

**Sustainable Communities:
A Tool to Convert the Liability of a Need to Thin and Clear Forests
around a Community into an Asset**

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**Gateway Technology for Restoring our
Forests, Watersheds and Economies**

- Free App for measuring the woody biomass nearby: the trees that need to be thinned or removed to ensure the safety of communities, their forests and watersheds in the case of a wildfire.
- This App provides a level of certainty that lenders and grantors need to finance the technology infrastructures. (See Appendix) This App is currently waiting for funding and will be available free of charge to anyone who wants to plan for restorative forest thinning for a community, watershed or residence.
- Available for locals: From county land managers to private landowners; from students to local biofuels entrepreneurs; or county or state facilities managers who want electricity, heat, air conditioning from local wood slash “wastes” for their buildings.
- Strengthening local economies by turning local liabilities into assets in a safe way.
- This tool will quickly help your community mitigate inevitable natural disasters into not only fire ready communities, but also provide multi-faceted assets and benefits for your communities.

PROJECT BENEFITS:

- Provides local users with the assessment tool they need now to protect & restore and in the process utilize their woodland resources.
- Replaces costs associated with firefighting, property loss and ecosystem destruction with net revenue and job creation.
- Will be a replicable tool for forest restoration across the U.S. and the world.
- Turns community liabilities (unhealthy forests, fire devastation, watershed vulnerability, wastes) into community assets (forest restoration, “fire ready” communities, clean water, economic development).
- Improves the health and diversity of NM’s forest landscapes and watersheds.
- Utilizes NM Forest Restoration Principles developed by a diverse group of forestry experts to have a level of certainty for when to stop thinning.
- Is key to developing a renewable energy business sector in NM.
- Enhances local economic development activities throughout NM.
- Engages educational institutions across NM in the process on an ongoing basis. (Institutions are eager for real-life education opportunities for their students. Their engagement also reduces the costs of this project and will provide the means to fund those institutions’ continued participation.)
- Educates students of all ages in the many aspects of sustainable utilization of woody biomass for energy and other wood-based products.
- Creates a robust, sustainable and reliable energy and fuel resource for NM’s essential services and community power during supply disruptions.
- Creates the potential in the first 5 years of use for 400 to 1200 new and permanent, direct, indirect and induced biomass-based jobs in NM resulting in \$14,000,000 to \$42,000,000 of new payroll (based on a current average salary of \$35,000/year). These salaries also favorably and directly enhance local tax bases and bonding capacities.

- Further enables the robust, creative development and implementation of NM renewable energy technologies now being researched in our State's National Labs, Universities, Community Colleges and among its many eager entrepreneurs.
- Supports a larger zero waste economic development initiative in NM and enables a shift in focus toward an efficient and clean zero waste economy.

APPENDIX:

Example Technologies & Products largely derived from the article below:**

- “[Gasification](#) and [fermentation](#) technologies, to turn different types of waste materials, including municipal solid waste, into advanced biofuels and renewable power, producing 8 million gallons of [cellulosic ethanol](#)...” [links added] *SFCC
 - See http://en.wikipedia.org/wiki/Cellulosic_ethanol_commercialization, <http://en.wikipedia.org/wiki/Gasification>, http://en.wikipedia.org/wiki/Synthesis_gas_fermentation
- **Pyrolysis:** See: <http://en.wikipedia.org/wiki/Pyrolysis> “High temperature in the absence of oxygen.” Products are 1) pyro-oils, 2) biochar, 3) flammable gas. *SFCC
- “AVAP (American Value Added Pulping) co-produces pulp and ethanol from biomass in an **integrated biorefinery application**. Biomass is converted to sugars using a two step proprietary process. In the first step biomass is quickly broken-down into its three major components: cellulose, hemicelluloses and lignin. In the second step, hemicellulose is hydrolyzed to sugars using heat and cellulose is hydrolyzed to sugars using enzymes. Lignin is removed and burned to produce the energy required to run the process.”
- “...a **proprietary biomass pretreatment platform** that makes it possible to cost-effectively develop cellulosic sugars as a feedstock to a range of biochemicals and biofuels.”
- “Gevo’s **integrated fermentation technology** (platform consists of two components: a yeast biocatalyst and a separations technology unit that bolts into existing ethanol plants. Isobutanol can be used directly as a solvent and converted to isobutylene, the raw material for plastics and fibers.”
- “The technology developed by Mascoma Corporation uses **yeast and bacteria** that are engineered to produce large quantities of **the enzymes necessary to break down the cellulose and ferment the resulting sugars into ethanol**. Combining these two steps (**enzymatic digestion and fermentation**) significantly reduces costs by eliminating the need for enzyme produced in a separate refinery. This process, called **Consolidated Bioprocessing or “CBP”**, will ultimately enable the conversion of the solar energy contained in plants to ethanol in just a few days.” [emphasis added]
- **Biomass Furnace** – *using woodchips heats 2/3 of the *SFCC campus.*
- **Biomass Energy**—Biogas: Anaerobic Digestion, Combined Heat & Power (CHP) or CoGeneration (**Co-Gen**) - *SFCC “Cogeneration or combined heat and power (CHP) is the use of a heat engine[1] or power station to simultaneously generate electricity and useful heat [such as processed steam]. Trigenation or combined cooling, heat and power (CCHP) refers to the simultaneous generation of electricity and useful heating and cooling from the combustion of a fuel or a solar heat collector. A plant producing electricity, heat and cold is called a trigeneration[2] or polygeneration plant.” http://en.wikipedia.org/wiki/Combined_heat_and_power
- **Methanation** <http://en.wikipedia.org/wiki/Methanation> “**Methanation** is a physical-chemical process to generate **Methane** from a mixture of various gases out of biomass [fermentation](#) or thermo-chemical gasification.[1]”

Example Products: (This is a partial list only!)

*Cellulosic ethanol, electricity, heat, refrigeration, methane. *SFCC,*

Cellulosic diesel, biofuels, gasoline and diesel fuel blendstocks, biochemicals (for plastics production, etc.).

**SFCC: Similar or same as taught at Santa Fe Community College’s Biofuels Center of Excellence.*

****12 Bellwether Biofuels Projects – where do they stand?, Biofuels Digest, July 2013**

<http://www.biofuelsdigest.com/bdigest/2013/07/22/12-bellwether-biofuels-projects-where-do-they-stand/>

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