Greater Flagstaff Forests Partnership (GFFP)
Forest Biomass Coalition Working Group (FBC)

Biomass Fiber Supply and Public Safety Position Paper

A Crisis: Undesired wildfire is the leading social, environmental, and economic threat to Northern Arizona's forested communities. Forest management, including private sector wood utilization operations, have proven successful at reducing wildfire risk across the Four Forest Restoration Initiative (4FRI) landscape. However, the economic sustainability of the private sector is at risk because half of what loggers must remove is often low value to unmerchantable biomass fiber. To be successful, ***there is an urgent need to find utilization options for the biomass fiber.*** Without additional economically viable ways to dispose of the biomass fiber now and in the future, we may lose the private sector forest industry that took 20 years to rebuild in Northern Arizona. We will also lose our investment in making the 4FRI landscape healthier and lowering the threat of wildfire.

Why: At the full 4FRI restoration goal of 35,000-40,000 acres/year the amount of biomass fiber will double. Even at our current level of 20,000 acres/year there are insufficient options for biomass fiber utilization.

We're Investing: Industry investment from 2022 to 2024 was $300 Million. In fact, for every United States Forest Service (USFS) dollar invested over the last three years, industry and partners' (cash and in-kind services) have invested more than double that amount- $2.07!

Solution: Based on 20 years of effort to recruit private sector businesses that can use biomass fiber, we conclude that ***one of the few options currently demonstrated at the scale needed is to add 30 MW of bioenergy generation to the current and emerging mix of biomass fiber utilization options in Northern Arizona.*** It is important to note that our endorsement of bioenergy does not preclude support for current and future utilization options.

Major Hurdle: The biggest hurdle to bioenergy generation is identifying a power offtake opportunity/business that is willing to work creatively to make this a reality. Presently, a gap exists between the cost of bioenergy and other less expensive sources for energy generation. Filling that gap will require creative public/private solutions. We must also assist to identify public and private sources to support the capitalization and operation of the facility.

Everyone must help: Undesirable wildfire impacts us all. Stakeholders, businesses, and all levels of government must work together to solve Northern Arizona's excess biomass fiber disposal challenge. Enabling private sector offtake of biomass fiber would not only reduce wildfire risk, but also it would help sustain the investments of existing industry. An ideal solution is to co-locate a bioenergy facility with other wood-based processors to create an industry cluster.

Next Steps to Support a Biomass Bioenergy Facility in Northern Arizona

Forest Biomass Coalition and other Stakeholders

- Initiate conversations with utilities and stakeholders such as the Salt River Project (SRP), Arizona Public Service (APS), Tucson Electric Power (TEP), City of Flagstaff, Coconino County, Northern Arizona University (NAU), electric co-ops, and industry partners to identify all power offtake opportunities.

Congress

- Complete FY27 Appropriations by September 30th, 2026. Congress' failure to pass annual appropriations on time undermines private sector confidence in the biomass fiber supply chain and therefore confidence to invest in biomass disposal solutions. Appropriations must include funding for adequate USFS staffing levels to ensure forest management, timber contracts, and other agreements are not interrupted by personnel disruptions. Funding for Wood Innovation Grants, including technical assistance and Hazardous Fuels Transportation Assistance Grants are proven investments that can be leveraged with private dollars for maximum benefit.
- Provide direct federal assistance to communities that are willing to form federal/state/local/private partnerships to develop innovative bioenergy facilities designed to dispose of liability biomass fiber. The cost of new construction for a biomass energy facility depends on scale and technology. One recent estimate state that a 20 MW plant can range in cost from $50 to $120 million with additional operating and financing costs to be evaluated (https://latestcost.com/biomass-plant-construction-costs-pricing). Federal land management actions and adjacent communities are beneficiaries of a biomass fiber utilization strategy. We want to engage Congress in a way that ensures success.
- Amend Title III of the Fix Our Forests Act (FOFA) to include provisions to support the utilization of biomass. The section should have all available incentives including: federal loans or guarantees, federal cost share (35%), production tax credits (PTC), and funding for the Hazardous Fuels Transportation Assistance Grants to support the siting of appropriately scaled bioenergy facilities in high-fire risk areas identified by the FOFA Fireshed Management Areas.

USDA Forest Service

- Continue to increase contract offerings that achieve the full 4FRI operations' goal of 35,000 to 40,000 acres annually.
- Explore and use the full suite of contracting tools, agreements, and other authorities that build private sector confidence in the USFS' ability to consistently deliver sufficient acres for treatment and utilization.
- Work collaboratively with industry partners and stakeholders to align forest restoration implementation contracting and funding with best available utilization options, focusing on enabling current industry capacity while also supporting new investments.

Arizona State Legislature, Governor, Department of Forestry and Fire Management (DFFM) and Arizona Department of Environmental Quality (ADEQ)

The State of Arizona is a beneficiary of improved federal forest management and associated community wildfire resilience and public safety. The State has also been a solid and reliable partner in forest restoration efforts. The State should continue these partnerships and participate in a strategy to help increase the pace and scale of forest restoration work.

- Ensure adequate State funding for DFFM to support Good Neighbor Authority agreements and other actions that facilitate forest restoration treatments.

- The Arizona Legislature and Arizona Corporation Commission should explore policy pathways to enable 60 MW of biomass fiber-based energy in strategic locations to facilitate wildfire risk reduction (this total includes Novo Biopower).
- ADEQ should work efficiently with biomass energy developers while following Clean Air and other applicable laws.

County/Local Government

County and local governments have the most to lose from wildfire in their communities. Research shows that the cost of wildfire and post-wildfire flooding recovery does not end when the fire is extinguished, but rather it goes on for years. A proactive strategy of reducing wildfire risk is a hallmark of the City of Flagstaff and Coconino County.

- Develop bonding, sales/property tax, disposal fee, or other revenue streams to support the utilization or disposal of liability biomass fiber.
- Provide efficient permitting processes.

Background

The background section provides information to support the FBC position. It is derived from over 20 years of experience rebuilding and sustaining industry and attempts to create a private sector biomass fiber market.

Amount of Biomass:* Based on the science-driven desired conditions of 4FRI forest plans, and over 20 years of in-woods thinning, to restore forests requires the removal of:

1. In-woods: restoration treatments typically generate on average 25 green tons (GT)/per acre of merchantable small and medium diameter logs.
2. In-woods: restoration treatments typically generate about 17 green tons per acre of "brown" chip based biomass, although amounts will vary depending on site conditions and related prescriptions.
3. Sawmill Residuals: approximately 10 GT of "white" chip based biomass are created on average, as a by-product from processing the 25 GT/acre of small diameter logs removed during forest restoration.

*These totals may differ depending on contract specifications.
"Feedstock Supply Assessment for HM3 Energy, Inc. Camp Navajo Facility." Ecological Restoration Institute. July 2020.
"Regional Economic Contributions of the Four Forests Restoration Initiative (4FRI) in Northern Arizona in 2023." Conservation Economics Institute. Hjerpe, Mottek Lucas.

Current disposal capacity: Even at the current level of thinning (15-20,000 acres/year), industry struggles to dispose of biomass. Lack of markets for biomass impact the bottom-line profitability of private industry, yet failure to remove biomass undermines the goal of reducing the risk of wildfire and restoring forests. Stakeholders, businesses, governments, and the USFS have wrestled with the disposal problem since the late 1990s. Except for Novo Biopower (that can use about 15,000 acres/annually), there are few large-scale disposal options, especially on the west side of the 4FRI landscape (See Appendix).

Why biomass energy? Biomass energy generation is a proven technology that can use the volume of biomass predicted to be harvested over the next 20 years. It can be quickly deployed, especially if the choice is made to purchase used equipment that is currently available.

The ***benefits*** of this effort are distributed across all sectors because it will:

1. Help sustain the private logging and sawmill industry that has taken 20 years to build—yet is still very vulnerable.
2. Improve treatment effectiveness to reduce the threat of wildfire and return beneficial, natural fire.
3. Reduce harmful smoke exposure for communities and fire managers.
4. Generate reliable and renewable power.
5. Allow for other value-added products to be created via forest restoration.
6. Be fiscally conservative and cost effective when government agencies consider the "avoided costs" associated with the negative health impacts of smoke, avoided wildfire and flooding recovery costs, and recreation and water quality impacts.

The ***challenges*** of biomass energy:

1. Presently, bioenergy currently faces cost competitiveness challenges and will require creative public-private solutions. It is only feasible now because of federal subsidies and public utilities purchasing bioelectricity at above market prices.
2. Utilities have historically been hesitant due to cost considerations, highlighting the need for creative partnership and policy solutions.

Actions

The cost of a new 20MW biomass energy facility is estimated range $50 to $120 million with additional operating and financing costs to be evaluated. This investment is small when compared to the projected costs of between $535M–$2.82 Billion if a fire burns the San Francisco Peaks, followed by flooding into downtown Flagstaff. The Forest Biomass Coalition will work with other stakeholders and industry to support the following actions:

1. Initiate a process to identify an appropriate location for 30 MW of power on the west side of the 4FRI landscape (NAU, Bellemont, East Flagstaff, Winslow, other).
2. Explore opportunities to sell heat to other entities such as NAU or forest product manufacturers co-located with a biomass energy facility.
3. Explore opportunities with the utilities to examine the feasibility of new off-take agreements and how the higher cost of biomass power could be offset with market and nonmarket monetary benefits that will accrue from biomass disposal (see #7).
4. Identify options for "behind the meter" operations.
5. Identify funding sources for capital development that include: private equity, public bonds, federal appropriations or grants, charitable grants, federal loan guarantees, federal technical assistance, and local, state, and federal tax assistance.
6. Work in cooperation with the USFS to identify priority acres that will need biomass transportation offsets.
7. Determine the gap between power sale revenue and operating costs and identify a sustainable subsidy. This may be possible if local and county government is involved.

Appendix
Biomass Businesses, Current, Emerging, Inactive

Arizona has considerable experience with biomass utilization and disposal, and many lessons have been learned. The following biomass utilization and disposal technologies have been implemented, tested, studied, or attempted in Arizona:

Active:

- Sawdust & chips boiler-fired kilns (common sawmill application e.g. Lumberjack Mill and Drake Cement)
- Pellets, briquettes (Forest Energy / Lignetics)
- Bioelectricity (Novo Biopower)
- Landscaping bark or mulch (Scotts Miracle-Gro)
- Landscaping chips (White Mountain Lumber)
- Potting soil (GroWell)
- Distributed charcoal kilns (NAU)
- Biochar (Lateral Investment Management (LIM), Southwest Biochar, Arizona Log & TimberWorks)
- Landfill Cover (City of Flagstaff)
- Soil Amendments (Restoration Soils)

Emerging:

- Biomass blocks carbon capture (Graphyte) and Carbon Credits (Graphyte)
- OptimWall, and OptimBoard™ (WoodSyn)
- Additional Biochar capacity

Investigated feasibility and no longer active:

- OSB co-gen plant
- Liquid fuel
- Syngas gasification
- Distributed Air Curtain incineration
- “Chip and Ship”- sending brown chips to South Korea (NAU)

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