Recent Status of NEDO's EV Quick Charger related Projects

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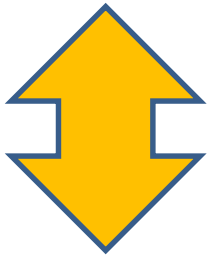
Rev.2.2

Basic Strategy on EV Dissemination

Development of high performance

battery and system with innovative research

<Universal>



Combination of both way is
important for widely dissemination

- Development of easy to use environment for EV
- Additional merit for the society to increase EV

<Some Regionality>

EV Quick Charger Related Project

Malaga
（Spain）

50kW and 320kW
Quick Chargers are used in
demonstration projects

California (US)

Putrajaya (Malaysia)

Hawaii （US）

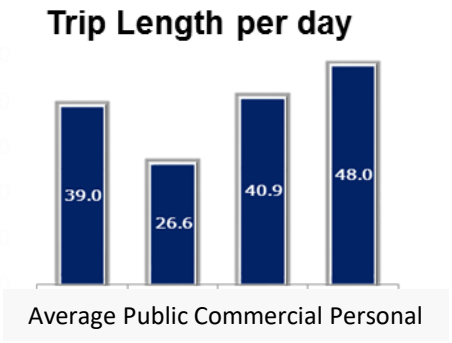
Malaga EV Project 【ZEM2ALL】

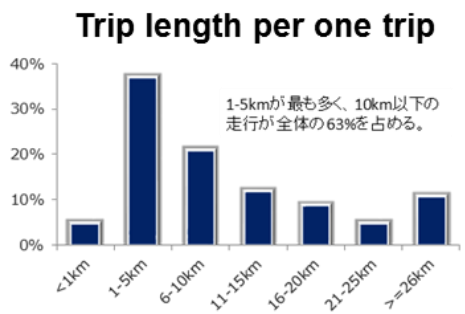
- Making Smart with EV and EV management System -

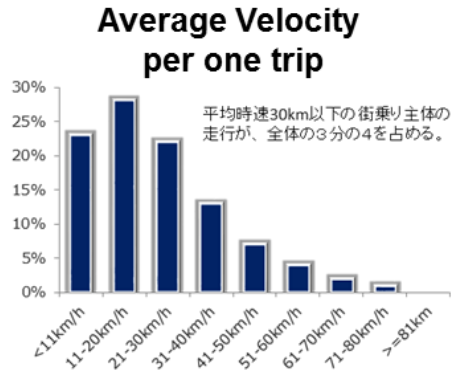
- Demonstration of EV managing Center and Infrastructure
- Demonstration of M:N output allocation type Quick Charger
- Demonstration of Electric managing System

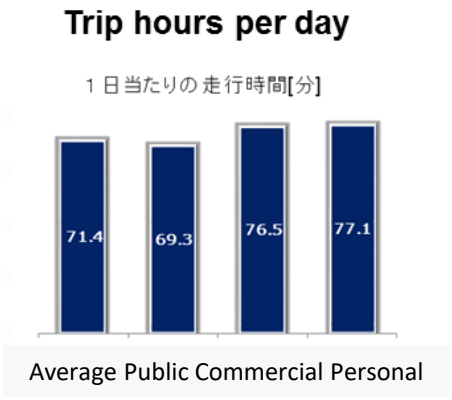
Period : 2013 April -2015 Dec
Place: City of Malaga, Spain
Participants : 209 EVs

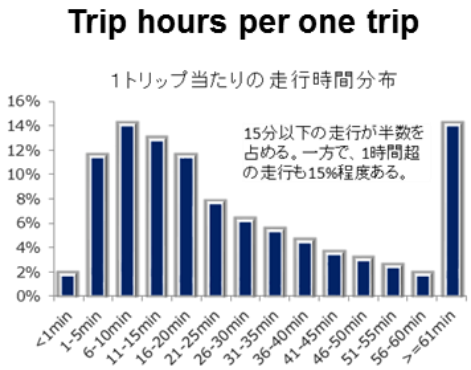
Result 1 : Behavior analysis of EV drivers

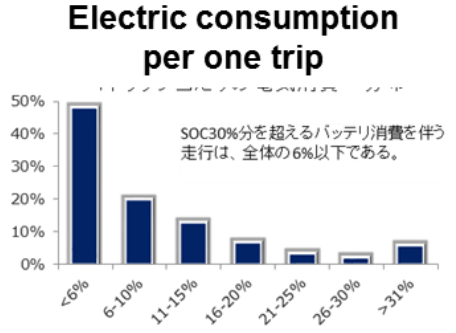








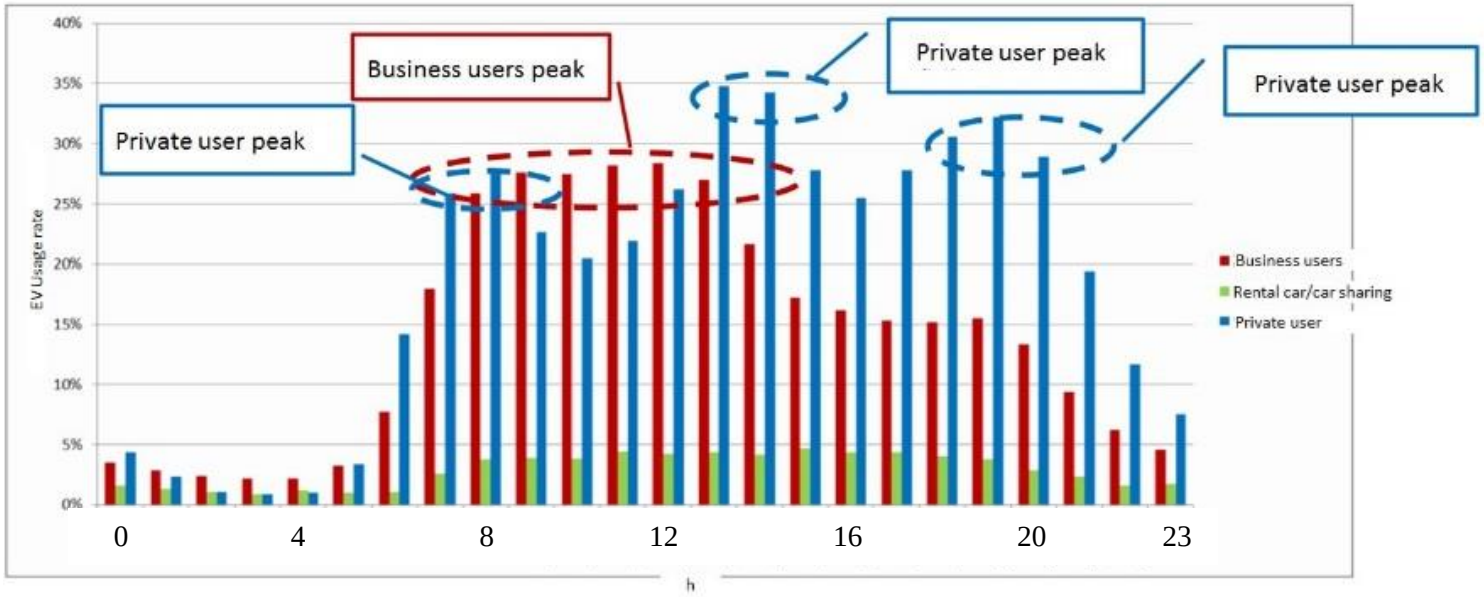




http://www.nedo.go.jp/content/100789468.pdf

Malaga EV Project 【ZEM2ALL】

- Making Smart with EV and EV management System -



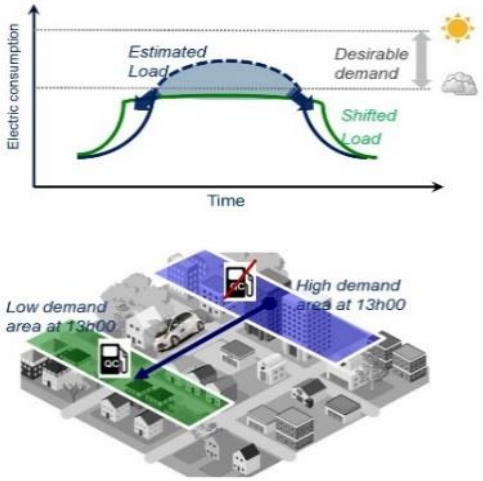
<Analysis result>

- The peak time of travel by private drivers is commuting rush hours(7-8 am and 6-8 pm). As for another peak during 1-2 pm, it is likely that their driving to home is lunch break called “Siesta”.
- On the other hand, the peak time of travel by business drivers ends around 2 pm, with the probable intention of having Siesta from 2 to 4pm.

Malaga EV Project 【ZEM2ALL】

Result 2 : Load management by EV demand response

DR for EV charging, EV users are asked to shift the charging time or charging location.



		Registered participants	Individuals	Companies
抑制		+ 4.0% X	**- 16.2%** ○	+ 14.2% X
促進		- 4.0% X	**+ 16.2%** ○	- 14.2% X

<Analysis result>

- If many EVs recharge at the same time during the peak time of regional electricity demand, it could lead to an overload on local grid. As a load leveling system, EV demand response program was conducted with to change getting program points depending on the timing and place of recharging.
- A certain effect was observed (with some significance) for private-drivers-group in our demand response operation. The result implies that some private drivers changed their recharging action for incentive points. On the other hand, no effect was observed in our operation for business-drivers-group.
- The difference in price sensitivity between two driver's category is clearly observed.

Maui EV Project 【JUMP smart Maui】

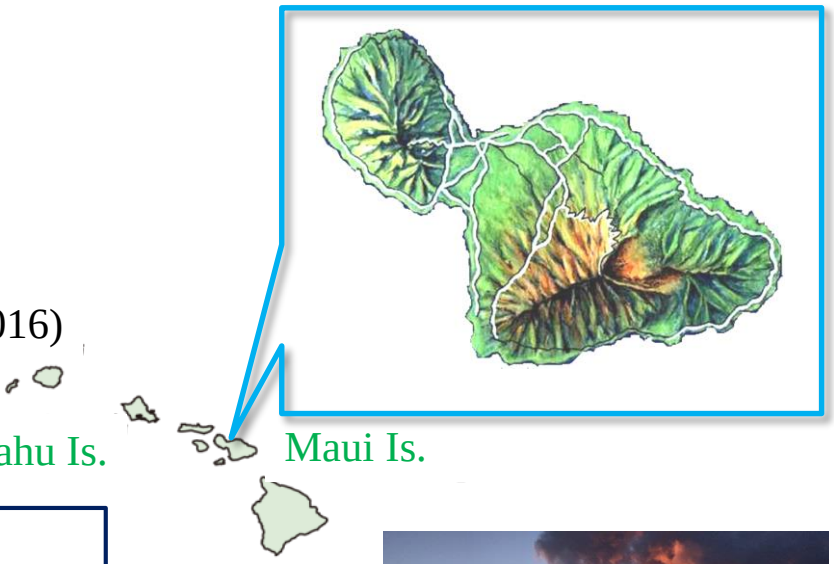
Population

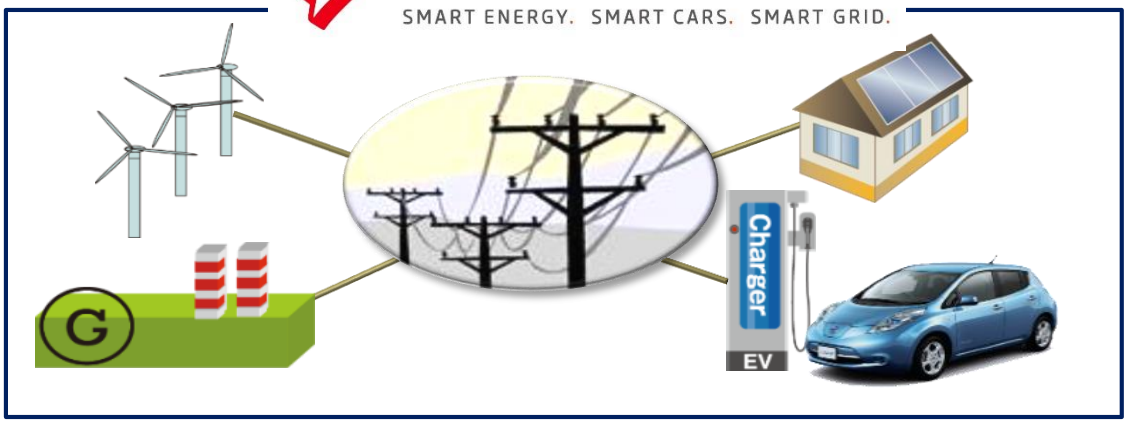
Around 160,000 (third largest in Hawaii)

Period : 2011 Oct - 2017 Feb
Place: Maui County, USA
Participants : 200/80 EVs

Situation of electricity

Demand : 90 ~ 200 MW
Wind Power : 30 MW → 72 MW
PV Power : 2 MW → 94 MW
(2009) (2016)

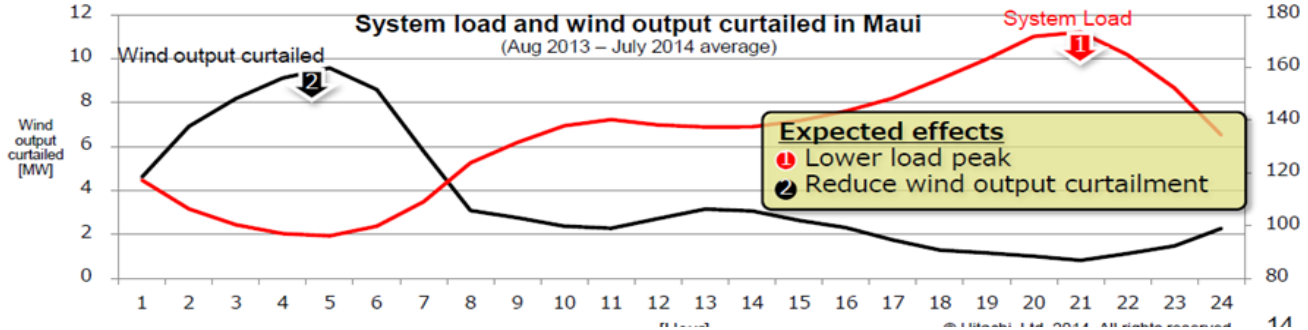




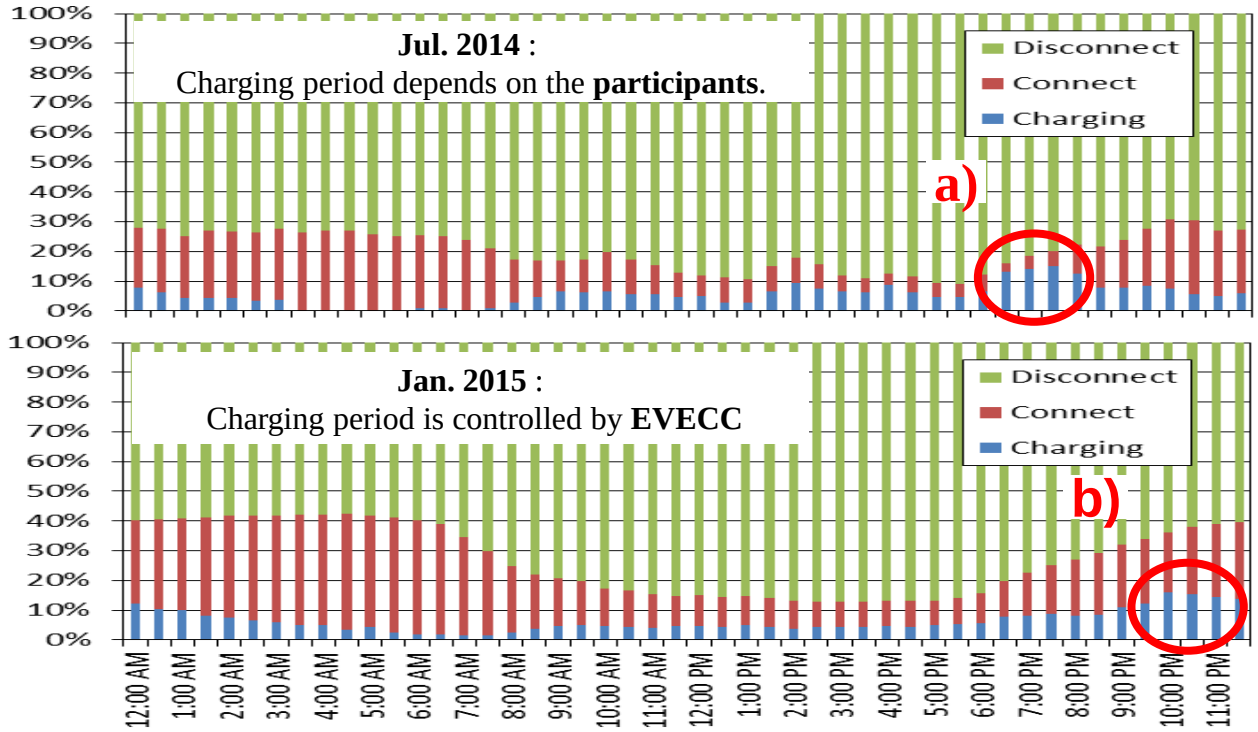
Maui EV Project 【JUMP smart Maui】

- Smart Energy, Smart Cars, Smart Grid -

[Target]



[Trial]

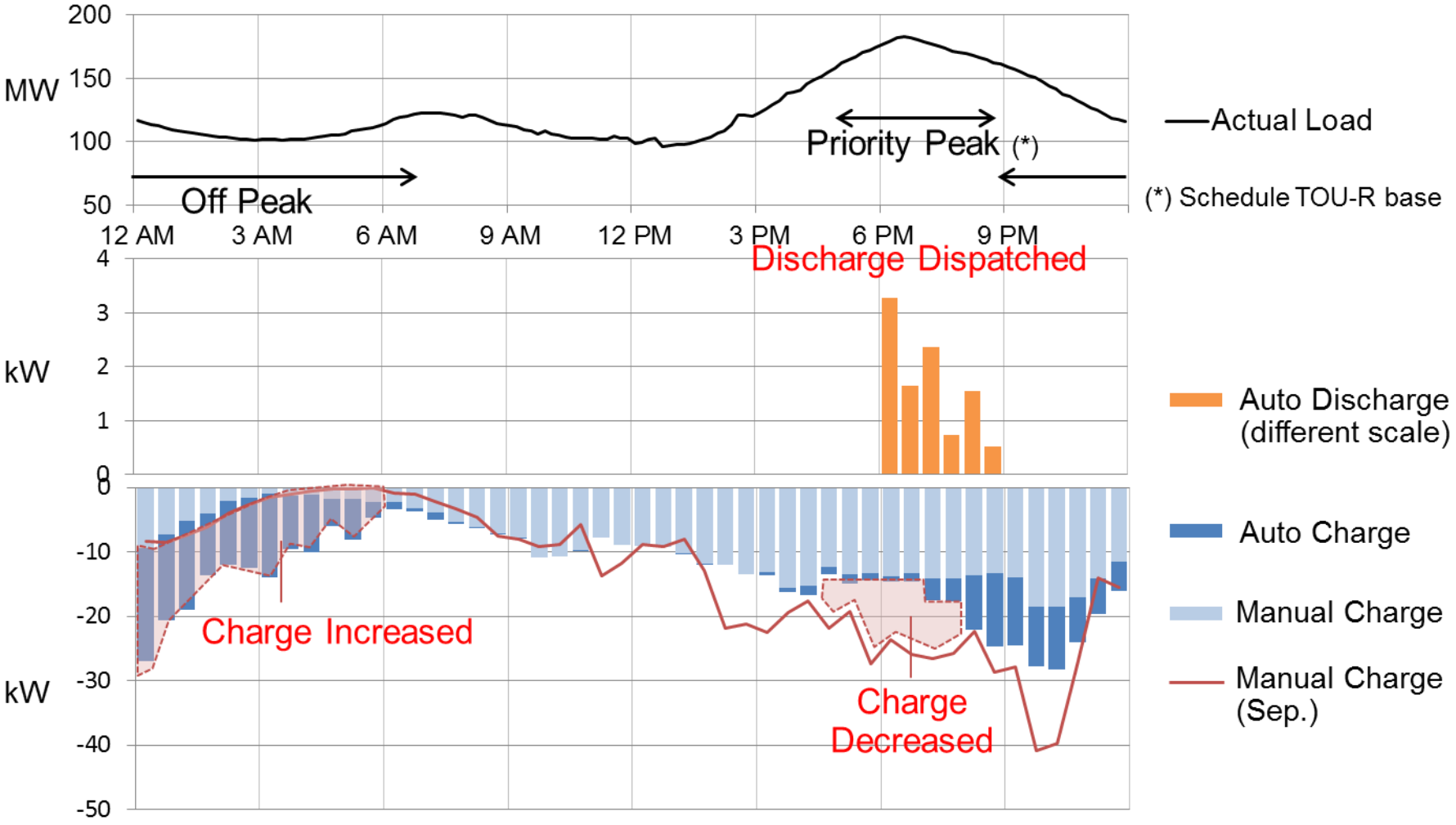


a) EV users tend to charge EV **during the system load peak hours** (7-8pm)

b) EVECC **shifts EV charging peak to the time when more renewables are expected available without EVs less charged** when those are used for driving.

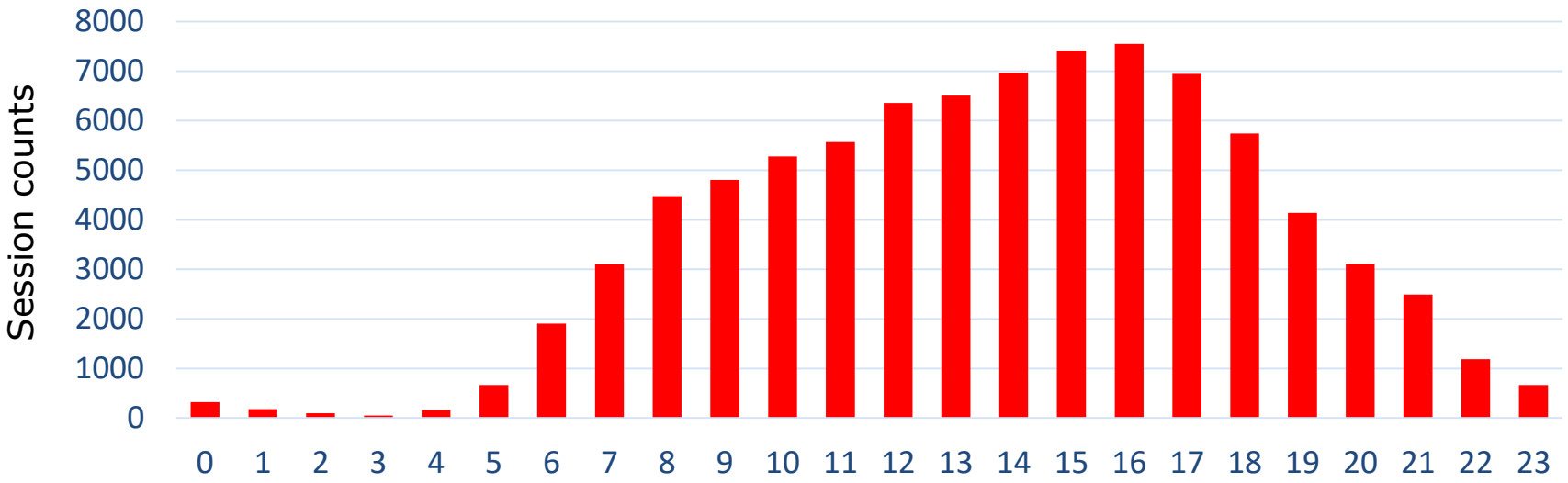
Maui EV Project 【JUMP smart Maui】

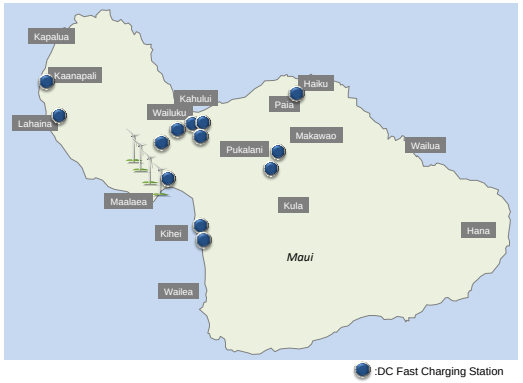
Charge/Discharge results on average (Oct. ~ Jan. vs Sept.)



Maui EV Project 【JUMP smart Maui】

DC Fast Charger usage during the demo PJ (2013/9 – 2016/7)





California Q-Charger Project 【DRIVEtheARC】

The Corridor of Quick Charger makes EV more fun

[Purpose of the project]

- NEDO aims to promote clean energy vehicle, especially EV which is effective in global environment.

Period : 2015 Sep -

Place: State of California, USA

Expected Participants : 4,000 users

[Outline of the project]

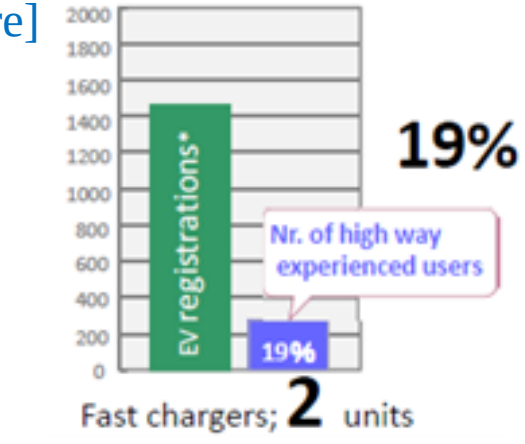
- Demonstrate the expansion of EV driving distance by installing DC fast chargers near inter-city highway, and change EV drivers' mind for long distance driving.
- California is two leaders both in terms of policy and EV initial market. It is the most suitable area for our demonstration project.

California Q-Charger Project 【DRIVEtheARC】

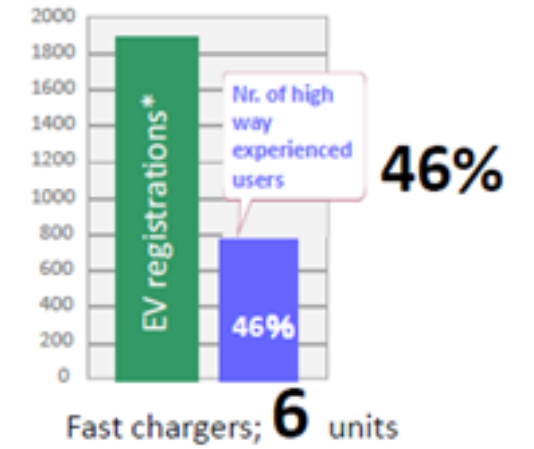
[Back ground]

- Demonstrate the expansion of EV driving distance by installing DC fast chargers near inter-city highway.
- Change EV drivers' mind for long distance driving, while EV is currently used just for short distance driving.

[Before]



[After]



[Reference data] Changes in the rate of EV use in Japan

(Source) CHAdeMO Association

California Q-Charger Project 【DRIVEtheARC】

Project Partners

NEDO

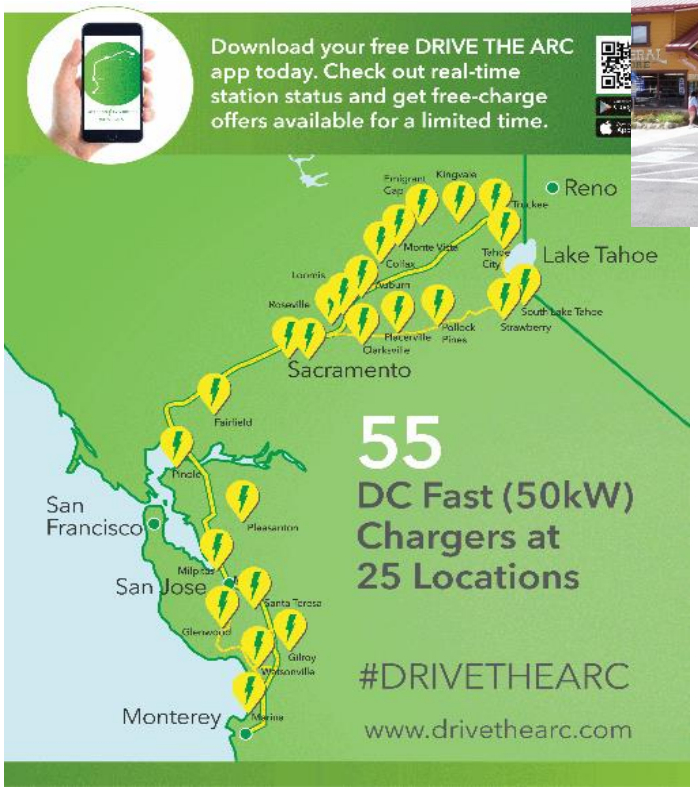
CALIFORNIA GOVERNOR'S OFFICE OF BUSINESS AND ECONOMIC DEVELOPMENT

NISSAN MOTOR CORPORATION

KG KANEMATS

EVgo

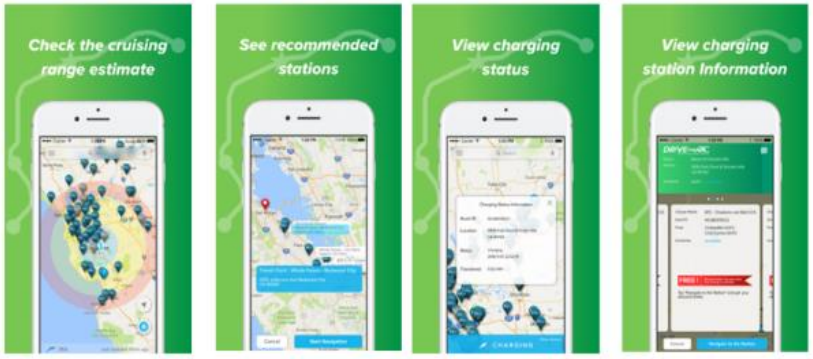
- The distance between Surf to Ski : 550 km
  - Paris – Lyon : 470 km
  - Tokyo – Kyoto : 513 km
- Average of charger location : 34 km



Real-time information service

- Navigation for suitable charging location (availability, congestion)
- More accurate cruising range

and more …



Visit the web.
https://drivethearc.com/

PUTRA NEDO EV BUS Project

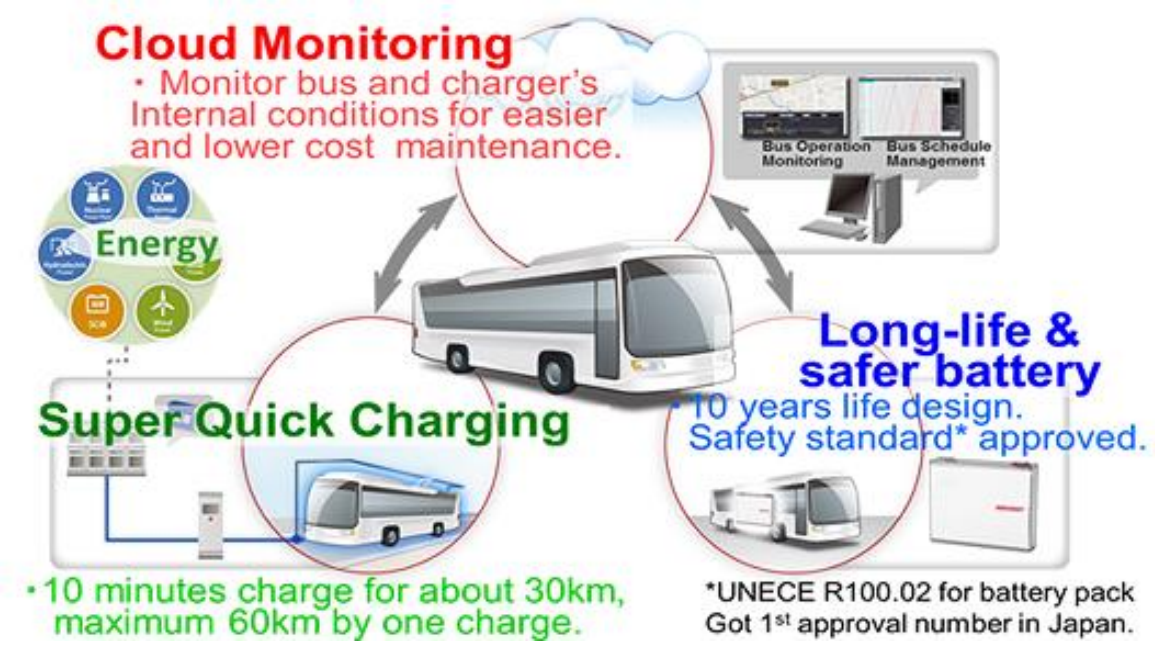
The First Super Quick Charge
- Large Bus Operation in ASEAN as well as in Japan-

- Demonstration of EV Bus and Super Quick Charging System
- Demonstration for reliability of battery and bus drive system in the real operational condition
- Demonstration of Cloud Monitoring for EV bus operation

Period : 2015 -

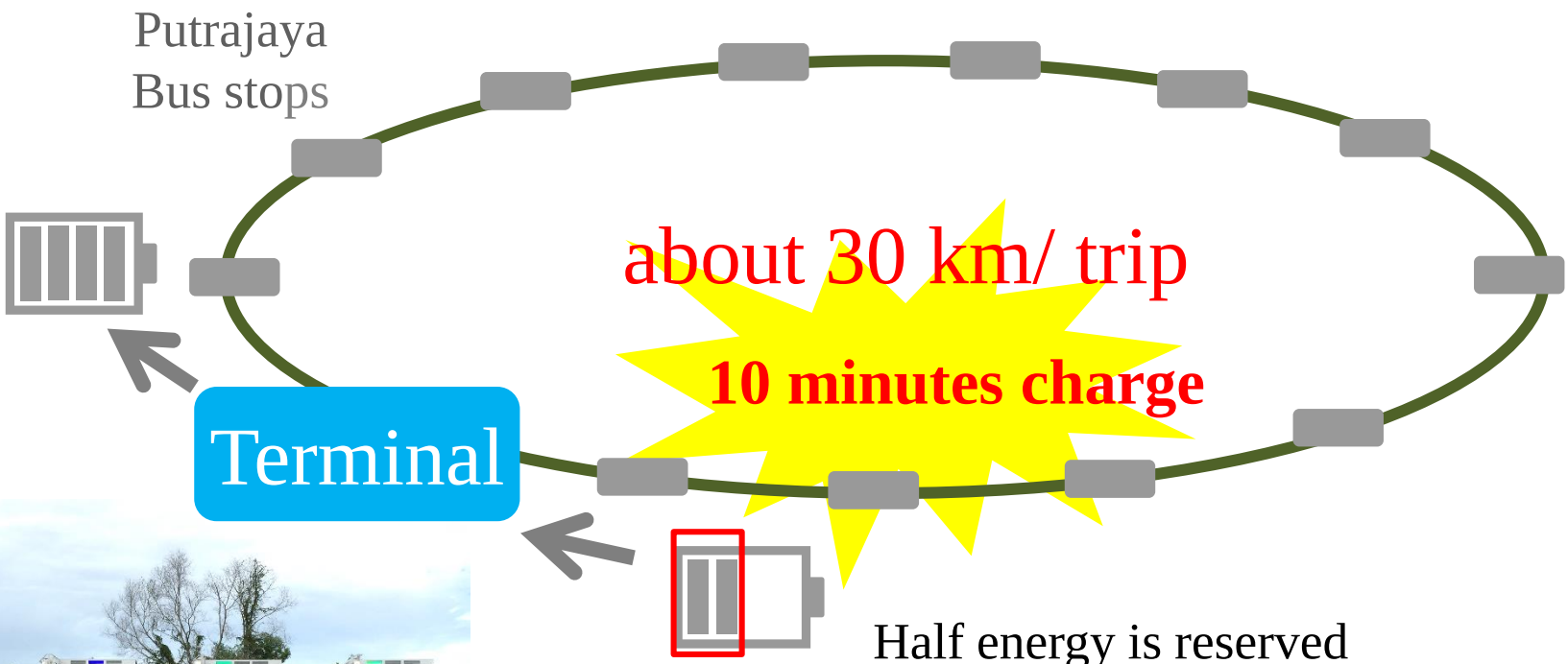
Place: City of Putrajaya, Malaysia

Operation : 10 EV Bus



PUTRA NEDO EV BUS Project

A 10 minutes battery charging cycle will enable an EV bus to travel a distance of 30km within a city



Half energy is reserved
for the case of traffic jam.

Visit the web.
https://youtu.be/S_zvkniVaTQ

PUTRA NEDO EV BUS Project

Merits of NEDO EV Bus

① Extra passenger space due to a smaller battery size.
② Shorter charging time makes longer operation times
③ The battery has a longer life and a longer replacement cycle.
④ Low maintenance costs

EV BUS SPECIFICATIONS (Single Decker bus)	
SIZE	12m long, 2.5m wide, 3.8m high
WEIGHT	Curb weight 12.8 ton Maximum weight 16.6 ton
PASSENGERS	33 seated, 30 standing, 1 wheelchair space
BATTERY	86kWh
CHARGING OPTIONS	320kW Pantograph, 44kW CHAdeMO Plug-in, 22kW AC415V Plug-in
MAX SPEED	80km/h

CHARGER SPECIFICATIONS (For Single Decker)	
RATED INPUT	AC415V, 530A
OUTPUT RANGE	DC150~450V, 1A~800A
MAX OUTPUT POWER	320KW, 10minutes
REPETIBITY	10 minutes by 320kW charge, 4 times an hour,

Summary

- Behavior
  - Initial EV user behavior was observed during the demonstration PJ both in Malaga and Maui. Also the possibility of demand response using EV Quick charging was confirmed.
  - In California, the possibility of driving area expansion will be evaluated with the corridor of Quick Charger.

- Dissemination
  - Showing the data of durability and reliability are strongly accelerate the dissemination of EV. NEDO conducts international demonstration projects and will share the valuable data for the future deployment.

Thank you for your attention

More Information about NEDO demonstration on our web.

Case Study of completed projects

http://www.nedo.go.jp/english/reports_20130222.html

- New Mexico (U.S.) Project
- Malaga (Spain) Project
- Hawaii (U.S.) Project
- Lyon (France) Project * coming soon