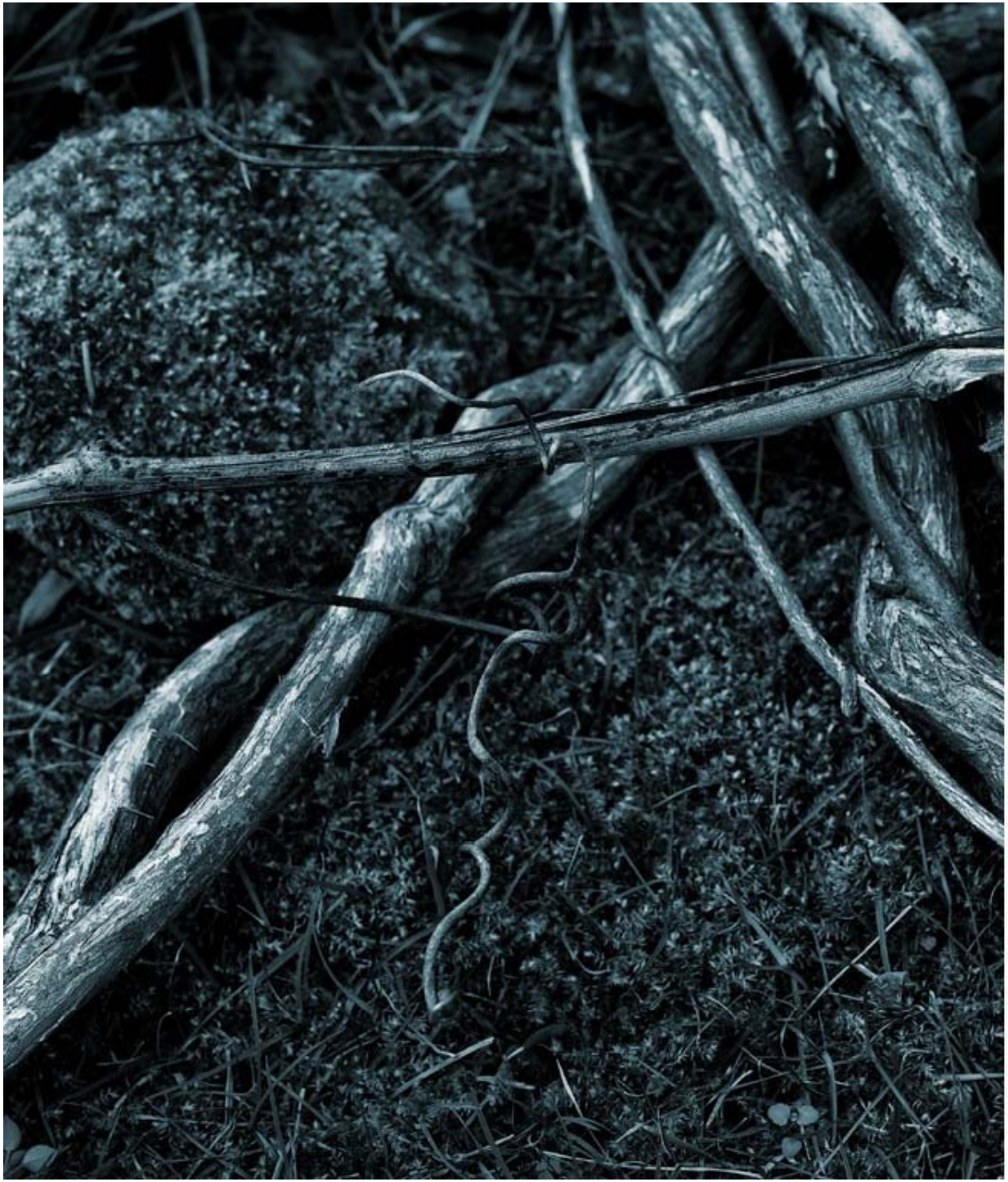


Pinchot Institute Heinz Center

Interior West Regional BioEnergy Policy Forum

Fort Colllins, CO

October 8, 2009

ADAGE

Chadds Ford, PA

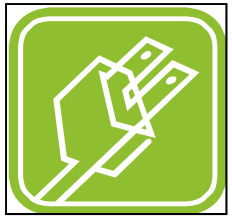
610.358.3404

www.adagebiopower.com

WGA 2009 - Recent Presentation By Cabinet Members Limited Emphasis On The Role Of Biopower

Impressionist Ballroom
(The Chateaux)

Plenary II – *Tapping the West's Renewable Energy Potential*
Secretary of the Interior Ken Salazar, Secretary of Energy Steven Chu, Secretary of Agriculture Tom Vilsack and FERC Chairman Jon Wellinghoff will provide their perspectives on developing large amounts of clean energy in the West …



As renewable power grows …

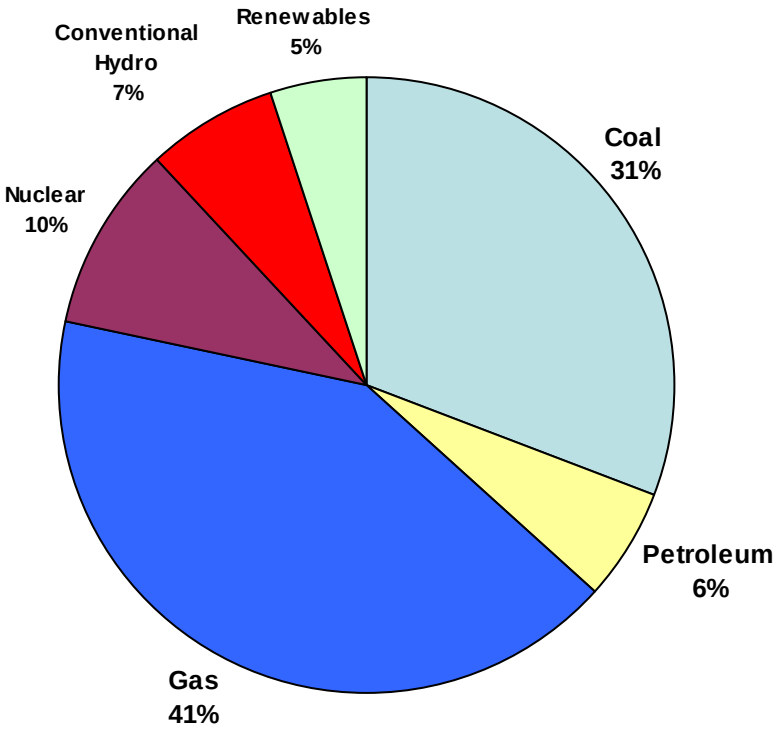
we don't want to be the "other renewable"

Let's Take Advantage of this Opportunity!

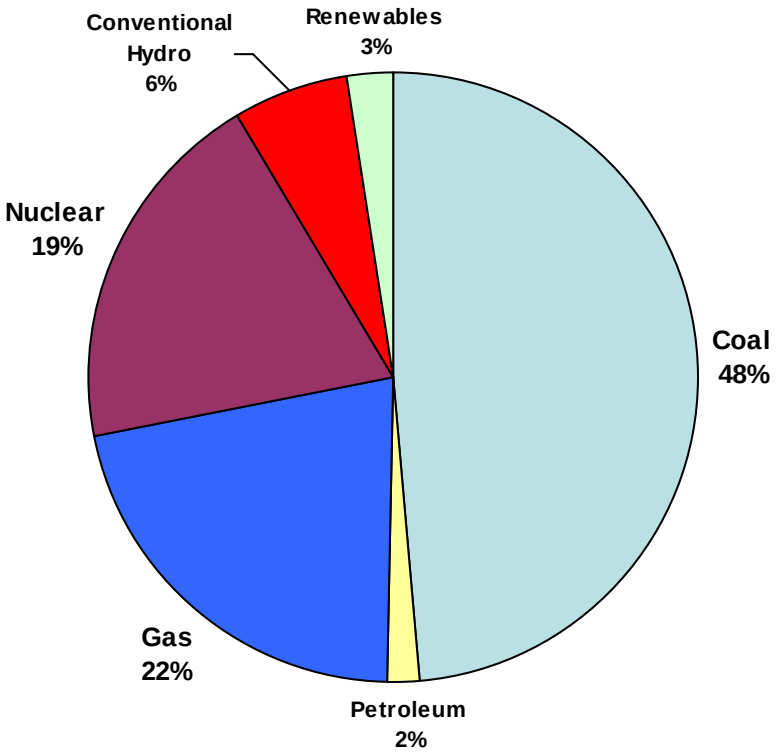
ADAGE

US Electricity Market:
Renewable Energy is 3% of Electricity Market

2007 Nameplate Electricity Generation Capacity



2007 Net Electricity Generated

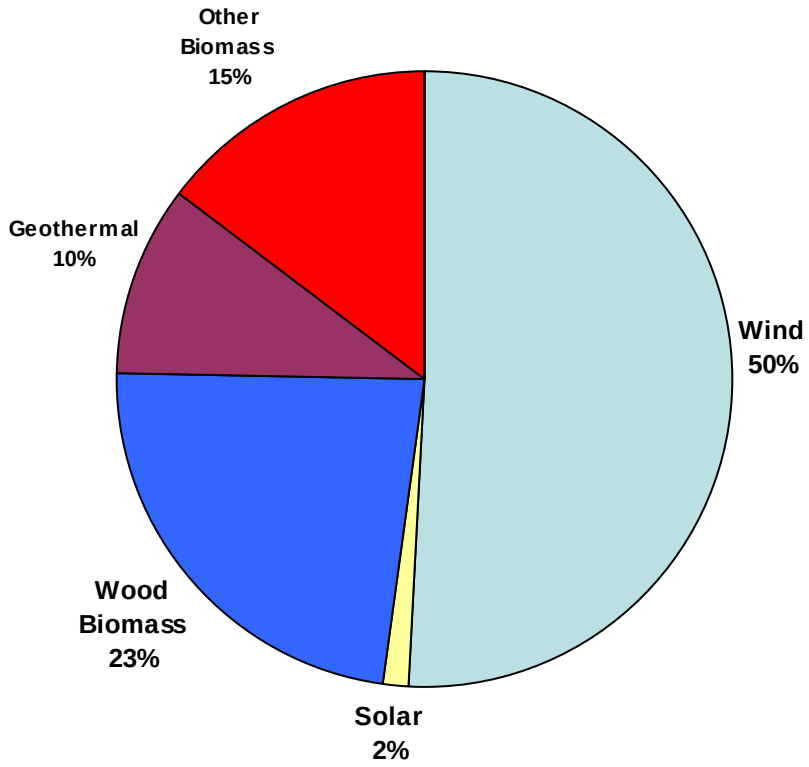


ADAGE

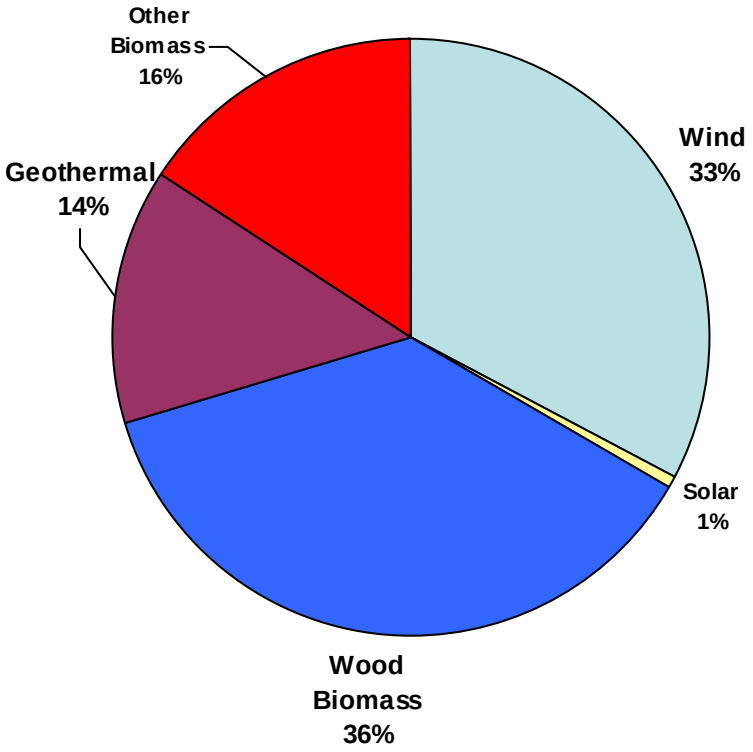
Source: EIA

US Renewable Electricity Market:
Woody Biomass is 36% of Renewable Market

2007 Renewable Electricity Nameplate Generation Capacity



2007 Net Renewable Electricity Generated



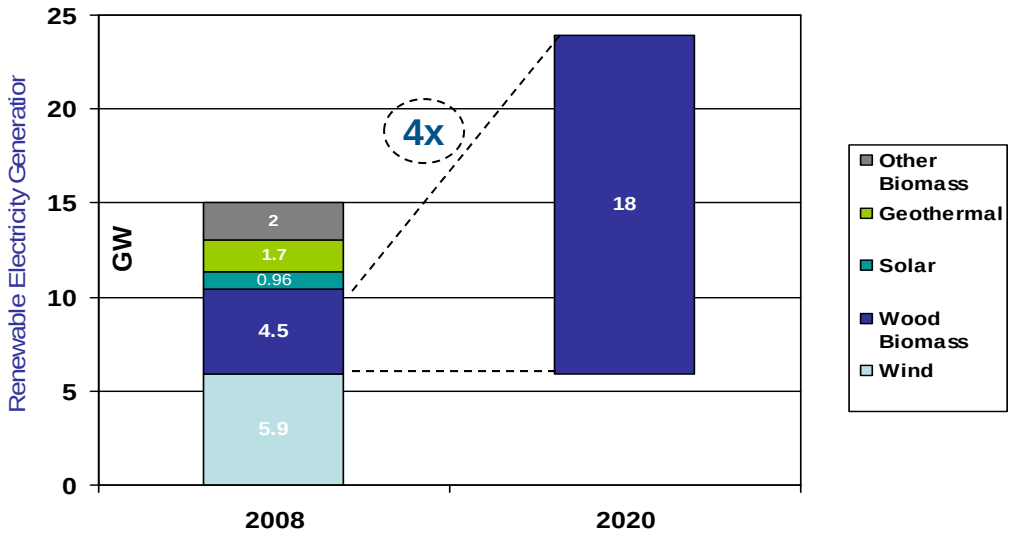
ADAGE

Source: EIA

Federal Renewable Electricity Standards:
4x Increase Needed by 2020

- House Bill = American Clean Energy and Security Act of 2009 = 12% RES
- Senate Bill = American Clean Energy Leadership Act of 2009 = ~11% RES

- The current renewable electricity standards from the House and Senate will require renewable energy production to nearly quadruple by 2020
- The current generation of woody biomass is nearly 4.5 GW, which is equal to roughly 29 million BDT of biomass
  - However, only about 1 GW of that generation is produced by dedicated biomass plants with the rest coming from current operations in the forest products industry



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Demand for New Biomass is High but, Supply is Available within the Current Market

1,000 MW = Current Dedicated Wood Biopower Generation

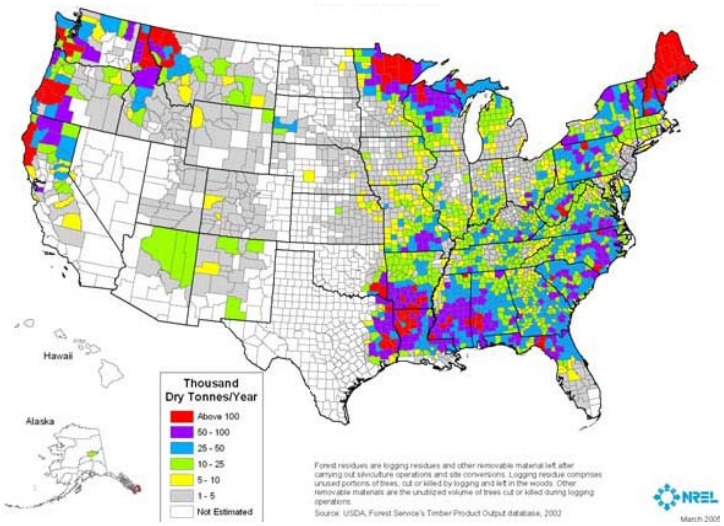
5,000 MW = EIA projected biopower market growth over the next 10 years

14,000 MW = New Generation needed to quadruple output and meet biopower share of potential Federal Renewable mandate

30,000 MW = Biopower potential based on Billion Ton Supply Study estimates

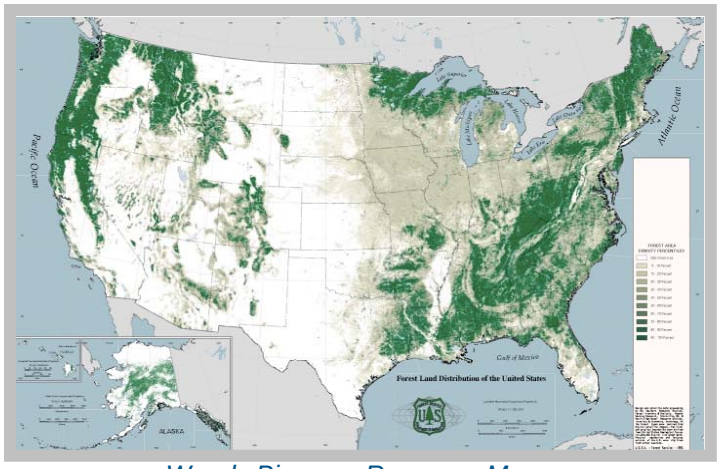
The Billion Ton Supply Study estimates that there is roughly 200 million bdt of sustainable unused biomass available largely from forest residuals

This equals only 1% of forest land but has the potential to provide nearly 30,000 MW of biopower based on ADAGE's estimated fuel supply requirements for a 50 MW plant



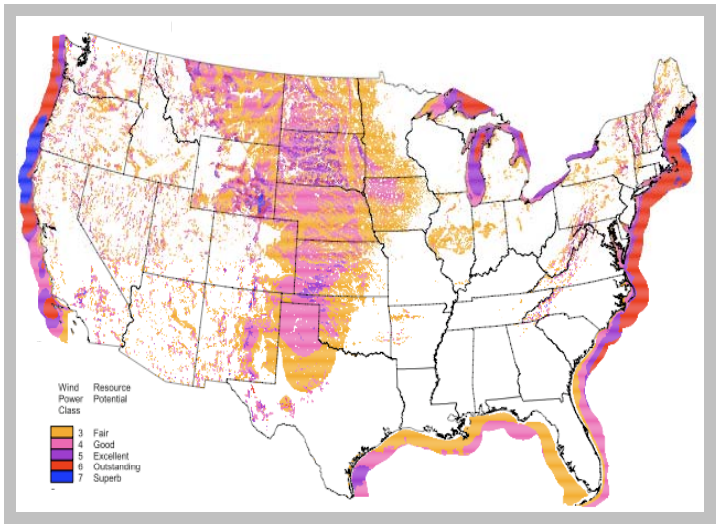
ADAGE

Forest Resources Provide Renewable Resources where Wind and Solar are Less Viable

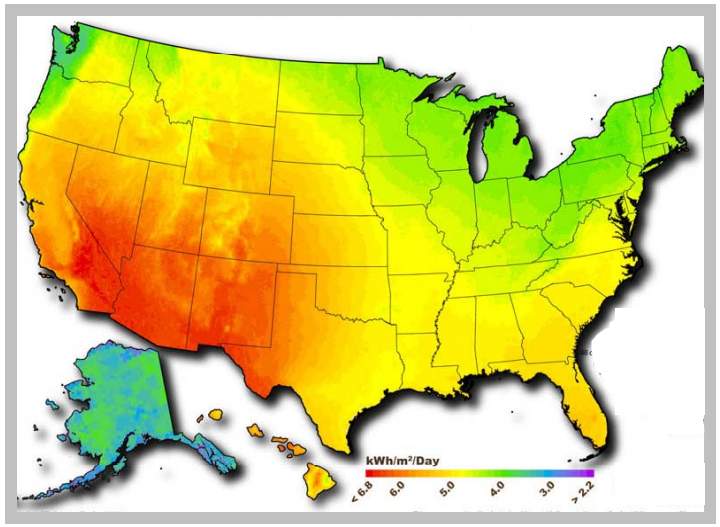


Woody Biomass Resource Map

- Large growing stocks exist in the northwest, southeast and northeast
- These areas have less potential for solar and wind (unless coastal)
- Utilizing forest residues, fuel treatments and urban wood waste can offset feedstock constraint



Wind Resource Map



Solar Resource Map

ADAGE

Sources: National Renewable Energy Labs

Given This Great Market Opportunity … ADAGE Formed To Be A Utility Scale Biopower Market Leader

- **Joint Venture between AREVA and Duke Energy**
- **Business was launched Sept 2008 at the Clinton Global Initiative**
- **Plan to develop, own and operate twelve wood biopower energy plants by 2014**

Feb '09 Olympia, WA
Energy NW Alliance

FOREST LANDOWNERS ASSOCIATION, INC.
Protecting America's Private Forest Landowners

May '09 Amelia Island, FL
Hamilton Project

Power
- Regional focus
- Green energy solution

Wood
- Major landowners
- Sustainable supplies

Real Estate
- Land acquisition
- Permitting
- Infrastructure

ADAGE

Finance
- Debt
- Equity
- Tax Appetite

O&M
- Duke Energy is the facility operator

Duke Energy

EPC
- AREVA is the EPC contractor

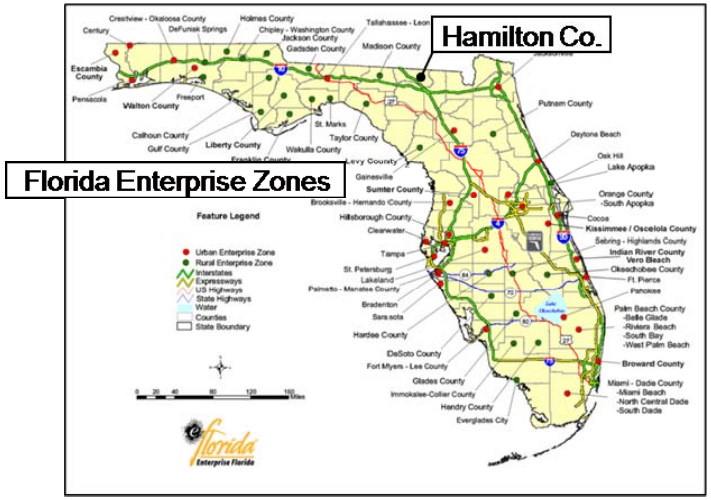
AREVA

From fuel to financing, ADAGE has the resources to execute, offering a higher certainty of outcome

ADAGE

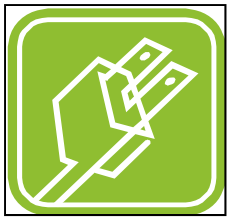
ADAGE Hamilton County Project

- **On May 27, announced the site of the first facility in Hamilton County, Florida, about 80 miles west of Jacksonville**
  - The rights to a 215 acre site have been secured
  - State environmental permits applications have been submitted
  - Negotiations are under way for power purchase and with The Langdale Company for long-term fuel supplies
  - Hope to begin construction early in 2010



ADAGE

ADAGE Policy Initiatives



- **PTC Parity with Wind**
- **Broaden Biomass Definition**
  - **Working in Cooperation with Landowners**
  - **Sustainable Use of Woody Biomass from Public Lands**
- **Incentives for our Forest Partners**
  - **Improve Field Collection and Transport**
    - **Slash Bundlers (reduce open burning)**
    - **Improved Engine Technology**
  - **Financing Incentives**
    - **Innovation Grants**
    - **SBA Loans**