



Regional Biochar Production for Circular Economies

Using agricultural feedstocks to address environmental challenges with market-driven solutions

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About FFAR

As the global population increases, the effects of climate change deepen and natural resources diminish, research is crucial to help farms adapt to these unprecedented developments.

FFAR, established in 2014 by the Farm Bill, connects funders, researchers and farmers to pioneer the next frontier of agriculture innovation through public-private partnerships.



The FFAR Factor

FFAR's Research:

- Complements USDA's research agenda; avoids duplication
- Fills critical knowledge gaps
- Increases public agriculture research investments
- Focuses on actionable science
- Involves farmers to solve current challenges
- Translates research results into available solutions through private-sector partnership



We Fund Pioneering Research

BY FOCUSING ON THESE KEY CHALLENGE AREAS:



Next Generation
Crops



Advanced Animal
Systems



Sustainable Water
Management



Health-Agriculture
Nexus



Urban Food Systems



Soil Health

550+ Distinct Funding Partners



Agriculture as a Market-Led Solution

Challenges:

- **Climate change**
- Negative environmental impacts
- Feeding a growing population
- **Competition for resources**
- Farm profitability
- Traditionality of sector

Opportunities:

- Abundant and underutilized feedstocks
- Regulatory pressure to reduce emissions
- Industry-driven sustainability goals
- Resource efficiency and circularity
- Societal pressures to act
- Consumer demand for sustainable products
- Growing market opportunities
- Resource efficiency



Bioeconomy Initiative

2022

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Applying transformative technology
to things that matter.

Innovation Studios

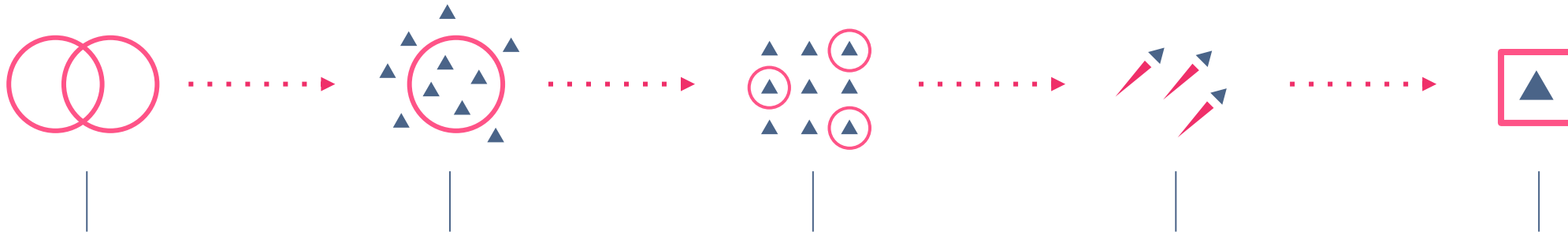
Venture Studio

Membership

Investments

The Bioeconomy Initiative will deploy a new approach

We will take a systems-level, regional-scale approach to evaluate innovation opportunities across the value chain starting in New York State. The goal is to drive towards **real-world, tech-based pilots** grounded in science, business and policy, which we'll achieve through a phased strategy.



Kickoff

Develop a clear understanding of Studio partners' strategic focus areas and where emerging technology and collaboration with an external ecosystem can drive impact.

Research

Apply generative and ecosystem research approaches to generate a blueprint identifying the technologies and teams with the right capabilities to drive transformation within the focus areas.

Convene

Engage a wide range of founders, entrepreneurs and experts to inform the selection of a cohort of vetted startups that address partner needs and the industry's pain points.

Pilot

Design and deploy pilots with startup teams to validate technologies that are primed for impact and investment potential; de-risk future scalability for long-term partnerships and co-creation.

Partnership

Facilitate a continued relationship between partners and startup teams for mutually beneficial outcomes.

Initial Research Outcomes

Strong promise to reduce carbon emissions

Relevant waste streams in **New York State:**

- Manure Waste - 12.8M metric tons/year
- Cellulosic Waste - 5.4M metric tons/year
- Municipal Organic Waste - 3.8M metric tons/year
- Forestry Waste - 8-9M metric tons/year

Potential for market-driven solutions

Some of the leading applications being considered:

- Water or Air filtration
- Storm water handling
- Bio-asphalt
- Non-load bearing construction/building materials

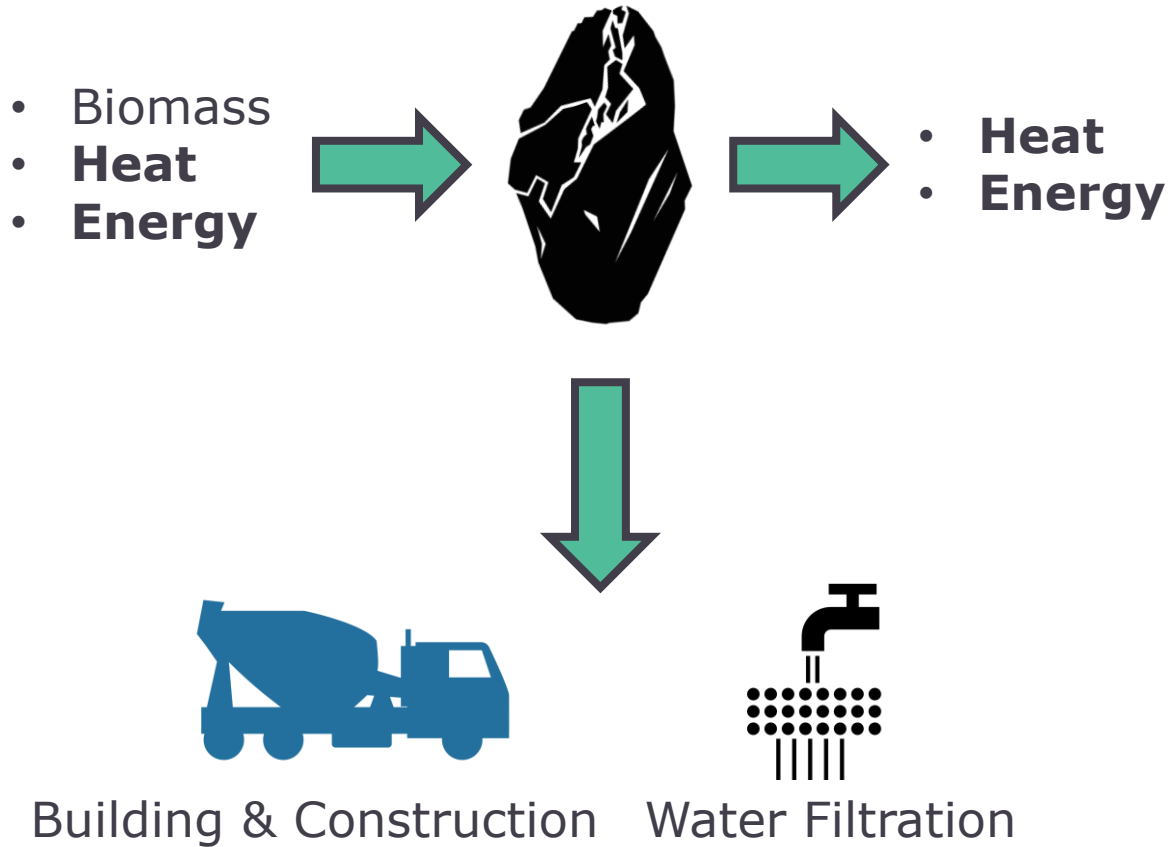
Tech to enable a regional system

Strategies include:

- Tech-based pilots to test hypotheses, assess opportunities for innovation and validate new solutions
- Assess and evaluate policy and business model considerations and net-climate impact

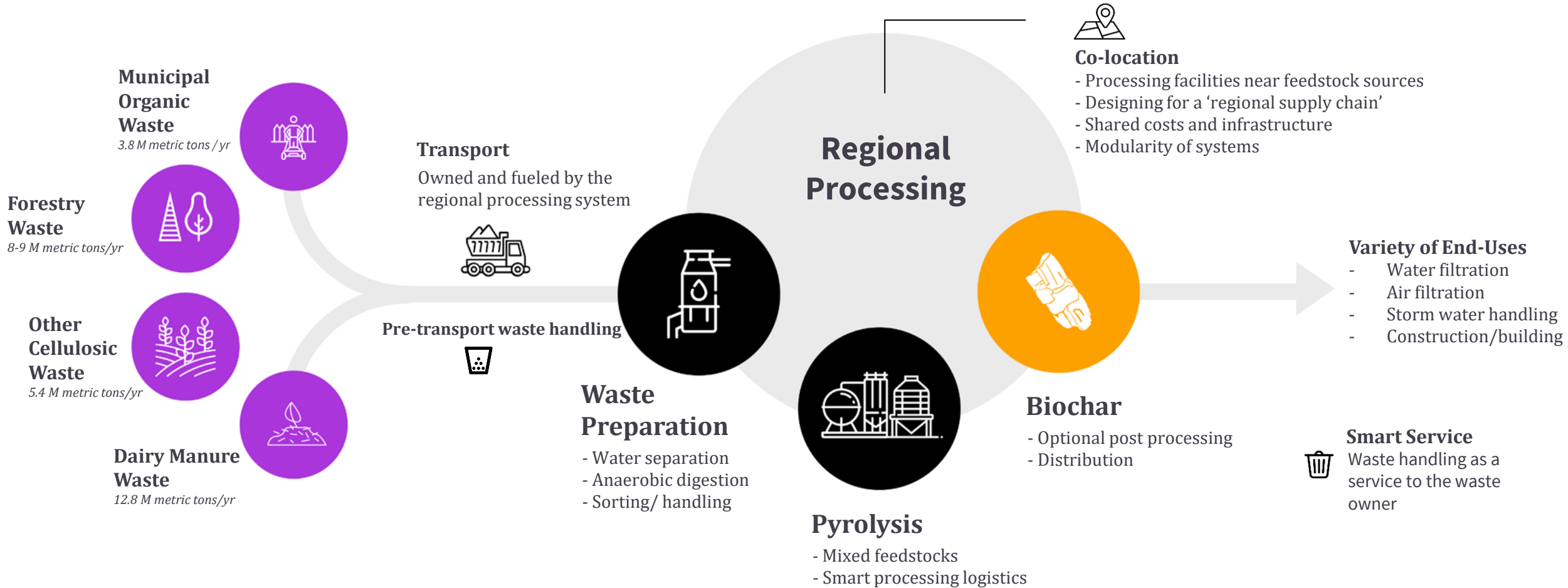


Coupling Technologies



Waste to Biochar Journey


SYSTEMS LEVEL VIEW OF WASTE-TO-BIOCHAR VALUE CHAIN IN NEW YORK STATE



Regional Biochar Production for Circular Economies

Summary of Key Points

- Drives innovation by advancing new technologies and considers how they're used
- Effective use of resources and systems
 - Reducing the resources needed to produce a product
 - Better utilizes waste
 - Co-creation of products
 - Sharing heat and energy
- Regional economies
 - Takes into account regional feedstocks
 - Shortens transport to production and processing facilities
 - Benefits to local farmers and co-ops

A photograph of a hydroponic system with rows of lush green basil plants growing in white containers. The plants are arranged in a grid pattern, and the background shows more of the system. A teal geometric shape is overlaid on the right side of the image.

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