

Sustainable Materials Management (SMM) in Wood Waste Operations

Applying SMM to Increase Wood Waste Reuse and Save Money



Clear Water

Marshall Erickson

Clear Water

612.850.3006 / marshallerrickson@nitratereduction.com

www.nitratereduction.com



1.0 Introduction

The EPA defines [Sustainable Materials Management](#) (SMM) as a systemic approach to using and reusing materials more productively. By looking at a product's entire lifecycle, new opportunities can be found to reduce environmental impacts, conserve resources, and reduce costs.

This paper introduces SMM to wood waste management. Specifically, managing lifecycle components (**Source, Production, and Use**) to maximize operational, financial, and environmental benefits.

“**Source**” is wood waste generated by tree removal, trimming, and brush-cutting activities.



“**Production**” is repurposing wood waste into usable products

“**Use**” is applying Products in various scenarios.

The following sections take you through where wood waste management is today, where it can be, and how to get there. As an introductory paper, we introduce key points and actions to integrate a synchronized SMM approach into current wood waste operations.

2.0 Wood Waste Management Today

Wood waste is projected to increase due to disease, insect infestation, invasive trees, and more violent weather events. Cities, counties, states, and businesses are looking for ways to address more wood waste in an already full waste stream.

Current wood waste programs tend to have a processing network but lack systemic collaboration and approach. This is limiting operation efficiency and wood waste reuse.

A typical program accepts wood waste at drop-off/disposal sites. These sites produce chips and compost, then sell/give away these products for use in various projects. A small quantity of wood waste may go to a sawmill for lumber, and some may be offered to the community for firewood. Each component in this wood waste management model (Source, Production, and Use), and stakeholders, operate autonomously.

Cities, counties, and businesses are experiencing:

- Piles of wood waste decaying and overrunning sites.
- Paying to have piles chipped/ground to save space and/or adding disposal sites.
- Transporting wood chips to Waste-to-Energy (WTE) facilities which can be big GHG emitters.
- Open burning: A practice generating a lot of GHG emissions and reducing local air quality.
- Much usable wood waste is not being reused.
- Increased operations costs and missed operations, financial, and conservation benefits.

Primary challenges in today's wood waste operation include:

- An imbalance – too much wood waste (Source), not enough Use (options and quantity).
- Product options beyond chips/compost to increase reuse.
- Stakeholder and lifecycle coordination/collaboration.

Adopting a systemic SMM approach addresses these challenges.



3.0 Where Wood Waste Management Can Be

A best practice wood waste program might look something like this:

Source	Wood waste from all stakeholders is consolidated at easily accessible disposal sites.
Production	Wood waste is quickly repurposed into usable products (chips, compost, biochar, etc.). No big piles taking up space and rotting.
Use	Products are used in many projects/practices in agriculture and urban environments. Use happens quickly after Production. No product piling and requiring storage.
Localization	Source/Production co-located. Use within a 50-mile radius of the Source/Production
Systemic approach	<ul style="list-style-type: none">• Stakeholder collaboration within/across Source, Production, Use.• Active engagement and collaboration from all stakeholders.• Tech, ops, business models drive efficiency & effectiveness.• Operations are self-supporting with minimal grant funding.• Access to all stakeholders in the community/region.

4.0 How To Get There

Whether making small refinements or major changes to a wood waste operation, a purposeful, detailed approach helps. Here we introduce key points and actions to make it happen. Put it all together, and you'll have a balanced wood waste program reusing most of the wood waste you generate, making operational sense, and saving money.

Let's start with key facts/guiding principles.

- Use is the biggest driver in increasing wood waste reuse. Optimize the many ways wood waste can be used, and everything else becomes easier.
- More wood waste product offerings mean more Use options and more wood waste reused.
- Understand your wood waste Source situation (in detail) to guide Production/Use decisions.
- Adopting a systemic SMM approach improves wood waste operations.

Here are actions to get you where you want to be. Your action plan and execution timeline will depend on priorities, resources, complexity, and other aspects of your situation.

Phase 1 - Current Program Analysis. Knowing where you're at today helps determine how to move forward. Details make a difference. Conduct an in-depth, fact-based analysis of all aspects of your current wood waste operation (Source, Production, and Use) from operations, financial, and environmental perspectives. Projections based on data sources (tree canopy and other regional metrics) can be helpful but should not be the primary analysis tool. Information on actual wood waste Source, Production, and Use is best. While not always readily available, an accurate situation profile can be compiled through investigative work. In addition to helping program planning and next steps, this process finds easy-to-implement operation improvement and cost reduction opportunities in the current operation.

Phase 2 - Program Roadmap. Now that you have a solid understanding of the current program (your starting point) you can confidently identify what's working, what's not, and specific improvement opportunities. Phase 2 is a 2-step process: (1) define where you want to be (your destination), and (2) how you'll get there (your route). Again, details make a difference.



First, create a profile of what you want your wood waste program to look like. The best practice profile in section 3.0 is a guide, and your profile should have more detail and be customized for your wood waste situation.

Next, you create an initial roadmap of actions, tasks, etc. to begin working toward your destination. Integrating an SSM approach requires launching, assessing, and refining new things. Your roadmap will likely have sub-projects (pilots, feasibility studies, etc.) and may change as you try new things and learn. The approach is always to do it as risk-free as possible.

An additional consideration – Biochar. As you assess and improve your wood waste operation, you may want to consider biochar. While not right for every situation, it's a unique product that can be a powerful asset in maximizing wood waste reuse and balancing your wood waste operation.

- Biochar production uses a lot of wood biomass.
- Biochar has many uses beyond what chips/compost can do.
- Biochar stores carbon and is approved for carbon credits.

Adding products brings additional complexity, risk, and reward. Biochar Production and Use is more complex than chips and compost. Detailed investigation is recommended to determine (1) if/how biochar fits into your wood waste operation, and (2) the operational, financial, and environmental risks/rewards from including it. Biochar can be a low cost wood waste reuse and conservation asset if you align Source, Production, and Use.

5.0 Conclusion / Key Takeaways

- Wood waste is increasing, and the current wood waste model is struggling to keep up.
- Wood waste operations are unbalanced – too much coming in, not enough being reused, and a lot of usable wood waste is disposed of in costly, environmentally unfriendly ways.
- Current wood waste models have a processing network but lack systemic collaboration/mindset.
- A systemic SMM approach (Source, Production, Use) wood waste management maximizes wood waste reuse; and delivers operations, financial, and environmental benefits.
- Optimizing Use and expanding product offerings are key reuse drivers.
- Detailed situation analysis and an execution roadmap can make it happen.

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Clear Water focuses on reusing wood waste to optimize financial and environmental sustainability. We do it through three (3) practice areas:

- Wood Waste Consulting – complete lifecycle wood waste reuse programs.
- Biochar – we make it, use it, sell it, and help others do the same.
- Water Quality - engineered solutions removing pollutants from runoff and impaired waters.

Clients include:

cities, counties, states, businesses, landowners, universities, and conservation organizations