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# Methodology for Stored Heat “Heat In Place” (HIP) assessment of geothermal aquifers

- Exemplified by a study of the **Arnager Greensand** in SW Scania

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**In this project, a geothermal assessment has been conducted on the Arnager Greensand over SW Scania using the Stored Heat “Heat-In-Place (HIP) method.**

The Arnager Greensand is an unconsolidated fine to medium grained quartz arenite (sandstone).

During an extensive Cretaceous transgression, the Arnager Greensand deposited in a marginal shelf environment and represents a regional **inner-shelf sand deposit.**

The Arnager Greensand holds potential for **direct-heat utilization** (district heating) and is also considered a promising option for CO<sub>2</sub> storage.

The **Stored Heat Method** estimates the amount of geothermal energy in the subsurface. The input parameters are the volume of the reservoir, volumetric heat capacities of the rock and fluids, reservoir temperature, porosity, and a reference temperature.

The Arnager Greensand is found at depths between **1170 - 2240 meters** below mean sea level. The depth is greater next to the Romeleåsen Fault Zone (RFZ) and shallower over the Falsterbo Peninsula. A constant geothermal gradient was used to estimate the reservoir temperature.

In SW Scania, the **Arnager Greensand is thickest in the south** and thins out towards the RFZ. The volume strongly impacts the stored heat results and is determined through the interpretation of both the base and top boundaries of the formation from borehole cores and vintage wireline logs.

For the main geothermal assessment, the Arnager Greensand is estimated to store **3270 PJ** of geothermal energy. The stored heat content within the reservoir varies between **1.25 - 4.53 GJ/m<sup>2</sup>**. In comparison to other assessments, the Arnager Greensand shows relatively low stored heat values.

**Additional deep drillings** are needed to better determine the spatial distribution of the Arnager Greensand which would improve the geothermal assessment.

