

## Systems Analysis

### Summary of Annual Merit Review Systems Analysis Subprogram

#### Summary of Reviewer Comments on Systems Analysis Subprogram:

The reviewers considered the Systems Analysis Subprogram essential component to the Hydrogen Program mission and critical to the President's Hydrogen Fuel Initiative. The projects are considered appropriately diverse and focused on addressing technical barriers and meeting targets.

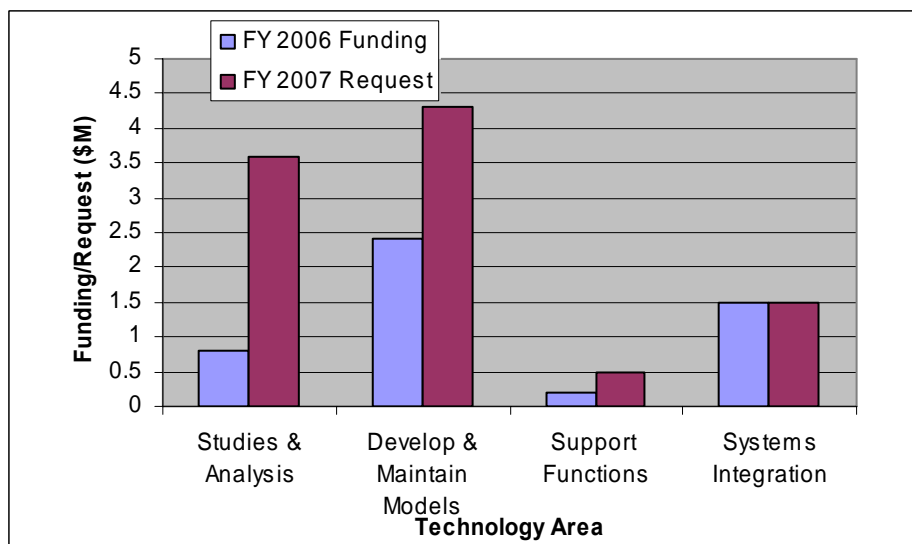
In general, the reviewers noted that Systems Analysis is a complex subprogram but is receiving the appropriate management attention. Some reviewers commented that the subprogram is well managed and has adopted an organized approach for analytical support of the Hydrogen Program, which is consistent with addressing the comprehensive list of identified barriers.

The major concerns identified by the reviewers for Systems Analysis were: 1) coordination and cooperation with the other DOE offices, e.g., Biomass, Solar and Wind, is required; 2) the plan for how the analytical parts fit together should be defined; 3) roles of the various models should be described; and 4) a summary of the common set of inputs and assumptions used for the modeling should be provided. The Systems Analysis subprogram addresses these issues in the Systems Analysis Plan which is soon to be issued.

Finally, the reviewers commented on the need to understand the international drivers and factors impacting a hydrogen economy. The models and systems should evolve to include the analysis of the impact of the world economy on the U.S. fuel systems.

#### Systems Analysis Funding:

The funding portfolio for Systems Analysis primarily addresses the model development and required analysis to support the Technology Readiness Goal. The requested 2007 funding profile, subject to Congressional appropriation, addresses the National Academies' Report recommendations and provides greater emphasis on the transition analysis.



### **Majority of Reviewer Comments and Recommendations:**

In general, the maximum, minimum and average scores of the reviewers of the Systems Analysis projects were 3.7, 2.7 and 3.1, respectively. The Systems Analysis project portfolio includes a mix to address the “analysis and modeling gaps” of the subprogram and the transition requirements. The major recommendations for the Systems Analysis projects are summarized below. DOE will act on the reviewer recommendations for the overall Systems Analysis effort.

- **Hydrogen Production Infrastructure Options Analysis Project:** Consider adding actual supply and demand data from gasoline station performance to answer questions of committing overcapacity/supply without policy incentives. Emphasis should be directed to analyzing the advantages/disadvantages of different pathways that minimize capital risk early in the transition.
- **Impact of Hydrogen Production on U.S. Energy Markets Project:** Focus on the linkage and integration with other models to insure consistent inputs, outputs and assumptions are being utilized. Introduce plug-in hybrid technology in the analysis of alternative pathways for energy security.
- **Analysis of the Hydrogen Production and Delivery Infrastructure as a Complex Adaptive Model Project:** Considering the complexity of the modeling approach, incorporate a broader advisory group to enhance the model applicability and adaptability with other models. Ensure the agents representing industry include risk profiles, spending practices and business goals. Introduce methodology to analyze policy implications.
- **WinDS-H<sub>2</sub> Model and Analysis Project:** Ensure this model is incorporated in the Macro-System model architecture. Focus on adding demand forecast information and model output in the model as a next step. Consider the addition of gasoline hybrid and plug-in hybrid technology in the modeling structure.
- **Macro-System Model Project:** Ensure common and consistent assumptions and inputs are utilized in the linked models. Emphasis on a coherent summary report product from the model is required.
- **Hydrogen Transition Modeling and Analysis: HyTrans v.1.2:** Ensure the model analytical capabilities include plug-in hybrid and other alternate fuel vehicles.
- **Hydrogen Analysis Resource Center (HyARC) Project:** Focus on continued maintenance and updates to the resource center. Introduce international data and information as a resource. Consider adding safety and education information/data to the resource center.











































