

Solmax Banking on Using Geomembranes in Earth Basin Heat Storage (EBHS) for District Heating (DH)

By GNA Editor



Geosynthetics are emerging as a significant contribution to promoting renewable energy, particularly in the realm of earth basin heat storage (EBHS). Solmax, a global leader in geosynthetics, is investing heavily in this emerging technology. By expanding its reach into EBHS, the company aims to unlock new markets for its HDPE geomembranes and other geosynthetic solutions. To spearhead these efforts, Solmax has appointed an Engineering Geologist dedicated to facilitating a sustainable heat transition.

What is Earth Basin Heat Storage?

Thermal Energy Storage in Earth Basins

Earth basin heat storage involves the use of large, excavated basins, filled with water or soil, to store thermal energy. This energy is often sourced from solar panels, geothermal systems, or industrial waste heat. Geomembranes play a vital role in these systems by ensuring:

- **Water-tightness:** Preventing leaks of water or heat-transfer fluids.
- **Thermal efficiency:** Acting as a barrier to reduce heat loss.
- **Environmental protection:** Preventing contamination of soil or groundwater.

Integration with District Heating Systems

Heat stored in earth basins is transferred to district heating networks via heat exchangers. Geomembranes contribute to the durability and reliability of these systems by withstanding thermal stress, thereby enabling the long-term performance of the heat storage infrastructure.

District heating systems, which provide centralized heat to entire communities, are increasingly vital in reducing CO₂ emissions. Germany's Renewable Energies Heat Act (EEWärmeG) mandates the use of renewable heat sources in new buildings, driving the expansion of district heating networks, such as the one in Dresden. Here, stored heat from EBHS systems will serve as a critical component in municipal heating strategies.

Large Solar Thermal Systems and Pit Thermal Energy Storage (PTES)

For solar heat to contribute more than 25% to district heating networks, large-scale heat storage is essential. Pit Thermal Energy Storage (PTES) offers a cost-effective solution, with storage capacities exceeding 100,000 m³. A crucial component of PTES is the polymeric geomembrane, which provides the seal between the pit and the ground. These membranes must withstand high temperatures while ensuring environmental safety and system efficiency.

Solmax's Role in Advancing Geosynthetics for EBHS

Solmax has already demonstrated its expertise by supplying geomembranes for a seasonal storage facility in Meldorf, Germany. This project, initiated in autumn 2022, involves the storage of industrial waste heat from a printing plant and a biogas facility.

The PTES system employs a multi-layer sealing approach:

1. A protective erosion-control layer is installed on the compacted subsoil to create a stable base.
2. A temperature-resistant polymer membrane is then placed over the protective layer. This membrane not only seals the stored water but also serves as the bottom layer for an insulated floating cover.

Thomas Labda, Solmax's Key Account Manager for Renewable Energy, emphasizes the importance of matching the protective layer to the subsoil and geomembrane base materials to ensure optimal performance.

Expertise at Solmax: Engineering Geologist Gilbert Smigielski

Gilbert Smigielski, a seasoned Engineering Geologist, has joined Solmax as a Sales Engineer for Renewable Energy. With a robust academic background in geology and hydrogeology, combined with years of professional experience in geosynthetics, Smigielski is poised to drive Solmax's initiatives in EBHS. His vision aligns with the company's commitment to sustainable heat transition and the broader goal of decarbonizing district heating systems.

Future Outlook and Further Reading

Solmax's innovations in geomembranes, coupled with advancements in EBHS technology, have the potential to revolutionize district heating systems worldwide. By leveraging its

expertise and investing in sustainable solutions, Solmax is setting the stage for a greener energy future.

For more insights, explore these resources:

1. [New Developments in Geomembranes for Pit Heat Storages](#)
2. [Seasonal Thermal Energy Storage: A Challenging Application for Geosynthetics](#)
3. [Geosynthetic Clay Liner for Seasonal Thermal Energy Stores](#)
4. [Influence of Geometry on the Thermal Performance of Water Pit Seasonal Heat Storages](#)