



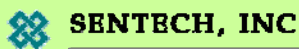
PHEV Market Introduction Study *Project Plan*

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PHEV MARKET INTRODUCTION STUDY

PROJECT PLAN SUMMARY

As a component of the Plug-in Hybrid Electric Vehicle (PHEV) Value Proposition Study, Oak Ridge National Laboratory (ORNL), Sentech, Inc., Energetics, Inc., and Mr. Thomas Gross (consultant) will conduct a Market Introduction Study to identify actions items that are critical to creating and sustaining a market for plug-in hybrid electric vehicles (PHEVs). The impact of potential action items will be assessed, and possible pinch points during market growth will be identified. Results will be used to recommend an action plan aimed at successfully transitioning what began as a grassroots industry into a thriving market between now and 2030.

While there is significant overlap in the project partners' capabilities and the assignments that will be made in the project, the primary function of each member is as follows:

- *ORNL – Project Manager:* Will conduct, jointly with Sentech, a significant portion of the initial research on policies, regulations and incentives that have been proposed and/or enacted to support the development of innovative vehicles and alternative vehicle fuels. ORNL will also be a primary analyst of data collected at workshop using its consumer preference model.
- *Sentech – Subcontract Manager:* Will conduct, jointly with ORNL, a significant portion of the initial research on policies, regulations and incentives that have been proposed and/or enacted to support the development of innovative vehicles and alternative vehicle fuels. Sentech will also help facilitate the workshop with Energetics and provide guidance on the facilitation plan.
- *Energetics – Subcontractor:* Will take lead in coordinating meeting logistics, preparing a facilitation plan, and helping facilitate workshop sessions. Energetics will provide a note taker and is responsible for producing a summary report of its facilitation session.
- *Mr. Thomas Gross – Consultant:* Mr. Gross will assist in the identification of policies that have been proposed and/or enacted to support the development of innovative vehicles and alternative vehicle fuels. He will also participate in workshop and review final report.

A Guidance & Evaluation Committee, assembled in Phase 1, will again provide industry expertise throughout this study. Representatives from the Pacific Northwest National Laboratory (PNNL) and the University of Michigan's Transportation Research Institute (UMTRI) will also be called upon to provide input to this study.

BACKGROUND

The PHEV Value Proposition Study is an in-depth study that investigates the benefits, barriers, opportunities, and challenges of grid-connected PHEVs in order to establish potential value propositions that will lead to a commercially viable market by 2030. In Phase 1 of the study, the project team established a collection of value propositions associated with owning a PHEV in 2030 and weighed them against existing technology

barriers (e.g., battery costs) that the PHEV industry is likely to face. Phase 1's case study, based in southern California, concluded that PHEVs can be commercially viable since the reduced operating costs of a PHEV accrued over its ten year lifetime (~15,000 annual vehicle miles traveled) do indeed outweigh the initial vehicle purchase price premium, resulting in significant net cost savings over both conventional vehicles and HEVs.

For PHEVs to comprise 1 million of the area's private vehicles by 2030 (as defined in Phase 1), the project team assumed that appropriate market incentives were established at some point to support steady growth of PHEV sales. Additional interest from early adopters was also anticipated. The PHEV Market Introduction Study will take a closer look at what incentives or regulations are truly necessary to achieve this level of market penetration.

In Phase 1, the project team also outlined several pressing issues that must be addressed over the next two decades to ensure a successful introduction of PHEVs and thriving market beyond 2030. These include:

- Increased federal R&D for advanced batteries
- Increased domestic battery manufacturing capacity
- Passage of supportive policies, regulations and incentives
- Consumer awareness of PHEV benefits
- Integration of PHEV charging with utility smart grid
- Robust private and public charging infrastructure
- Collaboration among utilities and auto OEMs
- Trained technicians to properly service batteries and electrical systems in PHEVs

The project team plan to address these issues from a policy standpoint in the PHEV Market Introduction Study.

OBJECTIVE

The Market Introduction Study will investigate aspects of the industry that require aggressive action in the immediate future to ensure strong market penetration once PHEVs are available for purchase. Supportive policies, regulations, and temporary incentives are likely to be key enablers for a successful market debut.

APPROACH

Overview

The technical approach for identifying critical actions items needed to create and sustain a market for PHEVs is summarized below:

- Gather information on previous and existing policies, incentives and regulations that have been created or proposed in support of introducing innovative vehicles.
- Preliminarily assess the effectiveness of the potential policies, incentives and regulations.

- Identify critical pinch points in the market in which small supply efficiencies could have potentially large effects on the success of the PHEV market.
- Assemble a pre-workshop discussion paper that summarizes preliminary findings and conclusions.
- Schedule, structure, and facilitate a small workshop to discuss and prioritize the topics outlined in the pre-workshop discussion paper. Document activities in workshop report.
- Feed workshop data through consumer preference models to determine which actions have the greatest impact on PHEV sales.
- Compile all major conclusions and recommendations into final report.

Task Statement

This study will be divided into three tasks. Each task will have a logical termination point and will include a deliverable.

Task 1: Workshop Preparation

Task 1 will begin immediately after the Phase 2 award and continue through November 17, 2008, when the Task 1 deliverable is planned for distribution to Workshop invitees. Task 1 activities will focus on preparing documents for this Workshop. Specifically, these activities will include the:

- **Research of Policies, Incentives and Regulations**
Governments have enacted various policies to promote the market introduction and successful commercialization of technologies deemed to have public benefits. During the initial three months of the PHEV Market Introduction Study, Sentech and ORNL will lead in the initial gathering of information on previous and existing policies, incentives and regulations that have been created or proposed in support of introducing innovative vehicles (e.g., electric vehicles, hybrid electric vehicles, fuel cell vehicles) into the marketplace. Potential benefits to PHEV owners may include access to high-occupancy vehicle (HOV) lanes, tax incentives, purchase rebates, etc. Potential incentives to automotive or vehicle component OEMs may include manufacturer tax credits and funding to retool facilities planned for PHEV manufacturing.
- **Impact Assessment of Potential Action Items of PHEV Market Introduction**
Sentech and ORNL will preliminarily assess the effectiveness of the potential policies, incentives and regulations previously gathered. Specific characteristics of each will be pinpointed to determine why certain actions may be more successful in the introduction of PHEV than others. Factors that may affect an incentive's impact may include its rate of saturation (e.g., availability of preferred parking spots) and geographic location (e.g., whether or not HOV lanes exist).
- **Identification of Critical Pinch Points during PHEV Market Introduction**
Sentech and ORNL will identify critical pinch points in the market in which small supply deficiencies could have potentially large effects on the success of the PHEV market. For instance, a shortage in battery components could potentially

cause PHEV sticker prices to skyrocket or can even delay production (as recently experienced by Toyota's Prius line). Sentech will also investigate potential pinch points related to charging infrastructure and smart meter technology.

- **Assembly of Pre-Workshop Discussion Paper on Preliminary Findings**
Sentech will assemble a report that summarizes its preliminary findings and conclusions gathered in the preceding bullets. In this document, the project team will suggest what it believes to be the building blocks of effective legislation for the PHEV industry. The discussion paper will be distributed prior to Task 2's workshop.

Team Member Roles:

- ORNL
 - Project management
 - Conducts significant portion of initial research on policies, incentives, and regulations in coordination with Sentech.
- Sentech
 - Conducts significant portion of initial research on policies, incentives, and regulations in coordination with Sentech.
 - Drafts summary pre-workshop discussion paper to be distributed prior to workshop.
- Mr. Thomas Gross
 - Contributes to market impact assessment on preceding policies, incentives, and regulations.

Task 2: PHEV Market Introduction Study Workshop Planning

In parallel to the initial research conducted in Task 1, Sentech and Energetics will schedule, structure, and facilitate a small workshop to present and discuss the preliminary findings and conclusions outlined in the pre-workshop discussion paper. Task 2 activities will conclude at the close of the workshop on December 2, 2008. Specifically, Task 2 activities include:

- **Develop a Facilitator Plan**
With Sentech's guidance, Energetics will develop a facilitator plan which will outline the purposes of the technical workshop, logistical requirements, focus questions, and facilitation techniques. Energetics will lead a telephone call to discuss comments and suggestions for improvement. Based on feedback, a final facilitation game plan will be produced.
- **Conduct Workshop**
A small workshop tentatively schedule for December 1-2, 2008, in Washington, D.C., will be jointly facilitated by Sentech and Energetics. Note takers will be present in all sessions to document key points of discussion. Workshop invitees will include the Guidance and Evaluation Committee, any additional consultants, and representatives from PNNL and UMTRI.

- **Prepare Workshop Report**

A workshop report will be prepared to document the results of each breakout sessions. The report will include a list of participants, summaries of the notes presented in tabular format, and a written narrative that summarizes the major findings and conclusions.

Team Member Roles:

- ORNL
 - Project management
 - Six participants in Workshop
- Sentech
 - Provides guidance on facilitation plan development
 - Assist in drafting meeting agenda
 - Provides one facilitator and one notetaker
 - Provides workshop notes and summary report from facilitation group
 - Drafts workshop report from information in facilitation group reports
- Energetics
 - Plans workshop logistics
 - Prepares facilitators plan
 - Assist in drafting meeting agenda
 - Provide one facilitator and one notetaker
 - Provides workshop notes and summary report from facilitation group
- Mr. Thomas Gross
 - Will participate in Workshop

Task 3: Analysis of Workshop Findings

Task 3 includes all post-workshop activities, including:

- **Feed Workshop Data Through Consumer Preference Models**

Once all potential action items have been compiled and prioritized, it will be sent to analysts at ORNL and UMTRI/PNNL to be inputted into each of their consumer preference models. With these models, the project team will be able to observe which action items are likely to have the greatest impact on overall PHEV sales nationwide. Characteristics of each action item that may be weighed by the models include cost of implementation, value to consumer, and rate of saturation.
- **Assembly of Action Items and Incorporation of Feedback into Final Report**

Sentech will combine information in the workshop report with consumer preference model outputs to draft the final report. Sentech will assign a technical writer to thoroughly review and edit the document for content and format. Mr. Gross will also review and edit the final report as necessary. The final report is scheduled for delivery to the client approximately six months after the Phase 2 award.

Team Member Roles:

- ORNL
 - Project management
 - Analyze workshop data with consumer preference model
- Sentech
 - Draft final report
 - Review and edit report
- Mr. Thomas Gross
 - Contribute to review and edit of report

DELIVERABLES

- Monthly activity reports due no later than the 15th of the month following the report period (i.e., report covering July 2008 would be due on August 15, 2008). Activity reports shall be sent via e-mail to the TPO, Robert DeVault, devaultrc@ornl.gov, office phone 865-574-2020.
- Task 1 Deliverable: Pre-workshop discussion paper of preliminary findings and conclusions to be provided to workshop participants
 - Due November 17, 2008
- Task 2 Deliverable: PHEV Market Introduction Study Workshop Report
 - Due January 31, 2008
- Task 3 Deliverable: Market Introduction Study final report
 - Due six months after Phase 2 award

SCHEDULE

