AUDIT REPORT

Of organisation:

Revised emissions factors for Ports of Auckland Limited's Freight emissions calculator

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Report reviewed by	Andrea Topp, Enviro-Mark Solutions, 26th January 2020

OVERVIEW

Ports of Auckland Limited (POAL) has developed an online freight emissions calculator that will allow customers to calculate emissions of their container cargo from three different modes of transport – road, rail and coastal shipping. Emission factor sourcing conducted via a KPMG commissioned report, which was then peer reviewed by Sapare, which included a review of international best practice.

An initial verification was completed in March 2020, covering the emission factors embedded in the calculator (to confirm that they are appropriate), and peer reviewing the calculator methodology, to provide customers with confidence in the emissions estimates generated by the calculator.

Subsequent to the initial verification, POAL implemented revised and updated emissions factors into the calculator. POAL have asked for verification of these revised emissions factors, which is the scope of this verification.

OBJECTIVES

The objective of the audit was to determine if:

The revised emission factors in the POAL carbon calculator remain aligned to with ISO14064-1 measurement requirements.

AUDIT CRITERIA AND SCOPE

The audit criteria and scope are detailed in the following table:

Audit criteria	Relevant sections of ISO 14064 Part 1:2006, ISO 14064 Part 3:2006 Relevant section of Toitū carbonzero and Toitū carbonreduce Programme Measure guides v2.0, and associated Emissions Factor Manual
Audit date	January 2021
Audit scope	The methodology for producing emissions results from the Ports of Auckland online freight emissions calculator has been independently verified by Toitū Envirocare. The information therein is suitable for contributing to a ISO 14064-1:2006 compliant inventory.
Audit type	Verification of Ports of Auckland online freight emissions calculator
Registered office address	Ports of Auckland Building, 1 Sunderland Street, Mechanics Bay, Auckland 1010
Locations visited	Remote audit, desktop based.
Audit contract	Email agreement December 2020

METHODOLOGY

The verification was conducted via a desktop review, using the methodology outlined below:

1. POAL provided Toitū Envirocare with revised emissions, via:
    a. Email correspondence
    b. Emissions factors for POAL_Final_Nov 17 2020.pdf
    c. TEU handling emissions at the Port and Freight Hub - Nov 27 - CCv2.xlsx
2. The Revised factors were then reviewed to check for alignment to the requirements of the Toitū carbon programmes, ISO 14064-1, and the New Zealand context.

RESULTS

The revised factors are listed in Table 2, alongside the previous options considered in the first verification report. The revised Sapare report[1] provides sufficient explanation on the updates, in particular the executive summary.

Provence of the factors were reviewed in the context of what are considered significant components for factor publication quality. These include:

1. Geographic suitability - ideally the data should reflect the country or region that the emissions calculation is associated with.
2. Time period - ideally the data should reflect the time period that the emissions calculation is associated with.
3. Multiple gases - Whether it covers just one gas or multiple gases (e.g. CO_2, CH_4, N_2O, etc.) – ideally the data should cover all GHGs, and have the ability to calculate both individual gases and total GHG emissions as tonnes of carbon dioxide equivalents (tCO_2e)
4. Peer review - Whether some or all of the data has been peer reviewed and/or third party verified - ideally the emissions data presented should have gone through external third party verification, or a peer review process to ensure accuracy and reliability.
5. Version of publication - Is the publication the most recent version?
6. Applicability - What typical emission source activities are anticipated for the factor and will these be an appropriate match?
7. Updates – Are there likely to be version updates? (i.e. will there be a need to monitor for new publications?)
8. Scope - Are the factors aligned to organisation or product/service measurements e.g. Tank to Wheel vs Well to Wheel

The sources that the Sapare report references to (for the revised factors) are detailed in table 3, with commentary on suitability to each component. For the majority of the components, the data quality is shown to be appropriate. The exception is the geographic transferability of the STREAM report. Because it is based on data from the Netherlands, one has to make judgement on if this is reflective of a New Zealand environment. This is discussed extensively in the Sapare report and the rationale for selection is deemed appropriate.

Observation 1: *For all the data reference sources, there are likely to be updates to existing reports and/or totally new publications released that may show greater quality and accuracy. Therefore, the factors in the calculator should be reviewed, on an annual basis, and considered for applying updated values to reflect best available source data.*

It is recommended *that any updates to the calculator be checked, via a similar verification review report such as this one.*

Table 1. Overview of emission factors by source.

Emission source	Unit of measure	Revised factors[2]	Options as documented in the March Verification report[3]				
			KPMG	Sapare	Toitū	MfE 2019	DEFRA 2019
Road - default	gCO_2e/tkm	106.6	136	n/a	136	136	110
Road - single TEU (<16 tonnes)	gCO_2e/tkm	n/a[4]	n/a	136	n/a	n/a	154
Road - double TEU (16-22 tonnes)	gCO_2e/tkm	n/a	n/a	73	n/a	n/a	76
Rail	gCO_2e/tkm	28.9	28	29	28	28	33

[1] Emissions factors for POAL_Final_Nov 17 2020.pdf
[2] Pg 2 of the Sapare report (Emissions factors for POAL_Final_Nov 17 2020.pdf)
[3] Verification_Report_2020_POAL_calculator.pdf
[4] Revised factor set recommends one single factor for all road transport, as opposed to previously having split factors

Emission source	Unit of measure	Revised factors[2]	Options as documented in the March Verification report[3]				
			KPMG	Sapare	Toitū	MfE 2019	DEFRA 2019
Coastal and International Shipping - default	gCO_2e/tkm	n/a[5]	45	n/a	45	45	n/a
Coastal and International Shipping - International ship (across all sizes)	gCO_2e/tkm	17	n/a	46	n/a	n/a	n/a
Coastal and International Shipping - Domestic ship (1000-1999 TEUs)	gCO_2e/tkm	36	n/a	21	n/a	n/a	n/a
Freight Hub handling "Container handling at Wiri" (POAL)	gCO_2e/TEU	5,390	100	n/a	n/a	n/a	n/a
Straddles and reach stackers at Port[6] (POAL)	gCO_2e/TEU	7,267	n/a	n/a	n/a	n/a	n/a
Cranes at Port (POAL)	gCO_2e/TEU	0	n/a	n/a	n/a	n/a	n/a
Freight Hub handling (Large NZ Port)[7]	gCO_2e/TEU	8,500	n/a	n/a	n/a	n/a	n/a
Freight Hub handling (Medium-sized NZ Port)[8]	gCO_2e/TEU	14,000	n/a	n/a	n/a	n/a	n/a
Freight Hub handling (Small-sized NZ Port)[9]	gCO_2e/TEU	14,000 – 31,000	n/a	n/a	n/a	n/a	n/a
Freight handling facility[10]	gCO_2e/TEU	8,000	n/a	n/a	n/a	n/a	n/a

Table 2. Factor quality review for proposed Sapare report factors.

Factor	Geographic suitability	Applicable time period	Multiple gases	Publication peer review	Applicability	Source version	Updates	Scope
Road - default	Yes - NZ publication	Yes - 2020 data from Ministry of Transport, so very recent	Yes	Yes	Freight of containers (TEUs) between New Zealand locations	n/a	Unknown	Appropriate, Organisation (Tank-to-Wheel)
Rail	Yes - NZ publication	Yes - 2019 publication, so very recent	Yes	Yes	Freight of containers (TEUs) between New		Unknown for Samuelson (2019), but noting MfE 2019	Appropriate, Organisation (Tank-to-Wheel)

[5] Revised factor set recommends split factors
[6] Newly proposed in the new factor dataset
[7] Example 'large sized port' = POAL
[8] Example 'medium sized port' = Port of Tauranga, Lyttelton Port
[9] Example 'small sized port' = Napier Port
[10] Reference port = POAL

Factor	Geographic suitability	Applicable time period	Multiple gases	Publication peer review	Applicability	Source version	Updates	Scope
					Zealand locations		is likely to have updates	
Coastal and International Shipping - International ship (across all sizes)	STREAM report is based on Netherlands data - suitability to NZ subject to consideration on loading rates and fuel efficiencies for the NZ context	Yes - 2016 publication, which is relatively recent	Yes	Yes	Freight of containers (TEUs) between New Zealand locations		Unknown for STREAM report, but noting MfE 2019 is likely to have updates	Appropriate, Organisation (Tank-to-Wheel)
Coastal and International Shipping - Domestic ship (1000-1999 TEUs)	STREAM report is based on Netherlands data - suitability to NZ subject to consideration on loading rates and fuel efficiencies for the NZ context	Yes - 2016 publication, which is relatively recent	Yes	Yes	Freight of containers (TEUs) between New Zealand locations		Unknown (STREAM report)	Appropriate, Organisation (Tank-to-Wheel)
Freight Hub handling "Container handling at Wiri"	Yes	Yes	Yes	No	Yes – POAL specific data	2019 consumption data	TBC	Appropriate, Organisation (Tank-to-Wheel)
Straddles and reach stackers at Port	Yes	Yes	Yes	No	Yes – POAL specific data	2019 consumption data	TBC	Appropriate, Organisation (Tank-to-Wheel)
Cranes at Port	Yes	Yes	Yes	No	Yes – POAL specific data	2019 consumption data	TBC	Refer to Finding 2

Observation 2: *For the emissions factor 'Cranes at Port', the factor proposed is 0, based on the rationale that POAL use electric cranes that use electricity backed by Renewable Energy Certificates (RECs) with a 0 emissions rate per unit of electricity. POALs use of RECs has been reviewed under previous dialogue, in relation to accounting principles within the carbonreduce programme. This dialogue concluded that the POAL REC scenario is appropriate to apply a 0 rated factor under what is called the GHG Protocol Scope 2 'Market-based accounting' approach. ISO14064-1:2018 refers to this under 'Contractual instruments.'*

It is recommended *that for full transparency, a short reference note is added in the calculator to confirm the 'Cranes at Port' portion of the freight movement uses a Market-based accounting approach for the electricity consumed.*

It is also recommended *that disclosure of what the location-based emissions (i.e., using the grid average electricity emissions factor) would be for the same activity, to enable users to complete dual reporting (reporting emissions under both market and location-based methods) if this aligns to their intended use.*

CONCLUSION

Based on the information provided and the review conducted, Ports of Auckland (POAL) has selected appropriate emission factors for their online freight emissions calculator, and the associated calculator methodology is sufficient for generating emissions estimates to customers to meet the needs of customers seeking to incorporate their freight activity into their own emissions reporting objectives.

The findings are summarised in table 4, with recommended actions. Acting on these observations are optional.

Table 3. Summary of findings.

Finding	Recommendation
Observation 1: For all the data reference sources, there are likely to be updates to existing reports and/or totally new publications released that may show greater quality and accuracy. Therefore, the factors in the calculator should be reviewed, on an annual basis, and considered for applying updated values to reflect best available source data.	It is recommended that any updates to the calculator be checked, via a similar verification review report such as this one.
Observation 1: For the emissions factor 'Cranes at Port', the factor proposed is 0, based on the rationale that POAL use electric cranes that use electricity backed by Renewable Energy Certificates (RECs) with a 0 emissions rate per unit of electricity. POALs use of RECs has been reviewed under previous dialogue, in relation to accounting principles within the carbonreduce programme. This dialogue concluded that the POAL REC scenario is appropriate to apply a 0 rated factor under what is called the GHG Protocol Scope 2 'Market-based accounting' approach. ISO14064-1:2018 refers to this under 'Contractual instruments'.	It is recommended that for the full transparency, there a short reference note is added in the calculator to confirm the 'Cranes at Port' portion of the freight movement uses a Market-based accounting approach for the electricity consumed. It is also recommended that disclosure of what the location- based emissions (i.e. using the grid average electricity emissions factor) would be for the same activity, to enable users to complete dual reporting (reporting emissions under both market and location based methods) if this aligns to their intended use.

ASSURANCE

The reports are not Toitū carbonreduce or Toitū carbonzero certified. Ports of Auckland agrees not to claim that the reports are certified by Toitū Envirocare.

Toitū Envirocare reserves the right to define the claim that can be made on the customer reports. The emission factor set provided to Ports of Auckland by Toitū Envirocare remains the property of Toitū Envirocare and may not be passed onto a third party. They are only suitable for inclusion in reports generated by Ports of Auckland. The carbon emissions included in the report are not suitable for reporting into other carbon measurement schemes other than Toitū carbonreduce and the Toitū carbonzero certification programmes.

The assurance from this verification is limited to the sample of reports verified by the verifier as described above.

Level of Assurance	Limited
Qualifications/Limitations	None

NOTES

1. The detailed audit findings and calculations are given in the Verification Plan and Working Papers associated with this audit. These contain proprietary verification methodologies and remain confidential to Toitū Envirocare.
2. The audit is based upon sampling and as such nonconformities may exist that have not yet been identified.
3. The scope of the review was limited to personnel interview, analytical review procedures applied to GHG emissions data, and review of the input of data into the emissions calculator. A **non-conformance (NCR)** indicates that the auditor has found a non-conformance with scheme Technical Requirements (audit criteria) and requires you to take the appropriate corrective action and provide evidence of this correction within two weeks.
4. A **minor non-conformance (mNCR)** which the auditor has found which is not material to the outcome of the inventory, but to which a failure to address in the preparation for future audits could lead to a major Non-Conformance (NCR).
5. **Observations** made by your auditor are strongly advised but the actions are not required for the for limited assurance to be given.
6. Neither Toitū Envirocare nor the auditor has any interest in the organisation, other than in our capacity as assurance providers.
7. This report has been prepared solely for the use of the organisation, reports produced by the organisation for its clients, and Toitū Envirocare. It may be relied on solely by the organisation and Toitū Envirocare for that purpose only. Toitū Envirocare does not accept or assume any responsibility to any person other than the organisation in relation to the statements or findings expressed or implied in this report.
8. Any correspondence regarding this audit report should be directed to your Lead Auditor.
9. A copy of this report has been provided to the nominated client contact.

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