

Smart Home & V2G Technology

Towards a stable and reliable VER Grid integration



IRENA-SLP 2021
Group 2



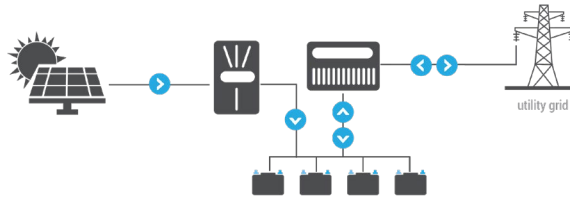
- **UNSDG7 & PARIS AGREEMENT**
- **Wind and Solar on the rise**
- **Power Systems Requirements**
- **Integration Challenges**
- **Smart Homes & V2X Technology**
- **Market Design and Strategy**



UNSDG7 & PARIS AGREEMENT



- Increase Renewable Energy into Energy Mix
- Decarbonize the energy sector



Challenges

Wind and Solar Characteristics

- Variability
- Non- Dispatchable
- DC- Output

Power Systems Requirement

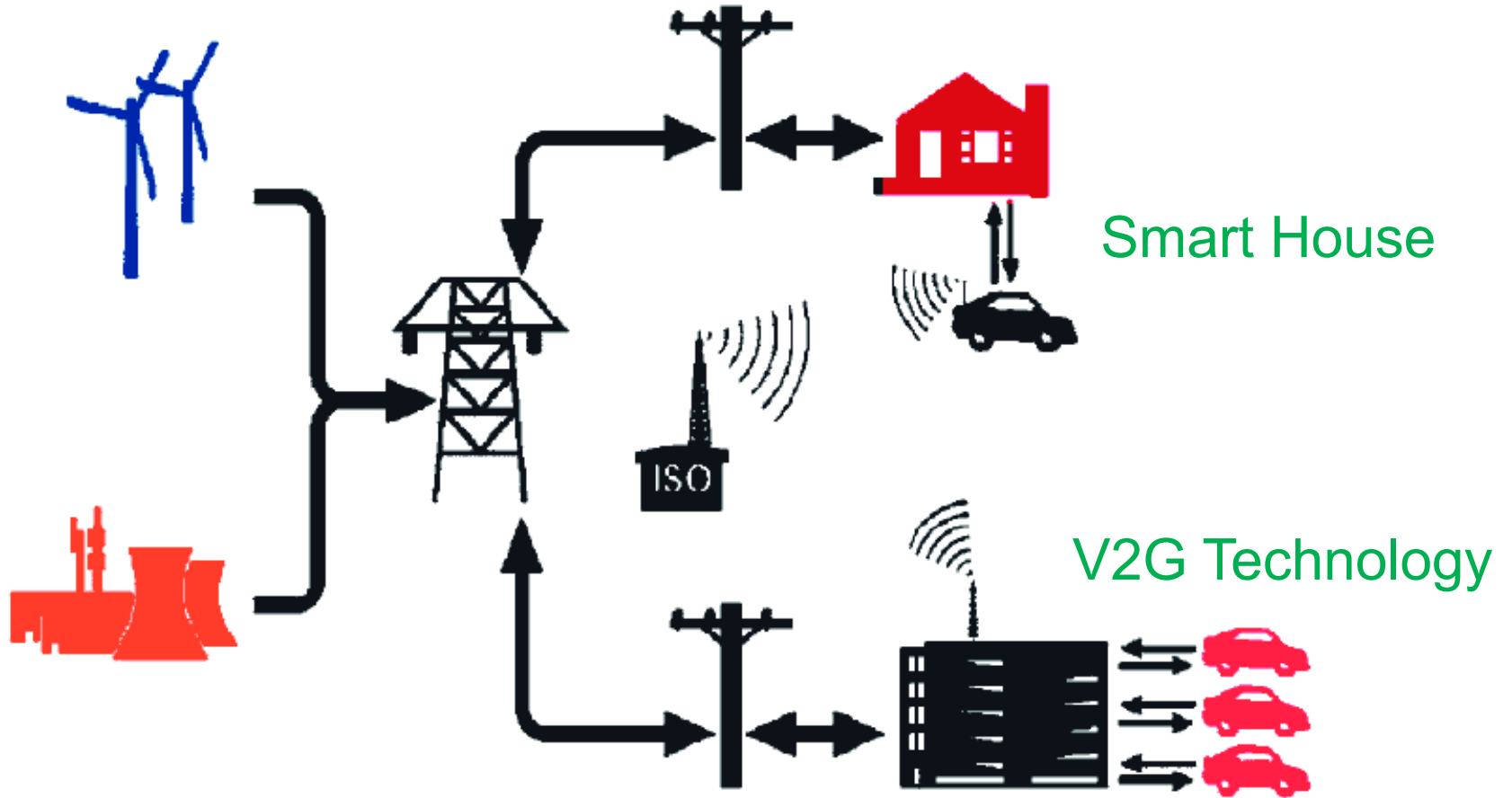
- Generation and Consumption Balance
- Dispatch
- Voltage and frequency Control
- AC infrastructure

Integration Challenge

- Power fluctuations
- Lack of inertia
- instability

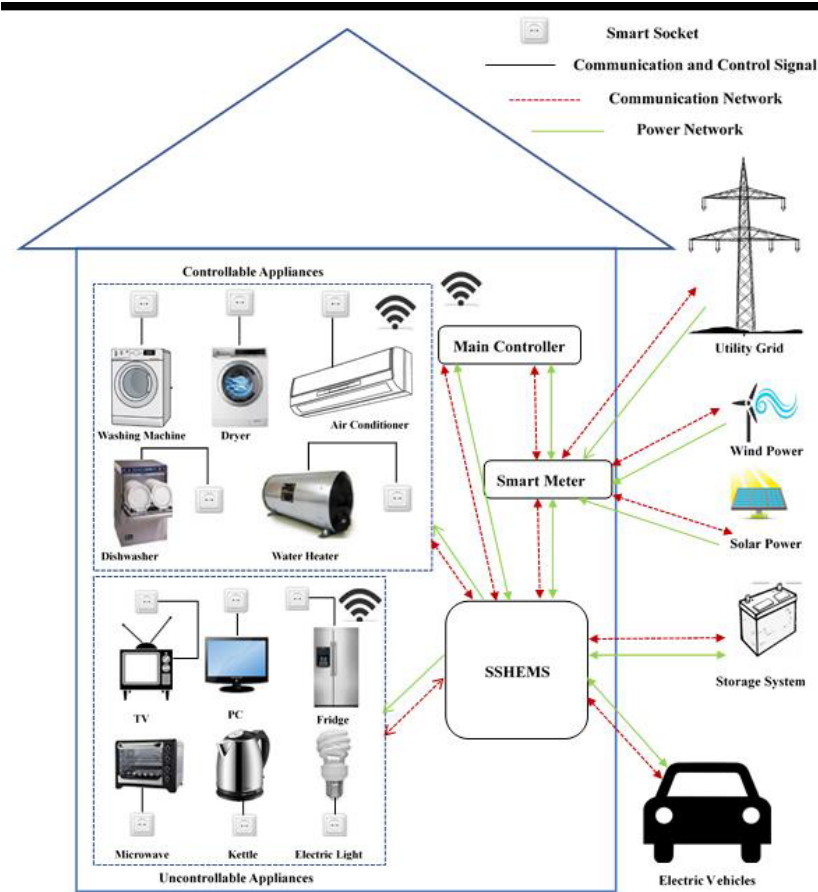


Integration Solutions



Smart House

- Smart Meters
- Intelligent Sockets
- Rooftop Panels or backyard Wind Turbines
- Battery Storage and Electric vehicle



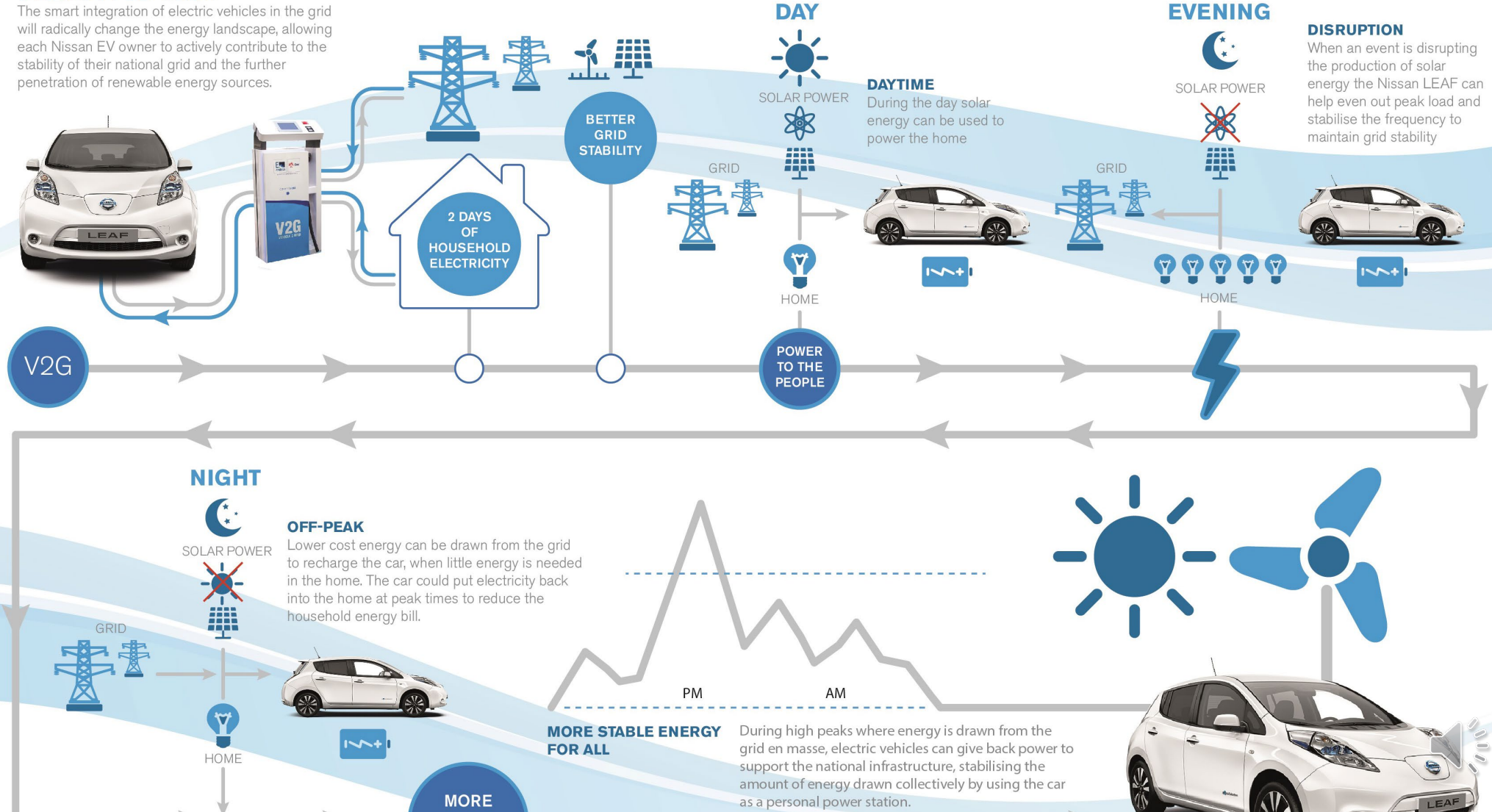
Power Systems Benefit

- Ease congestion on grid during peak time
- Feed power into the grid at appropriate time



VEHICLE-TO-GRID

The smart integration of electric vehicles in the grid will radically change the energy landscape, allowing each Nissan EV owner to actively contribute to the stability of their national grid and the further penetration of renewable energy sources.



How V2G Works

1 PLUG IN YOUR CAR to any charger



2 CHARGE BATTERY safely and efficiently in V2G Mode



3 MAKE MONEY by providing power capacity and sending energy back and forth to regulate the Grid

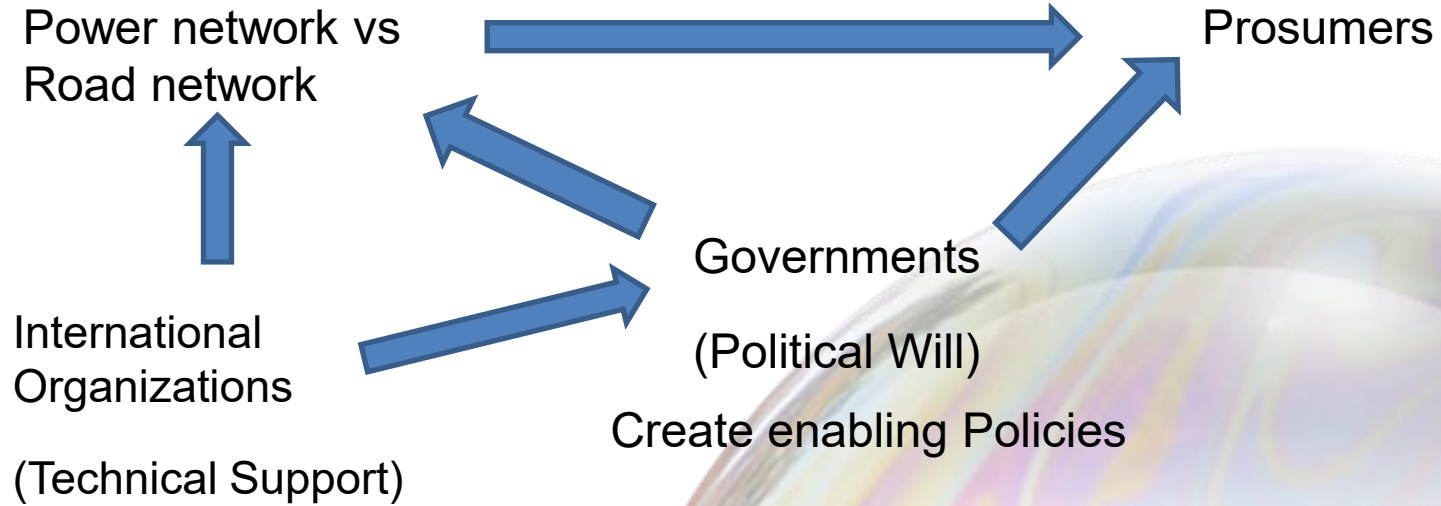


OR SAVE COSTS by using stored energy from EV batteries to reduce building energy peak consumption

4 YOU'RE READY TO DRIVE with the charge you set for the day with advance trip planning using a mobile fleet management app



Enabling Strategies & Market Design



Thank You

