

# Cooperation with EURAMET in research

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## Basic info on WELMEC

### WELMEC – European Legal Metrology Cooperation

- an association of legal metrology authorities of the EU Member States founded in 1990 on the basis of an MoU
- a sister European metrology organization to EURAMET e.V. with 50% overlap in membership at the level of working groups
- in 2020 reestablished as a legal body – a non-profit association under German law, eingetragener Verein, e.V.
- as a result of the Brexit, the UK withdrew its membership in April 2021
- membership: **38 full Members (EU / EFTA)** inclusive former Associate Members (candidates for EU - Stabilization and Association Agreement with the EU)

## The mission

### WELMEC – European Legal Metrology Cooperation

- development of (technical and non-technical) guides to achieve common interpretation of EU-legislation as regards harmonized (new approach) EU directives in metrology MID / NAWID (10 + 1 categories of measuring instruments) and old-approach directives on prepackages
- an exceptional arrangement – the only new-approach directives supported by such guidance-developing body
- objective: to cover those metrology area which may have influence on trade, safety, health and environment protection with a double aim: harmonization + safe products (sufficiently accurate measurements for citizens)
- supporting the application of so called normative documents (OIML recommendations) in MID by way of so called corresponding tables – world-wide harmonization
- a special WG 7 on software

## Guidance documents

### WELMEC – European Legal Metrology Cooperation

- available publicly free of charge at [www.welmec.org](http://www.welmec.org) and updated regularly
- referenced by the European Commission (EUC), DG GROW :  
[https://ec.europa.eu/growth/single-market/goods/building-blocks/legal-metrology/measuring-instruments\\_en](https://ec.europa.eu/growth/single-market/goods/building-blocks/legal-metrology/measuring-instruments_en)
- in total 63 „live“ guides, 12 withdrawn, 17 corresponding tables
- **Motto:** to achieve utmost liberal regulation guaranteeing an effective protection of public interests (protection of consumers)
- **permanent agenda points for WG WP:** [proposals for research in EURAMET research programme EPM](#), deficiencies in the metrology EU Directives

## WELMEC technical scope

Measuring Instrument Directive (MID, 2014/32/EU) covers 10 categories of measuring instruments, most important to citizens:

- MI-001: watermeters
- MI-002: gasmeters + volume conversion devices
- MI-003: (active AC) electricity meters
- MI-004: thermal energy meters (heating + cooling)
- MI-005: measuring systems for continuous and dynamic measurement of quantities of liquids other than water
- MI-006: automatic weighing instruments
- MI-007: taxi-meters

## WELMEC technical scope

- MI-008: material measures
- MI-009: length measuring instruments
- MI-010: exhaust gas analyzers

Non-automatic weighing instruments Directive (NAWID, 2014/31/EU) :

- out of historical reasons it covers only non-automatic weighing instruments

The impact of digitalization:

- classical hardware functionalities being quickly replaced by software ones
- information and communication technologies are playing significant role
- inevitably research has to concentrate on these aspects as well

## WELMEC technical scope

- **Guide on Software – WELMEC Guide 7.2 + associated guides:** de facto global state-of-the-art for validation of software
- **Analysis of communication protocols for smart meters** – to prevent any data manipulations
- **Hash functions** to protect data transfers – developed by national metrology institute of the USA, NIST (industrial standard to be - SHA 256)
- **Up-load of software (remote or local)** - without breaking any seals
- Metrologically-controlled **transfer of measured data to ICT-devices of citizens** (NBs, tablets, mobiles), e.g. electrical energy meters under the Electricity Directive
- **Application of blockchain** to metrological traceability of IoT devices
- **Machine-readable certificates** of any kind
- And many others...

## Targeted amendment of MID 2023

On May 24, 2023 EC DG GROW approached WELMEC with a question whether WELMEC would be able to develop requirements to **technically fast-track amend MID** with this specification:

- the set of essential requirements **e-vehicle charging stations** should meet;
- the set of essential requirements **hydrogen refuelling stations** for motor vehicles should meet;
- requirements on **electrical energy meters (AC, DC)**;
- new uses and the roll-out of **smart meters**;
- to propose corresponding changes **in Annex I Essential requirements**

**The deadline: rather tough - October 31, 2023 !**



## Targeted amendment of MID 2023

- Technical concepts in both directives (especially in Annex I Essential requirements and in the instrument-specific annexes) are now more than 20 years old, no major technical revision since that time
- In times of digitalization and energy transition (implementation of the Green Deal) such a metering regulation is fast becoming out of date - as a result, any scope for more guidance in WELMEC is fast becoming quite narrow
- WELMEC Board therefore decided to launch a project to develop the specified requirements - to full use this window of opportunity

## Targeted amendment of MID 2023

- A robust link exists between the structure of projects under EURAMET-sponsored past research projects and this specification !
- Therefore, WELMEC hugely benefitted from the results of those research projects, being available just on time !
- On September 28 WELMEC organized a webinar with 200 registered participants where the proposals were introduced to stakeholders
- Final versions after a collation of comments are now available on the WELMEC website and in time will be sent to the European Commission DG GROW to the next steps

## EURAMET research projects relevant to Legal Metrology

1	14IND08	ElPow	<a href="#">Metrology for the <u>electrical power industry</u></a>
2	14IND10	MET5G	<a href="#">Metrology for 5G communications</a>
3	15NRM03	Hydrogen	<a href="#">Metrology for <u>sustainable hydrogen energy applications</u></a>
4	15RPT04	TracePQM	<a href="#">Traceability routes for electrical power quality measurements</a>
5	15SIP06	ValTraC	<a href="#">Validation of software development and analysis tools using TraCIM</a>
6	16ENG01	MetroHyVe	<a href="#">Metrology for hydrogen vehicles</a>
7	16ENG08	MICEV	<a href="#">Metrology for inductive <u>charging of electric vehicles</u></a>
8	16ENG09	LNG III	<a href="#">Metrological support for <u>LNG and LBG as transport fuel</u></a>
9	17IND02	SmartCom	<a href="#">Communication and <u>validation of smart data in IoT-networks</u></a>

## Situation on national level

- The scope of the European directives in metrology is rather limited
- For protection of public interests a number of other instrument categories are regulated on the level of Member States
- In areas where there is no EU regulation WELMEC can step in with **voluntary type examination (or other) agreements** among legal metrology authorities (like in times before the EU metrological directives appeared – TAA, Type Approval Agreements)
- Such a concept would be strongly supported by the EU legislation on mutual recognition [Regulation \(EU\) 2019/515 on the mutual recognition of goods lawfully marketed in another country](#)

## Situation on national level

Examples might be:

- Measuring instruments in the area of ionizing radiation
- Medical devices with a measurement function
- Evidential breath analysers (OIML R126)
- Automatic instruments for weighing road vehicles in motion and measuring axle loads (OIML R134)
- Speedometers, mechanical odometers and chronotachographs for motor vehicles (OIML R 55)
- Radar equipment for the measurement of the speed of vehicles (OIML R 91)

## Situation on national level

Therefore, the research under the EURAMET leadership is equally important to support regulation in metrology on the national level in the Member States

## Conclusions

- WELMEC is thus a natural customer for EURAMET-organized and administered research, now the European Partnership for Metrology (EPM) in association with measuring instruments and measurements
- even if in a relatively narrow scope as regards the European regulation the joint research in metrology performed by EURAMET plays a significant role for regulation in metrology on the level of Member States as well
- The strong cooperation between EURAMET and WELMEC has thus direct impact on daily life of European citizens
- Also in response to technological progress EURAMET and WELMEC have to continue to work closely together in future to meet the societal requirements to metrology in Europe



**THANK YOU FOR YOUR  
ATTENTION!**

[www.welmec.org](http://www.welmec.org)