

3rd Workshop on Marine Black Carbon Emissions:

Measuring and Controlling BC from Marine Engines

ICCT & ECCC

7-8 September, 2016
Vancouver, BC, Canada



Agenda

Dan Rutherford, Ph.D.

**CCAC Black Carbon Workshop
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Agenda – Day 1

Time	Activity	Details
9:00-9:30 am	Registration and Coffee	
9:30-9:45 am	Welcome Remarks and Review of Agenda Richard Holt, ECCC Dan Rutherford, ICCT	
9:45-10:00 am	Brief Summary of Previous Workshops and Background Dan Rutherford, ICCT	<ul style="list-style-type: none"> - Project background - Definition of BC - Measuring BC - IMO Context
10:00-11:15 am	Session 1: Measuring Marine BC Ralf Oldenburg & Peter Lauer, MAN Kent Johnson, UCR Greg Smallwood, NRC-Canada	<ul style="list-style-type: none"> -Setup -Instruments -Results -Reporting protocols
11:15-11:30 am	Break	
11:30 am-12:30 pm	Session 2: Marine Fuels and BC Päivi Aakko-Saksa, VTT, Finland Wayne Miller, UCR	<ul style="list-style-type: none"> - Engines - Fuels - Instruments - Results
12:30-1:15 pm	Lunch (Provided)	

Agenda – Day 1

Time	Activity	Details
1:15-2:30 pm	Session 3: BC Control Tech. and Op. Strat. George Lin, Caterpillar Jiacheng Yang, UCR Mike Geller, MECA	<ul style="list-style-type: none"> - Technologies - Operational strategies - BC reduction potential - Implementation
2:30-2:45 pm	Break	
2:45-4:00 pm	Session 4: Potential BC Control Policies Sian Prior, ECF Contractor Tom Brewer, ICTSD Jan Hulskotte, TNO	<ul style="list-style-type: none"> - Policy alternatives - BC reduction potential - Implementation
4:00-4:15 pm	Day 1 Closing Remarks Dan Rutherford, ICCT	<ul style="list-style-type: none"> - Closing remarks - Logistics for dinner - Preview of Day 2 agenda
4:15 pm	Adjourn	
6:30-9:30 pm	Group Dinner Vancouver Harbor Sunset Dinner Cruise 501 Denman Street, Vancouver, V6G 2W9	-Cruise begins 7:00 p.m. sharp. Please arrive at 6:30 p.m. to board.

Agenda – Day 2

Time	Activity	Details
9:00-9:30 am	Coffee	
9:30-9:45 am	Recap of Day 1	- Brief recap of Day 1 - Instructions for Breakouts
9:45-11:15 am	Breakout Groups (concurrent) 1. BC Measurement Protocols 2. BC Control Policy Alternatives	Goal: Identify areas of consensus and questions for the larger group to discuss after lunch
11:15 am-12:15 pm	Groups Report Out	Report out to include larger questions or issues needing more input
12:15-1:00 pm	Lunch (Provided)	
1:00-2:00 pm	Discussion 1: BC Measurement Protocols Facilitated by ICCT	Outcome: Identify promising BC measurement protocols related to controlling marine BC; capture challenges and opportunities

Agenda – Day 2

Time	Activity	Details
2:00-3:00 pm	Discussion 2: Potential BC Control Policies Facilitated by ICCT	Outcome: Identify promising potential BC control policies; capture challenges and opportunities
3:00-3:15 pm	Break	
3:15-4:00 pm	Discussion 3: Future Research Needs Facilitated by ICCT	Outcome: Identify future research needs related to controlling marine BC
4:00-4:30 pm	Summary of Workshop Outcomes Dan Rutherford, ICCT	Outcome: Agree on key workshop outcomes
4:30-4:45 pm	Closing Remarks Paul Izdebski, ECCC Dan Rutherford, ICCT	
4:45 pm	Adjourn	

Workshop background

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Funded by Climate and Clean Air Coalition

50 Country Partners + 16 IGOs + 45 NGOs

 Australia	 Bangladesh	 Benin	 Cambodia
 Canada	 Central African Republic	 Chad	 Chile
 Colombia	 Cote d'Ivoire	 Denmark	 Dominican Republic
 Ethiopia	 European Commission	 Finland	 France
 Germany	 Ghana	 Guinea, Republic of	 Iraq
 Ireland	 Israel	 Italy	 Japan
 Jordan	 Kenya	 Korea, Republic of	 Laos
 Liberia	 Maldives, Republic of the	 Mali	 Mexico
 Moldova	 Mongolia	 Morocco, Kingdom of	 Netherlands
 New Zealand	 Nigeria	 Norway	 Paraguay
 Peru	 Philippines	 Poland	 Russian Federation
 Sweden	 Switzerland	 Togo	 United Kingdom
 United States of America	 Uruguay		

CCAC Funded a 2-year ICCT and UNEP project to develop:

- A refined global marine BC inventory
- BC control technology performance database

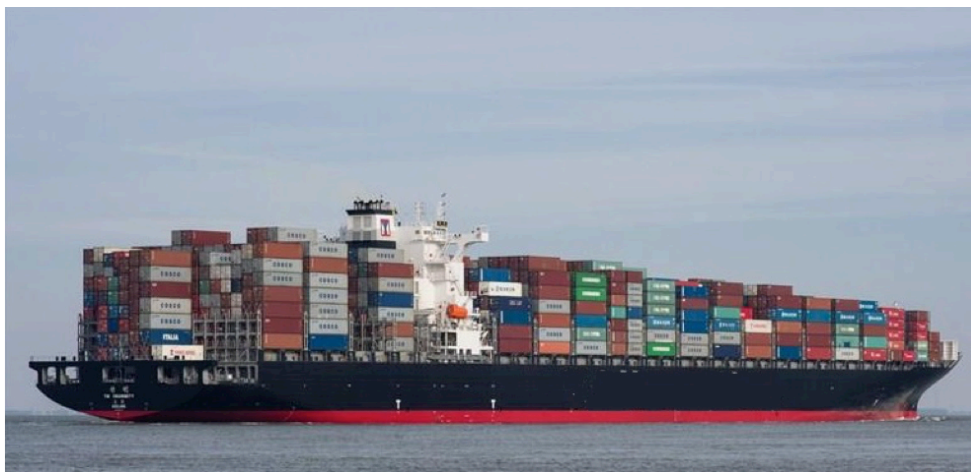
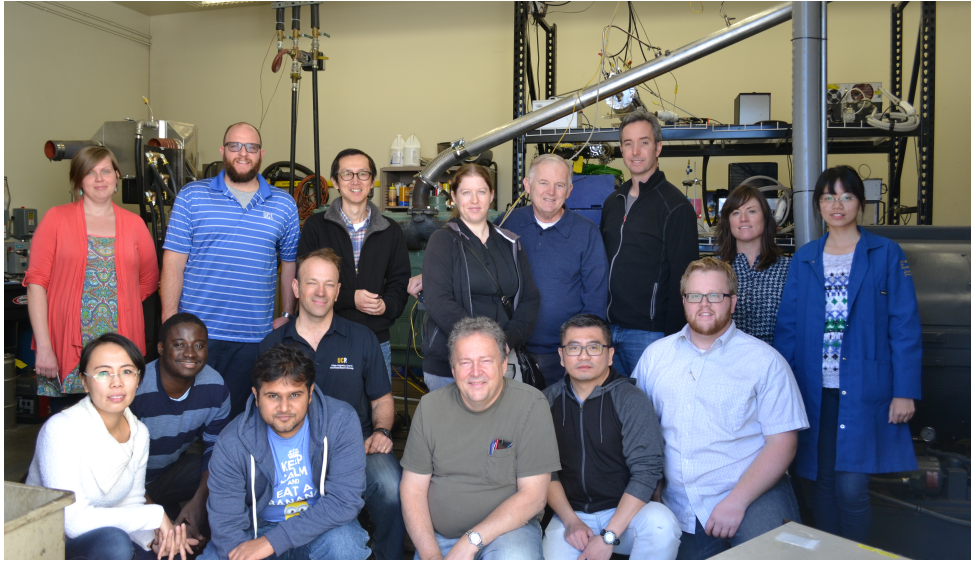
Series of 3 Marine BC Workshops

Funded by the Climate and Clean Air Coalition

1. Defining BC	2. Measuring BC	3. Controlling BC
Ottawa (2014)	Utrecht (2015)	Vancouver (2016)
<ul style="list-style-type: none">• Bond et al. 2013<ul style="list-style-type: none">• Recommended BC definition• Potential controls need investigating<ul style="list-style-type: none">• Fuel switching• Scrubbers• Slow steaming• DPFs• Etc.• Measurement protocols need to be established	<ul style="list-style-type: none">• Sample conditioning/pretreatment should be tested• EUROMOT protocol should be used and refined• Measurement Protocols<ul style="list-style-type: none">• Need to be established• Accuracy vs. precision<ul style="list-style-type: none">• <i>Accuracy</i> needed for inventories• <i>Precision</i> needed for standards	Goals: <ol style="list-style-type: none">1. Solidify recommendations for marine BC measurement approaches2. Identify effective tech. and operational strategies to control BC

Workshops Inform BC Science

Example: UC-Riverside Consortium



UC-Riverside
National Research Council Canada
Envi. and Climate Change Canada
UC-San Diego
Eastern Research Group

Funded by: CCAC and U.S. MARAD

IMO Policy Background

Year	Meeting	Outcomes
2011	MEPC 62	<ul style="list-style-type: none"> Tasked BLG 16 (now PPR) with a work plan to figure out how to define, measure, and control BC
2012	BLG 16	<ul style="list-style-type: none"> Established BC correspondence group
2013	BLG 17	<ul style="list-style-type: none"> High level policy definition proposed Discussed measurement methods and control measures
2014	PPR 1	<ul style="list-style-type: none"> Recommended MEPC choose one BC definition: eBC or LAC (linked to specific instruments)
2014	MEPC 67	<ul style="list-style-type: none"> Declined to choose one definition Retasked PPR 2 to develop a technical definition
2015	PPR 2	<ul style="list-style-type: none"> Agreed on a measurement method neutral definition of BC Noted need for studies to compare measurement methods, protocols
2015	MEPC 68	<ul style="list-style-type: none"> Adopted recommended Bond et al. (2013) definition Invited governments and observers to submit proposals/information on BC data collection protocols to PPR 3.
2016	PPR 3	<ul style="list-style-type: none"> Discussion of protocols for voluntary data collection; endorsement of EUROMOT measurement reporting protocol
2017	PPR 4	<ul style="list-style-type: none"> ?

Let's get started!

- Thank you for your participation – we're excited to have you here!
- Thanks to our co-sponsor:
 - Environment and Climate Change Canada
- Next up: Session 1: Measuring Marine BC (10:00 - 11:15 a.m.)