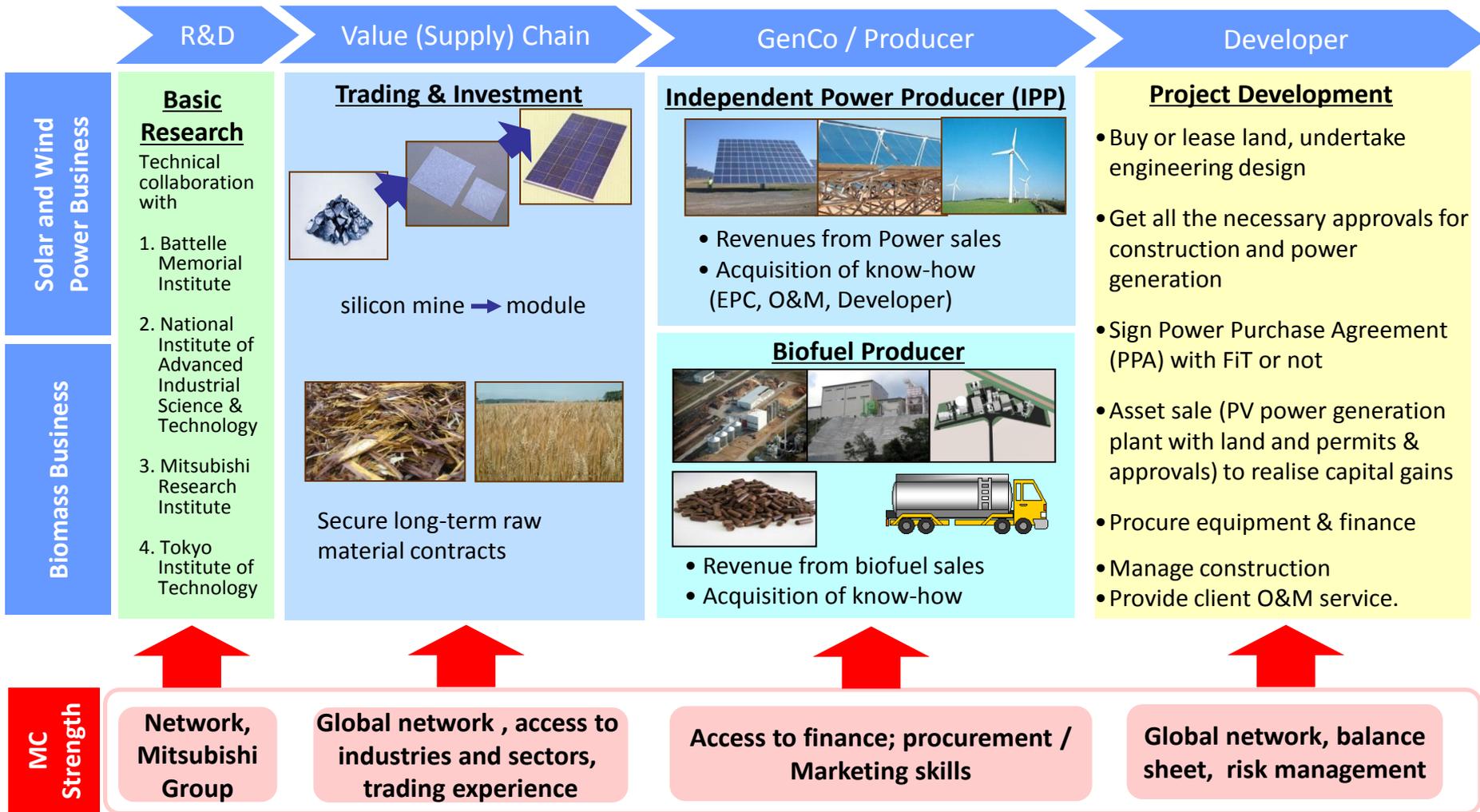


Battery Charging Infrastructure for EV by utilizing Renewable Energy (RE-EV Project)

Presented by
KIYOSHI SHISHIDO
General Manager, R&D Unit
New Energy Business Development Division
Mitsubishi Corporation

Mitsubishi Corporation Renewable Energy Business Portfolio



Future Value Chain in Automotive-related Business

Two Chains of Innovative Motors and Batteries for Electric Vehicles

Magnet to Motor Business

Rare Earths



Nedymium and Dysprosium

Neodymium Magnet



10 times stronger than ferrite magnet

Compact and Powerful Motors



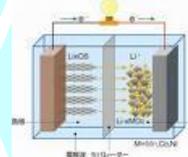
Electric Vehicles

Lithium Ion Battery (LiB) Business

Large Capacity LiB



Various Materials for LiB



Anode, Cathode, Electrolyte and Separator

Rare Metals



Lithium carbonate, Nickel, Cobalt, Manganese

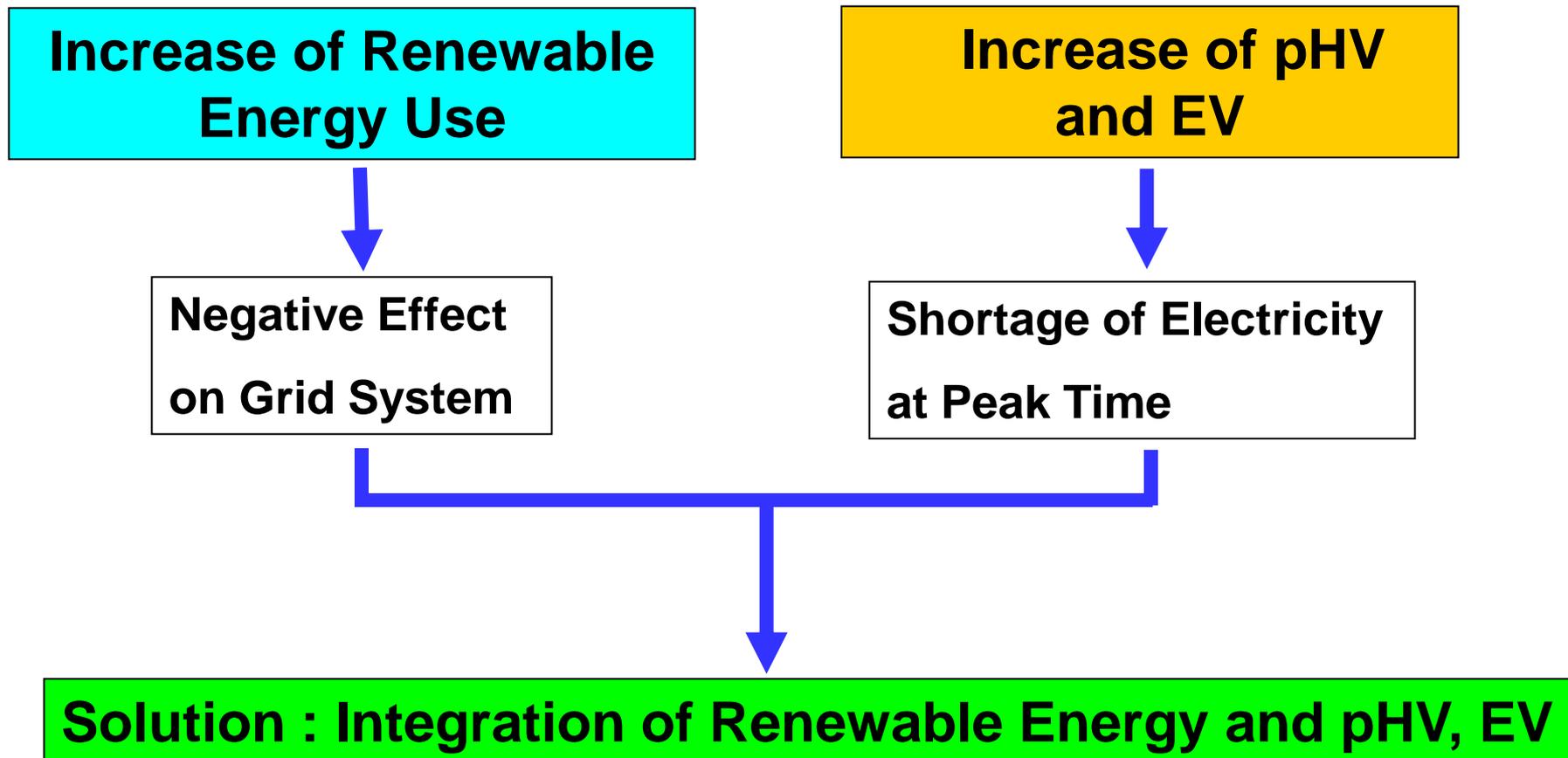
Outline of **Lithium Energy Japan (LEJ)**

- Establishment: December 2007
- Headquarters: Kyoto, Japan
- Capital: 2.5 Billion Yen (US\$25 Mil.)
- Shareholders: GS Yuasa Power Supply Ltd. (51%), Mitsubishi Corporation (34%), Mitsubishi Motors Corporation (15%)
- Business line: Development, manufacture and sale of large capacity lithium ion batteries for electric vehicles

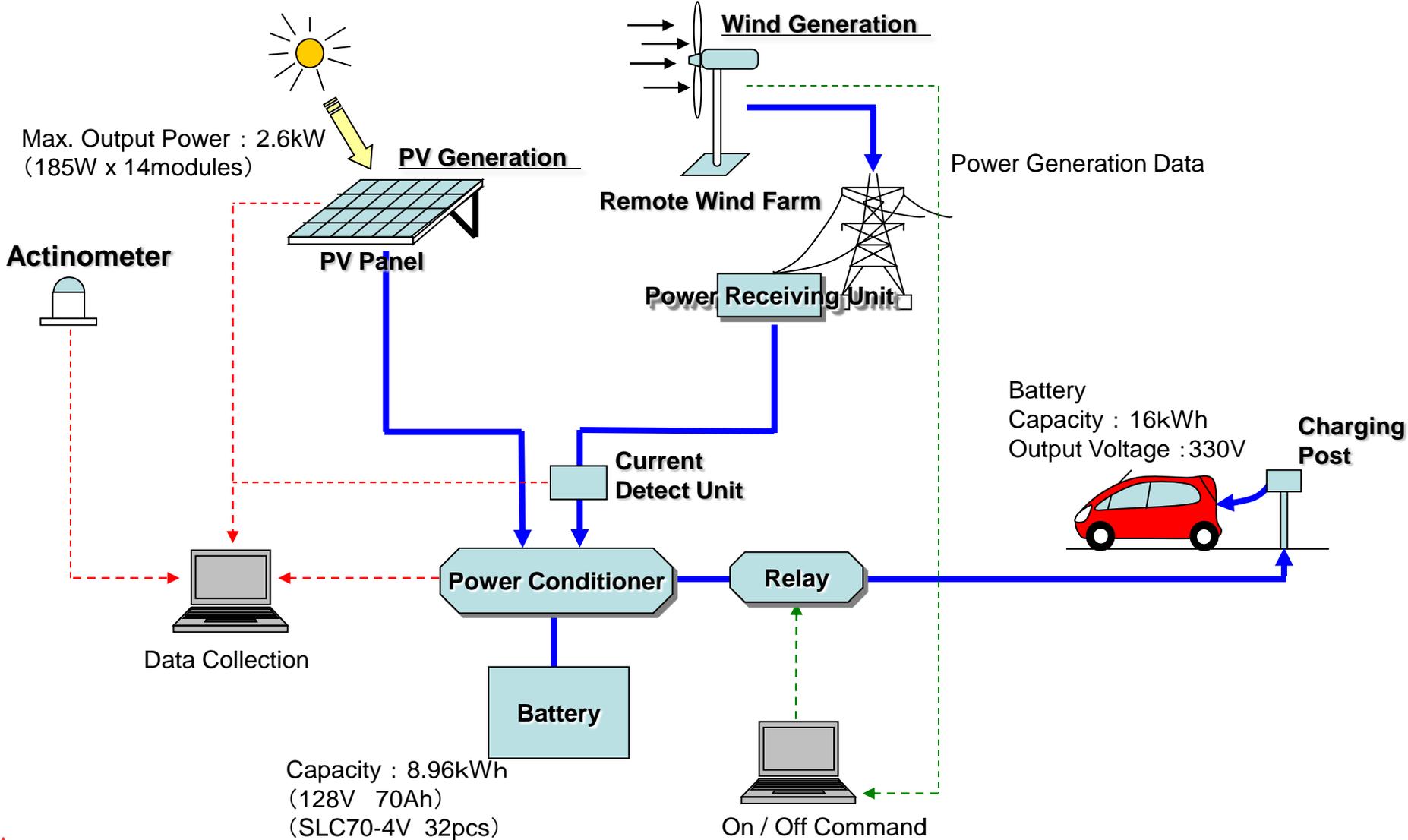
50 Ah LiB produced by LEJ



Issue of Electricity Supply

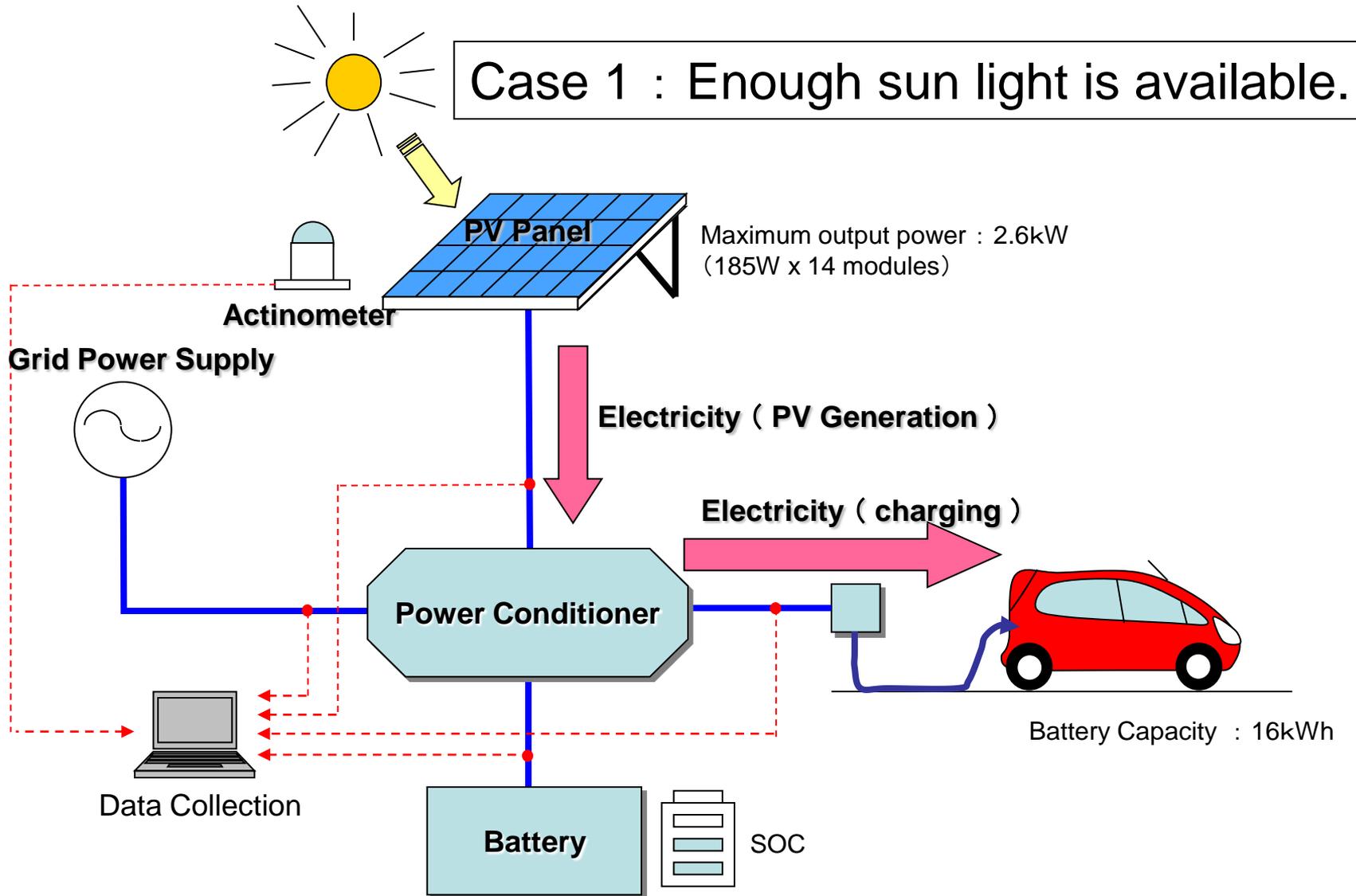


Outline of RE-EV Project

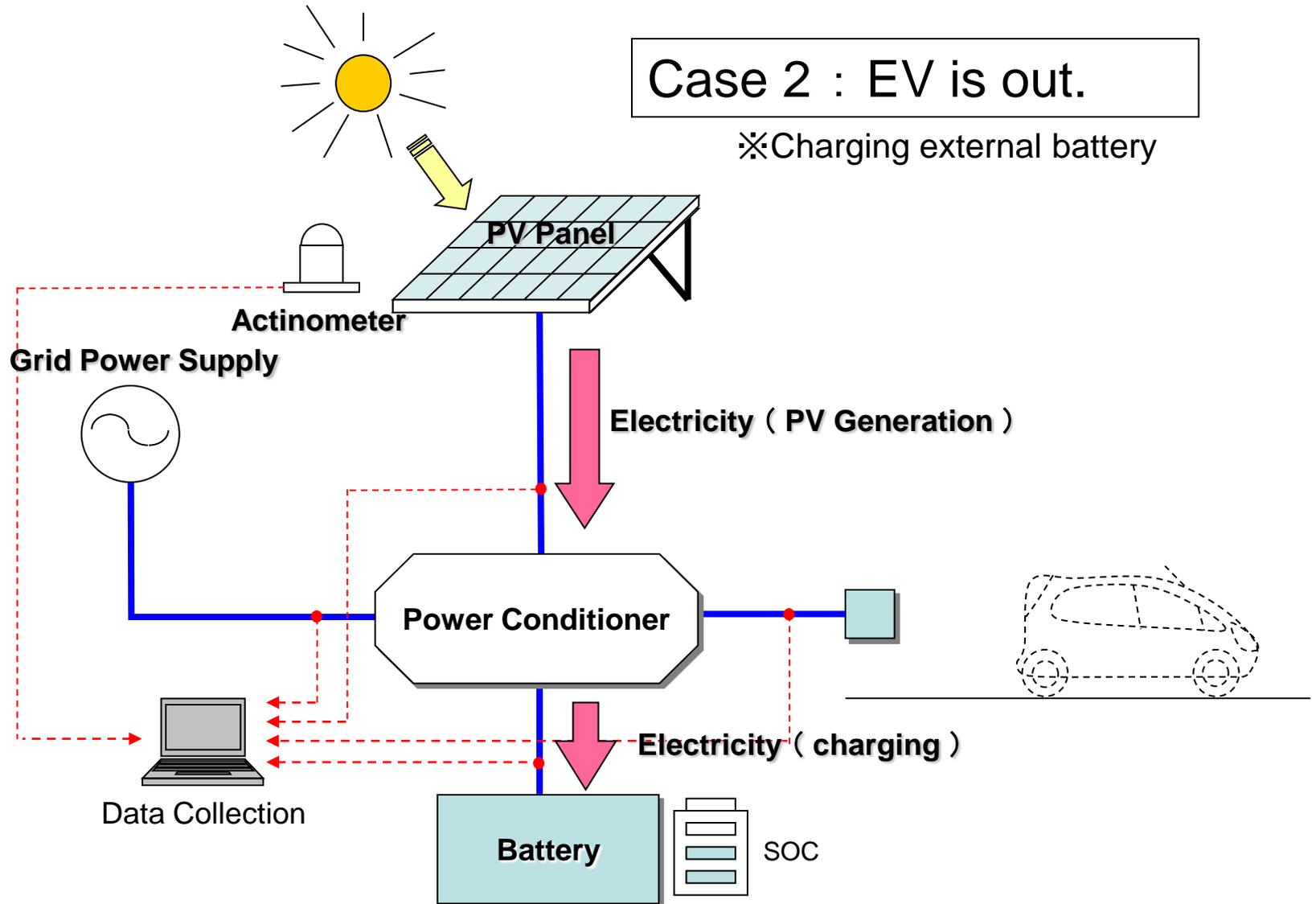




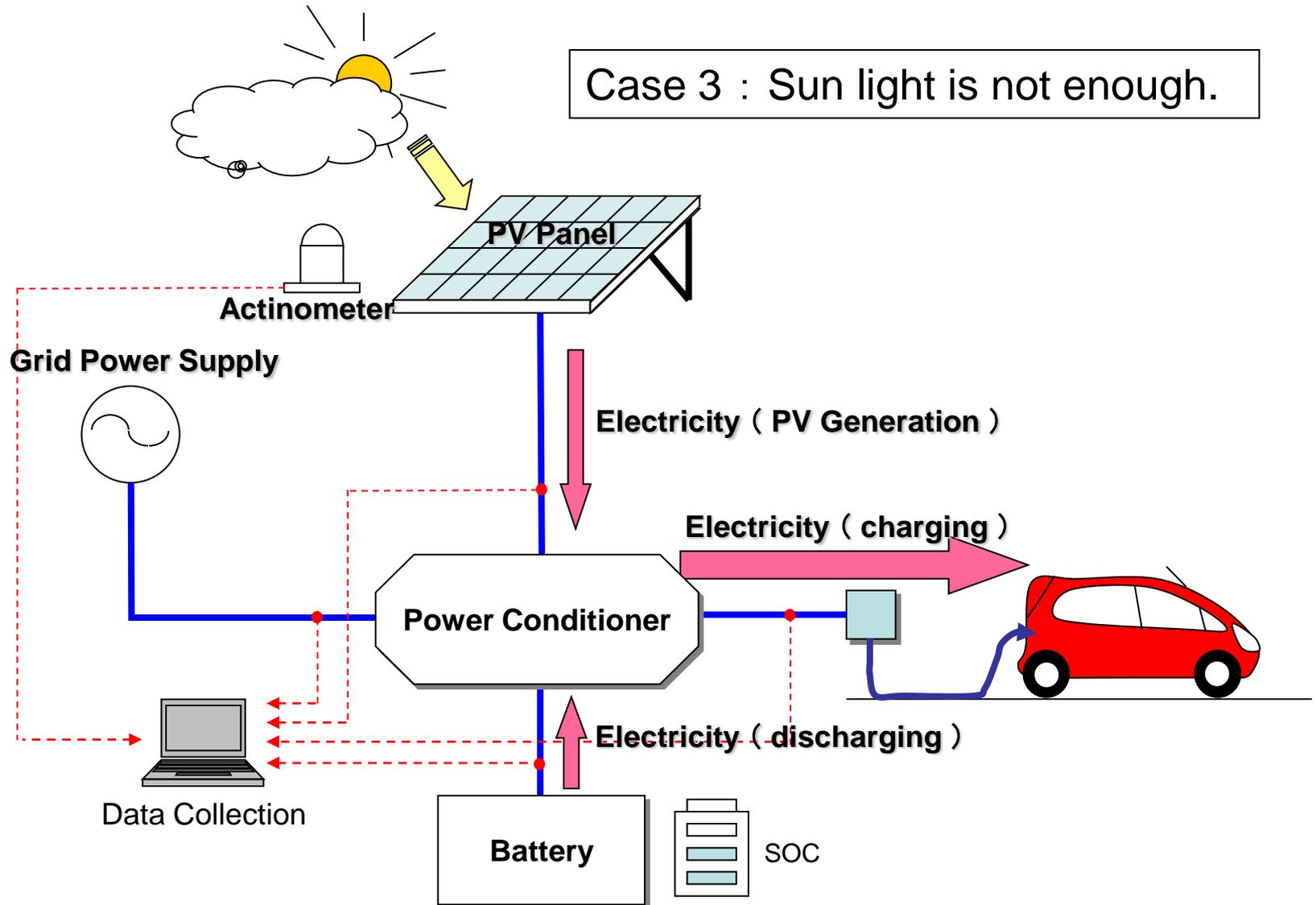
PV Charging System Conceptual Figure (1)



PV Charging System Conceptual Figure (2)

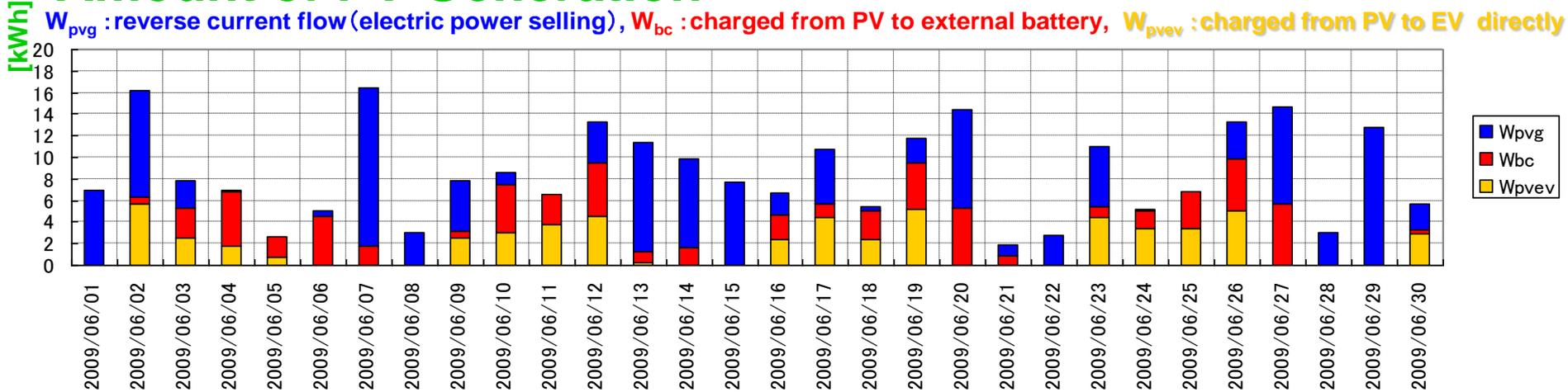


PV Charging System Conceptual Figure (3)

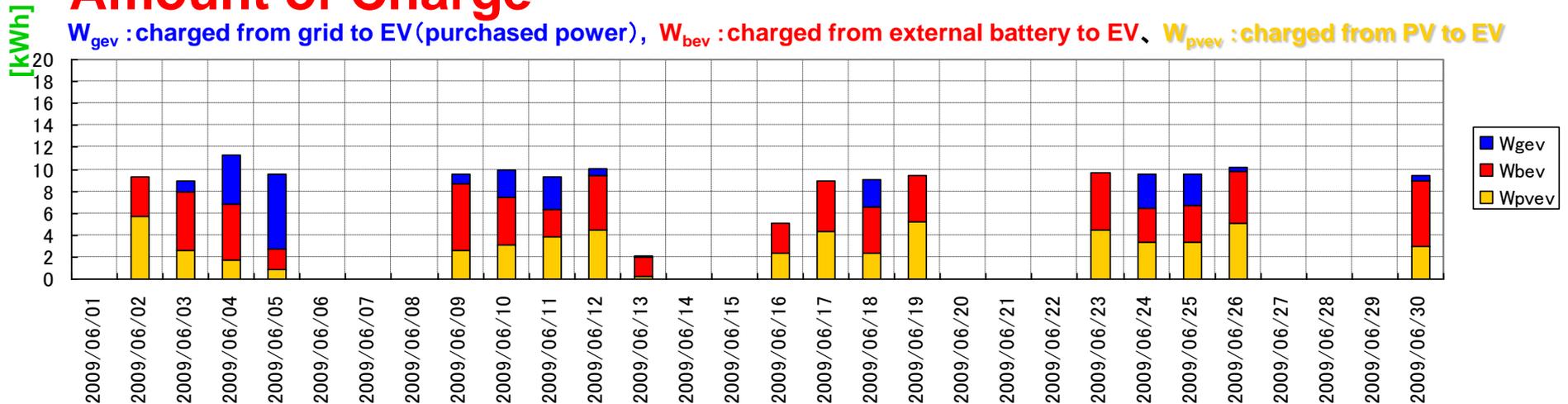


Measurement Result (June '09)

Amount of PV Generation



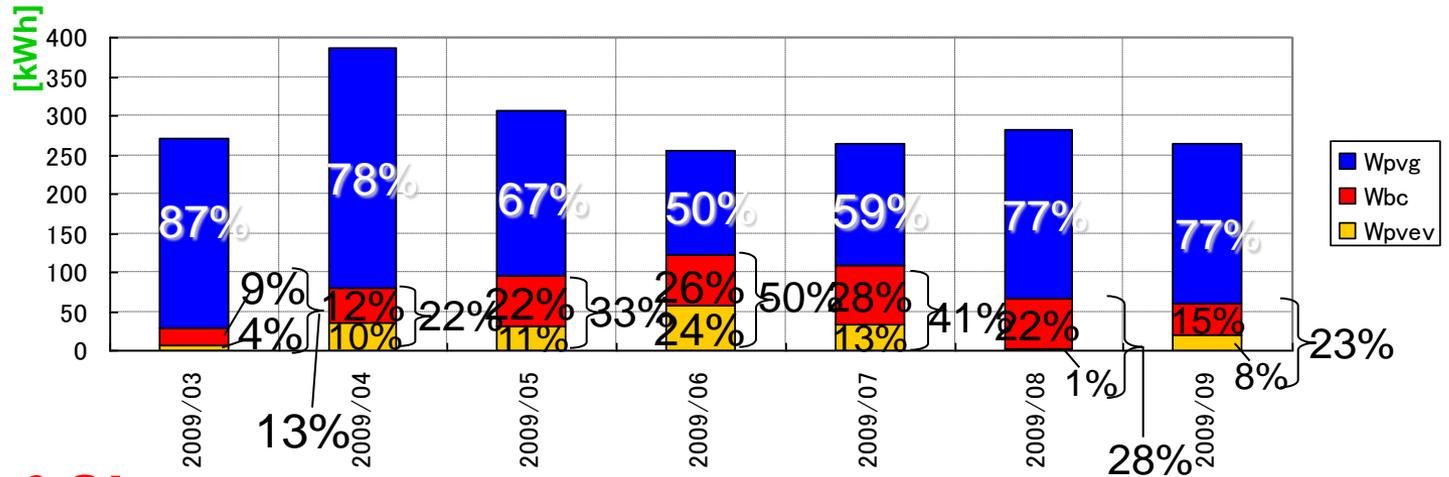
Amount of Charge



Summary of PV Generation and Charging Amount

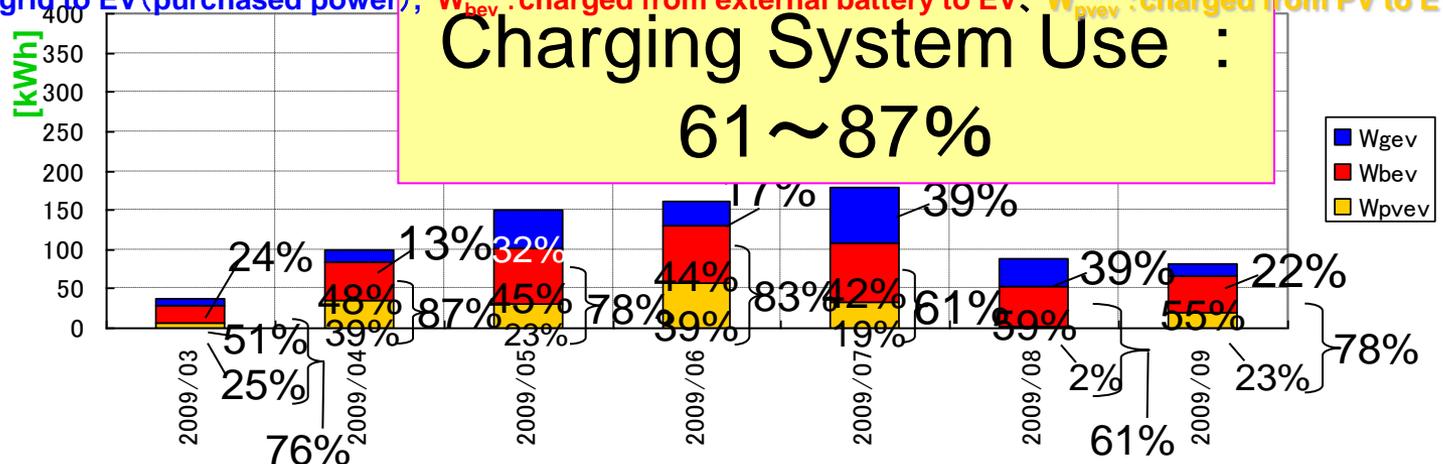
Amount of PV Generation

W_{pvg} : reverse current flow (electric power selling), W_{bc} : charged from PV to external battery, W_{pvev} : charged from PV to EV directly

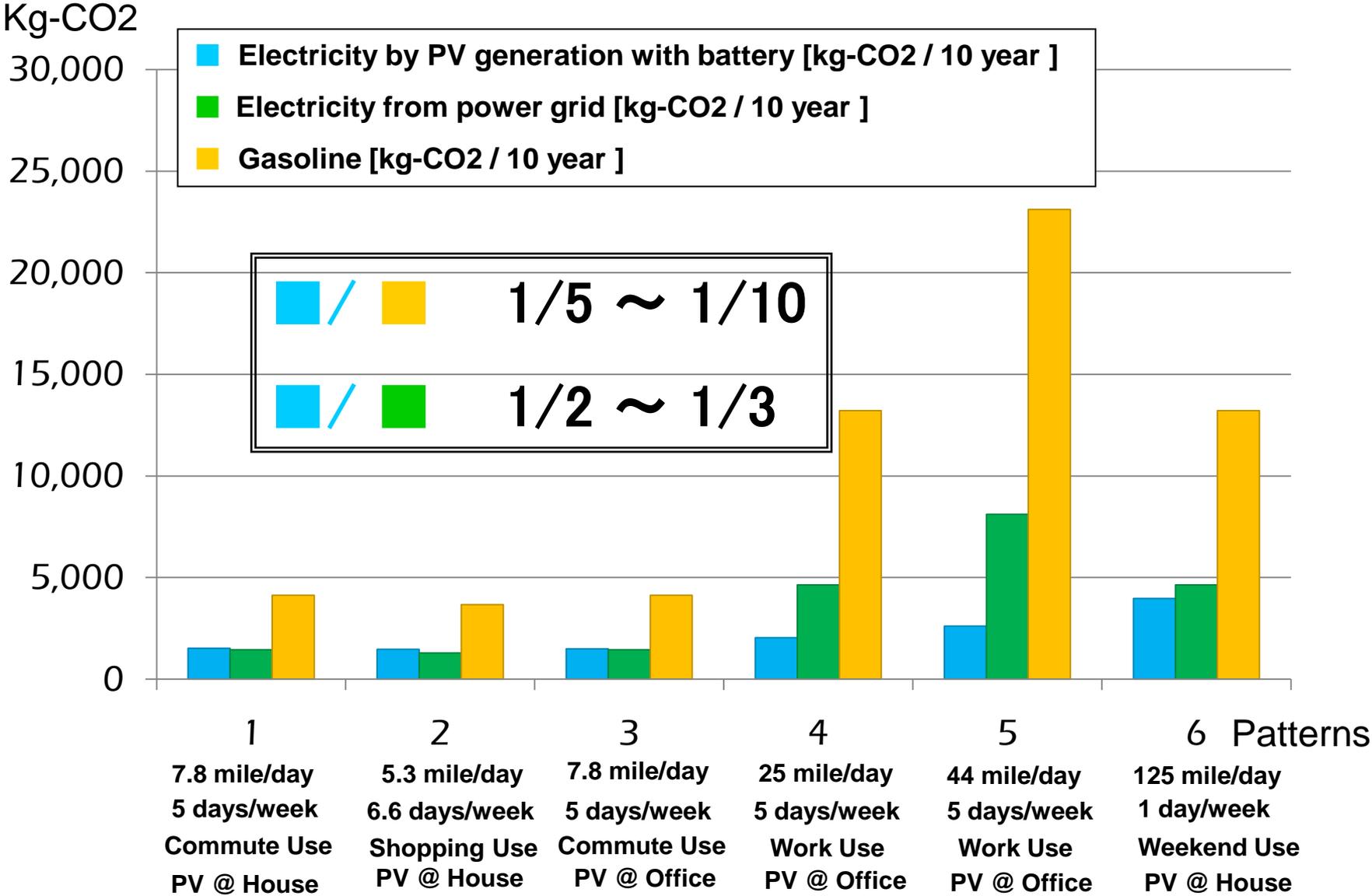


Amount of Charge

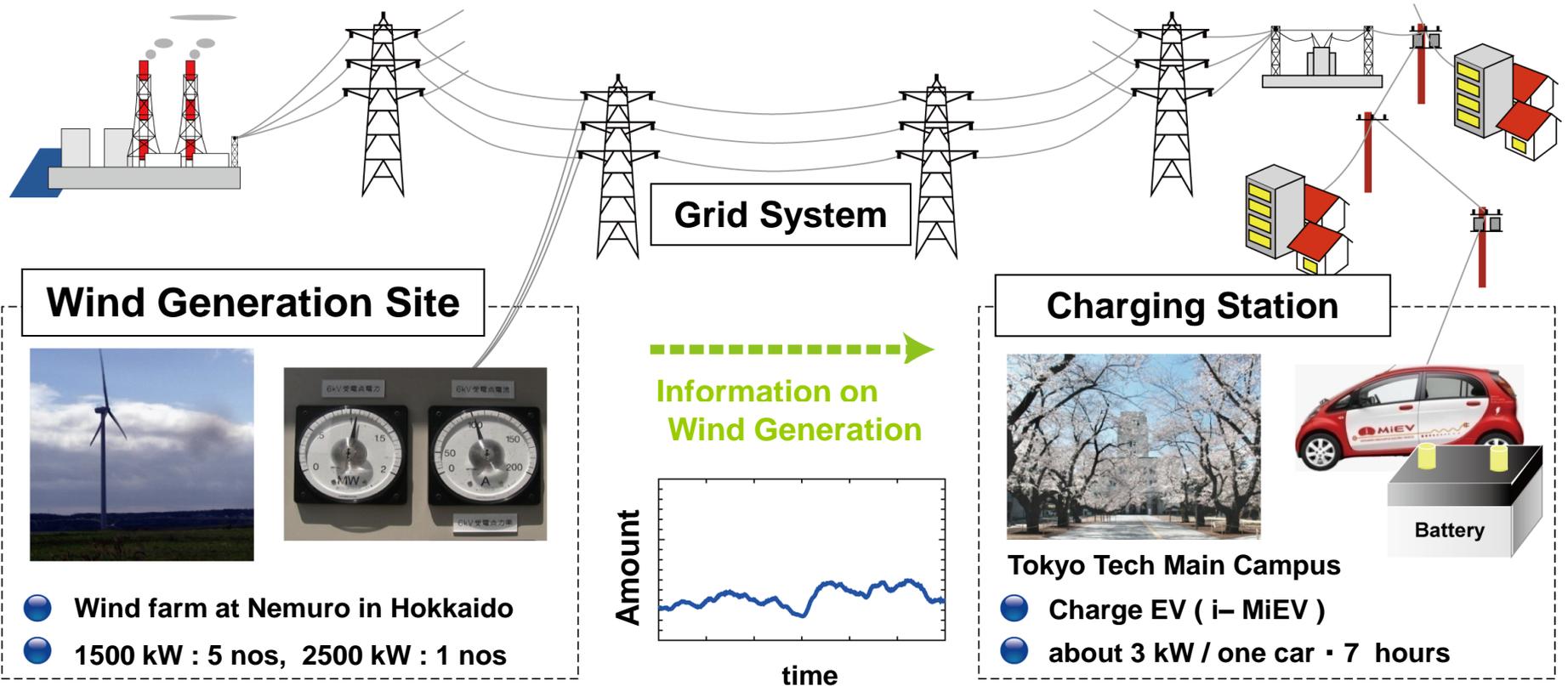
W_{gev} : charged from grid to EV (purchased power), W_{bev} : charged from external battery to EV, W_{pvev} : charged from PV to EV



CO2 Emission Analysis for 10 years (LCA)

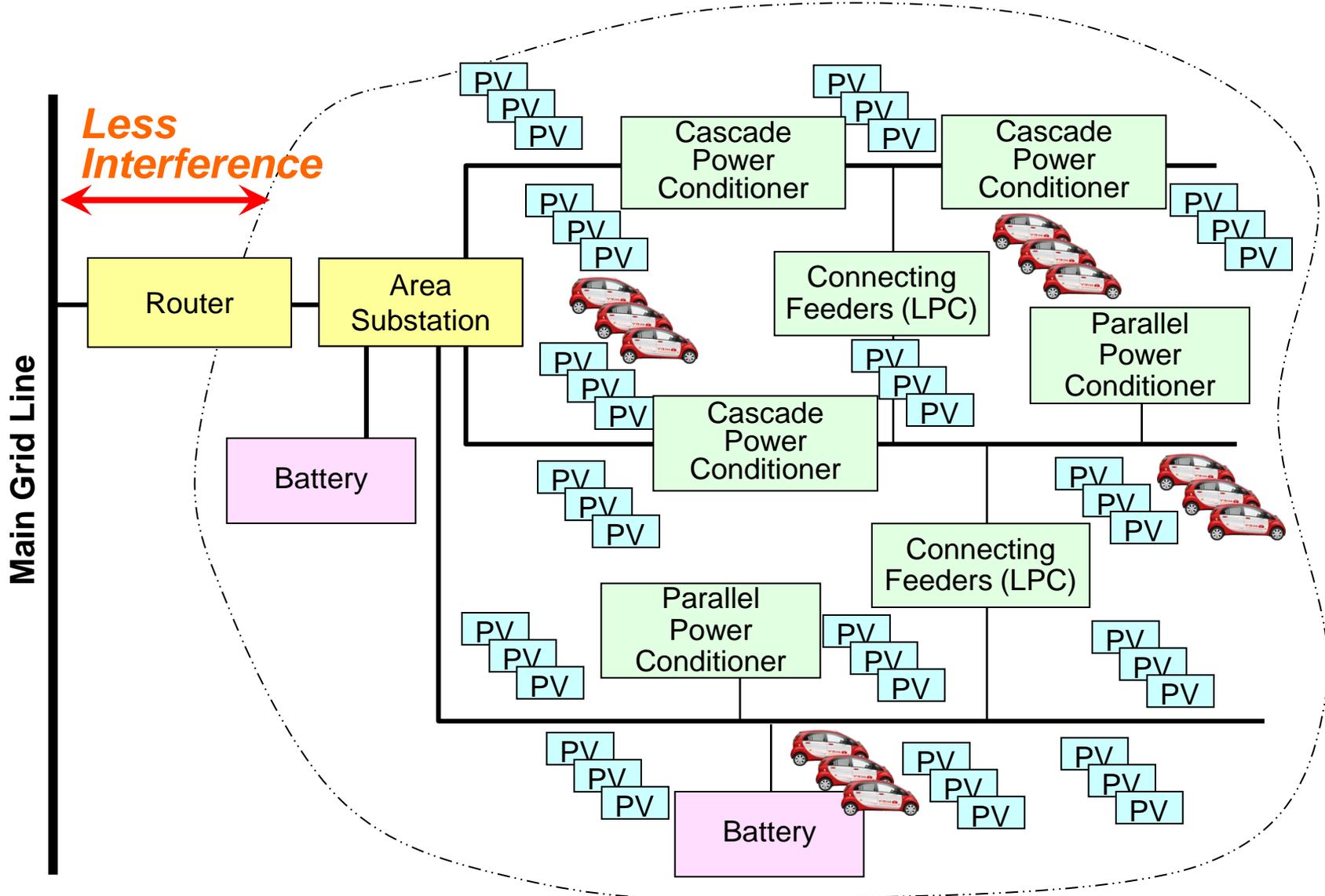


Concept of Wind Power Offset System



- Control amount of charge by transmitting data of wind generation amount in remote location to the charger of EV

Future Application



COMMUNITY

Countrywise Target to Introduce Renewable Energy for Electricity Supply

