Recent Status of NEDO’s EV Quick Charger related Projects

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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

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

- Malaga (Spain)
- 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

Average Public Commercial Personal

Trip Length per day

- Average Public Commercial Personal

Trip length per one trip

- Average Public Commercial Personal

Average Velocity per one trip

- Average Public Commercial Personal

Trip hours per day

Electric consumption per one trip

- Average Public Commercial Personal

Average Public Commercial Personal

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 4 pm.
Result 2: Load management by EV demand response

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

<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)

Situation of electricity

Demand : 90 ~ 200 MW
Wind Power : 30 MW → 72 MW
PV Power : 2 MW → 94 MW


Place: Maui County, USA
Participants : 200/80 EVs
Maui EV Project

- Smart Energy, Smart Cars, Smart Grid -

[Target]

Charging period depends on the participants.

[Trial]

Charging period is controlled by EVECC

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

- Actual Load
- (*) Schedule TOU-R base

- Discharge Dispatched
- Auto Discharge (different scale)
- Auto Charge
- Manual Charge
- Charge Increased
- Charge Decreased
- Manual Charge (Sep.)
DC Fast Charger usage during the demo PJ (2013/9 – 2016/7)
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.

[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.

Period: 2015 Sep -
Place: State of California, USA
Expected Participants: 4,000 users
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
The distance between Surf to Ski: 550 km
Paris – Lyon: 470 km
Tokyo – Kyoto: 513 km
Average of charger location: 34 km
California Q-Charger Project 【DRIVEtheARC】

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

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

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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