



Energy Efficient Passenger Transport Report: United States Portrait

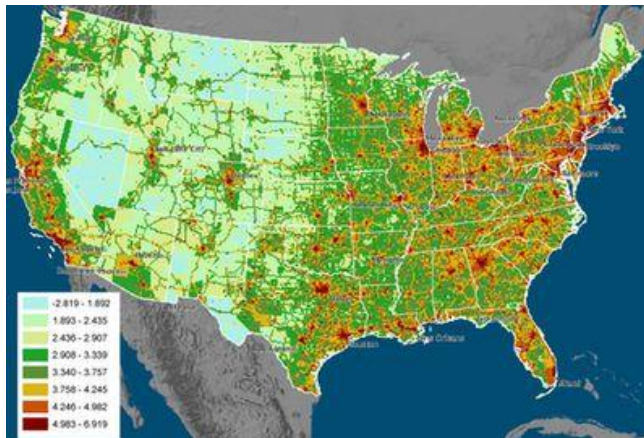
*Presented to the APEC Cooperative
Energy Efficiency Design for Sustainability
(CEEDS) Workshop*

Eugenie L. Birch

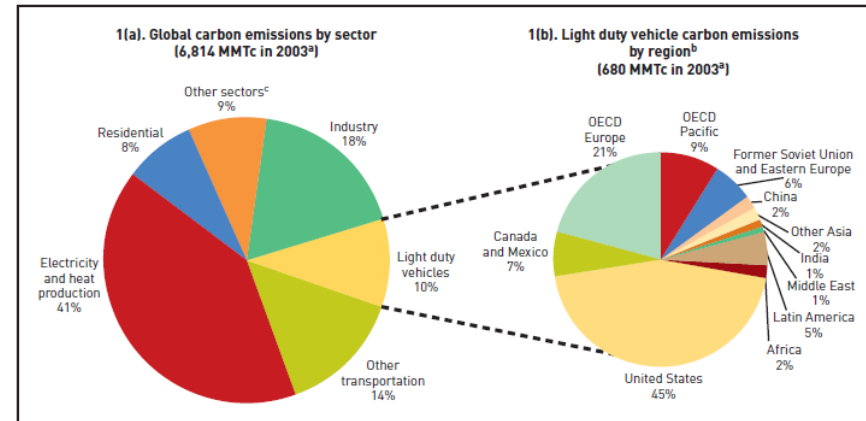
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Current Conditions

CO2 Hotspots in the US -- All Sources



Global fossil carbon emissions by economic sector



These estimates include only CO₂ emissions from fossil fuel use, and so exclude emissions from biofuel use or deforestation.

United States

- 5% world's population
- 30% world's cars
- 45% world's contribution of auto-created GHG

Rolling stock carbon emissions by vehicle class, 2004

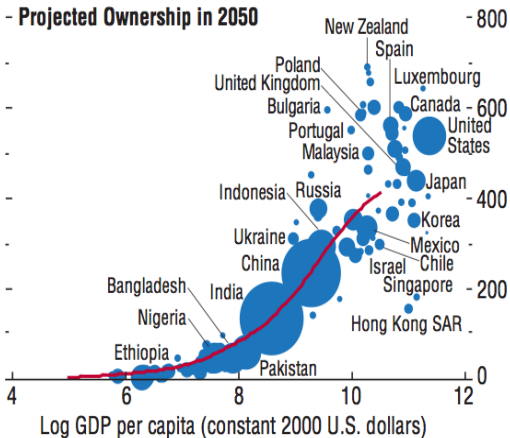
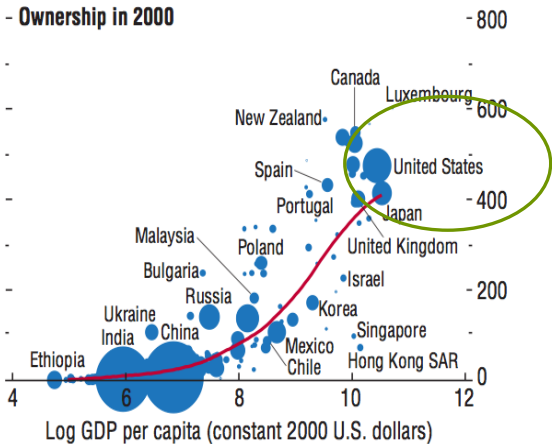
Vehicle class emissions share	Carbon emissions (MMTc)	Carbon
Small cars	77	25%
SUVs	67	21%
Pickups	60	19%
Midsize cars	54	17%
Vans	29	9%
Large cars	26	8%
Cars	157	50%
Light trucks	157	50%
Overall	314	100%

Source: DeCiccio, 2006)

Current Conditions

Car Ownership

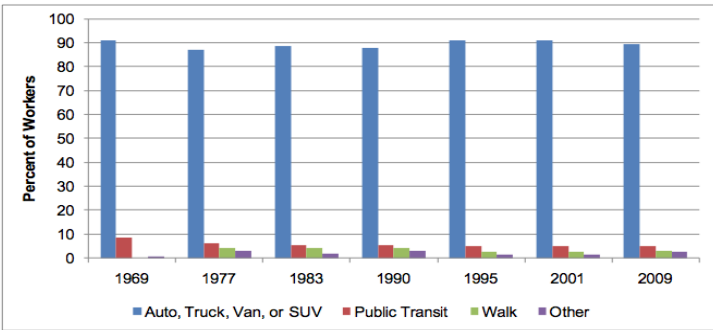
(Cars per 1,000 people on the y-axis; size of bubble represents population)



UNITED STATES

CAR OWNERSHIP	250,000,000
REPLACEMENT (ANNUAL)	12,000,000 (new)

Figure 10. Trends in the Distribution of Workers by Usual Commute Mode 1969, 1977, 1983, 1990 and 1995 NPTS, and 2001 and 2009 NHTS.



- Note:
- The usual mode is defined as the means of transportation usually used to go to work in the week prior to the travel day.
 - The 1969 survey excluded walk trips.
 - Public Transit includes local bus, commuter bus, commuter train, subway, trolley, and streetcar.
 - Other includes other modes not shown above such as motorcycle, Amtrak, airplane, taxi, bike, school bus, and other.

Three main factors behind rolling carbon

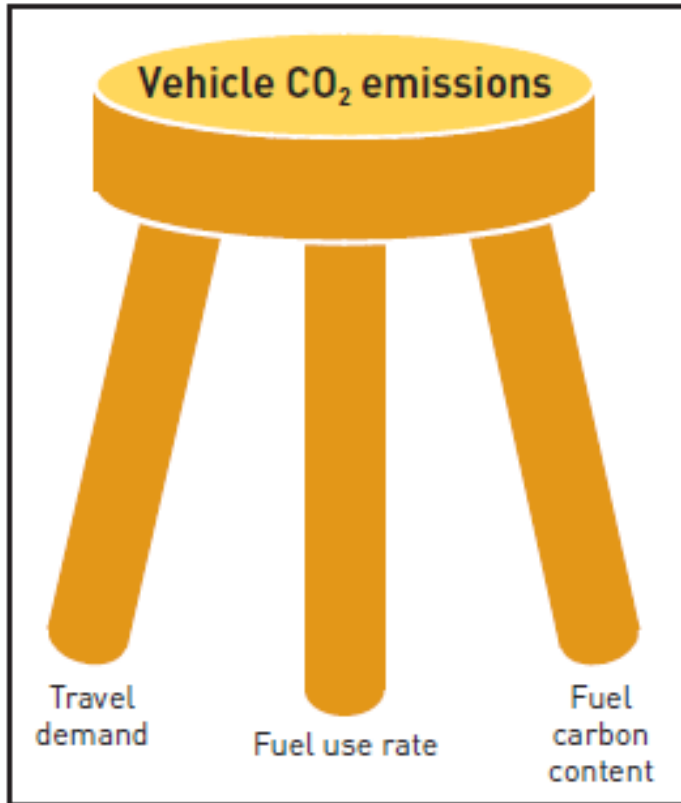
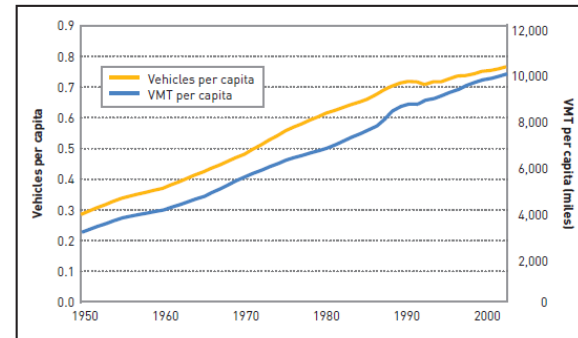


FIGURE 7
U.S. vehicle ownership and VMT per capita (1950–2002)



Source: Davis and Diegel (2004), Table 8.2

PUBLIC SECTOR

LEGISLATION/REGULATIONS

FEDERAL

CAFE STANDARDS
CLEAN AIR REGULATIONS
INCENTIVES/TAXES

STATE AND LOCAL

FUNDING: R&D AND PROJECTS

US DEPARTMENT OF ENERGY
US DEPARTMENT OF TRANSPORTATION
US ENVIRONMENTAL PROTECTION AGENCY

EDUCATION

PRIVATE SECTOR

R&D/VENTURE CAPITAL
PROJECTS

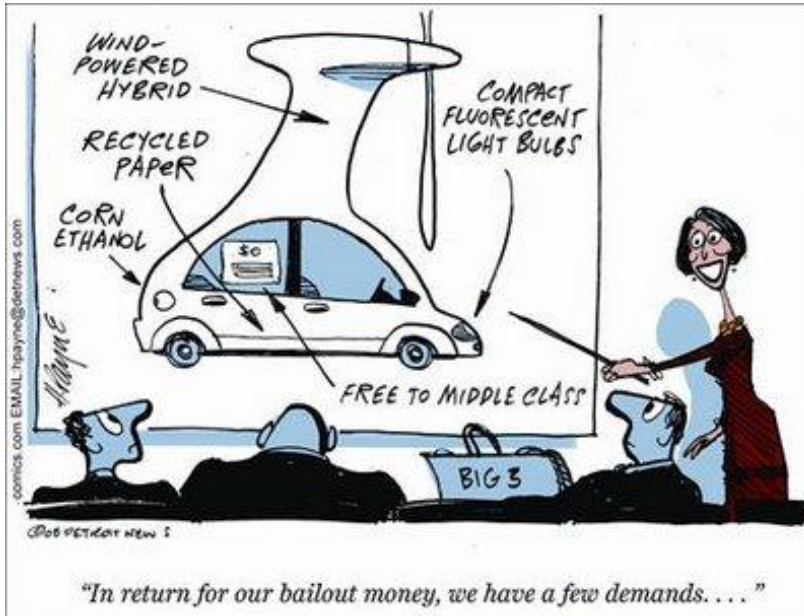
NON GOVERNMENTAL

SCHOLARSHIP/RESEARCH
ADVOCACY/INFORMATION

○ **CAFE STANDARDS** (Corporate Average Fuel Economy)

Model Year	Cars mpg	Light trucks mpg (8,500 lbs after 1980)
1978	18	
1979	19	17.2 <small>(2 wheel)</small> 15.8 <small>(4 wheel)</small>
1980	20	20.7 19.1
1985 to present	27.5	
1992		20.2
2001		20.7
2007		22.2

CAFE STANDARDS (Corporate Average Fuel Economy)



"In return for our bailout money, we have a few demands. . . ."

The fleet-wide average will be

54.5 MPG

Consumers will have saved **\$1.7 TRILLION** at the pump over the life of the program.

A family that purchases a new vehicle in 2025 will save **\$8,200** in fuel costs when compared with a similar vehicle in 2010.

Over the life of the program, the standards will:

Save **12** billion barrels of oil.

Eliminate **6** billion metric tons of carbon dioxide pollution.

This program, together with standards already put into place by this administration for Model Years 2011-2016, will result in significant cost savings for consumers at the pump, dramatically reduce oil consumption, cut pollution and create jobs.

Smartphone Code

Goals of the Clean Air Act

Mitigate potentially harmful ambient concentrations of six “criteria” pollutants: **carbon monoxide (CO)**, nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter (PM), and lead (Pb).

Limit sources of exposure to hazardous air pollutants (HAPs).

Protect and improve visibility in wilderness areas and national parks.

Reduce emissions of substances that cause acid deposition, specifically sulfur dioxide and nitrogen oxides (NO_x).

Curb use of chemicals that have the potential to deplete the stratospheric ozone layer.

STATE AND LOCAL REGULATIONS

GROWTH MANAGEMENT: OREGON

ZONING: PARKING REQUIREMENTS, BIKE STORAGE, PERMIT/
STATION REQUIREMENTS (NEW YORK)

BUS LANES

BIKE LANES

NO CAR/PEDESTRIAN ONLY ZONES

TAXI MEDALLION REQUIREMENTS

CONGESTION PRICING

PUBLIC SECTOR

FUNDING: R&D

PUBLIC SECTOR

FUNDING: PROJECTS

FEDERAL TAX CREDITS: PLUG-IN ELECTRIC VEHICLES
CHARGING STATIONS

STATES: 18 STATES

- NO SALES TAX (NEW JERSEY)
- REBATES (CALIFORNIA, HAWAII)
- HOV STICKERS (CALIFORNIA)
- TAX CREDITS (COLORADO, GEORGIA)

UTILITIES: TIME OF USE (TOU) RATES REDUCE
RATES FOR CHARGING CARS

INSURANCE: DISCOUNTS E.G. FARMERS -5%

Chevrolet Volt



Fisker Karma



Toyota Prius Plug-in Hybrid





AT LEAST 8 STATES HAVE SOME FORM OF HYBRID-FAVORING HOV LANES

AZ, CA, CO, FL, NJ, NY, TN, UT, VA

Electric Vehicles

Compare Side by Side

New & Upcoming Electric Vehicles

Tax Incentives

Links

New & Upcoming Electric Vehicles

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Electric vehicles are now available for sale in the United States. The selection is very limited, but more manufacturers have announced plans to offer EVs for sale in the U.S. in the next few years.



Currently Available

[Ford/Azure Dynamics Transit Connect EV](#)



Seating capacity: varies
Top speed: 75 mph
Range: 50-80 mi.
Power: 140 hp
0-60 time: NA

Availability: Available
Price: NA

[Nissan LEAF](#)



Seating capacity: 5
Top speed: 89 mph
Range: 73 mi.
Power: 107 hp
0-60 time: 11.9 sec.

Availability: Limited production 2010; mass production 2012
Price: \$32,780

PRIVATE SECTOR PROJECTS



[Ford/Azure Dynamics Transit Connect EV](#)



[Nissan LEAF](#)



Chevrolet Volt



Fisker Karma



Toyota Prius Plug-in Hybrid



PRIVATE SECTOR PROJECTS

US hybrid sales for August 2011

Model	Units	vs. last month	vs. August 2010	CYTD	vs. CYTD 2010
Toyota Prius	5,491	↑ 20.0%			
Hyundai Sonata	4,128	↓ -1.0%			
Lexus CT 200h	2,087	↑ 34.4%			
Honda Insight	981	↓ -2.8%			
Honda CR-Z	748	↓ -18.1%			
Lexus RX450h	541	↑ 28.3%			
Ford Fusion	218	↓ -82.8%			
Ford Escape	585	↓ -13.7%			
Lin. MKZ Hybrid	491	↑ 2.3%			
Toyota Camry	318	↓ -19.1%			
Honda Civic	108	↓ -88.9%			
Lexus HS 250h	284	↓ -7.2%			
Altima	318	↑ 88.9%			
Toy. Highlander	228	↑ 22.2%			
Porsche Cayenne	128	↓ -1.8%			
Mazda Tribute	51	↑ 8.3%			
GMC Yukon Hybrid	18	↓ -80.9%			
Cad. Escalade	40	↑ 0.0%			
Chevy Silverado	18	↓ -30.8%			
Chevy Tahoe	18	↓ -37.8%	↓ -79.2%	418	↓ -81.8%
Infiniti M35h	54	↑ 54.3%	n/a	200	n/a
BMW Hybrid 7	18	↓ -28.0%	↓ -42.3%	237	↑ 347.2%
Lexus GS450h	17	↓ -34.8%	↑ 13.3%	190	↓ -9.8%
Mercedes S400	18	↓ -40.0%	↓ -82.1%	222	↓ -87.2%
VW Touareg Hybrid	10	↓ -28.8%	n/a	308	n/a
GMC Sierra	5	↓ -84.8%	↓ -90.2%	138	↓ -82.0%
BMW X5	0 (-2)	↓ -128.8%	↓ -188.7%	38	↓ -84.8%
Lexus LS600hL	9	↑ 80.0%	↓ -40.0%	54	↓ -33.3%
Chevy Malibu Hybrid	-	n/a	↓ -100.0%	24	↓ -95.8%
Mercedes ML450	-	n/a	↓ -100.0%	1	↓ -99.9%
All hybrids	21,177	↑ 7.9%	↓ -11.8%	173,918	↓ -2.7%
All vehicles	1,089,227	↑ 1.3%	↑ 7.3%	8,436,080	↑ 10.4%

AUTO SALES AUGUST 2011

Hybrids 21,177
EVs 1,664
Diesel 8,808
Total 31,649

ALL SALES 1,069,227

YEAR TO DATE ENERGY EFFICIENT ALL CARS 249,458*
8. 436.080

* 3% OF TOTAL AUTO SALES YEAR TO DATE

US clean diesel sales for August 2011

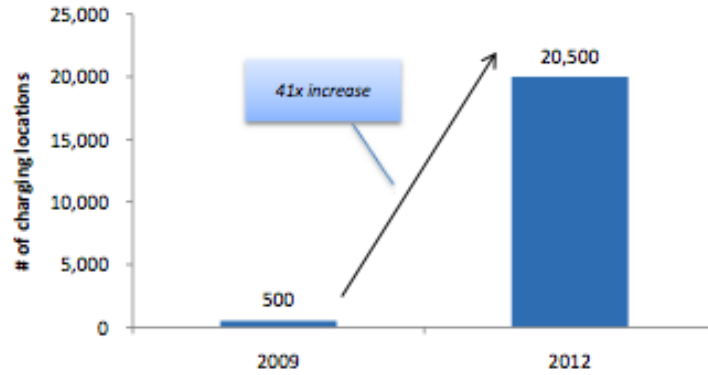
Model	Units	vs. last month	vs. August 2010	CYTD	vs. CYTD 2010
VW Jetta	4,800	↓ -7.8%	↑ 13.1%	38,928	↑ 34.3%
Volkswagen Golf	914	↓ -8.4%	↑ 23.8%	8,882	↑ 87.0%
BMW X5	598	↑ 8.4%	↑ 8.8%	↑ 4,421	↓ -9.9%
Mercedes GL320	230	↓ -38.8%	↓ -29.9%	3,181	↑ 83.2%
BMW 335d	340	↑ 8.8%	↓ -0.3%	2,208	↓ -9.8%
Mercedes ML320	319	↑ 0.3%	↑ 19.0%	2,198	↑ 48.8%
Audi Q7	328	↑ 13.9%	↓ -11.8%	2,842	↑ 37.7%
Audi A8	538	↑ 122.8%	↑ 88.2%	2,898	↑ 24.9%
Mercedes E320	294	↑ 37.4%	↑ 282.0%	1,981	↑ 1,700.9%
VW Touareg	298	↑ 48.8%	↑ 144.8%	1,832	↑ 59.7%
Mercedes R320	8	↓ -87.8%	↓ -73.3%	389	↑ 80.1%
Jeep Gr Cherokee	-	n/a	↓ -100.0%	182	↓ -79.8%
All clean diesels	8,808	↓ -8.1%	↑ 20.4%	86,114	↑ 37.0%
All vehicles	1,089,227	↑ 1.3%	↑ 7.3%	8,436,080	↑ 10.4%

US plug-in electric sales for August 2011

Model	Units	vs. last month	vs. August 2010	CYTD	vs. CYTD 2010
Nissan LEAF	1,382	↑ 48.3%	n/a	8,188	n/a
Chevrolet Volt	302	↑ 141.8%	n/a	3,172	n/a
Smart ED	1	n/a	n/a	88	n/a
All plug-in cars	1,684	↑ -28.8%	n/a	9,428	n/a

PRIVATE SECTOR VENTURE CAPITAL

Electric Vehicle Charging Locations













Global Warming on the Road

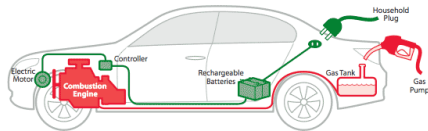


THE CLIMATE IMPACT OF AMERICA'S AUTOMOBILES

Electric cars produce no tailpipe emissions, reduce our dependency on oil, and are cheaper to operate. Of course, the process of producing the electricity moves the emissions further upstream to the utility company's smokestack—but even dirty electricity used in electric cars usually reduces our collective carbon footprint.

Electric vs. Gasoline

No Tailpipe Emissions 	Greenhouse Gases/Pollution 
Utility Company 	OPEC 
100+/- Mile Range 	300+ Mile Range 
Hours to Recharge 	Minutes to Refuel 
2 cents per mile 	12 cents+ per mile 



Another factor is **convenience**: In one trip to the gas station, you can pump 330 kilowatt-hours of energy into a 10-gallon tank. It would take about 9 days to get the same amount of energy from household electric current. Fortunately, it takes hours and not days to recharge an electric car, because it's much more efficient. Speaking of convenience, let's not forget two important points: charging up at home means never going to a gas station—and electric cars require less maintenance, less oil change and emissions

- TOP NEWS IN
Electric Cars
- ▶ 13 Sep 2011
[Audi Shows Urban Concept Electric Car At Frankfurt](#)
 - ▶ 8 Sep 2011

<http://www.hybridcars.com/electric-car>



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