

Stockholm Biochar Project

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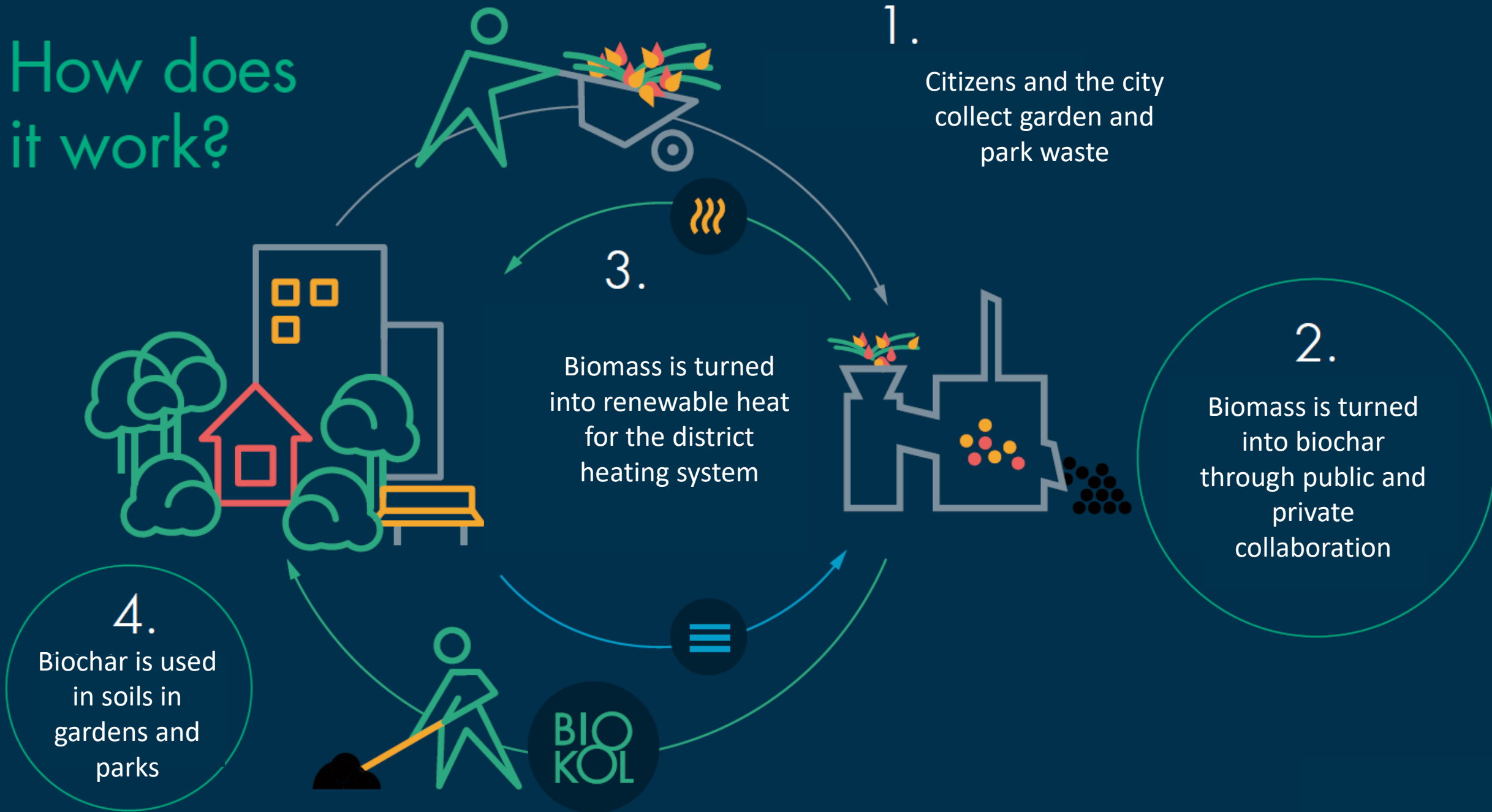
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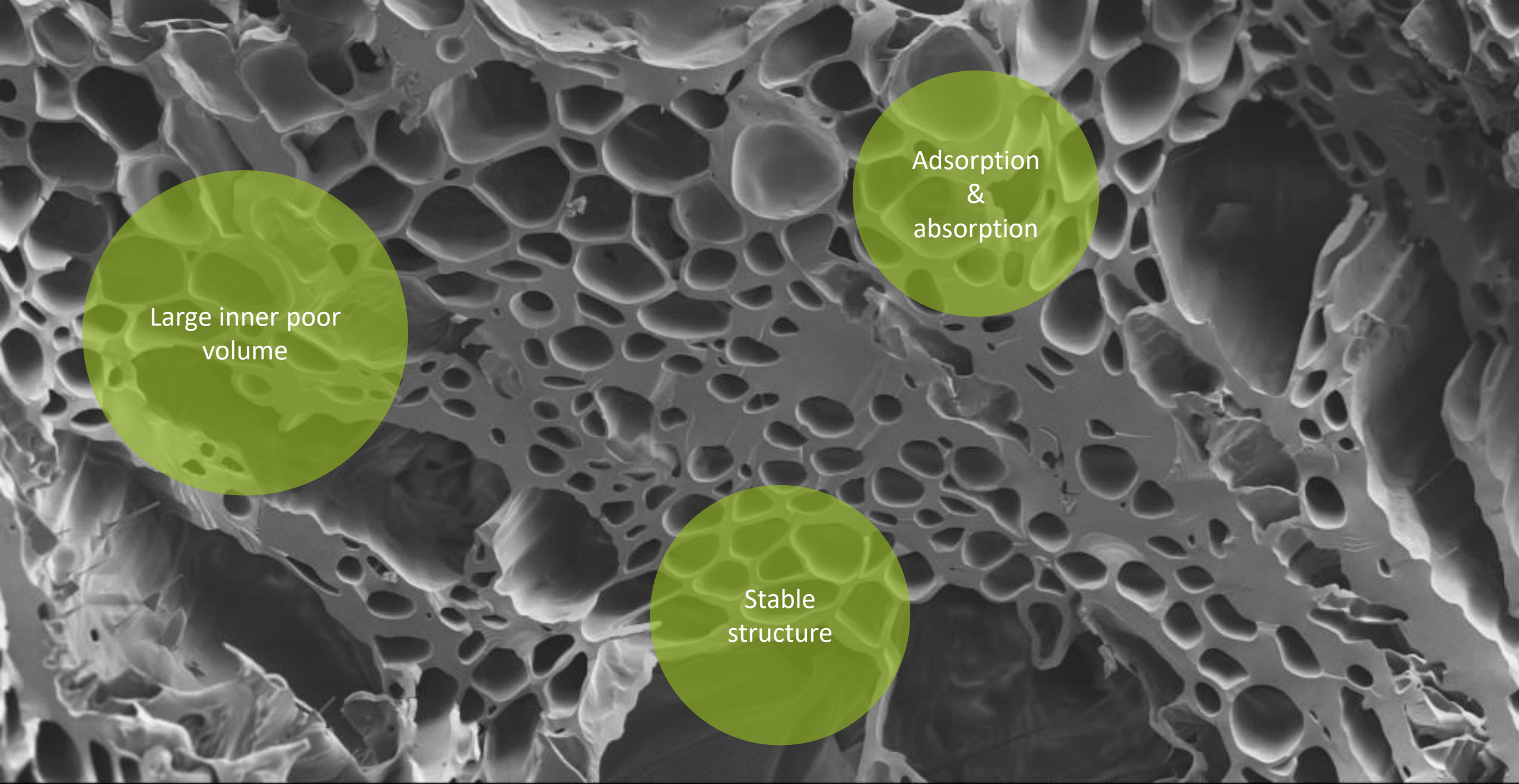
Winning Mayors Challenge

- Innovation competition for cities
- Bloomberg Philanthropies founder and financier
- 155 participating cities in Europe in 2014
- Project support and collaboration for 3 years

How does it work?



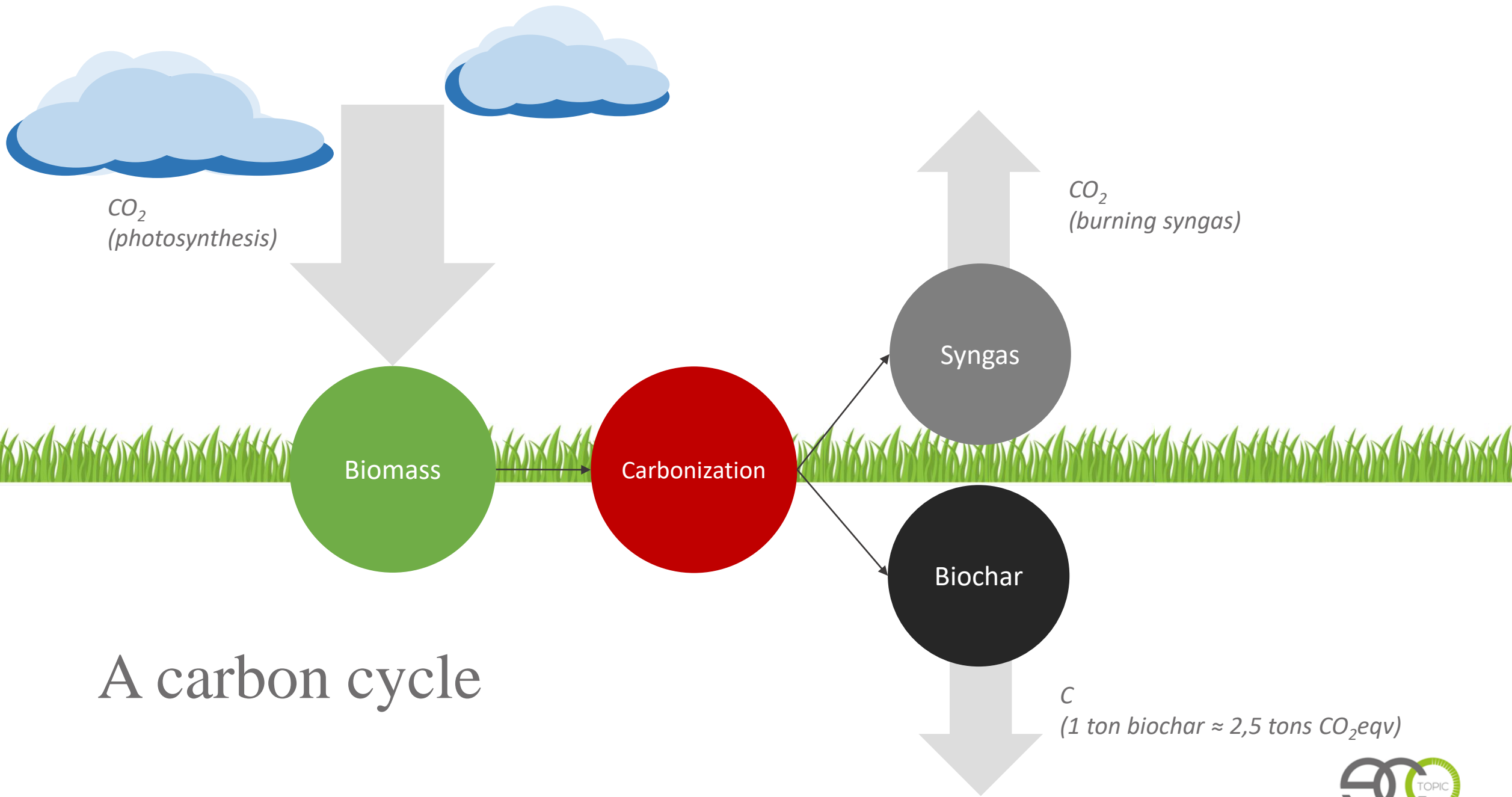




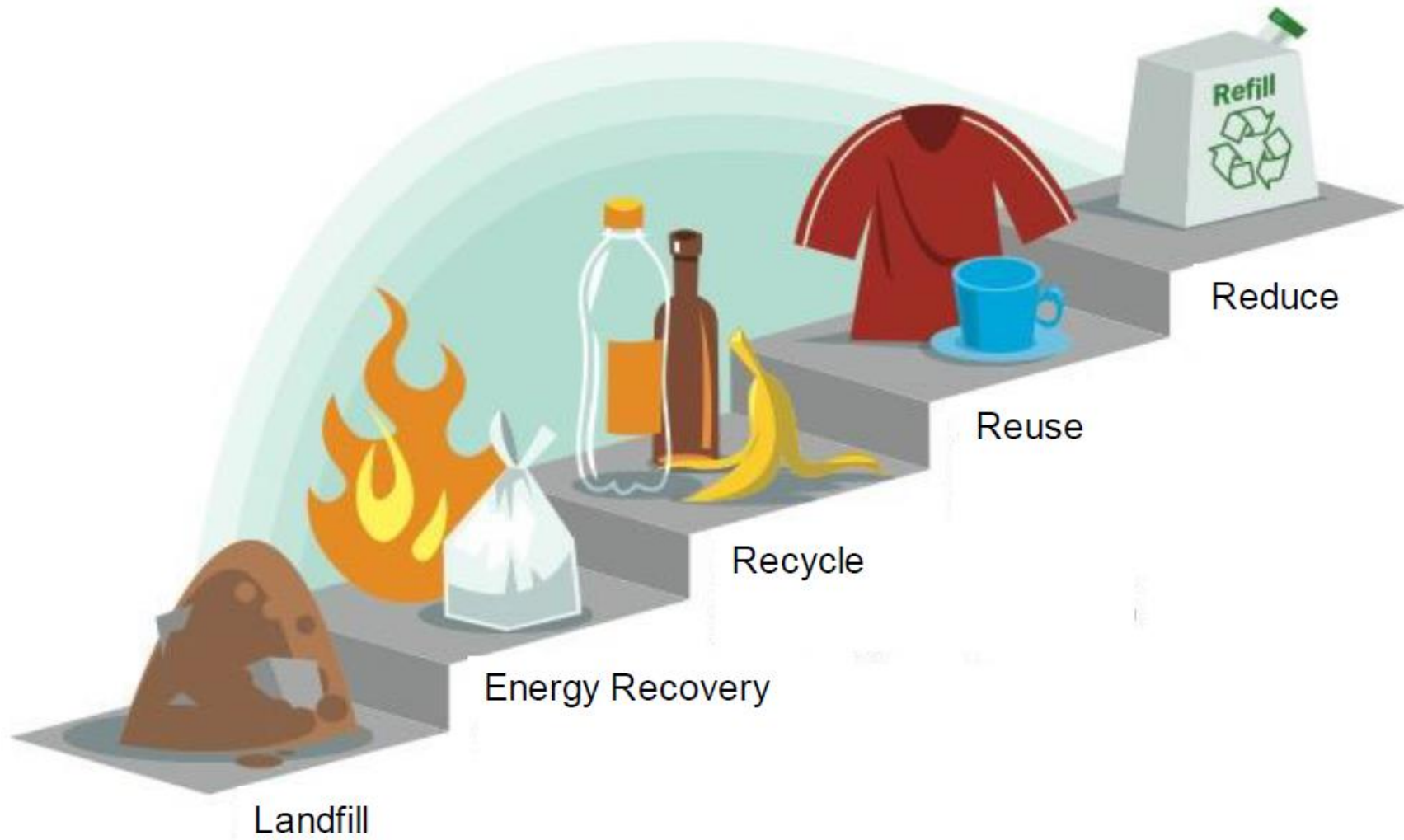
Large inner pore
volume

Adsorption
&
absorption

Stable
structure



A carbon cycle





Pilot plant

Renewable heat to 80 apts
Biochar corresponding to
CO₂-emissions from 700
cars

Full scale

Renewable heat to 400 apts
Biochar corresponding to
CO₂-emissions from 3500
cars



Connections

Biochar plant

Selling heat

Substituting finite resources with own biochar

Ground work

Turning waste into resource

Making biochar known

- ~2000 study visitors
- ~300 000 Stockholmers receiving direct information of the project
- 300 new urban plant beds in Stockholm with biochar every year
- 1500 Stockholmers have collected biochar (May of 2019)
- Award for best recycling facility in Sweden in 2018



Stockholm Biochar – the Experiment



- Inspiration from the Big Biochar Experiment in Oxford started by Cécile Girardin (Oxford Biochar)
- Participants: 65 (2016), 125 (2017)
- Varying results but increasing knowledge of biochar





Learnings

- Choose site based on costs
- There are only a few biochar plant suppliers
- Pre-treatment of garden waste is necessary for continuous carbonization processes
- Need of education

The urban carbon sink

Urban tree beds with structural soil and biochar



Region with 3,5 million citizens in the year of 2030



100 yrs



15 yrs



50 yrs



30 yrs



6 yrs



100 yrs



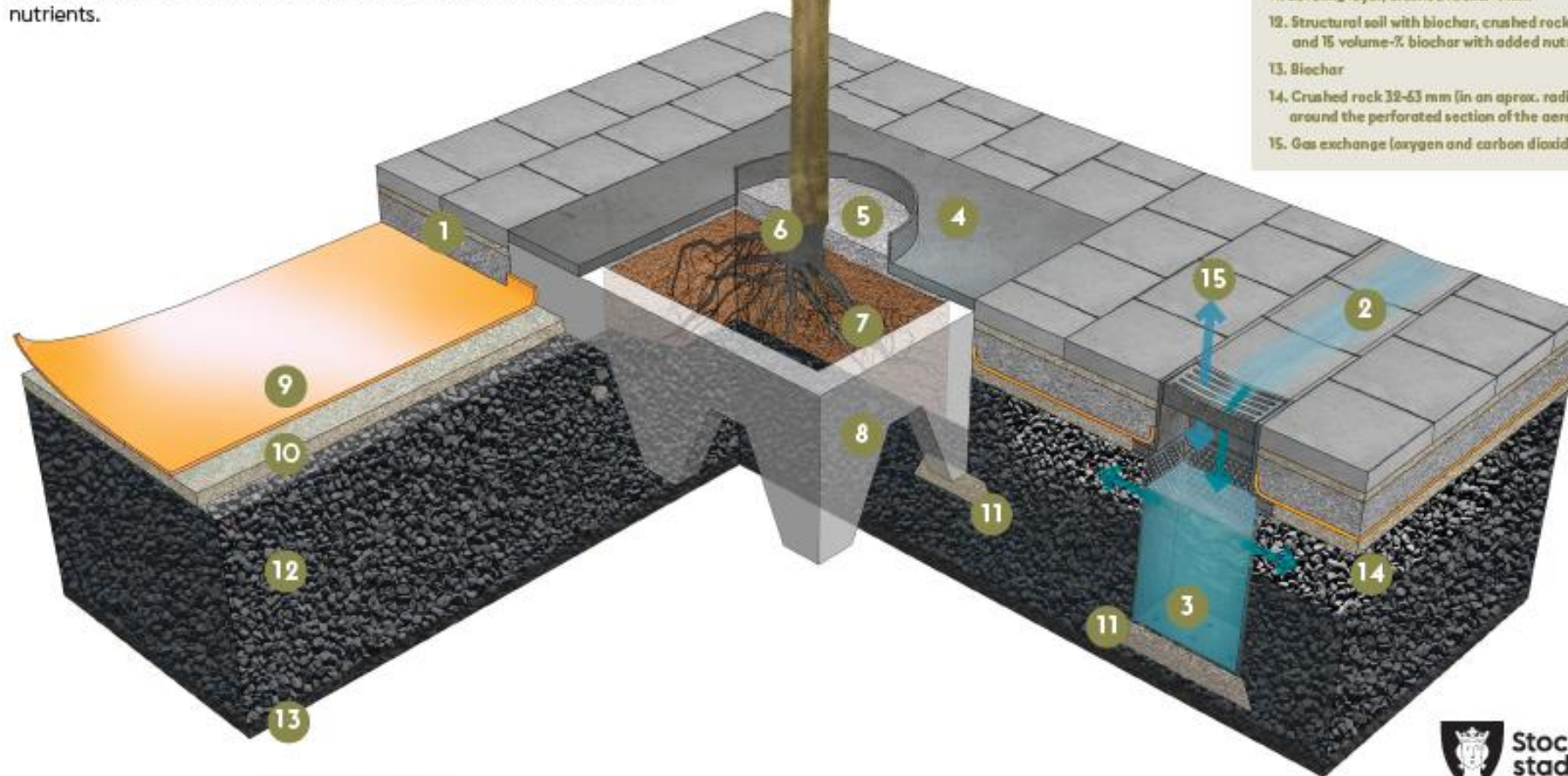
15 yrs



75 yrs

STRUCTURAL SOIL WITH BIOCHAR

The City of Stockholm have set as a goal to create sustainable and durable plant beds from locally sourced materials. Structural soils with biochar binds carbon from the atmosphere and reduces leaching of nutrients.



1. Paved surface and base course
2. Stormwater gutter
3. Aeration well: inlet for water and oxygen/carbon dioxide exchange
4. Surface grid
5. Stone mulch, crushed rock 4-8 mm
6. Root collar at nursery growing level
7. Crushed rock 4-8 mm with 25 volume-% biochar with added nutrients
8. Concrete bunker
9. Geotextile
10. Leveling layer, crushed rock 8-16 mm
11. Leveling layer, crushed rock 2-4 mm
12. Structural soil with biochar, crushed rock 32-63 mm and 15 volume-% biochar with added nutrients
13. Biochar
14. Crushed rock 32-63 mm (in an aprox. radius of 0,5 m around the perforated section of the aeration well)
15. Gas exchange (oxygen and carbon dioxide)



Nybrogatan 2015,
biochar & macadam

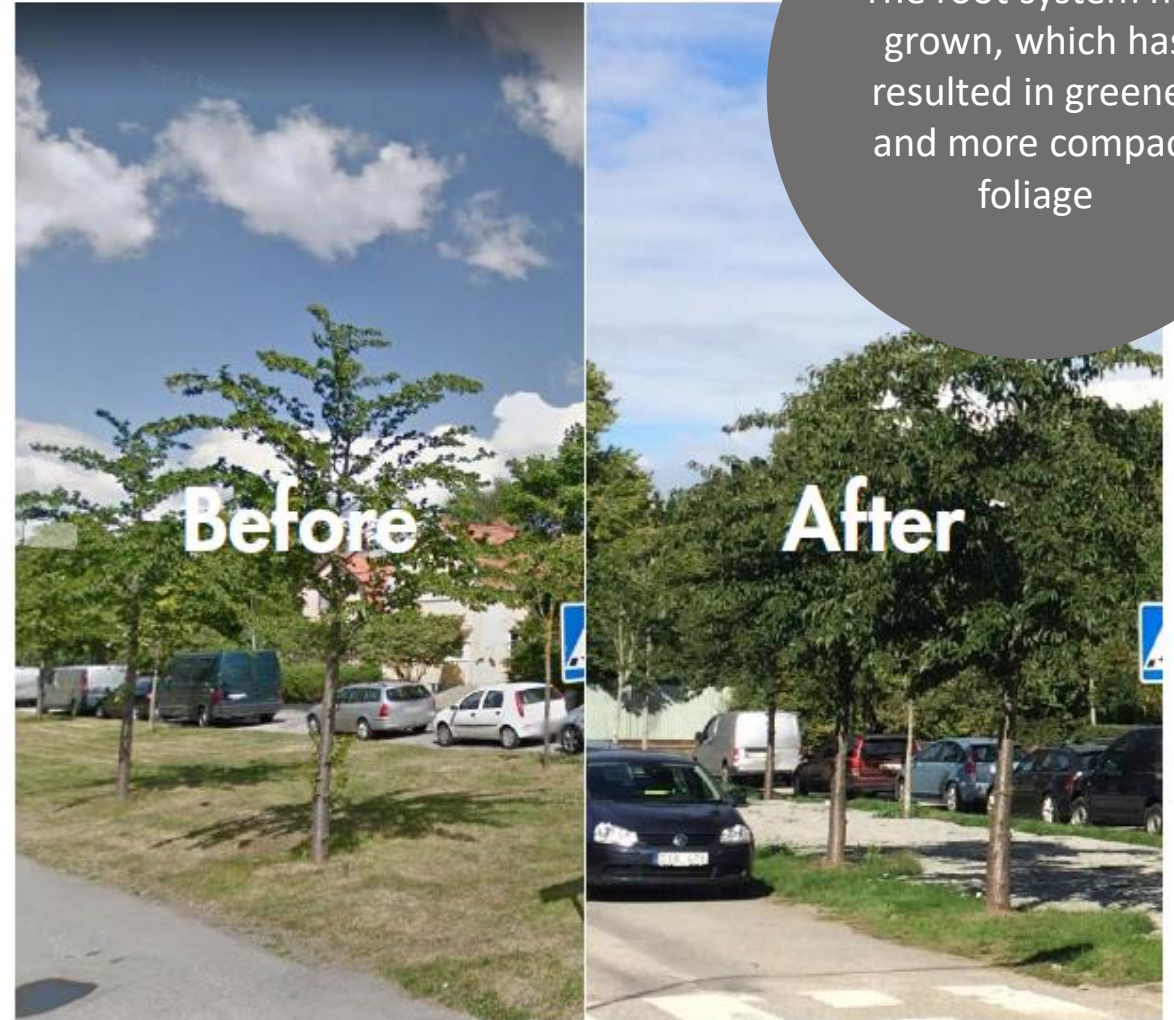


Macadam 32-63 mm
with 15% nutrient
enriched biochar



Nybrogatan
2016, magnolia

After one year with biochar



The root system has grown, which has resulted in greener and more compact foliage

Thank you for your attention!

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