2nd Life LEAF Battery Energy Storage System

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BACKGROUND

- Demand (instantaneous energy consumption) is the fixed cost component of electricity billing – indicator of cost to deliver electricity at peak usage times.
- Energy storage for peak energy consumption reduction
- Leading Environmentally-friendly Affordable Family car

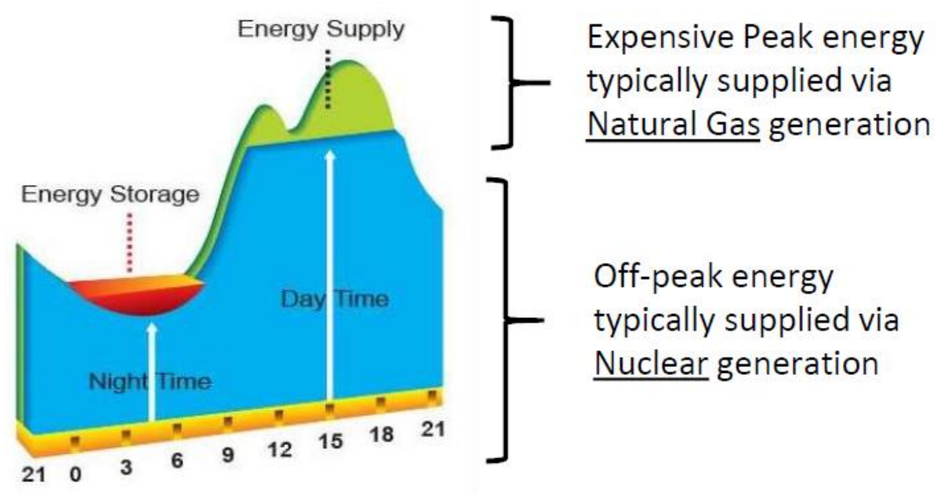

Fig. 1. Peak shaving peak demand

APPROACH

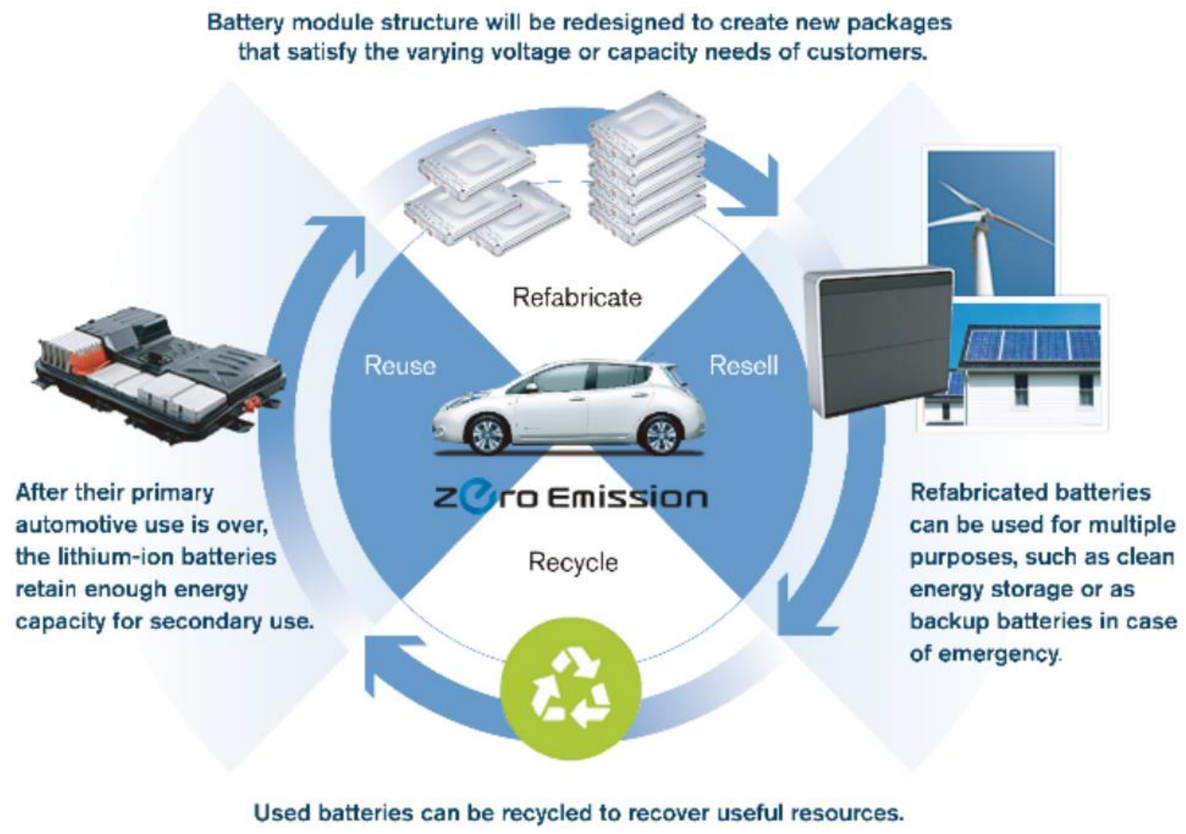

Fig. 2. Circular Economy of EV Battery use

- Batteries lose capacity to fully charge over time.
- When EV batteries reach that point, the battery's performance is no longer ideal for use in the vehicle and the battery is replaced.
- These used batteries have an opportunity to be repurposed in other long-life applications.
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- Proof of Concept (POC) test installation of a Battery Energy Storage Systems (BESS) that utilizes Nissan second-life LEAF batteries at the Owner's Headquarters building in Franklin, TN.

PROJECT DETAILS

- Two Behind-the-Meter BESS
- Smartville
  - Capacity: 125 kW / 500 kWh
  - Able to function with multiple packs of different sizes, histories and
  - states of degradation
  - Design based upon 40 kWh packs
- RePurpose
  - 1 BESS Unit
  - Capacity: 250 kW / 1 MWH
  - Design based upon modules from 24 kWh packs
  - No maximum scalability limit

Fig. 3. Battery Energy Storage System Left Housing 4 Tesla Battery Packs, Right Housing 4 Nissan Leaf Battery Packs

CONCLUSION

- This project will repurpose Nissan's used EV batteries, giving them a "second life" as a Battery Energy Storage Systems (BESS) at Nissan America's headquarters in Franklin, Tenn.
- The group will research how to best reduce energy usage, improve battery life, optimize energy distribution within the system and into the grid, house and scale the packs and system, in addition, make it easy and safe for consumers to connect to the electric grid.