



Yale Forest Forum

BEF Opportunities for Working Forests and Climate Mitigation

ENVIVA'S OPERATIONAL FOOTPRINT – OVERVIEW



PLANTS: Ten U.S. pellet production facilities with a total annual production capacity of 6.2 million metric tons

Ahoskie, NC (AHO)

Lucedale, MS (LUC)

Amory, MS (AMO)

Northampton, NC (NOR)

Cottondale, FL (COT)

Sampson, NC (SAM)

Greenwood, SC (GRE)

Southampton, VA (SOU)

Hamlet, NC (HAM)

Waycross, GA (WAY)



PORTS: Six deep-water marine export terminals

Port of Chesapeake, VA (CHE)

Port of Pascagoula, MS (PAS)

Port of Mobile, AL (MOB)

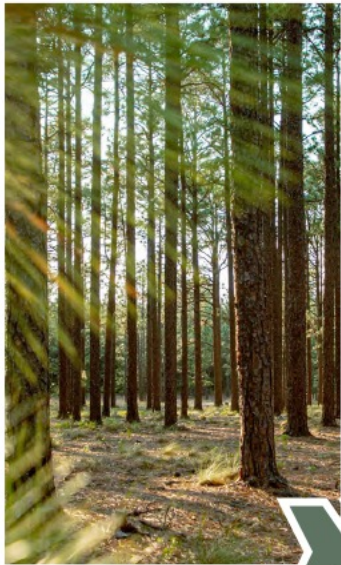
Port of Savannah, GA (SAV)

Port of Panama City, FL (PAN)

Port of Wilmington, NC (WIL)

THE BUSINESS OF WOOD PELLETS

Forest



It all begins with wood sourced from the U.S. Southeast, one of the world's most dynamic areas of forest growth and sustainable management. These working forests provide one-fifth of the wood used worldwide each year.

Receiving



The low-value wood we buy comes primarily from family forest owners who manage their land in a manner that adheres to our strict sustainability standards. Sourced wood is transported to our facilities for processing to create a higher-value end-product in the form of an energy-dense pellet.

Sizing



The low-value wood is handled in a manner to uniformly size chips for the dryer as well as to provide bark as a fuel source for the drying process.

Drying



The chips enter an industrial dryer that reduces the natural moisture content of the wood. The dry fiber is then sent to hammermills to reduce and refine the fiber for pelletizing.

Pelletizing



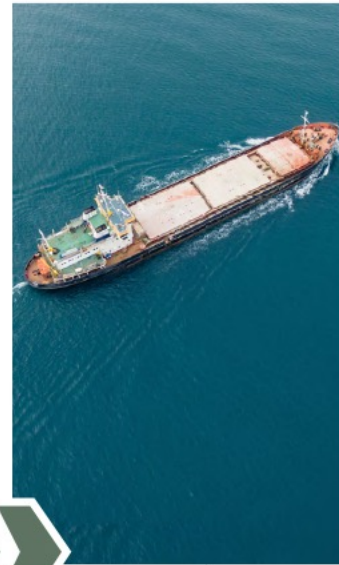
Refined dry fiber is then sent through the pellet presses where the material is compressed and naturally bonds to form energy-dense pellets that are safe and efficient for storage, transportation, and end use. No chemicals are used throughout the manufacturing process.

Port Facilities



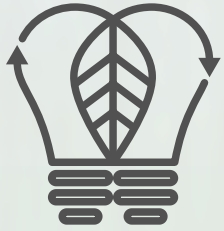
Our deep-water ports are strategically located to receive pellets from multiple facilities to minimize transportation and are stored to accumulate necessary volumes for bulk shipments.

Shipping



Bulk shipping via cargo ship greatly enhances transportation efficiencies to distribute pellets worldwide. Before and after their voyage, pellets are inspected for quality to meet customer specifications and to ensure that our renewable wood pellets serve as a reliable source of energy that directly replaces fossil fuel.

OUR PURPOSE



Displace Coal

Bioenergy is part of an all-in strategy to reduce carbon emissions and limit dependence on fossil fuels. Wood pellets directly replace coal, providing customers around the world with a renewable fuel source that improves the environmental profile of energy generation.



Grow More Trees

Key to keeping forests as forests is strong demand for forest products. We create a market for sustainable low-value wood that encourages good forest stewardship and creates incentives for forest landowners to replant and keep their land as forest.



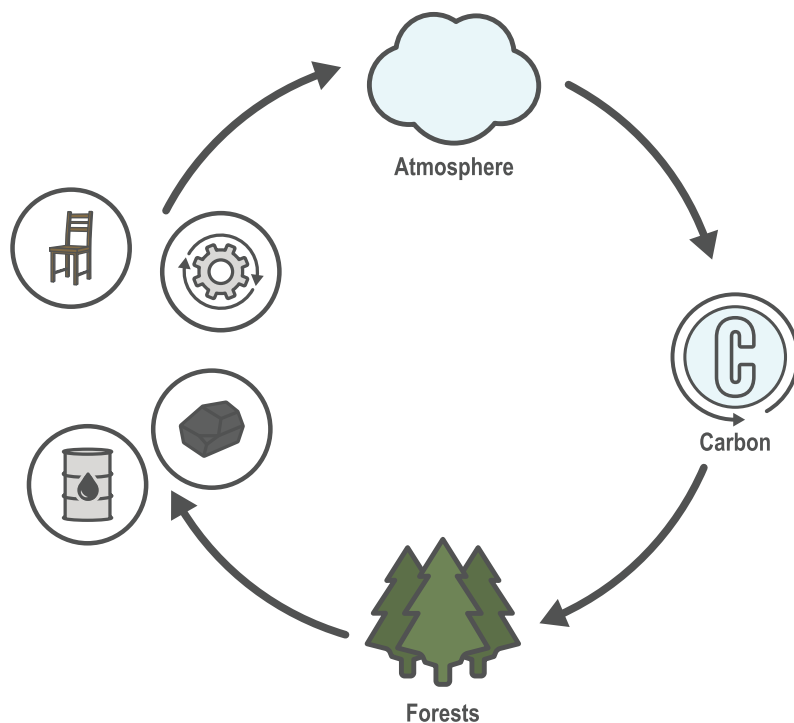
Fight Climate Change

The world cannot afford to delay taking decisive climate action. The Intergovernmental Panel on Climate Change has mapped out numerous pathways toward a sustainable future, and they all rely on wood bioenergy.

COMMITMENTS TO FIGHT CLIMATE CHANGE DRIVE MARKET GROWTH

GOLD STANDARD: United Nations Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C:

“Bioenergy use is substantial in 1.5°C pathways with or without BECCS due to its multiple roles in decarbonizing energy use.”



 Wood products store carbon for their lifecycle

 Innovation unlocks potential new uses of wood

 Biomass substitutes for fossil fuels

 Wood substitutes for non-renewable and energy intensive materials

GLOBAL

- The International Renewable Energy Agency specifies that biomass in energy generation needs to increase from 3% in 2018 to 18% in 2050 in order to reach net zero in 2050
- The International Energy Agency’s “Net-Zero Emissions by 2050 Scenario” shows output of bioenergy rising to 100 exajoules (EJ) in 2050 from less than 40EJ in 2020, enough to meet almost 20% of the world’s total energy needs

EU

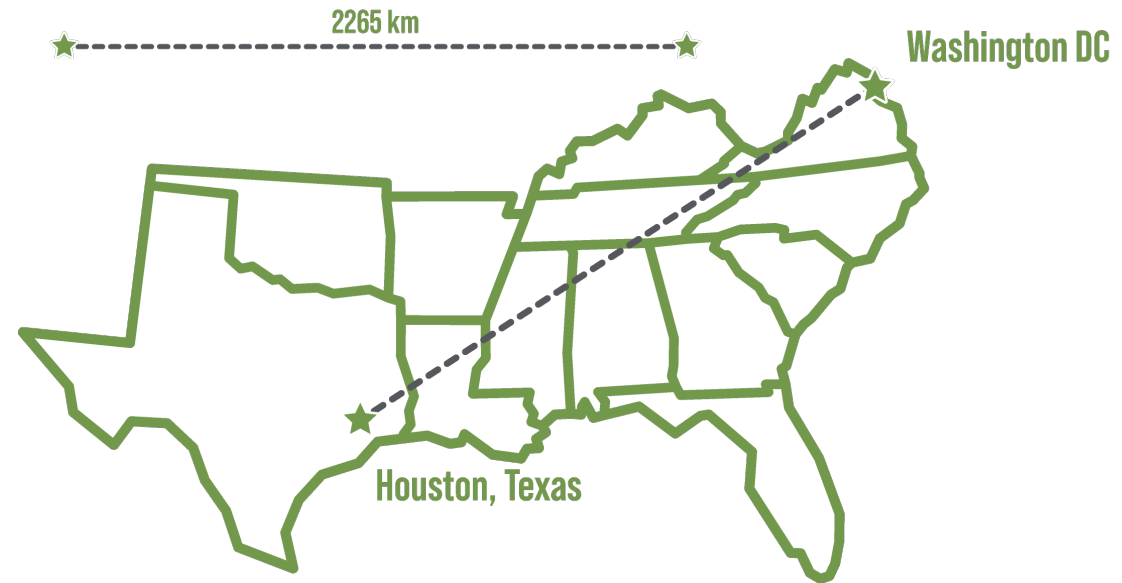
- EU Commission’s taxonomy recognizes bioenergy used for power and heat as making a substantial contribution to climate mitigation, alongside solar and wind
- All 27 EU member states agreed to raising EU’s 2030 GHG emission reduction target from 40% to 55%, as compared to 1990 levels, and RED II calls for renewables to account for at least 32% of EU’s gross consumption by 2030
- European Climate Law sets legally binding target of net zero by 2050

THE U.S. SOUTHEAST IS ONE OF THE WORLD'S LARGEST FOREST REGIONS

U.S. SOUTH

1.1 million KM² of forested land which is

300x
the forested
land of the
Netherlands.



Forested land
area in the
Southeast U.S.



Total land size of
Germany, Spain
and Italy **COMBINED.**

Southeast U.S.
forested land



Forested land in Sweden,
France, Finland, Spain,
Norway and Germany
COMBINED.

WHAT IS "GOOD" BIOMASS?



- Good biomass is made from low-value wood that is a by-product of a planned traditional timber harvest or a sawmill operation.
 - These by-products can be delivered directly from the forest, as tops, limbs, thinnings, and/or low-value smaller trees, or they can be delivered as secondary residues, like sawdust and shavings from industrial processing.
- Good biomass is not made from larger, high-value trees that instead could be used for longer-lived products.
- Good biomass comes from a region where forest carbon stocks are stable or increasing.
- Good biomass comes from harvest practices that safeguard biodiversity.
- Good biomass comes from a forest that is returned to forest after harvest, and not from land that will be converted to agriculture or development.

<https://www.envivabiomass.com/the-forest-biomass-promise/>

Timber Harvest Product Merchandizing

Higher-value markets, such as sawtimber, drive landowner harvest and planting decisions.

The average **price for high-value sawtimber** is up to **9 times** as much as the **lower-value pulp wood** used by the biomass industry.

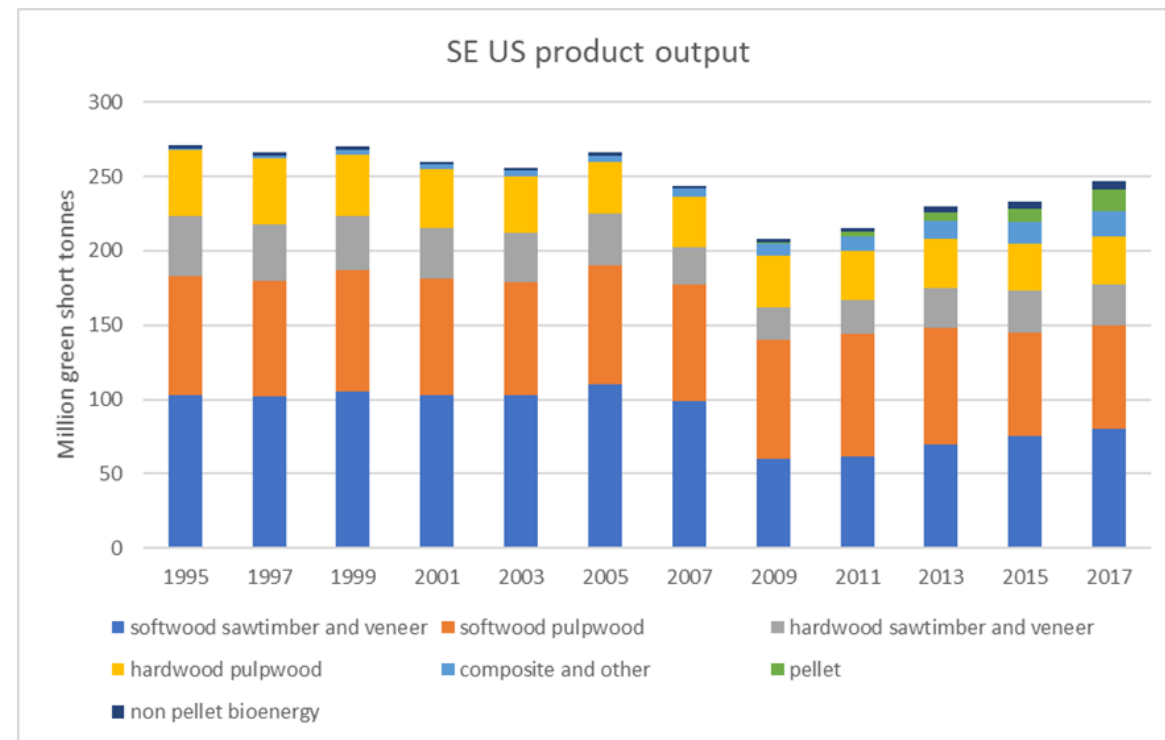
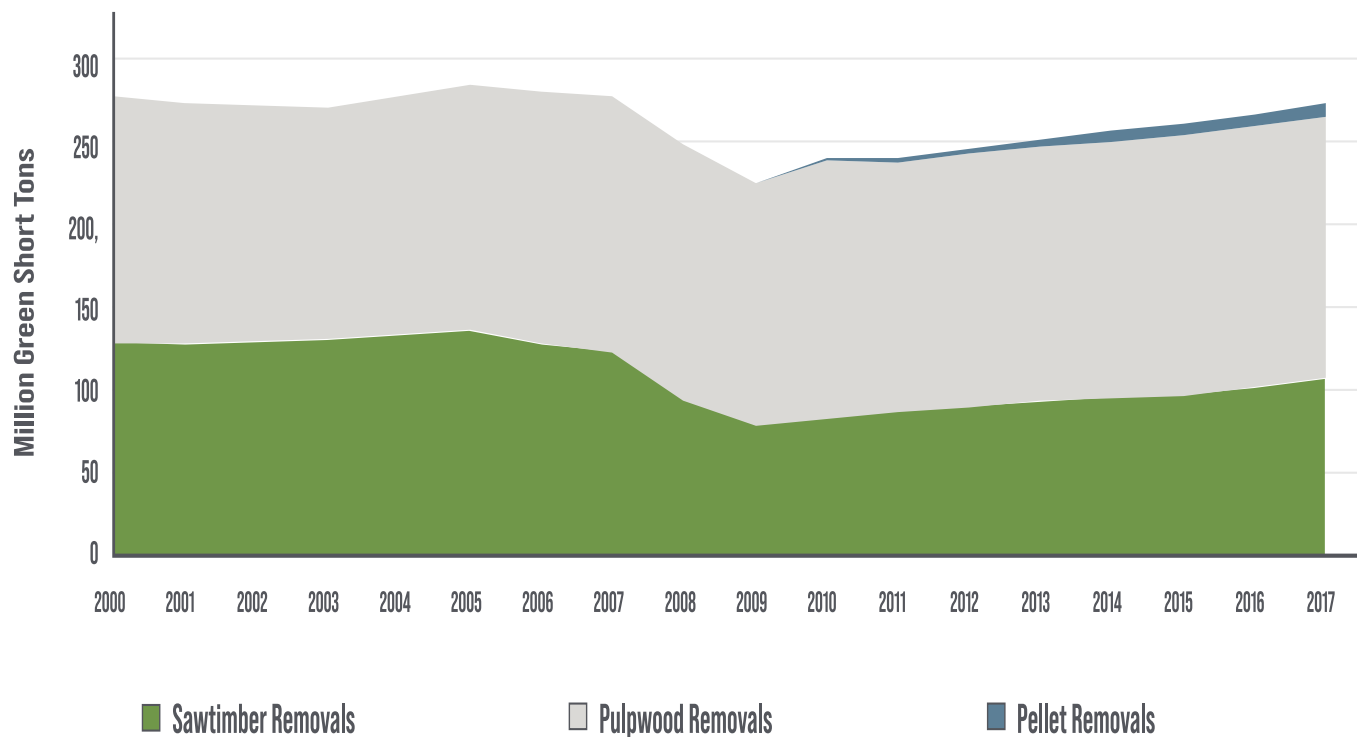
End products with permanent carbon storage, such as mass timber, telephone poles, furniture, etc. are valued highest by the marketplace.

Lower-value markets, such as biomass, benefit landowners by clearing away wood and by-products that are not of quality required for sawtimber markets, making replanting easier.



FOREST REMOVALS BY PRODUCT TYPE

Wood Pellets Accounted for 2.7% of Wood Removals in the U.S. South in 2017



Source: Forest2Market, Historical Perspective on the Relationship between Demand and Forest Productivity in the US South, 2017

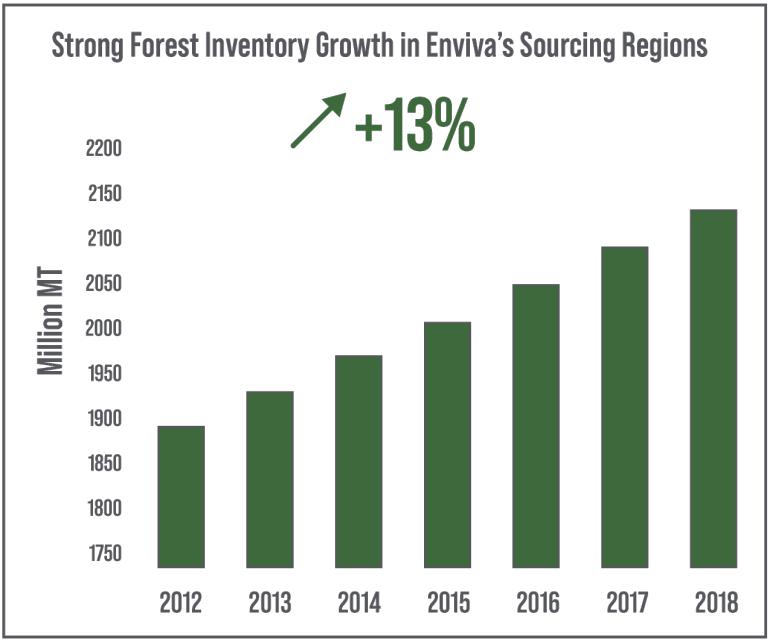
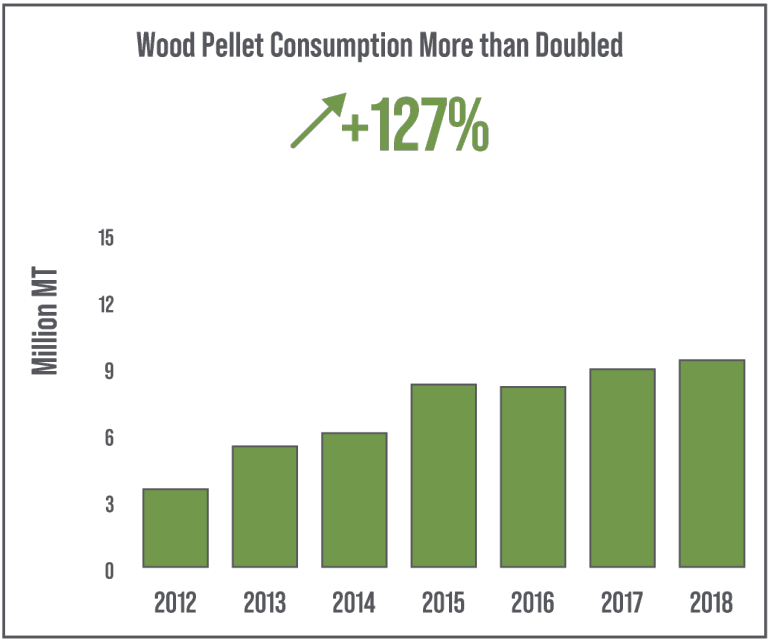
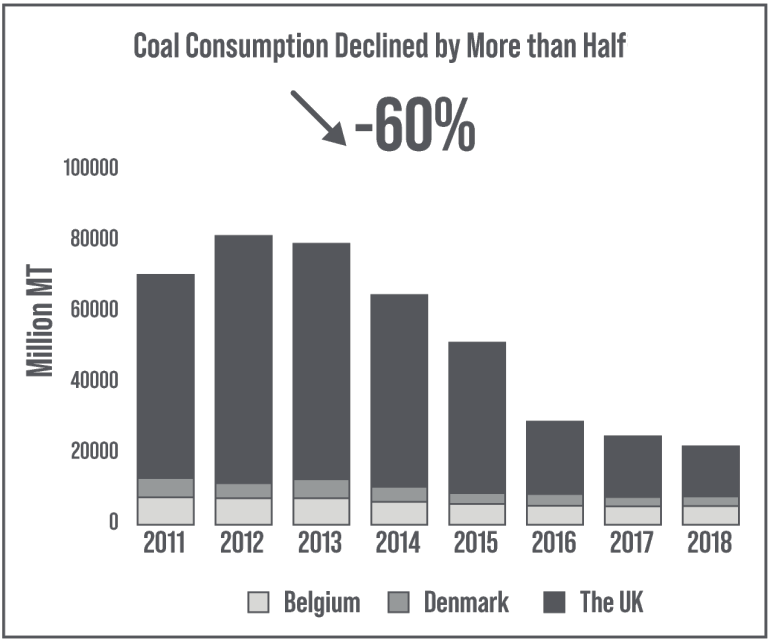
BIOMASS CREATES INCENTIVES TO GROW TREES ON PRIVATE FOREST LAND



In working forests, strong demand for forest products leads to investment in forests and increasing carbon stocks. A decline in demand for forest products will lead to less forest growth, not more.

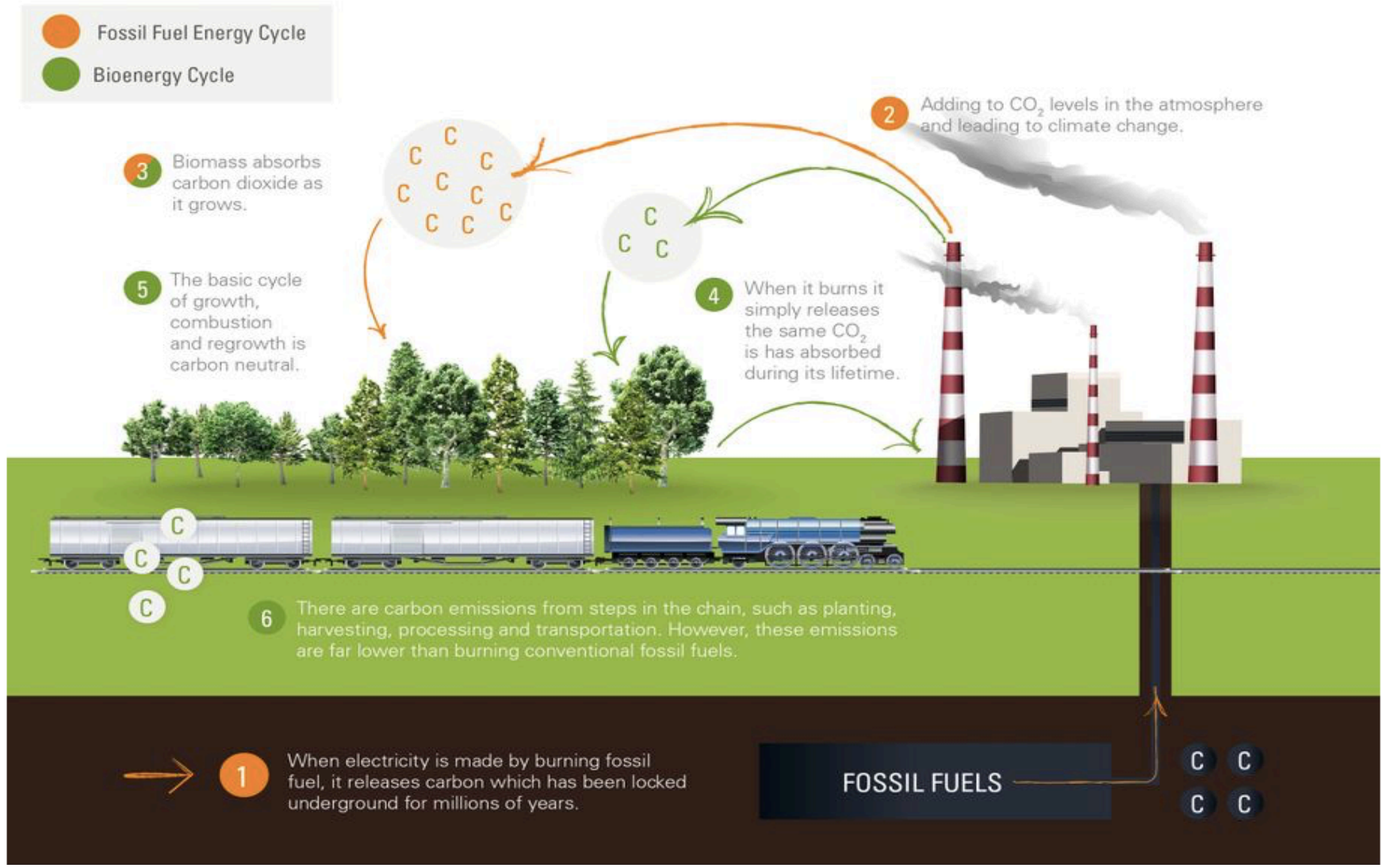
- Demand for all wood products—including biomass—drives growth in a market-driven environment like the U.S. Southeast.
- Forest landowners are incentivized to protect and grow the natural resource where there are strong, long-term markets available.*

Sustainable wood biomass is a unique solution because, done properly, it displaces coal, grows more trees, and fights climate change at scale



Through 2019, wood pellets supplied by Enviva have effectively displaced 14 million metric tons (“MT”) of coal and will be on track to displace another 86 million MT of coal by 2044.

BIOGENIC CARBON CYCLE INSTEAD OF ONE-WAY TRIP FOSSIL FUELS



ENVIVA'S RESPONSIBLE SOURCING POLICY

SUSTAINABLE FORESTRY STANDARDS

ENVIVA WILL ONLY SOURCE PRIMARY MATERIALS FROM A SUPPLIER WHEN:

- The forest source will be replanted or regrown as forests and will not be converted to non-forest uses
- Water quality in a harvest area is protected through adherence with forestry Best Management Practices (BMPs)
- High Conservation Values (HCVs) are not threatened by harvest activities

PLEDGES IN CONSERVATION LEADERSHIP

WE PLEDGE TO COLLABORATE WITH STAKEHOLDERS TO HELP:

- Keep the amount of forestland stable or increasing at regional scales;
- Conserve wetland forest ecosystems, peatland forests, and high-carbon tropical forests;
- Address the conversion of forest types that provide high-quality habitat for at-risk species; and
- Restore critical, threatened, or declining forest types

ENVIVA'S RESPONSIBLE SOURCING POLICY - VERIFICATION

Enviva's Forest Management Groups have certified over **70,000 acres (28,000 hectares)** of private forest land in the U.S. Southeast to ATFS and FSC standards.

Enviva's Third-Party Forest Certification Standards

Forest certification ensures an internationally-accepted standard for sustainable forestry and encourages better forest management. The audits that accompany these standards provide assurance to customers, regulators, and environmental stakeholders.



Sustainable Forestry Initiative® (SFI®)



Forest Stewardship Council® (FSC®)



American Tree Farm System® (ATFS®)



Sustainable Biomass Program® (SBP®)



Programme for the Endorsement of Forest Certification® (PEFC®)

THE ENVIVA FOREST CONSERVATION FUND

- A \$5 million, 10-year program
- Conserving working forests and sensitive bottomland ecosystems in VA and NC
- Partnership with the U.S. Endowment for Forestry and Communities
- Annual matching-fund grants to nonprofit conservation organizations



ENVIVA'S TRACK & TRACE[®]

Enviva reports quarterly T&T updates and provides tract-level data on its sourcing on its website.

A leading-edge sustainable sourcing program that provides, transparent, public data and allows stakeholders to track the source of our wood to its origin in the forest.

With Track & Trace, we can tailor our sourcing practices to the specific need of our operations and provide an **unprecedented level of transparency**, going above and beyond any other pellet producer or southern forest products company.

Where does Enviva source its wood?

Over **1400** working forest harvests

in more than **100** counties

in **7** Southern states



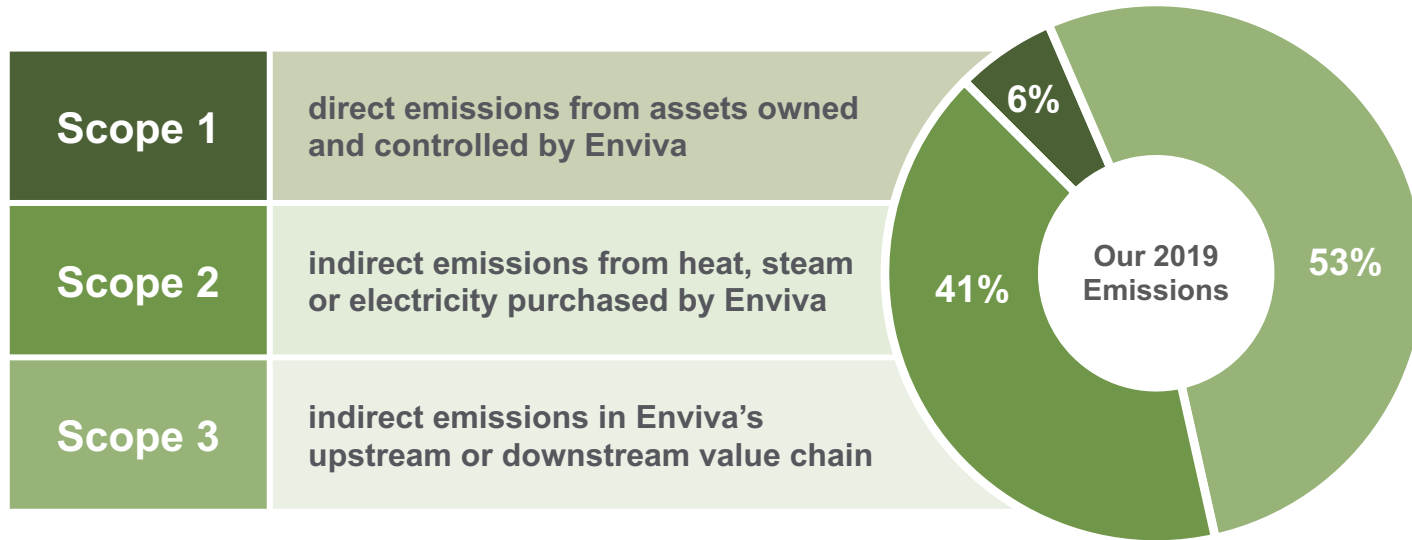
The forests in the U.S. Southeast continue to grow and thrive



Thank You

www.envivabiomass.com

COMMITMENT TO "NET-ZERO" IN OUR OPERATIONS BY 2030



Transparency and Reporting

- Track and report annually on all emissions
- Commit to disclose climate-relevant data and risks through CDP (formerly the Carbon Disclosure Project) by the end of 2022

For Scope 1 Emissions

- Immediately work to minimize the emissions from fossil fuels used directly in our operations
- Offset 100% of our residual emissions through investments in projects that result in real, additional, and third-party verified net-carbon reductions
- Focus on forest offsets in partnership with Finite Carbon and others

For Scope 2 Emissions

- Source 100% of energy for our operations from renewable sources by 2030, with interim target of at least 50% by 2025
- Maximize use of on-site renewable energy generation at our facilities, as well as develop new off-site renewable energy resources physically located in our operating regions where possible

For Scope 3 Emissions

- Proactively engage with partners and other key stakeholders to adopt clean-energy solutions, including trucking, rail, and shipping logistics
- Take steps to accelerate and advocate for the development of new solutions and to work with stakeholders to bring those solutions to market

The Partnership and Our Sponsor Commit to the Goal and Plan to Become "Net-Zero" in Our Operations by 2030

LOW-VALUE WOOD



This tree is large enough in diameter to make a pine sawlog classification, but these 3 point of sweep or crook would make it a pulpwood tree in the US. Sawmill will not saw a crooked tree because inherently the lumber when dried will be crooked as well because the grain of the wood determines the straightness of the lumber it will produce.

This tree is large enough to make a sawlog classification and is straight indicating a straighter, more uniform wood grain. Once it is sawn into lumber and dried the lumber will be straight and useful.