STATE OF CALIFORNIA
EPIC TRIENNIAL INVESTMENT PLAN 2015-17
Proposed Energy Research Initiative
Questionnaire

CALIFORNIA ENERGY COMMISSION

Title of Proposed Initiative (Short and concise): ***The Electricity-Transportation Nexus: Planning a Smooth PEV Transition for California***

Investment Areas (Check one or more) – *For definitions, see First Triennial Investment Plan, page 12*:

☒ Applied Research and Development

☒ Technology Demonstration and Deployment

☐ Market Facilitation

Electricity System Value Chain (**Check only one**): *See CPUC Decision 12-05-037, Ordering Paragraph 12.a. http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF.*

☒ Grid operations/market design

☐ Generation

☐ Transmission

☐ Distribution

☐ Demand-side management

Issues and Barriers:

Transportation is responsible for 40% of California's GHG emissions and is the primary source of hazardous air pollution in the state. Decarbonizing California's transportation sector is likely to require substantial electrification coupled with a shift toward renewable power generation. Plug-in electric vehicles (PEVs) allow for the electrical grid to meet some fraction of transportation energy demand, providing an opportunity for decarbonization and human health benefits through a reduction in tailpipe emissions. However, there is a significant lack of research on integrating PEVs into the California electric power system in a manner that can be mutually beneficial to both the transportation and the electricity sectors. The research shortfalls in this area span PEV and grid hardware development, information and communication technologies to market and policy design.

Initiative Description and Purpose:

The initiative will be a concerted effort involving automakers, utilities, CAISO, government and researchers to systematically plan for a future where PEVs benefit the climate, the owner and enable the large scale integration of renewable electricity in the California grid. The initiative will narrow the gap between the development of technologies and demonstrate their potential for deployment with innovative market and policy designs.

Stakeholders:

- Utilities who must prepare for the increased demand from PEVs.
- MTAs who must include and plan for climate mitigation from transportation
- Researchers who develop related technology and analysis markets, policy and energy systems
- Automakers
- State and local governments
- CAISO

Background and the State-of-the-Art:

- There is significant research in the individual aspects of PEV development, renewable integration and electricity system planning. However for the explicit perspective of planning a smooth transition to a clean PEV future, these research areas need to be addressed as an integrative whole.

Justification:

Describe how this technology or strategy will provide California IOU electric ratepayer benefits and provide any estimates of quantified annual savings/benefits in California, including:

- Unmanaged or uncontrolled PEV charging demand will impose tremendous costs on the CA grid. This initiative will ensure that such an outcome is avoided.
- PEVs can reduce the cost of integrating renewable electricity into the grid, thereby reducing the cost to ratepayers of meeting California's climate goals.

Ratepayer Benefits (Check one or more)**:**

☒ Promote greater reliability

☒ Potential energy and cost savings

☐ Increased safety

☒ Societal benefits

☒ Environmental benefits – specify—protection the California population from extreme climate and assuring reliability of energy supply during extreme climate events

☒ GHG emissions mitigation/adaptation in the electricity sector at the lowest possible cost

☒ Low emission vehicles/transportation

☐ Waste reduction

☒ Economic development

Describe specific benefits (qualitative and quantitative) of the proposed initiative

Planning for a smooth transition for substantial PEV penetration in the State will not only reduce the cost of procuring power for utilities but could also make renewable electricity cheaper. Large scale PEV deployment in the state will substantially reduce GHG emissions and air pollutant emissions. Since many EV manufacturers are based in California, this initiative will bring more green jobs to the state.

Public Utilities Code Sections 740.1 and 8360:

Please describe how this technology or strategy addresses the principles articulated in California Public Utilities Code Sections 740.1 and 8360. The California Public Utilities Code is available online at www.leginfo.ca.gov/cgi-bin/calawquery?codesection=puc.