

CO₂ Capture at ARC

CO₂ Capture, Storage & Reuse
18th May 2022, Copenhagen

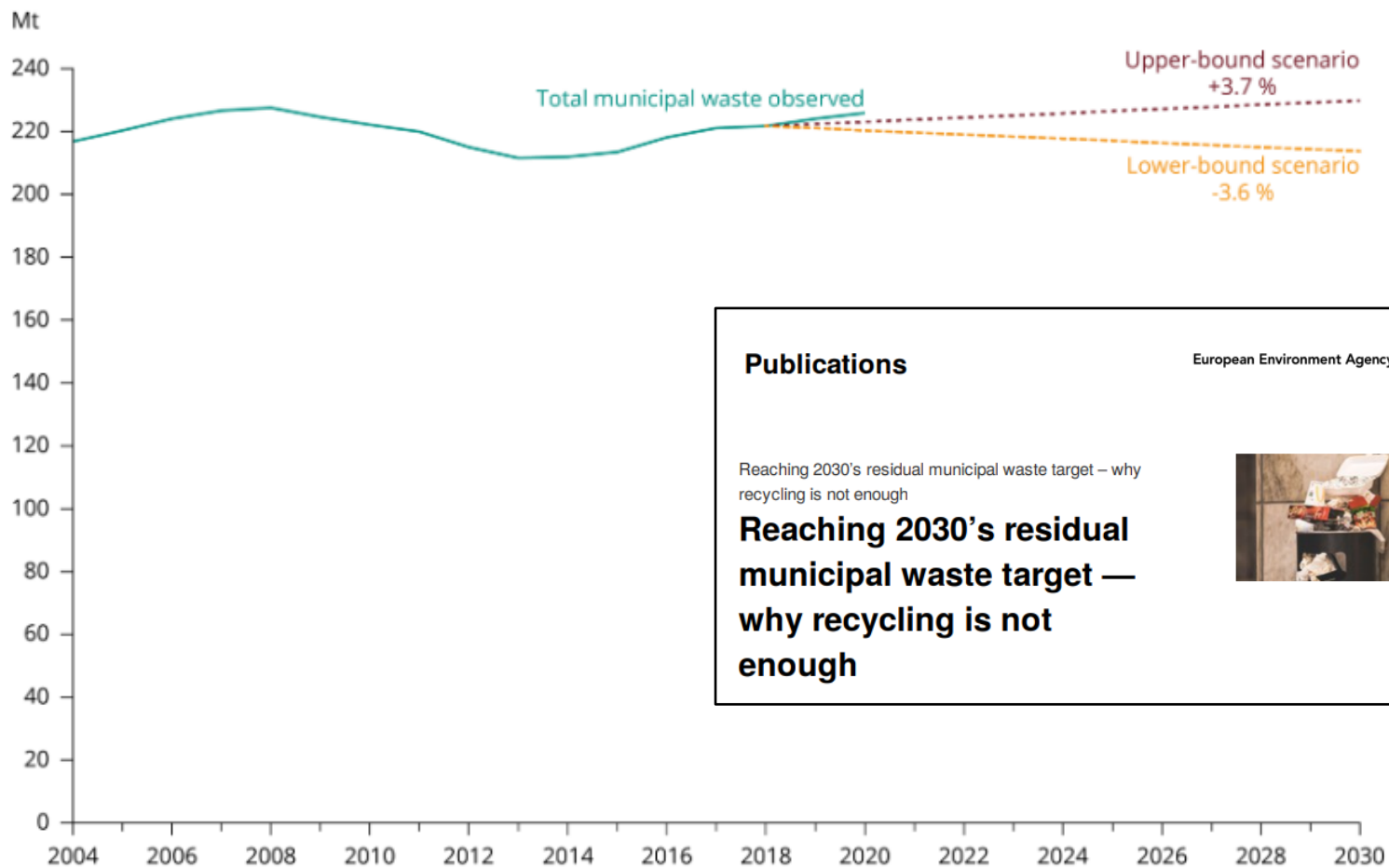
arc



The WHY



Figure 4. Total municipal waste generated in the EU-27 during the period 2004-2020 and projections for the period 2019-2030



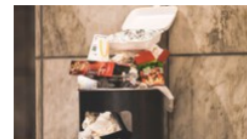
Publications

European Environment Agency



Reaching 2030's residual municipal waste target – why recycling is not enough

Reaching 2030's residual municipal waste target — why recycling is not enough



- ➔ Even if all EU Member States reach their binding 60% recycling target by 2030, current trends indicate that the amount of residual municipal waste might exceed 80 million tonnes in that year — missing the target by more than 23 million tonnes.
- ➔ If municipal waste generation continues growing, at least 72% of waste generated would need to be recycled to meet the circular economy action plan target of halving the amount of residual municipal waste by 2030 — a significantly higher rate of recycling than at present. Alternatively, the target could be achieved by reducing the amount of waste generated by around one third or through a combination of these approaches.

Junkies of consumption

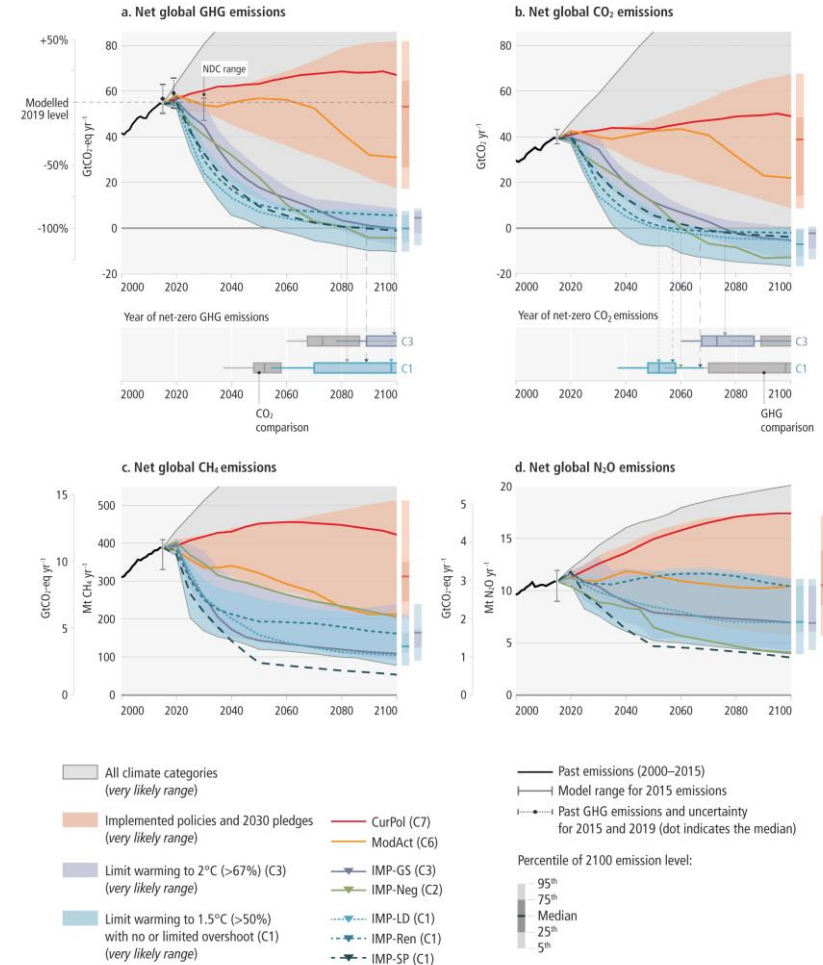


Climate Change 2022 Mitigation of Climate Change

Summary for Policymakers



Modelled emission pathways that limit warming to 1.5°C, and 2°C, involve deep, rapid and sustained emissions reductions.



License to operate



Ambitious Danish targets

The government enters into an agreement with the Socialist People's Party, Danish Social-Liberal Party, and the Red Green alliance on ambitious climate goals in 2025 (**50-54%**)

7th May 2021



2030: 70%

2050: Carbon Neutral



København
CO₂-neutral
2025

KBH 2025 KLIMAPLANEN

EN GRØN, SIKKER
OG CO₂-NEUTRAL
BY



KBH2025 Klimaplanen

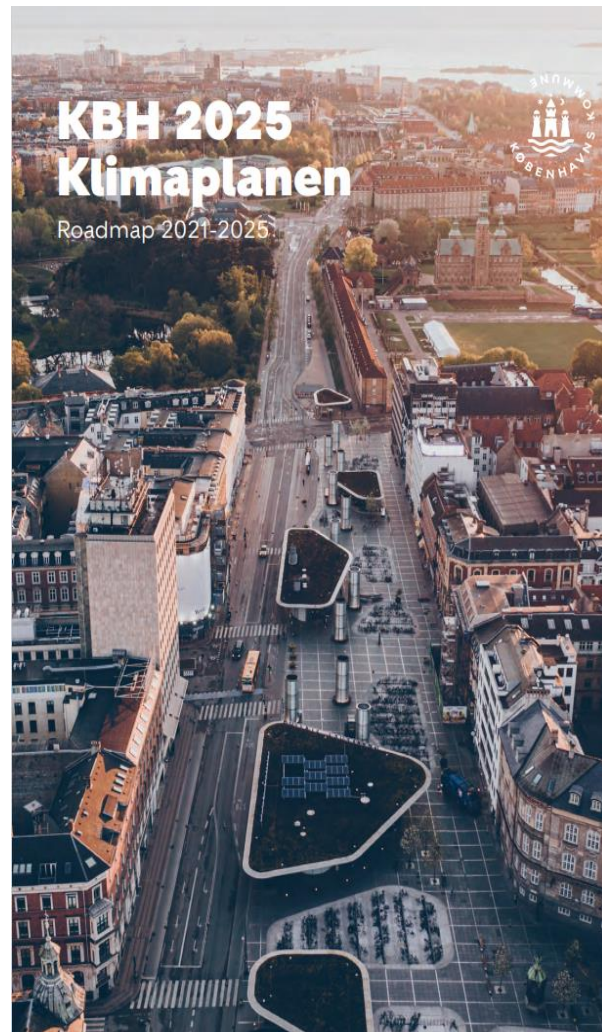
Roadmap 2017-2020



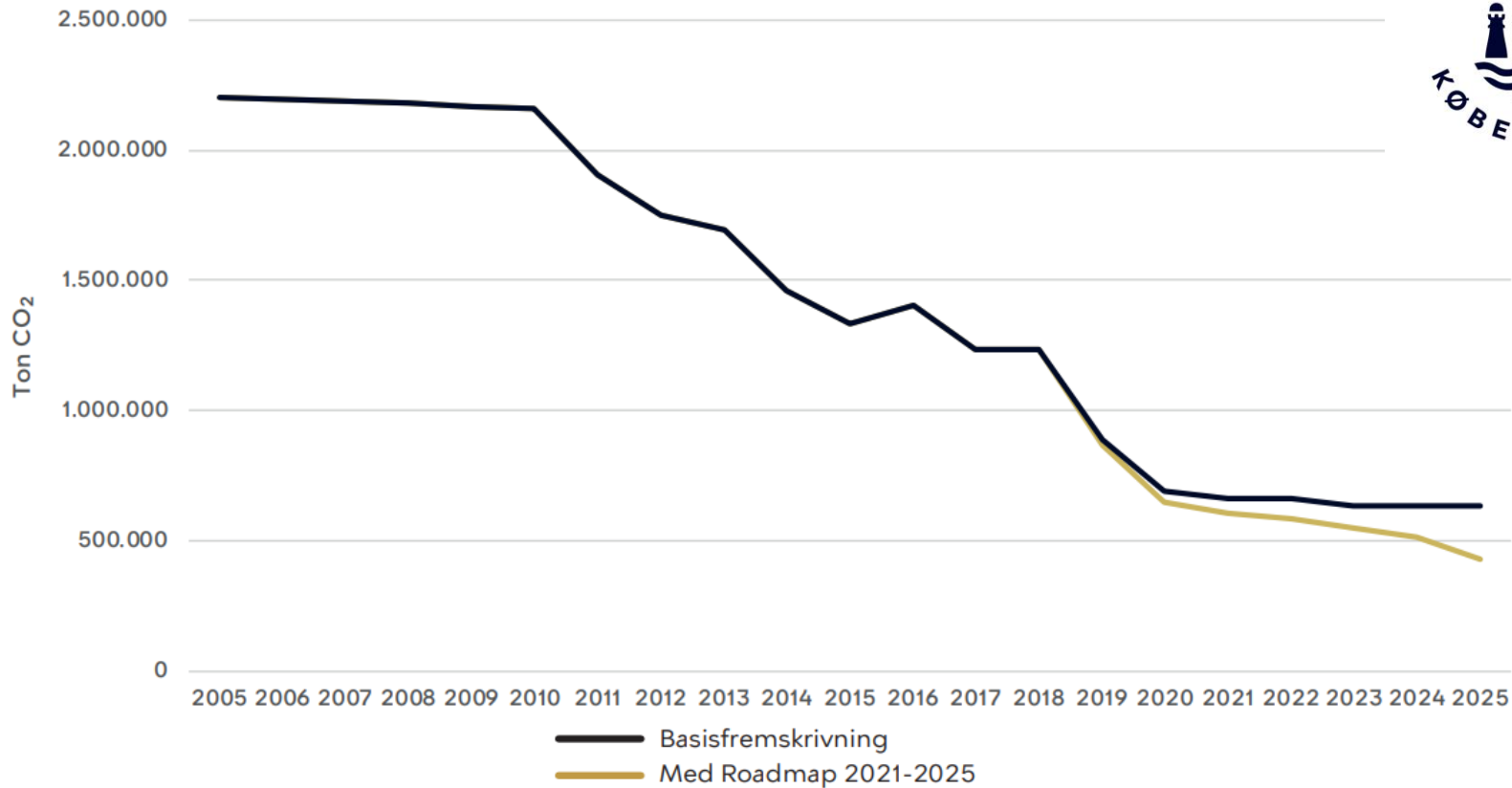
KØBENHAVNS KOMMUNE

KBH 2025 Klimaplanen

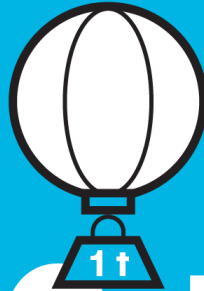
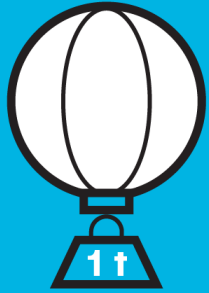
Roadmap 2021-2025



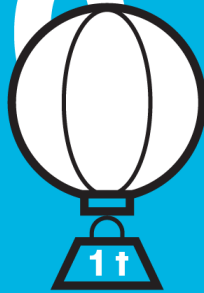
CO₂-udledning i København 2005-2025



Potential by CO₂-capture at ARC



500 000 t
CO₂ / år



CO₂-
neutral

Fossil CO₂
(167.000 t/year)

CO₂-
negativ

Biogenic CO₂
(333.000 t/year)

How much is 500.000 tonnes of CO₂?



**Annual emissions of
287.356 cars**

(116 grams per km - 15,000 km.
per year per car)



**Annual CO₂-
emissions of
90.000 Danes**

(11 tonnes per capita)



**Planting trees on an
area equivalent to six
times Copenhagen –
annually!**

Pilot plant

- Testing solvents
- Testing energy solutions
- Catch & release

June 2021 – April 2022
5-6 kg/hour

Demonstration

- Energy optimization as full scale
- Continuous operation
- CO2 dried, cooled, collected, usage

Late 2022
4 ton/day



Full scale

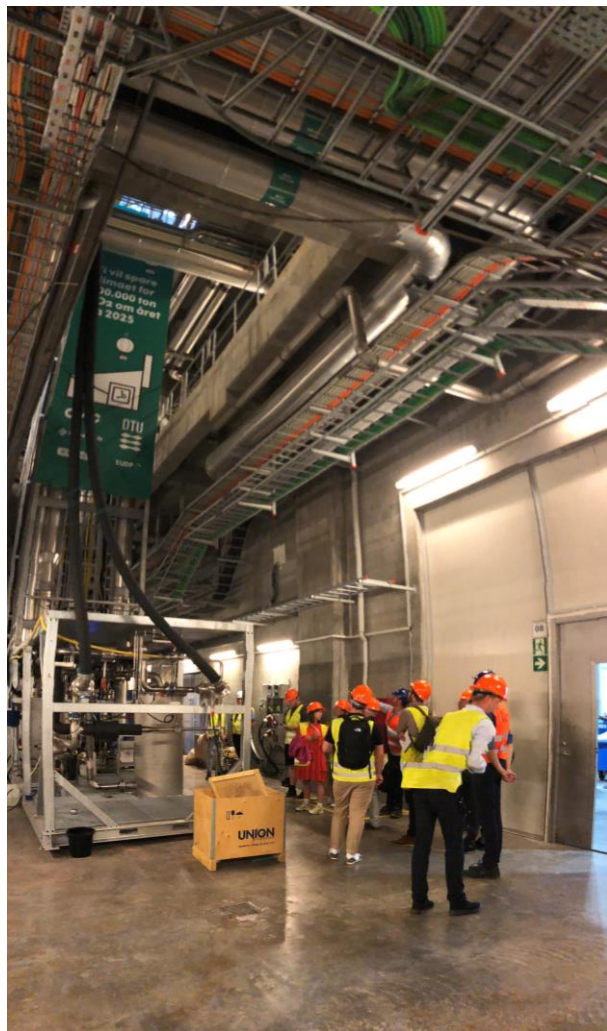
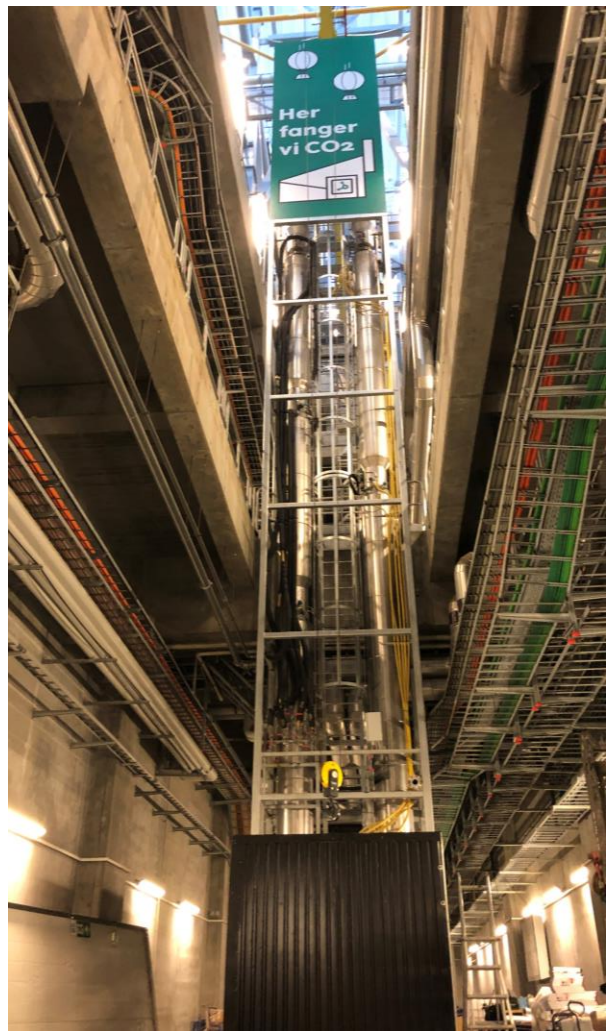
Late 2025
500.000 ton/year

EUDP

ARC/Pentair/DTU/Rambøll

EU innovationsfund

DK CCS support scheme



Environmental assessment of amending the Amager Bakke incineration plant in Copenhagen with carbon capture and storage

V. Bisinella¹ , J. Nedenskov², Christian Riber³,
Tore Hulgaard³ and Thomas H. Christensen¹

Waste Management & Research
1–17

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DOI: 10.1177/0734242X211048125

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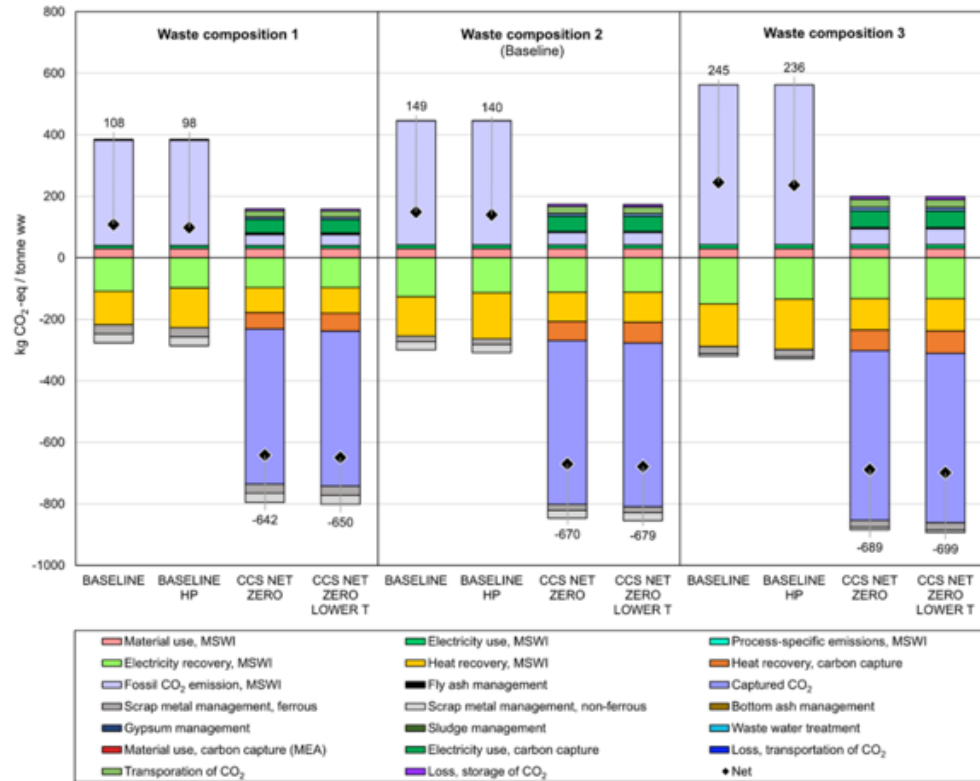


Figure 2. LCA results and climate change impact category, for the three waste composition scenarios (WC1, WC2 and WC3, Table 3) and baseline ES (ES3, Table 4). Results are provided in kg CO₂-eq per tonne ww of incinerated waste and subdivided according to the processes contributing to the results. The Amager Bakke configurations with and without CCS correspond to those reported in Tables 1 and 2. The characterization factors for fossil and biogenic CO₂ are provided in 2.1.2.

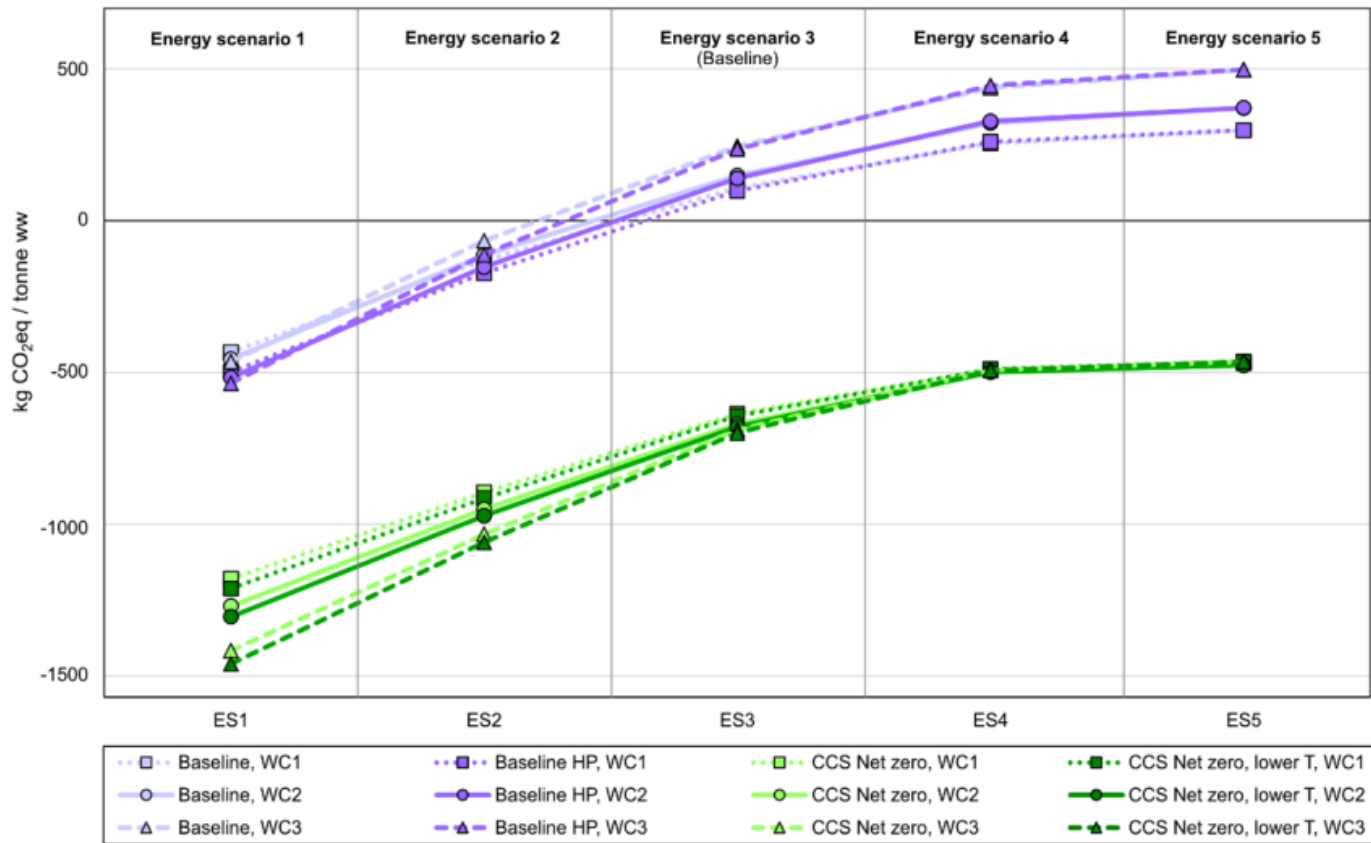
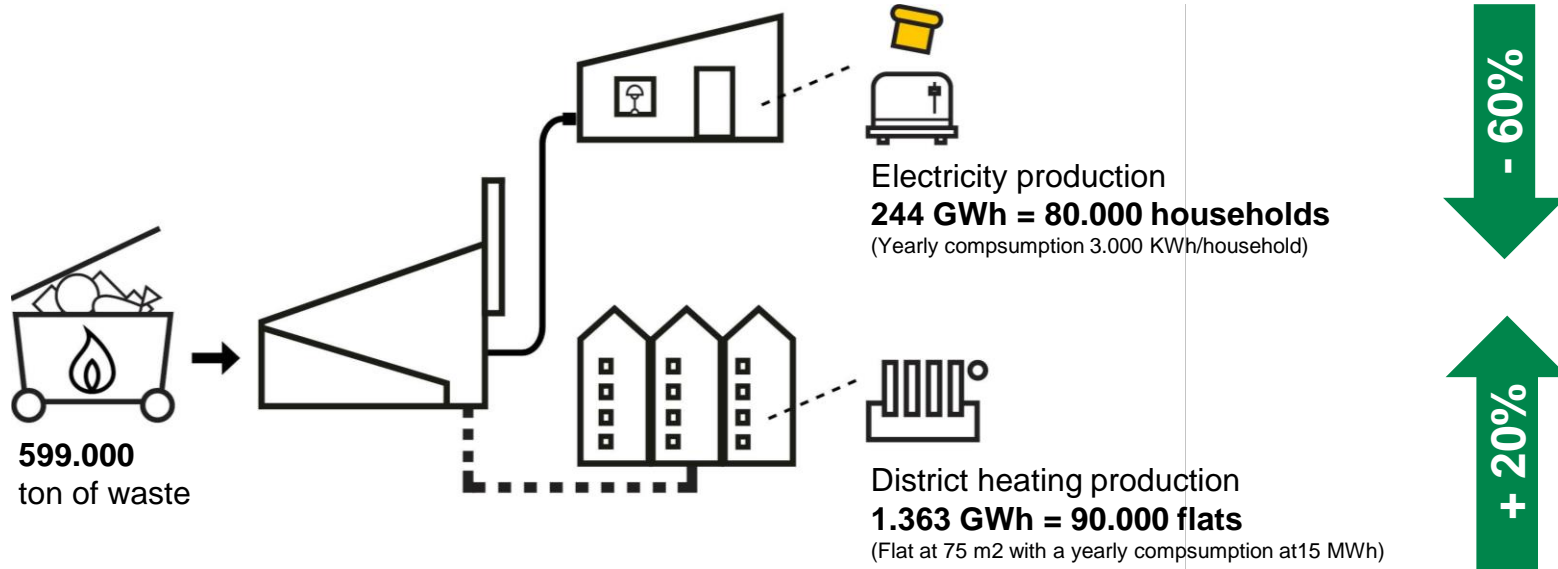
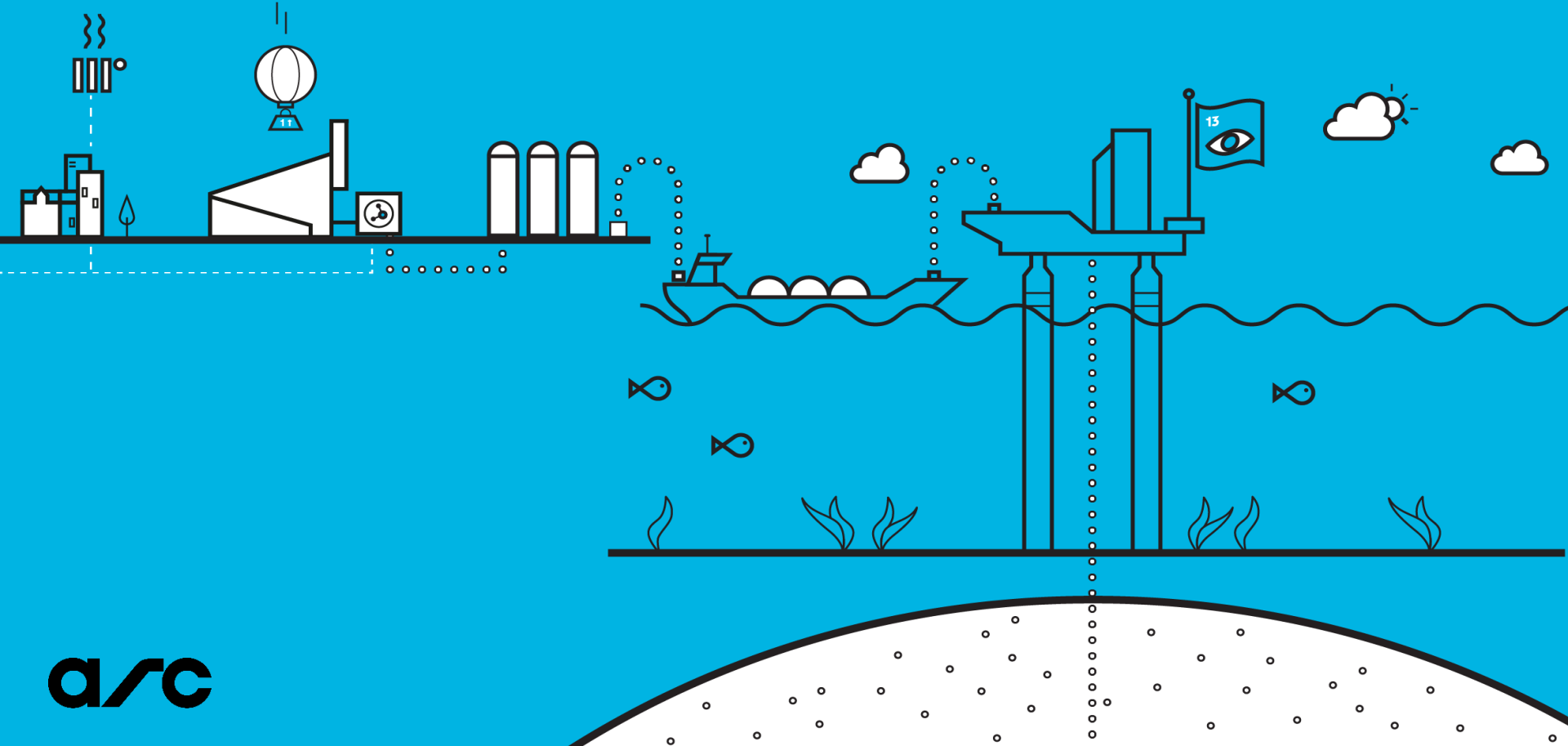


Figure 5. Summary of climate change results for each ES and waste composition scenario for Amager Bakke configurations with and without CCS.

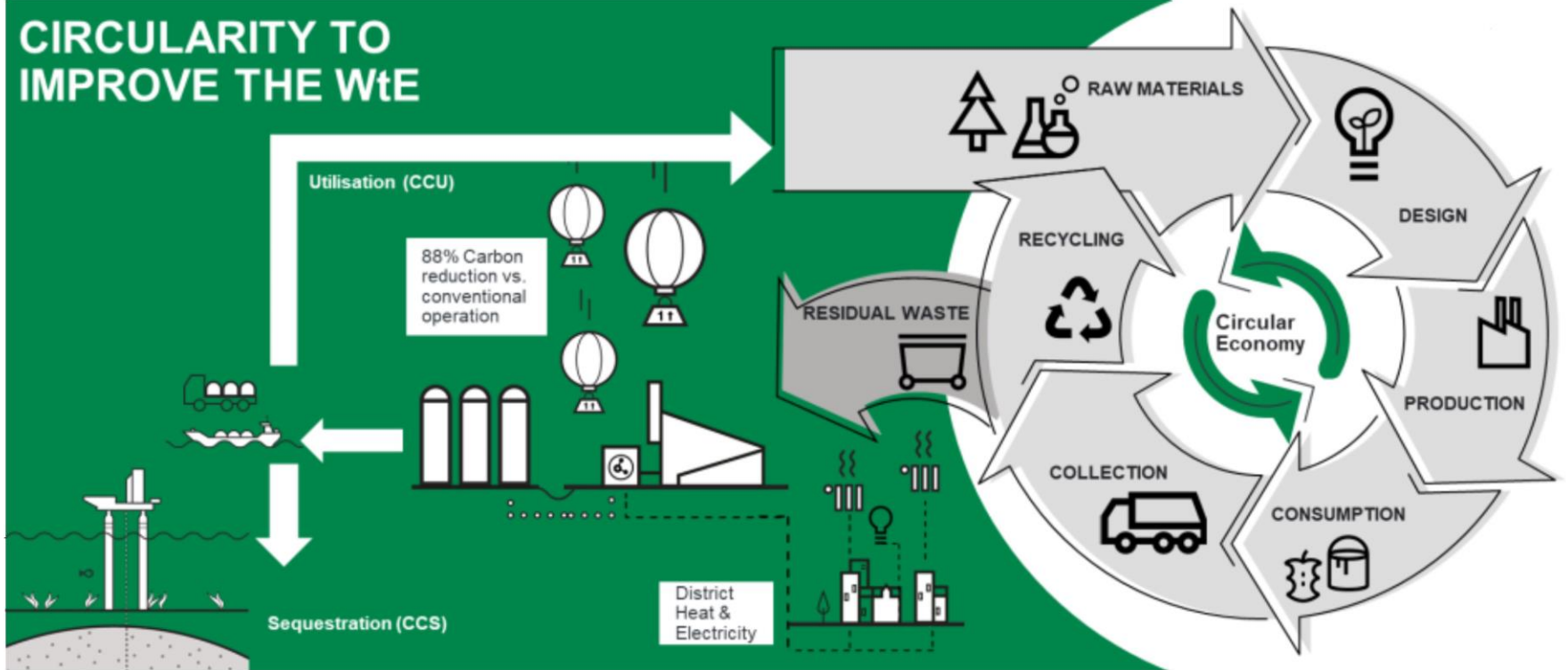
Energy production 2020



Valuechain



CIRCULARITY TO IMPROVE THE WtE



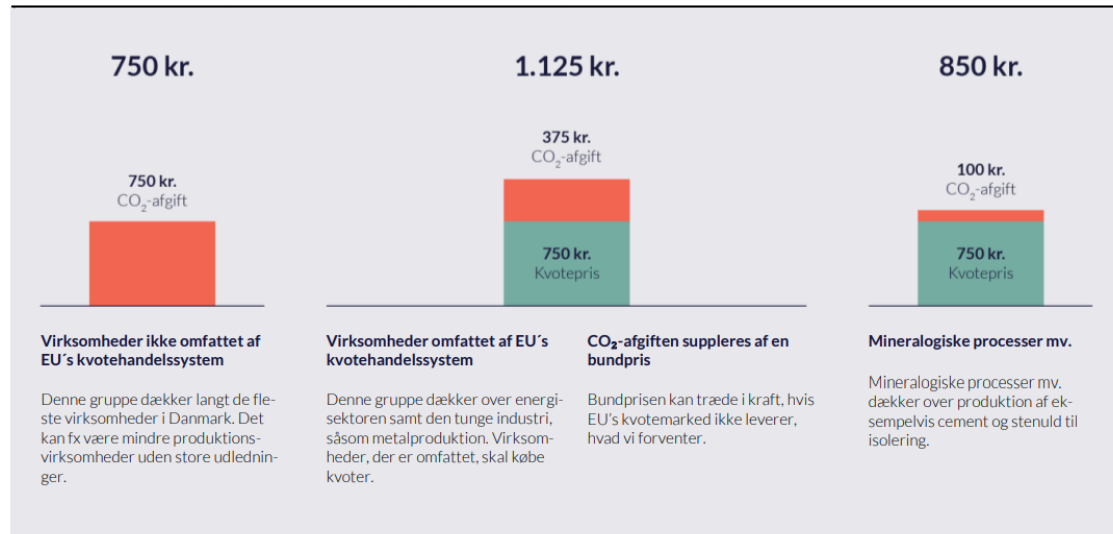
Power-to-X

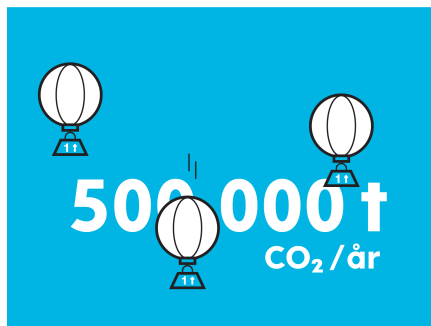


Grøn skattereform

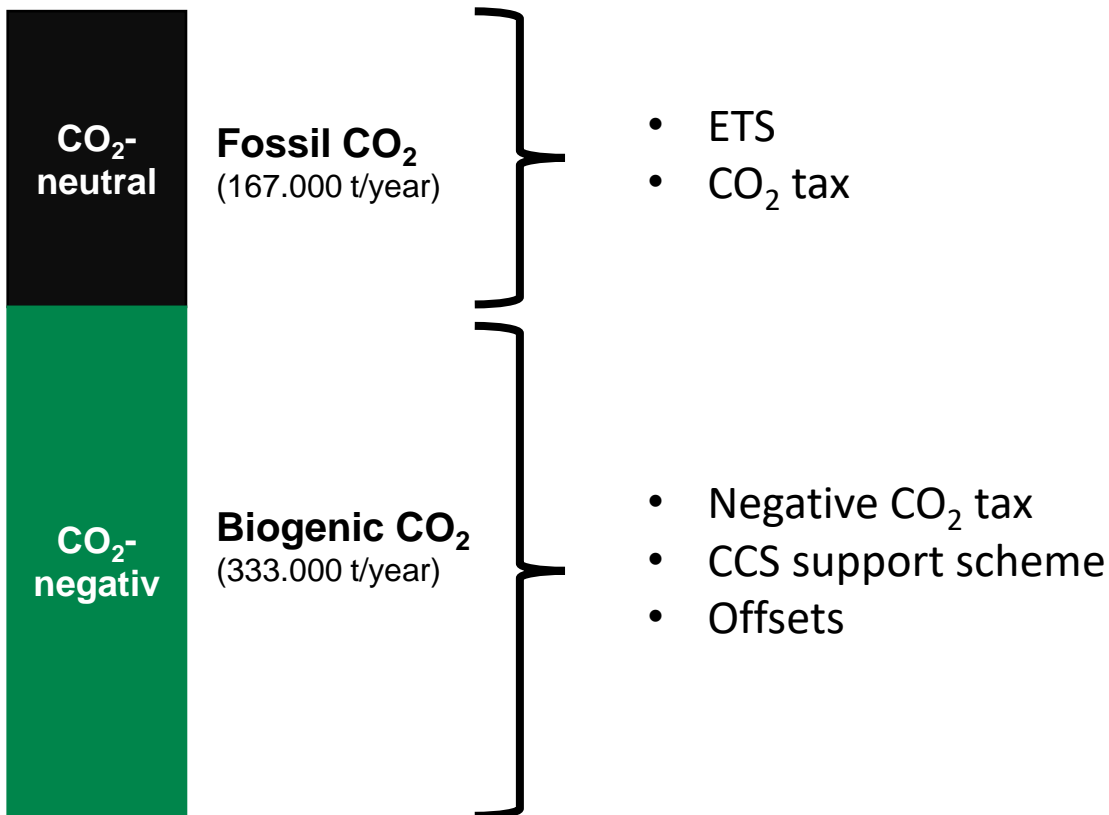
Et stærkere og grønnere Danmark i 2030

Figur 2. Pris på udledning af CO₂ med en høj og ambitiøs CO₂-afgift suppleret med en bundpris (kr. pr. ton)



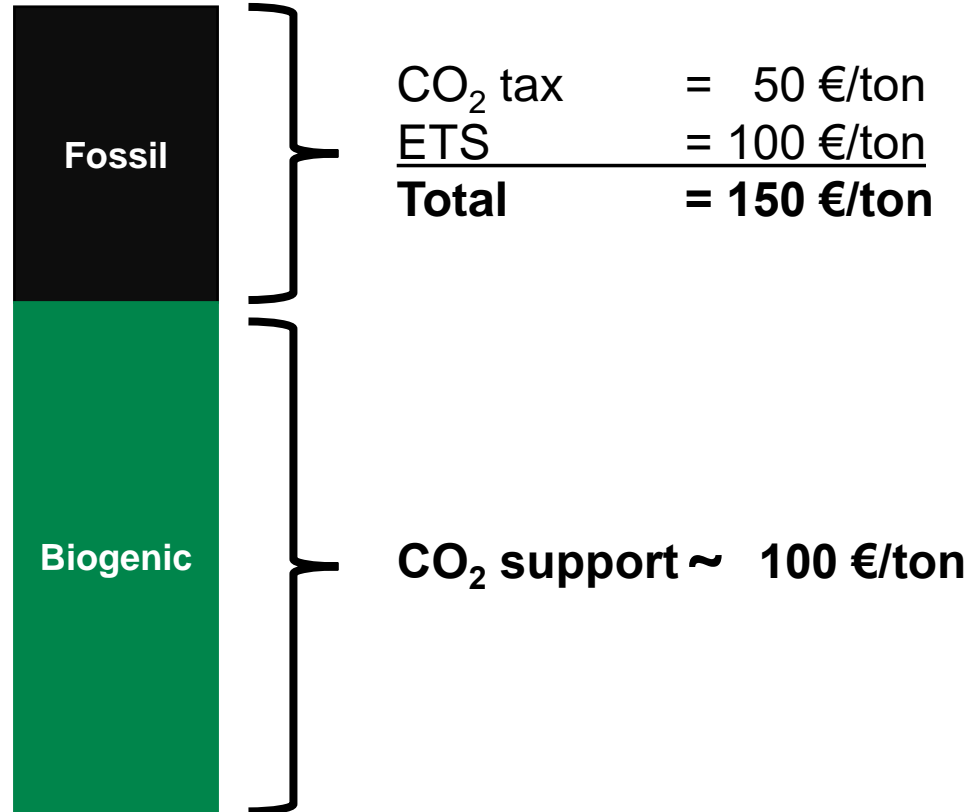


Economic OPEX drivers





Proposal: Green tax reform for 2030



Thank you

Jacob H. Simonsen, Direktør/CEO

✉ jhs@a-r-c.dk

🐦 [@JacobAffald](https://twitter.com/JacobAffald)

☎ +45 22 51 66 61

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