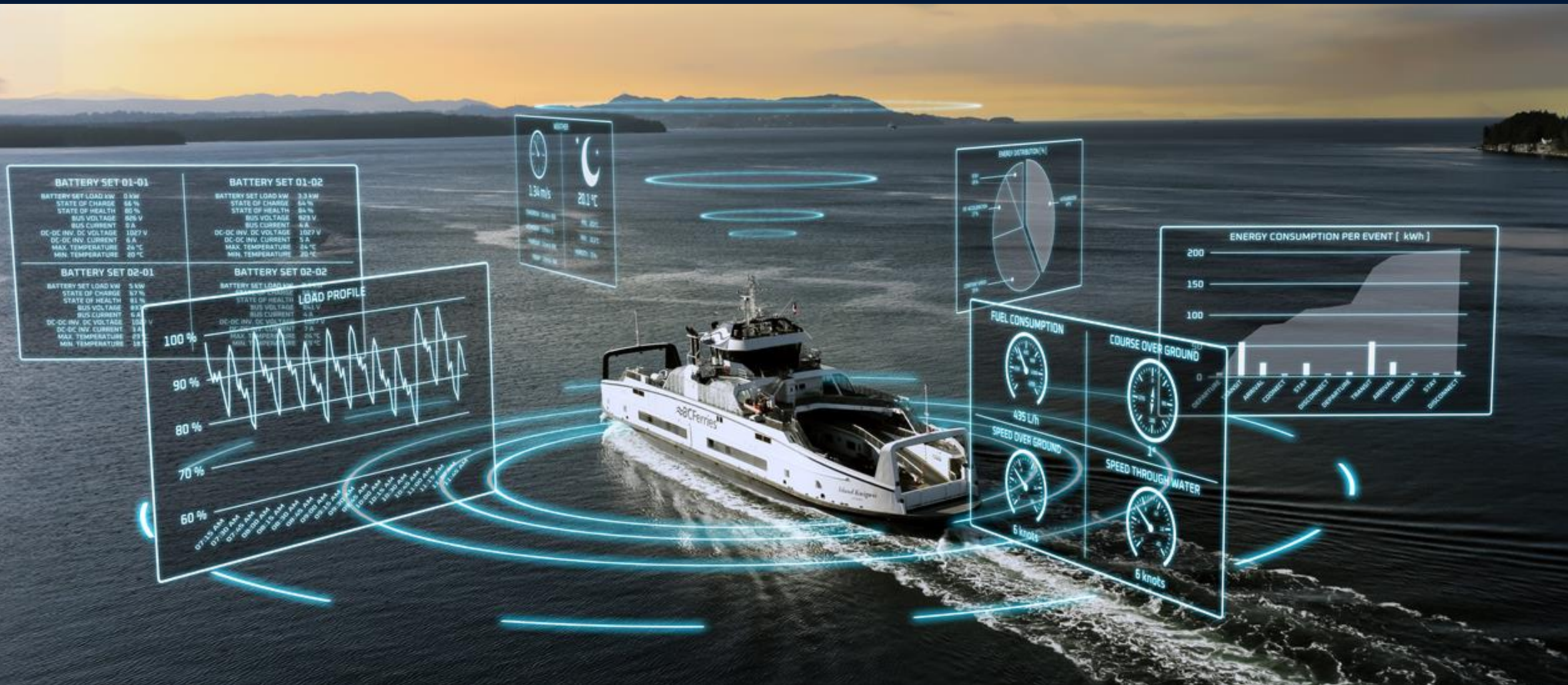
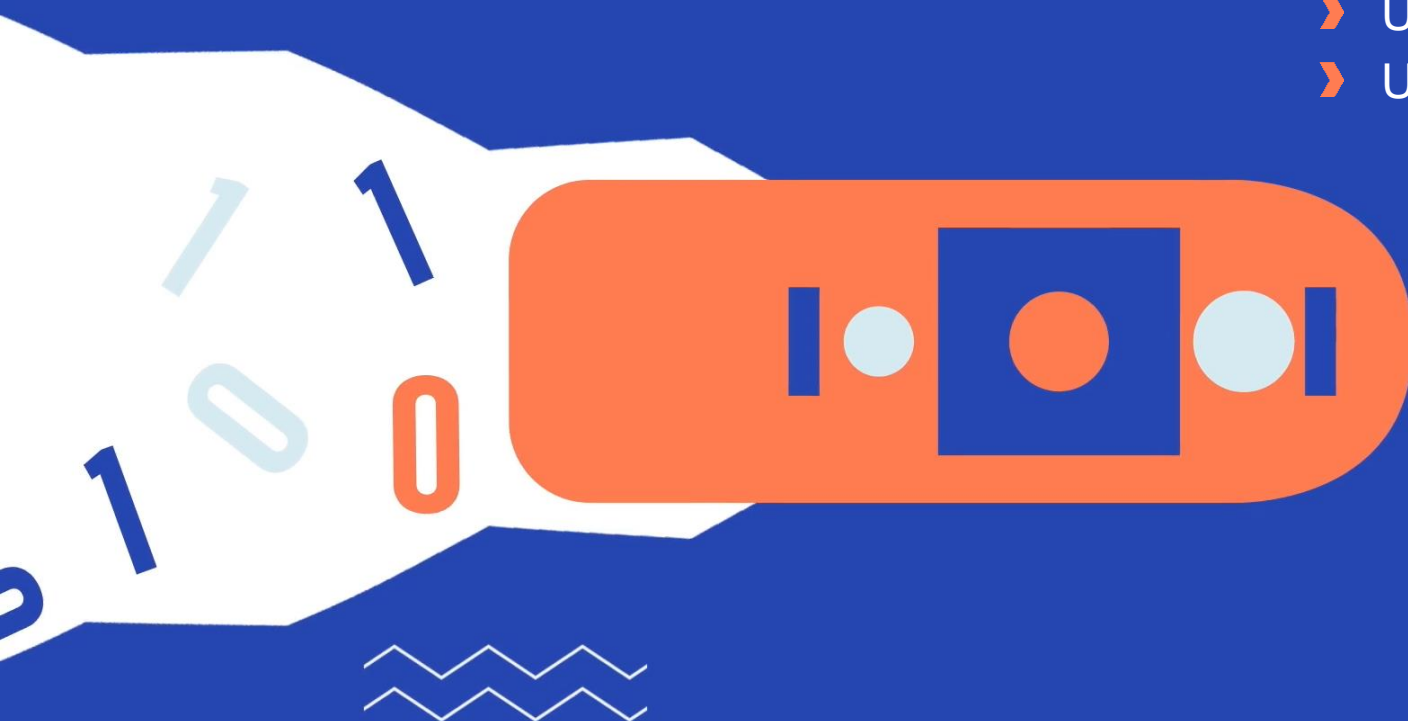


Unlocking the potential of connected vessels



Data acquisition at Damen

- › Damen Triton started 7 years ago
- › Approximately 15.000 sensors installed per vessel
- › More than 600 vessels connected
- › Under which 40 ferries
- › Under which 25 hybrid and electric ferries



EXPLORING THE USE CASES



Operability



Emissions



Sailing within time



Electrification



Energy consumption



Battery system design

Functional requirements

Battery lifetime

Operational profile



System specifications

Battery capacity

Operational limits

Power Management System

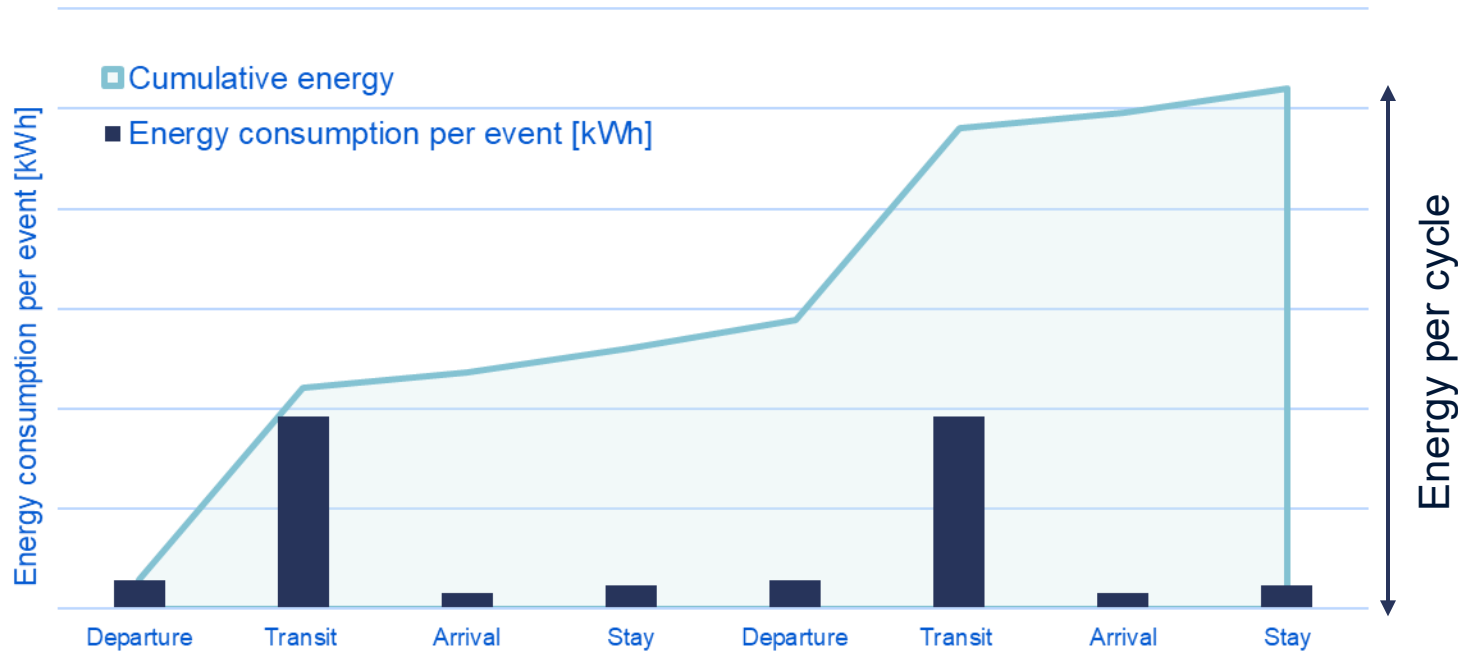
Cooling system

.....

Battery system design

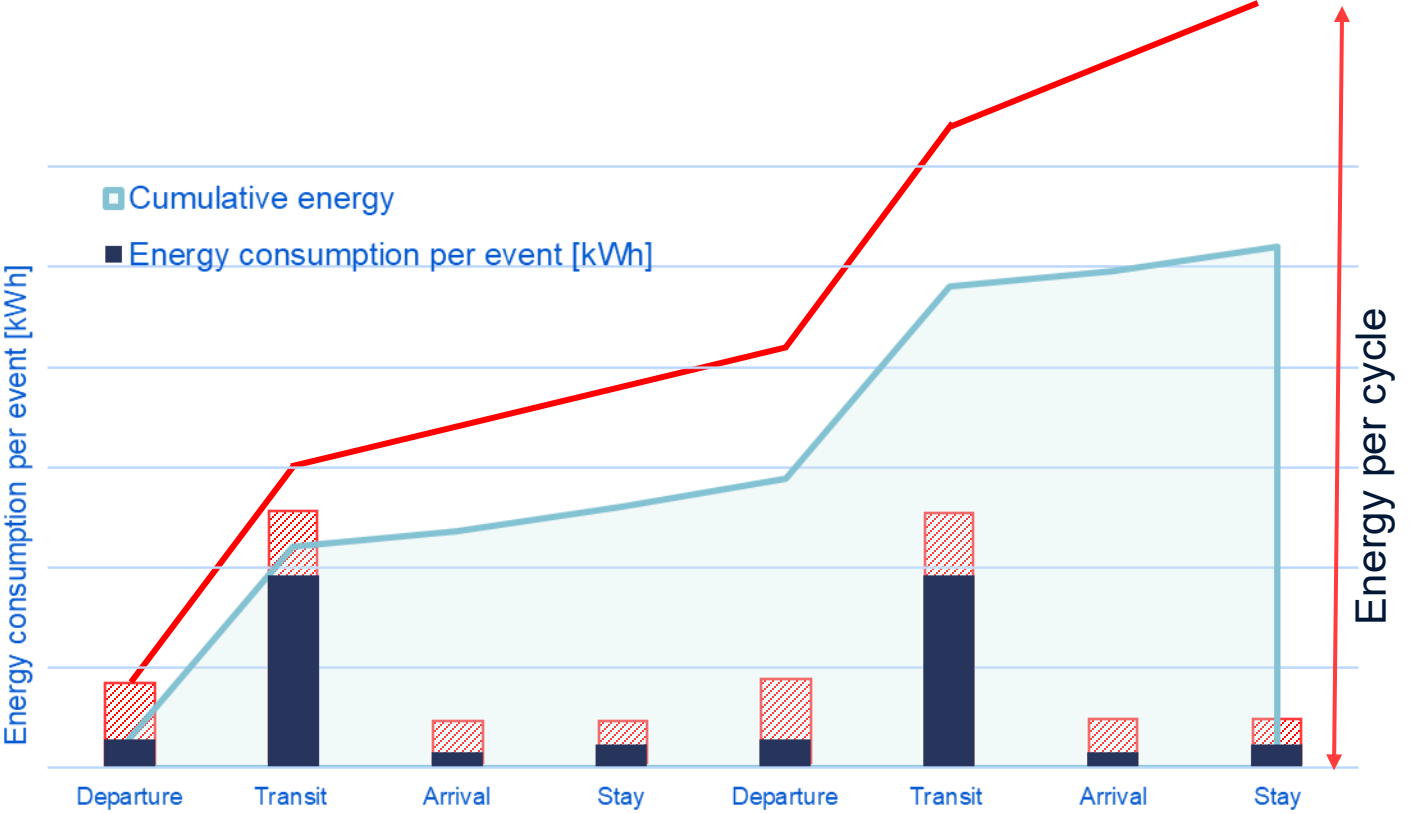
Operational profile

Required time per event \times Required power per event [kW] = Required energy per event [kWh]



Battery system design

Battery lifetime



Indicators of battery use:
Temperature
Energy per cycle
C-rate



DAMEN TRITON



Live Dashboard

Last updated
0 minute ago

Vessel time
13 Oct 2025, 06:25 (PDT)

● Available ● In Use ● Defect



Fuel Consumption [Ⓢ]



452 L/h

Course over Ground (degrees) [Ⓢ]



251.8 °

Speed over Ground (knts) [Ⓢ]



10.6 knots

Speed through Water (knts) [Ⓢ]



13 knots

Heading from Gyro [Ⓢ]



252.8 °

Thruster Control 02

Load kW 0 kW
Load 1 %
Propeller Rpm 0 rpm

Thruster Control 01

Load kW 0 kW
Load 1 %
Propeller Rpm 0 rpm

Generator Set 01 [Ⓢ]

Fuel Rate 0 L/h
Load 0 %
Load kW 0 kW
Speed 0 rpm
Exh. Gas Temp. 135 °C
LB Fuel Pres. 0.11 Bar
RB Fuel Pres. 0.07 Bar
Lub Oil Temp. 48 °C
HT Coolant Pres. - 01 0.41 Bar
LB HT Coolant Temp. 55 °C
RB HT Coolant Temp. 54 °C
LT Coolant Pres. - 01 0.42 Bar
LT Coolant Temp. 30 °C
Turbo Pres. - 01 0 Bar
Gen Run Hours 5964 Hr

Onboard Equipment 01

- Generator Set 01
- Grid Converter MCC 01
- Battery Set 01-01
- Battery Set 01-02

Net Overview 01

Battery Load kW -179 kW
State of Charge 77 %
Remaining Charge Ti... 0 s
DC BUS voltage 1008 V

Net Overview 02

Battery Load kW -62 kW
State of Charge 77 %
Remaining Charge Ti... 0 s
DC BUS voltage 1008 V

Onboard Equipment 02

- Generator Set 02
- Grid Converter MCC 02
- Battery Set 02-01
- Battery Set 02-02

Generator Set 02 [Ⓢ]

Fuel Rate 452 L/h
Load 57 %
Load kW 1153 kW
Speed 1200 rpm
Exh. Gas Temp. 409 °C
LB Fuel Pres. 4.90 Bar
RB Fuel Pres. 4.65 Bar
Lub Oil Temp. 92 °C
HT Coolant Pres. - 02 0.83 Bar
LB HT Coolant Temp. 77 °C
RB HT Coolant Temp. 76 °C
LT Coolant Pres. - 02 1.88 Bar
LT Coolant Temp. 46 °C
Turbo Pres. - 02 1.43 Bar
Gen Run Hours 7992 Hr

Bilge Condition 01

- Battery Room 01 High Level
- Drenching Room High High Level
- Generator Room 01 AFT High Lev...
- Generator Room 01 FWD Middle ...
- Generator Room 01 High High Le...
- Generator Room 01 PS AFT High ...
- Generator Room 01 PS High Leve...
- Technical Space High High Level
- Technical Space PS FWD High Le...
- Technical Space SB FWD High L...
- Thruster Room 01 Center High Le...
- Thruster Room 01 FWD High Lev...
- Thruster Room 01 High High Level
- Thruster Room 01 PS AFT High L...
- Thruster Room 01 SB AFT High L...

ESS Grid Converter MCC 01

Actual Load -115.4 kW
AC Voltage 574.1 V
DC Voltage 1007 V
Current 119 A

Battery Set 01-01

Battery Set Load kW -82.3 kW
State of Charge 76 %
State of Health 91 %
Bus Voltage 848 V
Bus Current -97 A
DC-DC Inv. DC Voltage 1008 V
DC-DC Inv. Act. Current 89 A
Max Temperature 25 °C
Min Temperature 22 °C

Battery Set 01-02

Battery Set Load kW -98.4 kW
State of Charge 76 %
State of Health 93 %
Bus Voltage 848 V
Bus Current -116 A
DC-DC Inv. DC Voltage 1008 V
DC-DC Inv. Act. Current 112 A
Max Temperature 26 °C
Min Temperature 22 °C

Battery Set 02-01

Battery Set Load kW -24.9 kW
State of Charge 78 %
State of Health 86 %
Bus Voltage 859 V
Bus Current -29 A
DC-DC Inv. DC Voltage 1008 V
DC-DC Inv. Act. Current 31 A
Max Temperature 24 °C
Min Temperature 20 °C

Battery Set 02-02

Battery Set Load kW -37.6 kW
State of Charge 77 %
State of Health 89 %
Bus Voltage 854 V
Bus Current -44 A
DC-DC Inv. DC Voltage 1008 V
DC-DC Inv. Act. Current 41 A
Max Temperature 24 °C
Min Temperature 20 °C

ESS Grid Converter MCC 02

Actual Load 0 kW
AC Voltage 0 V
DC Voltage 1008 V
Current 2 A

Battery Pack 01-01A

Max Temperature 25 °C
Avg Temperature 24 °C
Min Temperature 22 °C

Battery Pack 01-02A

Max Temperature 25 °C
Avg Temperature 23 °C
Min Temperature 22 °C

Battery Pack 02-01A

Max Temperature 24 °C
Avg Temperature 22 °C
Min Temperature 21 °C

Battery Pack 02-02A

Max Temperature 23 °C
Avg Temperature 22 °C
Min Temperature 20 °C

Use cases

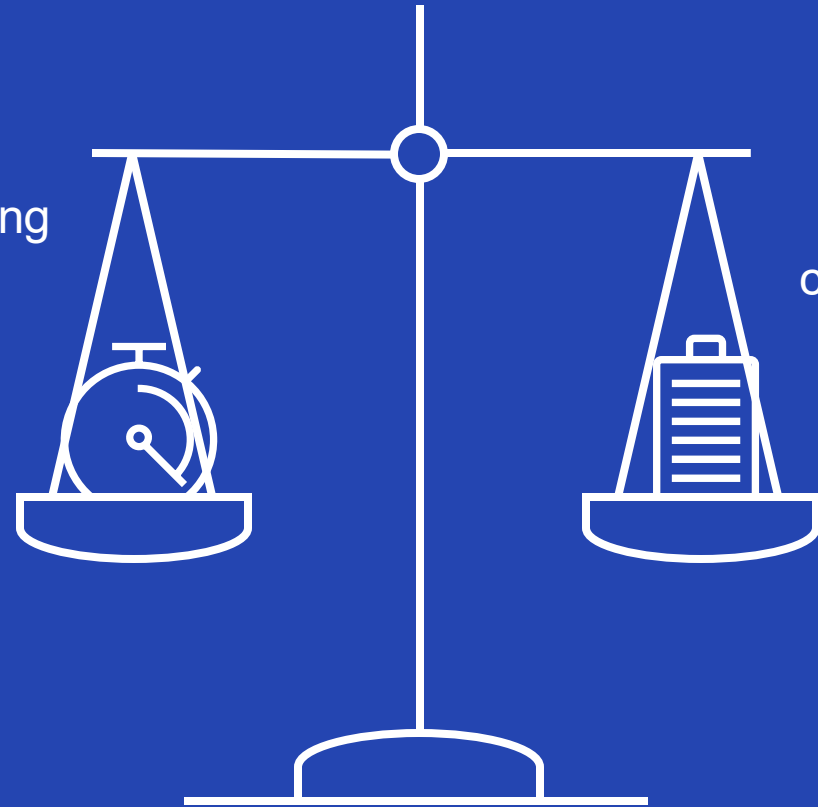




USE CASES

Advise on vessel operation

Sailing according
schedule

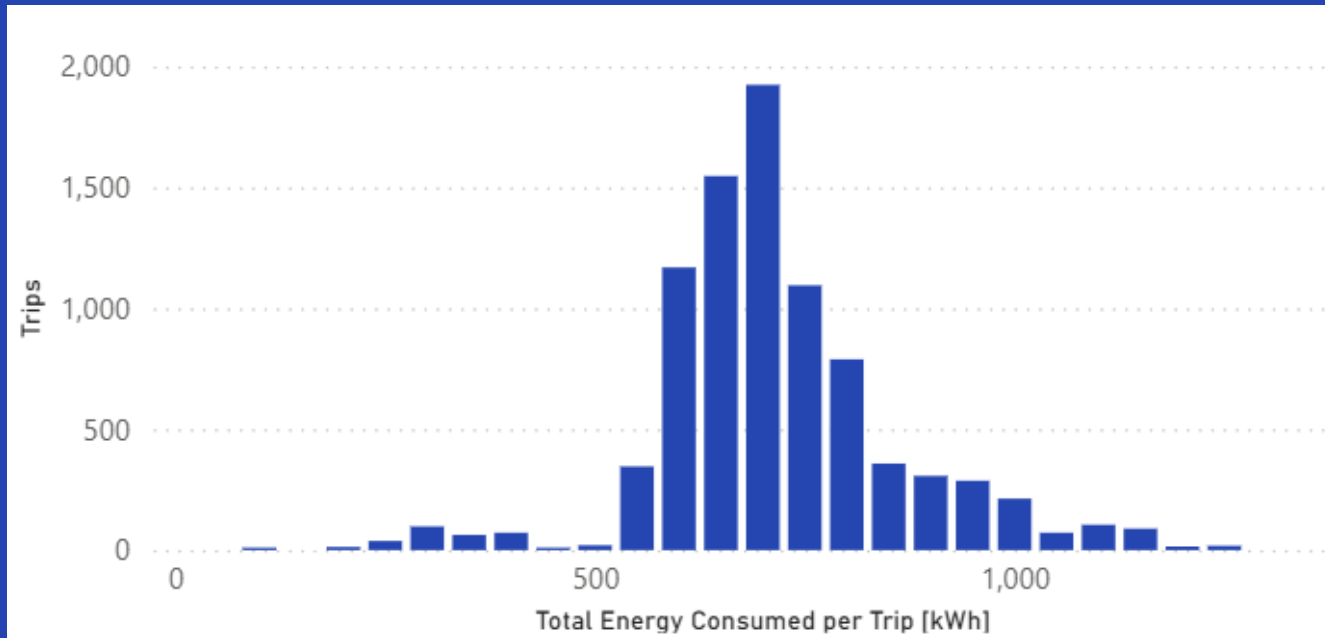


Energy
consumption



USE CASES

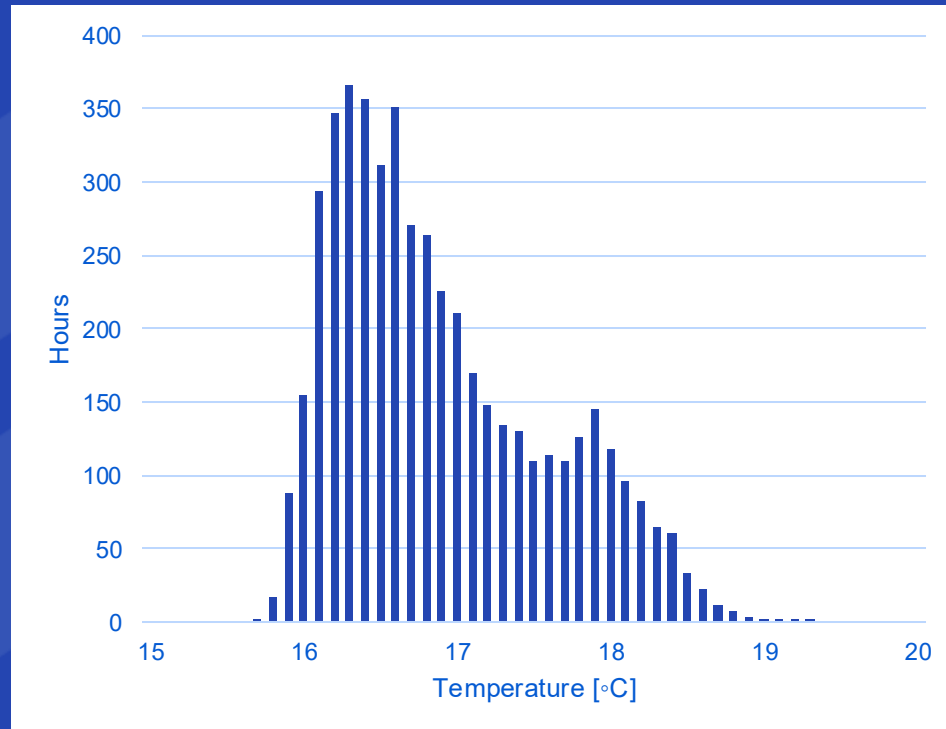
Feasibility of electrification



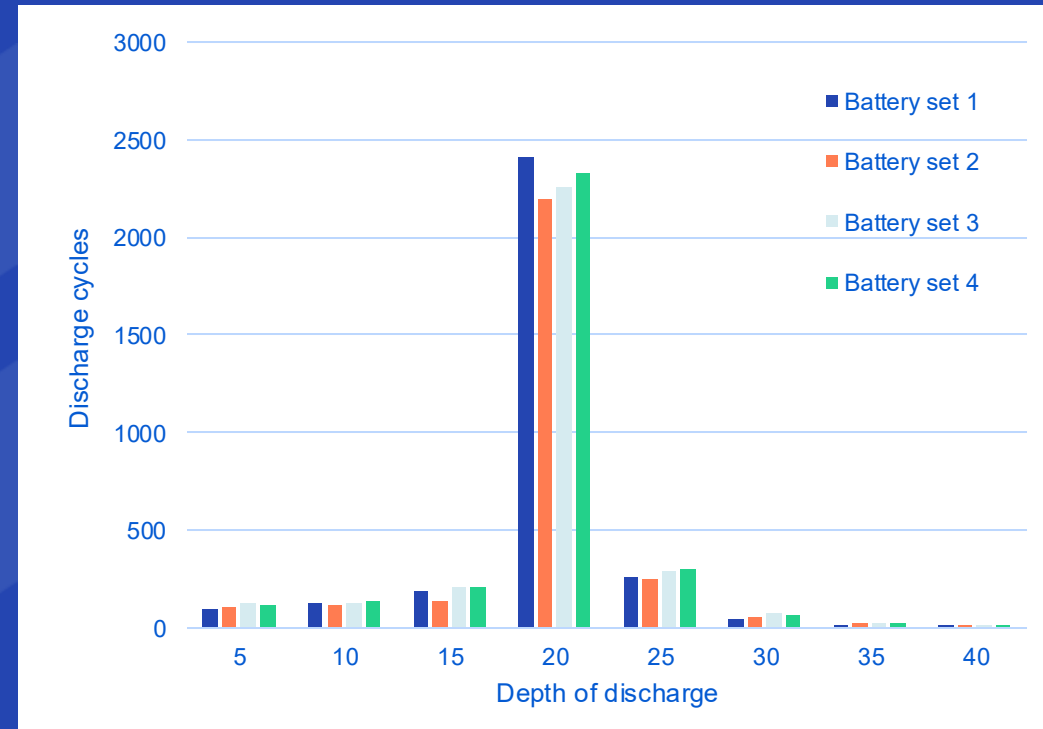
USE CASES

Battery monitoring

Battery room temperature



Depth of discharge





DAMEN

OCEANS OF POSSIBILITIES

Thank you for listening!