Committee on Utilities & Telecommunications

Tuesday, February 7, 2006
9:45 am – 11:45 am
404 HOB

Revised

Allan G. Bense
Speaker

Ken Littlefield
Chair

Florida House of Representatives

Commerce Council
Utilities & Telecommunications Committee

Kenneth W. "Ken" Littlefield
Committee Chairman

Bob "Coach" Henriquez
Committee Vice-Chairman

Agenda

Utilities and Telecommunications Committee
February 7, 2006 9:45 a.m.–11:45 a.m. 404 HOB

I. Welcome and Opening Remarks by the Chairman

II. Roll Call

III. Florida Department of Environmental Protection - Power Point Presentation – Florida's Energy Office and Florida's Energy Plan (Allan Guyet)

IV. Florida Department of Agriculture and Consumer Services - Power Point Presentation – Farm to Fuel (Jay Levenstein)

V. Florida Solar Energy Center - Power Point Presentation – Solar Energy System Opportunities for Florida (Philip Fairey)

VI. Florida Renewable Resource Conservation Council – Power Point Presentation - Overview of Wood Burning Power Plant Project (Tom Cunilio)

VII. Covanta Energy – Power Point Presentation – Renewable Energy and Specifically Waste Energy (Joseph Treshler)

VIII. Florida Association of Resource, Conservation and Development Councils Inc. – Power Point Presentation – Alternative Energy Resources (Nick Francisco)

IX. Closing Remarks by the Chairman

X. Adjourn

Florida Department of
Environmental Protection

Florida's Energy Office

and Florida's Energy Plan

House Committee on Utilities and Telecommunications
February 7, 2006

Allan Guyet, Director

Florida Energy Office

Department of Environmental Protection

Agenda

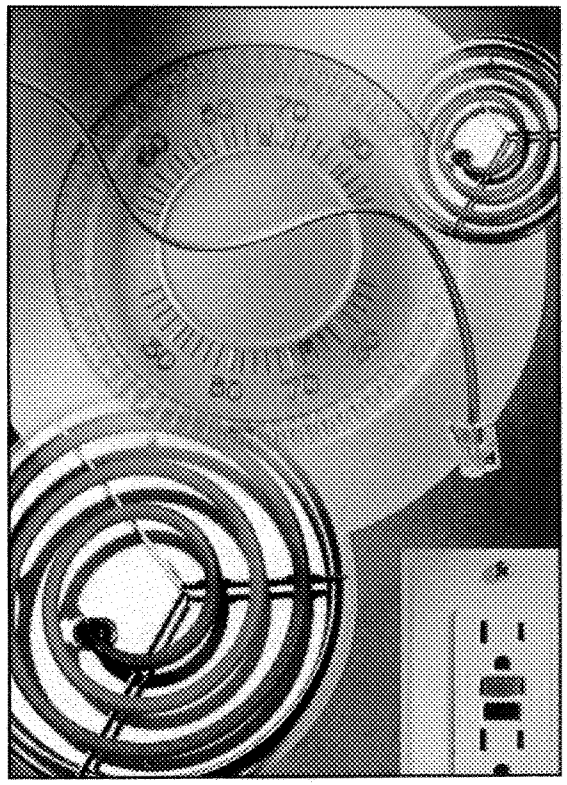
- Overview of the Florida Energy Office
- Review of Florida's Energy Plan

Florida Energy Office

- In 2003, the FEO was transferred to the Department of Environmental Protection to serve as a repository for information on energy in Florida.
- Operational funding for the FEO is received through an annual grant from the U.S. Department of Energy.
- There are currently seven full-time equivalent positions in the FEO.

Legislative Directives

- Coordinate State energy policy
- Promote the efficient, effective, and economical management of energy in Florida
- Perform or coordinating the functions of any federal energy programs delegated to the state
- Coordinate energy-related programs of state government
- Promote the development and use of renewable energy resources



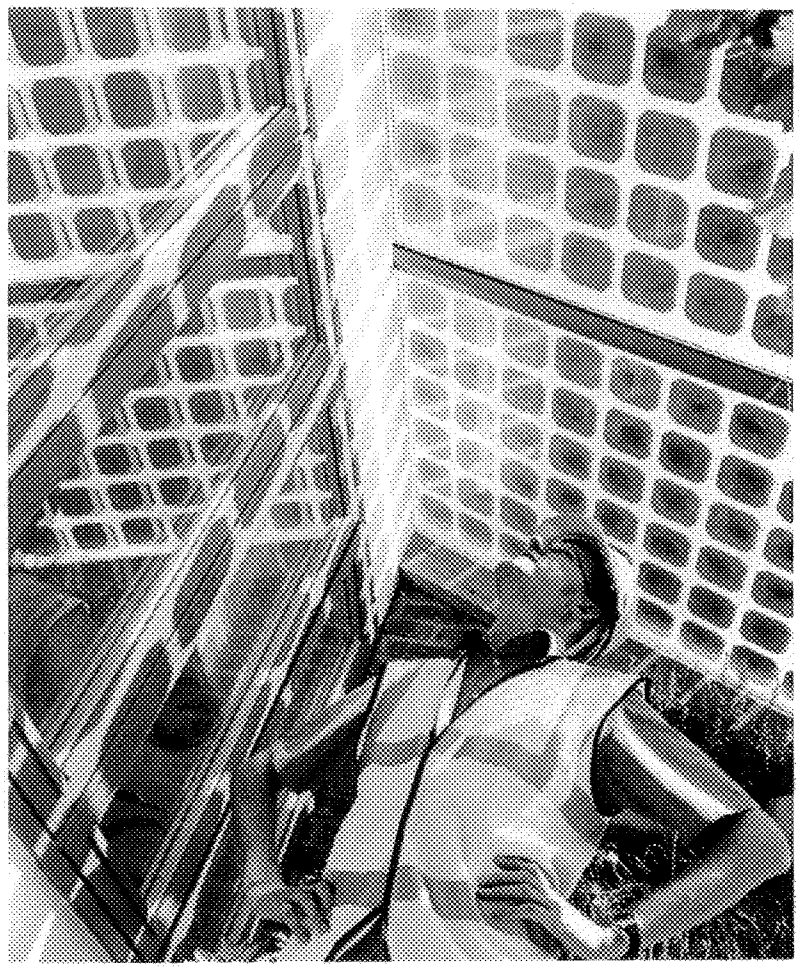
Programs

- Program areas within the FEO include:
  - Energy Efficiency
  - Alternative Energy
  - Solar
  - Hydrogen
- During hurricane season and other natural disasters, FEO coordinates fuel supply and requests by local governments, law enforcement and healthcare facilities throughout the state.

Siting Coordination Office within the Energy Office

- The Siting Coordination Office is an essential component of the energy value chain
- The Siting component of the Energy Office is funded by the State of Florida and staffed by 6 FTE

Mission - Siting Coordination Office



- To coordinate the review of applications submitted pursuant the Florida Electrical Power Plant Siting Act, The Transmission Line Siting Act, The High Speed Rail Siting Act, the Multi-purpose Hazardous Waste Facility Siting Act, and the Natural Gas Pipeline Siting Act.

Florida Energy Plan

- On November 10, 2005, Governor Jeb Bush issued Executive Order #05-241.
- The Order directed the Department of Environmental Protection (DEP) to develop recommendations for a statewide energy plan by January 17, 2005.
- The DEP explored options for:
  - Diversifying Florida's electric generation capacity;
  - Increasing and diversifying transportation fuel supply; and
  - Increasing the State's conservation and efficiency initiatives.

Florida Energy Forum

- On December 14, 2005, the DEP hosted the 2005 Florida Energy Forum in Tallahassee.
- Led by Secretary Colleen M. Castille, the forum consisted of panel participants representing:
  - Florida Public Service Commission
  - United States Department of Energy
  - Utility Companies
  - Fuel Companies
  - Alternative and Renewable Energy Experts
  - Businesses
  - Florida Legislature
  - Environmental Community

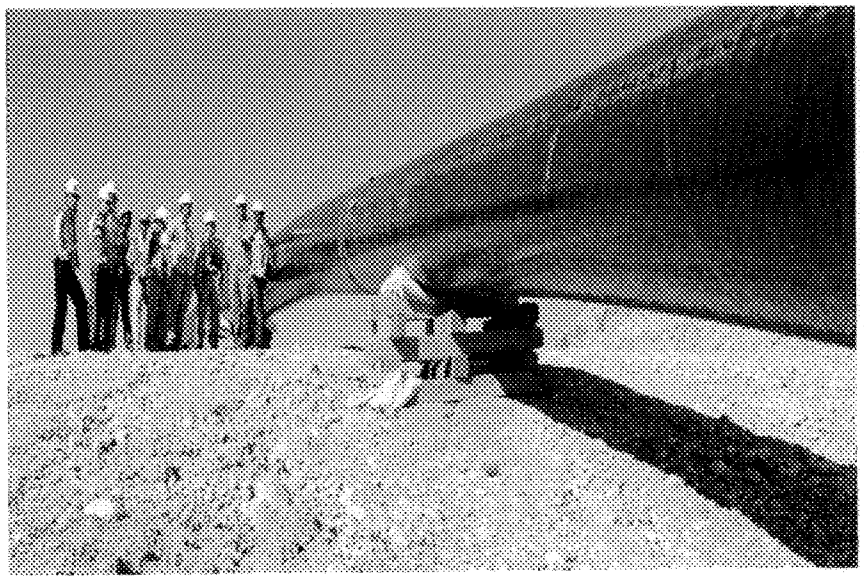
2006 Florida Energy Plan

- On January 17, 2006, the DEP submitted recommendations to Governor Jeb Bush regarding Florida's energy future.
- On February 2, 2006, Governor Bush released substantive and budget recommendations regarding Florida's Energy Future.
- The recommendations surround two energy areas:
  - Electric Power Generation
  - Transportation Fuels

Electric Power Generation Recommendations

Recommendations included:

- Streamline and expedite the siting and permitting of generation resources by revising the provisions of the Florida Electrical Power Plant Siting Act.
- Streamline and expedite the siting and permitting of electric transmission and distribution resources by revising the provisions of the Florida Electrical Transmission Line Siting Act.
- Promote fuel diversity, fuel supply reliability and energy security.
- Facilitate additional fuel delivery mechanisms in Florida for power generation. Expedite all State permits required for the redundancies and increased capacity.

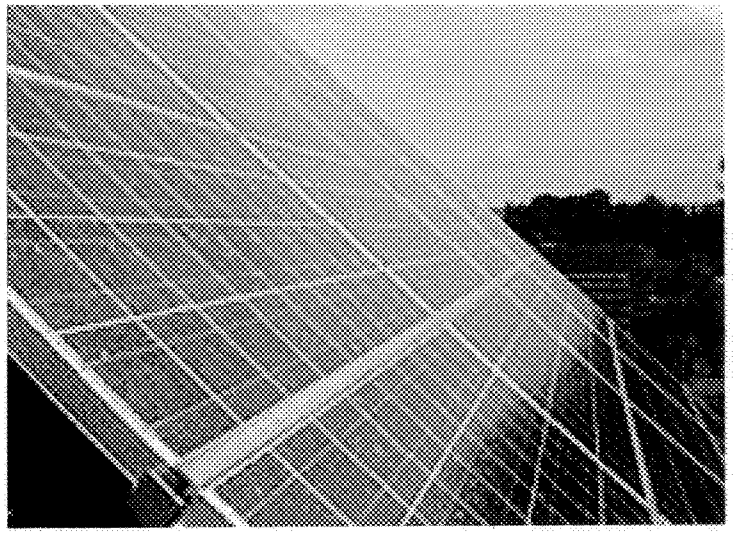


Electric Power Generation (cont.)

- Adopt updated interconnection standards to include all distributed generation technologies.
- Establish an energy council to provide policy advice and counsel to the Governor, Speaker of the House and Senate President.
- Expedite State performance contracting with Energy Service Companies.
- Promote awareness of energy conservation and alternative energy technologies.
- Use discretionary enforcement authority to allow approved alternative energy projects that provide a greater public benefit in lieu of civil monetary penalties.
- Require all new State government building construction to meet the U.S. Green Building Council's Leadership in Environmental Design standards.

Electric Power Generation (cont.)

- Provide grant funding for research and demonstration projects associated with the development and implementation of renewable energy systems. Expand solar, hydrogen, biomass, wind, ocean current and other emerging technologies.
- Identify alternative energy production and distribution industries as Qualified Target Industries.
- Provide consumer and commercial rebates to assist with initial cost of solar technology installations on residential and commercial buildings.
- Provide consumer rebates for purchases of ENERGY STAR™ appliances.
- Provide sales and corporate tax incentives for the manufacture, purchase and use of fuel cells for supplemental and backup power.



Transportation Fuel Recommendations

Recommendations included:

- Facilitate additional and diverse petroleum supply and distribution mechanisms into and within Florida. Expedite State permits required for the redundancies and increased capacity.
- Encourage fueling stations to cooperatively adopt a system modeled after the Florida WARN System to facilitate the relocation and use of generators to reestablish service.
- Foster state-local partnerships to encourage well-designed transportation and transit systems between established communities and within new community development.
- Raise public awareness for alternative fuel vehicles through public programs. Encourage public entities, including school districts and local governments, to use biofuels in fleets.

Transportation Fuels (cont.)

- Provide grants for applied research and demonstration projects associated with the development and implementation of alternative fuel vehicles and emerging technologies.
- Provide sales and corporate income tax credits for hydrogen vehicles and fueling infrastructure.
- Provide tax incentives to improve production, develop distribution infrastructure and increase availability of clean fuels, including biodiesel and ethanol.

Budget Recommendations

- $ 5 million for grant funding for research and demonstration of projects associated with the development and implementation of renewable energy systems.
- $2.5 to provide rebates for solar technologies, both photovoltaic and solar thermal.
- $2.5 million for ENERGY STAR rebates.
- $2.5 million for fuel cell tax incentives.
- $5 million for tax grant funding for research and demonstration of alternative fuel vehicles and other emerging technologies.
- $5 million for tax credits for hydrogen vehicles and infrastructure.
- $7.5 million to provide tax incentives for clean, alternative fuels.

Contact

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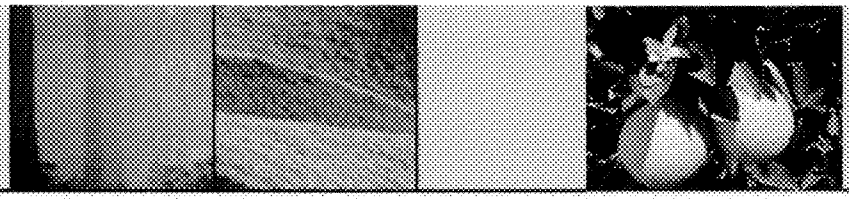
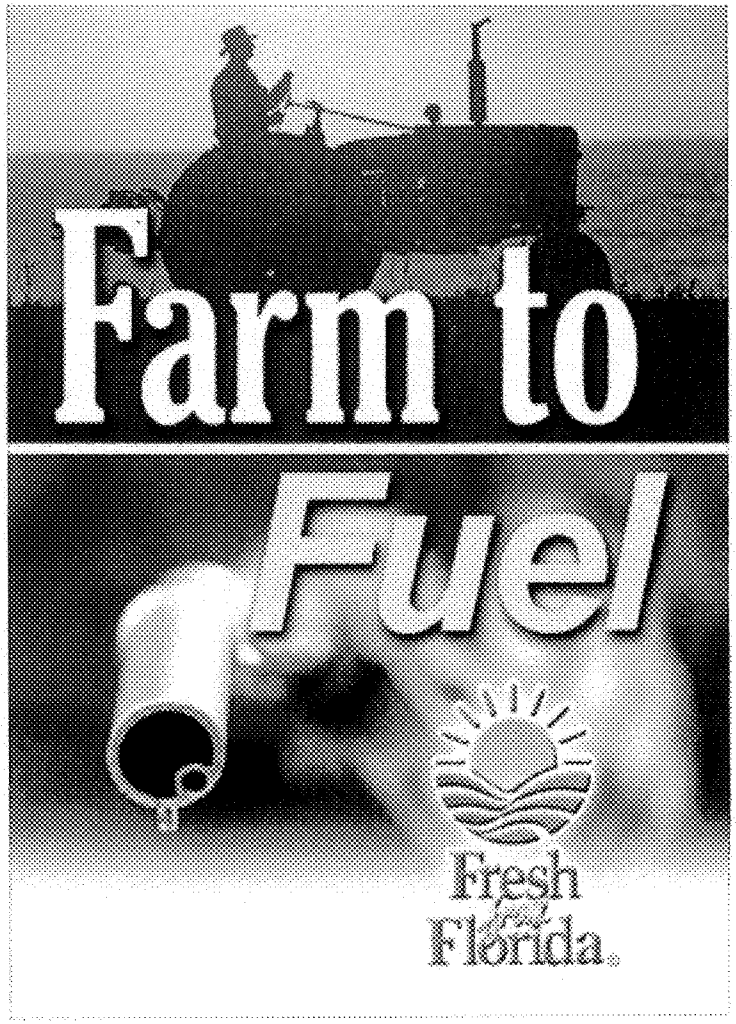
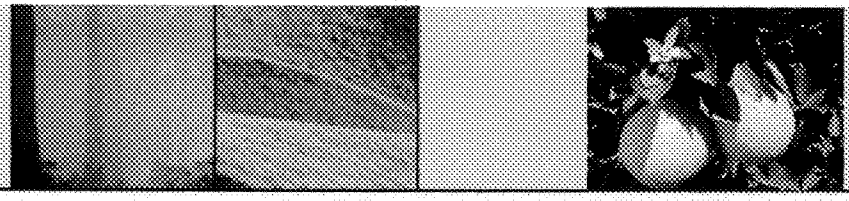
Fla. Dept. of Agriculture
and Consumer Services





Florida Department of Agriculture
and Consumer Services
CHARLES H. BRONSON
COMMISSIONER



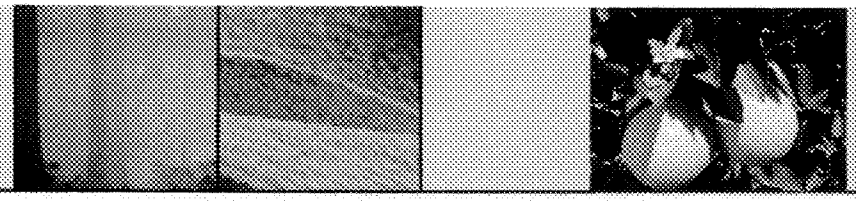
25 X 25

"Agriculture will provide 25 percent of the total energy consumed in the United States by 2025 while continuing to produce abundant, safe and affordable food and fiber."

Ag Energy Work Group

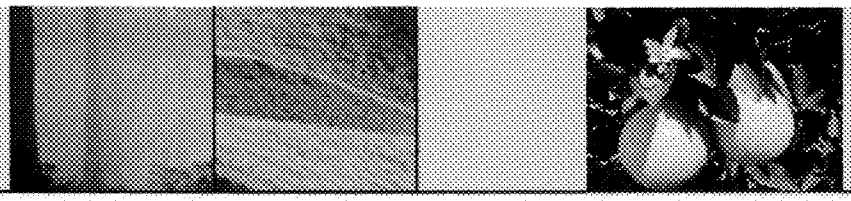
National Association of State Departments of Agriculture

Farm to Fuel



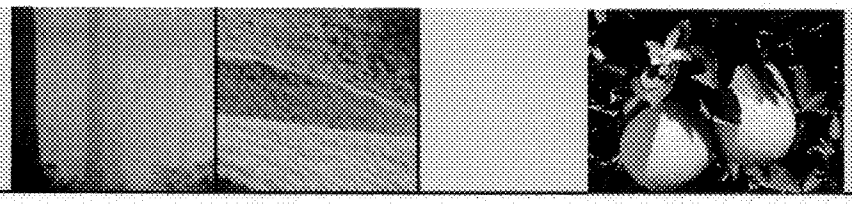
Renewable Fuel Standard

- The EPA recently developed new standards which will provide the first step toward the Renewable Fuel Standard Program. The program will focus on reducing vehicle emissions and strengthen U.S. energy security by *doubling the use of fuels produced from American crops by 2012.*



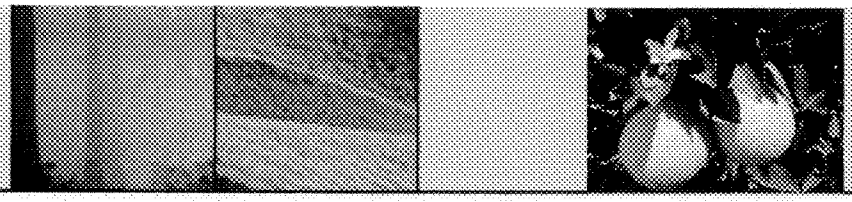
The President's Advanced Energy Initiative

- Sets a national goal of replacing more than 75% of our oil imports from the Middle East by 2025
- Accelerates research in cutting-edge methods of producing "cellulosic ethanol" from agricultural waste products, such as wood chips, stalks, or switch grass



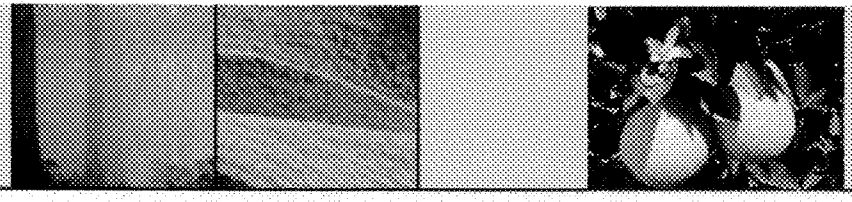
Florida's Current Situation

- Depend almost exclusively on other states and nations for supplies of oil and gasoline.
- Use 8.6 billion gallons of gasoline per year and consumption is growing by 300 million gallons per year.
- No public ethanol availability.
- Limited biodiesel availability.



Florida's Energy Plan

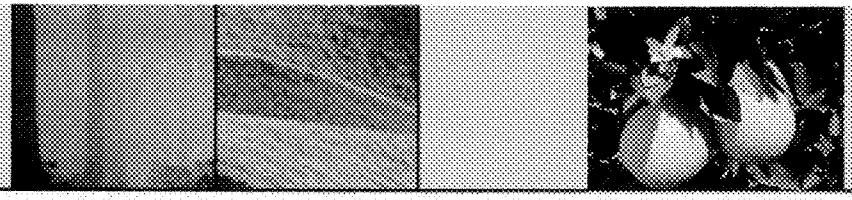
- On November 10, 2005 Governor Bush signed an executive order directing the Secretary of DEP to develop a statewide comprehensive energy plan by evaluating Florida's current and future energy supply and demand.
- The Plan, released on January 17, 2006, makes a number of recommendations relating to alternative fuels.
- On February 1, 2006 Governor Bush unveiled the 2006 Florida Energy Act
  - The Act, among other things, seeks to increase the use of home grown biofuels from Florida's crops by providing grants and tax incentives.



Biomass

- Includes all plant and plant-derived material — essentially all energy originally captured by photosynthesis. This means that biomass is a fully renewable resource and that its use for biomass-derived fuels, power, chemicals, materials, or other products essentially generates no net greenhouse gas.
- Of growing importance are biomass-derived ethanol and biodiesel which provide the only renewable alternative liquid fuel for transportation.

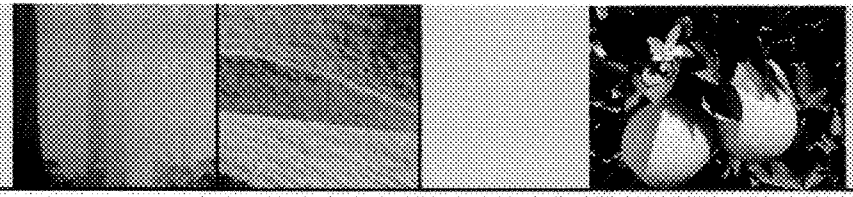
Source: U.S. Department of Energy



Biomass Benefits

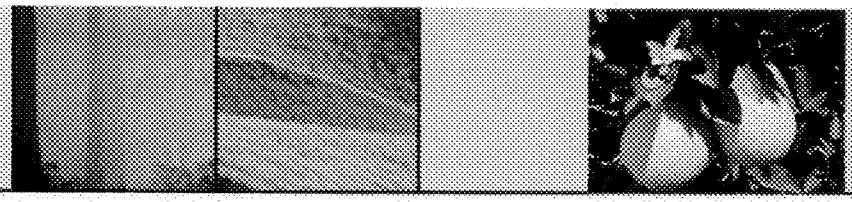
- Offers an alternative to conventional energy sources
- Provides national energy security, economic growth, and environmental benefits.

Sources: U.S. Department of Energy
Energy Efficiency and Renewable Energy
Biomass Program



Sources of Biomass in Florida

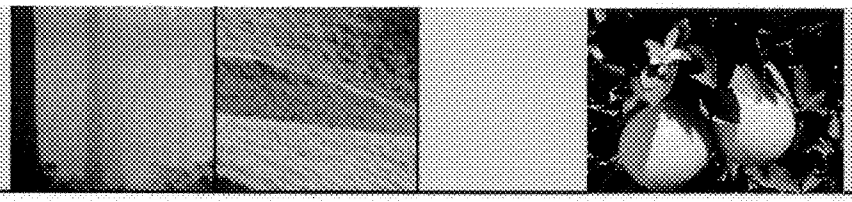
- Fast-growing trees and crops
- Agricultural residues
- Animal manures
- Forest debris and thinnings, undergrowth in timber stands
- Leftover materials from the wood products industry
- Urban wood waste
- Florida 1st in biomass production (IFAS Study)



Ethanol

- An alcohol-based alternative fuel produced by fermenting and distilling starch crops that have been converted into simple sugars. Ethanol can also be produced from "cellulosic biomass" such as trees and grasses and is called bioethanol.
- Ethanol can be blended with gasoline to create E85, a blend of 85% ethanol and 15% gasoline.

Source: U.S. Department of Energy

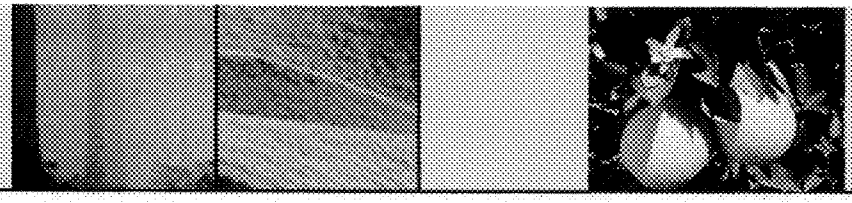


Ethanol Benefits (E85)

- E85 is easy to use and handle.
- Using E85 reduces petroleum consumption.
- E85 is good for the environment.
- Flexible Fuel Vehicles (FFVs) are available and affordable.
- FFVs have flexible fueling options.

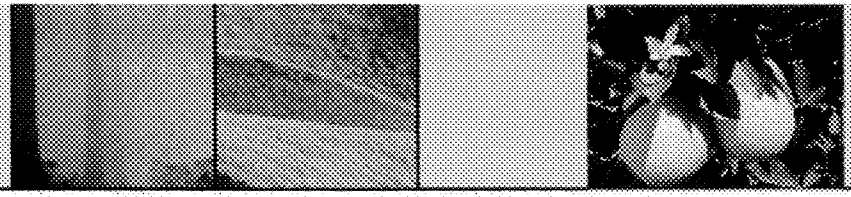
Source: U.S. Department of Energy
Energy Efficiency and Renewable Energy
Alternative Fuels Data Center

Not Just Corn



Sources for Ethanol in Florida

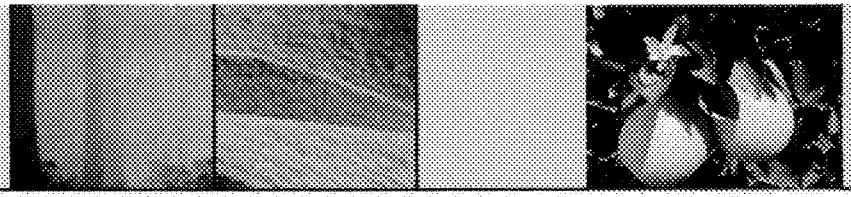
Crop	Acreage
Sugarcane	383,000
Citrus	748,555
Vegetables	192,800
Cotton	85,000
Field Corn	65,000
Potatoes	29,000
Wheat	20,000



Biodiesel

- Domestically produced, renewable fuel that can be manufactured from vegetable oils, animal fats, or recycled restaurant greases.
- Safe, biodegradable, and reduces serious air pollutants such as particulates, carbon monoxide, hydrocarbons, and air toxics.
- Blends of 20% biodiesel with 80% petroleum diesel (B20) can generally be used in unmodified diesel engines. Biodiesel can also be used in its pure form (B100), but it may require certain engine modifications.

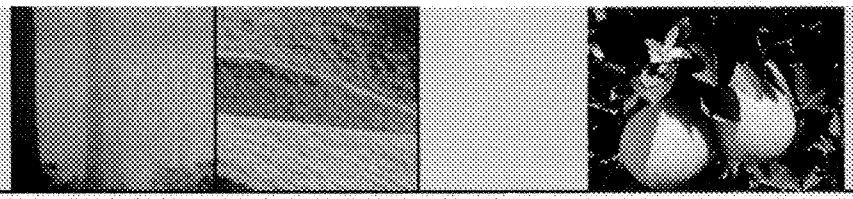
Source: U.S. Department of Energy



Biodiesel Benefits

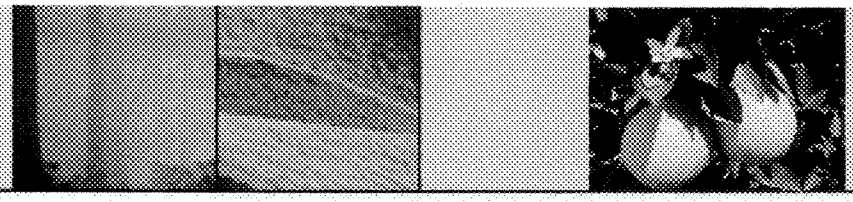
- Special pumps or high pressure equipment for fueling are not needed. Special vehicles or engines to run biodiesel do not need to be purchased.
- Reduced carbon dioxide emissions.
- Produces fewer air pollutants.
- Reduces the country's dependence on imported oil.
- Biodiesel offers safety benefits over petroleum diesel because it is much less combustible.

Source: U.S. Department of Energy
Energy Efficiency and Renewable Energy
Alternative Fuels Data Center



Sources for Biodiesel in Florida

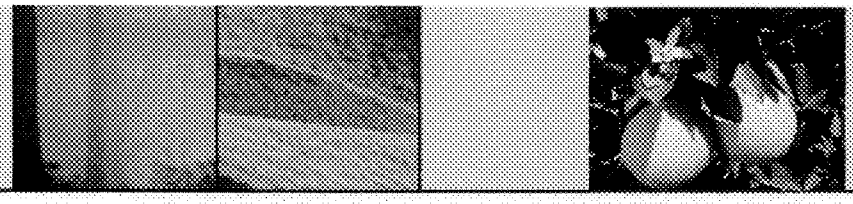
Crop	Acreage
Peanuts	160,000
Soybeans	11,000
Cotton	85,000
Poultry Fat	1,329,000 birds



Benefits to Agriculture

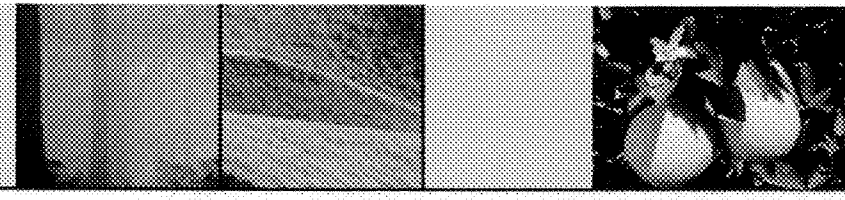
- Increase farm income.
- Added value uses for crops, livestock, agricultural residues, and byproducts.
- Alternative agricultural and rural enterprises.
- More productive use of marginal land.
- Resolution of air, water and soil quality problems.
- Increased reliance on new markets to maintain the viability of U.S. agriculture.
- Major impact on rural development with many job opportunities being created through the processing of agricultural products and byproducts.

Source: Ag Energy Work Group



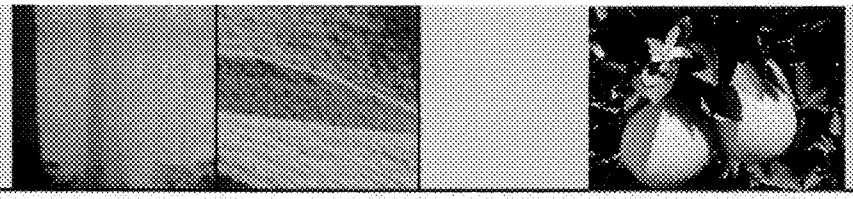
Alternative Fuel Standards

- The Division of Standards is in the process of adopting a rule to define the standards to which alternative fuels must conform (ASTM).
- The Division is also be seeking funding to purchase new laboratory instrumentation to analyze new alternative fuels entering the market to ensure these fuel quality standards are met.



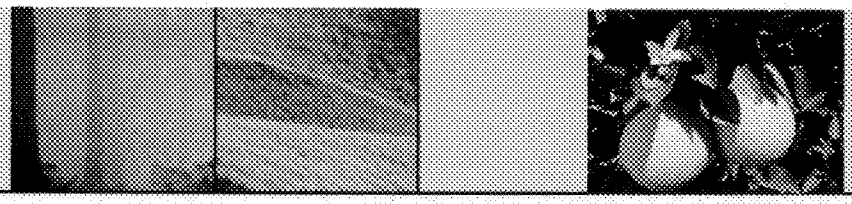
Research

- Current research projects at UF/IFAS
  - Bacteria to convert ag and forest biomass into biofuel (e.g. ethanol)
  - Anaerobic digestion systems for waste treatment & biogas production (e.g. biomass feedstocks, manure)
- UF/IFAS: Proposes research & extension programs in 4 critical areas
  - Developing Biomass Energy Crops
  - Industrial Research & Development
  - Environmental Assessment of Energy Systems
  - Energy Conservation and Biomass Energy Extension
- FAMU College of Engineering Sciences, Technology and Agriculture is also doing research in this field.



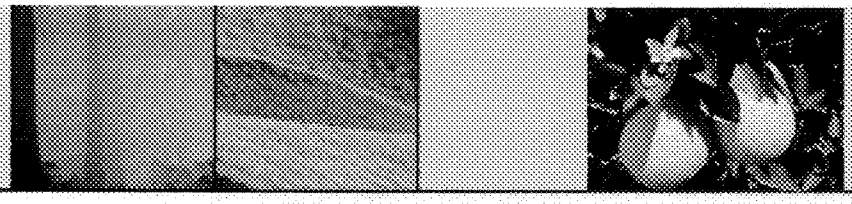
Federal Incentives

- The USDA's Bioenergy Program pays U.S. commercial ethanol and biodiesel producers to increase their annual production from eligible commodities.
- The American Jobs Creation Act of 2004 created tax incentives for alcohol and biodiesel fuel blenders/retailers. The credits are $.51 per gallon of ethanol, $1.00 per gallon of agri-biodiesel, and $.50 per gallon of waste-grease biodiesel. If the fuel is used in a mixture, the credit amounts to $.05 per percentage point ethanol or agri-biodiesel used or $.01 per percentage point of waste-grease biodiesel.
- Small Agri-Biodiesel Producer Credit allows a tax credit of $.10 per gallon to small agri-biodiesel producers for up to 15 million gallons.



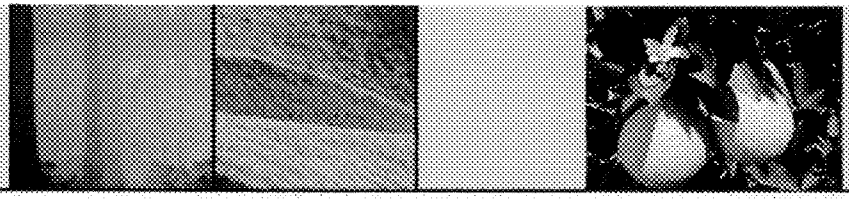
Federal Incentives

- Alternative Fuel Infrastructure Tax Credit equal to 30% of the cost of alternative refueling property, up to $30,000 for business property. Qualifying alternative fuels include E85, or biodiesel mixtures.
- Renewable Energy Systems and Energy Efficiency Improvements Grant - grant funds and guaranteed loans for the purchase of renewable energy systems and energy improvements for agricultural producers and small rural businesses. Eligible projects include biofuels.



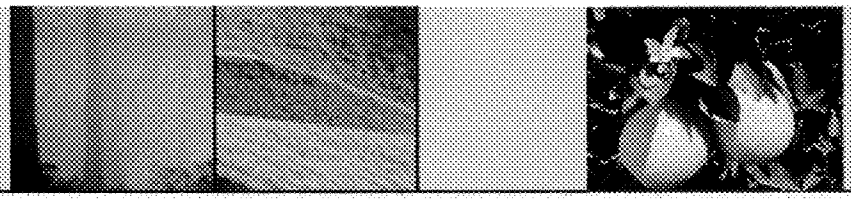
State Ethanol Production Incentives

- Hawaii - fuel blends of at least 10% alcohol fuel blended with petroleum fuel, and 100% alcohol fuel, are exempt from the 4% state excise tax on retail sales.
- Iowa - E85 is taxed at a reduced rate.
- Illinois - sales and use taxes do not apply to ethanol-blended fuels (containing between 70% and 90% ethanol).
- Maryland - $.20 per gallon from small grains, $.05 per gallon for others.
- Minnesota, Mississippi, Oklahoma, South Dakota, Texas, Wisconsin - $0.20 per gallon.
- Missouri - $0.20 per gallon for the first 12.5 million gallons and $0.05 for the second 12.5 million gallons produced.
- North Dakota, Wyoming - $0.40 per gallon.
- Pennsylvania - $.05 per gallon.



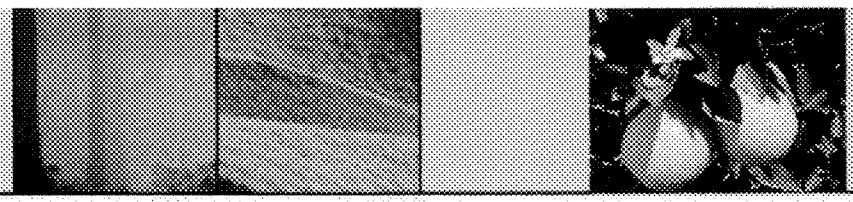
State Biodiesel Production Incentives

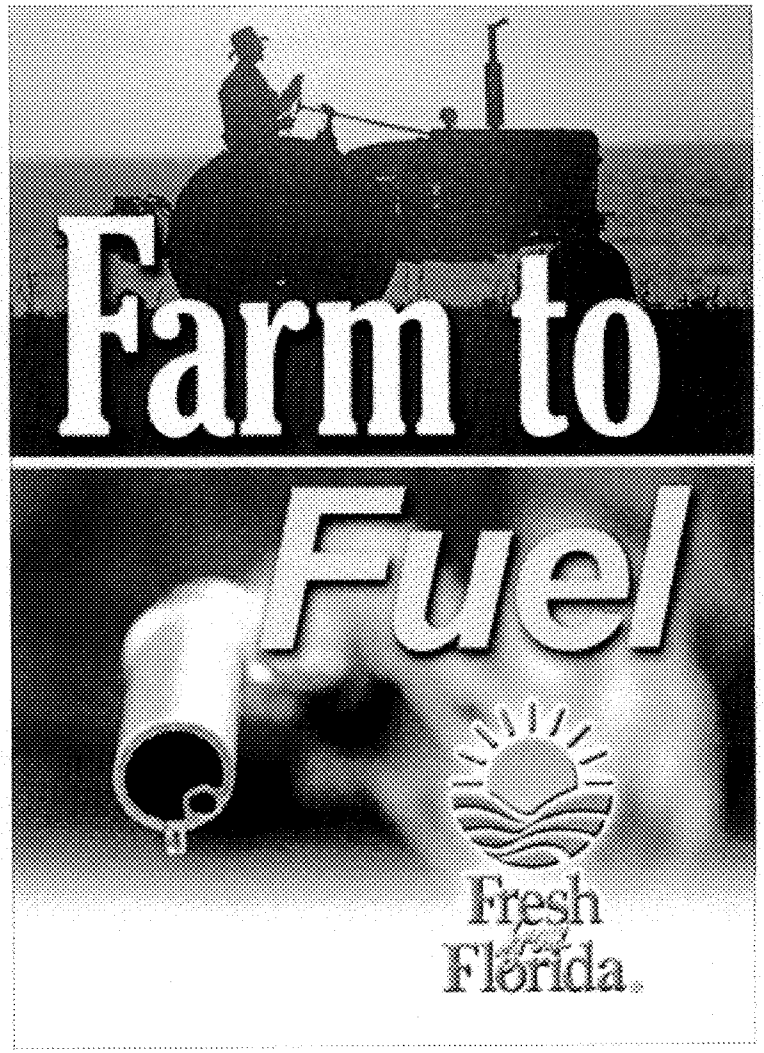
- Arkansas - biodiesel supplier is entitled to a tax refund of $0.50 per gallon of biodiesel used to produce a biodiesel mixture that contains not more than two percent (2%) biodiesel. An income tax credit is available to biodiesel suppliers for up to 5% of the costs of the facilities and equipment used in the distribution of biodiesel.
- Delaware - grants equal to 25% of the cost of a project which demonstrates the market potential of Renewable Energy Technology including biodiesel manufacturing facilities.
- Idaho - tax deduction for the use of biodiesel and ethanol.
- Indiana - taxpayer credit of $1 per gallon of biodiesel used to produce blended biodiesel. Taxpayer that produces blended biodiesel is entitled to a credit of $0.02 per gallon.
- Iowa - zero-percent interest loans for up to half the cost of biomass or alternative fuels related fuel production projects.



State Biodiesel Production Incentives

- Kentucky - income tax credit of $1.00 per gallon for producers and blenders.
- Louisiana - property and equipment used in the manufacture, production, or extraction of unblended biodiesel exempt from sales and use taxes.
- Maine - tax credit of $0.05 per gallon for the production of biofuels.
- Maryland - production credits of $0.20 per gallon of biodiesel produced from soybean oil and $0.05 per gallon produced from other feedstocks.
- Mississippi – production credit of $.20 per gallon.
- Missouri - grant to producers of $0.30 per gallon for the first 15 million gallons produced in a fiscal year and $0.10 per gallon for the next 15 million gallons provided that 51% of the feedstock originates in Missouri and 100% originates in the U.S.
- North Carolina - taxpayers who construct, purchase, or lease renewable energy property eligible for a tax credit of 35% of the cost of the property.
- Oklahoma - credit of $0.20 per gallon of biodiesel produced.
- Rhode Island - organically produced biodiesel fuels exempt from motor fuel tax.
- Texas - biodiesel blended with taxable diesel is exempt from the diesel fuel tax.




Farm to
Fuel
Fresh
from
Florida

Florida Solar
Energy Center

FLORIDA SOLAR ENERGY CENTER

Creating Energy Independence Since 1975

Solar Energy System Opportunities for Florida

House Committee on Utilities and Telecommunications

Philip Fairey
Deputy Director

A Research Institute of the University of Central Florida

Florida's Growth

- Florida has one of the nation's fastest growing populations (1,000 new residents per day), promoting rapid expansion of an energy industry that imports its fuel supplies.
- 160,000 new homes per year in Florida – most in the nation
- The tourist industry brings upwards of 80 million visitors a year to Florida, adding to the burgeoning demand.

Economic Context

- The economic implications of fuel purchases in Florida are large
  - At $2.50/gal = $23 billion/year for automotive fuel. Plus another $17 billion/year for electricity yields a total of $40 billion/year
  - At least half ($20 billion per year) leaves Florida's economy as fuel payments to other states and nations.
- Keeping this money in Florida would result in $40 to $60 billion/year (2-3 times the $20 billion exported) in real economic activity and job creation.

Florida Solar Energy Center

Creating Energy Independence Since 1975

A Research Institute of the University of Central Florida

Florida Solar Energy Center

- Created in 1975 by the Florida Legislature
- The energy research institute of the state of Florida
- Mission is research, testing and education
- More than $9 - 12 million annually in external contracts and grants
- The experience, staff (>140) and capabilities to help solve our energy problems and help meet our energy needs
- Began as a "solar energy" center, but grew into many new research and development areas
- Housed in one of the world's most energy-efficient buildings.

FSEC Program Areas

- **High-Performance Buildings** (energy efficiency)
- **Solar Thermal Systems** (today's cost-effective solution)
- **Photovoltaics** (solar electricity)
- **Testing & Certification** (protecting Florida's citizens)
- **Hydrogen and Fuel Cells** (the future's fuels and engines)
- **Education and Training** (Florida's workforce for today and the future)
- **Alternative Fuels & Transportation** (an agricultural opportunity for Florida)

Some FSEC Highlights

- Our buildings research has helped save state residents more than $2.2 billion in energy costs.
- Our solar research has led to more than 250,000 solar water heating systems installed in the state – saving homeowners $30 million annually.
- We have trained more than 15,000 industry professionals, government officials and others.
- Our PV research has helped accelerate a market now growing 30 percent annually.

Current State Programs

- SunSmart Schools:
  - 29 existing SunSmart school installations across the state – more this year
  - Provides classroom learning activities based on monitored data from installations
- Front Porch Sunshine:
  - Solar water heating program for low-income families
  - More than 900 systems installed – more this year
- SunBuilt:
  - Builder incentive program to install solar hot water systems on new Florida homes
  - Managed by Florida Solar Energy Research and Education Foundation (FlaSEREF)

New Opportunities

Federal Tax Credits!

- $2,000 to builders of highly efficient new residences
- 30% of expenditures, up to $2,000, to purchasers of residential solar hot water systems
- 30% of expenditures, up to $2,000, to purchasers of residential PV systems.
- Up to $500 for energy-efficiency improvements to existing homes.

Some Problems

- Federal tax credits are not performance based
  - Sends wrong signal – pressures industry to raise prices to increase amount of credit
  - Opens door to less than honest interlopers
- Federal tax credits are only authorized for years 2006 and 2007
  - Not long enough to transform renewable energy markets
  - Not long enough for solar industry to invest in new manufacturing facilities to meet any increased demand.

A Potential Solution

- "Wrap-Around" Rebates
  - Create a long-term (more than 6 years) performance-based wrap-around Florida rebate
  - Wrap-around means that the amount of the federal tax credit is subtracted from the Florida rebate
- Proposed performance-based wrap-around rebates:
  - Solar hot water systems – $0.60 per annual kWh equivalent saved
  - Photovoltaic systems – $3.50 per peak watt

Residential Goals

- Hot water systems:
  - Solar hot water systems installed on 15% of new Florida homes and 1% of existing Florida homes each year
  - Total of 86,000 hot water systems installed per year
- PV systems:
  - PV systems installed on 0.15% of Florida's homes per year
  - Total of 9,300 PV system installations per year (average = 2 kW peak)

Resulting Florida Benefits

Cumulative Ten Year Totals

Total energy savings	10.5 TWh
Total consumer cost savings	$1.05 billion
Total fuel not purchased	$526 million
Avoided capacity	681 MW
Avoided generation costs	$681 million
New jobs	53,000
Tradable renewable energy credits (TRECs)	$420 million
CO_2 savings	15.2 million tons

More Information

- In the packet provided:
  - Additional information on Florida Solar Energy Center research programs, activities and vision
  - Backup documentation on Florida renewable energy and energy efficiency study
- FSEC web site:

  http://www.fsec.ucf.edu

- Questions?

Resource Conservation
& Development Council

"The Zero Waste Solution"

Dr. Alex Green, Graduate Research Professor Emeritus, UFL and
Tom Cunilio, Coordinator, FL Renewable RC&D Council

BIOMASS ENERGY NETWORK

- FL ENERGY OFFICE (DEP) AWARDS GRANT to FL RENEWABLE RC&D COUNCIL (Jan. '06) to:

- Build Network on RC&D Council State Assoc.
- Develop methodology for urban wood
- Inventory FL's urban woody biomass with IFAS
- Identify urban woody biomass suppliers
- Build small wood-fired power plants in each Council with business partnerships and 2005 Energy Bill incentives.

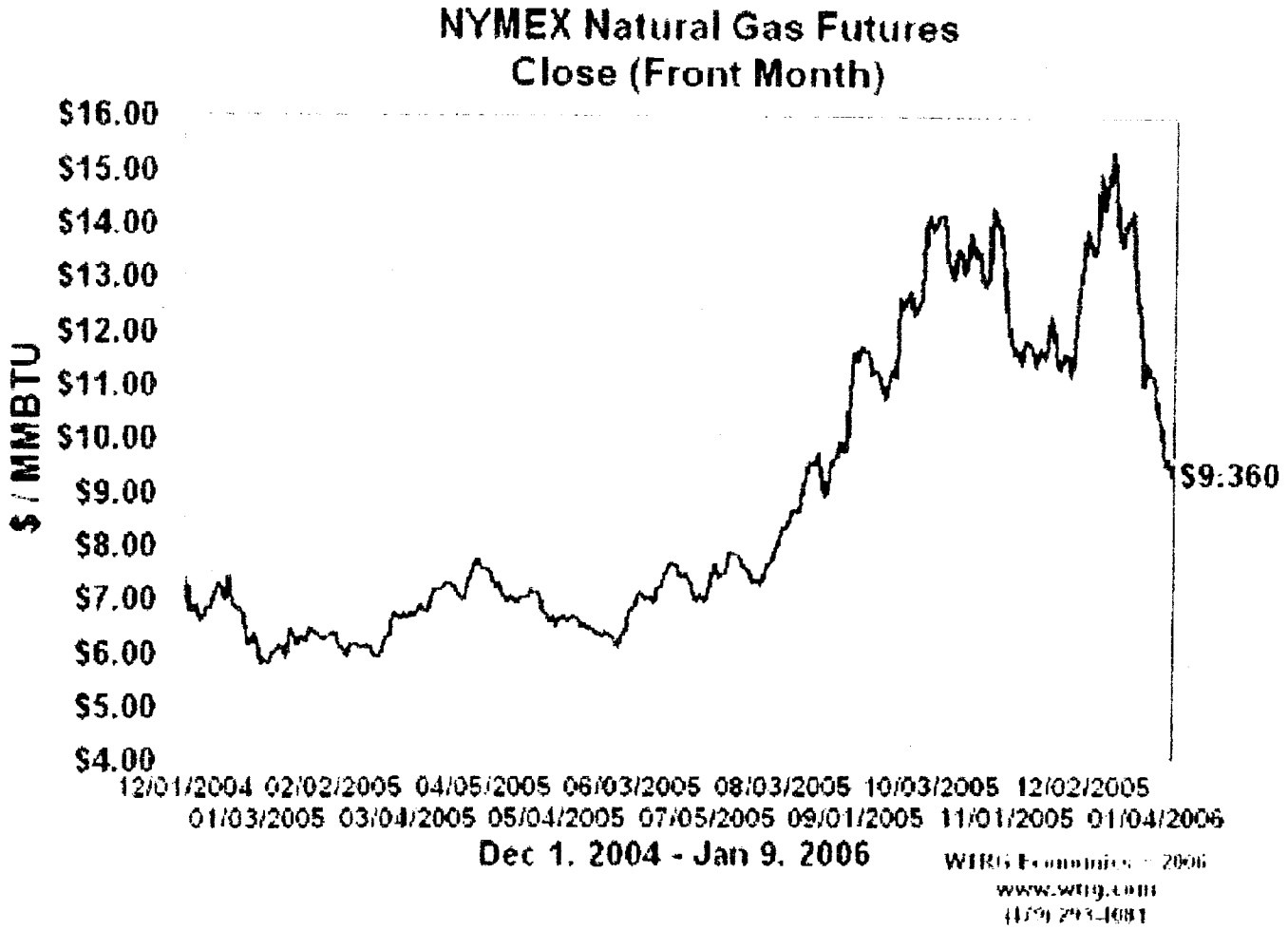
BIOMASS ENERGY NETWORK

- State-owned 3 MW woody power plant ran two years and was shut down.
- Recommissioning this plant is a priority for the Council.
- Funding is being requested in CBIR sponsored by Rep. Aaron Bean (HS Tracking #2410.

Primary vs Secondary Energy Supplies (PES vs SES)

- Oil, coal, natural gas, nuclear, and the renewables (biomass and waste, hydroelectric, geothermal, wind, solar) are primary energy supplies (PES).
- Steam, electricity, **syngas**, liquid synfuel, batteries, fuel cells, hydrogen, reactive chemicals etc. are secondary energy supplies (SES) that get their energy from PESs.
- One must recognize PES and SES differences and the costs and potential time scales for conversion.
- Thermo-chemical production of **Syngas** and liquid synfuel are fast and have near term potential.

Every city made its own gas until after WW II when cheap natural gas (NG) became widely available. Natural Gas cost $1-2 /MMBtu, when from 1985-2000 almost all new electrical generating plant were built as NGCC plants. In 2004 it cost over $5/MMBtu. Today it costs about $10 /MMBtu.
Has the Gasification Age returned?



Fuel and Solid Waste Problems and Solutions

- Safe landfill space becomes limited as population density increases., Tipping fees are high.
- Conservation-going Green with recycling and energy efficiency can reduce waste and our country's dependence on imported liquid and gaseous fuels.
- We can get closer to Zero Waste and further reduce ou fuel imports by converting Solid Waste to Energy by Advanced Thermal Technologies (SWEATT).
- Baby boomers and generations X, Y and Z do not appear concerned about running out of fuel but the dangers to our national security, transportation and economy are well recognized by the WWII generation.

Wasted Organic Solids in the U.S.

- Agricultural residues
- Forest under-story and forestry residues
- Construction and deconstruction debris
- Hurricane debris
- Refuse derived fuels
- Urban yard waste
- Food serving and food processing waste
- Used newspaper and paper towels
- Energy crops on under-utilized land
- Infested trees, (beetles, canker, spores)
- Invasive species (cogon-grass, melaluca..)

>1.5 billon dry tons biomass (ORNL report)

Additional Wasted Solids

- Used tires
- Waste plastics and auto fluff
- Plastics mined when restoring landfills
- *Bio-solids (dried pelletized sewage sludge)
- *Poultry and pig farm waste
- *Water plant-remediators (algae, hydrilla..)
- *Muck pumped to shore to remediate lakes
- *Manure from cattle feed lots
- Plants for phyto-remediation of toxic sites
- Treated wood past its useful life

*helps in water remediation

> 0.5 billion dry tons, Estimated aesg.

Energy Potential of Solid Waste (SW)

TOTAL SW potential 1.5+0.5 =2 Billion Dry Tons

(2*10^9tons)*(2000lbs/ton)*(7500Btu/lb)=

30 *10^15 Btu = 30 quads

Compared to Coal

(1*10^9tons)*(2000lbs/ton)*(11,500Btu/lb)=

23 *10^15 Btu = 23 quads

Solid Waste now 3 quads could be 30 quads

The other renewables, hydroelectric (2.7%), geothermal 0.34%), wind (0.14%) and solar (0.06%). have much further to go to become major primary energy supplies in the U.S.

Implications of the ACE Analyses SWCC vs NGCC and MADBANG

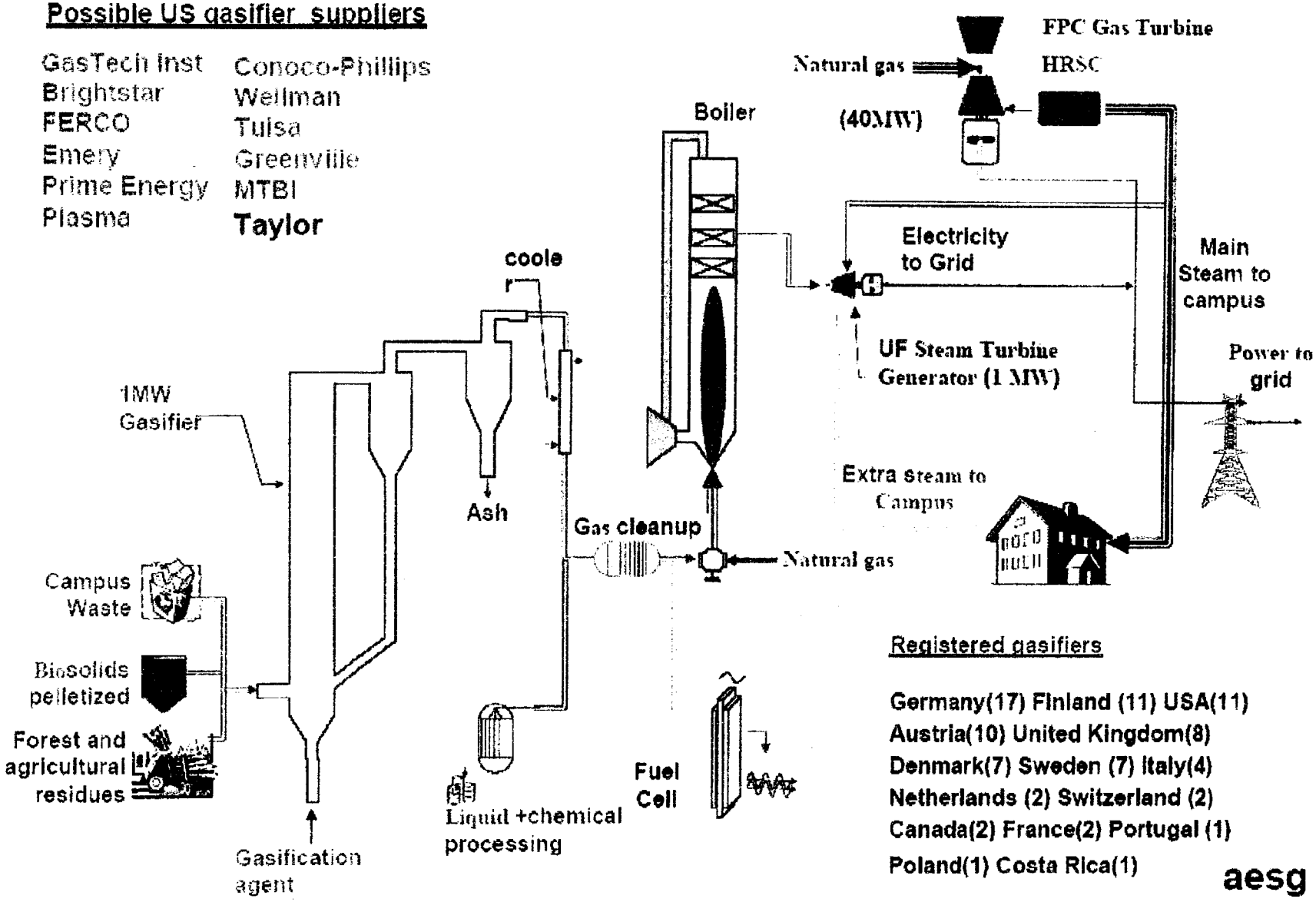
- Convert SW to gas at high NG prices particularly when a second income from disposal services, heat, steam, fuels, chemicals, etc effectively lowers X.
- SWCC competes with cheap (in $/MMBTU) coal if scrubbing systems increase Kc, or externalities are added to coal costs, Xc.
- Strategy: Develop advanced thermal technology (ATT) with a SW tipping fee. Then apply the SWEATT to biomass residues and energy crops.
- Research and test strategy with campus waste mostly consisting of (in tpy) 8400-garbage, 2100-paper, 3000- yard waste. Potential energy and waste disposal savings ~$5 Million/yr (MADBANG).

Conceptual U.F. 1MW MADBANG/SWEATT-CHP

Possible US gasifier suppliers

GasTech Inst
Brightstar
FERCO
Emery
Prime Energy
Plasma

Conoco-Phillips
Wellman
Tulsa
Greenville
MTBI
Taylor



Registered gasifiers

Germany(17) Finland (11) USA(11)
Austria(10) United Kingdom(8)
Denmark(7) Sweden (7) Italy(4)
Netherlands (2) Switzerland (2)
Canada(2) France(2) Portugal (1)
Poland(1) Costa Rica(1)

aesg

California Integrated Waste Management Board's *Evaluation of Conversion Technology Processes and Products* (forthcoming part of conclusion)

- "Thermo-chemical conversion technologies, su as gasification and pyrolysis, can treat nearly a of the organic fraction of MSW and can, in general, treat a more heterogeneous feedstocl including high energy content plastics. Pyrolys and gasification applications for MSW have expanded considerably in the past five years, especially in Japan ... Over 50 commercially active facilities were identified ..."

Future:Zero Waste with SWEATT

- With natural gas 3-7 times higher (constant dollars) than when most NGCC were built it makes energy, economic and environmental (EEE) sense to convert local SW to gas & use modern gas clean-up technologies.
- Co-use of SW gas with NG provides flexibility in responding to NG price fluctuations.
- Co-operation of concerned energy sectors would greatly accelerate ATT development and use.
- Zero Waste with SWEATT could save U.F. ENERGY and DISPOSAL costs that are now over $30 Million.
- Zero Waste with SWEATT can mitigate major US and FL energy, environment and economic problems.

Question: Why is SWEATT hard to sell in the US, FL, Gainesville, UF but sells well in Japan and EU?

COVANTA

Safe Waste Disposal and Clean Energy Solutions
... For Generations To Come.

Testimony
before the
Florida House of Representatives
Utilities and Telecommunications Committee

February 7, 2006

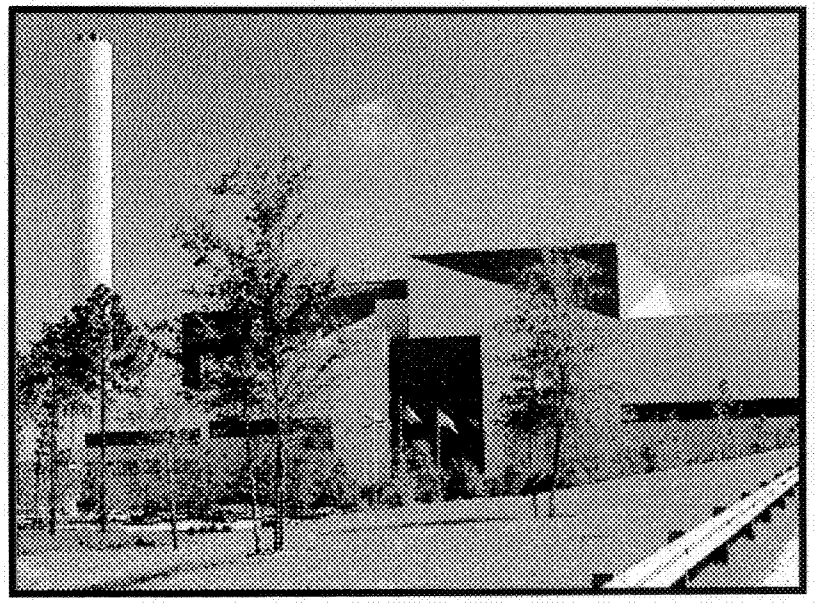
Introduction

- **Purpose**
  - Provide beneficial information on the status of Resource Recovery utilizing waste-to-energy (WTE) as a source of clean, environmentally-sound, renewable energy
- **Strong industry foundation for waste-to-energy**
  - Represented at national level through Integrated Waste Services Association (IWSA).
  - Public and private entities involved in waste-to-energy as integral component of comprehensive solid waste management.
    - Covanta Energy Corporation
    - Wheelabrator Technologies, Inc.
    - Montenay Power Corporation
    - Energy Answers Corporation
    - 28 municipalities utilizing WTE
  - A multitude of businesses and other industry relayed organizations engaged in support of WTE

COVANTA

Industry Overview of Waste-to-Energy

- According to the US EPA, the WTE industry disposes about 13% of the nation's waste
  - 89 facilities processing 29 million tons per year
  - 36 million people served in 27 states
  - Power generation capacity in excess of 2,700 MW
  - Produces 16 million MW-hours of clean, renewable power on an annual basis



COVANTA

Covanta Energy Corporation

- Covanta Energy is the largest owner/operator of WTE facilities in the US
  - 31 domestic WTE facilities; more than any other single vendor
  - Disposes of nearly 7% of nation's waste
  - Processed 15 million tons in 2005
  - Generates approximately 1,200 megawatts of clean, renewable energy.
- Within the State of Florida, Covanta operates:
  - Four WTE facilities
    - Pasco County, FL
    - Hillsborough County, FL
    - Lee County, FL
    - Lake County, FL
  - Collectively, these four facilities:
    - annually process over 1.25 million tons per year of MSW
    - generate 114.5 megawatts of electric power

COVANTA

The "Power" of WTE in Florida

One ton of MSW
(energy equivalent)
One barrel of fossil fuel oil or 10 MCF of natural gas!

- **All FL MSW equivalent to 72 million barrels of oil per year**
- **17,900 tons per day (TPD) of MSW processed by WTE in FL today**
- **Avoids annual consumption of 6.5 million barrels of oil or 65 million MCF of natural gas**
- **506 MW of electricity generated on a daily basis from WTE**
- **Through volume reduction, annually saves over 8,125 acre feet of precious landfill space**

COVANTA

WTE: A Success Story

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 14 2003

Mario Zanesi, President
Integrated Waste Services Association
1401 H Street N.W., Suite 220
Washington, DC 20005

Dear Mr. Zanesi:

EPA recognizes the vital role of the nation's municipal waste-to-energy industry, and wishes to thank you for your environmental efforts.

Upgrading of the emission control systems of large combustors to exceed the requirements of the Clean Air Act Section 129 standards is an impressive accomplishment. The completion of retrofits of the large combustion units enables us to continue to rely on municipal solid waste as a clean, reliable, renewable source of energy. With the capacity to handle approximately 15 percent of the waste generated in the US, these plants produce 2800 megawatts of electricity with less environmental impact than almost any other source of electricity. With fewer and fewer new landfills being opened, and capacity controls being imposed on many existing landfills, our communities greatly benefit from the dependable, sustainable capacity of municipal waste-to-energy plants.

We applaud the leadership taken by the Integrated Waste Services Association in coordinating research needs to continue to improve the performance of these plants. Your willingness to work with EPA and the State governments on responses to natural or man-made emergencies, including anthrax, is greatly appreciated. Our staff in the Office of Solid Waste and Emergency Response and the Office of Air and Radiation look forward to working with you on defining your research agenda and in addressing our national security concerns.

Sincerely yours,

Marianne Lamont Horinko
Assistant Administrator
Office of Solid Waste and
Emergency Response

Jeffrey R. Holmstead
Assistant Administrator
Office of Air and Radiation

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

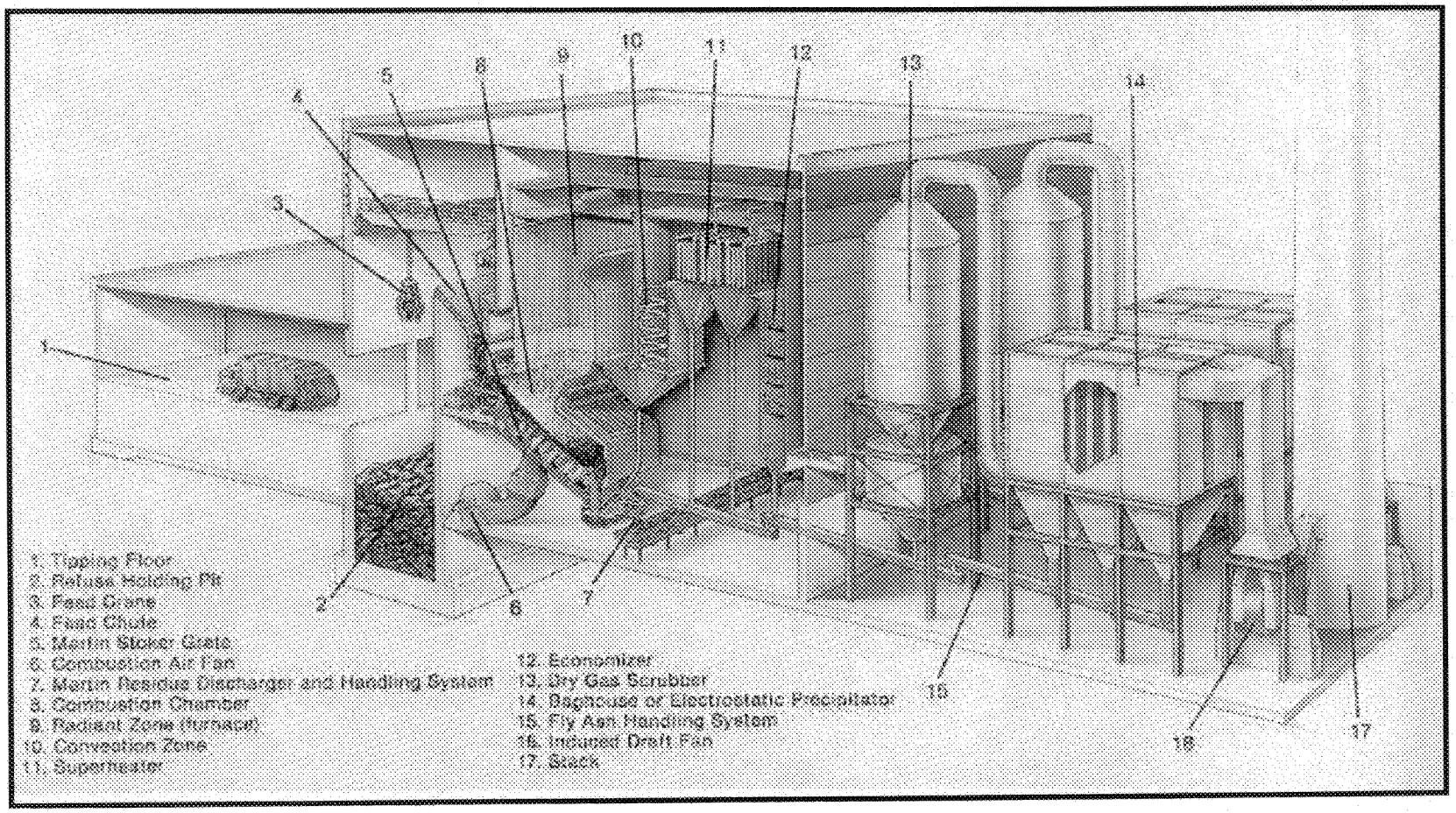
"Upgrading of the emissions control systems of large combustors *to exceed the requirements of the Clean Air Act* ***Section 129 standards is an impressive accomplishment. The completion of retrofits of the large combustion units enables us to continue to rely on municipal solid waste as a clean, reliable, renewable source of energy. With the capacity to handle approximately 15 percent of the waste generated in the US, these plants*** *produce 2,800 megawatts of electricity with less environmental impact than almost any other source of electricity."*

-- letter to IWSA from Assistant Administrators Jeff Holmstead and Marianne Horinko, US EPA

February 2003

COVANTA

Proven, Utility Grade Technology



Exclusive North American licensee for Martin GmbH Reverse Acting Stoker Grate technology – successfully processed more refuse worldwide than any other system available,

COVANTA

Benefits of WTE as Component of Comprehensive Waste Management

- Environmentally sound.
- Reduces landfilling requirements in excess of 90%.
- Most advanced pollution control of any energy generation source.
- Offsets toxic emissions from landfills, providing a net environmental gain by minimizing the release of greenhouse gases.
- WTE and recycling are compatible: Studies demonstrate actual recycling rate of WTE communities exceed the national average by over 5%.
- Twelve states (including FL) plus the District of Columbia include waste-to-energy and/or municipal solid waste within its definition of eligible technologies for Renewable Portfolio Standards.

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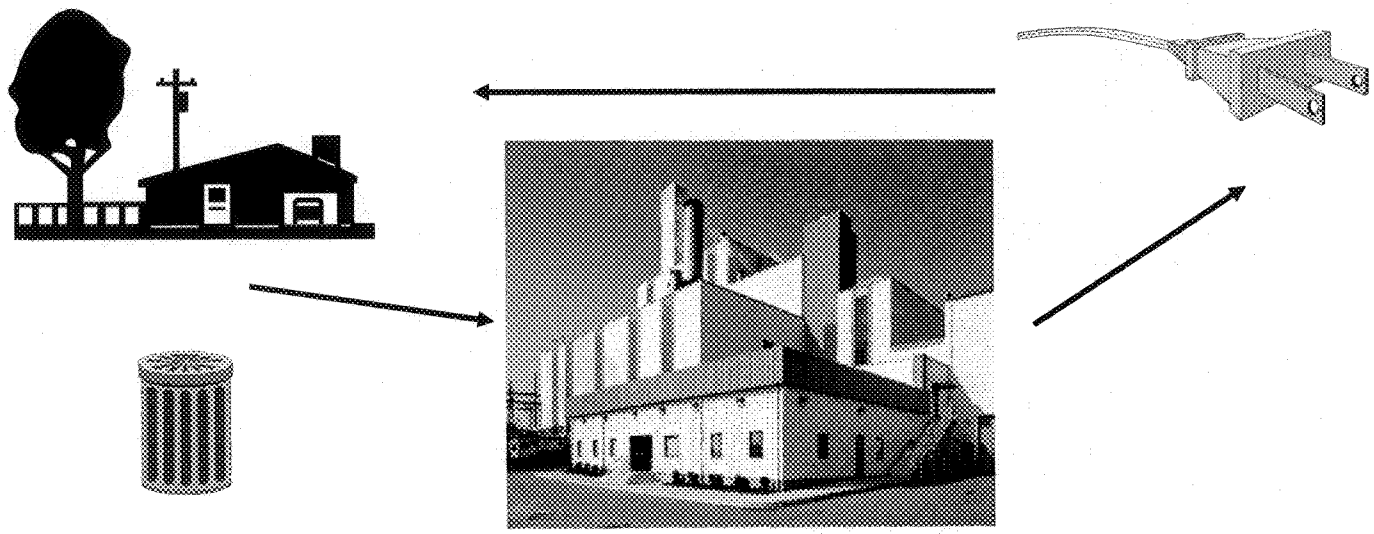
WTE Energy IS Renewable Energy

MSW is sustainable resource for "local" power



- **MSW is considered biomass.**
- **WTE contributes to fuel diversity while building stronger domestic renewable energy industry.**
- **WTE plants are located near power users increasing cost efficiency.**
- **WTE reduces transportation with positive impact on fuel consumption / vehicle emissions production.**

COVANTA

We Are Doing More …

- Renewable Energy in the form of electricity available from WTE will increase by 85 MW by 2010 while safely eliminating the need to landfill approximately 2,800 tons of raw waste everyday…

- FL counties with WTE expansion plans:
  - Lee County 20 MW
  - Hillsborough County 17 MW
  - Palm Beach County 28 MW
  - Pasco County 20 MW

- These expansions will increase Renewable Energy from WTE to 591 MW while utilizing less than 10% of the available waste stream.

COVANTA

How to Encourage Renewables

Use the Florida Energy Plan to guide the development of renewable generation

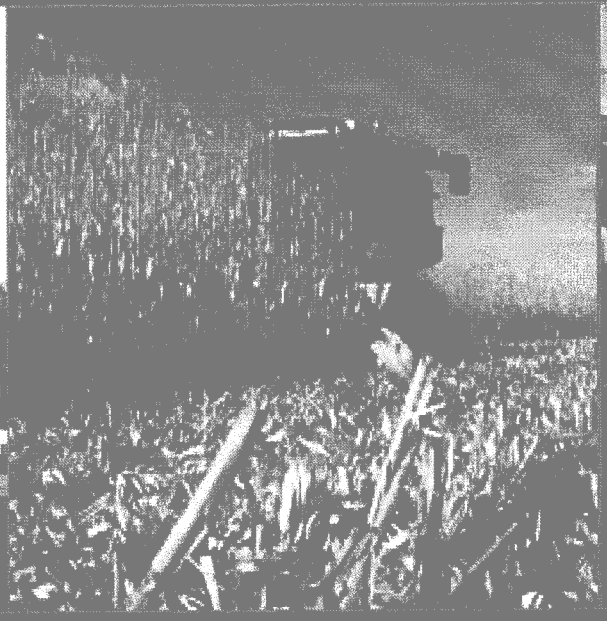
- **Current Situation**
  - 63% of Florida's generation capacity is fueled by oil and gas
  - Yet, WTE facilities are compensated based on "coal plant prices"
  - No alternate/functional wholesale electricity markets to support WTE facilities after current agreements expire

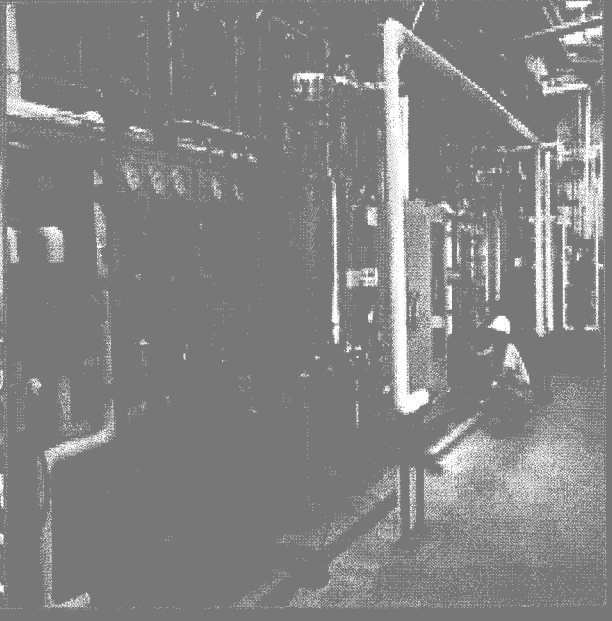
- **The Future**
  - 81% of Florida's capacity additions will be fueled by oil and gas
  - New WTE capacity should be compensated based on "avoided' new natural gas and oil plant prices
  - Encourage the development of functional and liquid wholesale electricity trading markets

COVANTA

Fla. Assoc. of Resource,
Conserv. & Develop. Councils

FLORIDA ASSOCIATION OF RESOURCE CONSERVATION AND DEVELOPMENT COUNCILS, Inc





Working to conserve our environment through renewable resources

WHO WE ARE

The Florida Association of Resource Conservation and Development Councils is:

A nonprofit association of local citizens through 12 RC&D's statewide joining together for the common good to plan and implement projects that improve the quality of life for the people of the State of Florida. Our projects, developed at the local level, create positive impact upon the communities we serve.

We are a locally led grass roots organization with 12 individual RC&D members

Central Florida RC&D	**East Central Florida RC&D**
First Coast RC&D	**Florida Renewable RC&D**
Florida Three Rivers RC&D	**Florida West Coast RC&D**
Florida RC&D	**South Florida RC&D**
South West Florida RC&D	**Suwannee River RC&D**
Treasure Coast RC&D	**West Florida RC&D**

All projects increase the quality of life in our local Community, our Area, our State, and our Nation.

Our Mission

Improving the quality of life for all Floridians through:

- **Quality in the natural resource base for sustained use;**
- **Quality in the environment;**
- **Quality in the standard of living, based on community improvement and adequate income**

OUR ORGANIZATION

1) We are a locally led grass roots organization.

2) We set our projects based on local needs in 12 areas of the state (each RC&D has a designated area by county).

3) Members are 501C3 corporations organized under USDA's RC&D program.

4) Members form a committee, seek volunteers committed to the mission, gather community support for their endeavors (includes public officials) , apply to NRCS for authorization, complete working agreements with NRCS a division of USDA.

OUR ORGANIZATION

FARCD (the Florida Association of Resource, Conservation, and Development Councils) assists it's 12 members in the following:

•Provide a forum for members to network;

•Develop and implement regional and statewide projects;

•Coordinating individual projects statewide;

The state association is made up of 2 members elected from each RC&D who elect an Executive Board of President, two Vice Presidents, Treasurer, Secretary, Parliamentarian, and Past President to implement ideas and potential projects from the local level statewide.

ABILITY TO AFFECT CHANGE IN FLORIDA'S OVER RELIANCE ON FOSSIL FUEL

- Identification of Resources for use in Alternative Energy by cataloging the availability of bio-mass energy resources throughout the state through its council structure.
- Facilitating and coordinating Alternative Energy projects statewide through an Alternative Energy Network.
- Expertise through its councils to execute bio mass renewable energy projects through its various councils

COST EFFECTIVEMNESS OF CONSERVATION AND DEVELOMENT OF RENEWABLE ENERGY IN FLORIDA

LEVERAGING EXPERTISE OF RC&D COUNCILS

RC&D Councils have:

- Access to a broad base of expertise throughout the state;
- Partnerships with NRCS, engineers, inspectors, academics, & local involvement for solutions to problems.
- An existing network to communicate among partners for solutions.
- A track record of identifying and exploring alternative energy resources.

PROJECT CRITERIA

We identify, address and solve challenges to sustain and improve quality of life in our own local, area, and statewide communities.

Our Projects relate to the following five areas:

(1) Energy
(2) Community Development
(3) Land Management
(4) Water Management
(5) Land Conservation

Assisting NRCS as it helps bring about:

Quality in the natural resource base for sustained use

Quality in the environment

Quality in the standard of living, based on community improvement and adequate income

*Achievement of these three goals for all Americans is a shared mission of NRCS and RC&D's.

FUTURE RENEWABLE ENERGY PROJECTS

The potential for renewable energy projects is unlimited.

Bio-Energy

Bio-energy is any organic material that is produced by the process of photosynthesis and is available on a renewable basis, including crops and their residues, wood and its residues, animal and municipal wastes, and aquatic plants.

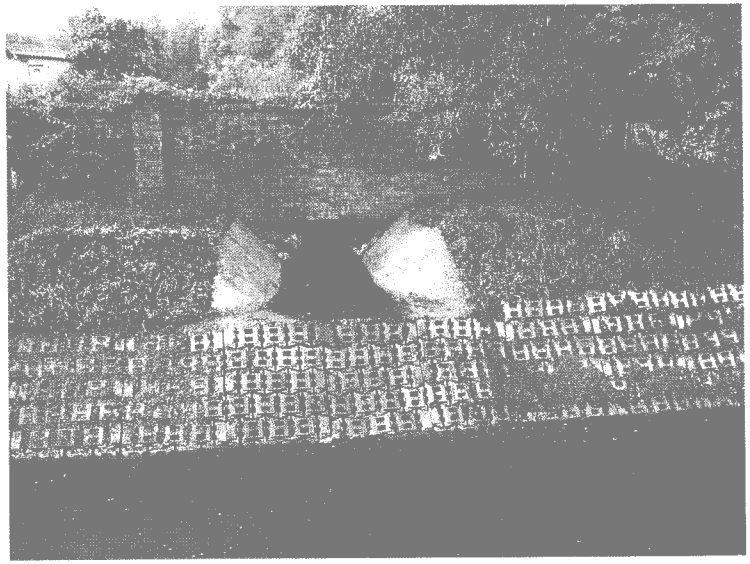
Bio-energy is being explored as a way to provide power to the United States by increasing domestic energy resources. Bio-energy resources are an important domestic source of energy.

Bio-diesel

Bio-diesel is a cleaner burning type of fuel, which can be made from soy beans, vegetable oils, or animal fats. It is also a renewable fuel that can be produced domestically from a variety of agricultural resources

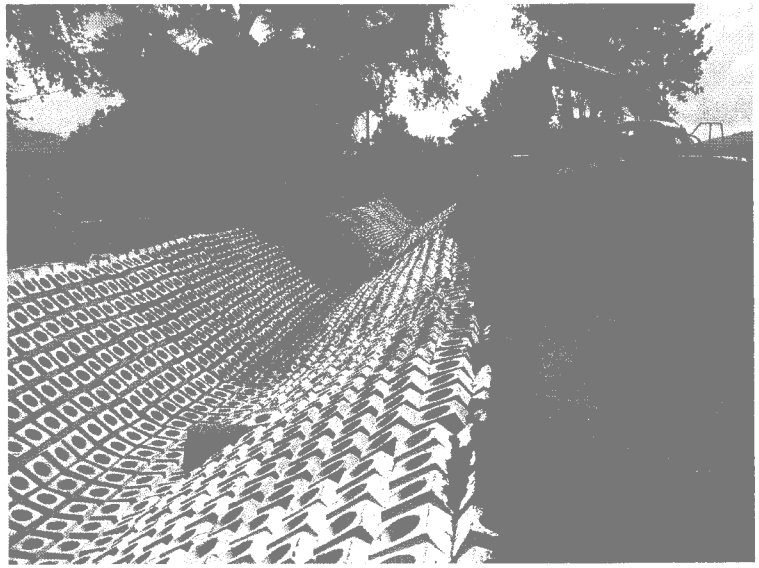
- The following slides are examples of some existing projects our RC&D's are working on around the state.

Emergency Watershed Program

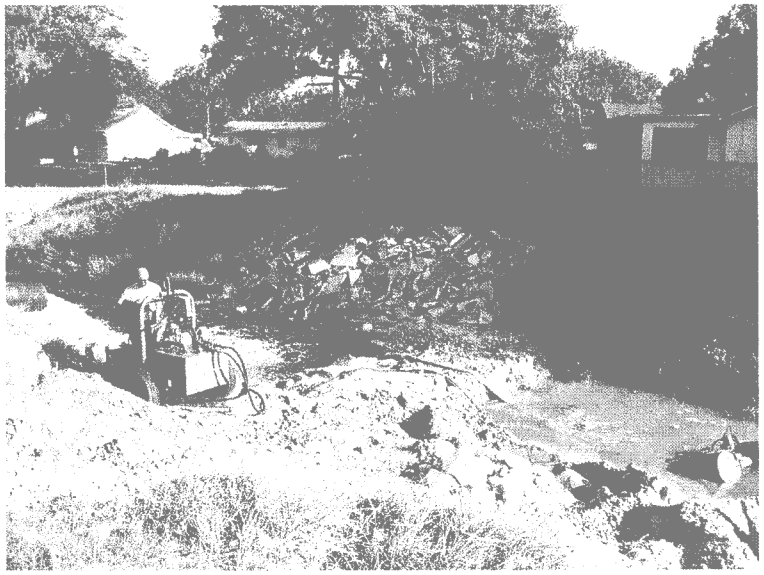


- **The purpose of the Emergency Watershed Protection (EWP) program is to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed.**

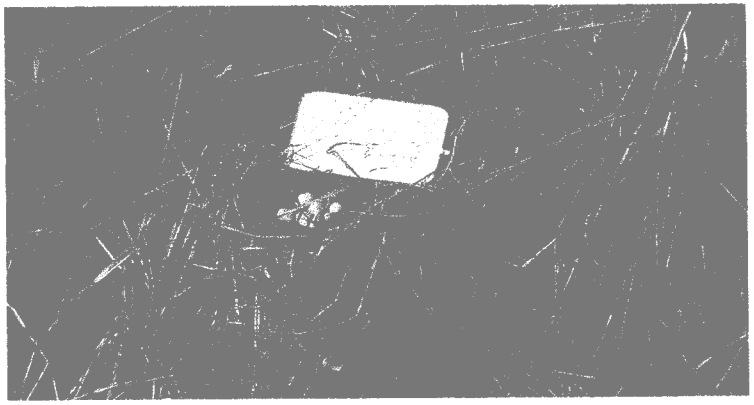
BEFORE



AFTER



Wetland Reserve Program



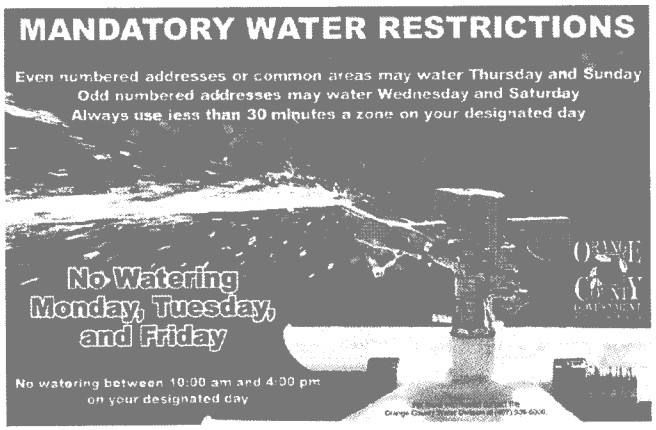
- A partnership was developed between the USDA-Natural Resources Conservation Service, the Florida Association of RC&D councils and the ECFRC&D to provide the following services: establish wetland monitoring protocol, provide vegetative surveys, establish photo plot sites for monitoring, participate in wildlife surveys, engineering and planning, and to obtain permits for projects enrolled in the Wetland Reserve Program.

Wetland Reserve Program

- A partnership was developed between the USDA-Natural Resources Conservation Service, the Florida Association of RC&D councils and the ECFRC&D to provide the following services: establish wetland monitoring protocol, provide vegetative surveys, establish photo plot sites for monitoring, participate in wildlife surveys, engineering and planning, and to obtain permits for projects enrolled in the Wetland Reserve Program.

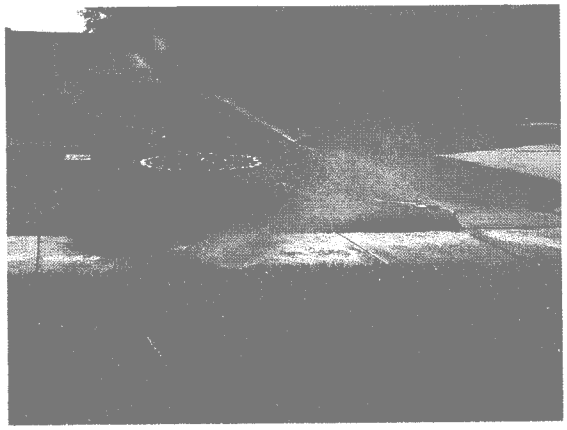
Water Watch Program

- In January 2001 the St. Johns River and South Florida Water Management Districts imposed water restrictions due to drought and water shortage conditions throughout Orange County and other areas of the state. The Orange County Water Division and the East Central Florida RC&D work together to provide education programs on water conservation and restriction issues. This combined effort has formed what is now called the Water Watch Program.



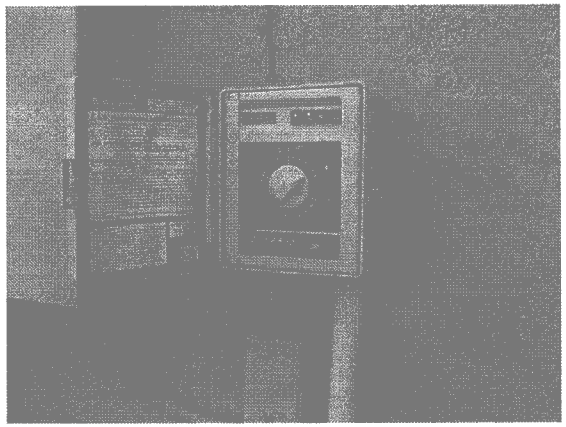
- The Water Watch Program staff patrols service areas throughout the week, issuing warnings for violation of the water restrictions. In addition, they provide education to consumers on resetting irrigation timers, and retrofitting irrigation systems in order to comply with the restrictions; While also providing free water saving devices and free literature.

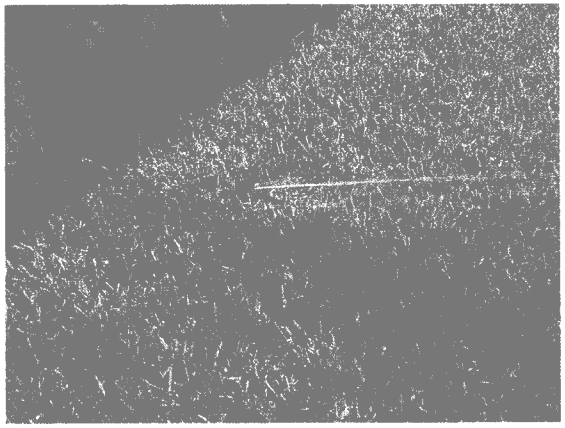
Mobile Irrigation Lab

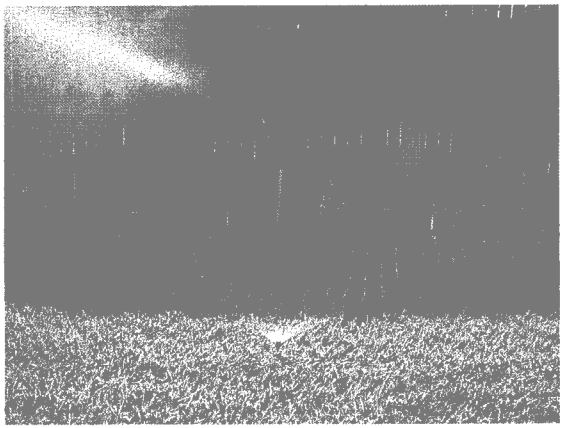


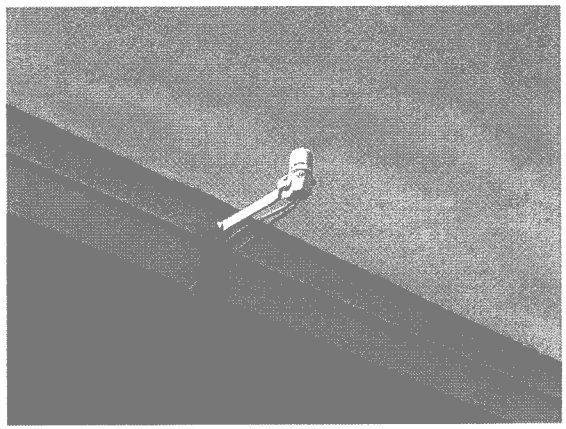
- The Mobile Irrigation Lab (MIL) is a partnership between the St. Johns River Water Management District and public utilities from Orange and Seminole County.
- This two-person team conducts evaluations on urban irrigation systems as specified by the public water utility. The program goal is to reduce water used for irrigation by evaluating how well the irrigation system is operating and to offer guidance on managing the system. Customers can experience a reduction in their water bill by implementing recommended system changes.

Irrigation Inspection/ correction

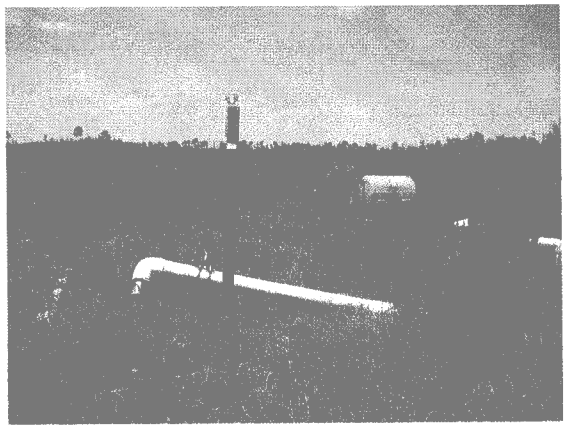


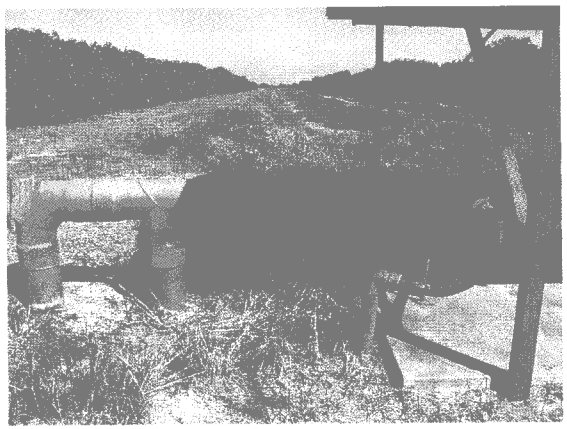






Benchmark Farms Program

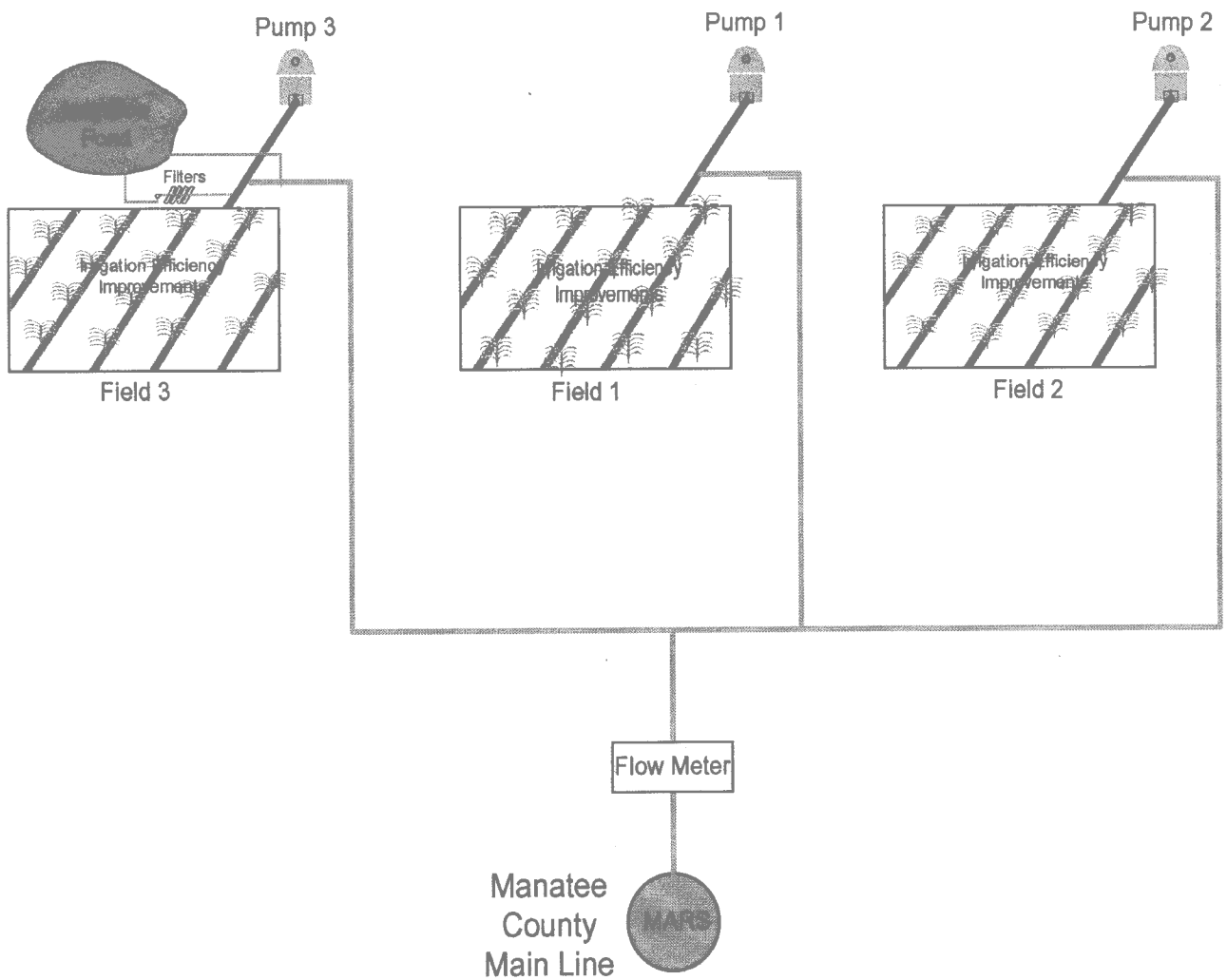




- This program involves a cooperative agreement between the ECFRC&D and the St. Johns River Water Management District. Water use data is collected monthly on citrus groves in Orange, Lake, Polk, Marion, Brevard and Indian River Counties. This information is helpful in determining how much irrigation water citrus crops require.

FLORIDA WEST COAST R&D RESOURCE CONSERVATION &DEVELOPMENT

Manatee Agricultural Reuse System (MARS) Farm Connection Grant Program



FLORIDA WEST COAST RC&D RESOURCE CONSERVATION & DEVELOPMENT

Geraldson's Community Farm - *What it can be:*

Economics: A working farm in the community that provides jobs and promotes small enterprises

Recreation: Festivals, farm tours, farm history, and school field trips.

Innovation: A place to demonstrate new farming methods and technology

Education: Prepare the next generation for farming and teach children where their food comes from

Community: Community garden plots where people can grow food and share resources

Heritage: Fostering agricultural land conservation methods demonstrating historical agricultural equipment

Nutrition: A farm that produces and promotes local food and good nutrition

A Sense of Place: Experience community and natural resources production in the past, present, and future

FLORIDA WEST COAST R&D RESOURCE CONSERVATION &DEVELOPMENT

Farmworker Laundry Project

- Assisting the Latino Community Network with implementing their needs assessment
- Laundry facilities as a low-hanging-fruit and critical health issue
- Pesticides and clothing education
- Developing partnerships to bring laundry facilities to areas in need.

FLORIDA WEST COAST
RC&D
RESOURCE CONSERVATION &DEVELOPMENT

Natural Capitalism Seminar

Co-presenting a seminar on Natural Capitalism:

EDC
ECONOMIC DEVELOPMENT CORPORATION
SARASOTA COUNTY

ROCKY MOUNTAIN INSTITUTE

- Integrating smart growth and sustainable economic development
- The book, Natural Capitalism: Creating the Next Industrial Revolution
- The Natural Capitalism Collection, an art gallery on-site focused on the topic,