

Fueling Florida's Future

Strategic Fit of Alternative Fuels in Florida

Automakers tout vehicles' flex-fuel capabilities as gasoline prices soar at the pump

Gasoline price hikes in recent months have had nearly every consumer grumbling at the pump. As a result, interest in alternative fuel vehicles has increased, but there hasn't been a real rush to purchase AFVs. Both Ford and General Motors are taking this opportunity to point out the inherent flex-fuel capabilities of some of their car and truck models.

And now that gasoline prices are high, the automakers are giving their flex-fuels more exposure.

Ford has been reminding customers that its 2000 model year Taurus sedans and 1998-2000 model year Ranger pick-up trucks with 3.0-liter, V-6 engines can run on

ethanol (E85), unless a combination of the

General Motors 10 and GMC Sonoma the standard 2.2-liter which went into pro-

be flex-fuel vehicles. The company has announced its 2002 model year

and GM's Yukon and

EXs can gas-

(E85) and



Clean-air grant plugs electric vehicles

Clean Fuel Florida Advisory Board

The electric vehicles, which depending on the model resemble either a glorified golf cart or a tiny pickup, should appear in Southwest Florida communities within weeks.

"The police departments like them because they are kind of neat looking and become a conversation point with the public," Valko said. The open-air vehicles "make the officers more accessible instead of sitting behind closed windows with air conditioning on."

The savings to taxpayers over more conventional modes of transportation will not be much, Whitmore said, but that's not the point.

In Palmetto, police Chief Jay Ridings said the electric vehicle will be used for police duties in mobile home parks and housing complexes, as well as for parade appearances.

Bradenton Beach Mayor Conrad Drescher last week persuaded the City Commission to apply for the grant.

"It's a chance for us to try electric cars that would promote a cleaner air," she said. "Although it will keep it on the back streets."

January 2001

CLEAN FUEL FLORIDA ADVISORY BOARD

Steve Somerville, Chair
*Broward Co. Dept. of Planning
& Environmental Protection*

Ed Coven, Vice Chair
Fla. Dept. of Transportation

Terrill Booker
Tallahassee Natural Gas Dept.

Roosevelt Bradley
Miami-Dade Transit Agency

David E. Bruderly
Bruderly Engineering Assoc.

Robert G. Burleson
Fla. Transportation Builders Assn.

Holly Castille
Fla. Propane Gas Assn.

Julia Cope
EV Ready Broward

Donald Crane, Jr.
Floridians for Better Transportation

Jim Davis
OceanAir Environmental

Dotty Diltz
Fla. Dept. of Environmental Protection

Marcia Elder
Project for an Energy Efficient Fla.

James Flood
Gold Coast Clean Cities

Wade L. Hopping
Alliance of Automobile Manufacturers

Jo Ann Hutchinson
*Commission for the Transportation
Disadvantaged*

Bill Jones
Project for an Energy Efficient Florida

David R. Mica
Fla. Petroleum Council

Gary Millington
Enterprise Fla., Inc.

Vicki O'Neil
Fla. Dept. of Agriculture & Consumer Svcs.

Kathleen A. Randall
BP Amoco Corp.

Rocky Randels
Fla. League of Cities

William R. Schroyer
Fla. Dept. of Education

Steve Simon
Fla. Assn. of Counties

Robert Suggs
Fla. Power and Light Co.

Bryan Taylor
Th!nk, Ford Motor Co.

John Thomas
Fla. Institute of Technology

R. Ed Underwood
Fla. Dept. of Management Svcs.

Harold L. Young
Miami-Dade Co. Public Schools

William Young, Jr.
Space Coast Clean Cities

Harry Zehender
Sunrise Gas Dept.



CLEAN FUEL FLORIDA ADVISORY BOARD

January 8, 2001

The Honorable Jeb Bush
Governor, State of Florida
The Capitol
Tallahassee, FL 32399

The Honorable Steven M. Seibert
Secretary, Florida Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399

Steve Somerville, Chair
Broward County Dept. of
Planning & Environmental Protection

Ed Coven, Vice Chair
Department of Transportation

Board Members

Terrill Booker
Tallahassee Natural Gas Dept.

Roosevelt Bradley
Metro-Dade Transit Agency

David E. Bruderly
Bruderly Engineering Associates

Robert G. Burlison
Florida Transportation Builders Assoc.

Holly Castille
Florida Propane Gas Assoc.

Julia Cope
EV Ready Broward

Donald Crane, Jr.
Floridians for Better Transportation

Jim Davis
OceanAir Environmental

Dotty Diltz
Dept. of Environmental Protection

James Flood
Gold Coast Clean Cities

Wade L. Hopping
Alliance of Automobile Manufacturers

Jo Ann Hutchinson
Comm. for the Transportation Disadvantaged

Bill Jones
Project for an Energy Efficient Florida

David R. Mica
Florida Petroleum Council

Gary Millington
Enterprise Florida, Inc.

Vicki O'Neil
Dept. of Agriculture and Consumer Services

Kathleen A. Randall
BP Amoco Corporation

Rocky Randels
Florida League of Cities

William R. Schroyer
Department of Education

Steve Simon
Florida Association of Counties

Robert Suggs
Florida Power and Light Company

J. Bryan Taylor
THINK Mobility, LLC

John Thomas
Florida Institute of Technology

R. Ed Underwood
Department of Management Services

Harold L. Young
Miami-Dade County Public Schools

William Young, Jr.
Florida Solar Energy Center

Harry Zehender
Sunrise Gas Department

Dear Governor Bush and Secretary Seibert,

I am pleased to submit for your review and consideration our report "Fueling Florida's Future."

The Clean Fuel Florida Advisory Board was organized as a result of the Florida Clean Fuel Act signed by the Governor in 1999. The purpose of the Board is to study the implementation of alternative fuel vehicles and formulate and provide policy recommendations to the Secretary of Community Affairs on the expansion of their use. The Board's initial findings and recommendations are included in this report.

I wish to extend my sincere thanks to the members of the Board for their participation and contribution of time, energy and expertise that enabled us to achieve our objectives, as well as the staff of the Department of Community Affairs for their support of our activities. I also wish to recognize the Center for Urban Transportation Research (CUTR) at the University of South Florida for its contribution in providing information for the Board and the Florida Conflict Resolution Consortium at Florida State University for assisting the Board in reaching consensus on the diverse issues addressed by this report.

With this report, the work of the Board has only just begun. This report should be viewed as the basis of an ongoing effort to improve fuel choices and provide a secure economic future for the state of Florida.

Respectfully submitted,

Steve Somerville
Chair
Clean Fuel Florida Advisory Board

TABLE OF CONTENTS

Overview	5
What are Alternative Fuels and Alternative Fuel Vehicles?	6
Why is Expansion of the Alternative Fuel Market Important?	6
The State of the Current Alternative Fuel Vehicle Market in Florida	9
Florida Success Stories	9
EV Ready Broward	9
Gold Coast Clean Cities Coalition	10
Broward County	10
City of Sunrise	11
Sarasota County	11
Neighborly Senior Services	11
Public Transit Systems	12
Clean Fuel Corridors	12
What are Some of the Current Obstacles to Expansion of the AFV Market?	13
The Case for Enhancing the Alternative Fuel Market in Florida	14
Recommendations	18
Moving Forward	19

OVERVIEW

Throughout 2000, the issue of rising gasoline prices became a regular feature of news headlines. Fuel protests in Europe have threatened the economies of several countries. Retail gasoline prices in the U.S. increased nationally from \$1.16 per gallon in the summer of 1999 to an average of \$1.60 per gallon by the winter of 2000.

The nation's transportation system relies heavily on the supply of gasoline and diesel fuel to bring food to tables and workers to jobs. The transportation sector of the U.S. remains more than 97% dependent on petroleum fuels and consumes approximately 2/3 of the nation's oil demand. Highway transportation alone uses more than half of the nation's oil demand, while the number of vehicles on our roads and miles driven continue to steadily increase. As a result, U.S. oil import demands continue to rise concurrently with an increase in the global demand for oil.

Worldwide oil reserves are becoming more concentrated in a smaller number of countries. This situation leaves the U.S. increasingly vulnerable to the potentially serious adverse economic impacts of disruptions in oil supply. The large and growing levels of oil imports also represent a major transfer of wealth from the United States to oil exporting countries; in 1999, this exceeded \$49 billion.

Coupled with decreasing air quality and increasing global competition in transportation technologies, the nation's attention is focused on the issue of energy policy and the need to secure our energy future. Consumers want more than an explanation about rising fuel costs; they want solutions. Policy makers need to ensure a sound economic future. Fortunately, in Florida the work is well under way to improve energy security, establish an environment for energy choices, and to strengthen the economic future of the state.

In 1999, Governor Jeb Bush signed the Florida Clean Fuel Act, which established the Clean Fuel Florida Advisory Board to study alternative fuel vehicles and formulate and provide policy recommendations. The Board is now developing an action plan for the mid and long term to remove obstacles to the development of an alternative fuel market in Florida, create a business and consumer environment to support a thriving alternative fuel industry, and recommend strategic investments for the market to grow. Expanding the use of alternative fuels in Florida will enhance the quality of life in the state and contribute to its continued economic prosperity. Promoting a cohesive program of alternative fuel use offers large potential rewards to the state, with minimal risk.

The transportation sector of the U.S. remains more than 97% dependent on petroleum fuels and consumes approximately 2/3 of the nation's oil demand.



This situation leaves the U.S. increasingly vulnerable to the potentially adverse economic impact of disruptions in oil supply.

WHAT ARE ALTERNATIVE FUELS AND ALTERNATIVE FUEL VEHICLES (AFVs)?

Alternative fuels include natural gas, both liquid (LNG) and compressed (CNG); propane (LPG); electricity; bio-diesel (diesel fuel produced from a source other than petroleum, alone or mixed with traditional diesel); alcohol (both methanol and ethanol, alone or mixed with gasoline); hydrogen; and synthetic fuels.



Vehicles that use these fuels are regarded as alternative fuel vehicles and fall into three major categories:

- 1) dedicated—designed to use only one specific alternative fuel
- 2) bi-fuel / flex-fuel / dual fuel—capable of operating on two different fuels, usually a traditional and an alternative fuel
- 3) hybrid—uses electric and another fuel source simultaneously for propulsion

Flex-fuel technologies and dedicated or bi-fuel systems for CNG and LPG are well developed; fuel sources for hybrid electric applications, such as hydrogen for fuel cells, still require development prior to commercial use.

Expanding the use of alternative fuels in Florida will enhance the quality of life in the state and contribute to its continued economic prosperity.

WHY IS EXPANSION OF THE ALTERNATIVE FUEL MARKET IMPORTANT?

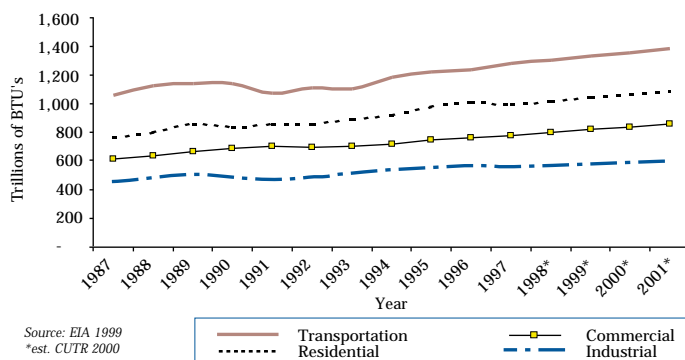
Two primary factors drive the importance of AFVs—the economy and the environment.

ECONOMIC ISSUES

Florida and U.S. dependence on gasoline as a transportation fuel source continues to grow while more and more of the oil is imported. Petroleum imports make up about half of the U.S. trade deficit and are estimated to account for up to 70% within the next 20 years. Military spending to protect U.S. interests in the Gulf region cost an estimated \$57 billion per year.

The transportation sector is a major contributor to the growing U.S. trade deficit and is the leading sector in the use of energy. Imports of oil and motor vehicles and parts accounted for 57% of the \$322.4 billion deficit in 1999, imposing large penalties on the nation's economic growth and a loss of do-

Florida Energy Consumption by Sector



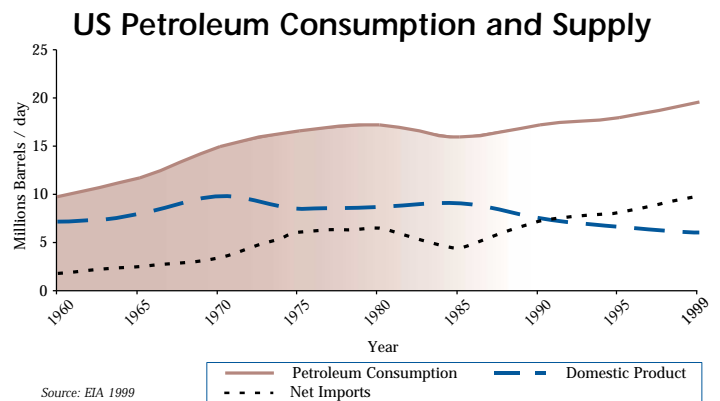
mestic jobs. To the consumer, transportation accounts for about 14% of the total personal consumption expenditure of \$86.4 trillion (in 1999). In 1999, consumers spent \$99 billion on new cars for personal use, and \$134 billion on fuel and oil. To business and industry, transportation costs are a significant component of overall operating costs, and the sustainability of our transportation systems is a major concern. If transportation-related costs are reduced through enhanced fuel choices, it could provide significant direct benefits to consumer pocketbooks and business profits.

U.S. reserves of petroleum are not matched by consumption patterns. According to the U.S. Energy Information Office, imports exceeded domestic supplies of petroleum in 1993 and have been growing as a percentage of our supply ever since. In Florida, petroleum is, by far, the leading source of energy consumed in our state. Coal and natural gas are the next two most significant energy sources, primarily for electric power generation.

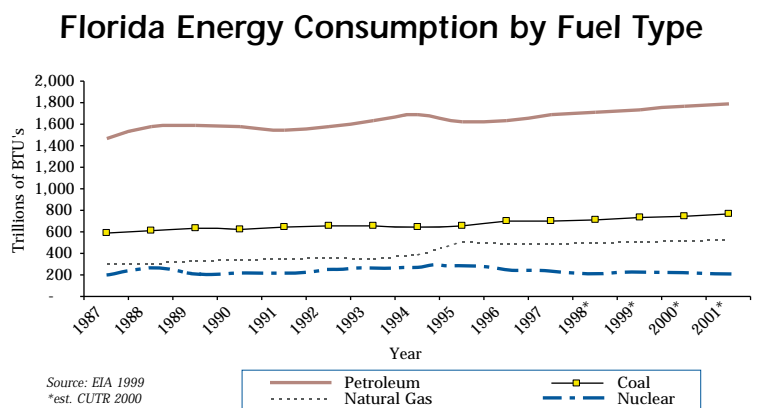
Transportation consumption patterns can be changed through the increased use of alternative fuels. This fact is central to why U.S. and Florida policy makers should look to AFVs as a start to a fresh energy approach.

Consumption of gasoline in Florida in 1999 was over 18 million gallons daily. Petroleum consumption in Florida is projected to grow at rate of 1.8% each year over the next 20 years and, at this projected rate, will exceed 28 million gallons (671,000 barrels) per day by 2020.

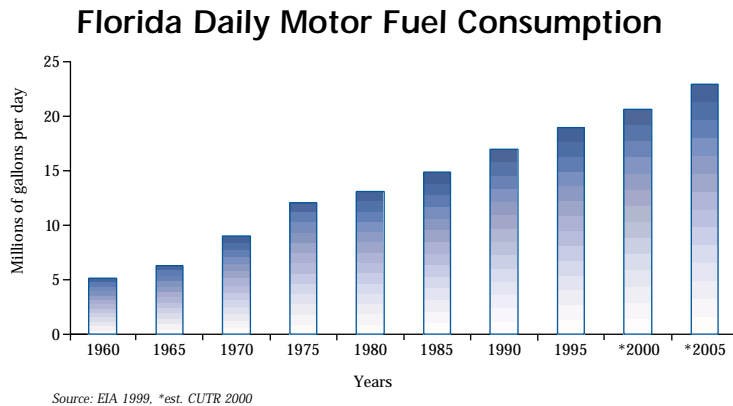
Of additional concern to Florida's policy makers is sustained economic activity and increases in living standards for Florida citizens. The state's highway system is essentially reliant on just one source for fuel—petroleum. It is difficult to imagine any business in the position of dependence on a single supply, yet this is the position that Florida and the nation find themselves in with their heavy dependence on petroleum as a transportation fuel. To ensure that the transpor-



If transportation-related costs are reduced through enhanced fuel choices, it could provide significant direct benefits to consumer pocketbooks and business profits.



Petroleum consumption in Florida is projected to grow at a rate of 1.8% each year over the next 20 years and, at this projected rate, will exceed 28 million gallons per day by 2020.



Florida now stands poised to develop and nurture advanced transportation technologies and take advantage of the opportunities offered by the growing global market for motor vehicles.

tation system can continue to be accessed and utilized well into the future, it is prudent to reduce dependence on a finite resource such as petroleum and foster the use of alternative fuels.

The transportation sector is a key component of the U.S. economy, representing over 16% of the U.S. Gross Domestic Product, with 15% of the U.S. work force being employed in jobs directly related to transportation. The state now stands poised to develop and nurture advanced transportation technologies and take advantage of the opportunities offered by the growing global market for motor vehicles. Recent projections indicate that much of the future growth in motor vehicle sales will occur overseas, especially in developing markets.

ENVIRONMENTAL ISSUES

Extensive data collected throughout the U.S. have led to the recognition that a major contributor to our country's air quality problem is the exhaust from highway transportation vehicles. To address these problems, regulations and technology developments have targeted highway vehicles as specific pollutant sources. As a result of the Clean Air Act and the introduction of new technologies, emissions per vehicle mile have been reduced by more than 90 percent since the 1960s. However, due to the dramatic increase in vehicle-miles traveled, transportation still remains a major contributor to U.S. emissions of pollutants.

Assuming continued growth in the number of licensed motor vehicles, as well as continued growth in vehicle miles traveled, much of the gain in cleaner air anticipated from new motor vehicle technologies will not be realized unless something is done to reduce aggregate demand for petroleum as a transportation fuel source. Regardless, many of the new motor vehicle technologies continue to use non-renewable petroleum as their primary fuel source. The transportation sector is by far the largest consumer of petroleum fuels in Florida and the U.S. and accounts for about 33% of carbon dioxide and NOx emissions, 77% of carbon monoxide emissions, and more than 33% of volatile organic compounds. Alternative fuels can reduce emissions of many of these pollutants.

THE STATE OF THE CURRENT ALTERNATIVE FUEL VEHICLE MARKET IN FLORIDA

Alternatively fueled vehicles have moved into the mainstream and are in wide use in private and government fleets. The U.S. Department of Energy estimates that more than 430,000 alternative fuel vehicles are on the road in the United States today. Throughout Florida, alternative fuel vehicles are successfully serving their communities and businesses, as the success stories that follow will illustrate.

A survey conducted by the Center for Urban Transportation Research at the University of South Florida in Tampa in mid 2000 identified 5,725 AFVs in 25 counties in Florida. More than 50% of the reported AFVs are private, business or local fleet vehicles. Of Florida's AFVs, the federal government fleet operates 33%, State government fleets operate 3%, and energy providers operate 13%. The remaining AFVs are local or municipal fleets or vehicles operated by private businesses and individuals.

FLORIDA SUCCESS STORIES

The following success stories briefly outline some of the alternative fuel vehicle programs already under way in Florida.

EV READY BROWARD (EVRB)

Partnering public and private sector entities can ensure sustainable and economically viable alternative fuel programs. In recognition of the need for strong, committed private/public partnerships to advance the broad-based implementation of zero emission transportation, Broward County joined forces with Florida Power & Light Company, South Florida Regional Planning Council, and key community leaders to establish EV Ready Broward (EVRB). EVRB is one of the 11 nationally designated electric vehicle market launch sites and has been the impetus for the implementation of electric vehicles and infrastructure in Broward County and surrounding areas. Additionally, EVRB was the driving force behind the creation of the Clean Fuel Florida Coalition, the forerunner to the Clean Fuel Florida Advisory Board (CFFAB), and the successful passage of legislation that established the CFFAB. Since it began, EVRB volunteers from both the private and public sectors have marshaled resources to influence public policy changes in support of zero emission transportation such as amending

Much of the gain in cleaner air anticipated from new motor vehicle technologies will not be realized unless something is done to reduce aggregate demand for petroleum as a transportation fuel source.

Florida AFV Inventory

Fuel Type	Total Vehicles
CNG	2,151
LPG	2,466
E85 ¹	601
EV	352
Bio-Diesel ²	128
M85	11
Hybrid-elect. Transit	16
Total	5,725

¹ Includes only fleet vehicles operated on E85
² Includes diesel fleet vehicles operated on B20 Bio-diesel.
Source: CUTR 2000



Partnering public and private sector entities can ensure sustainable and economically viable alternative fuel programs.

In FY2000, general fleet drivers in Broward County logged more than 600,000 miles operating on an alternative fuel, resulting in fuel cost savings of \$22,000, a reduction of more than 140,000 pounds of carbon dioxide emissions, and the displacement of more than 41,000 gallons of gasoline.



In 2000, Gold Coast Clean Cities Coalition programs placed in service 22 CNG vehicles and 3 bi-fuel propane vehicles, which will displace over 20,000 gallons of gasoline annually.

Broward County Building Codes to require all single-family homes to be built EV ready. Education and community outreach have been the cornerstones of EVRB, with volunteers working with area high schools in the building of electric vehicles and bringing awareness to younger students about electric transportation and environmental benefits.

EVRB and Gold Coast Clean Cities Coalition work together to maximize the membership and resources of both groups, creating a strong synergism for the implementation of alternative fuel vehicles in the South Florida area. EVRB's Community Transportation Initiative discussed in the public transit systems is a good example of these two groups' collaborative efforts.

GOLD COAST CLEAN CITIES COALITION

The Gold Coast Clean Cities Coalition (CCC), based in Broward County in southeast Florida, is a prime example of the impact that clear leadership, dedication, and public/private partnerships can play in the promotion of alternative fuel use. Almost 2,200 alternative fuel vehicles are operating in the area by organizations and agencies such as the local police, Broward County, and the United States Postal Service. Miami Beach, Deerfield Beach, Coconut Creek, Sunrise, and Ft Lauderdale all operate alternatively-fueled transit buses. More than 60 alternative fuel vehicle refueling sites were added in the coalition area in 1999, and it is estimated that more than one million gallons of gasoline and diesel fuel are being displaced annually because of the use of alternative fuels.

Several successful cooperative agreements promote the use of alternative fuels in the area, with one program providing vehicle cost rebates for alternative fuel fleet operators. The program used U.S. Department of Energy (DOE) grant funds and local matching funds to purchase 22 CNG vehicles and 3 bi-fuel propane vehicles, which are estimated to travel over 300,000 miles annually and will displace over 20,000 gallons of gasoline.

BROWARD COUNTY

Broward County began its Alternative Fuel Vehicle (AFV) program in 1988, and, since that time, more than 193 AFVs have been introduced into the County's general-purpose fleet, utilizing compressed natural gas, liquefied petroleum gas (propane), and electricity as fuel. In FY2000, general

fleet drivers logged more than 600,000 miles operating on an alternative fuel, resulting in fuel cost savings of \$22,000, a reduction of more than 140,000 pounds carbon dioxide emissions, and the displacement of more than 41,000 gallons of gasoline. As a result of this success, significant expansion plans are under way.

CITY OF SUNRISE

Sunrise, in Broward County, has been using alternative fuels since 1993 and is success story on two levels—AFV operation and alternative fuel provider to other fleets. Currently, the City operates 140 CNG AFVs, the bulk of which are operated by the police department. The City has both dedicated and bi-fuel vehicles and uses approximately 100,000 gasoline-equivalent gallons of CNG annually.

The City also partnered with the U.S. Postal Service (USPS) to provide an overnight fueling site on USPS property, which serves both the USPS and the City. The City facilitated the installation of the station and trained USPS supervisors to operate the fuel dispensers, resulting in the City's municipal gas utility expanding its market and increasing revenues while allowing the USPS to meet federal compliance.

SARASOTA COUNTY

The Sarasota County Sheriff's Department has been using LPG since 1978 and has more than 225 bi-fuel vehicles. The Department's vehicles travel more than 5 million miles per year and consume more than 330,000 gasoline-equivalent gallons of LPG, saving more than \$100,000 per year in fuel costs. The program also reduces emissions of CO by 6 tons per year, and CO₂ by more than 2 million pounds per year. Additionally, the Sheriff's emergency response vehicles are in a better position to maintain operations and serve the community as its vehicles can operate on either gasoline or LPG.

NEIGHBORLY SENIOR SERVICES

Located in Clearwater, Neighborly Senior Services (NSS) serves the retirement community in Pinellas County, providing adult day care, in-home care, meals and transportation. NSS has been using bi-fuel CNG buses since 1980, operating 47 vehicles, including 27 bi-fuel CNG buses. NSS uses approximately 52,000 gasoline-equivalent gallons of CNG annually and expects fuel savings in excess of \$40,000 for fiscal year 2000. Additionally, the organization has reduced annual emissions of CO by 18,000 lbs and NOx by over 1 ton.

The Sarasota County Sheriff's Department's vehicles travel more than 5 million miles per year and consume more than 330,000 gasoline-equivalent gallons of LPG, saving more than \$100,000 per year in fuel costs.



NSS uses approximately 52,000 gasoline-equivalent gallons of CNG annually and expects fuel savings in excess of \$40,000 for fiscal year 2000.

The Miami Beach Transportation Management Association estimated that its Electrowave System service has eliminated more than 3.7 million vehicle miles in one of South Florida's most heavily congested transportation areas.



In recognizing the need to expand concentrated areas of alternative fuel activity, the concept of a clean fuel corridor was developed to link AFV fleets and increase alternative fuel use.

PUBLIC TRANSIT SYSTEMS

Florida has a number of successful, high profile alternative fuel transit systems in operation. Transit systems are an ideal application for alternative fuels, since vehicles are centrally fueled, remove single or low occupant vehicles from the roads, and bring new technologies into direct contact with the general public. Replacing one diesel transit bus is an easier challenge than achieving the replacement of 100 light duty vehicles driven by the average citizen.

The Miami Beach Transportation Management Association recently expanded its fully-electric transit buses (the Electrowave system) to 11 vehicles and has carried over 2.5 million passengers. It is estimated that the service has eliminated more than 3.7 million vehicle miles in one of south Florida's most heavily congested transportation areas. In early 2001, the City of Coconut Creek will place in service four 22 seat hybrid-electric / propane transit buses, with service routes connecting with two other transit systems in Broward County.

CLEAN FUEL CORRIDORS

In recognizing the need to expand concentrated areas of alternative fuel activity, the concept of a clean fuel corridor was developed to link AFV fleets and increase alternative fuel use. The Space Coast Clean Cities Coalition on Florida's west coast analyzed a number of existing alternative fuel vehicle fleets within close proximity to both each other and the Florida Gas Transmissions Pipeline. It was found that the vehicles traveled in the most part in a north / south direction along US Hwy 1 and I-95, and in an east / west direction along I-4 and SR 50. The coalition coordinator identified 12 potential refueling sites at 25-mile intervals along these corridors, and approached the District 5 office of the Florida DOT, the General Services Agency (GSA) at the Kennedy Space Center, and Patrick Air Force Base to share refueling information and needs. Partnering with NUI City Gas, the fleet operators and the coalition established a series of CNG refueling sites incorporating a new design of refueling equipment that uses the pipeline pressure to power the compressor. The stations are unmanned, with common card-type readers for recording and billing, and al-

low the AFV drivers to operate their vehicles in a much-expanded area. As volumes increase, the sites will be converted to public access with commercial credit cards readers similar to those at gasoline stations.

WHAT ARE SOME OF THE CURRENT OBSTACLES TO EXPANSION OF THE AFV MARKET?

Significant and ongoing alternative fuel vehicle programs are already established in Florida. However, there are several barriers to further expanding the AFV market in the state, particularly into the private, non-fleet sector. The obstacles include fuel and vehicle availability and consumer awareness.

Operators of alternative fuel vehicles must be able to refuel in a cost and time efficient manner, with refueling infrastructure access comparable to traditional fuels. The question is whether it is best to first ensure that a sufficient level of refueling infrastructure is in place, or to ensure that a large enough fleet of alternative fuel vehicles is in place that will patronize the refueling sites. The answer is that a simultaneous rollout of both must occur, as vehicles without fuel are just as ineffective as refueling sites without customers.

Growth in the Florida AFV market initially revolved around fleet use, and Energy Policy Act (EPACT) mandated government and energy provider operators. However, EPACT mandates address only new vehicle acquisitions, not conversion of older vehicles, and the mandates will not create the impetus or critical mass for a sustainable alternative fuel market. Accordingly, future growth in the alternative fuel market must come from the private-use sector.

Understanding the pricing of alternative fuels is another obstacle for market development. Most alternative fuel vehicles are presently more expensive than their conventional counterparts in initial cost; however, they may be less expensive over the full operating life cycle of the vehicle. Consumers and policy makers lack the knowledge to make fully informed decisions and require information that facilitates meaningful comparisons of the benefits and costs of alternative fuel and vehicle choices. Providing a clear understanding of the alternative fuel vehicle choices and fuel options is essential for market growth.

Significant and ongoing alternative fuel vehicle programs are already established in Florida.

Operators of alternative fuel vehicles must be able to refuel in a cost and time efficient manner, with refueling infrastructure access comparable to traditional fuels.

Providing a clear understanding of the alternative fuel vehicle choices and fuel options is essential for market growth.

THE CASE FOR ENHANCING THE ALTERNATIVE FUEL MARKET IN FLORIDA

Through development of an alternative fuel market, Florida can improve energy security, create additional economic activity for the state, attain a competitive edge, and address the needs of the statewide consumer market.



As a supplier of emerging technology automotive components, Florida can position itself to take advantage of new markets both domestically and internationally.

Florida can stake a claim in emerging technologies through the development of an alternative fuel market. In doing so, the state can improve energy security, create additional economic activity for the state, attain a competitive edge, and address the needs of the statewide consumer market.

Florida has a number of qualities essential in the creation of an advanced technology vehicle industry and market:

It is a state dependent upon transportation for its national and international tourists and its extended geography and flat topography are ideal for many alternative fuel vehicle types.

It serves as the point of departure or entry for much of Central and South America.

It has a relatively warm climate that supports use of multiple alternative fuel types.

As a result, Florida is targeted by auto manufacturers as one of the key early markets for advanced vehicles. Representatives from vehicle Original Equipment Manufacturers and energy providers have stated that Florida is one of the strongest markets for these vehicles. The rationale given includes the prevalence of two-car households with one of the vehicles being for short distance use. Shorter trip lengths associated with an aging population and commuting patterns in the state also support this view. All of these elements point to a strong market for these vehicles in our state.

As a supplier of emerging technology automotive components, Florida can position itself to take advantage of new domestic and international markets. The state already has an established base of both current and leading-edge technology businesses. The Florida vehicle manufacturing industry, including automobile, truck, rail, and small and industrial vehicle segments, is concentrated in two areas: vehicle suppliers providing parts, which provides the majority of the employment, earnings, and output base for the industry in the state; and a growing number of companies serving niches in the advanced vehicle technologies industry, including maglev, electric bicycle, small electric vehicles, component suppliers to the EV and electric / hybrid bus manufacturers, fuel cells, and the production of hydrogen, ethanol and bio-diesel. These companies have identified areas such as electric vehicle maintenance, fuel cell research, and alternative fuel technology development as having the potential to grow as new markets for vehicles grow. More than 50,000 employees are reported at over 1,200 firms involved in these sectors in Florida. Florida can leverage the existing alternative

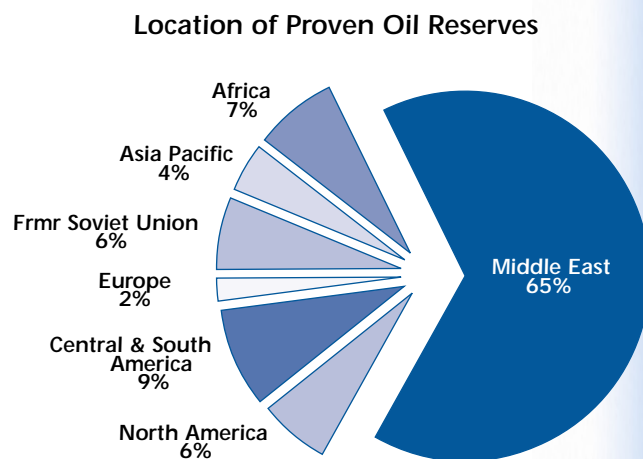
fuel vehicle market and the current business activity in this sector into a program that will improve energy security, capitalize on the business potential, develop a higher level of economic competitiveness, and address consumer needs.

THE POTENTIAL FOR CONTRIBUTING TO ENERGY SECURITY

Florida can do its part in reducing the U.S. dependence on imported petroleum. A secure source of energy means both a stable supply and a stable price. The U.S. holds approximately 6% of current known oil reserves and is highly dependent upon foreign sources of oil. In July 2000, the U.S. released oil from the Federal Strategic Petroleum Reserve in an effort to ensure adequate supplies at reasonable prices for consumers. For both the U.S. and Florida, a reduced dependence on imported oil can minimize the effects of oil price increases and protect the state from concerns over supply issues. Furthermore, the U.S. refinery system has little excess capacity, and continuing growth in the number of distinct gasoline types being delivered to different locations increases the potential for temporary supply disruptions and increased price volatility. Disruptions to the supply of petroleum to Florida would have significant and adverse effects on Florida's economic activity and growth.

Motor fuel consumption in Florida will exceed 20 million gallons per day in 2001. At projected growth rates, daily consumption will exceed 28 million gallons by 2020. By that time, U.S. dependence on foreign oil resources is projected to exceed 64% of annual consumption. Indeed, Florida must be especially concerned, because it has experienced considerable growth in both population and affluence over the last 25 years, leading to above-average growth in motor vehicle ownership, vehicle miles traveled, and gasoline consumption. By the mid-1990s, Florida had one of the highest rates of gasoline consumption in the nation. In 1996, median per-capita gasoline consumption in Florida was 525 gallons per year, compared with only 482 gallons per year in the rest of the U.S. (excluding California). Use of alternative fuel vehicles will greatly diversify the type of fuel used reducing the amount of petroleum that the U.S. and Florida imports and reducing the threat associated with disruptions in the oil supply.

Disruptions to the supply of petroleum to Florida would have significant and adverse effects on Florida's economic activity and growth.



Life of proven reserves for each country differs due to consumption patterns.
Source: BP Oil Statistical Review, 1999

Florida must be especially concerned about oil consumption, because it has experienced considerable growth in both population and affluence over the last 25 years, leading to above-average growth in motor vehicle ownership, vehicle miles traveled, and gasoline consumption.

THE POTENTIAL FOR INCREASED BUSINESS AND FOREIGN TRADE

Diversifying the supply of fuels used for transportation and identifying niche markets unique to Florida make good business sense and can position Florida as a national leader in new technologies and transportation alternatives. Currently, almost half of the cost per gallon of fuel purchased by Florida consumers goes to crude oil producers. Without affecting the economic viability of the refiners, marketers, distributors, or state revenues, there exists enormous revenue potential for Florida-based alternative fuel providers to establish a viable business sector.

Diversifying the supply of fuels used for transportation and identifying niche markets unique to Florida make good business sense and can position Florida as a national leader in new technologies and transportation alternatives.



Florida is in an excellent geographic and economic position to serve the Central and South American markets.

Three alternative fuel types are already produced in Florida. Ethanol is produced in Bartow, bio-diesel is produced in Lakeland, and hydrogen production takes place in Pace. Each of these fuels, plus existing LPG and CNG suppliers and electric energy providers, all have a substantial market potential.

An example is the bio-diesel facility in Lakeland, which has a production capacity of approximately 5 million gallons annually. All diesel vehicles can run on bio-diesel, with little, if any, modification. For significant reductions in pollution levels, a B-20 blend (20% bio-diesel, 80% petro-diesel) is commonly used. A potential market for this may be the Florida School bus system. Florida has the 7th largest school bus fleet in the nation, carrying more than one million school children daily. If it operated on B-20 bio-diesel, the fleet would achieve an estimated 10 ton reduction in hydrocarbon emission and create a \$1.5 million market for bio-diesel producers.

Florida is in an excellent geographic and economic position to serve the Central and South American market. Volume of exports from the U.S. to Central and South America increased from \$932 billion to \$956 billion from December 1998 to December 1999. Given the expected population growth of 1.6% for Central and South America and the Caribbean, the number of vehicles in use in those countries will most certainly rise at a high rate. Mexico City alone has more than 4.2 million motor vehicles; and in some Central and South American locations, the number of motor vehicles has tripled in the past 15 years. This provides a great opportunity for the alternative fuels industry. There is also tremendous potential for vehicle and vehicle parts manufacturers that export their products abroad. Exports of cars and trucks to Brazil in August 2000 equaled \$2 million, while these exports to Mexico rose to \$263 million. Likewise, exports of automotive parts to Brazil in August 2000 were at \$45 million, and to Mexico at \$1.1 billion.

THE CONTRIBUTION TO FLORIDA'S ECONOMIC COMPETITIVENESS

Florida, with more than 24 million acres of farm acreage, has the potential to be a major producer of alternative fuel feedstock. Energy experts see the use of bio-engineered crops for fuels as one of the major economic innovations occurring in the next ten years. New genetic technologies that permit the cultivation of crops to produce fuels such as ethanol will allow regions to effectively grow gasoline and reduce dependence on imported oil.

Given the comparative lack of common borders with other states, many Florida businesses must expend proportionately more in fuel costs to deliver or receive goods from elsewhere in the United States. Developing an alternative to traditional petroleum based fuels will offer a choice to these businesses, and, if developed properly, could provide both a competitive edge for existing firms and an incentive for new firms to locate their operations in Florida.

THE POTENTIAL FOR DEVELOPING A CONSUMER MARKET

Florida is the fourth most populous state in the U.S. With a population of more than 15 million, including nearly 12 million licensed drivers and nearly 11 million licensed motor vehicles and light trucks, Florida's demand for motor vehicles and fuels is enormous. At current population growth rates, Florida adds an average of 100,000 households per year, creating an additional demand for new motor vehicles of almost 200,000 vehicles per year.

Opportunities for electric vehicles abound in Florida. Numerous senior citizen, tourist, and master-planned family communities exist throughout the state that lend themselves perfectly to electric or neighborhood vehicles. The potential for a low speed, short-range electric vehicles to become a key element of these communities is substantial.

Alternative fuel use has historically been seen as the domain of mandated fleet operators. These small and concentrated areas of alternative fuel activity, although a valuable source of experience and information, cannot provide the impetus for a sustainable AFV market. Petroleum consumption in Florida is projected to grow at an annual average rate of 1.8% between 2000 and 2020, relating to an increase in petroleum consumption in Florida on an annual basis of approximately 156 million gallons per year.

Targeting 15% of the incremental growth in petroleum consumption would create a Florida market for over 500 million gallons of fuel annually by 2020. At the projected fuel economies of new vehicles over the same period, this would equate to more than 12 billion miles driven using alternative fuels, valued in excess of \$750 million in revenues.

Florida, with more than 24 million acres of farm acreage, has the potential to be a major producer of alternative fuel feedstock.



Targeting 15% of the incremental growth in petroleum consumption would create a Florida market for over 500 million gallons of fuel annually by 2020, valued in excess of \$750 million in revenues.

RECOMMENDATIONS

There is significant additional effort required to thoroughly investigate and recommend strategies for the advancement of alternative fuels and alternative fuel vehicles in Florida. With the tremendous potential for Florida to contribute to energy security, increase business and foreign trade, contribute to Florida's economic competitiveness, and develop a consumer market, the following actions are recommended to enhance the use of alternative fuels in Florida.

RE-ESTABLISH THE STATE SALES TAX EXEMPTION FOR SALE OR LEASE OF ELECTRIC VEHICLES AND RE-CHARGING INFRASTRUCTURE.

An existing exemption for electric vehicles expired in June 2000. The exemption should be reinstated for the purchase or lease of all electric vehicles for road use, including low speed vehicles (LSVs), neighborhood electric vehicles (NEVs), and electric bikes. Further, it is recommended that all dedicated alternative fuel vehicles be provided with this exemption. This action will help to communicate the State's commitment to AFVs without eliminating any long-term revenue source from the tax base.

There is significant additional effort required to thoroughly investigate and recommend strategies for the advancement of alternative fuels and alternative fuel vehicles in Florida.

WAIVE THE EXISTING REQUIREMENT FOR THE ALTERNATIVE FUEL TAX DECAL.

The decal is currently required for propane and natural gas vehicles at a cost of between \$176 and \$336 annually as payment in lieu of the State portion of the motor fuels tax. While there is a legitimate concern that, when the growth of AFVs becomes significant, there could be a deleterious effect on transportation funding, the current system of alternative fuel taxation is inequitable and not supportive of promoting cleaner burning motor fuels. With 64% of the propane and natural gas fleet currently registered to government agencies, the impact on tax revenues will be minimal in the short run. The current decal process is onerous and difficult to enforce.

IN CONJUNCTION WITH THE APPROPRIATE STATE ENTITIES, HAVE THE CLEAN FUEL FLORIDA ADVISORY BOARD CONDUCT A TAX POLICY STUDY.

While the enabling legislation that created the Board calls for consideration of the impact on transportation funding, it is recommended that, in conjunction with the recommendation for the elimination of the decal, an equitable taxation plan be developed to be forwarded to policy makers for consideration in the year 2002 legislative session. Some alternative fuels are exempt from a portion of the federal fuel tax, others pay no state motor fuel tax, some are taxed identically to gasoline, and still others have not yet been addressed in the state statute. The impact of new engine technologies and improved fuel efficiencies on the collection of motor fuel taxes at federal, state, and local levels and the resulting decrease in available funding for highway maintenance and capacity improvements on the state highways should be addressed.

APPROPRIATE A SUM IN THE FY 2002 BUDGET FOR CLEAN FUEL PROGRAM DEVELOPMENT.

There are currently no remaining resources for the Department of Community Affairs' Energy Office or the Clean Fuel Advisory Board to fulfill their mandate. A \$500,000 appropriation would allow the Department to continue program development and public awareness initiatives that the Board is contemplating. As a part of the Board's continuing program development process, it will study and make recommendations regarding financial, regulatory, and policy incentives for the acquisition and operation of heavy-duty, medium-duty and light-duty AFVs, low speed vehicles, and electric bicycles. In addition, until a statewide program is proposed, a portion of this appropriation could help ensure the continued viability of the Clean Cities Coalition approach.

MOVING FORWARD

The Board envisions that this report forms the basis of an ongoing effort to evaluate the strategic fit of alternative fuels in Florida. In the immediate future, it is important to conduct a more thorough analysis of the economic, social, national security and environmental consequences of current energy use.

To be effective decision makers, the Florida Governor and legislators will need an evaluation of incentives, support, and co-funding programs that have been applied or proposed both in Florida and nationally for increasing the use of alternative fuels. This may include an analysis of tax and emission credits and emissions trading. The adoption of performance standards for use by State agencies should be assessed as a means to provide support to the goal of increased alternative fuel use. Education programs should be developed and implemented for their potential to create a consumer market as well as to address future technology requirements. Community outreach efforts can also assist in raising public awareness and enthusiasm to help create the critical mass to ensure a healthy and sustained market for AFVs. Nationally and within Florida, the Clean Cities programs have had considerable success in reducing petroleum consumption and emissions of pollutants. These approaches should be further evaluated to determine their fit in energy policy for the state. Thirteen states have adopted emission limits for truck and bus engines. Consideration should be given to adopting similar emission limits in Florida.

This work can be realized through the ongoing efforts of the Clean Fuel Florida Advisory Board and the Department of Community Affairs. With continued support, a long range plan can be developed that will include recommendations beyond those included here and establish a strategic direction for expanding the use of alternative fuels in Florida.

Broadening fuel choices will enhance Florida's competitiveness and help ensure a strong economic future. Through the increased use of alternative fuels, Florida can assure energy security, create new business opportunities, and enhance the environment. Florida can become a leader in these new technologies. Efforts must continue to plan and implement an alternative means of fueling Florida's future.



Through the increased use of alternative fuels, Florida can assure energy security, create new business opportunities, and enhance the environment.

**This report was prepared by the Clean Fuel Florida Advisory Board
with assistance from the Center for Urban Transportation Research
at the University of South Florida.**

Published by

***Florida Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100***

1-877-FLA-DCA2 (toll free)

1-877-352-3222

<http://www.dca.state.fl.us>

GOVERNOR

Jeb Bush

SECRETARY

Steven M. Seibert

CHIEF OF STAFF

Pamela Duncan

Produced by

Center for Urban Transportation Research

University of South Florida

4202 East Fowler Avenue, CUT 100

Tampa, Florida 33620

January 2001

printed on recycled paper



Center for Urban Transportation Research

College of Engineering, University of South Florida

4202 East Fowler Avenue, CUT 100

Tampa, FL 33620-5375

(813) 974-3120, SunCom 574-3120, Fax 974-5168

www.cutr.eng.usf.edu