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LOMAIVITI PRINCESS





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Ships are to Oceania as horses, roads, cars, rail and trucks are to continents.

- globally, 90% of goods/resources transported by sea
- costs more to ship a container by road 100km than it does to move by sea from China to Europe
- Sea transport produces more CO₂ than Germany
- produces more sulphur dioxide than all global cars and lorries.
- generates 27 per cent of the world's nitrogen oxide emissions

Oceania is more reliant on imported fossil fuel than any other part of the world – 95% (99% if PNG/Fiji excluded)



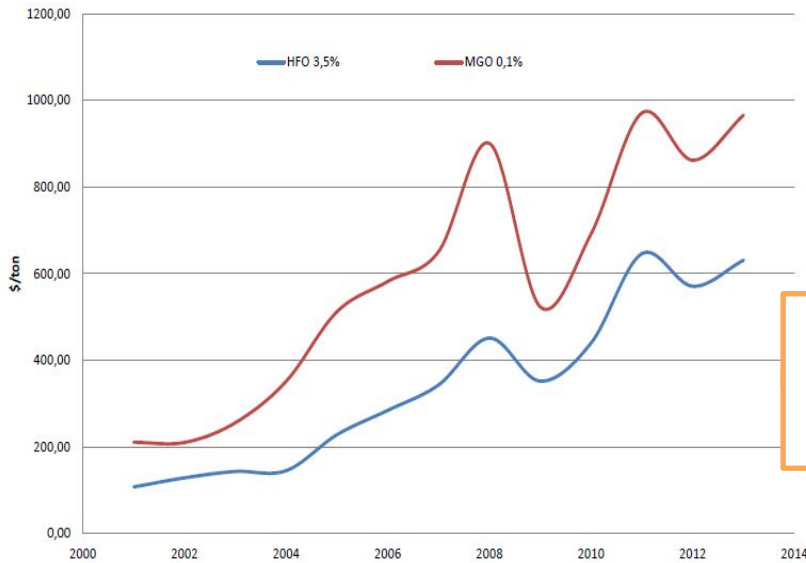
Ships are to Oceania as horses, roads, cars, rail and trucks are to continents

2011 Data

- 65,000 deaths p.a. globally directly attributable to shipping emissions
- 4 % of all global GHG
- 15 ships = more SO_x than the entire world vehicle fleet

Oceania is more reliant on imported fossil fuel than any other part of the world – 95% (99% if PNG/Fiji excluded)

Marine fuel price development



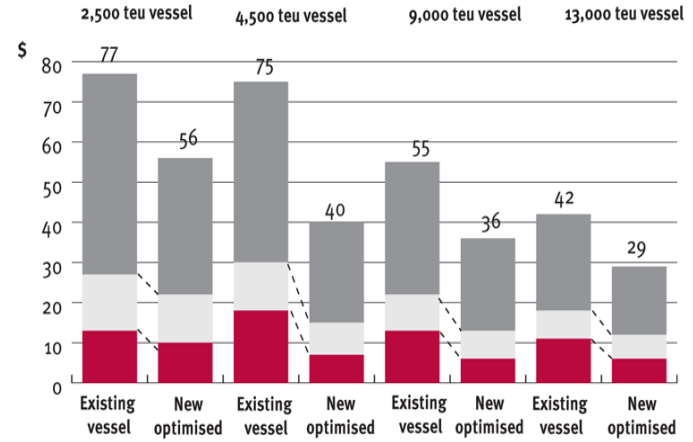
Fuel Costs

Sustainable Sea Transport Efficiency

GLOBAL DRIVERS

COST PER 1,000 CONTAINER MILES

Bunkers at \$750 per tonne, sailing at 19 knots and excluding port/canal fees

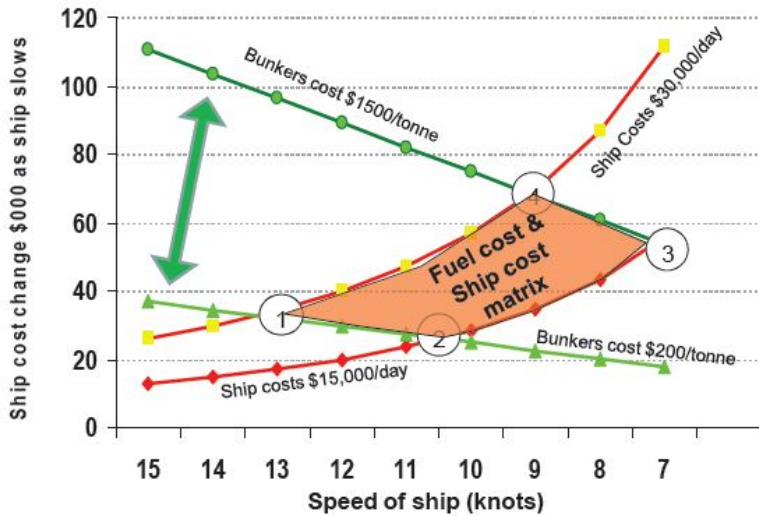


Capital costs Operating costs Bunkers

Source: Germanischer Lloyd

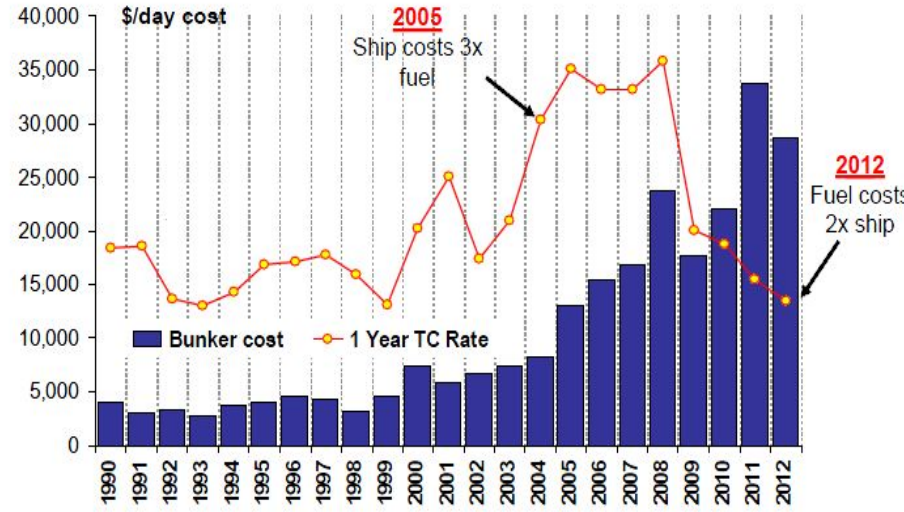
The Ship Speed & Consumption Matrix

Shows effect on fuel cost (green lines) & the cost of shipping capacity (brown line) of changing ship operating speed in 1 knot increments on a 5000 mile voyage)



1. The Eco-ship Issue:

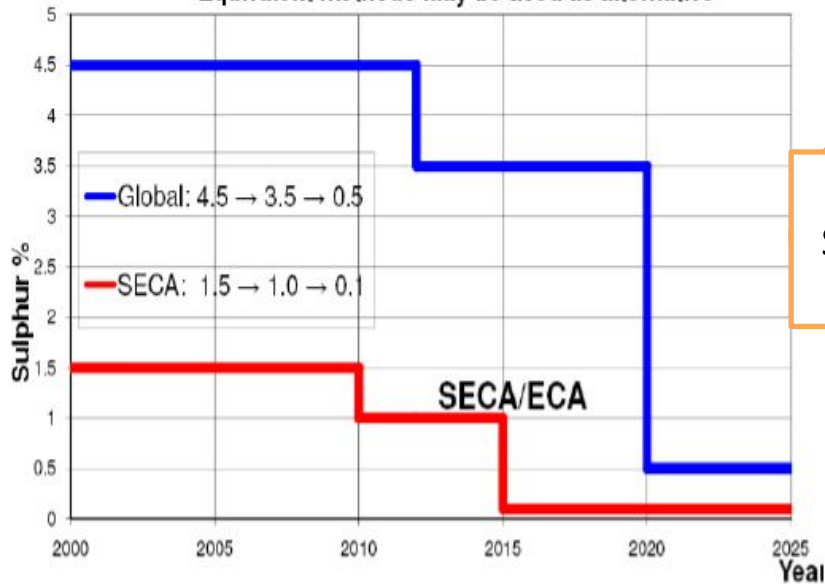
TODAY BUNKERS COST MORE THAN THE SHIP



Based on Aframax tanker, 1 year TC rate and Rotterdam bunker price

MEPC 57 IMO Fuel-sulphur Content

Equivalent methods may be used as alternative

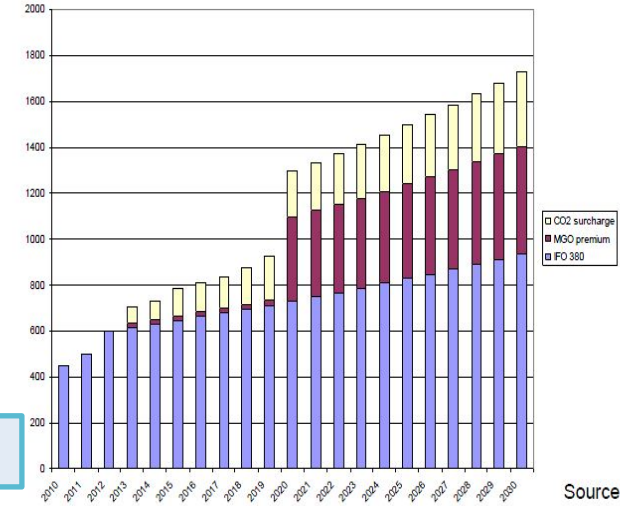


Sustainable
Sea Transport
Efficiency

Climate Change

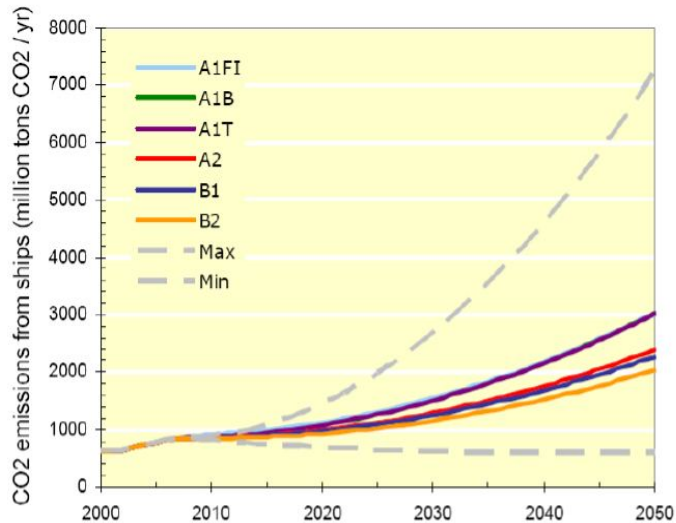
GLOBAL DRIVERS

Fuel Oil Price Scenario

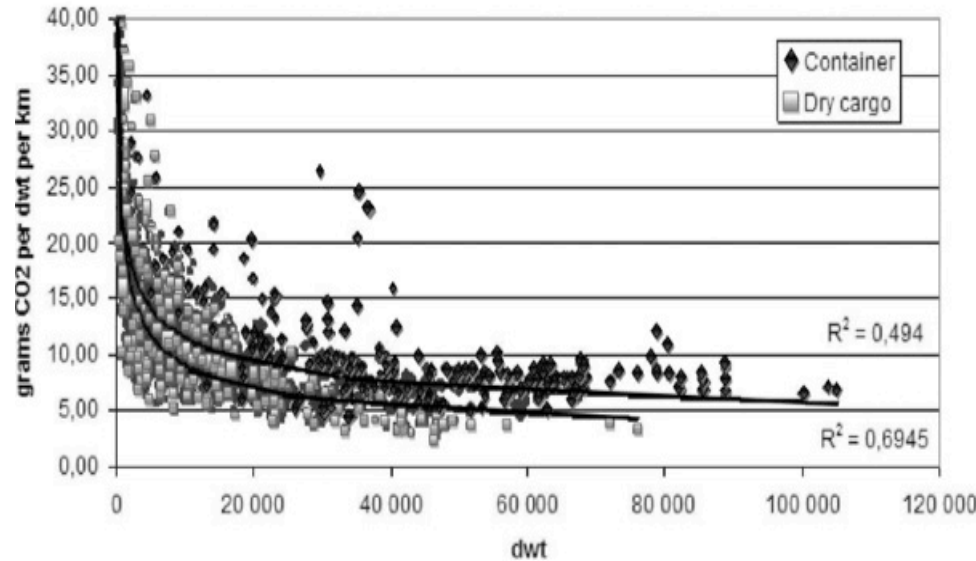


Source GL

International shipping CO2 emission scenarios



CO2-index for container and dry cargo ships

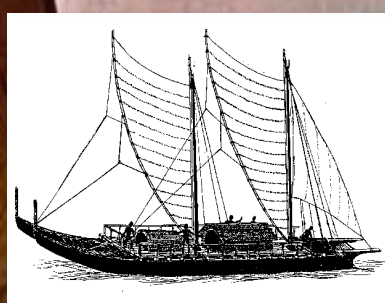
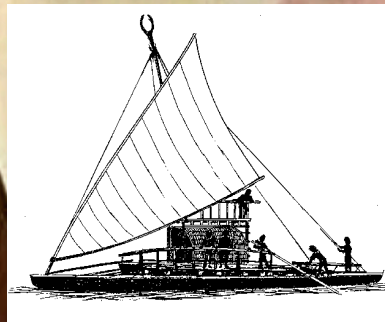
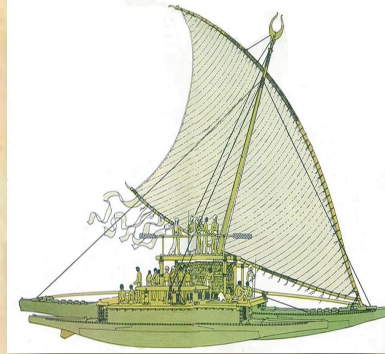
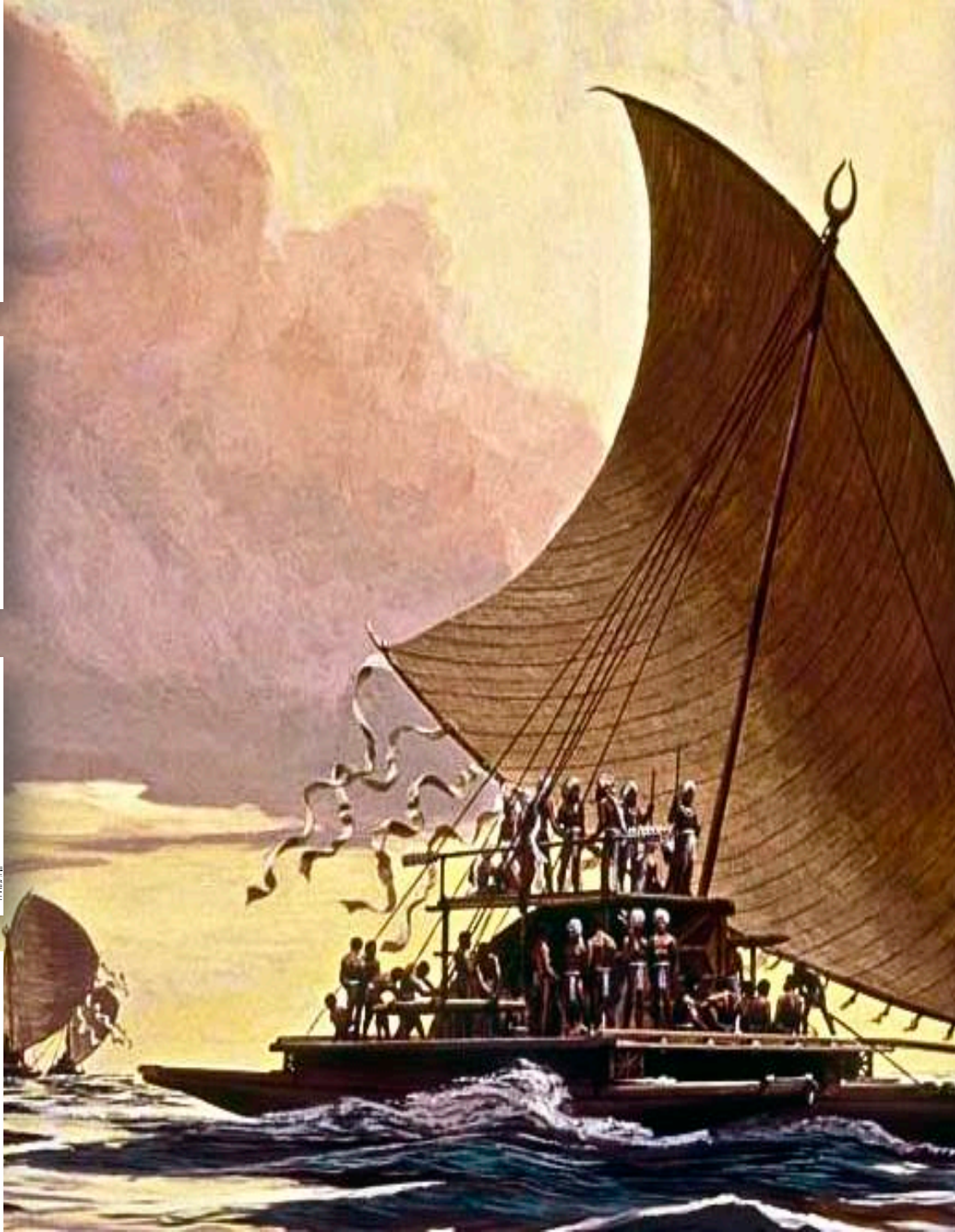
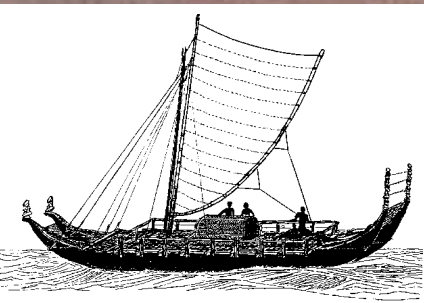
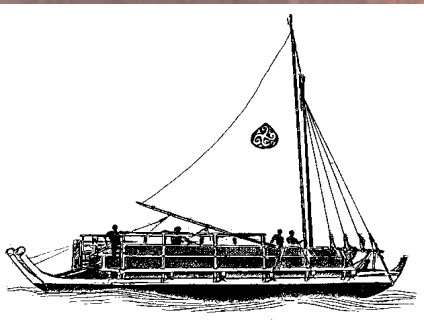


Final Seminar, Gothenburg, March 21, 2013

Final Seminar, Gothenburg, March 21, 2013





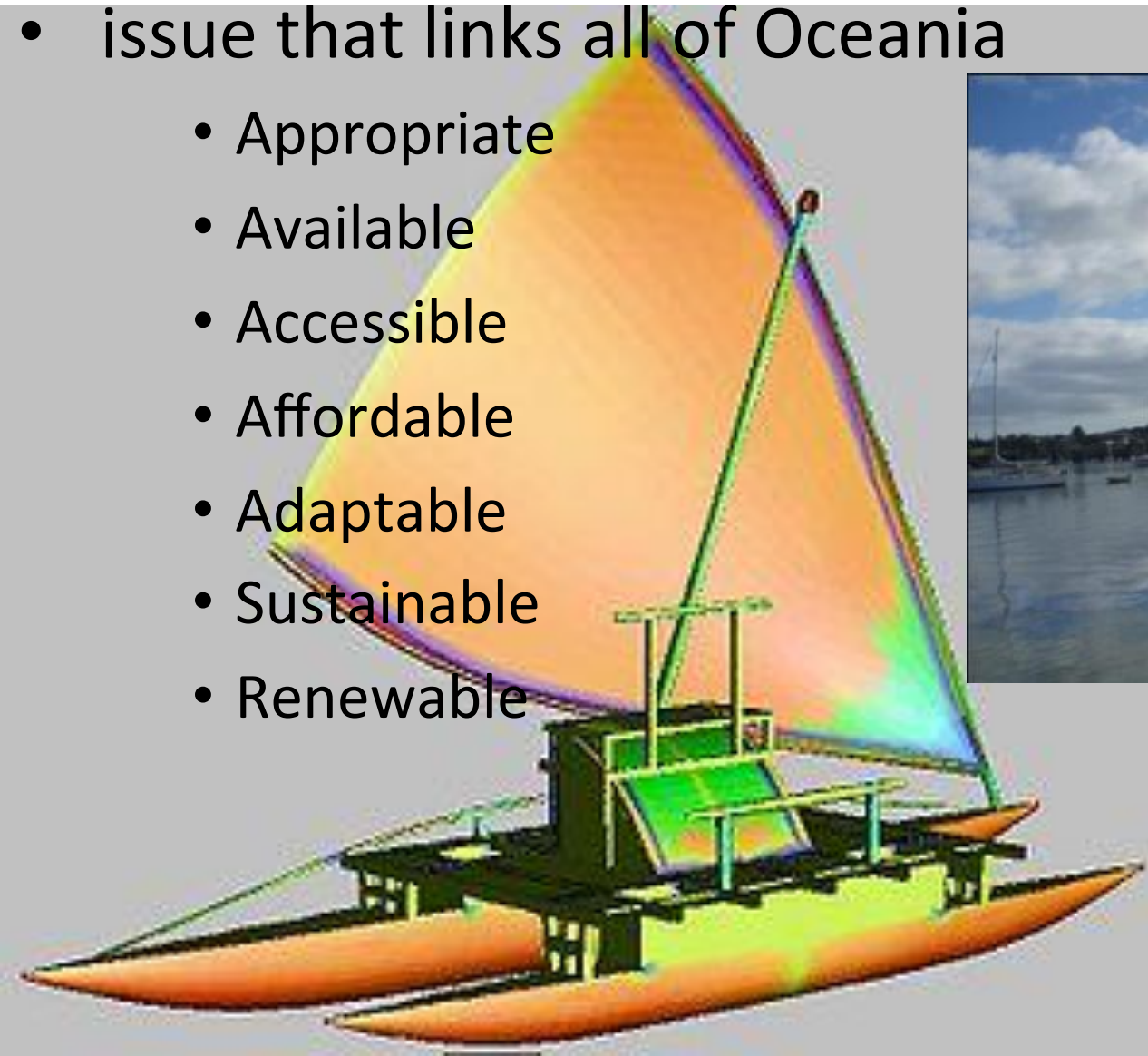


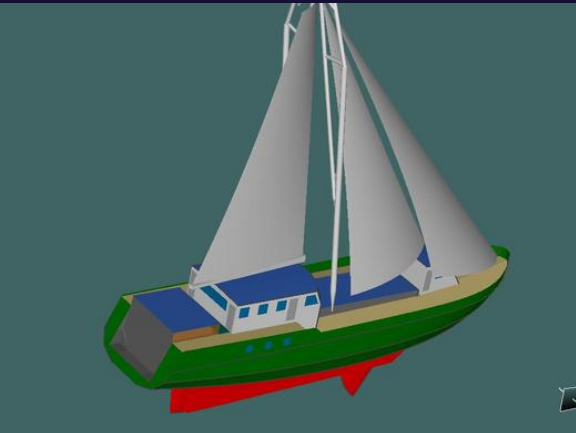
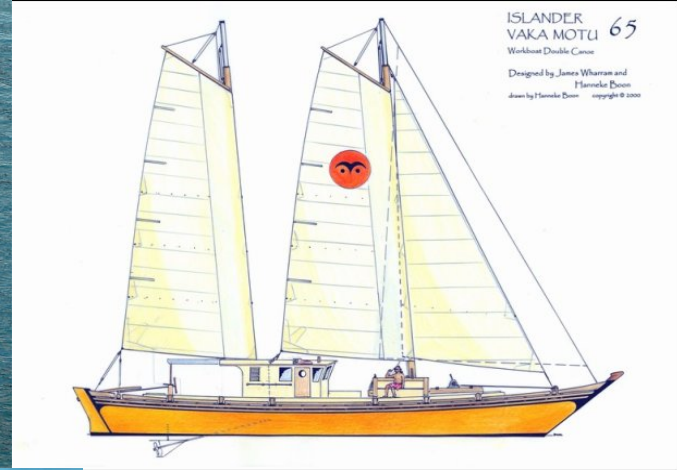
It's a wind
generator Jim,
just not as we
know it!!!



Sail-powered sea-transport:

- intellectual property legacy of the Pacific
- issue that links all of Oceania
 - Appropriate
 - Available
 - Accessible
 - Affordable
 - Adaptable
 - Sustainable
 - Renewable



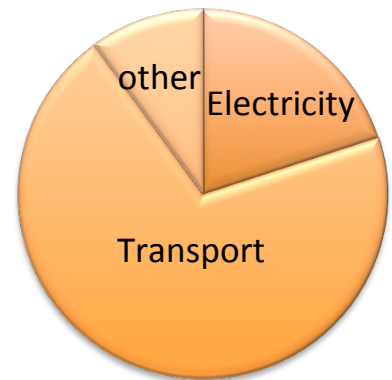




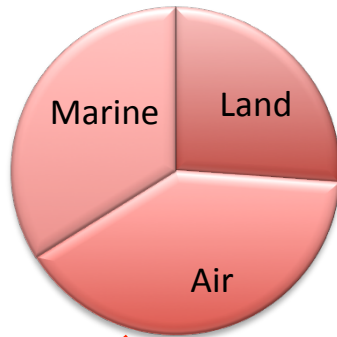
BLANDER 65
AKA MOTU



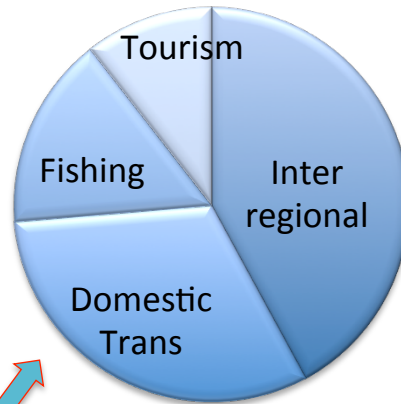
Imported Regional Fuel by Sector



Transport Fuel by Sector (Fiji)



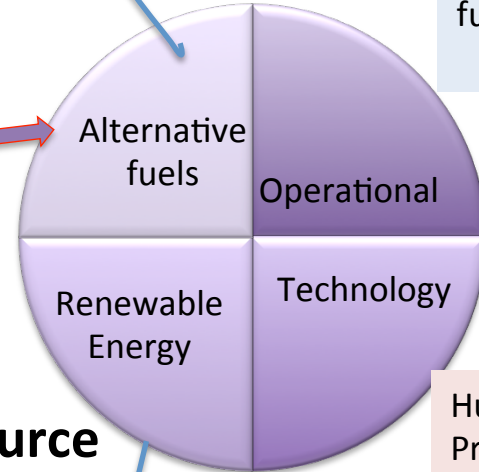
Marine by sector



LNG; hydrogen, methane, biofuel, biogas, etc

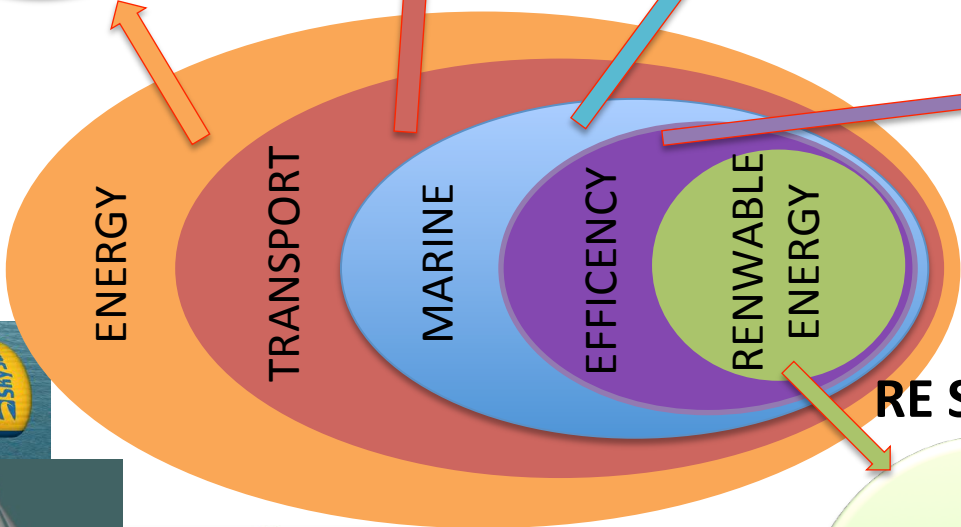
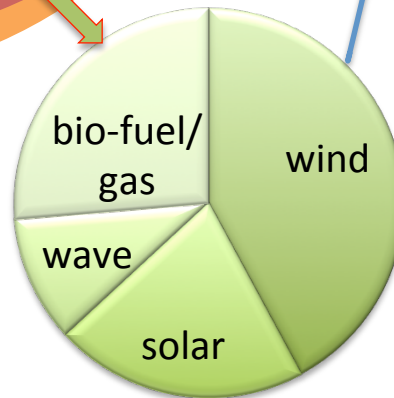
Slow Steaming, Port efficiencies, Weather routing, Just-in-time, bulk fuel purchase, etc

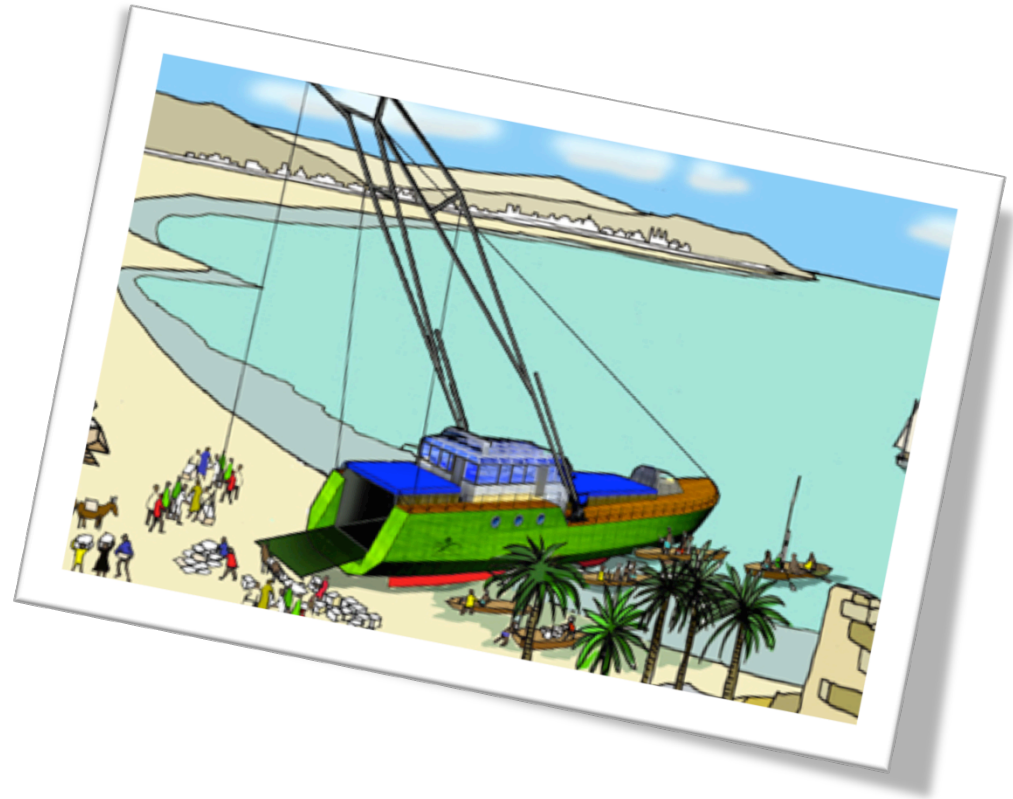
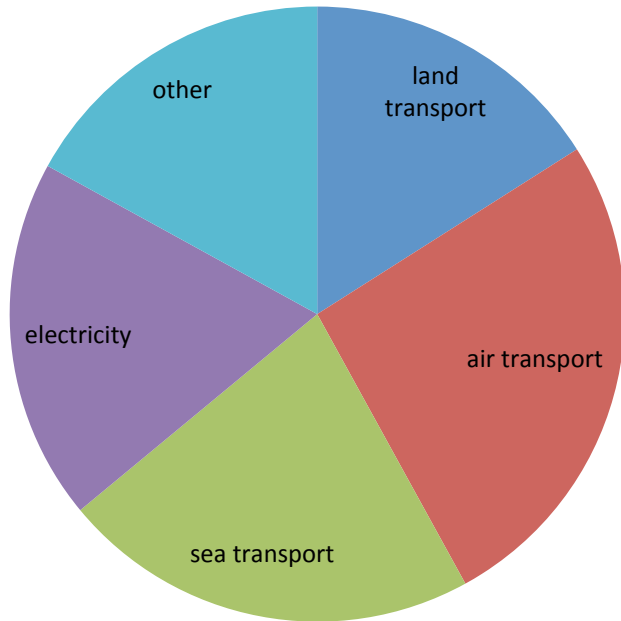
Efficiency Methods



Hull design, Propeller upgrade, Waste heat recovery, etc

RE Source

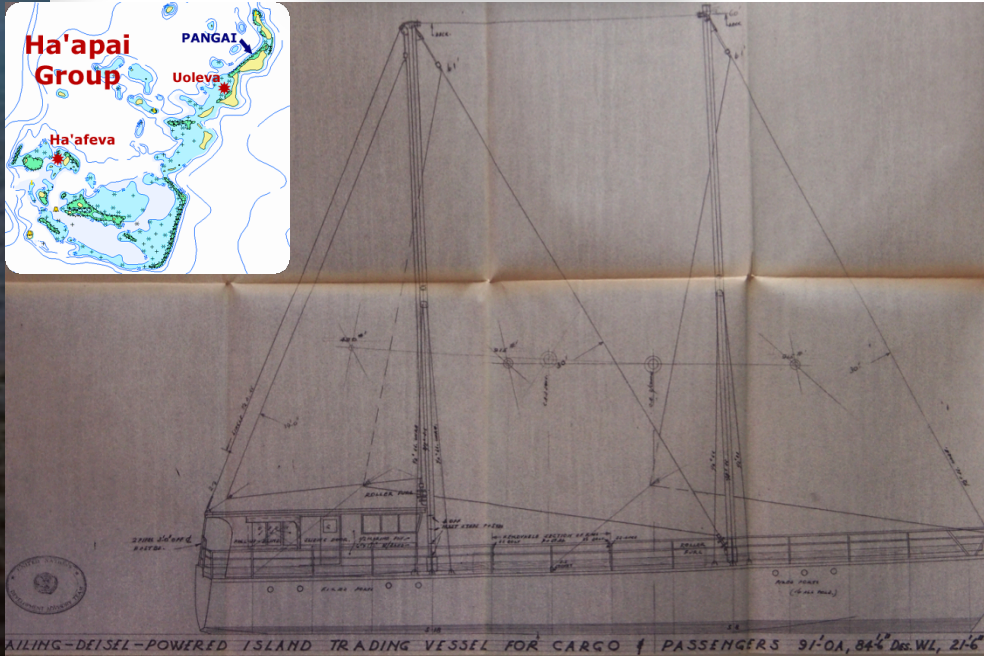
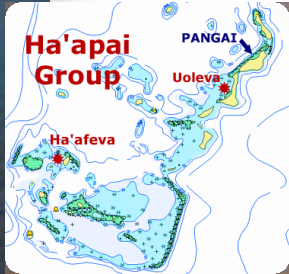
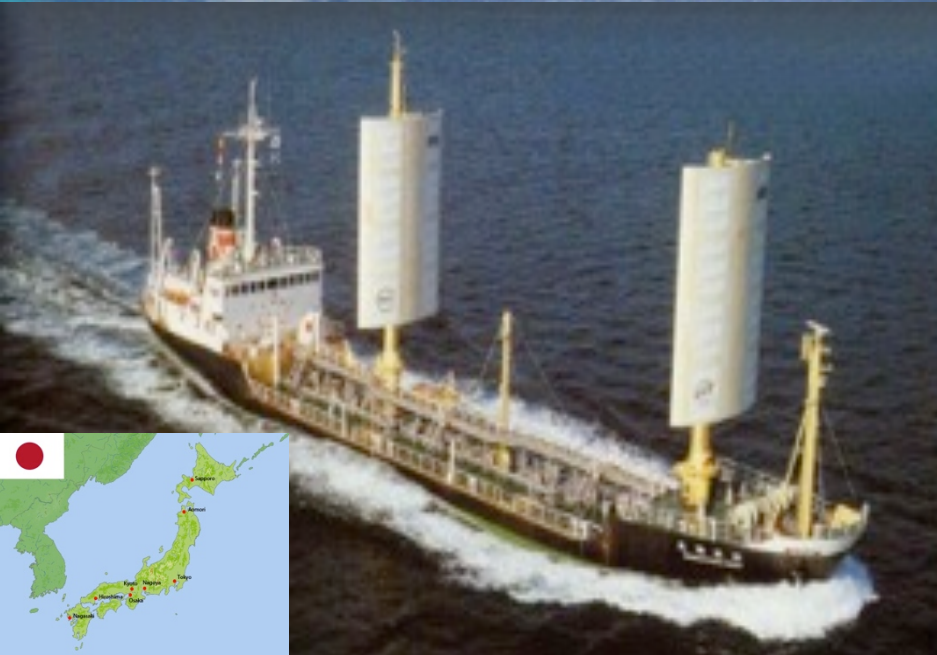




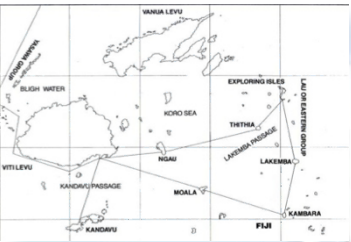
Policy –regionally almost invisible at all levels

- SIDS DOCK = 25% reduction in conventional transport fuel use – 2033
- PIDF outcomes.
- Fiji draft National Energy Policy
- TOR National Transport Policy

What happened in the last Oil Crisis?

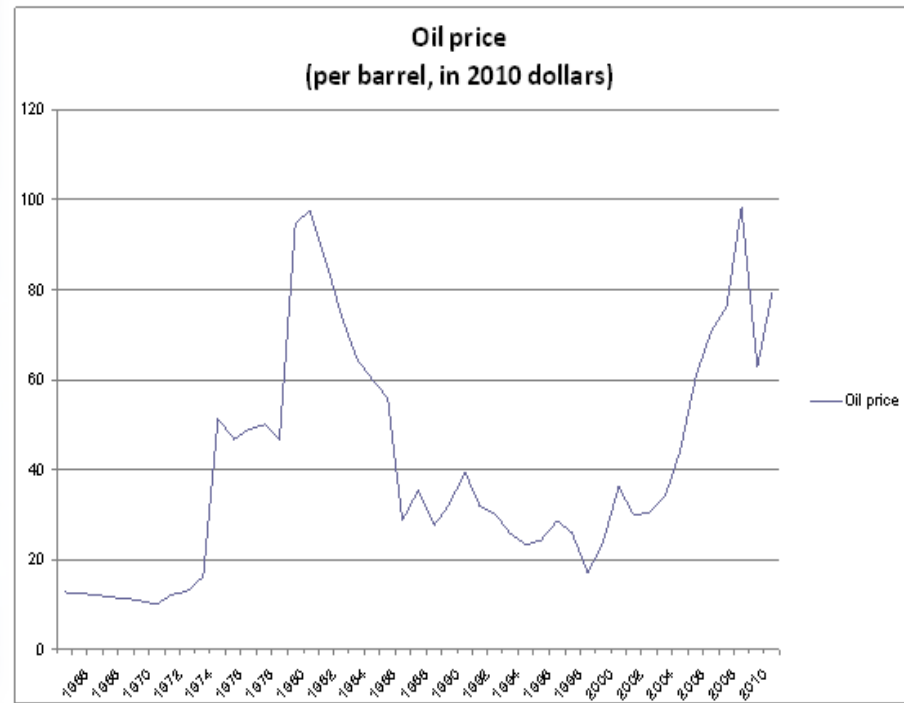
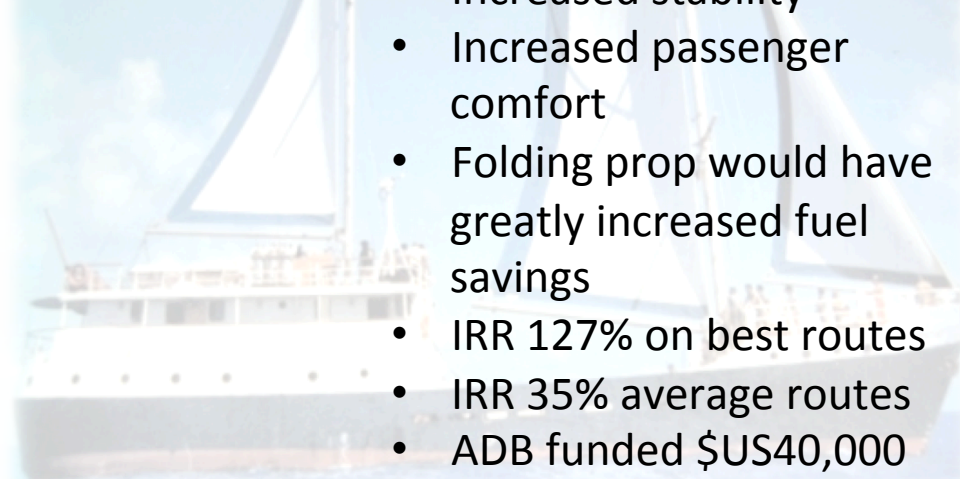


SAILING-DEISEL-POWERED ISLAND TRADING VESSEL FOR CARGO & PASSENGERS 91'0A, 86' Deg. WL, 21'



1984/86

- 23-30% fuel savings
- 30% reduced engine wear
- Increased stability
- Increased passenger comfort
- Folding prop would have greatly increased fuel savings
- IRR 127% on best routes
- IRR 35% average routes
- ADB funded \$US40,000



1983-86

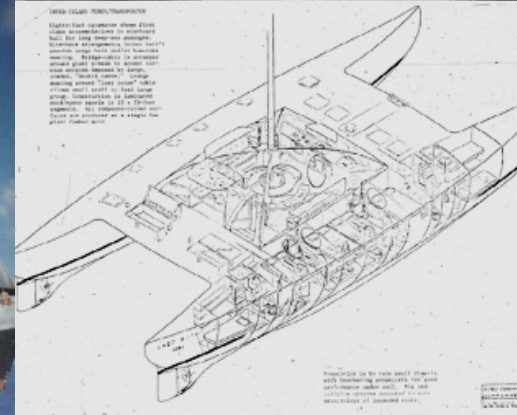
- 30% fuel savings
- Increased passage average speed from 12-14 kts
- Reduced crew downtime
- Increased manoeuvrability
- Could hold station in typhoon conditions
- Trialled on 600-31000 tonne vessels



1982-85

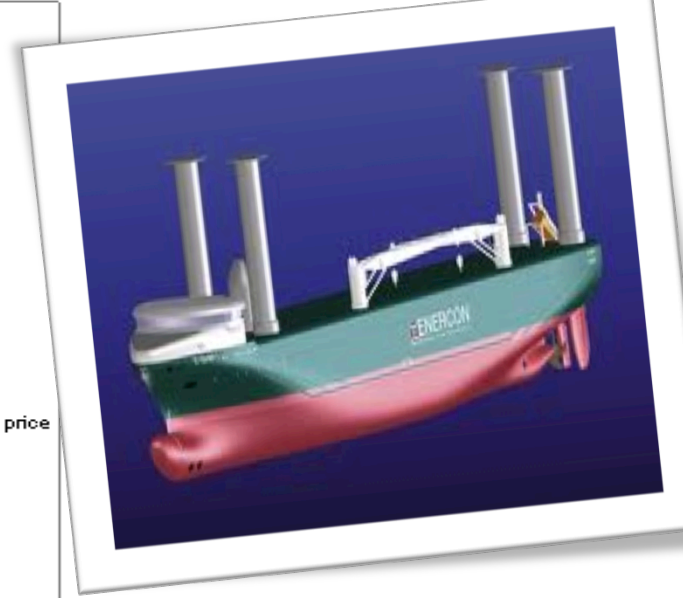
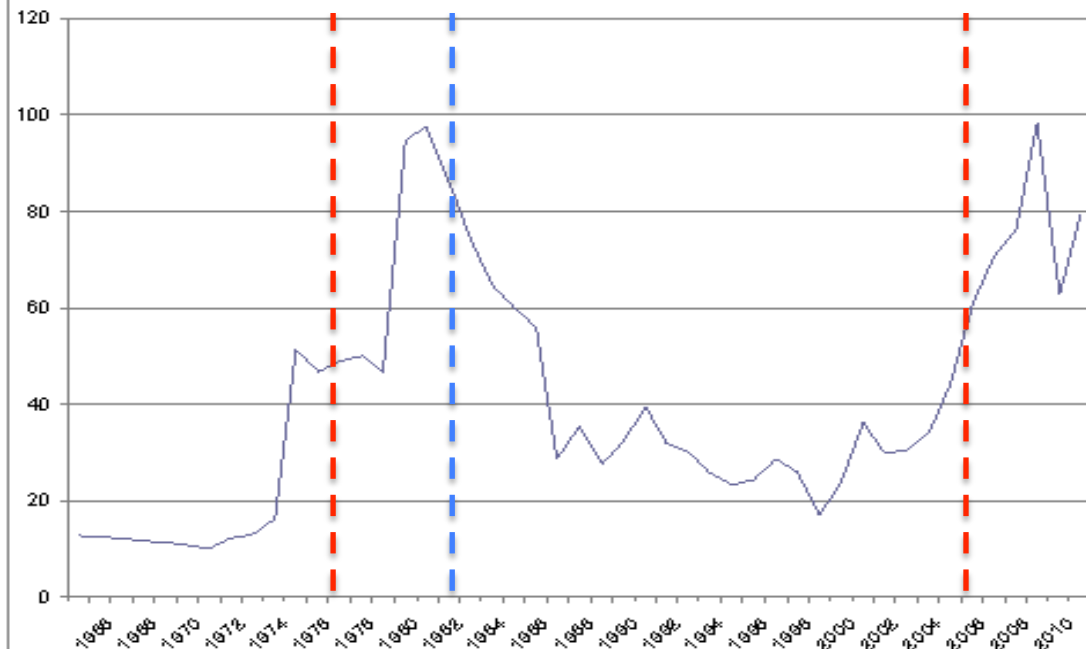
- UNESCAP/ADB funded needs assessment & analysis
- Recommended network of trading catamarans and small energy efficient sail-freighter
- Commissioned design for 92' freighter carrying 30 T/30pax





PROJECT	Description	Outputs	Agencies	Comments
Fiji soft sail retrofit	Auxiliary rig retrofitted to two government vessels of ~300t. Rigs built and installed in-country	Fuel savings 23-30%, but also 30% engine/prop wear reduction, greater stability, incr passage times. IRR on best route = 127%, average route = 33%	ADB, Southampton University, McAllister Elliot	Southampton University collated historical wind data for all Fiji routes and produced fuel saving ratios for all routes.
Lau Passenger / cargo	50 ton primary sail powered trading vessel, designed and built on Kabara by local builders (1984-87). First of 3 planned vessels to service Lau and Lomaiviti Groups.	<i>Tai Kabara</i> became the main vessel operating on the Sth Lau route until she was scuttled in 2006. Used local materials wherever possible.	European Union	Construction of the other two ships was cancelled when the oil crisis abated.
Ha'apai Freighter	Needs assessment and design analysis led to commissioning of build plans for a 100 ton energy efficient freighter	Needs assessment, transport census and full build plans for a 100 ton energy efficient freighter.	UNESCAP, UNCTAD, UNDP, ADB	Vessel never constructed due to end of crisis. Similar needs assumed today.
SCF/Jim Brown	Save the Children Fund Tuvalu employed catamaran designer Brown to develop locally built boats for Tuvalu/Kiribati	A range of designs and processes for locally built/operated catamarans for artisanal and commercial fishing and local and inter-island transport. Training of local shipwrights. Local materials favoured	SCF	This project closely associated with the FAO/UNDP project. Local build/materials used wherever possible. Fuel savings of up to 60%.
FAO/UNDP	A multi-county fisheries programme to develop RE artisanal and small-scale commercial vessels for local community benefit.	A portfolio of 10 designs from single dugouts to 11m trimarans. 350 vessels built in 8 countries. Demonstrated need for vessels to be affordable and locally appropriate.	FAO UNDP	Uptake ceased with end of project and falling fuel prices. Communities with 'living tradition' of sail had greatest uptake.

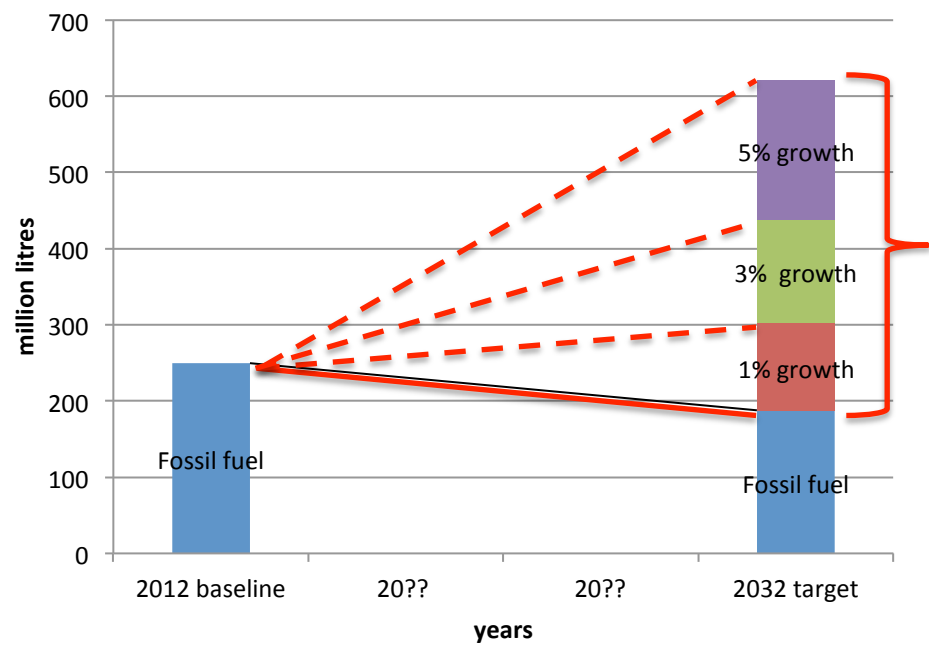
Oil price
(per barrel, in 2010 dollars)



— Oil price

Sust sea transport is invisible
Pacific Energy Forum 2013

- Objective to “reduce Pacific’s dependency on diesel.”
- \$NZ635m committed by international donor community.









A number of core issues are facing the village associated with the need to generate a sustainable cash income for the village.



- Kadavu is not on the main tourist routes of Fiji. Although good conservationists (community bush reserve/MPA), opportunities for eco-tourism are poor.



- The village is located some distance from good gardening areas
- The costs of transport for people and goods both outgoing from the village (primarily kava and honey) and incoming (basic food, building and fuel supplies) is high & increasing.

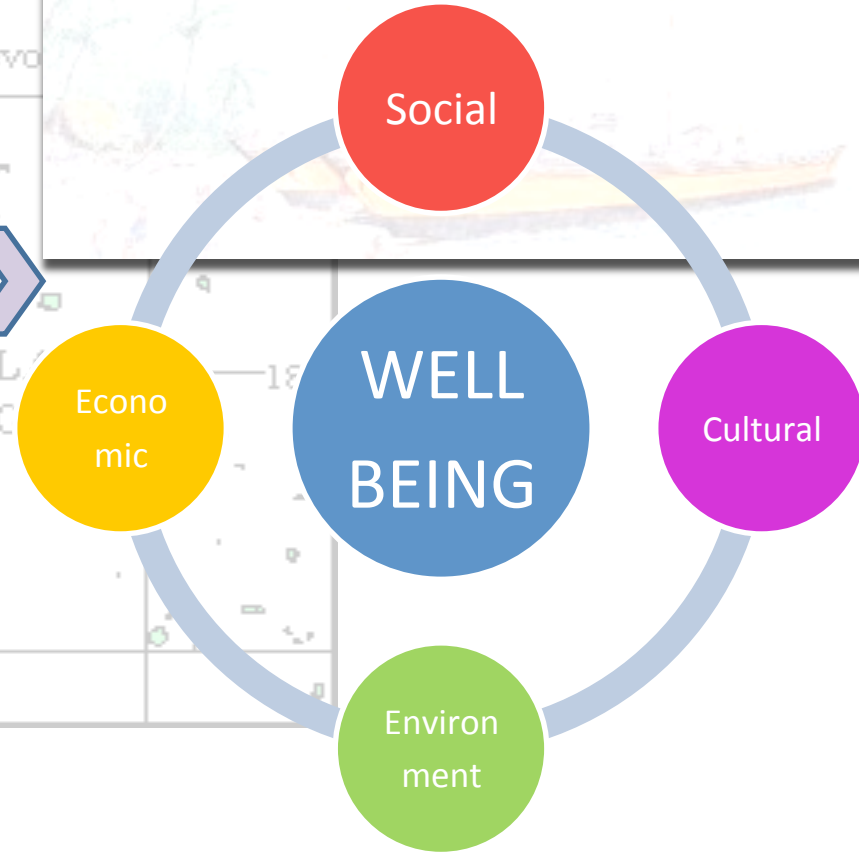
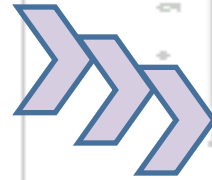


Solodamu, like most villages in Fiji is reliant on fibers and ferries for transport of people and goods and for fishing.



OBJECTIVE

A SUSTAINABLE SOLODAMU SAIL TRADING ENTERPRISE



For additional info on this initiative:

www.sailingforsustainability.org

Primary

- ↑ sea transport options = incr village resilience
- ↑ ties between communities/ kin networks

Secondary

- ↑ sustainable village employ/ enterprise
- ↑ access to services
- ↑ collaboration between key stakeholders

Primary

- sea transport fuel ↓
- Village transport cost ↓

Secondary

- Transport ↑ = ↑ econ opportunity
- Sustainable businesses
 - Sailors
 - Boatbuilders
 - Traders
- Carbon Credits



Primary

- Central cultural icon
- Trad knowledge/ practice

Secondary

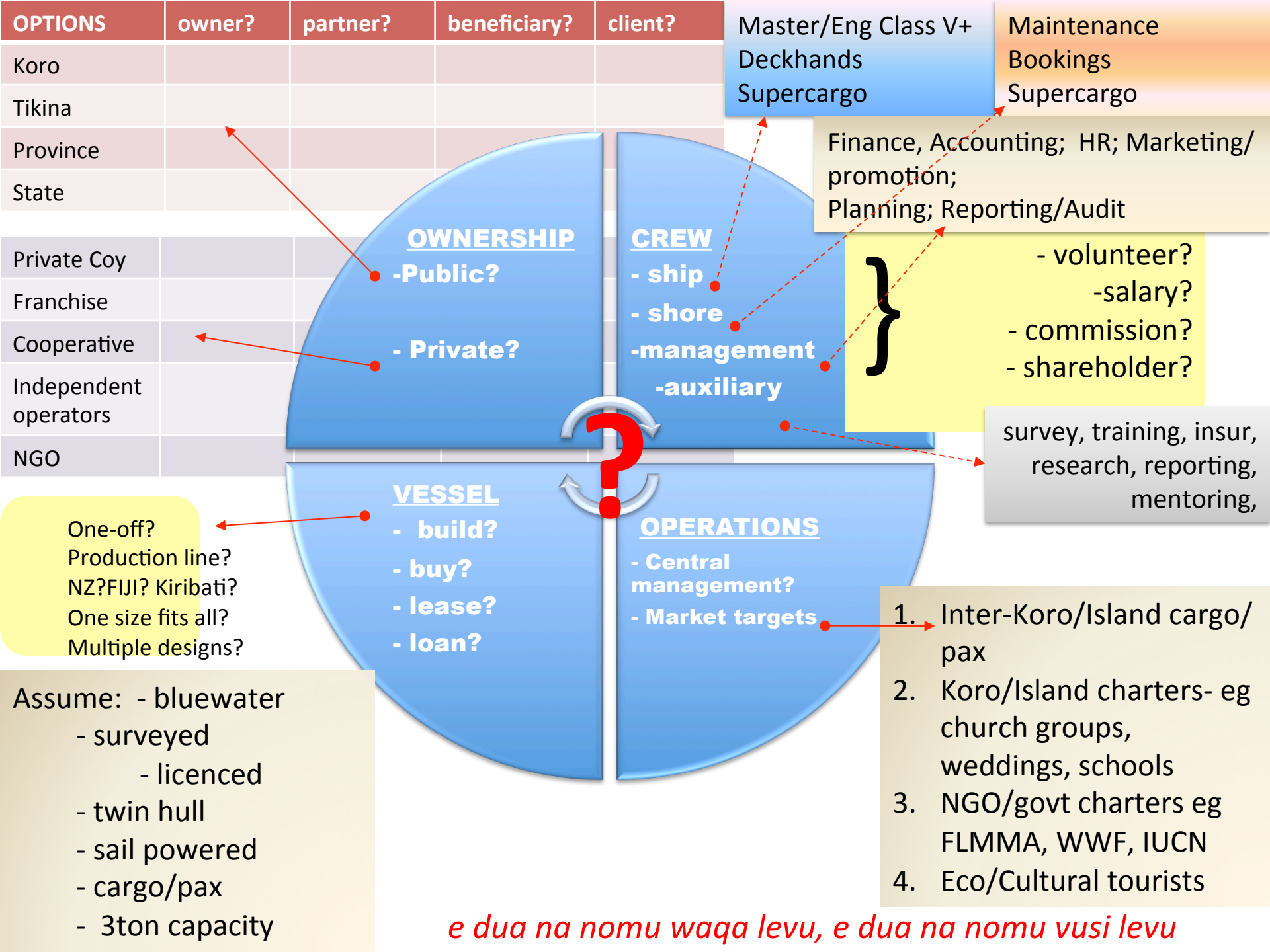
- Develop culturally appropriate business
- build leadership
- ↑ pan-Pacific collaboration

Primary

- Greenhouse Gas emissions ↓
- Carbon fuel dependency ↓

Secondary

- ↑ transport options for FLMMA, Fisheries, etc
- ↑ Fiji's "green" image



Greenheart Ship – Prototype

- Naval Architects - Mr. Haruhiko Kaku; Professor Takeshi Kinoshita, Mr. Peter Schenzle
- 32m, 220 tonne multipurpose ship, single A-frame mast/crane. Primary propulsion comes from 300 m² of sail, fore and aft rigged



shallow draft design for beach landing

Roll-on/roll-off port ramp, hinged just above the waterline in the stern. It can be lowered into the water for launching and shipping boats, or for handling fishing gear



Hull speed = 10-11 knots, unlimited range.

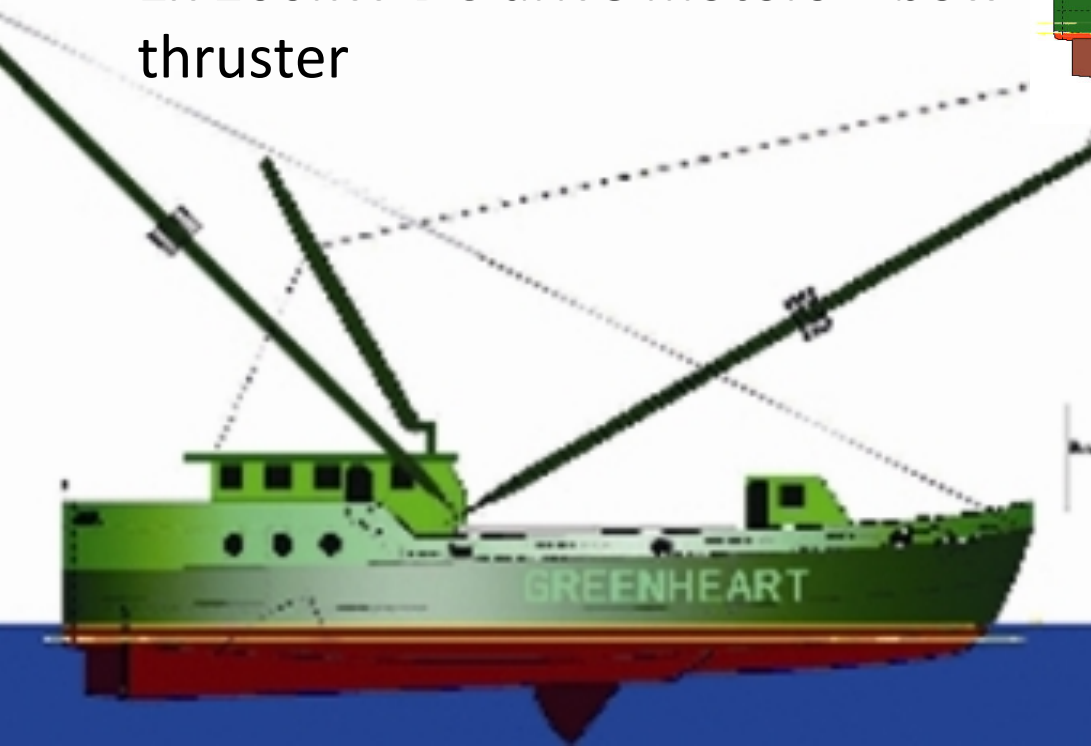
Auxiliary propulsion and onboard power,

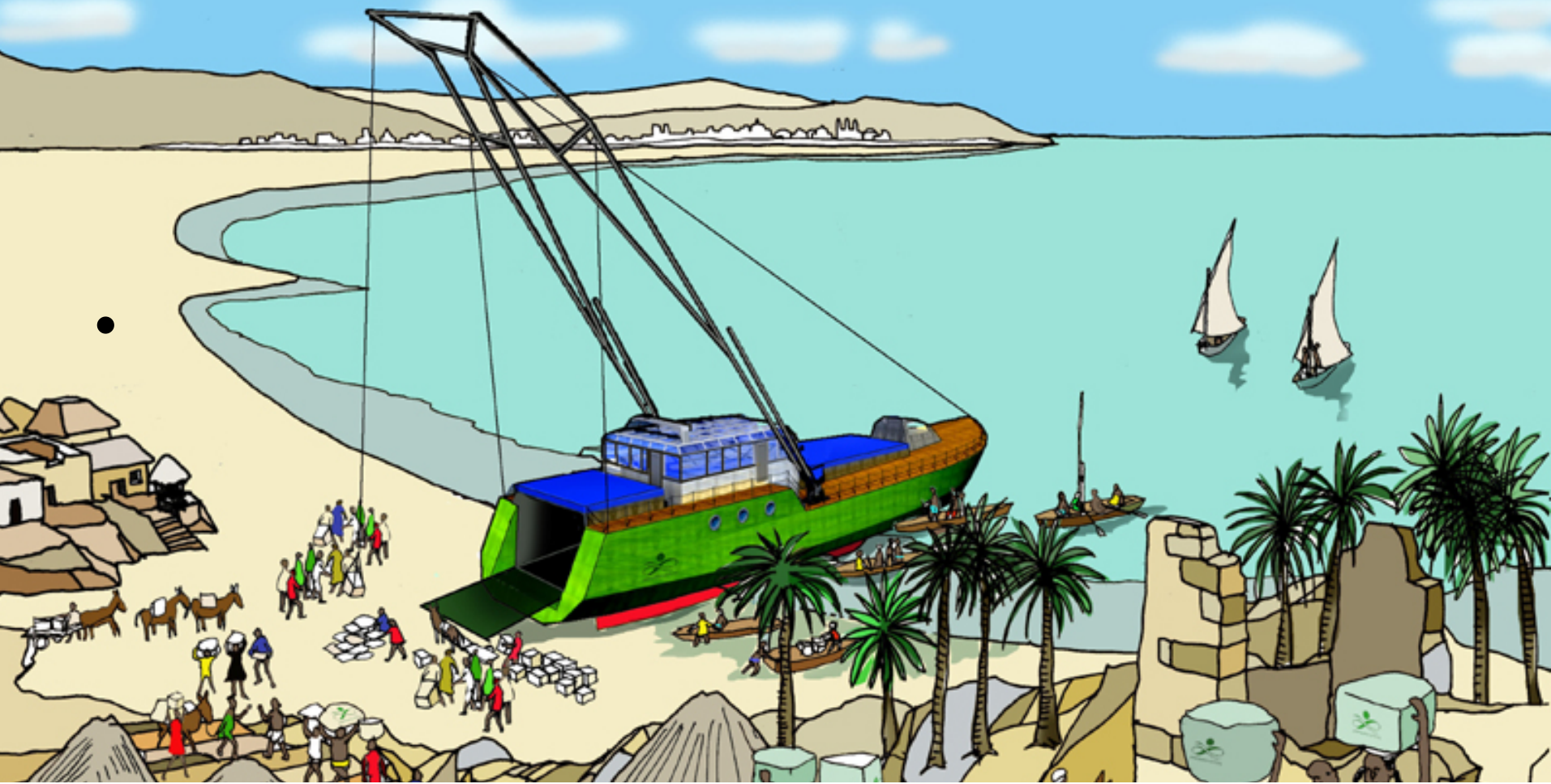
- 125 m² photovoltaic array to lead/acid battery capacity
- 55 mile range under power alone.
- 2x 200kW DC drive motors + bow thruster



The mast/crane reaches over bow and stern for cargo handling.

can be lowered to the deck in cases where low clearance or low wind resistance is necessary (e.g. going upwind and under bridges), or to allow dockside cranes to operate freely.





- Cradle to cradle design criteria = limiting toxic materials in construction.
- Cost for the first vessel (projected approx) US\$ - 600,000
- Due for launch 2014.

Sustainable Sea Transport Talanoa Programme 2014

14th – 18th July 2014

Hosted by



Marine Studies Lecture Theatre, Lower Laucala Campus,
Suva, Fiji Islands

In partnership with:

SUSTAINABLE SEA TRANSPORT IN THE PACIFIC TALANOA 14—18 JULY 2014



Call for Abstracts



Sea transport is the lifeline of Pacific communities. The International Sustainable Sea Transport in the Pacific Talanoa 2014 will bring together artists, traditional seafarers and craftsmen, industry, leading experts in vessel design and development, researchers, government departments, NGOs and agencies to celebrate the Pacific's seafaring heritage and to seek solutions for future sea transport.



Important Deadlines:

- 30th Nov 2013 Submission of abstracts
- 28th Feb 2014 Registration of presenters
- 31st May 2014 Submission of full paper

Sustainable Sea Transport in the Pacific Talanoa Themes:

- Heritage Revival, Pacific Voyaging, Traditional Navigation, Arts (weaving, carving, performance)
- Networks, Collaboration, Relationships
- Sea Transport Technology and Innovation
- Blue/Green Economies, Financing, Policy
- Research, Training, Qualifications, Regulation

Call for Abstracts

Participants are invited to submit abstracts to the Talanoa. For more details on the format and layout of abstracts please contact Alison Newell or Anitelu St John

Contact Alison Newell or Anitelu St John for more information
Email: alison.newell@usp.ac.fj or anitelu.stjohn@usp.ac.fj

Sustainable Sea Transport Talanoa 2012 Programme, Presentations and Outcomes Record are available at: www.usp.ac.fj/index.php?id=12456

We carry the cultural and historical inheritance of ocean navigators of peerless skill and their courageous kin who crossed vast distances before the tribes of Europe had ventured forth from their small part of the earth. Ratu Kamiseva Mara, 1999

Sustainable Sea Transport Talanoa Programme 2014

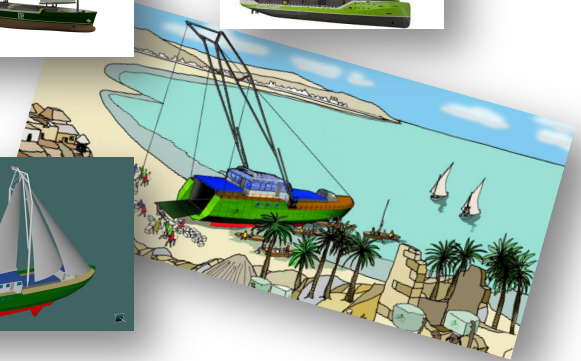
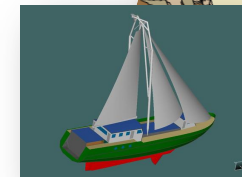
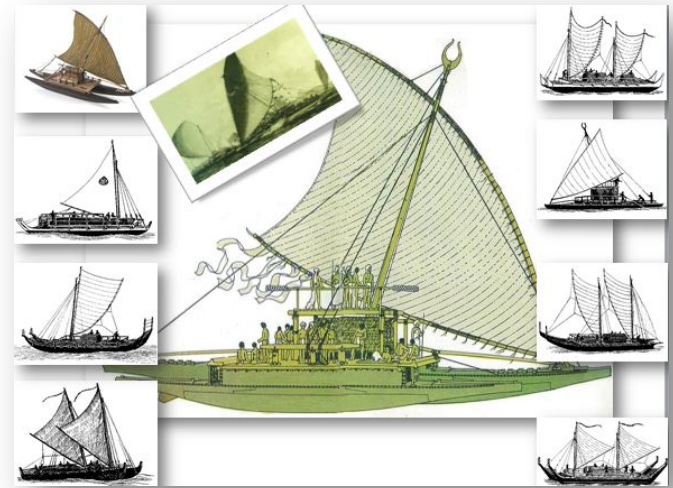
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Suva, Fiji Islands

In partnership with:



L'Hydrotere



Sail Rocket





WHOA! HALF
EMPTY! DEFINITELY
HALF EMPTY!!

JUST LISTEN
TO YOU! ALWAYS
THE PESSIMIST!

VERA
2008