

Most osmotic power plants are insular and built out of sight. Osmotic Gradients celebrates the infrastructural rawness of the technology, confronting the essential need for alternative thinking about the future of energy production by creating an immersive and public sculpture.

Materially, the project is intentionally reductive, using the typical pipe modules of osmotic energy as a primary form. Shaped in part for efficiency and in part for experiential heightening, the final site design is an intricate network of pipes leading out into the Kattegat. We have increased the efficiency of the system by maximizing the volume of piping and the transfer surface area by spiraling a series of membrane sheets within pipes. Freshwater and saltwater meet within the pipes, outputting a gradient -brackish water – and a seemingly unlimited source of osmotic energy. The length of piping in our proposal covers approximately one third of the LAGI site, and can generate enough electricity to power 30,000 European households annually.

The sculpture is also intentionally not objective, but specific to the site and landscape. Approached from Refshalevej, visitors enter a dense corridor of piping, framing slivered views of the ice mass. Moving towards the harbor, in a processional that follows the melt, the pipes begin to slowly open up, offering views to the water, sky and beyond. Alternatively, visitors can experience the process in reverse, also entering the site via water taxi. Movement through the site offers what we hope will be the story of climate change – from melting ice to introspection of past actions to the need for innovation, ending with generation of a new energy landscape.

- 1. Membrane
- 2. Lichen Growth
- 3. Ice
- 4. Platform
- 5. Water Taxi Stop
- 6. Entrance
- 7. Transformer
- 8. Section (2x)

Osmotic power works through the separation, and then equalization, of salt and freshwater. On site, a collection of piping with an internal membrane separates the salt and freshwater. The freshwater travels through the membrane to equalize salinity. The subtle movement of water increases pressure on the saltwater side, causing the movement of a turbine that generates electricity.

Once deposited onsite, the ice will slowly begin to melt, producing osmotic energy as it mixes with the saltwater of the Kattegat in a series of pipes.

