

A HUB in Balance with the Nature

Trondheimfjord Marine Center



TESTING FACILITY:

Trondheimsfjord Marine Center

FIELD:

- New Norwegian Coast Centre for Research on Renewable Energy Resources and Nature Balance
- Trondheimfjord Marine City (“Marinebyen i Trondheimsfjorden”) a new Living and Industry LAB
- New Infrastructure HUB for transport of people and cargo
- New Trondheim harbour
- New Floating bridge crossing the fjord (energy structure)

LOCATION:

Trondheim, Norway

DESCRIPTION OF EXISTING INFRASTRUCTURE:

Trondheim is located in the Trondheimfjord close to Norwegian University of Technology (NTNU). This is 500 north of Oslo, which is the Capital of Norway.

Trondheim is a student city with almost 40000 students and 150000 inhabitants.

Trondheim has many smaller companies, which comes out from research activities around NTNU. Many of them has a link to the sea and the coast activity. We have also among others Kværner Verdal which a bigger yard that has facility for to build big oil&gas-structures. The yard has also built jackets for offshore windmills, which is places outside Germany.

Trondheim is the far biggest city in Trøndelag County and the Trondheimfjord divide Trøndelag County in two parts. To go to Fosen you need to take the Ferry or by a boat opportunity called “Kystekspressen”. The Ferry is expensive to use. Kystekspressen has just few boarding opportunities typically in the rush hours. Geographically the distance to Fosen is short and in a

development perspective, the infrastructure should have been better locally. There are projects ongoing for autonomous ships and ferries.

The Fosen region have had decreasing population the last 50 years. Most businesses and work opportunities in that region so the trend is that people move to the other side of the fjord more than the other way.

Norwegian coastline has a length ... around the world and consists ofmany islands but the Trondheimsfjord has few island and is up to more than 1000 meters deep. The fjord has tidal current and wind that can be used for energy production. Especially the current during springtime is strong and it may last for several weeks. This since the snow melts first in the low land, later on the water come the inner and higher mountains areas. The amount of water that in the end comes to the fjord via the rivers and all other places are significant.

There are some fishing activities but not in a big scale. Some of the rivers in Trondheim fjord like Gaula and Orkla are some of the best rivers for salmon fishing worldwide. There are the therefore strong restrictions around fish farming production in the fjord. At the same time, there are there are more activities around to use the weeds which is growing in the coastline. This has become an export article to some known Michelin restaurants in Europe and local raw materials are partly the secret for the Michelins stars that a Trondheim restaurant got this year for the first time.

Some of the biggest fishing farming are located outside Mid-Norway where the big farming companies Marine Harvest, Lerøy and Salmar has some of their biggest facilities. The Norwegian government has as goal to increase the fish production more than 5 times what it is today and almost all transport go on the roads to central Europe and typically Paris. It is required to be innovative to improve the capacity in an eco-friendly way. This transport goes through the same area. The same is fish from further north.

At the same time, the plan is to transform Trondheim harbour area from industry to living areas. The industry need a place to be. To be eco-friendly a new “New Trondheim harbour” is requires. The discussion around location for this new railway cargo enter has been a political issue several decades.

The coastal nature in Trondheimsfjord has a potential for to be..... Trondheim has established a climate plan, which is very ambitious. If we look at the whole region most of the people in the region lives in Trondheim. The climate plan includes only Trondheim but that should not lead to sub-optimisation only on Trondheim. This is the case today. It is most efficient and environmental friendly to include all the factors the has environmental impact which takes place not only in Trondheim.

PLANT SIZE:

TRONDHEIMFJORD MARINE CENTER

“Trondheimsfjord marine center” will be located at Byneset, which is a part of Trondheim municipal and in the Trondheimsfjord between Byneset and Fosen. The center includes a new Trondheim harbor, New Trondheim railway station, Trondheimfjord marine city and a floating bridge that cross the fjord with its energy power system that includes energy from movement of the bridge itself and additional energy power systems.

TRONDHEIMFJORD MARINE CITY (Marinebyen i Trondheimsfjorden)

“Trondheimsfjord marine city” will have a population of 2000 inhabitants, an R&D center with a wide broad of facilities made for use for the industry. The island city has a limit of 500 employees.

INFRASTRUCTURE ROADS

To link the region together a bridge is requires to cross the fjord. A 600 meter long submerged tunnel give access the “Trondheimsfjord marine city” and a 6 km. floating bridge that makes it possible to cross the fjord.

INFRASTRUCTURE RAILWAY

A new Trondheim harbour can handle the cargo that comes from Europe and fish from the fish industry to Europe and worldwide. In addition, the railway station will have efficient communication to centre of Trondheim city.

ENERGY PRODUCTION SYSTEM

Both the bridge itself and its surroundings has the opportunity to produce energy.

HOW TO BE A POSITIVE CONTRIBUTION TO THE NATURE

MAIN CAPACITIES:

TRONDHEIMFJORD MARINE CENTER

The project includes a new floating bridge, which is 6 km. long. An artificial island, a submerged tunnel, which connect the island and the bridge to land and the New Trondheim Cargo Centre at the same spot.

The plan is to make an efficient HUB for transport of people and cargo by produce and use Renewable energy resources. The project will be eco-friendly in a 100-year perspective.

The project will cover transport, food production, renewable energy production, living, leisure activities, industry and research.

Smaller businesses, which has its business based on how to operate in sea and the sea zone, will fit in here. The “Trondheimsfjord Marine City” has its own production system to make their own food in sea and above sea level based on salt water. What potential is it if you can manage to grow vegetable on salt water (“Aquaponi”)?

The new “Ocean Space Center” will be test facility for the new energy production system. Smart Grid will be part of it. The new “Trondheimsfjord Marine Center” will be a full-scale R&D facility and the next step in order to develop the next generation of coastal infrastructure. The technology comes out because of the new “Ocean Space Center”.

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