NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Alternative Fuels Data Center and API

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Overview

Timeline

Project start date: 1991

Project end date: Ongoing

Percent complete: N/A

Barriers

- Availability of alternative fuels and electric charging station infrastructure
- Availability of alternative fuel vehicles (AFVs) and electric drive vehicles
- Lack of technical experience with new fuels and vehicle technologies

Budget

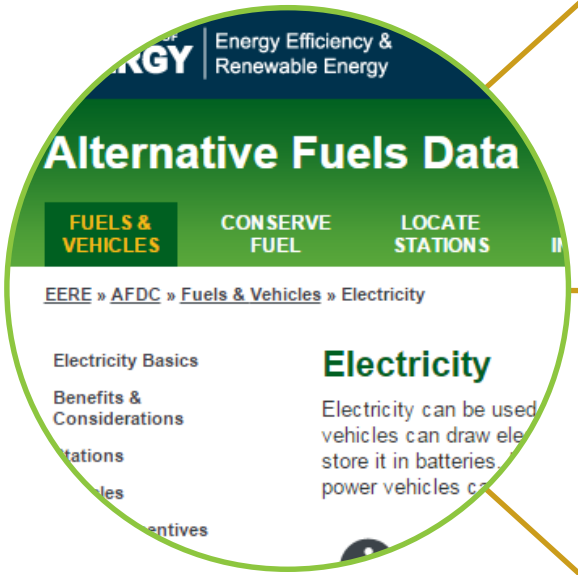
Total project funding: $965k ($2.6M in Category)
NREL budget categories: *Technical and Problem Solving Assistance,* Consumer Information and Outreach, *Local Coalitions and Partnerships*
% of annual allocation for budget category: 37%

Team Members

- **Project leads:** DOE Clean Cities program, NREL
- **DOE programs:** BETO, FEMP, H&FC
- **Vehicle Technology Office:** Hybrid Electric Systems, Fuel Technologies and Deployment
- **Labs:** ORNL, ANL
- **Collaborations:** Industry, Clean Cities Coordinators, INL, DOE T2M, ICF

Relevance – Addressing Barriers

The Alternative Fuels Data Center (AFDC) is a clearinghouse for information that reduces the barriers to adopting alternative fuel technologies



Fuel Available

- Web Station Locator*
- iPhone Station Locator*
- Android Station Locator*
- APIs
- Widgets

Vehicles Available

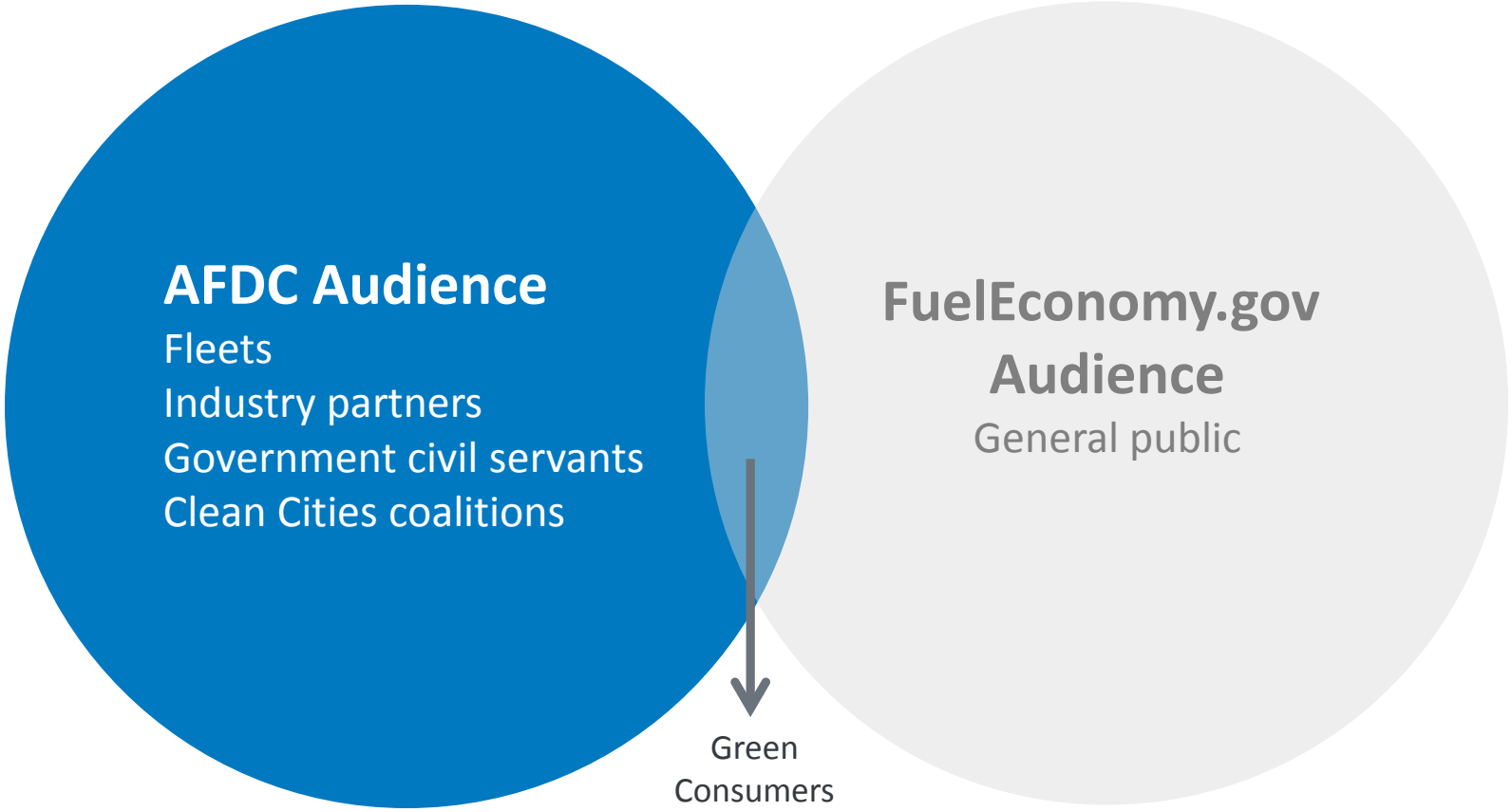
- FuelEconomy.gov*
- Alt Fuel Vehicle Search
- TransAtlas
- Laws and Incentives

Technical Expertise

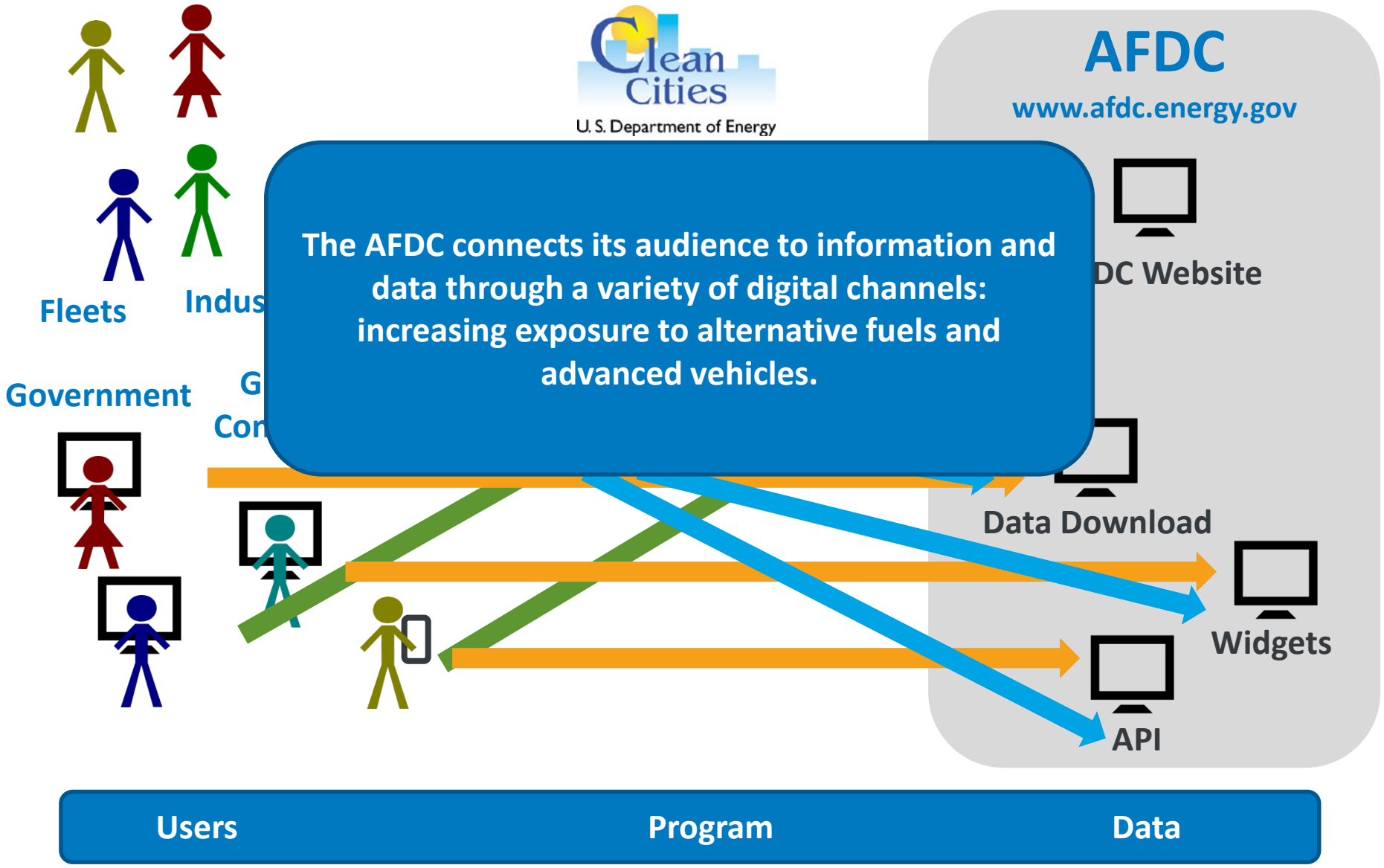
- Case Studies
- Publications
- AFLEET*
- PEV Scorecard
- VICE Model

*Discussed in other Clean Cites AMR presentations

Relevance - Audience



Relevance – The Role of the AFDC



Project Approach – Objective

AFDC Overall

Overall Objective: The AFDC provides information, data, and tools to help fleets and other transportation decision makers find ways to reduce petroleum consumption through the use of alternative and renewable fuels, advanced vehicles, and other fuel-saving measures. (**afdc.energy.gov**)

FY14 and FY15 Objectives:

- Increase impact through new data sharing techniques

Annual Objectives:

- Report measured impact through quarterly metrics reports
- Ensure data and content on site is accurate and current

AFDC APIs

Overall Objective: Provide data to developers, analysts, and partners via Application Programming Interfaces (APIs) (**developer.nrel.gov and api.data.gov**)

What is an API?

- Securely shares data using standard methods and data formats
- Allows the data owner to maintain ownership and control of the data
- Ensures the user always gets the most up to date data

FY14 and FY15 Objectives:

- Create API for laws and incentives data
- Enhance station data

Annual Objectives:

- Report measured impact through quarterly metrics reports
- Respond to user and partner needs

Project Approach – Users, Markets and Metrics

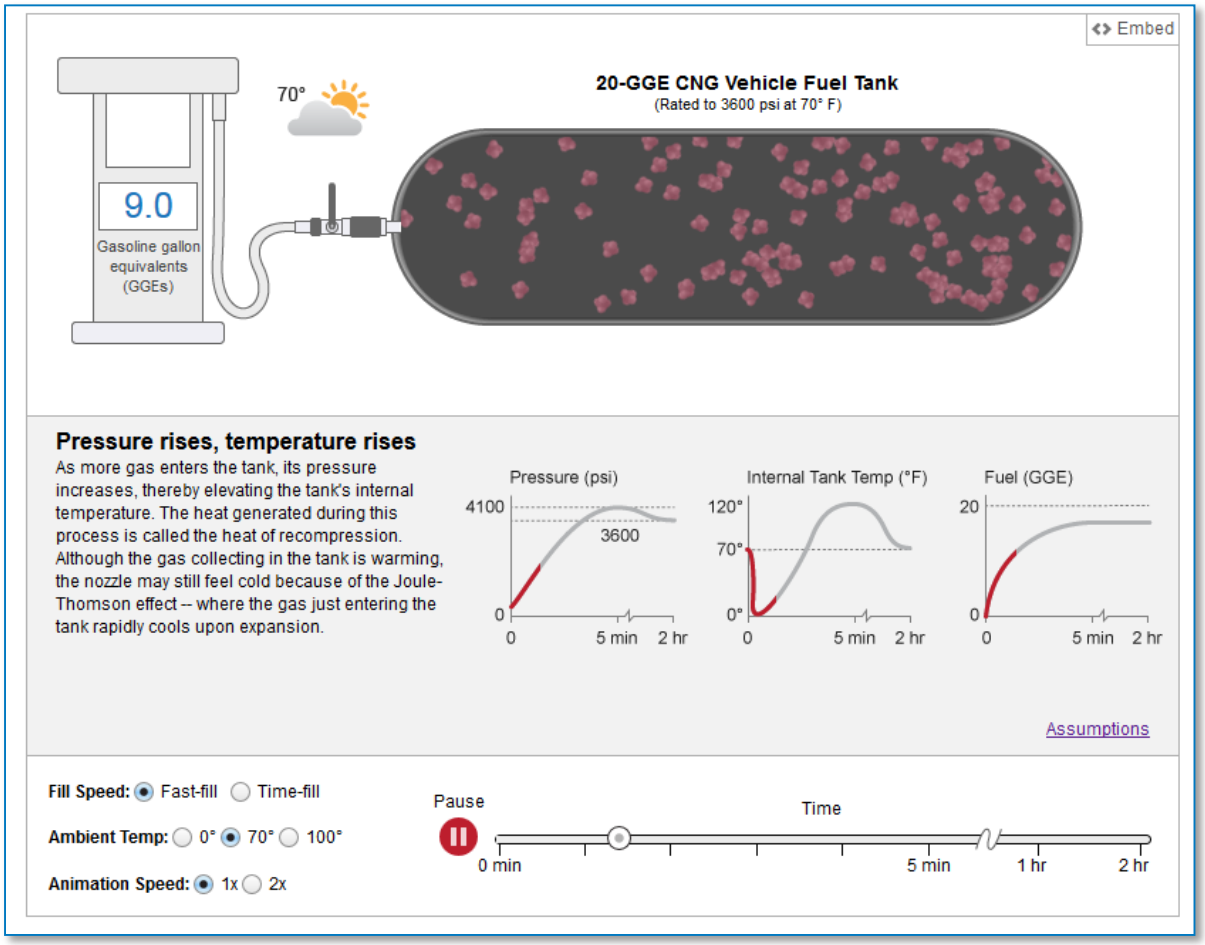
Gaseous Fuels vs. Liquid Fuels example

Driven by input from our market partners

Helps non-technical users understand how gaseous fuels work

3,800 people have viewed since September 2014 launch

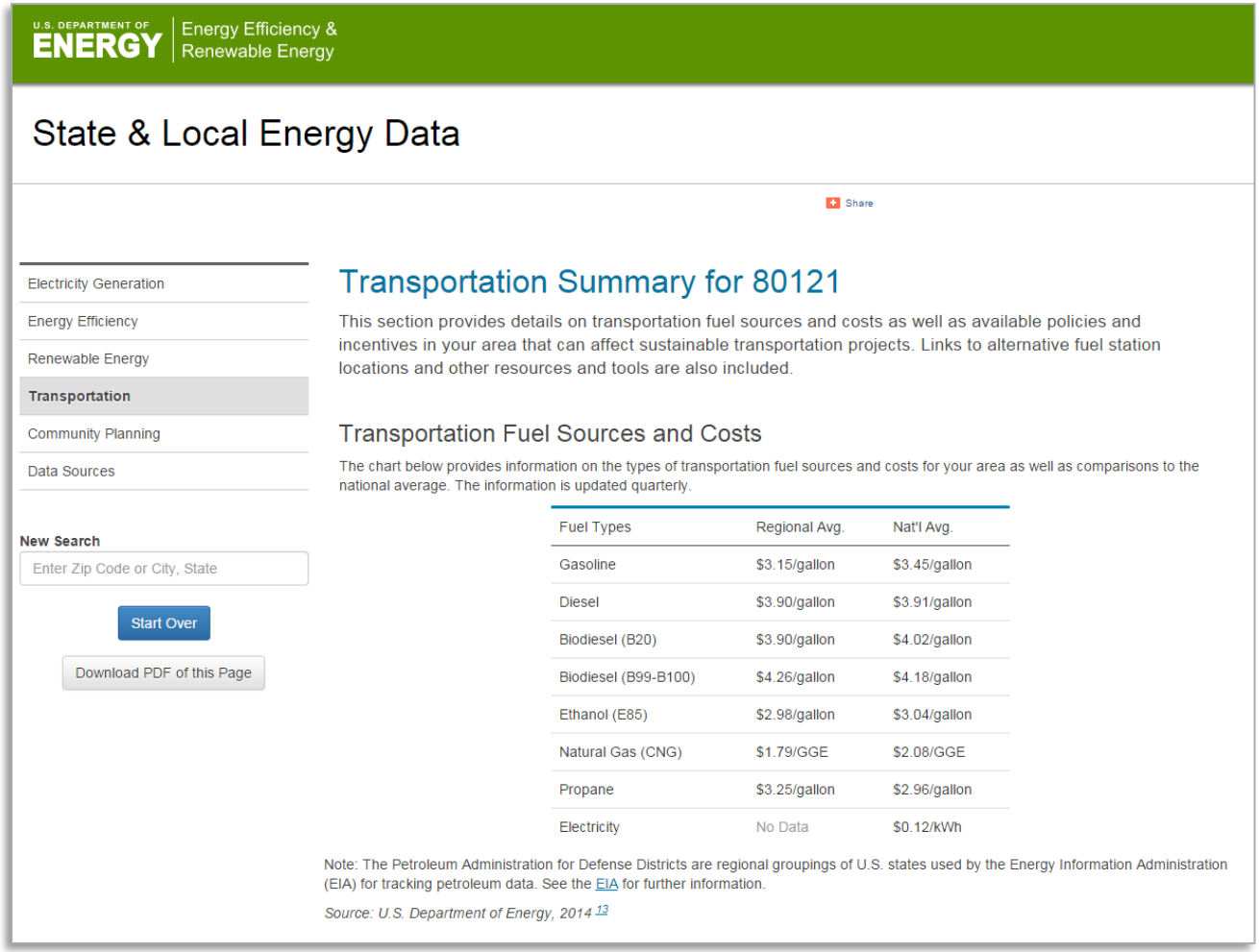
Leveraged to create hydrogen tank visualization



Project Approach – Users and Collaboration

SLED Tool

The DOE Technology-to-Market Program (T2M) built the State & Local Energy Data (SLED) tool to help communities understand their energy markets. AFDC widgets and APIs were used to build the transportation section.

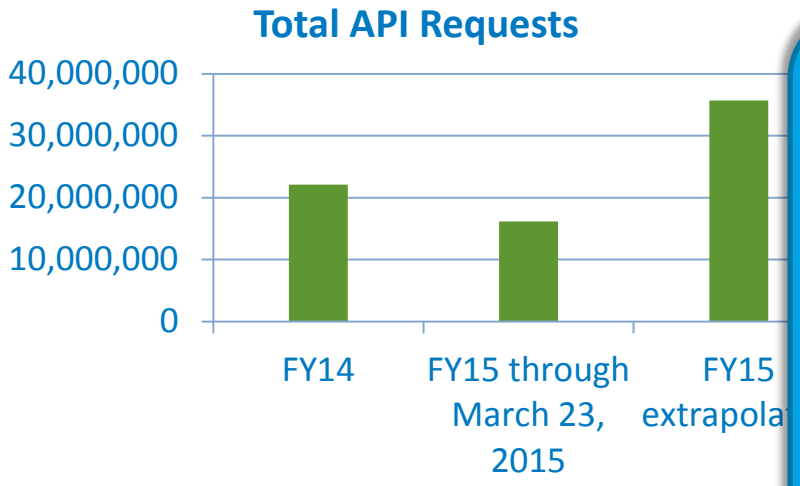


http://apps1.eere.energy.gov/sled/#/

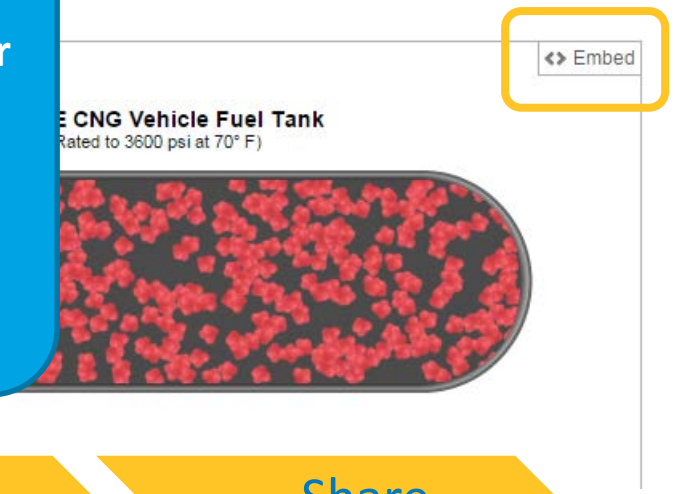
Project Approach – Users and Data Sharing

Data Stream

Create API → Use API internally → Share API externally



The AFDC provides data and applications for end users to enhance their own sites, analyses and tools.



Tool and Content Stream

Create application → Use application on AFDC → Share application as widget

Milestones

Month / Year	Milestone or Go/No-Go Decision	Description	Status
12/2013 FY14	Milestone	Provide a statistics report on the web activity for AFDC and Clean Cities websites.	Complete
12/2014 FY15	Go/No-Go	Determine if current Outreach and Information plan is effective and initiate necessary changes. Criteria – Collect feedback from CC stakeholders to determine continued usability of and need for information products.	Complete
12/2014 FY15	Milestone	Provide a statistics report on the web activity for AFDC and Clean Cities websites.	Complete

Project Accomplishments and Progress – FY14

Leading the Way at EERE

Clean Cities continues to lead the way for the Office of Energy Efficiency and Renewable Energy (EERE). EERE has over 140 websites and here's how the AFDC stacks up:

24% of FY14 pageviews are to the AFDC

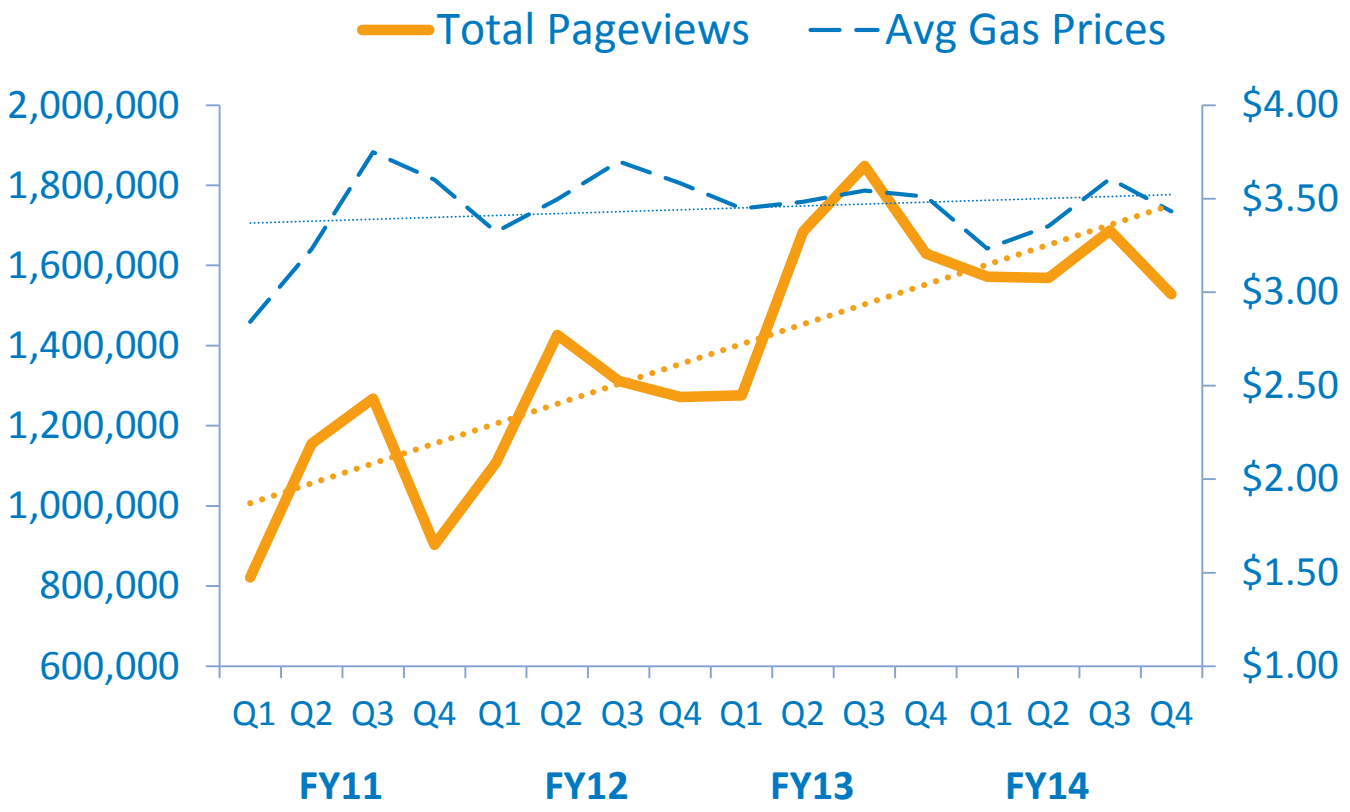
11 of the top 25 EERE pages were AFDC pages

Top EERE Pages FY14
EERE Home Page
Solar Decathlon: Home Page
How Wind Turbines Work
AFDC: Station Locator
AFDC: Home Page
Solar Decathlon: Scores
EnergyPlus Energy Simulation Software
Building Energy Codes Program
AFDC: Electric Charging Station Locations
Status of State Energy Code Adoption
Solar Decathlon: Registration
AFDC: Alternative Fuels and Advanced Vehicles
AFDC: E85 Station Locations
How Does a Wind Turbine Work?
REScheck
Solar Decathlon: Teams
EnergyPlus Energy Simulation Software: Register
AFDC: Vehicle Cost Calculator
Steam Turbine Calculator
AFDC: Maps and Data
AFDC: State Laws and Incentives
AFDC: Biodiesel
AFDC: Natural Gas Station Locations
Energy Plus: Weather Data
AFDC: Laws and Incentives

Project Accomplishments – Continued Growth

The AFDC has seen continued growth over the past four years even as gas prices fluctuate.

In FY14, 1.4 million visitors viewed 6.4 million pages on the AFDC.

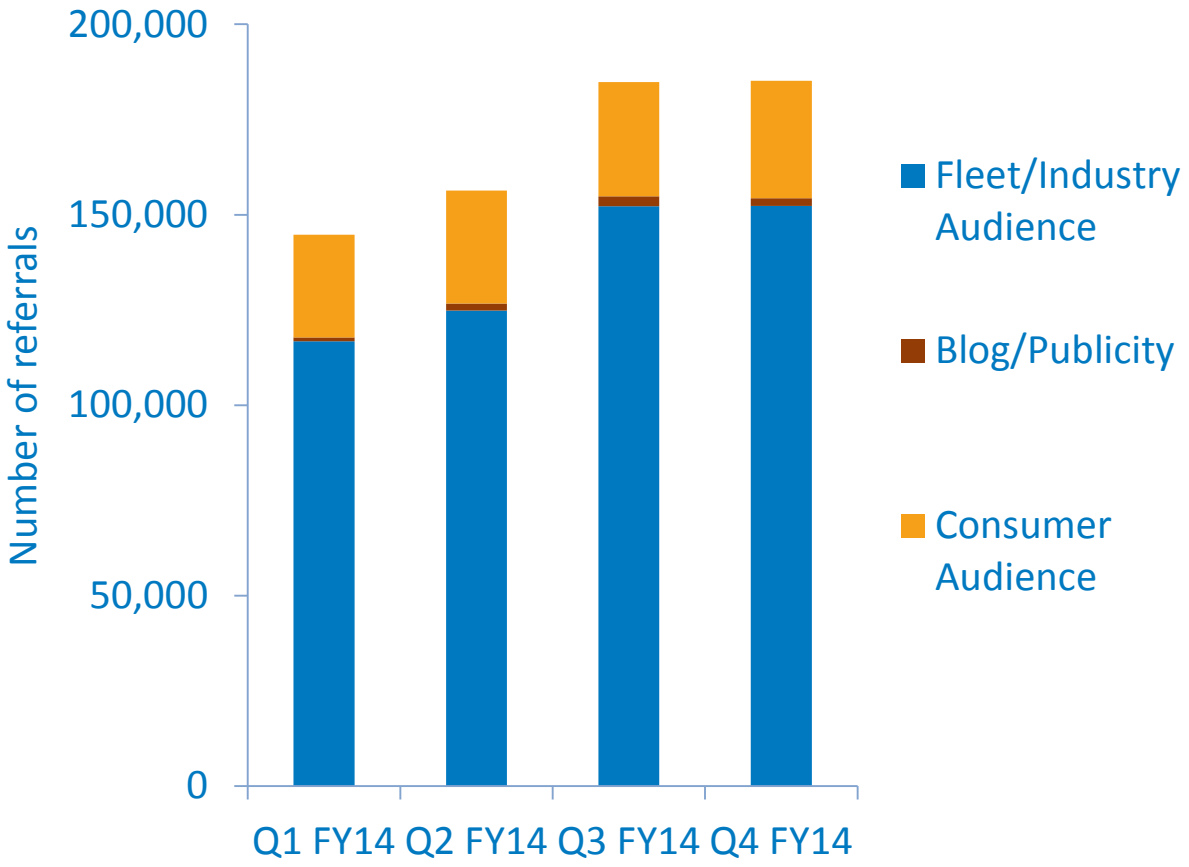


Visit Summary	FY14 Total
Pageviews	6,355,104
Sessions	1,808,478
Average Pages per Visitor	3.51

Project Accomplishments – Markets

Subset of Referrers Consistently in the Top 40 (2012-2014)
fueleconomy.gov
teslamotors.com
afdc.energy.gov
energy.gov
eere.energy.gov
automobiles.honda.com
content.bmwusa.com
edmunds.com
en.wikipedia.org
metroplugin.com
pge.com
nps.gov
smartusa.com
dsireusa.org
cngvc.org
ngvamerica.org
epa.gov

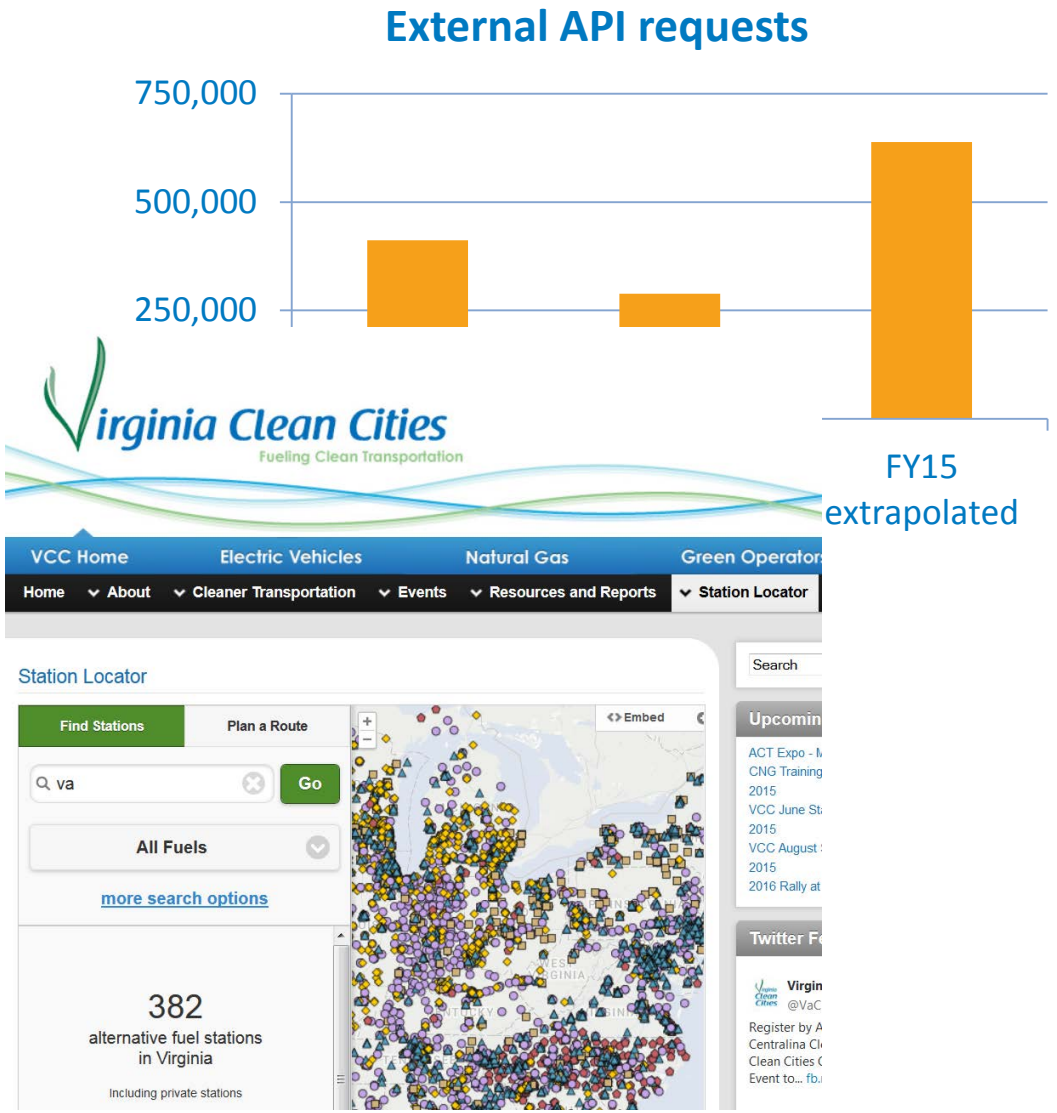
Measuring sites that send traffic to the AFDC helps find new partners and ensure we are providing value to our existing market partners



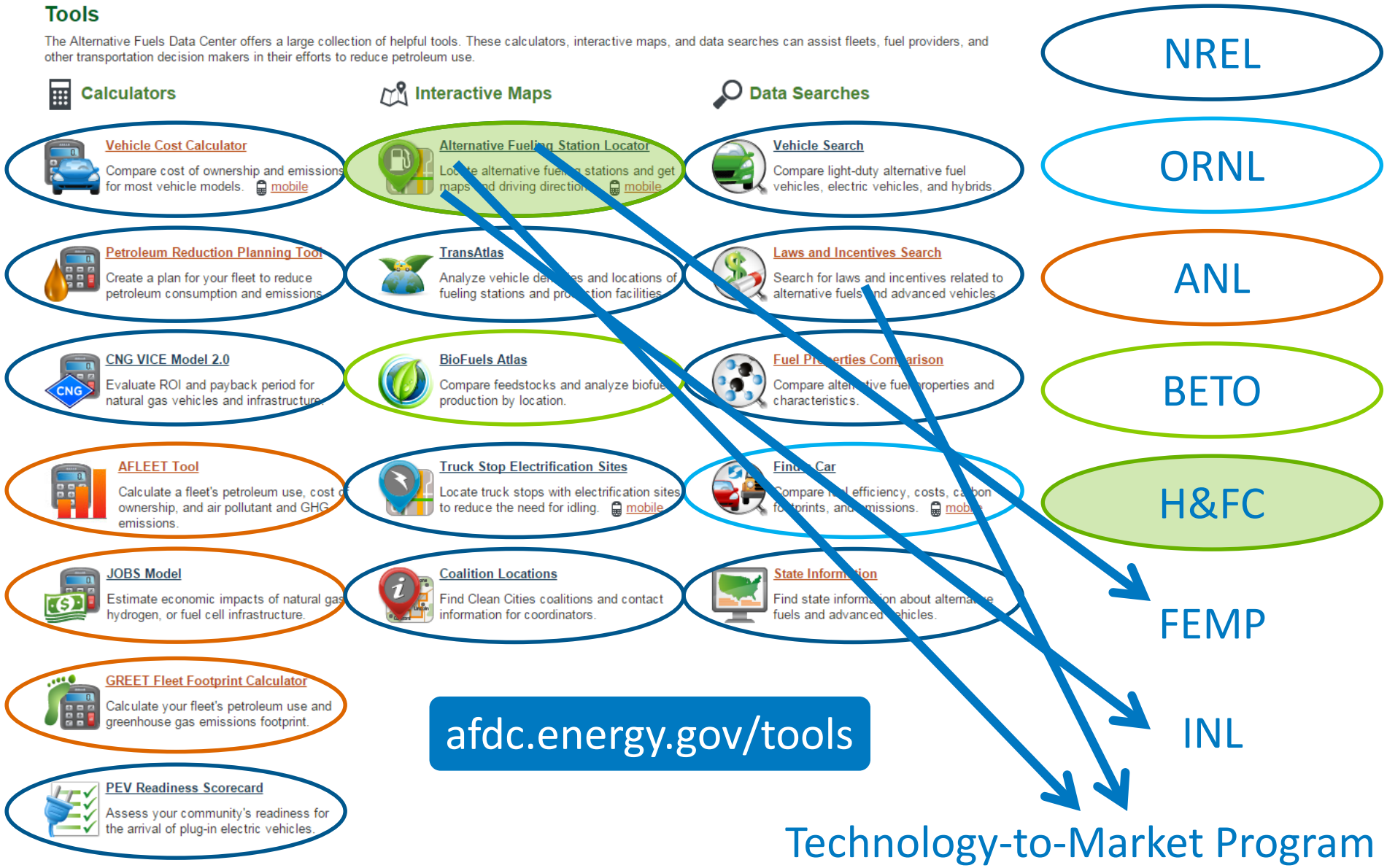
Project Accomplishments – API and Data Sharing

API - 422,661 requests in FY14
Fiat
Department of Labor
Recargo
Chevy
INL
EPA
Volkswagen
Illinois State DOT
General Electric

Widgets
Washington Post
Chevy
ABC News
EERE
FuelEconomy.gov
Clean Cities Coalitions
City of Chicago



Project Collaboration and Coordination – Tools



Alternative Fuel Market Expansion - FY15 plans

Significant Updates

- State Pages
- Webinar Database
- Data Download
- Station Locator
- Station Admin
- Clean Cities Template
- Search Functionality
- Publication Order Form
- Annual Report

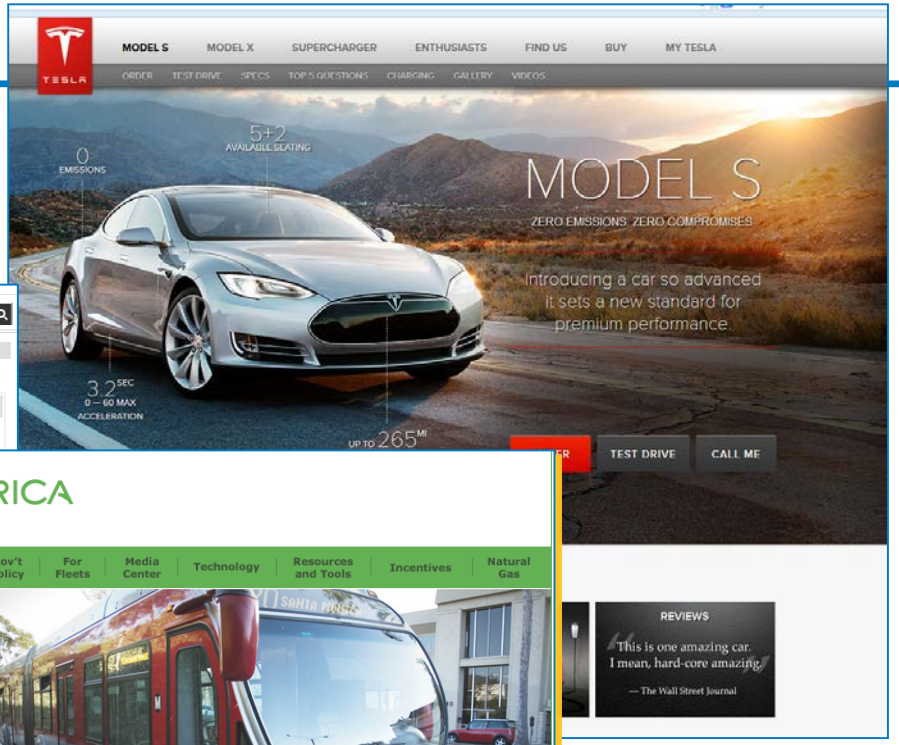
Leveraging Existing Assets

- Lemay Museum Apps
- Niche Market pages
- Fuel Properties
- Propane Widget
- Impact Metrics

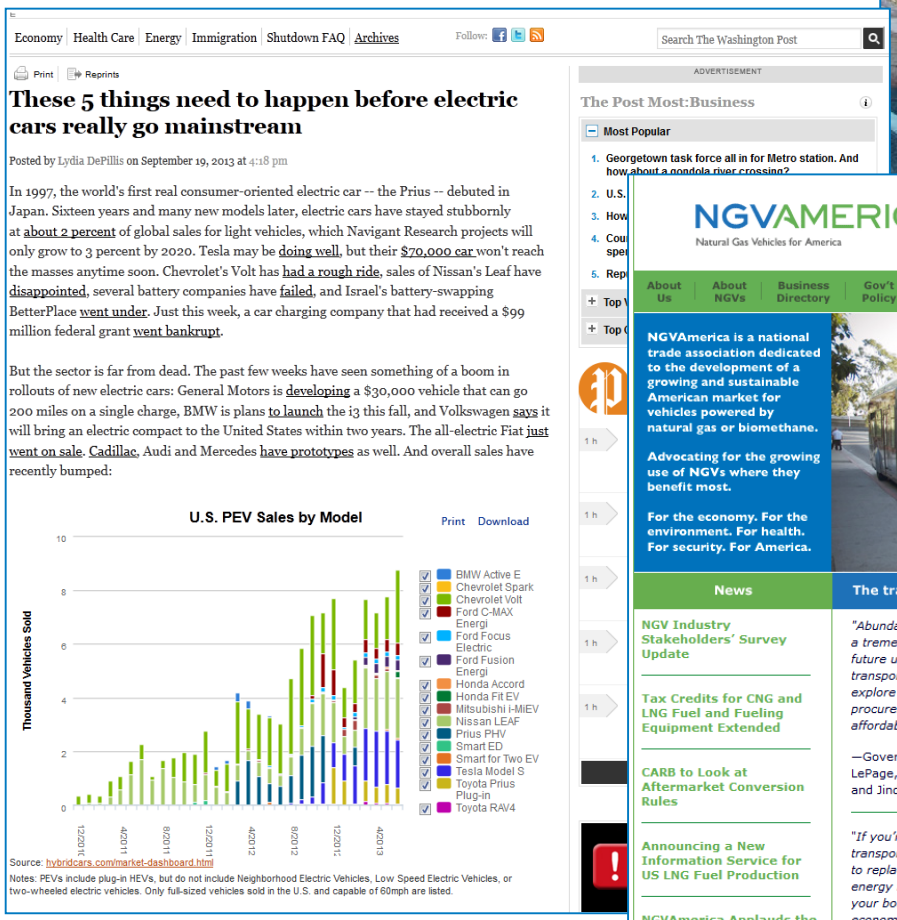
Expansions

- Price Reporting Tool
- Station Android App
- Toolbox Login
- ARRA Conclusions

Alternative Fuel Market Expansion



Consumer



Publicity/Blog

Fleet/Industry

Summary

- AFDC is a market and user driven website
- In FY14 we accomplished
  - 1.4 million visitors viewing 6.4 million pages
  - Continued growth even as gas prices fluctuate
  - Enhancement of API and data download capabilities
  - Application sharing through widgets
- Effectiveness is measured quarterly and metrics drive change
- Collaboration with our key audiences expands the alternative fuel market
  - Fleets, Industry Partners, Government Civil Servants, Clean Cities Coalitions
- Leveraging assets developed by AFDC has supported
  - Industry Partners by providing data and applications
  - GSA to build api.data.gov
  - DOE programs including Hydrogen and Fuel Cell and Technology to Market to visualize data
  - DOE websites including Energy.gov, EERE, FuelEconomy.gov, FEMP

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Technical Back-Up Slides

Project Accomplishment – User Feedback

I am truly impressed with the wealth of information and the fact so much of this information is truly up to date and accurate. This website shows that the team at AFDC take pride in their work and believe their mission to be important..and it is. This website and the AFDC is a valuable resource that allows my company to pursue its objective of providing the lowest carbon clean and compliant alternative fuel solutions to the US fleets. I feel confidant that the information provided here is accurate and unbiased, which can not be said for the privately funded sites. Thanks again for your hard work and dedication.

Dr. John Reed
CEO, North American Repower
March 7, 2014

I want to congratulate whomever organized this website. It is well organized, easy to navigate, multiple links to help the visitor find what they are seeking, easy on the eyes, and contains a ton of great information.

Great job!

Dean Wickstrom
(Just some guy from Minnesota)
January 31, 2014

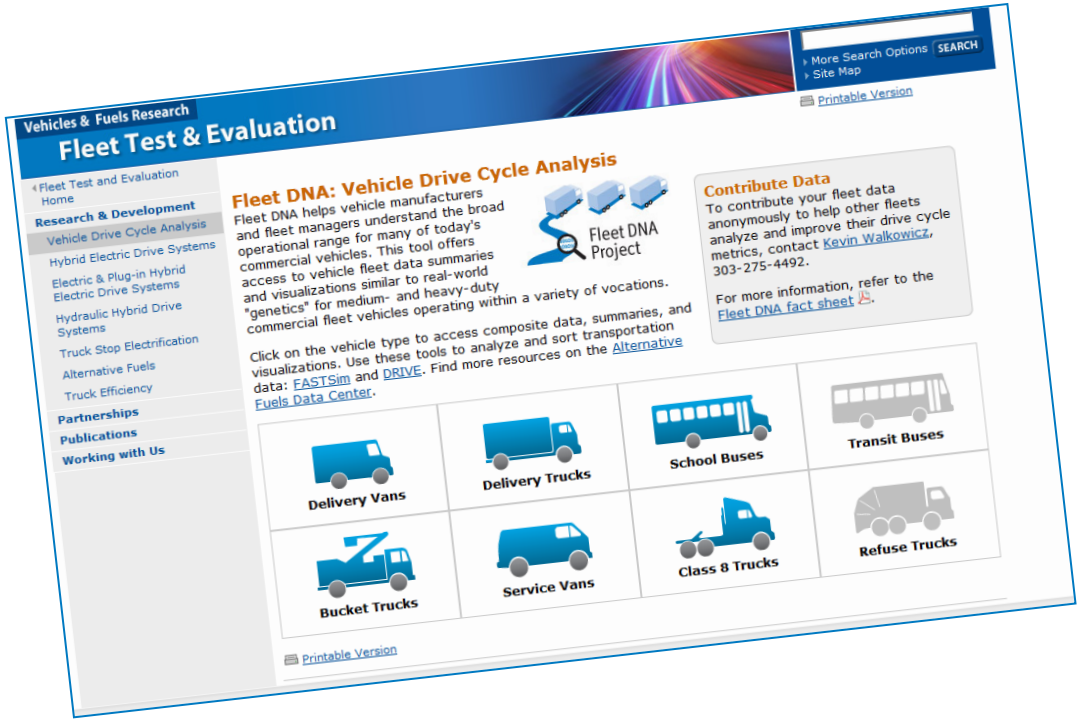
"I know you guys hear this all the time but the resources are incredible. Thank you."

Maggie Stritz-Calnin
Lansing Clean Cities
April 9, 2014

Project Accomplishment – Collaboration with VTP

FleetDNA Tool

- Leverages AFDC Maps and Data to visualize drive cycle data for commercial vehicles



- Data will be used in the future to create qualitative and quantitative case studies about fleets using alternative fuels
- API created to access summarized drive cycle data

Project Accomplishment – Fuel Neutral

The AFDC provides quality content for all fuels and is a trusted resource regardless of the ebb and flow of fuel popularity.