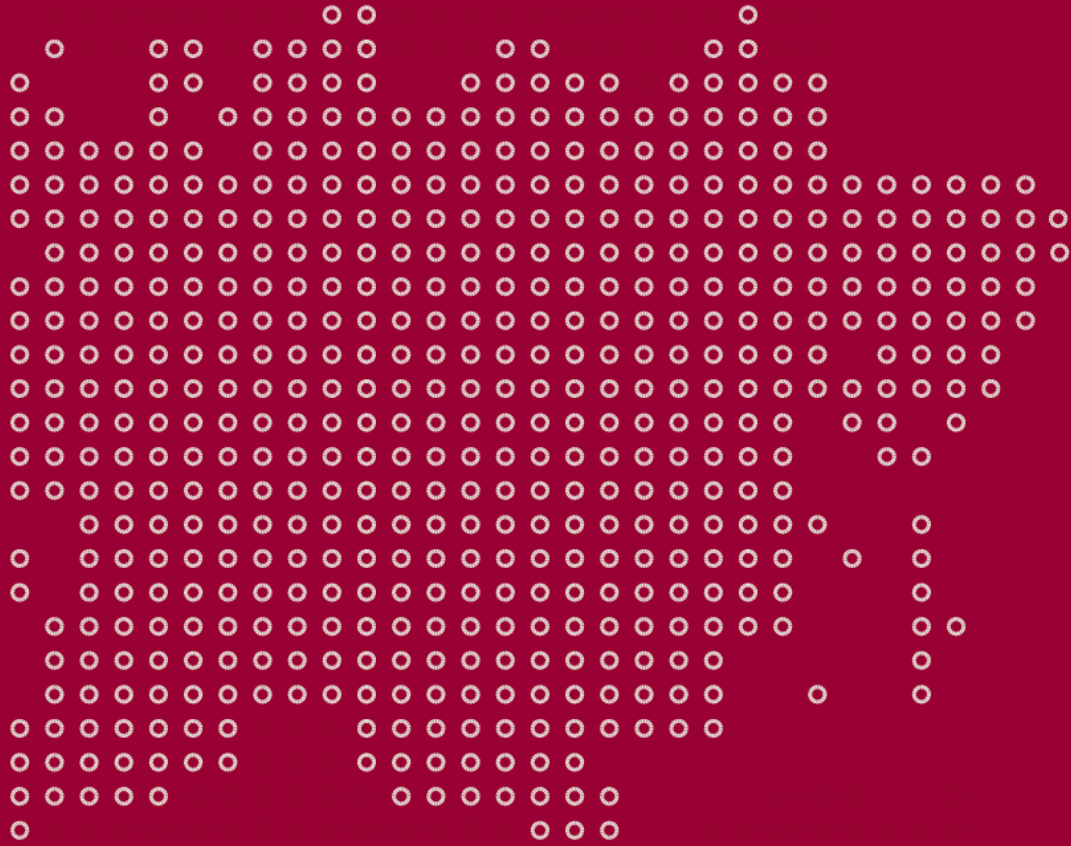
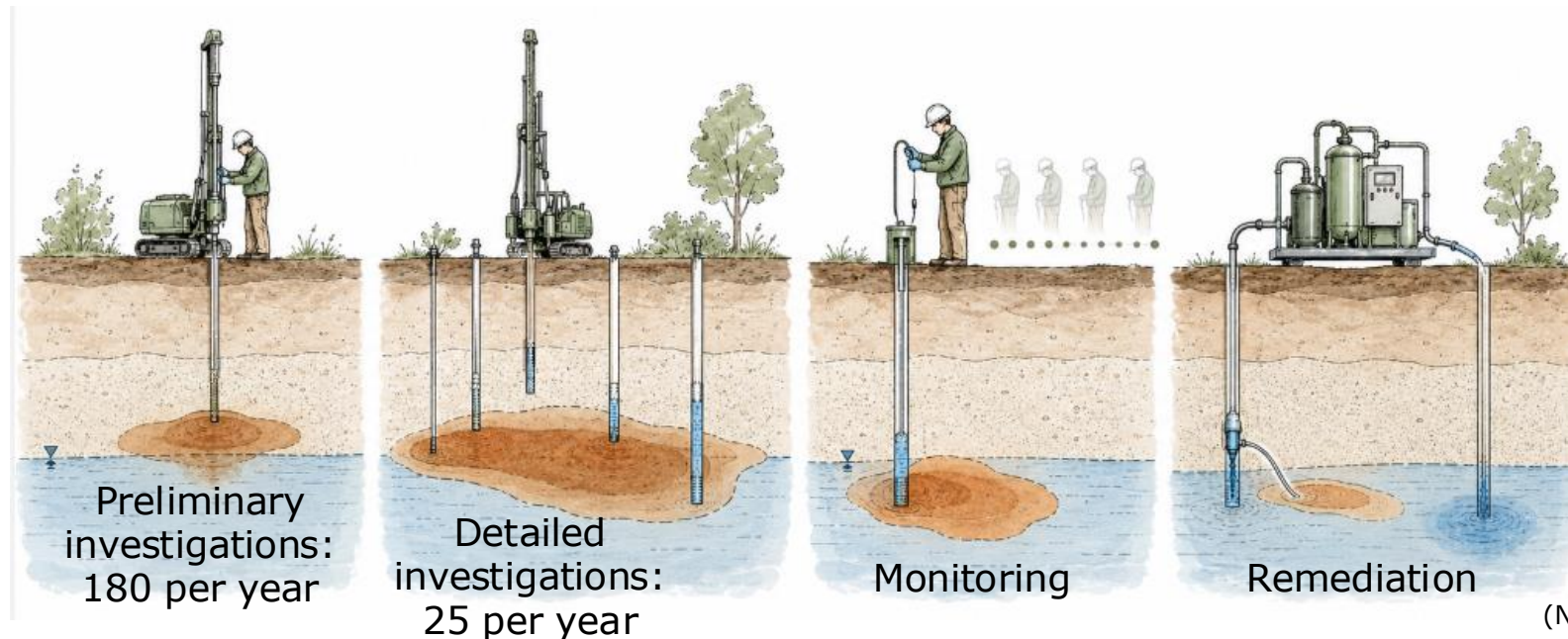




Evaluating Environmental Impacts in Contaminated Site Investigations

Protecting people and the environment from contaminated sites

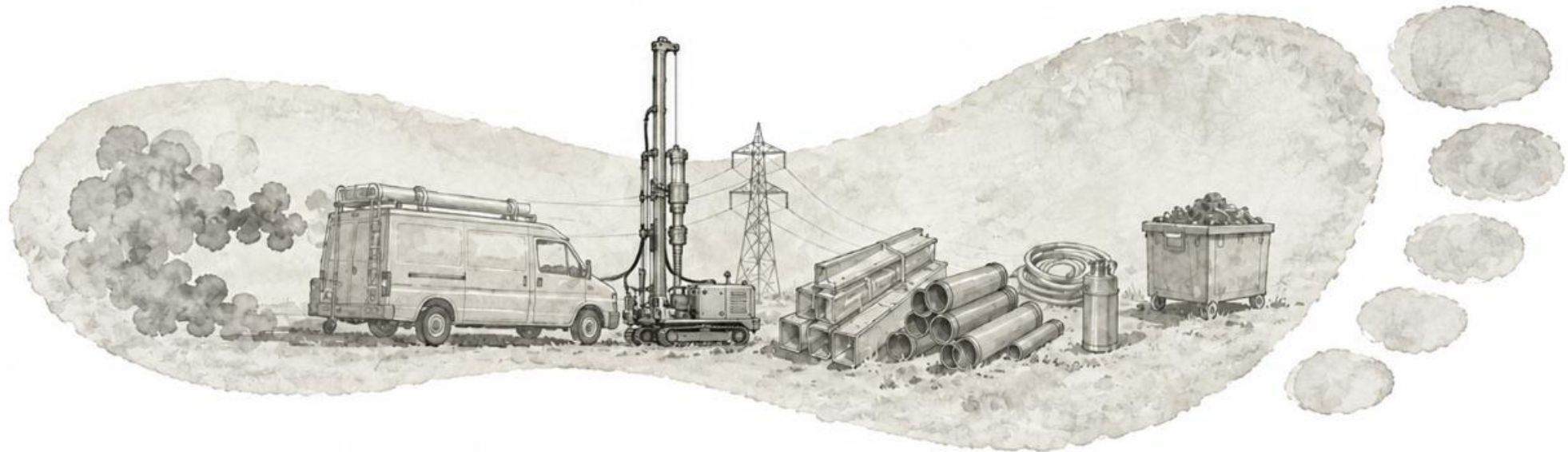
Each year the Danish Regions investigate, monitor and remediate contaminated sites to protect people, groundwater and the wider environment.



Protecting people and the environment from contaminated sites

Each year the Danish Regions investigate, monitor and remediate contaminated sites to protect people, groundwater and the wider environment.

→ While protecting the environment, what footprint do our own activities leave behind?



Previous focus: remediation

Beslutningsstøtteværktøj for valg af afværgestrategi overfor jord- og grundvandsforurening - RemS

Remediation Strategy for Soil and Groundwater Pollution - RemS

Introduktion

Indtastning af stamdata

Lokalitet: Lokalitetsnummer/ID:

Miljømyndighed:

Bruger: Organisation/firma:

Udarbejdet pr: Projektstart: Ugenr: År:

Vejledning om indholdet af regnearkets faner

2010 – RemS

OBS input values not updated

Indtastning i ark 2 og 3 er en forudsætning for brugen af de efterfølgende ark nr. 4 – 8. Se også separat brugervejledning.

Læs mere for henholdsvis fokus på signatur i sammenhæng med...

Intro / 1. Sammenfatning / 2. Forureningsbeskrivelse / 3. Afværgestrategi / 4. LCA-inddata / 5. LCA-resultater / 6. Carbon footprint / 7. Omkostninger / 8. Tilføjelse

Carbon footprint
från efterbehandling och andra markarbeten

Start Metoder Mina behandlingar Information

Introduktion

Syftet med verktyget är att beräkna utsläppet av koldioxidäkvivalenter i samband med efterbehandling av förorenad mark. Om mängder ej justeras ger verktyget schabloniserade utsläppsdata som främst är avsedda för att i ett preliminärt skede göra en grov jämförelse mellan olika metoder och de bör därför inte ligga till underlag för beslut. Om mängderna däremot justeras till platsspecifika förutsättningar kan verktyget även användas för detaljerade beräkningar och beslutsunderlag. Innan verktyget används bör användaren läsa igenom tillhörande användarmanual. Kontakta info@atgardsportalen för att lämna synpunkter.

Användaren av verktyget ansvarar för resultaten av beräkningarna.

⊞ Visa information ▼

Välj tjänst

Metoder

Här kan du snabbt få en jämförelse av utsläpp baserat på standardscenario av alla metoder som finns i verktyget.

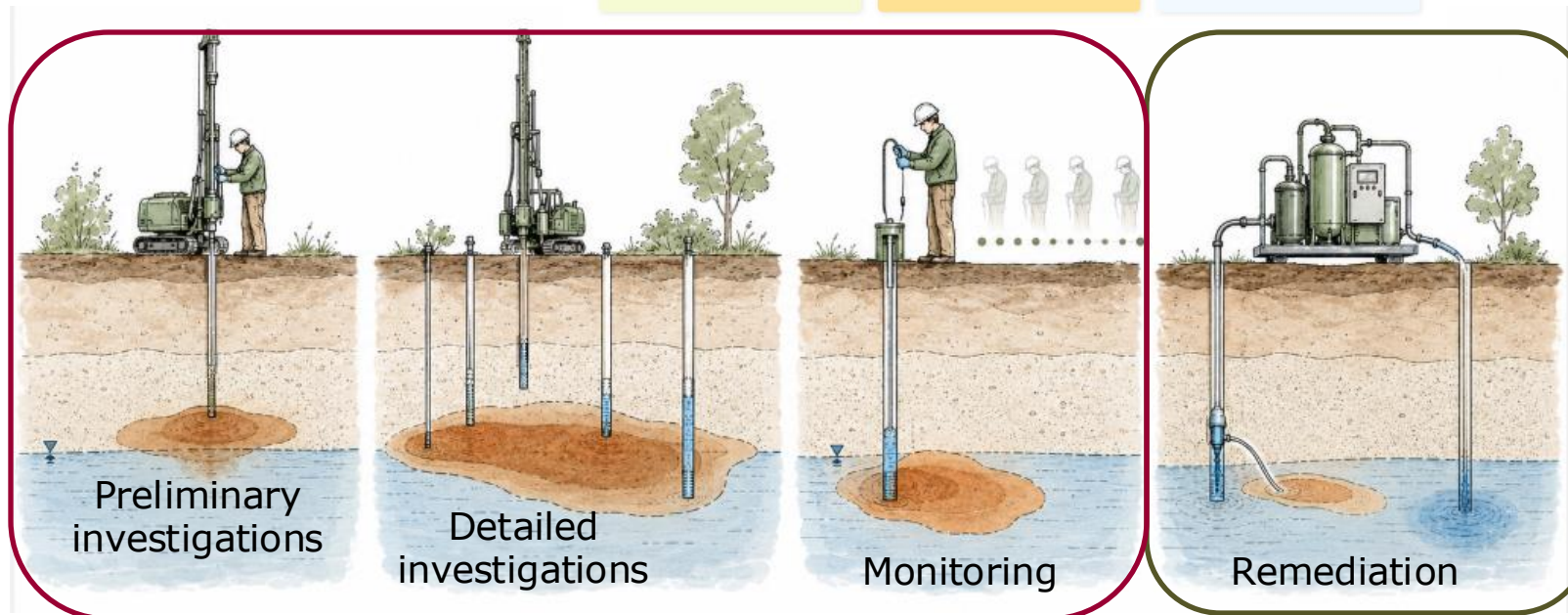
Skapa en behandling

Här kan du själv justera förutsättningarna och lägga till platsspecifika data för en eller flera metoder, som sedan kan jämföras.

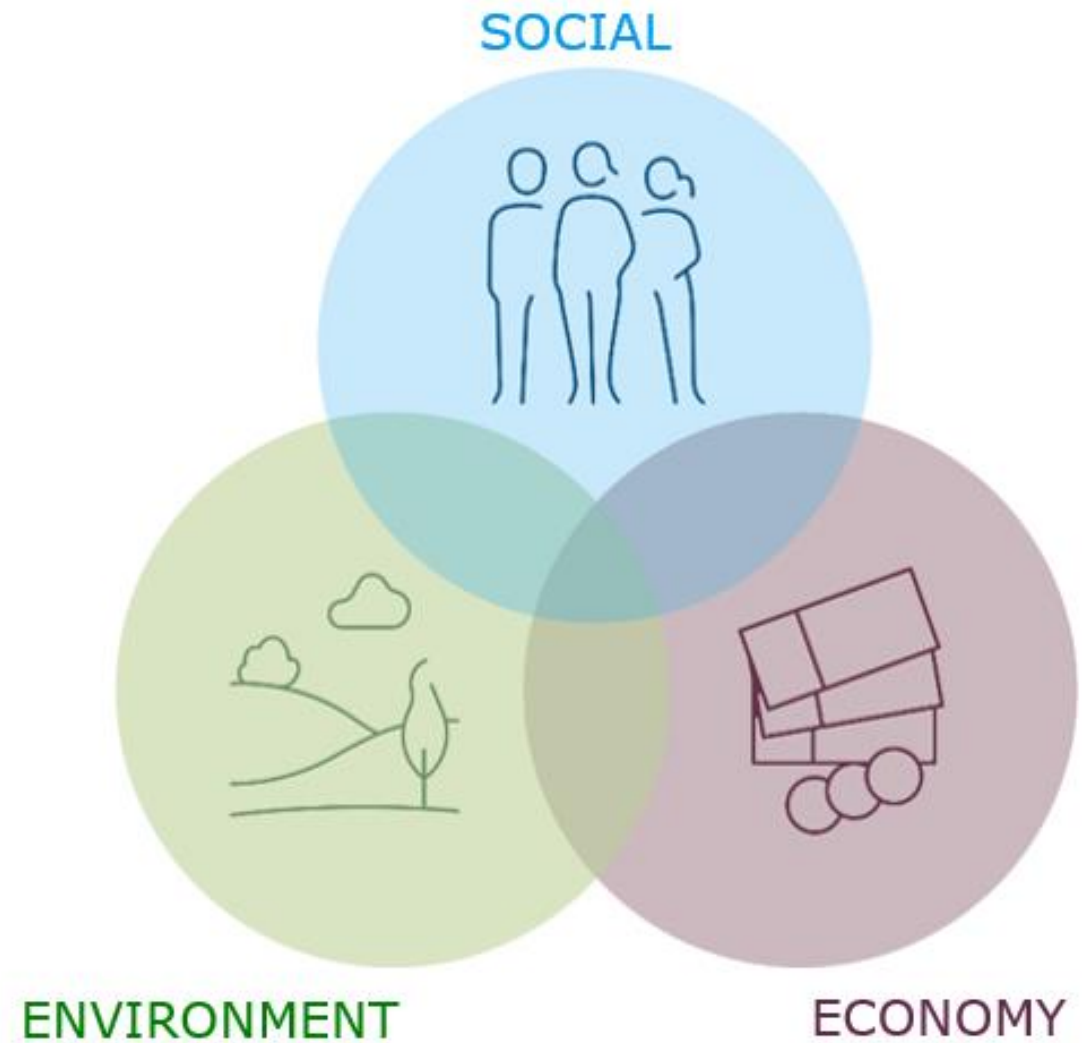
Fortsätt på tidigare arbete

Har du sparat ner beräkningar på din dator kan du ladda upp dem igen här, och fortsätta arbetet.

<https://co2.atgardsportalen.se/>



Contaminated site investigations



Contaminated site investigations

Objective of project:

- overview of activities and impacts and which impacts do they have?
- where can we make a real difference?

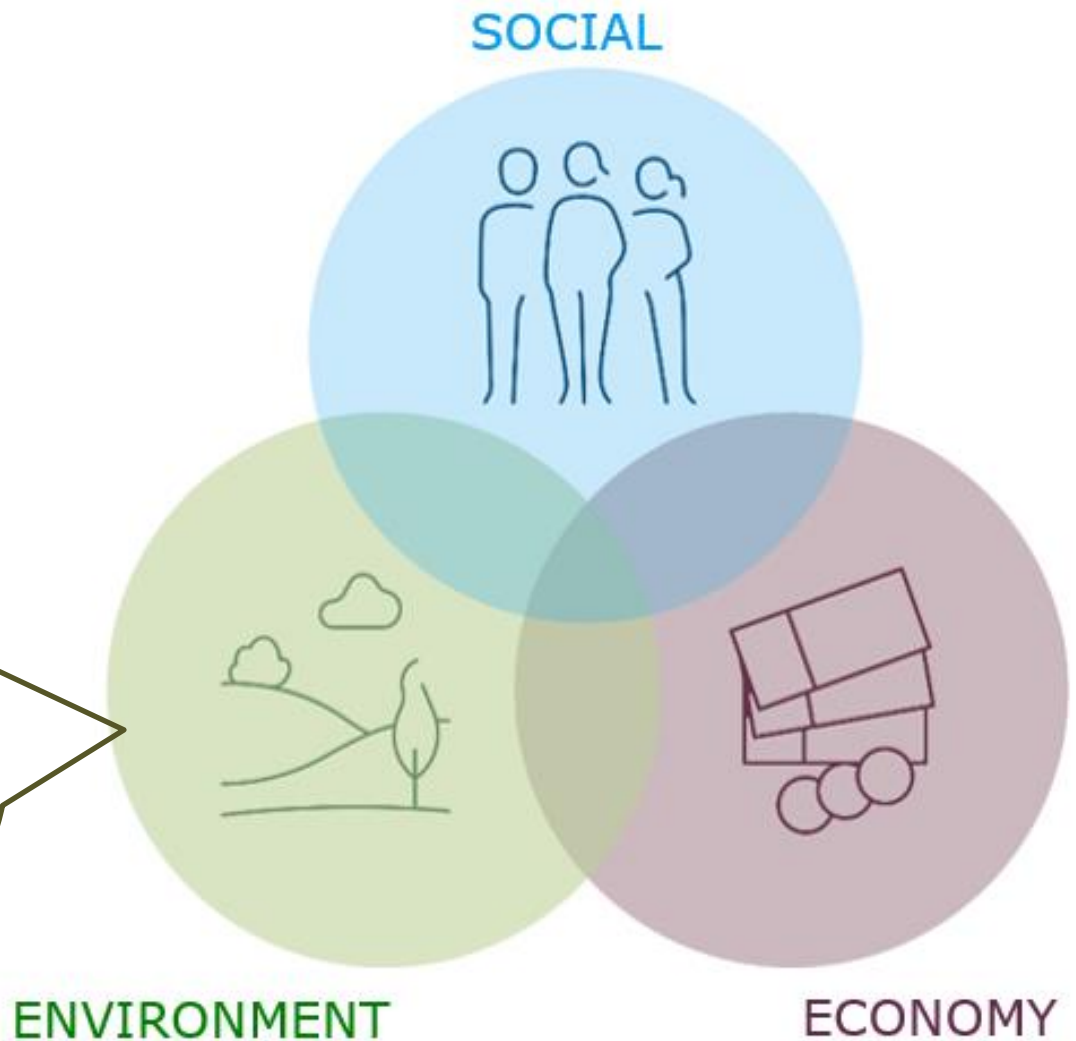
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Hovedstaden

NIRAS

RAMBOLL



Contaminated site investigations

Assessing Social Sustainability in Contaminated Site Investigations

Tuesday, September 15, 16:30 - 16:50

Gitte Lemming Søndergaard



SOCIAL

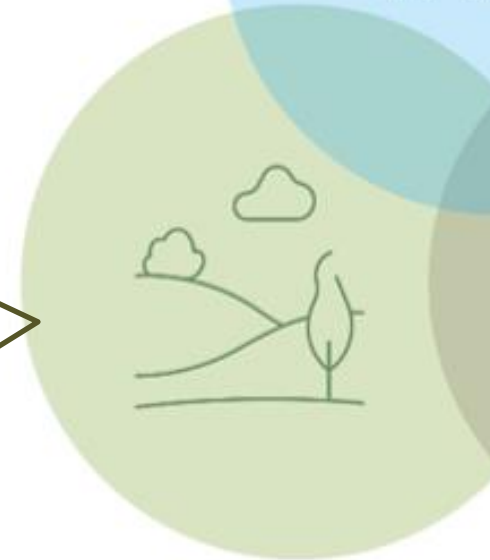


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ENVIRONMENT

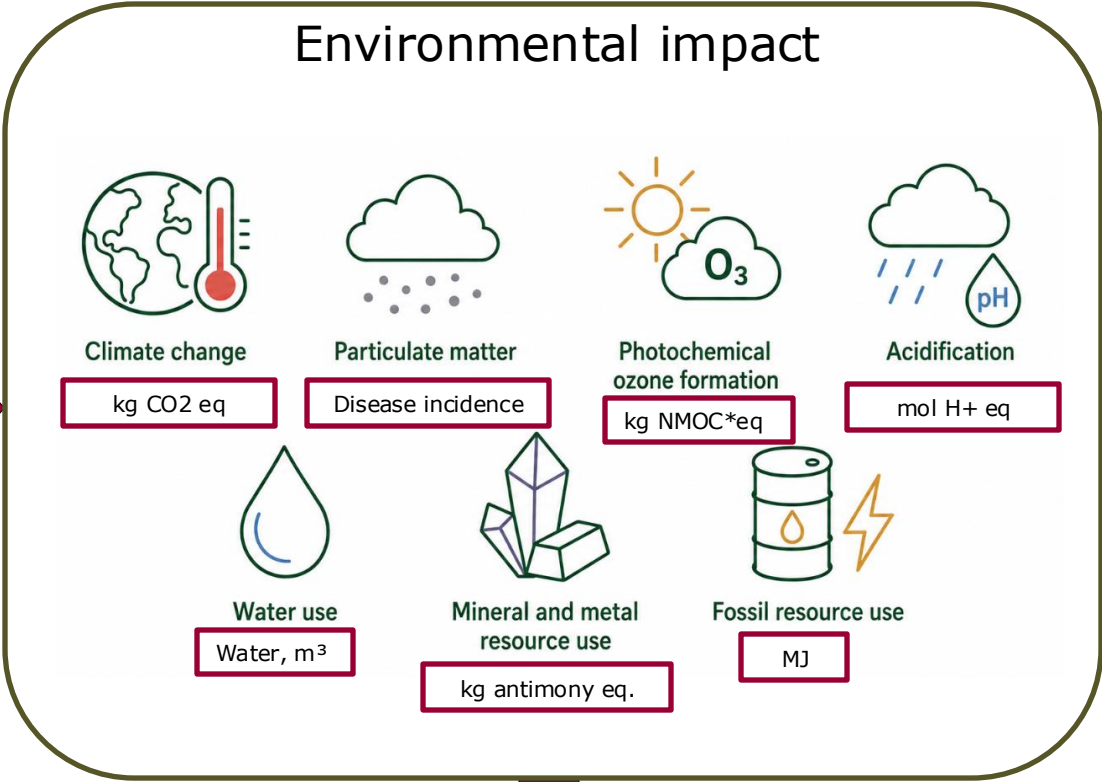
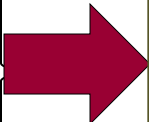


ECONOMY



LCA screening of contaminated site investigations

Activity group	Variants	Functional unit
Transport and mobilisation	7	1 km
Geophysics	3	1 km line profile
TV inspection and sewer flushing	2	1 m of pipe
Soil-gas measurements	1	1 measurement
Indoor-air measurements	3	1 measurement
Geoprobe investigations	4	1 m
Drilling	11	1 m
Supervision of drilling	1	1 site inspection
Disposal of drill cuttings	2	1 m ³
Environmental measurements in the soil laboratory	2	1 PID measurement
Groundwater-monitoring loggers	2	1 logger for 3 years
Water sampling	3	1 sample
Environmental laboratory analyses	5	1 analysis
Office work	1	1 kontortime



= **1 PE**
Annual environmental footprint
of one average global citizen

Case: Detailed investigation, Capital Region of Denmark

- Metal foundry and machine workshop, where chlorinated solvents were likely used to clean metal components.
- Investigations of soil contamination were conducted between 2019 and 2022.



Case: Detailed investigation, Capital Region of Denmark

Soil gas:

- Mobilisation: 370 km by van
- 54 soil-gas measurements



Supervision of drilling activities:

- Mobilisation: 3,330 km
- 1,726 soil samples

Geoprobe investigations:

- Mobilisation: 666 km by truck and 1,406 km by van
- 651 m of probing
- 61 depth-specific groundwater samples



Groundwater sampling:

- Mobilisation: 370 km
- 24 groundwater samples collected using different types of pumps

Drilling investigations:

- Mobilisation: 784 km by truck and 1,736 km by van
- 817 m of 6" drilling
- 47 m of 10" drilling

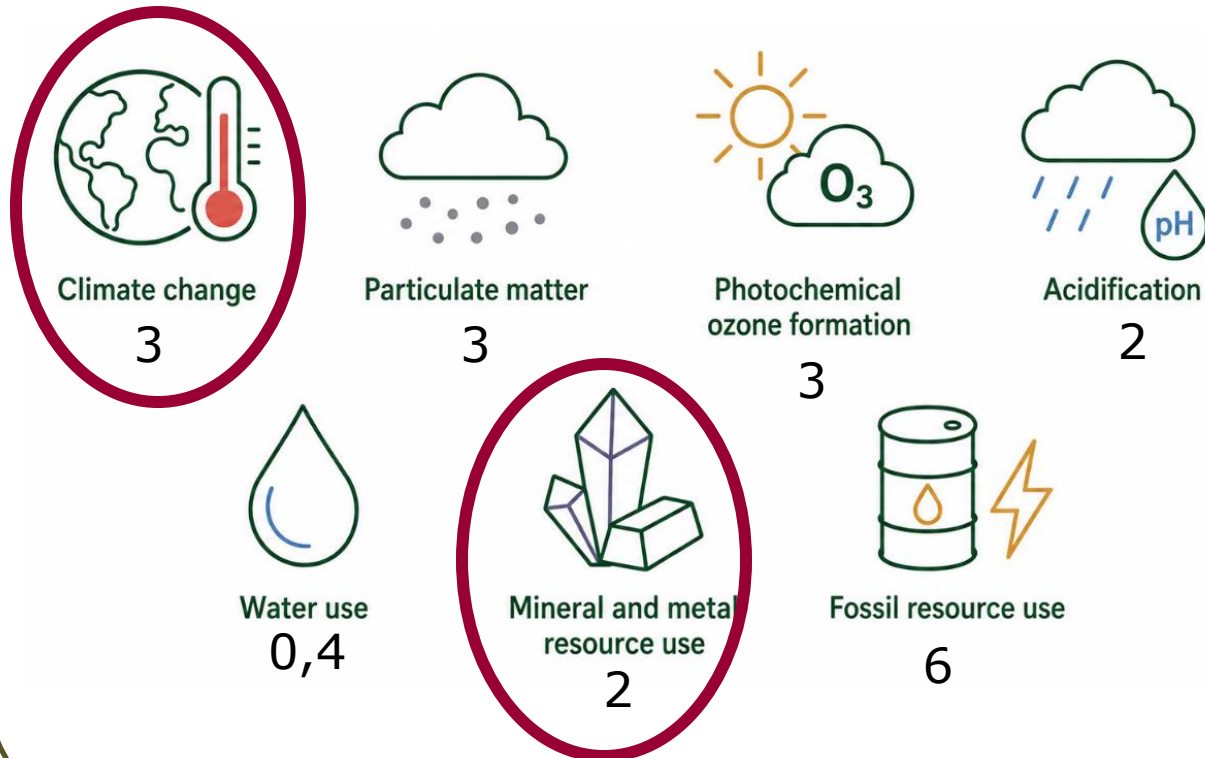


Laboratory analyses:

- Approximately 1,600 chemical analyses of soil, groundwater and air samples

Case: Detailed investigation, Capital Region of Denmark

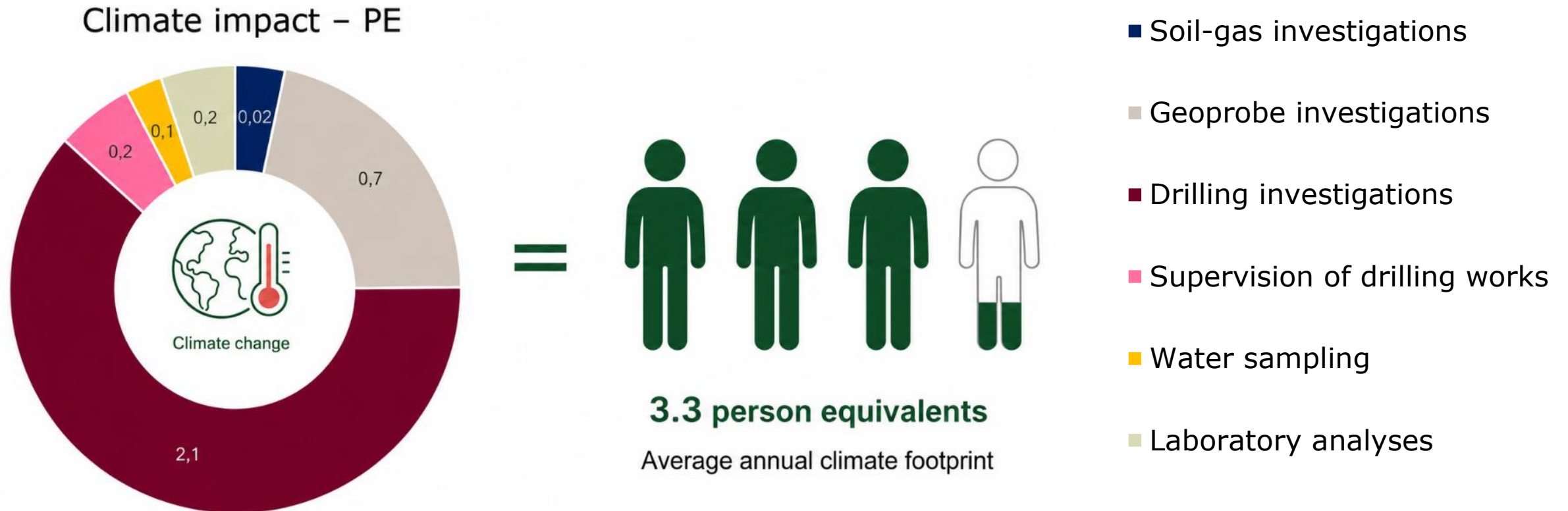
Environmental impact



= **1 PE**

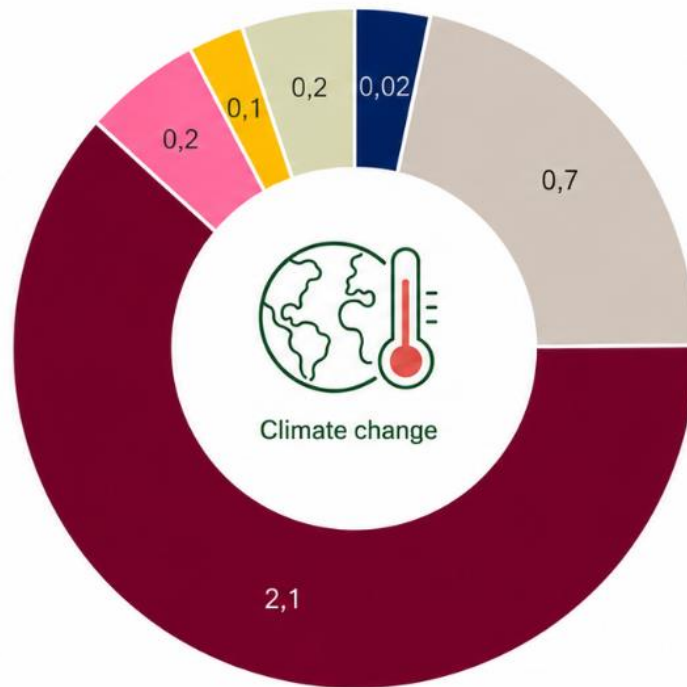
Annual environmental footprint
of one average global citizen

Case: Detailed investigation, Capital Region of Denmark



Case: Detailed investigation, Capital Region of Denmark

Climate impact – PE

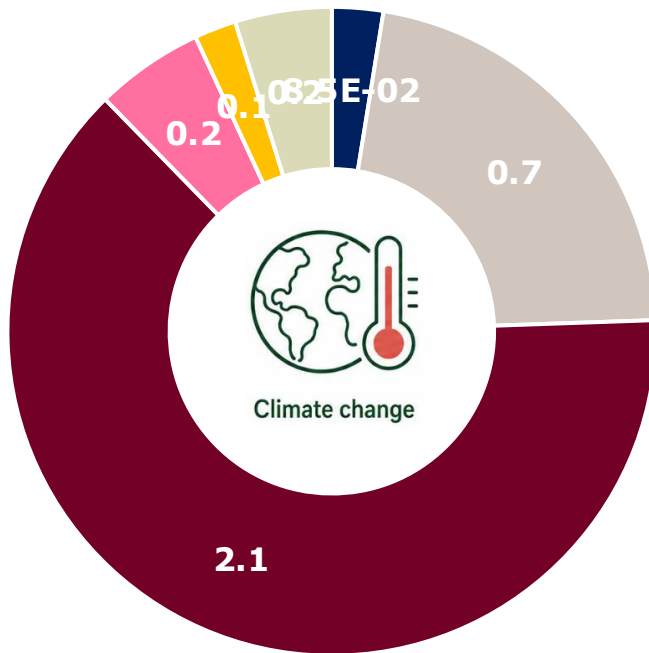


Mobilisation consistently contributes to the environmental impact and should therefore be carefully considered and minimised wherever possible



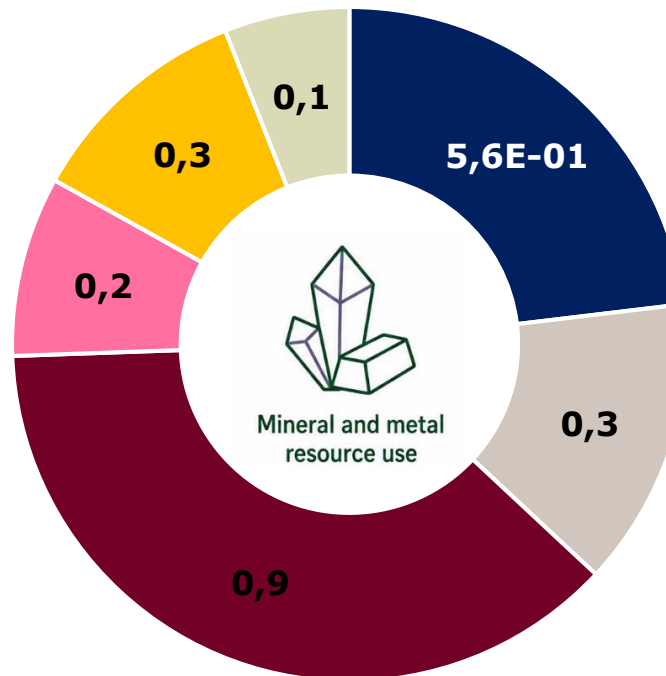
Case: Detailed investigation, Capital Region of Denmark

Climate impact – PE



Total: 3,3 PE

Resource use: minerals and metals – PE



Total: 2,4 PE

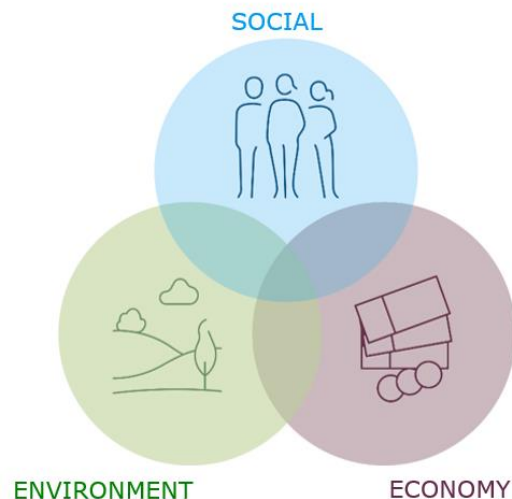
- Soil-gas investigations
- Geoprobe investigations
- Drilling investigations
- Supervision of drilling works
- Water sampling
- Laboratory analyses

Conclusions

A practical framework

- Web LCA-based screening tool make the environmental impacts of site investigations visible and comparable.
- The framework covers 14 environmental indicators and 47 investigation scenarios.

→ Access to and use of the tool require a valid licence!
(contact iddamg@rm.dk)



Indtastning | Tabelvisning | Grafisk visning | Sammenlign | Hjælp | Gem | Nulstil | Download... | Luk alle | Åbn alle

Beregning af miljøpåvirkninger

Bæredygtighedsbegrebet underinddeles traditionelt i miljømæssige påvirkninger, sociale påvirkninger og økonomisk forbrug. Dette værktøj begrænser sig til de miljømæssige påvirkninger forbundet med regionernes forureningsundersøgelser.

Resultater er som udgangspunkt afrundet, hvis ikke andet er angivet.

Vælg påvirkningskategorier

- ☒ Klimapåvirkning
- ☒ Ressourceforbrug (Vand)
- ☒ Ressourceforbrug (Mineraler og metaller)
- ☒ Ressourceforbrug (Energi (fossil))
- ☒ Partikelforurening
- ☒ Fotokemisk ozondannelse
- ☒ Forsuring

Indlæs gemte værdier

Indtast referencekode for at indlæse gemte oplysninger

XXX Hent

Miljøpåvirkninger

Indtastning

- Transport/mobilisering
- Geofysik
- TV-inspektion med spuling af kloak
- Poreluftmålinger
- Indeluftmålinger
- Geoprobe sonderinger
- Boringer
- Tilsyn med borearbejde
- Bortskaffelse af opboret jord
- Miljøtekniske målinger i jordlaboratorium

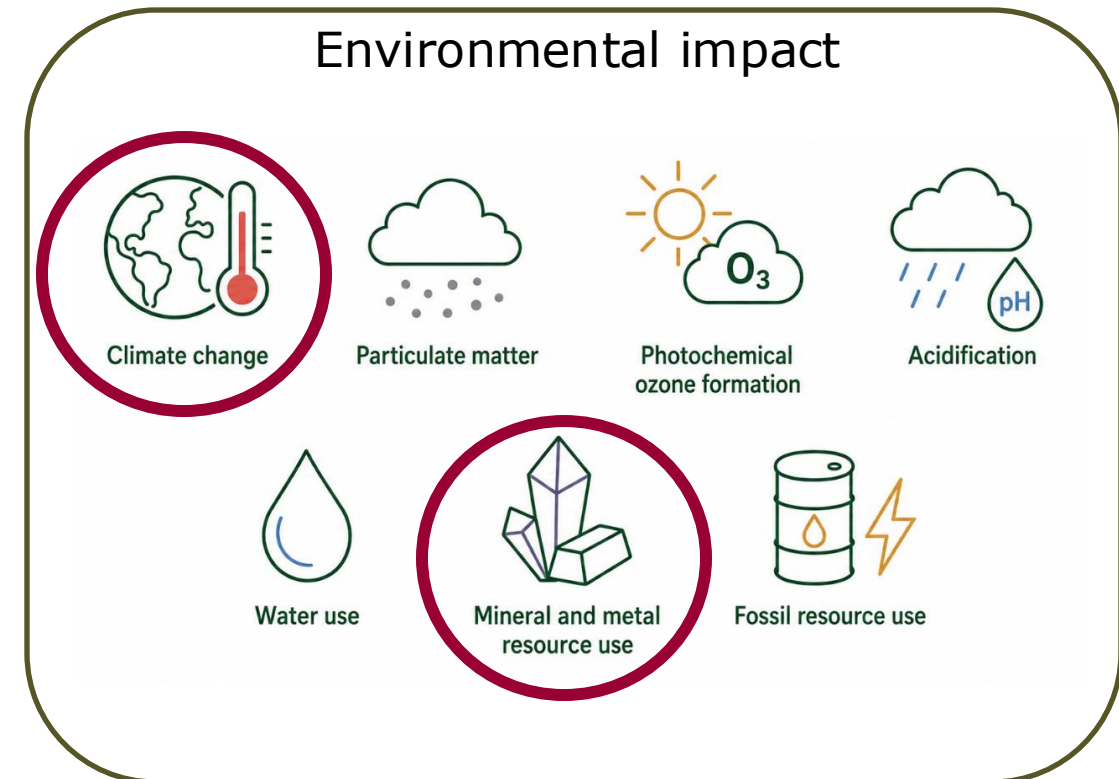
Udviklet af Region Midtjylland og Region Hovedstaden

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Initial findings from using the tool

- Of the 7 environmental impact categories, **fossil resource** use is the most significantly affected by our site investigations
- Overall **mobilization** has a non-negligible impact
- Drilling** is one of the largest contributor.
- Geoprobe** investigations are the next-largest contributors.

→ **Our work has an environmental footprint that should be considered in how we plan and carry out our activities!!!**

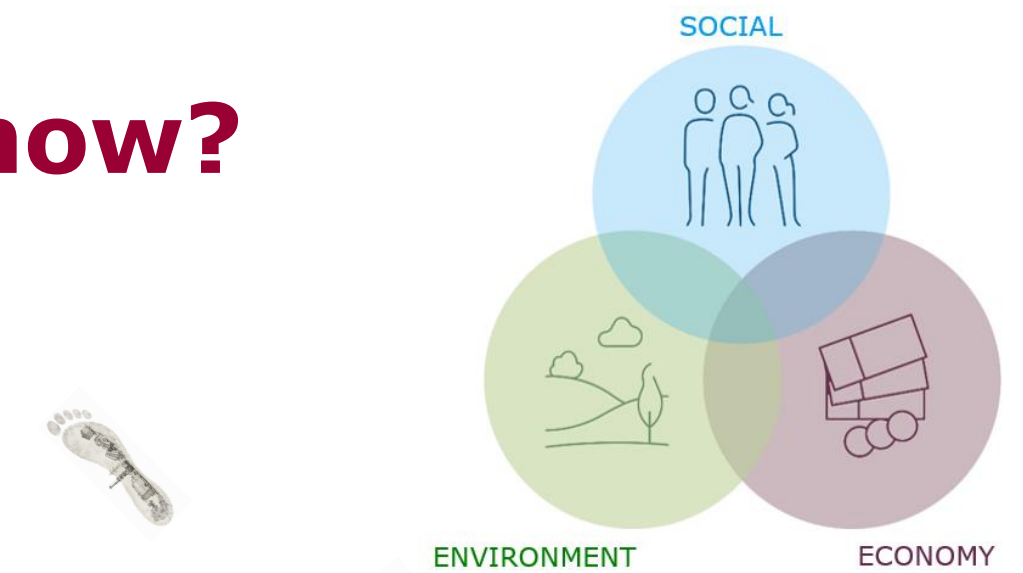


What did we learn until now?

- Coordinate field activities → reduce mobilisation.
- Optimise drilling, electrical drilling, dimensions, equipment, sampling strategies and material use.
- Reuse clean drill cuttings and improve waste management.
- Include transparency and environmental optimisation, maybe in tender documents?

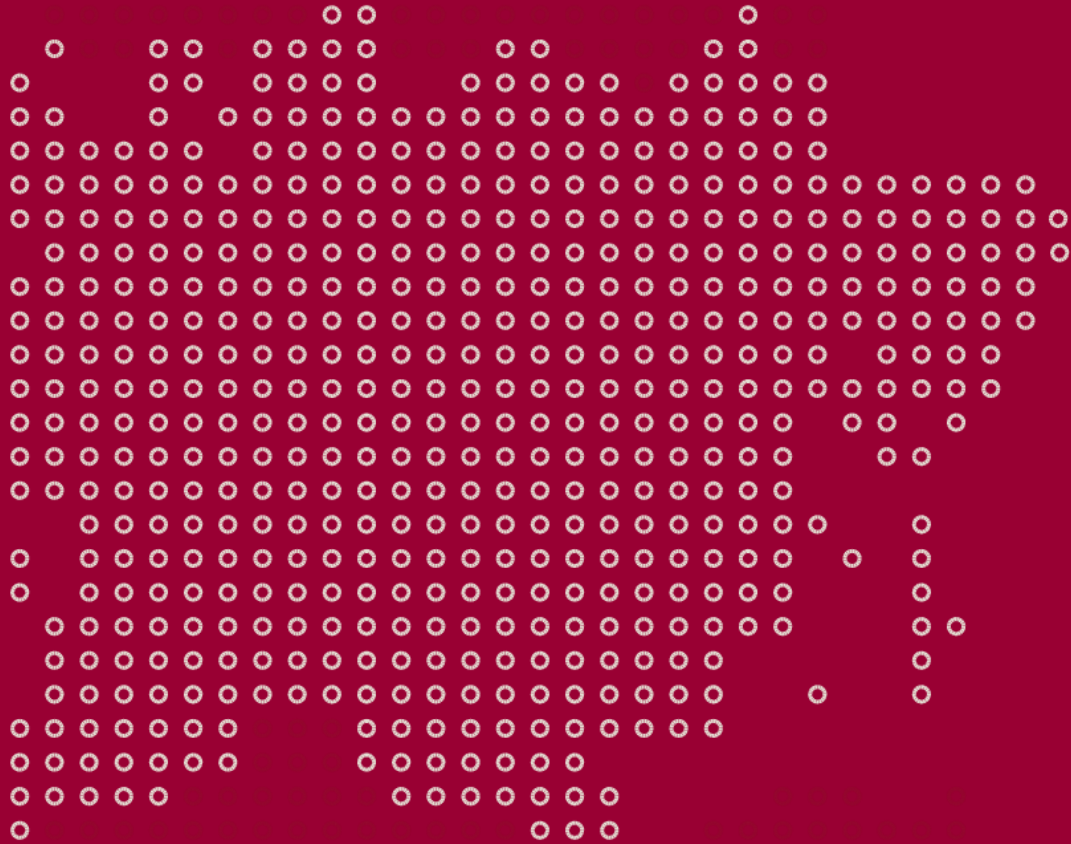
Key message:

Environmental performance should become an integral part of investigation planning, however still important to maintain the data quality required for robust risk assessments.



+SOCIAL





Ida Dyrlund Damgaard, Susanne Arentoft og Lone Egeris Lund, Central Denmark Region
Kim Sørensen og Arne Rokkjær, Capital Region
Klaus Weber og Freja Rebecca Johansen, Niras
Gitte Lemming Søndergaard, Rambøll