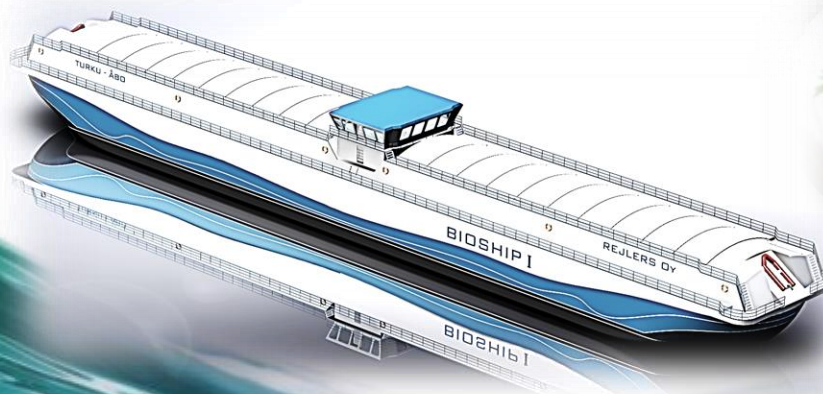


ULIVES

Veikko Hintsanen

Paris, Martec II

05.02.2013



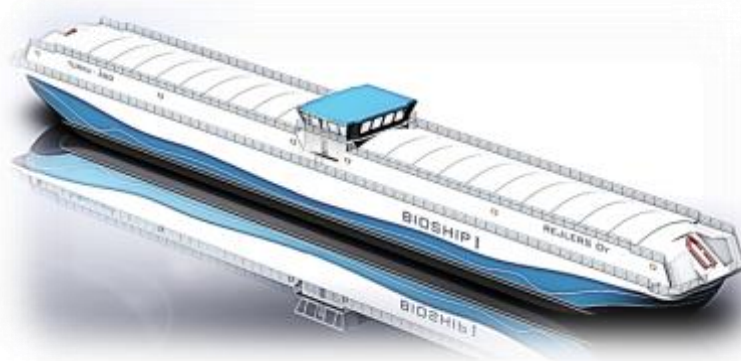


150 mm
Stainless
Steel

See:
aircraft carrier
"A small boat"



120 m long vessel
6000 tons steel for
Arctic Survey vessel



114 meter long
Ultra Light Ice Going Vessel
Hull weight abt 900 tons
Target 600 tons



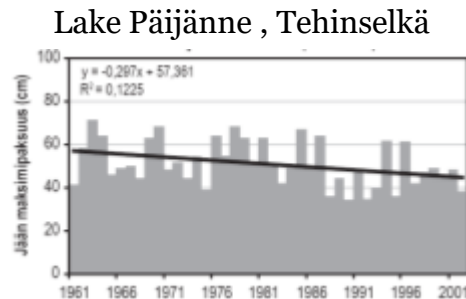
Ultra Light Ice going VESsel



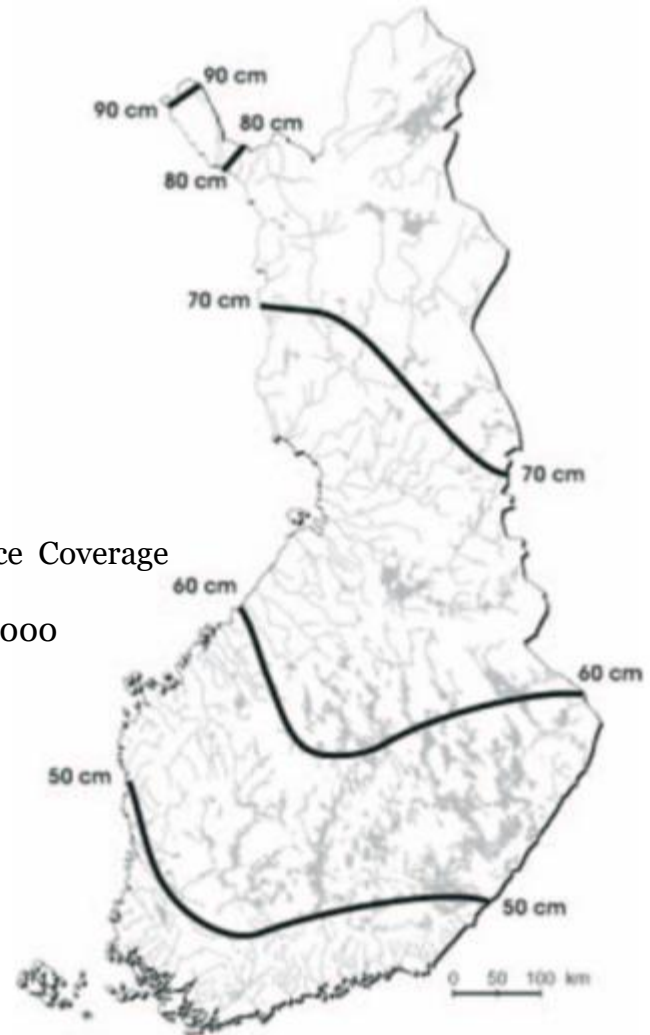
ICE GOING

Vessel is to sail without assistance
in all ice conditions in the area

- Ice Thickness
- Coverage period
- Traffic Cycle

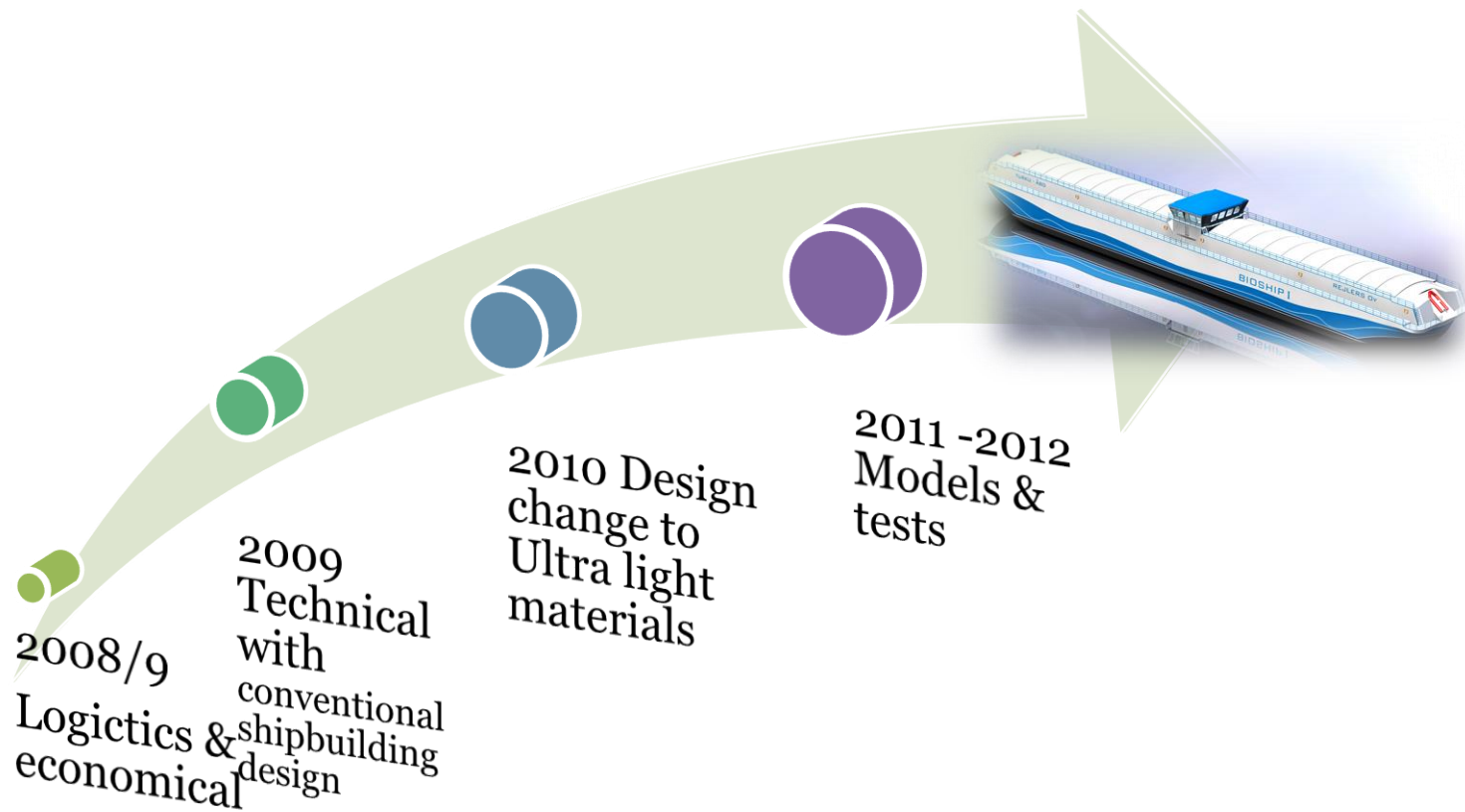


Lake Ice Coverage
Yy
1961-2000



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Arctic Inland Navigation Wood chips & peat carrier





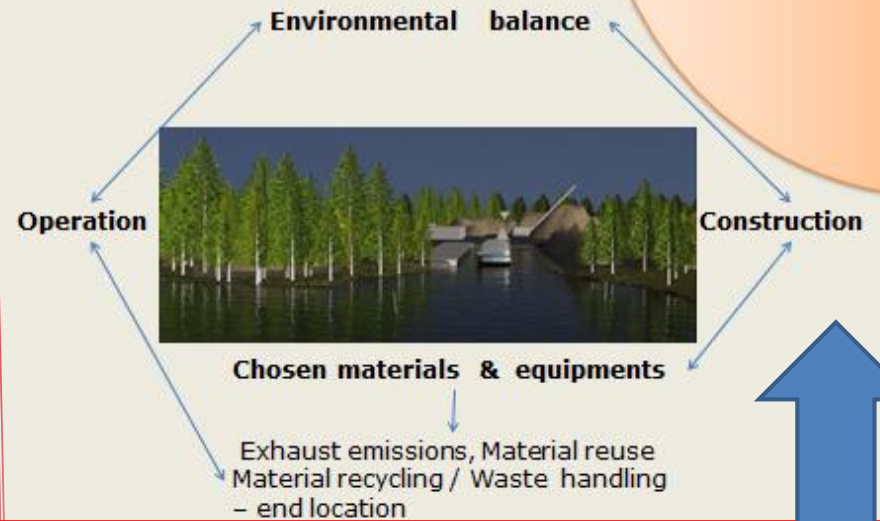
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Logistics , economical and environmental Studies yy 2007-2012

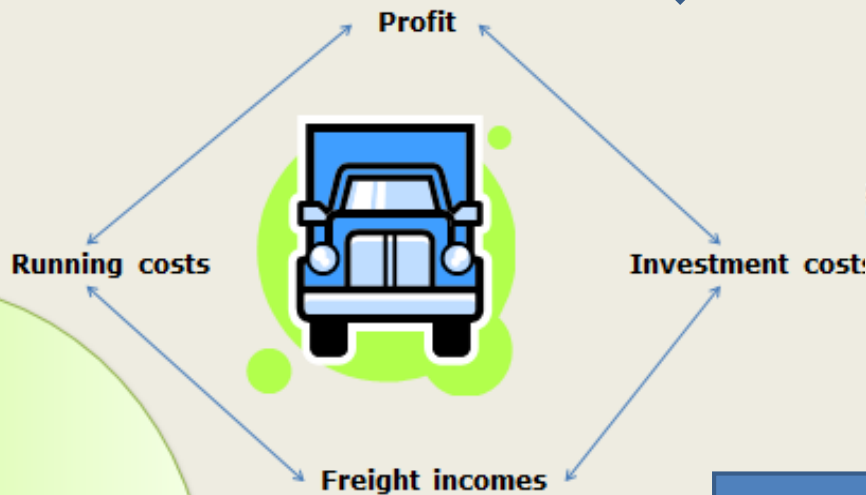
Bioship 1



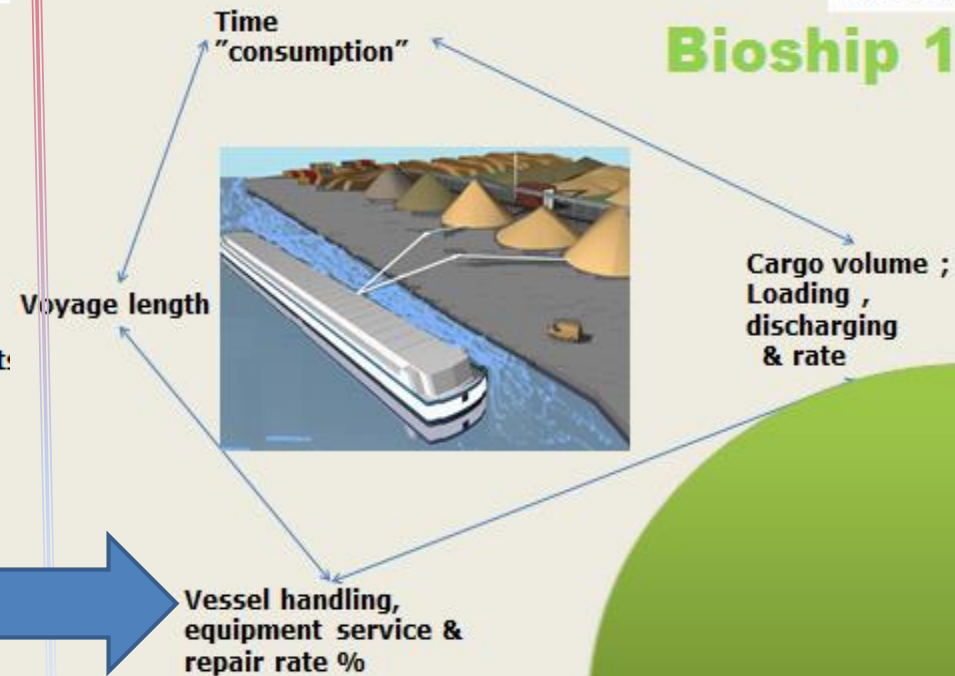
Bioship 1



Bioship 1

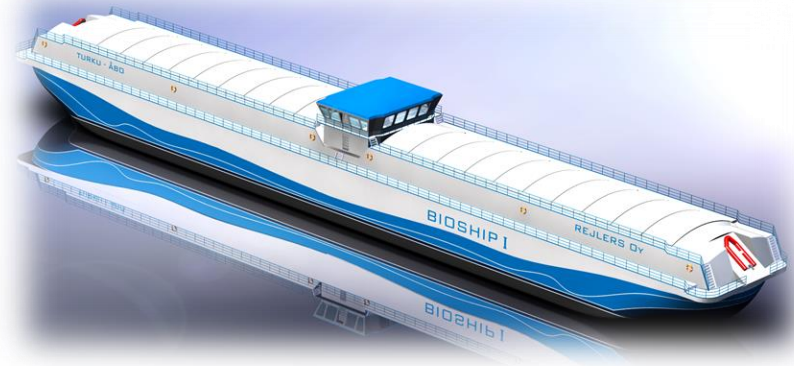
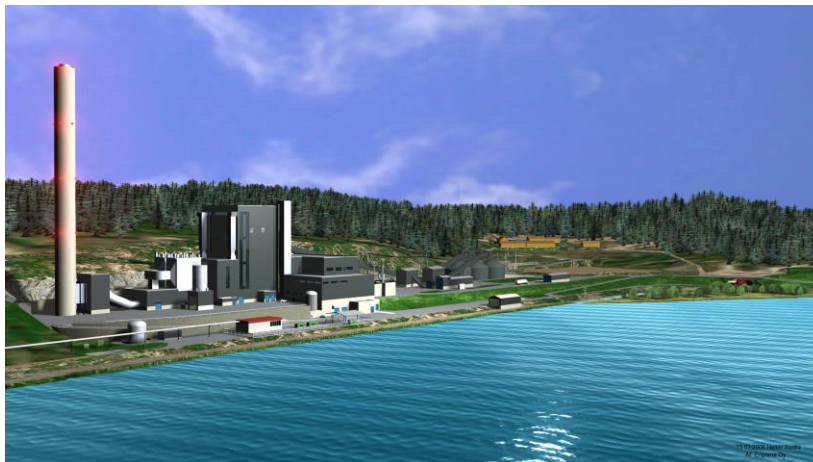


Bioship 1



Ultra Light Ice going Vessel For Wood Chip and Peat to replace trucking in Jyväskylä Power Plant

Power plant running 450 MWh Ratio 30/70	Number of Trucks per day /year 110 m ³	Or Number of Railway wagons day /year 150 m ³	Or Inland ships year 7000m ³
Wood chips	37 / 13505	27 / 9855	200
Peat	58 / 21170	50 / 18250	328
Yearly totals	95 / 34675	77 / 28105	528



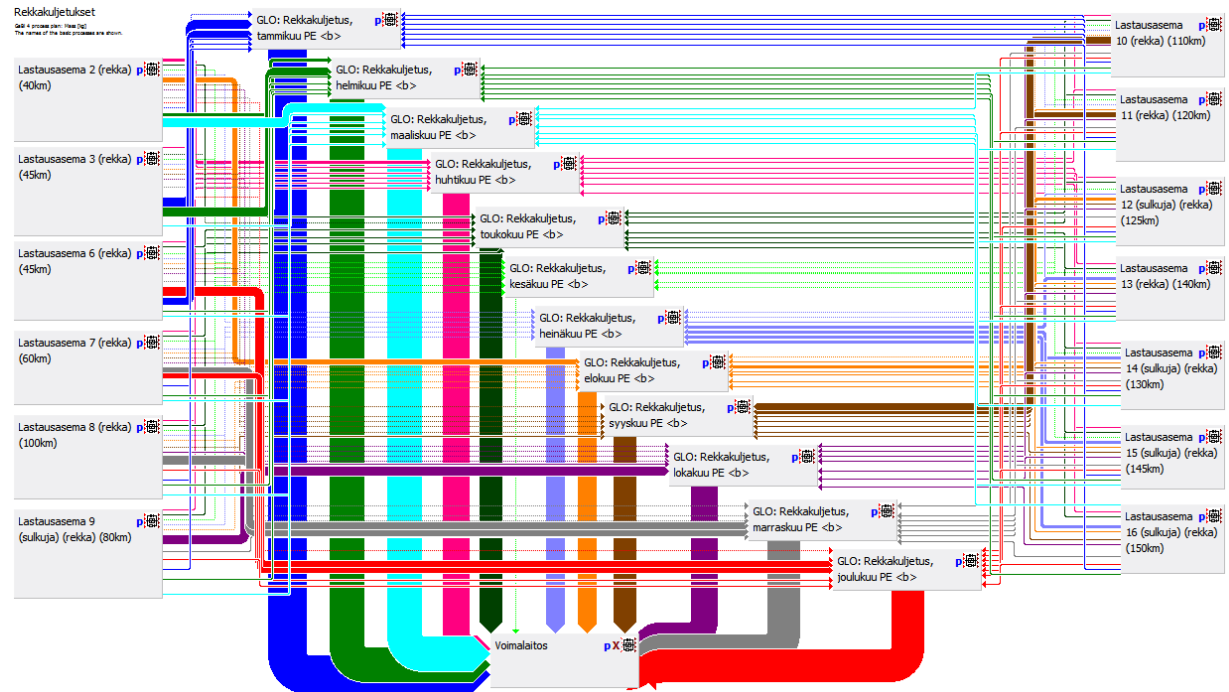


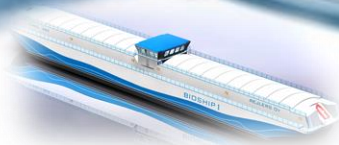
Traffic Area



Logistic

comparison analysis model to fulfill Powerplant
raw material request & supply by Lappeenranta University





Results 1 (ship / truck)

	LNG vessel Kilos/annum	Truck ,diesel Kilos/annum	Vessel , diesel Kilos/annum
Fuel consumption	1 434 168	1 652 041	1 697 240
Sailing	600 009	1 525 213	717 170
Loading discharging	828 159 (Pneumatic)	126 828 (diesel-loader)	980 070 (Pneumatic)
CO 2	4 088 819 Kg/annum	6 015 494 Kg/annum	6 152 580 Kg/annum
Transit kms by vechicle	55 400 kms	3 880 572 kms	

Transported quantity to Power plant 2 041 000 m3 /year

In addition to that used intermediate storage abt 30 kms from Power Plant
To transport during summer time to cut expensive ice period transport from longer
Distance suppliers.

Results 2 (ship / truck)

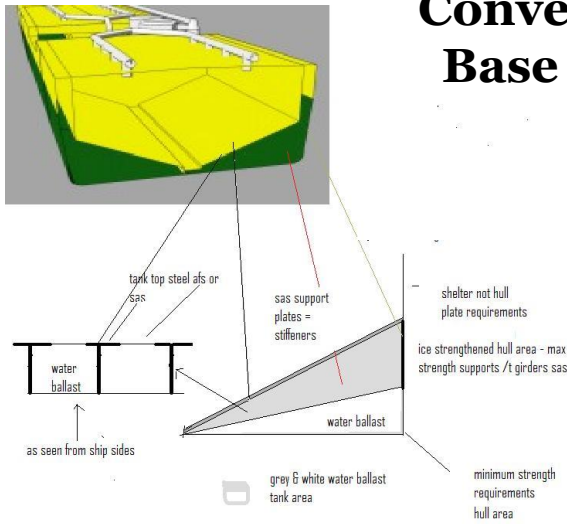
- Fuel consumption when LNG used 54 % less in year round sailing (without loading /discharging) operation ; arctic circumstances - ice sailing included.
- Yearly CO₂ emissions 66% less when using LNG compared to Diesel Trucking





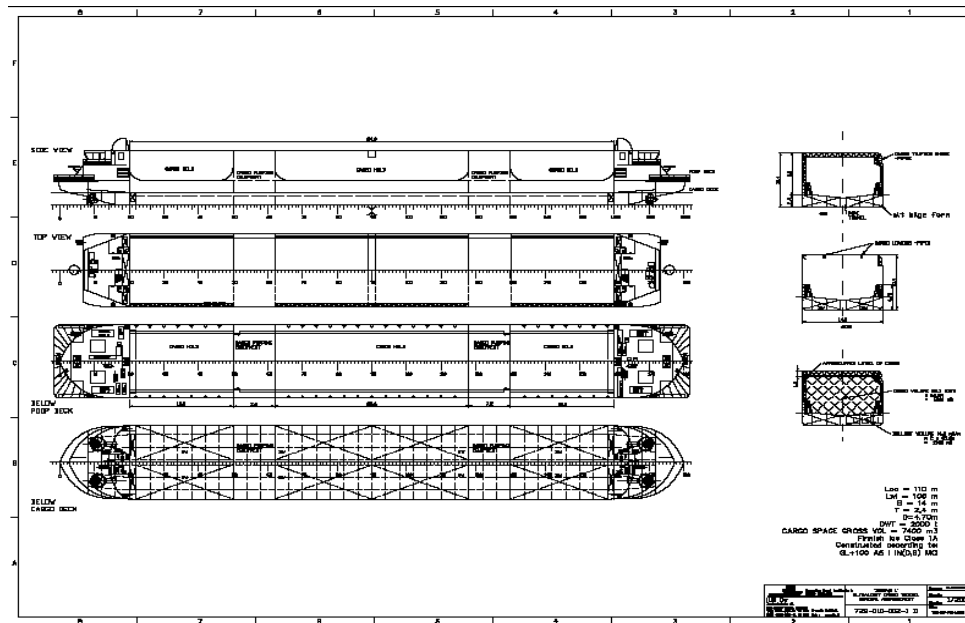
Conventional Ship Design

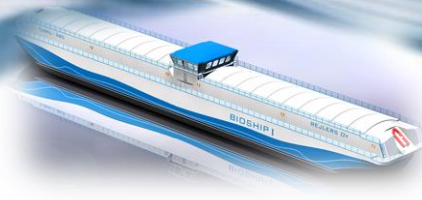
Conventional ship design Base for Ultra light hull



FEATURES

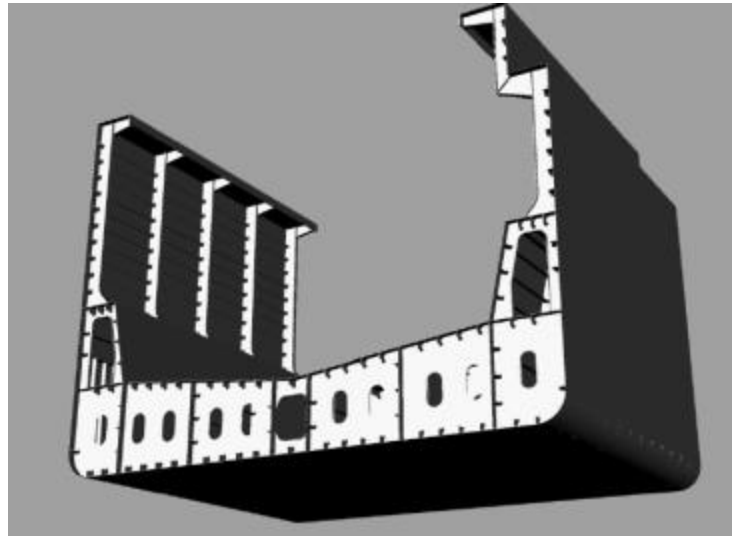
- Length overall : 110 m,
 - Width max : 14 m,
 - Max Height: 10,4 m
 - Max draft 2,4 m
 - Ice breaking max 60 cm /
-
- SOLAS 2002 17 F - regulations to be used
 - Maximum capacity of ballast tanks 2000 m³ which can also be partly used for ballast.
 - 4 x propulsion thrusters, 2 in both ends
 - LNG engines TOTALLY 4000 HV minimum emissions
"
 - The vessel can travel in either direction; personnel 2+2
 - Symmetrical
 - If necessary, can move sideways
 - Construction
 - The ice belt will be designed for maximum ice load
 - Superstructures (shelter) will be optimized for minimum weight

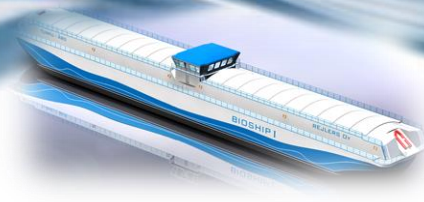




Hull design / 3 – D drawing

The 3 – dimension detailed hull drawing – middle section for construction change to AFS material conventional design





Hull Design Steel change to Aluminium Foam Steel



Hull design / 3 - D drawing

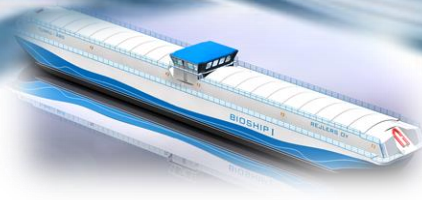
The 3 - dimension detailed hull drawing - middle section for construction change to AFS material conventional design





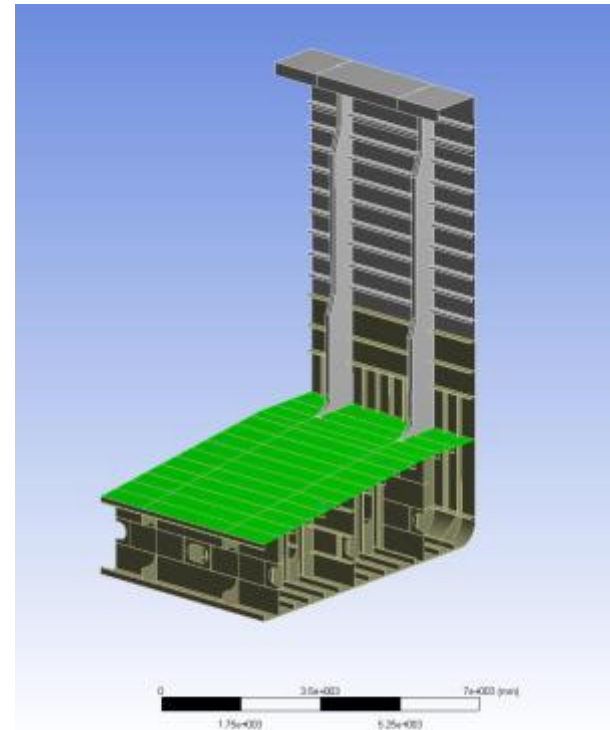
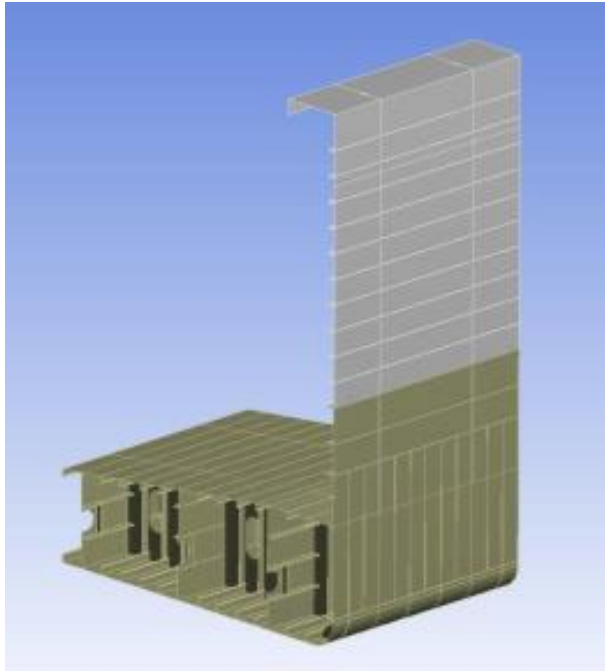
Aluminium Foam Steel Sandwich plates by Fraunhofer institute : professor Thomas Hipke





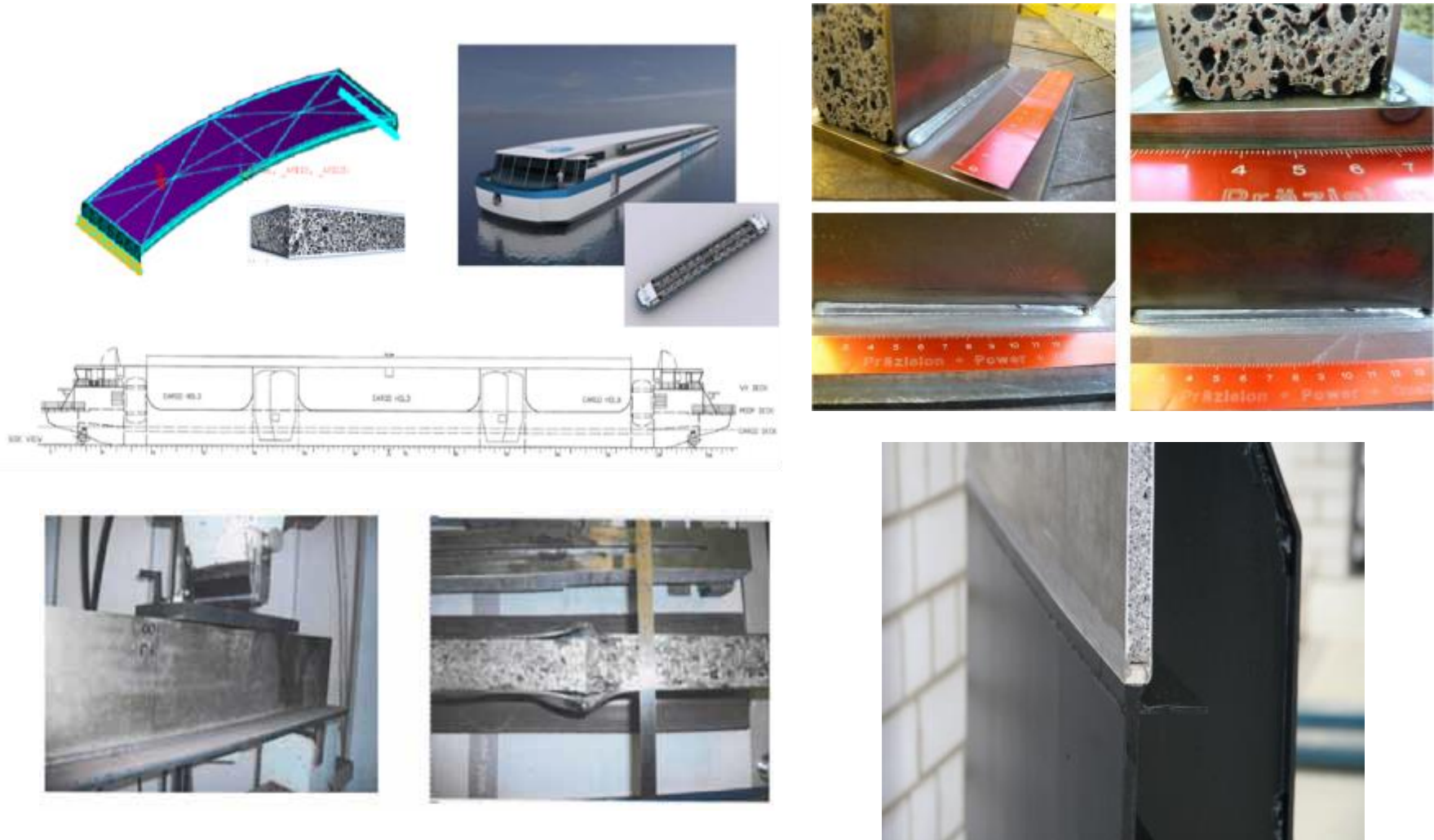
**Design change to Aluminium Foam Steel requirements
Result gained 27% reduction in hull weight by Fraunhofer institute.**

**GERMANISCHER LLOYD / Bureau Veritas " Rules for Inland Navigation Vessels
" GL + 100 A5 I IN (0,6) MC 6 Finnish Ice Class 1a Super**



SMK GMBH Welding Studies & tests of Aluminium Foam Steel

DR. Peter Kauffmann



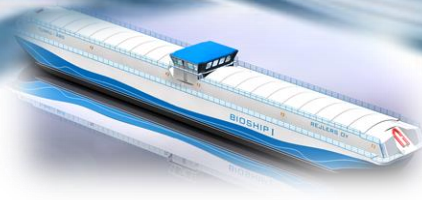
Constructed hull part :
Middle section 1:4 by
Fraunhofer institute

Project completed
31.12.2012





**Future of AFS : Ultra light ship -
based sustainable and efficient
transport logistics**



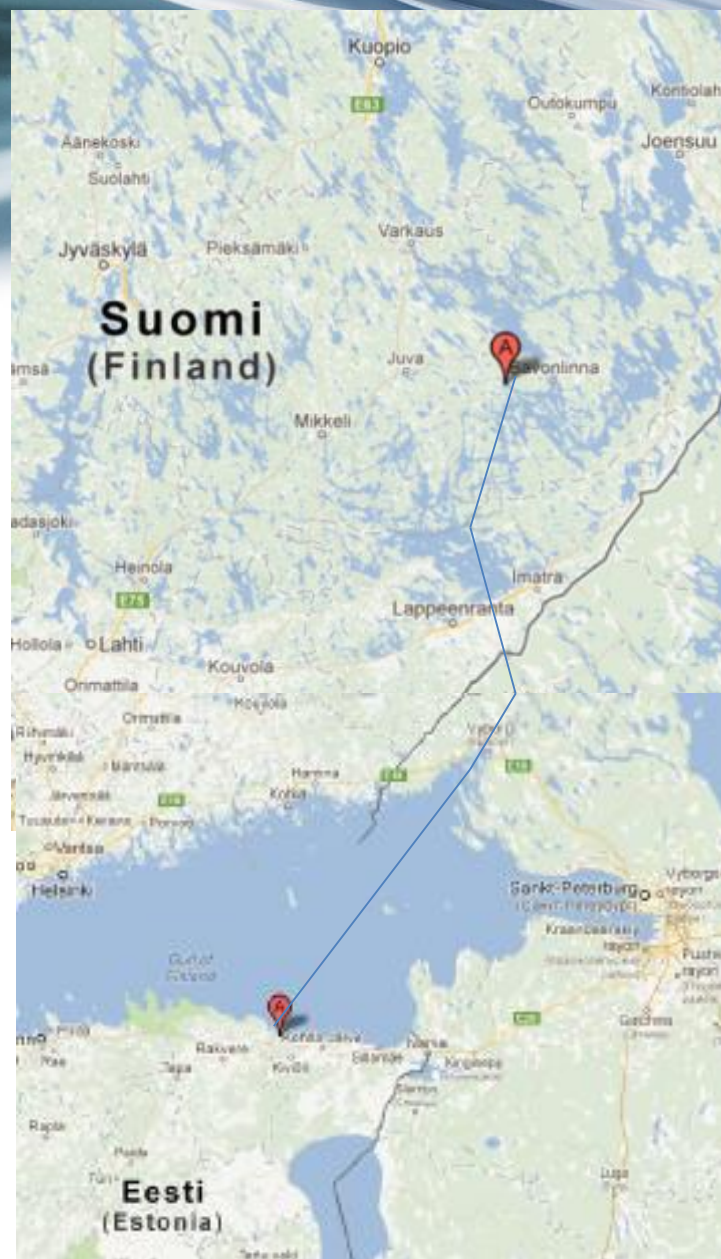
1. Päijänne Wood Chip and Peat transport

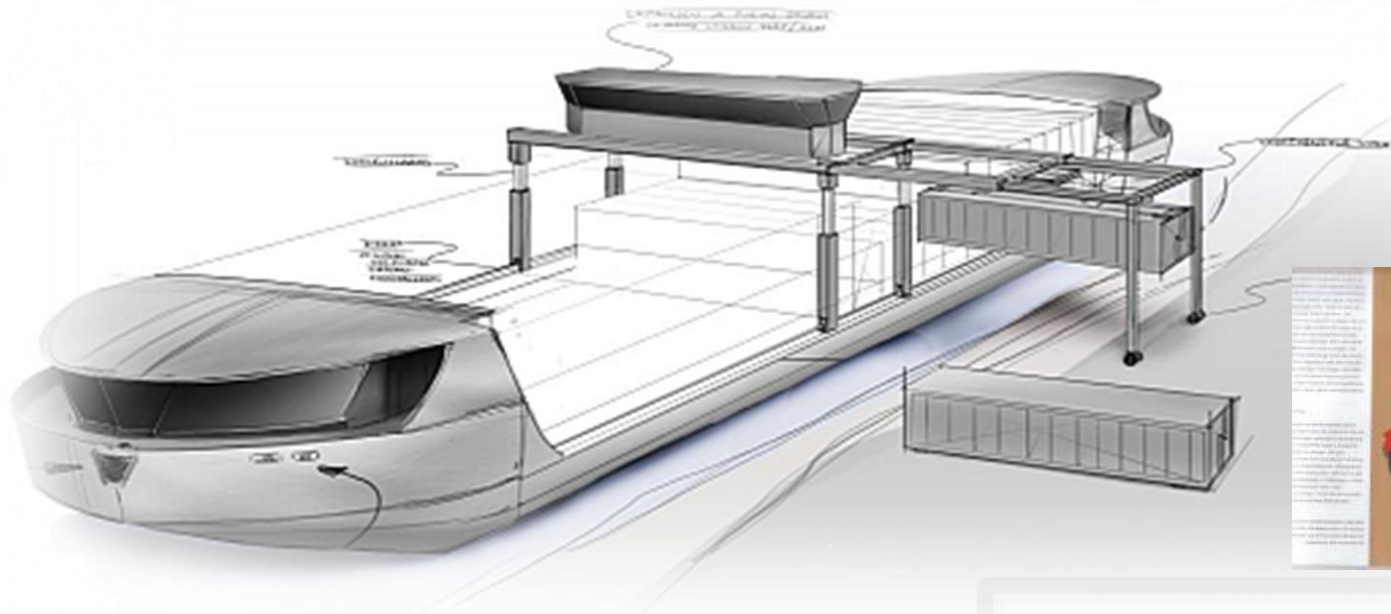
- Jyväskylä power plant requests for waterborne transport up to 2-3 mill m³ /year plans from beginning of 2000.
 - EU Creating studies 2005-2007 results : Profitable water transport can be arranged
 - Martec pre studies 2009 by Lappeenranta university and Laffcomp : profitable sustainable development waterborne traffic can be arranged.
 - Finnish Government Traffic ministry Studies 3/2009 :” ***There are no economic conditions in the Keitele and Päijänne regions for a vessel carrying new types of bio-fuels***”
 - Finnish Government applying presently from EU a special permission to start using 75 ton trucks



2. Pihlajanlahti- Aseri

stone, timber containers





2050 EU strategy required new traffic where River container traffic in Central Europe is Connected to city electrical vans , picking up the minicontainers directly from riverharbour , operated by vessel and van - drivers only

PROJEKTSTRUKTUR

