



DESOTEC

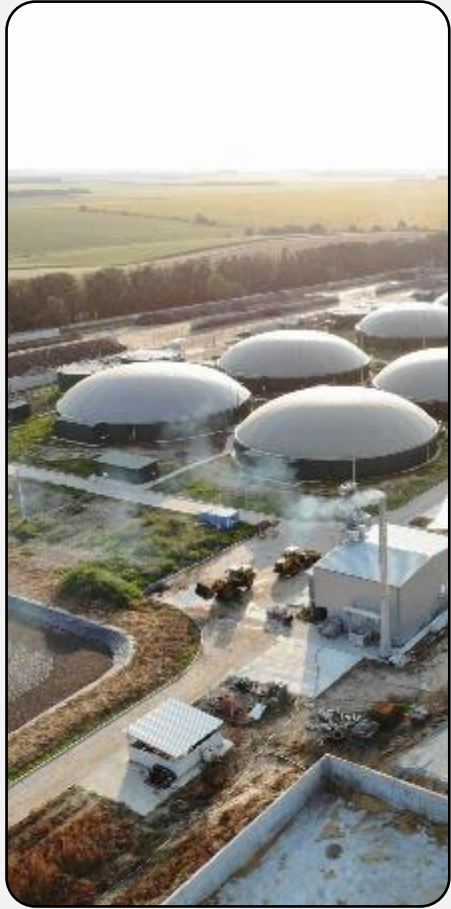
Sustainable mobile
filtration solutions

**Sustainable biogas purification
using new, renewable activated
carbon and mobile filters.**

Green Gas Day – 5th September 2024

Why are we here?

Produce
Renewable Energy



Reduce Waste



Reduce Costs



Protect Environment
Reduce CO₂



Improve Safety



Biogas Landfill Gas Purification uses Activated Carbon



Traditionally coal-based products
→ **Non-renewable sources**



Virgin carbon from SE Asia / China
→ **High cost & CO₂ footprint**



No use for high sulphur spent carbons
→ **Waste disposal**



Manual handling of spent carbon on-site
→ **Safety risk**

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→ **European Manufacturing**
→ **Reduces cost and CO₂ footprint**



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→ **Use to produce new carbons**
→ **Reduces waste, cost and CO₂**



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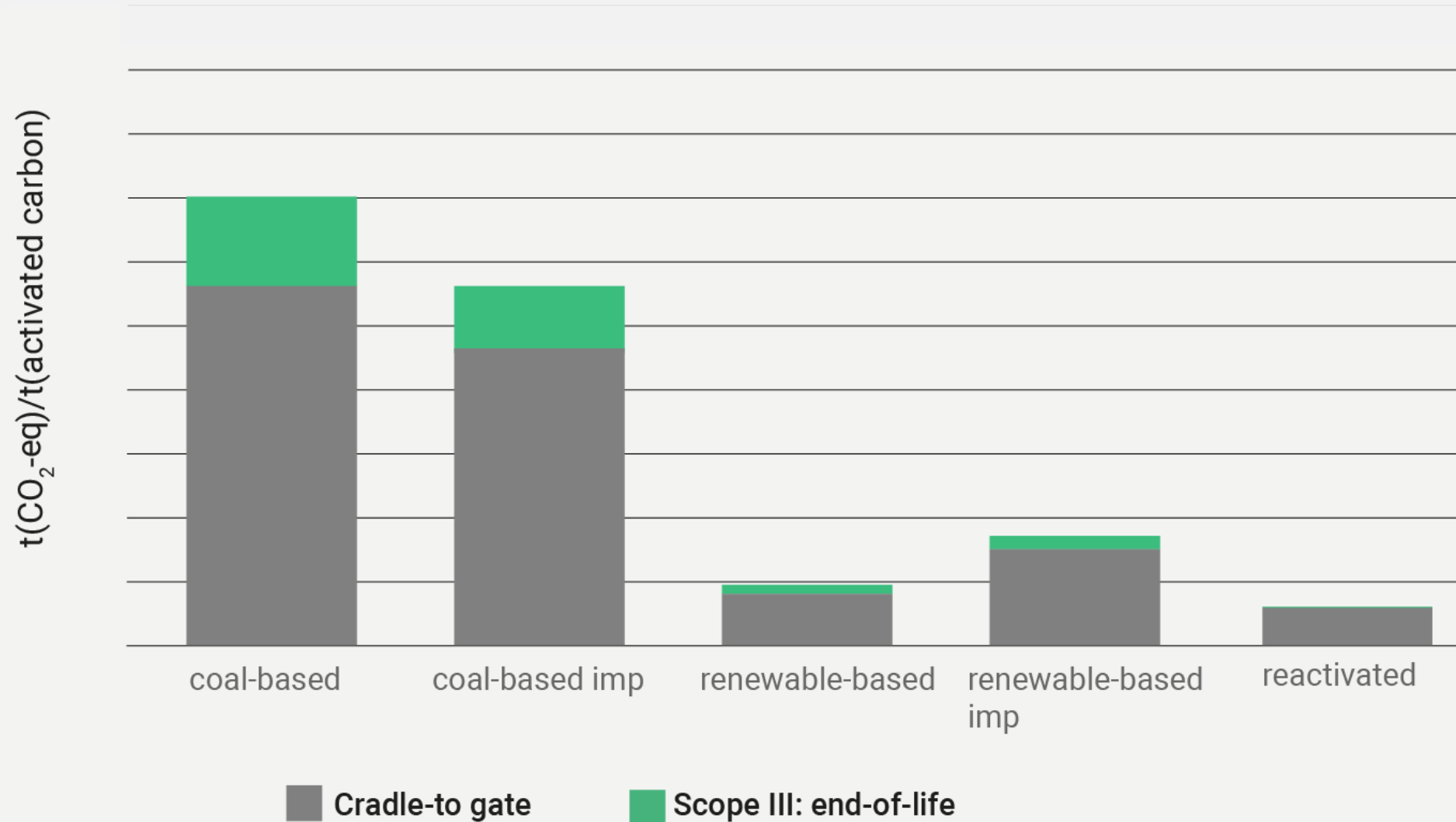


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- ~~Waste disposal~~
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- Reduces waste, cost and CO₂



- Manual handling of spent carbon on-site
- ~~Safety risk~~
- Use Mobile Filters
- Reduces waste
- Improves safety

CO₂ footprint of different activated carbon types

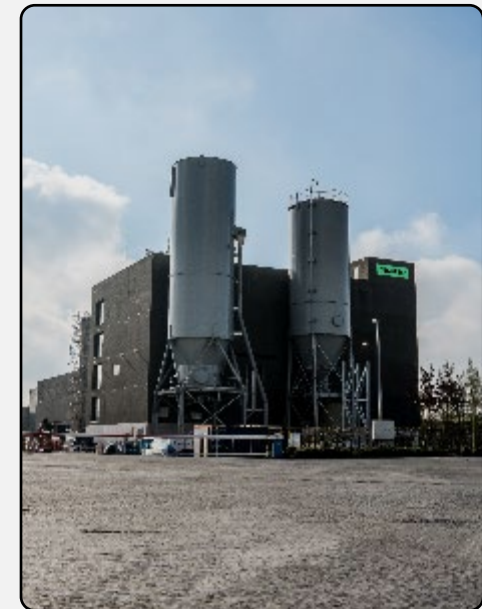


Reducing waste, cost and CO₂ footprint through re-use

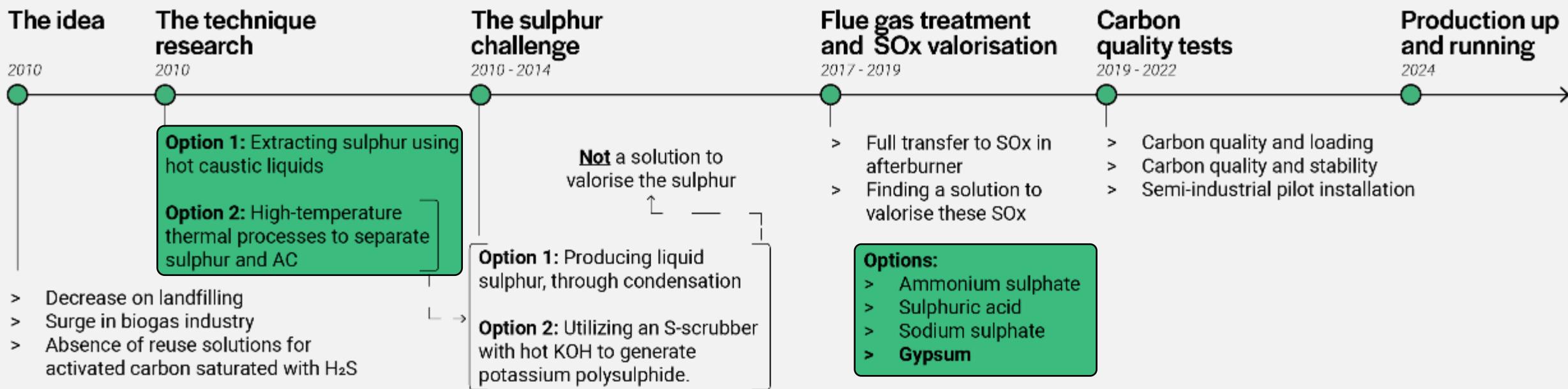
- **Re-activation** of non-impregnated carbons is common practice
- **Reuse** of high-sulphur carbon waste, offering sustainable solution was the challenge

Key Criteria for this new plant and products were:

- **Sulphur loading and Stability** equivalent to current products
- **Granulometry, Density, Iodine Number & Impregnation** same as current products
- **Zero-discharge** process converting by-products into valuable resources, i.e **No Waste**
- **Supply Chain Security** by removing reliance on SE Asia



A 10-year R&D journey



A 10-year R&D journey: Thermal v Washing processes



Washing

- **Successfully** removed the majority of the sulphur
- A large proportion of the VOCs, incl POPs, (PFAS/PFOS), **remained** on the carbon
- **Sulphur loading** measured on the produced product was **lower than** the original material
- Washing appeared to additionally **load/block** the activated carbon pores
- Produced **a waste water stream** containing sulphur, VOCs and POPs, (incl PFAS/PFOS)



Thermal process

- **Successfully** removed the majority of the sulphur
- **Successfully** removed/destroyed the majority of the VOCs, incl POPs (PFAS/PFOS)
- **No reduction** in sulphur loading on the finished product, so can be recycled indefinitely
- Also produces a **usable and saleable** by-product that uses the recovered sulphur, (Gypsum), so **no waste**

Biogas Activated Carbon Applications and Mobile Filters

- Activated Carbon applications on AD Plant and Landfill sites:
 - Biogas H₂S removal
 - Biogas VOC, Siloxane, Terpene etc removal
 - Waste Hall Odour Abatement
 - Tank Vent and Pasteuriser Vent Odour Abatement
 - Leachate Treatment



- Mobile, plug-and-play filters are **delivered pre-loaded with carbon and replaced** once the carbon is saturated
- Exchanges typically **only take 20 to 30** minutes
- Filters are **returned and emptied under controlled** conditions, avoiding the risks of handling spent, waste carbon on-site
- Spent carbon is **Reactivated / Re-used** rather than disposed of



Making biogas and landfill gas operations more sustainable



Carbon produced from renewable raw-materials is more sustainable and has lower CO₂ footprint.



Re-activation and Re-use of spent carbon in Europe reduces cost, waste and CO₂ footprint.



Re-using spent H₂S carbon reduces waste, cost and CO₂ footprint.



Using mobile carbon filters improves site safety and facilitates re-use.

DESOTEC 

Sustainable mobile
filtration solutions

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Or visit www.desotec.com