

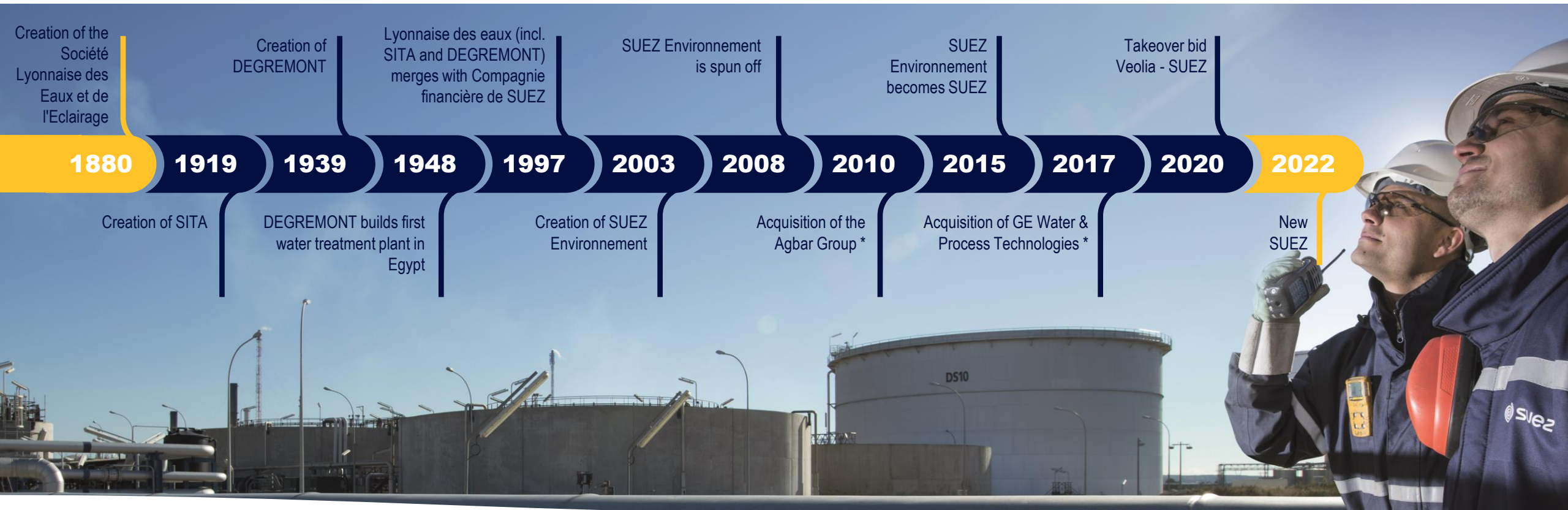
INTRODUCTION TO BIOCHAR IMPACT ON SOIL/WATER PRESERVATION



Biocitech, 11 mars 2025

Dominique HELAINE (Carbon Solutions Director)

2022: A NEW CHAPTER IN THE HISTORY OF SUEZ BEGINS



* Assets were sold in 2022 before the new SUEZ .

SUEZ has a diversified portfolio of activities globally to support our stakeholders

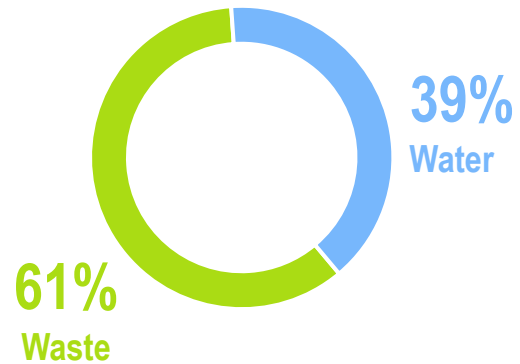
A TRUSTED PARTNERS IN WATER & WASTE

160+
years of history

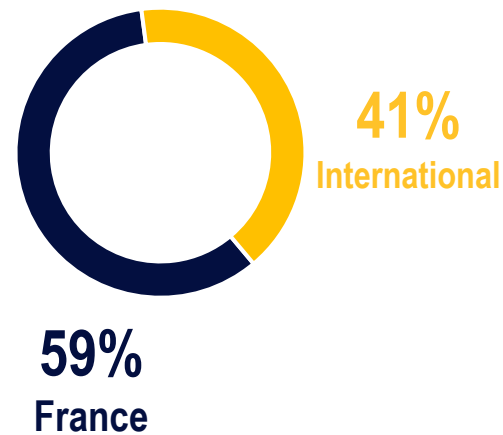
40,000
employees

€8.9b
revenue 2023

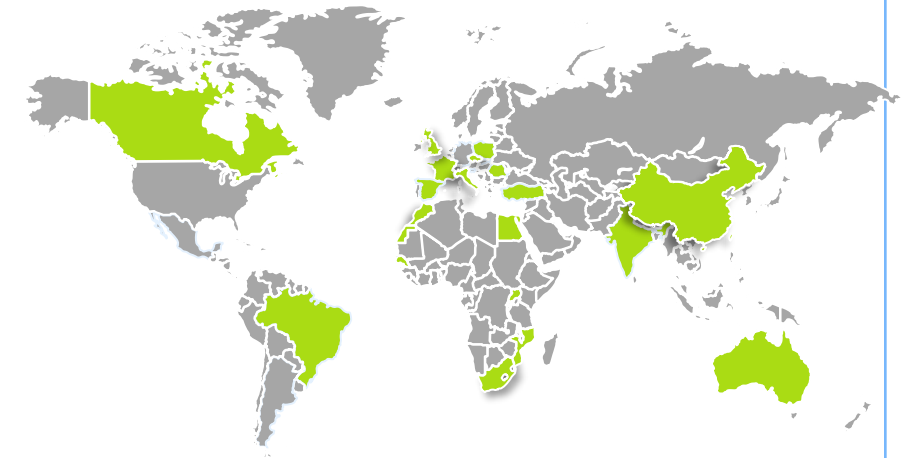
BUSINESS MIX



GEOGRAPHICAL MIX



40
countries with operations



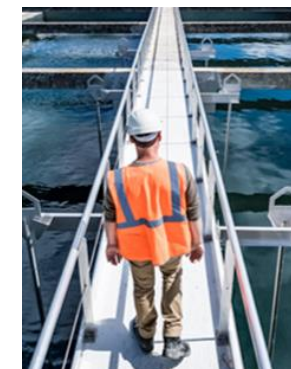
57 million
people supplied by SUEZ
with drinking water



6.4 million tons
of CO_{2eq} avoided
through Energy-from-Waste
and material recovery



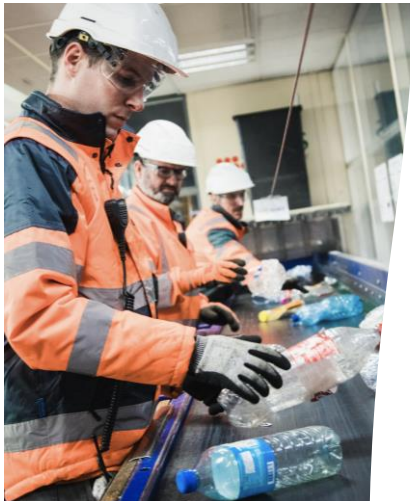
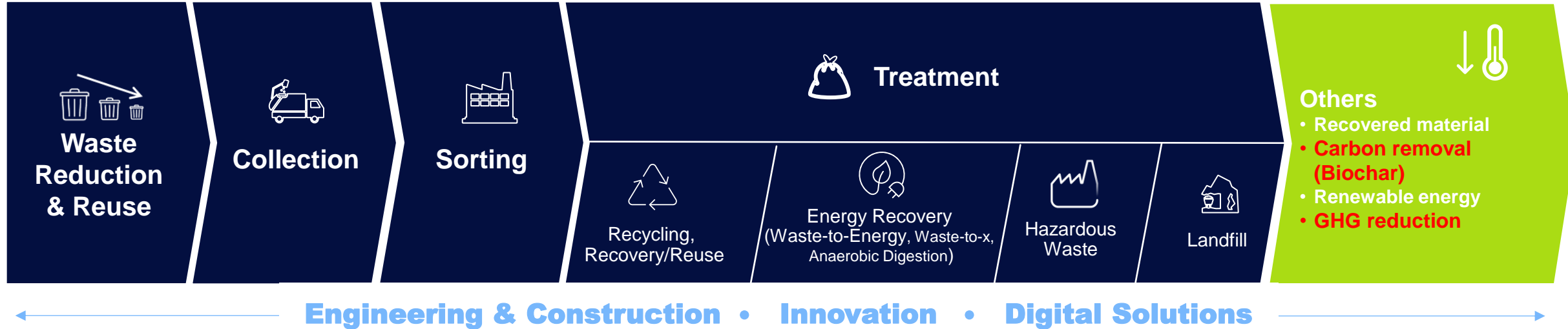
7.7 TWh of energy
produced from waste
and wastewater



36 million people with
access to sanitation
services provided by SUEZ

WASTE MANAGEMENT: WHAT WE DO?

WE MANAGE THE ENTIRE WASTE VALUE CHAIN



CITIES AND COMMUNITIES

- Collection and logistics
- Sorting and pre-treatment
- Recycling, recovery and selling
- Urban sanitation and property upkeep
- Consulting and engineering
- Digital solutions
- Monitoring

BUSINESSES

- Collection & logistics recycling, recovery and sale of secondary resources
- Consulting and engineering
- Digital solutions

CONSUMERS

- Connected waste management
- Environmental initiatives
- Container rental
- Waste online tracking platforms
- Smart waste meter
- Environmental education and support

BIOCHAR, TRANSFORMING BIOMASS INTO CARBON SINKS AND SOIL AMENDMENTS

PORT-CARTIER, QUÉBEC, CANADA

- In 2023, SUEZ joined forces with Airex Energy and Groupe Rémabec to create Canada's first industrial biochar production plant in Port-Cartier, Québec.
- By transforming **forest and agricultural residues into carbon sinks and soil amendment**, the facility will produce a carbon-rich biochar with high environmental qualities from the residual biomass of Groupe Rémabec's operations.
- It will leverage Airex Energy's innovative CarbonFX™ pyrolysis technology and SUEZ's expertise in the transformation and valorisation of organic waste, agricultural soil enhancement, biofertilizers, and new resources from the circular economy.
- Biochar is a material with highly promising environmental benefits, identified by the UN IPCC as one of five negative-emission solutions to curb global warming and help achieve the carbon-neutral targets set by the Paris agreements.

10 000

tons/year of initial production capacity (1st phase) in 2025, which will be tripled by 2026

75 000

tons of carbon (CO₂) sequestered per year

350 000

tons/year of if biochar will be produced by 2035



RECYCLE AND RECOVER YOUR WASTE

Transform your waste into new resources



1

First biochar plant in Canada & will become the largest in North America



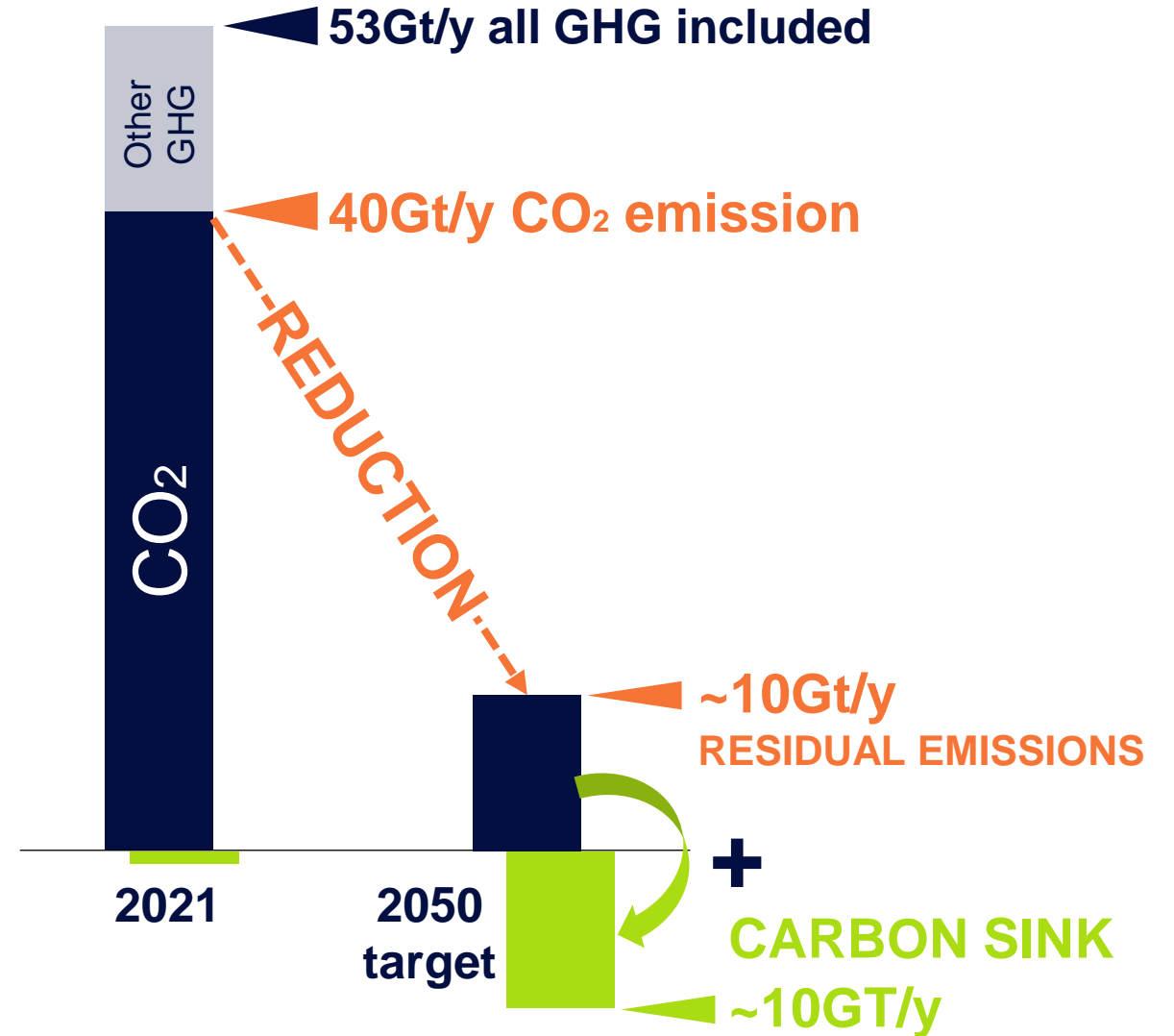
Why biochar ?

CLIMATE CHANGE MITIGATION ... needs CARBON REMOVAL SOLUTIONS

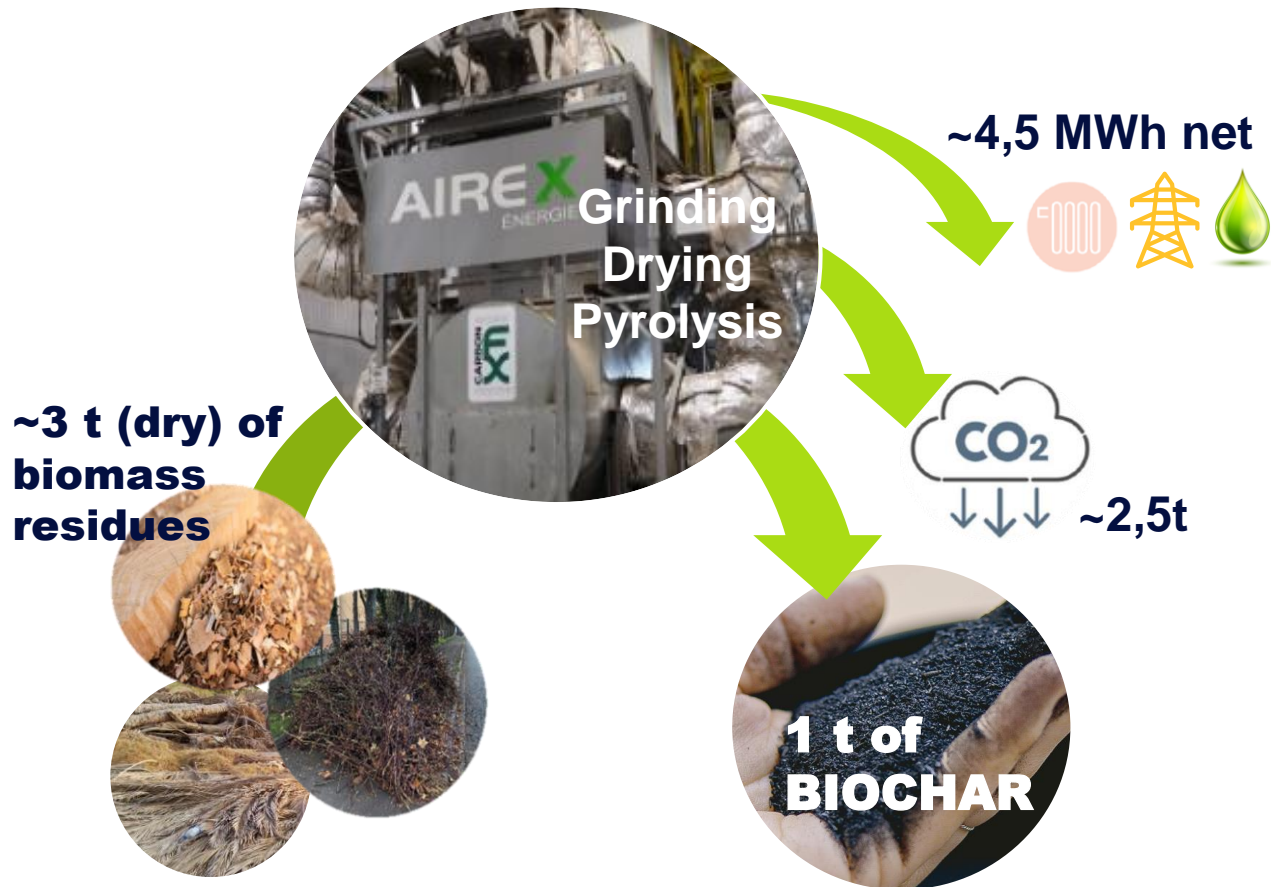
PARIS AGREEMENT OBJECTIVES:

- **Reduce** dramatically CO₂ emissions at worldlevel
- Deploy and operate 10Gt/y of **CO₂ removal capacity** by 2050

+ favoring solutions creating **value** and **co-benefits** for the society at large

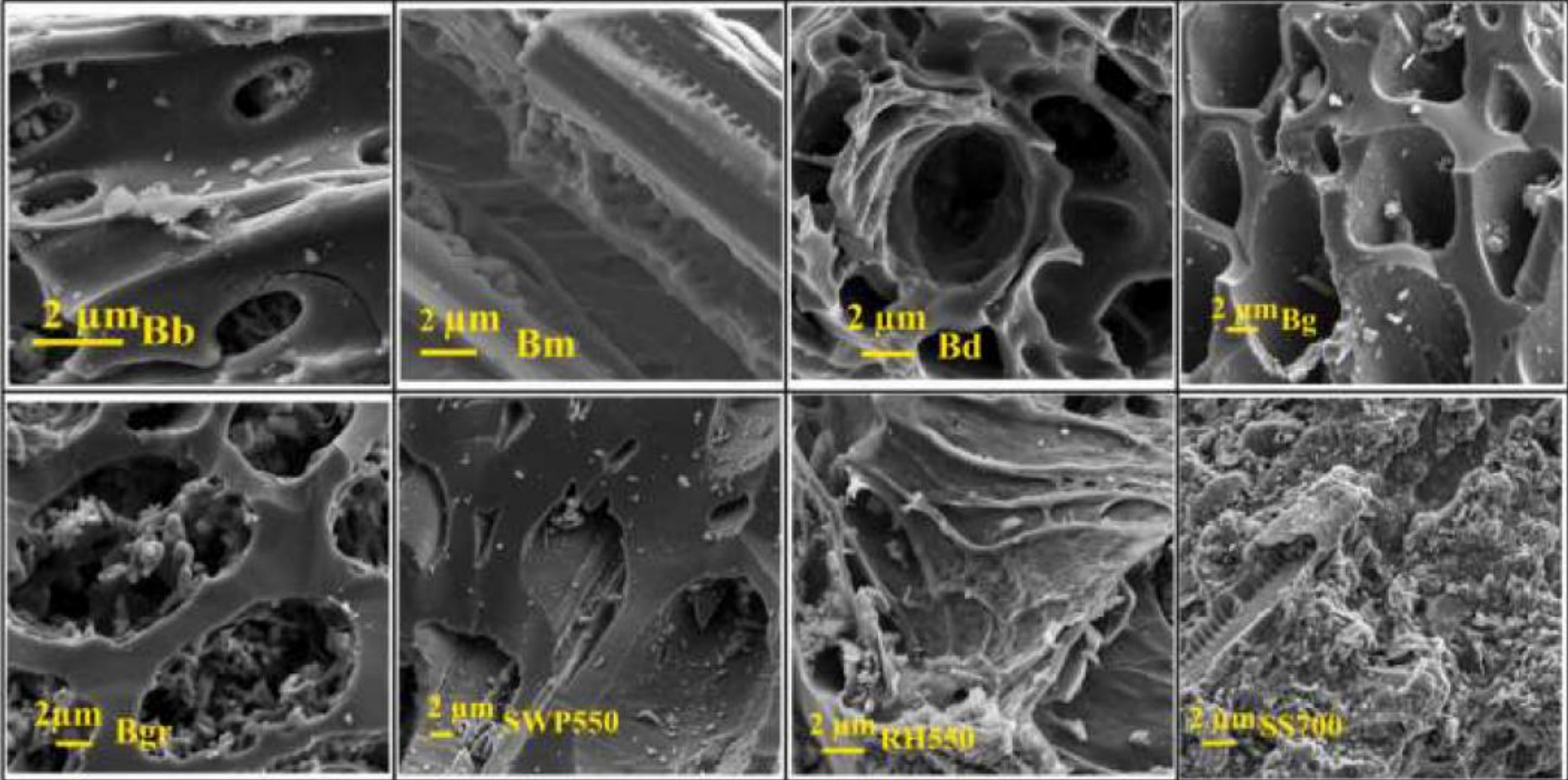


BIOCHAR, one of the most relevant solution to remove carbon and generate valuable co-benefits for users



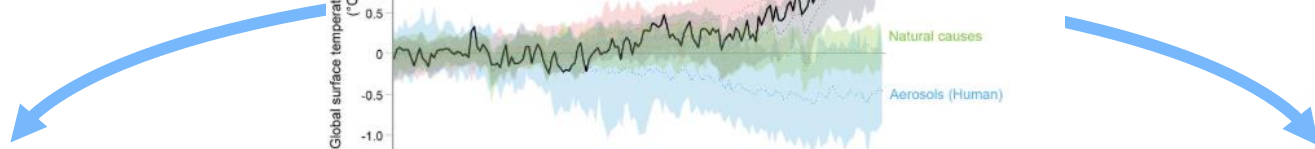
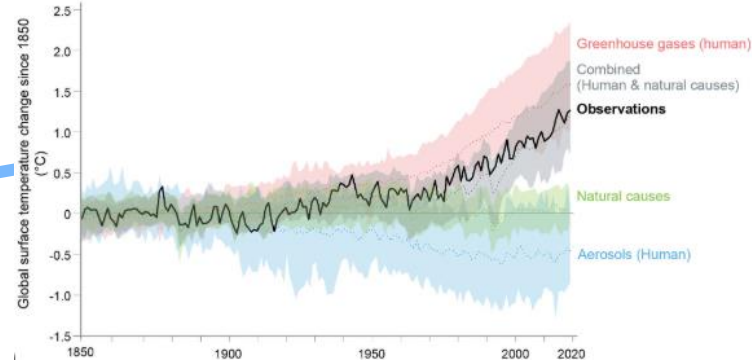
- A relevant answer to key-goals for our clients
- **Market demand** to grow permanent carbon sink capacity up to 10 GT CO₂/y by 2050
- **Compliance with new EU RED.III** prioritizing biomass to become carbon sink or long-lasting materials ahead energy
- Biochar recognized as one of the most efficient carbon removal solution and generates also **green energy** as a co-product : carbon credits leverages biochar to **become competitive** for end-users
- Urgent need to **restore a sustaining health of urban and rural soils** as the main path for feeding the world, adapting soils to Climate change and capturing CO₂ from the atmosphere through photosynthesis

Influence of input feedstock on porosity distribution



Focus on water stress

CLIMATE CHANGE



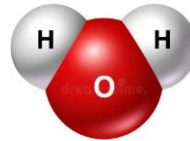
Yield/Quality reduction

Heat islands



Soil degradation

Plant vulnerability



Natural resource depletion

Rainfall and wastewater management

Sponge city / Renaturation





Which applications ?

BIOCHAR, a wide application potential

- A meaningful path for decarbonizing our clients in :
- Using **BIOCHAR** as a carbon removal agent in “conservative” applications
- Using **BIOCARBON** as a carbon neutral material in “non-conservative” applications (metal industries)

BIOCHAR (including carbon credits)

BIOCARBON

Conventional SUEZ's value chain



Outside SUEZ's value chain



Critical industries



Main action principles associated to biochar

Effet
immédiat



Effet moyen
terme

Augmente la capacité de **réten**tion d'eau d'un sol

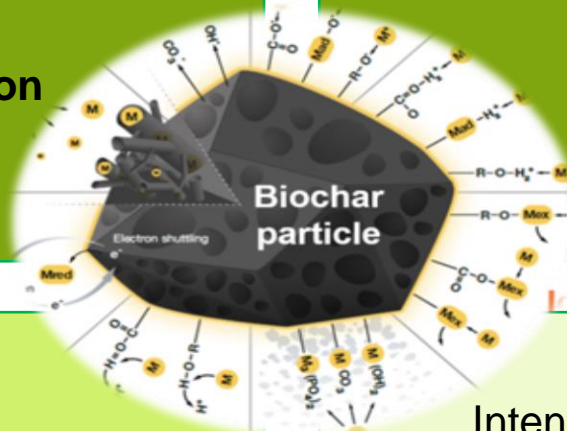
Environnement favorable à l'**activité microbienne**

Augmente la **disponibilité** des nutriments, réduit leur lixiviation / volatilisation

Restaure la **fertilité** des sols

Fixe les **polluants** (métaux, organiques, ...)

Séquestration carbone



Tampon pH

Augmente la **taille des racines**

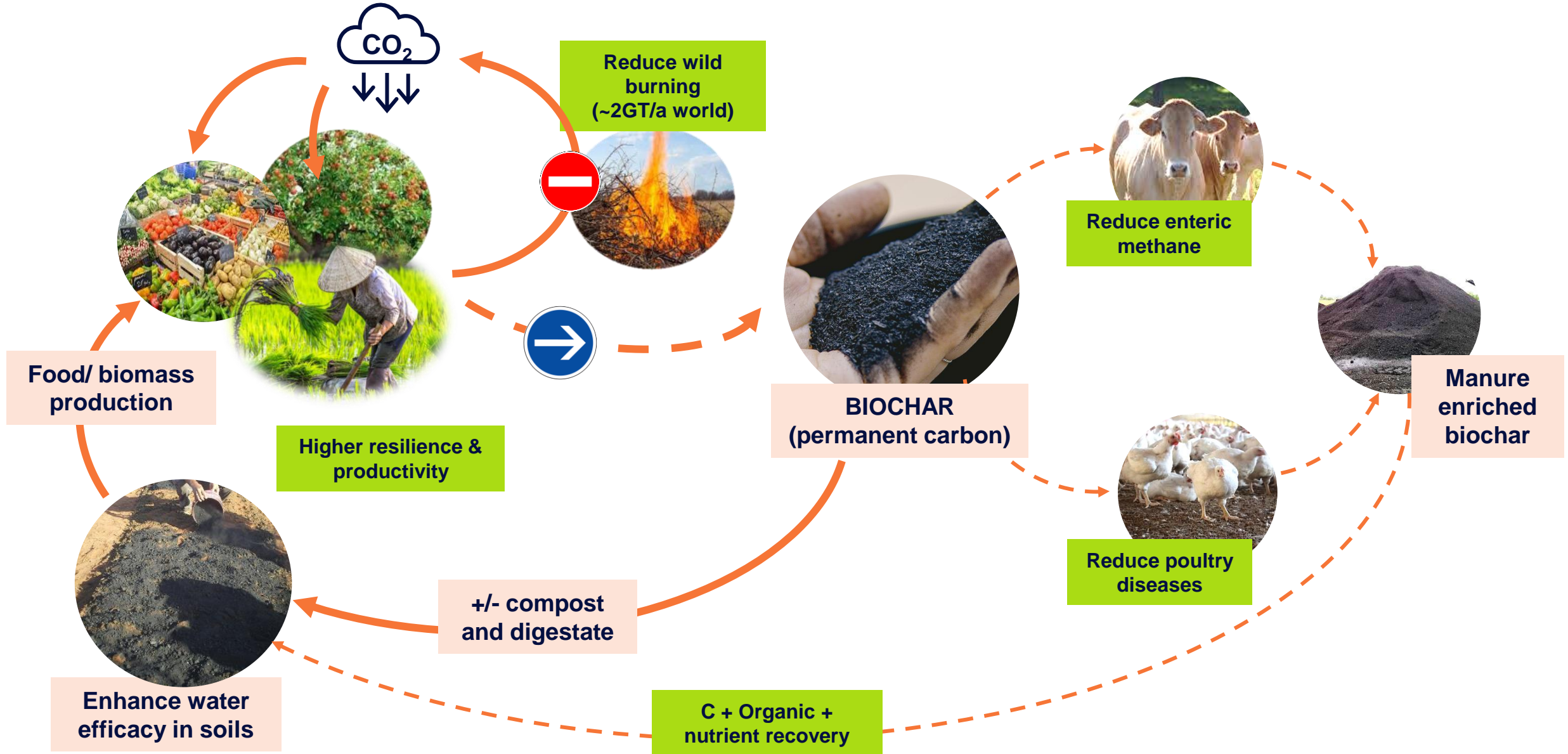
Aération du sol

Améliore la photosynthèse

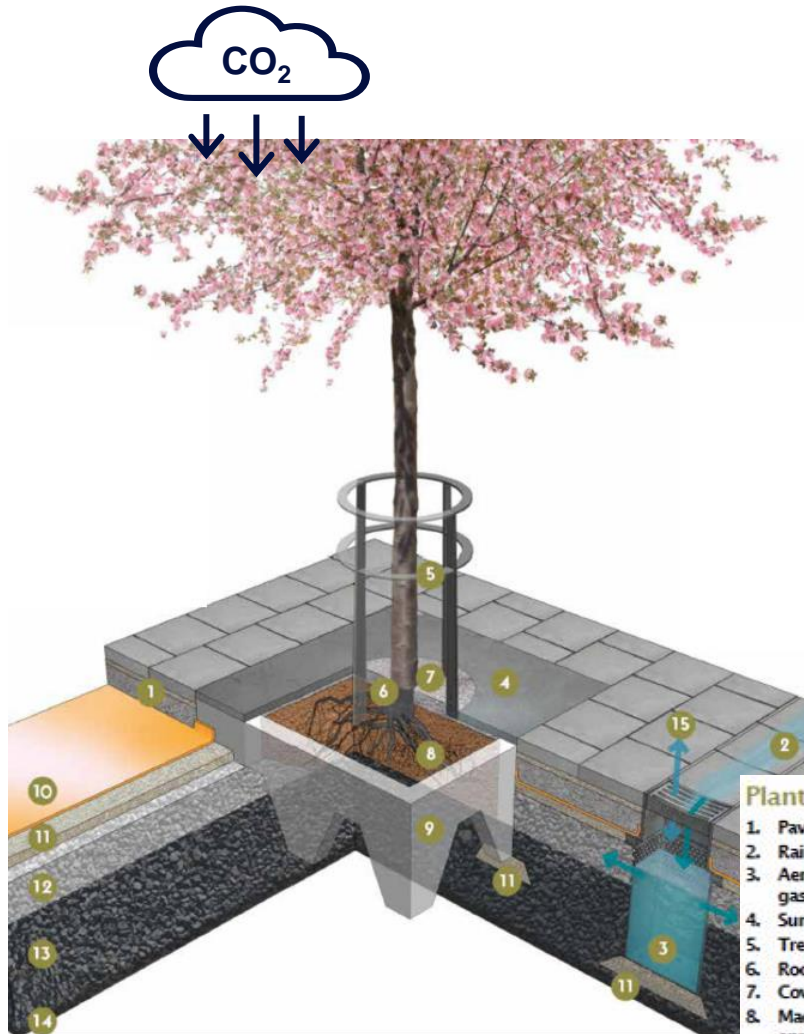
Intensifie la minéralisation du carbone dans les sols

Augmente le **rendement biomasse** & la santé des sols

Example : Food production & Soil regeneration



Example : Biochar and Water cycle in cities

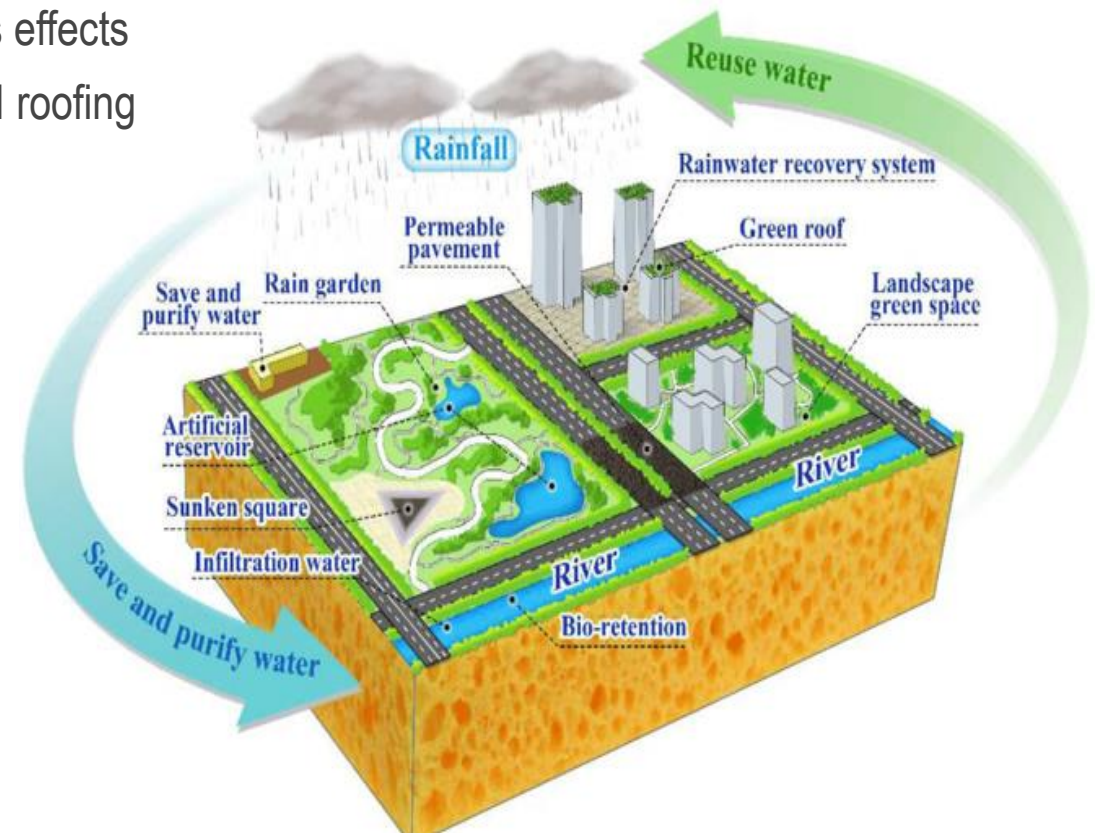


Plant bed with biochar macadam

1. Pavement with superstructure
2. Rainwater gutter
3. Aeration well for infiltration of stormwater and gas exchange of oxygen and carbon dioxide
4. Surface grate
5. Tree support
6. Root collar at the same level as in nursery
7. Cover material, macadam 4/8 mm
8. Macadam 2/6mm + 25% by volume nutrient enriched biochar and compost (50/50)
9. Tree pit foundations in concrete
10. Geotextile
11. Leveling stones, macadam 8 / 11mm
12. Aerated carrier, macadam 32 / 63mm
13. Biochar macadam, macadam 32/90 mm + 15% by volume of nutritionally enriched biochar and compost (50/50)
14. Biochar layer
15. Gas flow (carbon dioxide, oxygen)

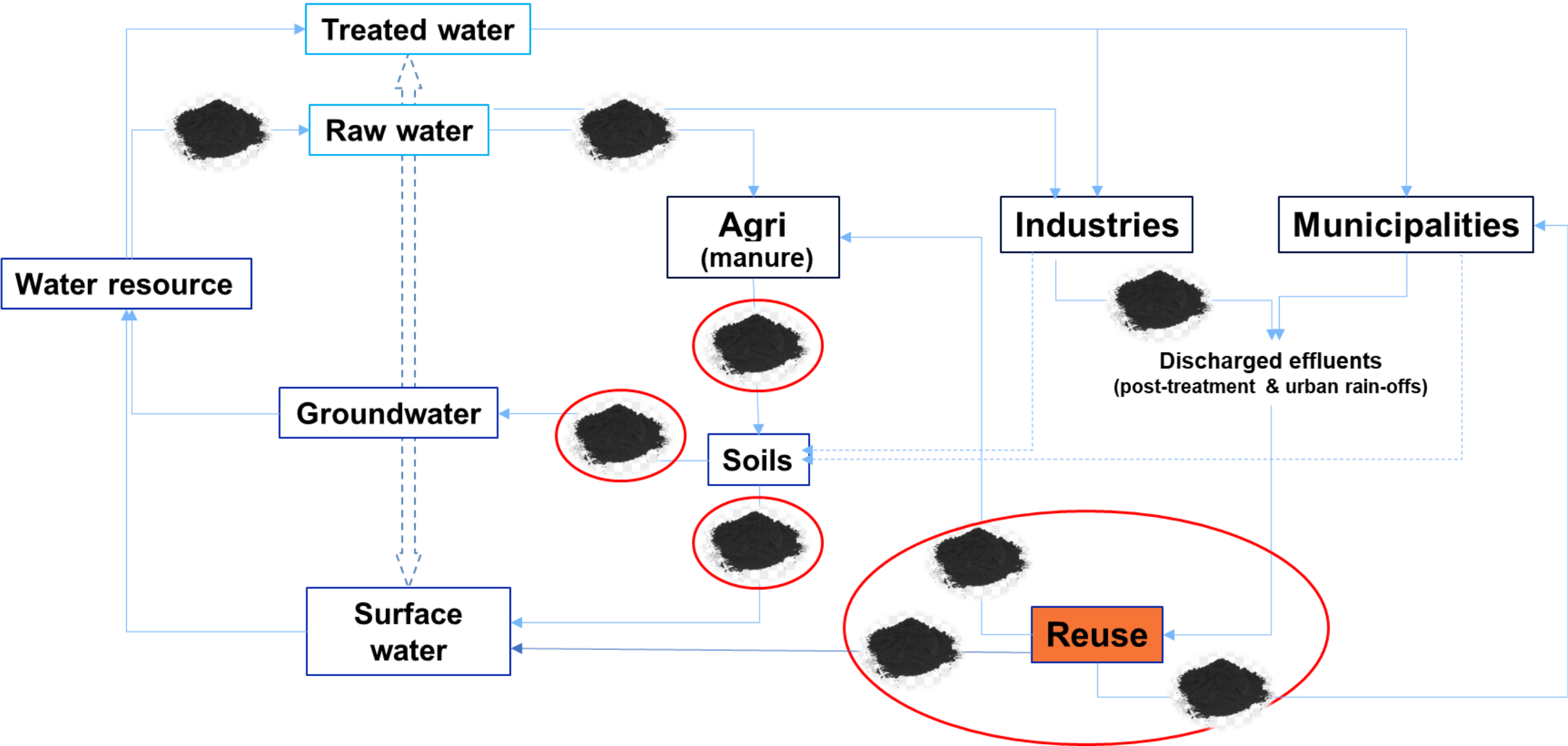
Adapting cities to Climate Change needs :

- Enhance renaturation including non-suitable areas
- Increase carbon capture within territories
- Manage rainfalls (quantity & quality) and reduce non-permeable surfaces
- Increase porosity and sponge capacity
- Reduce heat islands effects
- Promote vegetalized roofing
- ...



Source : https://www.biochar.info/docs/urban/Planting_beds_in_Stockholm_2017.pdf

As a summary, potential impacts of Biochar on Water cycle





CREATING CYCLES. FOR LIFE.

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