Standards Update / Global Approaches to Vehicle-Grid Connectivity

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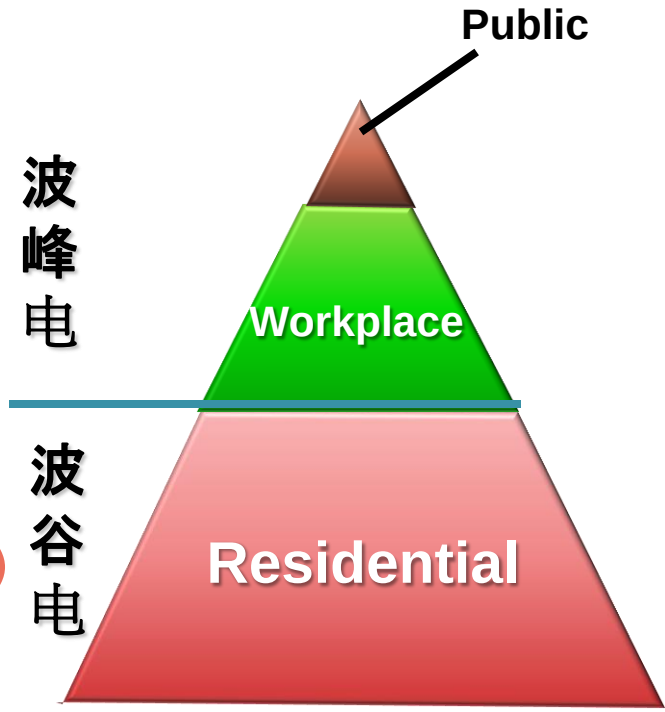
Agenda

- Electric Vehicle Charging International Standards Status 电动汽车充电国际标准一览
  - China
  - IEC 62196-2
  - Japan
  - SAE J1772™
- AC and DC Charge Standards Harmonization Opportunities 交流及直流充电标准协调的机遇

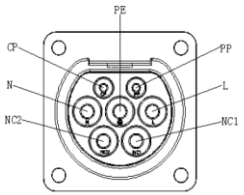
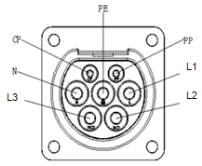
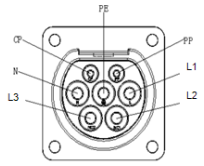
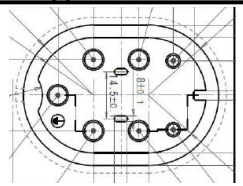
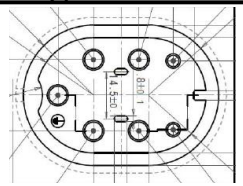
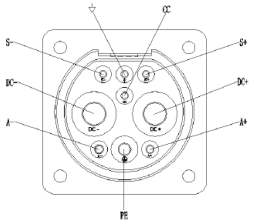
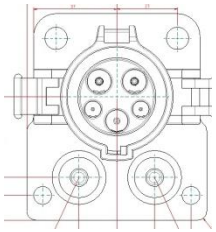
Private Vehicle Charging Infrastructure
私人电动车充电设施

- Public charging 公共充电
  - High Visibility 标识醒目
  - Commercial/Retail 商业区/零售店
- Workplace 工作场所
  - Corporate, Municipal Parking Lots
    公司，单位的停车场
- **Residential (majority) 住宅区(主体)**
  - Satisfying consumer-driven home installation process
    满足消费者家用安装流程，方便安全
  - Includes single and multiple family homes, apartments and remote charge locations
    单个及多个家庭、公寓和附近的充电站
  - Permits, electricians, inspections, meters, rates
    安装许可、电工资质认可、安全质检、计量仪表、收费



CHARGING STANDARDS SUMMARY
充电标准一览

Charge Standards Summary

		China	US	Japan	EU	
AC	Single Phase	 Type 2	 J1772	 J1772	 J1772-Type1	
	1 Phase or 3 phase				 Type 2 Mode 1	 Type2 All Modes
	1 Phase or 3 phase				 Type 3 Mode 1	 Type3All Modes
DC 200A 350A 400A		 Mode 3	 J1772 "Hybrid"	 TEPCO	Type 2 "Hybrid"	

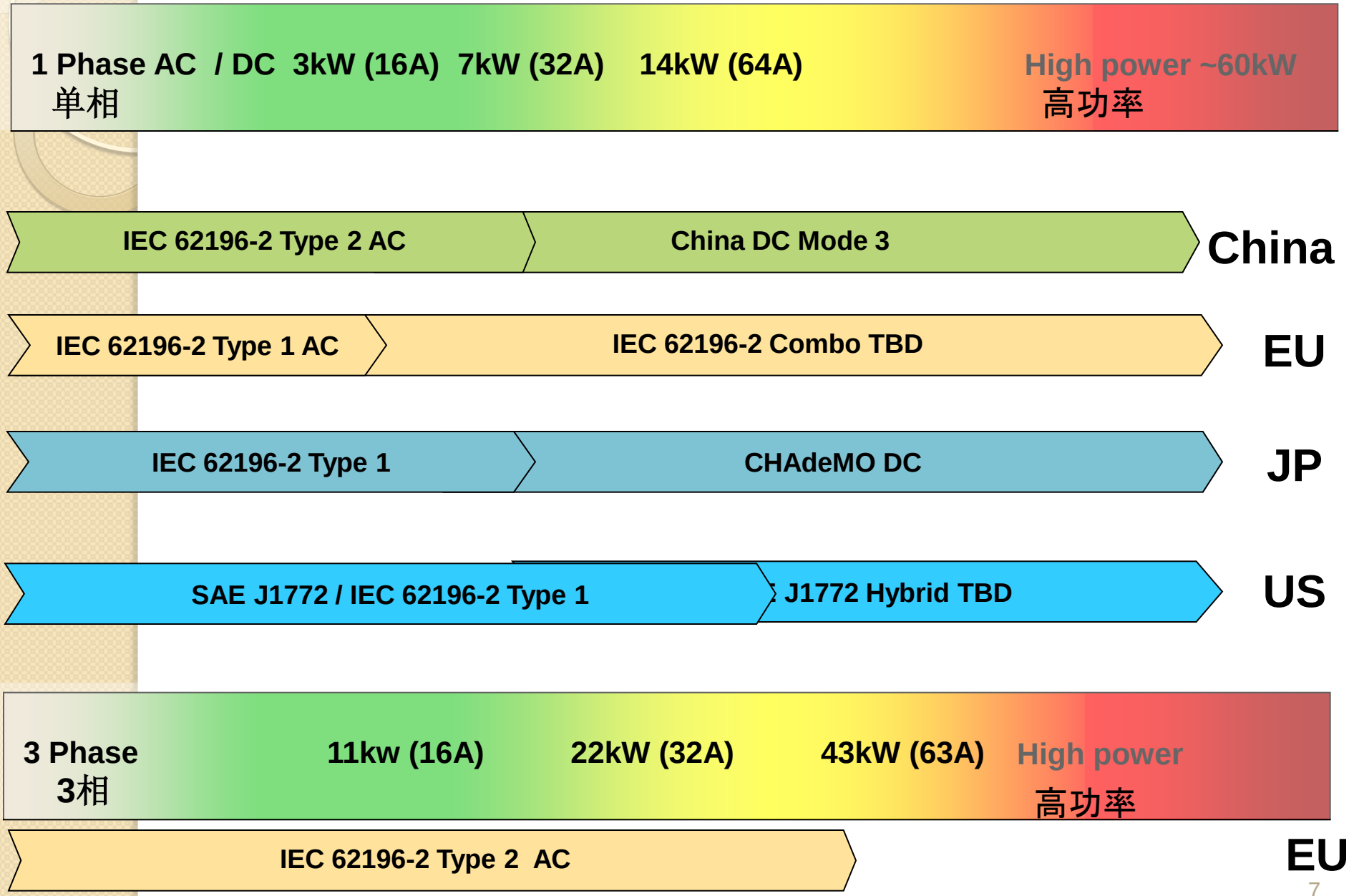
SAE Charging Configurations and Ratings Terminology

- **AC L1:** 120V AC single phase
  - Configuration current 12, 16 amp
  - Configuration power 1.44, 1.92kw
- **AC L2:** 240V AC single phase
  - Rated Current ≤ 80 amp
  - Rated Power ≤ 19.2kw
- Δ**AC L3:** TBD
  - AC single or 3ϕ ?
- Δ **DC L1:** 200 – 450V DC
  - Rated Current ≤ 80 amp
  - Rated Power ≤ 19.2kw
- Δ **DC L2:** 200 – 450V DC
  - Rated Current ≤ 200 amp
  - Rated Power ≤ 90kw
- Δ **DC L3:** TBD
  - 200 – 600V DC ?
  - Rated Current ≤ 400 amp?
  - Rated Power ≤ 240kw?

Voltages are nominal configuration operating voltages, not coupler rating.
Rated power is at nominal configuration operating voltage and coupler rated current.

Δ Not Finalized

Charging Power Summary



Charging Standards Timing
充电标准的时间表

- China 中国
  - Published
- EU 欧洲
  - IEC 62196 Types 1, 2, 3 publication September 2011
    IEC 62196 对类型1，2，3的标准将于2011年9月颁布
  - IEC 62196 DC publication June, 2012?
    IEC 62196 对直流充电的标准于2012年6月颁布？

尚处于论证阶段

- Japan 日本
  - AC and DC defacto standards in place
    交流的产品遵循 SAE J1772
    东京电力已有直流的产品应用于商业，但还未颁布标准
- US 美国
  - SAE J1772™ AC L1 & L2 published January 2010
    SAE J1772 AC L1&L2 已于2010年1月发布
  - SAE J1772™ AC L1 & L2, DC L1 & L2 publication December 2011?
    SAE J1772 AC L1&L2，DC L1&L2 于2011年12月发布？

已经可用于商业阶段

REGIONAL CHARGE STRATEGIES AND HARMONIZATION POTENTIAL
区域性的充电策略和达成一致的可能性

Harmonization Benefits

- China will be the largest market, has the opportunity to help lead the global harmonization.

  中国将成为最大的汽车市场，百年不遇的机会成为电动汽车行业的领导者，引导全球标准的统一。
- Harmonization helps to expedite the global acceptance of electrified vehicles

  统一有助于加快全球接受电动车
  - Helps local OEMs and components suppliers develop and participate in global market.

    帮助中国本土的车厂和供应商发展并参与到全球的市场中
  - Helps vehicle OEMs to develop common global components

    帮助汽车OEM供应商开发共同的适用于全球的零部件
  - Helps to develop common global infrastructure. Customer charging experience the same globally, similar to fueling a vehicle with gasoline

    帮助开发出全球共同的基础设施，使全球的消费者进行“同样”的充电。

Harmonization Potentials
标准一致的机会

- Regions with similar charge strategies have the most potential to harmonize

  具有相似的充电策略的地区最有可能达成一致
  - AC charge strategy of China, US and Japan are very similar

    中国、美国和日本的交流充电策略非常相似
- Japan and US have harmonized AC charge standards

  日本和美国已经拥有一致的交流充电标准
  - Charge coupler 充电接口

    Charge control 充电控制

Consequences of Not Harmonizing
不达成一致的弊端

- AC charging
  交流充电
  - Vehicle OEMs need to package different charge receptacles and have different vehicle controls

    汽车OEM供应商需要组装不同的充电器插座且使用不一样的汽车控制器
  - Suppliers will lose the benefits of economies of scale.

    供应商将失去全球经济规模
  - Infrastructure cannot be shared

    基础设施不能共享
  - Costs are higher (vehicle and infrastructure) with no benefit to customers

    汽车和基础设施的成本增加，对消费者没有好处
- Similar issues for DC charging.
  对于直流充电有类似的问题

Thank you!

谢谢！