NORTHERN NEVADA CORRECTIONAL CENTER RENEWABLE ENERGY CENTER

Partnerships & Lessons Learned

Presented By:

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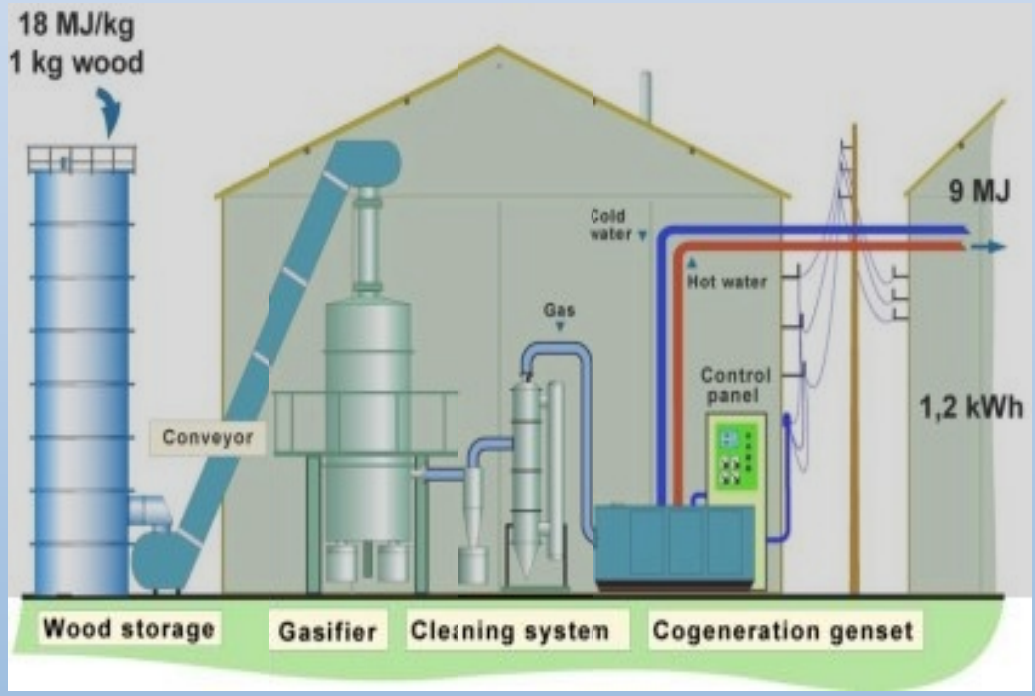
Making Wood Work Workshop
Missoula, MT October 2007

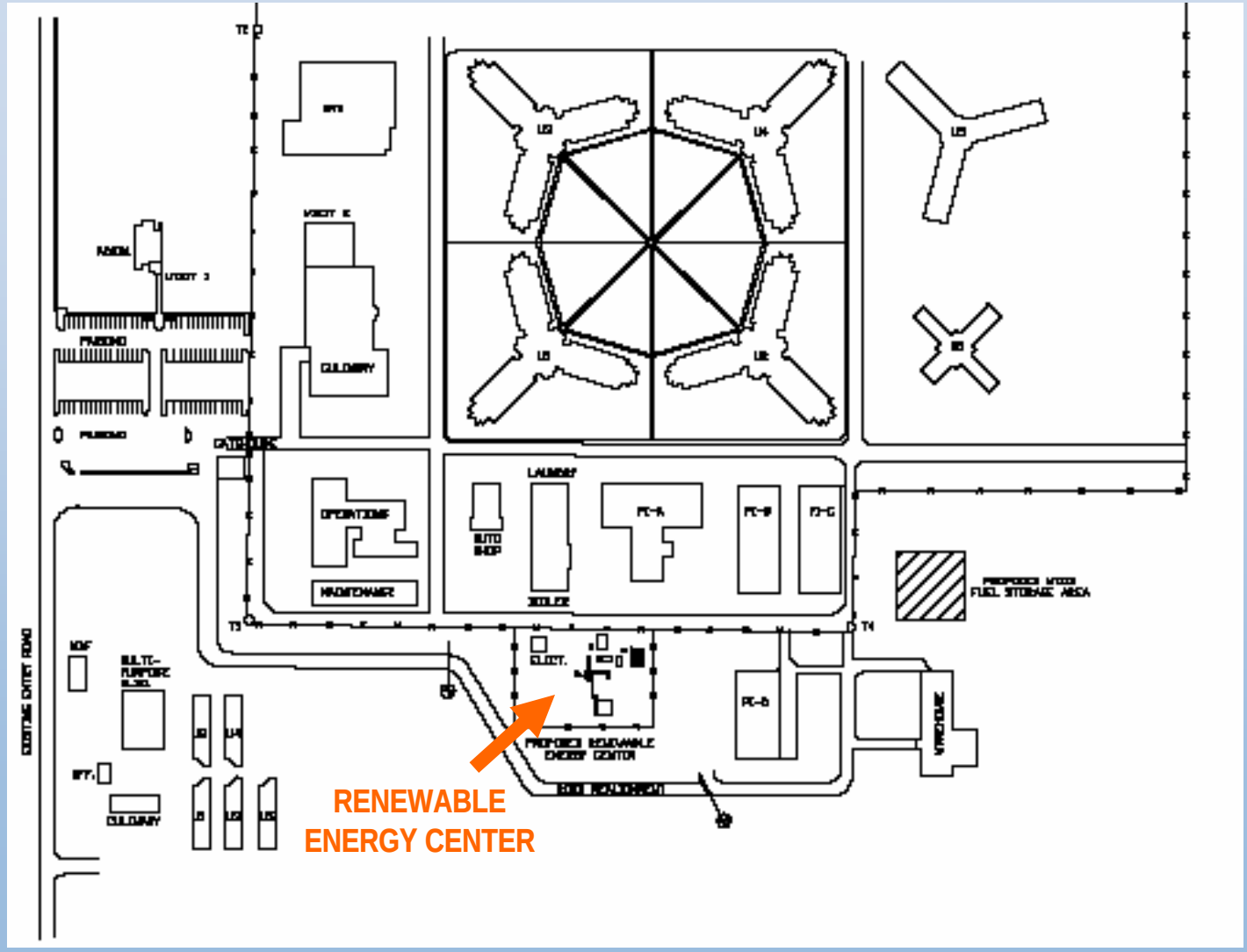
NNCC: Renewable Energy Center

- **Woody Biomass Combined Heat & Power Plant**
  - 1,000 kilowatt Electrical Generator System
  - Wood Waste Fired Steam Boiler
  - Pollution Control Equipment
  - Wood Fuel Conveyors
  - Metal Building
- **PV Solar System**
  - 30 kilowatt
- **Fuel Sources**
  - Forrest Slash
  - Land Development
  - Landfill Wood Recovery
- **Benefits**
  - 100% of Heat
  - 95% of Electric



NNCC: Renewable Energy Center

- **Located within Property**



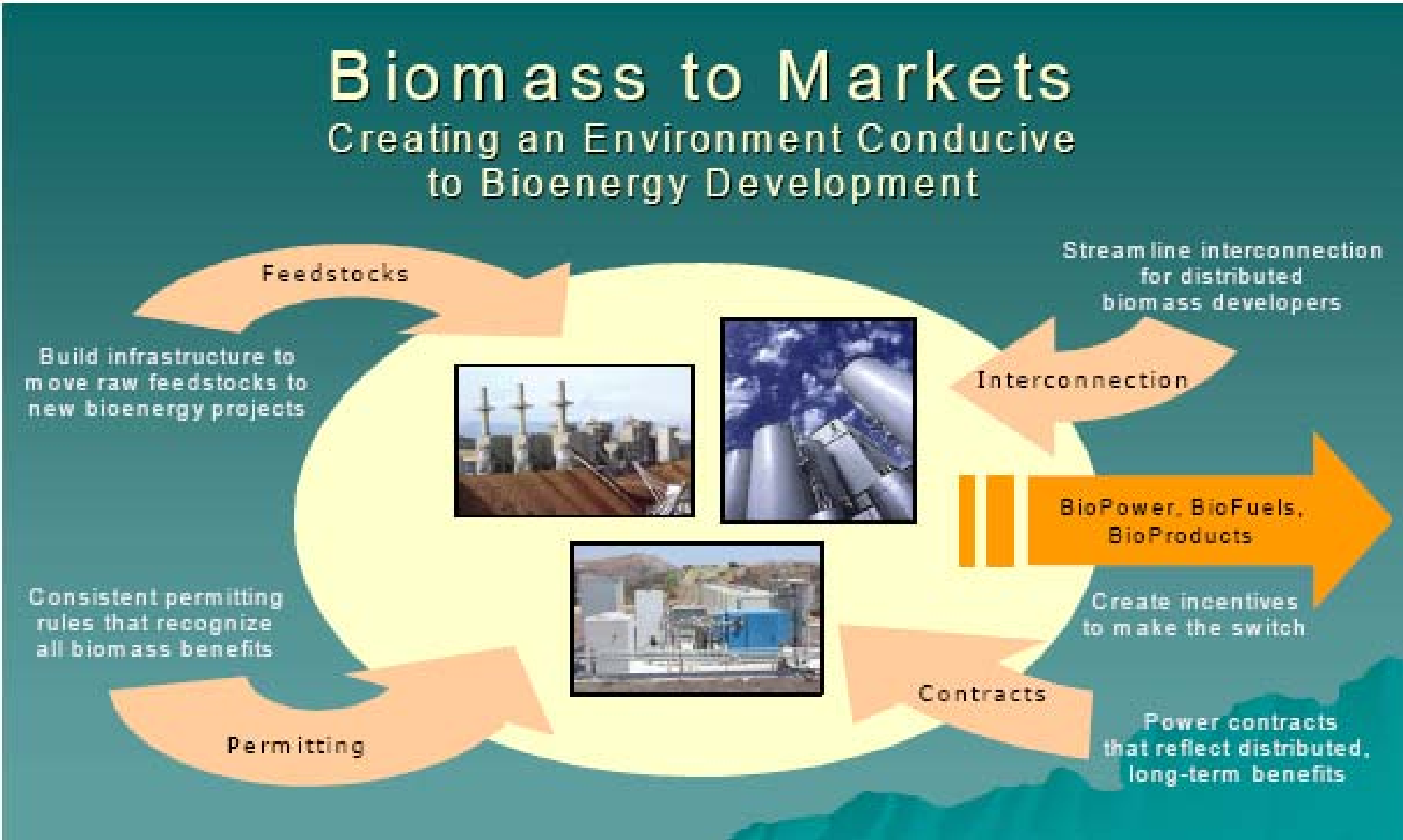
Building Goes Up!

Steam Turbine Generator

Wood Fired Boiler

Unexpected Findings...

Western Governor's Association:
Biomass Task Force Report, January, 2006



Partners

- **Nevada Division of Forestry**
  - Identification and coordination of fuel supply and procurement
  - $80,000 Fuels for Schools grant
  - Continued technical assistance
- **US Forest Service**
  - $250,000 National Woody Biomass Utilization Grant for the purchase of the boiler system
  - $20,000 State & Private Forestry Region 4 Grant to fund removal of construction and demolition wood waste from the Carson City Landfill
  - Humbolt-Toiyabe National Forest and Lake Tahoe Basin Management Unit
  - Continued technical support from State & Private Forestry regions 1 and 4
- **Nevada State Biomass Working Group**
  - Technical support
  - Clearing house of state-wide biomass utilization and biomass producing projects
  - Professional biomass presentations at public hearings to acquire necessary permits

More Partners

- **Nevada State Office of Energy**
  - Technical assistance with the State of Nevada Public Utility Commission
  - Continued assistance in acquiring grant dollars for biomass fuel supply infrastructure equipment
- **Nevada Fire Safe Council**
  - Provided funding for the for *Biomass Resource Assessment for Carson City and Surrounding Areas*, June 8, 2004
  - Contributing biomass fuel when economically feasible
- **Carson City**
  - Obtained land from the Bureau of Land Management adjacent to the Carson City Landfill to provide for a biomass processing yard to extend the life of the landfill (lease)
  - Provided special use permits to construct the facility
  - Facilitated air quality requirements on a municipal level

Even More Partners

- **Carson City Renewable Energy**
  - Private contractor to supply NNCC with woody biomass fuel
  - Collects, processes and delivers biomass from the urban waste stream and construction and demolition wood diverted from the Carson City Landfill
- **APS Energy Service**
  - Energy Savings Company performance contractor whom designed and built the NNCC woody biomass plant and other energy savings retrofits
- **Sierra Pacific Power Company**
  - Power purchase agreement to buy excess electricity produced by the NNCC woody biomass plant
- **Governor Jim Gibbons, State of Nevada**
- **Bureau of Land Management**
- **Nevada Commission on Economic Development**

Partners (Again)

- Nevada Legislature's Committee on Public Lands
- Tahoe Regional Planning Association
- Lake Tahoe Fire Chiefs
- Nevada Division of State Parks
- Nevada Division of Environmental Protection
- Nevada Department of Natural Resources
- Nevada Department of Agriculture
- Nevada Tahoe Conservation District
- US Senator Harry Reid
- US Senator John Ensign

Partners (Finally)

- Cal Fire (Formerly California department of Forestry and Fire)
- Western Governor's Association
- Private Landowners

Biomass Energy: Key Components

- **Strategic Planning**
  - Feasibility
  - Procurement
  - Approvals & Permits
  - Experienced Contractor
- **Fuel Source**
  - Transportation and Delivery
  - Long-term Contracts
  - Seasonal Availability and Storage
- **Ongoing Operational Items**
  - Biomass Supply Availability
  - Contracts for Supply
  - Handling & Transportation
  - Conversion
  - Heat & Electricity Generation

Lessons Learned

- **Renewable Projects**
  - These projects have their challenges. They should be understood and evaluated with each application for use of renewable resources.
- **Fuel Supply**
  - The most critical component of the project considerations. Negotiation with managing agencies and local vendors can be very trying.
- **Permitting**
  - Be aware of potential additional Local requirements above meeting the requirements of State and Federal Regulations.
- **Generation**
  - The process of generating electricity and placing it on the grid includes negotiation and approval by multiple public agencies, and close cooperation of the utility for success.

Lessons Learned

- **Power Purchase**
  - The process must be understood and utility interactions are critical to the outcome for the plant.
- **Construction**
  - Project requirement changes and field modification affect construction schedule. Weather and timing are critical. Prison requirements are unique. Accurate As-Built drawings are very helpful.
- **Green Value**
  - Green isn't enough, the project must be financially competitive and technically viable.
- **Woody Biomass**
  - To make this resource utilization profitable in a commercial setting, public policy must change and processes streamlined for fuel acquisition, permitting and, interconnection requirements.

Summary and Conclusions

- **This groundbreaking project is a shining star for the State of Nevada in utilizing an otherwise wasted resource**
- **The project has not been without complications**
  - These should be understood and evaluated with each application for use of renewable resources
- **The process of generating electricity and placing it on the grid for a utility requires effort in negotiation, approval by public agencies, and cooperation of multiple parties for success**
- **To make this resource utilization profitable public policy must be streamlined for fuel acquisition, permitting and interconnection requirements.**
- **Partnerships will be the key to success**