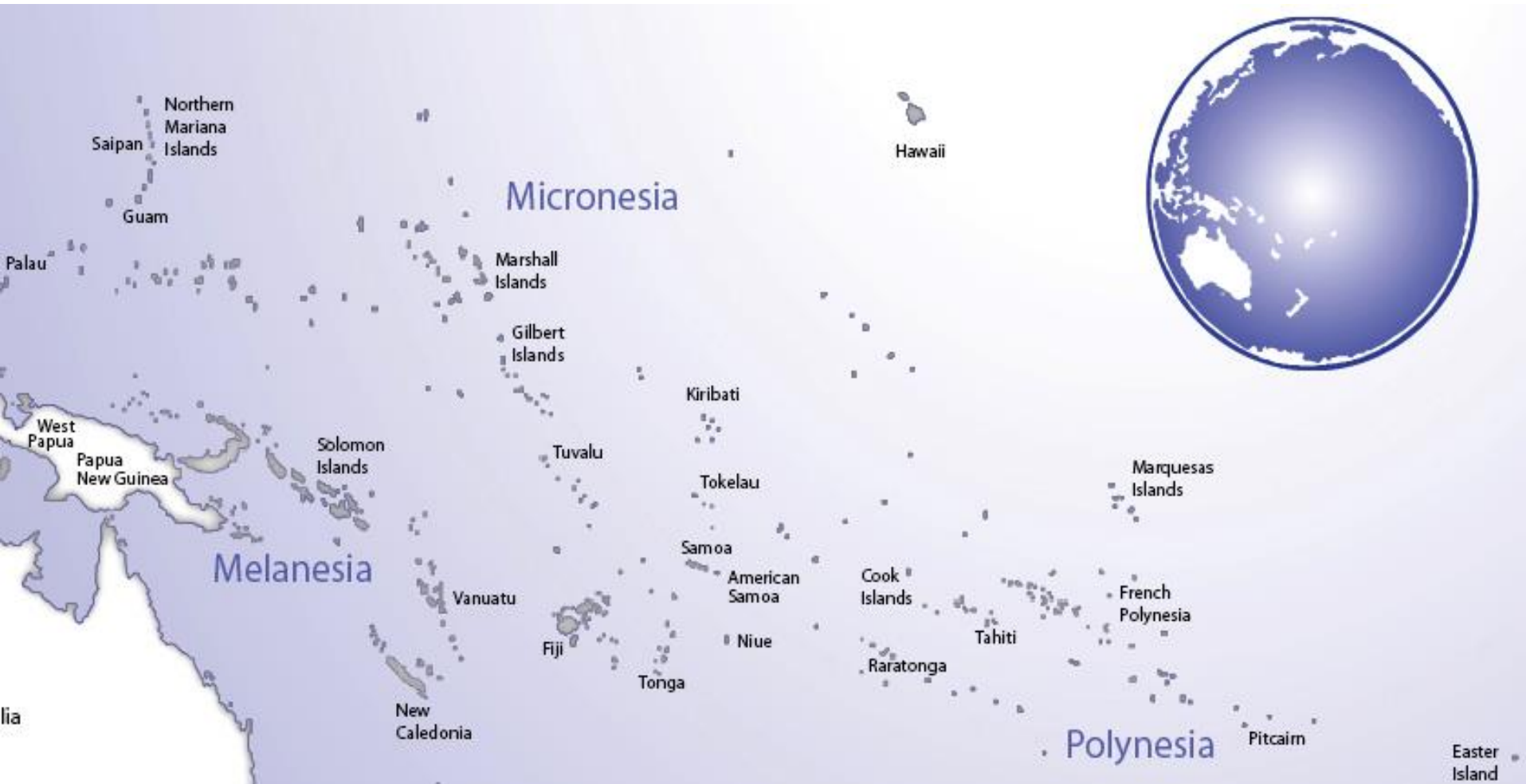


# Turning the Tide: transitioning to low carbon sea transport futures



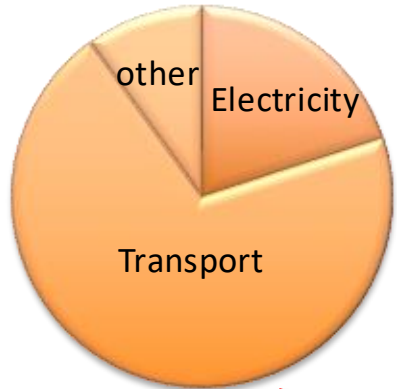
John Kaituu

Sustainable Sea Transport Research Programme

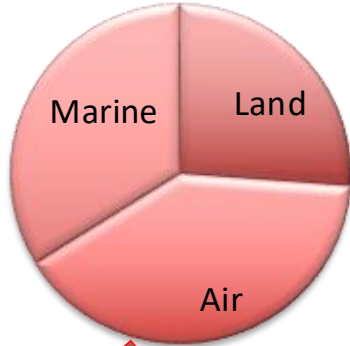




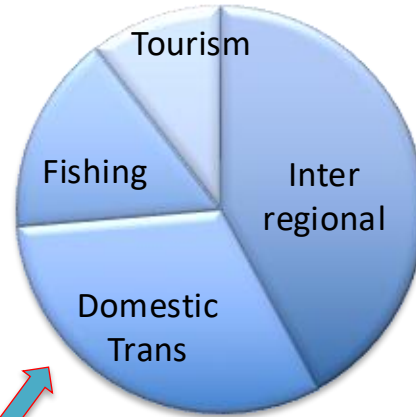
# Imported Regional Fuel by Sector



# Transport Fuel by Sector (Fiji)



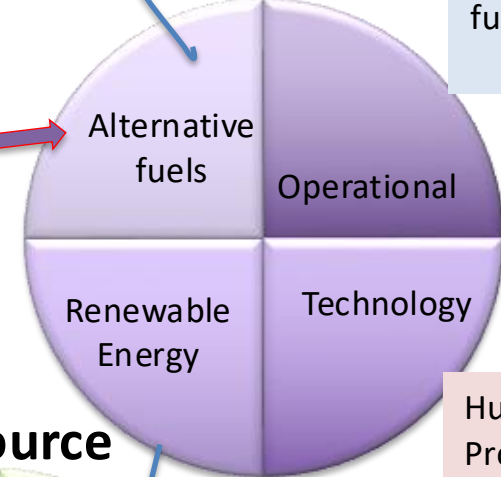
# Marine by sector



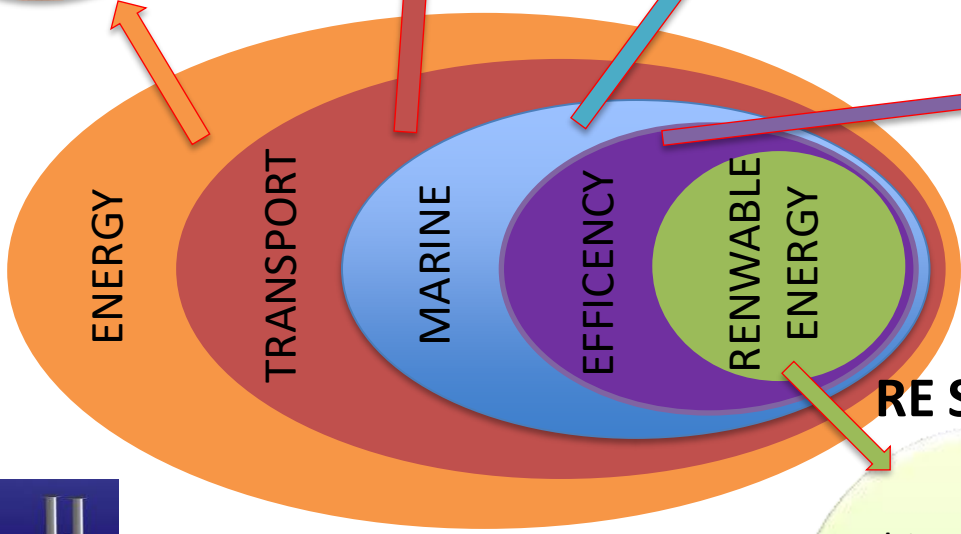
LNG; hydrogen, methane, biofuel, biogas, etc

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

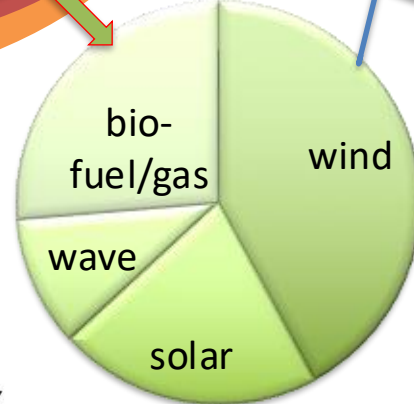
# Efficiency Methods



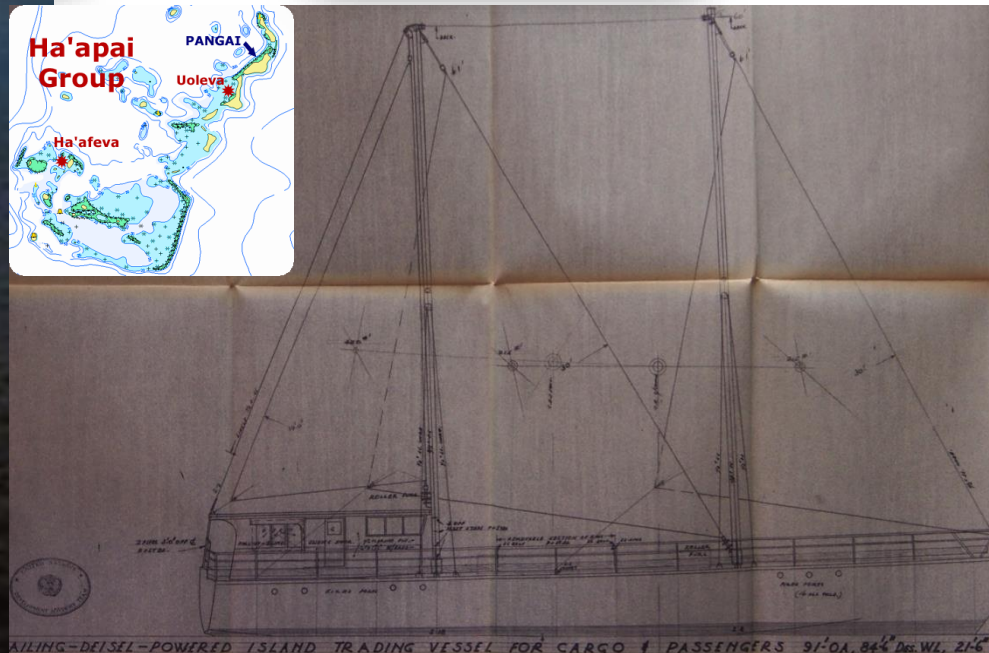
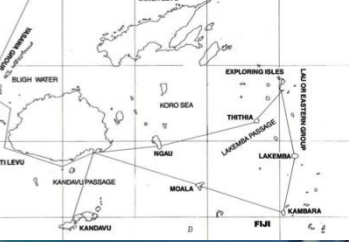
Hull design, Propeller upgrade, Waste heat recovery, etc



# RE Source



# What happened in the last Oil Crisis?

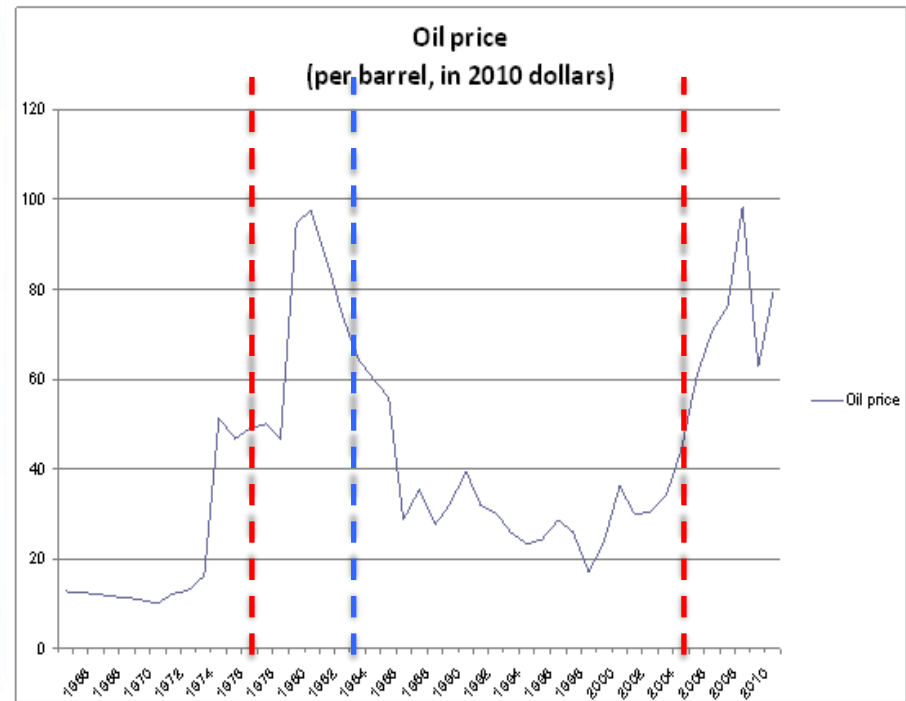


SAILING-DEISEL-POWERED ISLAND TRADING VESSEL FOR CARGO & PASSENGERS 91'0A, 86'4" DEEP WL, 21'



## 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

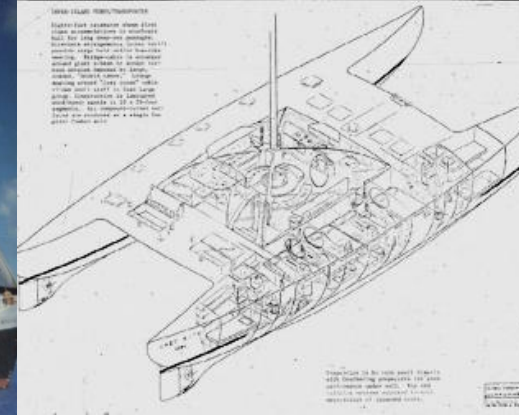
- 30% fuel savings
- Increased passage average speed from 12 - 14 kts
- Reduced crew downtime
- Increased manoeuvrability
- Could hold station in typhoon conditions
- Trialled on 600-31000 tonne vessels



## 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.

# Support PICs transition to low carbon sea transport as a more affordable and appropriate option for remote/island communities in the Pacific

## Research Programme

- train current and future PIC capacity
- macro and micro economic analyses
- quadruple bottom-line reporting framework
- carbon management policy for transport emissions

## Regional Research and Education Strategy

- Long term regional strategy
- Prepare country plans for transition to low carbon
- Provide strong country support - quality research & practical trials

## Oceania Centre for Sustainable Transport

- Portal for knowledge, research, networking, exchange  
[www.oceaniatransportcentre.org](http://www.oceaniatransportcentre.org)
- Multi-partner – IUCN, WWF, PIDF - from village to global

## International Research partnerships:

- with Centres of Excellence – UCL, Tyndall, MARIN, Emden, Columbia
- Post graduate and expert exchange – build long term PIC capacity

# Transitioning to a low carbon sea transport future for Oceania



Regional Research and Education Strategy

**OCEANIA CENTRE FOR SUSTAINABLE TRANSPORT**

# REGIONAL DRIVERS



Majuro Declaration For Climate Leadership



SIDS DOCK

25% by 2033

FATS

Energy Framework



PIDF Outcomes

Green Growth

Sust Sea Trans

# OSST-RRES

Sustainable Sea Transport

Sustainable Sea Transport Talanoa 2012

Partnerships

Applied Research

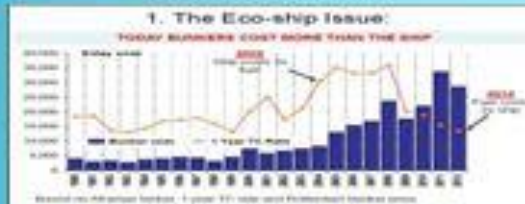
O.C.S.T.

Education & Capacity Building

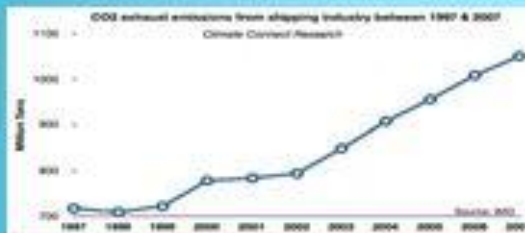
Economic Analysis/Technology Development

# GLOBAL DRIVERS

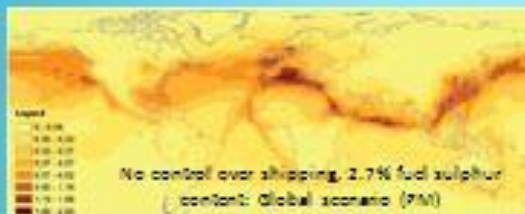
Fuel Costs



Climate Change



Public & Env Health



- CP - MARSHALLS
  - CP - TUVALU
  - CP - VANUATU
  - CP - PNG
  - CP - TONGA
  - CP - SOLOMONS
- Sustainable Sea Transport Country Program - FIJI

- ### OSST-RRES Work Streams
- WS1 - Partnerships
  - WS2 - Capacity Building
  - WS3 - Past Experiments
  - WS4 - Country Programs
  - WS5 - Economic Analysis
  - WS6 - Policy Analysis
  - WS7 - Technology
  - WS8 - M&E

OSST-RRES Country Programme Framework: Fiji

	Policy				Economics				Heritage			Practical Trials				Teaching		Additional Research								
	Strategic		Infrastructure		Fiji route case studies		International route case studies					Sustainable (Vessels)		Practical		Theory										
Relevant Plans	International	Regional	National	Agency	Qualifications	Survey	Licensing	Finance, Tax, Insurance	Sth Lomaiviti	Kadavu	Lau	Rotuma	Central Polynesia	MSG	Micronesia	Traditional Knowledge	Vessel Construction	Voyaging	SVV (Sustainable Village Vessels)	100 ton Cargo/pax	200-300 ton Freighters	Retrofitting Sail/Rotor rigs	Undergraduate Bachelors	Postgraduate (Dip, Masters, PhD)	Seafaring, Construction, Naval Architecture, Engineering, Survey, Heritage	Data collection (sectors), MARPOL Annex I, Carbon Trading (financial mechanisms), letter technology, electric motors, Franchise/Subsidies, emerging technologies
Scoping (current, gap analysis, needs analysis)																			Design, Build, Pilots, Ops, Ownership/Management models	Design, Build, Pilots, Ops, Ownership/Management models	Lease Pilot Trials, Ownership/Management models	Sail and Rotor designs, testing			Economics, Marine Studies, Physics, Technology, Climate Change, Law, Pacific studies, History	
Research/Action/Project Plan																										
Monitoring and Reporting Framework																										

