

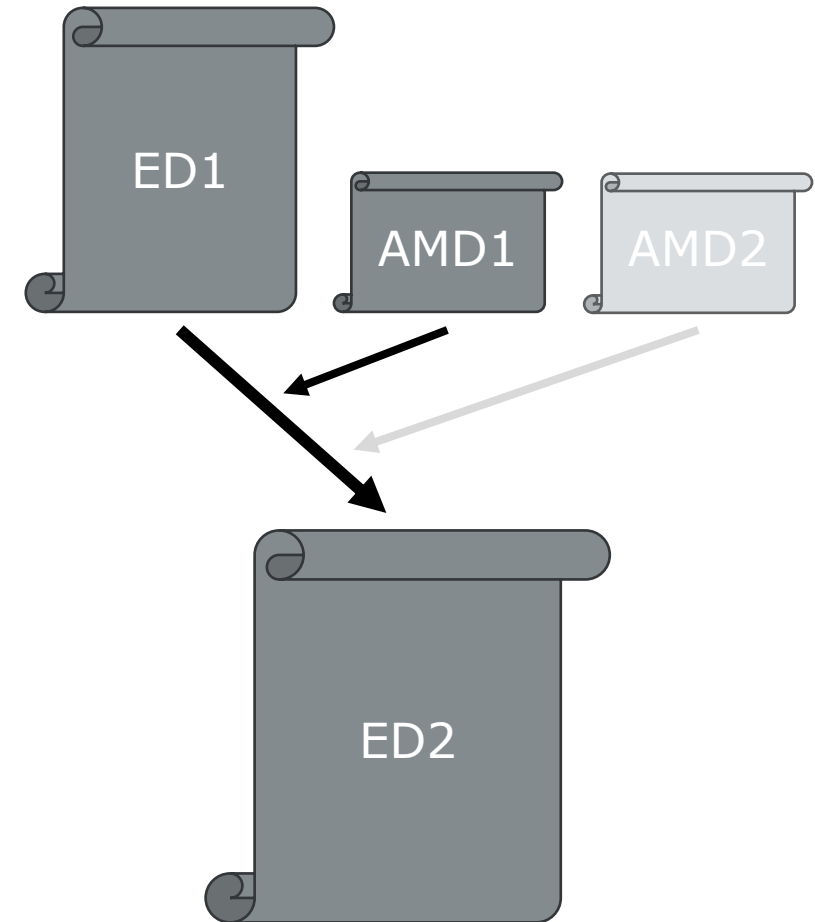
DOCKETED	
Docket Number:	22-EVI-06
Project Title:	Vehicle-Grid Integration
TN #:	256284
Document Title:	ISO 15118 Workshop - Vector ISO 15118-20 AC Bidirectional Presentation
Description:	N/A
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AC BPT DER according to ISO 15118-20 AMD1

Amendments to ISO Documents

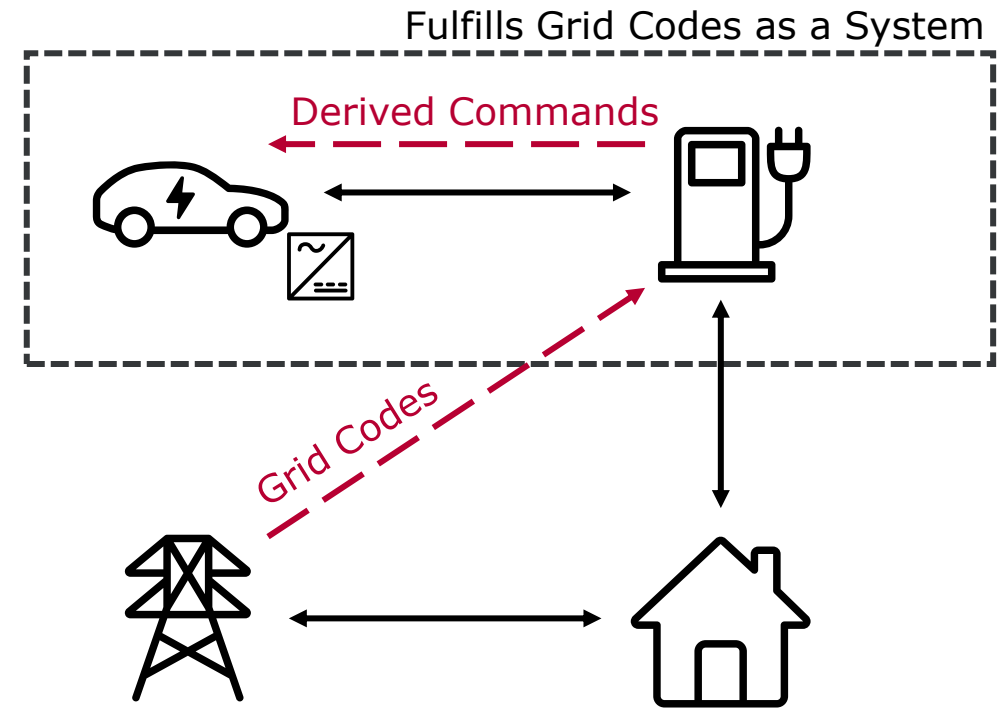
- ▶ Standardization process of ISO allows 2 kinds of documents for international standards
 - ▶ Editions
 - > Complete versions of a standard document
 - > Replace previous releases
 - > New edition at most every 3 years
 - ▶ Amendments
 - > Describes changes to be made, e.g., adding or removing requirements
 - > Only complete with corresponding edition
 - > Next edition will incorporate changes of amendment
 - > At most 2 amendments to 1 edition
- ▶ All documents need to go through balloting
 - ▶ Amendments can be submitted in FDIS stage
 - > Reduces time until publication
 - > Approach planned for ISO 15118-20 AMD1
- ▶ Errata and similar documents not available



AC BPT according to ISO 15118-20:2022

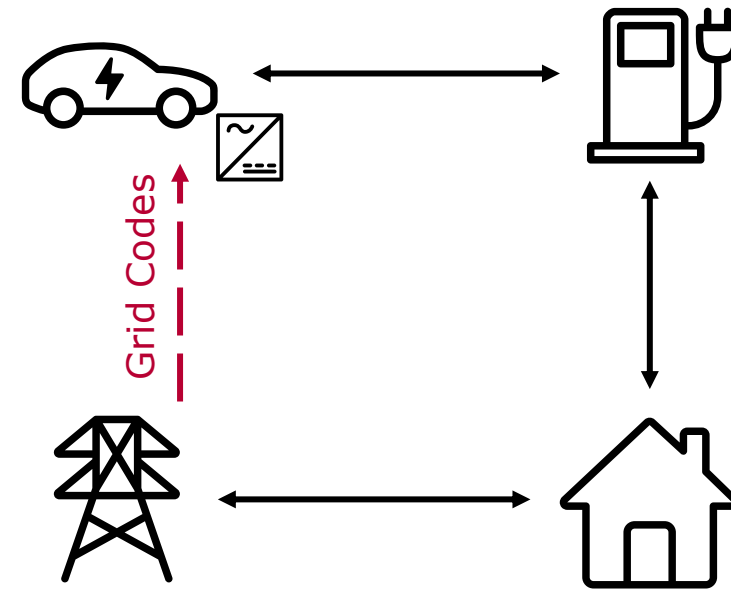
- ▶ EV might not have knowledge of grid codes
- ▶ As EV is mobile, many different grid codes may apply
- ▶ EVSE is stationary, only one set of grid codes applies
- ▶ Grid codes will be translated to simple commands by EVSE
- ➔ EV does not require any knowledge of grid codes

- ▶ For discharging into grid, certification is necessary
- ! Some certification bodies cannot certificate a system of two components
- ▶ EV is required to fulfill grid codes on its own



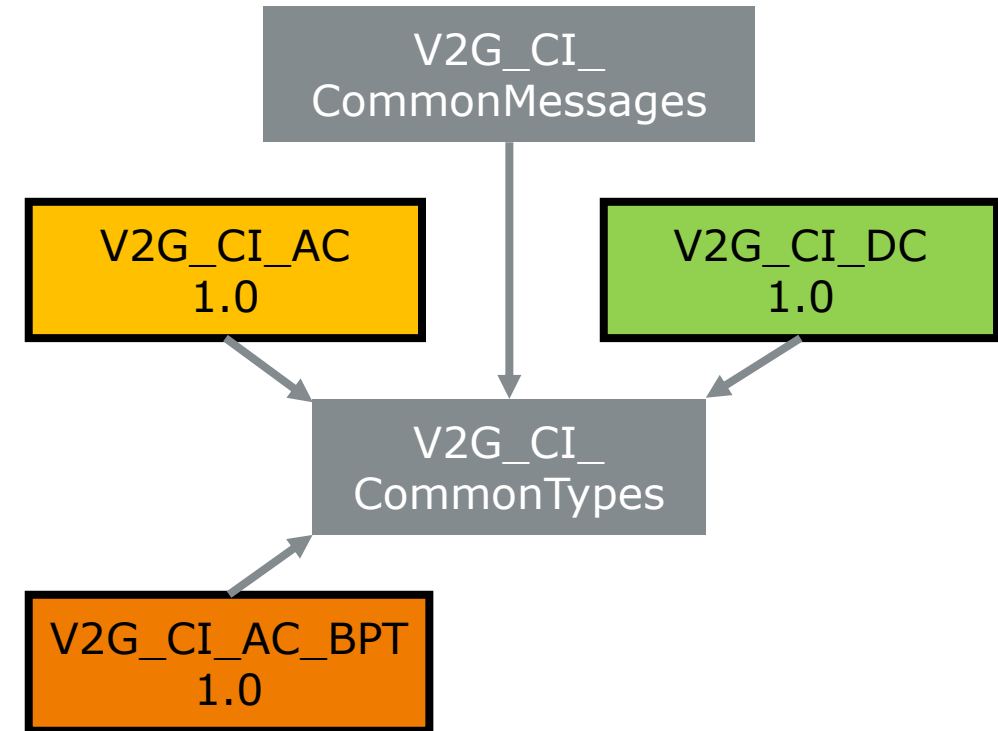
AC BPT DER according to ISO 15118-20:2022 Amendment 1

- ▶ Grid codes are processed by EV
- ▶ Negotiation between EV and EVSE which grid codes are supported
- ▶ Certification of EV as DER
 - ▶ Certification of EVSE not relevant or separate
- ▶ Fulfillment of volt-var curves, frequency droop functions, over-/under-voltage curves, ...
- ▶ Many new parameters required
 - ▶ Increase in complexity of communication
- ▶ Compatible with various markets
 - ▶ USA, Europe, South Korea, Australia
 - > Experts of those regions contributed
 - ▶ Various standards considered
 - > IEEE 1547-2018, EN 50549, AS/NZS 4777, ...
 - ▶ Possibly compatible with other regions



AC BPT DER according to ISO 15118-20:2022 Amendment 1

- ▶ New parameters necessary for AC BPT DER
 - ! Updating existing schema would break compatibility
 - ➔ Additional schema needed
- ▶ AC BPT DER is a new service
 - ✓ No AC specific messages before service negotiation
- ▶ Based on selected service, schema is decided
- ▶ Any existing implementation, even of AC BPT, is not affected by addition of AC BPT DER
- ▶ Same process as previously for AC and DC
- ▶ Similar process in the future
 - ▶ For new services, add new schema



Service	AC	AC BPT	AC BPT DER	DC	DC BPT
ServiceID	1	5	8	2	6
Schema V2G_CI_	AC 1.0	AC 1.0	AC BPT 1.0	DC 1.0	DC 1.0

AC BPT DER according to ISO 15118-20:2022 Amendment 1

- ▶ Many new parameters introduced
 - ▶ Actual usage depends on grid functions
 - ▶ Bitmap used to negotiate 39 supported and required grid functions
- ▶ In ServiceDetailRes, SECC informs EVCC about mandatory grid functions
 - ▶ If EVCC selects service, it confirms that grid functions are supported and will be followed
- ▶ EVCC provides full capabilities to SECC in ChargeParameterDiscoveryReq
 - ▶ SECC might utilize this knowledge to improve discharging by applying additional grid codes
- ▶ ServiceRenegotiation must be supported
 - ▶ AC BPT DER might still be withdrawn, if SECC isn't satisfied with capabilities of EVCC

Bit	Description	0/1
0	Charge mode support	1
1	Discharge mode support	1
2	Ability to disconnect and reconnect to the grid via galvanic isolation	1
3	The authorization for the EV to discharge at the site	1
4	Fixed power factor setpoint when absorbing active power (Under-excited)	1
5	Fixed power factor setpoint when injecting active power (Over-excited)	1
6	Reactive power setpoint	0
7	Charge setpoint in % of MaxChargeRateW if positive or %setMaxW or %setMaxDischargeRateW if negative value	0
...

	Binary	Decimal	Hex
DERControlFunctions	0011 1111	63	0x3F

Your questions are welcome!

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