NL proposal Annex V and corresponding requirements in Annex I

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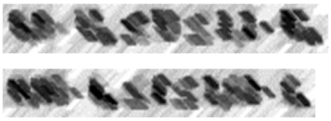
Recitals

1. This proposal is largely based on the Proposal Active Electrical Energy Meters-Annex V-MI-003, developed by the drafting group Annex V, dated 18 September 2023.
2. The proposal of the drafting group is highly appreciated because it retains the structure of the current Annex and stands out in technological neutrality and therefore seems future and innovation proof.
3. Both in the current Annex V and in the drafting group proposal the term 'meter' is used. This is problematic because this can be interpreted as if 'systems with a measuring function' (e.g. EVSE) are not covered by this annex. For that reason, we propose to use the term 'Electrical Energy Measuring Instrument'. Together with the definition of measuring instrument, this makes clear that also systems with a measurement function like EVSE are covered. This eliminates all ambiguity.
4. Leaving most of the proposal intact, we believe that clarity can be improved with some minor additions, especially relevant for EVSE. Also minor corrections are proposed, especially related to connected cables.
5. The basic idea is that the measurement result should apply at the transfer point. As a result it should not be possible to keep a continuously connected cable (DC) outside legal metrological control. It should be noted, however, that this does not automatically mean that the connection point of the cable should also be under the metrological seal.
6. Because the drafting group has also provided proposals regarding Annex I, we also express our views to the topics covered.
7. All changes to the drafting group annex V proposal are marked in red.
8. We believe that our proposal is consistent with MID and eliminates all ambiguity whether or not EVSE are covered up to and including the transfer point. Requirements are limited to the essential ones and seem future and innovation proof. The extent of the changes is limited.
9. A consequence of the proposal is that MPE's of Electrical Energy Measuring Instruments remain at the same level, although we know that the current market can do better than that.
10. A big advantage of the targeted amendment is that it gives clarity to the market on a short term (mid/end 2024). This proposal may not be fully ideal, but it should be judged as being a onetime opportunity and with the alternative in mind that a full revision of MID may result in harmonised national implementations only by 2030.

1. Suggested textual changes for Annex I and Annex V

Table 1: proposed changes to Annex V

Annex V – current text (MID 2014/32/EU)	**Suggestion for change, if any** marked with **bold lettering** for additions/changes and strikethroughs for deletions	**Notes and motivation**
Title ACTIVE ELECTRICAL ENERGY METERS (MI-003)	Title ~~ACTIVE~~ ELECTRICAL ENERGY Measuring Instruments ~~METERS~~ (MI-003)	The current wording of the title seems to exclude measuring systems being covered by this Annex. By changing the title to Electrical Energy Measuring Instruments both devices and systems with a measuring function are covered, including EVSE.
The relevant requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in this Annex, apply to active electrical energy meters intended for residential, commercial and light industrial use. Note: Electrical energy meters may be used in combination with external instrument transformers, depending upon the measurement technique applied. However, this Annex covers only electrical energy meters but not instrument transformers.	The relevant requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in this Annex, apply to ~~active~~ electrical energy ~~meters~~ measuring instruments intended for residential, commercial and light industrial use. Note: Electrical energy measuring instruments ~~meters~~ **are** used **with the direct or the indirect measurement technique. When the indirect measurement technique is used, a representation of the energy consumed in the circuit to be measured is applied to the electrical energy ~~meter~~measuring instrument. This Annex covers only electrical energy ~~meters~~measuring instruments. It does not cover the external instruments such as instrument transformers used to generate the representation.**	Suggested change makes this point future proof without requiring changes to existing technical solutions. For example, with the new suggestion, not only conventional instrument transformers would be explicitly qualified as being outside the scope of ~~the~~ MID (as is already the case with the current MID), but also the customers' separately connected EVSE cables (AC) and modern instrument transformers ("LPIT"), which can be digital. This exclusion ~~achieves two things simultaneously:~~ ~~1. It~~ prevents such external parts from having to be under legal metrological control~~seal (which would make maintenance of, e.g., DC EVSE in use unnecessarily burdensome)~~; ~~2.~~ It leaves the option open for ~~EVSE~~ technical standards to explicitly include hardware up to and including the transfer point as well as compensation parameters in software in the conformity assessment procedures. Current and recent work on prEN 50732 and OIML G22 have in fact done this. For instrument transformers, such standards exist already, for example national Metering Codes (for

		utilities) and EN 50470-3, subclause 10.5 (for manufacturers). In our view, standardization groups should be urged to continue to take the inclusive approach.
DEFINITIONS An ~~active~~ electrical energy meter is a device which measures the active electrical energy consumed in a circuit.	DEFINITIONS An ~~active~~ electrical energy ~~meter~~ measuring instrument is a device which measures the ~~active~~ electrical energy ~~consumed in a~~ **transferred between** circuit**s**.	Remove the word “active”, to be inclusive to reactive energy. Replace “consumed” by “transferred” to be clearer in the case of small scale producers (households, commerce and light industry), see Directive (EU) 2019/944 and M/541. Between circuits means that accuracy requirements of the measuring instrument apply at the transfer point.
2. Rated operating conditions The manufacturer shall specify the rated operating conditions of the meter; in particular: The values of fn, Un, In, Ist, Imin, Itr and Imax that apply to the meter. For the current values specified, the meter shall satisfy the conditions given in Table 1; [Table 1] The voltage, frequency and power factor ranges within which the meter shall satisfy the MPE requirements are specified in Table 2. These ranges shall recognise the typical characteristics of electricity supplied by public distribution systems. The voltage and frequency ranges shall be at least: $0{,}9 \cdot U_n \leq U \leq 1{,}1 \cdot U_n$ $0{,}98 \cdot f_n \leq f \leq 1{,}02 \cdot f_n$ power factor range at least from cosϕ = 0,5 inductive to cosϕ = 0,8 capacitive.	2. Rated operating conditions The manufacturer shall specify the rated operating conditions of the ~~meter~~measuring instrument; in particular: The values of fn**,** Un, In, Ist, Imin, Itr and Imax that apply to the ~~meter~~measuring instrument. For the current values specified, the ~~meter~~measuring instrument shall satisfy the conditions given in Table 1; [Table 1] The **manufacturer shall specify the operating** ~~voltage, frequency and power factor~~ ranges within which the ~~meter~~measuring instrument shall satisfy the MPE requirements ~~are~~ specified in Table 2. ~~These ranges shall recognise the typical characteristics of electricity supplied by public distribution systems.~~ ~~The voltage and frequency ranges shall be at least: *(remove formulae)*~~ 	Changes suggested allow flexibility for ~~meter~~measuring instruments (devices or systems) to be designed for different purposes and conditions, including DC metering. We suggest removing the last two sentences as they are often redundant and sometimes in contradiction (for transformer-operated ~~meter~~measuring instruments). Point 7(c) is a better place for this. At present, the upper temperature limit specified by the manufacturer may not exceed 70 °C. Therefore, the users have to make sure the ambient temperature does not exceed 70 °C, requiring impractical technical measures such as active cooling in outdoor applications with solar irradiation. Allowing MID certification at higher (or lower) temperatures (to be declared by the manufacturer) would facilitate the

	~~power factor range at least from cosϕ = 0,5 inductive to cosϕ = 0,8 capacitive.~~ **Upper temperature limits above 70 °C may be specified. Lower temperature limits below -40 °C may be specified.**	market in finding more efficient technical solutions.
3. MPEs The effects of the various measurands and influence quantities (a, b, c,…) are evaluated separately, all other measurands and influence quantities being kept relatively constant at their reference values. The error of measurement, that shall not exceed the MPE stated in Table 2, is calculated as: Error of measurement = sqrt[a^2+b^2+c^2 …] When the meter is operating under varying-load current, the percentage errors shall not exceed the limits given in Table 2. MPEs in percent at rated operating conditions and defined load current levels and operating temperature Operating temperatures: + 5 °C … + 30 °C | Operating temperatures: – 10 °C … + 5 °C or + 30 °C … + 40 °C | Operating temperatures: – 25 °C … – 10 °C or + 40 °C … + 55 °C | Operating temperatures: – 40 °C … – 25 °C or + 55 °C … + 70 °C Meter class: A B C | A B C | A B C | A B C Single phase meter; polyphase meter if operating with balanced loads $I_{min} \le I < I_{tr}$: 3,5 2 1 | 5 2,5 1,3 | 7 3,5 1,7 | 9 4 2 $I_{tr} \le I \le I_{max}$: 3,5 2 0,7 | 4,5 2,5 1 | 7 3,5 1,3 | 9 4 1,5 Polyphase meter if operating with single phase load $I_{tr} \le I \le I_{max}$, see exception below: 4 2,5 1 | 5 3 1,3 | 7 4 1,7 | 9 4,5 2 For electromechanical polyphase meters the current range for single-phase load is limited to $5I_{tr} \le I \le I_{max}$ When a meter operates in different temperature ranges the relevant MPE values shall apply. The meter shall not exploit the MPEs or systematically favour any party.	3. MPEs The effects of the various measurands and influence quantities (a, b, c,…) are evaluated separately, all other measurands and influence quantities being kept relatively constant at their reference values. The error of measurement, that shall not exceed the MPE stated in Table 2, is calculated as: Error of measurement = sqrt[a^2+b^2+c^2 …] When the ~~meter~~measuring instrument is operating ~~under varying-load current~~**within rated operating conditions**, the percentage errors shall not exceed the limits given in Table 2. *[for readability, a proposed version of* Table 2 *is shown in full width below this table; additions:* ***new accuracy class D; removed caps of upper and lower temperatures by replacing "-25 °C to -40 °C" by "below -25 °C" and "55 °C to 70 °C" by "above 55 °C").****]* When a ~~meter~~measuring instrument operates in different temperature ranges the relevant MPE values shall apply. The ~~meter~~measuring instrument shall not exploit the MPEs or systematically favour any party. Accuracy requirements shall apply at the transfer point.	We suggest to introduce a new accuracy class ‘D’. This may prove useful for current high-power and other future applications. See the proposed new Table 2: Proposed changes to Table 2 in point 3 of Annex V (changes highlighted in yellow): below this table. In addition to the proposed changes in the middle column, some clarification is needed on the interpretation of ‘temperature’, which in the case of EVSE could be interpreted as ambient temperature just outside an integrated meter (inside the EVSE), or ambient outside the EVSE enclosure. This topic should be covered in a WELMEC guide, in our view. This means that MPEs in this Annex apply at the transfer point, which is nothing new for ‘traditional’ ways of trading electricity, while it ensures that an EVSE up to and including its connection point falls under this Annex.
4.2 Effect of disturbances of long duration Table 3: Critical change values for disturbances of long duration	*Remove Table 3.* **4.2.1. The effect of a disturbance of long duration on an electricity ~~meter~~measuring instrument shall be such that:**	Removing the overly specific content of Table 3 makes this point robust for future developments, independent of technology.

Critical change values for disturbances of long duration **Disturbance** | **Critical change values in percent for meters of class** A | B | C Reversed phase sequence | 1,5 | 1,5 | 0,3 Voltage unbalance (only applicable to polyphase meters) | 4 | 2 | 1 Harmonic contents in the current circuits (2) | 1 | 0,8 | 0,5 DC and harmonics in the current circuit (2) | 6 | 3 | 1,5 Fast transient bursts | 6 | 4 | 2 Magnetic fields; HF (radiated RF) electromagnetic field; Conducted disturbances introduced by radio-frequency fields; and Oscillatory waves immunity | 3 | 2 | 1	**- the change in the measurement result is no greater than the critical change value as defined in point 4.2.3, or** **- the indication of the measurement result is such that it cannot be interpreted as a valid result, such as a momentary variation that cannot be interpreted, memorised or transmitted as a measuring result.** **4.2.2. After undergoing a disturbance, the electricity ~~meter~~measuring instrument shall:** **- recover to operate within MPE, and** **- have all measurement functions safeguarded, and** **- allow recovery of all measurement data present just before the disturbance.** **4.2.3. The critical change value is the quantity corresponding to half of the magnitude of the MPE.**	It takes away, among other things, the problem that DC cannot be a disturbance if it can also be defined as a valid rated operating condition. The text proposed here to replace Table 3 has been inspired by the gas meter requirements, Annex IV point 3.1.
4.3. Permissible effect of transient electromagnetic phenomena	4.3. ~~Permissible~~ **E**ffect of **disturbances of short duration** ~~transient electromagnetic phenomena~~	*Replace it with, e.g., fixed absolute error (independent of MPE), like in Point 3.1 of Annex IV gas meters.* The phrasing of the titles of point 4.2 and point 4.3 should be such that there is no possibility of an unintended gap. The present phrasing excludes disturbances of short duration that are not electromagnetic phenomena, which is not intended.
4.3.1. The effect of an electromagnetic disturbance on an electrical energy meter shall be such that during and immediately after a disturbance: ● any output intended for testing the accuracy of the meter does not produce pulses or signals corresponding to an energy of more than the critical change value, and in reasonable time after the disturbance the meter shall: ● recover to operate within the MPE limits, and	4.3.1. The effect of ~~an electromagnetic~~ **a** disturbance **of short duration** on an electrical energy ~~meter~~measuring instrument shall be such that during and immediately after a disturbance: ● any output intended for testing the accuracy of the ~~meter~~measuring instrument does not produce pulses or signals corresponding to an energy of more than the critical change value, and in reasonable time after the disturbance the ~~meter~~measuring instrument shall: ● recover to operate within the MPE limits, and	The formula for the critical change value is rephrased to cover the case of meter for wide voltage ranges, as commonly used for EV charging applications.

• have all measurement functions safeguarded, and • allow recovery of all measurement data present prior to the disturbance, and • not indicate a change in the registered energy of more than the critical change value. The critical change value in kWh is m*Un*Imax*1e-6 (m being the number of measuring elements of the meter, Un in Volts and Imax in Amps).	• have all measurement functions safeguarded, and • allow recovery of all measurement data present prior to the disturbance, and • not indicate a change in the registered energy of more than the critical change value. ~~The critical change value in kWh is m*Un*Imax*1e-6 (m being the number of measuring elements of the meter, Un in Volts and Imax in Amps).~~**The critical change value is the product of the number of measuring elements of the ~~meter~~measuring instrument, the highest voltage within the rated operating conditions, Imax and 0,001 h.**	
4.3.2. For overcurrent the critical change value is 1,5 %.	(remove)	If overcurrent is transient, a relative error is meaningless and 4.3.1 is sufficient. If overcurrent is of long duration, 4.3.2 doesn't apply (4.2 does).
5.Suitability		
5.1. Below the rated operating voltage the positive error of the meter shall not exceed 10 %.	(remove)	The requirement is redundant: If the voltage is high enough for the ~~meter~~measuring instrument to be operational, then it is covered by 4.2 (if we change it to generalised form). If it is not operational anymore, it will not be measuring at all.
5.2. The display of the total energy shall have a sufficient number of digits to ensure that when the meter is operated for 4 000 hours at full load ($I = I_{max}$, $U = U_n$ and PF = 1) the indication does not return to its initial value and shall not be able to be reset during use.	(remove)	The requirement is redundant: More than one overflow during the billing period is a violation of the MPEs. Harmonised standards should (and do) define useful technical specifications. The present point 5.2 is not future proof since it is based on an assumption of the billing period (at the time, one year). A reset feature is a feature facilitating fraudulent use (Annex I point 7.1). NB: No change to the current harmonised standard is needed.

5.3. In the event of loss of electricity in the circuit, the amounts of electrical energy measured shall remain available for reading during a period of at least 4 months.	(remove)	The requirement is redundant: If any loss of electricity causes a reset, this is a feature facilitating fraudulent use (Annex I point 7.1). Technical details of this nature are best left to harmonised standards. NB: No change to the current harmonised standard is needed. Requirement of 4 months also follows from 2 (b) Article 21 directive 2019/944, i.e., 11520 records on 15 min interval). Thoughts: ● *In practice, nowadays if you require 4 months, a manufacturer will give you 10 years.* ● *Assuming that the wording and/or interpretation of horizontal requirements in Annex I is adapted such that storage capacity is legally allowed to be provided outside of the measuring instrument (under seal, e.g. with an electronic seal), then there is no problem with (costly and unreliable) internal storage capacity.* *As a result, point 5.3 of Annex V (measurement results available for at least 4 months) does not pose any actual restrictions. It could (should?) be removed.*
5.4. Running with no load When the voltage is applied with no current flowing in the current circuit (current circuit shall be open circuit), the meter shall not register energy at any voltage between 0,8 · U n and 1,1 U n .	5.4. Running with no load When the voltage is applied with**out any significant** ~~no~~ current flowing in the current circuit ~~(current circuit shall be open circuit)~~, the ~~meter~~measuring instrument shall not register energy ~~at any voltage between 0,8 · U n and 1,1 U n~~.	The current wording contains technical details for testing and assumptions about the rated operating range that are not true in all applications any more. The proposed wording leaves the specification of technical details for testing to harmonised standards and

		adapts the requirements such that it refers to the rated operating conditions specified by the manufacturer (point 2 Annex V). NB: No change of the current harmonised standard is needed.
5.5. Starting The meter shall start and continue to register at U n , PF = 1 (polyphase meter with balanced loads) and a current which is equal to I st .	5.5. Starting The ~~meter~~measuring instrument shall start and continue to register at ~~U n , PF = 1 (polyphase meter with balanced loads) and a current which is~~ **a rate of change of energy** equal to **the product of the smallest voltage within the rated operating conditions and** Ist.	Current phrasing needs adaption to encompass reactive energy. The proposed new text would not constitute a change for current metering hardware, while simultaneously opening options to cover all electrical energies and all technologies.
6. Units The electrical energy measured shall be displayed in kilowatt-hours or in megawatt-hours.	(remove)	Annex I point 9.6 is sufficient (and better, because it is more future proof). NB: No change to the current harmonised standard is needed.
7. Putting into use (a) Where a Member State imposes measurement of residential use, it shall allow such measurement to be performed by means of any Class A meter. For specified purposes the Member State is authorised to require any Class B meter. (b) Where a Member State imposes measurement of commercial and/or light industrial use, it shall allow such measurement to be performed by any Class B meter. For specified purposes the Member State is authorised to require any Class C meter. (c) The Member State shall ensure that the current range be determined by the utility or the person legally designated for installing the meter, so that the meter is appropriate for the accurate measurement of consumption that is foreseen or foreseeable.	(a) Where a Member State imposes measurement of residential use, it shall allow such measurement to be performed by means of any Class A ~~meter~~measuring instrument. For specified purposes the Member State is authorised to require any Class B measuring instrument~~meter~~. (b) Where a Member State imposes measurement of commercial and/or light industrial use, it shall allow such measurement to be performed by any Class B ~~meter~~measuring instrument. For specified purposes the Member State is authorised to require any Class C ~~meter~~measuring instrument.	Public EVSE fall under 'commercial use', in our view, for which the current MID specifies class B already. No change needed.

	Rephrase 7(c): The Member State shall ensure that ~~the current range be determined by the utility or the person legally designated for installing the meter~~ **the user determines the foreseen and foreseeable practical working conditions, namely the rated operating conditions**, so that the ~~meter~~measuring instrument is ~~appropriate for the accurate measurement of consumption that is foreseen or foreseeable~~ **suitable for its use**. *(user :: any legal or natural person who determines the use of the measuring device, regardless of ownership)*	Regarding rephrased 7c: The "practical working conditions" (cf Annex I point 7.2) link the suitability for the intended use (manufacturer's responsibility) and the practical use (user's responsibility). Only this link gives practical relevance to Annex I point 7. In our view, it could be left to the user (e.g., distribution company, or CPO) to decide if a reactive energy ~~meter~~measuring instrument should have the same or a lower accuracy class than for active energy. The text in this point of Annex V needs no further adjustment to accommodate this.

Table 2: Proposed changes to Table 2 in point 3 of Annex V (changes highlighted in yellow):

MPEs in percent at rated operating conditions and defined load current levels and operating temperature																
	Operating temperatures				**Operating temperatures**				**Operating temperatures**				**Operating temperatures**			
	+ 5 °C … + 30 °C				**– 10 °C … + 5 °C or + 30 °C … + 40 °C**				**– 25 °C … – 10 °C or + 40 °C … + 55 °C**				**~~– 40 °C …~~ below – 25 °C or above +55 °C ~~… + 70 °C~~**			
~~Meter~~Measuring instrument class	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
Single phase meter; polyphase ~~meter~~measuring instrument if operating with balanced loads																
$I_{min} \leq I < I_{tr}$	3,5	2	1	0,4	5	2,5	1,3	0,6	7	3,5	1,7	0,8	9	4	2	1,0
$I_{tr} \leq I \leq I_{max}$	3,5	2	0,7	0,3	4,5	2,5	1	0,4	7	3,5	1,3	0,5	9	4	1,5	0,7
Polyphase ~~meter~~measuring instrument if operating with single phase load																
$I_{tr} \leq I \leq I_{max}$, see exception below	4	2,5	1	0,3	5	3	1,3	0,4	7	4	1,7	0,5	9	4,5	2	0,7
For electromechanical polyphase ~~meter~~measuring instruments the current range for single-phase load is limited to $5I_{tr} \leq I \leq I_{max}$																

As indicated in the introduction, we furthermore propose the following changes and/or simplifications to the horizontal Annex I:

Annex I – current text (MID 2014/32/EU)	**Suggestion for change, if any**	**Notes and motivation**
(In definitions list, above point 1 of Annex I.) Utility: A utility is regarded as a supplier of electricity, gas, thermal energy, or water.	*(We refrain from any concrete suggestions, but provide some notes and thoughts in the rightmost column.)*	Since Annex V is not specific to utility applications, the term "utility" is not used (except superfluously in point 7c) and could be removed (or maintained) without any effect as far as Annex V is concerned. To make the MID futureproof it is necessary to reconsider the definitions used. In the energy transition the boundaries of utility and utility measuring instruments become more fluid as users of utility measurement instruments are not necessarily only large-scale energy suppliers or utility companies anymore. Especially for the suppliers of EVSE and the growing potential of bidirectional charging the current definition of utility may be burdensome instead of helpful. If the original definition would be removed, there would no longer be a need to sweep any and all electricity and gas measurements under the utility umbrella. This would affect, of course, other parts of Annex I (8.5, 9.4, 10.5, 11.1.), for which adaptation proposals exist. For other/alternative suggestions on 'utility' matters throughout the remainder of MID (i.e., the instrument specific annexes and including Annex I) we are happy to provide additional input and textual suggestions.
8. Protection against corruption		
8.4. Measurement data, software that is critical for measurement characteristics and metrologically important parameters stored or transmitted shall be adequately protected against accidental or intentional corruption.	*Suggestion of drafting group Annex I:* 8.4. **Each of the following** shall be adequately **secured** and protected **to ensure availability, integrity and authenticity:**	

	• Measurement data **processed, stored or transmitted;** • Software **stored or transmitted** that is critical for measurement characteristics**;** • metrologically important parameters stored or transmitted. *////////* *Instead of the above, we (drafting group Annex V electricity) suggest the following alternative:* **Legally relevant** measurement data, software that is critical for measurement characteristics and metrologically important parameters ~~stored or transmitted~~ shall be adequately protected **to ensure availability, integrity and authenticity** ~~against accidental or intentional corruption~~.	Drafting group Annex V is worried that the wording proposed by drafting group Annex I could turn out to be insufficiently technology neutral. This might lead to unintended gaps in the future. Drafting group Annex V proposes an alternative wording that is more technology neutral and future proof, along the lines aiming for performance requirements. It enumerates the information to be protected and specifies that they are to be protected without enumerating under which conditions – they are to be protected *always*. Guidance should be provided by WELMEC guides, ideally horizontal WELMEC guides. Proposal: accept alternative. In agreement with proposal for Annex I
8.5. For utility measuring instruments the display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.	~~8.5. For utility measuring instruments the display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.~~ *(Remove)*	See our comments concerning the definition of utility. The requirement is redundant: A reset feature is a feature facilitating fraudulent use (Annex I point 7.1). Therefore, removing this requirement has no impact on Annex V and, most likely, no impact on any other instrument-specific annex. Proposal: Although the requirement is redundant, there is no objection to keeping it. This is in agreement with the proposal for Annex I.
10. Indication of result		
10.1. Indication of the result shall be by means of a display or hard copy.	*Suggestion of drafting group for Annex I with modifications by drafting group for Annex V:* 10.1. A measuring instrument shall:	The suggested changes, combining the current points 10.1 and 10.5, are in support of technology neutrality. It explicitly opens up options for other ways to indicate the measurement result, while staying in control of its

10.5. Whether or not a measuring instrument intended for utility measurement purposes can be remotely read it shall in any case be fitted with a metrologically controlled display accessible without tools to the consumer. The reading of this display is the measurement result that serves as the basis for the price to pay.	• be fitted with a metrologically controlled display, scale, readout and/or printer accessible without tools ~~to the consumer~~ to present the relevant data **and/or** • **be capable to present the relevant data on a metrologically controlled remote display accessible without tools and/or** • **be capable to easily present the data via metrologically controlled application software on the device of the user and/or consumer and/or** • **be capable to easily present the data via a metrologically controlled ~~webpage~~ channel** The ~~reading of this display is the~~ measurement result **presented by any of the four methods** ~~that~~ serves as the basis for the price to pay where applicable. The instrument specific annex shall specify the need for a local display. At least one of the options above shall be used to indicate the measurement result. 10.5. *(remove)* ////////////// *Alternative suggestion of drafting group for Annex V:* 10.1: The result **of the measurement shall be indicated.** 10.5. *(remove)*	authenticity and integrity. Additionally, the suggested change facilitates (remotely) displaying legally relevant measurement results on a website or an app on mobile phone. This is essential to streamline, e.g., dynamic tariffing display, needed to align with the energy directive. In our view (the MID electricity dg), the 'four bullets' options provided by the Annex I dg would be sufficient, but may unintentionally exclude (future) technological solutions that could be equally acceptable. As an alternative, this enumeration could be made a list of examples or moved to WELMEC guides. ////////////// The very short proposed alternative is future proof and open for innovation. Guidance should be provided in harmonised standards or horizontal WELMEC guides. Proposal: The extended version above is corrected in accordance with the proposal for Annex I (including the very last correction). The alternative proposal of the Annex V drafting group looks beautiful in its simplicity. However, in the absence of guidance and given the fact that MID prevails above guidance, the extended version is preferred.

10.2. The indication of any result shall be clear and unambiguous and accompanied by such marks and inscriptions necessary to inform the user of the significance of the result. Easy reading of the presented result shall be permitted under normal conditions of use. Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.	*Suggestion (possibly superseded by later versions) of drafting group for Annex I with modifications by drafting group for Annex V:* The indication of any result shall be clear, unambiguous, **trustworthy and non-discriminatory**. **The user shall be**~~.. and accompanied by such marks and inscriptions necessary to~~ inform**ed** ~~the user~~ of the significance of the result. ~~Easy reading of the presented result shall be permitted under normal conditions of use.~~ Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.	Proposal: both the latest proposal for Annex I and the suggestions by the drafting group for Annex V are acceptable.
10.3. In the case of hard copy the print or record shall also be easily legible and non-erasable.	*Suggestion of drafting group for Annex I with modifications of drafting group for Annex V:* 10.3. In the case of ~~**hard copy**~~ **a** print-**out,** ~~**record**~~, it shall ~~also~~ be easily legible and non-erasable. *///////* *Alternative:* *(remove 10.3)*	After a proposed change of points 10.1 and 10.2 is agreed upon, this point 10.3 should be adapted, or in fact removed completely. Reason: if not easily legible, then the requirements in 10.2 are sufficient; if it is erasable, then it does not meet "trustworthy", as suggested in the adapted version of point 10.2. Proposal: accept removal.
10.4. A measuring instrument for direct sales trading transactions shall be designed to present the measurement result to both parties in the transaction when installed as intended. When critical in case of direct sales, any ticket provided to the consumer by an ancillary device not complying with the appropriate requirements of this Directive shall bear appropriate restrictive information.	*(remove)*	This requirement is redundant with points 10.1 and 10.2, so it should be removed. Proposal: accept removal
10.5	*(remove; see above at 10.1)*	Proposal: accept removal.
11. Further processing of data to conclude the trading transaction		
11.1. A measuring instrument other than a utility measuring instrument shall record by a durable means the measurement result accompanied by information to identify the particular transaction, when: (a) the measurement is non-repeatable; and	*Suggestion of drafting group for Annex I with modifications of drafting group for Annex V:* 11. A durable proof ~~**in the form of a print-out or electronic receipt**~~ of the measurement result and the information to identify the transaction shall be available on request at the time the measurement is concluded, when:	Combine 11.1 and 11.2 to enable the use of an electronic receipt as durable proof of the transaction. A "durable proof" is understood to mean (in the world of today), a print-out, or electronically sealed data

	(b) the measuring instrument is normally intended for use in the absence of one of the trading parties. 11.2. Additionally, a durable proof of the measurement result and the information to identify the transaction shall be available on request at the time the measurement is concluded.	(a) the measurement is non-repeatable; and (b) the measuring instrument is normally intended for use in the absence of one of the trading parties. ~~In the case of an electronic receipt the measurement result and the information to identify the transaction shall be accompanied by information that enables the consumer to verify the integrity and authenticity with easily available tools.~~	indicated somewhere, while it does not exclude future technologies. The sentence proposed by the Annex I drafting group, starting "In the case of .." is really an example, and it is too specific to one technical implementation. Better placed in a WELMEC guide. Proposal: accept suggested alternative text drafting group Annex V.