



BioLite Environmental Sustainability Report 2012 - 2014

September 2015

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Letter from Jonathan Cedar, CEO

At BioLite, we create products that enable our customers to cook cleanly, charge their devices, and light their lives off grid. These basic energy services unify our increasingly diverse array of products. They also unite the diverse people we serve, from Yosemite to Uganda. We founded BioLite not only to design and manufacture great outdoor recreational gear, but also to address the daunting challenge of energy poverty in the developing world.

Reducing greenhouse gas emissions is at the core of who we are and what we do. Consequently, in addition to designing greenhouse gas saving products, we wanted to take a closer look at our own carbon footprint as a company and identify how we can reduce our greenhouse gas emissions. Embarking on a corporate carbon footprint analysis has allowed us to reflect on issues that are integral to BioLite's mission. The first is how we are doing on an absolute basis. How much greenhouse gas emissions do we release by manufacturing and selling our products? Across our operations from 2012 to 2014, BioLite has an aggregate emissions footprint of 2,921 tons of CO₂e. The second, and to me the most compelling, is to identify our net impact on the atmosphere. How much greenhouse gas emissions do we emit compared to what is saved by using our products? I was pleased to learn that for each ton of CO₂e released into the atmosphere from BioLite operations during the 2012-2014 period, we anticipate saving nearly 16 tons CO₂e from the use of BioLite HomeStoves sold during 2013 and 2014¹.

Yet we can still do more. We constantly strive to minimize our carbon footprint by streamlining raw materials use, packaging and shipping logistics. With the release of this report, we are also launching an ambitious strategy to offset the total carbon footprint of our operations from 2012-2014 by retiring (instead of selling) independently verified carbon credits that we produce from the use of BioLite products in Uganda and India. We are proud to be the first company to facilitate our own carbon neutrality by both producing and consuming carbon credits. See the introduction section of this report for a more detailed explanation and background of what it means to produce and retire a carbon offset.

BioLite is fortunate to have the support of a community of outdoor recreational enthusiasts and environmental activists. You seek high quality, innovative products to maximize your outdoor adventures, but want to engage with companies that care about more than just the bottom line. For us, enjoying the outdoors is not just about finding the perfect adventure (though

¹ Over the duration of these HomeStoves' useful life

this is important). Our passion for the outdoors is coupled with awareness of the fragility of our environment, and the impact that environmental degradation has on all of us, especially the planet's poorest people. Your purchase of BioLite products helps you enjoy the outdoors as well as protect it and our global community. Your enthusiasm and support help us keep these goals at the very center of our work. Thank you.

Sincerely,

A handwritten signature in black ink that reads "Jonathan Cedar". The signature is written in a cursive, flowing style.

Jonathan Cedar
Founder / CEO - BioLite

1. Introduction

BioLite is dedicated to creating positive environmental, health and social impact through the development and distribution of safe, affordable, and desirable clean energy technologies for households living in energy poverty in the developing world. We serve two distinct markets: 1) emerging market families living in energy poverty, and 2) outdoor recreation users seeking fuel-independent cooking, charging and lighting. Through a process of “parallel innovation,” BioLite incubates core technologies for both markets. BioLite reinvests near-term revenue from our outdoor recreation business to support the emerging markets business until it is commercially self-sufficient.

Since BioLite’s inception, we have sought to minimize our resource consumption and create products that have a net benefit to humanity and to the planet. In 2015, BioLite embarked on a more deliberate corporate sustainability effort by measuring our carbon footprint across all levels of our operations, from product design and sourcing of raw materials to the purchase of finished products by customers. This allowed us to better understand our environmental impact as the first step in mitigating this impact. This report covers BioLite’s carbon footprint during the calendar years 2012 through 2014 (since our inception²). This report is meant to be the first of annual sustainability reports, allowing us to identify trends and track our progress towards greening our operations.

With the release of this report, BioLite is also launching an ambitious strategy to offset the total carbon footprint of our operations from 2012-2014 by retiring (instead of selling) independently verified carbon credits produced from the use of BioLite products in Uganda and India. When a household in Uganda, for instance, cooks on the BioLite HomeStove, they reduce the amount of greenhouse gas emissions compared to the smoky, open fire with which they previously cooked. This savings is independently verified by Gold Standard Foundation, the leading carbon accreditation body. For every ton of greenhouse gas emissions saved (measured in tons of carbon dioxide equivalent), BioLite generates a carbon credit, which we can sell to a government, company, or individual that wants to offset their carbon footprint. We reinvest this revenue into our emerging markets business, to enable poorer and more remote households to purchase HomeStoves. As discussed in this report, we can also use a portion of our verified credits to offset our internal carbon footprint, by retiring (instead of selling) these credits.

² Although BioLite operated in 2011, our limited operations were such that our environmental impact was negligible.

2. Methods, Approach and Function-Specific Results

In quantifying BioLite's carbon footprint, we applied the World Resources Institute's Greenhouse Gas Protocol,³ taking into consideration resource and data constraints and where applicable, using best efforts to arrive at reasonable and conservative conclusions (overestimating emissions where uncertainty exists). In this analysis, we considered all material sources of greenhouse gas emissions throughout the value chain, as defined in the Greenhouse Gas Protocol. The analysis was conducted from June to September, 2015. The analysis was conducted by business school students from the Wharton School of Business through the Wharton Social Impact Initiative, with support from BioLite staff. Due to resource constraints, an external auditor was not engaged to verify the results of this analysis.

All of the numbers and claims in this report can be supported by a detailed excel model and references to authoritative third party documentation for all conversion factors and calculations. Business functions falling into scope 1, 2 and 3 emissions were quantified, as outlined in the sections below.

2.1 Scope 1

Scope 1 emissions are defined as those originating from emissions sources directly controlled and owned by BioLite. Since BioLite uses an external manufacturing facility to fulfill our manufacturing needs, there are no sources of emissions within operations over which we have direct control. For that reason, scope 1 emissions are zero, while all manufacturing emissions are included in scope 3 below.

2.2 Scope 2

Scope 2 emissions include those from purchased electricity, steam, natural gas, etc. BioLite has only one office for which electricity and natural gas is purchased. These emissions fall under building emissions.

Building Emissions

BioLite purchases electricity as well as gas for heating to power our headquarters office. Standard and universally accepted conversion factors were applied to calculate total emissions from the consumption of electricity and natural gas to arrive at the final values. Building emissions were minimal, as they never exceeded 10 tons CO₂e for any year of operations.

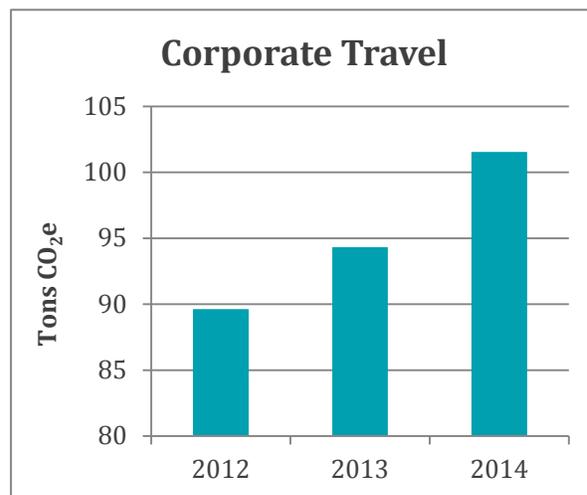
³ <http://www.ghgprotocol.org/files/ghgp/public/ghg-protocol-revised.pdf>

2.3 Scope 3

Scope 3 intends to capture all other sources of emissions, which for BioLite encompasses the overwhelming majority of our emissions, since we do not have direct control over most of the emissions in our value chain.

Corporate Travel

Corporate travel emissions were quantified by examining records of all company travel for the periods in question and calculating the distance traveled for each trip. These distances were then multiplied by industry standard conversion factors based on the type of transport. The majority of corporate travel occurred by commercial aircraft.

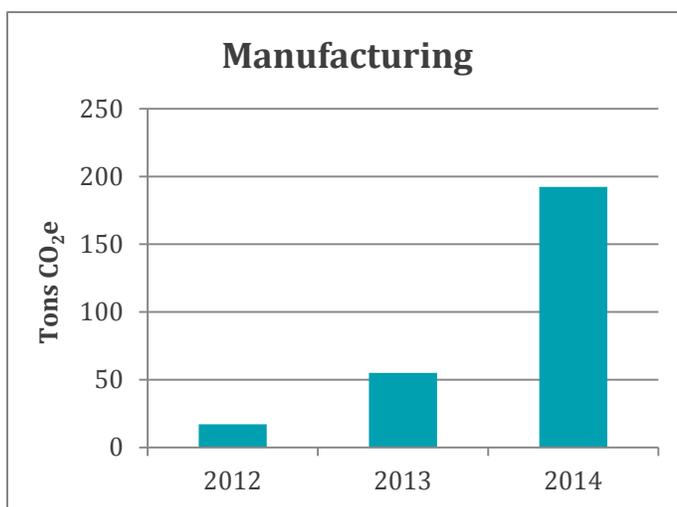


Commuting

Company employees completed a survey during 2015 in which they self-reported their commuting patterns, revealing the frequency with which employees commute via public transportation, bicycle, car or by walking. The results of this survey were then scaled up or down between different years to correspond with the number of BioLite employees in a given calendar year. On average a majority (51%) of BioLite employees bike or walk to work at least some of the time. 8% of BioLite employees drive at least some of the time, with the balance taking some form of public transportation, Total emissions from commuting never exceeded 10 tons CO₂e for any of the three years.

Manufacturing

Since BioLite was unable to attain direct energy consumption data from our third party factory in China, we used publicly available benchmarks from the automotive industry and then adjusted them to be more applicable to BioLite's products. We accounted for all manufacturing processes involved in manufacturing each BioLite product to



arrive at the following values.

Raw Materials

Although some manufacturing companies choose not to include raw materials in their scope 3 analysis, BioLite elected to include these values since they are so integral to manufacturing and using BioLite products. Raw materials represent the majority of BioLite's total carbon footprint and were calculated using the following methodology.

Each BioLite product was catalogued by its component parts, their material type and respective masses. Widely accepted embodied energy conversion factors⁴ for each material were then applied to calculate a per unit embodied energy value for each product. This was then multiplied by the total number of products sold in each calendar year to arrive at a total figure for raw materials as follows:

Shipping

Shipping emissions within BioLite are broken into two categories. The first is comprised of sea or air freight from BioLite's manufacturing facility in China to one of several BioLite warehouse and distribution hubs throughout the world (inbound). The second consists of truck or air freight from those hubs to either resellers or directly to customers (outbound).

i. Inbound

All containers shipped via sea freight were examined for the period in question and were multiplied by standard conversion factors for sea freight to arrive at the following figures.

⁴ Inventory of Carbon & Energy by Sustainable Research Team, University of Bath, United Kingdom, 2011

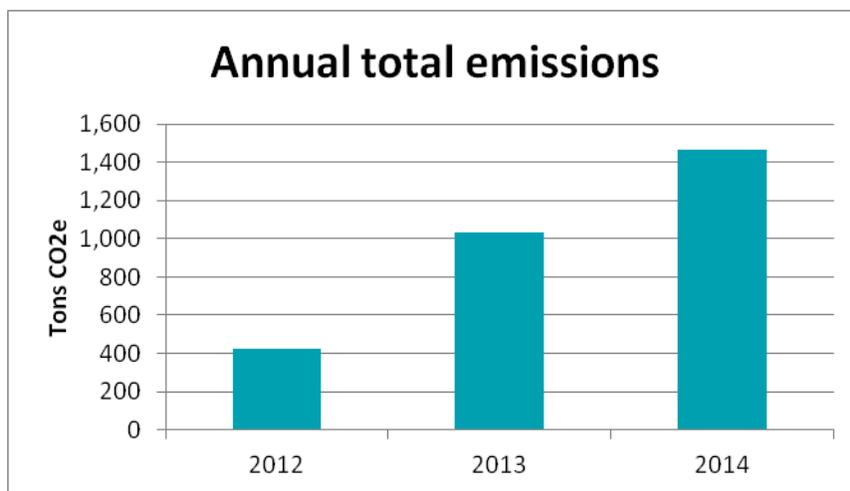


ii. Outbound

Due to the volume of transactions, a program was used to calculate the distance between the distribution hub and the final destination for each product or product lot. This distance was multiplied by standard conversion factors for truck and air freight as appropriate.

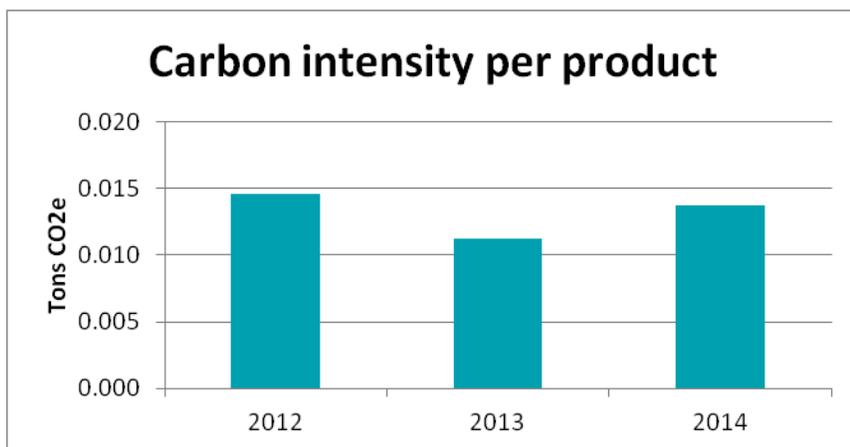
3. Result Summary and Analysis

Across the three year period we observe a steady increase in emissions that is roughly proportional to the growth of BioLite as a company and an increase in company sales. Below is a summary of annual emissions across all business functions. Between 2012-2014, BioLite emitted in aggregate 2,921 tons of



CO₂e. As mentioned, we plan to offset this carbon footprint by retiring the same number of carbon credits generated from the reduction in carbon from HomeStove usage in India and East Africa.

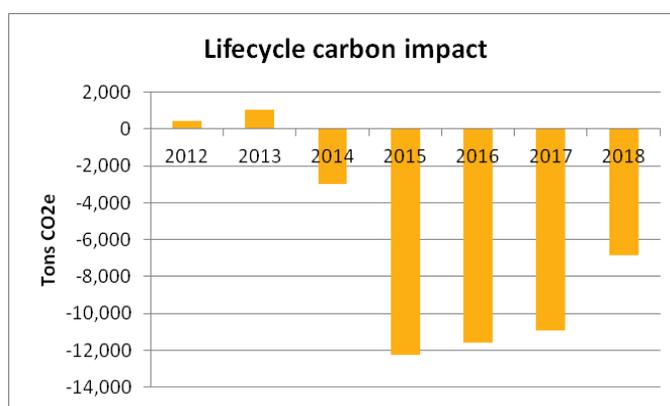
When we normalize for total annual sales figures to calculate carbon intensity per product, a different picture emerges. We observe carbon intensity on a per product basis holding relatively steady, ranging from about 0.010 to 0.015 tons CO₂e per product.



The variation can be explained by two factors. In both 2012 and 2014, BioLite launched a number of new products and invested heavily in research and development. These activities created additional emissions without scaling sales in the near term, thus setting the stage for lowering emissions on a per unit basis in the future. Further, in 2014 BioLite launched the BaseCamp, which is a much larger product relative to BioLite’s other product offerings, and therefore has significantly more embodied energy from raw materials. This increased BioLite’s per unit carbon intensity for 2014.

Lifecycle Analysis

Another approach to analyzing BioLite’s carbon footprint is to take a lifecycle analysis and compare the total amount of emissions that result from producing BioLite’s products vs. the total emissions saved by using these products. In order to do this, we first assume a baseline scenario in which BioLite customers did *not* purchase BioLite’s energy saving devices and continued with business as usual. In calculating the emissions saved by using BioLite products, we include only the usage of the HomeStove in emerging markets, since this is the product that is being used by low-income households on a daily basis, thus saving material quantities of greenhouse gas emissions. We conservatively assume that each HomeStove saves on average 2.5 tons CO₂e per year and that the stoves gradually break due to normal wear and



tear. These assumptions are consistent with our field experience with the HomeStove to date, as well as our laboratory testing. The above chart plots emissions released from all BioLite manufacturing during 2012-2014, combined with emissions savings resulting from the use of HomeStoves during 2014 through 2018 that were sold in 2014. As you can see from this chart, the results are overwhelmingly positive in terms of saving greenhouse gas emissions on a net basis.

Put another way, **for each ton of CO₂e released into the atmosphere from BioLite operations during the 2012-2014 period, we anticipate saving approximately 15.8 tons CO₂e by 2018 from the use of HomeStoves.** Furthermore, since the HomeStove was only sold during 2014 and a short period in 2013, and sales are expected to increase over time, we anticipate the net greenhouse gas savings to grow significantly.