AUTOSMOLT 2025

Autonomous containment- and production systems for smolt and post-smolt production.

Present day smolt production plants are still based on the same management principles and methods as the first generation of such facilities established in the 1980's, just in bigger scales. This is seen in that several of the most common cost driving operations, such as moving and sorting fish (e.g. internal logistics connected to vaccination), washing and disinfection of rearing tanks and general animal husbandry, are manually executed. Existing production sites are also physically large, meaning that the workers often need to spend a considerable amount of their daily work time moving between different parts of the facility to perform their tasks.
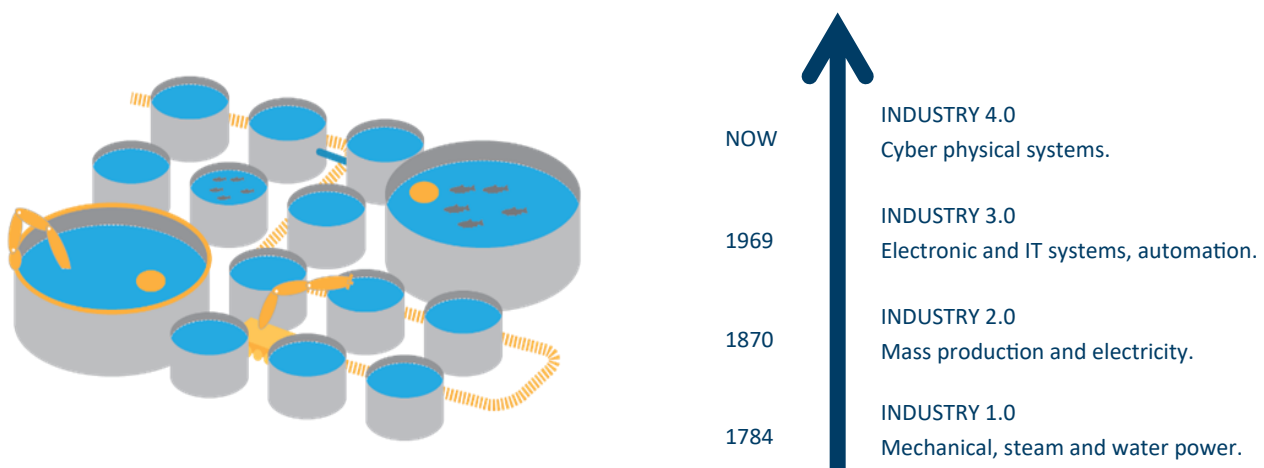
Today, a general trend in aquaculture industry is shifting production methods from manual operations and experience-based reasoning towards a more objective approach using intelligent sensors in combination with mathematical models and decision support- and autonomous systems in different stages of production.

VISION OF THE PROJECT

The ultimate vision of AUTOSMOLT 2025 is to adapt and develop a holistic approach as a solution for the next generation of smolt production by applying the principles of Precision Fish Farming (PFF) at different stages of the smolt production cycle, thus bringing smolt production closer to realization within the framework of Industry 4.0 (Figure 1). This entails increasing the level of autonomy and objectivity in smolt production operations to reduce dependencies on manual labour and subjective assessments, and to improve accuracy, precision and repeatability.

Figure 1: Foundation for the next generation of autonomous smolt production.

NOW	**INDUSTRY 4.0** Cyber physical systems.
1969	**INDUSTRY 3.0** Electronic and IT systems, automation.
1870	**INDUSTRY 2.0** Mass production and electricity.
1784	**INDUSTRY 1.0** Mechanical, steam and water power.

RESEARCH AREAS

Motivated by the current status and main challenges in the smolt production industry, AUTOSMOLT 2025 focuses its research efforts towards three research areas:

- **Optimized smolt production and autonomy:** Enabling new services and business models for the next generation of smolt production: new and updated structures for management, organisation, working conditions and competence by enabling remote and autonomous production, monitoring and control in smolt facilities.

- **Self-monitoring rearing tanks:** Enabling technologies for production monitoring: generate knowledge fundamental for realization of fully autonomous smolt production.

- **Autonomous tank operations:** Unmanned operations and possible applications: creating the foundation for the fully unmanned smolt production sites of the future.

VALUE CREATION

Since no commercially available products resembling the project idea currently exist, the strong consortium in AUTOSMOLT 2025 will have the opportunity to pioneer these ground-breaking technology innovations. Realizing new products, methods and services based on the innovations of the project will thus provide them with a significant potential for value creation. The consortium as a whole will address Norway as the primary market from the outset, while significant growth is expected internationally, also for other species than salmon. For all project partners, AUTOSMOLT 2025 poses a unique opportunity to develop the technological foundation for fully autonomous and unmanned smolt production.

The value creation potential is connected to:

- Reduced cost and increased productivity
- New sales

PROJECT PARTNERS

The consortium behind the AUTOSMOLT 2025 project is built around:

- A global leader within aquaculture technology (Scale Aquaculture AS).

- Three salmon farming companies (Sinkaberg-Hansen AS, Salmon Evolution AS and Andfjord Salmon AS).

- World-leading suppliers of smolt production tank systems (Brimer AS).

- Autonomy and sensor technology (Wago Norge AS, Festo AS and Posicom AS).

- Two research partners (SINTEF Ocean AS and NTNU).

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TECHNOLOGY FOR A BETTER SOCIETY