

POSITION PAPER

MID directive 2014/32/EU needs some light updates !!

1. Background

MID directive 2014/32/EU was issued on 26 February 2014, it deals with the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments.





MID aims at setting-up a system of “trust in measurement”, for the benefit of European consumers and producers. MID defines technology neutral performance requirement that do not impede technical progress. MID essential requirements, specified in Annex I aim at ensuring a fair trading between consumers and energy suppliers:

- Protecting consumers:
 - o Avoid consumers to be over-invoiced
 - o Give consumers a mean to verify that the invoice is consistent with the meter index
- Protecting energy suppliers:
 - o Avoid unintentional misuses or fraudulent uses of the meter installed in the consumer premises

Several annexes cover legal metrology aspects of specific devices, for example:

- ACTIVE ELECTRICAL ENERGY METERS (**MI-003**) are specified in Annex V, used for electrical revenue meters.
- MEASURING SYSTEMS FOR THE CONTINUOUS AND DYNAMIC MEASUREMENT OF QUANTITIES OF LIQUIDS OTHER THAN WATER (**MI-005**) are specified in Annex VII, used for fuel dispensers, milk dispensers etc.

Note – Milk dispenser usually don't have any price indication displayed.

<p>MID MI-001 – Water meters</p> 	<p>MID MI-002 – Gas meters</p> 	<p>MID MI-003 – Active electrical energy meter</p>  <p>(utility meters, revenue meters, billing meters)</p>	<p>MID MI-008, chapter II</p> 
---	---	---	--

2. Executive summary

CAPIEL welcomes the possibility to amend the MID directive and would like to provide the following recommendations, needed by recent market evolutions on “Electric vehicle supply equipment”, “Flexibility services” and “Complex tariffs”.

Market need	MID annex	Proposed modification
EV Supply Equipment	Annex V (MI-003) Electrical meters	Confirm that “DC energy” measurement is already covered by Annex V.
	Annex I Essential requirements	Confirm that “remote displaying” is already permitted.
	Annex I Essential requirements	Confirm that synchronisation to external time references is related to the use; thus it cannot be checked at the time of making measuring instruments available on the market.
	Annex I Essential requirements	Consider that temperature can go higher than 70°C or lower than -40°C.
Flexibility services	Annex V (MI-003) Electrical meters	Confirm that active energy meters are suitable for flexibility services.
Complex tariffs	Annex I Essential requirements	Confirm that complex tariffs are already covered by MID.

Concrete proposals are made in clause 6 at the end of this document.

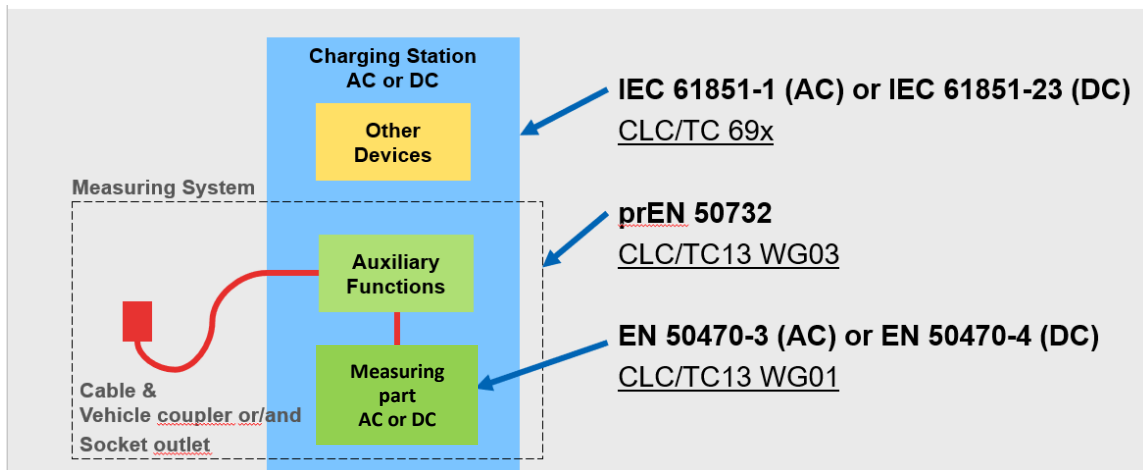
Probably all proposals could be adopted via a Delegated Act; others, if any, may request a light evolution of MID.

3. EV Supply Equipment

The measuring system of an EVSE, as covered by the future standard EN 50732 encompasses the below measurements:

- AC or DC active energy.
- Time duration on a parking place, usually after the charge is completed.

MID requires the result of the measurement to be indicated to all parties affected by the measurement. This can be done by any fit-for-purpose technical implementation: a display on the meter accessible without tools to the consumer, or any other equivalent means, provided the metrologically-relevant information is protected against corruption.



Article 4 of MID states the following:

For the purposes of this Directive, the following definitions shall apply: (1) 'measuring instrument' means any *device* or *system* with a measurement function that is covered by Article 2(1);

Based on its scope and the preliminary work, EN 50732 should be a product standard mandatory for all EVSE in Europe. But the need for its harmonisation against MID directive has to be verified.

In any case, the below clarifications should be brought in the directive:

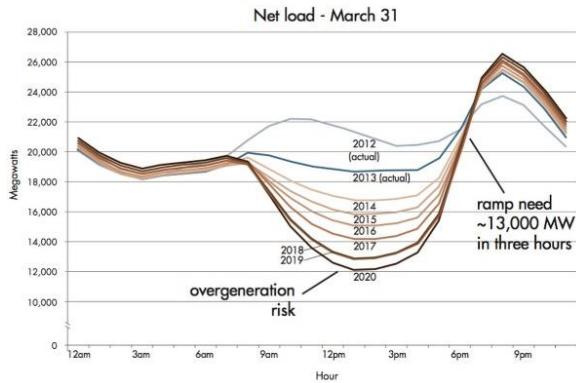
- Even if obvious in most European countries, it would need to be clearer that MI-003 covers both AC and DC active electrical energy.
- Time: reliable time in the EVSE will be updated remotely by the Charge Point Operator (CPO) through the communication channel, then time should not be considered as metrologically-relevant in the EVSE.
- Display: it would need to be clearer in interpretation documents that the indication of the result may can be made locally on the meter or remotely provided there is a means to avoid corruption of the data (e.g. encryption, with a private key managed by the meter and a public key allowing end-applications to read data). This is important for smart metering (EMD, Directive (EU) 2019/944) and accessibility (Directive (EU) 2019/882).

Consequently, only Annex V would need a slight update while Annexes I and V would need some additional clarifying notes, see clause 6.

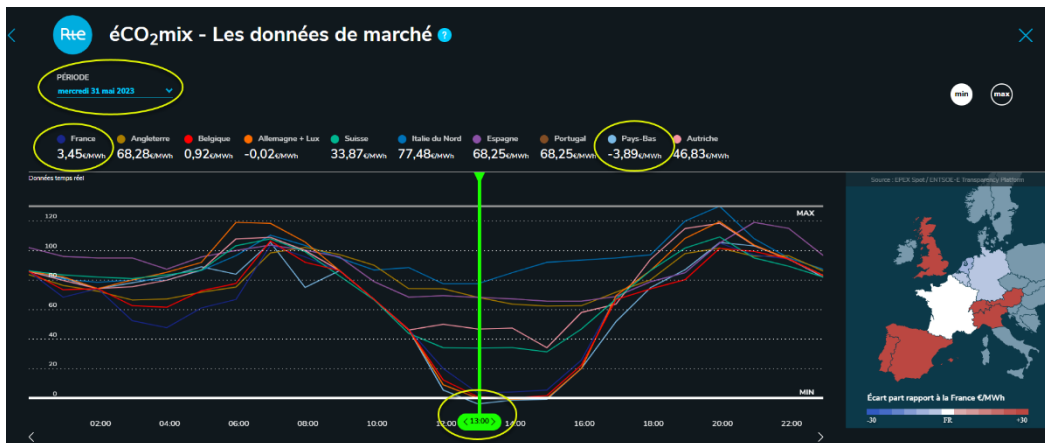
4. Flexibility services

Use of renewable energy is widespread in Europe, but induces some risks of overgeneration for example on sunny days for photovoltaic (see below duck curve), or on windy days for wind farms.

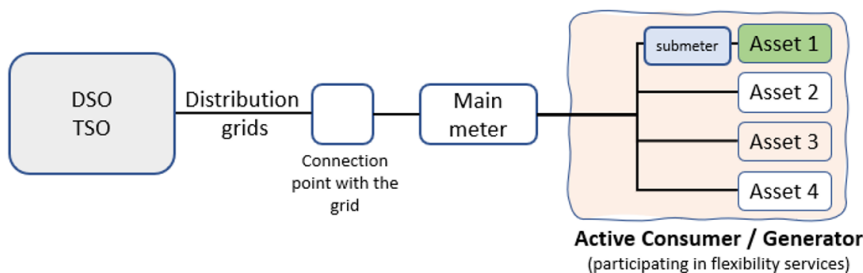
Figure 2: The duck curve shows steep ramping needs and overgeneration risk



For grid stability, it is more and more necessary to balance the supply with the demand. As an example, on the SPOT market, on 31 May 2023, Netherlands was paying (-3,89€/MWh) to anyone willing to use its electrical energy.



BEFLEXIBLE, an organisation funded by the European Union, has issued the below scheme, describing a “submeter” (that should be called a “flexmeter”), in charge of easing flexibility services.



Indeed, flexibility services will be based on measurement of “electrical power”, used for billing of flexibility services. Increment of active energy over a specified time duration needs then to become mandatory for billing of flexibility services.

Consequently, only it should be made clear that Annex V covers "electrical energy increment over a period of time", which is a typical smart meter implementation of active electrical energy measurement that relates to electrical power.

5. Complex tariffs

Traditionally, there are two kind of contracts:

- A contract with a single tariff per kWh. A single meter index is used for billing.
- A contract with two tariffs per kWh (one tariff for peak hours and one tariff for off-peak hours). In this case, two different meter indexes are used for billing

New contracts are now available, thanks to the Energy Market Directive (Directive (EU) 2019/944). Those let consumers have access to the SPOT market, with dynamic tariffs, evolving for example every hour as shown in the below table.

Elspot Prices in EUR/MWh											
Data was last updated 10-01-2021											
	Hours	SYS	SE1	FI	DK1	Oslo	AT	BE	DE-LU	FR	NL
4.1.2021	01 - 02	23,72	24,05	24,05	24,05	24,05	29,88	19,42	24,82	47,01	39
4.1.2021	02 - 03	23,46	23,88	23,88	23,88	23,88	29	20	24,65	43,79	37,14
4.1.2021	03 - 04	23,56	24,03	24,03	24,03	24,03	28,63	20,71	24,8	41,65	35,79
4.1.2021	04 - 05	24,25	24,58	24,58	24,58	24,58	30,87	24,34	27,71	41,62	36,63
4.1.2021	05 - 06	25,55	25,84	25,84	25,84	25,84	32,08	23,25	28,58	44,5	41,83
4.1.2021	06 - 07	27,46	28,21	28,21	28,21	28,21	41,32	30,51	37,04	56	38,74
4.1.2021	07 - 08	31,22	30,85	49,76	30,85	30,85	55,18	68,25	52,03	62	41,61
4.1.2021	08 - 09	45,95	49,2	54,42	49,2	49,2	58,18	71,54	55,76	64,84	60
4.1.2021	09 - 10	48,58	50,02	50,72	50,02	50,02	59,19	54,5	57,06	68,25	64,83
4.1.2021	10 - 11	50,76	55,4	55,4	55,4	55,4	58,81	54,5	57,18	65,97	60
4.1.2021	11 - 12	50,94	56,53	56,53	56,53	56,53	60,69	58,19	60	63,93	58,4
4.1.2021	12 - 13	50,01	52,07	52,07	52,07	52,07	61,73	59,86	61,27	63,94	59,34
4.1.2021	13 - 14	50,08	56,53	56,53	56,53	56,53	60,92	58,51	60,28	63,94	58,4
4.1.2021	14 - 15	50,72	57,99	57,99	57,99	57,99	60,41	59,32	60,07	61,97	59,91
4.1.2021	15 - 16	50,75	58,03	58,03	58,03	57,61	59,99	57,61	59,46	62,45	59,52
4.1.2021	16 - 17	50,94	60,5	60,5	60,5	60,07	62,33	60,77	61,99	63,9	62,06
4.1.2021	17 - 18	57,98	65,22	65,22	65,22	65,22	66,88	67,04	66,82	67,02	67,37
4.1.2021	18 - 19	50,71	60,05	60,05	60,05	59,59	64,44	76,05	61,97	71,05	61,56
4.1.2021	19 - 20	49,22	53,73	53,73	53,73	41,53	59,93	45,88	55,06	72,6	42,9
4.1.2021	20 - 21	34,77	37,68	37,68	37,68	37,68	52,23	37,43	47,34	70	41,39
4.1.2021	21 - 22	33,01	34,82	38,49	34,82	34,82	49,06	39,07	45,64	61,39	42,9
4.1.2021	22 - 23	29,77	30,95	30,95	30,95	30,95	51,13	47,1	48,93	59,8	41,94
4.1.2021	23 - 00	26,68	27,35	27,35	27,35	27,35	46,71	43,8	44,64	54,69	40

Synchronisation to reliable time sources (e.g. IrigB, SNTP, NTP, DCF77, PTP, GPS, ...) is an in-use requirement. Whether this synchronisation is done in use cannot be checked at the time of making available on the market and therefore outside the scope of MID. It should remain thus outside the scope of MID.

Note: reliable time source means secured or redundant time sources

6. Concrete change proposals

Item	Current version	Change proposal																																																																														
Annex V	<p>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.</p> <p>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</p>	<p>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.</p> <p>Note 1: 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.</p> <p>Note 2: Electrical energy meters may be considered as measuring AC and DC active energy as well as its increment over a specified duration.</p>																																																																														
Annex V (3)	<p style="text-align: center;">Table 2</p> <hr/> <p style="text-align: center;">MPEs in percent at rated operating conditions and defined load current levels and operating temperature</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3">Operating temperatures</th> <th colspan="3">Operating temperatures</th> <th colspan="3">Operating temperatures</th> <th colspan="3">Operating temperatures</th> </tr> </thead> <tbody> <tr> <td></td> <td colspan="3" style="text-align: center;">+ 5 °C ... + 30 °C</td> <td colspan="3" style="text-align: center;">- 10 °C ... + 5 °C or + 30 °C ... + 40 °C</td> <td colspan="3" style="text-align: center;">- 25 °C ... - 10 °C or + 40 °C ... + 55 °C</td> <td colspan="3" style="text-align: center;">- 40 °C ... - 25 °C or + 55 °C ... + 70 °C</td> </tr> <tr> <td style="text-align: center;">Meter class</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> </tr> </tbody> </table>		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 ... - 25 °C or + 55 °C ... + 70 °C			Meter class	A	B	C	A	B	C	A	B	C	A	B	C	<p style="text-align: center;">Table 2</p> <hr/> <p style="text-align: center;">MPEs in percent at rated operating conditions and defined load current levels and operating temperature</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3">Operating temperatures</th> <th colspan="3">Operating temperatures</th> <th colspan="3">Operating temperatures</th> <th colspan="3">Operating temperatures</th> </tr> </thead> <tbody> <tr> <td></td> <td colspan="3" style="text-align: center;">+ 5 °C ... + 30 °C</td> <td colspan="3" style="text-align: center;">- 10 °C ... + 5 °C or + 30 °C ... + 40 °C</td> <td colspan="3" style="text-align: center;">- 25 °C ... - 10 °C or + 40 °C ... + 55 °C</td> <td colspan="3" style="text-align: center;">- 40 °C ... - 25 °C or + 55 °C ... + 70 °C</td> </tr> <tr> <td style="text-align: center;">Meter class</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> <td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td> </tr> </tbody> </table>		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 ... - 25 °C or + 55 °C ... + 70 °C			Meter class	A	B	C	A	B	C	A	B	C	A	B	C
	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 ... - 25 °C or + 55 °C ... + 70 °C																																																																						
Meter class	A	B	C	A	B	C	A	B	C	A	B	C																																																																				
	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 ... - 25 °C or + 55 °C ... + 70 °C																																																																						
Meter class	A	B	C	A	B	C	A	B	C	A	B	C																																																																				
Annex V (4.2)	<p>4.2. <i>Effect of disturbances of long duration</i></p> <p>Table 3</p>	<p>4.2. <i>Effect of disturbances of long duration</i></p> <p>The effect of a disturbance of long duration shall be such that the change in the measurement result is no greater than the critical change value as defined in Table 3.</p> <p>Table 3</p>																																																																														
Annex I (10.1)	<p>10.1. Indication of the result shall be by means of a display or hard copy.</p>	<p>10.1. Indication of the result shall be by means of a display or hard copy.</p> <p>Note: The display can be the meter display or any other display, provided there is a means to avoid corruption of the data transferred to the remote display (e.g. encryption, with a private key managed by the meter and a public key for end-devices). This requirement needs to be considered as technology agnostic and future proof.</p>																																																																														

Item	Current version	Change proposal
Annex I (10.5)	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.	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. Note 1: The metrologically controlled display is not necessarily part of the measuring instrument. It shall be fitted and accessible when the instrument is in use. Note 2: For electrical energy, the basis for the price to pay is the meter index, that applies for fixed tariffs as well as for dynamic tariffs, where the tariff can change every Time Of Use (TOU), usually 1 hour or 15 minutes time duration.

2023-09-29

CAPIEL PG4/TF1

<https://www.capiel.eu/>