

Community-Based Small Diameter  
Utilization  
& Biomass Opportunities for Rural  
and Tribal Communities

a presentation by:

Restoration Technology Group

&

Community Energy LLC

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# Restoration Technology Group

## Mission Statement:

*To support community-based forest and economic development in rural and tribal communities that creates long-term ecological health and broadly distributed economic prosperity and community well-being.*

# Restoration Technology Group

## Strategy:

- Analyze available resource flows from site-specific restoration/fire hazard treatments and identify opportunities for locally-based enterprises.
- Develop new forestry and wood products technologies scaled to local forest and community capacities.
- Provide training and technical assistance in enterprise design. Development, and business management.

# Team Description

Brett KenCairn—Community Energy

Enterprises development, business assistance

Gordon West—Gila Woodnet, Santa Clara Woodworks

Technology development and training

Allan Branscomb—Center for Sustainable Environments

Resource assessment, spatial analysis

Lucinda Andreani—Energy Consulting

Energy systems development

# RTG Activities—Resource Assessment/Spatial Analysis



Commonweal Conservancy Biomass Energy  
Resource Assessment and Development

# RTG Activities—Technology Development--Forestry



Unilogger

# RTG Activities—Technology Development--Forestry



Bobcat  
logging  
winch

# RTG Activities—Technology Development--Utilization



Centerline  
Machine



# RTG Activities—Technology Development—Utilization



# RTG Activities—Training & Technical Assistance



Log  
Building  
Workshop  
Torreon  
Chapter,  
Navajo  
Nation

# RTG--Current Project

- Jemez Pueblo--Biomass Feasibility Assessment
- Silver City, New Mexico—Gila Woodnet Log Sort Yard & Integrated Utilization Facility
- Gallup, New Mexico—Wood Utilization Incubator development
- Ramah Navajo—Forestry enterprise training & development
- Commonweal Conservancy—Biomass thermal district heating & energy system assessment/develop
- Two biomass energy development projects-Oregon

# What is Community-Based?

1. Enterprises that are > 60% locally owned
2. Landscapes within reasonable daily travel (<2 hr daily commute)
3. Participants have some capacity to influence management decisions—public process, collective ownership, etc.
4. Economic activity “spins” within the community.

Local in: place, ownership, participation and benefit

# Why Does Community-based Matter?

## Social Considerations

1. Local ownership fosters is closely linked to local investment: goods & services, infrastructure, civic involvement
2. Development occurs within the capacity of local community—avoid the boom & bust cycle
3. Investment within the capacity of local individuals/institutions--\$5-10million investment vs \$75-\$100 million investment
4. Diversified use—High Value-added (HV), low value added (LVH) and biomass create diversity of economic opportunities—diversity equals greater stability

# Why Does Community-based Matter?

## Ecological Considerations

1. Scale related to local resources: 5MW biomass requires 2,000-2,500 acres of thinning/yr, 35 MW plant requires 15,000-20,000/year
2. Diversity of uses enables adaptive management based on changing ecological conditions e.g. large scale fire or mortality, appearance or loss of endangered species, changing understanding of ecological effects of treatments
3. Smaller scale reduces propensity of “sunk cost catastrophe”

# Why Does Community-based Matter?

## Economic Considerations

1. Diversity of economic uses captures more value from available resource (example to follow)
2. Diversity of economic players increases distribution of economic benefits across community
3. Diversity of users creates more innovation in uses for materials.



# Community-Based Wood-yard Scenario

## Revenue Potentials for Forest Restoration and Fire Hazard Reduction Treatments

Southwest US Scenario--Figures based on actual experience at Gila Woodnet,  
Silver City, New Mexico

### Assumptions

**Yields**            **13 tons/acre total yield all products**

**Units**            **1 ton = 333 log ft, 1 ton = .67 cords**

**Biomass**                                      **\$35/green ton**

**Firewood**                                     **\$100/cord (dry)**

**Low Value Add (LVA)**                    **\$1.40/log ft**

**High Value Add (HVA)**                   **\$8.60/log ft**



# Community-Based Wood-yard Scenario

## Scenario 1: Biomass Only

	<u>Tons</u>	<u>Log Ft</u>	<u>\$/lg ft</u>	<u>\$/ton</u>	<u>Total</u>
<u>Product</u>					
Biomass	13			\$35	455

# Community-Based Wood-yard Scenario

## Scenario 1: Biomass Only

	<u>Tons</u>	<u>Log Ft</u>	<u>\$/lg ft</u>	<u>\$/ton</u>	<u>Total</u>
<u>Product</u>					
Biomass	13			\$35	<b>\$455</b>

## Scenario 2: Biomass Only

	<u>Tons</u>	<u>Log Ft</u>	<u>\$/lg ft</u>	<u>\$/ton</u>	<u>Total</u>
<u>Product</u>					
Biomass	6.5			\$35	\$228
Firewood	6.5			\$66	<u>\$429</u>
Tot al					<b>\$657</b>
Improvement over Scenario 1					44%

### Scenario 3: Biomass Only

	<u>Tons</u>	<u>Log Ft</u>	<u>\$/lg ft</u>	<u>\$/ton</u>	<u>Total</u>
<u>Product</u>					
Biomass	5.85			\$35	\$205
Firewood	5.85			\$66	\$386
Vigas (unpeeled)	1.3	433	\$1.40		<u>\$606</u>
<b>Total</b>	(165% improvement over Scenario 1)				<b>\$1,197</b>

### Scenario 4: Biomass Only

	<u>Tons</u>	<u>Log Ft</u>	<u>\$/lg ft</u>	<u>\$/ton</u>	<u>Total</u>
<u>Product</u>					
Biomass	5.2			\$35	\$182
Firewood	5.2			\$66	\$343
Vigas (unpeeled)	1.95	649.35	\$1.40		\$909
Vigas (peeled)	.65	216.45	\$8.60		<u>\$1,861</u>
<b>Total</b>	(Improvement over Scenario 1--624%)				<b>\$3,296</b>

# Economic Cost/Benefit of Biomass Chip vs Natural Gas Boiler

SEE SPREADSHEET

# Troubling Trends

1. Focus on large scale, regional biomass projects
  - Institutionalize large annual demand
  - “Sink” millions into “one-size fits all” strategy (sunk cost phenomena)
2. Shift towards large stewardship contracts
3. Assumption that restoration will “pay for itself” through “Goods-for-Services” provisions
4. Displacing existing community-based enterprise
5. Re-ignite the “environmental wars”

# Community Recommendations

From: “Rural Voices for Conservation”

1. Biomass utilization is a land management issue, not just an energy issue.
2. Federal funds for biomass should also support diversified forest products utilization.
3. Federal policies should promote biomass at a variety of scales
4. For many rural/tribal communities small (1-10 megawatts) is the *appropriate scale*
5. Incentives for biomass should not harm existing enterprises utilizing small diameter materials

# Next Steps—A Comprehensive Framework for Evaluating Biomass Options

- Social
- Ecological
- Economic

# Social



- Compatibility with existing local capacity
- Proportion local ownership
- Equitable distrib of benefits/costs
- Degree of local participation/control



# Ecological

- Landscape scale assessment—ERA vs CROP
- Long-term effects modeling-monitoring
- Incremental expansion of treatment regimes
- Flexibility and adaptation to changing conditions



# Economic

- Jobs Created vs resources utilized
- Revenue generated and retained locally
- Level of local investment/”spin”
- Accessible to local investors
- Ability to adapt infrastructure to changing ecological conditions/ecosystem needs



# The Next Crossroads for the West

## Boom & Bust Biomass-the “Sunk Cost Catastrophe” or Biomass as Part of Community-based Restoration & Stewardship

### Coal-Bed Methane Development Model

- Rapid expansion, minimum local investment
- 80-90% profit extraction
- Reliance on imported workers
- Large Social Impacts

Substance abuse

Domestic abuse

- Major environmental impacts

### Oregon Country Beef Model

- Locally developed and financed
- 90% profit retention
- Builds place-based professionalism & stewardship
- Invests in local community infrastructure
- Creates market incentives for environmental protection
- Adaptive economically & ecologically