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June 19-22, 2016 | du 19 au 22 juin 2016

Montréal, Québec, Canada

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Electric Vehicle Infrastructure Standardization

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Introduction

- Electric Vehicles have been around for over 100 years
- Resurgence in 2007 – 2008 - Here to stay
- Standards existed in 2008, but in some cases not ready
- Certification around the globe was also in question
- Standards development work started in earnest in 2008



wood phaeton 1902



- Concepts from paper:
 - Which standards exist today to cover infrastructure products
 - Which products are covered by which standards
 - Where each of these standards currently resides in the development process
 - What is published today and what future editions are anticipated
 - Discussion around global certification options
- Too much content to cover completely
- We will focus on conductive charging and wireless power transfer standards for this discussion



Conductive Charging

- Conductive charging may be performed by delivering AC to the vehicle - EVSE
- EVSE – has 3 types
 - Portable EV Cord Sets – or Mode 2 cable assemblies
 - Fastened in place charge stations – Mode 2 charge station
 - Fixed in place - Mode 3 charge stations
- In North America – the standards are harmonized
 - UL 2594/CSA C22.2 No. 280/ANCE-NMX-J-677
- In the EU (and countries that accept CB reports) the standard is
 - IEC 61851-1 and IEC61851-22
- Future in the EU:
 - IEC 61851-22
 - IEC 62752

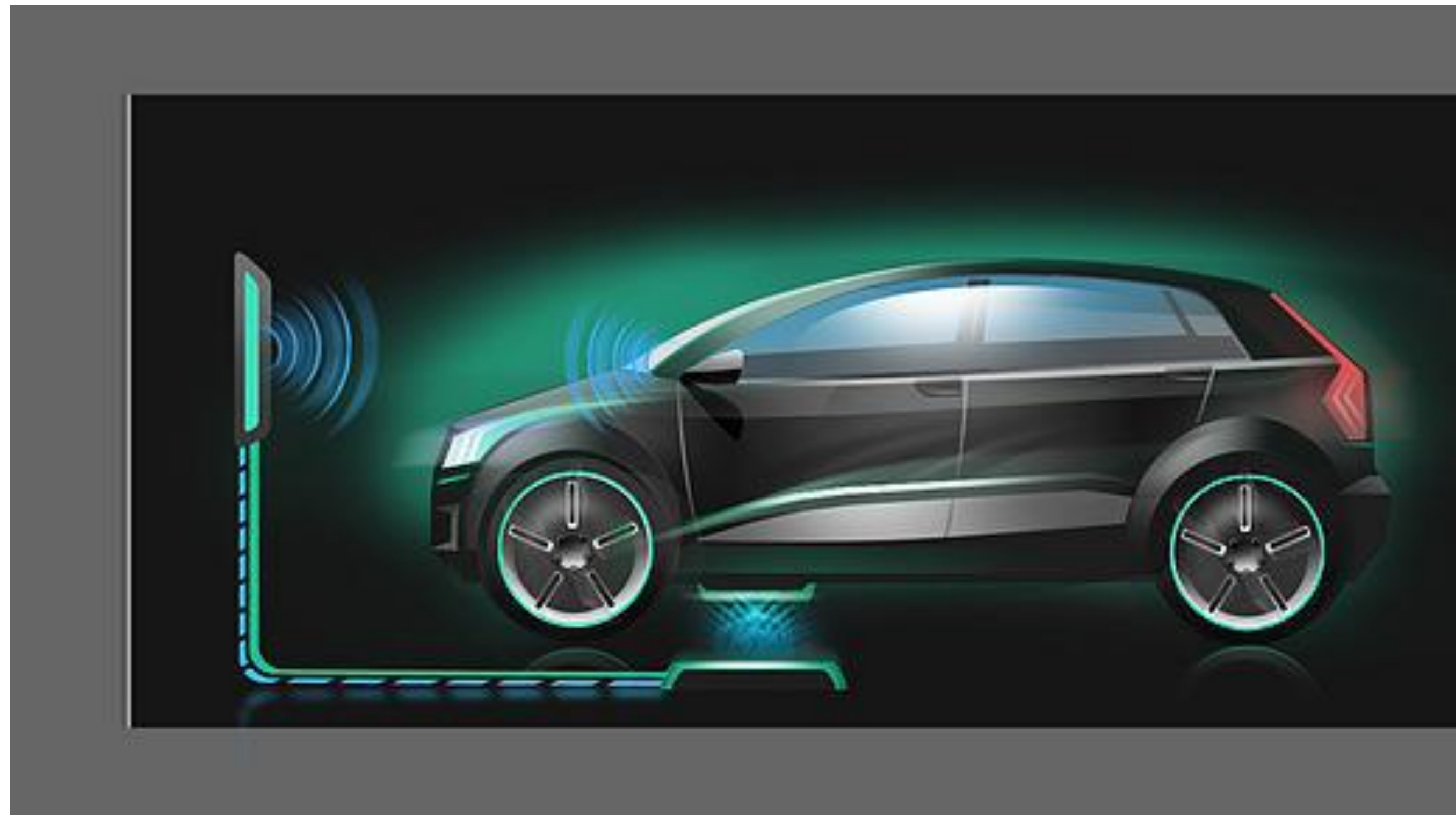


Conductive Charging

- Conductive Charging may be performed by delivering DC to the vehicle
- These devices may be referred to as
 - quick chargers
 - fast chargers
 - DC Chargers
 - DC Charge Stations
 - Mode 4 Charge Stations
- In North America – the standards are not harmonized
 - UL 2202
 - CSA C22.2 No. 107.1
- In the EU and countries that accept CB reports the standard is
 - IEC 61851-1, IEC 61851-23, and IEC 61851-24



- Wireless Power Transfer involves no direct connection to the vehicle
- Development efforts have been in place for a number of years
- Development efforts in UL, SAE, and IEC TC 69
- In North America:
 - UL 2750 and SAE J2954 are being developed in conjunction
 - UL 2750 must be able to cover other designs if presented
 - SAE J2954 recently published as an Information Report
- In the EU and countries that accept CB reports:
 - IEC 61980 is expected to be used
 - Consists of three parts, only part 1 published so far



- Looking at certification, the landscape is complex.
- In the US and Canada, the harmonized documents or the country specific standards are used for NRTL certification.
- In the EU and countries that will accept a CB report, the IEC documents are used following the CB scheme.
- In some countries, testing to IEC or EN requirements is allowed, but testing must be done at local labs
- In some countries, local labs must use country specific standards that may or may not be based on IEC requirements
- In some other countries, additional requirements for EMC, or customs, or other regulations may be needed.
- As the industry matures, these certification options are also maturing.
- Ultimately it is the target country's choice on what is to be used, and that is always subject to change.

- Since the writing of the paper, some further developments have occurred and these were incorporated into this discussion.
- Changes can occur at any time and these changes could be small or could have a major impact on the direction of the industry in one country, one region or globally.
- As mentioned, many standards are in development phases right now, and what will change is not always known until later in the cycle
- Further, country specific regulations, such as the NEC in the US or the CE Code in Canada, may also change and drive additional standards changes
- The best thing to do is always check to determine what the most up to date information is when preparing to certify infrastructure products



Thank you

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