

Forestry Production Potential in the Brazilian Central-Western Region (MT, GO, MS) Supply and Demand

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Board Chairman and CEO of Grupo Innovatech



Material prepared by ESG Tech's consultancy team.



Grupo

Innovatech

Business model based on open innovation, spin off and principles of governance (IBGC)



Codes of Conduct (in force)



Sustainability Report (June/22)



Business Management
Operates in the agribusiness management
Forestry / MDF / Energy / Solid Wood



Strategic Consultancy
Helps leading agribusiness companies to earn more



Human Development
Builds bridges between processes and people



DATA & AI and Automation
Brings technologies from the future to today



Business Acceleration
Discovers and accelerates technologies that will change the future of business

Strategic partnerships and institutional alliances



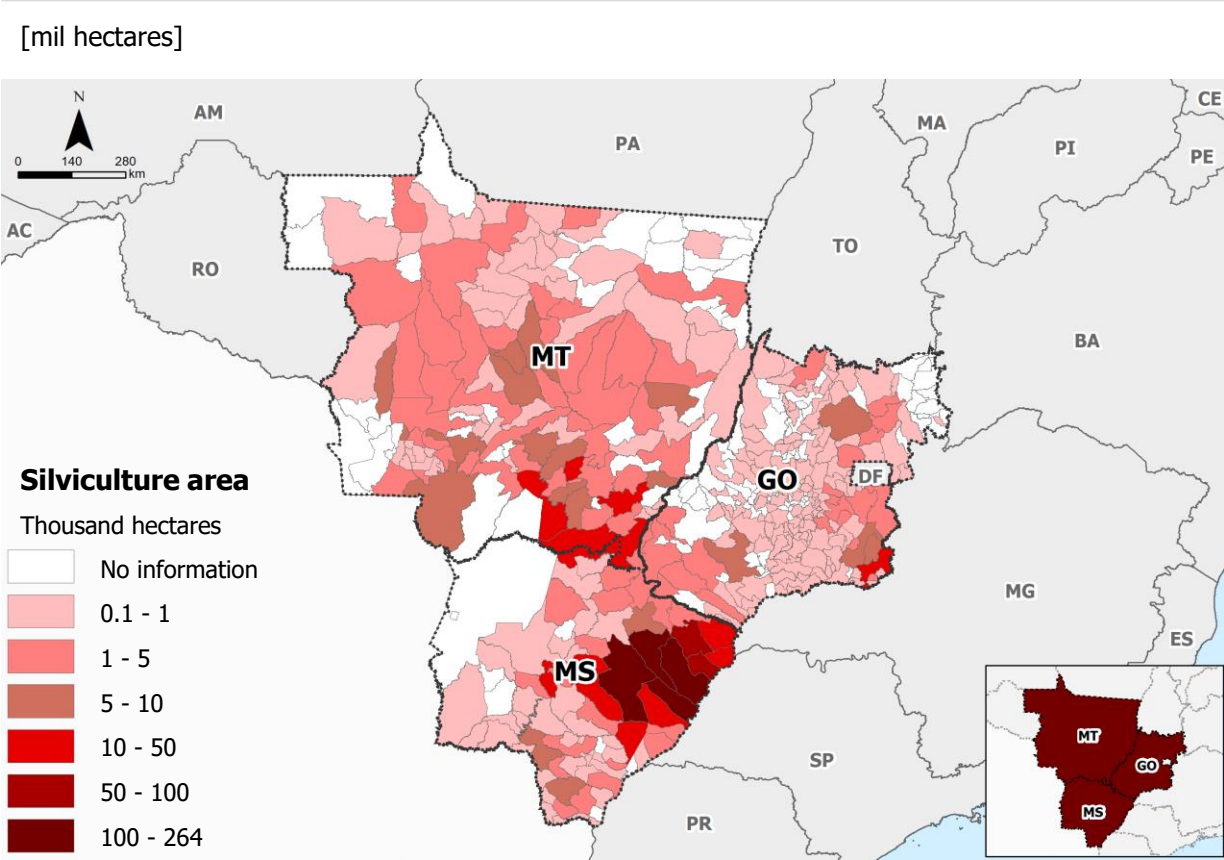
Connection between people
Innovation environment to sustain business growth
(Campinas and Ribas do Rio Pardo)



Israel Connection
We are present in the ecosystem considered the most productive center of technological innovation in the world (Sr. Business Development Associate)

For a supply and demand analysis, the Central-Western region is wide and diverse – in terms of land use, yields, demand, forest maturity, and other local characteristics.

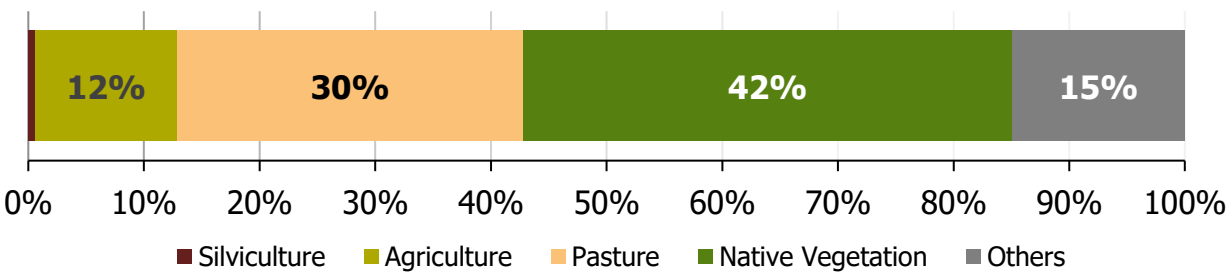
Silviculture area per municipality in the Central-Western region



Source: IBGE 2020

Soure: Mapbiomas (2020), IBGE (2020), CONAB (2022) *Major crops: Cottonseed, peanut (1st and 2nd harvests), rice, oat, canola, rye, barley, beans (1st, 2nd e 3rd harvests), sesame, sunflower, castor bean, corn (1st, 2nd e 3rd harvests), soya bean, sorghum, wheat e triticale

The Central-Western region has 160 million hectares



The region is the largest producer of major crops*

46% of national production

~117
million tons/year

The region has large dimensions

1.900 km from north to south

1.580 km from east to west

MS is an important state in the pulp industry

Pulp production

~4,8
million tons/year



Presentation Content

Market



Wood supply



Demand



Balance

Solutions



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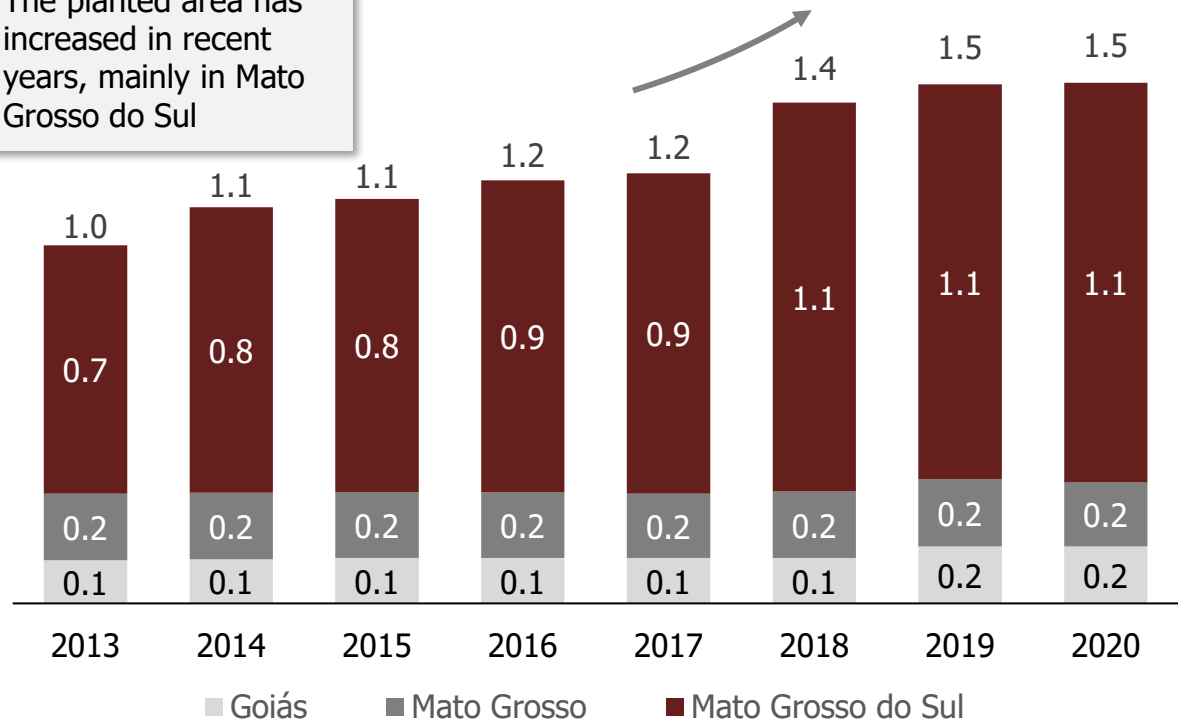


The supply of wood should increase in the coming years due to the expansion in the planted area, with risks of productivity, though

History of Eucalyptus planted area in the Central-Western Region

[Millions of hectares of Eucalyptus]

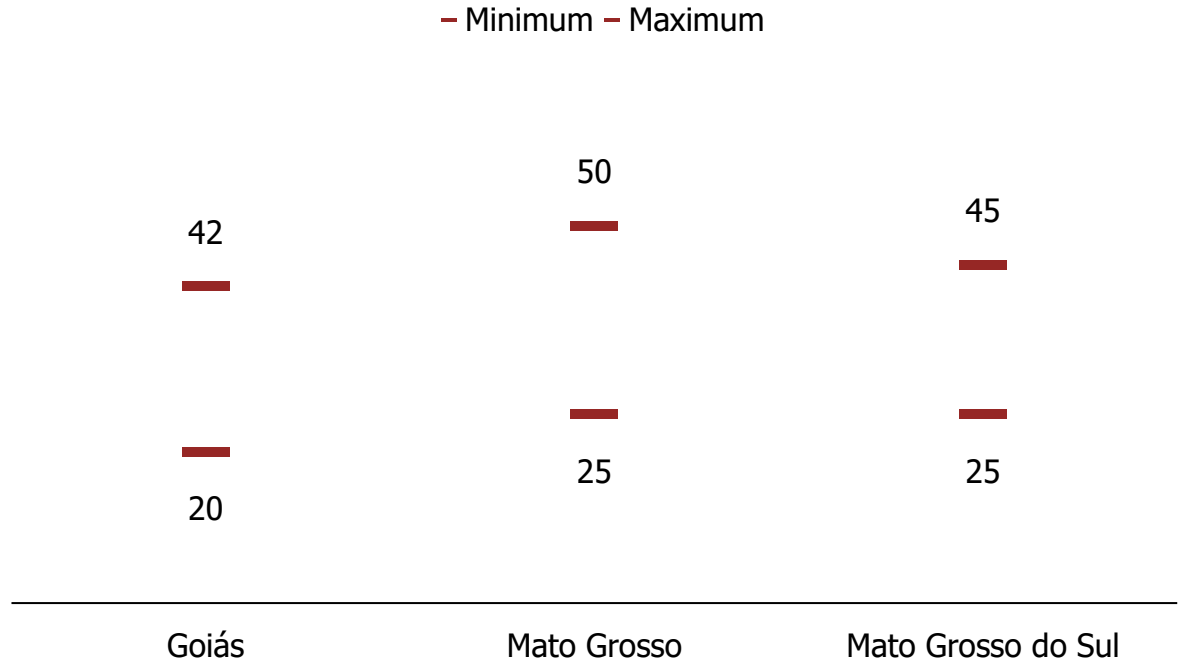
The planted area has increased in recent years, mainly in Mato Grosso do Sul



Source: annual report Ibá 2021 (Pöyry & Ibá – untill 2017, FGV & Ibá as of 2018)

Minimum and maximum productivity of Eucalyptus by state in the Central-Western Region

[m³ overbark/ha.year at 6 years]



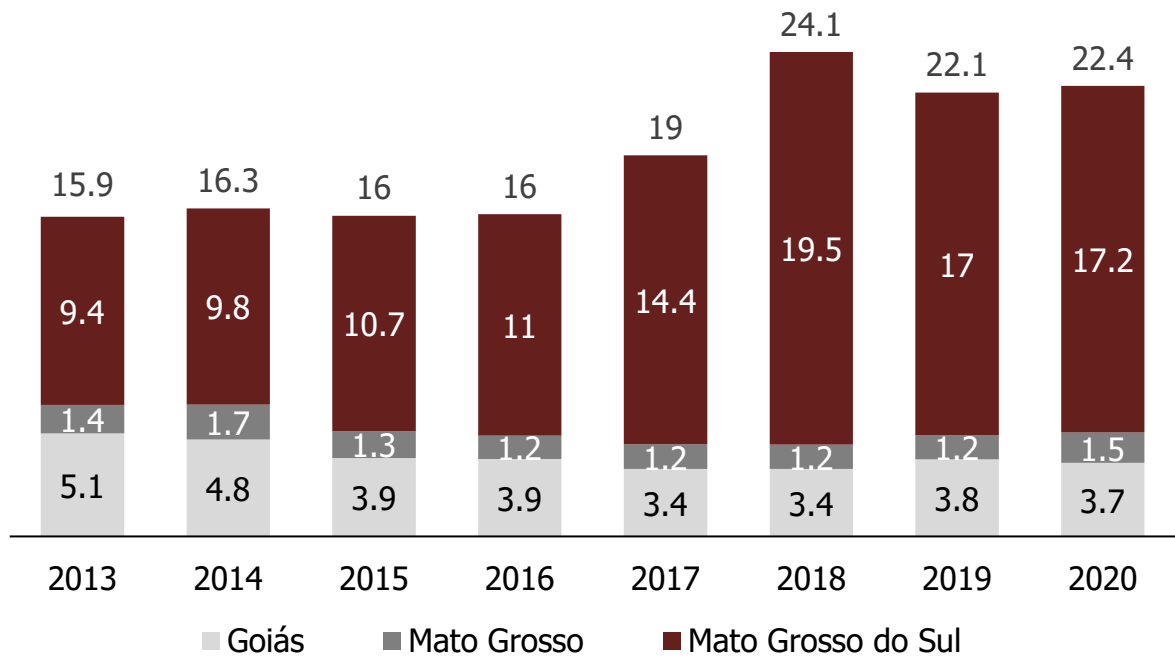
Source: ESG Tech



Wood consumption has grown in recent years, largely motivated by new industrial projects. However, the future presents distinct trends by segment

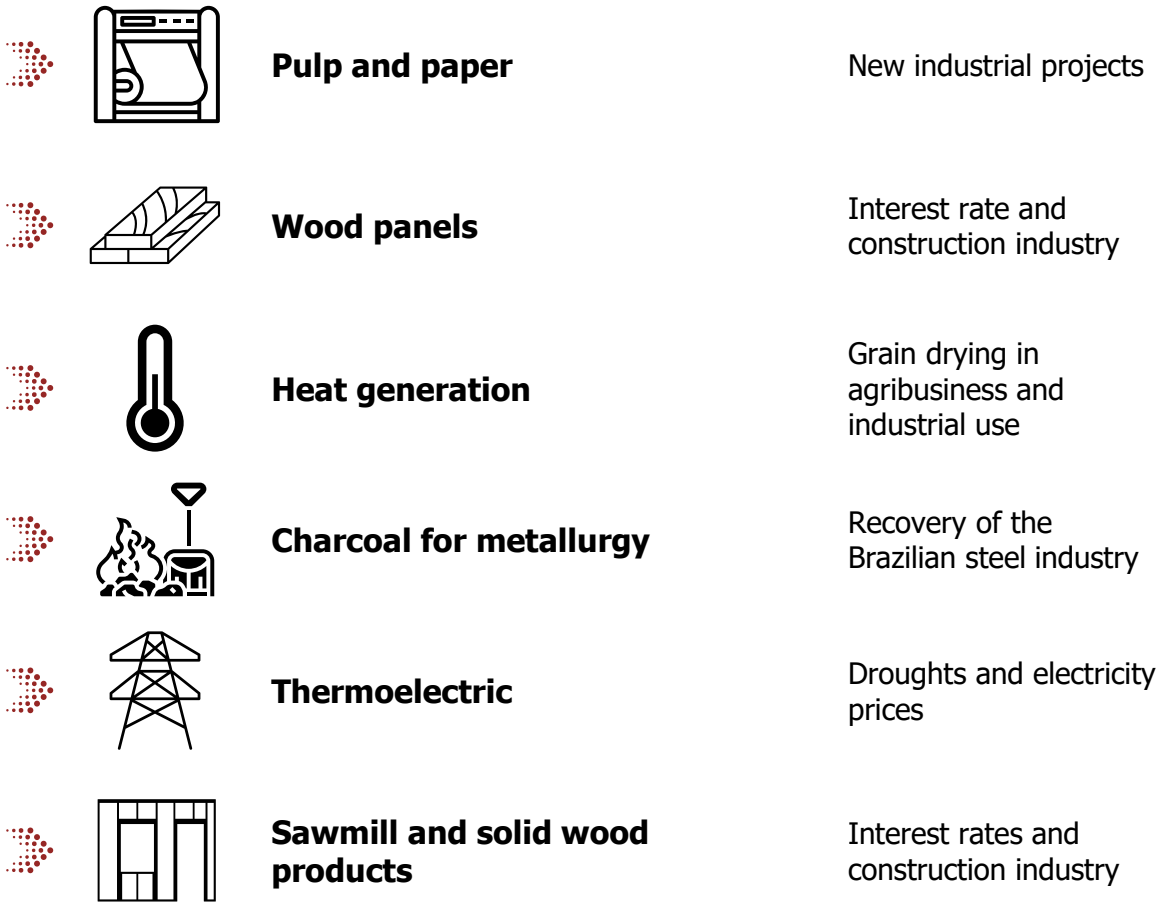
Eucalyptus consumption history in the Central-Western Region

[millions of m³ of eucalyptus]



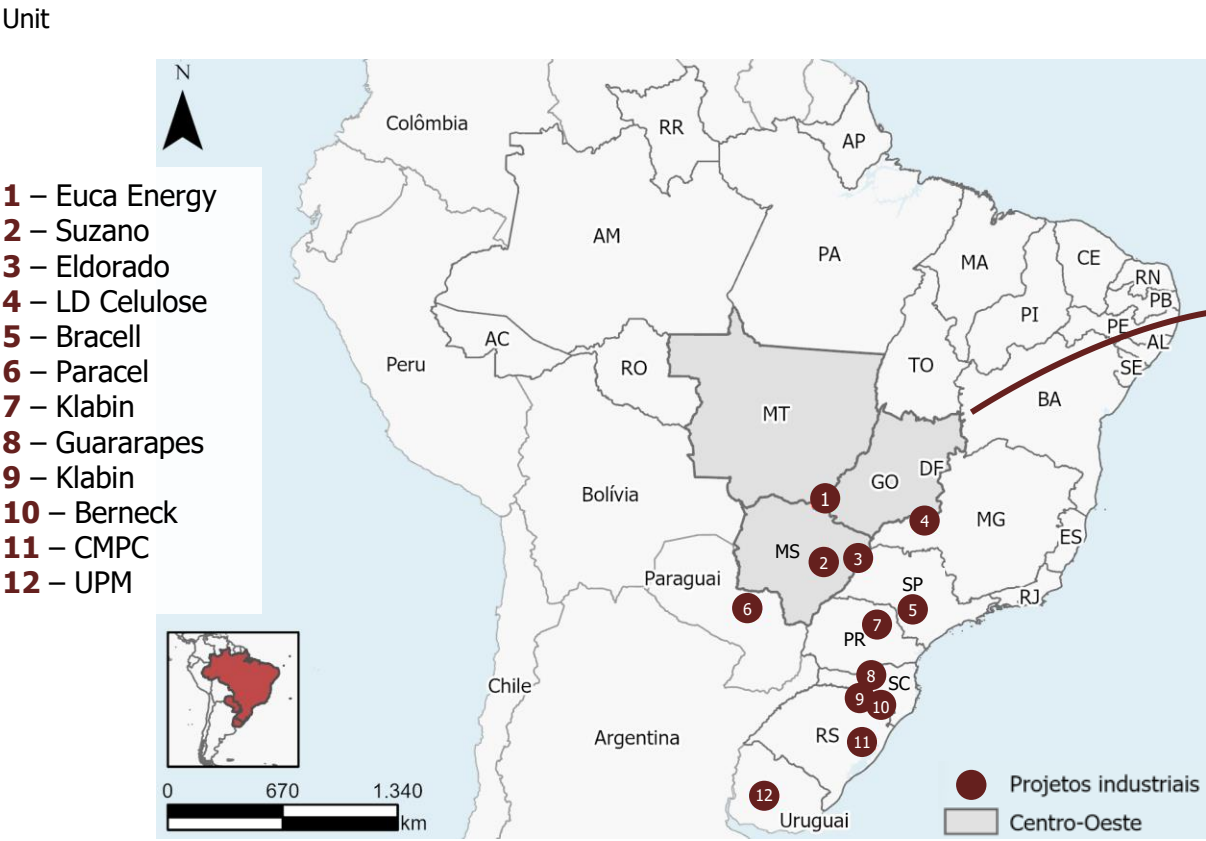
Source: Sidra, IBGE

Main wood consumption segments and trends



3 announced and estimated industrial projects should more than double the demand for wood in the Central-Western Region, another 9 projects should change the market in nearby regions

Location of the main industrial projects in and around the Central-Western Region



Source: ESG Tech collection

Source: Companies' website | Analysis: ESG Tech

Wood capacity and consumption of the main new industrial projects in and around the Central-Western Region

Unit

	Project	Capacity	Eucalyptus Consumption (Mi m³ o.b./year)
Central-Western Region	Suzano Cerrado Project	2,55 Mi ton/year BHKP	10,2
	Eldorado Vanguarda Project	2,3 Mi ton/year BHKP	9,2
	Euca Energy	2,0 Mi ton/year BHKP	8,0
	Subtotal	6,85 Mi ton/year BHKP	27,4
Nearby areas	Paracel	1,5 Mi ton/year BHKP	6,0
	Bracell Star Project	3,0 Mi ton/year BHKP ou 1,5 Mi ton/year DP	12,0
	LD Celulose (Pulp)	0,5 Mi ton/year DP	2,8
	Total	-	48,2

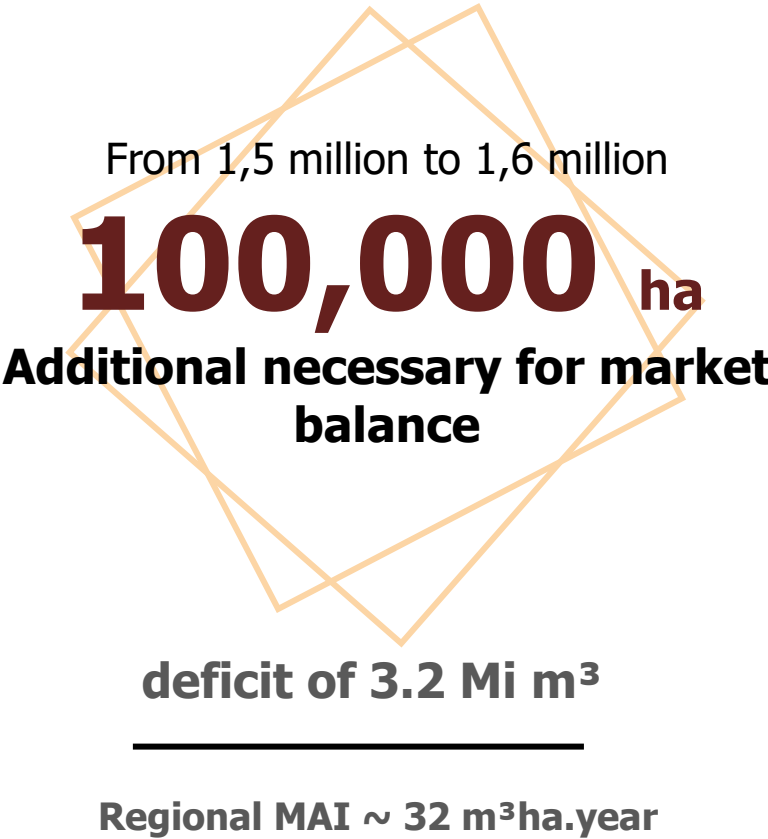
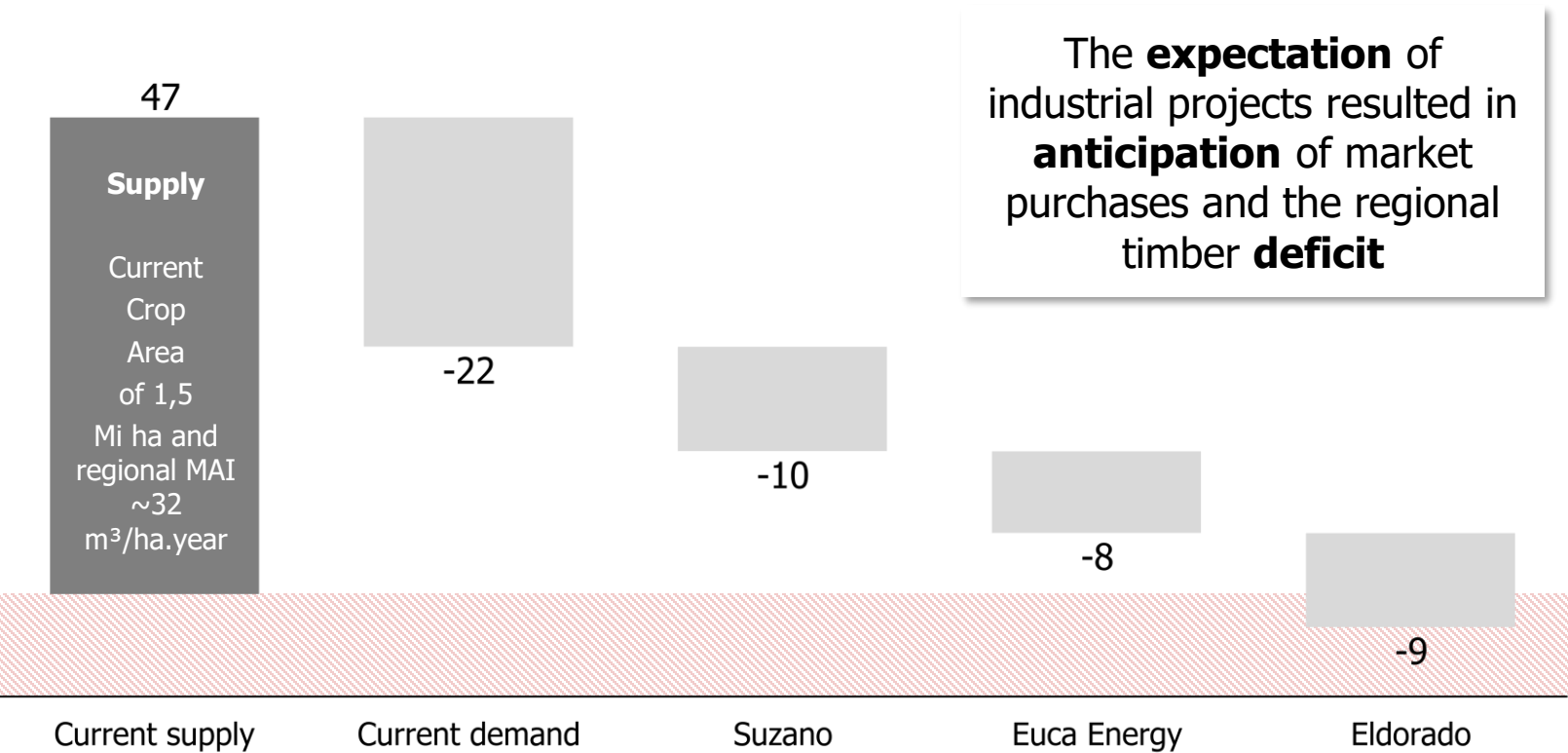
In operation

Note: DP – Dissolving pulp (celulose solúvel) | BHKP - Bleached hardwood kraft pulp (celulose branqueada de fibra curta)

Market balance scenarios present a risk of timber deficit resulting in an additional 100 thousand hectares for market balance

Latest market balance and future trends (considering sustainable supply of wood with the current area - distance analyses disregarded)

[Million m³ of Eucalyptus]

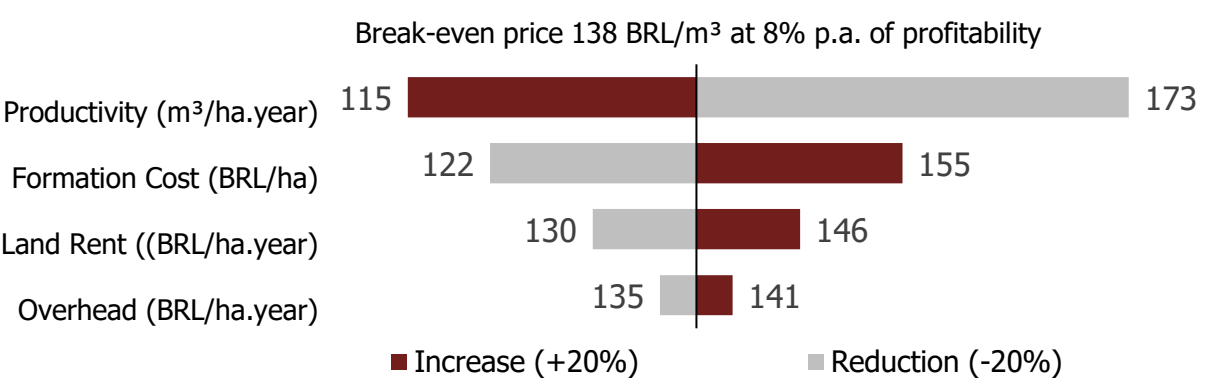


Source: IBGE, IBÁ, companies' websites and ESG Tech estimates



Break-even price for the Central-Western Region estimated at BRL 138 / m³ overbark

Price sensitivity analysis with land opportunity cost



Break-even price with land opportunity cost

Productivity (m³ o.b./ha.year)	Internal Rate of Return		
	6%	8%	10%
26	156	170	186
32	126	138	151
38	106	116	127
44	92	100	110

Source: ESG Tech | Premises: MAI 32 m³ o.b./ha.year | Silviculture 14.000 BRL/ha | Overhead 350 BRL/ha.year | Internal Rate of Return 8% p.a. | Land Rent 1.000 BRL/ha.year | formation + conduction | Conduction cost = 60% of formation cost | Conduction Productivity = 90% of formation productivity

 In a similar analysis conducted in August 2021, the break-even price was BRL 100 / m³ overbark

 Cost impacts during the pandemic were significant

 Productivity risks can exacerbate market price and supply costs



Conclusions

Market



Wood supply



Demand



Balance

Solutions

Wood supply

Increase in wood supply due to the area expansion will be observed after 2024

Productivity risk (pests, diseases, weather events) can impact wood supply

Demand

Wood consumption will be leveraged by new industrial projects: the startup of three pulp projects can double wood consumption

Balance

The market balance points to a deficit and prices should suffer upward pressure (increase in costs and demand)

Break-even prices at BRL 138 / m³ (BRL 100 / m³ in August 2021)



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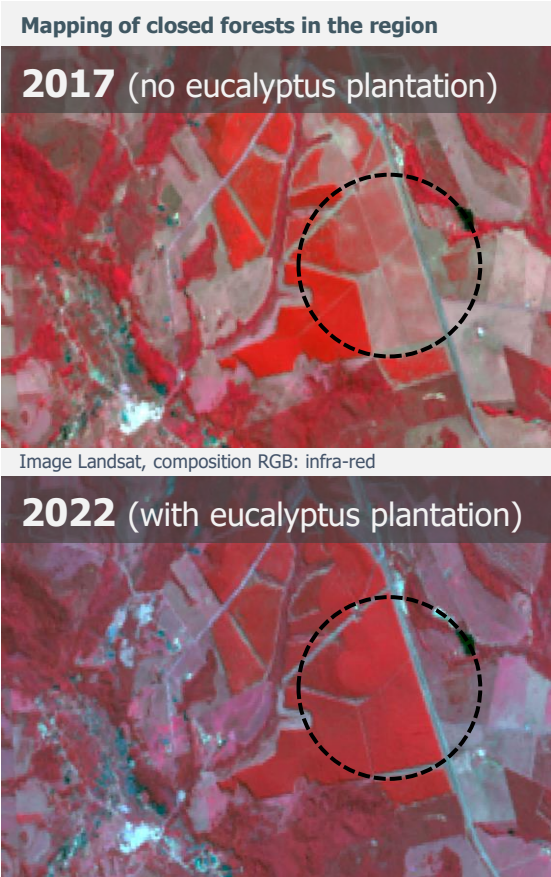
Balance

Solutions



Wood supply strategy

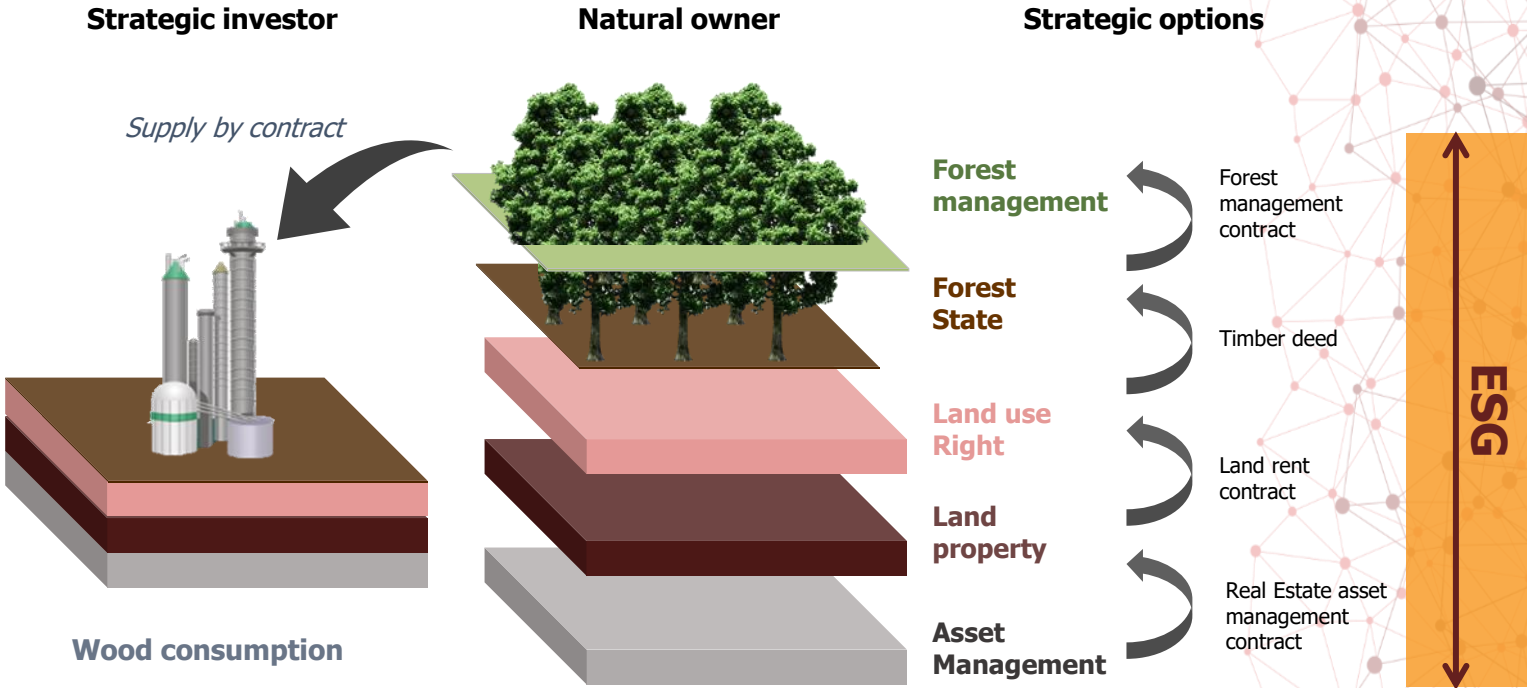
Build forest base growth strategy considering market scenarios and resource allocation optimization



Planted area
Forest age
Market data
Logistic mapping
Government data

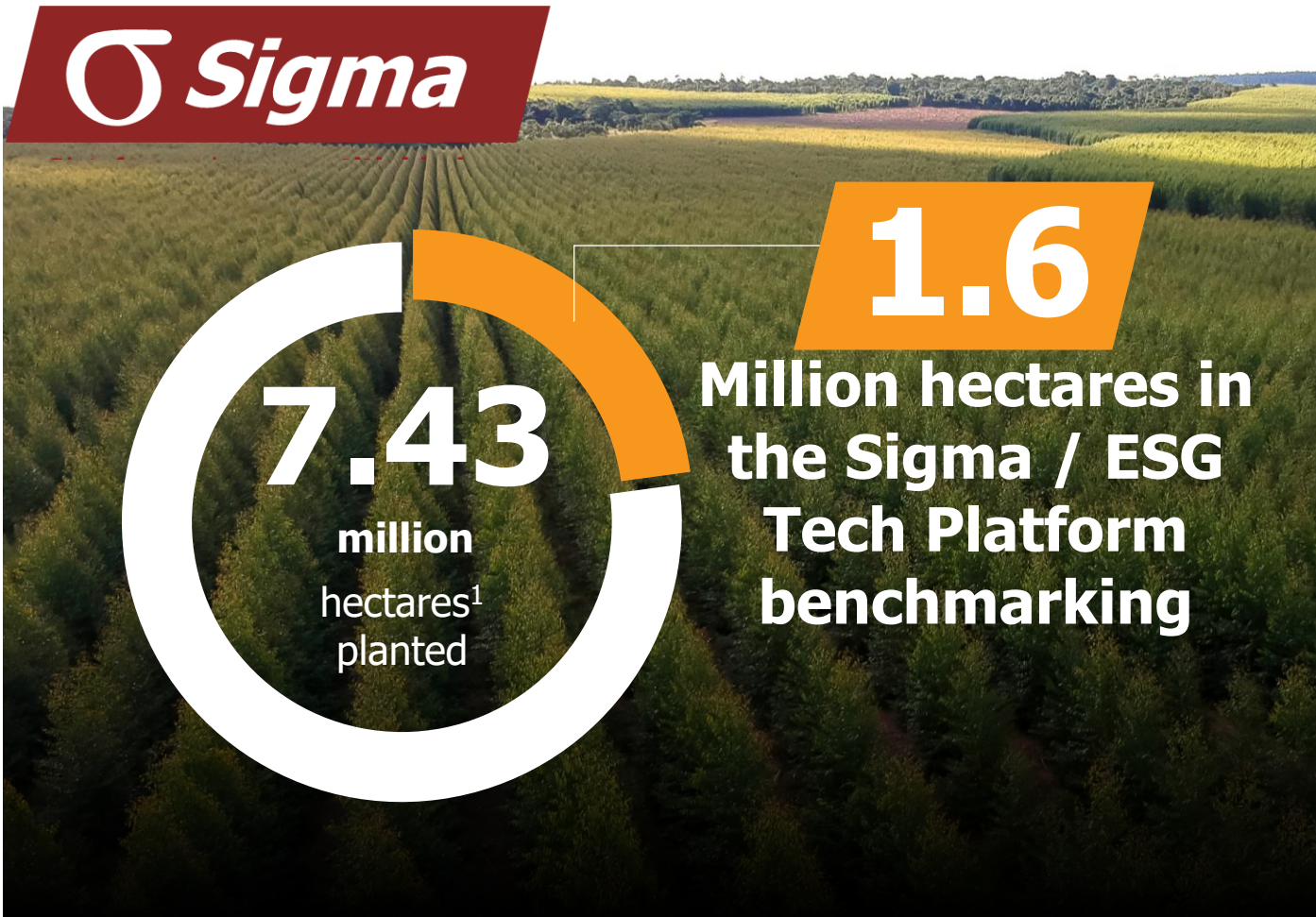


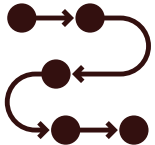
ESG Tech Vision: Supply + Competitiveness + Asset Optimization



Operational Excellence Program

Perform analysis of forest operations to identify gaps based on market information and internal data founded on processes, systems and people




Processes


System


People

 **ESG**Tech

 **auctus.ai**
inteligência aumentada

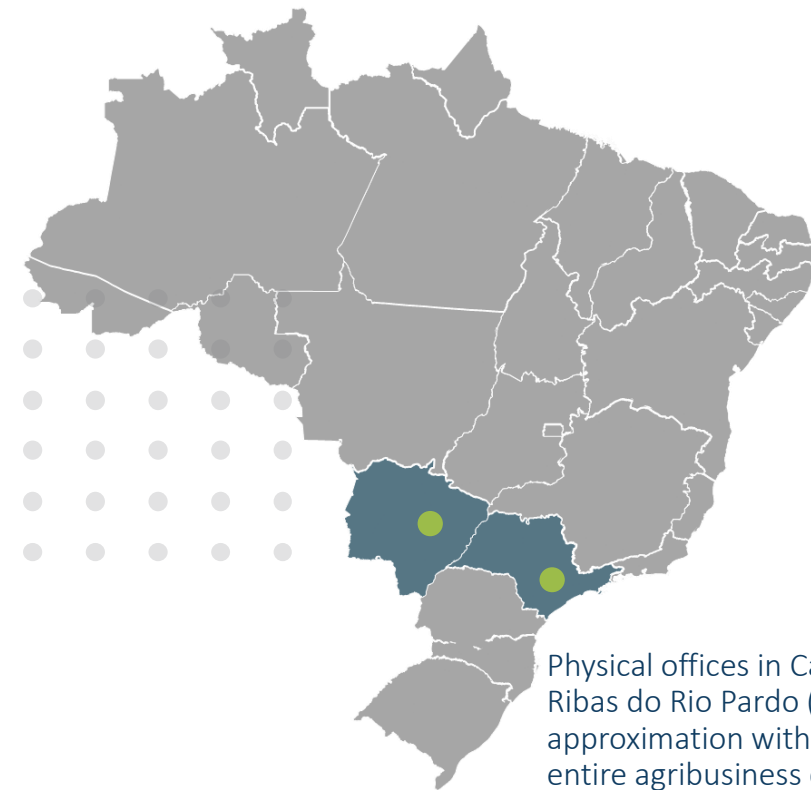
 **YouGe**
DESENVOLVIMENTO



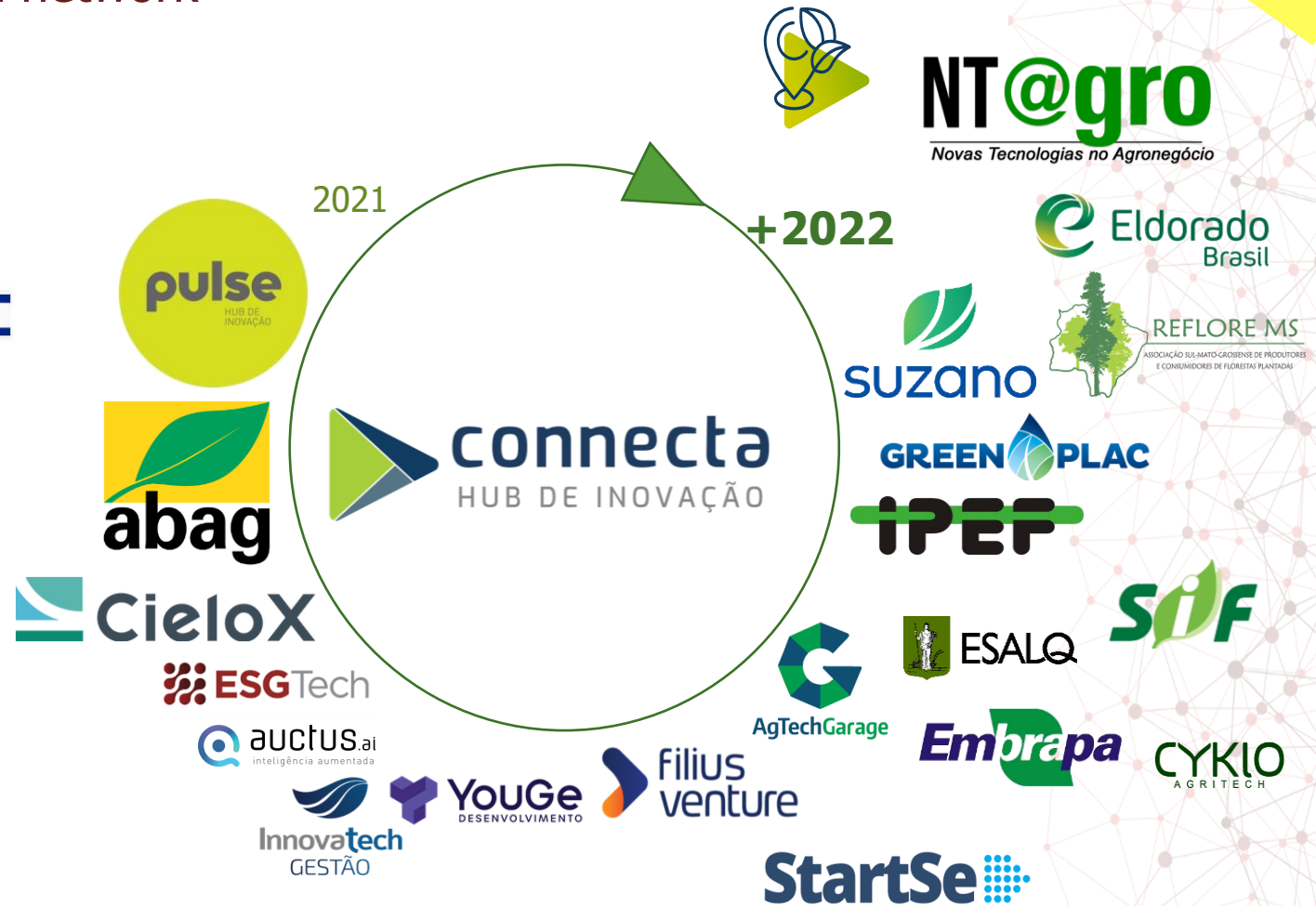
Innovatech Group Open Innovation

We want to create an open innovation space for the forestry and agribusiness sector in the Central-Western region with a successful network

Potential Alliances



Physical offices in Campinas (SP) and Ribas do Rio Pardo (MS) allow an approximation with players from the entire agribusiness chain: research centers, universities, industries, producers



Having ESG at the heart of strategy

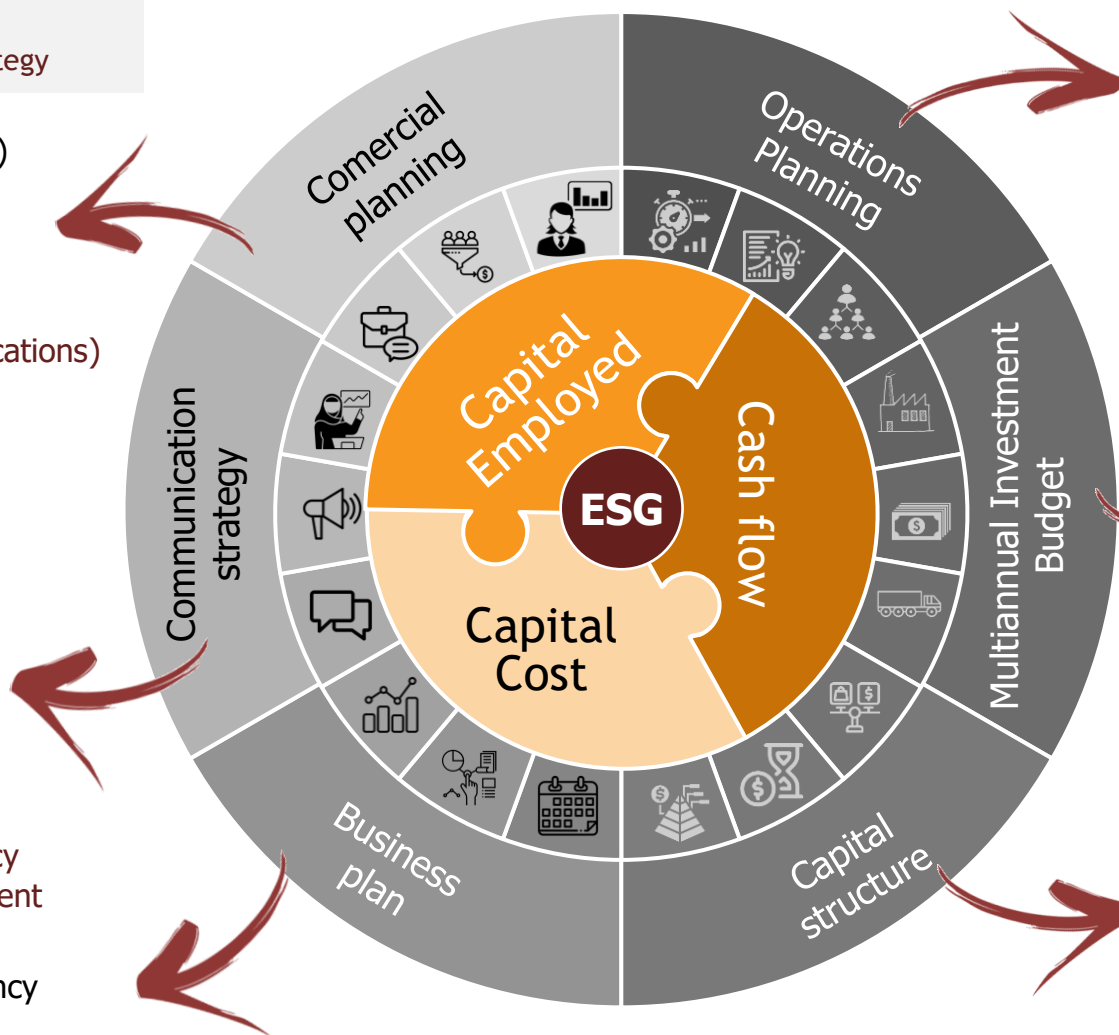
Aa Traditional strategic planning

Aa ESG implications at the heart of strategy

- Products (specification and quality)
- Markets
- Customers
- Prices
- Margins
- ESG attributes (e.g.: origin, certifications)
- Price differential
- Costs differential
- Volume differential

- *Stakeholders* mapping
- Identity / Branding
- Tool / channels
- *Reporting* Standards
- Purpose and legitimacy
- Transparency
- Interested parties
- Coherence and consistency
- Reputation risk management

- Return metrics and capital efficiency
- **Materiality assesment**



- Technology and innovation
- Competitiveness
- Productivity
- Human Resource
- Use of natural resources
- Life cycle assessment
- Social externalities
- Diversity and equity

- Compliance with the legislation
- Capacity maintenance
- Capacity expansion
- New capacities
- Social license
- Mitigation and compensation of impacts
- ESG requirements of markets
- Carbon credits

- Availability and cost per source
- Warranties and other requirements
- Risks
- Optimal structure
- Governance
- Market requirements (KPIs ESG)
- Access to financial products linked to sustainability (differential cost of capital)

Fonte: ESG Tech Consulting



Conclusions

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Supply strategy

Considering market scenarios and optimizing invested capital is essential for business sustainability

Operational Excellence

Continuous improvement must consider processes, people and systems to build long-term competitive advantage

Innovation

Look at market trends and create successful alliances

Having ESG at the heart of strategy is essential for business resilience





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