TECHNOLOGY

Pollution becomes fuel for the flames

New method for the purification of soil with chlorinated solvents by burning away pollution

ENVIRONMENT

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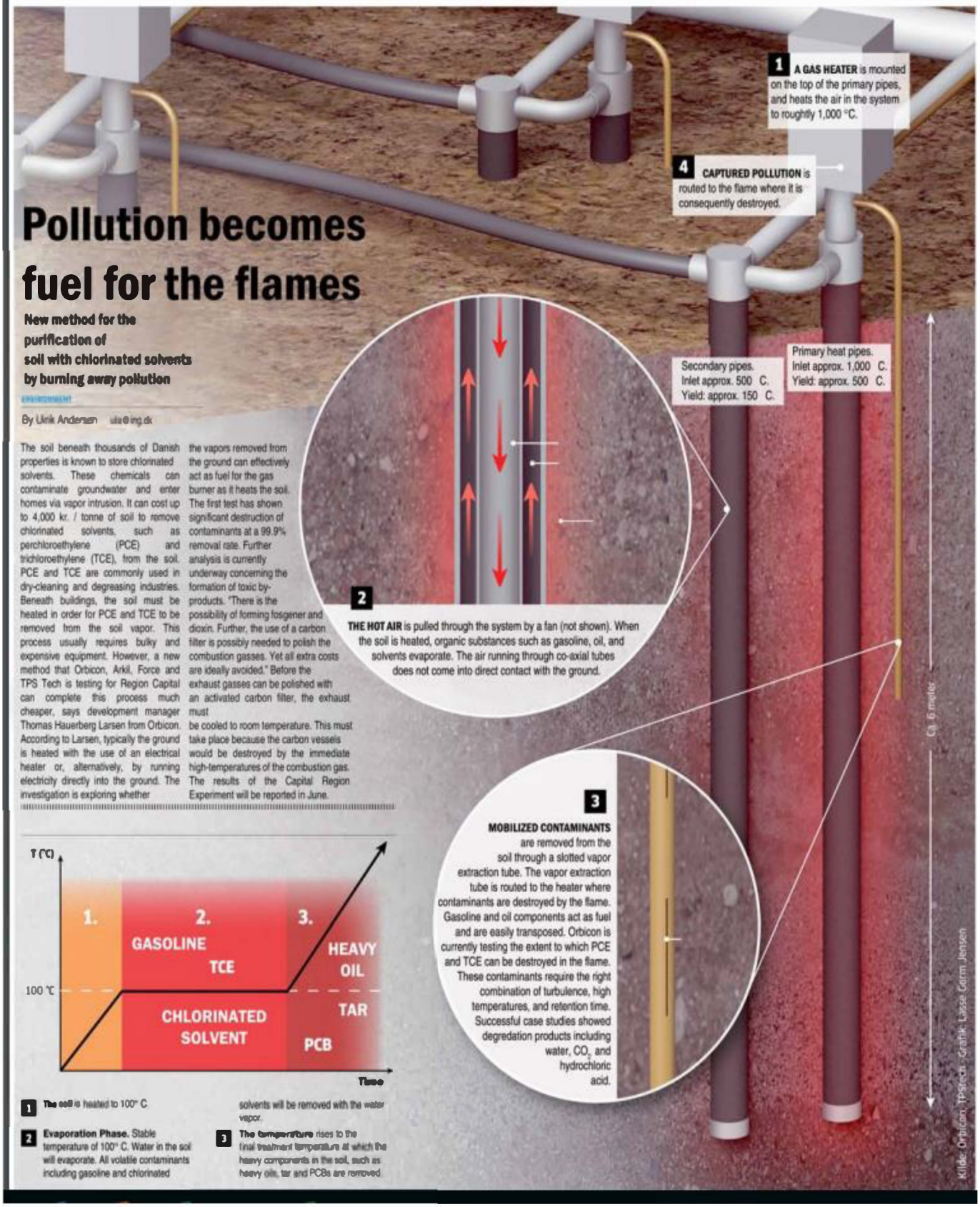
The soil beneath thousands of Danish properties is known to store chlorinated solvents. These chemicals can contaminate groundwater and enter homes via vapor intrusion. It can cost up to 4,000 kr. / tonne of soil to remove chlorinated solvents, such as perchloroethylene (PCE) and trichloroethylene (TCE), from the soil. PCE and TCE are commonly used in dry-cleaning and degreasing industries. Beneath buildings, the soil must be heated in order for PCE and TCE to be removed from the soil vapor. This process usually requires bulky and expensive equipment. However, a new method that Orbicon, Arkil, Force and TPS Tech is testing for Region Capital can complete this process much cheaper, says development manager Thomas Hauerberg Larsen from Orbicon. According to Larsen, typically the ground is heated with the use of an electrical heater or, alternatively, by running electricity directly into the ground. The investigation is exploring whether the vapors removed from the ground can effectively act as fuel for the gas burner as it heats the soil. The first test has shown significant destruction of contaminants at a 99.9% removal rate. Further analysis is currently underway concerning the formation of toxic by-products. "There is the possibility of forming fosgener and dioxin. Further, the use of a carbon filter is possibly needed to polish the combustion gasses. Yet all extra costs are ideally avoided." Before the exhaust gasses can be polished with an activated carbon filter, the exhaust must be cooled to room temperature. This must take place because the carbon vessels would be destroyed by the immediate high-temperatures of the combustion gas. The results of the Capital Region Experiment will be reported in June.



1 **The soil** is heated to 100° C.

2 **Evaporation Phase.** Stable temperature of 100° C. Water in the soil will evaporate. All volatile contaminants including gasoline and chlorinated solvents will be removed with the water vapor.

3 **The temperature** rises to the final treatment temperature at which the heavy components in the soil, such as heavy oils, tar and PCBs are removed.