



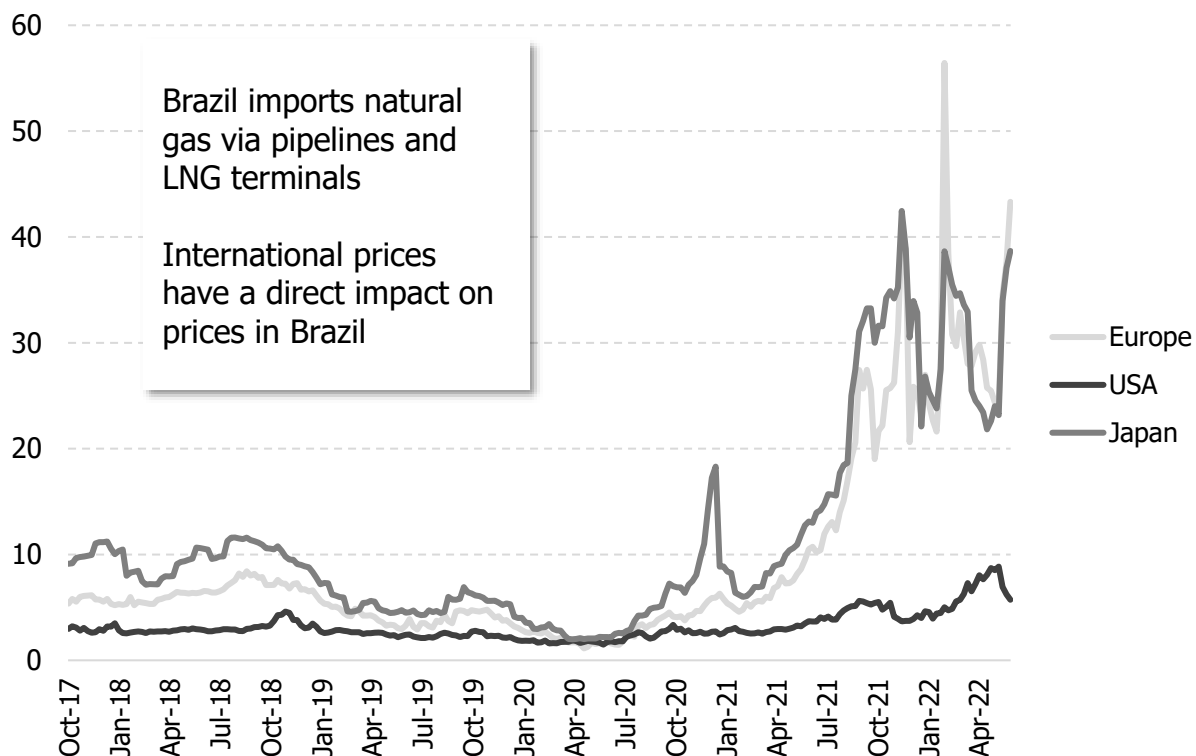
Strategic Dialogue

Biomasses Supply Strategies

During the last months, the prices of natural gas and forest formation increased, impacting the price of energy generation for industrial processes

Natural gas prices in the European, US and Japanese markets

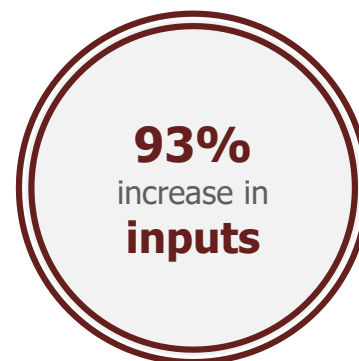
[Europe = EUR/MMBtu; USA and Japan = USD/MMBtu] – (10/29/2017 to 06/26/2022)



Source: ICE and CME

Note: Natural gas price indices: European – Dutch TTF, American – Henry Hub and Japanese – Japan Platts

Increase in costs with inputs and services for forest formation between January/2020 and April/2022

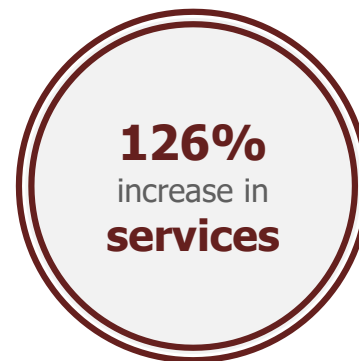


Highest increase

Fertilization inputs showed increases close to 100% in the period

What we heard

"The devaluation of the real (BRL) directly impacts the costs of imported fertilizer components, in addition to the increase in prices in dollars"



Highest increase

More significant increases in activities that demand the most machine hours (e.g. pre-emergent total area application)

What we heard

"We have more demand for services and maintenance costs have increased due to the shortage of components and the increase in steel, for example"

Note: increase in fuel prices are reflected in the services category, as only outsourced activities were considered.

The generation of energy through biomass has some advantages over fossil fuels, among them: availability, price and sustainability

Availability

The territorial dimension of Brazil, associated with the multiplicity of crops planted in the country, brings the wide availability of various plant biomass throughout the year, enabling the diversification of the energy source.



Price

Plant biomass can be obtained as residues or by-products of other agro-industrial processes. As they are further removed from exchange rate risk and external supply and demand problems, the price of biomass is more competitive than that of oil derivatives on the domestic market.

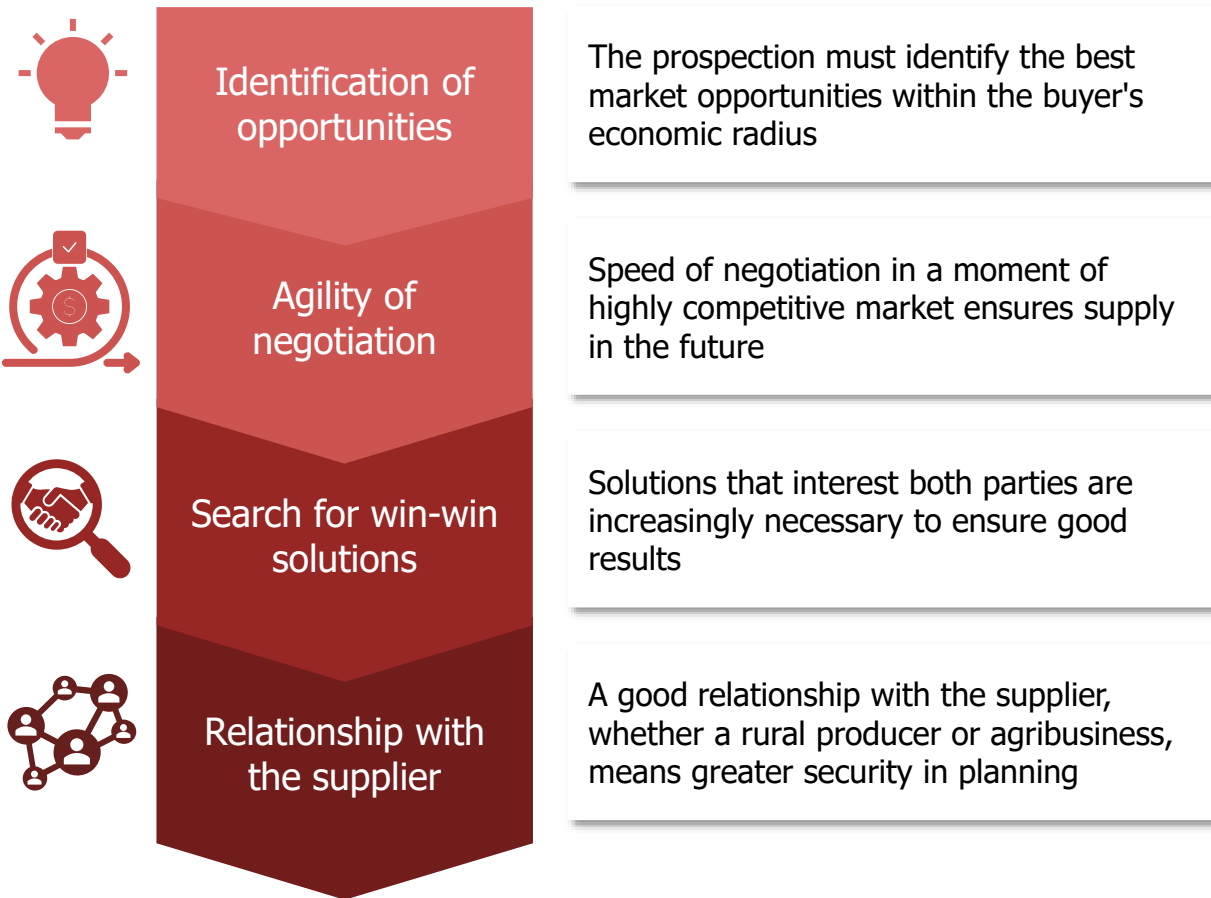
Sustainability

The use of biomass from agroforestry resources, which are renewable, brings the possibility of reducing CO2 emissions



The supply strategy has two planning fronts: short-term, providing efficiency to the purchase of biomass and establishing fruitful relationships with suppliers, and long-term, involving the study of supply strategy, with technical and economic foundations.

Short term: effectiveness in the acquisition of biomass

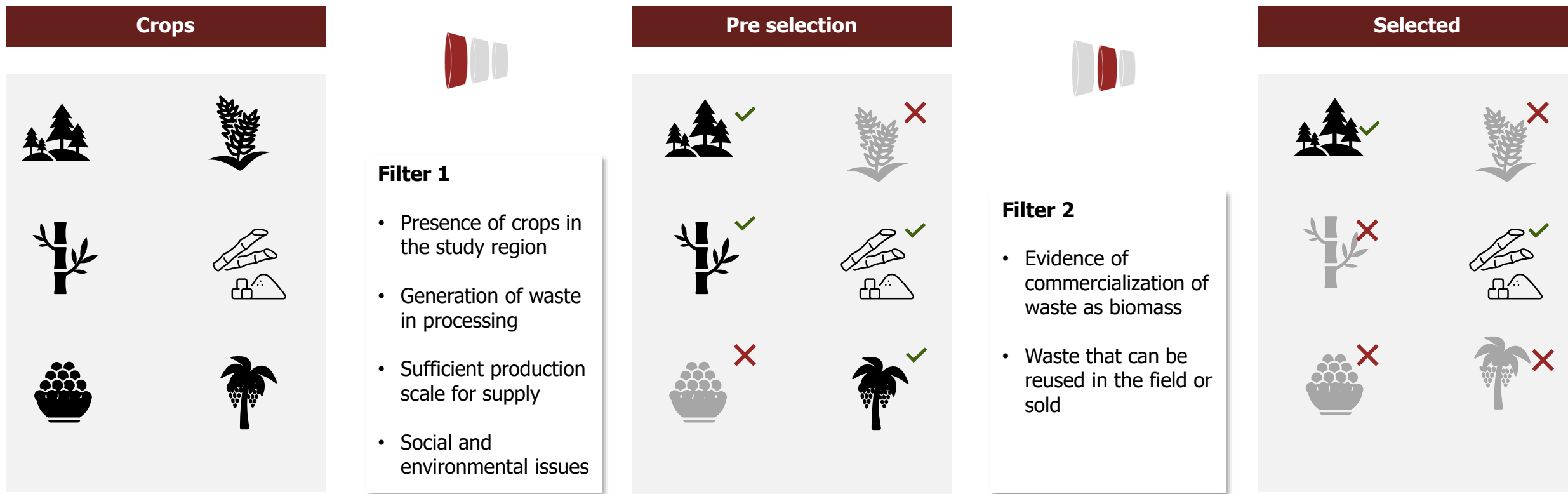


Long term: supply strategy

- ✓ Study of regional land use, survey of planted area and productivity estimate
- ✓ Projection of the regional biomass balance with seasonality study
- ✓ Price survey and cost estimation – for both own forest formation and supply by third parties.
- ✓ Long term trends
- ✓ Definition of supply scenarios
- ✓ Technical-financial modeling of supply scenarios
- ✓ Risk analysis, mitigation actions and opportunities

The selection of alternative biomasses must be carried out under criteria that involve technical and economic characteristics for industrial supply

Example of filters use to select alternative biomasses



Source:

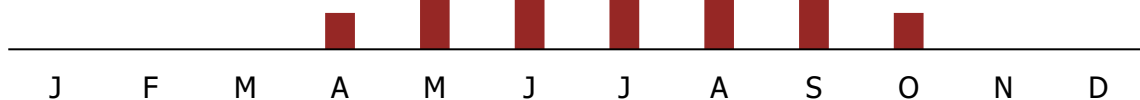


Alternative biomasses may have seasonal production characteristics. The in-depth study of the characteristics of each biomass should serve as a basis for setting up a solid supply strategy, aimed at reducing risks

Biomass A



Biomass B

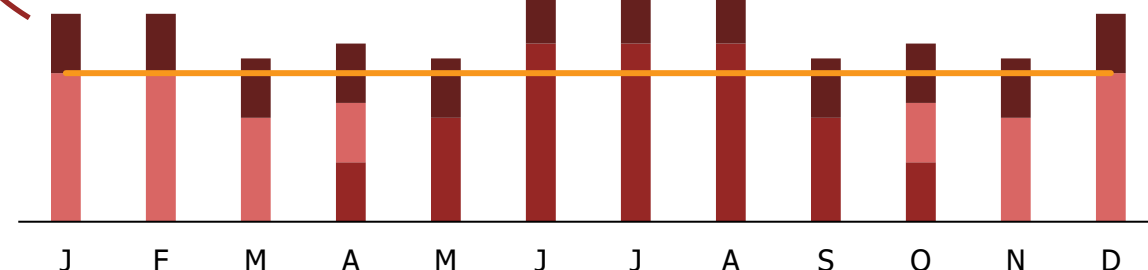


Biomass C



Times of the year with a surplus in the supply of biomass can serve to reduce the deficit of other times of the year

Combination of biomass supply



The prioritization of biomass must also be done considering factors such as post-industry cost, logistics and other factors



ESG Tech Consulting

Since 2012, with a history that has passed through hundreds of consulting projects in several countries, ESG Tech Consulting is dedicated to understanding the demands and trends of agribusiness to guide projects aimed at growth and market capture. Our team has diverse and qualified professionals, with knowledge, profile and soft and hard skills, having as a differential the experience in administration and business, adding to the technical expertise.



ESG

- Sustainability Reports (GRI)
- Diagnostics, due diligence and socio-environmental monitoring
- Greenhouse Gas Management
- Preparation of Certifications (FSC, CERFLOR, ISO9001, 14001 and 45001) and other ESG services



Strategy and innovation

- Strategic planning
- Preparation of the ESG Sustainability Strategy
- Expansion plans
- Site location
- new investments



Governance

- Communication plan with stakeholders
- Organizational structure
- ESG Governance



M&A

- Asset valuation
- Acquisition of assets
- Growth strategies



Market study

- Market and trends analysis
- Entry into new markets
- New products
- Green markets



Operational excellence

- Time and motion studies
- Cost reduction
- Process mapping
- Optimization of natural resources

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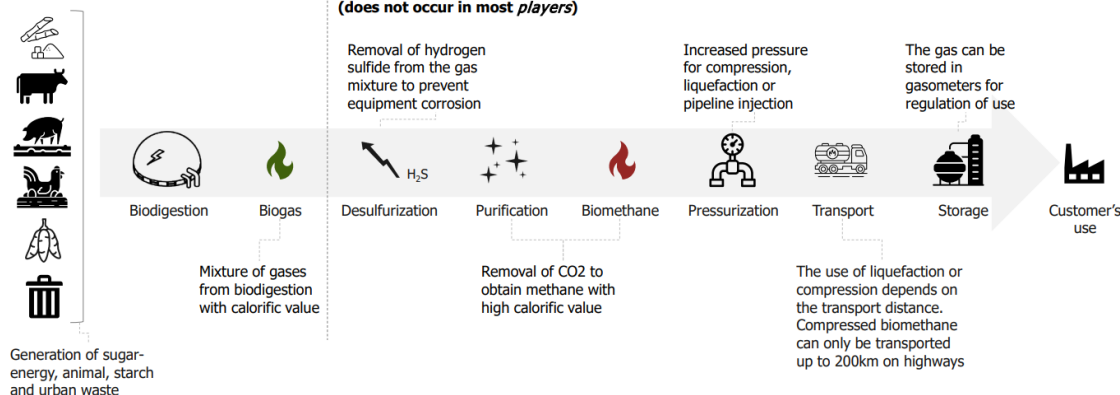
ESG Tech publishes STRATEGIC DIALOGUES bimonthly, with relevant information for decision-making on current issues in the Brazilian agribusiness chain

Recent dialogues

The production chain of biogas and biomethane from waste goes through several processes. The intense use of machinery makes the need for a technical-economic analysis essential to determine whether or not the enterprise is viable

Example:
biogas and
biomethane

Production of biogas and biomethane



Source: ESG Tech elaboration

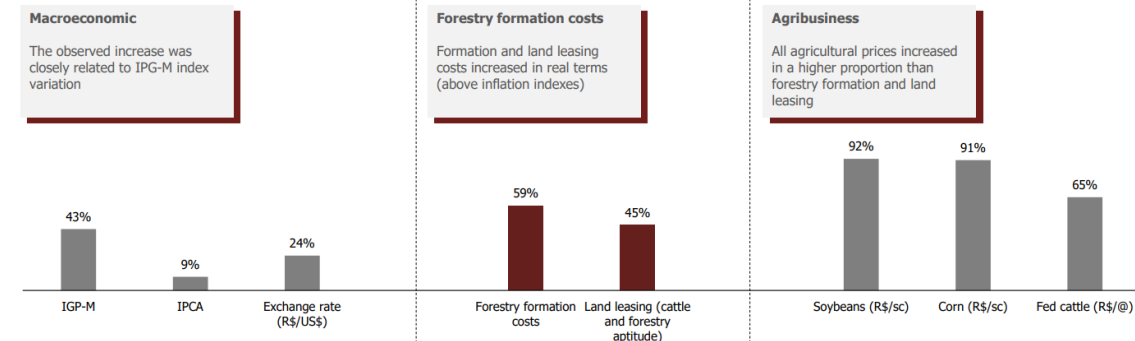
ESG Tech | Waste to energy
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Planting costs (forestry formation and land leasing) increased in real terms since the beginning of the pandemic, although lower than other agricultural prices

Cumulative variation of selected indicators between January 2020 and July 2021

Percentual variation



Note: IGP-M and IPCA are inflation indexes; 1 sc = 60 kg or 2,2 bu; 1 @ = 33 lb.

Source: ESG Tech database for land leasing and forestry formation costs; other indicators from BACEN, IPEA, and CEPEA

ESG Tech | Strategic dialogue: COVID-19 pandemic impact on forestry planting costs
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How we can help

Dialogue theme

With the increase in fossil fuel prices and the restriction in the supply of wood in some regions, other biomasses can help reduce costs, increase supply security and achieve sustainability goals.

Companies with demand for biomass

- What is the **land use** in the study region?
- What **types of biomass** are used in the study region?
- Which biomasses have **scalability**, **availability** and **attractive cost** criteria?
- What is the **supply** and **demand** trend and the **regional availability** of potential biomasses?
- Is the **availability** of wood and other biomasses **verified in the field** in the **short term** and are the **long term trends positive**?
- What are the **operational costs**?
- What are the **prices** of selected **biomasses**?
- What are the **land prices** in the region?
- What are the potential **suppliers**?
- What risks, opportunities or necessary mitigation actions?
- What are the **possible supply scenarios**?
- Which **scenario** brings the **best** balance between financial return and supply risk?

How does ESG Tech contribute to this dialogue?

ESG Tech is a strategy and business development consultancy, focused on the forestry and agribusiness sectors. ESG Tech does not commercialize technologies or is linked to any supplier, in order to ensure the independence of our analyzes and the freedom to seek in the market the solutions that will bring the greatest return to our customers.

Our team of consultants has specialists in different cultures and different links in the agribusiness chains that can assist our clients in all stages of decision making and execution.

- **Market studies:** market size, internal and external markets, competitiveness, entry model and financial projections
- **Viability analysis:** investment and return projections; determination of optimal scale and location
- **M&A:** from the selection and evaluation of targets or potential strategic partners, to the structuring and negotiation of transactions, as well as support in the management of post-acquisition integration
- **Supply plan:** origin of raw material, supply costs and scenario modeling



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