



MARITIME TECHNOLOGY COOPERATION CENTRE IN THE PACIFIC (MTCC-PACIFIC)

CAPACITY BUILDING FOR CLIMATE MITIGATION IN THE MARITIME SHIPPING INDUSTRY
THE GLOBAL MTCC NETWORK (GMN) PROJECT

REGIONAL WORKSHOP ON ENERGY MANAGEMENT IN PORTS
Auckland, New Zealand
31 July – 2 August, 2017



HOST INSTITUTIONS
OF MTCC-PACIFIC



The Global MTCC Network (GMN) project is funded by the European Union and implemented by the IMO. This publication was produced with the financial assistance of the European Union. The contents of this publication are the sole responsibility of MTCC-Pacific and can in no way be taken to reflect the views of the European Union.

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EXECUTIVE SUMMARY

The Regional Workshop on Energy Management in Ports took place from 31 July to 2 August in Auckland, New Zealand, back-to-back with the Conference of the Pacific Maritime Transport Alliance (PMTA), which is the regional association of Pacific ports. Managers and CEOs from the port authorities and administration in Cook Islands, Fiji, Kiribati, Nauru, Tonga, Solomon Islands and Vanuatu attended the workshop (List of participants in Annex 1). A Request for Quotation (RfQ) in line with SPC Procurement Policy was disseminated to well-known consultants to deliver the workshop. Bruce Rowse was contracted for this consultancy. Bruce is the Founder and Principal Consultant of 8020GREEN PTY LTD which provides training and advisory services to business and organisations operating in the area of sustainable energy (such as energy efficiency, solar energy), with a focus on Asia, Australia and the Pacific.

The objective of the workshop was to provide participants with methods and tools to improve energy management in ports using the experience from the energy audit conducted by SPC in Fiji in July 2016 (Agenda is attached in Annex 2). The output of this workshop is the agreement with participants on the way forward in the scope of the MTCC-Pacific pilot-project. During the workshop, the participants were able to use data collection tools, adapt model of energy management policy and plan for port and discuss the job description for an energy manager. To complement this, the Head of MTCC-Caribbean, Captain Sukhjit Singh, presented on Green Port initiatives and incentives.

The topics deliberated upon in this workshop are listed below:

- Various aspects of energy management; its drivers and barriers.
- Energy uses in ports in terms of electricity or fuel consumption; the entities responsible for energy used; electricity saving opportunities; and fuel saving opportunities;
- Determination of operational control and energy boundary; establishing energy baselines; sourcing energy consumption data; units of energy use; greenhouse gas emissions determination; and energy costs determination (based on tariffs);
- Webinar was held with the Head of MTCC-Caribbean with whom various approaches were presented and discussed to reducing ship energy consumption and incentives for energy efficiency in Port;
- The need for an energy management policy; components of an energy management policy (including other policies that should consider energy); and the role of the energy manager;
- Definition of energy performance for port representatives; sourcing and collecting data to enable determination of Energy Performance; considerations when setting a performance target; and determining how frequently energy performance can be determined;
- Contents of an energy management plan; energy efficiency opportunities to consider; ways of identifying energy saving opportunities; calculating cost benefit; continual improvements of the plan; and operational procedures as tabulated below;
- The various tools for energy management. The tools outlined were consultation tool which can be used to overcome non-technical barriers; spreadsheet tools which can be used for energy consumption tracking, cost-benefit calculation and quantitative risk assessment; measurement tools for measuring electrical power, fuel flow and illumination; and check list tool to keep track of all tools and such.
- The importance of proper communication and promotion of energy management, which could enable access to resources, increased public awareness, establish a professional reputation and allows for engagement with staff.

The detailed presentations are attached in Annex 3 in consecutive order as outlined in the Agenda.

The workshop was a good follow-up of the Regional Workshop on Energy Efficiency in Maritime Transport organised by SPC in Vanuatu in December 2016 during which were presented opportunities to reduce GHG emissions from port operations. The MTCC-Pacific Regional Workshop on Energy Management was welcomed by the participants as it provided clear understanding on what could be done to effectively reduce energy consumption and GHG from port operations. It was also the opportunity to acknowledge

several initiatives in Pacific port to reduce energy consumption and to propose specific tools for a more consistent approach.

The overall objective of the concept of Green Pacific Port is to support the sustainable economic development of Pacific Island countries and territories (PICTs) by improving the efficiency and sustainability of maritime ports as an essential element of transportation system; specific objectives are to improve the efficiency of port operations; ensure energy efficiency and carbon footprint reduction; and prevent marine pollution and manage waste.

INTRODUCTION

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A media release was sent out noting that several ports were already committed with the support of MTCC-Pacific to implement energy management systems and reduce greenhouse gas emissions from their operations. The support was further demonstrated by the high-level representation from Pacific ports and administrations at the workshop. Several tweets/retweets and posts/re-posts were sent out as well on social media. Supporting workshop images are attached in Annex 5 and Annex 6 are examples of communication and visibility activities that took place during this workshop.

1 PRESENTATION OF THE WORKSHOP AGENDA *(Bruce Rowse, MTCC-Pacific Consultant, SPC)*

The Consultant provided a more detailed presentation on the workshop agenda and objectives related to the Port Energy Management Policy and Port Energy Management Plan.

The consultant then provided a brief outline of the agenda for the two and a half day workshop before facilitating and introductory session where participants were requested to introduce themselves and their approach to energy management in port if any.

2 GREEN PACIFIC PORT CONCEPT *(Sitalingi Payne, Maritime Port Security Adviser, SPC)*

The overall objective of the concept of Green Pacific Port is to support the sustainable economic development of Pacific Island countries and territories (PICTs) by improving the efficiency and sustainability of maritime ports as an essential element of transportation system; specific objectives are to improve the efficiency of port operations; ensure energy efficiency and carbon footprint reduction; and prevent marine pollution and manage waste.

The purpose of the project is to support PICTs in having a consistent approach in:

- Quality Management for improved efficiency and sustainability of port operations;
- Energy Management for improved energy efficiency, renewable energy uptake and reduced carbon footprint; and
- Environmental Management for addressing climate change and disaster risk issues and waste management and pollution control.

3 INTRODUCTION TO GMN PROJECT AND MTCC-PACIFIC *(Thierry Nervale, Deputy Director, SPC Transport and MTCC-Pacific Head, SPC)*

The Global Maritime Technology Cooperation Centres (MTCCs) Network (GMN) is a project implemented by the International Maritime Organization (IMO) and funded by the European Union with total funding of Euro 10 million for a period of four years (January 2016 to December 2019). The overall objective of the project is to support selected developing countries in limiting and reducing GHG emissions from their shipping sector through technical assistance/capacity-building to promote shipping low carbon and energy efficient technologies and operations.

More specifically, the project has established five MTCCs one in each of the target regions (MTCC-Caribbean – at the University of Trinidad & Tobago; MTCC-Africa – Jomo Kenyatta University of Agriculture & Technology; MTCC-Asia – Shanghai Maritime University; MTCC Pacific – Pacific Community; and MTCC-Latin America – International Maritime University of Panama), which would act as centres of excellence to promote the uptake of low carbon technologies in maritime transport.

The project objectives will be achieved through a number of clearly defined actions and interventions that generally include capacity building, uptake of energy efficient technologies and operations pilot projects, data collection and reporting pilot projects and dissemination activities; all to be carried out within the framework of the newly established MTCCs.

The MTCC-Pacific's vision is to promote Pacific low-carbon maritime transport that supports the sustainable development goals of Pacific Island countries and territories (PICTs) and the transition towards a greener economy in the Pacific.

The MTCC-Pacific will provide capacity-building activities to improve the capacity of PICTs to comply with international instruments and facilitate the implementation of energy efficient measures in the maritime industry. This complements the regional maritime capacity-building activities related to the mandate of both SPC and SPREP namely: maritime safety, security and governance; trade facilitation and port efficiency for SPC; and pollution prevention from ships for SPREP. The delivery of pilot-projects will also assist in the promotion of low-carbon technologies and operations in the maritime sector.

The MTCC-Pacific will form part of international and regional networks of centres of excellence to share information and experiences and promote the uptake of low carbon technologies and operations and energy efficient practices in the maritime industry.

Target countries include Fiji, Samoa, Marshall Islands, Kiribati, Solomon Islands, Tuvalu and Vanuatu.

4 AN OVERVIEW OF ENERGY MANAGEMENT, STANDARDS, PRINCIPLES, THE DRIVERS OF ENERGY MANAGEMENT AND CASE STUDY *(Bruce Rowse, MTCC-Pacific Consultant, SPC)*

This presentation revolved around the definition of energy management; energy management standards; energy management principles; drivers of energy management and barriers to energy management. The participants were also presented with a case study followed by an activity on the identification of the drivers and barriers to good energy management in the representatives' various ports.

DISCUSSION

Definition of energy management and its benefits.

<i>What is energy management?</i>	<i>Benefits of Energy Management</i>
Reducing costs and emissions	Reduced costs/emissions GHG
Improving energy productivity	Improved cash flow
Coordination to achieve the above	Improved productivity
Optimising energy sources	Improved safety
Understanding how much energy is used and where its used	

Drivers and barriers to Energy Management in Ports

<i>Drivers</i>	<i>Barriers</i>
Cost of energy (capacity development)	Cost of implementation
National initiatives e.g. green growth emission targets	Budget constraints
Environment	Pay-back period
Competitive advantage	Lack of government support (funding and procurement challenges)
Keeping cost of EE down	Political interference
International requirements (ISL standards) and compliance	Port profitability
Reputation	Lack of expertise
Policies and procedures in place	Lack of legislations
Safety	Lack of policies to support energy efficiency
Policies and procedures	Resistance to change
CSR compliance	

Whilst energy management is a great initiative, implementation can be a challenge.

Systematic/Process Based Energy Management: Linfox Case Study

What were the lessons learned from this case study?

- The program was well communicated.
- There was commitment at all levels of work which was critical for the project to work.
- All stakeholders in the supply chain benefited.
- Ten percent was saved by planning the route of the truck.
- A good understanding of, analysing the key consumption areas, and focusing on fuel consumption and electricity.
- Reduction of speed also saved energy.

Identify whether or not improved Energy Management would be good for your port/port authority, and why and why not?

Barriers	Ways to overcome these barriers
Cost of implementation	Spread the costs out over several years
Budget constraints	Energy performance contract where the guarantee supplies the savings and
Pay-back period	Grant funding available
Lack of government support (funding and procurement challenges)	Getting a strong policy in place.
Political interference	Getting government support
Port profitability	Communicating: make it hard not to support
Lack of expertise	Having long-term approach
Lack of legislations	
Lack of policies to support energy efficiency	
Resistance to change	

5 ENERGY SAVING OPPORTUNITIES IN PORTS (Bruce Rowse, MTCC-Pacific Consultant, SPC)

This presentation revolved around the understanding of where energy is used in ports in terms of electricity or fuel consumption; the entities responsible for energy used; electricity saving opportunities; and fuel saving opportunities. The participants were then tasked to conduct a rough inventory of energy consumptions within their various ports. They were to list down everything (plant, equipment, fixtures, etc.) that uses electricity; fuel or any other energy sources within their respective ports. Information was to be entered into the *WhereEnergyIsUsed.xlsx* template as sampled in Annex 4.

The facilitator then provided an example of an electrical energy breakdown and an energy audit of the Suva Port; and the evaluated results containing a breakdown of how much energy is consumed within a duration of time. An energy breakdown of diesel by entity was also provided.

Energy Saving Opportunities in Ports – Electricity

- Lighting upgrades to LED (yard lighting, all internal lighting)
- Lighting control measures
- Power factor correction, particularly on the supply to reefers (\$ savings)
- Installation of solar PV on rooftops
- Measures to reduce air conditioner and ventilation energy
- Measures to reduce pumping and conveyor energy use (bulk handling)

Energy Savings Opportunities in Ports – Fuel

- Upgrades to more efficient equipment
- Handling process design (reducing travel distances/lifts)
- Terminal/vehicle operating system
- Tyre pressure, vehicle maintenance
- Driver training (eg reducing idling)
- Shore to Ship power (reduces fuel usage, increases electricity)
- Slow steaming

Discussion

Port representatives then shared energy saver mechanisms currently applied within their respective ports. Most country ports indicated the transition to or implementation of LED lighting systems. Rearrangements of containers and mobile equipment to improve efficiency. Implementing a lot of minor changes such as shutting down of equipment and facilities when not in use, resulting in significant savings.

This session then ended with an activity where port representatives were asked make a list of common equipment types/measures that apply to ALL Pacific ports (incl. type/wattage of yard lighting, lifting equipment); quantity and so forth. This information was to be again fed into the excel sheet file name *WhereEnergyIsUsed*. Sample attached as Annex 4.

6 ENERGY USE AND ENERGY BASELINE (Bruce Rowse, MTCC-Pacific Consultant, SPC)

This presentation focused on the determination of operational control and energy boundary; establishing energy baselines; sourcing energy consumption data; units of energy use; greenhouse gas emissions determination; and energy costs determination (based on tariffs).

The facilitator then led the port representatives through an activity of determining the energy usage boundary controlled by each entity in their various ports. The participants then also listed the equipment each of these entities have operational control over and input all these data into the *WhereEnergyIsUsed.xlsx* template.

The group also conducted exercises and calculations on energy concept and units; green-house gas emissions; and consequently determining costs (based on tariffs). The facilitator also discussed the systems needed to collect data; capturing energy consumption data; and determining the total energy use over a period.

There were three possible approaches to achieving the above and they are tabulated in the following table.

Approach	Plus	Minus
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Don't Adjust	Low cost, simple Adequate for annual tracking of energy performance.	Can be hard to monitor energy intensity (eg kWh/TEU) accurately over short periods. May not be able to easily do a month to month comparison. Hard to assess if operational improvements are delivering results.
Approximate	More accurate than ignoring, can roughly calculate monthly energy intensity (eg kWh/TEU) Can generally compare month to month. Can see the benefit of operational changes in 1 to 2 months.	More complex spreadsheet, more work to generate reports, and possibly more chance of errors.
Measure	Most accurate, and enables determination of site energy intensity on a daily basis. Can be used to "drill down" and look at energy intensity/energy productivity of individual machines. Provides fast feedback on initiatives to save energy through operational control (eg operator training), can compare day to day. Can more easily take into account external factors that may impact on energy use (eg the weather impacting on reefer energy consumption).	Requires cap ex in metering equipment Requires a data collection system. Large amounts of data and the most complex data management system.

The session then ended with the participants feeding the information gathered from the activities into their respective port Energy Management plans, taking into consideration the following pointers:

- Determination of how energy used will be tracked (don't adjust/approximate/measure).
- Setting up of a spreadsheet to enable the tracking of energy consumption: open *energytracker.xlsx*
- Determination of annual total fuel and electricity usage in terms of consumption; cost; and emissions.
- Working within the boundary of respective port's energy management.

7 WEBINAR (Capt Sukhjit Singh, Deputy Director & Technical Head, MTCC-Caribbean)

A webinar was held with the Head of MTCC-Caribbean with whom various approaches were presented and discussed to reducing ship energy consumption and incentives for energy efficiency in Port. The presentation elaborated on specific tools available to support Green Port initiatives but also how those initiatives are incentives to Green Shipping. Various Green Shipping Award mechanisms were highlighted that would merit consideration for ports. In addition, details were provided on what is required from ships in term of energy efficiency international standards that can be checked by port authorities through Port State Control.

Discussion

Eventually the discussion focussed of examples of small ports having embraced such initiatives were known to see whether it could be replicated in Pacific Ports. It appears that Green Port approach is still initiatives in large ports in the world with a lot of maritime traffic and competition for calls that facilitate the implementation of incentives and control by ports. However the participants acknowledged that such an

approach could be champion in the Pacific focussing on specific aspects of energy efficiency in maritime transport.

8 ENERGY MANAGEMENT POLICY AND THE RESPONSIBILITY OF THE ENERGY MANAGER *(Bruce Rowse, MTCC-Pacific Consultant, SPC)*

This session focused on why the need for an energy management policy; components of an energy management policy (including other policies that should consider energy); and the role of the energy manager. The results of the discussions are tabulated below.

Why have an EM	What is a good EM policy	Other policies impacted by EM policy	Energy manager role
EM may be a guide on how to achieve goals.	Policy tailor-made to fit the circumference of its organisation.	Finance	Responsible for the overall energy performance of the organisation
Set of principles to abide by	May include longer term targets	Procurement	Responsible for implementing the energy management plan
Frameworks will encourage commitment to achieving energy efficiency goals.	Addresses purchasing policy	HR	
Precision protocol	This is the driver for implementing a systematic approach to reducing energy use.	Asset management	
	The dissemination and distribution of this policy is used as a driver to manage organizational behaviour.	Environment	
	It is documented and communicated at all levels within the organization.	OHS	

The facilitator displayed and discussed a draft port energy management policy document with the group as an example. The session ended with an activity where participants were to identify an energy manager for their respective organisation (existing employee or new); capacity building requirements for this EM manager; whether part time or full time; resourcing requirements (salary, tools); and identify activities to be managed by the EM manager and that which needs outsourcing.

9 SETTING OF ENERGY PERFORMANCE TARGETS (Bruce Rowse, MTCC-Pacific Consultant, SPC)

The session encompassed participants defining energy performance for their respective ports; sourcing and collecting data to enable determination of Energy Performance; considerations when setting a performance target; and determining how frequently energy performance can be determined.

Discussions on these are tabulated below.

Defining energy performance	Sourcing and collection of data	Considerations to setting a performance target	How frequently energy performance can be determined
Depends on the type of port: <ul style="list-style-type: none"> • Container – per TEU • Passenger – per passenger • Bulk goods – per tonne • Mixed use. Multiple measures? Or just select one? Can usage be isolated? 	Should be relatively easy to collect/already by collected	The extent of opportunity to reduce	Yearly? Monthly? Daily?
May depend on the extent of operational control/influence	Should be reliable	Available resources (skills, finance) now	Depends on data
How many energy performance parameters will you measure?	Ideally should enable comparison and benchmarking	Ability to attract more resources for EM in the future	In general the longer the interval for measuring energy performance, the longer it will take to validate operational improvements
	What is already being collected and can be used?	How long it takes to get things to happen	
		Constraints (eg lease agreements)	
		Technical capacity	

The group were then tasked with activities where participants were to work individually according to how this can be applied to their respective ports.

Activity 1

- Decide on what you think are reasonable energy performance indicator(s) for your port or port authority.
- Is the data already available, or do you need to put in place a process to collect the data needed.
- Add this data to your energy tracking spreadsheet so you can track energy performance and performance improvements.

Activity 2

- Decide how frequently you will determine your energy performance
- Set a preliminary energy performance target for your port / port authority.

10 ENERGY MANAGEMENT PLANS (*Bruce Rowse, MTCC-Pacific Consultant, SPC*)

This session focused on the contents of an energy management plan; energy efficiency opportunities to consider; ways of identifying energy saving opportunities; calculating cost benefit; continual improvements of the plan; and operational procedures as tabulated below. The participants were then provided with a draft energy plan and tasked to tailor this to suit their respective ports.

Energy efficiency opportunities to consider	Ways of identifying energy saving opportunities	Calculating cost benefit	Continual improvements of the plan	Operational procedures
Eliminate the need for the service	Consult internally. ✓ Focus on those who control large energy uses. ✓ Look for ongoing suggestions to improve energy use.	Determine annual savings ✓ Energy savings ✓ Maintenance savings ✓ Savings from reduced downtime ✓ Etc.	Update the Energy Management Plan annually	The execution of routine procedures can have a large impact on energy use. ✓ Slow steaming and good maintenance ✓ Quay-side planning ✓ Daily routine checks ✓ Driving procedures.
Reduce the need for the service	Undertake an energy audit. ✓ A key skill of auditors is being able to quantify the likely saving from energy improvements.	Determine costs ✓ Design and specification costs ✓ Capital cost of measure ✓ Project management costs ✓ Shutdown costs ✓ Etc.	Monitor energy performance at the smallest practical interval	
Improve system efficiency		Simple payback = costs/savings	Have a “Monitoring and Targeting” approach where operational behaviour and operational settings have a large impact on energy use	
Eliminate or reduce storage/transmission losses			Always be looking for ways to improve, and always be seeking ideas	
			Technology continues to improve, follow technological developments	
			Use scheduled plant and equipment upgrades to make step improvements in energy performance (30% rule)	

11 TOOLS FOR ENERGY MANAGEMENT (*Bruce Rowse, MTCC-Pacific Consultant, SPC*)

This session focused on the various tools for energy management. The tools outlined were consultation tool which can be used to overcome non-technical barriers; spreadsheet tools which can be used for energy consumption tracking, cost-benefit calculation and quantitative risk assessment; measurement tools for measuring electrical power, fuel flow and illumination; and check list tool to keep track of all tools and such.

Discussion

The participants in this sessions discussed on the various tools needed within their respective ports. Some tools needed were monitoring the combustion in the engine and testing for pollution control; application for illumination metre on phones and determination of lighting.

12 COMMUNICATING AND PROMOTING YOUR EMP; WORKSHOP WRAP UP – NEXT STEPS (*Bruce Rowse, MTCC-Pacific Consultant, SPC*)

In this session, participants discussed the importance of proper communication and promotion of energy management, which could enable access to resources, increased public awareness, establish a professional reputation and allows for engagement with staff. The group further deliberated that such things as justifications for an energy management plan, target energy savings and achievements is to be communicated and communication must be conducted to all relevant stakeholders and levels such as staff, government, shipping agents, consignees, customs/quarantine, electricity authority, oil company and suppliers.

Activity

The group was then divided into two-port region representatives per group upon which each group will present their energy management plans to each other.

13 GROUP DISCUSSION AND SHARING (*Thierry Nervale, MTCC-Pacific Head, SPC*)

MTCC-Pacific will hold activities with ports around the region, particularly the targeted countries in terms of energy management. The targeted countries are Fiji (host country), Samoa, Marshall Islands, Kiribati, Solomon Islands, Tuvalu and Vanuatu. Some regions in the Pacific have commenced with energy management. MTCC-Pacific will be conducting level 1 and 2 energy audits within targeted countries, and will be making recommendations in terms of energy savings opportunity and baseline data and targets. Solomon Islands and Samoa are in the pipeline for energy audits in the coming weeks. Countries do not necessarily need to have energy management plans and policies in place to qualify for energy audits as level 1 audits are similar to surveys seeking to understand energy consumption and identify energy-saving opportunities. However, energy audits are only tools for starting energy management initiative while what MTCC-Pacific is promoting is effective energy management in port that will require the adoption of energy policy and energy management plan as well as the appointment of an energy manager.

Non-targeted countries requesting technical assistance for energy management will require some financial contribution towards the hiring of the consultant and logistics expenses.

Fiji is a pilot-country for energy management and MTCC-Pacific can share information gathered from Fiji port's progress to other regional countries.

Kiribati Port Authority (KPA) has some initiatives currently implemented. Lights in yard and workshop now switched to solar. First workshop intent on preparation of energy policy, development of an energy

management action plan and appointment of suitable personnel to overlook the project. Tarawa has a 2-million project funded by the KI port that will be incorporated in the project procurement to reduce carbon emission and consequently reduce electricity costs. Similar work will be implemented on Kiritimati Island that has adopted a strategic plan for to develop a port and solar panels and windmills. Kiribati welcomes data templates supplied by MTCC-Pacific.

Nauru is in need of funds at this point to engage in energy management in port. Nauru Port development will cost USD 70 million and ADB is currently seeking partnerships for this developmental work that could include energy management.

Solomon Islands Port Authority (SIPA)'s first intent is on the development of an energy policy and appointment of a suitably qualified energy manager in SIPA. SIPA has a strong focus on reducing energy consumption and costs. Energy audit planned is in the pipeline for Honiara and Noro ports with development to commence first with Noro port. Installation of LED lights will come to completion in a few months' time. SIPA is also considering installation of solar panels as secondary source of alternate power to fuel. SIPA plan to take a more detailed energy audit in Level 2 after initial implementation of the action plans. SIPA will also be monitoring progress, savings and further improvements to saving energy. The SIPA is also prospecting primary renewable energy sources. SIPA welcomes data templates from MTCC-Pacific to collect information.

Port Authority Tonga (PAT) is receptive of the energy management notion and has begun initiating the process. PAT's main objective is to document energy management into plans and policies. PAT potentially has data but the main challenge lies in a contact person to manage this. PAT surely requests for an energy audit in the near future and is willing to work in partnership with MTCC-Pacific in terms of energy management.

On behalf of MTCC-Pacific and SPC Thierry Nervale thanked the participants for their contribution in the workshop and confirmed that MTCC-Pacific is fully committed to assist in the area of Port Energy Management. MTCC-Pacific will follow up on this approach in the coming months.

14 CLOSING REMARKS *(Bruce Rowse, MTCC-Pacific Consultant, SPC)*

MTCC-Pacific's consultant and workshop facilitator, Bruce Rowse thanked all participants for a productive interactive workshop and wished all regional port authorities the very best in their energy savings endeavour.

ANNEXES

ANNEX 1: Signed List of Participants

WBS	Partner Type	Partner number	Name	Job Title	Organisation	Gender	Line 1 address	Line 2 Address	Building number	Post code	City	Country where based	Telephone	Mobile Number	Email Address	Source of Funding	Role	Nationality	Signatures
1	PARVW	PARNR	Eranda Kotelawala	Chief Executive Officer	Solomon Islands Ports Authority	M	Hibiscus Apartments	Honiara		PO BOX 307	Honiara	Solomon Islands	677 7496711		ekotelawala@sipa.com.sb	self funded	participant	Other	*
2	PARVW	PARNR	Glyn Joshua	Commercial Manager	Solomon Islands Ports Authority	M		Honiara		PO BOX 307	Honiara	Solomon Islands	677 22646		g Joshua@sipa.com.sb	self funded	participant	Solomon Islands	
3	PARVW	PARNR	Douglas Alex	Port of Noro Manager	Solomon Islands Ports Authority	M	Noro Port	Munda			Munda	Solomon Islands	677 22646		dalex@sipa.com.sb	self funded	participant	Solomon Islands	
4	PARVW	PARNR	John Hugo Bugoro	Manager Operations	Solomon Islands Ports Authority	M		Honiara		PO BOX 307	Honiara	Solomon Islands	677 22646		g Joshua@sipa.com.sb	self funded	participant	Solomon Islands	
5	PARVW	PARNR	Ruatu Titaake	Chief Executive Officer	Kiribati Ports Authority	M	Betio	Tarawa			Tarawa	Kiribati			ruatit@gmail.com	self funded	participant	Kiribati	
6	PARVW	PARNR	Vajira Piyasena	Chief Executive Officer	Fiji Ports Corporation Ltd	M	21 Marion Road	Suva		GPO BOX 780	Suva	Fiji	679 9907102		vajira@fijiports.com.fj	self funded	participant	Other	*
7	PARVW	PARNR	Maniana Tantaake Tos Nekayama	Human Resources Director Manager	Kiribati Ports Authority Department of Transportation & Public works, Chuuk	F	Betio	Tarawa		PO BOX 1372	Chuuk	Kiribati Federated States of Micronesia			haabuaka@gmail.com renomu1965@gmail.com	self funded	participant	Kiribati Federated States of Micronesia	*
8	PARVW	PARNR	Nooroa Tou	General Manager	Cook Islands Ports Authority	M	Rarotonga			PO BOX 2027	Rarotonga	Cook Islands	682 52681		nooroa.tou@cookislands.gov.c	self funded	participant	Cook Islands	
9	PARVW	PARNR	Andre Watson Raymond Tuiravakai	Assets and Operations Manager	Cook Islands Ports Authority	M	Rarotonga	Avarua		PO BOX 915	Rarotonga	Cook Islands	683 21921		andre.tuiravakai@cookislands.	self funded	participant	Cook Islands	*
10	PARVW	PARNR	Kemp Detenamo	Maritime/Port Operations Mana	Ministry of Transport	M	Nauru				Nauru	Nauru	674 5573089		kemp.detenamo@gmail.com	self funded	participant	Nauru	*
11	PARVW	PARNR	Issac Aremwa	Chairman of Board - Nauru Ports	Ministry of Transport	M	Nauru				Nauru	Nauru	674 5573089		kemp.detenamo@gmail.com	self funded	participant	Nauru	
12	PARVW	PARNR	Mosese Lavemai	Chief Executive Officer	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa		PO BOX 144	Nuku'alofa	Tonga	679 9907102		mlavemai@portsauthoritytong	self funded	participant	Tonga	
13	PARVW	PARNR	Hon. Poasi Tei	Hon. Minister for Public Enterpr	Ministry of Public Enterprise	M	Nuku'alofa	Nuku'alofa		PO BOX 144	Nuku'alofa	Tonga	679 9907102		mlavemai@portsauthoritytong	self funded	participant	Tonga	attending last day.
14	PARVW	PARNR	Etikeni Samani	Manager Risk & Compliance	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa		PO BOX 144	Nuku'alofa	Tonga	676 23168		etikeni.samani@portsauthority	self funded	participant	Tonga	
15	PARVW	PARNR	Hakaumotu Fakapelea	Port Master	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa		PO BOX 144	Nuku'alofa	Tonga	676 23168		ikaufusi@portsauthoritytonga.	self funded	participant	Tonga	*
16	PARVW	PARNR	Iketau Kaufusi	Manager Insfrastrutere & Techn	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa		PO BOX 144	Nuku'alofa	Tonga	677 23168		ikaufusi@portsauthoritytonga.	self funded	participant	Tonga	
17	PARVW	PARNR	Viliami Takau	Director Ports Authority	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa		PO BOX 144	Nuku'alofa	Tonga	678 23168		mlavemai@portsauthoritytong	self funded	participant	Tonga	
18	PARVW	PARNR	Stephen Edwards	Tonga board member	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa		PO BOX 145	Nuku'alofa	Tonga	679 23168		mlavemai@portsauthoritytong	self funded	participant	Tonga	*
19	PARVW	PARNR	Touifa	Tonga board member	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa		PO BOX 146	Nuku'alofa	Tonga	680 23168		mlavemai@portsauthoritytong	self funded	participant	Tonga	

20	PARVW	PARNR		Tonga board member	Ports Authority of Tonga	M	Nuku'alofa	Nuku'alofa	PO BOX 147	Nuku'alofa	Tonga	681 23168		mlavemai@portsauthoritytong	self funded	participant	Tonga	
21	PARVW	PARNR	Henry Worek	Director	Ports & Marine	M	Port Vila	Port Vila	Private Mail Bag 9046	Port Vila	Vanuatu	678 7743972		hworek@vanuatu.gov.vu	self funded	participant	Vanuatu	<i>Henry Worek</i>
22	PARVW	PARNR	Russell Mitchel	GM-IPDS Vanuatu	Vanuatu	M	Port Vila	Port Vila		Port Vila	Vanuatu			GM@ifira.com.vu	self funded	participant	Vanuatu	
23	PARVW	PARNR	Philip Ryan	Chief Executive Officer - NISCOL	Vanuatu	M	Port Vila	Port Vila		Port Vila	Vanuatu			ceo@niscol.com.vu	self funded	participant	Vanuatu	
24	PARVW	PARNR	Bruce Rowse	Consultant - Workshop Trainer	Consultant	M	Melbourne	Melbourne		Melbourne	Australia	61 438 878 311		bruce@8020green.co	SPC	Trainer		
25	PARVW	PARNR	Thierry Nervale	Deputy Director Transport	The Pacific Community	M	3 Luke Street, Nabua	Suva	2nd Floor, Lotus Building	Private Mail Bag	Suva	Fiji	679 3379276		thierry@spc.int	SPC	Resource	
26	PARVW	PARNR	Sitalingi Payne	Maritime Port Security Adviser	The Pacific Community	M	3 Luke Street, Nabua	Suva	2nd Floor, Lotus Building	Private Mail Bag	Suva	Fiji	680 3379276		sitalingip@spc.int	SPC	Resource	
27	PARVW	PARNR	Bernedine Managreve	Administrative Assistant	The Pacific Community	F	3 Luke Street, Nabua	Suva	2nd Floor, Lotus Building	Private Mail Bag	Suva	Fiji	681 3379276		BernedineM@spc.int	SPC	Organiser	<i>Bernedine</i>
28	PARVW	PARNR	Lore Croker	Admin and Communications Ass	The Pacific Community	F	3 Luke Street, Nabua	Suva	2nd Floor, Lotus Building	Private Mail Bag	Suva	Fiji	682 3379276		lore@spc.int	SPC	Organiser	

ANNEX 2: Agenda

Maritime Technology Cooperation Centre - Pacific
Pacific Community, Suva Regional Office
Private Mail Bag, Suva, Fiji
Tel: (679) 337 0733 | Fax: (679) 337 01 46
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REGIONAL WORKSHOP ON ENERGY MANAGEMENT IN PORTS
Auckland, New Zealand, 31 July – 2 August 2017

PROGRAMME

Time	Agenda item	Agenda issues	Presenters
Day 1: Monday, 31 July 2017			
0830 – 0900	Registration of Participants		
0900 – 1000		Administrative remarks	MTCC-Pacific
		Prayer	Country
		Opening address	MTCC-Pacific
		Consultant Introduction	Consultant
	1	Green Pacific Port concept	SPC
2	Introduction to GMN project and MTCC-Pacific	MTCC-Pacific	
1000 – 1030	Photo Session and Morning Tea		
1030 – 1230	3	An overview of energy management, standards, principles; the drivers of energy management and a case study	MTCC-Pacific
1230 – 1330	Lunch		
1330 – 1500	4	Energy saving opportunities in ports	MTCC-Pacific
1500 – 1530	Afternoon Tea		
1530 – 1700	5	Energy use and energy baseline	MTCC-Pacific
Day 2: Tuesday, 1 August 2017			
0830 – 0930	6	Webinar on Green Port Initiatives	MTCC-Caribbean
0930 – 1030	7	Energy Management Policy and the Responsibility of the Energy Manager	MTCC-Pacific
1030 – 1100	Morning Tea		
1100 – 1230	8	Setting of energy performance targets	MTCC-Pacific
1230 – 1330	Lunch		
1330 – 1500	9	Energy Management Plans	MTCC-Pacific
1500 – 1530	Afternoon Tea		

1530 – 1700	10	Tools for energy management, and Energy Management Plans	MTCC-Pacific
Day 3: Wednesday, 2 August 2017			
0900 – 1030	11	Pacific Port Energy Management Collaboration and next steps	MTCC-Pacific
1030 – 1100	Morning Tea		
1100 – 1200	12	MTCC-Pacific pilot-project and implementation in Pacific ports – the way forward	MTCC-Pacific
		Closing	MTCC-Pacific
1200 – 1300	Lunch		

ANNEX 4: WhereEnergyIsUsed Template

ANNEX 5: Photos

Energy Management in Ports workshop



Webinar with MTCC-Caribbean (Capt Sukhjit Singh)



ANNEX 6: Communication and Visibility Activities

Lore Croker

From: press-releases-bounces@lists.spc.int on behalf of SPC Media <media@spc.int>
Sent: Tuesday, 1 August 2017 9:21 AM
To: press-releases@lists.spc.int
Subject: [SPC-News] MARITIME TECHNOLOGY COOPERATION CENTRE IN THE PACIFIC ASSIST IN ENERGY MANAGEMENT IN PACIFIC PORTS
Attachments: ATT00001.txt



Pacific
Community
Communauté
du Pacifique

MEDIA RELEASE

Maritime Technology Cooperation Centre in the Pacific Assist in Energy Management in Pacific Ports

1 August 2017

Auckland, New Zealand – Directors, Chief Executive Officers and managers from nine Pacific Island countries ports and administrations convened today for the Maritime Technology Cooperation Centre in the Pacific (MTCC-Pacific) *Regional Workshop on Energy Management in Ports* in, Auckland, New Zealand.

An energy audit conducted by the Pacific Community (SPC) in the port of Suva, Fiji, in 2016, showed a production of 3,100 tonnes of Greenhouse Gas (CO₂-e) energy which was the Port's third highest expense, after labour and machinery.

Approximately 25 kg CO₂-e are produced per container in Suva port, slightly lower than the 2013 reported 30 kg CO₂-e/container for 42 ports in the world. However, the energy audit demonstrated that an energy management system associated to short-term energy saving projects could result in a reduction of 440 tonnes CO₂-e of greenhouse gas per year with 3-years recovered costs.

The aim of this two and a half day regional workshop is to provide the participants with an understanding of energy consumption in ports and with tools and methods to monitor and reduce energy consumption and greenhouse gas emissions from port operations.

"Reducing energy consumption from port operations will contribute to the overall objective of reducing greenhouse gas emissions from the Pacific maritime sector. MTCC-Pacific is established to build the capacity of Pacific Islands countries and lead by example in this goal," said Head of MTCC-Pacific, SPC's Deputy Director Transport, Thierry Nervale.

MTCC-Pacific is one of the five centres of excellence in the world and forms part of the Global MTCC Network that aims at building the capacity of developing countries for climate mitigation in the maritime shipping industry.

The vision of MTCC-Pacific is a Pacific low-carbon maritime transport that supports the sustainable development goals of Pacific Islands countries and territories. MTCC-Pacific provides capacity-building activities and implement pilot-projects to facilitate the implementation of energy efficient measures in the maritime industry.

"SPC in collaboration with the Secretariat of the Pacific Regional Environment Programme (SPREP) are the hosting institutions of MTCC-Pacific and are proud to partner in this project funded by the European Union and implemented by the International Maritime Organization (IMO)," Said Mr Nervale.



Lore Croker

@Lore_Croker



#MTCC-Pacific RegWrkshop webinar learning session with #MTCC-Caribbean. @IMOHQ @spc_cps @EUPasifika @ThierryNervale @BBernedine @AtishmaLal6



2:28 PM - 31 Jul 2017

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1 August ·

Directors, Chief Executive Officers and managers from nine Pacific Island countries ports and administrations convened today for the Maritime Technology Cooperation Centre in the Pacific (MTCC-Pacific) Regional Workshop on Energy Management in Ports in, Auckland, New Zealand. http://www.spc.int/.../maritime-technology-cooperation-centr...



Maritime Technology Cooperation Centre in the Pacific Assist in Energy Management in Pacific Ports

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Pacific-Community-SPC

23 November at 17:59 ·

On 25 November the "16 Days of Activism against Gender-Based Violence Campaign" will begin. This year, a multi-agency campaign in the Pacific will



Chat (Off)

Government organisation in Nouméa, New Caledonia

4.7

Community

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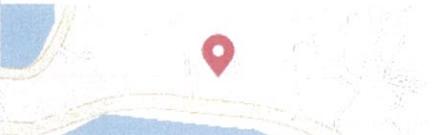
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ANNEX 7: Evaluation Analysis



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Email: mtcc-pacific@spc.int | Web: www.spc.int

MTCC-PACIFIC – REGIONAL WORKSHOP ON ENERGY MANAGEMENT IN PORTS

BECA Building, Auckland, New Zealand

31 July – 2 August

Arrangements prior to the activity

- 1 Was the invitation received in good time? Yes No
- 2 Did you receive the information listed below about the event before your participation
- on its objective and scope Yes No
 - subject areas and programme Yes No
- 3 Were the instructions on the following clear and easy to understand?
- profile required of participant Yes No
 - completion and submission of the nomination form Yes No
- 4 Did you receive logistical information on
- venue Yes No
 - workshop requirements Yes No

During the activity

- 5 To cover the topics fully, was the event (*please check the appropriate box*)
(1) too long (2) just right (3) too short
- 6 How do you rate the event with regard to the following? (*tick one box in each case*)
- | | excellent | good | satisfactory | poor |
|------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Venue | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Facilities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Equipment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
- 7 How would you rate the following aspects? (*tick one box in each case*)
- | | excellent | good | satisfactory | poor |
|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Presentation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Clarity | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Technical content | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Comprehensiveness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Quantity | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8 How would you rate the following sessions according to the day's agenda? *(tick one box in each case)*

	excellent	good	satisfactory	poor
Course materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IMO reference materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other resource materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Group and practical activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

At the end of the activity

9 Please rate each facilitator with regard to the following *(check one box in each case)*

- delivery of presentation
- ability to guide discussions
- effectiveness in:
 - answering questions
 - suggesting solutions to problems

10 What topics were of most interest and relevance to your Administration?

11 Are there any topics which should be added? Yes No
If yes, please list them:

12 Do you consider that the objective of the event was met? Yes No

13 Are the outcomes achieved likely to be useful to your Administration? Yes No

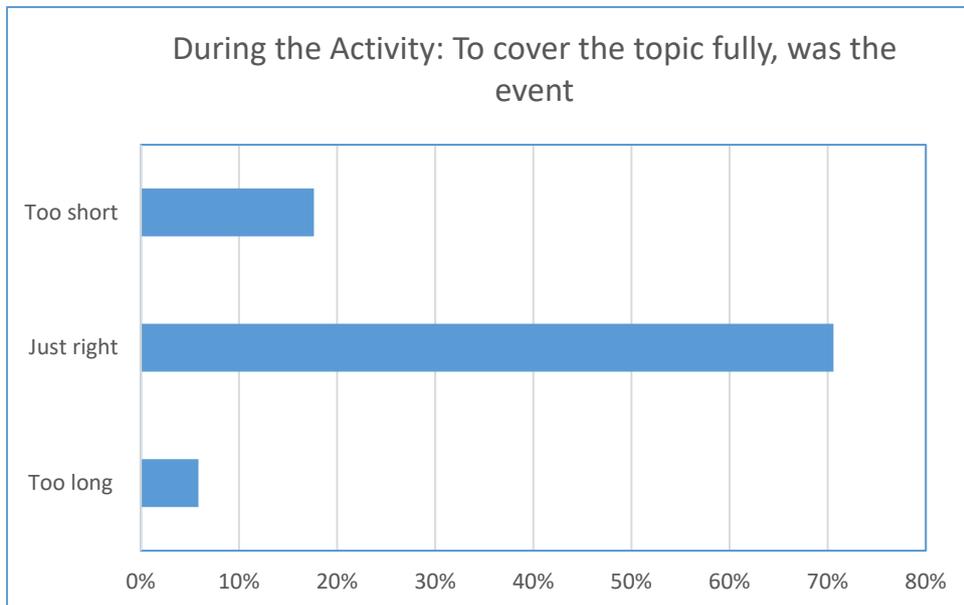
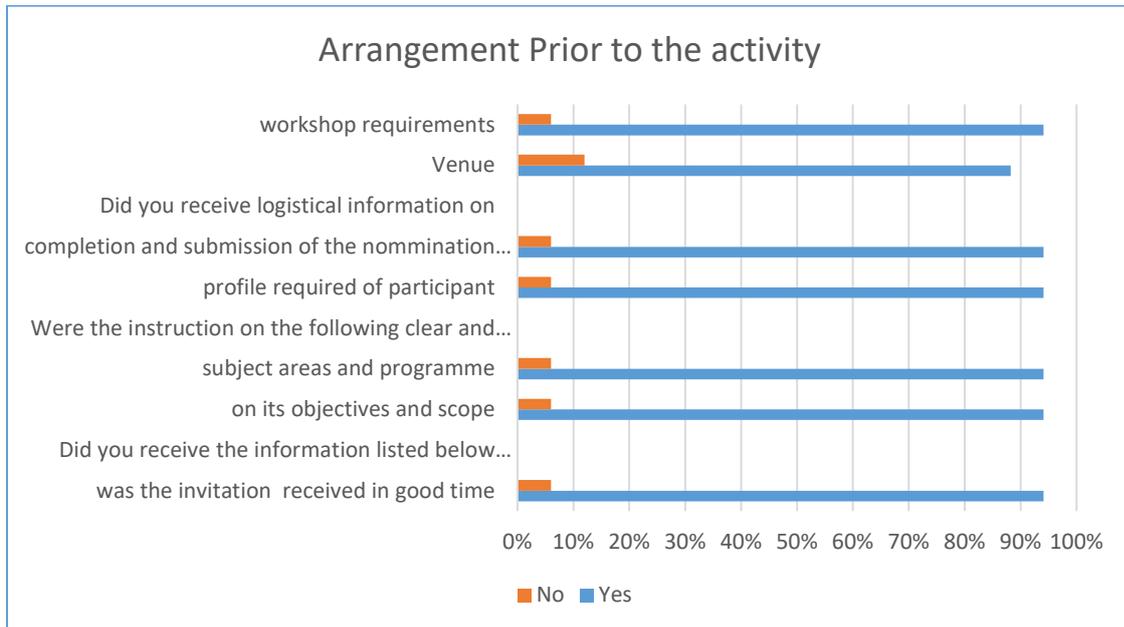
14 Will you have the opportunity to transfer the knowledge gained to your colleagues at work? Yes No

Comments:

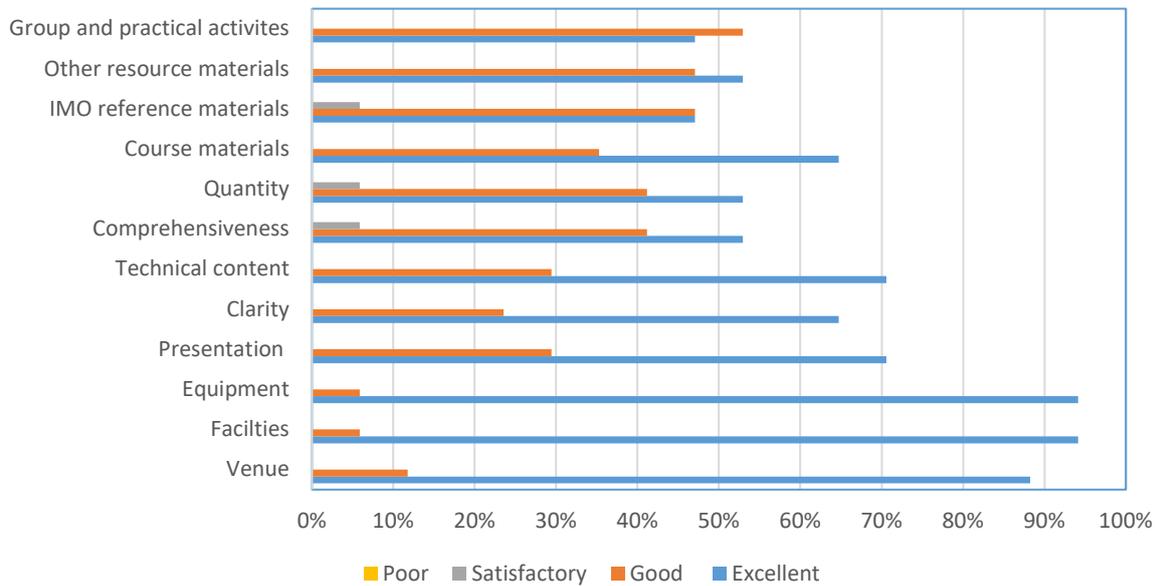
We greatly appreciate your time in completing this evaluation questionnaire. It contains important information that will assist the MTCC team in determining the success and impact of the activity.

Thank you.

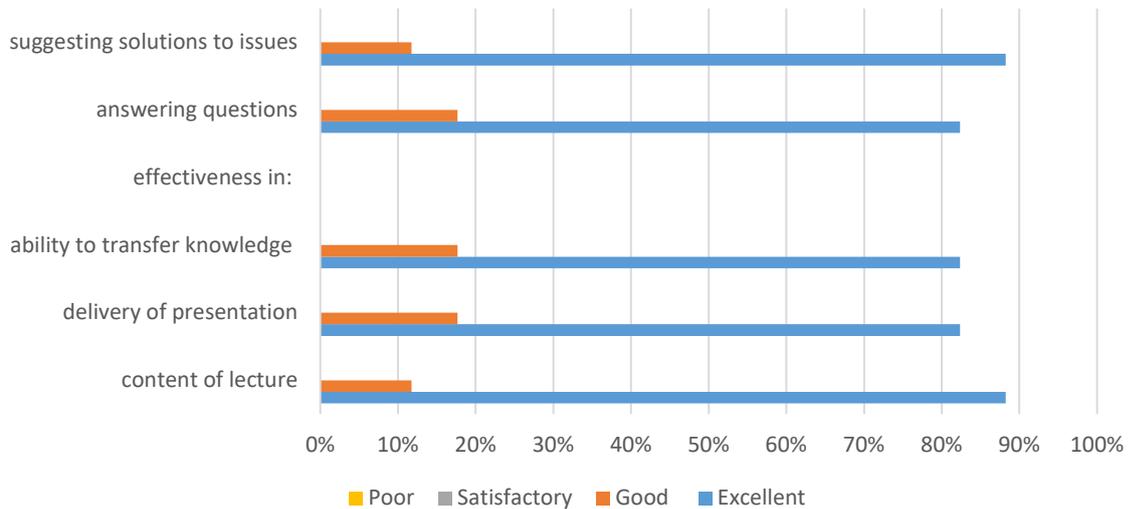
EVALUATION ANALYSIS



During the Activity: How would you rate the use of the following?



Rating of the facilitator, Bruce Rowse, with regards to the following:



What topics were most relevant to you?

Port energy management tools

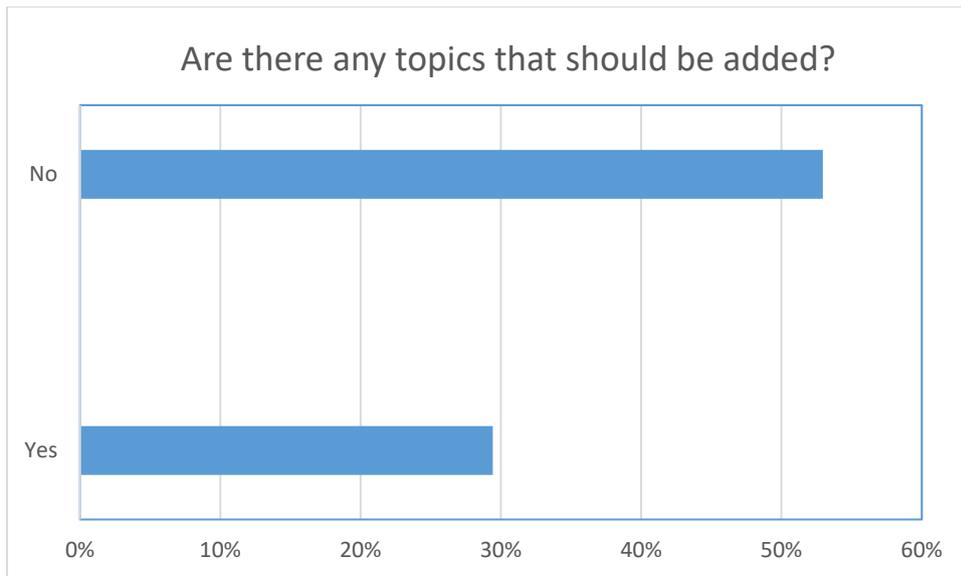
All

Energy savings opportunities in ports

Preparing and implementing energy management

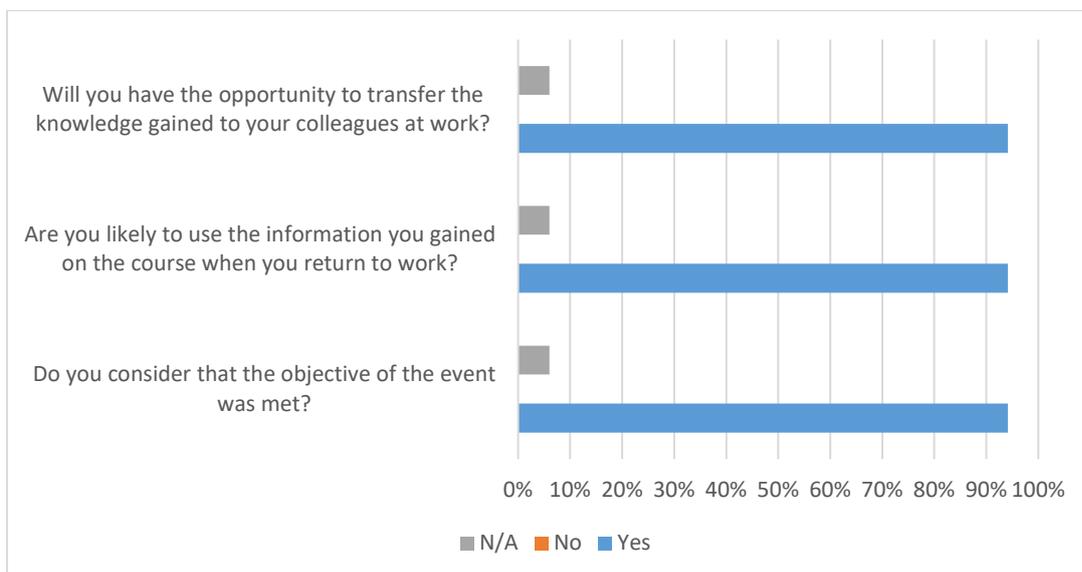
Setting of energy performance targets

A number of ideas where we are to make savings on energy bills. Eco driving/auto shut off switches.



If yes, please list.

- More calculations (energy) and management
- Available funding sources
- More training in Energy baseline and policy
- Cost-cutting tips
- Do more exercises, calculations of energy performances



Additional Comments

- As most ports have very little knowledge on energy savings technologies, some emphasis could be based on energy savings technologies available in the market which can be trusted.
- Good workshop.
- Workshop too short. Needed a few more days to focus on this subject. Thank you SPC team
- Very interesting workshop but needs more time and maybe some more group work/practicals based on country policies and how to go about to convince countries to imitate this

- The workshop answers some of our prayers, especially on reducing operation cost
- The only problem with the training is that we have been sitting in a room for a long time
- Course is timely. Learnings will be applying in our planning/policy making going forward
- I would love to attend another workshop to update the work/establish of energy management plan
- A little more time and not in a very cold place
- Passing on ideas of energy management to all staff at our two offices. Use of a baseline and encourage staff to make savings. Able to consolidate energy management into one document instead of a number of different and isolated documents.
- Thank you SPC/IMO/MTCC-Pacific