

Report on  
Questionnaire concerning legal metrology framework for EVCS

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To help the relevant authorities of different European states participating in the project to prepare metrology legislation in the context of electric vehicle charging, the consortium circulated a questionnaire between 15 July and 12 September 2021.

The questionnaire was returned by

- meter manufacturers,
- electric vehicle charging system (EVCS) manufacturers,
- charge point operators,
- consultants,
- accredited test laboratories and

organisations representing meter and EVCS manufacturers as well as charge point operators from across Europe. A total of 18 replies were received, representing 38 entities. Since some questions are more relevant to, e.g., manufacturers than to charge point operators, abstentions are not counted.

Half of the EVCS manufacturers prefer using modular meters – i.e. independently certified as stand-alone devices –, half of them prefer integrating the metering function in the electronics of the EVCS. One manufacturer explained they prefer modular meters in the short-term, but will integrate the metering function into the overall EVCS electronics in the long term.

## 1. Active electrical energy meter in EVCS

The first set of questions aimed to establish whether the requirements for active electrical energy meters, both for AC and DC, as harmonised under MID (Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments) are suitable and sufficient.

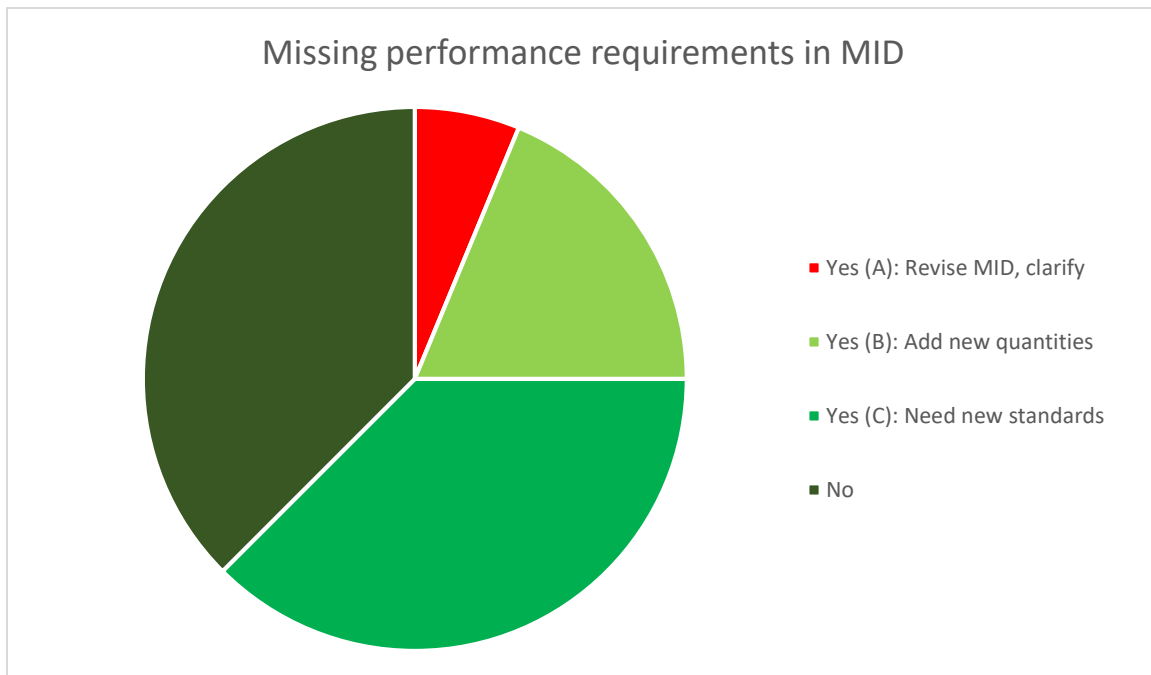
The replies showed that many market actors do not differentiate between MID, i.e. the directive itself, and the harmonised standards they use to establish the presumption of conformity. This shows that the concept of limiting MID to the expression of essential requirements, preferably performance requirements, and to allow presumption of conformity based on detailed technical specifications as laid out in harmonised standards – as laid out in recital 25 MID – works very well.

One implication is, however, that some replies claiming missing or incompatible requirements in MID refer to the harmonised standards and not MID. Since all positive replies include a comment, these cases are easy to identify.

### Question 1.1: Missing performance requirements in MID

For active electrical energy meters, do you see any performance requirement relevant to EVCS that is missing from MID? If so, which ones and why?

Yes (A) related to MID itself or its implementation and concerning active electrical energy	Yes (B) related to MID, but concerning new quantities	Yes (C) related to the harmonised standards or other requirements – can be implemented without modifying MID	No
1	3	6	6



Comments caused one response to be counted in multiple categories (Yes (A) and Yes (C)).

Category Yes (A) requires a revision of MID, a clarification or more harmonisation concerning active electrical energy meters.

Category Yes (B) requests new kinds of measuring instruments to be included in MID.

Category Yes (C) requires new or revised harmonised standards, but no revision of MID.

The following comments fall into category Yes (A):

- There is an urgent need for clarification that active electrical energy meters are within the scope of MID, regardless of whether AC or DC is used.

If it is confirmed that active electrical energy meters for both AC and DC are within the scope of MID, no revision is necessary. If, on the contrary, active electrical energy meters for DC are excluded from the scope, MID would need to be revised in order to either extend the scope or adapt the wording to make the exclusion of active electrical energy meters for DC more explicit. If active electrical energy meters for DC should be excluded from the scope of MID, standardisation mandate M/541 would need to be modified accordingly.

Since active electrical energy meters for DC are increasingly used for EVCS, removing them from the scope of MID would hinder the implementation of the Green Deal.

- In the longer term there is a need to look at harmonisation across the EU with regard to different national and local requirements for metering. Currently, varying Local regulations on measurement issues such as national accuracy metering certification laws, retrofitting and certification are causing major issues for business in terms of compliance, hindering the development of a single market for EV charging in the EU.

Traditionally, non-harmonised regulation on installed electricity meters did not hinder the development of a single market since installed electricity meters e.g. in households were not traded across borders. However, EVCS are assembled by EVCS manufacturers using active electrical energy meters. Once the meter is installed, it is considered in use. Both EVCS manufacturers and charge point operators are active in multiple Member States and need to deal

with non-harmonised legislation in all Member States they are active in. This legislation covers three main aspects: 1. requirements for EVCS as a whole, 2. transitional provisions in Member States that newly prescribe the use of active electrical energy meters in EVCS (Art. 3 MID) and 3. requirements for meters in use (subsequent verification etc.).

Aspect 1 is solved by Regulation (EU) 2019/515 (see question 2 below). Aspect 2 is only of temporary importance and its impact is limited. EVCS manufacturers can already choose to buy only MID compliant active electrical energy meters, regardless of whether or not the Member State to which they intend to sell a particular EVCS prescribes the use of active electrical energy meters already. The importance and impact of aspect 3 is comparable to the same aspect in, e.g., active electrical energy meters used in households. The fundamental question is whether MID should be extended to include provisions for meters in use, e.g. subsequent verification. Since the existing system is well established and satisfactory for other applications, such an extension might not be proportionate. EVCS in use are not sold across Member States, so non-harmonised requirements are not hindering the single market for EVCS. While it complicates the provision of services by charge point operators, the impact of the lack of harmonisation could be reduced through easy to find information about

- prescribed procedures for maintenance of stability (e.g., subsequent verification, statistical survey) and their frequency;
- contact details of the relevant authorities.

This complexity of this information is rather limited, so harmonisation does not seem to be necessary.

The following comments fall into category Yes (B) – new quantities to be included in the MID:

- Monitoring of the harmonic emission limits of an EVCS
- In addition to the active energy [kWh] the charging duration [h] should be an additional measurand, that can be invoiced and has to be calibrated.  
This is quite relevant for different use cases as an HPC DC charging station, where the operator wants to offer a tariff as follows: 0,25 €/kWh and 1 €/min.  
This tariff scheme is also relevant for public EVCS, where the users should only occupy an EVCS, in case they really charge the battery and not just connecting the car for parking.  
In both cases the tariff scheme protects the operator or provides the operator with a reliable business case.
- MID certified current and power

All of these points require new physical quantities to be included in MID. While the proposals have their merits, these physical quantities are not specific to EVCS. Harmonic emission limits, current and power are also relevant in traditional applications. For instance, in some countries, the tariff depends on the maximum current at the main fuse, while others use load profiles to establish the average power in a given interval. The problem of metering the charging duration is the same as in parking meters, even though the unit price might be different.

Since these quantities have been used in other applications for some time, even before the revision of the Directive 2004/22/EC (MID, version 2004), such requests should be discussed in a larger scale without limitation to the use case of electro-mobility.

The following comments fall into category Yes (C) – new or revised harmonised standards:

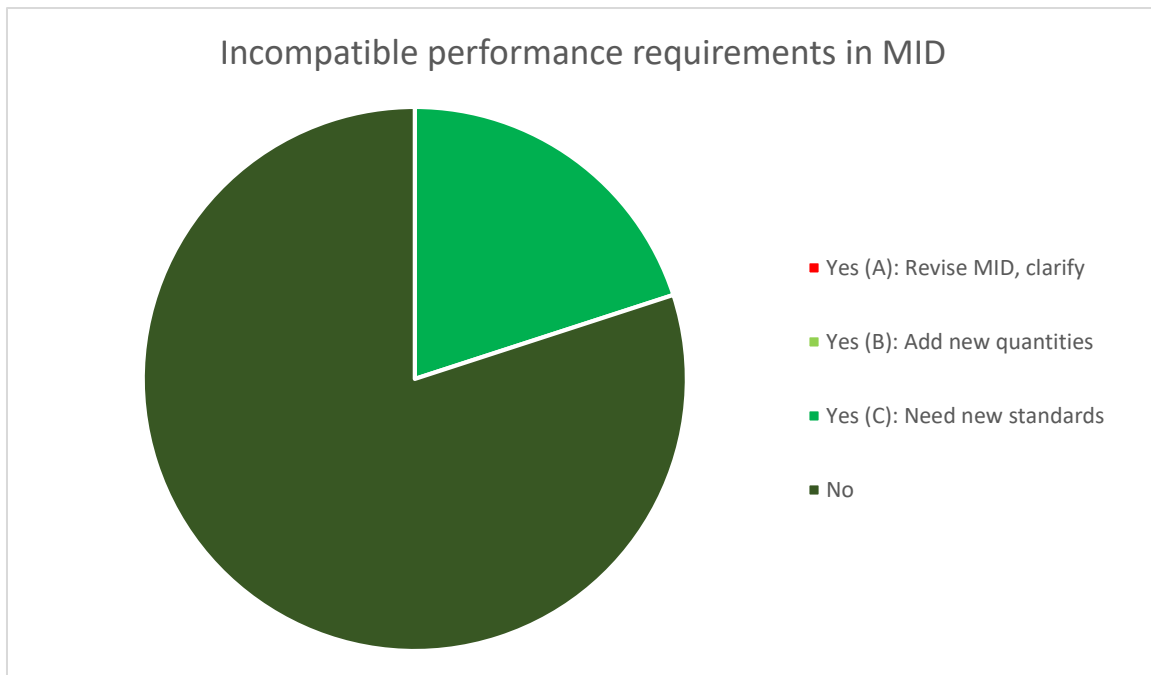
- MID was solely written for self-contained meters, which are certified as independent components, and then integrated into a charging station. The option of charging stations with fully/seamlessly integrated metering functions is completely missing in MID.
- Process of verifiability/traceability of billing up to end-customer
- Process of price display and electronic proof of purchase
- DC metering is not properly addressed in MID. More specifically, MID requirements for AC Metering cannot be applied to DC metering as they concern different physical quantities (not only voltage and current).
- DC-Metering annex for EN 50470
- Metering at EVSE requires not only getting a meter value at a certain time it requires to report a start and end value of a charging session combined with a unique User-ID.
- Metering at EVSE requires that the End-User is able to check the session values of the meter afterwards due to invoicing is mostly done not directly at the EVSE. It will be done later via credit card or MSP (Mobility Service Provider) invoice. In Germany we use a transparency software which enables the customer to check the signed meter values (we call them datatuple) retrospectively.
- Requirements directly related to standard EN 62053-41, including other important ones: possibility of compensating losses in the cable for very high currents.

MID was intended to define essential requirements that do not impede technical progress, preferably performance requirement (recital 25 MID). Therefore, MID was not intended to make a statement on detailed technical specifications such as the question whether the meter needs to be self-contained or integrated into a charging station, how to implement the durable proof of the measurement and how to account for cable losses. The harmonised standards of the EN 50470 series reflect the traditional use cases. The EU commission requested adapted standards for EVCS in their mandate M/541. These standards were requested by 31 December 2017, but are still missing.

### Question 1.2: Incompatible performance requirements in MID

For active electrical energy meters, do you see any performance requirement in MID that is incompatible with the use in EVCS? If so, which ones and why?

Yes (A) related to MID itself or its implementation and concerning active electrical energy	Yes (B) related to MID, but concerning new quantities	Yes (C) related to the harmonised standards or other requirements – can be implemented without modifying MID	No
0	0	3	12



The following comments fall into category Yes (C):

- Not directly MID, but related to EN 50470-3: The requirements given there, especially concerning test parameters (e.g. from Table 9), are partly outdated and not suitable for modern charging stations. For example, no EV charging station will ever use a Ferraris meter anymore, so the requirements e.g. with regards to external electromagnetic fields should be re-discussed.
- DC metering is not properly addressed in MID, so it cannot be applied to DC charging systems. There are currently still very few DC meters and DC EVCS for the required power range (350kW / 500A) that have been certified within Europe.
- The scope of the MID should also explicitly provide for its application to meters for electric cars!
- MID does not have specific accuracy requirements for DC, and does not foresee other applicable requirements: input resistance, loss compensation with high currents (fast charging stations)!
- The MID is applied to contacted AC and is supported by specific standards: EN 50470-1, EN 50470-2 and EN 50470-3, although inspired by other standards!
- However, in a transitional phase it could refer to the standard EN 62053-41!

MID was intended to define essential requirements that do not impede technical progress, preferably performance requirement (recital 25 MID). Therefore, MID was not intended to make specific requirements for different applications such as EVCS. The harmonised standards of the EN 50470 series reflect the traditional use cases. The EU commission requested adapted standards for EVCS in their mandate M/541. These standards were requested by 31 December 2017, but are still missing.

**Question 1.3: Need for guidance**

For active electrical energy meters, do you see need for guidance on EVCS-specific interpretation of MID? If so, which guidance for which clauses is missing and why is it needed?

Yes	No
12	3



No replies were counted as yes if the replies to questions 1.1 or 1.2 fell into category Yes (C).

The following comments were submitted:

- Clear statement, that MID is applicable for DC energy meters (when utilized within EVSC) as well plus clear differentiation within the MID for DC usage (e.g. frequency == 0 Hz | no “Reversed phase sequence”, etc.).
- As stated in 1.1., there is an urgent need for clarification that active DC electrical energy meters are within the scope of MID.
- The result of the measurement is the supplied energy to the EV and not the cumulated meter value of all previous charging sessions!
- The result of the measurement is the supplied energy to the EV at the delivery point, which is the connector and not the terminals of the meter itself. The electrical losses between the meter and the delivery point have to be compensated by the equipment!
- Annex I §11. “Further processing of data to conclude the trading transaction” of the MID applies for EVCS.
- MID was written for self-contained meters, certified as independent components. The option of EVCS with fully integrated metering functions is completely not explicit in MID.
- It is strongly advised to underline the necessity for the EVCS comply with certain aspects of MID: (identical comment submitted by two respondents)
  - the obligation for the EVCS to have a physical display with the info on the energy delivered to the client. We think that MID allows both solutions, a display directly from the meter itself or a ECVS display that communicates with the meter.

- the obligation for the EVCS to have a metrological led for metrological verification purposes.
- The scope and applicability within various use-cases and integration models is not always necessarily clear, therefore appropriate guidance would be helpful.
- Details for DC measurement and requirements to DC-meters
- In general, [we] would support using the general tenets of the MID requirements as a baseline (we have expanded on this in Q3). [We do] not have a specific position on the details of the MID requirements.
- DC metering is not properly addressed in MID, we do not believe guidance is sufficient.
- Already answered ago!
  - For AC, the scope should include electric vehicles!
  - Furthermore, for DC it should include specific requirements!
  - It makes no sense to base DC requirements on AC standards, namely EN 50470-1 and EN 50470-3!
- EN 50470-3: 7.1: Power consumption  
MID defines a maximum power consumption of 2W and 10VA (voltage circuit). This is ok for the meter itself but too less for a EVCS with an integrated electricity meter.
- EN 50470-3: 8.7.9.2 Initial start-up of the meter  
A starting time of less than 5 s is defined. This is too less for an EVCS with an integrated electricity meter.
- EN 50470-1: 5.1: Display of measured values  
It is defined that the total quantity of electrical energy supplied should be shown on the display. This is very confusing for the end-customer because he is only interested in the energy used in this charging transaction and not in the “counter value”.  
An acceptable solution would be that only on request (e.g. button press or light impulse) the counter values and other legal requirements (CRC, Version, ...) are shown on the display.

These reasons and those in the category Yes (C) of questions 1.1 and 1.2 show very clearly that the delay in the preparation of standards in response to the EU commission’s standardisation mandate M/541 issued on 15 December 2015 is a substantial obstacle. The standards were due on 31 December 2017.

However, since MID conformity assessments without the benefit of harmonised standards have been done successfully, it is clear that MID is suitable, but standards are missing.

## 2. EVCS as a whole

Metrology requirements for EVCS as a whole, i.e., other than for the active electrical energy meter itself, are not harmonised under MID. Therefore, Regulation (EU) 2019/515 of the European Parliament and of the Council of 19 March 2019 on the mutual recognition of goods lawfully marketed in another Member State and repealing Regulation (EC) No 764/2008 applies (“Cassis de Dijon” principle). Consequently, no Member State can enforce non-harmonised national legislation concerning the making available on the market of EVCS as long as there is at least one Member State without such legislation unless there are ‘legitimate public interest grounds’.

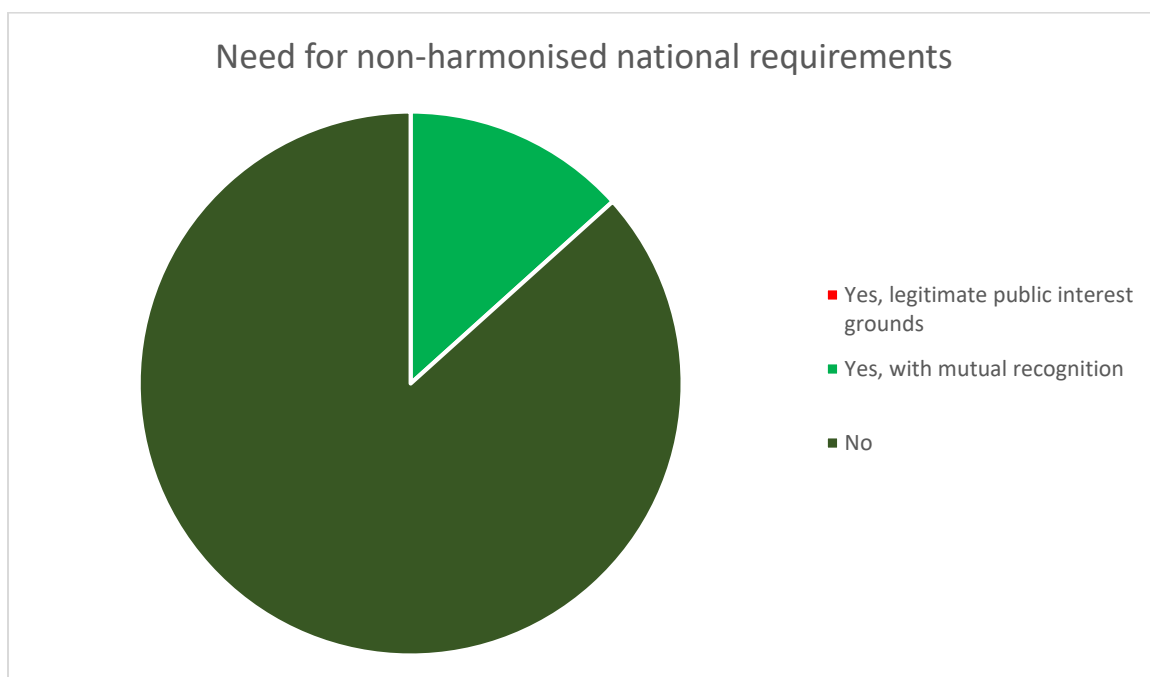
### Question 2.1: Non-harmonised national requirements

Do you see metrology requirements for the making available on the market of EVCS that need to be included in non-harmonised national legislation for reasons of protection of consumers, levying of taxes and duties and fair trading? If so, which ones and why? Please



explain also the ‘legitimate public interest grounds’ (Art. 5 paragraph 11 point (b) Regulation (EU) 2019/515) justifying such non-harmonised national legislation.

Yes, with ‘legitimate public interest grounds’	Yes, but with mutual recognition of goods (Regulation (EU) 2019/515)	No
0	2	13



Non-harmonised national requirements justified by ‘legitimate public interest grounds’ as required by Regulation (EU) 2019/515 would lead to justified barriers to trade. No such grounds were stated. Therefore, EVCS lawfully marketed in a Member State without non-harmonised requirements may be used in any other Member State and non-harmonised national requirements do not lead to barriers to trade. Manufacturers and importers are free to choose which Member State’s non-harmonised requirements they would like to satisfy. As long as there is at least one Member State without non-harmonised requirements, respecting no non-harmonised requirement can be enforced.

Consequently, this project will be based on the assumption that no non-harmonised requirements apply to the EVCS as a whole.

In the absence of non-harmonised national requirements, the questions

- 2.2: Putting on the market and into use  
If you deem metrology requirements for EVCS as a whole necessary, how should the conformity of EVCS be assessed?
- 2.3: Maintenance of the stability  
If you deem metrology requirements for EVCS as a whole necessary, how should the stability of EVCS be maintained?

are irrelevant to the project.

### 3. Any other comment or suggestion

The questionnaire asked for any other comment or suggestion to be included in the report.

- Wider interpretation of MID is urgently needed in particular about the inclusion in the scope of active AC and DC electrical energy meters.

Note: Some notified bodies accept that active electrical energy meters for EVCS using AC and DC are within the scope of MID, while others do not.

- Since 2004, MID (Directives 2004/22/EC and 2014/32/EU) defines performance requirements for the measurement of active electrical energy for the “protection of consumers, levying of taxes and duties and fair trading” (Art. 3 MID 2014/32/EU). By definition, the term active electrical energy includes both AC and DC (“electrical energy transformable into some other form of energy”).
- While it is clear that in 2004, all measurements of active electrical energy relevant for the “protection of consumers, levying of taxes and duties and fair trading” were using AC technology, this does not exclude DC active electrical energy meters once DC technology is used in such transactions.
- Regarding the MID requirements and all relevant standards from CENELEC, IEC, OIML and WELMEC as well as electric vehicle supply equipment (EVSE) application standards we understand that all MID requirements (environment, EMC, accuracy, reliability) can either be applied just as for AC meters or are not applicable by definition.
- No MID requirements exclude the use of DC active energy meters. Furthermore, the essential requirements of MID are complete and applicable for both AC and DC active energy meters in the sense that no essential requirement that an active energy meter can be reasonably expected to comply with is missing from MID.
- As shown above, the legal and technical situation seems clear beyond any doubt and notified bodies also carry out conformity assessments for both AC and DC active electrical energy meters. However, some Member states contemplate introducing non-harmonised requirements for active electrical energy meters if DC technology is used.
- This lack of consistency would fragment the EU market through technical barriers to trade, leading to an increase in cost and time to market for DC fast charging stations: A DC charger would need multiple certifications by nationally nominated bodies, each taking from several weeks to months for approval.
- If we simplify and assume certification cost and time spent of 50 000€ per vendor and an effort of 15 vendors in 27 Member States, the financial cost of these technical barriers to trade reaches €20m for product compliance alone (not taking into account indirect changes e.g. alterations on charger design, production lines, and certifications of systems for ingress protection and so forth). This launch could not be synchronised in markets because of different time spans for certification.
- Moreover, if the non-harmonised requirements differ from MID or each other, the technical design of DC chargers would have to be specifically adapted to the respective Member State’s non-harmonised requirements, further increasing the cost. The industry’s success also depends on the acceptance of the consumer, to which appropriate protection is essential. Therefore, it is highly undesirable to have varying levels of protection of the consumer across the EU. Non-harmonised requirements of different technical content will lead to such a situation.
- At present, the industry is directly exposed to the legal uncertainty caused by non-harmonised requirements within the scope of MID. Consequently, it is delaying

investments into the charging infrastructure, namely the DC chargers which already today have capacities ranging from 15 kW to 450 kW, deployed on both private and public sites and which are so important for the transition to a carbon-free mobility and thus the Green Deal.

- On top of these issues, there are other barriers where clarity is needed in order to provide clear direction for the market.
- Clarity should be provided on the range of MID certified DC meters - if one DC meter is certified this does not automatically mean that all DC charging systems can be updated, for example, because of the DC power range of the DC meter and/or the space restrictions in the charger. Next to that it should be outlined that having a certified DC meter doesn't need the full charger to be certified. Isolating the DC meter from the charger by sealing that specific component can be a solution, as long as there are sufficient authorized personnel to work with it.
- Regarding retrospective requirement of DC metering, clarification is needed on whether it is expected to update systems already in the field that physically do not have the space to add a DC meter. One can think of a date until when chargers can be installed without DC meter. This clarity enables investments in the upcoming years, as the cost of DC meters in both investments as operational expense is not yet clear.
- There are also two key issues for the operation of charging points once legal metrology standards have been introduced: retrofitting requirements and re-certification post maintenance:
  - Legislation needs to be forward-looking, and to not require retrofitting of metres to comply with new legal metrology requirements. As well as being costly, retrofitting is not always technically possible, and is often not economically viable. This is especially the case as older charge points reach the end of their life cycle. As we expect to see huge numbers of new chargers coming to the market in the near future, the number of chargers that are not compliant with new legal metrology requirements will be insignificant.
  - Legislators should not require recertification after regular maintenance of charge points. If each charge point must be recertified after maintenance, there could be long delays in getting chargers operating again and therefore a reduced service for customers. Needless to say, all CPOs would certainly welcome regular spot checks to ensure that the authorities can be confident that the legal metrology requirements are being met.

Note: These aspects are very important, but out of scope of MID. LegalEVcharge is also intended to provide a platform for discussing such questions in order to co-ordinate non-harmonised legislation.

- The development of a functioning EU market for DC charging systems with DC meter cannot occur as long as there is only one manufacturer (of DC meters) certified and if there is a risk of lack of components needed for the steady supply of DC meters. Stimulating the development and MID certification of DC meters beforehand can be a measure to overcome this.
- Furthermore, legal certainty should be provided regarding the application of existing national accuracy metering certification laws beyond the scope of MID across Member States. We recommend recognising that the certification of DC metered chargers in one EU Member State (where such law exists) is valid in all European Member States.

- We would therefore welcome a clarifying statement from the Commission that active electrical energy meters are within the scope of MID, regardless of whether AC or DC is used.  
Only in this way will the European consumer be protected uniformly in all Member States. This is especially important for charging of vehicles, which are made to travel across borders. For industry, such a clarification will provide much needed legal certainty, enabling them to speed up investments.
- In the broader context of the decarbonisation of EU road transport and the shift to e-mobility, such a clarification will help to create a truly single EV charging infrastructure market in the EU, speeding up the transition to zero emission transport.
- There is a very efficient, practical and simple method that can be used for AC and DC EVCS to comply to the requirements of the MID including Annex I §11 and which is already certified by two notified bodies (Module B+D) in Germany and recognized by the Federal Office of Metrology and Surveying (BEV) in Austria.

This method consists in:

- storing the measurement results of each charging session in an additional device which is integrated into the EVSC and
- providing an user interface at the EVSC to check a specific historical measurement result at any time by displaying it on a display at the request of a user.

An example of this method is the so called [...] developed [by us] for AC and DC EVSC. [...] is a certified additional device installed within the charging station and equipped with a data storage, two buttons to retrieve any historical measurement result and a display to show the measurement result during, at the end and after a charging session.

Note: This aspect should also be included one or more of the long-overdue standards prepared in response to M/541.

- The new regulation should not have retroactive effects regarding the already installed and operating EVCS. Besides not being possible to retrofit all models of EVCS, retrofit costs can kill the business case of the previous investments, which were made acquiring the state-of-the-art EVCS available in the market. At least an adequate transition period should be considered, allowing the end of life of such previous assets.
- The new metrological regulation must encompass the equipment already installed, through a transition calendar.
- Thank you for the opportunity to feedback as part of this questionnaire. [We understand] the importance of legal metrology in ensuring that the EV driver feels confident that they receive the amount of electricity that they paid for when they charge their car. [We are] very confident about its methods in ensuring this, but believes that introducing low maintenance metrology requirements is an excellent way to ensure the EV charging market is transparent for all.
- [We] would like to urge [the consortium] to take the following points in to consideration in the development if its system:
  - 1. No obligatory retrofitting  
[We urge the consortium] to avoid the obligatory retrofitting of currently installed charge points. The requirement to retrofit all existing charge points at the same time is likely to be too much for a CPO to manage concurrently, and could lead to many charge points being shut down until they can be retrofitted, which would be bad for the consumer.

Beyond this, retrofitting existing charge points is not always technically possible due to changes in hardware and technology. As well as this, retrofitting may not always be economically viable, particularly if the asset (i.e., the charger) is already near the end of its lifecycle and scheduled for replacement.

With the very large numbers of new charge points coming to the market in the years to come, and given the lifecycle of chargers, the number of chargers in use that pre-date the new metrology requirements will be very limited in practice. As well as an extensive roll out of new charge points, [we] regularly [update our] existing charge points with new technology, e.g. faster chargers, and as part of such updates charge points would naturally be brought in to line with legal metrology requirements. We therefore expect that only a small percentage of our total amount of chargers will not be in line with metrology requirements, in contrast to the large majority of metrology-certified chargers in use.

- 2. No need for recertification after maintenance  
[We urge the consortium] to not require recertification after maintenance of charge points. If each charge point must be recertified after maintenance, there could be long delays in getting chargers operating again and therefore a reduced service for customers. [We] is strongly of the opinion that chargers should be back in use for the customer immediately after maintenance is completed. Needless to say, [we] would welcome regular spontaneous verification of the charge points.
- 3. Example of issues when requirements go beyond MID  
Requirements beyond the EU's MID can cause issues for charge point operators, create expense or delay the rollout of charging infrastructure. A valuable example is the requirement in German Eichrecht for customers to be able to independently check meter values. This requirement adds considerable additional costs to the CPO (e.g. in hardware and software) but it is not expected to be a feature that is used in practice by customers.  
[We] would welcome the opportunity to discuss these matters with you in more detail, and is ready to answer any questions about our response. Many thanks!
- The market needs a standard communication protocol between DC-Meter and EVSE-charging controller, which is secure and enables a PKI (public key infrastructure) communication of charging session meter values. OCPP is the standard protocol from controller to the backend used in the field, but the other communication is not standardised yet. What about the communication hardware in the EVSE? Do this communication hardware (gateway, router, Sim) needs protection against external manipulation? How high should be the requirements? In Germany they discuss to use Smart Meter Gateways from the household application as secure communication hardware for invoicing meter values.

Note: This aspect should also be included one or more of the long-overdue standards prepared in response to M/541.

- Important for us would be a uniform European solution. One of the biggest challenge of a EVSE with integrated meter is that it is accepted in all European countries.
- One point there is the software separation. An EVSE needs to be able to updates [its] software, but the MID measurement part [cannot] change. To make this easier we have created a small Meter Module that does all the MID part (except display) and makes a digital signature to all charging transactions. We are doing this according the "MEMO 4 der Physikalisch Technischen Prüfanstalt"

“Ende-zu-Ende-Sicherungskonzept für eine eichrechtlich günstige Lösung („GL“) für die Übertragung von Messdaten auf Fernanzeigen”

It would be great if this solution would be accepted also outside Germany.

Note: This aspect should also be included one or more of the long-overdue standards prepared in response to M/541.

## 4. Conclusion

All respondents found that there are neither missing nor incompatible requirements in MID for the active electrical energy meters as such. With these meters, the energy transferred between the charging station and the vehicle that can be used to propel the vehicle can be determined as required for the protection of consumers and fair trading (Art. 3 MID). The only condition is that active electrical energy meters for both AC and DC must be taken to be included as, e.g., the EU commissions standardisation mandate M/541, Union law, standards and terminology databases, suggest. One response highlighted that legislation on transitional provisions, e.g. with respect to retrofitting, the maintenance of stability, e.g. subsequent verification and statistical survey, should be harmonised.

A large majority noted that the long overdue standards “concerning the legal metrological control of delivery to the public of electricity for use in electrical means of transport covered by Article 4 of Directive 2014/94/EU (i.e. electric road transport, maritime transport and inland navigation)” “with reference to Annex I (e.g. point 10.4) and Annex V to Directive 2014/32/EU” (see standardisation mandate M/541) are necessary. Their delay is causing considerable uncertainty in the market. Therefore, LegalEVcharge will prepare a provisional standard for DC active electrical energy meters. This provisional standard can be used until CENELEC publishes a standard in response the standardisation mandate M/541.

## 5. Abbreviations

M/541	Commission implementing decision of 15.12.2015 on a standardisation request to the European Committee for Standardisation, to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute pursuant to Regulation (EU) No 1025/2012 of the European Parliament and of the Council as regards certain measuring instruments
MID	Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments