ADVANCING PUBLIC TRANSPORT

EV BUS CHARGING STANDARDS - INDIA

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INDIA

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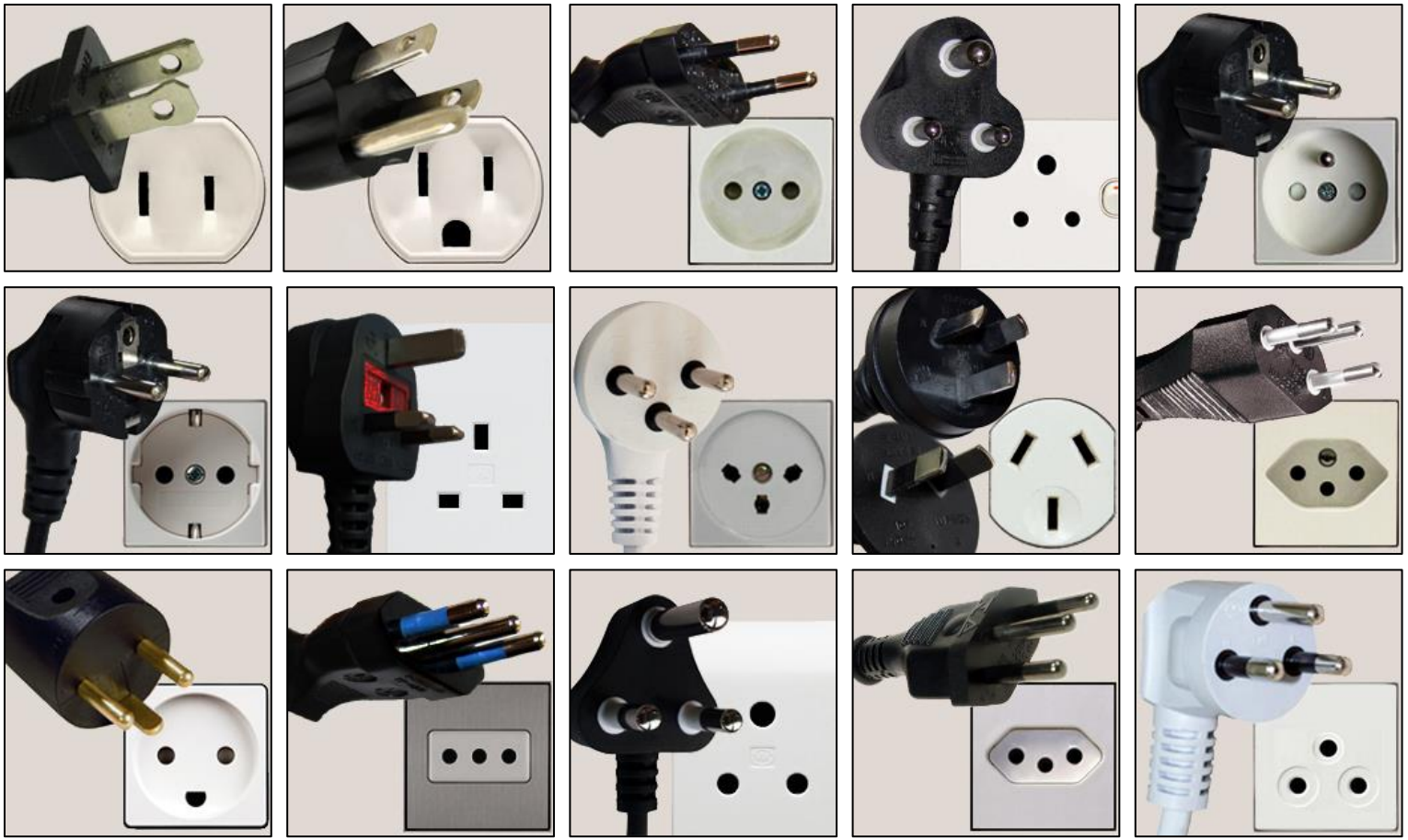
ESTABLISHED BEST PRACTICE



THE MENU (IEC COMPLIANT)

Electric cars' plug types

Carmakers have come up with different standards for the type of plug used to recharge their electric cars.

TYPE 1 PLUG	TYPE 2 PLUG	GB-T PLUG	COMBINATION PLUGS	CHADEMO PLUGS	TESLA SC PLUG
					
Single-phase plug used in car models from the Asian region.	Triple-phase plug considered to be the standard model in Europe	Similar to the Type 2 plug but with additional male connectors.	Enhanced version of the Type 2 plug, with additional power contacts for quick charging.	Quick charging system developed in Japan.	Modified version of the Type 2 Mennekes plug

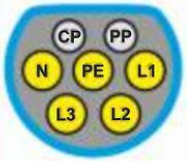
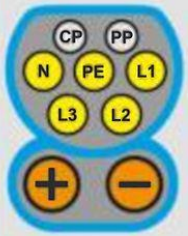
Source: The Mobility House.

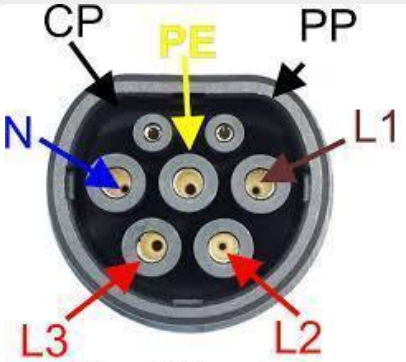
G. Cabrera, 17/01/2018

REUTERS

AC COUPLER

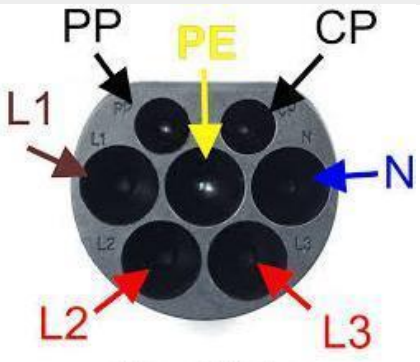
AC & DC Ladesteckvorrichtungen Typ 2

	AC ein - bis dreiphasig	max. 500V AC 3 x 63A oder 1 x 80A
	AC ein - bis dreiphasig DC-Low	max. 500V AC/DC 3 x 63A AC oder 1 x 70A AC oder 1 x 80A DC
	DC-Mid	max. 500V DC 1 x 140 A
	DC-High	≥ 500V DC 1 x 200A



Type 2 Female Plug Pinout

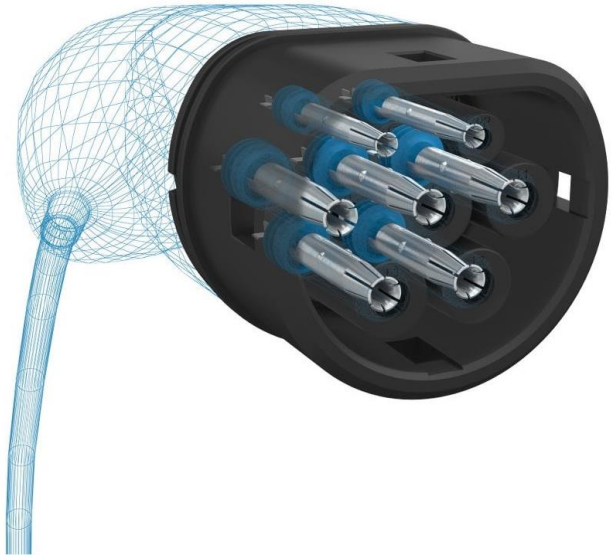
(EVCables.co.uk)



Type 2 Male Plug Pinout

DC COUPLERS

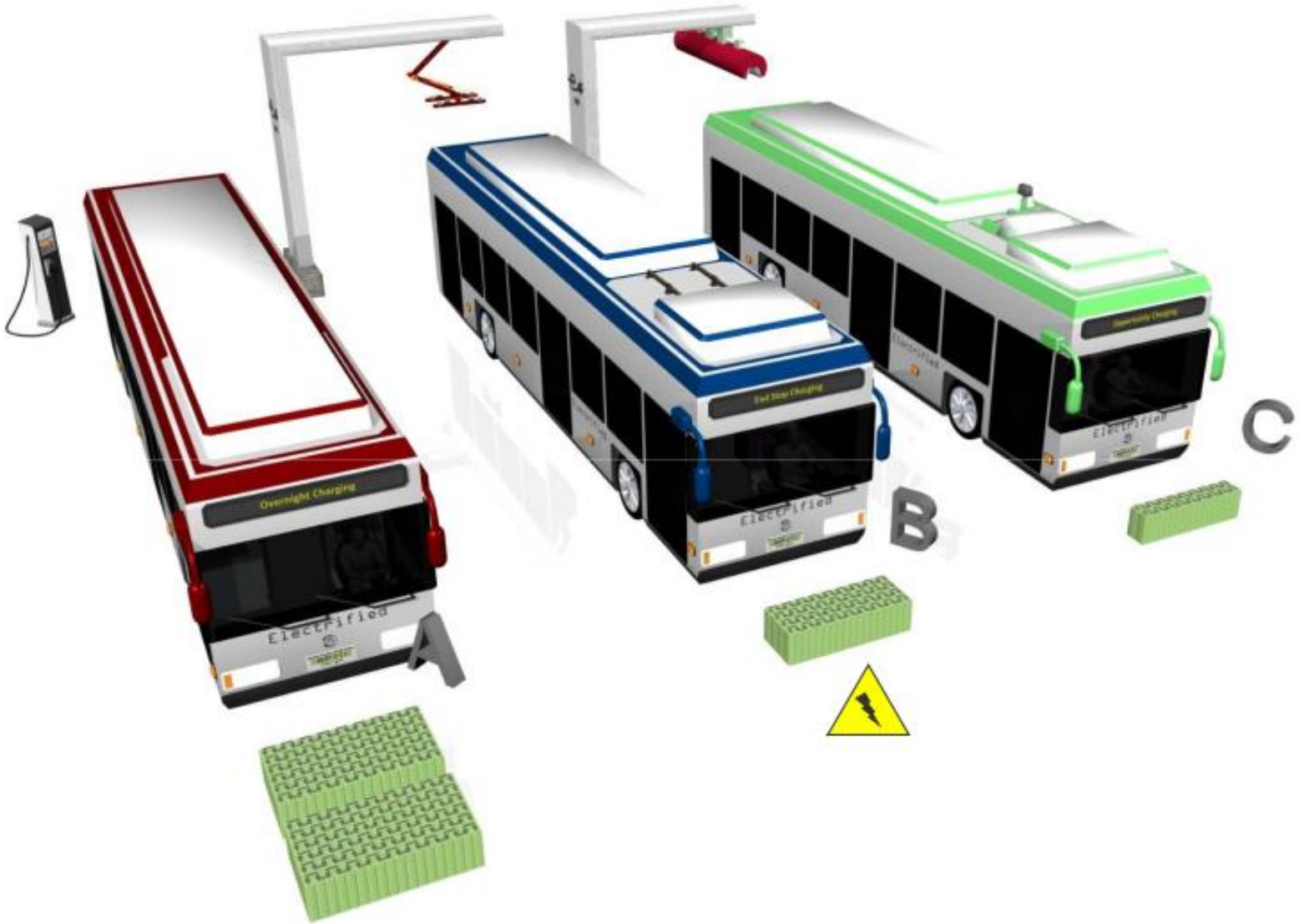
DESIGNS



ALTERNATE EV BUS

- **BYD Electric Buses**
  - Plug-In charging, 1.5 to 5 hours in bus yard. Proprietary Iron-Phosphate battery, meets roughly 80% of urban transit needs with typical range of 200+ km

- **Proterra Electric Buses**
  - Light body reduces weight (<20-40%), crash resistant and designed for the battery-electric drive technology. Terra-Volt charging system under 10 minutes



UITP INDIA DIMTS We help people move

UITP – DIMTS Bus Seminar
11-12 May 2018, Delhi

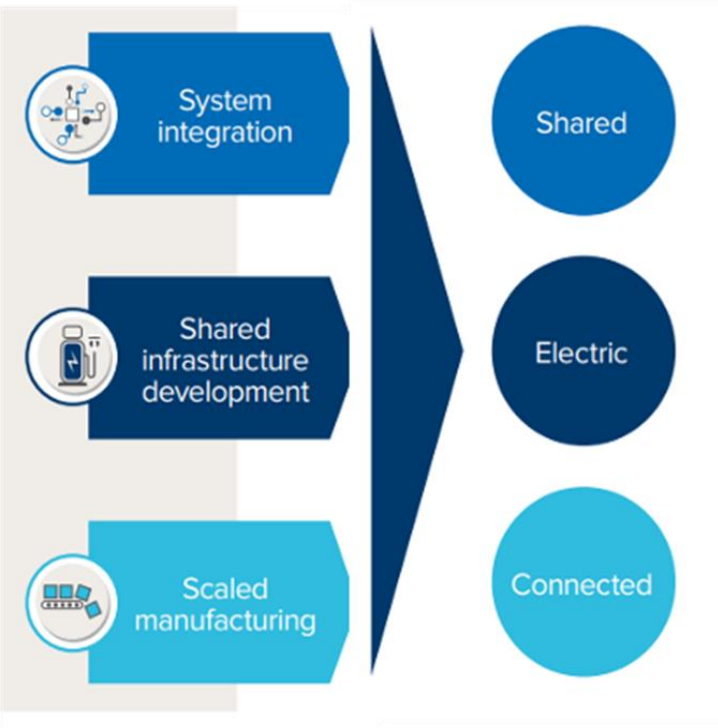
There's a new patent-free fast charging system for electric buses

Recharging an electric bus can be as fast as refilling a diesel one, apparently.

JONATHAN M. GITLIN - 7/9/2016, 12:50 AM

INDIA EV MISSION

- Aim: Improve air quality in India's high pollution cities, bring zero emission mobility to India, introduce manufacturing of global size and scale and reduce oil import dependence.
- Method: Making India's passenger mobility



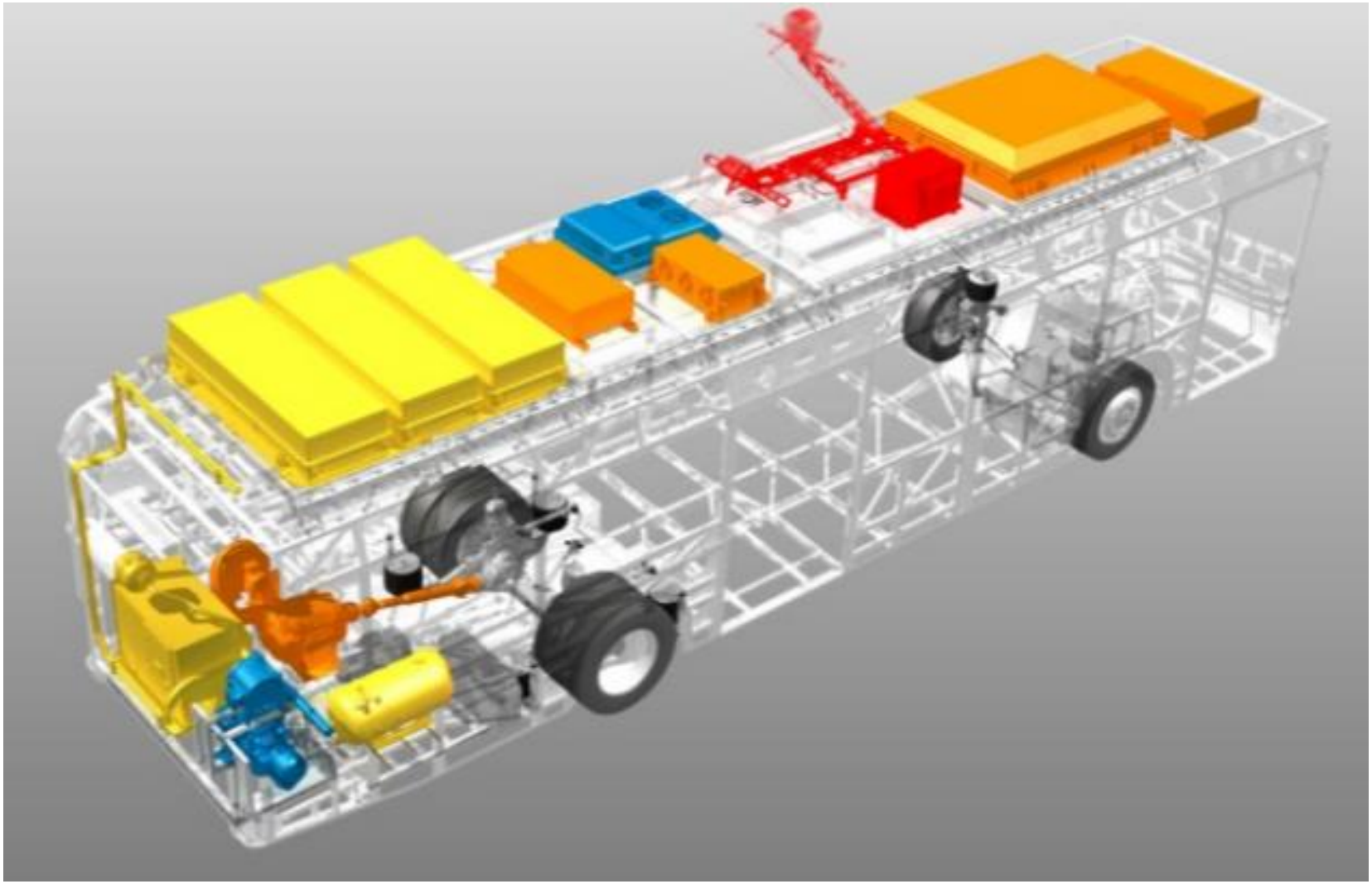
NEED FOR INDIA STANDARDS

- The Niti Aayog is the nodal agency.
- **Aim**: Improve air quality in India's high pollution cities, bring zero emission mobility to India, introduce manufacturing of global size and scale and reduce oil import dependence.
- **Method**: Making India's passenger mobility shared, electric and connected can cut its energy demand by 64% and carbon emission by 37%.

INDIA SPECIFIC

- Low Voltage (Small Vehicles – 2W, 3W, 4W)
- Medium Voltage (Cars, SUV, intra-city trucks- 4W)
- High Voltage (Buses, Trucks – 6W or more)

TECHNOLOGY TO EXPLORE



FRAUNHOFER PPP IN R&D

- Charging Station
- Electrical Contact System
- Safety Concept
- Communication between Charging Station and Vehicle
- Batteries for High Charging Capacity
- Modified Traction Equipment

THE PROJECT

- Fast Charging Systems for Electric Buses in Public Transport, funded by the German Federal Ministry of Education and Research (BMBF).
- Pantograph: Schunk Bahn- und Industrietechnik GmbH and the Fraunhofer IVI.
- Charging station: M&P motion control and power electronics GmbH in Dresden.
- Energy storage 85 kWh for 12-meter electric bus: HOPPECKE Advanced

THANK YOU!!
IS A DIMTS-UITP DESIGN TEAM POSSIBLE FOR INDIA EV BUS STANDARDS?

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