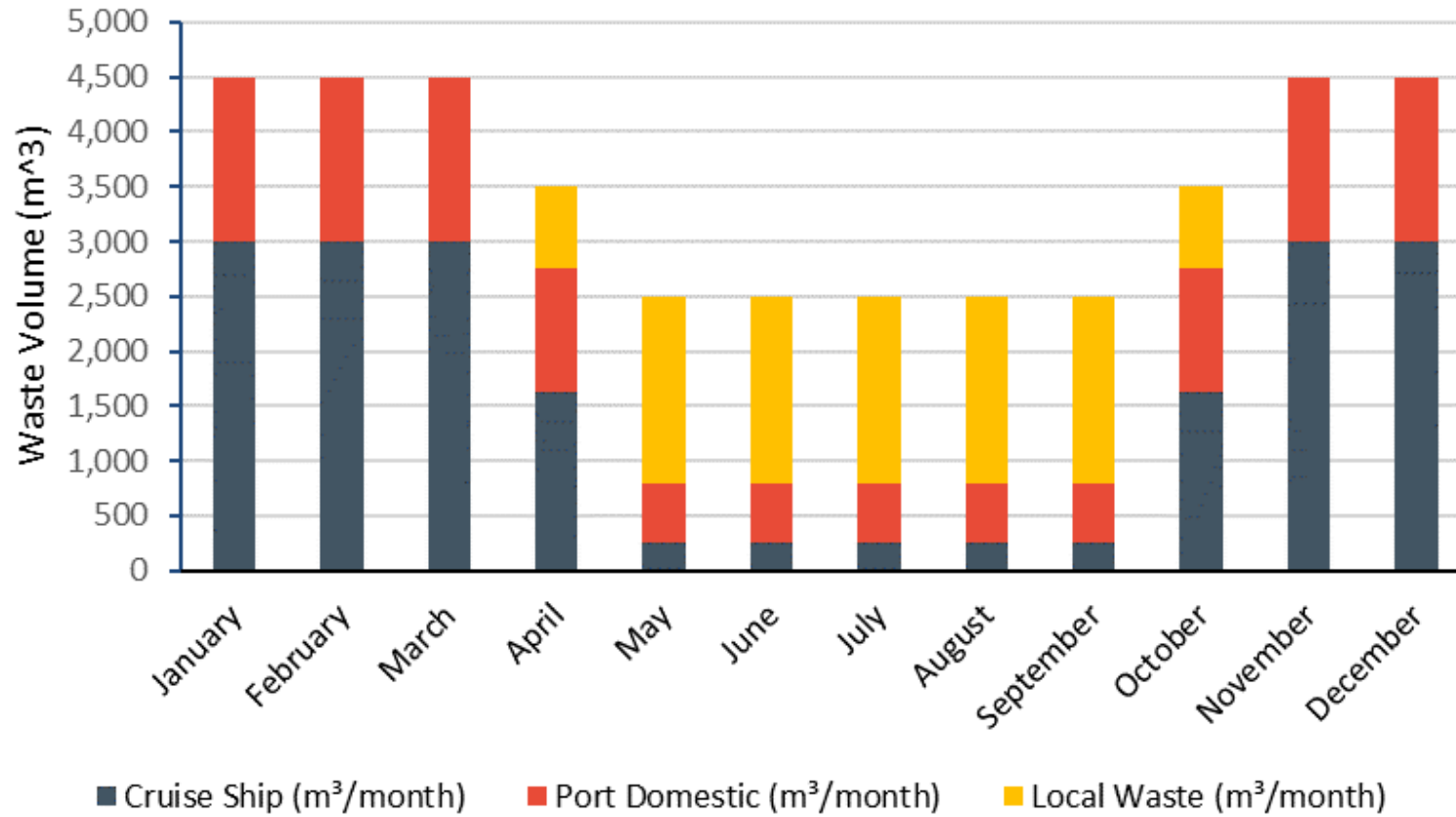


Response to Clarification on waste composition provided for information

We would like to get a summary of the waste stream, broken down by type of waste, volume of waste, and monthly (seasonal) amounts of waste. And, to learn if some of the wastes are source separated in the cruise ships and other Port facilities (i.e., organics wastes, plastics, etc.).

Waste Quantification

Waste quantities vary depending on high- and low- cruise ship seasons



Assumed Waste Properties:

- It was assumed that the waste stream is primarily composed of paper, plastic, and food waste, except in the case of the local waste for which more information was available
- Averages of standard values for known waste stream components were used to determine the used caloric value, density, and moisture content

Port Waste

Waste Parameter	Utilized Value	References
LHV (MJ/kg)	16.6	[2], [3], [4], [5], [6]
Density (kg/m ³)	194.9	[8], [9]
Moisture Content (%)	21	[9]

Local Waste

Waste Parameter	Utilized Value	References
LHV (MJ/kg)	8.9	[2], [3], [4], [5], [6] [7]
Density (kg/m ³)	210.9	[8], [9]
Moisture Content (%)	21	[9]

Cruise Waste

Waste Parameter	Utilized Value	References
LHV (MJ/kg)	10.3	[2], [3], [4], [5], [6]
Density (kg/m ³)	239.1	[8], [9]
Moisture Content (%)	21	[9]

Note that the references are not available.

Waste Composition – Cruise Ships

The Port confirmed that it will be accepting wet food waste under the new MARPOL change.

Material	Present in Waste Feedstock? (Y = yes, N = no, U = unclear)	Quantity (m3)
Paper	Y	Not provided
Plastic Wrap	Y	Not provided
Dry food waste	Y	120 - 150
Plastic Bottles	U	Not provided
Aluminum Cans	U	Not provided
Plastic Food Containers	U	Not provided
Wet food waste	N	-
Glass	N	-
Medical waste	N	-

Waste Composition – Local Waste

The Port has indicated that it may look to supplement waste by diversion from the local landfill in the low season to maintain the required waste quantities for the WTE system. Waste characteristics for local waste were taken from the Waste Characterization Study for Barbados 2015

Material Type	Round 1: Mean	Round 2: Mean	Round 3
Paper and Paperboard	10.28%	23.30%	22.4%
Glass	2.40%	4.30%	8.1%
Metal	3.07%	3.90%	6.4%
Plastic	7.70%	13.90%	16.7%
Textiles	7.16%	8.70%	10.1%
Organics	41.00%	30.10%	24.5%
C&D Materials	20.09%	3.30%	6.0%
Special Care Wastes	0.20%	0.02%	2.1%
Other Wastes	8.10%	7.30%	3.7%

Waste Composition – Port Operations

Port domestic waste is typical of office/household waste – paper, plastics and cans

END