



Biomass conversions in La Reunion

December 2021



ALBIOMA

Sommaire

1		Overview of Albioma group	3
2		The energy transition in La Reunion	7
3		Sourcing sustainable wood pellets	14
4		Delivering impact through local value chain	18
5		Questions & answers	21

1



Overview of Albioma group



Albioma

An independent renewable energy producer



Thermal biomass

A unique **partnership** of over 30 years with the sugar industry to **produce renewable energy from bagasse**, the fibrous residue from sugar cane



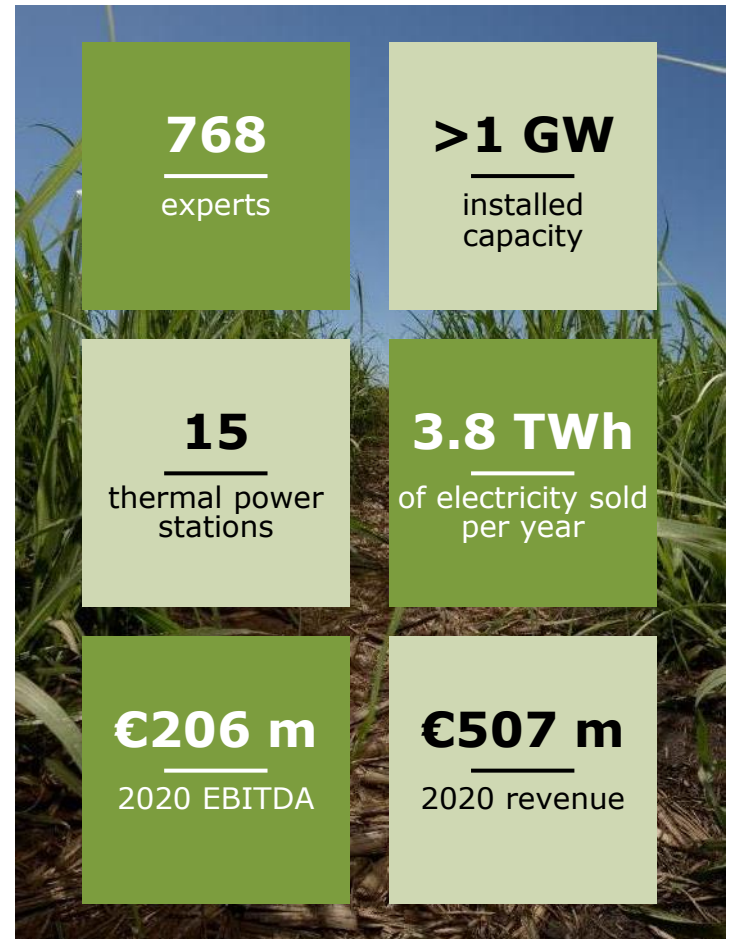
Photovoltaic

The leading producer of photovoltaic energy in the French overseas territories



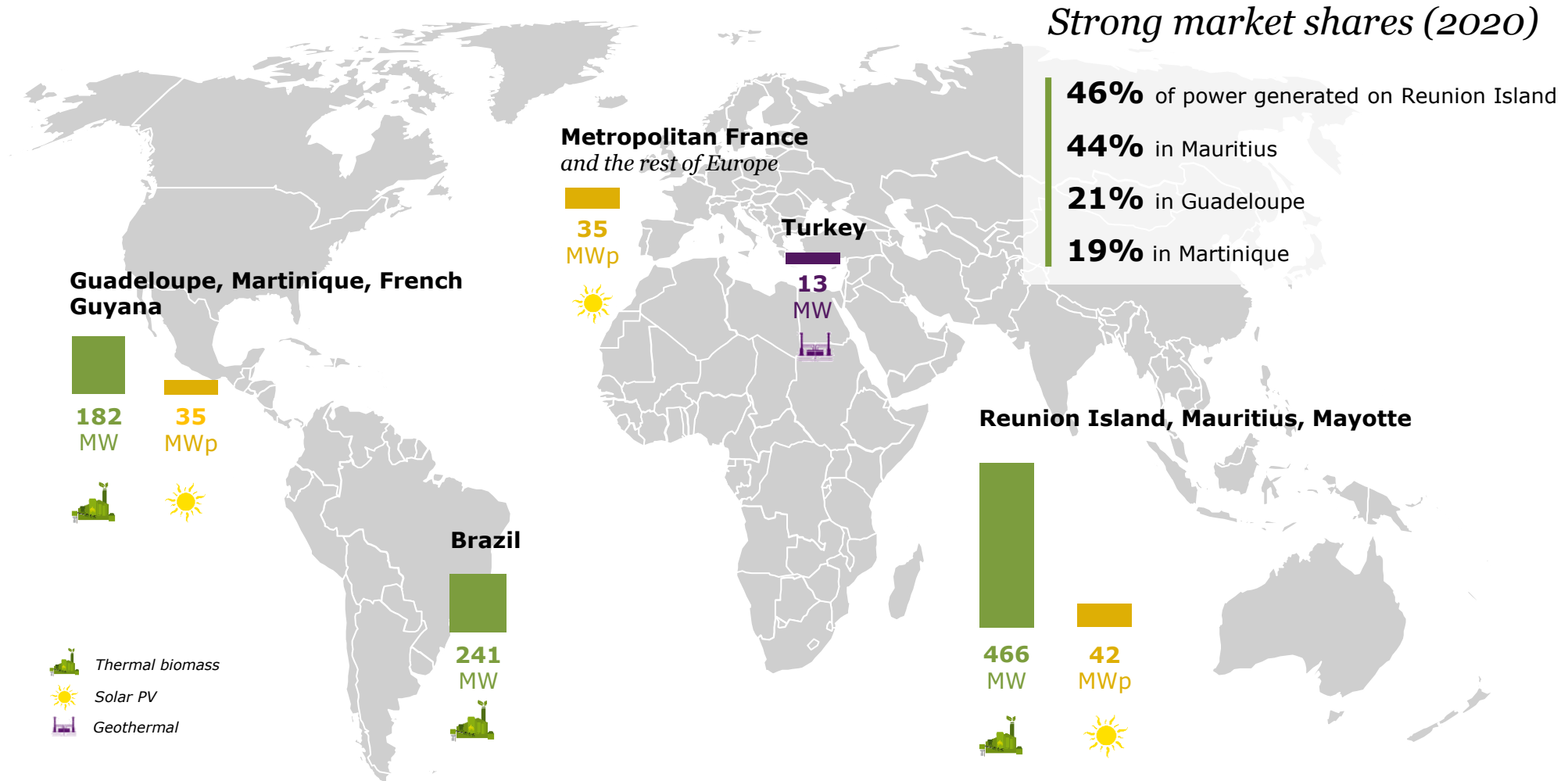
Geothermal

Our new **renewable baseload energy**



> 1 GW installed capacity across the world

889 MW thermal biomass, 112 MWp solar and 13 MW geothermal



Note: June 2021

2

The energy transition in La Reunion



Albioma, power producer in La Réunion since 1992



251

MW
thermal

40

MW
solar

200

M€
Invested over
2016-2020

213

employees

200

FTE through sub-
contractors

Data 2020

The energy transition in La Reunion

Albioma's projects are part of the French government's Climate plan

- ▶ **Switching out of coal to a fuel mix of wood pellets, local biomass and bagasse, aiming to generate 100% green power**
 - Priority to **local biomass**, while avoiding conflicts over uses (cane straw, forest residues, etc.) and contribute to a circular economy (e.g. green waste)
 - **Security of supply** with imported biomass, focusing on regional sources
 - **Traceability and sustainability** through certification systems and inspections by third-party organizations
- ▶ **The conversion of Albioma's power plants is included in the decrees related to the Multiannual Energy Programme for La Reunion**
 - Our projects are underpinned by a supportive regulatory framework with a long-term horizon
- ▶ **The conversions of Bois Rouge and Le Gol power stations and the investment in the associated port infrastructure are under way**

Albioma power stations in Réunion Island

Albioma Bois Rouge (ABR) conversion to 100% biomass approved in 2020

Capacity:	100 MW (on-line since 1991)
Fuel mix (up to 2023):	Coal/biomass/bagasse
Fuel mix (2023):	Biomass/bagasse
Imported biomass:	450,000 tonnes/year
Local biomass:	50,000 tonnes/year



ABR will supply 21% of the island's power from renewable sources

Albioma Le Gol (ALG) conversion to 100% biomass approved in 2022

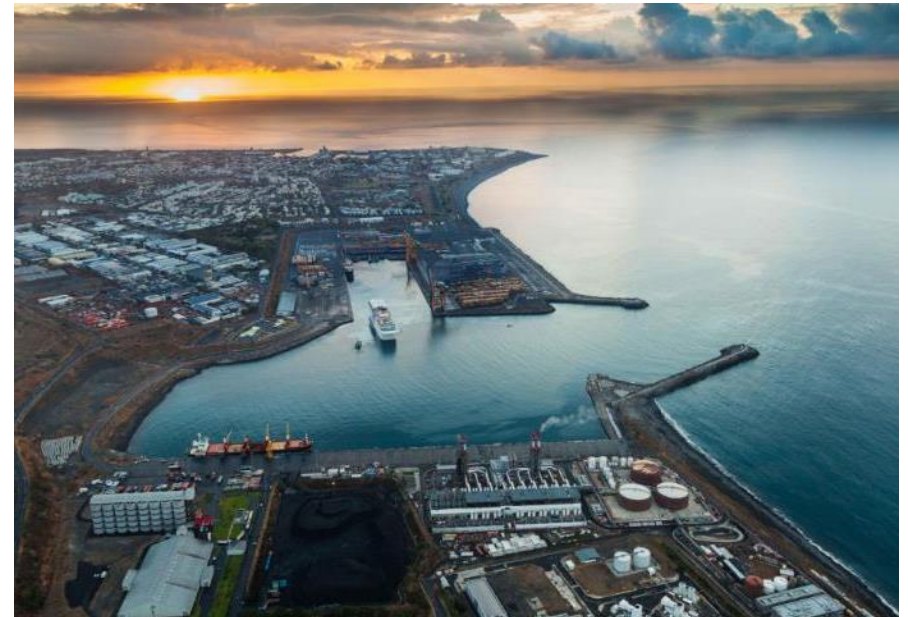
Capacity:	110 MW (on-line since 1995)
Fuel mix (now):	Coal/bagasse
Fuel mix (2024):	Biomass/bagasse
Imported biomass:	450,000 tonnes/year
Local biomass:	50,000 tonnes/year



ALG will generate 24% of the island's power from renewable sources

Wood pellet handling

- ▶ Wood pellets are produced from **by-products of the forestry and sawmilling** industries and are a sustainable fuel source
- ▶ The production involves milling and drying of the raw material, to turn it into sawdust, which is then **compacted in the form of pellets**
- ▶ Given the energy and effort that went into the manufacturing of the pellets, it is important to keep them in **covered storage**, to ensure their integrity
- ▶ The energy content of wood pellets is **17GJ/t**
- ▶ One of the consequences of switching from coal (25GJ/tonne) to wood pellets is that a **greater volume** of fuel is needed to produce the same power output
 - Greater throughput for port operators
- ▶ **The need for covered storage requires port investments**



Investment in port infrastructure

- ▶ Construction of 4 domes, to allow the import and storage of wood pellets
- ▶ Each dome will have a capacity of 45,000m³ or 30,000 tonnes of wood pellets
- ▶ 2 domes per power station
- ▶ Domes are particularly adequate for wood pellets storage in tropical zones given their resistance to higher winds



3

Sourcing sustainable wood pellets



An overview of the wood pellet market

► Evolution of the market

- Wood pellets have become the **most liquid, internationally traded type of biomass** used for power and/or heat generation
- The wood pellet market has grown substantially, with **25-30 million tonnes** of wood pellets traded on an annual basis

► Demand drivers

- The use of wood pellets has evolved from an opportunistic and short-term activity to a **stable and growing business** underpinned by coal to biomass conversions and demand for home heating
- The biggest sources of demand are coal to biomass conversions and dedicated biomass plants in Europe and Asia

► Wood pellet supply

- Wood pellet supply has evolved at the **same pace with demand**
- Suppliers tend to be less creditworthy and smaller entities (compared to their clients), but there has been some **consolidation in the market**

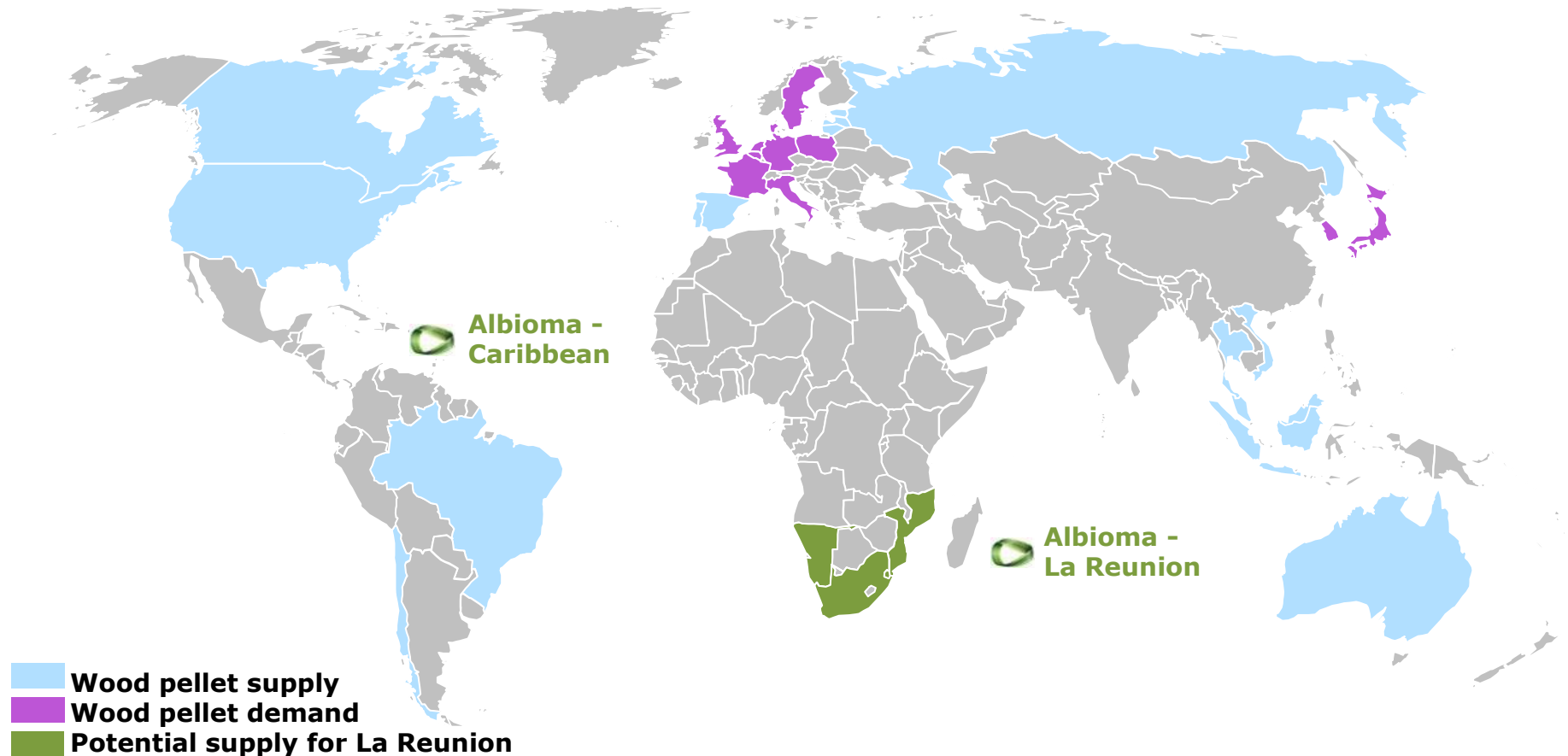
► The further convergence of specs and sustainability parameters will facilitate the market's growth and commoditization of wood pellets

Global industrial wood pellet supply/demand

The main **users** of industrial pellets are located in Europe, Korea and Japan

The largest **producers of pellets** are based in N. America, Russia and SE Asia

Albioma's diverse geographic footprint supports the emergence of **new suppliers**



Energizing the regional wood pellet supply potential

Wood pellets from Eswatini

- ▶ **August 2023: Albioma Bois Rouge and Emerald Renewables signed a wood pellet supply agreement with the following terms:**
 - Long-term pellet supply agreement starting in 2025
 - Quantity: 100,000 tonnes/year
 - Delivery: FOB Richards Bay or Maputo
 - Quality: I2 (industrial wood pellet quality standard)
 - Compliance with the European regulatory and sustainability standards
- ▶ **Project status:**
 - Development time: 18-24 months
 - In discussions with financial institutions and funds to secure funding
 - Exploring port storage and loading arrangements with stevedores in the ports of Richards Bay and Maputo
 - Aiming for a long-term stevedoring agreement with one of the two ports

Energizing the regional wood pellet supply potential

A strategic and sustainable investment in Namibia

Positive Environmental & Social impact

- ⊙ This investment is the **first project** for Albioma in **Namibia** and represents a **strategic investment**
 - Securing regionally sourced biomass for Albioma
 - Albioma will be the **off-taker** of the plant
- ⊙ Namibia has a **vast source of Encroaching Bush** and is looking for **Harvesting**
 - **No conflict over uses** as the encroaching bush species are **invasive** with **detrimental effects** on Farms, Natural Water Sources as well as Biodiversity
- ⊙ Currently, only a **small harvesting biomass** industry exists in Namibia, led by **Carbon Capital** and its Biomass Supply Chain feeding charcoal. This investment would allow a **scaling-up** of the industry
- ⊙ Good opportunity for **Transnamib** and **Namport** to develop the business

~30 employees

Pellets plant

100,000 mt/yr

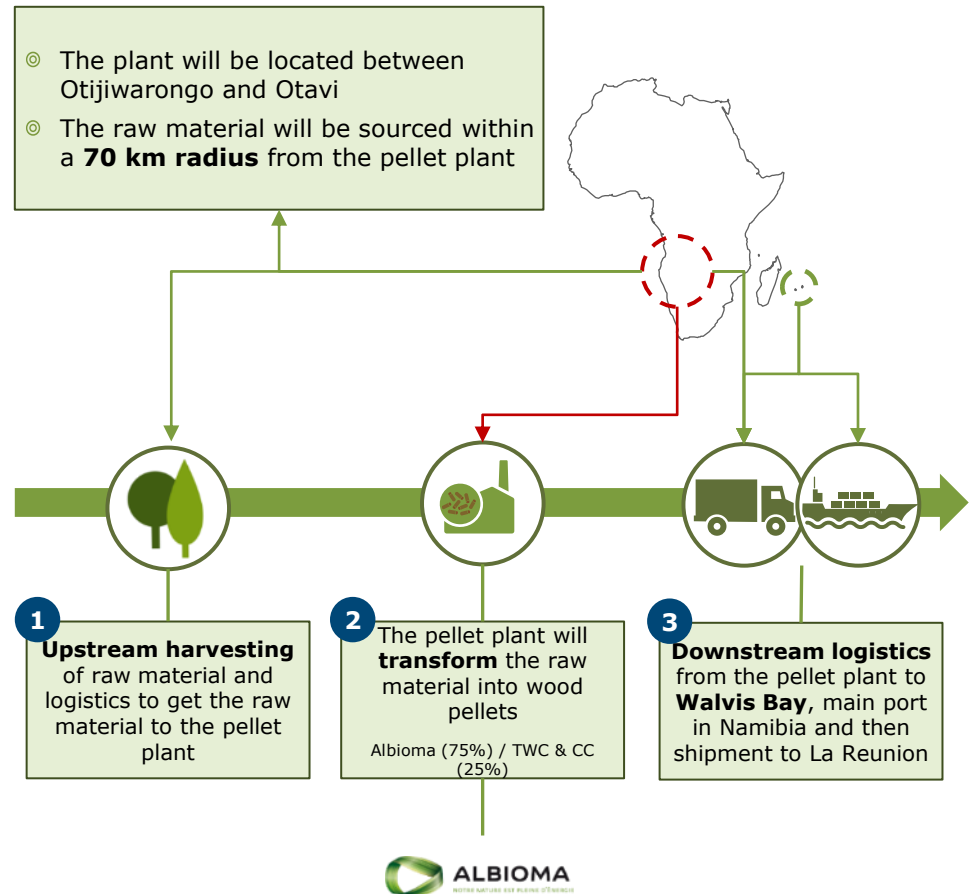
Volume of pellet produced*

~48 employees

Harvesting

- ⊙ Plan to increase capacity to 200 000mt/yr in case of success

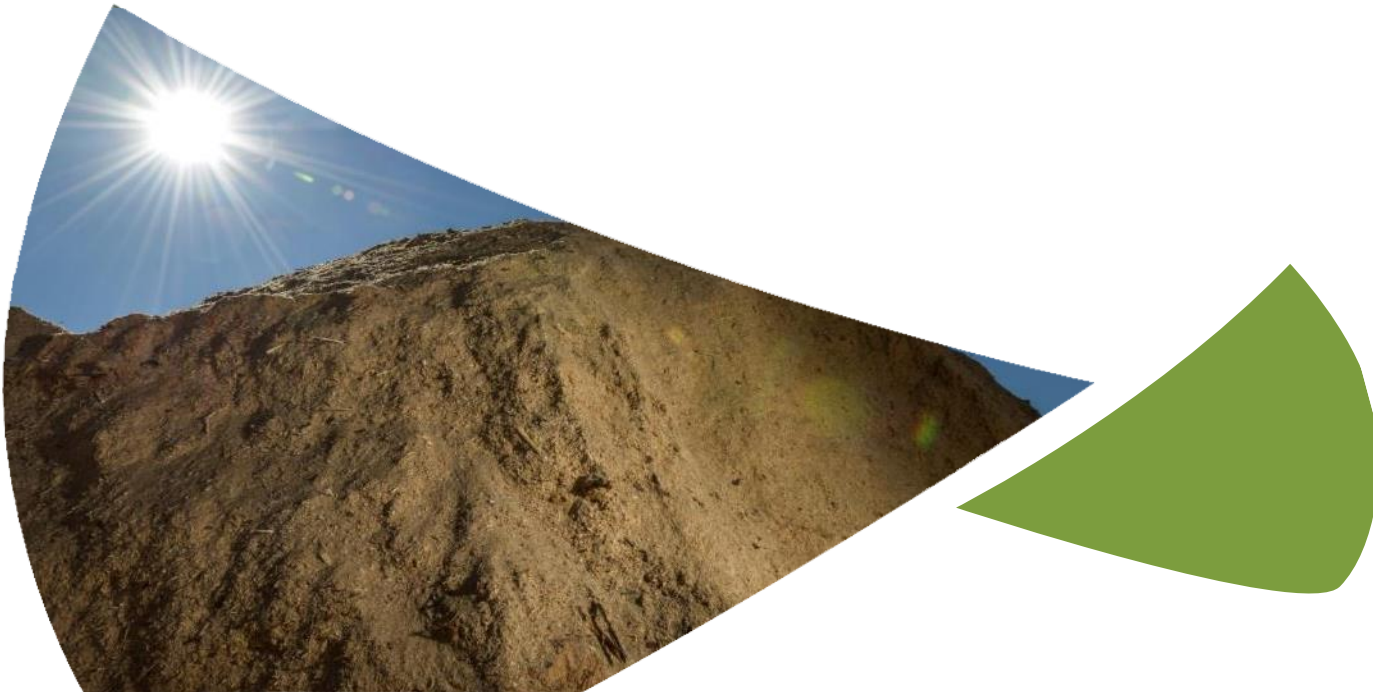
Operational Overview



4



Delivering impact through
local value chain



Focus on locally sourced biomass

Developing new value-chains on the territory



- ▶ We are developing local supply chains based on the estimation of **100 000 tons** of locally available biomass:
 - **45 000 tons** of shredded **green waste**
 - **10 000 tons** of **wooden packaging**
 - **10 000 tons** from **forestry by-products**
 - **25 000 tons** from **tree felling and trimming**
 - **10 000 tons** from **invasive wood species**



A strong potential for the local economy

- ▶ Albioma works closely with the ONF National Forestry Office, the Reunion National Park, research institutes (CIRAD), local authorities and the private sector to develop new value chains from untapped reservoirs
- ▶ **Boosting the local forestry industry** by offering new markets for under-valorised forestry by-products
- ▶ Supporting the **structuring of private forest landowners** to create value for the territory
- ▶ **Diminishing volumes destined to landfill** through the creation of value chains for green waste
- ▶ Fostering **circular economy** and boosting **employment opportunities** through the development of new activities (logging, collection, processing, transport...)



5 |

Questions & answers

