Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

OIML

Introduction of German Legal Metrology Management System

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„Scientific-technical cross-sectional tasks“

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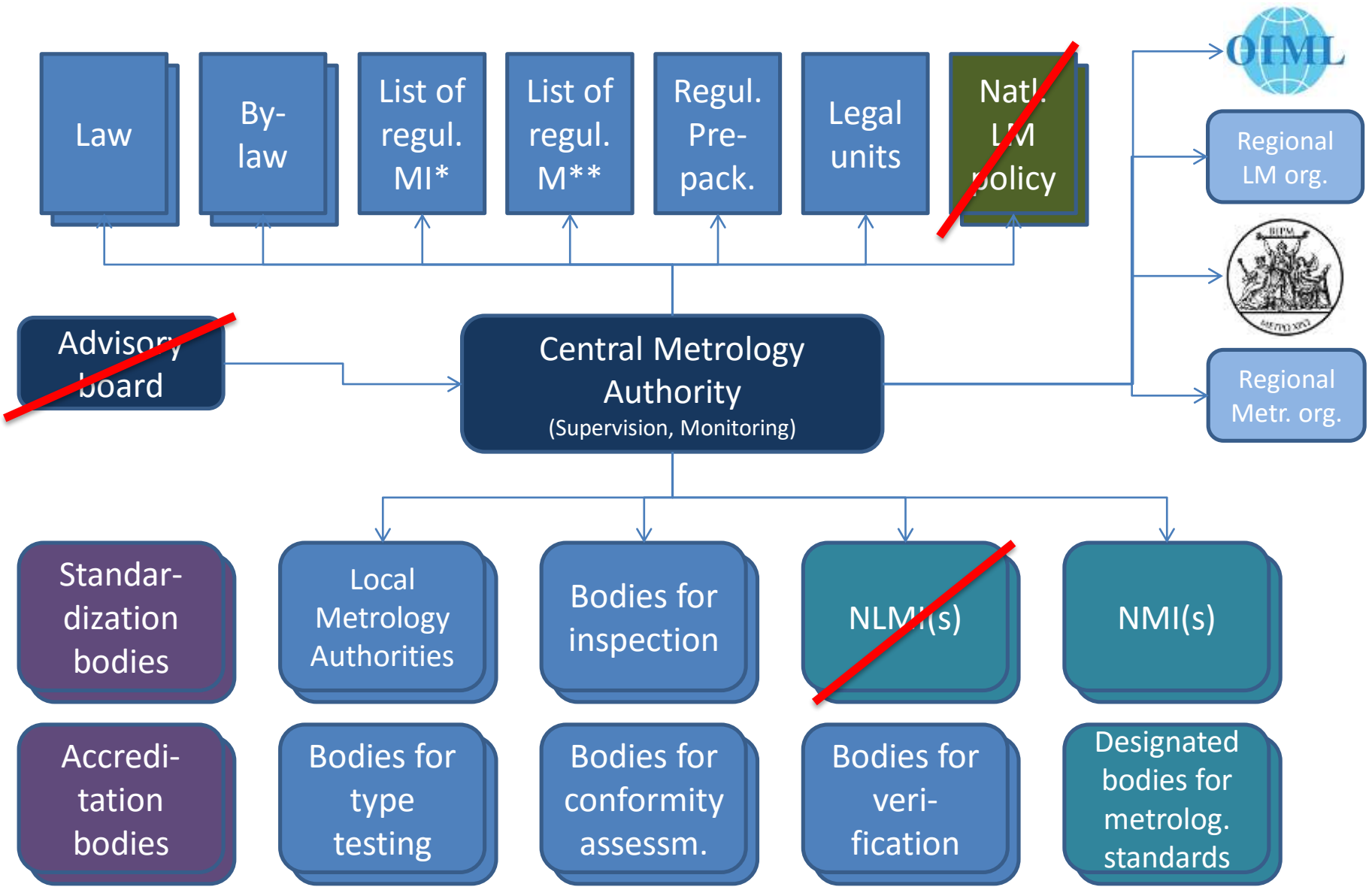
Some basic remarks

Countries are different, **political systems** are different,
traditions are different,

Legal metrology systems are different!

OIML D1

Legal Metrology Management System according to OIML D1



*MI = Measuring Instruments
**M = Measurements

LM = Legal Metrology

NMI = National Metrology Institute
NLMI = National Legal Metrology Institute

Short introduction into the topic

- basics of the legal metrology law are from about 1870 (Prussia)
- in 1969: little revision
- in 1990: work on another revision started
- in 2009: revision failed due to intended privatization of the verification sector

King Wilhem I.
of Prussia

- in 2011: definition of basic points (politically agreed)
- **in 2013: the new law was agreed and published**

Key questions concerning the new verification act:

1. What should be the scope of the legal metrology law?
2. Which level of protection should be valid?
3. How should the legal metrology system look like?
4. Who should be responsible for what?
5. Which instruments should be regulated for which purpose?
6. How to manage the legal metrology system?

1. What should be the scope of the legal metrology law?

To protect citizens and economic operators (OIML D1)

In detail:

- **to strengthen the trust in (official) measurements**
- to protect a final consumer resp. final user
- to realize a fair trade between economic operators
- to strengthen the acceptance of measurement results

1. What should be the scope of the legal metrology law?

fair trade

official measurements

environmental protection

safety at work

health protection

fiscal correctness

1. What should be the scope of the legal metrology law?

The German verification act regulates:

- **measurements related to trade**
  (e. g. the consumption of electrical energy)

- **official measurements**
  (e. g. the measurement of the speed of cars)

- **measurements carried out in public interest**
  (e. g. the measurement of sound level at airports, measurements related to the exhaust of cars etc.)

Regulates no measurements related to sports, military aspects, science etc.

2. Which level of protection should be valid?

Limits for the protection of economic operators:

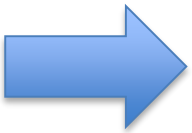
e.g. sale of self-made marmelade

Trade of energy between large companies

2. Which level of protection should be valid?

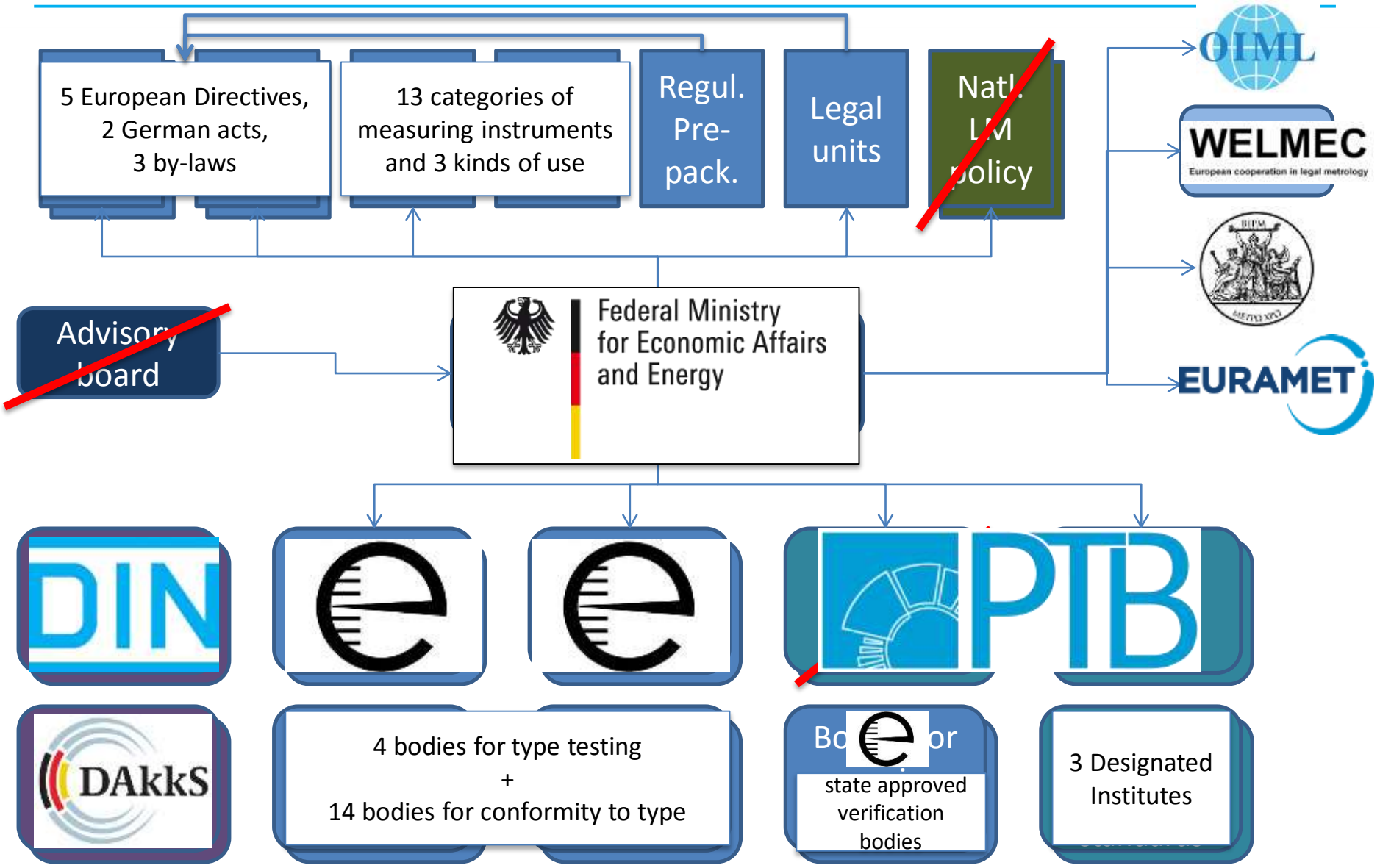
Maximum Permissable Errors (MPE)
need to be defined …

… as a function of the
economic value
of the good or the service!



Recommendations of OIML

3. How should the legal metrology system look like?



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3. How should the legal metrology system look like?

Structure of legal metrology system:

German government

German ministry of economy and energy

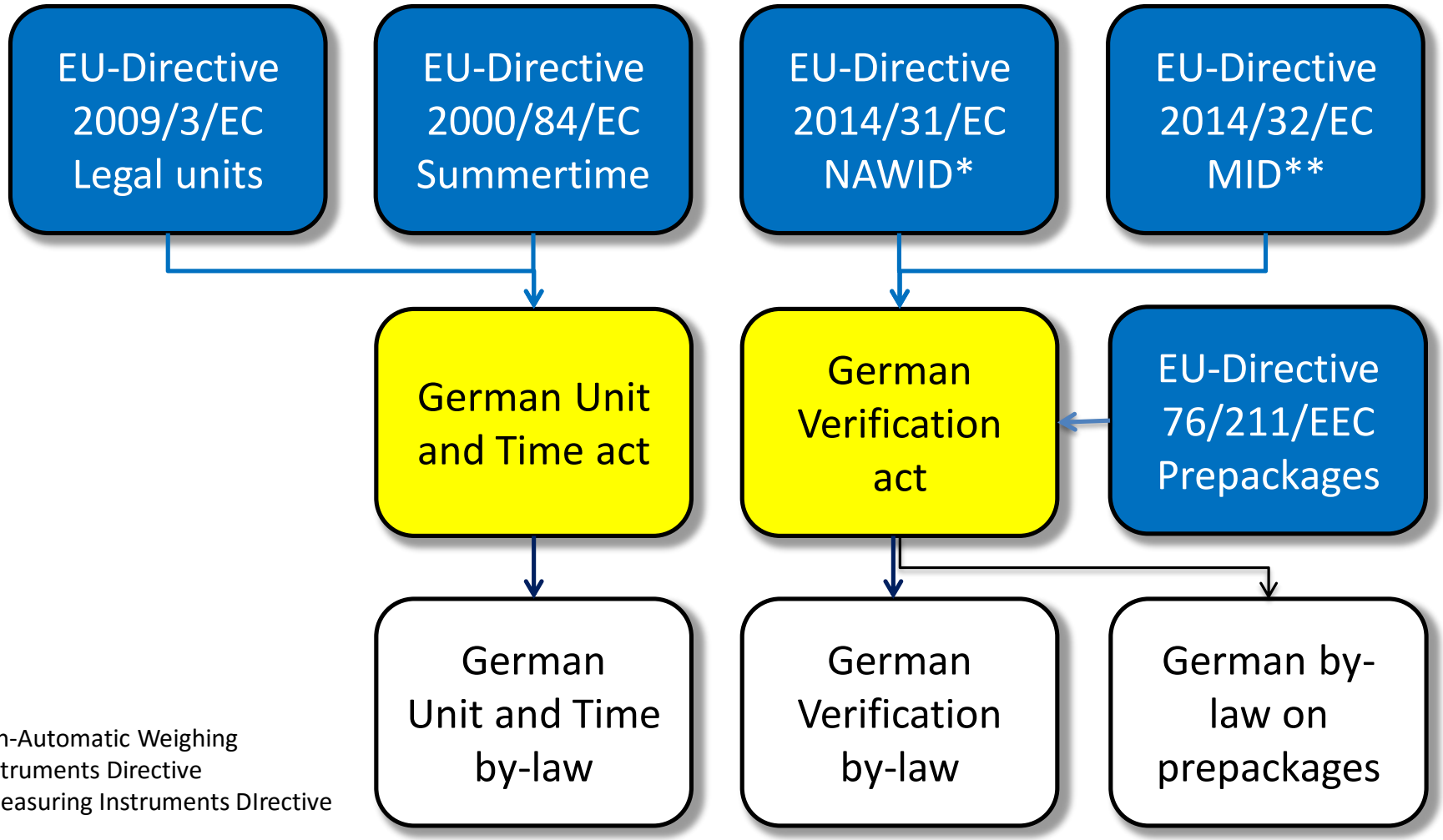
German metrology institute PTB

16 German federal governments

16 federal ministries of economy

13 verification authorities

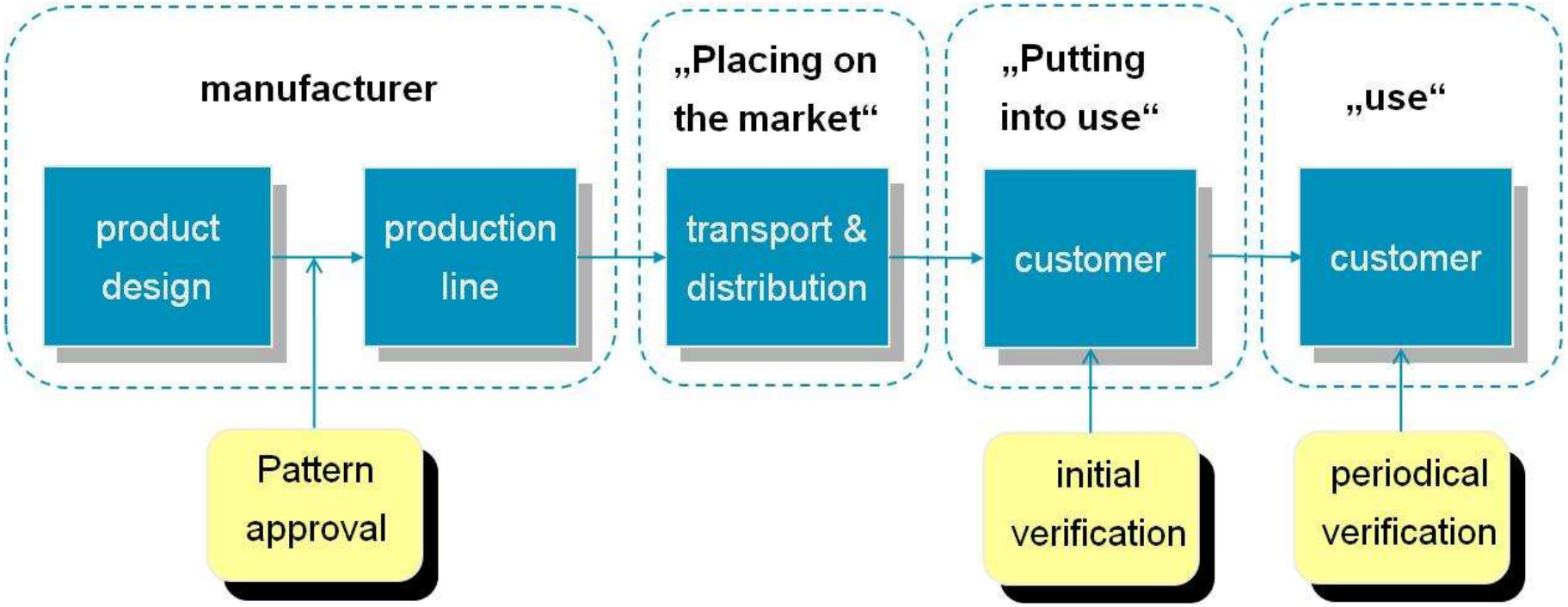
3. How should the legal metrology system look like?



*Non-Automatic Weighing Instruments Directive
**Measuring Instruments DIrective

3. How should the legal metrology system look like?

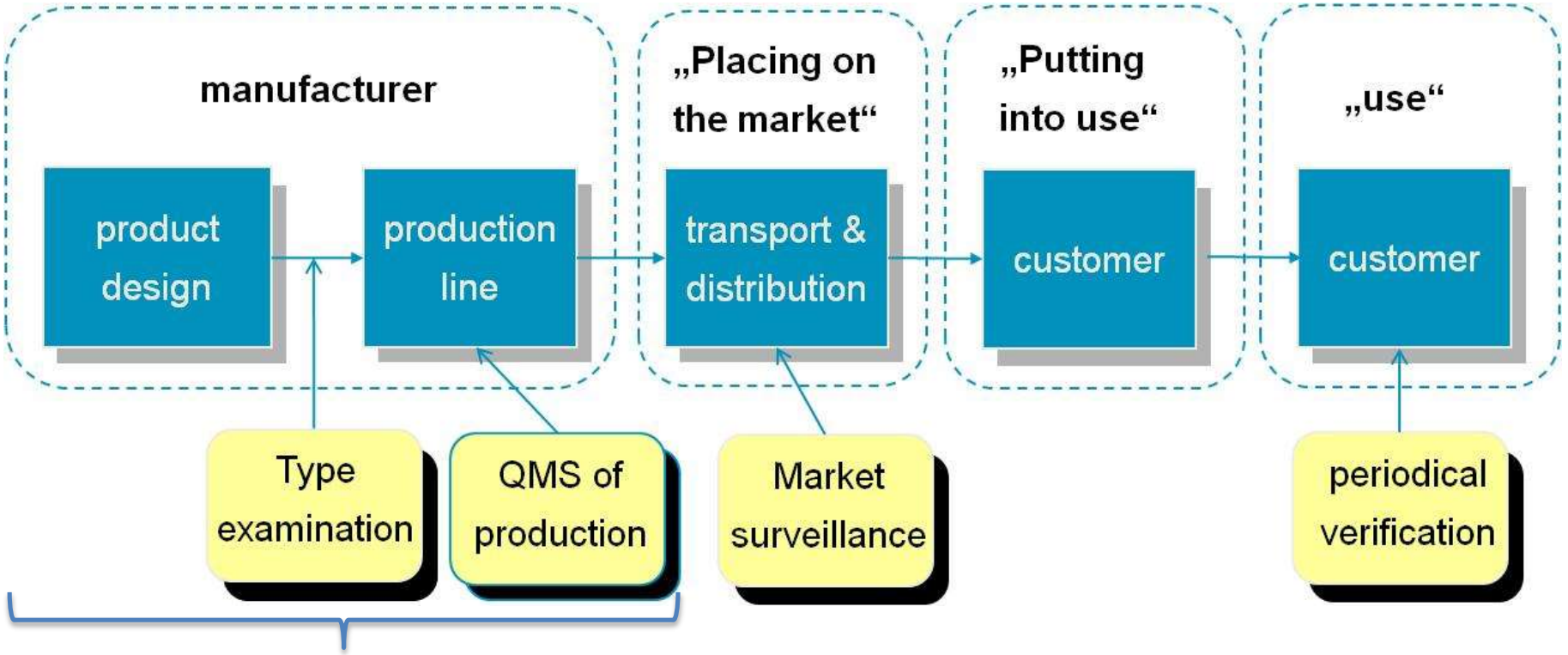
The „Old approach“ in Germany until 31 Dec 2014:



No pattern approval and no periodical verification
in case of simple long term stable instruments

3. How should the legal metrology system look like?

The „New Approach*“ in Germany from 2015 on:

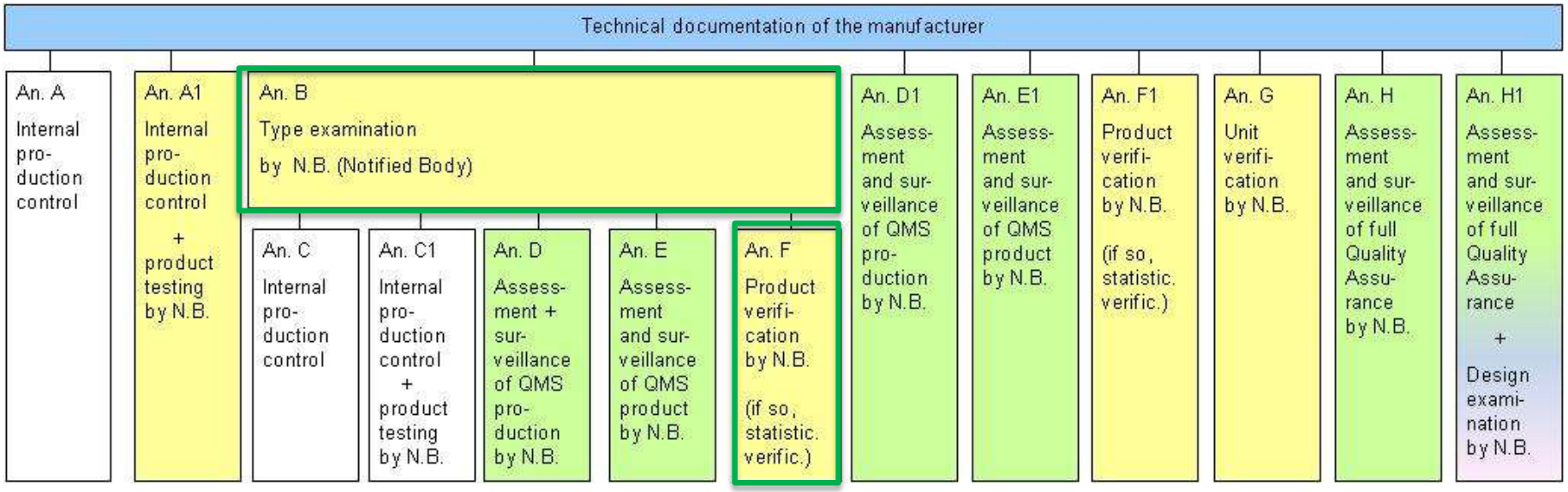


14 different **conformity assessment** procedures

*New Approach = EU-term

3. How should the legal metrology system look like?

Conformity assessment modules (of the EU):



Possible conformity assessment modules for each instrument **are selected by the government** (e. g. B+D, B+F, G, H1)

➡ **manufacturer chooses** the module (or module combination) he likes

4. Who should be responsible for what?

Which tasks are relevant in legal metrology?

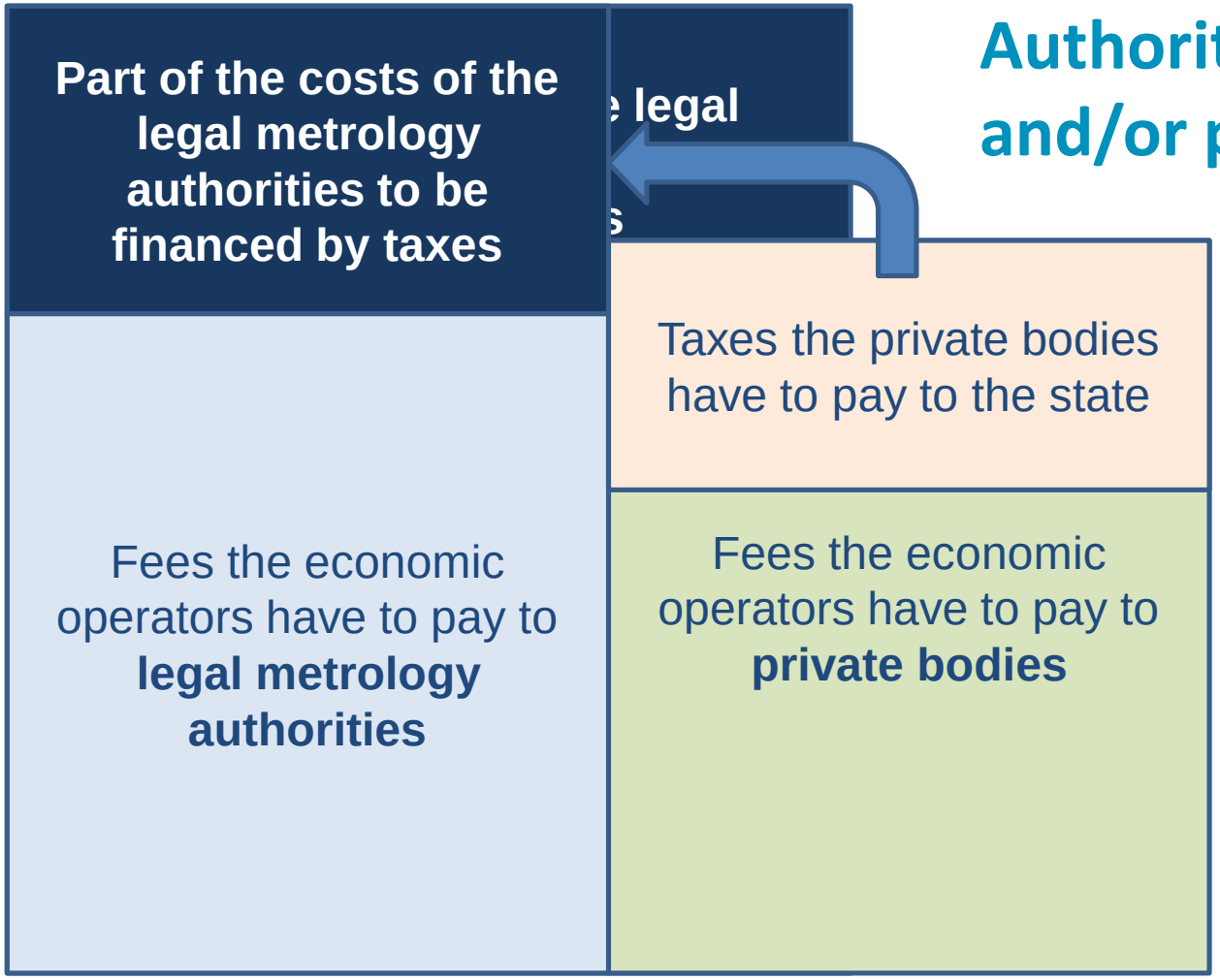
Type examination:
metrological test,
climatic test,
mechanical test,
Software test, etc.

Periodical verification:
metrological test,
compliance with requirements,
approved software,
etc.

Market surveillance:
compliance with requirements

Consultancy:
competent advice to all interested parties

4. Who should be responsible for what?



Authorities and/or private bodies?

4. Who should be responsible for what?

Finally: Optimum is given by a legal metrology system, which fulfills the requirements with the lowest possible overall effort

lowest costs for the economic operators? ⟵ **Optimum?** ⟶ lowest costs for the state?

⇨ **In most countries around the world the costs for the state are minimized!**

4. Who should be responsible for what?

Structure of legal metrology system:

German metrology institute PTB	Conformity assessment, consultation to ministries and verification authorities, research in legal metrology
13 verification authorities	Conformity assessment, periodical verification, market surveillance, supervision of state approved verification bodies
320 state approved verification bodies	Periodical verification of utility meters
4 private notified bodies	Conformity assessment

4. Who should be responsible for what?

Basic rules:

1. The fees of authorities were fixed to cover their efforts (without market surveillance activities!).
2. Market surveillance activities are to be financed by taxes (as it represents a public task with benefits for the whole society).
3. State approved verification bodies labs are allowed to carry out the verification of utility meters, but their fees are fixed by the government.

4. Who should be responsible for what?

Basic rules:

4. Private notified bodies (= CABs) can fix their prices on their own.

5. Which instruments should be regulated?

Criteria for instruments to be fulfilled:

- if there is **substantial economic relevance**
- to establish a **fair trade**, when one of the trading partners is not able to judge the correctness of the measurement (e. g. the consumer) or is absent (also to protect the seller!)
- for **official measurements** (e.g. speed meters, breath alcohol analyzers, …), which could have special relevance at court
- for **measurements in public interest** (e. g. sound level meters at airports, exhaust gas analyzers, …)

5. Which instruments should be regulated?

European approach:

11 kinds of
measuring instruments
(10 kinds (MID)
+ NAWI (NAWID)

German approach:

13 general categories of
measuring quantities
with defined exceptions
of certain kinds of
measuring instruments

5. Which instruments should be regulated?

13 Categories of measuring quantities:

1. **Length and combinations of lengths**
2. **Mass**
3. Temperature
4. Pressure
5. **Volume**
6. **Electricity**
7. **Heat and cold**
8. Density, mass fraction, concentration of liquids
9. Density, mass fraction, **concentration for other media than liquids**
10. **Volume flow of liquids and gases**
11. Sound level
12. Measuring quantities related to vehicle movement **(e.g. Taxameter)**
13. Dosimeters

(in blue: measuring instruments regulated by European directives)

Altogether about 150 measuring instruments and additional devices

6. How to manage the legal metrology system?

Communication, communication, communication …

Working group on Measuring Instruments	WELMEC committee	German legal metrol. committee
European Commission and representatives of 37 European countries	Representatives of 37 European countries	**Ministry of Economy**, PTB, federal ministries, verification authorities

German committee identifying rules	German committee for conf. assessm. bodies	German assembly for verification
PTB + 18 members representing all stakeholders	**PTB** + 17 members representing all conf. assessm. bodies	**PTB** + Ministry of Economy representatives of all verification bodies

Open questions concerning this seminar

Raising awareness of metrology

What do you expect to learn from others?

Please list top 3

1. What do other countries do to reach political decision makers and stakeholders?

2. What do other countries think about to be present in media (television, newspapers, social networks, on youtube etc.)?

3. Are there combined activities organized by all institutions of the national Quality Infrastructure to reach the relevant stakeholders?

Thank you for your attention!

Questions / remarks?

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