

# Renewable Energy Projects: Green Redevelopment on Brownfield sites



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## Presentation Topics

- ◆ Renewable Energy Studies
- ◆ BioEnergy Park Business Plan
- ◆ Eugene BioEnergy Industrial Park
- ◆ BioEnergy Technologies
- ◆ Green Jobs
- ◆ Development Financing Options
- ◆ Next Steps
- ◆ Q&A

## **Willamette Valley Renewable Energy Feasibility Studies**

- ◆ Renewable Energy Conversion Technologies: Overview and Bench Scale Tests
- ◆ Available Waste Inputs
- ◆ Collection, Transportation, Preprocessing
- ◆ Facility Siting Elements
- ◆ Financial Models for Facilities
- ◆ Findings, Recommendations, Next Steps

3

## **Study Group Recommendations**

- ◆ Develop a BioEnergy Park, where local and regional agricultural and municipal organic wastes can be processed, through a variety of integrated conversion technologies, to produce high-value, clean, renewable energy, biofuels and green bio-products.
  - The Park should be right-sized for the community it is sited in
  - The Park should be a model for similar projects
  - The Park should be a public/private partnership
  - Develop Business Plan for BioEnergy Park

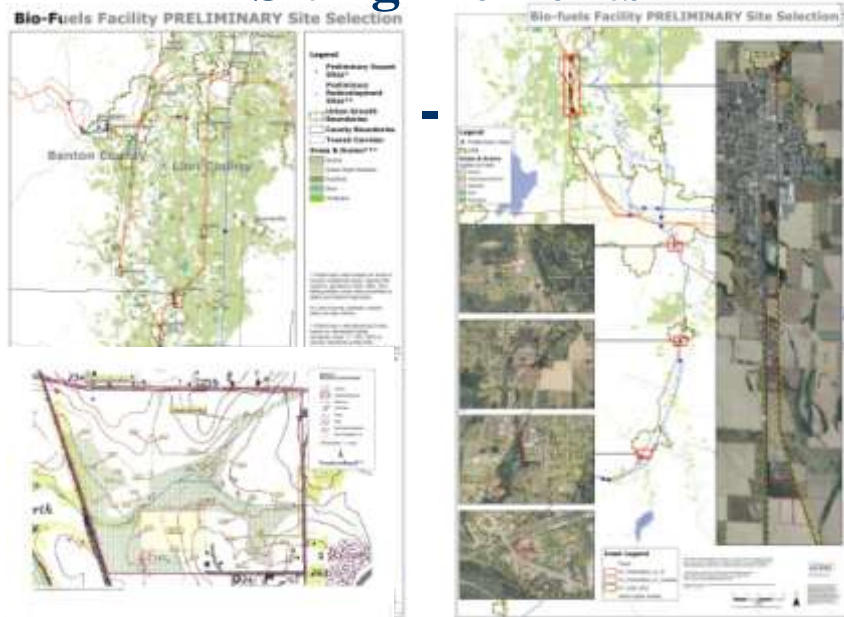
4

# BioEnergy Park Business Plan

- ◆ Goal: Create documents that bring
  - Private and Public financing to projects, and
  - Additional partners and opportunities.
- ◆ Three Focus Technologies
  - Biogas Plant (Anaerobic Digestion to electricity and compost)
  - BioBrick/BioPellet Mill
  - Cellulosic Ethanol
- ◆ Specific Sites
- ◆ Revenue & Expense Models
- ◆ Funding Options

5

## Siting Elements



6

## Eugene BioEnergy Industrial Park



7

## Solar on Brownfields



Distributed solar power does not involve the legal red tape or the large tracts of land that utility-scale projects require, and has the ability to generate enough energy for on-site manufacturing and nearby use.

8

## BioGas Production Facility



Liquid and solid organic wastes will be fed into anaerobic digester to create methane gas, which is sent to a combined heat and power unit to create electricity.

9

## Effluent to Soil Amendments



This simple compost system handles up to 150,000+ tons of material annually, using a 10' diameter by 200' length EcoPOD bag loaded with a 7-yard hopper

10

## Biodiesel Plant



Home and restaurant waste greases can be inexpensively converted to liquid transportation fuels in a facility retrofitted for the installation of inside tanks

11

## BioBricks Production



**BioBricks are** a densified biomass fuel made from forestry residuals and other woody biomass. The bricks are burned in existing wood stoves and can offset or entirely replace fossil fuel and electricity use for residential and commercial heating.

12

## Solar Panel & Frame Assembly



The capital cost of turning the solar cell into a solar module is lower than purchasing panels. Economics of small capacity plant for local installations are a local solution.

13

## New Jobs Onsite

- Construction of Facilities
- Operations and Maintenance of Facilities
- Processing of Local and Regional Organic Waste Streams
- Production of Renewable Energy and Green Products
- Green Product Sales and Services
- Manufacturing of components for similar Facilities
- Training facility to teach operations and manufacturing skills for renewable energy solutions.
- Potential Ancillary Businesses

14

## Estimated Capital Costs

- ◆ **Solar Project** – \$5,500,000 per 1MW
- ◆ **BioGas Facility** - \$5,000,000 per 2MW
- ◆ **Compost Facility** - \$300,000 per 100,000 tons
- ◆ **BioDiesel** - \$2,000,000 per 1Mg
- ◆ **BioBricks** - \$3,000,000 per 12,000 tons
- ◆ **Solar Panel Assembly** - \$2,000,000 per 12MW

15

## Development Financing Options

- ◆ **Project Financing Example**
  - **Private**
    - Equity
    - Bank Loans
  - **Public**
    - Oregon Business Energy Tax Credit
    - Federal Investment Tax Credit Sale
    - Oregon Energy Loan Program
    - Federal Loan Programs
    - Government Grants

16



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## Next Steps

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- ◆ Complete Business Plan: (2/2010)
- ◆ Secure Funding Partners for Project: (2010)
- ◆ Break Ground: (2010)
- ◆ Facility Open: (2011)

17



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## Question & Answers

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18