

# Biomass

A Vision, Opportunities and  
Project Development

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# Biomass – The Simple View

- **Problem:** GHG emissions too high
- **Solution:** Reduce fossil fuel combustion
- **Strategy:**
  - Use carbon neutral fuels
  - Produce energy more efficiently
  - Use less energy
- **Biomass role:** Fuel of choice

# People's Vision

Organization	Commitment	Benchmark
Kyoto Protocol	5.2% reduction of GHG emissions	From 1990 levels by 2012
U.S. Conference of Mayors	7% reduction of GHG emissions	From 1990 levels by 2012
American College & University Presidents	80% reduction of GHG emissions	By mid-century
University of Iowa	40%	Biomass fuels usage by 2020

# Public Policy

- Massachusetts v. EPA (2007)
- EPA Endangerment Finding (2009)
- EPA Final GHG Tailoring Rule (2010)
- Deferral for CO<sub>2</sub> Emissions from Bio energy (2011)
- EPA Permit Guidance Documents
- Boiler MACT Rules

***Fuel choice important***

# What's Out There?

- Large population of solid fuel boilers
- Circulating Fluidized Bed Boilers
- Stoker Boilers
- Retrofits
- New boiler installation

# Vision – Boiler Side

## *Retrofits & New Boilers*

- Multiple fuel capability
- Fuel flexibility
- Reduced operating costs
- Budget stability
- Enhanced asset value
- Asset life extension
- Hedge against uncertainties of coal combustion
- Substantial reduction in GHG emissions
- Cost effective environmental compliance strategy
- Meet / exceed sustainability commitments
- Effective transition to a clean energy future

# Vision – Fuel Supply Side

- Dedicated energy crops (switch grass, miscanthus or corn stover)
- Reliable biomass fuel supply
- Grown and supplied locally
- Long-term, fixed cost, fuel supply agreements with creditworthy counterparts
- Business model: Land owners, growers, harvesting and collection, processing, storage and transport
- Jobs, public-private partnership and expanded relationship with local community

# Biomass Fuel Supply

## *Biomass Crop Assistance Program (BCAP)*

- Financial incentives
- Qualified biomass conversion facility
- Project areas
- Establishment payments (75% of costs)
- Annual acreage payments (5 years)
- Matching biofuel delivery payments
- Feedstocks for heat, power and transportation fuels

# Project Development

## *Multi-Dimensional*

- Project management team/partners
- Planning preliminary design
- Permitting
- Procurement
- Project financing
- Design and construction
- Facility management
- Fuel supply
- Energy sales

***Lots of moving parts***

# Capital Investment

- Site acquisition and permitting
- Environmental permitting
- Design and engineering
- Equipment purchases
- Construction and installation
- Commissioning
- Professional fees

***\$\$ Can be expensive \$\$***

# Project Financing

- Earnings or internal cash flow
- Debt financing
- Equity financing
- Lease financing
- Project or third-party financing

***Address early on***

# Financial Performance

- Economic analysis over project life
- Capital costs
- Operating costs
- Project revenue
- Project payback
- Debt coverage ratio
- Rate of return

***There will be sharp pencils***

# Project Risks

- Stage of project development
- Project management
- Technology risks
- Risk of biomass fuel supply and price
- Price of alternative fuels
- Electric sales and price
- Steam, HW, CW sales and price
- Regulatory risks
- Operating risks

***Risks must be managed***

# Public Financing

- Tax-exempt financing
- Taxable financing
- Clean Renewable Energy Bonds
- Qualified Energy Conservation Bonds
- Recovery Zone Economic Development Bonds
- Build American Bonds

# Tax Equity Financing

- Production tax credit
- Investment tax credit
- U.S. Treasury grants
- Accelerated depreciation
- Bonus depreciation
- Type of biomass fuel
- Type of technology
- In-service date

***Key – whether it will be there***

# Biomass Facility Production Tax Credit

- Two categories of biomass
- Closed-loop biomass: planted exclusively for use at a qualified facility to produce electricity
- Open-loop biomass: agricultural livestock waste, cellulosic waste or lignin material (forest-related resources, wood waste, and crop by-products)
- No co-firing beyond startup and flame stabilization

# Biomass Facility Production Tax Credit

- Closed-loop biomass = 2.2¢/kWh escalated 10-year period
- Open-loop biomass = 1.1¢/kWh escalated 10-year period
- In service before Jan. 1, 2014
- Facility expansion after Oct. 1, 2008 eligible, but only to extent of increased electricity
- Credit reduced for government grants, tax-exempt bond proceeds, subsidized energy financing and other allowable credits
- Can elect to take Business Investment Tax Credit (ITC)

# Biomass Facility Investment Tax Credit

- Closed-loop and Open-loop biomass facilities
  - Eligible for 30% of qualifying project costs
  - Election of ITC is irrevocable
  - In service before Jan. 1, 2014
- Grant in lieu of tax credit
  - Eligible for entire 30% ITC
  - In service after 2010 and before January 1, 2014, construction commenced prior to December 31, 2010

# Tax Related Business Models

- Partnership flip
- Traditional sale – leaseback
- Modified sale – leaseback
- Inverted lease
- Prepaid power purchase agreement
- End user lease
- Direct ownership

# Project Documents and Risk Allocation

- Business model agreements
- Design and construction agreement
- Biomass fuel supply agreements
- Conventional fuel supply agreements
- Off-take sales agreements (electric, steam, HW, CW)
- Project finance agreements
- Utility agreements
- Facility management
- Real estate agreements

***All must fit like a glove***

# Projects to Watch

- City of Jasper, Indiana
- University of Iowa
- University of Missouri
- St. Paul District Energy
- City of Indianapolis

Thank You

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