

Metrology in Austria

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**Seminar “ Legal Metrology & EU directives, New Legislative Framework”
Zagreb, Croatia, 3 – 4 November 2010**

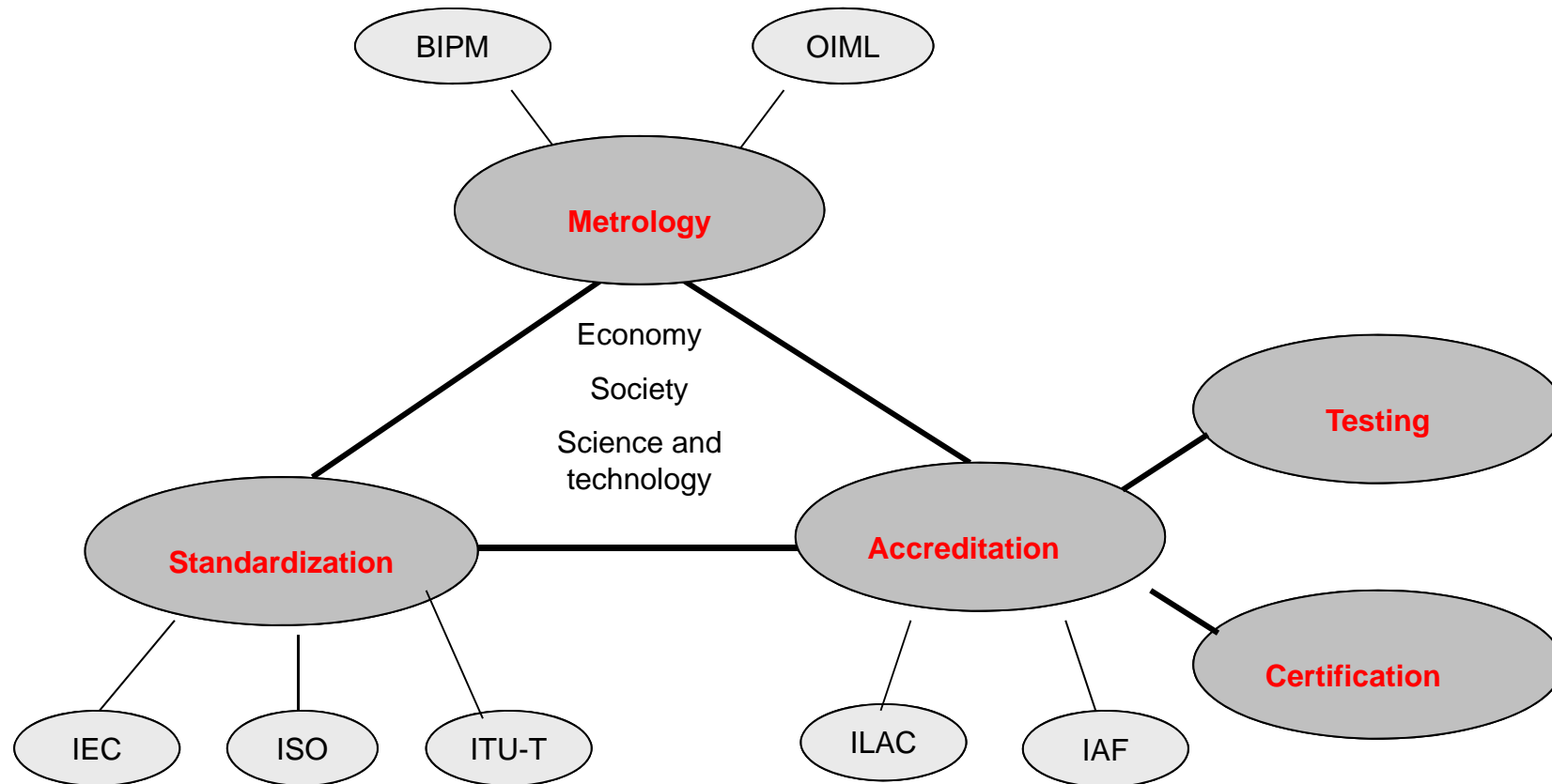
BEV - Bundesamt für Eich- und Vermessungswesen



Outline

- Introduction
- Measuring instruments subject to metrological control
- Type approval and verification
- Surveillance and inspection
- Implementation of NAWID and MID
- Recognition in the non-harmonized area
- Organizational structure of BEV

Quality infrastructure supporting a sustainable world economy



Metrological Infrastructure – Austria

National Metrology Institute



Legal Metrology Authority



Accreditation Body

Calibration laboratories: approx. 20

Verification laboratories: approx. 60



The Role of the BEV

- National Metrology Institute (NMI)
- Legal Metrology Authority
- National Cadastre Agency
- National Mapping Agency



Bundesamt für Eich- und Vermessungswesen

Main Tasks of BEV: National Cadastre Agency

- **Geodetic and geophysical reference system** for position, elevation and gravity
- **Austrian cadastral system**
 - updated documentation on all Austrian real estate with regard to its boundaries, land use, and potential agricultural output
 - together with the land register, the cadastre forms the Austrian system of **safeguarding ownership** in real estate and land

Main Tasks of BEV: National Mapping Agency

- Remote sensing, **topographic and cartographic models:**
digital landscape model and cartographic databases and topographic mapping
- **State boundaries:**
surveying, demarcation, and documentation of the Austrian state boundaries

Main Tasks of BEV : NMI

- Maintenance and development of the **national measurement standards**
- Ensuring their **international equivalence** and recognition
- **Calibration** of measuring instruments
- **Training** and knowledge transfer
- **International cooperation**

Main Tasks of BEV: Legal Metrology

- Issuing regulations
- Type approval
- Verification: complementary to private bodies
- Notified body for NAWI and MID
- Market surveillance and in-service-inspection
- Control of prepackages
- Supervision of accredited verification bodies
- Training and knowledge transfer
- International cooperation

Historical Developments

- 1875 Meter Convention
- 1923 BEV
- 1950 Metrology Act
- 1955 OIML
- 1987 EUROMET
- 1990 WELMEC
- 1993 Implementation of Old Approach Directives
- 1993 Restricted Legal Entity

Historical Developments

- 1994 Austria joins the EEA
- 1994 Implementation of NAWI Directive
- 1994 Private Verification Bodies
(Utility Meters)
- 1994 Calibration Service Ordinance
- 1995 Austria joins the EC/EU
- 1996 Implementation of the Medical Devices
Directive
- 1999 CIPM – MRA

Historical Developments

- 2002 Private Verification Bodies (extension to almost all categories of instruments)
- 2002 Decentralized Measurement System
- 2004 Designated Institute: Humidity
- 2007 EURAMET e.V.
- 2009 Designated Institute: Ozon in air

Metrology Act (MEG)

↓
Legal units of measurement
Role of NMI

↓
Verification

Type approval
Verification

Market surveillance and inspection

↓
Testing/Calibration

Calibration service

Physico-technical testing service

↓
Penal provisions

Transitional and final provisions

For the legal units of measurement the BEV has to ...

- maintain the **national measurement standards** or to designate institutes to maintain them
- take provisions for the **international recognition** of the national standards

2 Designated Institutes

Base Units of the SI

m

s

K

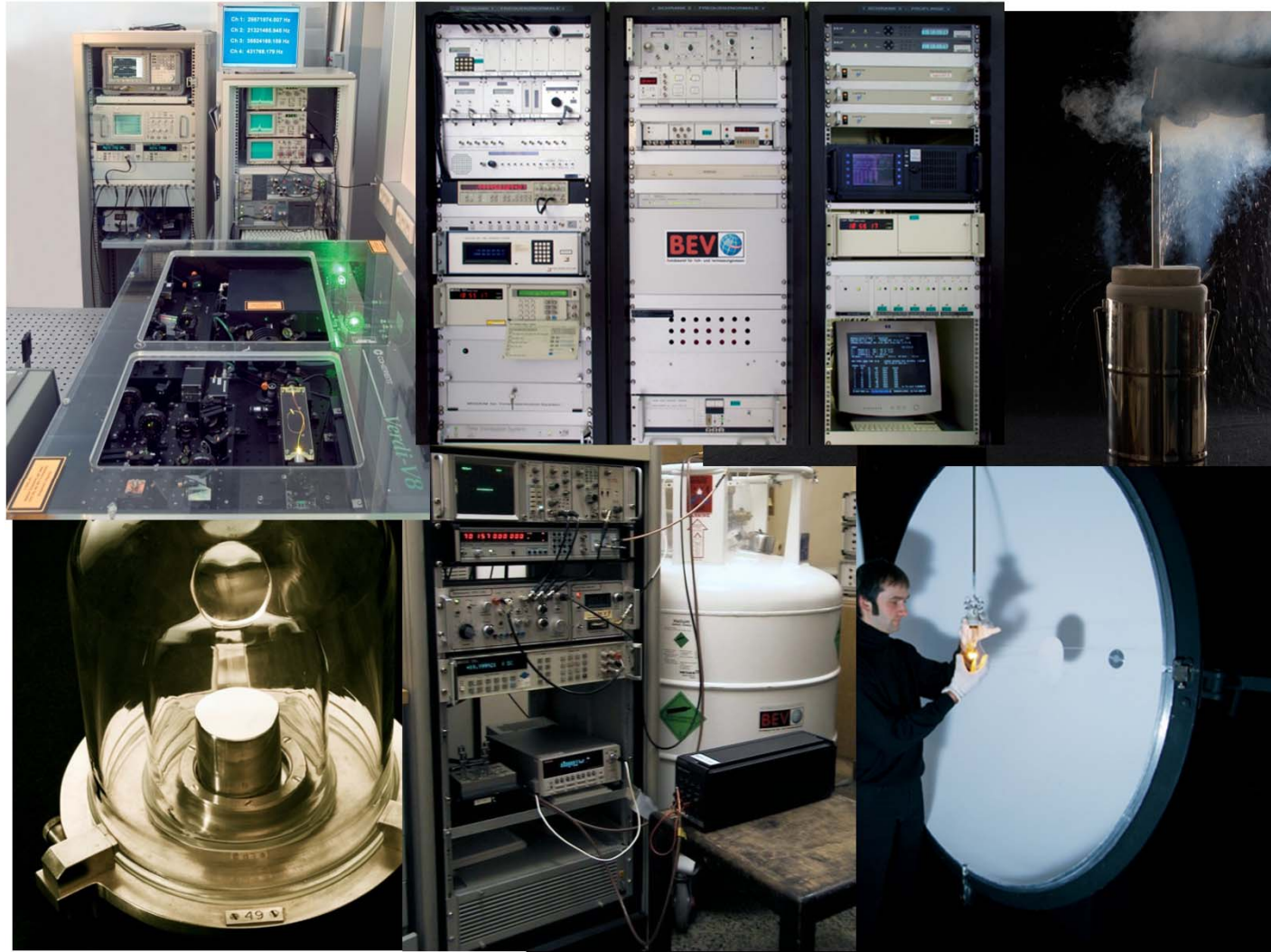
mol

kg

A

cd

Base Units of the SI



mol

Measuring instruments subject to metrological control

Measuring instruments subject to metrological control (1)

Instruments for official and commercial transactions

- Length measures and length measuring instruments
- Area measuring instruments
- Volume measures
- Dipsticks and Depth gauges for liquids
- Taximeters
- Weights
- Gas volume meters
- Volume correctors
- Liquid volume metering instruments
 - Water
 - Liquids other than water
- Capacity measures (tanks)

Measuring instruments subject to metrological control (2)

Instruments for official and commercial transactions

- Electricity meters (active e., reactive e., additional devices for billing))
- Heat meters
- Measuring instruments for grading cereals and milk
- Measuring instruments for density
- Manometers
- Thermometers
- Sound level meters
- Dosimeters
- Activity meters
- Hardness test blocks and indenters for hardness
- Non-automatic weighing instruments
- Automatic weighing instruments

Measuring instruments subject to metrological control (3)

Instruments for health service and environmental protection

- Weighing instruments
- Dosimeters
- Sound level meters
- Activity meters

Instruments for safety purposes

- Manometers
- Thermometers
- Dosimeters
- Activity meters

Measuring instruments subject to metrological control (4)

Instruments for road traffic and enforcement purposes

- Tyre pressure gauges
- Axle and wheel weighing systems
- Chronotachographs
- Traffic speed measuring instruments
- Accelerometers
- Breath analysers
- Revolution counters
- Sound level meters
- Dosimeters
- Activity meters

Type approval and verification

Type approval

- Instruments subject to metrological control require type approval prior to verification (exceptions for „simple“ instruments)
- Basis is the result of a physico-technical examination
- **Type approval is one of the tasks of BEV**

Verifications

The measuring instruments subject to metrological control are verified by

- **accredited verification bodies**
- **legal metrology authorities**
(only categories, for which no accredited verification body exists)

Verification mark

The verification mark consists of

- Verification sign
- Sign indicating the year
- X and Y being numbers identifying the verification body or verification authority



Subsequent verification (1)

Subsequent verification of measuring instruments has to be carried out periodically at specified intervals

Intervals for subsequent verification

- 2 years for all measuring instruments unless otherwise specified
- 1, 3, 4, 5, 8, 10, 12, 16, 20 years for certain measuring instruments
- Exemptions from subsequent verification

Extension possible for: electricity, gas, heat meters

Subsequent verification (2)

Intervals for subsequent verification - examples

- 2 years: Weighing instruments, fuel dispensers
- 3 years: Traffic speed meas. Instr.
- 5 years: Water and heat meters
- 8 years: Static electricity meters
- 12 years: Diaphragm gas meters
- 16 years: Electromechanical meters
- 20 years: Electromechanical meters since 1978

Repairers protective mark

- Measuring instruments can be used after repair until verification if sealed with a protective mark by an authorized qualified person
- Authorization by BEV
- Obligation for the authorized person to inform the legal metrology authority
- Obligation for the user to apply for verification

Legal Metrology Authorities



- Verification offices



Verification bodies

Verification bodies (1)

Verifications can be carried out by **accredited verification bodies**. The categories of measuring instruments are identified by an ordinance of the Federal Ministry of Economy, Family and Youth.



approx. 60 verification bodies

Verification bodies (2)

The verification bodies are accredited according to

- ISO/EN 17025
and
- the **verification bodies ordinance:**
requirements, duties, rights, supervision

Verification bodies (3)

- **Amendment in preparation:**
according to a draft amendment of the
Metrology Act:
instead of accreditation by the accreditation
body

authorization by BEV

Verification bodies (4)

If verification bodies are accredited for certain categories of measuring instruments, the verification authorities have to suspend the verification of these measuring instruments

Verification bodies (5)

In order to ensure verification services all over the country and to avoid disadvantages for the national economy the Minister for Economy, Family and Youth is entitled to issue an ordinance

- regulating maximum prices ... and
- granting exemptions concerning the suspension of activities of the verification authorities

Verification bodies (6)

Obligation to inform the BEV:

The information has to contain

- date and site of verifications (user, address)
- type of measuring instrument
- number of instruments
- ...

Supervision of verification bodies by BEV

Supervision with respect to

- compliance with the verification regulations
- compliance with the type approval certificate

Samples of measuring instruments tested:

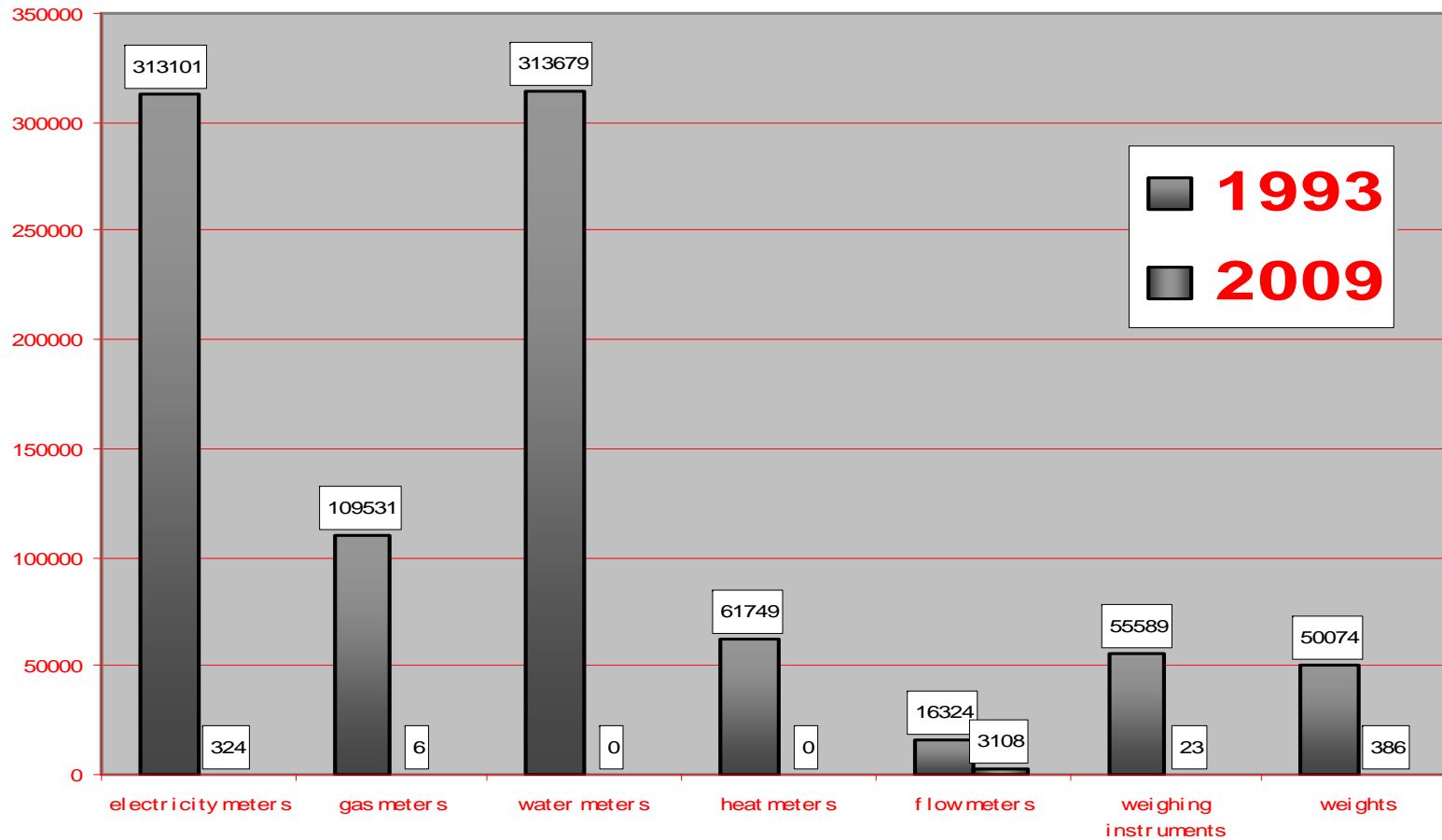
samples depending on the number of verified measuring instruments per year (categories of verification bodies)

Fees and sample sizes

Fees according to the verification fees ordinance

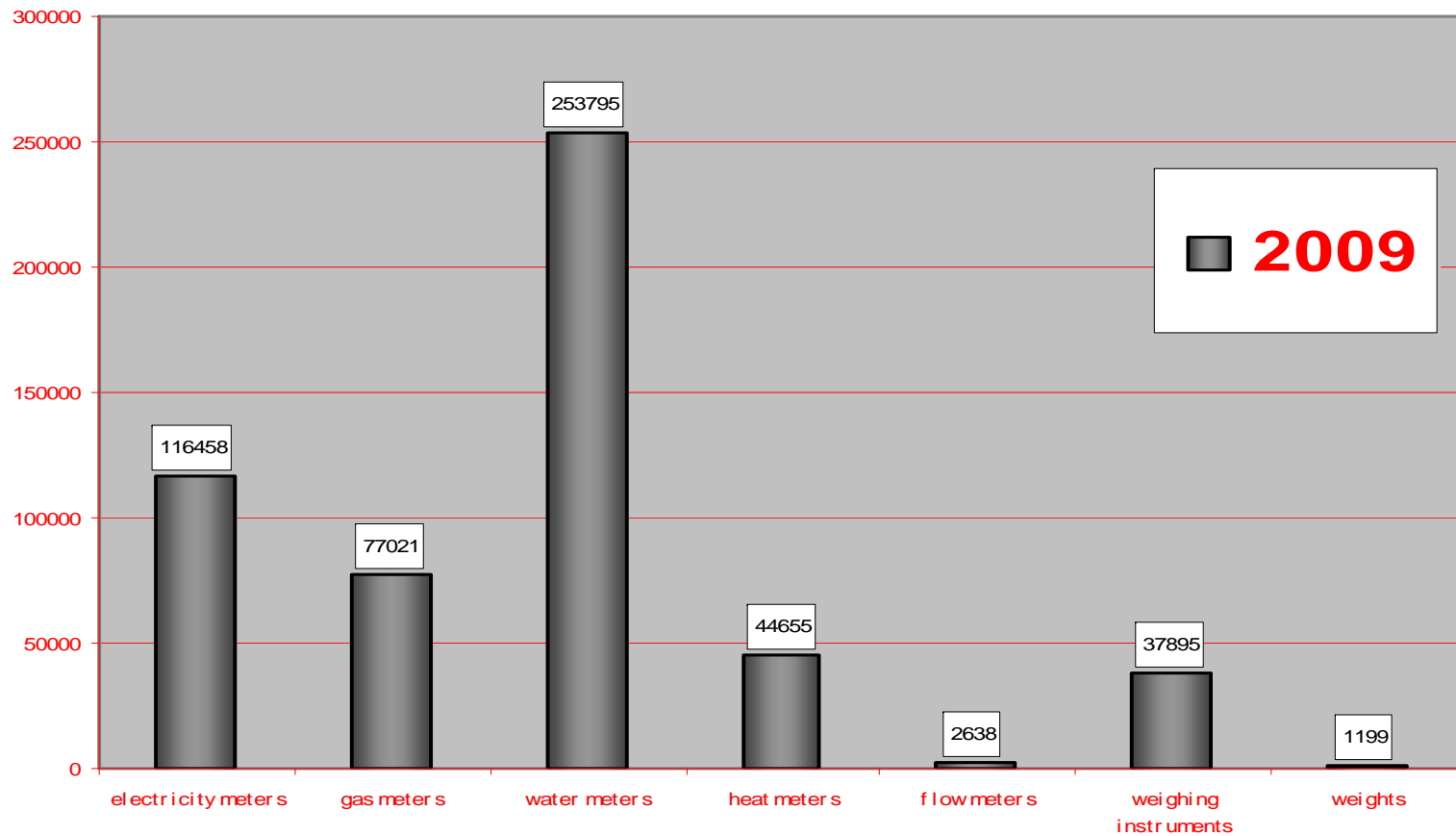
	fee	sample size
• Category A	€ 1308,11	5 - 35
• Category B	€ 2180,18	70
• Category C	€ 4360,37	120
• Category D	€ 7267,27	150

Verifications by legal metrology authorities



Verifications by verification bodies

2009



Surveillance and inspection

Surveillance and inspection (1)

include:

- Market surveillance
- Supervision of companies manufacturing prepackages, measuring container bottles, capacity serving measures
- Inspection of measuring instruments in service

Market surveillance

- Monitoring that products placed on the market comply with the provisions of the MEG (Metrology act)
- taking action to establish conformity, when necessary

In-Service-Inspection

- Inspect the compliance with the legal interval for subsequent verification, the stability and the correct use of verified measuring instruments
- Systematic “screening” all over Austria
- Inspection “on demand” (complaints)
- Free of charge for the user
- Reports published on BEV web pages

Revision von Messgeräten Ladentischwaagen

Ergebnis 2009

Within mpe in service

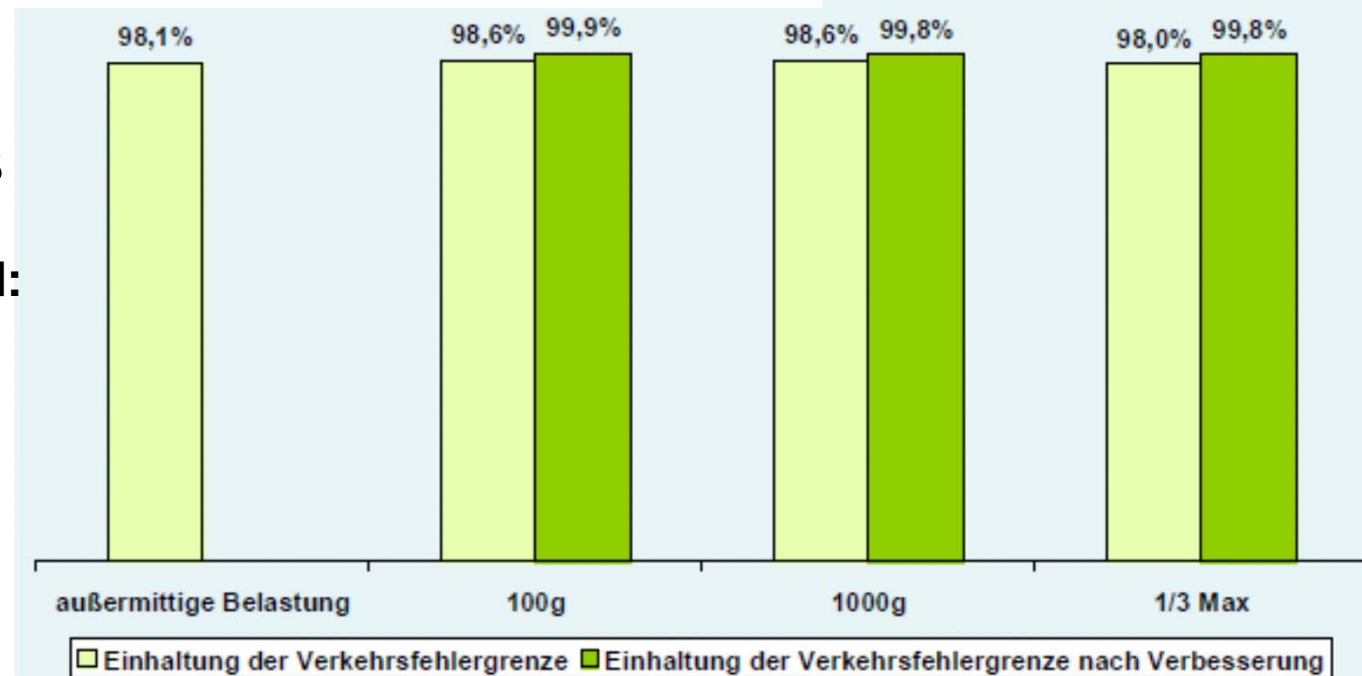
1016 NAWI's

Verification valid:

86,2 %

Correct use:

62,9 %



Betriebsstoffmessanlagen an Tankstellen

Erhebung 2009

Abschlussbericht

- 251 fuel filling stations
- 2 fuel dispensers at each station
- Valid verification : 91,8 %
- Verifications by verification bodies: 92,4 %
- Within mpe in service: 100 %

Provisions

- Warning with appropriate time limit for improvement
- Prevent further use by fixing an official seal (max. 6 months)
- Confiscate measuring instrument or parts of it (max. 6 months)
- Interdict further placing on the market
- Inform the notified body
- Publish in appropriate gazettes

Sanctions

- Administrative fines may be imposed by district administration authorities (up to €10 900)
- In severe cases, especially when fraud is evident, prosecution in a Court of Law is possible

Markt- überwachungs- programm 2010

Gemäß Verordnung
(EG) Nr. 765/2008

4.12.2009

V1.0



Implementation of NAWI-Directive and MID

Metrology Legislation in Austria

Parliament



Ministry



Legal Metrology Authority



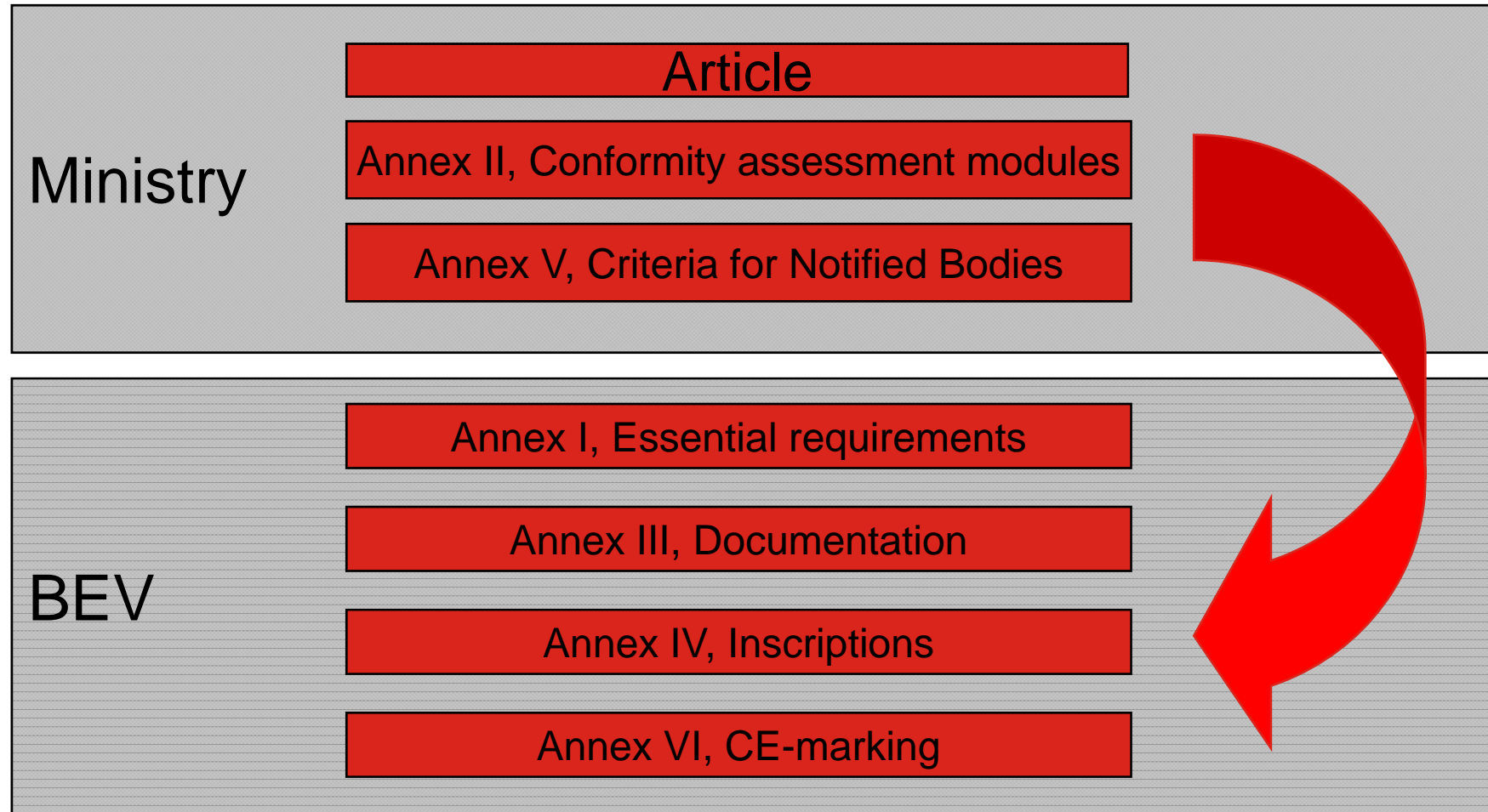
Metrology Legislation in Austria

- Laws (Federal Parliament)
 - Legal Basis
 - Framework for ordinances
 - Responsibilities

- Ordinances (Minister)
 - Based on laws
 - Detailing the content

- Ordinances (Authorities)
 - BEV (Regulations for verification)

Implementation of the NAWI directive



Implementation of the NAWI directive

- Metrology Act

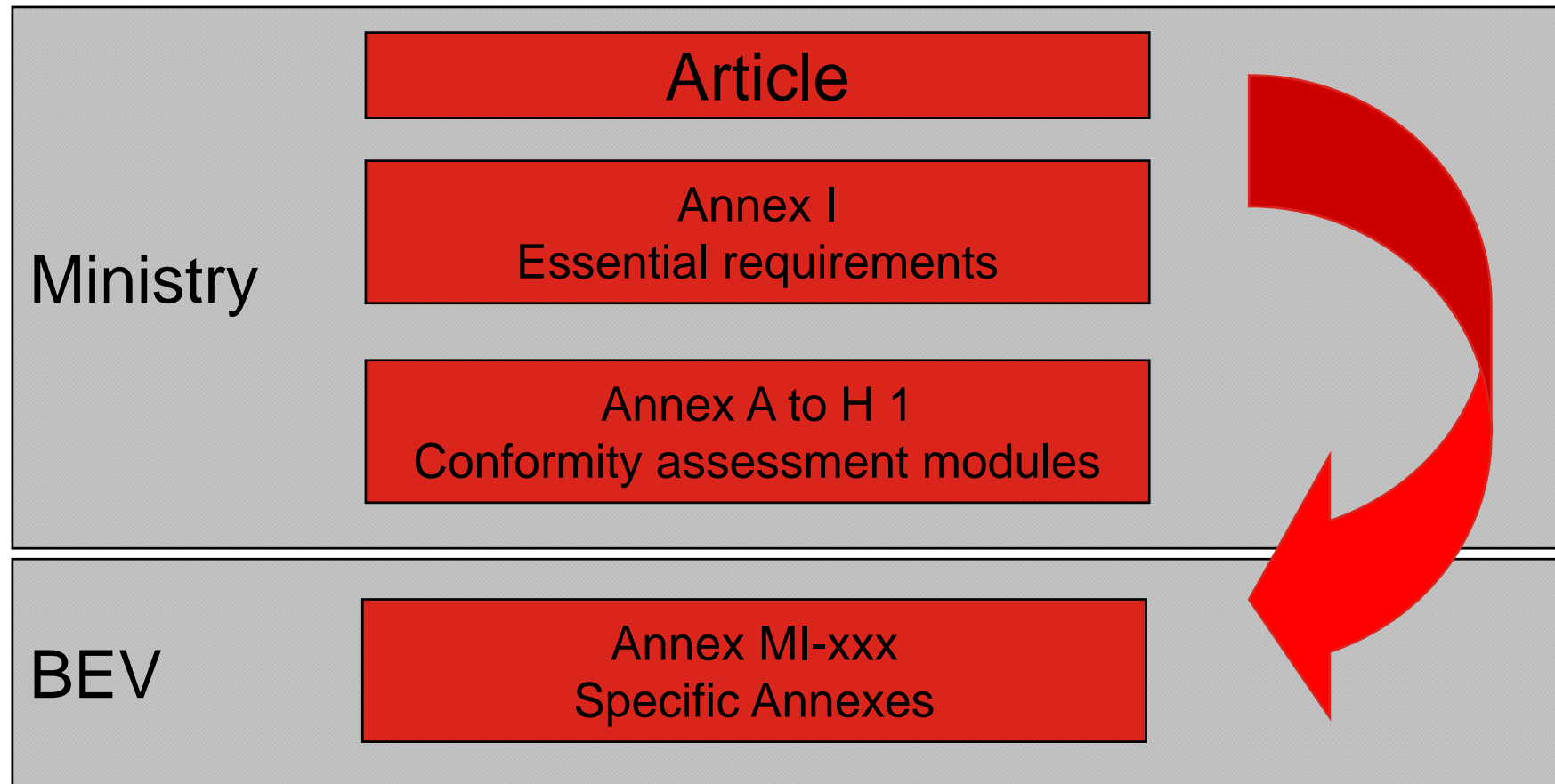
- Regulation issued by the ministry
 - Ordinance on conformity assessment of non-automatic weighing instruments

- Regulations issued by BEV
 - Ordinance on verification of NAWI

Implementation of MID

- Metrology Act (no amendments necessary)
- Regulations issued by the ministry
 - Ordinance on measuring instrumentsChanges in
 - Ordinance for type approval
 - Ordinance on capacity serving measures
 - Ordinance on mutual recognition
 - Ordinance on recognition of tests for verification
- Regulations issued by BEV
 - Ordinances on verification

Implementation of MID



Verification regulations

- Instructions for verification
 - **Water meters**
 - Gas meters and volume conversion devices
 - **Active electrical energy meters**
 - Heat meters
 - Measuring systems for the continuous and dynamic measurement of quantities of liquids other than water
 - **Automatic weighing instruments**
 - **Taximeters**
 - Material measures
 - Dimensional measuring instruments

Include also
National
regulations

Notification in Austria

- Notification of BEV based on
 - criteria in MID
 - peer assessment

- Notification of private companies based on
 - criteria in MID
 - accreditation

(up to now no further notification)

Certificate of approval of QMS

Bundesamt für
Eich- und Vermessungswesen



Benannte Stelle des BEV,
Bundesamt für Eich- und Vermessungswesen, Artlgasse 35, A – 1180 Wien

FL 06/2008 DVR: 0037028

GZ

Bescheinigung über die Anerkennung des QM-Systemes
nach der Richtlinie Auswahl
Qualitätssicherung für die Produktion, Modul D
approval of a quality management system according to Auswahl Annex Auswahl

ausgestellt von
issued by Bundesamt für Eich- und Vermessungswesen (BEV)
Kennummer als benannte Stelle: 0445

gemäß § 18 des Maß- und Eichgesetzes (MEG), BGBl.Nr.152/1950, in
der geltenden Fassung, in Zusammenhalt mit der Verordnung
Auswahl igF. und den Eichvorschriften für Auswahl, Amtsblatt
für das Eichwesen Auswahl igF., welche die Richtlinie Auswahl
igF. umsetzen.

according to § 39 of Metrology Act, federal gazette No. 152/1950, as amended, the regulation
concerning measuring instruments federal gazette II Auswahl as amended and the
regulation concerning Auswahl, Amtsblatt für das Eichwesen Auswahl as amended,
implementing directive Auswahl as amended.

ausgestellt für
issued to Firma
Adresse
PLZ Ort
Land

Messgerätekategorien:
Measuring instrument categories: Auswahl

Bescheinigungsnummer: A 0445/XXXX/2008
Certificate Number:

Gültig bis
valid until 00. Monat Jahr

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten,
die Bestandteil der Zulassung ist und n Seiten umfasst.
*Description, technical data, requirements and security measures are included in the Annex being part of the type
examination certificate.*

Wien, am 00. Monat Jahr
Die Leiterin der benannten Stelle

Dr. Ulrike Fuchs

BEV Bundesamt für
Eich- und Vermessungswesen
Artlgasse 35
A – 1180 Wien

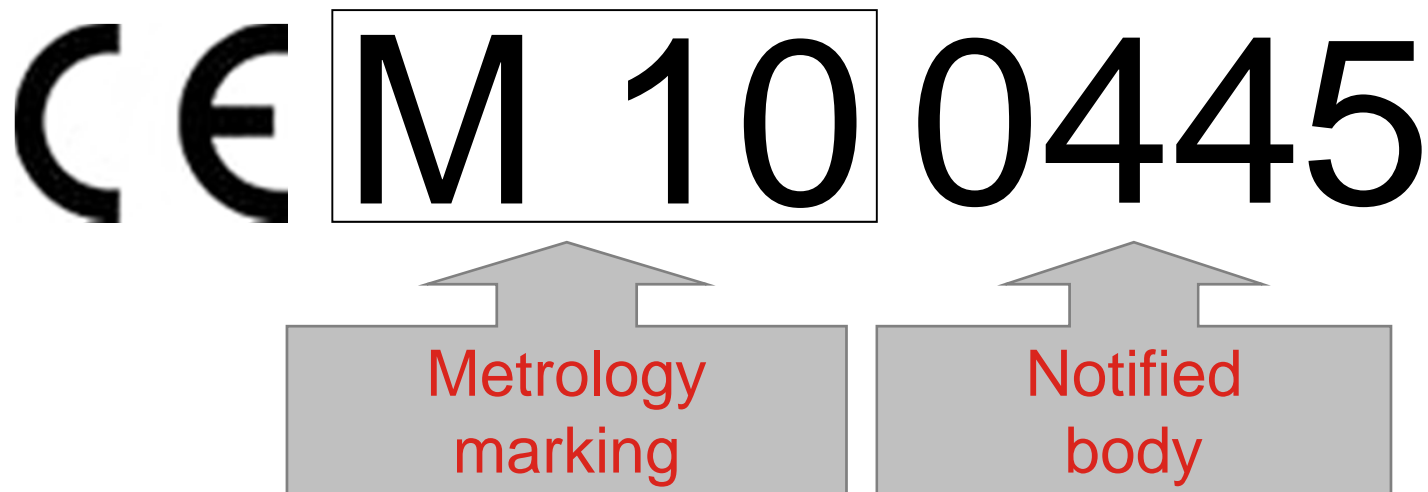
Tel.: +43-(0)1-21 110-0
Fax: +43-(0)1-21 110-6000
E-Mail: Benannte.Stelle@bev.gv.at
See you: www.bev.gv.at

UID: ATU38473200
PSK: 6180001
BLZ: 60000
IBAN: AT56 6000 0000 0519 0001
BIC: OPSKATWW

BEV: Notified Body No. 0445

for

- Non-automatic weighing instruments directive
- Measuring instruments directive (MID),
exception: exhaust gas analyzers



Recognition in the non-harmonized area

Recognition in the non-harmonized area (1)

Products (including their tests and inspections) from **member states of the EU or of the EEA** are treated as equivalent:

- if the products meet the test and inspection requirements in the member state,
- if a comparable level of protection is sustainably given.

Recognition in the non-harmonized area (2)

The Federal Minister of Economics, Family and Youth is authorized to decree **criteria and procedures** for the evaluation of **the equivalence of the level of protection**

Recognition in the non-harmonized area (3)

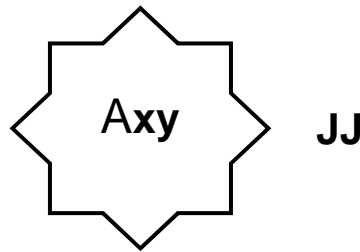
Products (including their tests and inspections) from **other states (non-EU/EEA)** are treated as equivalent:

- if the products comply with the legal provisions of the respective states and
- if the equivalent treatment is demanded by international law or
- if the equivalence is stated by an ordinance of the Federal Minister of Economics, Family and Youth

General preconditions

- A foreign test is equivalent to the domestic one, if the following preconditions are met:
 - neither EEC initial verification (old approach) nor CE marking (new approach) is possible
 - the test was carried out by a metrological body recognized by BEV

Verification mark



„A“ for Austria

„xy“ numbers identifying the metrological body

„JJ“ numbers indicating the year of verification

Differing agreements on marking are possible

Practical procedure for recognition

- Application to BEV
- Assessment of the quality system and
- Technical assessment by BEV at the laboratory
- Agreement on the verification mark
- Arrangement concerning the supervision by BEV
- Publication of the metrological body

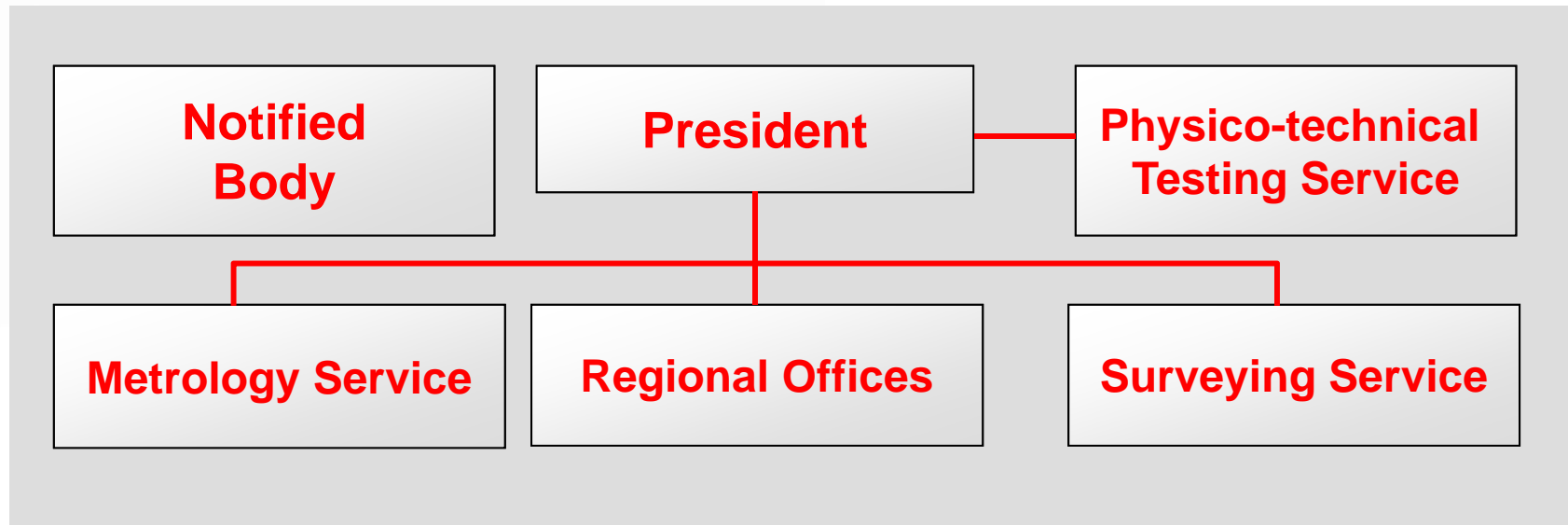
Organizational structure of BEV

BEV - Organisation Chart 1

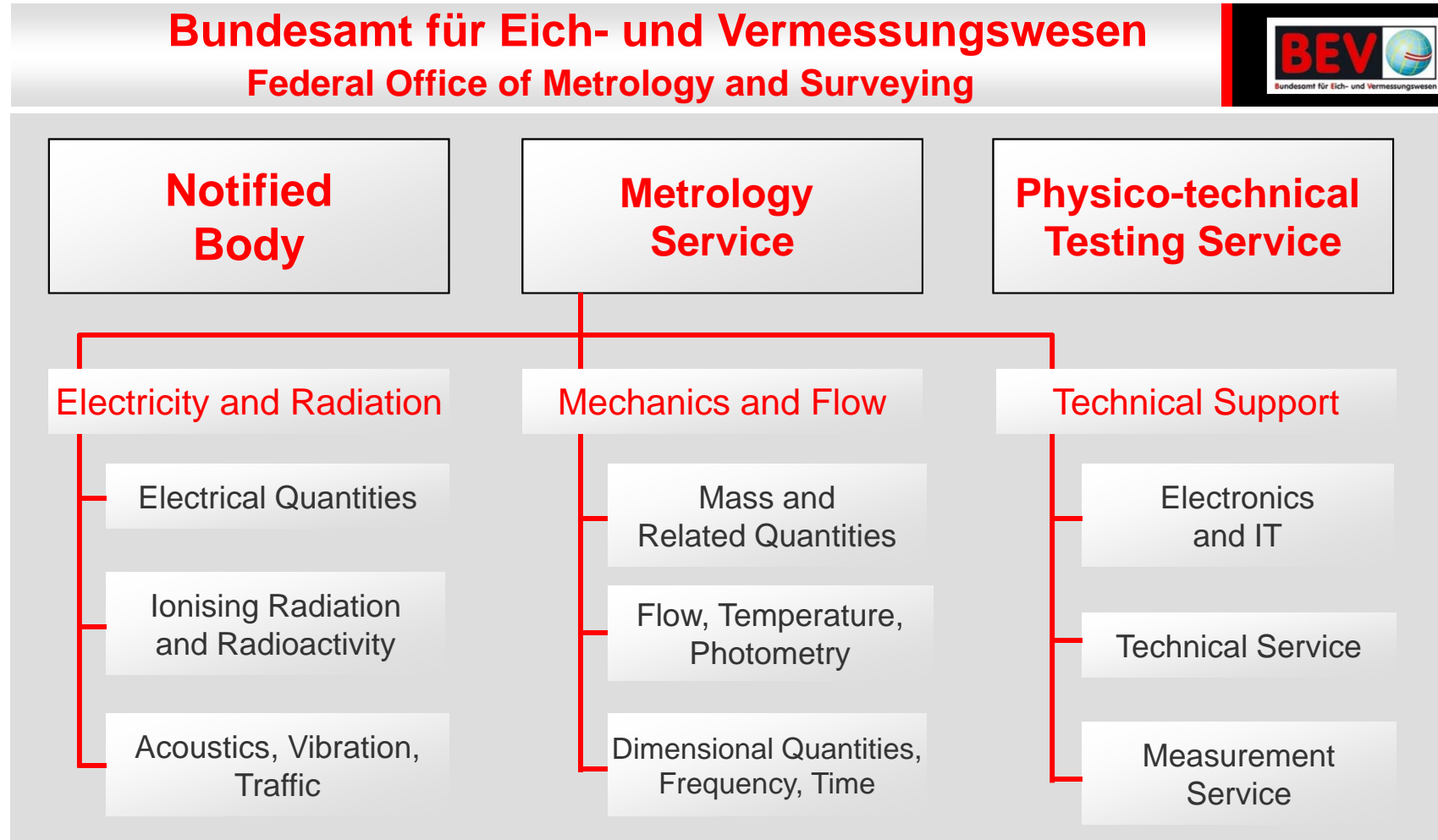
Bundesministerium für Wirtschaft, Familie und Jugend
Federal Ministry of Economy, Family and Youth



Bundesamt für Eich- und Vermessungswesen
Federal Office of Metrology and Surveying



BEV - Organisation Chart 2



Personnel

BEV	1300
Metrology Service	90
Verification Offices	90

Physico-technical Testing Service

- Restricted legal entity
- Calibrations
- Type tests (not approvals!)
- Tests for notified body
- Training and seminars
- Assessors for accreditation body
- Expert services
- Consultation

Physico-technical Testing Service

- Verification fees → state budget
- Revenues of Physico-technical Testing Service
→ own financial management

Quality management in BEV (1)

- **BEV:** QMS according to ISO 9001, since 1995
- **National Metrology Institute:**
 - QMS according to **ISO 17025** General requirements for the competence of testing and calibration laboratories (requirement of CIPM-MRA)
 - 2002: QMS accepted by EUROMET QS-Forum
 - Since 2004: internal audits with participation of technical experts from PTB and METAS










Quality management in BEV (2)

- **Legal Metrology, Notified Body:** QMS according to
 - **ISO/IEC Guide 65 (EN 45011)** General requirements for bodies operating product certification systems
 - **ISO/IEC 17020** General criteria for the operation of bodies performing inspection
 - **ISO/IEC 17021** Conformity assessment – Requirements for bodies providing audit and certification of management systems
- Testing: ISO 17025 General requirements for the competence of testing and calibration laboratories
- **Full external audit**

Activities of BEV 2009

- Calibration certificates: 3 373
- Type approvals:
(including amendments) 117
- Verifications: 23 000
- In-service-inspection: 22 000
- Market surveillance: 150
- Supervision of verification bodies: 13 700

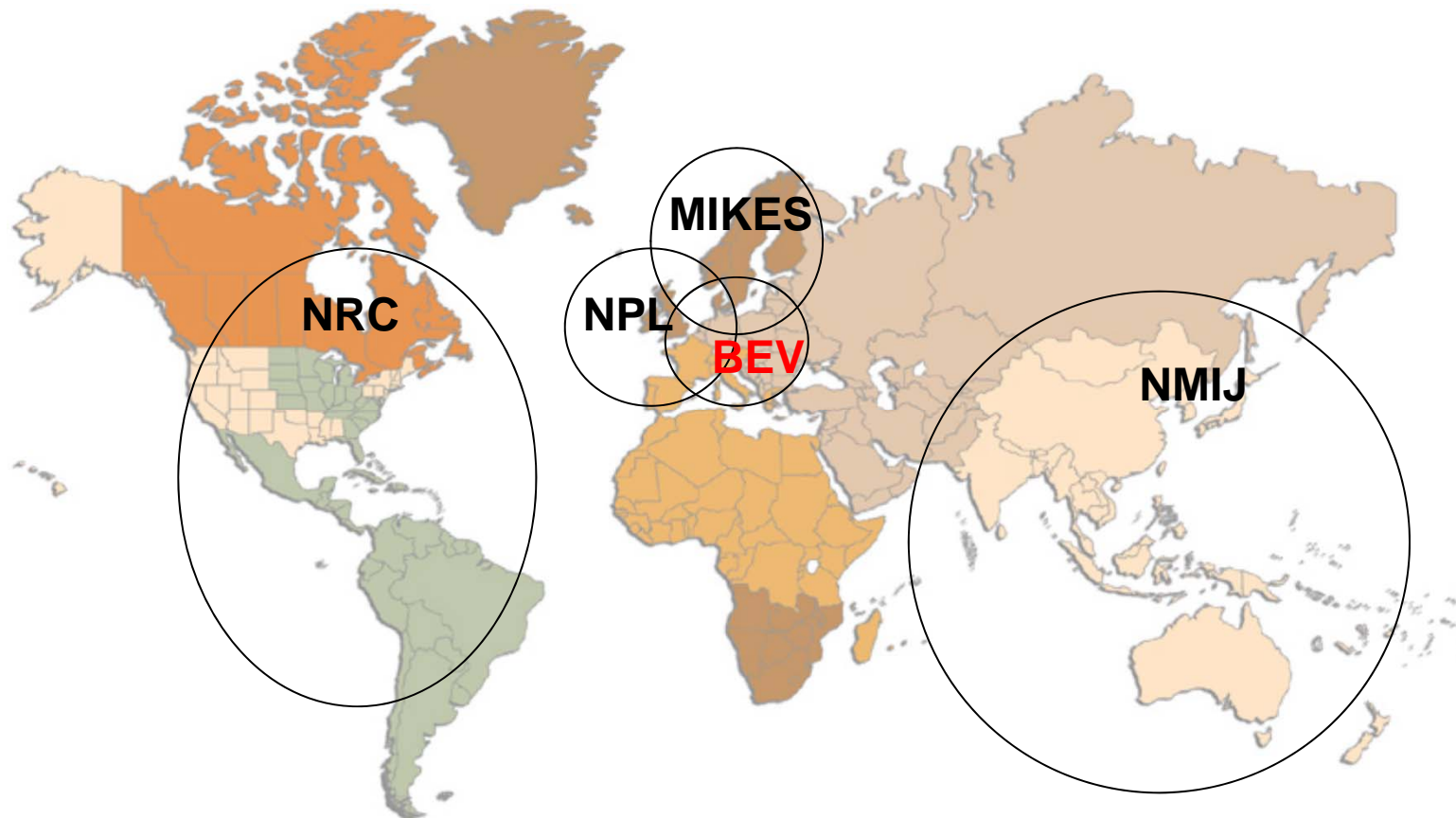
International Cooperation

	National	Europe	Worldwide
National Metrology Institutes			
Legal Metrology			
Accreditation			

Appendix C of the CIPM MRA

- Total: approx. 23 000 CMCs
- EURAMET e.V.: approx. 12 000 CMCs
- Austria: approx. 360 CMCs

Key comparison CCL-K11



BEV and Accreditation Body

- Lead assessors
 - Technical assessors
 - ILC provider (Interlaboratory comparisons)
 - National loops
 - Measurement audits
 - Training courses
- Restricted legal entity

Thank you for your attention!

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www.bev.gv.at

www.metrologie.at