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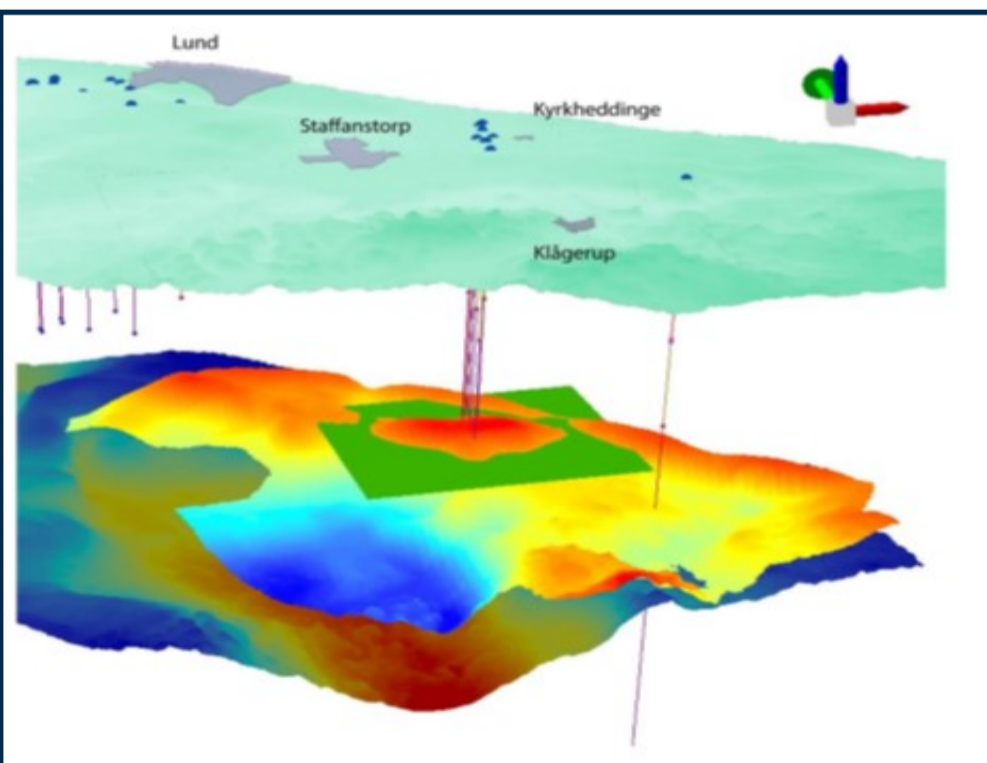
Subsurface characterization of the Lund Sandstone– 3D model of the sandstone reservoir and evaluation of the geenergy storage potential, SW Skåne, south Sweden

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Introduction

The goal of this study was to create a 3D model of the Lund Sandstone in the Kyrkheddinge area and evaluate the energy storage, and geothermal energy potential. This was done by digitalizing isochron maps combined with well data. The geothermal energy potential was done by evaluating gamma ray logs from the Kyrkheddinge Area and the Lund Geothermal Field

Structure	Green structure	Score	Brown structure	Score
Permeability (mD)	1700	5		
Porosity (%)	28.5	5	32	5
Total Reservoir Volume (V_R/V_S)	3.6	3	0.17–0.88	4
Total Closure Rating (h/H)	0.43	1	0.20–0.34	1
Depth to Top of Reservoir (m)	716	3	568	4
Reservoir Pressure (bar)	77.5	1		
Type of Reservoir	Channel Sandstone	4	Channel Sandstone	4
Residual Hydrocarbons (%)	1.9–3	3	1.9–3	3
Cap rock leakage	No data	2	No data	2
Cap rock Permeability	0.062	3		
Cap rock Threshold Pressure (bar)				
Cap rock Thickness	6-26	5	2	3
CAES score using ranking table from Succar and Williams (2008)		38/60		26/60
Available		56		37
Score percent (%)		67.86		70.27



Conclusions

- Digitalizing analog isochron maps into a 3D model using ArcMap and ArcScene is not overly complex but time consuming. It is a good way to find and visualize closed structures. It can also be used to do precise calculations on the area and volume on these structures. If the method is further developed and stream-lined it could prove an important tool in similar studies.
- The Kyrkheddinge area is likely a good place for geothermal energy utilization for district heating. It would probably be the lowest risk and upfront cost geenergy project.
- CAES could be possible in the Kyrkheddinge area. The Brown structure is the most likely option. This is a more high-risk project.
- If no closed structure can be used, thermal energy could be the best option.

Above: CAES ranking criteria from Succar & Williams (2008) with the data for the structure found in the Green Marker as well as data for the Brown Marker.

Below: 3D model showing the dome structure in the Green Marker. The green plane is horizontal at 770 meters below sea level and showing the level the green structure is closed at.