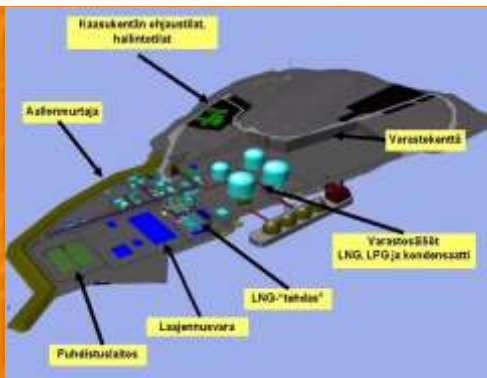




ECOFOSTER



Business case "Utilization of fish co-streams"

"AQUAREL"-closing seminar

Oulu 18.9.2014

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ECOFOSTER GROUP Ltd.*



Business case; Utilization of fish co-streams

There are three types of co-stream material from fish farms:

- 1. Guts**
- 2. Heads and bones**
- 3. Dead fish from cages**

Three examples of utilization of fish co-streams:

- 1. "Norwegian model A"**
- 2. "Norwegian model B"**
- 3. Karelian practice today**

What could be next?

”Norwegian model A”

Nurtimar AS in Kverva (Trondheim). Part of Salmar ASA (Norway’s 3rd biggest producer of fish and world’s

Salmon oil



Salmon meal



Protein concentrate



**Processes abt.
30.000 tn fish co-
stream / year ->
10.000 tn fish oil /
year**

Nutrimar produces fish co-stream products about 100meters from the fishery at a separate industrial factory building



”Norwegian model B”

AKVA REN AS located in Furuflaten (near a city of Alta Norway). Akva Ren collects biological wastes from fish producers, hotels etc. It’s main business is to process waste to products to sell to others.

Salmon oils



Feed for fur industry



”Norwegian model B”

AKVA REN AS



AKVA REN
production
facility

AKVA REN
products
transportation

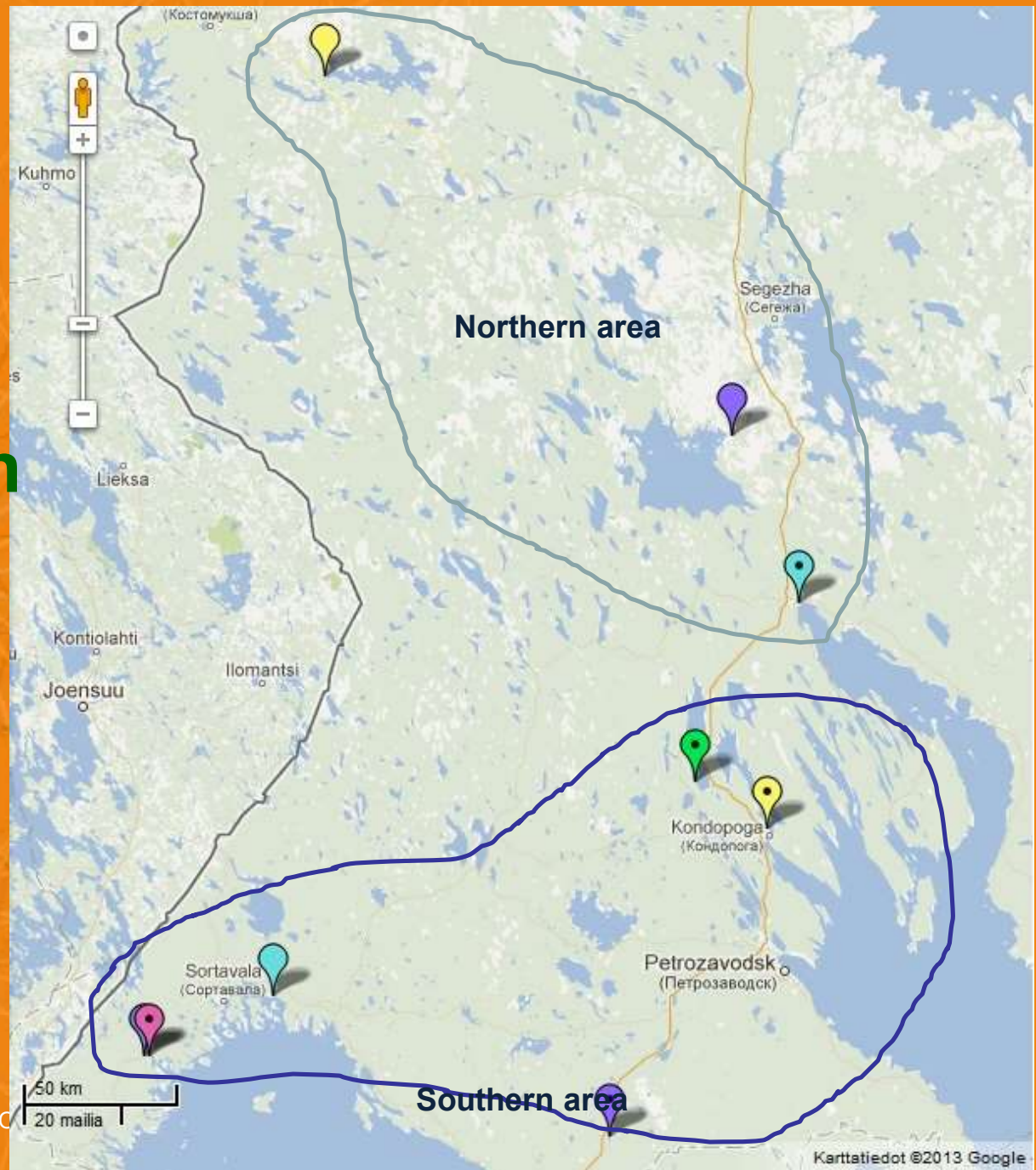


Karelian model

Today some individual fish producers process the guts to oil. The rest is used as fertilizer at farms.

Demand for full fish co-streams utilisation service is existing. The service should include transportation of guts etc. from fish plants.

Task no 1: Selection of optimal location for fish co- streams processing in Karelia



Example photos of a potential factory to be invested and built to Karelia (AlfaLaval ConDec mini) ECOFOSTER



**Capacity 1500-3000 tn fish
co-stream / year ->
500-1000 tn fish oil / year
Investment cost abt. 0,8M€**



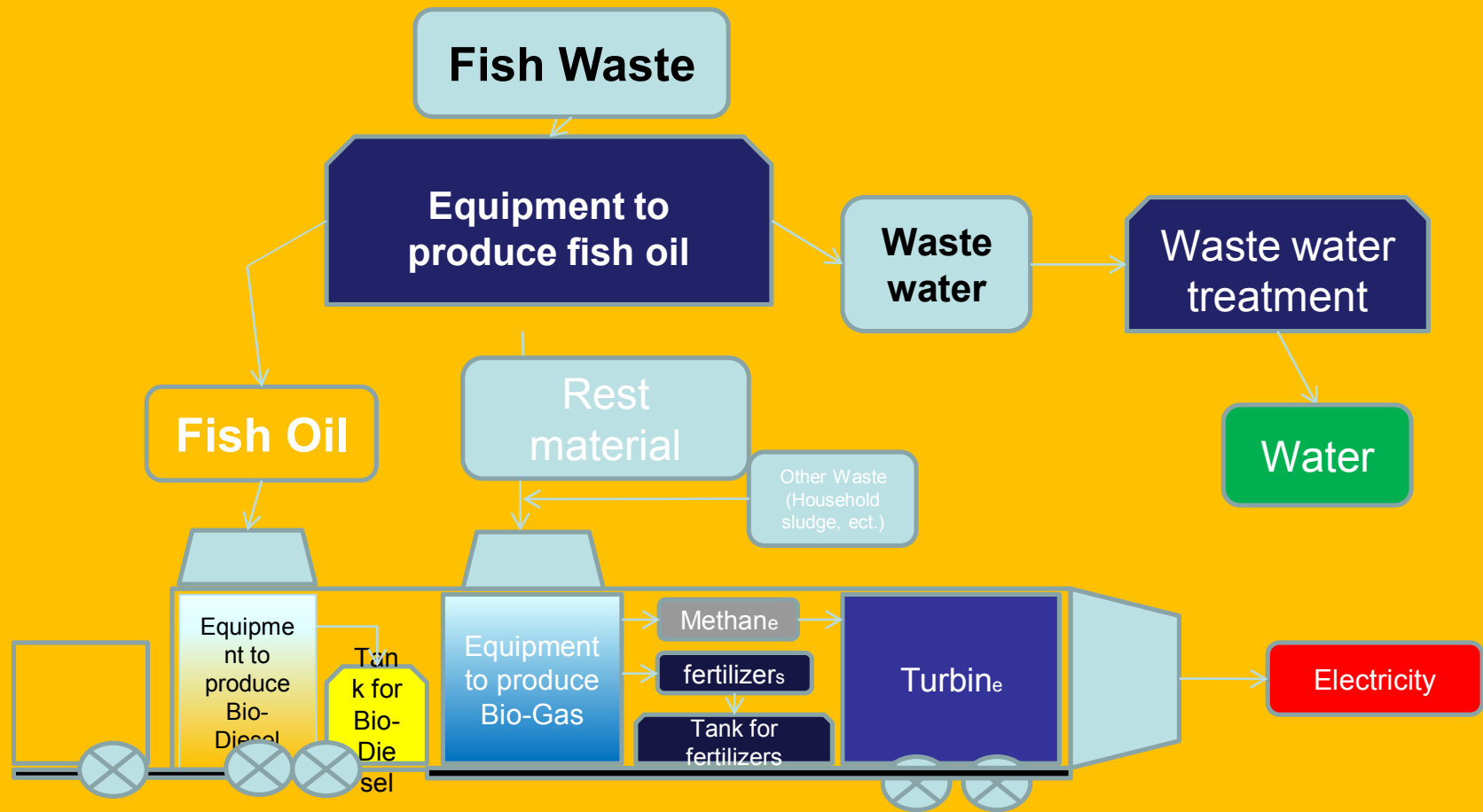
Example photo of a potential factory to be invested and built to Karelia, "Economy model"



Capacity 750-1500tn of fish co-stream / year -> 250-500m3/a fish oil

Investment cost abt. 70t€

Draft idea of a mobile fish co-streams utilization plant



Requirments for profitable fish co-streams business, general:

- 1. Amounts to be processed and produced must be large enough**
- 2. Transportation distances must be short enough**
- 3. Facility and machinery must be suitable for operation and high quality enough, hygienic conditions**
- 4. Electricity, water, waste water connections**
- 5. Personnell must be motivated and they must know their work**
- 6. Local requirements, approvals, licences, certificates are needed**
- 7. Agreements with co-streams producers and clients for a final product must be there!**
- 8. Financing for an investment and for operation is required**
- 9. Strong entrepreneurship to start such "future" business**

Thank you! Kiitos ! Спасибо!

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