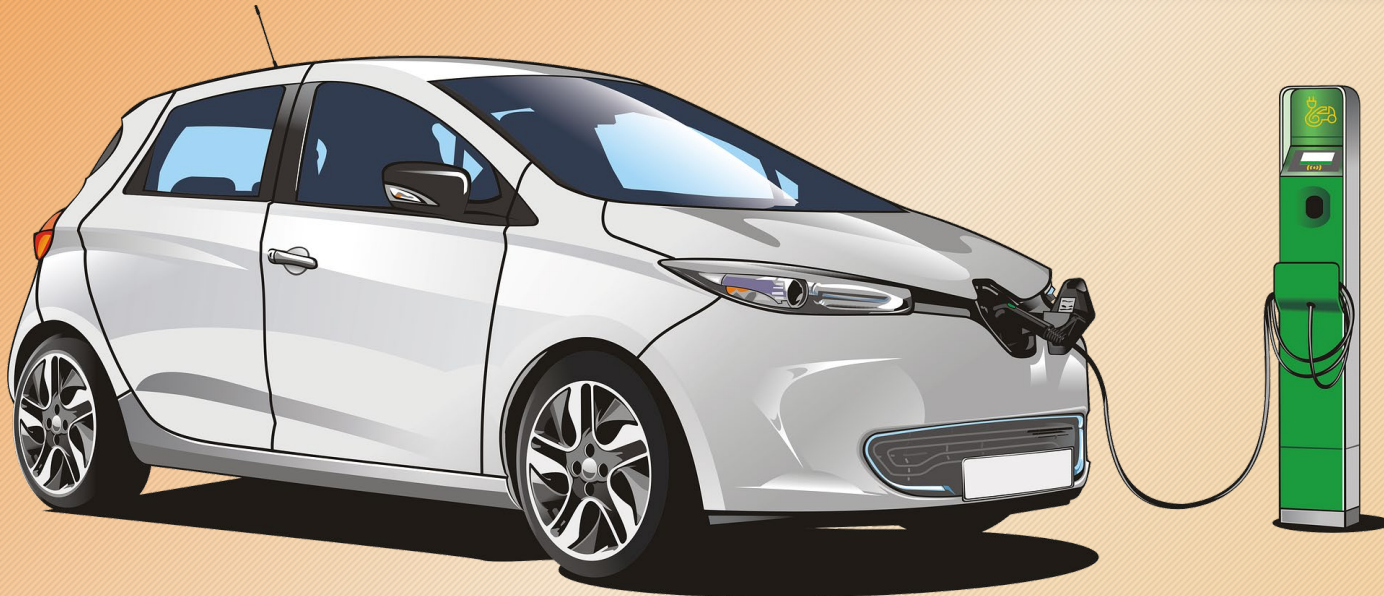


Proposal to Los Alamos County by
Tibbar Plasma Technologies, Inc.
October 2020



Electric Vehicle to Grid



Tibbar Plasma Technologies, Inc.



Team Members



Dr. Richard Nebel
President



Anthony Belletete
Certified Public Accountant



Keith Moser
Tech to Market Coordinator



Wendi Dunn
Executive Assistant

Buddy Laird
Preventech Automotive

Greg Mechels
Select Solar LLC

Pilot Study of 100 Electric Vehicles

- Solar energy and wind energy have capacity factors of about 25%, requiring energy storage.
- We are proposing to solve this problem in a novel way using electric vehicles to provide this energy storage.



Electric Car Energy Storage Capabilities

- A Tesla automobile stores about 80 kW-hrs of energy.
- Why not develop a standardized hookup that would allow customers to hookup their electric cars to their homes and avoid peak time of use rates?



Required Equipment for Hookups

- Electrical hookup on the automobile
- Electric hookup on the house
- DC-AC inverter
- Production meter (like the one presently used on solar systems)
- Power switch
- Smart metering device (to limit the current)
- Estimated Cost: less than \$3000 per hookup



Developing the New System

- Tibbar Plasma Technologies, Inc. will obtain a grant to finance the project.
- We will design and certify the components (or select and use off-the-shelf equipment).
- We will test a system using 2 24kW-hr Nissan Leaf battery banks and a 20kW solar array at Tibbar Plasma Technologies.
- We will procure and install the components for anyone in Los Alamos County requesting them.

Questions for the Pilot Study

- How much incentive will be required to entice electric car owners to use their vehicles?
- Can this be done with minimal battery lifetime degradation?
- What is required to manage a grid with distributed energy storage devices?
- What is the best way to extract energy from these batteries?
- Is it cost effective?

Incentives for Customers

- A higher nighttime rate would encourage people to recharge their cars during the daytime and then use this stored power from their vehicle to power their homes during peak power rates.
- Customers would save money on the rate difference which would be compensation for the wear and tear on the batteries in their electric vehicles.

Advantages for the County



- It can provide a large amount of energy storage which requires no investment in batteries by the utility.
- It would shed peak loads in the evening.
- No battery maintenance is required by the utility. This is provided by the consumer.
- The technology would be updated free of charge (by the car owners) as the battery storage technology improves.

In-kind Contributions



- Tibbar Plasma Technologies will provide an existing commercial 20 kW solar PV array.
- We are presently constructing a 10kW residential array which will also be made available in order to show how this technology interfaces with solar PV energy on a real grid.
- Tibbar Plasma Technologies will provide building space to house the testing facility

In-Kind Contributions



- Los Alamos County will provide 2 24kw-hr Nissan Leaf battery banks and equipment for a lease rate of \$1.00/year.
- Los Alamos County will write a letter of support for the project and offer the in-kind Nissan Leaf battery storage for the grant request.
- Los Alamos County will participate in the data acquisition and analysis using their Smart-Meters.

Value of Project



- This project is a paradigm change, and it could flourish into a new type of business.
- The major goal of this program is to see if this approach is viable.

Questions?

TIBBAR
PLASMA
technologies



Photo and Image Credits:

Vector Car Images by Francis Ray
<https://pixabay.com/users/painter06-3732158/>

Charging Port Image by Hans Rohmann
<https://pixabay.com/users/hrohmann-848687/>

Car Battery Image by F. Muhammad
<https://pixabay.com/users/artisticoperations-4161274/>