



## DESIGNACT

**Designing the aquaculture centre of technology - facing the unmet needs in European aquaculture**

### The Challenge

Provoked by over-fishing and by an increased focus by consumers on high-quality, safe and nutritious food, the demand for sustainable and highly competitive aquaculture systems is growing rapidly. Because the production line from egg to marketable product involves many separate steps, a wide range of technological and biological factors determines the success of the industry. A healthy high-quality end product can only be obtained by optimising each step, which requires advance in many different fields of science and technology.

### Project Objective

DesignACT was an FP6-funded project aiming to design a European Aquaculture Centre of Technology (ACT), a large-scale experimental facility in Mid-Norway that will address the unmet needs in the European aquaculture sector. As a meeting place for technology and biology, the goal is to seek technical solutions with direct or indirect biological impact. The design of the specialised laboratory will be based on a continuous and close cooperation between technologists, marine biologists and ecologists on one side and the fish farming industry and its suppliers on the other.

### Key Points

DESIGNACT has delivered:

- Inventory of infrastructure and knowledge gaps in aquaculture technology
- List of existing European marine aquaculture research facilities
- Infrastructure sketch, incl. preliminary cost calculations
- Site evaluation and assessment plan
- Management and operation plan
- Financial plan
- Construction plan
- Impact evaluation report



### EATiP Thematic Area of Relevance

TA1: Product Quality, Consumer Safety and Health

TA2: Technology and Systems

TA3: Managing the Biological Lifecycle

TA4: Sustainable Feed Production

TA5: Integration with the Environment

TA6: Knowledge Management

TA7: Aquatic Animal Health and Welfare

TA8: Socio-Economics and Management

### Key Words

Infrastructure, design, sea cage systems, aquaculture-environment interactions, new technologies

### Project Information

**Contract number:**

0011978

**Duration:**

36 months (01/04/2005 – 30/03/2008)

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## Output Highlights

The principal output of DESIGNACT is the **formation of AquaCulture Engineering AS, or ACE**: a non-profit company offering research facilities for sea-based aquaculture engineering.

ACE offers large-scale infrastructure, including plants, sites, monitoring systems, boats and personnel, for research, development and testing of aquaculture technology, novel solutions and operational methods at sea. When ACE is completed it will consist of ten different experimental facilities for salmon, marine fish and shellfish and for testing new technology.

Three main services are proposed:

- **Rental of large-scale infrastructure** (protected/exposed)
  - o Facilities with or without fish
  - o Expertise and support personnel
  - o Modern technology for documentation and surveillance
- **Educational support and training**
  - o Proper use and maintenance of equipment
- **Customer support services**
  - o Planning and design of experiments
  - o Field operations and measurements
  - o Data management, documentation and analysis

### Impact on industry:

ACE contributes to a continuous high productivity aquaculture industry through the development of more automated and secure solutions, better logistics, and the implementation of integrated operations at sea. Ultimately, it may lead to increasing exports of technological solutions and expertise, thus strengthening the European position in this area.

### Impact on environment:

Solutions developed at ACE may prevent fish escapes and environmental damage, leading to a more sustainable exploitation of the coast, and ensuring optimal environmental conditions for the fish (fish welfare).

### Impact on policy:

Generation of research based knowledge as a basis for joint European standards, protocols and best practice in sea-based aquaculture.

### Social and other benefits:

Preventing accidents and increasing safety; improving contact and interaction between the industry and the research community; industrial-scale site for education and training.

### The full report:

The main deliverables of DESIGNACT can be found at [www.aceaquaculture.com](http://www.aceaquaculture.com) under “about ACE/history”

## Next Steps – Suggested Actions/Follow On



### RTD

- A limiting factor within DESIGNACT was limited financial resources that did not allow making physical models of new type of sea-based platforms.



### Knowledge Transfer

- Collaboration with industry in the realisation of part of the research infrastructure has led to a new EC project on Research Infrastructures (AQUAEXCEL) including access opportunities to the ACE facilities, application for additional funding of the land-based facilities and remote access components by the Norwegian Research Council.
- However, **more coordination is needed between existing European aquaculture research infrastructures** in order to take efficiently advantage of the available facilities as tools to face upcoming challenges, the knowledge on experimental research, and the expertise in different disciplines.

- There is also a need for more controlled operations at sea and for monitoring systems that provide a better documentation of processes at sea. Implementation of technology developed for other, more mature sectors into sea-based aquaculture is required to make the sector more cost-efficient, with less impact on the environment and with better working conditions.
- Training of professionals in the operation of marine constructions combined with fish handling is crucial.



#### **SME**

- Although there were no SME partners, the plans were proposed and evaluated by aquaculture producing and technology supplying companies.

## **Related Publications/Projects**

AQUAEXCEL  
BILAT Escape