



# Environmental Responsibility Report

2015 Progress Report, Covering FY2014



Our micro-hydro project uses the natural drops in elevation along the Deschutes River to help power our Prineville, Oregon, data center.



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# Environmental Responsibility at Apple

Wastewater at our supplier facility in Dongguan, China, is treated and tested for reuse under the guidance of our Clean Water Program.



Our work is led by Lisa Jackson, Apple's Vice President of Environmental Initiatives, reporting directly to CEO Tim Cook. The Office of Environmental Initiatives works with teams across Apple to set strategy, engage stakeholders, and communicate progress. Our integrated approach means that decisions about environmental issues are reviewed at the highest levels of the company.

We strive to leave the world better than we found it, and that means considering everything we do—from the design of our products to the processes we use to make and recycle them. Our passion for innovation is also reflected in how we think about environmental responsibility. Our goal is to make not just the best products in the world, but the best products for the world.

Apple's 2015 Environmental Responsibility Report, covering fiscal year 2014, highlights the progress we've made. We have set three priorities where we believe Apple can make the most impact:

- Reduce our impact on climate change by using renewable energy sources and driving energy efficiency in our products.
- Conserve precious resources so we all can thrive.
- Pioneer the use of greener materials in our products and processes.

This report details how we are approaching each of these priorities and highlights some of our key accomplishments to date.

For starters, every one of our data centers is powered entirely by clean sources such as solar, wind, biogas fuel cells, micro-hydro power, and geothermal energy. So whenever you download a song from iTunes, install an app from the Mac App Store, or ask Siri a question, the energy Apple uses is provided by nature.

Of course, the cleanest energy is the energy you never use. That's why, thanks to innovations in energy efficiency, we've reduced the average total greenhouse gas emissions during the use phase of our products by 61 percent since 2008—helping reduce our customers' carbon footprints and electricity bills. And each one of our products far exceeds the strict energy efficiency guidelines set by ENERGY STAR.

By working with The Conservation Fund, we're permanently protecting more than 36,000 acres of working forest in the eastern United States. And we're working to ensure that our product packaging has a net-zero impact on the world's supply of sustainable virgin fiber.

We've led the industry in removing many harmful toxins from our products, such as PVC, brominated flame retardants, and phthalates. And we've designed iPhone 6, iPad Air 2, and MacBook to be beryllium-free. Many toxins are restricted not only in the products themselves but also in the manufacturing process, because we are committed to providing safe working conditions for the people who make, use, and recycle our products.

We now offer recycling programs in 99 percent of the countries where we sell our products and have diverted more than 508 million pounds of electronic waste from landfills since 2008. Every Apple Retail Store in the world will now take back Apple products for free and recycle them responsibly. We believe we must be accountable for every Apple product at every stage of its use.

We know we have a long way to go, and a lot of work ahead of us. We are committed to increasing openness in our work and welcome you to join us on our journey.



# Climate Change

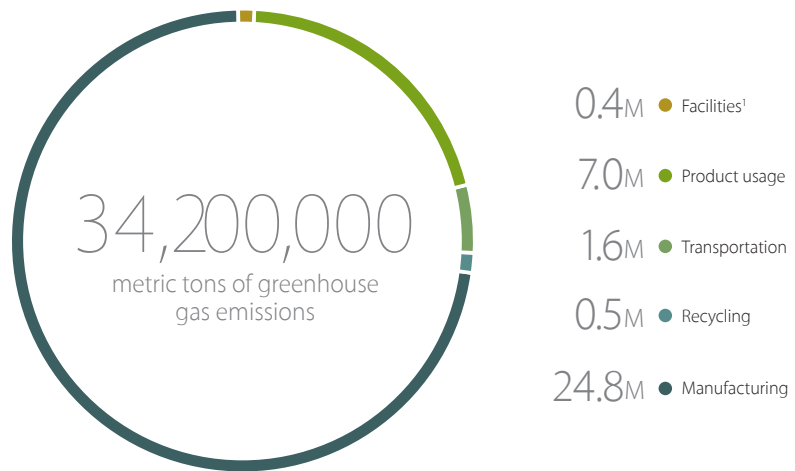
Our solar plant in Yerington, Nevada, generates up to 20 megawatts of renewable energy for our Reno data center.

We're proud to have signed the CERES Climate Declaration, which recognizes the business challenges and opportunities of fighting climate change. [www.ceres.org/declaration](http://www.ceres.org/declaration)

**We don't want to debate climate change. We want to stop it.** It takes an enormous amount of energy to design, assemble, and ship hundreds of millions of products all over the world. That energy makes up our carbon footprint and in turn, our share of the climate change problem. We've made real progress in reducing the impact of the things we control directly—our offices, retail stores, and products. But there's still a lot of work to be done to reduce the carbon footprint of our supply chain. And it's our responsibility to lead that effort.

## Why we measure our carbon footprint so rigorously.

We take a thorough approach to measuring and taking responsibility for our environmental impact. In fact, we know of no other company in our industry that goes so far in measuring, verifying, and disclosing its carbon emissions. Instead of reporting just the carbon footprint of the facilities we own, we also include the carbon footprint of our supply chain. And we don't use generalized industry-standard measurement models—we use a comprehensive product life cycle analysis that measures the carbon footprint throughout the entire life of our products, so everything is meticulously accounted for. That means adding up emissions generated from the manufacturing, transportation, use, and recycling of our products, as well as emissions generated by all our facilities. And while we're constantly improving, we're also constantly reporting—even when our numbers aren't as good as we'd like them to be.



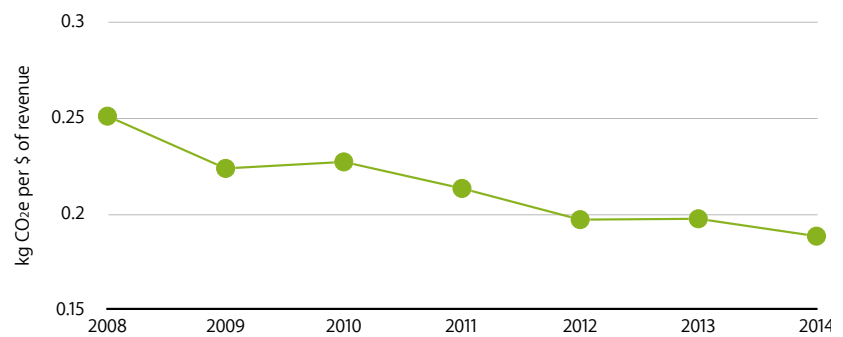


## How our carbon footprint informs our thinking.

We're always trying to improve the way we conduct our greenhouse gas life cycle analysis. And when our assessments reveal a material, process, or system that's making a significant negative impact on our carbon footprint, we reexamine how we design that product, process, or facility.

A significant factor in the increase of our overall carbon footprint from 2013 to 2014 is simply that we sold more products than ever before—iPhone, MacBook Pro, and MacBook Air in particular. Even though the quantity of the products we make is increasing, we are reducing the carbon intensity associated with making and using them. The ratio of carbon emissions to the revenue we generate—Apple's carbon efficiency—has dropped steadily every year since 2008.

### Apple's Carbon Efficiency



Looking at our overall carbon footprint, from 2013 to 2014, we saw a 7 percent decline in emissions associated with product use thanks to improved energy efficiency of our products. In the same period, there was a 5 percent increase in manufacturing emissions attributed to the production needs of increased memory and storage capacity of our iOS devices and notebooks.

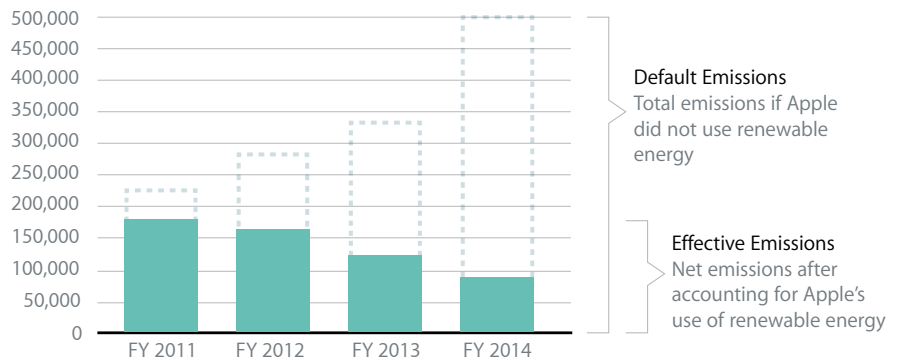
Our data shows that the carbon footprint of our manufacturing processes represents the largest portion of our impact on climate change. Every year we investigate more deeply into our supply chain, constantly analyzing inefficiencies and developing ways to help our suppliers make less of an impact on the planet. We've set an example with our own facilities around the world using clean, renewable energy. Our work in helping our suppliers do the same is just beginning, but we're making strides. And we're committed to reducing the environmental impact of our manufacturing.

## An energy-efficient facility is good, but a 100 percent renewable energy facility is better.

As of 2014, 100 percent of our U.S. operations and 87 percent of our operations worldwide are powered by renewable energy—which results in fewer carbon emissions. These worldwide operations include a lot of facilities—all our data centers; all our corporate offices, which house nearly 50,000 employees; and over 450 Apple Retail Stores around the world—but our goal is to power all of them with 100 percent renewable energy. So we're tapping into energy from solar, wind, micro-hydro, biogas fuel cells, and geothermal sources. We're designing new buildings and updating existing ones to use as little electricity as possible. And we're investing in our own Apple onsite energy production as well as establishing relationships with third-party energy suppliers to source renewable energy. For more details, read the Renewable Resources section of this report.

Our environmental commitment starts in the places where we work—from our corporate campuses to our data centers. Although our facilities now represent only 1 percent of our carbon footprint, they reflect our values, and we want them to act as models for others to follow. This is why we are constantly making our facilities more energy efficient and aggressively investing in renewable energy. In just three years, we've reduced our effective Scope 1 and 2 CO<sub>2</sub>e emissions by 48 percent, even while our overall energy consumption greatly increased.

### Scope 1 and 2 Effective Carbon Emissions (metric tons CO<sub>2</sub>e)



Scope 1 and Scope 2 CO<sub>2</sub>e emissions capture the emissions from our natural gas use and electricity use at our facilities—worldwide corporate offices, data centers, and retail—as well as our fleet vehicle fuel use. Detailed Scope 1, 2, and 3 emissions data is provided in Appendix C.

Our approach to renewable energy is based on three principles:

**Displacement.** We seek to displace more polluting forms of energy in the same electric grid region in which we operate—by putting into the grid an amount of renewable energy equal to the amount of energy taken from the grid by our facilities.

**Additionality.** We strive to create new clean energy that adds to the energy already being supplied to the grid. This generally means participating in renewable energy projects that would not have been built without Apple's involvement. And we make sure that the energy we count toward our goals is not counted toward the goals that utilities must already meet to comply with state standards, such as the Renewable Portfolio Standard.



**Accountability.** We apply rigor in measuring and tracking our energy supply resources, and use third-party registries such as WREGIS and NC-RETS, certification programs such as Green-e Energy, and contractual provisions to ensure that all renewable energy supplied to Apple is supplied only to Apple so there's no double-counting.

Where it's not feasible to create all our own energy, we fulfill the remaining needs with grid-purchased renewable energy, preferably delivered to our facilities or to the same electric grid in which our facilities are located. Here we have been exceptionally rigorous on two fronts: first, in ensuring that grid-purchased renewable energy be from newer projects, with the objective of providing investment incentives to local providers; and second, to secure renewable energy from the grid in the region in which we use it. In cases where we aren't able to purchase renewable energy in this way due to local regulations, Apple will purchase renewable energy credits, which we register and are careful to retire in certified tracking systems.<sup>2</sup>

## Our commitment starts at home.

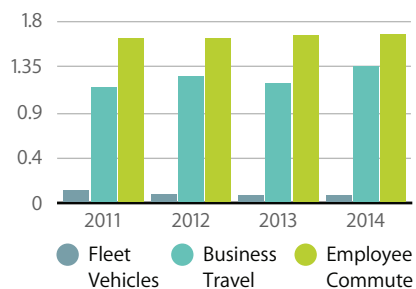
We've made energy efficiency and renewable power a priority in our current corporate campus in Cupertino. In 2012, we completed a major energy overhaul of our six Infinite Loop buildings, achieving a combined electric and natural gas savings of more than 30 percent at a time when occupancy increased by more than 12 percent. By applying similar equipment upgrades and control system improvements across the more than 100 buildings we occupy in Cupertino and the area, we have saved 34.4 million kilowatt-hours of electricity and 797,000 therms of natural gas over the past four years. Highlights of our energy efficiency program in California from 2014 include:

- Standardizing upon LED lighting for all Apple facilities undergoing new construction or major renovations, and selecting the most efficient fixtures and controls for each application
- Selecting high-efficiency HVAC and plumbing equipment, such as chillers, boilers, fans, pumps, water heaters, and packaged air conditioning units based on life cycle cost, and not first cost
- Optimizing new HVAC and lighting controls with strategies such as duct static pressure reset, supply air temperature reset, intelligent scheduling, and daylighting
- For existing buildings, troubleshooting outside air economizer operation, replacing old inefficient HVAC equipment with new, more efficient equipment, and optimizing HVAC and lighting control sequences for both operational and energy efficiencies

And in 2014, we began energy efficiency programs in our corporate and retail facilities throughout the rest of the United States, as well as in Europe and Asia.

Our Cupertino buildings are supplied by 100 percent clean, renewable energy. An onsite directed biogas fuel cell currently produces approximately 4 million kilowatt-hours of electricity annually, and rooftop solar systems on our Vallco Parkway, Homestead, and Alves cafeteria facilities collectively produce 1.3 million kilowatt-hours annually. To meet the balance of our load, we purchase clean power through California's Direct Access program and use the Green-e Energy program to certify that it's truly renewable.

**Emissions from Employee Travel**  
(metric tons CO<sub>2</sub>e/employee)



Absolute values for Scope 1 and Scope 3 emissions associated with employee travel are reported in Appendix C.

## We're lessening our impact when we commute or hit the road.

Apple is working hard to minimize the environmental impact of employee commutes, interoffice trips, and business travel. Apple's Commute Alternatives Program provides incentives and support for Apple employees to use alternative modes of transportation to commute to work and between offices. In 2014, more than 10,000 employees across our U.S. corporate offices and retail stores participated in our transit subsidy program, which offers up to \$100 per month for use of public transit. We also encourage ride sharing by providing a number of tools to connect employees, including commuter maps, suggestions for finding a good match, and volunteer Commute Experts who help advise new employees. In the Bay Area, more than 2700 Apple employees use our free, biodiesel-powered coach buses to commute to and from our corporate offices in Cupertino and Sunnyvale, California. Taking those cars off the road helped to avoid 8369 metric tons of CO<sub>2</sub>e emissions. To encourage electric vehicle use, we also offer our employees over 330 electric vehicle charging ports, at no cost, and are adding more to meet increased demand.

To get around while at work, our employees can use our Apple shared bike program, car-share vehicles, and intercampus shuttles. In 2014, employees took more than 110,312 trips on shared bikes, a 55 percent increase over 2013. By providing incentives for biking, using public transportation, and reducing the use of single-occupancy vehicles, our Commute Alternatives Program provided over 2 million trips.

To avoid employee travel when we can, we installed video conferencing equipment at all our major facilities around the world. And when employees must travel for business, we provide them with hybrid vehicle rentals where available. Apple employees drove more than 550,000 miles in hybrid rentals in 2014, as much as 2012 and 2013 combined, helping to avoid the use of 35,000 gallons of gasoline.

In 2014, Apple's total carbon emissions from employee commute, Apple fleet vehicles, and business travel were 275,000 metric tons of CO<sub>2</sub>e—a 16 percent increase from 2013, due primarily to increases in business travel and in the total number of employees working for Apple.

## We can make better products with cleaner practices.

Our dedication to an environmentally sustainable operation goes beyond our corporate offices and retail stores. We look for every opportunity to develop cleaner manufacturing processes that help us create not only great products, but also a better environment. We may not own our suppliers' facilities, but we do own their carbon footprint—72 percent of our total. And we'd like to see the same progress in our suppliers' use of clean energy that we've seen in our own.

For example, we worked with our supplier Flextronics to identify energy savings in the Austin, Texas, facility where they manufacture Mac Pro. Flextronics then shifted its entire Mac Pro operations to 100 percent renewable wind energy, purchased from the same local utility that provides our Austin campus with 100 percent renewable energy. And we're encouraging our other suppliers to follow Flextronics' lead and move toward clean energy.

We're also helping our suppliers in China pave the way for renewable energy. Our 40-megawatt solar project near Chengdu, designed to power our corporate offices and retail stores, is setting a precedent for large-scale renewable energy in China. By showing that green energy is a viable option in China, we hope to set a clear path for the companies there that manufacture our products.



## Energy efficiency is built in.

The energy consumed by our products during everyday use represents 21 percent of our carbon footprint. So we look at three ways to reduce a product's energy consumption: more efficient power supplies to bring electricity from the wall to the device, more efficient hardware, and smarter power management software.



The cost to charge the battery of an iPhone 6 once a day in the U.S. is 57¢ per year.<sup>3</sup>

M8

The M8 coprocessor measures motion data more efficiently for less recharging.



In idle mode, Mac Pro is 68 percent more power efficient than the previous generation.

2x

Mac Pro delivers up to 7 teraflops—more than twice the computing power of the previous generation—while consuming half as much energy at full power.



Mac mini is the world's most energy-efficient desktop computer.<sup>4</sup>

7x

Exceeds ENERGY STAR requirements by up to 7 times.

6w

Amount of energy used when idle.



38w

Power used in idle mode with the iMac display at full brightness.

97%

Power usage in sleep mode was reduced 97 percent compared with the first-generation 21.5-inch iMac.



The 21.5-inch iMac uses less energy than all other computers in its class.<sup>5</sup>

As a company that designs both the hardware and the software for its products, we're able to use that technological collaboration for greater energy efficiency. OS X, the Mac operating system, never misses a power-saving opportunity, no matter how small. It puts hard disks to sleep and runs processors in an ultralow power mode when you're not hard at work on your Mac. And when you are, OS X uses less energy for apps that are open but not visible, pauses animated website plug-ins until you give the OK, and can even idle the processor between keystrokes as you type. These energy savings might seem tiny, but when multiplied by every Apple computer in the world, they're huge.

A lot of the things that used to be done on a computer are now being done on an iPad or iPhone. Since these smaller devices use a lot less material and energy, their carbon footprint is much smaller than that of a computer. And as these devices become more and more advanced, their performance improves right along with their energy efficiency. For example, the A8 chip delivers up to 25 percent faster CPU performance and up to 50 percent faster graphics performance, yet it's 50 percent more energy efficient.

Thanks to improvements in energy efficiency, our products generate an average of 61 percent fewer greenhouse gas emissions during the use phase than in 2008. So even as we continue to grow faster than the rest of the industry, we're doing it with products that are friendlier to the environment.

**ENERGY STAR standards are just our starting point.**

Every Apple product not only meets but far exceeds the strict guidelines set by the U.S. Environmental Protection Agency for energy efficiency. No other company in our industry can make that claim. In fact, we go beyond the ENERGY STAR specification, offering notebooks that are up to five times as energy efficient as the ENERGY STAR specification and desktop computers that are up to seven times as energy efficient.<sup>6</sup>

**The EPEAT gold standard.**

The Electronic Product Environmental Assessment Tool (EPEAT) allows consumers to see the effect a product has on the environment. Each product receives a Gold, Silver, or Bronze rank depending on its efficiency and sustainability. Every Apple tablet, notebook, desktop computer, and display that EPEAT ranks achieves a Gold rating, the highest possible.



# Renewable Resources

Apple and The Conservation Fund are protecting more than 36,000 acres of working forests across the United States.



*Forests are essential to the future of our environmental health and economic vitality. It's crucial that we work together to protect them.*

**Evan Smith**  
VP, Conservation Ventures, The Conservation Fund in a Georgia forest protected by The Conservation Fund.

Some of the best technologies for preserving the environment are already here—sunlight, wind, and forests. These resources are naturally renewable and capable of providing energy and materials for a long time. We're committed to using forests responsibly so they're still here for future generations. And we're making real progress toward running all our facilities on 100 percent clean and renewable energy.

Forests give us so much. We need to return the favor.

Forests clean the air we breathe, protect the habitats of animals and plant life, and filter drinking water. They also provide wood fiber for the paper we use in our packaging. If protected and managed sustainably, forests can thrive, fulfilling their vital role in the ecosystem while still supplying the world's paper needs. But forests around the world are under threat from poor management, illegal logging, and aggressive land development. We need to protect this crucial resource and component of our ecosystem. Our goal is to ensure that our packaging has a net-zero impact on the world's supply of sustainable virgin fiber.

## **We're using paper more efficiently.**

The best way to preserve virgin paper is to use less of it. So we're designing our packaging to be smaller and to use more recycled paper, and we're developing technologies that use paper more efficiently. The packaging for iPhone 6 takes up 34 percent less volume than the first-generation iPhone packaging. And over two-thirds of the paper used for iPhone, iPad, iPod, Mac, and Apple TV packaging comes from recycled content.

## **We're sourcing virgin paper responsibly.**

When we do use virgin paper in our product packaging, we're continually working to ensure that it comes only from sustainably managed forests and controlled wood sources. Our sustainable fiber specification requires that when our suppliers use virgin fibers, they source only from forests that are certified as sustainably and responsibly managed or from controlled wood sources. In fiscal year 2014, over 80 percent of the paper and corrugated cardboard used in our iPhone, iPad, iPod, Mac, and Apple TV packaging came from certified sustainably managed forests, controlled wood sources, or recycled materials. We will not stop until 100 percent of the fibers we use meet these standards.

## **We're protecting sustainable forests.**

We are committed to protecting—and creating—as much sustainable working forest as is needed to produce the paper in our product packaging.<sup>7</sup> Through our work with The Conservation Fund, we're permanently protecting more than 36,000 acres of working forest in the eastern United States. The collective annual production from these forests is equivalent to nearly half of the virgin fiber used for iPhone, iPad, iPod, Mac, and Apple TV packaging in fiscal year 2014.<sup>8</sup>

## Clean, renewable energy is our standard, everywhere.

Our goal is to power all our corporate facilities around the world as we do all our data centers—with 100 percent renewable energy. And we're not content with just purchasing clean energy from existing sources. Whenever possible, we go even further by creating new sources that add clean energy to the grid. For example, we've partnered with First Solar to create a solar project in Monterey County, California. When it comes online in 2016, this 2900-acre facility will generate 130 megawatts of clean energy—enough to power Apple Campus 2, all our other California offices, all 52 retail stores in California, and our data center in Newark, California.

Our commitment to renewable energy also extends beyond our home in California. In China, we're undertaking a ground-breaking renewable energy partnership with SunPower, Tianjin Zhonghuan Semiconductor, and other companies to build a renewable solar energy project in Sichuan Province. It will generate up to 80 million kilowatt-hours per year of clean energy—far more than the energy used by all our offices and retail stores in China combined. This project is being developed to complement the natural environment, paying special attention to preserving the grasses that feed the indigenous yak population.

### How We're Achieving Net Zero Energy



#### Energy Efficiency

An important first step in managing electricity is to ensure our facilities use as little as possible, which is why we designed them for maximum energy efficiency.

#### Energy Generation

Where feasible, we're producing our own renewable energy by building our own solar arrays, biogas fuel cells, and micro-hydro generation systems.

#### Purchasing Renewable Energy

Where we can't produce our own, we purchase renewable energy, investing in local, newer projects to ensure additional development that is sustainable. And we are careful to retire all renewable energy credits in verified tracking systems.

## 100 percent of our data centers run on 100 percent renewable energy.

Since 2012, all our data centers have been powered by 100 percent renewable energy sources. That means no matter how much data they handle, there is a zero greenhouse gas impact on the environment from their energy use. These data centers use renewable energy sources like solar, wind, biogas fuel cells, micro-hydro power, and geothermal power from onsite and locally obtained resources. On any given day, our data centers will use renewable energy to serve tens of billions of messages, more than a billion photos, and tens of millions of FaceTime video calls. They also run services like Siri, the iTunes Store, the App Store, and Maps. So every time a song is downloaded from iTunes, an app is installed from the Mac App Store, or a book is downloaded from iBooks, the energy Apple uses is provided by nature.





### Maiden, North Carolina

Our Maiden, North Carolina, data center has earned the LEED Platinum certification from the U.S. Green Building Council—the first data center of its size to be so honored. On any given day, between 60 and 100 percent of the energy it uses is generated onsite through our biogas fuel cells and two 20-megawatt solar arrays—the nation’s largest privately owned renewable energy installation. It generates 167 million kilowatt-hours of renewable energy per year, enough to power the equivalent of 12,700 North Carolina homes. And we’ll finish another 17-megawatt solar array, capable of producing 39 million kilowatt-hours per year, later in 2015. We purchase any remaining power we need from entirely clean sources located within North Carolina.

Maiden, North Carolina			
100% renewable since opening June 2010			
Duke Energy Carolinas Default Grid Mix		Apple Actual Renewable Energy Use	
Nuclear	51%	PV1	19%
Coal	38%	PV2	20%
Other	11%	Fuel Cells	37%
Renewable	<1%	NC GreenPower	24%
2014 Emissions (metric tons CO <sub>2</sub> e/year)			
Default Grid Emissions	92,306	Apple’s Effective Emissions	0
<i>Duke Energy Carolinas: 2014 Statistical Supplement generation data</i>			
<i>Apple Energy: Actual fiscal 2014 energy data</i>			



### Prineville, Oregon

At our data center in Prineville, Oregon, we built a micro-hydro system that harnesses the power of water that’s been flowing through local irrigation canals for over 60 years. Located about 25 miles west of our data center, these micro-hydro projects will generate 12 million kilowatt-hours of clean, renewable energy a year. To supplement this micro-hydro generation, we’re able to directly access enough local wind energy to power the entire data center.

Prineville, Oregon			
100% renewable since opening May 2012			
Pacific Power Default Grid Mix		Apple Actual Renewable Energy Use	
Coal	65%	Oregon Wind	99%
Natural Gas	13%	Utility Green	1%
Other	13%	Micro-Hydro (to come)	
Renewable	9%		
2014 Emissions (metric tons CO <sub>2</sub> e/year)			
Default Grid Emissions	10,393	Apple’s Effective Emissions	0
<i>Pacific Power: www.oregon.gov/energy/pages/oregons_electric_power_mix.aspx</i>			
<i>Apple Energy: Actual fiscal 2014 energy data</i>			



Geothermal Power + Solar Arrays

### Reno, Nevada

Our Reno, Nevada, data center follows in the footsteps of our 100 percent renewable energy centers in Maiden and Prineville. We worked with the local utility to codevelop a 20-megawatt solar array using C7 solar panels, a new kind of photovoltaic panel with curved mirrors that concentrates sunlight. This type of solar panel is well-suited to the region's bright, sunny skies. The solar array has an annual production capacity of over 43 million kilowatt-hours of clean, renewable energy. When additional energy is needed, we use local geothermal energy purchased from the utility or other solar resources.

Reno, Nevada			
100% renewable since opening December 2012			
NV Energy—North Default Grid Mix		Apple Actual Renewable Energy Use	
Natural Gas	48%	Local Geothermal	100%
Coal	36%	(PV Forthcoming)	
Other	5%		
Renewable	11%		
2014 Emissions (metric tons CO <sub>2</sub> e/year)			
Default Grid Emissions	7,344	Apple's Effective Emissions	0
<small>NV Energy: <a href="http://www.nvenergy.com/bill_inserts/2015/Power-Content-North_2015-01_web.pdf">www.nvenergy.com/bill_inserts/2015/Power-Content-North_2015-01_web.pdf</a>            Apple Energy: Actual fiscal 2014 energy data</small>			



Wind Power

### Newark, California

Our data center in Newark, California, is powered by 100 percent renewable energy. We hit this milestone in January 2013, when we began serving the data center with energy sourced primarily from California wind power. We're acquiring this energy directly from the wholesale market through California's Direct Access program. Late next year, when our 130-megawatt solar project in Monterey County, California, comes online, we'll use Direct Access to supply power from that project directly to our data center.

Newark, California			
100% renewable since January 2013			
Pacific Gas & Electric Default Grid Mix		Apple Actual Renewable Energy Use	
Natural Gas	28%	Bundled Grid	61%
Nuclear	22%	(mostly wind)	
Other	28%	Grid (mostly wind)	39%
Renewable	22%		
2014 Emissions (metric tons CO <sub>2</sub> e/year)			
Default Grid Emissions	38,278	Apple's Effective Emissions	0
<small>PG&amp;E: <a href="http://www.pgecurrents.com/2015/01/30/pge-cuts-carbon-emissions-with-clean-energy/">www.pgecurrents.com/2015/01/30/pge-cuts-carbon-emissions-with-clean-energy/</a>            Apple Energy: Actual fiscal 2014 energy data</small>			



Solar Arrays

### **Mesa, Arizona**

Our Mesa data center will harness Arizona's abundant sunlight to supply 100 percent renewable energy to our new data and global command center. When the facility is fully operational in 2016, it will harness up to 70 megawatts of solar power to provide clean energy to the center.



Wind Power

### **Athenry, Ireland**

Our data center in County Galway, Ireland, will be built on recovered land that was previously used for commercial lumber. When it opens in 2017, the data center will run on 100 percent clean, renewable energy, and it will provide an outdoor education space for local schools and a walking trail for the community.



Wind Power

### **Viborg, Denmark**

In 2017, we'll open a new data center running on 100 percent renewable energy in Denmark's central Jutland region. Due to its proximity to one of Denmark's largest electrical substations, the data center won't require any additional generators. The facility is also designed to capture excess heat from its equipment and then conduct it into the district heating system to help warm homes in the community.

### **Our collocated facilities**

The vast majority of our online services are provided by our own data centers. We also use third-party colocation facilities for additional data center capacity. While Apple doesn't own these shared facilities and uses only a portion of their total capacity, we include them in our renewable energy goals. And we are working with these providers to ensure that our share of the energy is provided in the cleanest way possible. Over 80 percent of our power for collocated facilities is matched with renewable energy generated within the same state for facilities in the United States, or within the same country for those around the world. And we will keep working with the collocated suppliers to get to 100 percent.



## We're closer to powering 100 percent of our Apple Retail Stores with 100 percent renewable energy.

A key part of our fight against climate change is powering our facilities with renewable energy. We already hit a major milestone in 2014: 100 percent of the energy used by our U.S. operations—all corporate offices, retail stores, and data centers—was renewable energy. Now we've turned our focus to our more than 450 Apple Retail Stores across the world.

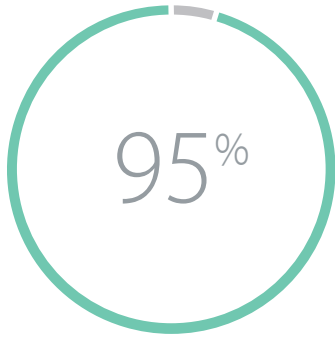


**The Apple Store, Stanford, one of 265 U.S. Apple Retail Stores powered by 100 percent renewable energy.**

Reaching our goal of 100 percent renewable energy-powered Apple Retail Stores worldwide presents some unique challenges. In many cases, an Apple Retail Store's electric meter is in a landlord's name, not ours. And many states and countries don't offer the ability to directly purchase renewable energy, especially for small electricity loads like our retail stores. Despite these challenges, we're already running more than 360 of our Apple Retail Stores worldwide on 100 percent renewable energy. This includes all 265 of our Apple Retail Stores in the United States, all 38 in the United Kingdom, all 14 in Germany, all 21 in Australia, all 15 in Italy, and all 11 in Spain.

For many of our retail stores, we purchase renewable energy from third-party providers. Where local regulations don't allow us to do so, we participate in utility green tariff programs, collaborate with landlords to purchase renewable energy on our behalf, or procure renewable energy certificates that meet demanding verification standards. And wherever possible, we source these renewables locally.

We won't stop until every Apple Retail Store is powered by 100 percent renewable energy. And with initiatives like our solar project that will support all our Apple Retail Stores in China, we're even closer to that goal.



We're recycling over 95 percent of the material from the existing buildings for use in our new headquarters.

## Our new home will be green from the ground up.

Like everything we build, our new Apple campus in Cupertino pushes the boundaries of technology—it will be the most energy-efficient building of its kind. Powered by 100 percent renewable energy, the campus goes beyond showing respect for the environment to forming a partnership with it. Air flows freely between the inside and outside of the building, providing natural ventilation for 75 percent of the year. And sunlight powers one of the largest onsite corporate solar energy installations in the world.

The City of Cupertino requires that construction sites recycle or reuse a minimum of 75 percent of materials demolished from previous structures. For the construction of Apple Campus 2, we're going above and beyond that requirement, recycling or reusing over 95 percent of the demolition materials onsite. We're finding ways to repurpose virtually every wall, window, and pipe rather than hauling them off to landfills.

The building itself is only part of the story. Just under 80 percent of the site will be open space, populated by more than 7000 trees, which includes more than 6000 newly planted shade and fruit trees. Drought-tolerant plants will be used throughout the landscape to minimize water use.



**Apple Campus 2 will use 30 percent less energy than a typical R&D office building.**

Getting to and from the new campus will be greener, too. We're expanding our commute alternatives program by 20 percent. This means that over a third of our nearly 15,000 employees in Cupertino can commute to the new campus using our biofuel buses, public transit, bicycles, carpools, and their own two feet. And for drivers, we'll have over 300 electric vehicle charging stations.

The new campus is being built from the ground up to meet the highest environmental standards set by LEED, an internationally recognized green building rating system. When completed, Apple Campus 2 will be an ever-present reminder of our commitment to sustainability and an example of what every corporate campus can be.



# Finite Resources

Aluminum purification at one of our suppliers in Taiwan.

We're conscious of how we use resources that may not be around forever. So we're designing products that use fewer materials than ever before. We've come up with innovative ways to minimize the environmental impact of our raw materials by using more recycled, recyclable, and sustainable plant-based materials. And we're striving to reuse as much water as we can when manufacturing our products, and in the data centers that help those products and services work.

## Making the most of our materials.

Over the past decade, Apple designers and engineers have continued to pioneer new ways to build our products with less material. Manufacturing innovations such as unibody construction have allowed products like iPad, MacBook, MacBook Pro, and MacBook Air to become thinner while being even more resilient. Today's Mac Pro uses 74 percent less aluminum and steel than the previous design. The newest 21.5-inch iMac is made with 68 percent less material than the first iMac, and the new MacBook uses 32 percent less aluminum than the first-generation MacBook Air.



74%

Amount of aluminum and steel Mac Pro saves compared with its predecessor.

30%

Amount of post-consumer recycled plastic in Mac Pro speakers.



39%

Amount of material iPad Air 2 saves, by weight, compared with the first iPad.

30%

Amount of post-consumer recycled plastic in iPad Air 2.



32%

Amount of material MacBook saves, by weight, compared with the original MacBook Air.

67%

Amount of bio-based content in the butterfly mechanism of the MacBook keyboard.

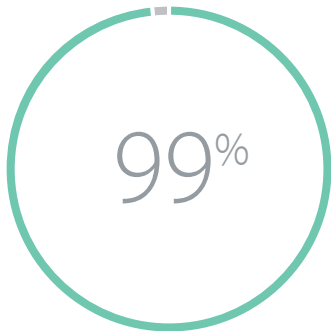


## Designed for durability.

Smaller and lighter products are easier on the environment, but sometimes the environment isn't easy on them. So we design everything from our largest displays to our smallest cables to be durable and long-lasting. And we test them in our own Reliability Testing Lab.

You don't have to buy a new Apple product to have one that feels new. We make it easy to update to new versions of apps, software, and entire operating systems—OS X Yosemite works on Mac computers made as far back as 2007—so you'll have a new experience without buying a new device. Our built-in notebook batteries are designed to last up to five years, which saves on buying new batteries, produces less waste, and increases the lifespan of your notebook.

And when Apple product owners pass along their devices to friends or family, they're conserving resources, too. The mark of a great product isn't just how many you sell, but how much it's used.



We've set up recycling programs in 99 percent of the countries where we sell our products.

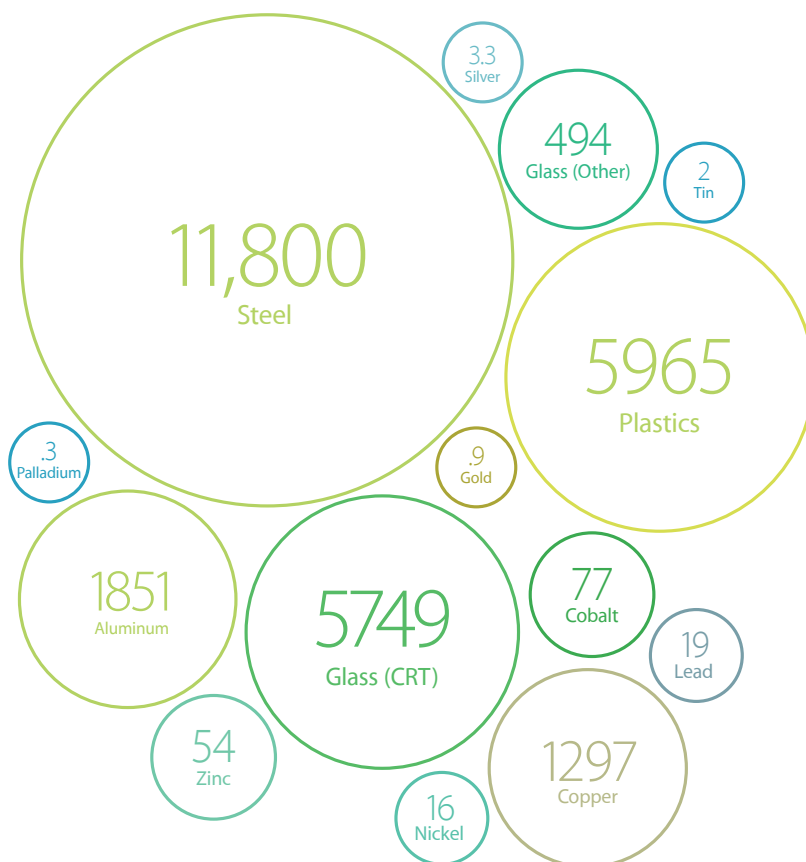
## Our commitment to recycling.

If not recycled properly, electronic waste can be a serious health and environmental issue. To make a quick profit, unethical recyclers sometimes dump e-waste or use dangerous techniques that can leak toxins and harm the environment. That's why we're committed to helping people recycle responsibly. Every Apple Retail Store in the world accepts Apple products for responsible recycling. Our Reuse and Recycling Program also allows customers in several countries to bring in their older devices in exchange for credit toward a new model. We've set up recycling programs—such as providing free shipping on e-waste returns and organizing collection events and ongoing take-back programs with governments and universities—in 99 percent of the countries where we sell our products. Since 1994, we have diverted more than 508 million pounds of equipment from landfills.



Apple employees conduct an audit at our partner recycling center in France, ensuring materials collected are handled properly.

## Amount of material recovered for reuse in 2014 in metric tons



In 2010, we set out to achieve a worldwide recycling collection rate of 70 percent of the total weight of the products we sold seven years earlier. Since then, we have consistently reached 85 percent. In 2014, we collected 40,396 metric tons of e-waste through our take-back programs. That's more than 75 percent of the total weight of the products we sold seven years earlier, and significantly more than others in the industry typically report.

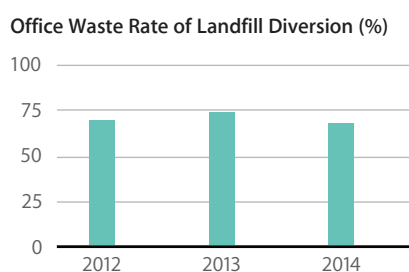
We wanted to better understand the impact of these programs throughout the entire recycling chain, so we worked with e-waste experts to calculate how our recycling programs break down into raw materials: how much aluminum, steel, and other materials from the waste we collect was recovered for reuse instead of mining more virgin material. The remaining amount of waste was processed and managed to minimize environmental impact.

Materials like aluminum, steel, copper, gold, silver, and palladium need to be mined from the earth and processed, which requires extensive land use and generates greenhouse gasses and other emissions. By recycling these materials, we can prevent a significant amount of these impacts. For example, we recovered enough steel in 2014 that the equivalent could be used to build over 100 miles of railroad track. And we are continually investing in new ways to better reuse these materials and recover other rare elements.

## Keep recycling local.

All electronic waste we collect worldwide is processed in the region where it's collected—nothing is shipped overseas for disposal. The vast majority of our recycling is handled in-region, so we can make sure our recycled materials are not being dumped unsafely in developing countries—a common problem in our industry. This also helps us keep our transportation-related greenhouse gas emissions low. We currently work with 140 partners around the globe whose facilities are rigorously evaluated annually on health and safety, environmental compliance, material tracking, social responsibility, and other Apple mandates.

## There are better things to do with waste than put it in a landfill.



Waste, recycling, and compost data is for all Apple facilities, including Apple Retail Stores.

We've created robust recycling and composting programs to minimize the environmental impact of the waste we produce in our corporate facilities. Our rate of landfill diversion at our corporate offices and retail stores remains high, despite a decrease to 68 percent, from 74 percent in 2013. We are currently undertaking a detailed waste audit of our facilities to identify opportunities for improvement.

Our multiuse facility in Cork, Ireland, has set the standard for our supply chain by receiving the first UL Zero Waste to Landfill validation outside North America. The location handles both corporate and manufacturing operations, and none of its 13,400 metric tons of annual waste is sent to landfills. The portion of waste the Cork facility sends to be incinerated and used for energy is just 3 percent, which is far below the maximum 10 percent allowed for Zero Waste to Landfill validation.

The Cork facility achieved Zero Waste to Landfill validation through a number of efforts. In the factory, the same packaging in which we receive iMac components is reused to ship iMac to customers. And all cardboard, foam packaging, plastic trays, electrical cables, and pallets are recycled. Even the cooking oil from the campus cafeteria is recovered to produce biodiesel fuel.

Apple responsibly manages the small amount of hazardous waste that we produce (mostly from research and development). We ensure that any materials that may create risks to the environment are treated and disposed of properly. In 2014, the total amount of solid waste created by Apple facilities was 4200 metric tons, and the total amount of hazardous waste generated was 230 metric tons.

## When we buy on behalf of Apple, we think green.

Apple prioritizes the use of environmentally friendly products and services in our operations. More than 98 percent of our U.S. office consumables contain post-consumer recycled content. The standard office chair contains up to 51 percent recycled content and is up to 95 percent recyclable, achieving a GreenGuard Gold Certification. The janitorial supplies we procure include 100 percent recycled paper products. And the majority of the food served in our Cupertino-area employee cafeterias comes from sources within 100 miles.



## Everyone should have water to use and reuse.

Water is the world's most precious resource. So we continue to look for ways to reduce water consumption during manufacturing, cooling, landscaping, and sanitation.

To meet the water needs of our offices, data centers, and retail stores across the world, Apple used 494 million gallons of water in 2014, which represented a 15 percent increase from 2013. This increase is driven primarily by cooling needs at our data centers, and we are focusing our water usage reduction efforts on these facilities. Our Maiden, North Carolina, data center employs an innovative cooling system that reuses water 35 times, resulting in a 20 percent reduction in overall water consumption at the data center. We are also building our newer data centers in locations that can rely heavily on outdoor air for cooling.

At our facilities that receive less dependable rainfall, we installed sophisticated irrigation systems that monitor local weather conditions and soil moisture, which led to a 40 percent reduction in landscape watering. At some facilities, we've achieved further reductions thanks to drought-tolerant landscaping and drip irrigation.

In 2014, we made a number of water improvements at our Cupertino headquarters, including a significant renovation of the landscaping on our Infinite Loop campus. There, we completed our conversion from inefficient overhead spray irrigation to sub-surface drip irrigation and surface bubblers, which conserves much more water. Across our Santa Clara Valley campuses, we planted more than 700 drought-tolerant trees. We also converted 2905 square feet of asphalt to permeable landscape, improving ground water recharge for natural aquifers in the area.

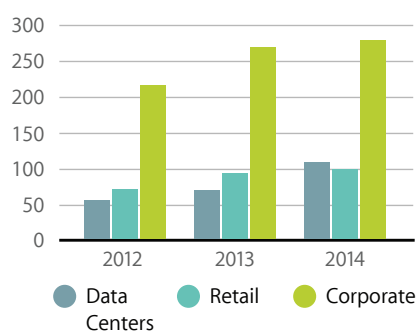
Overall, we converted over 130,000 square feet of landscaping to be better suited to our climate and to use less water. These efforts translate to an estimated water savings of 2.3 million gallons of water per year—about 5 percent yearly.

In 2014, a study of our facility water usage revealed that the industry-standard methods we were using over-estimated our water usage. Using our more accurate methodology, we reran our 2013 numbers and found that our 2013 water usage was 430 million gallons—much less than the 608 million gallons originally estimated.

To make sure our suppliers are also part of our water conservation efforts, we've established the Clean Water Program. This initiative helps reduce water use, promote water recycling and reuse, and prevent illegal water pollution within our supply chain.

The Clean Water Program has already proved successful at several of our supplier sites, including Dongguan Meadville Circuits (DMC), located in China's Guangdong Province. In September 2013, DMC had a nearly 12 percent wastewater reuse rate. After enrolling in the Clean Water Program and working with our experts, DMC's wastewater reuse rate climbed to approximately 61 percent by the end of 2014. Learn more about our Clean Water Program in Apple's 2014 Supplier Responsibility Report, available at [www.apple.com/supplier-responsibility](http://www.apple.com/supplier-responsibility).

Water Use by Facility Type (million gallons)





# Toxins

A worker in Shanghai, China, assembles an iPhone 5c, which is free of BFRs, PVC, and other harmful toxins.

We continue to lead the industry in reducing or eliminating harmful toxic substances to keep both people and the environment healthy. We've removed many harmful substances from our products, and we go to great lengths to make sure they stay that way. And our suppliers must adhere to our Regulated Substances Specification, which goes beyond the minimum required by law.

No product should be hazardous to your health.  
Or anyone else's.

### **Better for the environment.**

Good manufacturing processes and responsible recycling minimize toxins in our supply chain. That helps keep our land, air, and water free from pollutants. And our environmental standards for our suppliers are often higher than those required by law.

### **Better for the people who use them.**

No one spends more time with an Apple product than an Apple customer. By minimizing or outright eliminating many harmful toxins, we ensure that each product is safe to use, year after year. Our power cords are PVC- and phthalate-free.<sup>9</sup> Our touchscreens are arsenic-free. And our cases and enclosures are BFR-free.

### **Better for the people who make them.**

Apple is committed to providing safe working conditions for the people who make our products. Many toxins are restricted not only in the products themselves but also in the manufacturing processes. And our suppliers know how seriously we take this. Our Regulated Substances Specification requires them to demonstrate compliance and subjects them to third-party testing.

These principles are captured in Apple's Environmental Health and Safety Policy, included in Appendix A on page 25.

## The worst toxic offenders.



### **Beryllium**

Found in copper alloys used to make connectors and springs. iPhone 6, iPad Air 2, and MacBook were designed without the use of beryllium.



### **Mercury**

Present in the fluorescent lamps that once backlit Mac displays. Eliminated from our displays since 2009.



### **Lead**

Formerly used in display glass and solder. Phased out completely from our products in 2006.



### **Arsenic**

Traditionally used for clarity in glass. Our display glass has been arsenic-free since 2008.



### **Polyvinyl Chloride (PVC)**

Still widely used by other companies in computers, cables, and power cords. We began phasing out PVC in 1995.<sup>9</sup>



### **Brominated Flame Retardants (BFRs)**

Toxic compounds added to plastic enclosures, circuit boards, and connectors. Eliminated from our products in 2008.



### **Phthalates**

Used to soften plastics in cables and powercords. We finished eliminating them from our cables and power cords in 2013.<sup>9</sup>

## We design our products with greener materials.

We're conscious of how glass, plastic, metal, and other materials affect our products as well as the environment. We lead the industry in reducing or eliminating environmentally harmful substances, and we're always striving to make our products more environmentally friendly.

## Testing for toxins right from the start.

We work closely with our suppliers to make sure our products are free from the harmful substances we specify, and we confirm it in our own Environmental Testing Lab. We submit our products' components to rigorous analysis including X-ray fluorescence spectroscopy, laser-induced breakdown spectroscopy, and ion chromatography.

## We can do a lot. But we can't do it alone.

We've formed our own Green Chemistry Advisory Board to stay in the forefront of identifying, minimizing, and eliminating toxins from our supply chain. We have also established a roundtable on toxins to learn from top U.S. and international NGOs how we can make our products and processes even safer. We'll continue to seek out and take advantage of the best science, data, and solutions to keep both people and the planet healthy.



# Appendix A

## Environmental, Health, and Safety Policy Statement

### **Mission Statement**

Apple Inc. is committed to protecting the environment, health, and safety of our employees, customers and the global communities where we operate.

We recognize that by integrating sound environmental, health, and safety management practices into all aspects of our business, we can offer technologically innovative products and services while conserving and enhancing resources for future generations.

Apple strives for continuous improvement in our environmental, health and safety management systems and in the environmental quality of our products, processes, and services.

### **Guiding Principles**

Meet or exceed all applicable environmental, health and safety requirements. We will evaluate our EHS performance by monitoring ongoing performance results and through periodic management reviews.

Where laws and regulations do not provide adequate controls, we will adopt our own standards to protect human health and the environment.

Support and promote sound scientific principles and fiscally responsible public policy that enhance environmental quality, health and safety.

Advocate the adoption of prudent environmental, health and safety principles and practices by our contractors, vendors, and suppliers.

Communicate environmental, health, and safety policies and programs to Apple employees and stakeholders.

Design, manage and operate our facilities to maximize safety, promote energy efficiency, and protect the environment.

Strive to create products that are safe in their intended use, conserve energy and materials, and prevent pollution throughout the product life cycle including design, manufacture, use, and end-of-life management.

Ensure that all employees are aware of their role and responsibility to fulfill and sustain Apple's environmental, health and safety management systems and policy.

Luca Maestri  
Senior Vice President and CFO  
January 2015

# Appendix B

Carbon Assurance and Review Statements

**Apple 2014 Assurance Statement (Pages 27–29)**

**Corporate Carbon Footprint (CCF) FY14 Review Statement (Pages 30–33)**



## **BUREAU VERITAS NORTH AMERICA**

### **INDEPENDENT ASSURANCE STATEMENT**

#### **Introduction and objectives of work**

Bureau Veritas North America, Inc. (BVNA) was engaged by Apple, Inc. (Apple) to conduct an independent assurance of select environmental data reported in its 2014 environmental report (the Report). This Assurance Statement applies to the related information included within the scope of work described below. The intended users of the assurance statement are the stakeholders of Apple. The overall aim of this process is to provide assurance to Apple's stakeholders on the accuracy, reliability and objectivity of select information included in the Report.

This information and its presentation in the Report are the sole responsibility of the management of Apple. BVNA was not involved in the collection of the information or the drafting of the Report.

#### **Scope of Work**

Apple requested BVNA to include in its independent review the following:

- Assurance of select environmental data and information included in the Report for the fiscal year 2014 reporting period (September 29, 2013 through September 27, 2014), specifically, in accordance with Apple's definitions and • World Resources Institute (WRI)/World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol:
  - Energy: Direct (Therms) and Indirect (Million kilowatt hours (mkWh))
  - Renewable Energy Certificates (mkWh)
  - Water (Total withdrawal)
  - Greenhouse Gas (GHG) Emissions: Direct Scope 1 emissions by weight, Indirect Scope 2 emissions by weight, Indirect Scope 3 emissions by weight (Employee Commute and Air Travel)
  - Waste Quantities and Disposition
  - Appropriateness and robustness of underlying reporting systems and processes, used to collect, analyze, and review the environmental information reported;

Excluded from the scope of our work is any assurance of information relating to:

- Text or other written statements associated with the Report
- Activities outside the defined assurance period

#### **Methodology**

BVNA undertook the following activities:

1. Site visits to Apple facilities in Shanghai, China; Tokyo, Japan; and Prineville, Oregon;
2. Visit to Apple corporate offices in Cupertino, California;
3. Interviews with relevant personnel of Apple (10 individuals including employees and external contractors at the corporate level);
4. Review of internal and external documentary evidence produced by Apple;

5. Audit of environmental performance data presented in the Report, including a detailed review of a sample of data against source data; and
6. Review of Apple information systems for collection, aggregation, analysis and internal verification and review of environmental data.

Our work was conducted against Bureau Veritas' standard procedures and guidelines for external Verification of Sustainability Reports, based on current best practice in independent assurance. Bureau Veritas procedures are based on principles and methods described in the International Standard on Assurance Engagements (ISAE) 3000.

The work was planned and carried out to provide reasonable assurance for all indicators, and we believe it provides an appropriate basis for our conclusions.

## Our Findings

BVNA verified the following indicators for Apple's Fiscal Year 2014 reporting period (September 29, 2013 through September 27, 2014):

Parameter	Quantity	Units	Boundary/ Protocol
Natural Gas Consumption:	9,139,071	Therms	Worldwide occupied properties / Apple Internal Protocol
Biogas Purchases	5,403,276	Therms	Worldwide occupied properties / Invoiced Quantities
Electricity Consumption:	845	Million kilowatt hours (mkWh)	Worldwide occupied properties / Apple Internal Protocol
Total Renewable Energy Certificates	987	Million kilowatt hours (mkWh)	Worldwide / Invoiced quantities & self-generated
Applied Renewable Energy Certificates (excludes purchases for Mesa, AZ facility)	692	Million kilowatt hours (mkWh)	Worldwide occupied properties / Apple Internal Protocol
Scope 1 GHG Emissions	56,722	metric tons of carbon dioxide equivalent (tCO <sub>2</sub> e)	Worldwide occupied properties / WRI/WBCSD GHG Protocol
Effective Scope 1 GHG Emissions (Scope 1 emissions – Biogas purchases)	28,486	tCO <sub>2</sub> e	Worldwide occupied properties / Apple Internal Protocol
Gross Scope 2 GHG Emissions	306,675	tCO <sub>2</sub> e	Worldwide occupied properties / WRI/WBCSD GHG Protocol
Effective Scope 2 GHG Emissions (Electric Consumption – Renewable Purchases)	63,213	tCO <sub>2</sub> e	Worldwide occupied properties / WRI/WBCSD GHG Protocol
Scope 3 GHG Emissions (Employee Commute & Air Travel)	266,965	tCO <sub>2</sub> e	Worldwide occupied properties / WRI/WBCSD GHG Protocol Value Chain (Scope 3)
Water Withdrawal	1,839,812	cubic meters (m <sup>3</sup> )	Worldwide occupied properties / Apple Internal Protocol
Trash disposed in Landfill	4,188	Metric tonnes	Worldwide occupied properties / Apple Internal Protocol
Hazardous Waste (Regulated waste)	230	Metric tonnes	Worldwide occupied properties / Apple Internal Protocol
Recycled Material (Removal by recycling contractor)	8,707	Metric tonnes	Worldwide occupied properties / Apple Internal Protocol



## **Our Conclusion**

Based on the assurance process and procedures conducted, we conclude that:

- The Energy, Water, Waste, and Scope 1, 2 & 3 GHG Emissions assertions shown above are materially correct and are a fair representation of the data and information; and
- Apple has established appropriate systems for the collection, aggregation and analysis of relevant environmental information, and has implemented underlying internal assurance practices that provide a reasonable degree of confidence that such information is complete and accurate.

## **Statement of independence, impartiality and competence**

BVNA is an independent professional services company that specializes in Quality, Health, Safety, Social and Environmental management with over 180 years history in providing independent assurance services, and an annual 2014 revenue of \$4.2 billion Euros.

No member of the assurance team has a business relationship with Apple, its Directors or Managers beyond that of verification and assurance of sustainability data and reporting. We have conducted this verification independently and we believe there to have been no conflict of interest.

BVNA has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities.

The assurance team has extensive experience in conducting assurance over environmental, social, ethical and health and safety information, systems and processes, has over 20 years combined experience in this field and an excellent understanding of BVNA standard methodology for the Assurance of Sustainability Reports.



**Bureau Veritas North America, Inc.**

**San Ramon, California**

**March 2015**

## **Review and Verification Statement**

### Company Carbon Footprint – Scope 3: Product related Carbon Footprint for Fiscal Year 2014

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 2014.

#### 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 2014. 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 (98%) 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
<b>2014</b>	<b>24.763.237</b>	<b>1.611.744</b>	<b>7.031.009</b>	<b>451.775</b>
	[metric tons CO2e]	[metric tons CO2e]	[metric tons CO2e]	[metric tons CO2e]

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.

All results and also changes to figures reviewed for fiscal year 2013 are plausible.

## 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 FY2014, excluding accessories
- Regional distribution of sold units and country specific allocation per product to 15 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 2014
- The total company carbon footprint – scope 3 for the fiscal year 2014
- 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 2014 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 7 recent product LCA studies have been reviewed successfully against ISO 14040/44. These latest LCA studies cover products which represent in total 43,2% of the total scope 3 company carbon footprint.



The methodological changes implemented with the 2014 CCF data are confirmed to lead to a significant improvement in terms of accuracy of the results. Inevitably this hampers the comparability of 2014 results with earlier CCF data.

The increase in CCF scope 3 total values from 2013 to 2014 is largely due to increased sales. Emissions per unit sold are decreasing on a year-to-year basis.

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

## 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 the transportation and use phase models have been enhanced, modelling the sales markets more precisely on the level of individual countries. The differentiation of memory configurations for Macs and iPods introduced now provides an even more accurate result for the production carbon footprint.

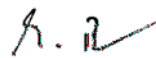
For all product LCA calculations, where exact data was missing, the principle of a worst-case approach has been followed and results have been calculated with rather conservative estimates regarding e.g. production yield losses and recycling.

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.

Berlin, April 9, 2015



- Karsten Schischke -  
Fraunhofer IZM  
Dept. Environmental and  
Reliability Engineering



- Marina Proske -  
Fraunhofer IZM  
Dept. Environmental and  
Reliability Engineering

# Appendix C

## Facilities Emissions: Scope 1, 2, and 3 Carbon Emissions Disclosure

Fiscal 2011						
Location	Scope 1		Electricity Use million kWh	Scope 2		Scope 3 Emissions (travel) tons CO <sub>2</sub> e
	Default Emissions	Effective Emissions (incl. renewable energy)		Default Grid Emissions*	Effective Emissions (incl. renewable energy)	
	tons CO <sub>2</sub> e	tons CO <sub>2</sub> e		tons CO <sub>2</sub> e	tons CO <sub>2</sub> e	
<b>Corporate</b>	<b>14,425</b>	<b>12,656</b>	<b>235</b>	<b>82,183</b>	<b>59,516</b>	–
Cupertino, CA	11,007	9,238	127	39,428	39,428	
Elk Grove, CA	556	556	26	7,930	0	
Austin, TX	45	45	18	10,139	0	
Other U.S.	564	564	6	2,141	2,141	
Cork, Ireland	804	804	10	4,598	0	
Singapore	–	–	6	3,243	3,243	
China	–	–	1	280	280	
Other International	1,449	1,449	41	14,424	14,424	
<b>Data centers</b>	<b>0</b>	<b>0</b>	<b>138</b>	<b>51,651</b>	<b>28,988</b>	–
Maiden, NC	0	0	44	22,663	0	
Newark, CA	0	0	93	28,988	28,988	
<b>Retail stores</b>	<b>2,600</b>	<b>2,600</b>	<b>121</b>	<b>65,769</b>	<b>65,769</b>	–
Domestic (U.S.)	746	746	–	–	–	
International	1,854	1,854	–	–	–	
<b>Employee travel</b>	<b>6,401</b>	<b>6,401</b>	–	–	–	<b>155,025</b>
Fleet Vehicles	6,401	6,401	–	–	–	–
Employee Commute	–	–	–	–	–	63,856
Business Travel (air and vehicle)	–	–	–	–	–	91,169
<b>Totals</b>	<b>23,426</b>	<b>21,657</b>	<b>493</b>	<b>199,603</b>	<b>154,273</b>	<b>155,025</b>
Emissions reduction from renewable energy	8%		23%			
Fiscal 2012						
<b>Corporate</b>	<b>13,160</b>	<b>11,343</b>	<b>232</b>	<b>84,611</b>	<b>48,215</b>	–
Cupertino, CA	10,949	9,132	130	39,457	25,450	
Elk Grove, CA	560	560	22	6,952	0	
Austin, TX	59	59	20	10,635	0	
Other U.S.	237	237	9	4,265	4,265	
Cork, Ireland	715	715	10	4,801	0	
Singapore	32	32	9	4,946	4,946	
China	–	–	2	1,049	1,049	
Other International	609	609	29	12,505	12,505	
<b>Data centers</b>	<b>146</b>	<b>146</b>	<b>217</b>	<b>87,732</b>	<b>7,664</b>	–
Maiden, NC	146	146	104	52,977	0	
Newark, CA	0	0	111	33,492	7,664	
Prineville, OR	0	0	2	1,263	0	
<b>Retail stores</b>	<b>2,812</b>	<b>2,812</b>	<b>159</b>	<b>83,285</b>	<b>83,285</b>	–
Domestic (U.S.)	787	787	–	–	–	
International	2,025	2,025	–	–	–	
<b>Employee travel</b>	<b>6,924</b>	<b>6,924</b>	–	–	–	<b>207,447</b>
Fleet Vehicles	6,924	6,924	–	–	–	–
Employee Commute	–	–	–	–	–	90,473
Business Travel (air and vehicle)	–	–	–	–	–	116,974
<b>Totals</b>	<b>23,042</b>	<b>21,225</b>	<b>608</b>	<b>255,628</b>	<b>139,164</b>	<b>207,447</b>
Emissions reduction from renewable energy	8%		46%			
Fiscal 2013						
<b>Corporate</b>	<b>15,211</b>	<b>13,727</b>	<b>232</b>	<b>85,354</b>	<b>17,503</b>	–
Cupertino, CA	12,231	10,747	144	43,116	0	
Elk Grove, CA	509	509	15	4,400	0	
Austin, TX	83	83	23	12,162	0	
Other U.S.	337	337	5	2,463	0	
Cork, Ireland	743	743	12	5,320	0	
Singapore	50	50	12	5,826	5,826	
China	390	390	9	7,490	7,490	
Other International	868	868	13	4,578	4,187	
<b>Data centers</b>	<b>19,360</b>	<b>2,201</b>	<b>305</b>	<b>123,855</b>	<b>0</b>	–
Maiden, NC	19,360	2,201	160	75,836	0	
Newark, CA	0	0	123	36,959	0	
Prineville, OR	0	0	18	9,965	0	
Reno, NV	0	0	3	1,095	0	
<b>Retail stores</b>	<b>6,158</b>	<b>6,158</b>	<b>171</b>	<b>77,425</b>	<b>74,002</b>	–
Domestic (U.S.)	3,548	3,548	98	44,606	44,606	
International	2,610	2,610	72	32,819	29,397	
<b>Employee travel</b>	<b>7,214</b>	<b>7,214</b>	–	–	–	<b>231,128</b>
Fleet Vehicles	7,214	7,214	–	–	–	–
Employee Commute	–	–	–	–	–	134,685
Business Travel (air and vehicle)	–	–	–	–	–	96,443
<b>Totals</b>	<b>47,943</b>	<b>29,300</b>	<b>708</b>	<b>286,634</b>	<b>91,505</b>	<b>231,128</b>
Emissions reduction from renewable energy	39%		68%			

Fiscal 2014						
Location	Scope 1		Electricity Use million kWh	Scope 2		Scope 3 Emissions (travel) tons CO <sub>2</sub> e
	Default Emissions	Effective Emissions (incl. renewable energy)		Default Grid Emissions*	Effective Emissions (incl. renewable energy)	
	tons CO <sub>2</sub> e	tons CO <sub>2</sub> e		tons CO <sub>2</sub> e	tons CO <sub>2</sub> e	
<b>Corporate</b>	<b>16,716</b>	<b>15,335</b>	<b>284</b>	<b>86,842</b>	<b>21,555</b>	<b>–</b>
Cupertino, CA	14,310	12,929	181	36,496	0	
Elk Grove, CA	411	411	13	2,516	0	
Austin, TX	148	148	32	15,149	0	
Other U.S.	115	115	5	2,270	0	
Cork, Ireland	1,000	1,000	13	7,678	0	
Singapore	51	51	12	6,852	6,852	
China	385	385	11	8,577	8,577	
Other International	296	296	17	7,304	6,126	
<b>Data centers</b>	<b>26,854</b>	<b>18</b>	<b>372</b>	<b>148,320</b>	<b>0</b>	<b>–</b>
Maiden, NC	26,835	0	188	92,306	0	
Newark, CA	0	0	138	38,278	0	
Prineville, OR	18	18	27	10,392	0	
Reno, NV	0	0	19	7,344	0	
<b>Retail stores</b>	<b>5,355</b>	<b>5,355</b>	<b>182</b>	<b>82,770</b>	<b>41,658</b>	<b>–</b>
Domestic (U.S.)	2,812	2,812	98	45,041	11,036	
International	2,543	2,543	84	37,729	30,622	
<b>Employee travel</b>	<b>7,778</b>	<b>7,778</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>268,011</b>
Fleet Vehicles	7,778	7,778	–	–	–	–
Employee Commute	–	–	–	–	–	148,187
Business Travel (air & vehicle)	–	–	–	–	–	119,824
<b>Totals</b>	<b>56,702</b>	<b>28,486</b>	<b>839</b>	<b>317,932</b>	<b>63,213</b>	<b>268,011</b>
<b>Emissions reduction from renewable energy</b>	<b>50%</b>		<b>80%</b>			

#### Notes

Apple's fiscal year begins approximately October 1 each year.

Scope 1 emissions result from natural gas use for facilities, and gasoline use for fleet vehicles. As is typical, these emissions are tracked separately from our 100% renewable energy claim.

Scope 2 emissions result from electricity use for facilities. In addition, Apple owned a facility in Mesa, AZ, that was operated by a supplier, which had default grid emissions of 151,279 tons CO<sub>2</sub>e and effective emissions of 0 tons CO<sub>2</sub>e.

Scope 3 emissions reported in this table include only those emissions associated with employee commute and business travel, calculated by employee miles traveled. Scope 3 emissions associated with product life-cycle emissions are disclosed separately.

\*Based on utility-scale and regional default grid emission factors (using the most granular data set available).

<sup>1</sup>For our facilities, we are now reporting effective emissions instead of gross emissions to better reflect the impact of our renewable energy program. All category totals are rounded to the nearest decimal.

<sup>2</sup>When Apple does acquire renewable energy certificates, we require that they are Green-e Energy certified and come from the same NER C region—and preferably the same state—as the Apple facility they support.

<sup>3</sup>Based on the average residential cost of electricity in the U.S. in 2014 to fully charge the battery once a day for one year; includes power consumed by the power adapter when disconnected from the iPhone.

<sup>4</sup>Claim based on total energy consumption of desktops categories I1 and I3 in the EPA ENERGY STAR registry as of June 2014.

<sup>5</sup>Claim based on total energy consumption of integrated desktops category D2 in the EPA ENERGY STAR registry as of June 2014.

<sup>6</sup>Based on ENERGY STAR Program Requirements for Computers Version 6.0.

<sup>7</sup>Based on equivalent virgin fiber production from protected forests and virgin fiber used for our product packaging.

<sup>8</sup>Based on estimates of the volume of virgin fiber required to produce our packaging and the volume of virgin fiber produced by those forests protected through our partnership with The Conservation Fund.

<sup>9</sup>With the exception of India and South Korea, where we continue to seek government approval for our PVC replacement.

Updated May 2015

FY 2014 water use figures were corrected and the Bureau Veritas assurance letter was updated to include additional indicators.

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