Electric Vehicle Technologies Workshop Session EV-09 Vehicle Electrification – Policy and Market Transformation

Presented by

Samantha Bingham

Chicago Department of Transportation

April 23, 2014

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About the Lecturer…

- Sam Bingham is an Environmental Policy Analyst at City of Chicago Dept. of Transportation (7+ years)
- Coordinator for Chicago Area Clean Cities Coalition
- Education
  - BS Public Affairs, Indiana University - Bloomington
- Obtains and manages over $56M in federal grants for air quality improvement transportation projects
- Assists in developing City policies and ordinances
- Encourages and supports local fleets to reduce dependence on petroleum

Outline

- Introduction to U.S. DOE's Clean Cities program
- Overview of transportation electrification policy landscape, issues, barriers and solutions
- Review of recent local EV adoption analysis
- Next steps for Chicago

Clean Cities

Clean Cities Mission

To advance the energy, economic, and environmental security of the U.S. by supporting local decisions to reduce petroleum use in transportation.

- Energy Policy Act of 1992 (EPAct)
- Provides a framework for businesses and government agencies to work together
- Goal: Reduce U.S. petroleum use by 2.5 billion gallons per year

Clean Cities

U. S. Department of Energy

www.cleancities.energy.gov

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Clean Cities Coalitions

- Nearly 100 coalitions throughout the United States
- 660,000 AFVs using alternative fuels

* Total includes more than 16,000 electric charging sites.

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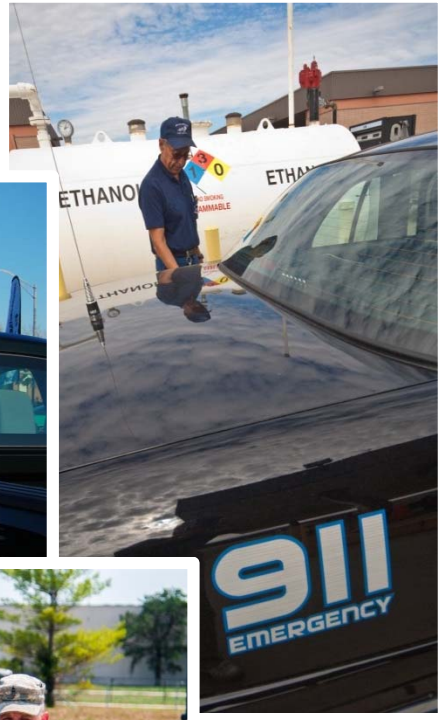
Clean Cities Stakeholders

Coalitions are made up of local and national stakeholders.

- Almost 18,000 stakeholders nationwide
- 48% private-sector stakeholders
- 52% public-sector stakeholders



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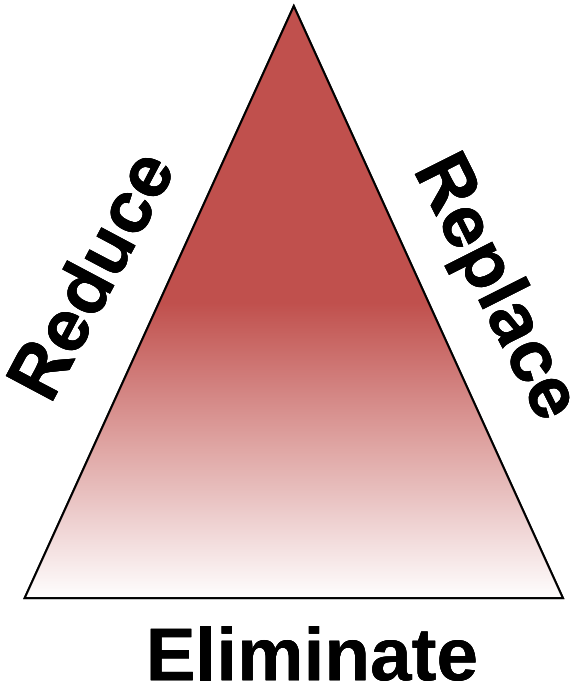
Clean Cities Strategies

- **Replace** petroleum with alternative and renewable fuels
- **Reduce** petroleum use through fuel efficiency measures, smarter driving practices
- **Eliminate** petroleum use through idle-reduction and other fuel-saving technologies and practices



Clean Cities has saved nearly 4.5 billion gallons of petroleum since 1993.

Clean Cities Portfolio of Technologies

Alternative and Renewable Fuels

- Biodiesel
- Electricity
- Ethanol (E85)
- Hydrogen
- Natural gas
- Propane

Fuel Economy

- Fuel efficient vehicles
- Driving habits
- Vehicle maintenance

Idle Reduction

- Technologies
- Behavioral changes

Trip Elimination

- Telecommuting
- Ridesharing

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Clean Cities Strengthens Markets

- Connecting fleets with fuel providers and industry partners
- Training and information
- Technical assistance
- Funding
- Education and outreach to decision makers, fleets, and the public

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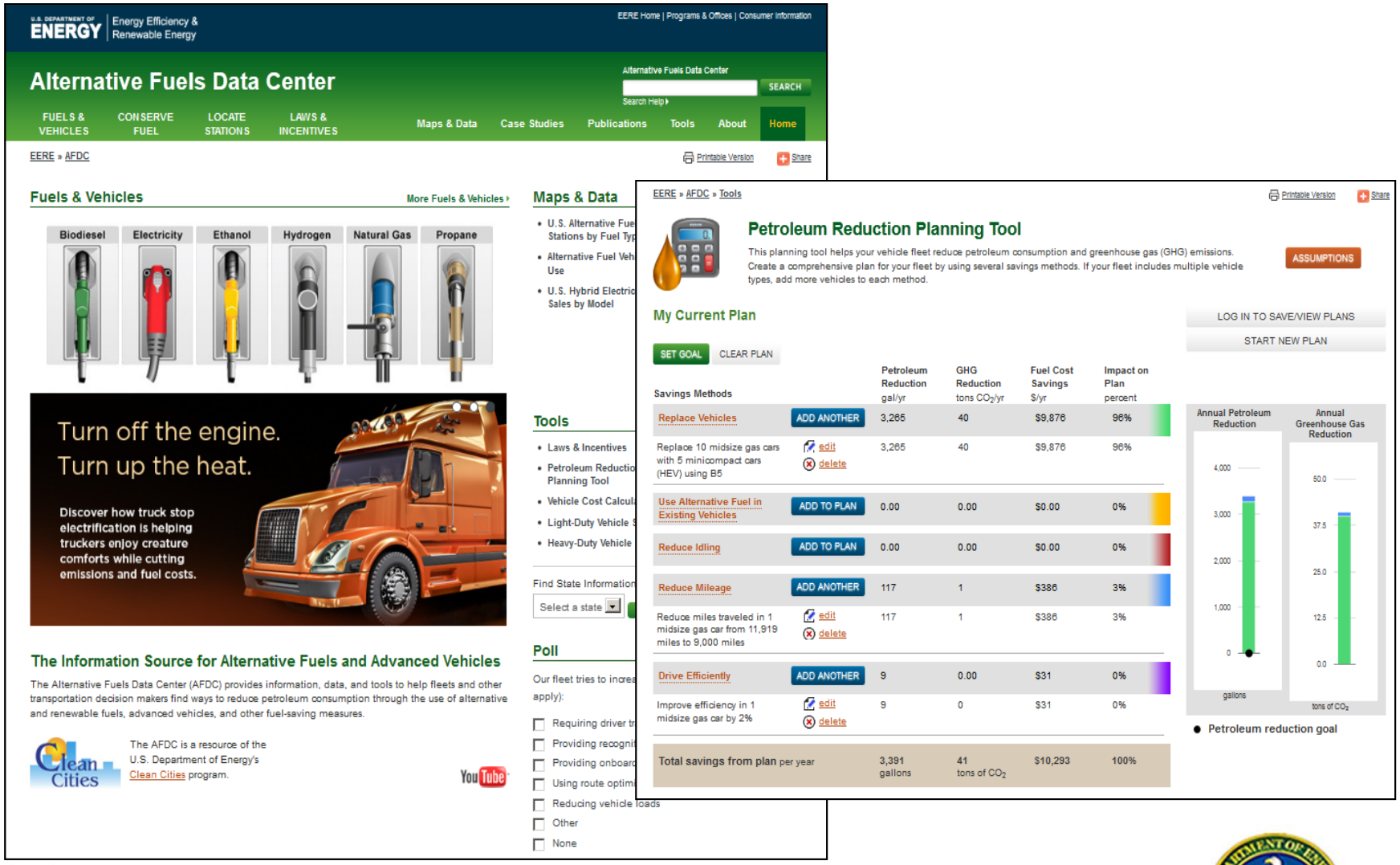
Alternative Fuels Data Center



www.afdc.energy.gov

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FuelEconomy.gov

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Office of Transportation & Air Quality | U.S. ENVIRONMENTAL PROTECTION AGENCY

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Save Money

- Gas Mileage Tips
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In the news...

2013 Dodge Dart Limited: Gas-Mileage Drive Report - Green Car Reports

2013 Mercedes-Benz GLK250 Bluetec gets 33 mpg, priced from $38,950* - Autoblog

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New on fueleconomy.gov...

- 2014 Model Year Vehicles
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Alternative Fuels Station Locator

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User Name:

Password:

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*User name and password are case sensitive.

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Chicago Area Clean Cities Background

History

- Formed in 1992, designated 10th Clean Cities coalition May 1994
- Coordinator designated by the City of Chicago

Area

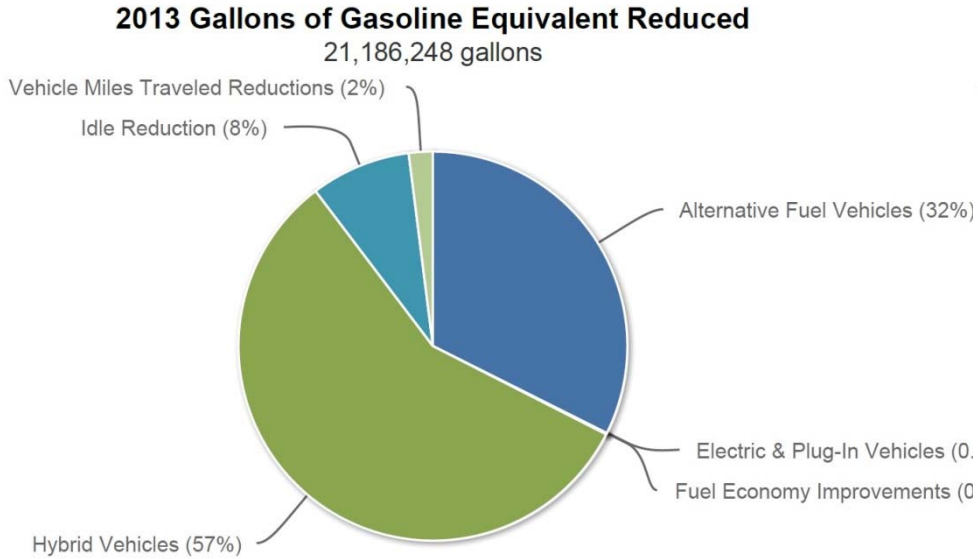
- 6-county Chicago area: Cook, DuPage, Kane, Lake, McHenry, and Will
- Support state-wide legislation and education events
- Lake Michigan Clean Cities Consortium

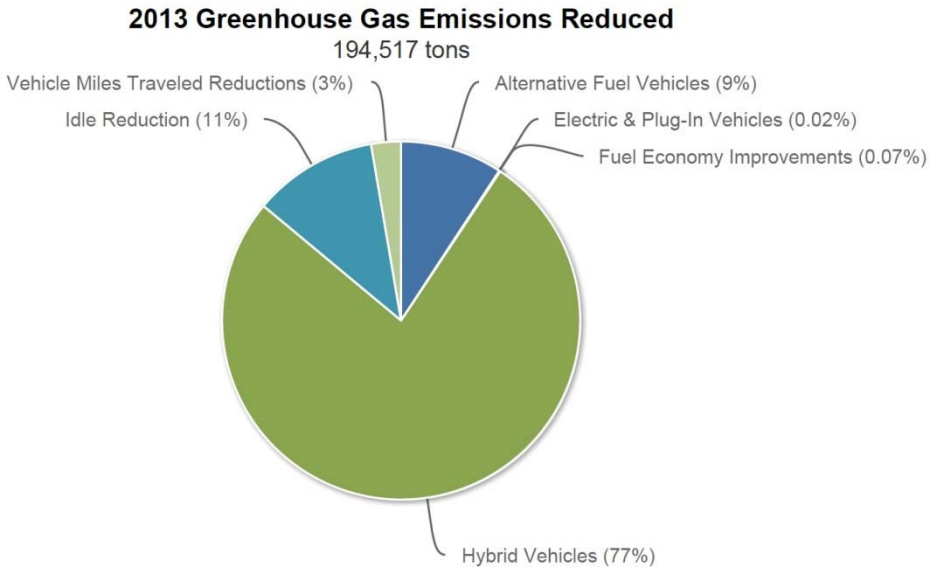
Coalition Structure

- Coordinator housed within City of Chicago Department of Transportation
- Executive Board directs activities and mission of the coalition
- Over 500 stakeholders, 70 dues paying members
- 3-4 coalition meetings per year coupled with educational event
- USDOE support funds, sponsorships and dues fund coalition activities
  - Grants support deployment and planning activities

Coalition Accomplishments

Since 2005, the coalition has reduced petroleum use by approximately 93 million gasoline gallon equivalents.





-Annual 2013 Transportation Technology Deployment Report: Chicago Area Clean Cities Coalition, *March 2014*

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Program Longevity

1994 **2014**

www.ChicagoCleanCities.org

Online Information Resources

Clean Cities

www.cleancities.energy.gov

Alternative Fuels Data Center

www.afdc.energy.gov

FuelEconomy.gov

www.fueleconomy.gov

Clean Cities Coordinators and Coalitions

www.afdc.energy.gov/cleancities/coalitions/coalition_locations.php

Chicago Area Clean Cities Coalition

www.ChicagoCleanCities.org

Supporting Sustainable Transportation Policy

City of Chicago is a national leader in applying new technologies and policies to support the City's sustainability goals

- Sustainable Chicago 2015 & CDOT's Chicago Forward
- 20 years supporting Chicago Area Clean Cities Coalition
- Green Taxi, Procurement and Other Policies
- Regional Alternative Fuel Deployment Projects

"The City of Chicago is committed to an environment in which energy efficient vehicles are the norm, not the exception…"
- *Mayor Rahm Emanuel*

www.cityofchicago.org/sustainability

www.cityofchicago.org/cdot

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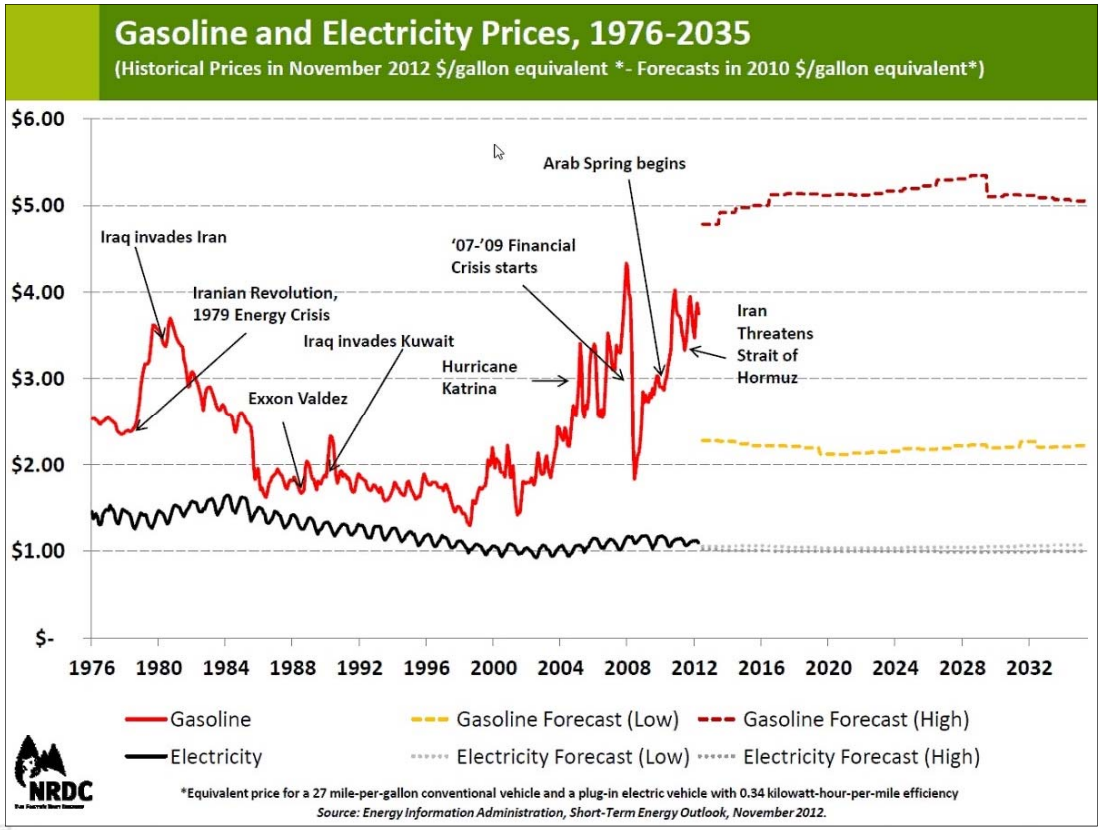
Benefits of EVs

- Environment and Economic impact
  - E-mobility can help Chicago reduce area **GHG emissions** and **improve quality** of life for citizens while securing **economic benefits**



- Natural Resource Defense Council slides for webinar to National Governors Association, *2/13/13*

Challenges

- "Chicken and egg" dilemma of EVs and ecosystem (charging, battery recycling, etc.)
- Charging infrastructure availability and range concerns of EV users
- EV clustering and impact on grid
- Home charging EV users without access to private secure garages (e.g., condo residents)
- Speed of permitting and inspection process for charger installations
- Limited awareness of EVs and proper usage

City's Goals

- Increase awareness and create a favorable ecosystem around EVs and e-mobility
- Remove hurdles to the adoption of EVs in the City of Chicago
- Maximize the environmental and economic benefits of e-mobility

Solutions

- **ECOSYSTEM**
  - Enhance Chicago's ecosystem for electric vehicles by improving infrastructure and removing obstacles to their adoption
- **ENGAGEMENT**
  - Increase awareness and attractiveness of electric vehicles in Chicago
- **CONTINUOUS IMPROVEMENT**
  - Track and measure progress to adjust policies, incentives and business models to increase EV adoption

Solution: ECOSYSTEM

1st Phase public charging program

- State of Illinois & City of Chicago supported
- 168 charging stations installed 2011-2012
  - 26 DC Fast Chargers - CHAdeMO

Station Location	City	Station Host	Level	Cumulative kwh
111 South Halsted Street	Chicago	Walgreens	Level 2	2154.397
15 Buffalo Grove Rd	Buffalo Grove	Walgreens	Level 2	1763.675
111 South Halsted Street	Chicago	Walgreens	Level 2	1564.115
1528 N Kingsbury St	Chicago	Whole Foods	Level 2	1430.174
700 East Tri-State Toll Road	South Holland	Toll Oasis	Level 3	1193.02
915 S Paulina	Chicago	UIC	Level 2	773.842
321 E Erie St	Chicago	Northwestern University	Level 2	767.013
15 Buffalo Grove Rd	Buffalo Grove	Walgreens	Level 2	717.63
200 Wilmot Rd	Deerfield	Walgreens Corporate HQ	Level 2	680.932
900 Dodge Ave	Evanston	Walgreens	Level 2	671.392
10345 W Roosevelt Rd	Westchester	Walgreens	Level 3	545.02

- Clean Cities Recovery Act Project Status & Data Quarterly Report, *4th Quarter 2013*

Solution: ECOSYSTEM

Expand User Experience by Leveraging Car-Share Organizations Membership Base

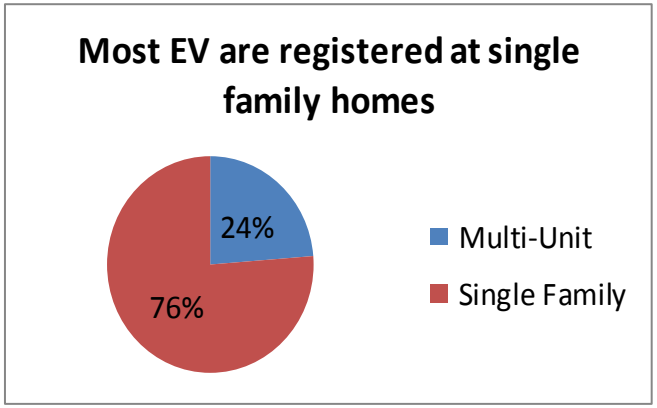
- 8 EVS, 6 PHEVs

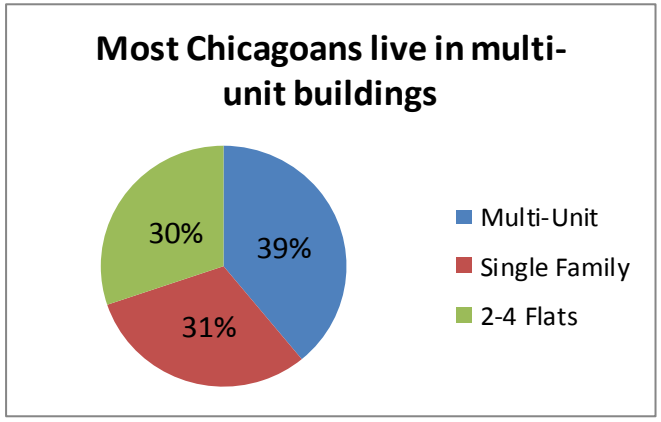
Solution: ECOSYSTEM

Guidance for EV owners by different user segment

- The continued growth of Chicago's electric vehicle fleet is dependent on the ability of Chicagoans to install residential plug-in electric vehicle (PEV) chargers

- A number of physical and social limitations make it difficult to install PEV chargers in multi-unit dwellings (MUDs)
  - According to Clerk data, 395 EVs were registered in Chicago in 2013, with an estimated **76% of those to single family addresses**
  - **31% of Chicagoans live in single family homes**





- Review of City of Chicago electric permits and IL DCEO EVSE rebate program participants

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Solution: CONTINUOUS IMPROVEMENT

- # of PHEVs and EV in Chicago

Polk Illinois EV Data December 13, 2013		
CITY OF CHICAGO		
MAKE	606XX Zip Codes	COUNT
Chevrolet Volt		173
Fisker		11
Ford Focus Electric		6
Mitsubishi Imev		5
Nissan Leaf		70
Smart Fortwo		
Tesla Model S		110
Tesla Roadster		10
Toyota Plug-in Prius		10
	TOTAL	395

Best in Class EV City Highlights

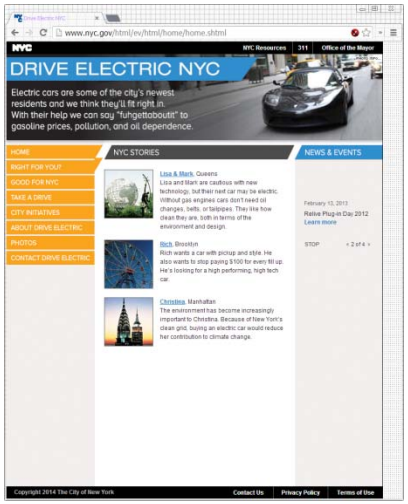
MUD EV Encouragement Initiatives	New York	San Francisco	San Diego	Seattle	Chicago
Public guidelines	**X**	**X**	**X**	**X**	**Opportunity**
Simplified permitting process		**X**		**X**	**In place**
Funding programs		**X**	**X**		**Possible collaboration opportunity**
Ordinance – Remove barriers to retrofit in existing buildings		**X**	**X**		**Opportunity**
Ordinance – EV readiness for new buildings	**X**				**Opportunity**
Total EVs as of 2013	1,200[1]	1,000[2]	6,000[2]	900[3]	395[4]
EVs per 1,000 people	0.14*	1.21	4.84	1.42	0.14

Source: 1. NYC Clerk data, 2. State of California rebate data, 3. City of Seattle estimate, 4. City of Chicago Clerk data

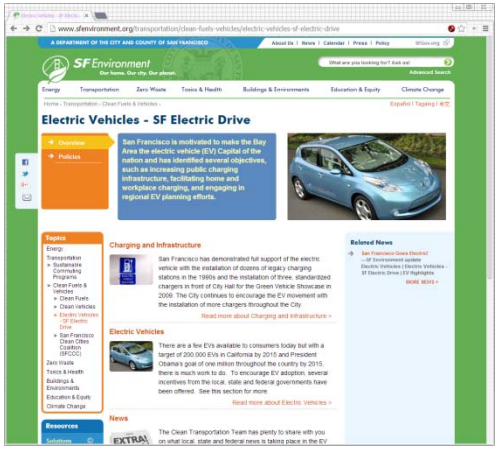
Potential Next Steps

1. Finalize and distribute electric vehicle charger installation **guidelines** to interested residents and building management
   - All peer cities have resident guidelines, some have also done building guidelines
2. Launch **a partnership to encourage installations** and use of State incentives dollars ($7 million in DCEO grants available for EV charging infrastructure)
   - Example: San Francisco, San Diego
3. **Create policy to support installations**
   - Ordinance to ease barriers in existing buildings; *Example: San Francisco, San Diego*
   - Ordinance to require EV readiness in new construction citywide; *Example: New York*
   - **Alternate path**: Amend the Chicago Sustainable Development policy to require EV readiness in Planned Developments or projects receiving TIF

Example Guidelines

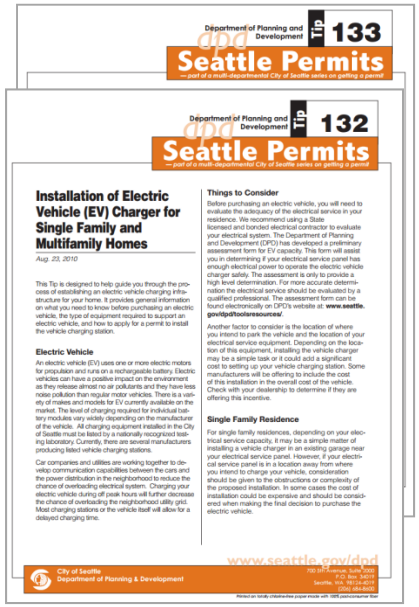


New York



San Francisco

San Diego



Seattle

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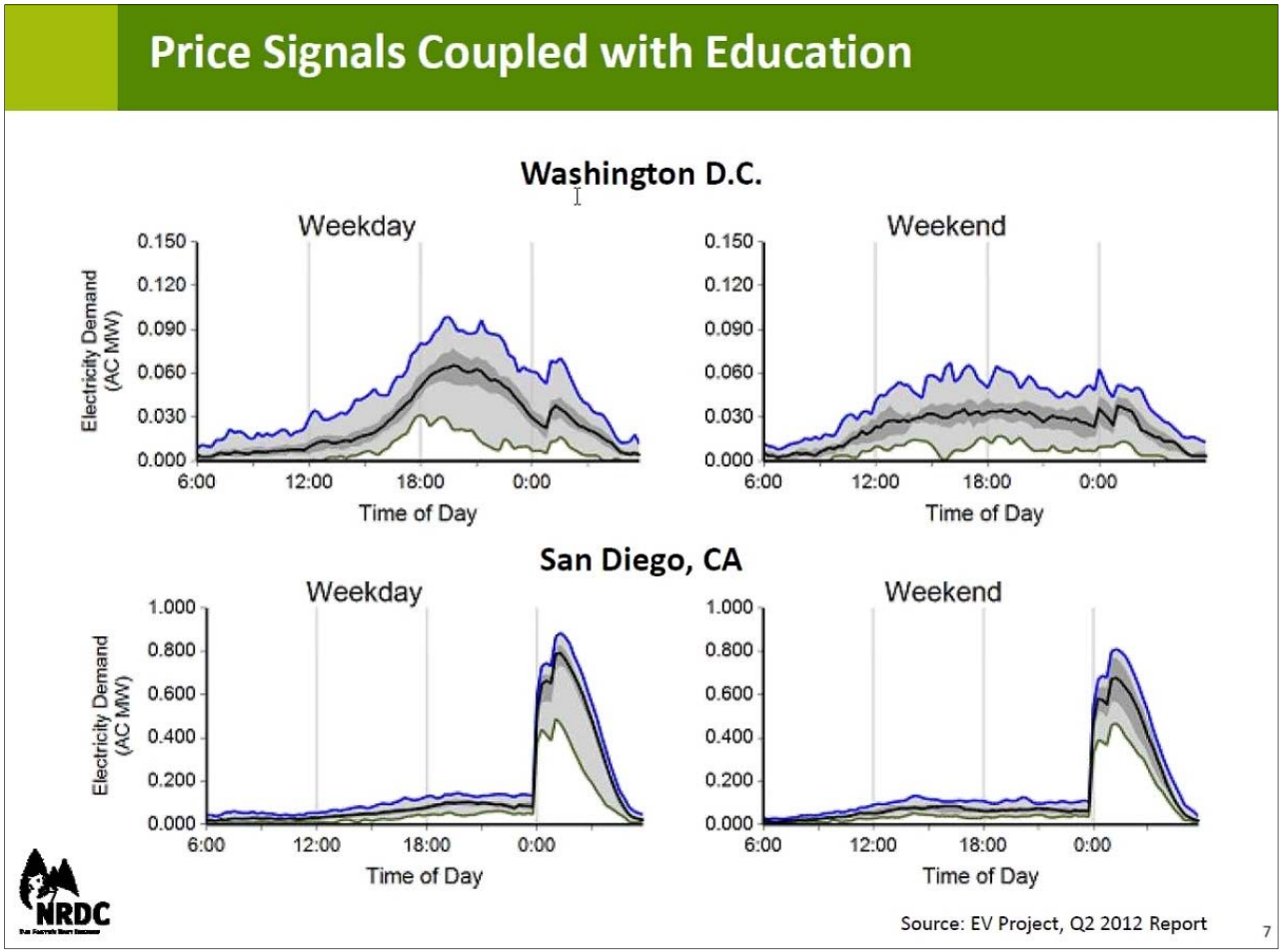
Solution: ENGAGEMENT

- Education can mitigate grid impact



Natural Resource Defense Council slides for webinar to National Governors Association, *2/13/13*

www.pluginillinois.org/MunicipalAggregationList

Chicago Area Alternative Fuels Deployment Program

$15M USDOE ARRA award in '10 to City of Chicago, $25M leveraged in local cost share

- 404 alternative fuel and hybrid vehicles & 234 alternative fuel stations (202 EV charging stations)
- Results: Over 200,000 barrels of oil displaced, 80,000 tons GHG reduced, emissions reductions equal to removing 12,060 passenger vehicles from the road
- Early release of Nissan Leaf and commitments from other OEMs to sell EVs in Illinois

Drive Clean Chicago

Drive Clean Taxi REBATE FUND	Drive Clean Truck VOUCHER FUND	Drive Clean Station REBATE FUND
Funds for Compressed Natural Gas (CNG) Taxis	Funds for Class 3 to 8 All-Electric Trucks	Funds for "Public" CNG Fueling and DC Fast Charging Stations
$1,275,000 available in incentives	$11,295,000 available in incentives	$1,425,000 available in incentives
$10,000 per rebate or covers incremental cost	$30,000 to $60,000 per voucher	Covers 30% of capital cost for station development
Vehicle Purchaser applies	Dealer applies on behalf of Vehicle Owner	End-User will solicit competitive cost proposals
Target Goal of 127 CNG Taxis	Target Goal of 250 E-Trucks	Target Goal of 4 CNG fueling and 17 DC Fast Charging stations
LEARN MORE	LEARN MORE	LEARN MORE

Voucher Program Summary

- Voucher incentive is applied at purchase
- Reduces purchase price to customer
- Vouchers are based on size of batteries
- $11.3 million in voucher funding
- Vendor (dealer) paid voucher amount at completion of sale and registration of vehicle

Program First Steps

- Informational workshop – *Oct 7, 2013*
- Informational website launch, fact sheets
- Implementation Manual "rulebook"
- Approve vehicles for voucher eligibility
- Launch voucher request system
- *Accept voucher requests April 30, 2014*

Web Site www.drivecleanchicago.org

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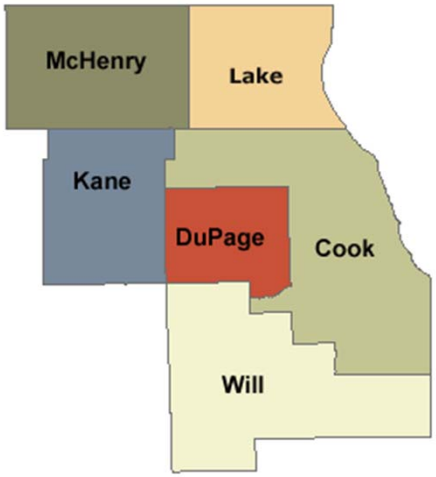
Eligible Vehicles: All-Electric (EV)

- On-road ***Zero-Emission Driveline***
- >10,000 GVWR trucks and buses
- Operates solely on battery pack—no internal combustion engine
- ***Conversions allowed***
- ***Fuel fired heaters allowed***

Eligible Fleets

- Domicile and operate >75% in six-county Chicago area
- Agree to program terms & conditions
- Agree to three-year reporting



E-truck Voucher Amounts

Vehicle Battery Size - kWh Pack	Incremental Cost of Vehicles	Voucher Amount	Average per Vehicle Cost
40	$50,000	**$30,000**	$105,000
60	$62,500	**$37,500**	$117,500
80	$75,000	**$45,000**	$130,000
100	$87,500	**$52,500**	$142,500
120	$100,000	**$60,000**	$155,000

Voucher Program Details

- Voucher applied at point of sale or retrofit
- Vehicles and conversions must be commercially available and meet all federal and state regulations to be sold and operated in Illinois
- Program website will contain all program details, eligible vehicles, forms and updated available funds remaining
- Applications will be reviewed and approved on a first come, first served basis and funding will be reserved until vehicle is purchased and vendor submits payment request

How it works

OEMs, Vendors and Fleets Participate

OEMs – Seek approval for "Vehicle Eligibility"

Vendors – OEM or Dealer becomes "Approved Vendors"

Fleets – Work with an "Approved Vendor" to submit a Voucher Request