CLEAN SOIL

- A framework for tackling soil contamination

Denmark has been tackling and developing solutions to soil contamination issues for more than three decades: and these solutions work. Denmark is now better equipped than ever to manage soil contamination. This booklet gives you a brief introduction to our approach.

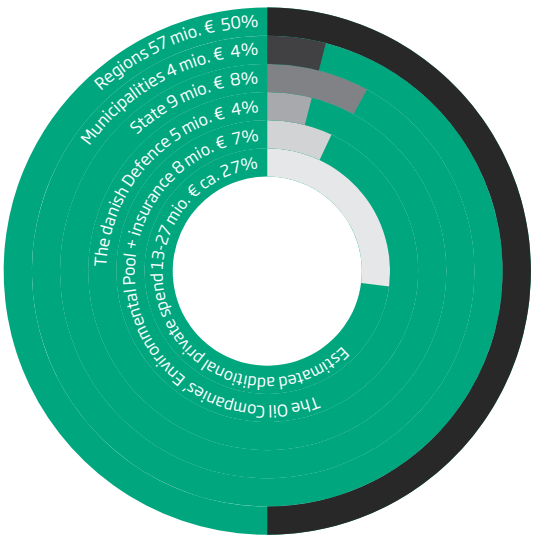
Denmark is deeply committed to remediating soil contamination. This is perhaps best illustrated in the fact that, in 2012 alone, the Danish authorities spent € 75 million on soil remediation (in 2012 the Danish GDP was € 245 billion).

In Denmark, protection of four key values forms the basis of our decisionmaking.

The regional authorities prioritize their remediation efforts towards

- Contaminated sites threatening our groundwater resource.
- Contamination where evaporation from the soil is causing a health risk.
- Sites where there is a risk of human contact with the contaminated soil.
- Contaminated sites posing a risk to nature protection areas and our lakes, fjords, streams and rivers.

Money spent on soil and groundwater remediation in Denmark in 2012



Source: Depotrådet 2012

Danish Ministry of the Environment
Environmental Protection Agency

State of Green
Join the Future. Think Denmark

A five-step approach to clean soil

In Denmark, the central government provides the regulatory frame-work, guidelines and funding for soil remediation. However the regional authorities are responsible for mapping, investigations and the actual remediation. They typically follow this five-step approach:

1. Mapping: based on data on historical use of the site (stage-one knowledge level).
2. Preliminary investigation (stage-two knowledge level): investigation to identify underground storage tanks etc. from historical archives. Soil and groundwater samples are taken to determine whether or not the site is polluted.
3. Further investigations: if the contamination might pose a risk to human health or the environment, further investi gations are carried out to determine the extent of the pollution and perform a risk assessment. Possible remediation measures are also suggested if the pollution poses a risk.
4. Remediation
5. Operation and control: This is only relevant for long-term remediation efforts.

35,000:
The number of sites mapped and classified as either "contaminated" or "potentially contaminated" in Denmark

Who foots the bill?

For any new soil contamination, the polluters pay for investigation and remediation.
Contamination often occurred years or even decades ago, meaning the perpetrating companies could be bankrupt or closed. And even if the companies are still in operation, it is often difficult to establish clear liability for the contamination.

Therefore, it has been paramount to establish a clear "polluter pays principle", and the Danish Act on Contaminated Soil from 2000 did just that.

For soil contamination committed in the past, the public authorities step in if remediation is not covered by insurance or it has been impossible to reach a settlement on voluntary remediation.

Developing solutions along the way

The challenges from soil contamination are on a societal scale and therefore the public sector is needed as a driver to push innovation.

The public authorities in Denmark are helping to start and fund new innovation projects in collaboration with the private sector and universities. This system has enabled us to develop unique solutions to dif-ferent soil contamination challenges.

Furthermore, the system ensures a high level of data transparency, as all innovations have been made publicly available, along with the data from the site-mapping and investigation processes.

This means that we can ensure that public and private actors have the best possible conditions to adopt new technology and find new and more cost-effective solutions to soil-contamination challenges.

DKJORD - the database on Denmark's soil

The regional authorities collect huge amounts of data. This data stems from the ongoing mapping of contaminated and potentially contaminated sites in Denmark, as well as the many site investigations, test and pilot projects, and actual remediation projects being carried out.

The data is uploaded and stored in a central, database called 'DKJord' ('DK Soil'). In addition, data about groundwater, geological soil composition and historical land use is also collected and used by the public authorities as well as the private sector.
This aids authorities in making the optimal decisions regarding new remediation projects.

LEARN MORE ABOUT THE DANISH SECTOR FOR SOIL AND GROUNDWATER REMEDIATION. FIND MORE CASES AND CONNECT WITH DANISH EXPERTISE AT:
STATEOFGREEN.COM/SOIL-QUALITY