

Hållbart och innovativt vattenbruk i symbios med skogsindustrin

Investment in Phase 1 is intended to generate essential data for the design of a full-scale facility, as well as to provide key knowledge to ensure that BIG Akwa becomes an attractive company for future investors. Consequently, the investment in this first phase is crucial for the further development of the business idea—from a sustainable innovation to a commercial, sustainable, and innovative company in Västernorrland.

Phase 1 consists of Pre-Study, Labtest and Process development.

Pre-Study Business plan

- **Economic Benefits:**
 - Reduced operational costs from integrated energy and nutrient systems.
 - Creation of a new food-tech industry potential in Sweden through scaled symbiosis projects.
 - High-efficiency protein production supports both local and global food demands.
- **Environmental Impact:**
 - High efficiency in reducing CO2 emissions and waste.
 - Reduced CO2 footprint with an estimated reduction of 1,000+ tons/year
 - Demonstrated circular economy principles with scalable potential.
 - Improved wastewater treatment results in better ecosystem preservation.
- **Fish Market Analysis:**
 - Address Sweden's seafood self-sufficiency gap (32 kg consumption vs. 1 kg production per capita).
 - Support the global fish market growth at +4-5% annually.
- **Pulp Sector Market Analysis:**
 - The Swedish pulp sector is a cornerstone of industrial symbiosis opportunities.
 - Collaboration with the pulp sector aligns with Big Akwa's mission to integrate aquaculture into existing industrial ecosystems, providing a dual benefit of operational efficiency and sustainability.
 - Market trends show increasing demand for renewable resources and sustainable practices, further supporting the symbiotic integration of aquaculture and pulp production.
- **Analysis of Sweden's Pulp Sector:**
 - Conducted a detailed analysis of the Swedish pulp sector to identify potential partners for an industrial symbiosis feasibility study with Husum (Metsä Group), Östrand (SCA), Grycksbo (Arctic Paper), Vallvik (Rottneros), and Sunne (Rottneros).
 - Husum and Östrand is added on the list of interested sites for future collaboration in an industrial symbiosis project
- **Blueprint Design:**
 - Collaborative design efforts with NAC and Frea to create a blueprint for the fish farm.

- Step 1: 3,000 tonnes/year requires 3.22 ha.
- Step 2: 6,000 tonnes/year expands the requirement to 5.29 ha.
- These designs account for integration with industrial symbiosis principles, particularly focusing on waste heat and nutrient recycling.
- **Technological and Environmental Consultation:**
 - Sweco provided expert guidance on technological solutions and environmental considerations.
- **Business Plan Development:**
 - Comprehensive business plan formulated to guide project development and strategic partnerships.

SCA Proof of concept

- **Veolia AnoxKaldnes Lab Trials:**
 - Case studies with SCA confirmed feasibility of symbiosis with pulp mills (e.g., Ortviken).
 - Positive scalability projections supported by lab-scale studies by AnoxKaldnes.
 - Verified COD removal efficiency at 90-95%.
 - Demonstrated the compatibility of fish farm sludge in pulp mill wastewater treatment processes without toxic effects.
 - Indicated potential nutrient utilization by bacteria (e.g., nitrogen and phosphorus).
 - Detailed study included:
 - Wastewater characterization, showing no significant toxicity.
 - Simulation of treatment processes at temperatures ranging from 28-40°C.
 - Efficient nutrient recycling measured by reduced COD levels and bacterial assimilation.
- **Approval by SCA:**
 - Results and findings were reviewed and approved by SCA, confirming the feasibility of the concept. Proof of concept is accepted by SCA Ortviken.
 - Letter of Intent (LOI) with SCA: A formal agreement to explore industrial symbiosis between Big Akwa and SCA
 - Industrial Symbiosis with Big Akwa is an interesting future Investment. Confirmations statement by SCA *“The demo trial results confirmed that the different types of water treatment technologies that are ususally employed in pulp mill water treatment plants can be succesfully operated also when partially fed with fish farm sludge. Accordingly, the results showed that the thought type of industrial symbiosis should be fully possible to put into industrial scale operation. Since these findings should be scaleable they imply a huge potential when it comes to the global potential of industrial symbiosis between landbased fish farming and wood pulp production.”*

SCA Logistic Park

- **Pre-Study Location:**

- Sundsvall Logistic Park was investigated due to its strategic location and proximity to SCA Ortviken operations. The area provided suitable infrastructure and access to necessary resources like water, power, and transportation. A 2022 agreement allowed Big Akwa to perform feasibility studies, focusing on land conditions, water supply, energy availability, and industrial integration.
- The study showed successful technological findings and synergies of collocation.
- **LOI with Sundsvall Logistic Park:**
 - Signed a Letter of Intent for the potential establishment of operations in Sundsvall Logistic Park, leveraging its strategic location.