

Letter of Assurance

Company Carbon Footprint – Scope 3: Product related Carbon Footprint for Fiscal Year 2016

Fraunhofer IZM reviewed Apple's scope 3 company carbon footprint (CCF) data related to the products manufactured and sold by Apple Inc. in fiscal year 2016.

1 Summary

This review checks transparency of data and calculations, appropriateness of supporting product related data and assumptions, and overall plausibility of the calculated corporate annual carbon footprint comprised of emissions derived from the life cycle assessment (LCA) of Apple products shipped in fiscal year 2016. This review and verification focuses on Scope 3 emissions for products sold by Apple Inc. (as defined by WRI/WBCSD/Greenhouse Gas Protocol – Scope 3 Accounting and Reporting Standard). It is noted that emissions relating to the facilities that are owned or leased by Apple (scope 1 and 2 emissions) as well as business travel and employee commute were subject to a separate third party verification and are therefore excluded from the scope of this statement. Confidential data relating to product sales and shipments were also excluded from the scope of this verification.

This review and verification covers Apple's corporate annual greenhouse gas emissions and does not replace reviews conducted for individual product LCAs for greenhouse gas emissions (GHGs). The life cycle emissions data produced by Apple for individual products has been calculated in accordance to the standard ISO 14040/14044: Environmental management – Life cycle assessment – Principles and framework / Requirements and guidelines. This review and verification furthermore complies with ISO 14064-3: Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions.

The review of the corporate annual carbon footprint has considered the following criteria:

- The system, boundaries and functional unit are clearly defined
- Assumptions and estimations made are appropriate
- Selection of primary and secondary data is appropriate and methodologies used are adequately disclosed

These criteria are also fundamental to the review of LCAs conducted for individual product emissions. The reviewers note that the largest share (99%) of Apple Inc. annual corporate carbon footprint is comprised of scope 3 emissions from individual products. The aforementioned criteria have been regularly reviewed by Fraunhofer IZM since 2007 with a view to providing independent feedback that can facilitate continuous improvement and refinement in the LCA methodology applied by Apple Inc.

Data reported by Apple is as follows:

	Manufacturing	Transportation	Product Use	Recycling
2016	22.77	1.20	4.86	0.30
	[MMT CO ₂ e]	[MMT CO ₂ e]	[MMT CO ₂ e]	[MMT CO ₂ e]

MMT CO₂e: million metric tons carbon dioxide equivalents

Including a reported value of 0.38 million metric tons CO₂e for facilities (out of scope of this verification), total CCF is reported to be 29.52 million metric tons CO₂e.

Apple’s CCF includes greenhouse gas emissions reductions for manufacturing resulting from Apple renewable energy projects, supplier renewable electricity purchases, and supplier renewable electricity installations. Many of these reductions are part of Apple’s Clean Energy Program. Fraunhofer IZM has not verified these emissions reductions.

Based on the process and procedures conducted, there is no evidence that the Greenhouse Gas (GHG) assertion with regards to scope 3 corporate carbon footprint

- is not materially correct and is not a fair representation of GHG data and information, and
- has not been prepared in accordance with the related International Standard on GHG quantification, monitoring and reporting.

2 Reviewed Data and Plausibility Check

A verification and sampling plan as required by ISO 14046-3 has been established in the course of this CCF review and verification, defining the level of assurance, objectives, criteria, scope and materiality of the verification.

As part of this review and verification Apple disclosed following data to Fraunhofer IZM:

- Sales data for FY2016, including accessories and including AppleCare, Apple's extended warranty and technical support plans for their devices.

- Regional distribution of sold units and country specific allocation per product to major sell-in countries
- Product specific data on transportation including breakdown of air and sea shipment
- Life cycle GHG emissions for all products, differentiating the actual product configurations (i.e. memory capacity)
- Calculation methodology for the company carbon footprint and methodological changes implemented in 2016
- The total company carbon footprint – scope 3 for the fiscal year 2016
- Detailed analysis of the CCF including:
 - The breakdown of the CCF into life cycle phases manufacturing, transportation, product use and recycling
 - Detailed product specific split into life cycle phases
 - The contribution of individual products and product families to the overall CCF

The data and information supporting the GHG assertion were projected (use phase and recycling) and historical (i.e. fiscal year 2016 data regarding sales figures, manufacturing, transportation).

This review comprises a check of selected data, which are most influential to the overall company carbon footprint. The overall plausibility check addressed the following questions:

- Are product LCAs referenced correctly?
- Are results for products, for which no full LCA review was undertaken, plausible?
- Are carbon emission data for individual products plausible in the light of methodological changes as indicated by Apple?

This review was done remotely.

3 Findings

Prior to this CCF review and verification 5 recent product LCA studies have been reviewed successfully against ISO 14040/44. These recent LCAs cover product segments Apple

Watch, iPad, and iPhone. These latest LCA studies cover products which represent in total 7,2% of the total scope 3 company carbon footprint. Representatives of other product segments (iPod, MacBook, MacBook Pro, iMac, Mac Pro, Mac Mini, Airport Express / Airport Extreme, Apple TV, and Beats products) underwent no or only minor design changes compared to those which went through a full LCA review in former years. All reviewed LCA studies up to now cover in total 55,6% of the total scope 3 company carbon footprint.

The methodological changes implemented with the 2016 CCF data are confirmed to lead to an improvement in terms of accuracy and real use patterns representation of the results. Inevitably this hampers the comparability of published 2016 results with earlier CCF data.

All questions raised in the course of the review were answered by Apple and related evidence was provided where needed.

Further improvements of applied data models have been discussed with Apple and are under consideration for future methodological revisions.

4 Conclusions

We observe from year to year an improvement of the assessment approach in terms of granularity of the used calculation data. This year several additional components are modelled with more accurate primary data from Apple's suppliers and with updated calculation models.

For all product LCA calculations, where exact data was missing, the principle of a worst-case approach has been followed and results have been calculated with rather conservative estimates.

The review has not found assumptions or calculation errors on the CCF data level that indicate the scope 3 corporate carbon footprint has been materially misstated. The excellent analysis meets the principles of good scientific practice.

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