

# MAURITIUS SUGAR INDUSTRY

SUSTAINABLE PRACTICES AT MILLING OPERATIONS



**terra**

# Terragri Ltd: A Vision of Sustainable Development





# Raw Materials for Sugarcane Production: **Herbicides**

Green Harvesting – GPS & Traffic Control



Use of cane straw to control weeds

Application of herbicides on cleared cane beds only = 25% less herbicide applied



Drone technology for weed detection after cane canopy closure



## Raw Materials for Sugarcane Production: **Fuel**

- Optimising the efficiency of equipment at Terragri is a priority towards reducing our fuel consumption
- Investment in the fleet management tool *Naveo*
- We have prioritised the purchase of fuel-efficient machines and have redesigned our fields to enhance the efficiency of their operation

### ***Size of a field at Terra***

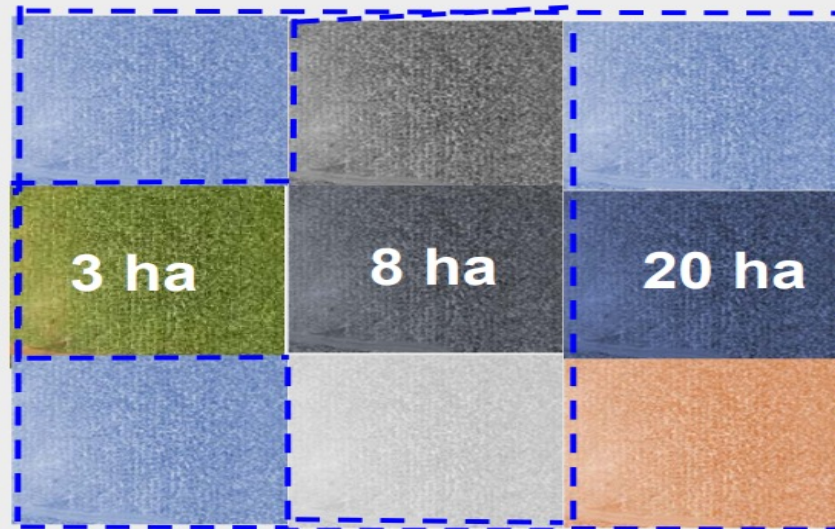
In 2008: 3 ha

x 2.7

In 2018: 8 ha

x 6.7

In 2019: 20 ha



# Climate Change

## Rainwater harvesting to face extended dry spells

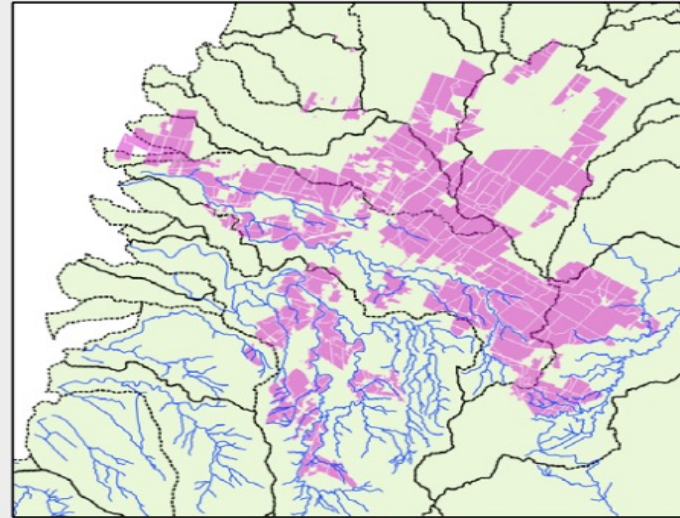
Pond under construction



Targeted result



## Use of Digital Elevation Models (DEM) and geographical information systems for land planning, and soil conservation



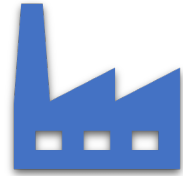
- Informed waterway design based on flow axes and catchment areas
- Adaptive measure against flash floods and convectional rainfall
- Aim is to minimise soil erosion, and conserve soil fertility

# People

- Having the right technical and leadership skills, diversity of experience, and a strong performance-oriented culture, is fundamental to Terra's ability to generate value
- Training to new technologies
- Coaching and continuous learning



# Water Management/ Consumption



Re-use the wastewater  
from the factory for cane  
irrigation



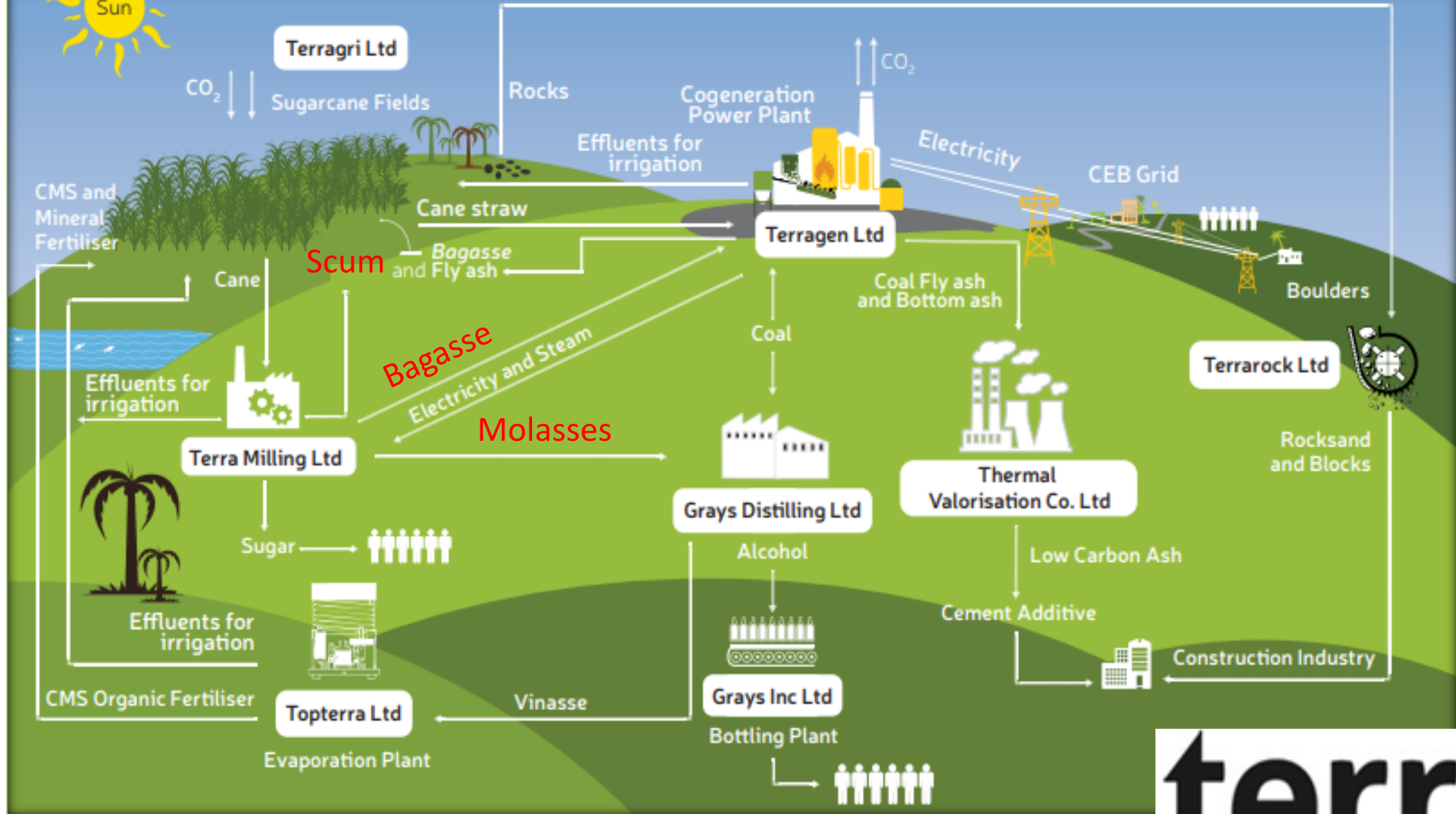
Reduce water  
consumption from  
reservoirs

## Characteristic and Key figures

Wastewater from the factory to use for irrigation

Crop 2019 (July – Jan)	509,400
Crop 2020 (July – Dec)	526,430
Crop 2021 (July – Jan)	502,089

# OUR INDUSTRIAL ECOSYSTEM



# terra

# Biomass

## By-products obtained during manufacturing of sugar:

- Bagasse sent to “Terragen” to receive electricity and steam in return for the operation of plant machinery
- Scum sent as fertilisers to sugarcane fields
- Molasses sent to “Grays” for production of alcohol
- Vinasse used as fertiliser in the form of CMS

## Characteristic and Key figures

	2021	2020	2019	2018
<b>Bagasse sent to Terragen (T)</b>	250 K	254K	318K	252K
<b>Steam received (T)</b>	321 K	287K	397K	346K
<b>Electricity obtained (kWh)</b>	21.1 M	22.6M	25.9M	22.8M

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# Waste Segregation

- ❖ Plastic, oil & grease and scrap metal are sent for recycling at approved recyclers
- ❖ Recently started the collection of PET bottles to be sent for recycling

## Characteristic and Key figures

Some recycling figures for 2021:

- Plastic – 6.4 T
- Used Oil – 2.8 T
- Organic Waste – 330 T



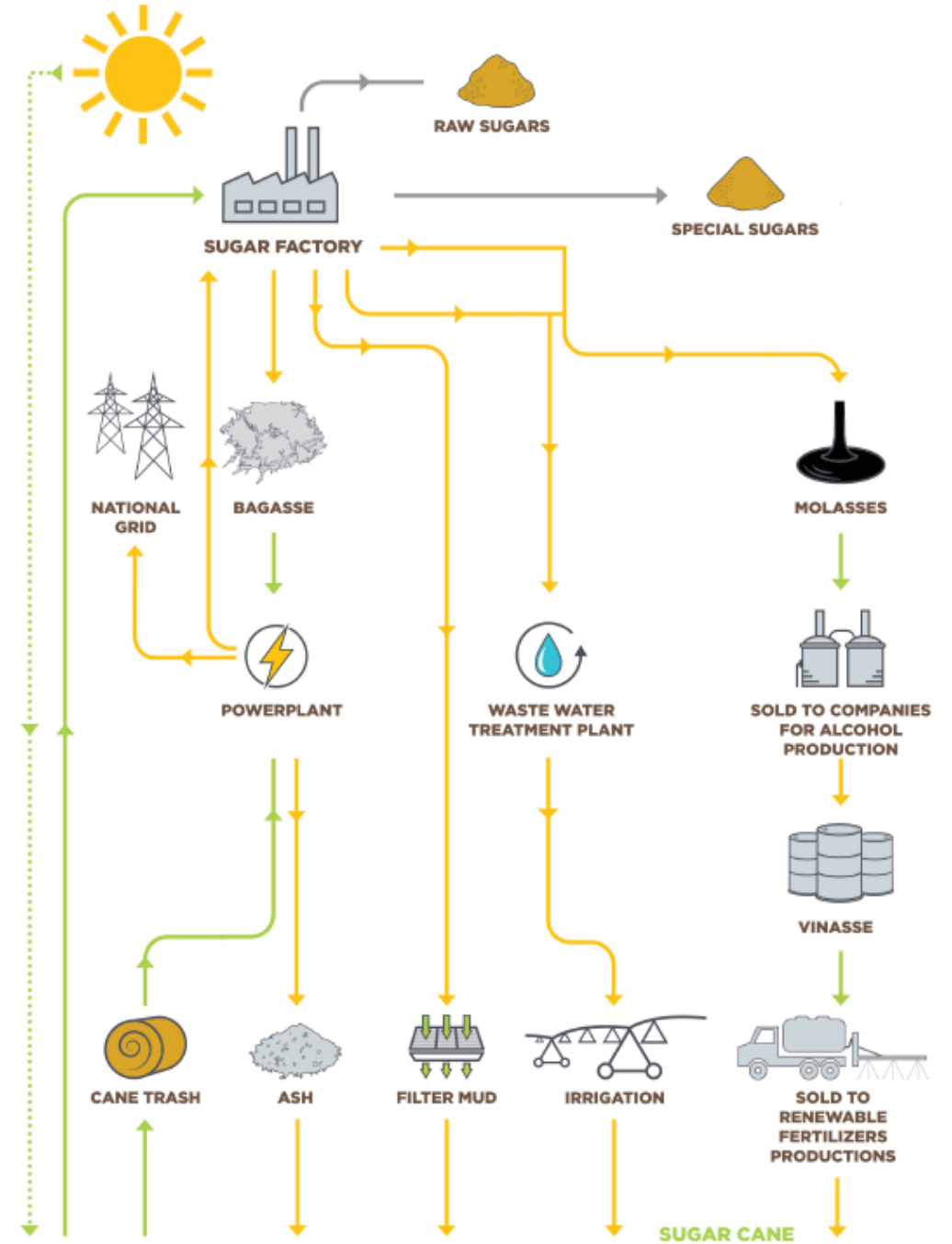
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Vision in Motion



# Sustainability at a Glance



# Managing production input parameters and environmental impacts within the agricultural activities





# Managing production input parameters and environmental impacts within the agricultural activities

1. 100% green cane harvesting policy, no more burning of sugar cane fields resulting in:
  - Improved biomass, organic matters enriching our soils
  - Reduced herbicide treatments
  - Reduced erosion
  - Full trash blanketing through green mechanical harvesting for soil protection.
2. Precision agriculture in cane growing resulting in 20% increase in equipment productivity and reduction of cane stool damage.
3. Burying of fertilizers, resulting in:
  - Elimination of nitrogen losses by volatilisation
  - Elimination of run-off to streams/rivers/lagoon
  - Improved cane yields

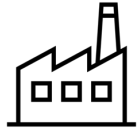


## Managing production input parameters and environmental impacts within the agricultural activities

4. Adoption of the Bonsucro threshold for herbicide application (< 5 kg of active ingredient per hectare of land) to minimise air, water and soil contamination
5. Exploring regenerative agricultural practices for improving soil health and potential of carbon offsetting.
6. Alteo Agri Ltd (3,000 ha of Beau Champ Section Area) is Bonsucro certified

Managing production input parameters and environmental impacts within the milling activities





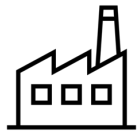
# Managing production input parameters and environmental impacts within the milling activities

## 1. Circularity

- Application of circularity principle for all major waste:
  - Bagasse and cane trash are used for renewable energy production [current production: 100GWh]
  - Effluents from the mill are reused for irrigation Alteo own sugarcane fields
  - Molasses are sold for alcohol production and onward production of liquid fertilisers
  - Filter mud and bagasse ash are re-applied in sugarcane fields for soil enrichment – 24T/ha
- A dedicated waste management system onsite for a proper management of all other waste (plastic, scrap metals, cartons, paper, hazardous waste etc..).

## 2. Effluent Management

- Monitoring of effluent parameters and volume for improving quality of effluents
- Wastewater treatment plant onsite (treatment capacity of 50m<sup>3</sup>/day)
- All effluents are used for irrigation of sugarcane fields



## Managing production input parameters and environmental impacts within the milling activities

4. Alteo Milling Ltd is Bonsucro certified
5. Carbon emission calculations for monitoring carbon footprint (Scope 1 & 2 only)
6. Monitoring of sustainability KPIs for the milling activities on a quarterly basis (water, energy, waste, effluent amongst others)



## **Helios Beau Champ Ltd Photovoltaic Farm**

- 9 MW Photovoltaic farm on 14 Ha of marginal land in Beau Champ
- Commissioned in December 2018
- Yearly production of some 16 GWh of electricity exported to the national grid

# Food Safety & Quality



# Food safety & quality certificates

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1. Brand Reputation Compliance Global Standards (BRCGS)
  - Scope of certification: From reception of intermediate products such as masecuite, syrup, and molasses, to manufacturing of sugar and dispatch.
  - Current certificate status: Grade AA
  - Internal audits: Unannounced
2. Vegan certification
  - Certification: BeVeg International BeVeg Vegan
  - Implementation of standard in progress
  - To be audited in 2022

## Improvements made at at 2022

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1. Replacement of mild steel vessels such as vacuum pans and pipings with stainless steel and lining of crystallisers and receivers with stainless steel
2. Installation of additional sets of magnets with a magnet management system
3. Replacement of some magnets by higher performance ones
4. Installation of a syrup filtration unit
5. Shifting of production of dry sugars to ex-Alteo Refinery Ltd which is fully equipped with stainless steel equipment and conditioning silos



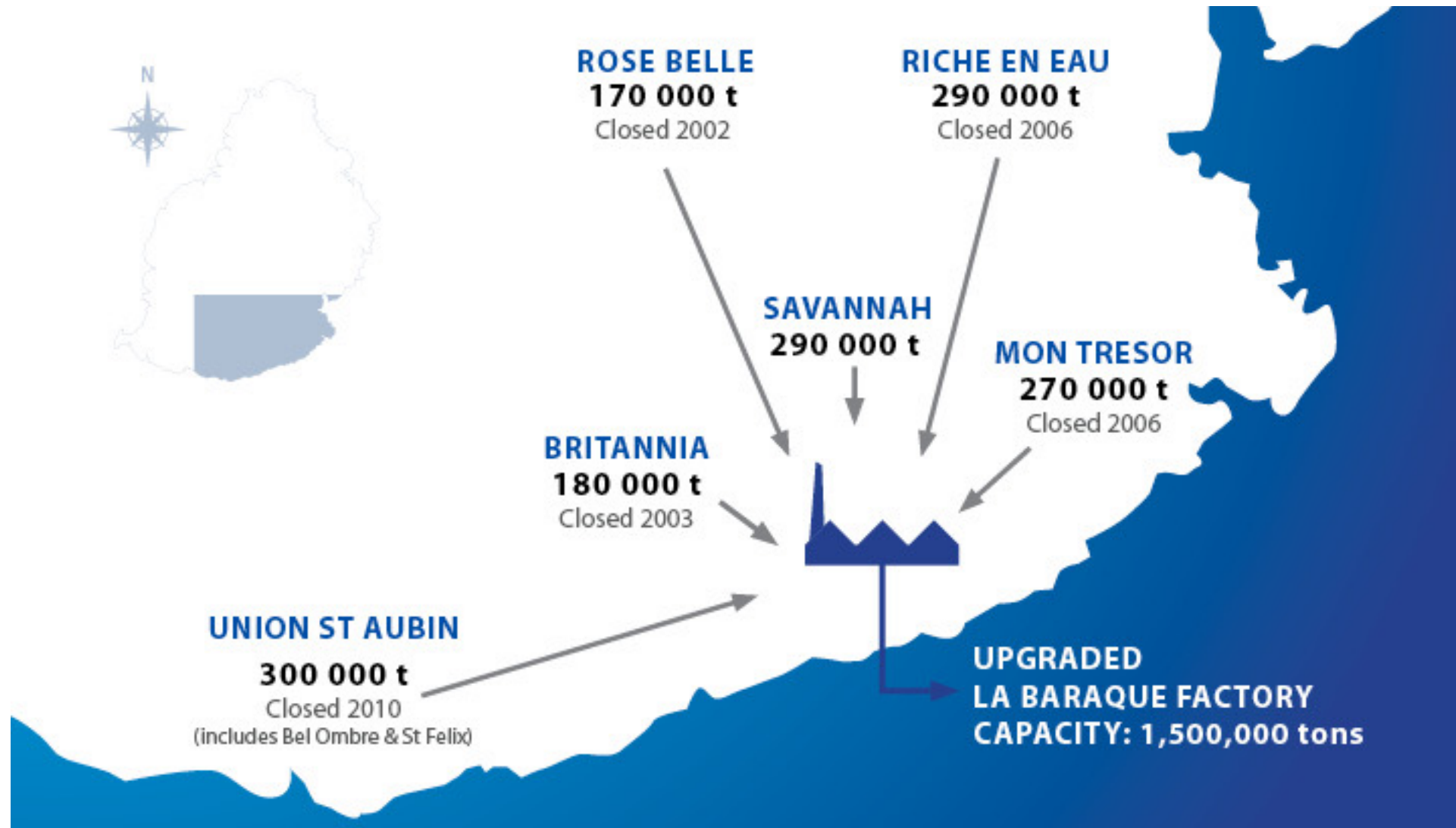
omnicane

*Integrating Energies*



## La Baraque Integrated Cane Cluster

# Centralisation of Milling Operations to La Baraque



# Our Fully Integrated Flexi-factory Complex





## Key Benefits from Circular Economy

- ✓ Reduced cost of production through less wastage and more efficient use of resources.
  - 1 tonne of sugar produces 1.1 MWh of renewable electricity
- ✓ Develop new products and attract new customers.
- ✓ Build loyalty with customers.
- ✓ Exceed Government Regulations and stay ahead of new requirements.
- ✓ Reinforce brand and reputation as an innovative organisation.
- ✓ Attract, retain and engage employees.