
Biomass
Making Renewable Energy Projects Happen
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December 7, 2007



Our Company: Marubeni Sustainable Energy, Inc.

- A USA based energy company specializing in development, ownership and operation of renewable energy projects, industrial cogeneration, and district thermal systems.
- Established in 2007 through the purchase of DG Energy LLC by a subsidiary of Marubeni Corporation of Tokyo.
- MS Energy's management has more than 25 years of direct operational experience in the cogeneration, biomass, and district systems business.
- The business is headquartered in San Diego, CA, with regional offices in Medford, NJ and Portland, Oregon.

Our Focus

- Long-term ownership and expansion is the primary objective for each new investment
- Acquisition of operating assets throughout North America, either as stand-alone units or portfolios of renewable energy generation, cogeneration or district heating/cooling systems.
- MS Energy now conducts sourcing, due diligence and negotiation for each new investment opportunity, and efficient long term operations and management of the portfolio.

Our Parent Company

Marubeni Corporation

- Founded: 1858
- Incorporated: 1949
- Listings: Tokyo, Osaka and Nagoya Stock Exchanges (code: 8002)
- Revenue: US\$27B FY 2006
- Domestic Offices: 14
- Overseas Offices: 124 (in 74 countries)
- Offices in U.S: New York, Washington D.C., Detroit, Houston, Los Angeles, Omaha, Portland and Silicon Valley

Marubeni Corporation in Global Power Market

• No. of Power Plants: >30 projects (in 14 countries)

• Gross Generation Capacity: >13,000MW



Our Projects

MSEnergy: 65 Megawatts of Operating Facilities in US

- ❑ Fairhaven Biomass 18 MWe
- ❑ Whitefield Biomass 16 MWe
- ❑ Kings Plaza 17 MWe reciprocating gas engine cogeneration plant
- ❑ Quonset Point 7.0 MWe + 2.5MWt gas turbine cogeneration plant
- ❑ Portland District Cooling 2.0 MWt district cooling system
- ❑ NFL Film Studios 1.5 MWt
- ❑ University of the Arts 1.0 MWt
- ❑ Others in Acquisition/Development



University of the Arts



NFL Film Studios



Portland District Cooling Co.



Whitefield Biomass



Kings Plaza



Fairhaven Biomass



Quonset Point Cogen

DG Fairhaven Biomass

Fairhaven, Humboldt County – near Eureka, CA

- ❑ 18 MW Plant Purchased in April 2005
- ❑ Supplies 125,000 MWh/year to utility (contract through Feb of 2017)
- ❑ Major refurbishment and enhancement program through investment by DGI during 2005-2007
- ❑ 100% Woody Biomass Fuel
- ❑ In continuous operation since 1985
- ❑ Employs 25 staff + approx 60 indirect FTEs
- ❑ Purchases 300,000gT/year of woody biomass



DG Lakeview Biomass plant

Lakeview, Oregon

- ❑ Located in Southern Oregon
- ❑ 13 MW Biomass Power Plant to be built 2008-2009
- ❑ Initial Capital investment >\$25mm
- ❑ Plant employment 15 full time personnel, new job growth in area to support plant operations = 60 +
- ❑ Will provide local lumber mill, (Collins' Fremont Mill) needed steam
- ❑ Consumes approximately 250,000gT of forestry biomass material from regional lumber mills and national forest
- ❑ Project to be funded by 2nd quarter 2008, with construction to begin summer of 2008
- ❑ Commercial operations by 2nd quarter 2009

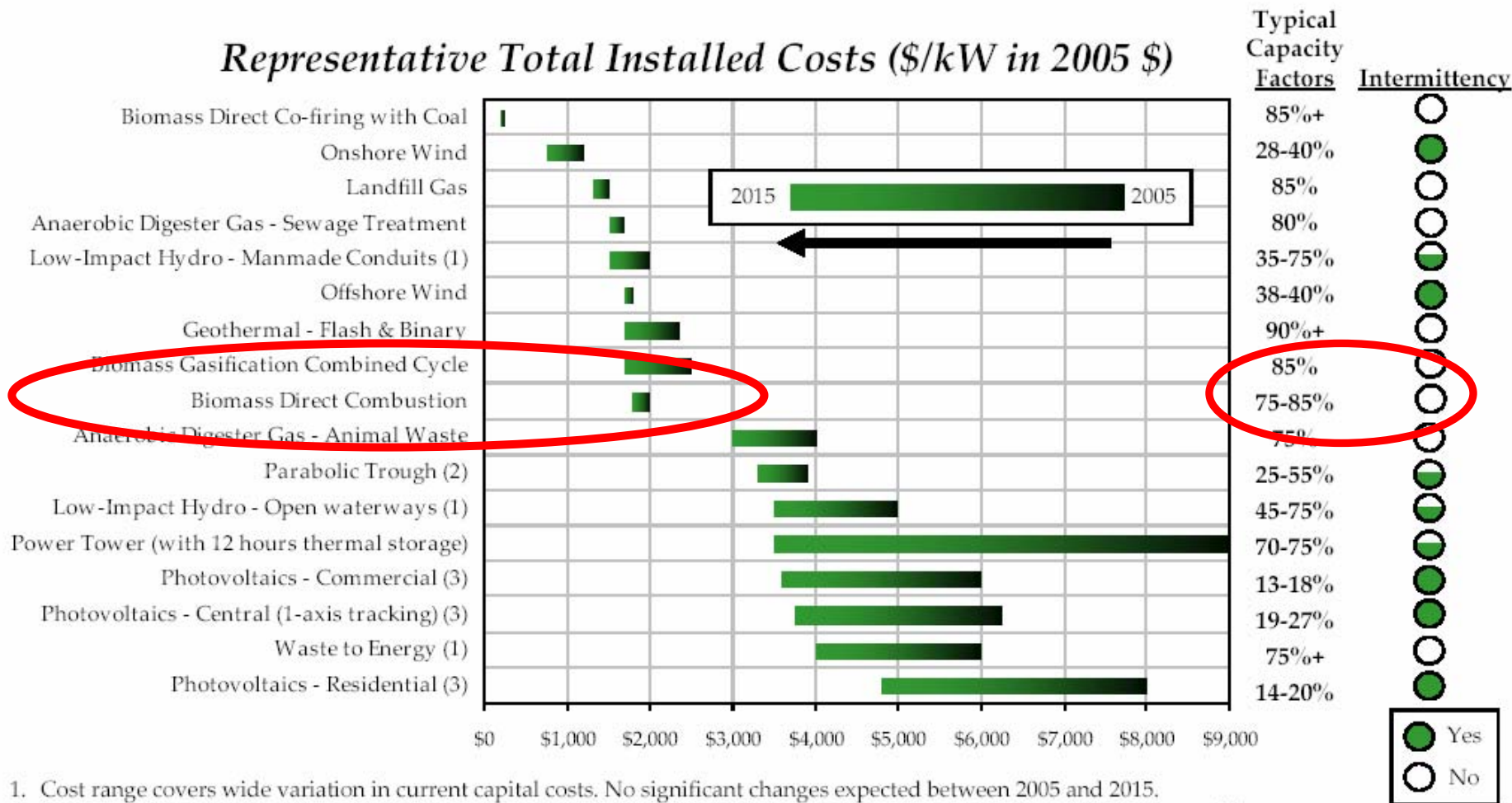


Typical biomass boiler under construction

Installed Costs

Renewable energy capital costs and performance vary considerably.

Representative Total Installed Costs (\$/kW in 2005 \$)

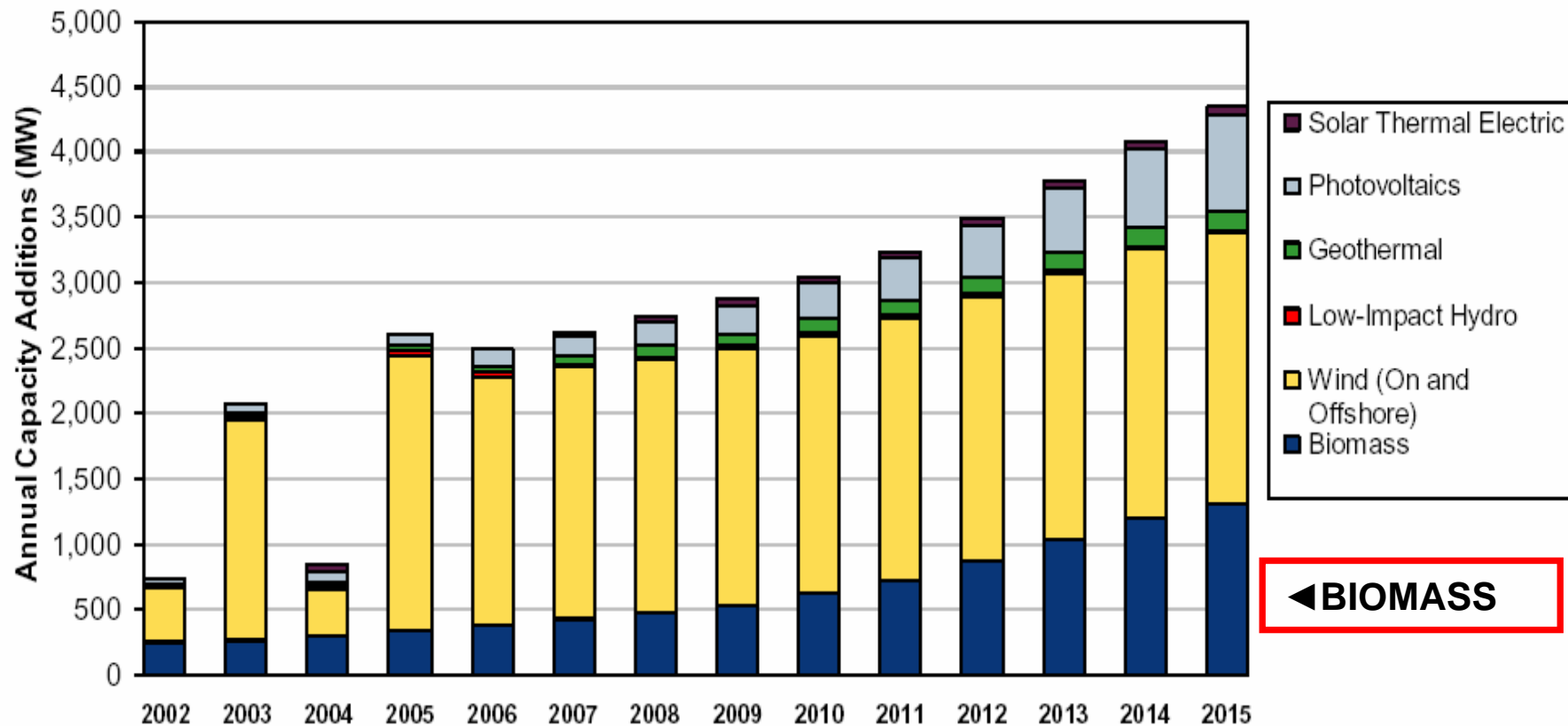


1. Cost range covers wide variation in current capital costs. No significant changes expected between 2005 and 2015.
2. Low end of capacity factor is without thermal storage, high end is with 12 hours thermal storage. Thermal storage provides some dispatchability and control of output.
3. These are effective capacity factors, including effects of temperature degradation and dust losses.

Forecast of U.S. Renewable Energy Installations

Annual U.S. installations of renewable energy are expected to increase from 2,620 MW/yr in 2005 to ~4,300MW/yr in 2015.

U.S. Estimated Renewable Energy Capacity Additions (Business as Usual*)



*Assumes an extension of the Production Tax Credit for Wind in late 2004 for three years.

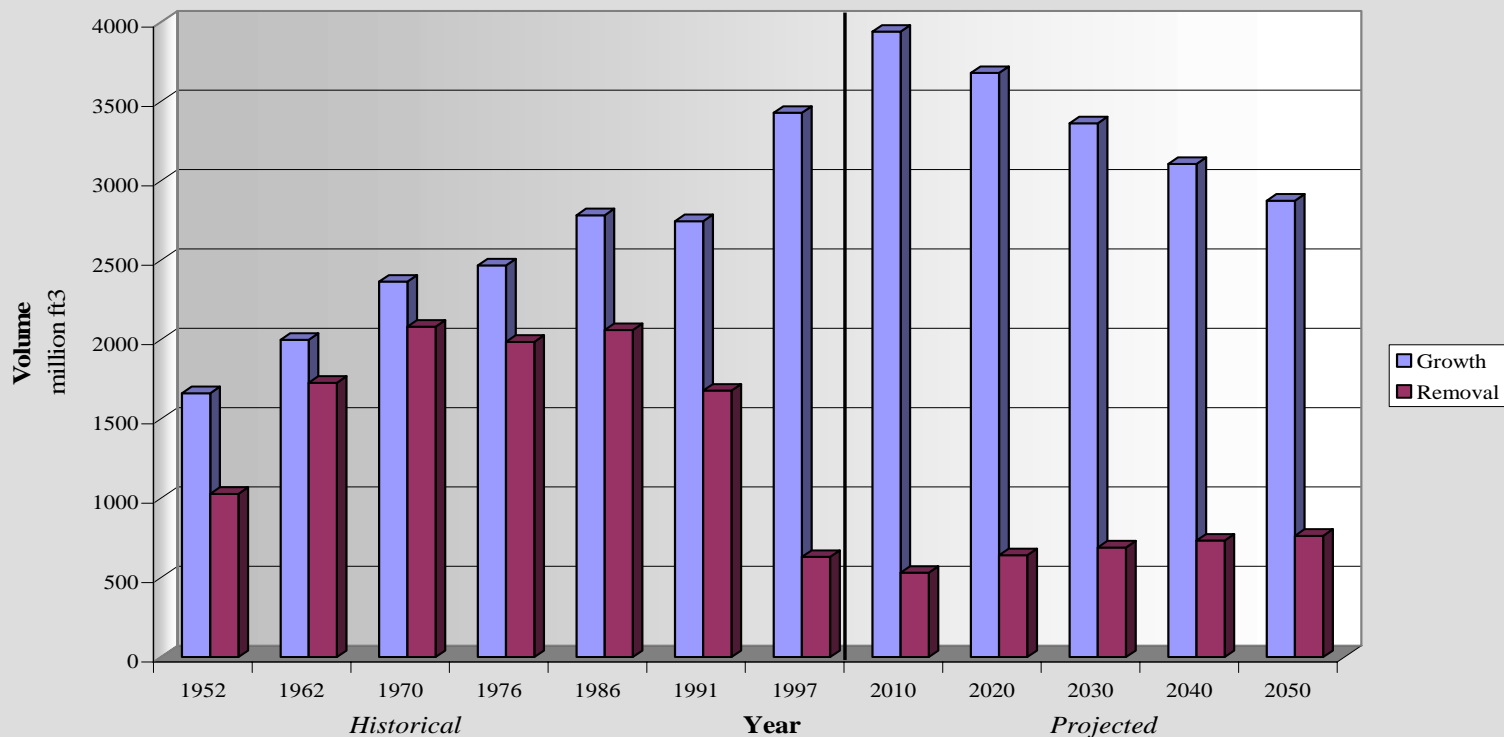
Biomass Renewable Energy Benefits

- 2x the renewable energy delivery of wind (due to capacity factors)
- 2x the benefit on GHG reduction – first by replacing fossil-fuel production and second by eliminating emissions from fires and decomposition of such waste materials
- Provides an assured disposal of mill waste and forest residue that would otherwise be burned or land-filled
- Facilitates improved Forest Management and Health
- Encourages Forest Products Industry and regional economies by creating receptacle for non-merchantable materials, narrowing the cost gap to return to the forest.

Annual Growth vs. Annual Removals on National Forests

Historical and Projected

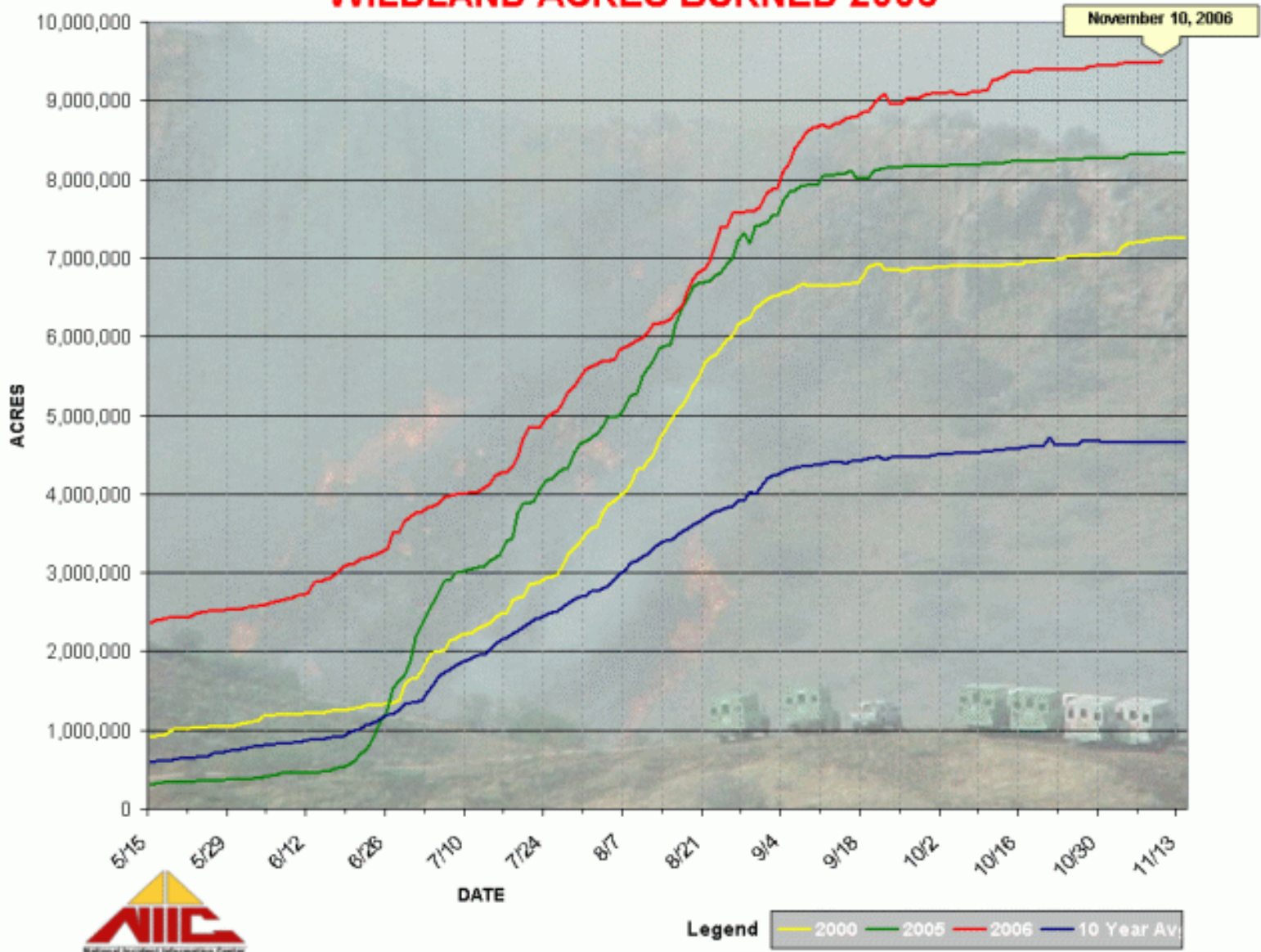
Source: 2002 RPA Database Tables -- Table 34 - Softwood removals, harvest, growth and inventory for the national forest timberlands, 1952-'97, with projections to 2050



**Growth is 5 times higher than removals*

Leads to Acreage Burned

WILDLAND ACRES BURNED 2006



Legend — 2000 — 2005 — 2006 — 10 Year Avg

FOREST FIRE MATH:

9 million acres /year destroyed by forest fire

7 BDT/acre X 9 million acres = 63 million BDT destroyed

63 million BDT/ 150,000BDT/15MW power plant

= 420 15MW power plants

= 6300 MW of power destroyed by forest fire each year

= enough power for 5.2 million households lost

Challenges in Developing a Biomass Renewable Generation Facility

- Economies of Scale. Projects are typically 3-30 MW in size. A typical Gas-fired combined cycle plant is about 250 MW.
- Distance and logistics. Limitations of moving fuel from the forests to the Plant site.
- New Equipment Required. The most expensive equipment is being marketed to handle the forest material with the least value.
- Long Term Fuel Supply. Banks loan money on power projects when there is a power purchase agreement and a guaranteed fuel supply to match the Term of the Debt.

Some Solutions to making Biomass Plants Happen

- Economies of Scale.
 - ODOE BETC program and other financial support to lower capital costs.
- Distance and Logistics.
 - Measures like HB2210 which helps reduce fuel transport costs by \$10/GT.
- New Equipment Required.
 - This may just take more Biomass Projects before Manufacturers believe there is a market.
 - ODOE BETC program eligible.
- Long Term Fuel Supply.
 - Ten year Stewardship Program is a Beginning.
 - New Programs to utilize Beetle-kill and other non-commercial timber.
 - Agreements with USFS and others to treat Acres rather than Years.

Conclusions on “Making it Happen”

It's less about traditional project development tasks, and more about cooperative and effective public policy:

- **Committed, capable, and sincere community and business leaders;**
- **Effective and trendsetting State leadership (from Governor's office and Legislature on down);**
- **Supportive Federal agencies, Congresspersons and staff;**
- **All occurring simultaneously with critical public policy needs & cooperative programs evolving among diverse sectors:**
 - Forest Health and Management
 - Energy resources, RPS planning, and open competition
 - Global environment change, REC and GHG trading, and local permitting policy
 - Regional economic development
 - Federal, State and local Taxation and incentives