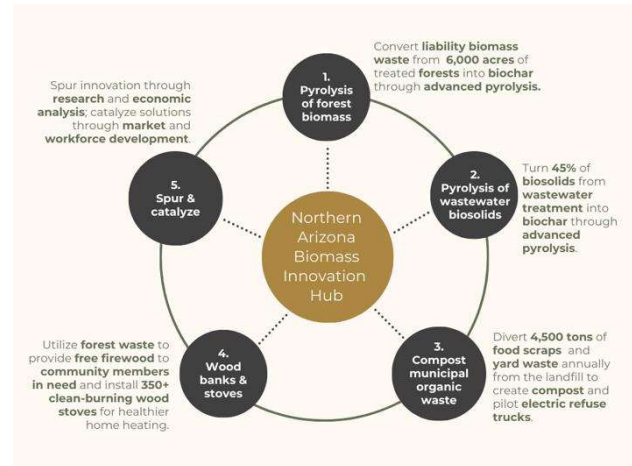




Northern Arizona Biomass Innovation Hub – EPA Grant

EPA Carbon Pollution Reduction Grant Implementation Proposal 2024 - City of Flagstaff (Lead Applicant)

Challenge: Northern Arizona faces novel challenges to reduce greenhouse gas (GHG) emissions. Like most communities, transportation, buildings and waste disposal are the top contributors to GHG emissions under normal conditions. But what Flagstaff and hundreds of other cities in the Intermountain West have in common is the impact from increasingly frequent and intense wildfires as the climate warms and dries. When catastrophic wildfires burn, status quo emissions pale in comparison to the millions of tons of emissions released from neighboring dense, overstocked forests. Tragically, wildfires are followed by a second potent threat to community well-being: flooding and debris flows now disrupt life in multiple Northern Arizona communities annually. Communities across the West are dealing with these immense challenges while simultaneously enacting plans to reduce emissions and build community resilience to climate change. This project will jump start replicable on-the-ground solutions that reduce the threat of catastrophic wildfire while reducing GHG emissions from problematic regional sources of organic waste we collectively refer to as liability biomass.



5 Part Solution: The Northern Arizona Biomass Innovation (NABI) Hub is a replicable hub and spoke model that will reduce carbon emissions as it solves the region’s longstanding liability biomass challenges. Research, workforce, and market development will spur and catalyze a new circular liability biomass economy that builds community resilience and supports underserved residents. The City is leading a robust NABI Hub Coalition, tapping community assets including forest restoration leadership, university forest and carbon removal researchers, and a robust network of city, county, state, federal, and tribal partners. The five NABI Hub spokes are integrated strategies that can be replicated by other cities in the Intermountain West facing similar challenges.

1. Advanced pyrolysis of forest biomass

Challenges: Catastrophic wildfire is the greatest threat to public safety in Coconino County, with the greater Flagstaff area in one of the nation’s top 10 fire sheds. Since 1996, diverse stakeholders have worked together to build and implement forest restoration strategies to reduce the threat of wildfire. Despite overwhelming socio-political support, progress has been limited, largely due to high volume/low value biomass and high start-up costs of biomass processing. Solutions: A new



industrial scale advanced pyrolysis facility at the regional Cinder Lake Landfill will convert forest biomass into marketable biochar products.

2. Advanced pyrolysis of biosolids

Challenges: Flagstaff's aging Wildcat Hill Water Reclamation Plant (Wildcat) is operating near its solids capacity limit requires a near term solution. Additionally, Flagstaff disposes of Class B biosolids pm a 40-acre Designated Land Disposal Site A more energy-efficient, cost-effective method for processing and handling biosolids has evolved that would eliminate the need for conventional solids capacity treatment at Wildcat & test the strategy for future full deployment. **Solutions:** A novel biosolids treatment train at Wildcat will convert contaminated biosolids to sterile marketable biochar.

3. Composting food and yard waste

Challenges: The CLL receives 110,000 to 130,000 tons per year of solid waste generated in the city, surrounding unincorporated communities in the County, and some communities on the Navajo Nation. CLL does not currently capture, vent, nor flare landfill gas, which comprises large amounts of methane. In 2021, CLL emitted an estimated 96,437 metric tons CO₂e of methane. **Solutions:** The first municipally run compost facility at the CLL, paired with scalable food waste and yard waste diversion programs in multiple jurisdictions, will convert municipal and county organic waste to useful, marketable products.

4. Firewood banks and stove replacements

Challenges: Northern Arizona ranks among the highest in the nation for dependence on wood for home heating, especially in low-income households and tribal communities. Following the 2019 closure of the Kayenta Mine, thousands of Navajo and Hopi homes that were heated with coal transitioned to wood for home heating. Old stoves are inefficient. Woody stems from restoration thinning are problematic when burned in slash piles—they can produce coals that spark wildfires. **Solutions:** Processing long-burning woody biomass into firewood delivered to new wood community banks; replacing inefficient wood stoves with EPA certified models; and assisting tribal wood banks with staffing.

5. Spurring innovation through biomass burial, workforce and market development, and research.

Challenges: Building a new liability biomass industry will need knowledge, new markets and a trained workers to sustain it.

SOLUTIONS

Research will inform economics, scaling, replication, and market development; entrepreneurship incentives and technical assistance will build markets; and career education programs will build workforce capacity.