

The 2006 New Jersey  
Clean Energy Conference

**Federal Tax Credit Panel**

New Brunswick, NJ      September 18, 2006

**Brian T. Castelli**  
**Executive Vice President**  
**& Chief Operating Officer**  
**Alliance to Save Energy**



ALLIANCE TO  
SAVE ENERGY

*Creating an Energy-Efficient World*

# Presentation Topics

---



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Quick Overview of the Alliance to Save Energy
- Federal Tax Incentives for New & Existing Homes
- Federal Tax Incentives for Businesses
  - Commercial Buildings
    - Lighting - Building Envelope – HVAC Equipment
- Federal Tax Incentives for Hybrid/Efficient Vehicles

# What is the Alliance?



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- NGO coalition of prominent business, government, environmental and consumer leaders who promote the efficient and clean use of energy worldwide to benefit the environment, economy, and national security.
- Mission: To advance energy efficiency world-wide through policy, education, research, technology deployment, market transformation and communication initiatives.
- Chaired by Senator Mark Pryor (D-AR) and James DeGraffenreidt (CEO Washington Gas) with strong bi-partisan congressional, corporate & public interest leadership.



# Forging Alliances: Business, Govt. & Public Interests



Alliance enjoys sponsorship by more than 115 businesses and organizations across a broad spectrum of economic sectors

Unique structure with expertise in research, policy advocacy, education, technology deployment, and communications



# Federal Tax Incentives



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

	<b>Businesses (Commercial)</b>	<b>Consumers (Residential)</b>	<b>Manufacturers and Builders (Residential)</b>
<b>New buildings</b>	<b>Sec. 1331</b>		<b>Sec. 1332</b>
<b>Building improvements</b>		<b>Sec. 1333</b>	
<b>Heating and cooling equip.</b>			
<b>Appliances</b>			<b>Sec. 1334</b>
<b>Hybrid vehicles</b>	<b>Sec. 1341</b>		
<b>Solar/Fuel cells</b>	<b>Sec. 1336</b>	<b>Sec. 1335</b>	



ALLIANCE TO  
SAVE ENERGY  
Creating an Energy-Efficient World

# Where are the Energy Savings?

## National Savings

Tax Incentives	<u>Cumulative Savings Thru 2020</u>		
	Energy (Quads)	Bill Savings (\$ million)	Carbon (MMT)
a. New Homes	0.36	\$2,751	6.3
b. Central AC/HP	0.45	4,587	8.7
c. Gas water heaters	0.13	946	1.8
d. HP water heaters	0.04	333	0.8
e. Furnaces	0.35	2,710	6.5
f. Appliances	0.61	4,642	9.8
g. Comm. Bldgs.	0.29	2,250	5.3
h. Fuel cell cogen.	0.00	5	0.0
i. Fuel cell vehicles	0.00	51	0.1
j. Hybrid vehicles (light duty)	0.48	6,172	8.5
k. Hybrid vehicles (heavy duty)	0.12	1,564	2.2
l. Existing homes	<u>0.08</u>	<u>574</u>	<u>1.2</u>
Total	2.92	\$26,586	51.3

Source: ACEEE

# Status of IRS Tax Guidance for Building Efficiency Tax Incentives



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Existing Homes Tax Credits
  - Notice 2006-26, Credit for Nonbusiness Energy Property
- New Homes Tax Credit for Builders
  - Notice 2006-27, Certification of Energy Efficient Home Credit
- Manufactured Housing Tax Credit
  - Notice 2006-28, Energy Efficient Home Credit, Manufactured Homes
- IRS Form 8909 published for new home and manufactured housing tax credits
- Commercial Building Tax Deductions
  - Notice 2006-52, Credit for Energy Efficient Commercial Buildings



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

# Tax Incentives for Consumers

- **Existing Homes:** Homeowner tax credit up to \$500. Available 2006-2007.
  - 10% of cost of insulation, doors, Energy Star roofs.
  - 10% of cost of windows (up to \$200 credit).
  - Central air conditioners, water heaters, heat pumps (\$300).
  - Furnaces and boilers (\$150 + \$50 for furnace fans).
  
- **Vehicles:** Buyer tax credit for light-duty hybrids ranging from \$250-\$3400 depending on fuel economy.
  - Phased out after manufacturer sells 60,000.
  - Also credits for diesel and alternative fuel vehicles. Existing electric vehicle credit.
  - For sales to non-taxable entities, tax credit goes to seller. Opportunities for government purchasers to make deals with sellers.
  
- **Solar equipment and fuel cells:** 30% tax credit.





# Tax Incentives for Builders and Manufacturers



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- **New Homes:** Builder tax credit of \$2,000 for home that uses 50% less energy than model residential code; \$1,000 for an Energy Star manufactured home. Available 2006-2007.
- **Appliances:** Tax credits ranging from \$50-\$200 for increased production of efficient refrigerators, clothes washers & dishwashers. Available 2006-2007.

# Tax Incentives for Existing Residential Buildings



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Two types of “Nonbusiness Energy Property” defined in statute and IRS Guidance Notice 2006-26:
- Section 4: Qualified Energy Efficiency Improvements
  - Building envelope measures
- Section 5: Residential Energy Property
  - HVAC and mechanical equipment

# Qualified Energy Efficiency Improvements



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

## Eligible Building Envelope Improvements:

- Must meet either 2001 Supplement to 2000 IECC or 2004 Supplement to 2003 IECC  
(See, Section 3 of 2006-26)
- Insulation, vapor retarder, infiltration seal
- Exterior window, skylight, door
- Storm window
- Storm door
- Metal roof (Energy Star)

## Comments

- **Cost of component only, not installation costs, for tax credit**
- Manufacturer's certification statement to taxpayer
- Taxpayer retains certificate for records
- Manufacturers to retain records that component is eligible
- Normal IRS penalties for false statements
- See IRS Notice 2006-26 for details

# A Special Treat for the Windows Industry: Energy Star!



ALLIANCE TO  
SAVE ENERGY  
Creating an Energy-Efficient World

- Windows eligible for the tax credit must meet or exceed the IECC requirements of either:
  - 2001 Supplement to 2000 IECC, or
  - 2004 Supplement to 2003 IECC
- Special rule for Energy Star windows and skylights:

*“A taxpayer may treat an exterior window or skylight that bears an Energy Star label and is installed in the region identified on the label as an Eligible Building Envelope Component and may rely on such Energy Star label, rather than on a manufacturer’s certification statement, in claiming the [EPACT Section 1333] Sec. 25 credit”*

# Section 5: Residential Energy Property



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

## Eligible Property

- Must meet specific efficiency requirements
- Heat pump water heater
- Heat pump
- Geothermal heat pumps
- Central air conditioners
- High efficiency water heaters
- 95 AFUE furnaces and boilers
- High efficiency furnace fans

## Comments

- **Full cost of components and installation costs for credit**
- Manufacturer's certification statement to taxpayer
- Taxpayer retains certificate for records
- Manufacturers to retain records that component is eligible
- Normal IRS penalties for false statements
- See IRS Notice 2006-26 for details

# Residential Heating and Cooling Equipment Efficiency Requirements



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

## Federal: \$300 tax credit for

- Central AC with 15 SEER, 12.5 EER
- Central heat pumps with 15 SEER, 13 EER, 8.5 HSPF
- Ground source heat pumps meeting Energy Star spec and with integrated water heating
- Electric water heaters with 2.0 EF (e.g. heat pump water heaters)
- Gas water heaters with 0.80 EF or CEF (instantaneous water heaters)

## NJ Rebate

\$400

\$450

# Residential Heating and Cooling Equipment Efficiency Requirements

---



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- \$150 tax credit for furnaces with AFUE 95%
- \$50 furnace fans meeting CEE/GAMA specification (can earn separately or combine with credit above)
- Cap of \$500 per taxpayer for heating/cooling credits *plus* building shell credits

# Summary of Tax Credits for New Residential Construction



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Builder tax credit of \$2,000 for home that uses 50% less energy than 2004 Supplement IECC model residential code.
  - Heating and cooling equipment efficiencies which are at least equal to the minimum allowed under NAECA, and
  - Building envelope component improvements account for at least one-fifth ( $1/5$ ) of such 50 percent.
- \$1,000 for an Energy Star manufactured home.
- Available 2006-2007 (including homes “substantially completed” after August 8, 2005 and sold in 2006.)



# Summary of Tax Credits for New Residential Construction (con't)



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Applies to “dwelling units”. Multifamily buildings 3 stories or less can claim credit for each unit. Each unit must be certified.
- Requires RESNET procedures to show compliance. Use RESNET publication No. 05-001 (Nov. 17, 2005)
- Contractors obtain certification from eligible certifier
- Builders use IRS Form 8908, Energy Efficient Home Credit, to claim credit

# Likely Characteristics of Energy Efficient Residential Buildings



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Energy Star Homes as a starting point
- Increased insulation
- Tight shell with field verification
- Ductwork inside conditioned space
- High performance windows
- Low SHGC and reduced internal gains in South
- Efficient lighting and appliances
- High efficiency furnace/boiler
- High efficiency air-conditioner/heat pump

# Federal Tax Incentives for Commercial Buildings - Summary



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Deduction up to \$1.80/square foot of building space for owners or lessees of any US building within scope of ASHRAE Standard 90.1-2001
- For buildings designed to use 50% less energy than required by ASHRAE Standard 90.1-2001
- Partial deduction (up to \$0.60) for building envelope, HVAC and hot water, or lighting systems
- For government buildings, deduction goes to designer, but rules not yet published
- Available 2006-2007; bills now in Congress to extend through 2010 or more

# New Jersey SmartStart Buildings Financial Incentives - Equipment



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Straightforward, Clear Criteria, and Amounts
- Simple, On-line, Pre-Approval Application
  - [http://www.njsmartstartbuildings.com/main/app\\_eforms.html](http://www.njsmartstartbuildings.com/main/app_eforms.html)
- NJ Incentives are in addition to Federal Incentives!!

## Example of NJ Equipment Incentive:

- Variable Frequency Drive

<b>HP Controlled by Each VFD</b>	<b>Incentive: \$/HP Controlled</b>
5 to <10 hp	\$155 per hp
10 to <20 hp	\$120 per hp
>20 hp	\$ 65 per hp

# Status of IRS Tax Guidance for Commercial Bldg. Tax Incentives



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Commercial Building Tax Deductions (June 06)
  - **Notice 2006-52**, Deduction for Energy Efficient Commercial Buildings
  - Public Buildings Guidance yet to be released
  - NREL Guidance in final draft
  - DOE Approved Software List at:  
[http://www.eere.energy.gov/buildings/info/qualified\\_software](http://www.eere.energy.gov/buildings/info/qualified_software)

## IRS Notice 2006-52

# Purpose

---








ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Applies to a taxpayer who owns or leases a commercial building
- Covers “property” installed as part of building’s interior lighting, heating, cooling, ventilation, and hot water systems, or building envelope (ASHRAE Standard 90.1-2001)
- Covers certification that “property” meets energy efficiency requirements and that proper software is used for calculations

# Five Ways to Claim the Commercial Tax Deductions



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

-  Whole building 50% energy cost reduction
-  Partial Deduction – Lighting Target
-  Partial Deduction – HVAC Target
-  Partial Deduction – Envelope Target
-  Interim Lighting Rules\* using ASHRAE prescriptive lighting tables (9.3.1.1 and 9.3.1.2)

\*Interim Lighting Rules only in effect until final regulations are published in Federal Register



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

## Maximum Amount of Deduction

---

- Equal to the cost of energy efficient commercial building property placed in service not to exceed \$1.80 per square foot of defined floor space
- Multiple taxpayers installing energy efficient property in the same building cannot exceed aggregate amount of \$1.80 per square foot
- Consult your tax advisor!



# Deductions for “Partially Qualifying” Property



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- A deduction of up to \$0.60 per square foot can be claimed for “partially qualifying” property
- Energy and power costs have to be reduced by 16 and 2/3 percent (16.66%)
- Applies to:
  - Lighting systems (under permanent rules)
  - Heating, cooling, ventilation and hot water systems
  - Building envelope systems

IRS Notice 2006-52

# Method of Computation



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Performance Rating Method (PRM) used to determine energy and power cost reduction percentage of proposed building compared to reference building (50% and 16.66% targets)
- Reference Building meets Standard 90.1 minimum requirements
- Baseline reference building performance uses PRM in Appendix G of ASHRAE Standard 90.1-2004
- California Title 24 “Alt. Calc. Method” requirements:
  - Internal loads (Tables N2-2 and N2-3)
  - Infiltration modeling (Section 2.4.1.6)
  - Luminaire power from Appendix NB (or manufacturers data)

# Let's Talk Lighting -- Why?



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- 50% of the electricity use in existing commercial buildings is for lighting; 30% in new commercial buildings
- Efficient lighting also reduces HVAC load
- New “state of the art” lighting products can reduce energy use substantially, but these technologies are not being widely deployed
- Lighting retrofits can be implemented relatively quickly and lighting can be redesigned relatively late in the construction of new buildings

# Lighting System Tax Deductions



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Interim rules provide a lighting system-specific deduction enabling systems to be designed before regulations are finished
  - Outperform the ASHRAE/IESNA Standard 90.1-2001 lighting requirements by 25% (\$0.30/sf) to 40% (\$0.60/sf).
  - Warehouses must outperform ASHRAE/IESNA Standard 90.1-2001 lighting requirements by 50% and only qualify for the full \$0.60/sf deduction.
- The provision is effective for property placed in service after December 31, 2005 and prior to January 1, 2008.
- Deduction can be allocated to design firms for energy-efficient commercial building property expenditures made by a public entity, such as public schools, hospitals or government offices.
- Deduction limited to the energy efficiency investment

# ASHRAE/IESNA 90.1 - 2001

## Building Interiors



ALLIANCE TO  
SAVE ENERGY  
Creating an Energy-Efficient World

### ■ Power Density Limits (space method)

	<b>Std 90.1- 2001</b>	<b>25% level (\$0.30/sf)</b>	<b>40% level (\$0.60/sf)</b>
<b>Office</b> Range depends on open versus private office	1.3 – 1.5 w/sf	0.98 – 1.13 w/sf	0.78 – 0.90 w/sf
<b>Warehouse*</b> Range depends on type of storage	1.1 – 1.6 w/sf	Not available	0.55 - 0.80 w/sf (50% below 90.1-2001)
<b>Classroom</b>	1.6 w/sf	1.20 w/sf	0.96 w/sf
<b>Retail</b> Sales area	2.1 w/sf	1.58 w/sf	1.26 w/sf

\* Warehouses must outperform ASHRAE/IESNA 90.1 requirements by 50%

# ASHRAE/IESNA 90.1 - 2001

## Lighting Controls

---



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- **Lighting Control Requirements**
  - Building control: Automatic shutoff for buildings greater than 5,000 ft<sup>2</sup>
  - Space control:
    - For a space > 10,000 ft<sup>2</sup>, 1 control per 10,000 ft<sup>2</sup>
    - For a space ≤ 10,000 ft<sup>2</sup>, 1 control per 2,500 ft<sup>2</sup>
  - Tandem wiring for 1 or 3 lamp linear fluorescents
- **For renovations, building and space controls are not required. Multi-level controls are required.**
  - 50-70% power reduction
    - Step level
    - Zone switching
    - Dimming

# Building Envelope: What is it?

---



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Separates interior of building from outdoor environment
  - Windows and doors
  - Walls, ceiling, and roof
  - Insulation
- Tight building envelope = lower energy costs, increased comfort, and environmental benefits

# How to Achieve a Tight Building Envelope



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Energy-efficient windows
- Improve insulation
- Minimize infiltration
- Optimize orientation
- Computer software will enable one to make trade-offs to optimize building envelope performance



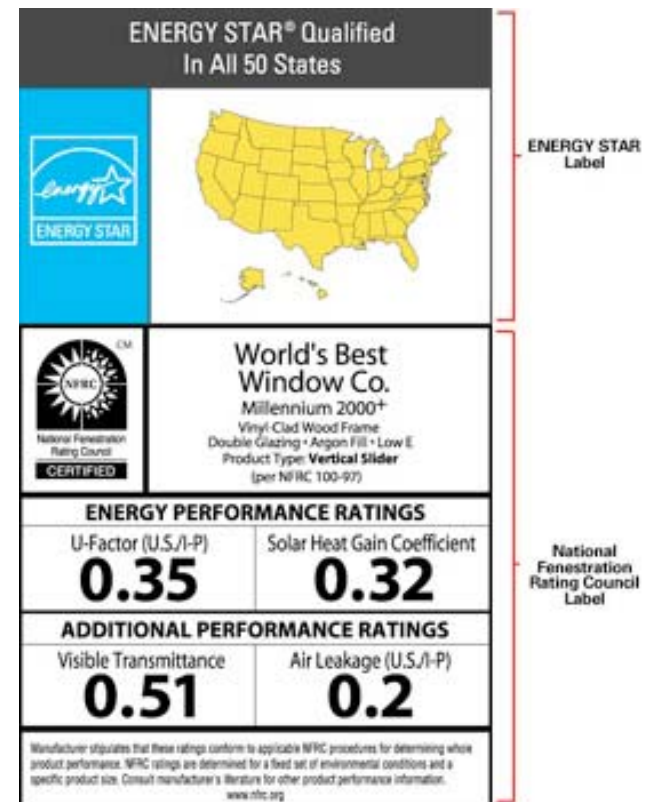


# Building Envelope: Window Performance



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- High-performance windows reduce heat loss in the cold season and heat gain in the hot season
- Low U-factor minimizes heat loss, low solar heat gain minimizes cooling load
- Window performance is crucial for thermal comfort
- Up to \$200 Federal tax credit for replacement windows meeting ENERGY STAR® criteria

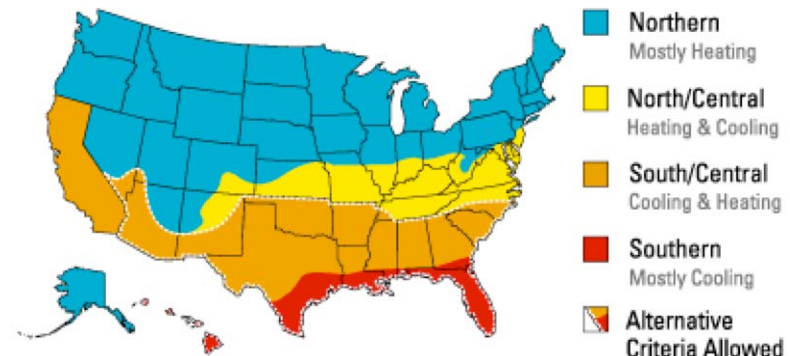


# Building Envelope: High-Performance Windows



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Depending on size and quality, windows can affect heating and cooling load by up to 50 percent
- Ideal window properties depend on climate and location (solar heat gain can be wanted or unwanted)
- State-of-the art technologies (e.g. highly-insulated dynamic glazing) can turn windows into net-energy gainers (through flexible solar heat control and controlled daylighting)



# HVAC Deduction: How to get it

---



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Need to do building simulation for partial deduction
- Some design strategies include:
  - High efficiency heating and cooling equipment
  - Exhaust air heat recovery
  - Variable speed devices on fans and large cooling equipment
  - Thermal energy storage
- Consult with your design team to find optimal cost-effective package of HVAC measures

# Likely Characteristics of Energy Efficient Commercial Buildings



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Design team “integration”
- Thoughtful orientation and form
- Efficient envelope systems
- High performance glazing and selective orientation with solar control
- Daylighting
- High efficiency lighting and controls
- High efficiency HVAC and controls
- Ventilation control and heat recovery

# Efficient vehicle incentives: Light-duty



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- **Vehicles:** Buyer tax credit for light-duty hybrids ranging from \$250-\$3400 depending on fuel economy.
  - Phased out after manufacturer sells 60,000.
  - Also credits for diesel and alternative fuel vehicles. Existing electric vehicle credit.
  - For sales to non-taxable entities, tax credit goes to seller. Opportunities for government purchasers to make deals with sellers

# Example of Federal and NJ Tax Credits for a Hybrid Vehicle



ALLIANCE TO  
SAVE ENERGY  
Creating an Energy-Efficient World

## Federal Hybrid Vehicle Tax Credit:

Vehicle Model	Model Year(s)	Full Credit	1/2 Credit*	1/4 Credit
Camry Hybrid	2005 & 2006	\$2,600	\$1,300	\$650

\* October 1, 2006 through March 31, 2007

## State Alternative Fuel Vehicle\* Rebate Program:

Up to \$4,000 of the incremental cost of a <8,500 pound vehicle

\* includes Hybrid vehicles

## Assumptions:

A non-taxable entity e.g.(local government or school district) in New Jersey purchases a Toyota Camry Hybrid.

The seller takes the \$2,600 credit and lowers the cost of the vehicle by \$2,600 to the non-taxable purchaser.

The incremental cost between the Camry Hybrid and a non-hybrid Camry is pegged at \$3,800.

**RESULT:** Buyer's benefit is \$2,600 (Fed) plus \$1,200 (State) or a TOTAL of \$3,800.

# Efficient vehicle credits: heavy-duty



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

<b>Improvement in city fuel economy*</b>	<b>Hybrid credit as percent of qualified incremental cost*</b>
At least 30% and under 40%	20%
At least 40% and under 50%	30%
At least 50%	40%

<b>Gross vehicle weight (GVW) rating*</b>	<b>Maximum qualified incremental cost*</b>	<b>NJ Rebate – Maximum \$ Up to the Incremental Cost</b>
8,501-14,000 pounds	\$7,500	\$7,000
14,001-26,000 pounds	\$15,000	\$12,000
> 26,000 pounds	\$30,000	\$12,000

Therese Langer, ACEEE, 7/21/06

# Status of Market: light-duty



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

- Hybrids
  - 11 eligible vehicles, gaining up to 93% of maximum credit
  - None available in certain classes (e.g. pickup)
  - Sales about ~ 1% of the market
  - One manufacturer has already hit 60,000-vehicle threshold, no others will meet this year
- Diesels
  - Not clean enough (yet)
  - First one slated for release this year
- Fuel cell vehicles
  - None commercially available



# Light-duty hybrid sales



ALLIANCE TO  
SAVE ENERGY  
Creating an Energy-Efficient World

	Calendar Year:	2003	2004	2005	2006 YTD	Cumulative
Honda Insight		1,168	583	666	489	13,653
<b>Toyota Prius</b>		24,627	53,991	108,077	<b>48,156</b>	276,088
Honda Civic Hybrid		-	25,571	25,774	15,755	67,100
Ford Escape Hybrid/Mariner Hybrid		-	2,993	15,719	11,996	30,708
Honda Accord Hybrid		-	1,061	16,826	3,245	21,132
<b>Lexus RX 400h</b>		-	-	20,661	<b>11,193</b>	31,854
<b>Toyota Highlander Hybrid</b>		-	-	17,954	<b>18,109</b>	36,063
<b>Toyota Camry Hybrid</b>		-	-	-	<b>7,386</b>	7,386
<b>Lexus GS 450h</b>		-	-	-	<b>666</b>	666
					<b>85,510</b>	
	<b>Total:</b>	<b>25,795</b>	<b>84,199</b>	<b>205,677</b>	<b>116,995</b>	<b>484,650</b>

Therese Langer, ACEEE,  
7/21/06

# Contact Us!

---



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*

Alliance to Save Energy

1850 M Street, NW

Suite 600

Washington, DC 20036

Phone: 202 857-0666

Website: [www.ase.org](http://www.ase.org)