BIOMASS IN HARD-TO-ABATE SECTORS: A SUPPLIER’S PERSPECTIVE

ANDREW GEORGIOU, DIRECTOR POLICY AND REGULATION – EUROPE, ENVIVA

EUROPEAN BIOENERGY FUTURE 2022

WOODY BIOMASS FROM THE US SOUTH-EAST

- US Southeast forests are equivalent to the total land size of Germany, Spain and Italy **combined**

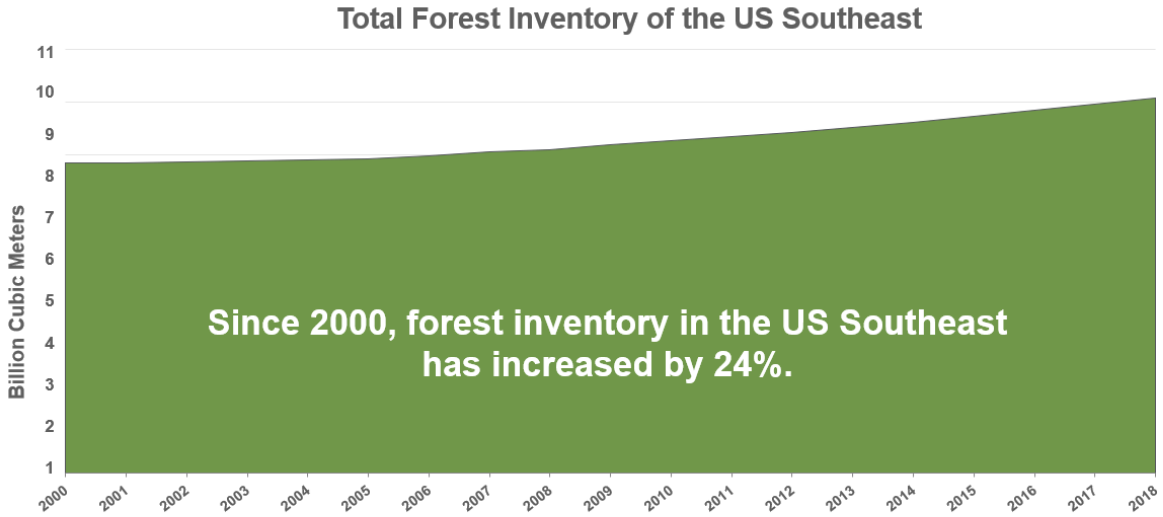
- They are predominantly working forest, producing a 1/5th of the world's industrial wood products

- Enviva produces 6.2 MTPY, operating 10 mills

- Forest inventory has grown 24% since 2000

- 86% of forest land in the US Southeast is privately held, owners rely on economic incentives to keep forest as forests

- Sawtimber industry drives market, demand for lower quality fibre from bioenergy sector supports this

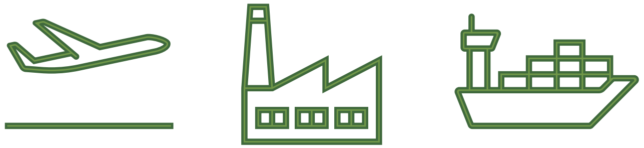


NET-ZERO:
MORE THAN A SLOGAN

FROM HEAT & POWER TO HEAVY INDSUTRY & TRANSPORT

DECARBONIZING POWER & HEAT

Scalable renewable source of dispatchable power and heat today.



DECARBONIZING HARD-TO-ABATE SECTORS

Scalable renewable solution for industry, shipping and aviation

Today’s power and heat supply chains are the foundation for tomorrow’s bioeconomy

BIOMASS: UNLOCKING A FUTURE BEYOND FOSSIL FUEL

Baseload, dispatchable

Security of supply, fixed prices

85% less GHG emissions

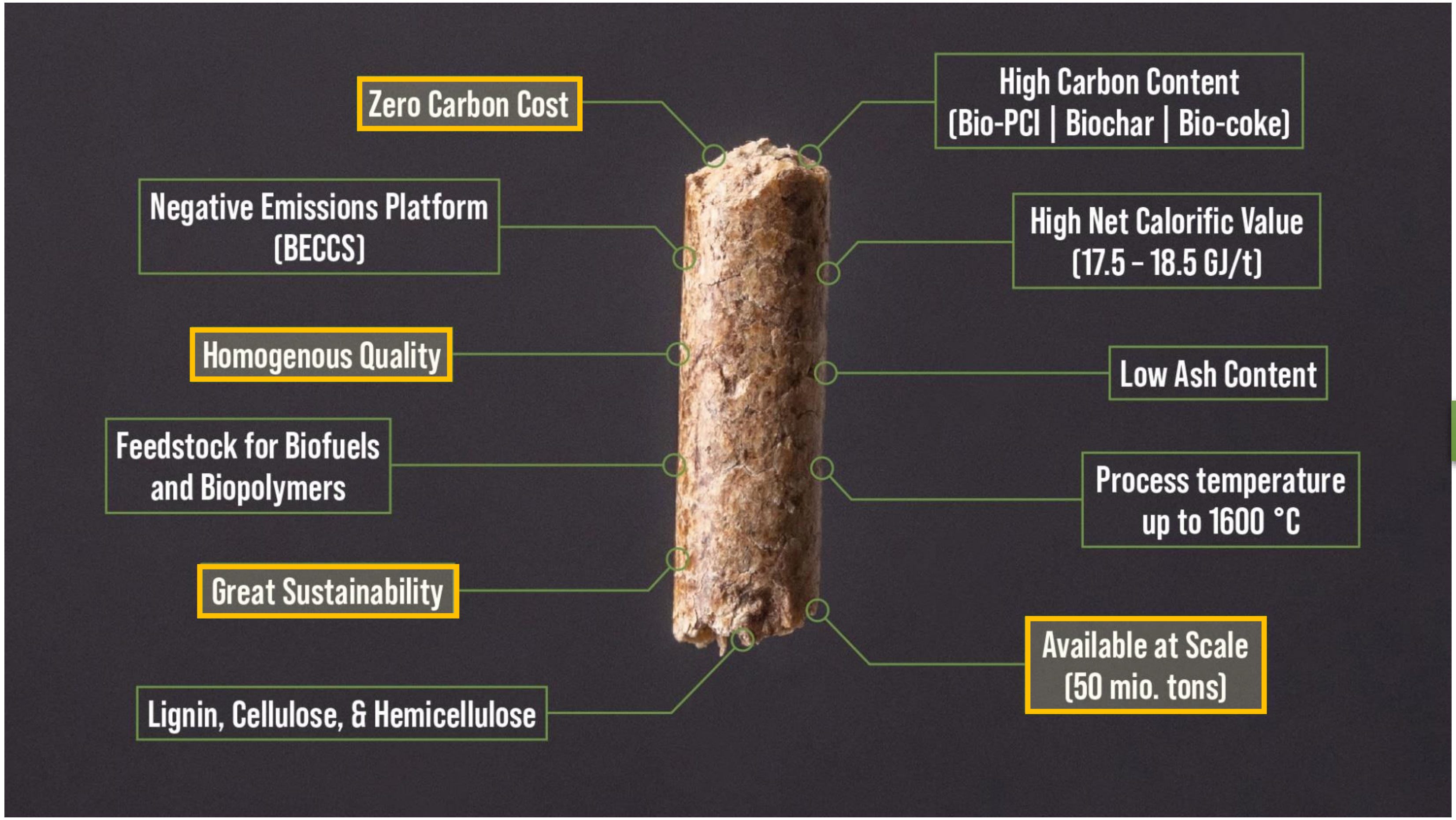
70% less GHG emissions

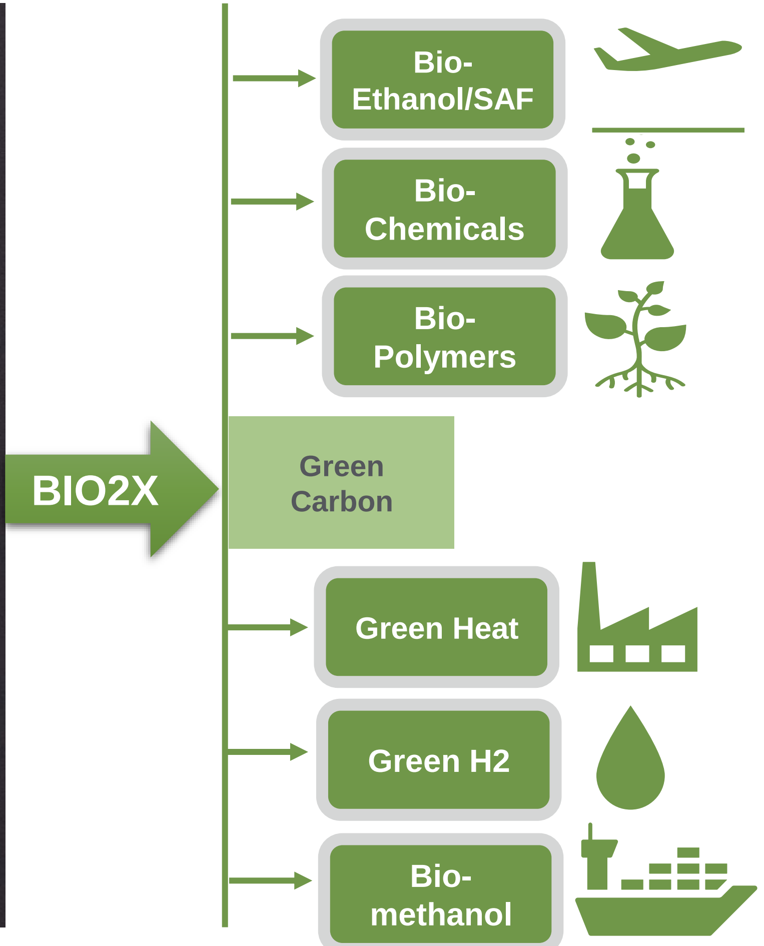
Cost-efficient, simple conversion

New value chains for hard-to-abate industries

Enabler of the bio-economy

BIO2X – VERSATILE BENEFITS OF WOODY BIOMASS



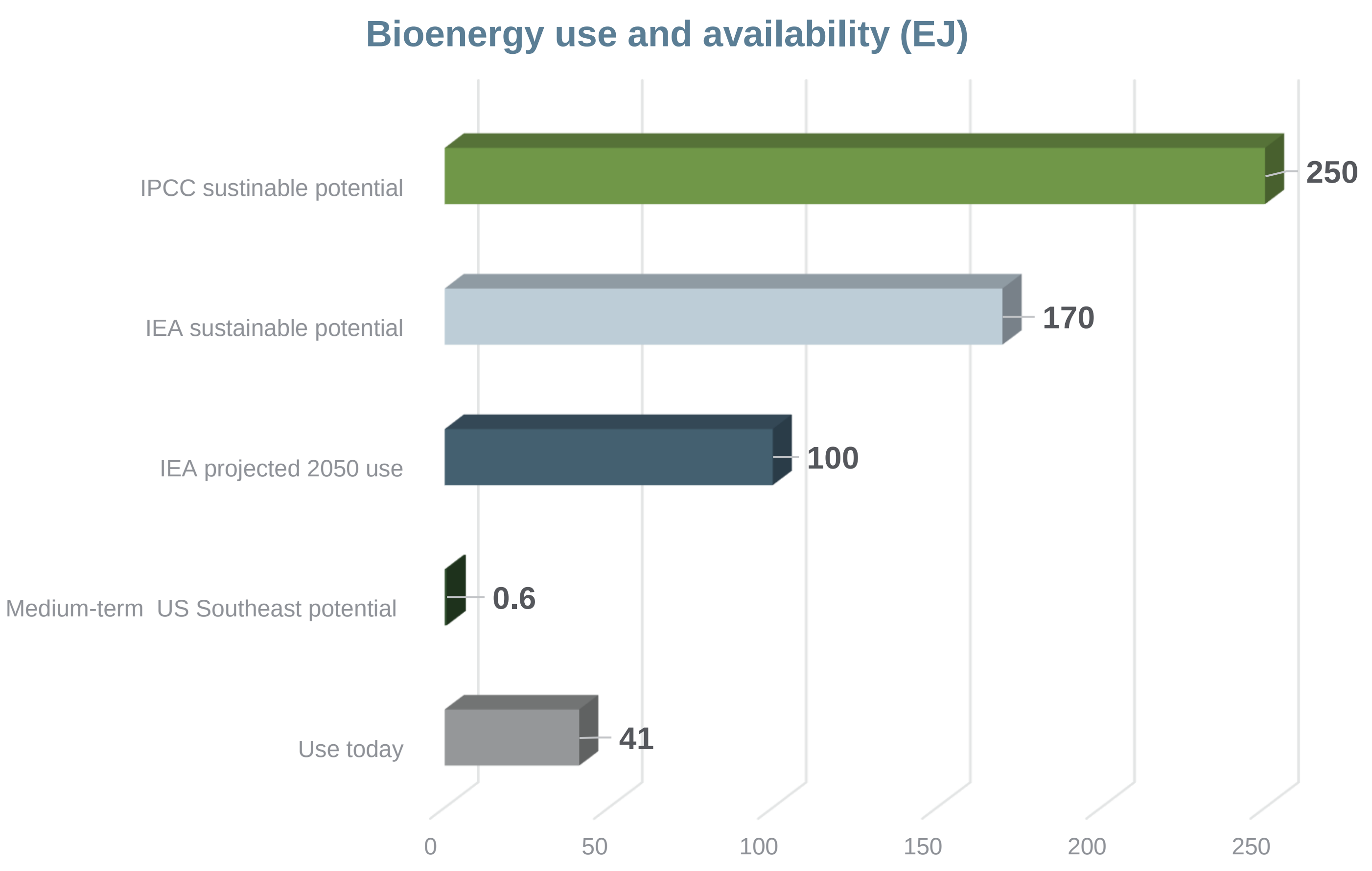


BIOMASS – LIMITED BUT NOT SCARCE

US Southeast production can **grow sustainably five times** to 35 million tonnes in the medium term

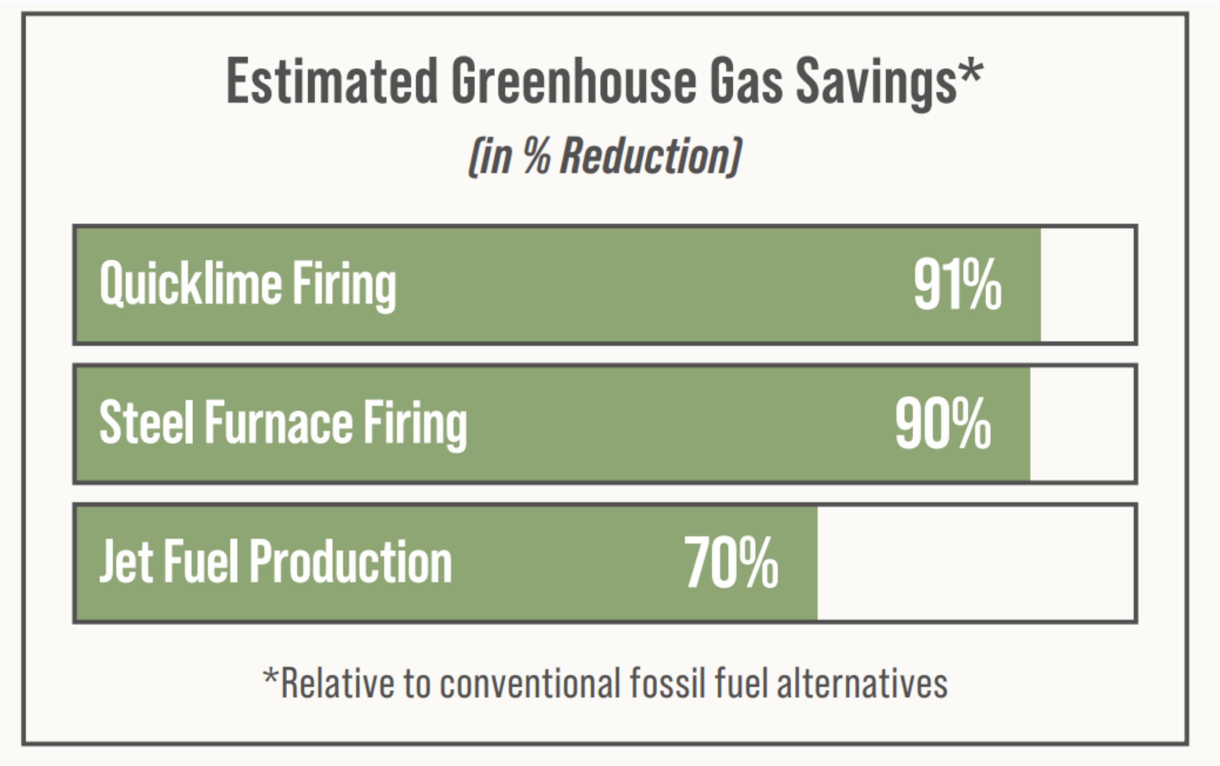
IEA projects 100EJ of bioenergy by 2050 – only 58% of sustainable potential

Demand in median **IPCC** 2050 scenario is **three and half times** today's use, just under sustainable potentials



A CLIMATE AND BUSINESS OPPORTUNITY

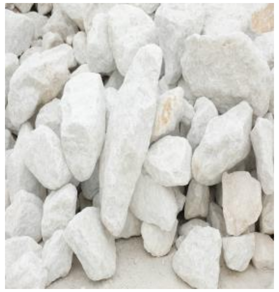
Significant GHG reduction



Growth opportunity for sector

Steel sector: 5MT of EU demand

Challenge: Scaling torrefaction



Lime sector: 30MT of EU demand

Challenge: Logistics

SAF sector: ~ 360 Bn liters/ year

Challenge: Scaling tech solutions

EUROPE IN THE LEAD – BUT FOR HOW LONG?

	Fuel producer		Total offtake volume (million liters) ▾	Number of offtake agreements
1.	Gevo		9.095,78	12
2.	Fulcrum		6.719,1	3
3.	Alder Fuels		5.678,12	1
4.	Shell		2.248,53	1
5.	DG fuels		1.457,38	1
6.	Aemetis		1.272,43	9
7.	OMV		1.201,95	3
8.	Dimensional Energy		1.135,62	1
9.	Velocys		1.105,34	2
10.	ECB Group	MERCOSUR	1.050,08	2
11.	Neste		1.036.41	12

- 61% of world now has net-zero commitments
- Only two of top eleven producers are EU based
- Getting regulatory framework right is key:
  - Support for Primary Woody Biomass
  - Harvesting criteria that recognizes local SFM
  - No cap on use of Forest Biomass
- Continue supply chain build out with power and heat sectors
- Phase-in financial support for hard-to-abate sectors