Scenario Evaluation and Regionalization Analysis (SERA) Model
## *(National Renewable Energy Laboratory)*

Objectives

Determine optimal regional infrastructure development patterns for hydrogen and other transportation fuels, given resource availability and technology cost estimates. Geospatially and temporally resolve the expansion of production, transmission, and distribution infrastructure components. Identify and characterize niche markets and synergies related to refueling station placement and early fuel cell electric vehicle adoption areas.

Key Attributes & Strengths

The model integrates production, transmission, and delivery components spatially and over time, taking into account legacy effects and market dynamics. Feedback between fuel cost, station availability, and vehicle purchase decisions are included while intra-urban clusters of fueling stations, production and delivery networks, and fuel cell electric vehicle adoption dynamics are resolved. The vehicle adoption submodel can replicate results from other analytic models, such as ADOPT or MA3T. The model's internal architecture is flexible, and is compatible with geographic information systems and the H2A suite of models.
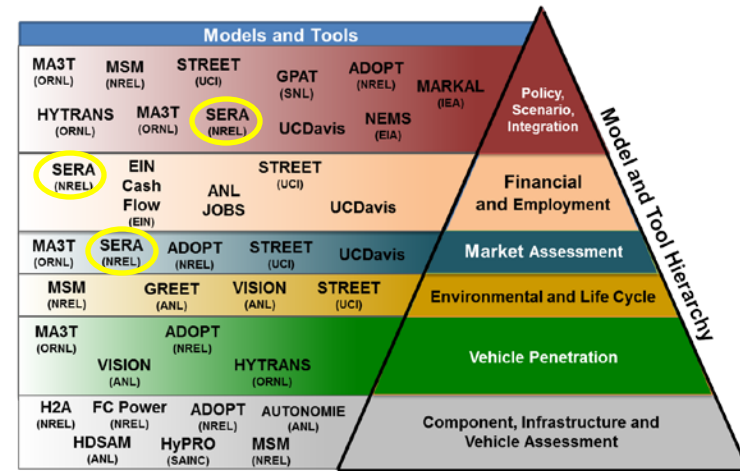
Platform, Requirements & Availability

Runs on multiple platforms (Windows, Mac, Linux), the model is not available to the public.

INPUTS	ASSUMPTIONS & DATA	OUTPUTS
• Techno-economic information from the H2A suite of models. • Feedstock price data from the EIA's Annual Energy Outlook projections. • Census and Polk data for spatial characterization of demand.	• Agnostic regarding the source of cost data. • Somewhat limits the infrastructure configurations that are allowable in the optimization. • Does not incorporate supply or demand curves, except implicitly when feedback between prices and consumer choice is included in the analysis.	• New vehicles sales and stock. • Fueling station placement and network expansion. • Location and timing of construction of new hydrogen infrastructure. • Cash flows for hydrogen infrastructure and vehicle costs.