

# Biochar-Urban Forestry Strategy

## RESOURCE LIBRARY

*Biochar presents an opportunity to derive a high-value and environmentally beneficial product from low-value or traditionally wasted organic material. But what is biochar? How and where should it be utilized? And what is the potential scale of city-wide production, application, and carbon impact? This project library provides resources toward the development of local biochar systems, as well as recommendations and key considerations surrounding biochar use.*

### **Introductory Resources: Design & Implementation of Municipal Biochar Systems**

#### Urban Forest Biomass/Biochar Playbook

A synthesis of best practices for municipalities looking to utilize urban forest biomass as a feedstock for biochar production, this playbook provides a framework for program development, example application areas, and associated environmental benefits. Recommendations are based on research and case studies from 4 peer cities: Boulder, Helsinki, Minneapolis, and Stockholm.

#### Biochar Guidance: Considerations for Municipal Procurement & Application

Looking to utilize biochar in your city? This tactical guidance document provides basic standards and best practices for the procurement and application of biochar. Developed by experts in the field, this resource is designed to provide key considerations and specifications for city officials and other first-time buyers evaluating various biochar products for quality and specific end uses.

#### Biochar Benefits Analysis

Recognized by the UN Intergovernmental Panel on Climate Change as a negative emissions technology, biochar offers an opportunity to reduce carbon emissions from organic decomposition, while providing a number of ecosystem benefits – from increasing plant growth and health to managing stormwater and contaminated soils. This analysis offers research and case studies to support biochar's use as a nature-based climate solution.

#### Biosolids to Biochar

Looking beyond woody biomass feedstocks, this white paper offers an introduction to wastewater sludge as an additional source of organic input into a pyrolysis system. The paper provides an overview of sludge-derived biochar, including physicochemical characteristics, potential uses within an urban environment, and case studies from sludge-char systems currently utilized in Europe.

## **Biochar Siting & Environmental Justice: A Guide for Cities and Communities**

This guide was written for cities and communities looking to technologies such as biochar to tackle climate in a way that centers equity and supports whole systems design. Discussion topics include potential biochar risks, identifying community red flags for biochar projects, and values to consider for a procedural justice framework. This guide underscores that approach matters, particularly centering frontline and impacted communities.

## **Urban Forest Biochar Strategies: Municipal Case Studies**

The following case studies showcase four different cities' potential for biochar production and application from local urban forest biomass. These strategies highlight opportunities and barriers to regional biochar production systems, local markets and end uses of char, as well as potential environmental impacts from city-scale implementation.

## **Urban Bioenergy-Biochar: Opportunity Assessment for Municipalities**

This report is the initial collaborative engagement of each of the four cities listed below. It works to develop a high-level overview on the topic of converting urban waste streams into both bioenergy and biochar.

### **Stockholm, Sweden**

- [Urban Feedstock Availability and Biochar Use Potential: A market analysis of Stockholm and Sweden](#)
- [Carbon Sinks in Urban Public Green Areas: Calculations of Potential Carbon Storage in the City of Stockholm](#)

### **Helsinki, Finland**

- [Biochar benefits and potential applications in Greater Helsinki](#)

### **Boulder, Colorado, USA**

- [Biochar & Urban Forest Strategy for the City of Boulder](#)
- [Biochar Feedstock Assessment for the City of Boulder](#)

### **Minneapolis, Minnesota, USA**

- [Biochar & Urban Forest Strategy for the City of Minneapolis](#)
- [Biochar Feedstock Assessment for the City of Minneapolis](#)

## Acknowledgements

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### Aalto University

Aalto University is a multidisciplinary science and art community located in Finland. The purpose of Aalto University is to shape a sustainable future and to drive research to make breakthroughs in science, art, technology and business.



### Cambium Carbon

Cambium Carbon is a Public Benefit Corporation using technology to build local, regenerative, wood supply chains. The company aims to create a circular economy model for urban forestry, turning fallen trees into valuable wood products that reinvest in local canopies. Cambium Carbon has two goals: to create positive, long-term climate impact and to benefit communities today.



### Carbon Neutral Cities Alliance (CNCA)

CNCA is a collaboration of leading global cities working to achieve carbon neutrality in the next 10-20 years – the most aggressive GHG reduction targets undertaken anywhere by any city. While it is possible for cities to achieve their interim carbon reduction targets through incremental improvements to existing systems, achieving carbon neutrality requires radical, transformative changes to core city systems.



### EcoTopic

EcoTopic AB is a biochar-specific consultancy founded in 2012. Then, biochar was almost completely unknown and we dreamed of working full time with our great passion. Imagine making the world better while we use, develop and challenge our best personal qualities and competencies! Our dream was realized faster than expected and since then we have started, developed and supported biochar projects and initiatives both in Sweden and internationally and lectured worldwide.



### Nature-Based Climate Solutions (NCS)

NCS brings together cities, resource specialists, community-based organizations, scientists, innovators, land managers, and others to accelerate the implementation of carbon removal strategies that simultaneously improve the social, economic, and environmental resilience of local communities. The Initiative was established to support and disseminate city-scale actions that operationalize high-leverage drawdown actions.