

# CHAdemo

## “Worldwide application and V2X”

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## WHAT'S CHAdeMO?



*CHAdeMO* = "*CH*arge *de MO*ve"

= "move by charge"

*CHAdeMO* = "O *cha demo* ikaga desuka?"

= "Let's have a cup of tea  
while charging"



**TEPCO**

# WHAT'S CHAdeMO?

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- TEPCO has developed the first ever global fast charging protocol “CHAdeMO” to disseminate EVs in the modern society.
- CHAdeMO Association was established in 2010, taking initiative by TEPCO.

## CHAdeMO Association

358

GLOBAL MEMBERS

36

COUNTRIES

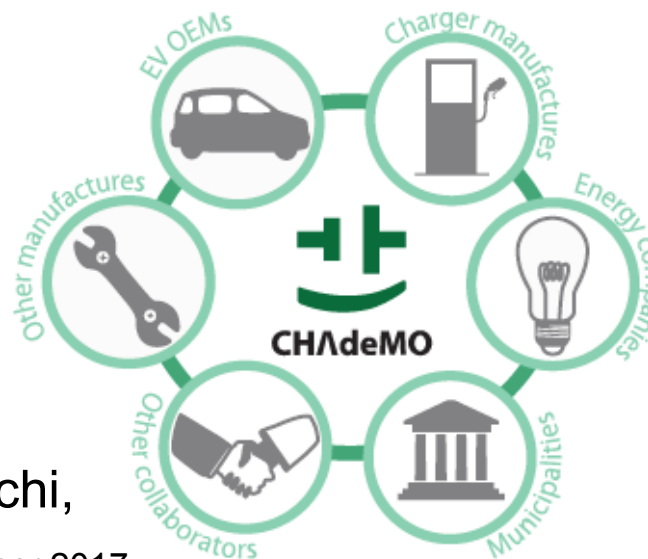
### ■ Board members:

TEPCO, Nissan, Toyota, Honda,  
Mitsubishi Motor, SUBARU, Hitachi,  
Panasonic



As of September 2017

## Consortium of stakeholders



- Manufacturers
- Power distributors
- Charger operators
- IT/ communication
- Installers
- Certification bodies
- R&D
- Municipalities
- ...

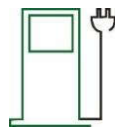
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# GLOBAL INSTALLATION



TOTAL

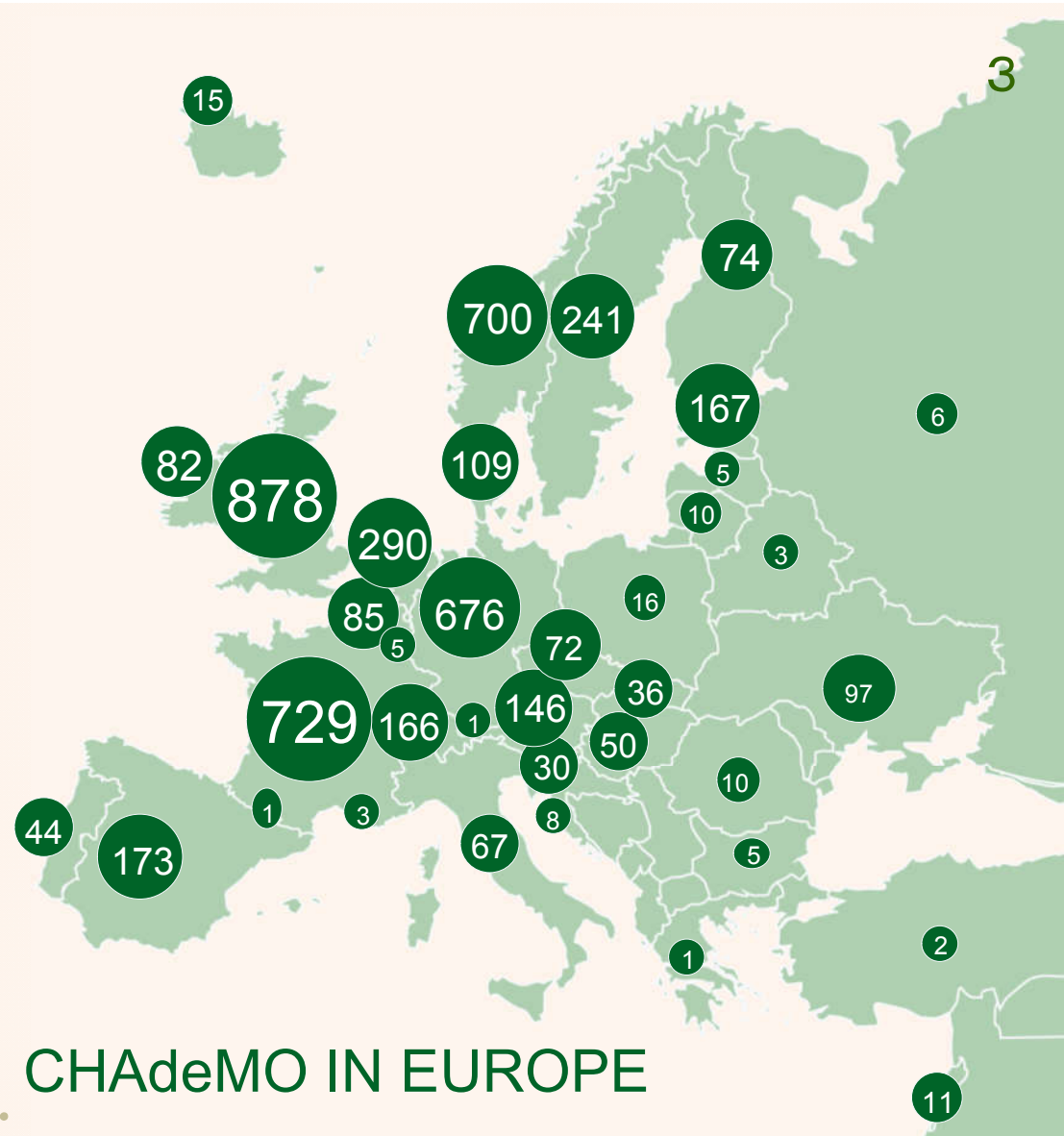
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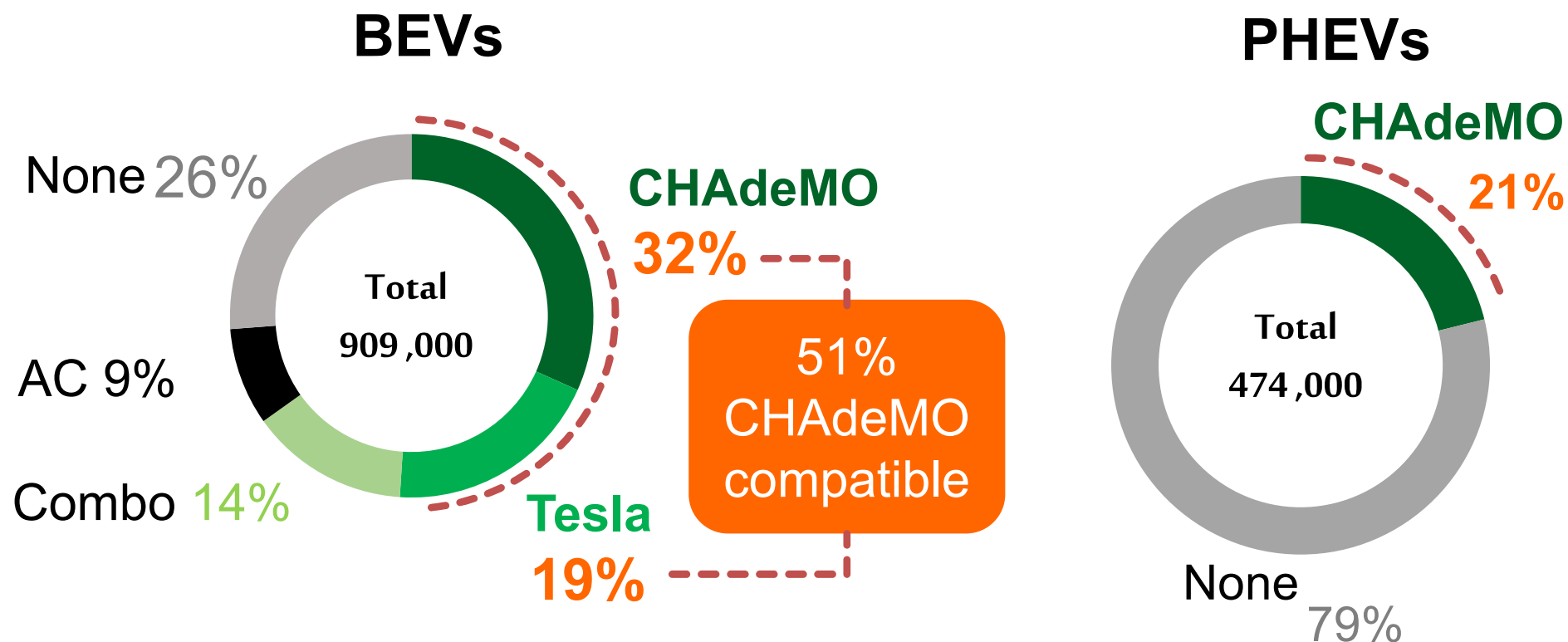
CHAdeMO

As of September 2017

## CHAdeMO IN EUROPE



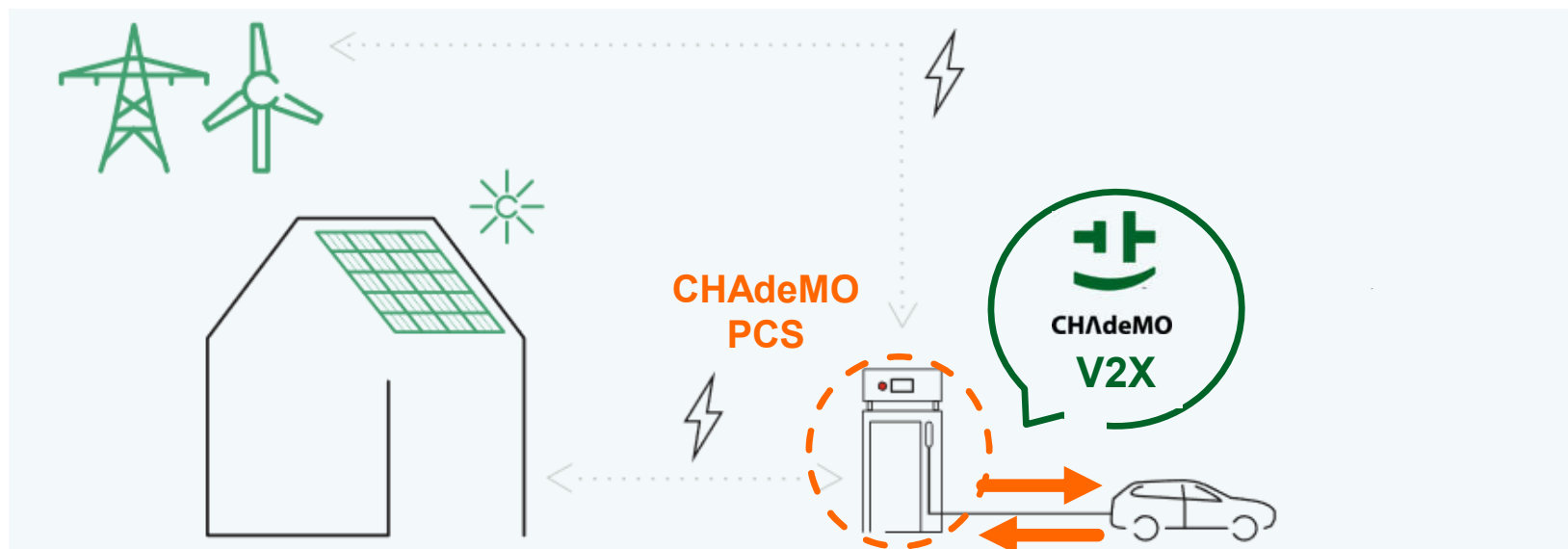
## Share of CHAdeMO Chargers (Excluding China)



Source: IHS Automotive; 2010-2016 cumulative data; passenger vehicles only

# V2X OVERVIEW

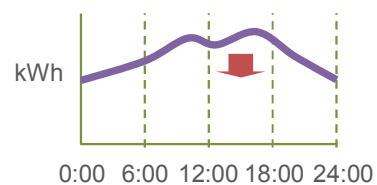
## "Benefits"



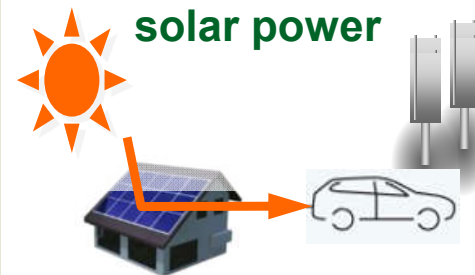
### Back-up for blackout



### Electricity peak shaving



### Connecting with solar power



# V2X OVERVIEW

## CHAdeMO V2X products in the market

V2V  
(Vehicle)



V2L  
(Load)



V2H  
(OFF Grid)



V2G/B/H  
(Grid)



**TEPCO**



# Smart charging business applications

## Already a reality !

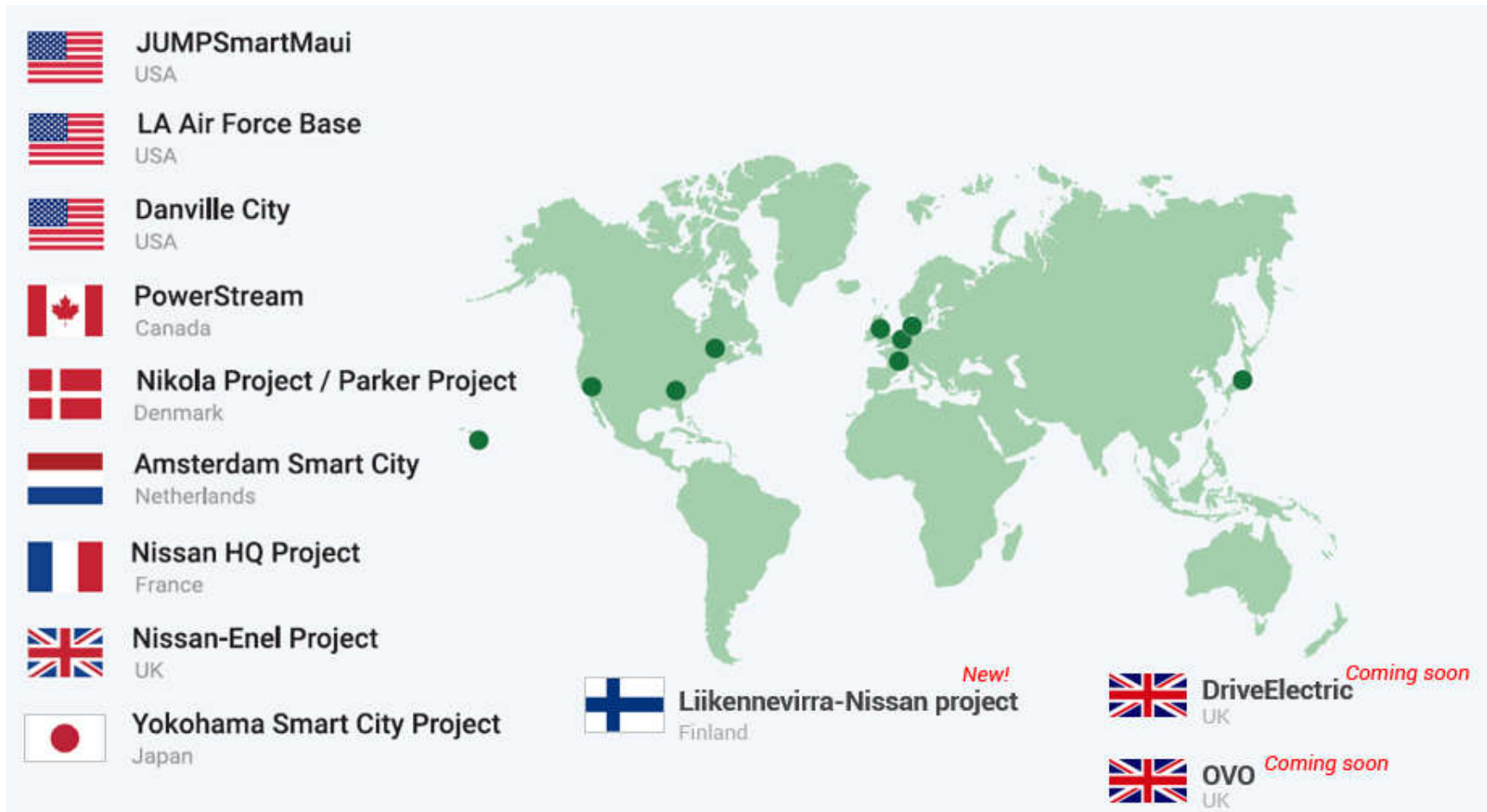
- Grid integrated vehicle fleet platform; 30 PCS+EVs
- Serve frequency regulation to the Danish TSO
- Currently generating 1300€/EV/year





# V2X PROJECTS

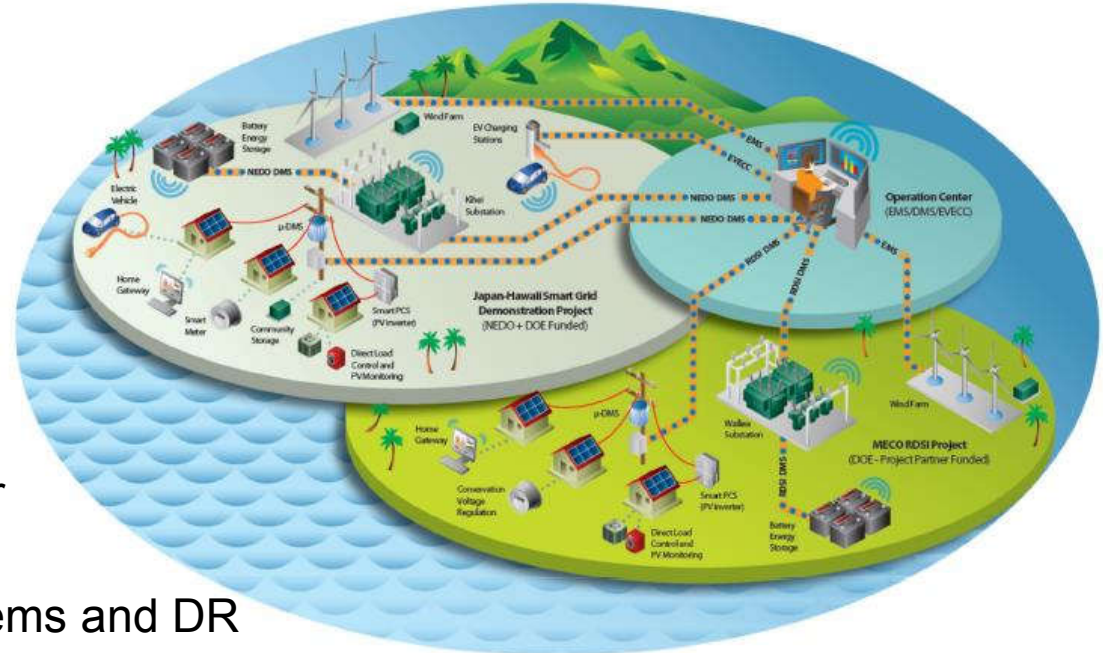
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# V2X PROJECTS

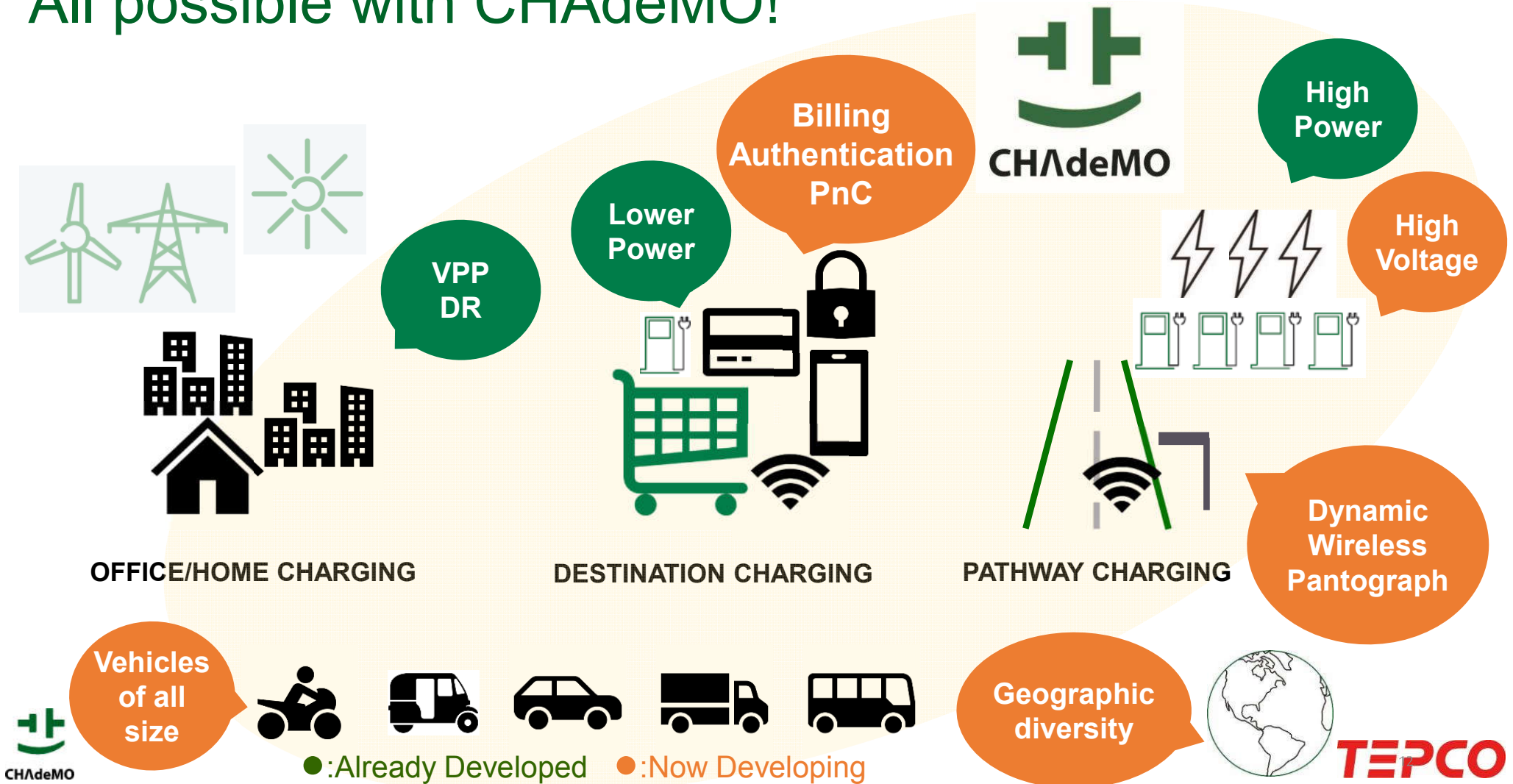
## RES integration and VPP (V2H/G)

- Phase I: 2013 – 2016
  - 200 EVs, 9 DC chargers
  - DC fast charger stations
  - EV energy control center (EVECC)
  
- Phase II: 2015 – 2017
  - 500 EVs, 13 DC chargers
  - V2G/H
  - EV charge/discharge to power Home/Business
  - Grid services using V2G systems and DR (80EVs)



# All possible with CHAdeMO!

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***THANK YOU FOR YOUR ATTENTION !***

