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## **Osmotic energy for solution mining – operating data and experience**

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## **Osmotic energy for solution mining – operating data and experience**

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### **Abstract**

Osmotic energy offers a solution for decarbonizing the solution mining operation, regardless of whether the purpose is for brine production or storage cavern construction. In the fall of 2023, SaltPower presented the operating data from the initial commissioning of the first osmotic power plant in the world. Now, SaltPower can present the experience and data after the first year in operation.

The technology Pressure Retarded Osmosis (PRO) utilizes that saturated brine has an osmotic pressure of 400 bar (5,800 psi). It requires a constant stream of brine, preferably saturated and freshwater, separated by a semipermeable membrane. The brine, pressurized to 70 bar (1,015 psi), will draw freshwater through the membrane from low to high pressure, diluting the brine in the process. The increased volume of diluted high-pressure brine is utilized to produce electrical power in a turbine or used as hydraulic pumping power.

The SaltPower plant has been commissioned and operates at Nobians brine production site in Hvornum, Denmark. The results show that the SaltPower plant contributes to the pumping power and reduces electricity consumption.

As this is the first osmotic power plant in the world, there have been challenges along the way. Since the first operating hours in the fall of 2023, SaltPower has successfully worked to find solutions for various problems to secure stable operations.

**Keywords:** Cavern Development, Solution Mining Surface Facilities, Energy Efficiency, Osmotic Energy