning the International System of Units (SI), ...
- ... in particular, on how to establish, maintain, and disseminate the SI at the state of the art of science and adapted to the evolving needs of its users across the world.
- It disseminates knowledge about the SI and about its practical realization not only to metrology experts but also to the general public.

**Scope of the CCU**

- Structuring, developing and disseminating the SI
- Advice to the CIPM concerning units of measurement
- Preparing the successive editions of the SI Brochure
- Educating the general public about the SI

**Main achievements**

Preparation for the redefinition of four base units (kg, A, I, and mol) in 2018

The CCU has prepared decisions by the CIPM and the CGPM on the wording of the definitions: "explicit-constant" formulation

- Definition of the units is independent of any particular realization
- The final definition is a direct reference to the definition of Planck constant in terms of the SI base units
- The technical norms will now relate to the redefinition of the unit ...
- ... and instead translate directly into a better realization of that unit (update of the mise en pratique)
- A number of fundamental constants and conversion factors will have a reduced or even zero uncertainty.

The CCU has prepared the public for the upcoming new-style SI

- Together with the BIPM, the CCU has expanded the information on the New SI on the BIPM website
- The SI has been propagated in a series of open characterization seminars and on the SI Metrology Gateway website

**Example 1: The metre**

**OM, pre-1983 definition:**
The metre is the length equal to 1 650 763.73 wavelengths in vacuum of the radiation corresponding to the transition between the levels 2^p_s and 2^p_p of the krypton-86 atom

**1983 definition: Prototype for the New SI**
The metre is the length of the path travelled by light in a vacuum during a time interval of 1/299 792 458 of a second.

**Key features:**
- Fixed numerical value of the speed of light in vacuum
- Practical advantages:
  - Spectral line or Rayleigh interferometer
  - Need geometrical lengths (Earth-Moon distance)
  - Uncorrelated time of light

**Example 2: The kilogram**

**Current definition:**
The kilogram is the unit of mass; it is equal to the mass of the International Prototype of the Kilogram.

**New definition:**
- The kilogram is the unit of mass; its magnitude is set by defining the relative atomic mass of the Planck constant to be equal to exactly 1 649 695 954.0 when it is expressed in the SI unit for action s = kg m s⁻¹.

**Key features:**
- Fixed numerical value of the Planck constant
- Practical advantages:
  - Need a 2 s mass
  - Use a small weight balance or silicon sphere
  - Need an atomic mass
  - Use recoil-scattering in optical spectroscopy

**Areas of impact and stakeholders**

- Uniform and correct measurements underpin all national and international trade
- CGPM Member States and Associates represent 97% of world economic power
- Other international stakeholders: such as OIML, ISO, IEC, CIE, IUPAP, IUPAC
- The SI Brochure is adopted as an official reference by almost all countries

**Key challenges for the future**

- Encourage better measurements of the defining constants of the New SI
- For instance, reduce uncertainties and possible discrepancies of determinations of the Planck constant
- Sufficient and consistent input from Consultative Committees and International organizations

**Prepare redefinition of the second in 2020 or later**

- Encourage and support research on optical and atomic timescales whose frequencies could be candidates for realizing the SI second
- Close collaboration with the Consultative Committee for Time and Frequency and the Consultative Committee for Length
- This will probably lead to a new redefinition of a unit of time.

**Continue monitoring and advisory activities related to the SI and its future**

- Monitor mise-en-pratique activities of Consultative Committees
- Consider working out a strategy for approval and publication
- Continue work on dimensions and counting quantities

- Working Group CCU 8.5 ADDG: "Angles and Dimensions in SI, in cooperation with ISO/TC 12
- Consider whether to systematically include physiologically weighted quantities
- For instance, in photometry, audimetry, and dosimetry