Refrigerant Consumption in Fishing Vessels operating in the Waters of Pacific Islands Countries

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(Presentation via skype)

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Overview of presentation

1. The fisheries sector contribution to PICs economies
2. Trend in the number of fishing vessels operating in the FFA region
3. Types of refrigeration technology used
4. Regional Estimation of HCFC usage
5. Implication of non-compliance and some concerns
6. Way forward
Contribution of Fisheries to PICs economies
For 2014 WCP-CA total tuna catch was 2.6 million mt (worth USD5.5 bn)

Around 60% of catch from WCP-CA is from FFA waters worth USD 3 bn.

36% or USD1.1 bn is taken by FFA fishing fleet.
4 key target species are skipjack, Yellowfin, Bigeye and Albacore.

Main fishing methods are Purse seine and longline.
Tuna markets and their value

For the same year-2014

- Tuna loin imports by major markets in the US, Japan and EU is valued to more than **USD 156 M**
- Canned tuna trade by FFA member countries is almost exclusively to EU market, valued at **USD 93 M**
- The value of sashimi and non-canned tuna trade with Japan and the US was **USD 81 M**
Access revenue from licensing

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US$ (millions)


Longline  Purse seine bilaterals  UST  FSMA

FFA database 2015
Employment opportunities in tuna fisheries development

Tuna Industry employment by sector

<table>
<thead>
<tr>
<th>Year</th>
<th>Processing</th>
<th>Govt Administration</th>
<th>Local crew</th>
<th>Observers (Nat'l &amp; regional prog)</th>
<th>Offshore (foreign vessels) crew</th>
</tr>
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<tbody>
<tr>
<td>2008</td>
<td></td>
<td></td>
<td>5,000</td>
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<td>2009</td>
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FFA database 2015
Tuna fishing contribution to GDP

Tuna fisheries contribution to GDP (Nominal)

US$ (millions)

LL  PS  PL  Troll  Other


FFA database 2015
How many vessels out there in FFA countries waters
GSR records for 3rd March 2015, listed a total of 1270 vessels
Distribution by flags

n=1270

- Foreign flagged: 77%
- FFA flagged: 23%

FFA database 2015
Types of refrigeration technology in the marine fishing sector
Purse seine vessels

- Purse seine uses brine immersion freezing
- The method is very ideal for quick freezing large quantity of catch
- Temperature of the brine solution is -18°C
- The refrigeration technologies used are R22 and Ammonia.
Long line fishing vessels

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• Short ranged vessels uses RSW at -18°C or ice slurry
• Long range uses a combination of RSW at -18°C and blast freezers -70°C.
• -40°C for storage
• Therefore require an highly efficient refrigerant = R22
Pole and line vessels

- Like purse seine they also uses brine immersion at -18°C
- The type of refrigeration technologies used: R22 and Ammonia
Fish Carriers

- Blast freezers - 70° C to -40° C for storage
- Therefore require an highly efficient refrigerant R22
- Type of refrigeration technology – R22 is dominant
Estimation of how much HCFC is used
Age distribution of vessels operating in FFA waters and type of refrigerant used.
Regional trend in the consumption of HCFC

HCFC-22 holding capacity for various type of fishing vessels chartered and flagged in FFA member countries

- Fish Carrier: 230.00 MT
- Long Line: 234.00 MT
- Pole and Line: 5.00 MT
- Purse seiner: 245.00 MT

Type of vessel: Fish Carrier, Long Line, Pole and Line, Purse seiner
Implication of non-compliance and some concerns
Some concerns on non-compliance

- **GSP+**: THE GENERALIZED System of Preferences Plus (GSP+) EU new trade arrangements that came into force on 1 January 2014 under Regulation (EU) No 978/2012. - Eligibility criteria requires that a country complies to 27 international treaties

- Under the Montreal Protocol: *Trade sanctions can be imposed in such case of non-compliance.*
### 27 treaties required under GSP+

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<tr>
<th>No.</th>
<th>Treaty Description</th>
<th>Treaty Number (No)</th>
<th>Treaty Name</th>
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<td>5.</td>
<td>Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment</td>
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<td>14. Freedom of Association and Protection of the Right to Organise Convention (No 87)</td>
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<td>8.</td>
<td>Minimum Age for Admission to Employment</td>
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<td>17. Montreal Protocol on Substances that depletes the Ozone Layer</td>
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<td>21. Convention on Biological Diversity</td>
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<td>22. Cartagena Protocol on Biosafety</td>
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<td>23. Kyoto Protocol to the UN Framework Convention on Climate Change</td>
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<td>24. UN Single Convention on Narcotic Drugs (1961)</td>
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<td>25. UN Convention on Psychotropic Substances (1971)</td>
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<td>26. UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988)</td>
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<td>27. Mexico UN Convention Against Corruption</td>
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Case example: Cost of retrofitting

- R404A has proves to be very costly e.g. In Fiji, it cost one fishing company around **US$60,000** to retrofit one long line fishing vessel

- Reduction in cooling efficiency, e.g. a drop by 15% of cooling efficiency as compared to R22
  - Quick freezing is very critical to maintain good quality
  - Therefore quick freezing units will always require highly efficient cooling refrigerants

- R404A has zero ODP but very high GWP of 3920

- Not the best option as alternative to R22
The tuna fisheries for the PIC region supports a billion (global) dollar industry.

For many of the PIC, this is the main economic resource they have.

The sustainability and successes of maintaining and developing this industry to maximise benefits – depends entirely on refrigeration technology – **no refrigeration no fisheries**

The sustainability of the marine-ecosystem depends entirely on a healthy ozone layer.

All PIC are Parties to the Montreal Protocol.
Balancing act - contd

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- There is a need to do more in-depth study of the full fisheries cold chain management and on all refrigeration technologies – there is no one size fits all
- In the immediate need, HCFC usage (supply, use, demand) by the marine fishing sector at the national, regional and international level has to be mapped and addressed
- Look at the transitional cost implications, both economic and social.
- There is a need to develop a holistic and comprehensive approach for the PIC guided by the sustainable development goals for this region: Economic: Social and Environmental---
- It can truly be said, that for this complex global industry: No refrigeration no fishery
Concluding Remarks

We owe it to our future generations to have solace in the fact that the marine ecosystem they will inherit are healthy. A healthy ozone layer will guarantee them that solace.