



STOCKHOLM
VATTEN
OCH AVFALL

Stockholm Biochar Project

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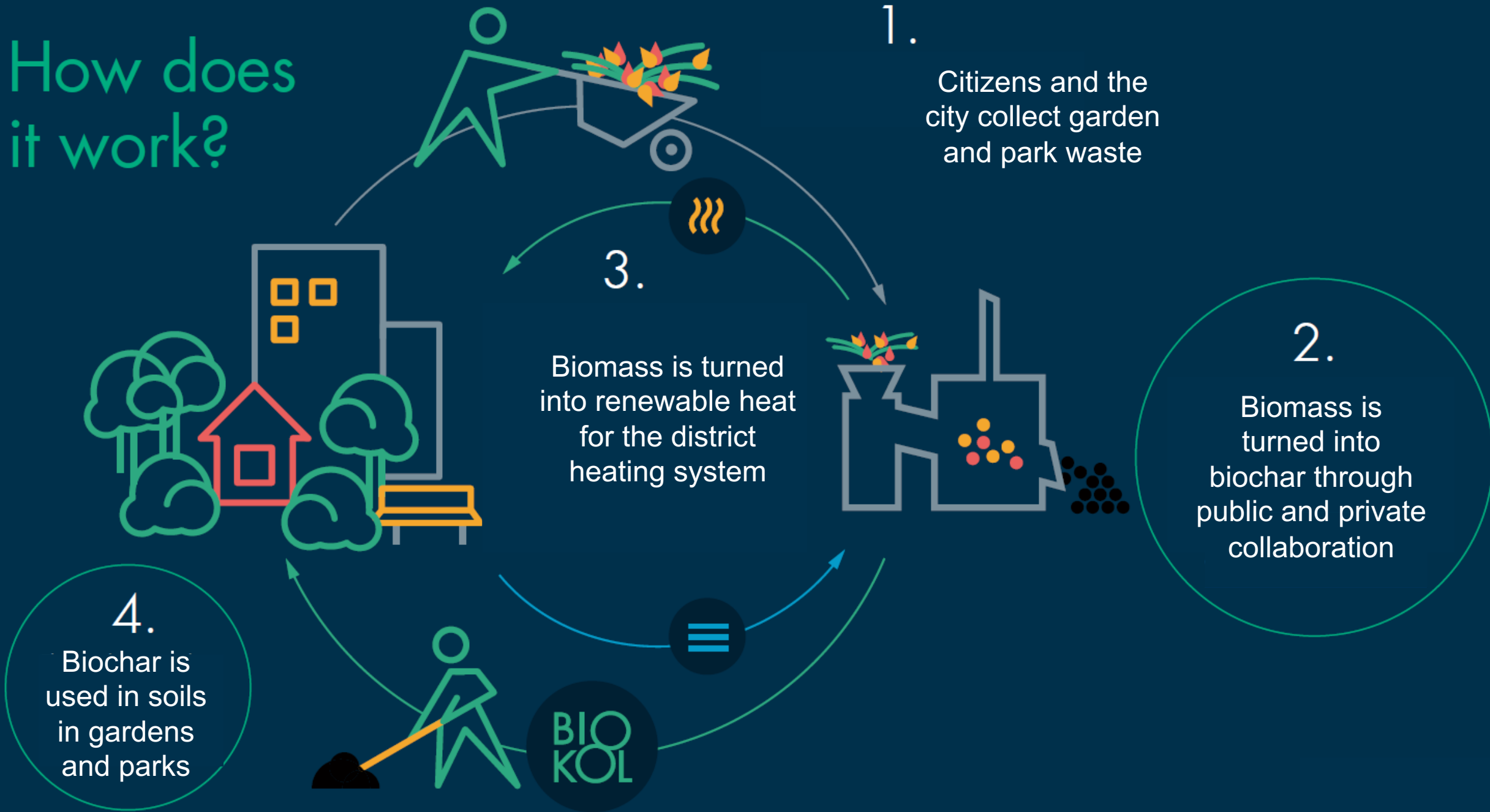


Stockholms
stad

 **Fortum**

Bloomberg
Philanthropies

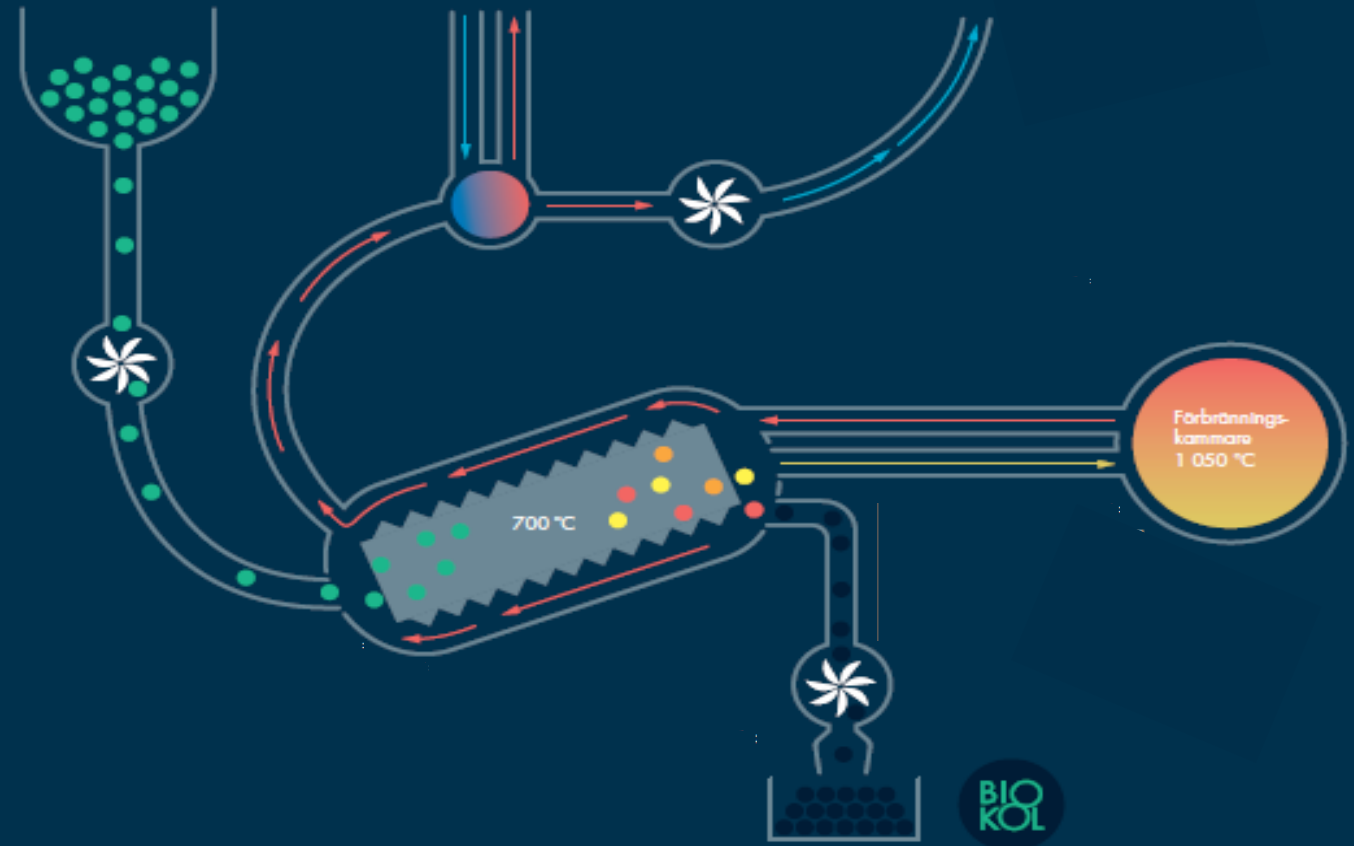
How does it work?



The technology

- Pyrolysis
 - Oxygen free environment
 - Carbonisation
- Heat
 - Pyrolysis gas
 - Low emissions
- Biochar
 - Char
 - Ash

The Stockholmer's garden waste becomes a part of the cycle



Et samarbeide mellom



Stockholm Biochar Prosjekt er en av fem vinnere av Bloomberg Philanthropies' Mayors Challenge.

Exhaust gas

Parameter	Enhet ¹⁾	Uppmätt	Villkor ²⁾	Villkor ³⁾	Villkor uppfyllt
			2017-07-01	2020-01-01	
Energieffektivitet	%	Ej kontrollerat	77	77	-
Partiklar (stoff)	mg/m ³ ntg	19	40	40	Ja
OGC	mg/m ³ ntg	< 0,09	20	20	Ja
CO	mg/m ³ ntg	4,0	500	500	Ja
NO _x	mg/m ³ ntg	378	-	200	Ja ⁴⁾

¹⁾ Alla halter avser 10 vol% O₂ i rökgaserna.

²⁾ Gällande villkor enligt Boverket.

³⁾ Kommande villkor enligt Ecodesignförordningen från Energimyndigheten.

⁴⁾ Villkor för NO_x saknas för närvarande. Kommande villkor 2020-01-01 uppfylldes ej vid mättillfället.



Pilot plant

Renewable heat to 80
apartments

Biochar corresponding to
CO₂-emissions from 700
cars

Production

Biomass 1300
tons/year

Heat 150 kW

Biochar 300 tons/year
Operation 7500 hours

Full scale

Renewable heat to 400
apartments

Biochar corresponding to
CO₂-emissions from
3500 cars



Stockholms
stad

Bridging



Biomass



Logistics



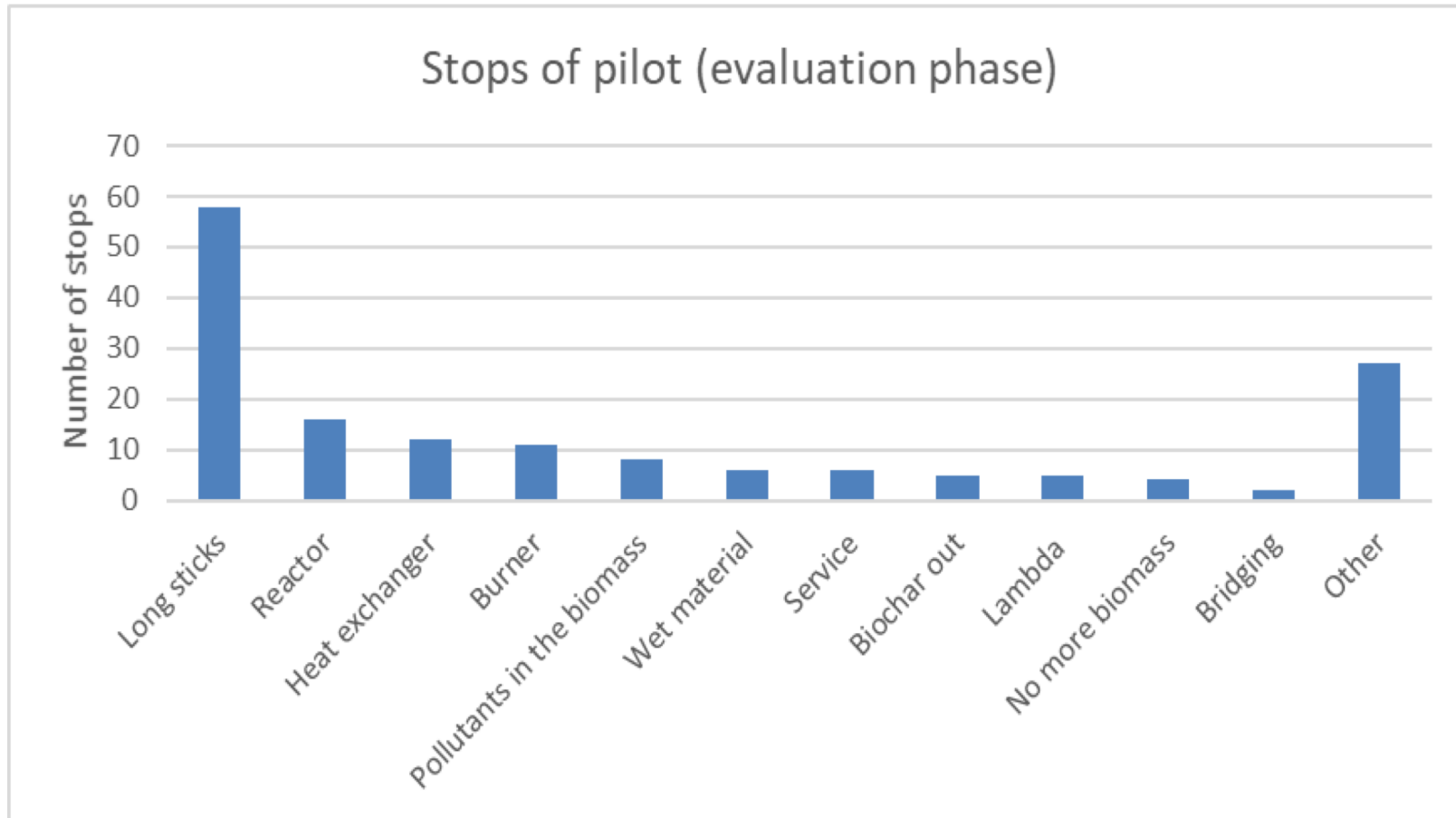
Wheeler



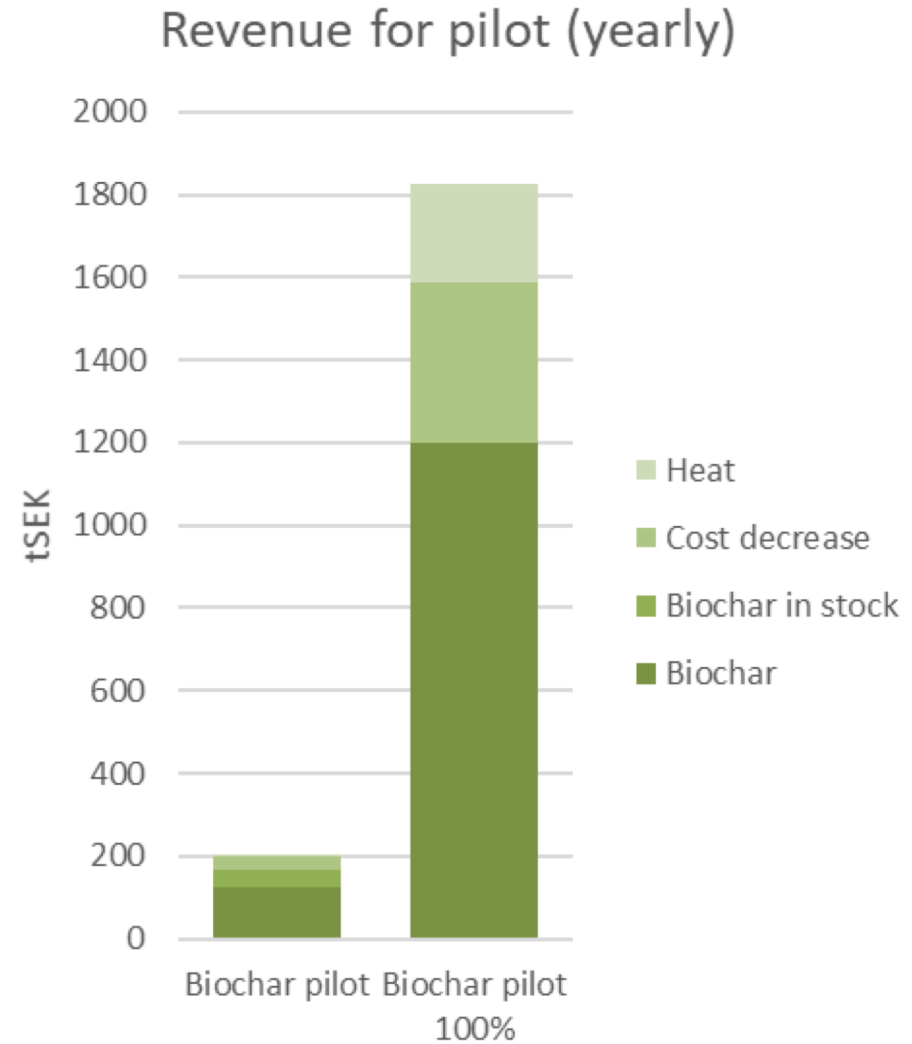
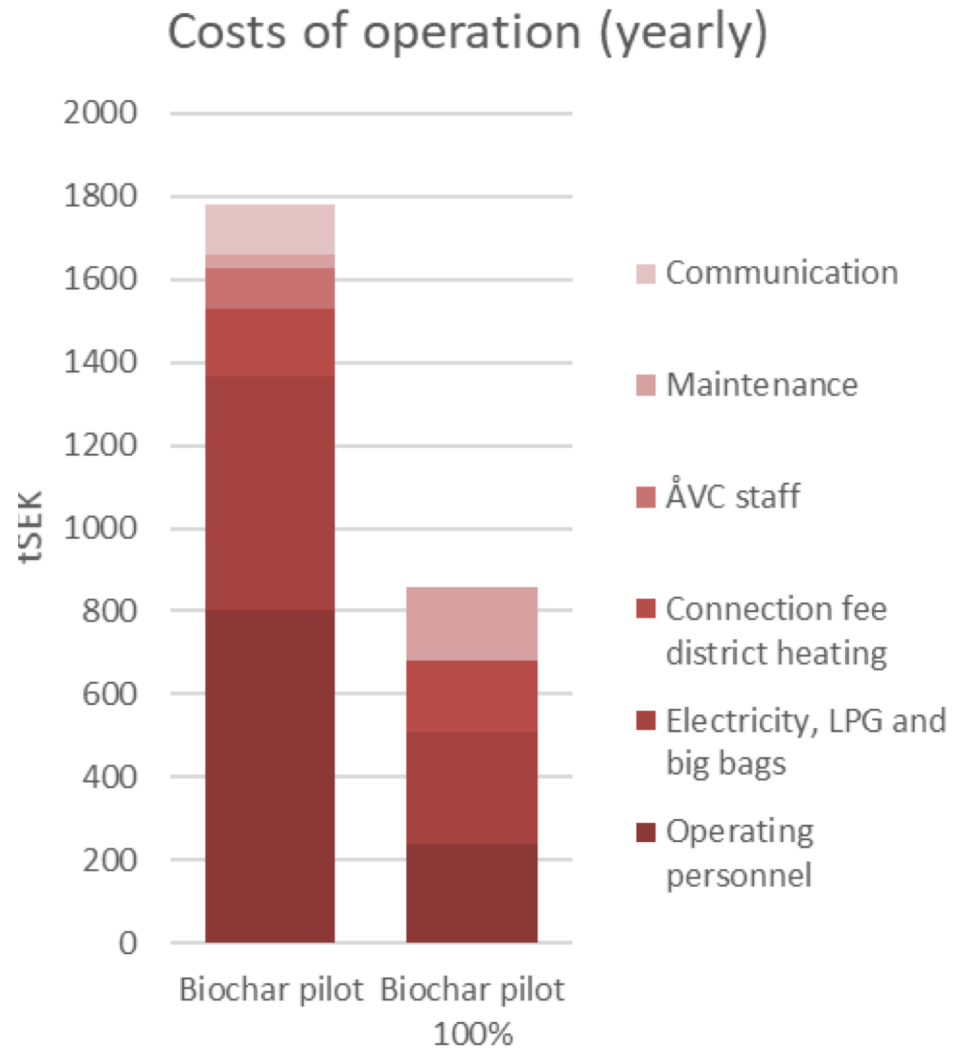
Quenching



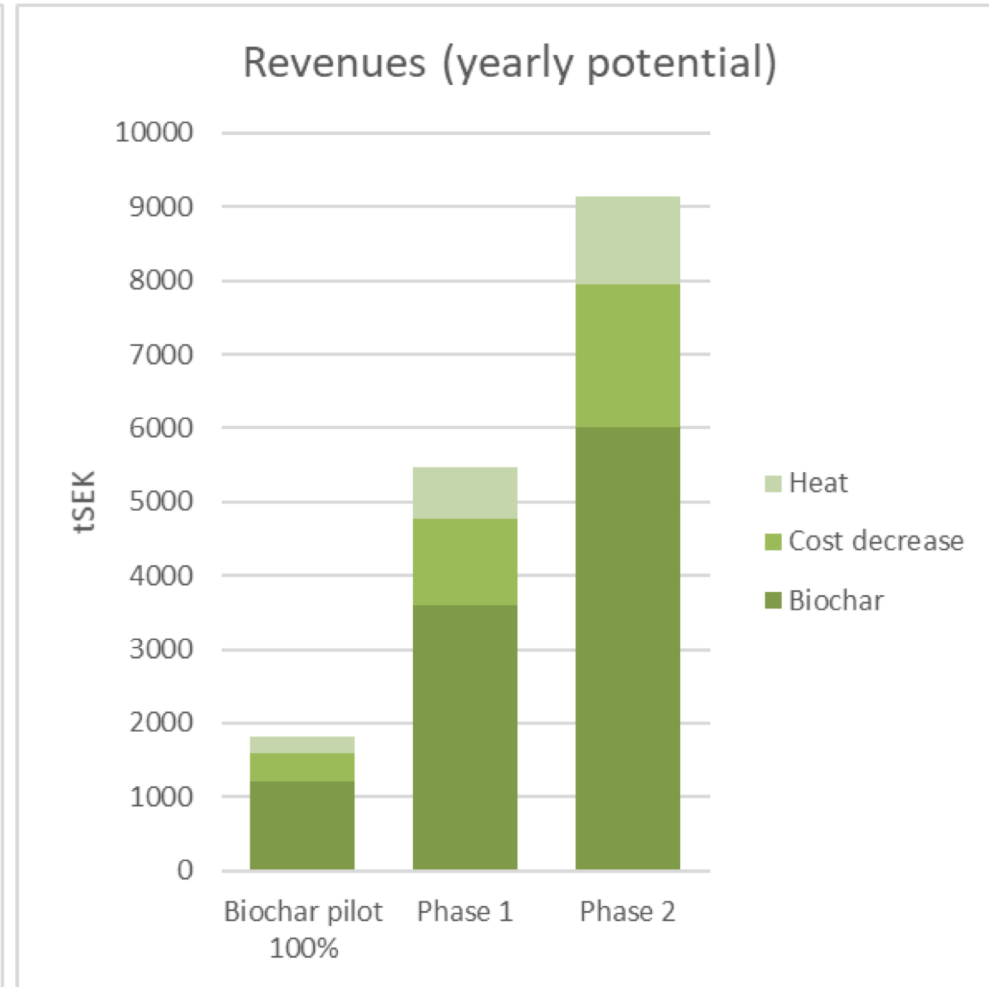
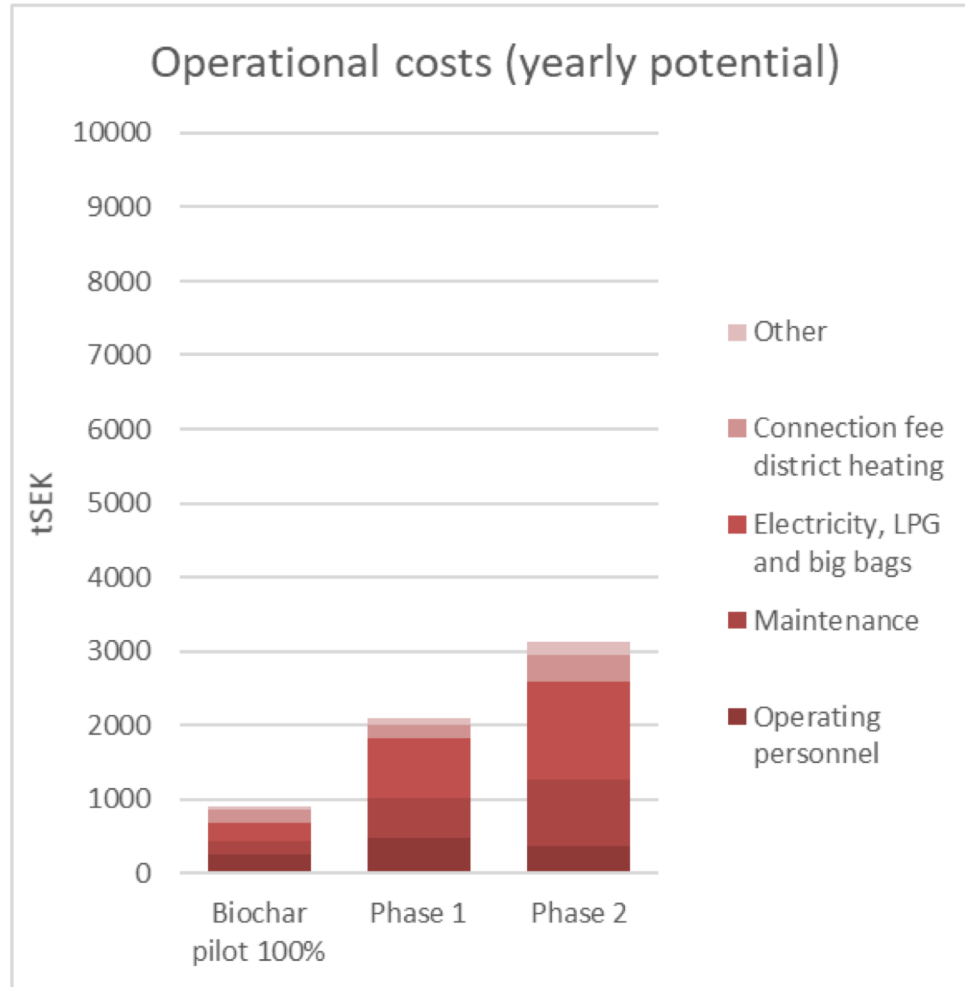
Stops



What about the money?



Potential

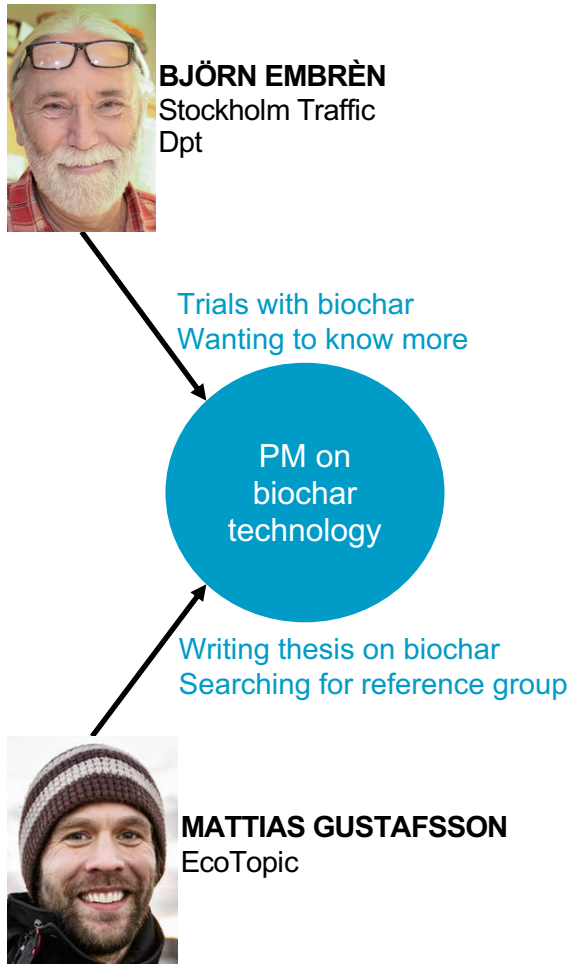




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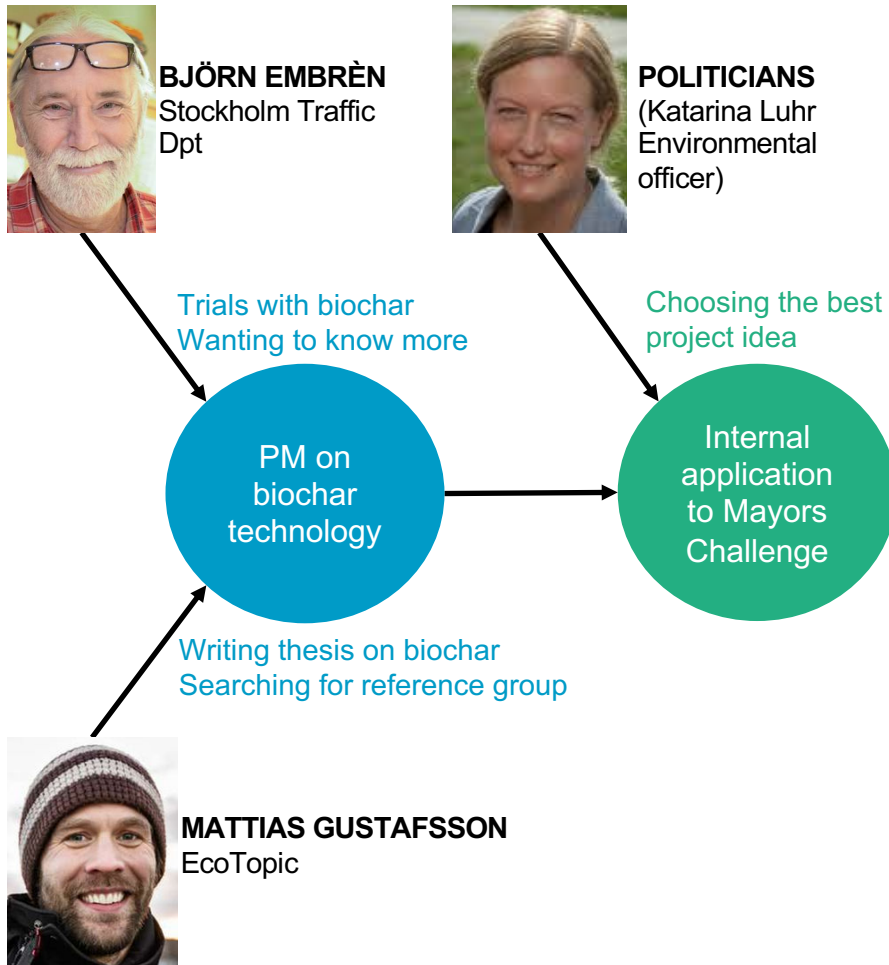
Building support for the
Stockholm Biochar Project

Pieces of the puzzle



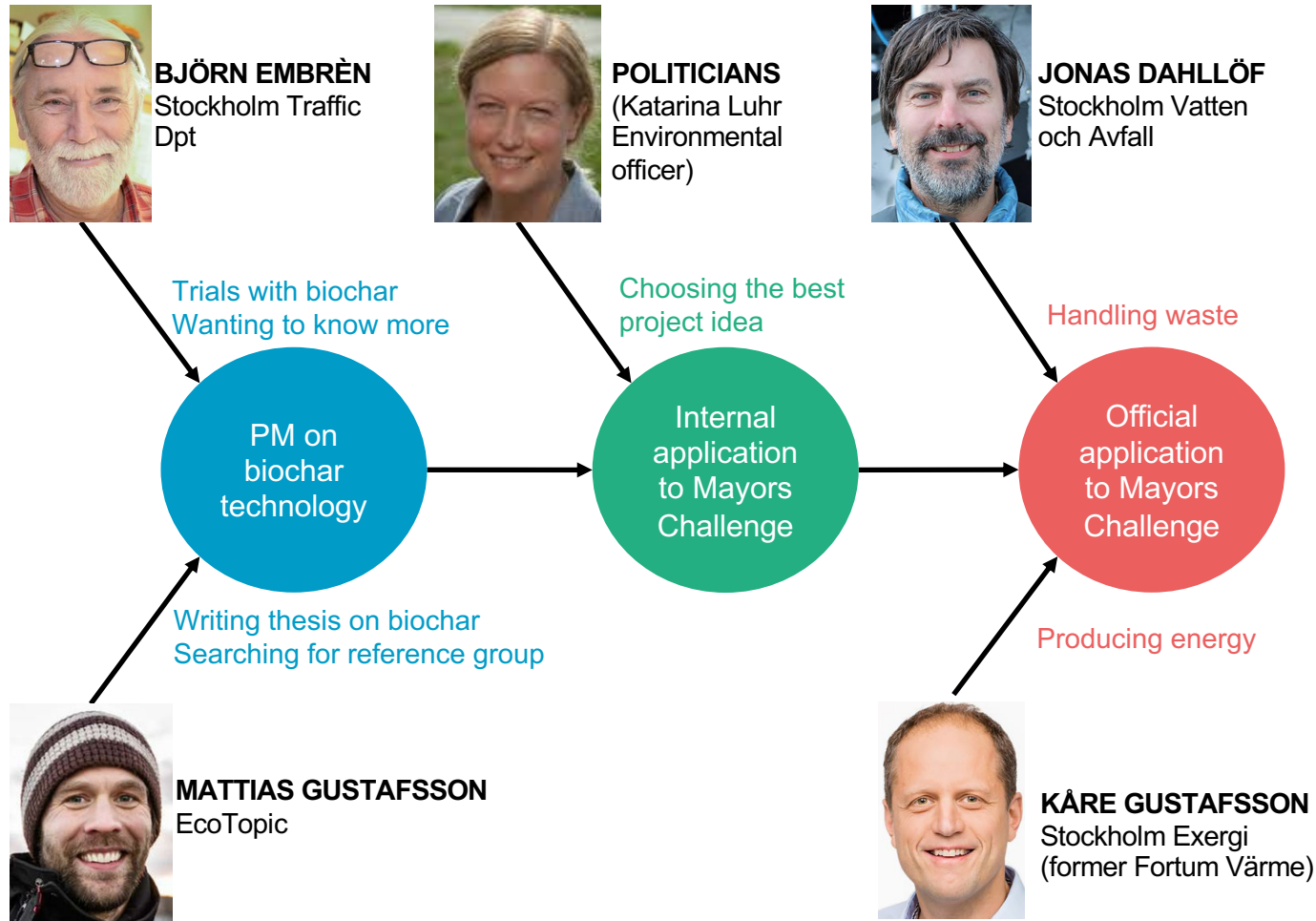
- Find key people who want to act
- Passion
- Seeing the possibilities
- No one knows what biochar is

Political support



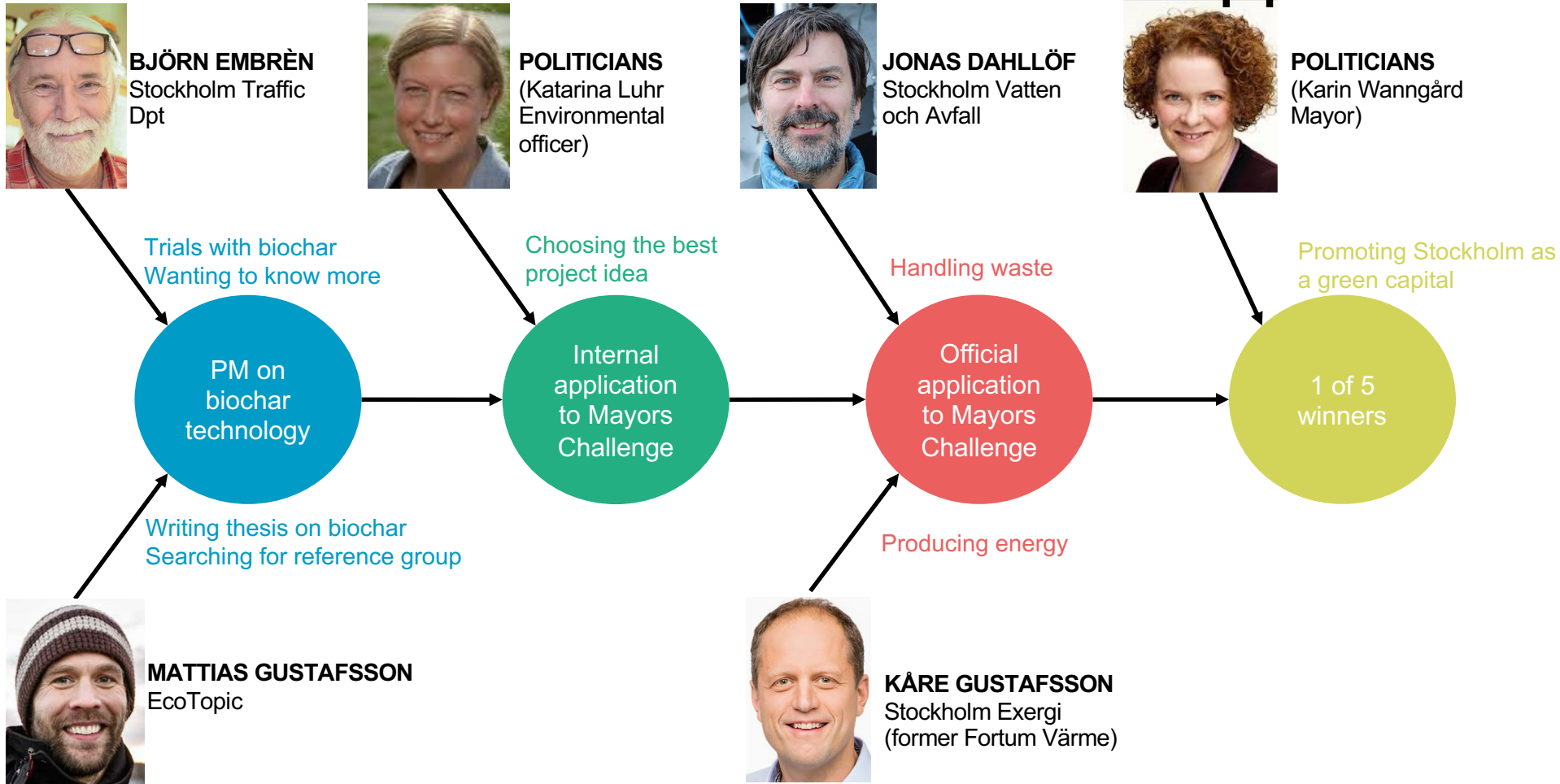
- Find your ambassadors
 - Circular economy
 - Climate change
 - Collaboration between municipal company, municipal department and semi-private company
 - Citizen engagement

Building the team

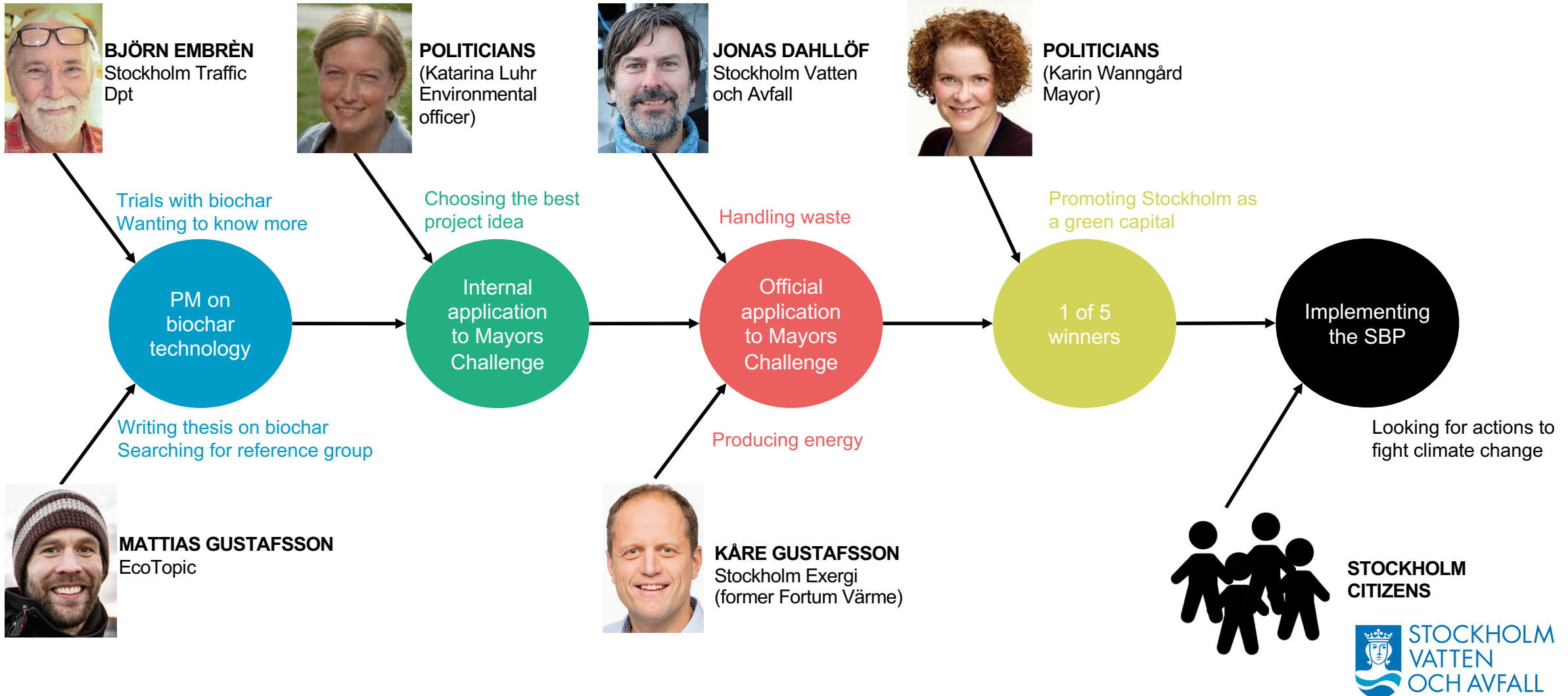


- Different expertises
- Contact networks including decision makers
- Meeting frequency depending on the project stage

Increased political support



Citizen engagement



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



Continuing in 2018, 2019 and 2020



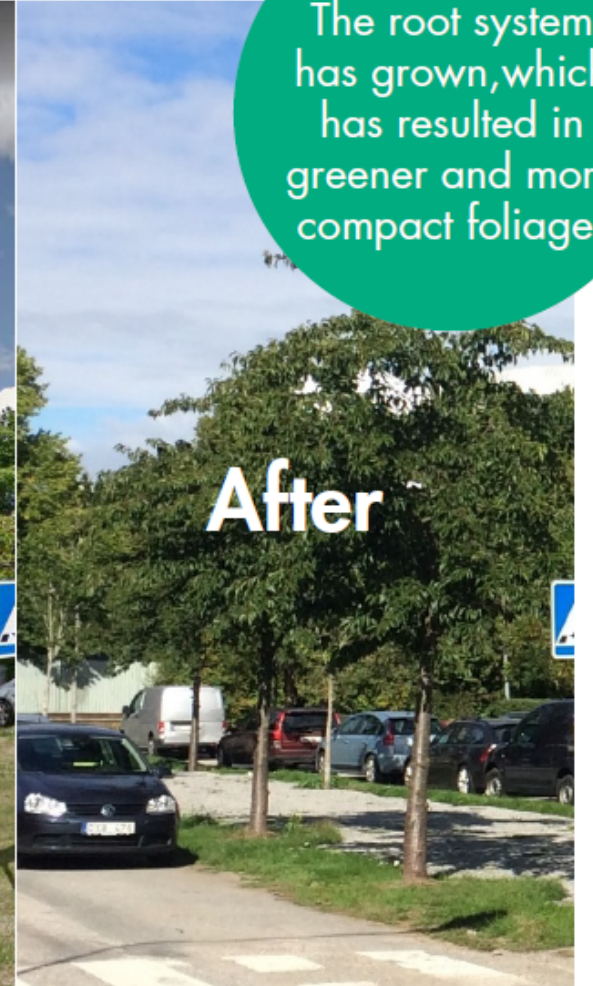
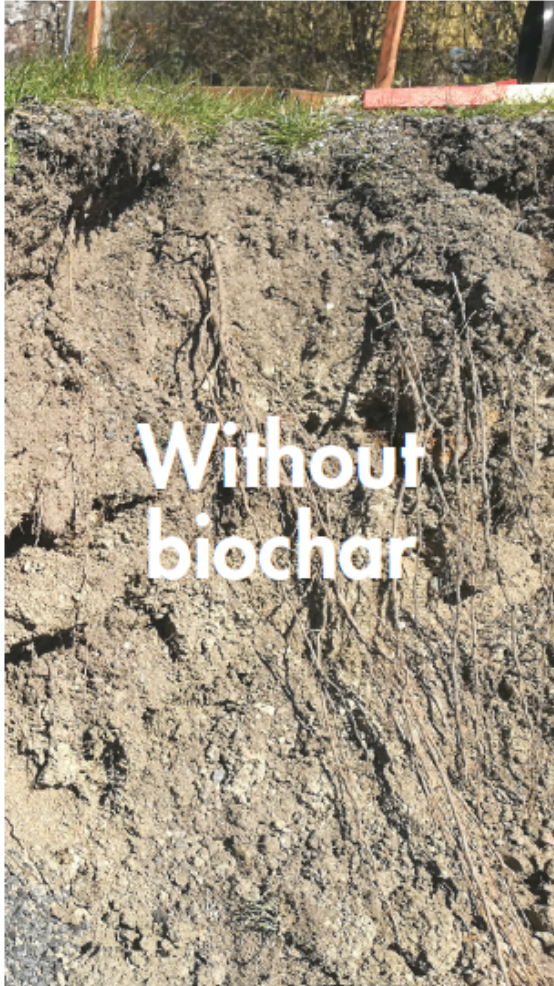
Making the pilot profitable

Stockholmers can keep collecting biochar

Evaluate

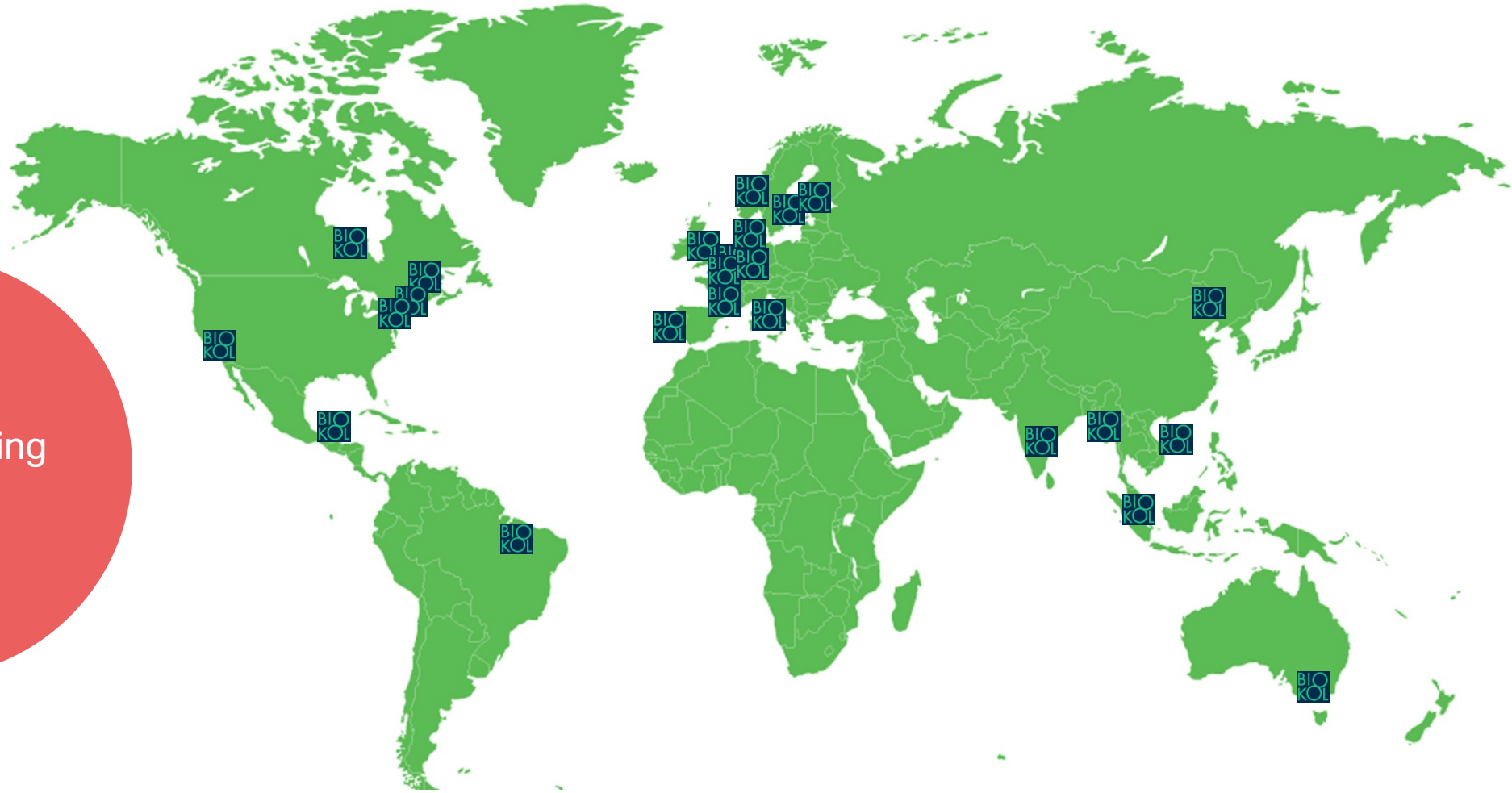
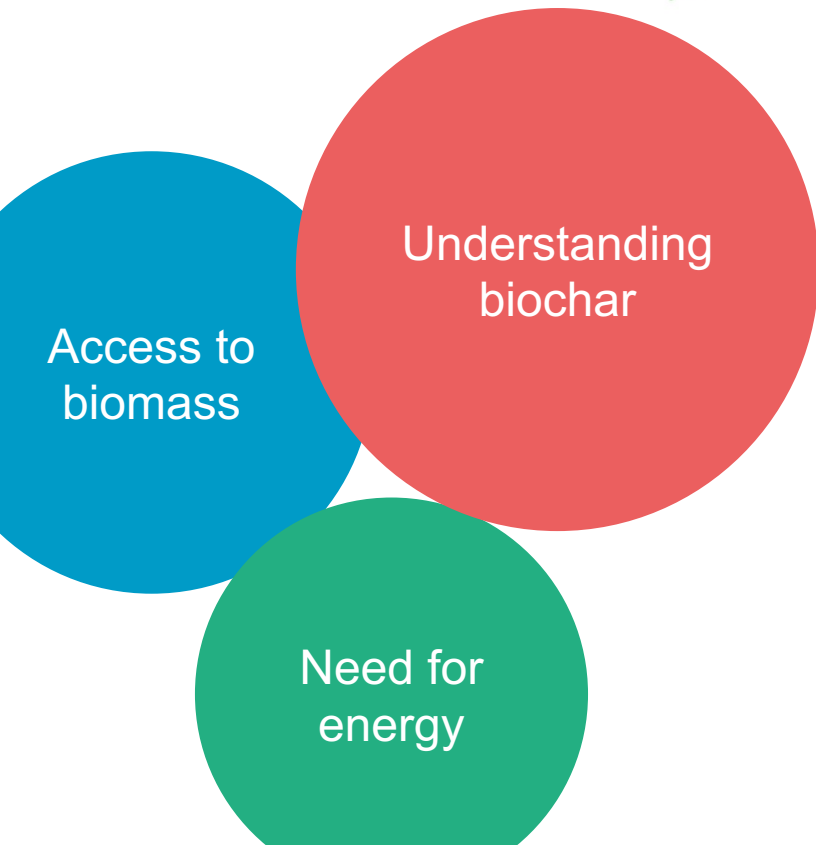
Deciding how to move forward

After one year with biochar



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

Potential global replication





Thank you for your attention

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