

Technology Evaluation and Integration Group

Center for Transportation Technologies and Systems

Highlights

NREL's TEI Group supports the reduction of U.S. petroleum consumption by developing online tools, providing technical assistance, and conducting analysis for several transportation-related DOE programs.

The goal of the TEI Group is to provide our models and tools to help government and industry decision makers analyze strategies for developing a sustainable transportation system.

The TEI Group's diverse staff includes engineers, information specialists, environmental analysts, and marketers—all of whom have years of experience in the alternative fuels and advanced vehicles field.

The TEI Group supports the deployment of alternative fuel and advanced vehicles to improve air quality in U.S. cities and reduce dependence on foreign oil.

The Technology Evaluation and Integration (TEI) Group catalyzes alternative fuel and advanced vehicle deployment to help reduce U.S. petroleum consumption in the transportation sector.

As part of the National Renewable Energy Laboratory's (NREL) Center for Transportation Technologies and Systems (CTTS), we accomplish this by providing analysis, online tools, data and information, and technical assistance to industry, government, and the public. Our current projects are funded by four programs within the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE)—Vehicle Technologies; Federal Energy Management; Hydrogen, Fuel Cells, and Infrastructure; and Biomass. This document summarizes the work we do to support these EERE programs.

Vehicle Technologies Program: *Clean Cities*

Clean Cities is a voluntary partnership program involving local champions, or "coordinators," who bring together critical stakeholders from industry, government, business, and the public in their communities to implement alternative fuel and advanced vehicle projects. Coalitions represent almost 90 cities, metropolitan regions, and states across the country. NREL's TEI Group provides support to local coalitions in the form of training, technical assistance, and information and outreach materials. NREL also assists DOE with programmatic and technical analysis related to the implementation of these technologies. For example, we have analyzed the business case economics for installing E85 infrastructure at existing gasoline stations and provided geographic analyses to inform the placement of new alternative fuel stations based on vehicle populations and existing stations. We also actively work with key players in the fuel and vehicle industries to facilitate solutions to market barriers and obtain data and resources that can support activities in coalitions in the field.

Vehicle Technologies Program: Alternative Fuels and Advanced Vehicles Data Center

The TEI Group produces the Alternative Fuels and Advanced Vehicles Data Center (AFDC), a comprehensive Web-based clearinghouse of data, publications, tools, and information related to advanced transportation technologies. Primarily funded by Clean Cities, the AFDC hosts more than 3,000 documents and a number of robust interactive tools that help fleets and consumers make decisions about

vehicles and fuels. Many of the documents and resources available on the AFDC were developed by the TEI Group. Our tools include:

- The Alternative Fueling Station Locator, which allows users to map locations of alternative fueling stations nationwide.
- The Truck Stop Electrification Site Locator, which pinpoints U.S. truck stops equipped with idle reduction technologies.
- The Federal and State Laws and Incentives database, which details tax benefits and legislation related to alternative fuels and advanced vehicles.

The TEI Group develops and manages the content, databases, and educational tools featured on the AFDC Web site.

The TEI Group creates specialized tools to help regulated state and alternative fuel provider fleets meet and surpass their EPA requirements.

In addition, the AFDC features resources that enable visitors to look up and compare specs on hybrid electric and other vehicles, download educational documents and materials, and analyze historical data and trends.

Vehicle Technologies Program: EPA Regulated Fleets

The Energy Policy Acts (EPA) of 1992 and 2005, along with the Energy Independence and Security Act of 2007, established requirements for state and alternative fuel provider fleets related to alternative fuels and advanced vehicles. These fleets are required to acquire alternative fuel vehicles (AFVs) as a large portion of their new vehicles and, in some cases, to use alternative fuel. If they prefer, they have the option to develop an Alternative Compliance strategy that reduces their petroleum consumption in lieu of purchasing AFVs. Other aspects of the legislation require analyses of various policy options and potential benefits of new alternative fuels, which the TEI Group supports.

NREL's TEI Group provides data management and analysis support to DOE for the State and Alternative Fuel Provider Rule by collecting required annual reports on fleet vehicles and activities. In addition, in fiscal year (FY) 2007, NREL developed an online tool and tutorial to assist fleets in developing Alternative Compliance strategies that take advantage of the

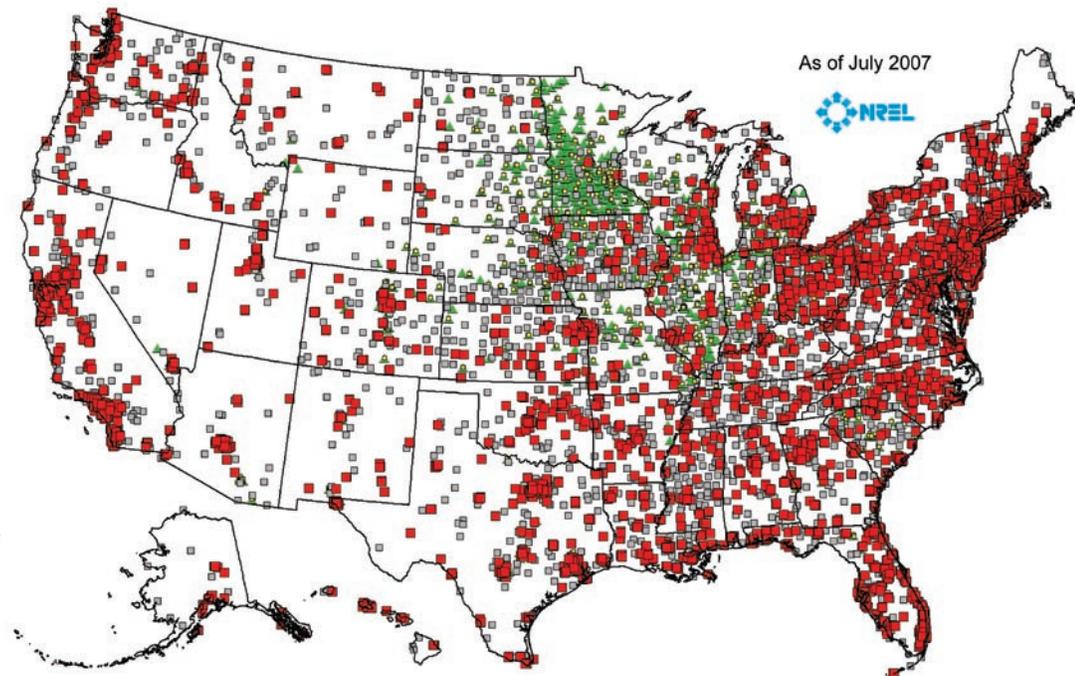
benefits of hybrid electric vehicles, alternative fuels, low-level fuel blends, truck idle reduction technologies, and other strategies for reducing their use of gasoline and diesel. NREL's TEI Group also provides technical assistance, training, and information about best practices to regulated fleets to help them meet and surpass their EPA requirements.

Federal Energy Management Program: Federal Fleet Requirements

Federal fleets are also regulated under federal legislation and must comply with requirements under executive orders. In January 2007, President Bush signed Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management, which requires agencies with 20 or more vehicles in the United States to decrease petroleum consumption and increase alternative fuel use relative to their FY 2005 baseline through FY 2015. Similar to our work with state and alternative fuel provider fleets, we provide analysis and implementation support to DOE and assistance to federal fleets to help them meet their requirements. One recent activity focused on identifying alternative fueling stations within a five-mile radius of garages for federal vehicles. This activity brought together the vehicle location data from the federal fleets with station location data from the AFDC.

Biomass Program: Biofuels Information Center

In late FY 2007, the EERE Biomass Program asked NREL's TEI Group to develop a Biofuels Information Center (BIC) featuring information and data related to biofuel feedstocks, production, and distribution. The BIC was envisioned as a companion resource to the AFDC with a focus further up the fuel production chain. Like the AFDC, the purpose of the BIC is to facilitate the near-term implementation of biofuels as opposed to longer-term research and development activities. The first phase



One way the TEI Group supports federal fleets is by creating maps showing the locations of nearby alternative fueling stations.

Washington Potential Biofuel Use
 These maps represent a snapshot in time and are updated periodically. Learn more by going to [Data Sources and Dates](#).

Select a State: [Dropdown] [Go]

Current Situation in Washington	
Gasoline Use	2,566 million gal.
Diesel Use	626 million gal.
Total Cellulosic Biomass	9.1 million dry T
Total Crop Biomass	0.3 million dry T
E85 Stations	5
Biodiesel Stations	26
Ethanol Plants	1
Ethanol Production Capacity	55 million gal.
Biodiesel Plants	4
Biodiesel Production Capacity	109 million gal.

Potential Use	
Technology Scenario	Million Gallons
0 Percent Utilization of FFVs	0.0
B2 Biodiesel Blend	13.8
Number of New Stations Required	
E85	0
Biodiesel	171

[Calculate]

The TEI Group's State Assessment for Biomass Resources helps users understand the potential for biomass resources in their states.

of the new site went live in April 2008. Among other resources, the site provides a new tool to help states assess the potential for biomass resources in their states based on available feedstocks, potential demand, and nearby infrastructure.

Hydrogen Program: HyDRA Model

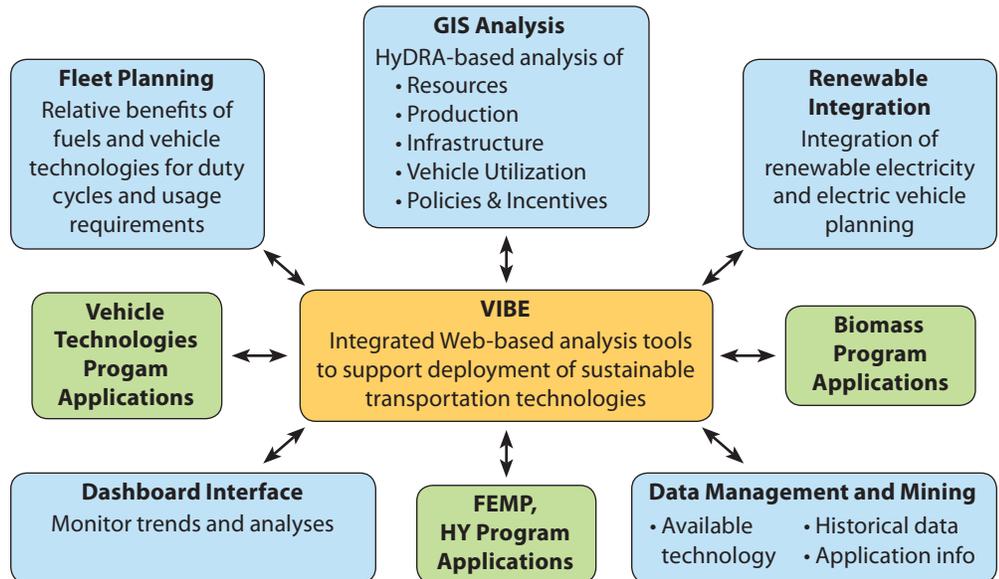
The Hydrogen Demand and Resource Analysis (HyDRA) tool was developed for the EERE Hydrogen, Fuel Cells, and Infrastructure Technologies Program with guidance from the FreedomCAR and Fuel Partnership Fuel Pathway Integration Tech Team. This Web-based geographic information system (GIS) application allows analysts, decision makers, and general users to view, download, and analyze hydrogen demand and infrastructure data both spatially and dynamically.

Spatial analysis is critical for developing implementation strategies for hydrogen. Hydrogen can be produced from a variety of feedstocks that will vary regionally. Demand and infrastructure availability will also vary regionally. HyDRA facilitates regional analyses by allowing users to combine data to understand how optimal configurations of hydrogen systems vary regionally. In the future, users of other alternative fuels could benefit from similar analyses.

Where We're Headed

Our vision involves integrating our models and tools to help decision makers throughout the transportation sector analyze strategies for developing a sustainable transportation system. Each of the resources we've developed represents an important piece of the puzzle in transforming the transporta-

TEI Group Capabilities



The TEI Group is developing VIBE, a new application that will integrate the tools and resources created for individual programs to help accelerate deployment.

tion sector. Whether it's geographic analysis of renewable resources and fuel infrastructure, the connection between the utility grid and plug-in hybrid electric vehicles, decisions a private fleet must make between competing technologies and fuels, or analysis of the economics of an E85 fuel station, the creation of an integrated, publicly available tool will help us leverage individual decisions into a sustainable path forward.

Who We Are

The TEI Group is composed of individuals with diverse backgrounds in engineering, marketing, Web and database development, environmental science and law, computer program-

ming, business management, economics, communications, and public administration. Our experience includes original equipment manufacturers/government relations, biofuels research and development, vehicle sales, policy and regulatory analysis, and energy marketing, along with many years of collective experience in alternative fuels. We also draw resources and technical expertise from other groups at the lab and from private companies through subcontracts in the areas of fuel and vehicle research, GIS analysis, computer programming, communications, and policy analysis. This diversity of experience and skills brings a unique perspective to our projects, allowing us to deliver exceptional value to our clients.

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See our work on the following Web sites:

- *Clean Cities*: www.eere.energy.gov/cleancities
- *AFDC*: www.eere.energy.gov/afdc
- *EPA Act Regulated Fleets*: www.eere.energy.gov/vehiclesandfuels/epact
- *Federal Fleets*: www.eere.energy.gov/femp/about/fleet_requirements.html



Transportation Technologies



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