Pacific domestic maritime technology transfer pathways

Various ship types
**2019**

Lomaiviti V cargo/pax ferry 130m, 5000 tonne built 1964, in service Fiji domestic inter-island
No additional efficiency measures
Low Capex, High Opex – 12-15 tonne fuel oil p.d.

**2024**

Neoline 138m, 5000 tonne,
Launch 2021 in St-Nazaire
Improved hull design and energy efficiency built in from design phase
Wind - diesel/electric hybrid for main propulsion.
High CAPEX/low OPEX - 80-90% operational efficiency

**2030**

With either advanced biofuels, fuel cells or full electric drop - in replacement motors this design could achieve zero emissions from operations
MV Kwajalein – RMI 560GT cargo/pax ferry
Fuel = 390,000 litres/$250,000 p.a

Retrofit/efficiency options available 2020
Fuel = $US70,000 p.a (incl slow steaming regime)
Energy savings of 16-60% depending on option selection

New Build – improved hull design and energy efficiency built in from design phase with diesel/electric – wind hybrid for main propulsion.
High CAPEX/low OPEX. 40% +

New Build – improved hull design and energy efficiency built in from design phase with diesel/electric – wind hybrid for main propulsion.
Higher CAPEX/lower OPEX. 80-90% +

100% REQUIRES FUEL SHIFT

Battery/electric
Fuel cell
Bio-diesel
SV KWAI – 179 GT, copra boat
2010 retrofit – 10-30% fuel savings
2017 retrofit – 25-50% fuel savings

Cerulean – 199 GT, copra boat, new build
2020. 40-75% fuel savings

Battery/electric
Fuel cell
Bio-diesel

100% REQUIRES FUEL SHIFT
Fast Ferry – Fiji = Current
– all diesel power

Fast Ferry – NZ = under construction
– all electric
CAPEX = $2.6m. Annual OPEX savings = $200k

Fast Ferry – Norway = current
– all electric

Fast Ferry – Norway = future
– hydrogen fuel cell or electric
1986 – retrofit – 10-30% fuel savings

2010 – 0% fuel savings except by energy efficiency (1-8%)
Slow steaming (10-30%)

2018 Retrofit – 15-20% fuel savings

2030 new build – ?% fuel savings
Vessels under 15m, generally powered by 2-stroke petrol fuel outboards make up a significant portion of Pacific domestic emissions. Low CAPEX, high OPEX

Transition to 4-stroke provides 40% efficiency gain. High CAPEX, lower OPEX

Transition to electric outboard/inboards with onboard or shoreside RE charging. 70-90%. High CAPEX, low OPEX

Fuel cells?