



AUTONOMOUS PASSENGER BOAT IN HAUGESUND

Arne-Christian Mohn
mayor

HAUGESUND, BUILT ON HERRING



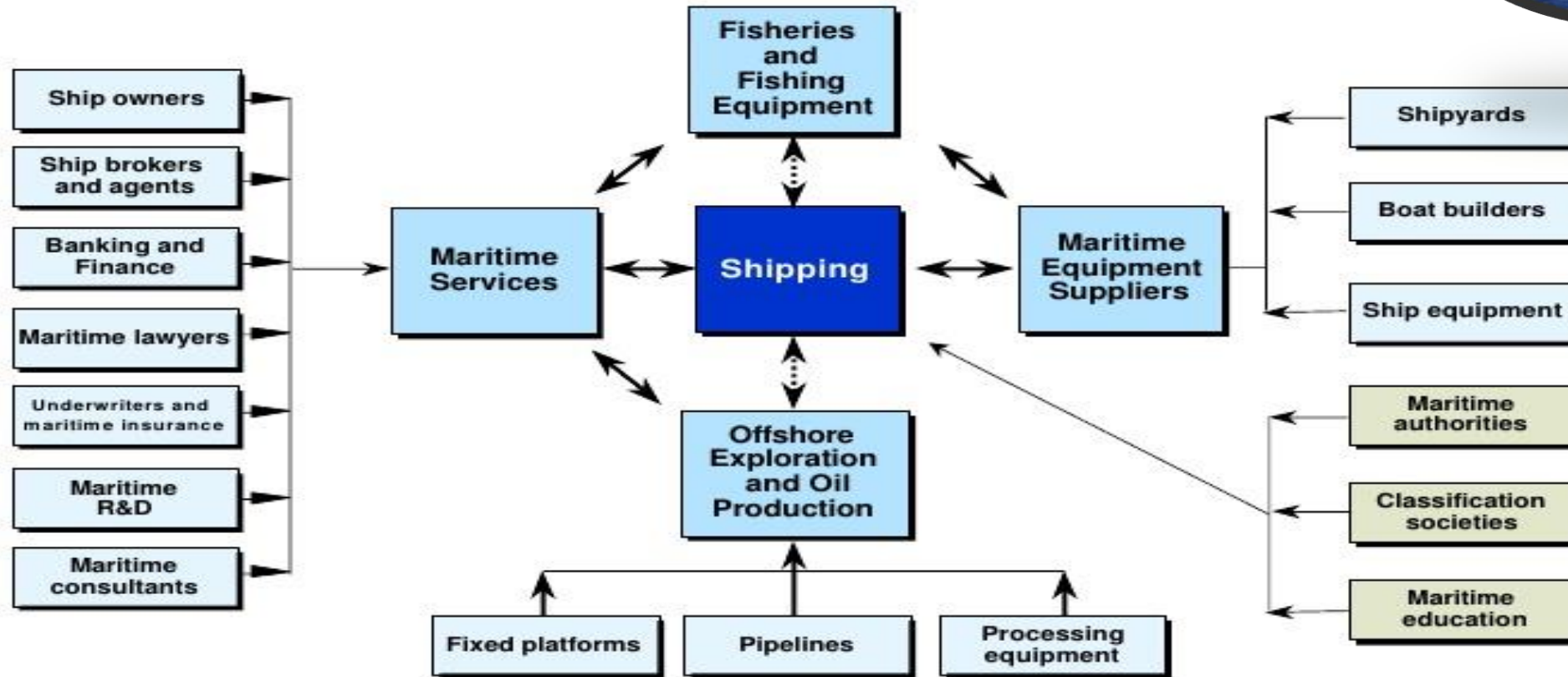
Historical boats



The Maritime Capitol of Norway



The Norwegian Maritime Cluster



- Norway has 0.1% of the world's population, represents 1.0% of the world's economy, yet accounts for 10% of world seaborne transportation

Source: Sven Ullring, presented to M.I.T.

rs - 35-00 ppt

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THE OCEAN SPACE



- ▶ Mining
- ▶ Ocean wind
- ▶ Aqua culture
- ▶ Fishing
- ▶ Oil & gas
- ▶ Tourisme



Photo Credit: Snapperfarm



EQUIPMENT AND SERVICE SUPPLIERS

YARDS

SHIP OWNERS

Samarbeid for utvikling av miljøteknologi som reduserer skadelege utslipp frå maritime aktivitetar.

POWER COMPANIES

R&D AND EDUCATION

PUBLIC SECTOR

CLASS SOCIETY - REGULATORS

FINANCE & LAW

ELECTRIC FERRY



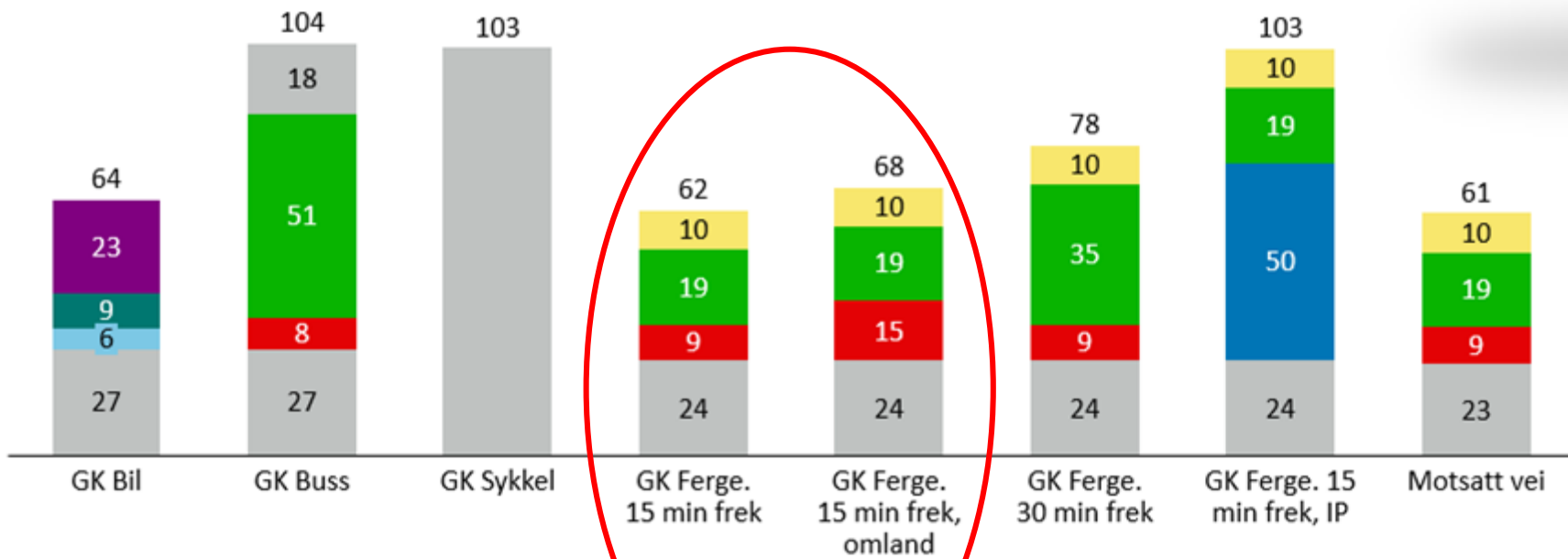
Urban Water Shuttle – «The Tesla of the seas»







Fergerute 1 fra Kai 1 Haugesund sentrum til Kai 5 Vikjå







AEROTM
by Brodrene Aa

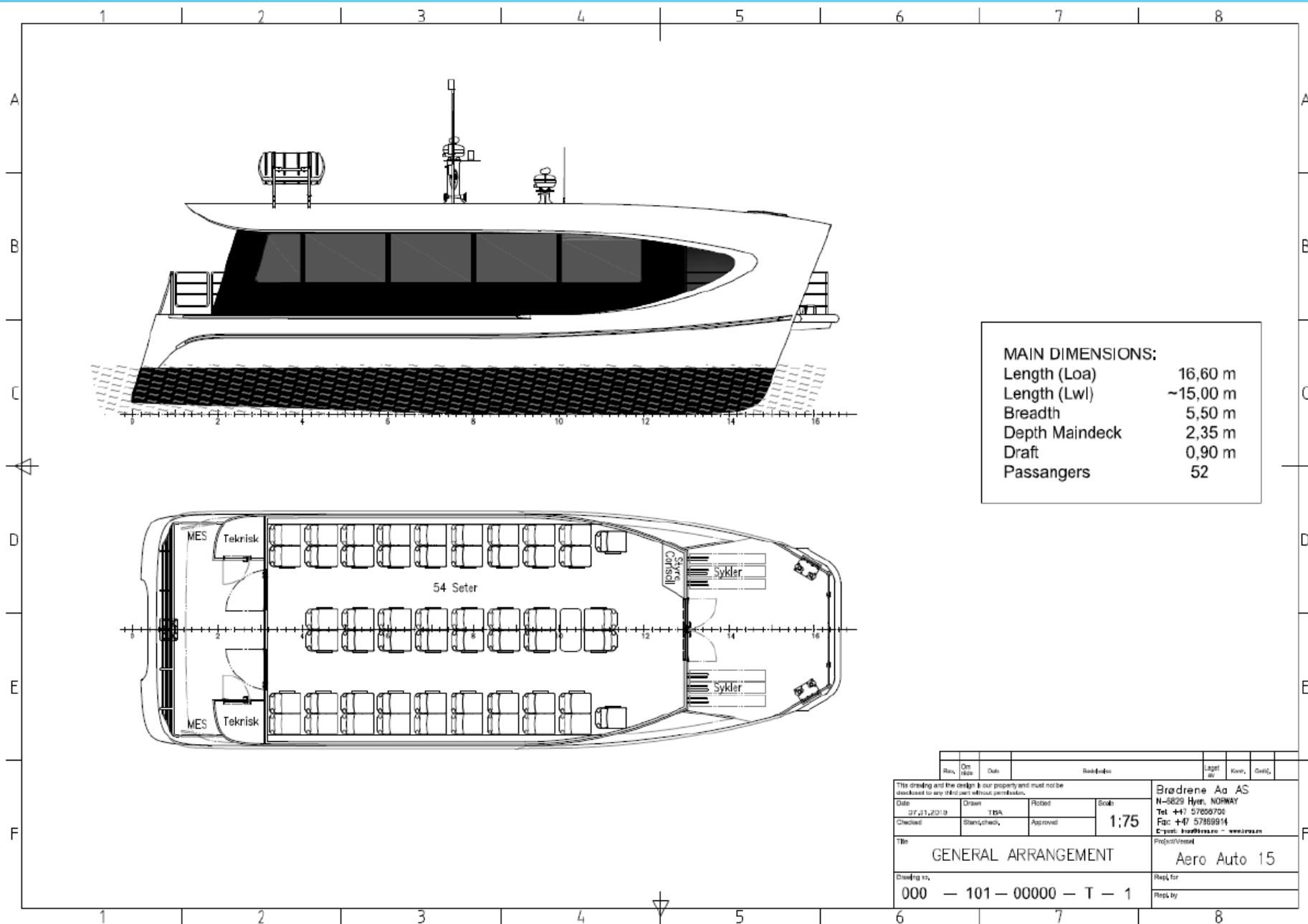


Fig.6 – Generalarrangement

Charging and el-need



Batteri Båt	450,8	kWH	
Max C Rate Lading Batterier Ferje	2,2		
Max SOC	80 %	Min SOC (Normal Drift)	20 %
End Of Life SOH	75 %		
Til og Frakoblingstid Lader	90	Sek	
Min Tid For Lading	60	Sek	
Første Tur Morgen	00:00:10		
Tap Batteri Ferje oppladning	5,00 %	Tap Utladning Batteri Ferje	2 %

Orca Energy battery module specifications	
Chemistry	lithium ion NMC / graphite
Energy	5.65 kWh
Capacity	128 Ah
Dimensions	420 x 163 x 590 mm
Weight	60 kg
Maximum Voltage	50 VDC



AERO™
by Brødrene Aa



AERO™
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www.aero.no | Design by Brødrene Aa





NTNUs autonome ferge Milliamperere - demo i Haugesund



Dette skjer, og det skjer mye raskere enn for biler. Testseilaser i år, gå inn i trafikk 2020

Illustrasjon: Yara, Kongsberg, Marin Teknikk



THE GLOBAL GOALS
For Sustainable Development





```
for_mirror_object  
operation == "MIRROR_X":  
mirror_mod.use_x = True  
mirror_mod.use_y = False  
mirror_mod.use_z = False  
operation == "MIRROR_Y":  
mirror_mod.use_x = False  
mirror_mod.use_y = True  
mirror_mod.use_z = False  
operation == "MIRROR_Z":  
mirror_mod.use_x = False  
mirror_mod.use_y = False  
mirror_mod.use_z = True  
selection at the end, add  
obj.select= 1  
obj.select=1  
context.scene.objects.active  
"Selected" + str(modifier  
obj.select = 0  
bpy.context.selected_obj  
data.objects[one.name].sel  
int("please select exactly  
- OPERATOR CLASSES  
types.Operator):  
X mirror to the selected  
object.mirror_mirror_x"  
ror X"
```



United



**Smart
Sustainable
Cities**

Ålesund Airport

102
dB

Nedre Strandgate

14
km/h

Slowest traffic
flow in the region

Ivar Aasens gate

76
dB





THE WAY FORWARD



- ▶ National projekt – local test area
- ▶ Concretises design towards safety (HVL)
- ▶ Starts with a pilot 12 passenger boat (USN/NTNU)
- ▶ Testing in controled waters, then increasing to the traficated strait – Karmsundet – the busiest area in the country (The Norwegian Maritime Authority / The Norwegian Coastal Administration)
- ▶ Minimum CO2 footprint – aluminum? (Hydro)
- ▶ Business plan – most cities are located by rivers and sea

