PILOT STUDY
IMPACTS OF THE CRADLE TO CRADLE CERTIFIED PRODUCTS PROGRAM
Aveda Company Narrative
The study represents pilot research designed to contribute an initial evidence base for the Cradle to Cradle Certified™ Products Program and stimulate thought about how the making of things can be transitioned into a positive force for people, planet and profit. While the study is not intended to provide scientific verification or demonstrate causality, it does provide an initial indication of the very significant economic, environmental and social potential of the program. More granular research, considerate of a wider sample of companies, is needed to strengthen the pilot findings. The Pilot Study report series is available to download at www.c2ccertified.org/impact

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The Cradle to Cradle Products Innovation Institute is a non-profit organization, created to bring about a new industrial revolution that turns the making of things into a positive force for society, economy, and the planet. The Institute administers the publicly available Cradle to Cradle Certified Product Standard, currently in its third version, along with the Cradle to Cradle Certified Products Program to support it. It also audits the product assessments conducted by its Accredited Assessment Bodies, and issues the product certificates. The Institute is also responsible for selecting, training and accrediting these assessment bodies worldwide.

The Cradle to Cradle Certified Product Standard is a continuous improvement quality standard gifted to the Institute by William McDonough and Michael Braungart after eighteen years of development with the world’s leading brands. It guides the assessment of a product across five quality categories — material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. Qualifying products are awarded one of five levels of achievement — BASIC, BRONZE, SILVER, GOLD, or PLATINUM. Learn more.

Trucost Plc, a global environmental data and insight company, conducted the Pilot Study research and delivered the report.
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Economic growth has been accompanied by serious natural resource depletion and severe pollution impacts in recent decades. According to the Global Footprint Network, one and a half Earths are needed to support our current natural resource dependency and waste generation. And if current population and consumption trends continue, moderate United Nations estimates predict that we will need the equivalent of the resources of two Earths to support us by the 2030s.

The Cradle to Cradle Certified™ Product Standard was established to reverse unsustainable growth trajectories by transforming the way products are designed, what’s in them and where they go after use. Following Cradle to Cradle principles, products are designed from the outset to provide resource streams for new products at the end of their traditional use, or safely biodegrade into the environment – continually circulating as pure and viable nutrients that add value in the context in which they are used – and have as many positive benefits as possible. In this way, product manufacturing and product use become a positive force for people, planet and profit.

Because of these characteristics, Cradle to Cradle Certified products are aligned with and can demonstrate the benefits of the circular economy powered by Cradle to Cradle on a product-level and contribute to sparking the transition towards more circular systems.

The Cradle to Cradle Products Innovation Institute asked Trucost to quantify and assess the environmental, social and business impacts of its certification program across its five quality categories: material health, material reutilization, renewable energy and carbon management, water stewardship and social fairness. The Institute also engaged a panel of scientists from Oxford, Yale and Delft universities, as well as expert stakeholders, to validate the research methods and outcomes.

THE RESEARCH

Trucost carried out in-depth analysis of twenty products; ten certified to the Cradle to Cradle Certified Product Standard and ten baseline pre-certification or non-certified counterparts, with the aim of identifying and quantifying the actual environmental, social and business impacts – and actual added value – of the Cradle to Cradle Certified Products Program.

What emerged was a promising account of impact and value achieved by ten companies undertaking Cradle to Cradle Certified product certification.

Across the ten companies, the economic potential of Cradle to Cradle Certified™ product certification was evidenced through examples of higher than average sales performance, positive growth and increased profit margins, alongside significant cost savings related to water and energy efficiency improvements.

Environmental and social benefits were also evidenced through replacement of toxic and questionable ingredients by less toxic and defined alternatives, conservation of product materials in continuous product cycles, increased renewable energy use and improved energy and water effectiveness.

The study research provides an evidence base demonstrating the economic, environmental and social potential of the Cradle to Cradle Certified Products Program. It is not intended to provide scientific verification or demonstrate causality.
This case study details the findings of the analysis of a single Cradle to Cradle Certified product compared to a non-certified equivalent. The document is one of ten examples intended to support the Technical Report which provides more information on the framework developed and all findings of the pilot study across a range of products and companies. This document introduces the Aveda company narrative and product analysis of the Cradle to Cradle Certified GOLD Aveda Invati shampoo (with packaging certified at the SILVER level), compared to an earlier version of the same product. This identifies and describes impact improvements in the fields of business, society and the environment, related to Aveda’s pursuit of Cradle to Cradle Certified product certification.

An overview of the methodology is given on page 14 with a more detailed discussion of the approach available in the supporting Technical Report. The research findings (page 18) review work done by the company to optimize product performance across the five quality categories of material health, material reutilization, renewable energy and carbon management, water stewardship and social fairness, and its effect on business performance. Through product optimization, Aveda reduced impacts of the Invati shampoo across water consumption, energy requirements, and increased consumption of recycled material for packaging – increasing from 80% to 100% recycled content.
CRADLE TO CRADLE CERTIFIED PRODUCTS PROGRAM

The Cradle to Cradle Certified Product Standard is a multi-attribute, continuous improvement methodology that provides a pathway for companies to produce safe, recyclable and sustainable products. It is administered by the Cradle to Cradle Products Innovation Institute. The certification standard was launched in 2005, after many years of development by McDonough Braungart Design Chemistry, LLC (MBDC) in cooperation with EPEA Internationale Umweltforschung GmbH. Since the program began in 2005, nearly 200 companies worldwide have participated in the Cradle to Cradle Certified Products Program, with hundreds of product lines representing thousands of different products certified and millions of products sold. Companies include AGC Glass Europe, Herman Miller, Shaw Industries, Steelcase, Desso, Puma and Ecover.

The current standard is version 3.0, building on version 2.1.1 of the standard revised in 2010. It continues to be periodically revised to keep up with current research, data, and technologies. Subsequent revisions are public and will be informed by five expert advisory groups and public comment periods. The process is managed by the Institute’s independent Certification Standards Board (CSB) with input from consumers, manufacturers, NGO partners, and other interested stakeholders.

Full details of the certification can be found at http://c2ccertified.org/product_certification/c2ccertified_product_standard

Products are analyzed by Assessment Bodies that have been trained and accredited by the Institute. After auditing of this assessment, the Institute awards the product an overall score or level while encouraging continual improvement. Product certification is awarded at five levels (BASIC, BRONZE, SILVER, GOLD and PLATINUM), with the expectation that an applicant will optimize each aspect of their product over time. The ultimate goal is to encourage innovation and the design of products that effectively and positively impact people and the environment. Products are evaluated according to the requirements in five categories based on the Cradle to Cradle design principles.

THE FIVE PRODUCT STANDARD CATEGORIES

The five Cradle to Cradle Certified Product Standard categories are designed to provide a pathway to manufacturing safe and recyclable products for our world. The five categories are summarized overleaf:

1 http://www.c2ccertified.org/product_certification/revisions_to_the_standard
2 The Certification Standards Board (CSB) is an independent review panel, tasked with updating the standard and adjudicating appeals related to product certification http://www.c2ccertified.org/product_certification/certification_standards_board
3 For detail of the Accredited Assessment Bodies see http://www.c2ccertified.org/product_certification/accredited_assessment_bodies
THE PROGRAM

- **Material health**: Making products out of materials that are safe for humans and the environment
- **Material reutilization**: Designing products so all materials can return safely to nature or industry
- **Renewable energy and carbon management**: Assembling and manufacturing products with renewable energy
- **Water stewardship**: Making products in ways that protect and enrich water supplies
- **Social fairness**: Treating all the people involved in the product manufacturing
INTRODUCING THE CONCEPT OF ‘CAPITAL’

The Cradle to Cradle Certified Product Standard is a multi-attribute standard, so a holistic concept is needed to understand how it drives change in a company’s relationship with the environment, society and business. The concept of ‘capital’ is a useful starting point.

All companies depend on various forms of capital for their success. These capitals are stores of value that can, in one form or another, become inputs to a company’s business model or be affected by its outputs (such as emissions from product processing). They are increased, decreased or transformed through the activities of the company. There are six main types as defined by the International Integrated Reporting Council (IIRC), financial capital, manufactured capital, intellectual capital, human capital, social capital and natural capital.

Financial capital is broadly understood as the pool of funds available to an organization. This includes funds raised from both debt and equity finance.

Manufactured capital includes man-made physical objects (as opposed to natural physical assets) that are used in the production of goods or the provision of services.

Intellectual capital is defined by IIRC as knowledge-based intangible assets, in which they include tradable & private intellectual property such as patents, copyrights, software, etc. as well as “organizational capital” such as tacit knowledge, systems, procedures and protocols.

Human capital consists of the individual’s health and capabilities (knowledge, skills and experiences), as well as the motivation and capacity they have to enhance these capabilities.

Social or relationship capital is the relationships and networks together with shared norms, values, trust and understandings that facilitate co-operation within or among groups. Examples include the relationships found in families, communities, businesses, trade unions and voluntary organizations.

Natural capital is any stock of natural resources or environmental assets that provides a flow of useful goods or services now and in the future. This includes resources such as timber, fish, water and minerals, as well as ecosystem services from which humans benefit such as climate regulation.

In environmental economics literature, however, there are typically only four broad categories of capital - physical, human, social and natural capital. These two categorizations are in fact consistent. ‘Physical capital’ is the value stored in man-made assets, be they “financial” or “manufactured” or “intellectual”, as they are related: they are mostly privately owned, and one can be converted to the other through markets. ‘Human capital’ includes the intellect and knowledge of humans – it resides in human minds. When owned by businesses in the form of patents, copyrights, and software it can also be classified as physical capital. ‘Social capital’ resides in human relationships at various levels, enabling social interaction and reducing transaction costs: without social capital, normal business would become impossible to conduct. ‘Natural capital’ is made by nature, not man, and includes all valued supplies of goods, services and embedded intellectual property (used in bio-mimicry) emanating from all levels of biodiversity – ecosystems, species and genes.

Together these capitals are the basis of a company’s value creation. They also underpin the quality of human well-being. Natural capital, for example, underlines the need to maintain stocks of our natural assets such as rainforests, grasslands, wetlands, and mangroves. These provide flows of
services that benefit society, such as clean air, fresh water, climate regulation, crop pollination and protection from natural hazards. Similarly, financial capital when invested and distributed fairly allows for the creation of jobs and goods and services that ultimately benefit humans. These capitals are also interrelated and can influence each other directly and indirectly.

At present the stocks of natural, human and social capital are not recognized on a company’s balance sheet and are seldom the subject of management attention, and as such are being degraded or lost. In recent years, for example, growth in financial capital has often come at the expense of serious natural resource depletion and pollution impacts, representing costs to natural capital (sub-soil assets as well as wilderness of many kinds) and human capital (human health). The impacts of this imbalance are increasingly being felt on society and business through increased healthcare costs, increased volatility in the price of raw materials and intensifying ‘polluter pays’ regulations, to name but a few.

**SUMMARY OF THE CONCEPTUAL FRAMEWORK**

To capture the impacts of Cradle to Cradle Certified product certification, a conceptual framework was developed to highlight the impact areas that are affected through product optimization. Eco-effective products are considered to provide ‘more good’, delivering benefit to human well-being. Underpinning the conceptual framework is the principle that the manufacture of eco-effective products demands the maintenance and enhancement of all forms of capital upon which companies and their products rely. The five Cradle to Cradle Certified Product Standard categories drive change in companies by encouraging them to improve environment, social and business performance to enhance and protect all forms of capital (for more detail on the framework and methodologies, see the Technical Report).

To illustrate an example: let us consider the Cradle to Cradle Certified program’s material health category, which encourages companies to quantify and understand their product material composition, identifying ingredients as biological or technical nutrients, and removing hazardous chemicals, while replacing with optimized ‘good’ inputs. The adherence to this quality category motivates companies to improve understanding of their products through detailed scientific assessment and continuously work to improve them, through ongoing optimization. By reducing and ultimately eliminating toxicity, the natural capital stock of clean air and water is maintained, which itself has a positive indirect effect on human capital through improved health.

The figure overleaf outlines the conceptual framework.
FIGURE 1: THE CONCEPTUAL FRAMEWORK
COMPANY

Aveda is a beauty products company that manufactures skin care, cosmetics, perfumes and hair care products. Seven of Aveda’s products are Cradle to Cradle Certified, all falling within the hair care range. Six shampoo and conditioner products are certified to the GOLD level and a scalp revitalizer is certified at the SILVER level. The company first achieved certification in 2009 and was the first beauty company to become certified under the Cradle to Cradle Certified Products Program. The certification process has helped the company prioritize focus areas for sustainability initiatives.

THE PRODUCT

The product put forward for analysis is Aveda’s Invati Shampoo based on the study selection criteria4. This shampoo prevents hair breakage to yield thicker hair by way of densiplex® – a blend of ayurvedic herbs including turmeric and ginseng. The Invati shampoo is Cradle to Cradle Certified GOLD to v2.1.1 of the standard, although the shampoo itself achieves the PLATINUM level in the material reutilization and water stewardship categories. The shampoo’s packaging meets the SILVER level requirements on account of a lower score on the material health and material reutilization criteria. Aveda has developed a Re-Certification Optimization Strategy to assess any remaining undefined materials and optimize any problematic inputs. Invati shampoo will benefit, but the strategy is company-wide so all products are targeted for improvement.

FIGURE 2. INVATI SHAMPOO

The analysis focuses on the current Aveda Cradle to Cradle Certified Invati shampoo, in comparison to an earlier version of the product as it was when certified in 2008. No pre-certification product was available, as the shampoo was introduced to market as certified.

The analysis captures the operational differences over this period, and the optimization of packaging. The product composition is highly commercially sensitive, and could not be supplied. Supply chain impacts are therefore not possible to determine, and a comparison was not available. As an alternative

4 Selection criteria included ensuring product was certified at any level, had a well understood optimization process, and data was available for the product both before and after optimization.
approach, the continuous improvement of direct operations and the packaging optimization was investigated.

Since certification, no optimization of the product formula was required and the original formula met the GOLD level product standard requirements. As no optimization of formula occurred, there would be little difference in impacts associated with the supply chain of inputs expected between comparison products. The key optimization for the packaging was the increase in post-consumer recycled (PCR) HDPE content, and the impact of this on supply chain is addressed.

Due to data sensitivities, Trucost’s analysis was limited to only certain aspects of the product impacts. This is recognized as a limitation of the analysis, and therefore no estimation of percentage impact variation between comparison products is made as the reference is inconsistent.
This section defines the methodology used by Trucost to apply the conceptual framework to determine the impacts of certification across ten companies’ products. The section provides an overview of the methodology used to assess the environmental, social and business impacts associated with the Cradle to Cradle Certified Products Program. Detailed methodology is provided within the Technical Report which is available at www.c2ccertified.org/impact.

**APPROACH**

The impacts of product certification under the Cradle to Cradle Certified Products Program can be considered on several levels and across three impact fields: environmental, social and business. Environmental and social impacts may be apparent internally and externally, affecting both the company and third parties. Business impacts are directly linked to the company and operations and can be considered internal. Each of the three impact fields are given equal weighting for significance, though these will be approached in different manners. Figure 3 considers how the capitals feed into the three elements of human well-being.

An example given is the reutilization of materials. This reduces the dependency on natural capital as less resource is required. This includes not only material resource (such as wood, metal etc.) which is not required as recycled content is used in place of virgin, but also recycling often reduces the processing requirements required to convert raw material to product material (for example crude oil needs to be extracted then separated and processed into usable plastics for products – recycled plastic requires less processing to return the product material to a useable input material). This results in societal benefit through lower emissions and human health impacts due to manufacturing processes (the social cost of natural capital impacts). In turn, this impacts financial capital, directly related to business performance, through greater control of material inputs, less commodity dependency with associated price fluctuations and less external reliance on potentially scarce resource.
METHODOLOGY OVERVIEW

FIGURE 3: HOW CAPITALS FEED INTO HUMAN WELL-BEING

Environment: Reutilization of materials reduces natural capital dependency

Business: Availability and yield of natural capital, impacting commodity prices and security of resources

Society: Social costs of natural capital impacts

Environment: Use of safe and recyclable product inputs reduces detrimental impacts to water resources and emissions to air and land

Business: Improved corporate reputation and brand loyalty

Society: Avoided human health impacts

Society: Decoupled business models reduce negative impact on society due to lower environmental impacts

Business: Cost savings and greater financial stability through reduced natural capital dependency

Environment: Investment in sustainable production can lead to decoupling, financial growth and environmental impact

Business: Improved morale, via CSR programs, can improve productivity and shared knowledge

Environment: Improved training and CSR can reduce operational impacts on environment

Business: Improved collective behavior and social well-being

Society: Improved human health impacts

CRADLE TO CRADLE CERTIFIED PILOT STUDY: AVEDA ANALYSIS
Businesses operate within society, which is in turn contained within the environment. While these three aspects of human well-being can be considered separately, they are also interrelated as shown in figure 3. Each type of capital flows into these three aspects of well-being, and these are identified in examples given in figure 4. Not all impacts are detailed, however, this provides some context of how the capitals each apply to the individual fields.

Figure 4 below provides detail of the source of data and approach used to capture impacts across these different categories.

**FIGURE 4: ALIGNMENT OF QUALITY CATEGORIES**

Firstly, the individual impacts associated directly with the manufacture, use and end-of-use of a particular product are compared to the equivalent product before optimization for certification. The second consideration applies to the wider context of the benefit to the company of having one or more Cradle to Cradle Certified products.

Environmental, social and business drivers associated with each of the quality categories were identified, quantified and evaluated across product-use phases using a combination of quantitative and qualitative analysis.

The methodology is framed around four steps, given in figure 5.
Each step is considered in relation to the *Cradle to Cradle Certified* Product Standard quality categories and the three areas of environment, business and society in which the ultimate implications for human well-being exist.

The individual steps may be more or less significant for different scenarios, but are always appropriate to consider. Complex quantitative work may involve several steps within the impact assessment stage if numerous calculations are required, whereas qualitative information may be more directly understandable with less analytical processing required.

For the environmental impact analysis, interpretation includes the valuation of indicators. Valuation of environmental impacts estimates the value of natural goods and services in the absence of market prices to allow direct comparison with financial performance and appraisal of potential profit at risk. By applying valuation, the impacts are more aligned with the *Cradle to Cradle* philosophy, placing the impacts into context, for example by accounting for scarcity of water in the region it is consumed and the localized impacts of air pollution at the point at which it is emitted.

Valuations were derived from academic journals, government studies and established environmental economics techniques. The way in which these are applied depends on the environmental indicator. Greenhouse gases, for example, have the same impact wherever they are emitted. Values for other pollutants and water use depend on local biophysical and human geography, and so require a technique called benefit transfer to apply a value estimated in one location to another.

For the social and business evaluations, qualitative interviews were carried out to determine company trends and patterns that had been noted, but not evidenced through quantitative data. These took into account the staff and customer feedback, media responses and other anecdotal evidence of impact.
KEY FINDINGS

This report demonstrates the business, social and environmental benefits of the Cradle to Cradle Certified Product Standard for Aveda.

In 2012, Aveda achieved Cradle to Cradle Certified product certification at the GOLD level under version 2.1.1 of the standard for its Invati shampoo, with the packaging meeting SILVER level requirements.

Trucost analyzed the environmental, social and business impacts of a bottle of Invati shampoo, including the operational and packaging data, but excluding the supply chain impacts of the product itself, as the formula for this is considered too commercially sensitive.

A SILVER level product certified under Version 2.1.1 of the Cradle to Cradle Certified Product Standard is at least 95% defined by input material, down to 100 parts per million, with strategies in place to phase out any problematic chemicals. All materials have been characterized as either a part of the biological or technical cycle, with a material reutilization score of greater than 50 (see material reutilization below). Energy requirements for production have been characterized, with a strategy developed for using solar income for product manufacture. The GOLD level requires all lower level requirements to be met, as well as several more stringent criteria. For example, no problematic ‘x’ rated inputs can be contained within the product, and it must meet Cradle to Cradle Certified VOC emission standards.

The results show that the certified product is:

- 100% compostable and sourced from 100% renewable material (with packaging 100% recycled content and 96.8% recyclable content
- Packaged in 100% post-consumer recycled HDPE, an increase from 80% prior to optimization
- More water efficient to make, with a 6% reduction of water consumption, and a 9% reduction of cost to human well-being through both reduced consumption and smaller wastewater treatment impact costs than baseline product.

The actual formulation of Invati is unchanged, as the product met the GOLD level requirements for material health without any requirements of improvement. This reflects the high standard of sustainability ingrained within Aveda product development, but also suggests no ‘benefit’ of certification for optimization of this aspect, therefore focus is placed on other areas of certification and product phases such as direct operations, packaging and end-of-use. The supply chain impacts for HDPE used in packaging are considered.

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5 See ‘Material health’ section for greater detail on the Cradle to Cradle Certified Products Standard quality category requirements for material health
FIGURE 6: PRODUCT SCORECARD

The product and packaging were scored separately, with the packaging achieving an overall award level of SILVER, while the product itself achieves the higher level of GOLD.

MATERIAL REUTILIZATION

Products are designed either to biodegrade safely or be compostable as a biological nutrient or to be recycled into new products as a technical nutrient. At each level continued progress must be made towards increasing the recovery of materials and keeping them in continuous cycles.

Designing biodegradable or re-useable product materials, and ensuring effective systems for recovering those materials, protects diminishing natural resources by eliminating resource loss and disposal. It also avoids adverse health and other social impacts arising from landfill or incinerated waste disposal, and provides opportunities for business to re-use or re-market product materials at the end-of-use to generate new revenue streams and improve profitability.

The shampoo is designed for the biological nutrient cycle, sourced entirely from rapidly renewable content, and is 100% compostable at end-of-use, achieving the highest award level of PLATINUM for the product’s material reutilization. Packaging is made from 100% recycled high density polyethylene (HDPE), optimized from earlier composition of 80% recycled content (as shown in figure 7).
The packaging for Invati shampoo meets PLATINUM requirements for content, with a reutilization score of 96.8%, but further development of a recovery plan is required to achieve this overall.

Figure 8 shows the benefit to human well-being associated with the supply chain of the packaging material, before and after optimization. The most significant impact is associated with GHG emissions, which shows a 30% reduction when 100% HDPE is used. The figure also displays the cost to human well-being of virgin HDPE.

At end-of-use, the packaging is handled in the same manner regardless of recycled content, with consumers disposing of it to landfill, incineration (with or without energy recovery) or to be recycled. The proportional split for each pathway is based on sales data of Aveda’s parent company Estee Lauder.
with packaging disposal in Americas, Europe, Middle East and Africa (EMEA), and Asia Pacific.

No net benefit of optimization is seen at the end-of-use phase, but to reflect on the benefit that could be achieved were Aveda to promote increased take back of packaging, or work with the sector to do so, the difference in credit and burden of different pathways at end-of-use are given below in figure 9.

**FIGURE 9: END-OF-USE Pathways AVAILABLE FOR INVATI SHAMPOO PER 1KG OF PACKAGING**

Aveda has a history of working to optimize takeback where facilities do not exist, and has improved recycling in the caps of some other product lines.

"In 2008, we created a recycling chain for polypropylene caps, when curbside facilities did not exist. Since then, over 115 million caps have been collected and remade into post-consumer polypropylene resin, from which Aveda makes the caps for our professional hair color line". Dominique Conseil, Aveda Global President

**RENEWABLE ENERGY AND CARBON MANAGEMENT**

Cradle to Cradle envisions a future in which industry and commerce positively impact the energy supply, ecosystem balance, and community. This is a future powered by current solar income and built on circular material flows. The renewable energy and carbon management category is a combination of these core principles of Cradle to Cradle design. The category requirements at each level of certification build towards the expectation of carbon neutrality and powering all operations with 100% renewable energy.

Renewable energy provides a myriad of environmental and social benefits, including avoided air pollution and climate change impacts, alongside decreased dependency on finite fossil fuel resources. It also provides business benefits from reduced risk exposure to volatile energy prices and intensifying ‘polluter pays’ regulatory costs.

The Invati shampoo achieved the GOLD level for renewable energy and carbon management. Aveda purchased wind power for 100% of its electricity for production of the product, and offset credits are sourced for the natural gas requirements onsite. The energy required per product unit has decreased between the baseline and certified products, from 88kWh to 67kWh per 1000 bottles. This, a reduction of almost 24%.
In both 2008 and 2012, the burden of non-renewable gas consumption was offset. The net value of energy consumption related impacts therefore equates to the cost of supply of renewable energy, and due to lower intensity in 2012, this shows a decrease from US$0.13 to US$0.10 per 1,000 bottles of Invati 200mL shampoo, a reduction of 24%.

Average energy costs for natural gas and electricity were determined for the USA. For every 1,000 bottles of Invati shampoo produced, energy supply was estimated to cost US$4.75 in 2008, compared to US$ 3.62 for the certified product in 2012 – this equates to a financial saving of US$1.13 per 1,000 bottles.

WATER STEWARDSHIP

*Processes are designed to regard water as a precious resource for all living things. At each level, progress is made towards cleaning up effluent and process-water to drinking water standards.*

Water conservation and protection provide vital social and environmental benefits including sustenance and climate regulation, as well as underpinning essential business inputs.

Aveda has variety of measures in place to conserve water and improve the quality of water discharges. To reduce water consumption, boilers and chillers are incorporated in a closed-loop system, toilets and urinal flows have been adjusted and automatic features added to toilets and sinks, and native species have been planted at the Blaine facility in addition to a new sprinkler system to reduce irrigation requirements. Storm water is retained to recharge the aquifer and to be used for irrigation.
Water use per bottle at Blaine decreased by 6% from 2008 to 2012. When considering the impact on human well-being from water impacts which factor in water scarcity, the water optimization is more apparent, as shown in figure 12.

FIGURE 12: IMPACT ON HUMAN WELL-BEING FROM WATER USE AND WASTEWATER, FOR 1,000 BOTTLES OF INVATI 200ML SHAMPOO, 2008 AND 2012

Data was limited to assess the difference in water quality fully. The combined impact associated with water use and wastewater discharge of direct operations at the Blaine manufacturing facility is reduced from US$9.4 to US$8.5 per 1,000 bottles of shampoo, a reduction of 9%.

Both water consumption and waste water have direct financial costs associated with them, and through optimization of water managements, operational costs to Aveda were reduced. Average water supply and
discharge costs\textsuperscript{6} were used to calculate the estimated cost saving offered to Aveda from improved practices. A total of 59\textcurrency{ per 1,000 bottles was saved per year.

\section*{SOCIAL FAIRNESS}

Company operations are designed to celebrate all people and natural systems and progress is made towards having a wholly beneficial impact on people and the planet.

Adhering to robust social fairness principles helps companies to provide healthy and safe working environments for employees and suppliers thereby maintaining a happy workforce, reducing sick days and improving performance. The Cradle to Cradle Certified Products Program inspires a best practice approach to social fairness that goes beyond simply avoiding human rights violations to supporting employees and suppliers in their everyday working and personal environments.

Trends in employee data can be seen in the publically available Earth and Community Care reports, though quantified data for the specific years of comparison was not included. However, Aveda are commended for the public reporting of its social impacts.

The company has many social projects and has a mission directly related to the social impacts of its products and operations.

"Our mission is to care for the world we live in, from the products we make, to the ways in which we give back to society". Dominique Conseil, Aveda Global President

As an example of Aveda’s social projects undertaken, the company selects ‘Earth Month’ partners each year – these are organizations that carry out work for the planet and people. Aveda then supports the selected partners, through both financial support, and awareness and fund raising through the Aveda salon and spa network. Recent projects have focused on water conservation, for example providing communities that lack access to wells and clean water with wells and other infrastructure.

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
Social Hotspots index risk & Community Infrastructure & Governance & Health and Safety & Human Rights & Labor rights \\
\hline
6 & 5 & 30 & 7 & 18 \\
\hline
\end{tabular}
\caption{SOCIAL HOTSPOTS SECTOR-REGION MAPPING}
\end{table}

Health and safety is apparent as the most significant risk for the sector-region. This is typical across all manufacturing (not elsewhere classified) in the USA according to the SHdb. The 5 risk categories are scored against a potential score of 100 per category, giving a total maximum risk of 500 for a sector region, with three categories scoring less than 10% risk.

The Aveda site is certified to MNSTAR, the Minnesota Occupational Safety and Health Administration (MNOSHA) Program, and is considered to be a responsible employer, limiting likeliness of health and safety issues in the workplace. MNSTAR recognizes worksites where managers and employees

\textsuperscript{6} Global Water Intelligence (2013) \textit{Water Tariff Survey} for 2012
work together to develop safety and health management systems that go beyond basic compliance with all applicable OSHA standards and result in immediate and long-term prevention of job-related injuries and illnesses.

Aveda also work with suppliers to improve social practice. As an example, one Indian supplier of organic ingredients for Invati, agreed to extensive due diligence on its business practices – including an audit of its social performance. Aveda also funded a community water system in neighboring region to the supplier that greatly improved community access to safe drinking water.

No social improvement was required through Cradle to Cradle Certified optimization and no improvement is attributed to the certification directly. This is considered to reflect the high ethical and social commitments of Aveda generally, distinguished by the desire to achieve Cradle to Cradle Certified continuous improvement.

Social fairness includes many qualitative trends and quantification is not appropriate for many of the benefits recognized through Cradle to Cradle Certified product certification. Monetization is applied to social costs of natural capital impacts, but not currently applied to social capital impacts, and future opportunity could exist in incorporating this for a single metric approach to quantification of certification impact.

MATERIAL HEALTH

Product ingredients are inventoried throughout the supply chain and evaluated for impact on human and environmental health according to the Material Health Assessment Methodology for the Cradle to Cradle Certified Product Standard⁷. The criteria at each level build towards the expectation of eliminating all toxic and unidentified chemicals and becoming nutrients for a safe, continuous cycle.

Toxic product materials contribute to irreversible environmental costs such as biodiversity loss and human health damage including cancer, endocrine or hormonal disturbances and respiratory diseases. They may also inhibit opportunities to recycle product materials at the end of their typical use leading to toxic waste costs to our land, oceans and biodiversity. Permanently removing toxic materials from products means safer materials for nature, human well-being and future product manufacturing.

The material health quality category gives a material health ‘rating’ to each material in the product, based upon robust analysis of toxicity including consideration of both the hazard and the risk associated with their relative routes of exposure during the intended (and likely unintended) use and end-of-use product phases. Other material specific factors are also included such as recyclability or biodegradability. A description of these ratings is given in table 2.

### TABLE 2: MATERIAL HEALTH RATING DESCRIPTION

<table>
<thead>
<tr>
<th>Material assessment ratings</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Green)</td>
<td>The material is ideal from a Cradle to Cradle perspective for the product in question.</td>
</tr>
<tr>
<td>B (Green)</td>
<td>The material largely supports Cradle to Cradle objectives for the product.</td>
</tr>
<tr>
<td>C (Yellow)</td>
<td>Moderately problematic properties of the material in terms of quality from a Cradle to Cradle perspective are traced back to the ingredient. The material is still acceptable for use.</td>
</tr>
<tr>
<td>X (Red)</td>
<td>Highly problematic properties of the material in terms of quality from a Cradle to Cradle perspective are traced back to the ingredient. The optimization of the product requires phasing out this ingredient or material.</td>
</tr>
<tr>
<td>Grey</td>
<td>This material cannot be fully assessed due to either lack of complete ingredient formulation, or lack of toxicological information for one or more ingredients.</td>
</tr>
<tr>
<td>Banned</td>
<td>This material contains one or more substances from the Banned list and cannot be used in a certified product.</td>
</tr>
</tbody>
</table>

No optimization of product composition was made, rather an optimization of percentage recycled content – which did not change the material health toxicity ranking of the material. The formula for the shampoo itself met the GOLD level requirements in the category of material health, while packaging met the SILVER level due to some problematic dyes which are currently still being optimized to phase out. Problematic chemicals are related to the inks used within the labels and printing. Aveda has developed a Cradle to Cradle Certified Re-Certification Optimization Strategy, in which to phase out all remaining problematic chemicals and ensure full evaluation of grey inputs.

Detailed analysis of the toxicity of chemical inputs is not included, due to sensitivity of data.

### BUSINESS IMPACTS

*Business impacts were assessed by the Pilot Study to provide important economic context to the research findings.*

Production at the site has increased by 14% in tonnage since 2008, suggesting positive market trends. Aveda has led the market with innovative, sustainable products.

“The history of Aveda is paved with innovation in high performance and sustainable products. Aveda innovations are meaningful to industry and the world because they demonstrate that product performance and sustainability are not mutually exclusive. They demonstrate that at Aveda, economic and social goals can be synergistic. And they demonstrate that we can change the world, by changing the way the world does business.” Dominique Conseil, Aveda Global President
A key benefit of certification for Aveda is the driver and support to optimize materials – for example, while they had already targeted use of post-consumer recycled material within its packaging, this is considered to have been driven further due to the *Cradle to Cradle Certified* process. Certification helped optimize recycled content from 80% to 100% in the Invati shampoo packaging. Aveda has a strong sustainability focus and markets itself as such. *Cradle to Cradle Certified* is considered an additional point of assurance for customers to promote its sustainable products.

Water and energy reductions were apparent across the comparison years. Based on the average electricity prices\(^8\) and water prices\(^9\) in the USA, a total cost saving of US$1.35 per 1,000 bottles of 200ml shampoo is estimated.

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8 Based on 2011 business energy tariff, from the Electricity Regulatory Authority of Vietnam (2014)


Aveda has been committed to the sustainability principles that underline Cradle to Cradle for many years, and as such the company’s practices have changed very little as a result of certification. The Invati shampoo did not require change of formula to meet Cradle to Cradle Certified SILVER level, reflecting the Cradle to Cradle principles ingrained in production prior to pursuit of certification.

The research identified that improvements apparent within direct operational practices include a 24% reduction in energy impacts, and 9% reduction of water impacts, though Cradle to Cradle Certified is one of several initiatives undertaken by Aveda to advance its environmental practice.

Aveda has been committed to the sustainability principles that underline Cradle to Cradle Certified, with its mission ‘to care for the world we live in’. While not the only initiative undertaken, the certification process was considered to help Aveda to focus on areas of importance.

When considering packaging alone, benefits were associated with the additional post-consumer recycled HDPE. Without optimization, Aveda achieved 80% post-consumer HDPE recycled content, but the Cradle to Cradle Certified Products Program helped drive this to 100%. The impact to human well-being associated with the supply chain of the packaging material, is improved by approximately 30% when 100% HDPE is used.

The Ellen MacArthur Foundation’s Towards the Circular Economy report estimates that the circular economy represents a net material cost saving opportunity of up to $630 billion a year at EU level. Through optimization steps to increase use of recycled material, and designing products for the biological cycle, while packaging them for the technical cycle, Aveda are progressing the transition towards a circular economy. Innovation in the company has been key, with the Invati a world first for 97% naturally derived solution for thinning hair.

“At Aveda, we strive to set an example for environmental leadership and responsibility. Not just in beauty, but around the world.” Dominique Conseil, Aveda Global President
ASSUMPTIONS AND DATA GAPS

Data gaps were apparent throughout the analysis, and therefore overall analysis is limited.

The most critical issue is due to commercial sensitivities surrounding product composition, resulting in no supply chain impacts being assessed outside of the packaging used to contain the shampoo. In terms of net benefit, this is acceptable as the shampoo was not optimized, however, percentage improvement in the context of the whole product impact is not possible.

- Assumed 1 bottle containing 200mL of shampoo weighs 20 grams\(^{10}\) (plastic only)
- Invati shampoo assumed to constitute 1% of total production at Blaine facility
- Density of shampoo assumed to be 2 g/mL
- Assumed 55% of energy use constitutes natural gas and 45% electricity based on typical energy in Pharmaceutical product manufacturing in USA\(^{11}\)
- Transport split by geographic sales of shampoo, and average transport distances used. Transport within Americas assumed 44% by truck, 43% by rail and 13% by inland waterway\(^{12}\)
- Assumed 7 grams of shampoo and 22.5 liters of water consumed per use\(^{13}\) and that no variation of use exists in differing regions.
- Assumed geographic split of disposal of packaging weights mirrors geographic sales (revenues) of Aveda parent company Estee Lauder based on 2008 and 2012 Annual Reports\(^{14}\)
- Assumed heating value of plastics equal to 30.79 MJ per kg\(^{15}\)
- Waste management in Americas: 20% recycling, 71% landfill, 10% incineration with energy recovery\(^{16}\)

Further work may benefit from developing detailed analysis of the product itself, to compare to that of a non-certified shampoo of equivalent function (Invati contributes to hair regrowth, and therefore specific inputs are required that would not be comparable to a generic shampoo).

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\(^{15}\) Ecoinvent (Version 3) [Database] Available at: http://www.ecoinvent.org/database/ecoinvent-version-3/

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