



WORLD
RESOURCES
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2011 Greenhouse Gas Inventory and Sustainability Report

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WRI.ORG

ABOUT WRI

WRI focuses on the intersection of the environment and socio-economic development. We go beyond research to put ideas into action, working globally with governments, business, and civil society to build transformative solutions that protect the earth and improve people's lives.

Solutions to Urgent Sustainability Challenges

WRI's transformative ideas protect the earth, promote development and advance social equity because sustainability is essential to meeting human needs today, and fulfilling human aspirations tomorrow.

Practical Strategies for Change

WRI spurs progress by providing practical strategies for change and effective tools to implement them. We measure our success in the form of new policies, products, and practices that shift the ways governments work, businesses operate, and people act.

Global Action

We operate globally because today's problems know no boundaries. We are avid communicators because people everywhere are inspired by ideas, empowered by knowledge, and moved to change by greater understanding. We provide innovative paths to a sustainable planet through work that is accurate, fair, and independent.



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SUMMARY

The release of greenhouse gas (GHG) emissions associated with human activity around the world is the leading cause of climate change. As an organization dedicated to protecting Earth's environment and improving people's lives, the World Resources Institute (WRI) has long recognized our obligation to reduce our own GHG emissions. In 1999, WRI became the first nongovernmental organization to complete an inventory detailing its progress towards meeting GHG reduction goals.

This report provides a comprehensive description of WRI's 2011 GHG inventory. It compares our 2010 and 2011 inventories, notes changes to our base year emissions, and describes our other sustainability activities. The report covers the period from October 1, 2010 to September 30, 2011.

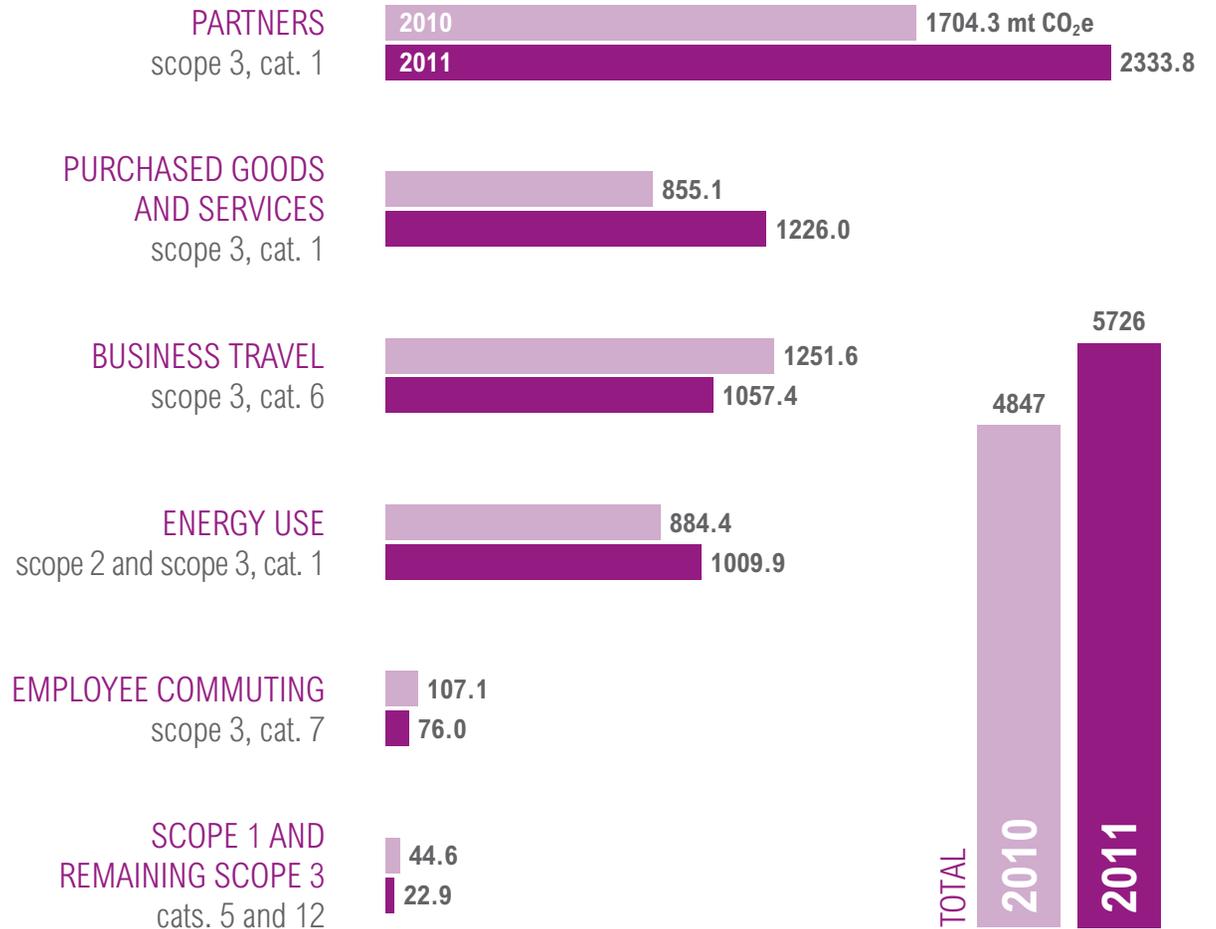
WRI's 2011 inventory revealed 5,726 metric tons of carbon dioxide equivalent (mt CO₂e) associated with our yearly value chain (scopes 1, 2, and 3) activities. This is an 18 percent increase from our 2010 base year inventory.¹ An increase in purchased goods, services, partner sub-grants,² and office space (which required construction services and furniture purchases—two GHG-intensive industries) drove the increase in emissions. Additional office space also caused a spike in emissions from the added demands for electricity, heating, and cooling. Travel budgets, and therefore travel-related emissions, decreased from 2010 to 2011. Although the number of staff remained steady, employee commuting emissions did decrease slightly from 2010 to 2011, likely due to an increase in staff working from home one or more days per week.

In November 2011, WRI set three absolute reduction targets relative to our 2010 base year inventory: 20 percent reduction in emissions from business travel, 20 percent reduction in emissions from other scope 3 categories, and a 50 percent reduction in purchased electricity by 2020.³ Because our 2011 inventory covers October 1, 2010 to September 30, 2011 (before we set our absolute reduction targets), no reduction projects were in place. It is not entirely surprising then to see an increase in emissions in this inventory. Nonetheless, we are concerned by the magnitude of the increase, and recognize that it will only make meeting our targets more difficult as we try to balance a growing institute with a reduction in absolute emissions. For example, it will be challenging to meet our other scope 3 reduction target because partners are responsible for the majority of those emissions. Moving forward, we will work directly with these partners to help them measure and reduce their emissions, which will in turn reduce our scope 3 emissions.

We have made two modifications to our 2010 base year inventory, which are reflected in this report. In order to better track progress on our emissions reductions from business travel and purchased goods and services, we have converted our inventory from a calendar year to a fiscal year (October 1st – September 30th). We also recalculated our business travel emissions to account for missing data during a transfer from a paper-based tracking system to a centralized online booking platform (CONCUR).

Finally, this report describes WRI's other sustainability initiative activities, including our annual nitrogen footprint assessment. For more information on WRI's GHG inventories, reduction targets, and Sustainability Initiative, please contact Laura Draucker (ldraucker@wri.org) or Amanda Stevens (astevens@wri.org).

Figure 1 | Comparison of WRI's 2010 and 2011 Inventory Emissions (mt CO₂e)



INTRODUCTION

The release of anthropogenic greenhouse gas (GHG) emissions around the world continues to grow, contributing to a changing climate and catalyzing new and unpredictable risks to our ecosystems and human communities.⁴ To mitigate escalating climate change effects, global emissions must drop by as much as 85 percent below 2000 levels by 2050.⁵ Record-breaking temperatures (2012 is the hottest year on record for the continental United States) and rising frequency of extreme weather events highlight the urgent need for global action.⁶ To achieve the necessary reductions, all members of our global community need to cut their individual emissions and encourage others to do the same. With a mission to move human society to live in ways that protect Earth's environment, WRI has a responsibility to reduce our own GHG emissions.

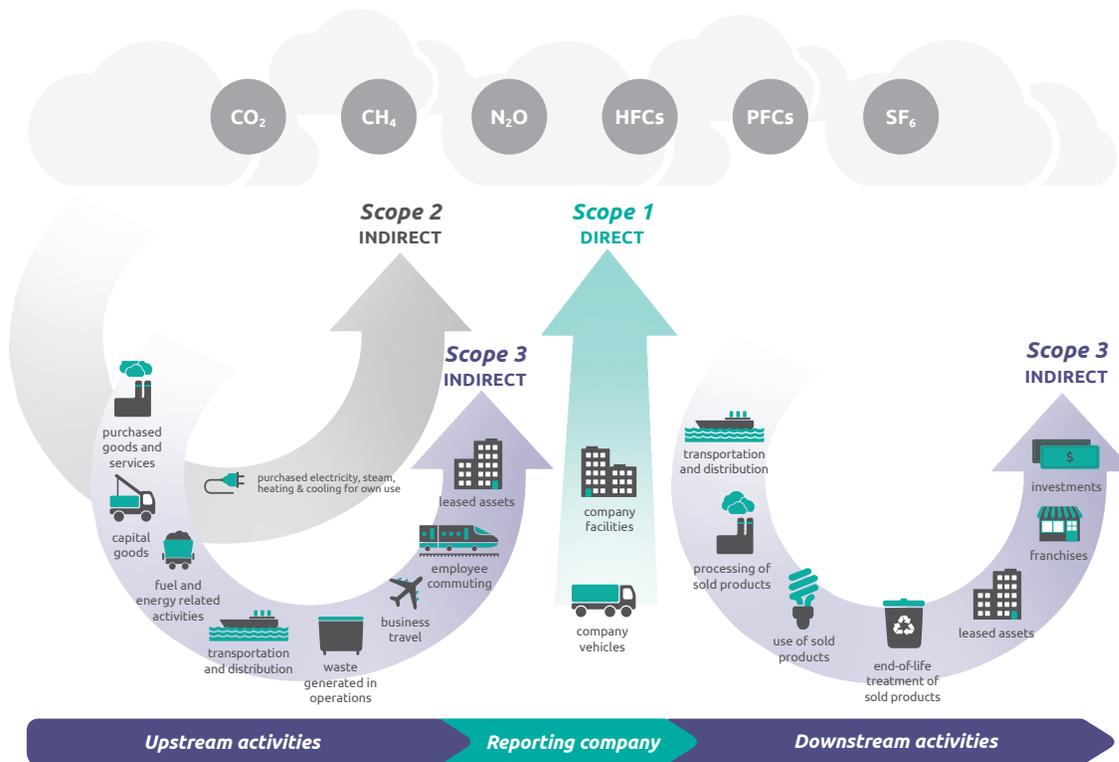
Since 1999, WRI has completed an annual GHG inventory. From 2000–2009, we purchased GHG emission offsets and renewable energy credits (RECs) equivalent to our total

GHG emissions.⁷ In 2010, we determined that purchasing offsets was not the best practice for addressing climate change mitigation. We stopped purchasing offsets and committed to achieving absolute⁸ reductions. This decision, spurred by the desire of WRI staff to reinvigorate our culture of “learning and leading by doing,” led WRI’s management to recommit to WRI’s organizational sustainability initiative in early 2011.⁹

WRI’s annual organizational GHG report reflects the work of the Sustainability Initiative staff to quantify and analyze the GHG emissions attributable to WRI’s business activities each year. We conduct a full GHG inventory, using the GHG Protocol’s¹⁰ Corporate Accounting and Reporting Standard and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard. Figure 2 shows the 15 scope 3 categories and the relationship between scopes 1, 2, and 3. More information on scope 3, including definitions of each category, is available at www.ghgprotocol.org/standards/scope-3-standard.

To achieve the necessary reductions, all members of our global community need to cut their individual emissions and encourage others to do the same.

Figure 2 | Overview of the GHG Protocol Scopes and Emissions Across the Value Chain



WRI's 2011 GHG inventory report is organized into seven sections:

1. Introduction
2. WRI's 2011 greenhouse gas inventory results
3. Inventory interpretation
4. Comparison with the 2010 base inventory
5. GHG reduction strategies
6. Other sustainability efforts
7. Conclusions

The appendix to this report contains more detailed descriptions of the calculations for the 2011 inventory and adjustments to the 2010 base year.

Notes: From the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard. Upstream activities are purchased by the company, while downstream activities are sold by the company.

WRI'S 2011 GREENHOUSE GAS INVENTORY RESULTS

This presentation of our inventory report follows the scope 3 template provided by the GHG Protocol, which also includes information pertinent to our scope 1 and scope 2 inventory. For more information on the scope 3 standard and to download a copy of the standard and reporting template, please visit www.ghgprotocol.org/standards/scope-3-standard.

Part 1 | Descriptive information

DESCRIPTIVE INFORMATION	COMPANY RESPONSE
Organization name	World Resources Institute
Description of the organization	WRI focuses on the intersection of the environment and socio-economic development. We go beyond research to put ideas into action, working globally with governments, business, and civil society to build transformative solutions that protect the earth and improve people's lives.
Chosen consolidation approach (equity share, operational control, or financial control)	Operational control.
Description of the businesses and operations included in the organizational boundary	WRI's scope 1 and scope 2 inventories account for emissions from WRI's Washington, D.C., and Beijing, China offices. All other activities are included in scope 3.
The reporting period covered	Fiscal Year 2011 (October 1, 2010 to September 30, 2011) (see Section 2.2 for additional information).

Part 1 | **Descriptive information (cont.)**

DESCRIPTIVE INFORMATION	COMPANY RESPONSE
A list of activities included in the report	Scopes 1, 2, and 3. Scope 3 sources are purchased goods and services, fuel and energy-related activities, waste generated in operations (D.C. office only), business travel, employee commuting (D.C. office only), end-of-life treatment of sold products.
A list of activities excluded from the report with justification for their exclusion	<p><i>The Beijing office's scope 1, employee commuting, and waste generated:</i> These categories were estimated to account for less than 1 percent of the total inventory and were therefore excluded given the challenges and costs associated with data collection.</p> <p><i>Emissions associated with individual payments (purchasing goods and services) totaling less than \$6,000.</i> These payments, more than 500 in all, make up less than 4% of total purchases. This is consistent with the 4% of purchases excluded from our 2010 inventory.</p> <p><i>Emissions associated with purchases made on the corporate credit card account (purchased goods and services):</i> Our yearly account summary includes one aggregated payment to our credit card provider. However, many of the purchases on the corporate credit card are accounted for in other parts of this inventory, including business travel and catering. Including this payment to the credit card provider risks double counting emissions; however, we recognize that some purchases may not be captured in the inventory following this approach.</p> <p><i>Upstream cradle-to-gate emissions associated with diesel fuel (scope 3, category 3):</i> Combustion accounts for approximately 80% of the total life cycle GHG emissions of diesel fuel. Because the combustion of diesel accounted for in scope 1 is minimal, we can assume that the upstream emissions are insignificant and are excluded from the inventory.¹¹</p>
Once a base year has been established, the year chosen as base year and rationale for choosing the base year	A 2010 base year was selected. See section 2.1 for rationale.
Once a base year has been established, emissions in the base year	See Appendix B.
Once a base year has been established, the chosen base year emissions recalculation policy and context for any significant emissions changes that trigger base year emissions recalculations	WRI will recalculate its base year emissions if there are significant changes to our GHG inventory following the guidance given in the GHG Protocol Corporate Standard and Scope 3 Standard. We define significant as a change or series of changes that impact our base inventory by more than 5%. This year we recalculated our base year emissions because of missing business travel data and a switch from calendar year to fiscal year reporting.

Part 2 | Greenhouse Gas Emissions Data

SCOPES AND CATEGORIES	METRIC TONS (mt) CARBON DIOXIDE EQUIVALENTS (CO ₂ e)
Scope 1: Direct emissions from owned/controlled operations	<1
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating, and cooling	675
Upstream (purchased) scope 3 emissions	
Category 1: Purchased goods and services	3560
Category 2: Capital goods	Accounted for in category 1 (purchased goods and services)
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)	335
Category 4: Upstream transportation and distribution	Accounted for in category 1 (purchased goods and services)
Category 5: Waste generated in operations	<1
Category 6: Business travel	1057
Category 7: Employee commuting	76
Category 8: Upstream leased assets	Accounted for in scope 2 and category 1 (purchased goods and services) ¹²

SCOPES AND CATEGORIES	METRIC TONS (mt) CARBON DIOXIDE EQUIVALENTS (CO ₂ e)
Downstream (sold) scope 3 emissions	
Category 9: Downstream transportation and distribution	N/A
Category 10: Processing of sold products	N/A
Category 11: Use of sold products	N/A
Category 12: End-of-life treatment of sold products (publications)	23
Category 13: Downstream leased assets	N/A
Category 14: Franchises	N/A
Category 15: Investments	N/A (Improving the sustainability of our investments is being addressed independently from our GHG inventory)

Part 2 | **Greenhouse Gas Emissions Data (continued)**¹³

GREENHOUSE GAS EMISSIONS ¹⁴	CARBON DIOXIDE (CO ₂)		METHANE (CH ₄)		NITROUS OXIDE (N ₂ O)		HYDROFLUORO-CARBONS (HFCs) ¹⁵		PERFLUORO-CARBONS (PFCs)		SULFUR HEXAFLUORIDE (SF ₆)	
	mt CO ₂	mt CO ₂ e	mt CH ₄	mt CO ₂ e	mt N ₂ O	mt CO ₂ e	mt HFC	mt CO ₂ e	mt PFC	mt CO ₂ e	mt SF ₆	mt CO ₂ e
Scope 1	0.20	0.20	8.2e-06	2.1e-04	1.6e-06	4.8e-04	0.0000051 (HFC-134a)	0.007	N/A	N/A	N/A	N/A
Scope 2	673.9	673.9	0.02	0.4	0.01	3.3	N/A	N/A	N/A	N/A	N/A	N/A

Part 3 | **Biogenic CO₂ Emissions Data (If Applicable)**

Biomass, such as trees, plants, or food crops emit biogenic CO₂ when they are combusted, used in biological processes (e.g., fermentation), or allowed to decompose at the end of their life. WRI does not use biogenic fuels (e.g., biodiesel) or materials in our operations, so no biogenic emissions are applicable to scope 1. In scope 3, category 5 (waste generated in operations) does include food waste that is subsequently treated, and the treatment of that waste does result in biogenic CO₂ emissions. However, the data used

to estimate category 5 does not disaggregate between biogenic and non-biogenic emissions. Therefore, we have included biogenic emissions associated with waste treatment as part of the scope 3 emissions listed in part 2. For more information on the data used for category 5, please refer to Appendix A.

Part 4 | **Description of Methodologies and Data Used**

This information is detailed in Appendix A.

Choice of base year

WRI has selected a single year (2010) as the base year for its GHG inventory. While WRI had reduction targets that pre-date 2010, WRI’s management team had already decided as part of the sustainability initiative to establish new targets. 2010 is also the year of WRI’s earliest comprehensive (value chain) inventory.

Base year recalculation

In 2010, WRI switched from a paper-based travel authorization system to a centralized online booking software (CONCUR). However, staff were not required to use the online software until 2011, so some trips taken in 2010 were not captured through either system. We were not able to determine how much trip data were missing until we had 2011 and 2012 travel data and budgets to compare with 2010. We determined that approximately 24 percent of trip data were missing from our 2010 base year inventory, which totaled 7 percent of our total inventory. This is above our recalculation threshold (see Part 1.2), so we used details of our travel expense report system to estimate the probable air travel emissions for our base year inventory. The updated 2010 base year inventory and more details on our recalculation procedure are available in Appendix B.

The recalculation of our business travel required data that are more reliably collected on a fiscal year (October 1st–September 30th) timeframe. Our scope 3, category 1 (purchased goods/services and partner subgrants) was already calculated on a fiscal year basis. These two sources account for 43 percent of our base year inventory, therefore we decided to convert the rest of our 2010 base inventory to a fiscal year basis for consistency

(see section 2.3 for limitations). We will conduct our 2011 inventory and all subsequent inventories on a fiscal year basis.

Inventory limitations

Appendix A includes the description of methodologies and data used to calculate scope 1, 2, and 3 emissions. Scopes 1, 2, and employee commuting are all calculated using activity data specific to WRI's operations; however, other scope 3 categories are more difficult to calculate and rely on secondary and estimated data. The limitations for our scope 3 calculations are listed below (further details can be found in Appendix A).

- Purchased goods and services (scope 3, category 1): This category of emissions was estimated using financial activity data from WRI and environmentally extended input output (EEIO) tables, which are based on average financial data and GHG emissions for each sector. Although this approach is necessary to estimate emissions over time, we hope to improve our scope 3 calculations by collecting primary data from our providers and partners.

- WRI's business travel emissions: This source of emissions is calculated through a combination of WRI-specific activity data and secondary data as recommended by the IPCC chapter on base year recalculation.¹⁶

Three percent of our 2011 inventory could not be realigned to a fiscal year basis (see section 2.2), including the following sources: scope 1; scope 3 category 7 (employee commuting); and scope 3, category 12 (publication end-of-life). Any anomalies caused by collecting this data on a calendar year rather than a fiscal year basis would be insignificant. However, beginning in 2012, we will collect employee commuting and publication end-of-life data on a fiscal year time frame. This will reduce the total calendar year-based data to less than 1 percent of our total inventory.

INVENTORY INTERPRETATION

WRI's 2011 inventory revealed 5,726 metric tons CO₂ equivalent (mt CO₂e) emissions associated with our yearly activities. Consistent with WRI's 2010 inventory findings, scope 3 continues to be the primary source of our GHG emissions. Figure 3 shows that 88 percent of the 2011 inventory is classified as scope 3, while 12 percent is attributed to scope 2, and less than 1 percent attributed to scope 1. Our minimal scope 1 results are not surprising for a service-based organization that does not produce any products in-house.

Figure 3 | WRI's 2011 GHG Emissions Inventory

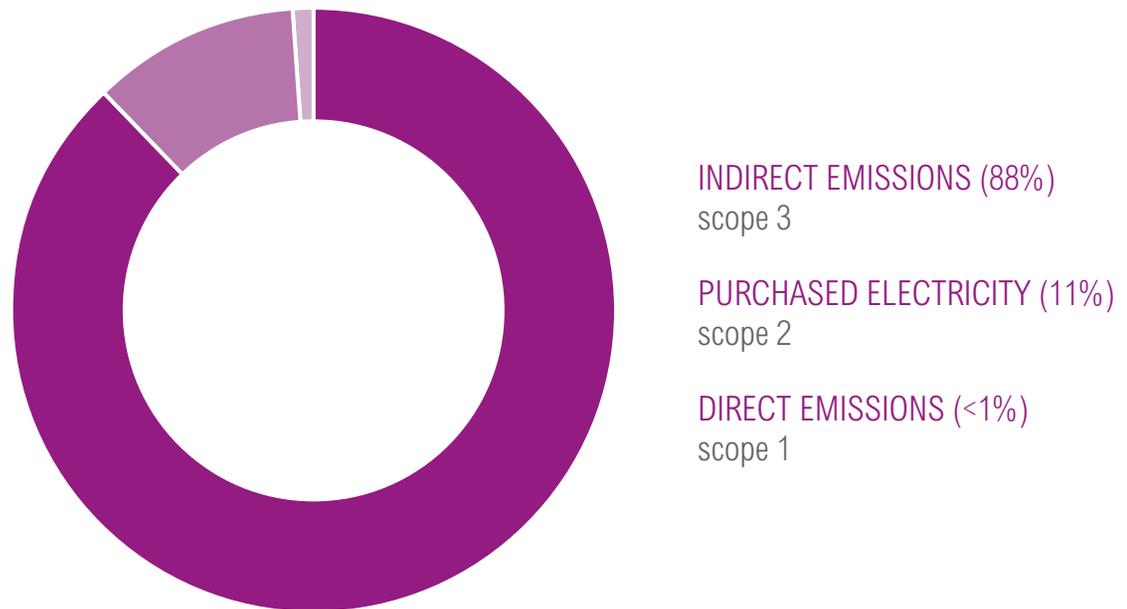


Figure 4 dives into the specific scope 3 emissions sources. The primary source of our scope 3 emissions (and our total 2011 inventory) comes from scope 3, category 1 (in this document as “partners” and “providers”¹⁷), which accounts for 70 percent of all scope 3 emissions. This is followed by business travel (21 percent), the upstream emissions from our purchased electricity (7 percent), and employee commuting (2 percent). The end-of-life treatment for publications and onsite waste is negligible.

Figure 4 | Scope 3 Emissions by Category



We break our largest emissions category—scope 3, category 1—into three sub-categories: purchased goods (e.g., food, office supplies); purchased services (e.g., consulting, design, printing); and financial relationships with WRI’s partners.¹⁸ Due to our current organizational structure, we also consider WRI-affiliated offices or organizations that are not currently under the same central operations as our D.C. and Beijing offices as scope 3. This includes our EMBARQ network centers in Brazil, Mexico, Peru, and Turkey, as well as our two growing WRI-affiliated offices in India.

Of our total category 1 emissions, 66 percent is generated through our work with partners, followed by purchased services (31 percent), and purchased goods (3 percent). Our purchased goods sub-category may be undercounted because staff use the corporate credit card to purchase some of our office supplies and this source is not included in the inventory results (see section 2.2). We estimate that even with the inclusion of these purchases, this sub-category would still be smaller than both partners and service providers due to the significantly greater budgets for sub-grants and purchased services, such as web and publication design, IT, and expert consultants.

It is important to note that the calculation methodology used for purchased goods and services, as outlined in more detail in Appendix A, does not use emissions factors specific to any one partner or goods/services provider, but rather relies on sector averages. Although there is variation in emissions factors for each given sector, partners or companies and organizations falling under the same sector (e.g., civil society organizations) are applied the same emissions factor, making amount spent or given to the partner the variable factor. Using secondary data based on financial information and average emissions factors does not allow us to distinguish partners and providers based on their own emissions profile and reduction practices. This is why collecting specific, primary data for our category 1 emissions continues to be a key step in improving our understanding of our supply chain and identifying opportunities for reduction.

Collecting specific, primary data from our partners and providers continues to be a key step in improving our understanding of our supply chain and identifying opportunities for reduction.

Figure 5 | Scopes and Activities That Contribute to WRI's 2011 Inventory

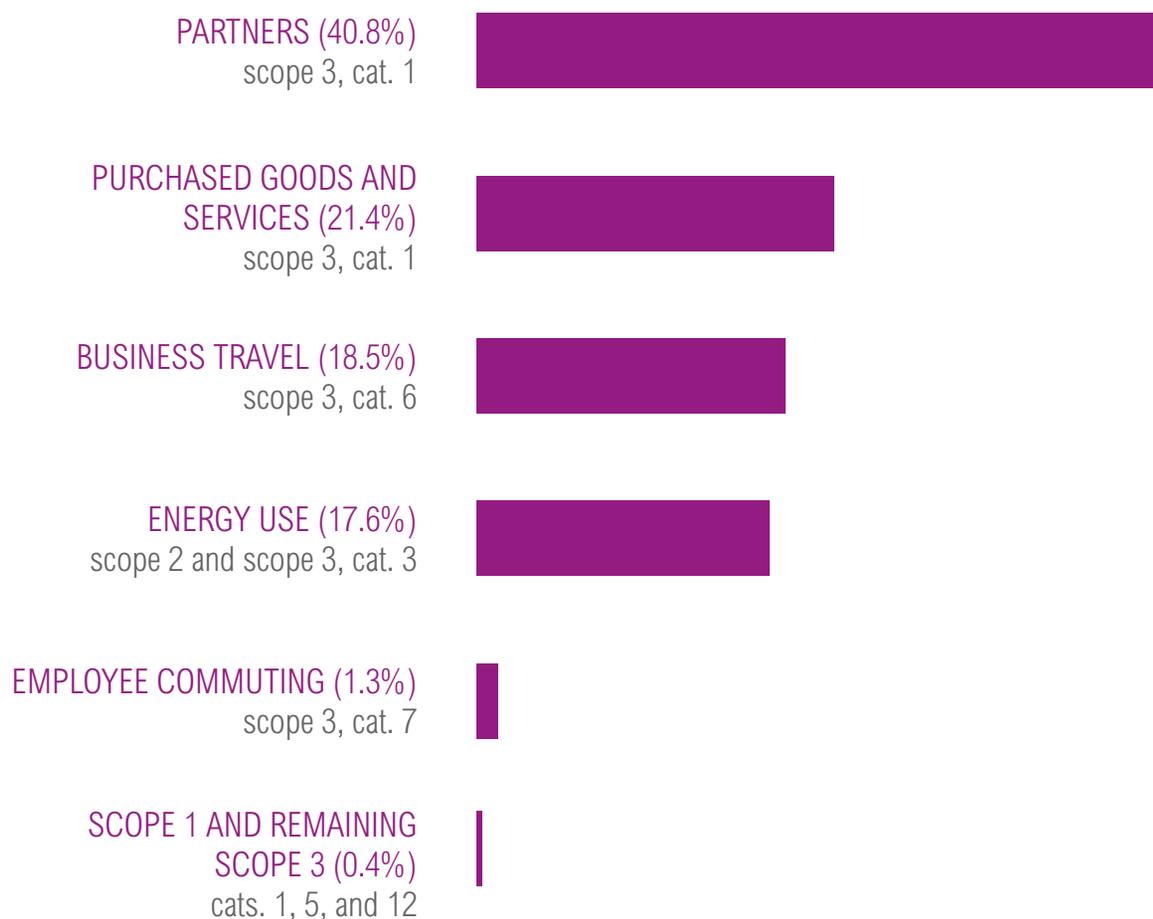


Figure 5 shows all the scopes and activities included in WRI's 2011 GHG inventory, ranked in order of highest to lowest contribution to our total mt CO₂e. Purchased electricity (scope 2) and upstream emissions from purchased electricity (scope 3, category 3) from our D.C. and Beijing offices are grouped together in Figure 5 as both will be affected by our electricity-use reduction strategies. Direct emissions (scope 1), waste treatment in operations (scope 3, category 5), end-of-life treatment of publications (scope 3, category 12), and purchased goods (scope 3, category 1) are also grouped together based on their low overall contribution (<1% of the total GHG inventory).

COMPARISON WITH THE 2010 BASE INVENTORY

In 2011, our GHG emissions grew 18 percent over our recalculated 2010 baseline. Although our reduction targets were not in place until after our 2011 inventory period ended, this increase will only make it more difficult to meet our goals. The greatest areas of growth came from purchased goods, purchased services, and partners (scope 3, cat. 1) and a small increase in electricity use (scope 2 and scope 3, cat. 3) (see figure 6). Some emissions sources decreased slightly, including scope 1, employee commuting, and business travel.

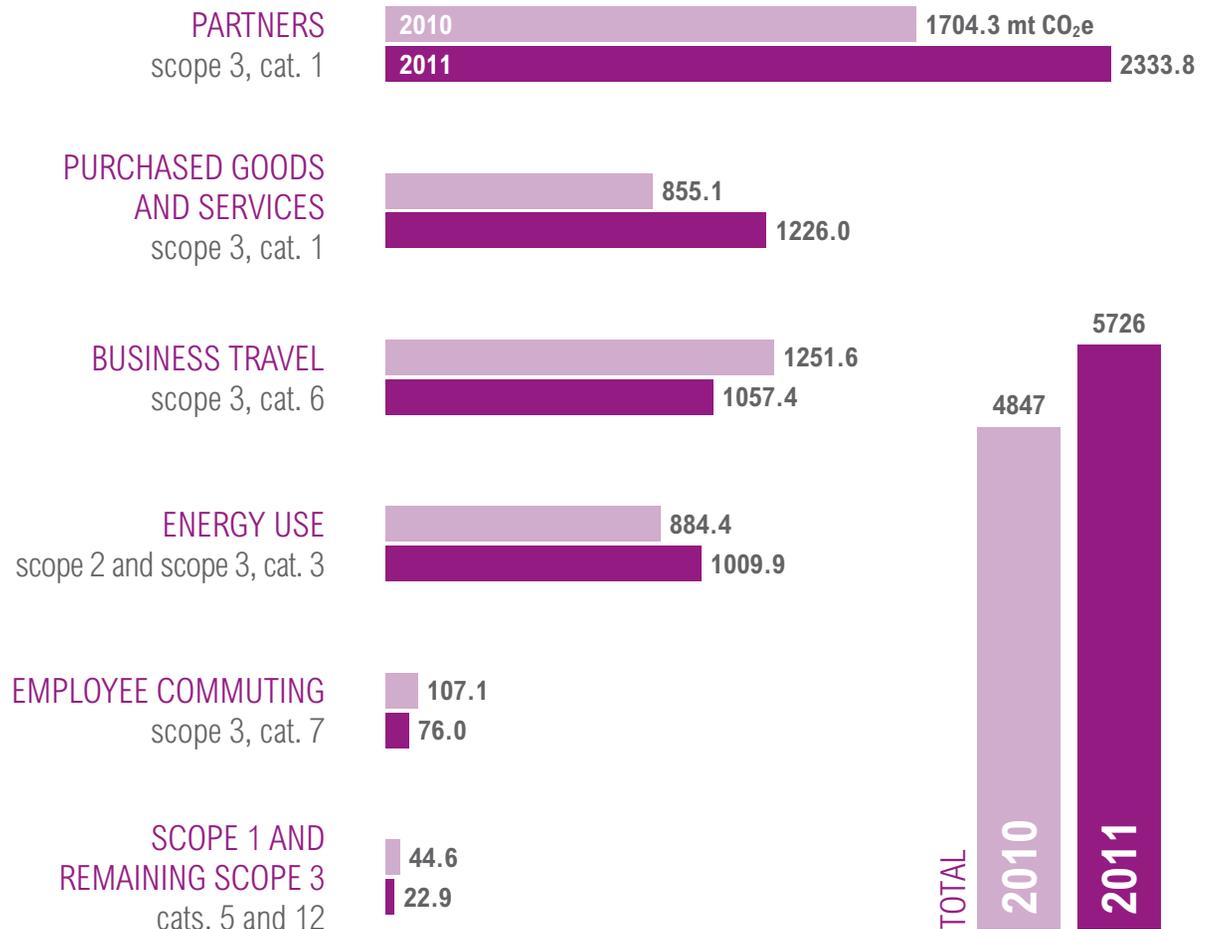
In 2011, WRI's total budget to partners and goods/service providers increased by \$1.1 million. Approximately 36% of the increases are attributable to construction activities and increased furniture purchases in the Washington, D.C. office. Within total vendor spending, partner spending increased by 20 percent, contributing to the overall scope 3, category 1 emissions increase.

Although our reduction targets were not in place until after our 2011 inventory period ended, this increase will only make it more difficult to meet our goals.

Overall electricity use (scope 2 and scope 3, category 3) increased slightly also due to the expansion of WRI's D.C. office. However, kilowatt hours (kWh) usage per square foot in the D.C. office decreased by 1 kWh/ft² for the year, indicating that we have increased the efficiency of our overall space. WRI's Beijing office also expanded in 2011, adding additional office space within its current building, effectively doubling the electricity-related GHG emissions from WRI China.

WRI's 2011 GHG emissions from business travel (air and rail) decreased by 16 percent. The exact cause for this decrease is unknown, but it is likely due to reduced travel budgets and decreased executive travel. Our Managing Director stood in as our interim president for part of FY11, combining the travel commitments of those two positions. Employee commuting has decreased, while total staff numbers have stayed the same. Our yearly commuting survey shows that the percentage of staff who reported working remotely has increased. More staff are teleworking one or more days a week or participating in the D.C. office's summer alternative work schedule program (one day off every two weeks from May to August). WRI staff are also moving closer to our D.C. office; the average daily commute distance decreased in 2011, which likely contributes to the 50 percent decrease in gasoline usage for car commuting. Scope 1 also decreased due to updated fuel and refrigerant purchases reported by our D.C. building engineer.

Figure 6 | Comparison of WRI's 2010 and 2011 Inventory Emissions (mt CO₂e)



GHG REDUCTION STRATEGIES

WRI has three absolute emissions reduction targets focused on our largest GHG-generating activities. We set these targets in 2010 and we aim to achieve them by 2020:

- 50 percent reduction in scope 2 emissions from purchased electricity;
- 20 percent reduction in scope 3 emissions from business travel; and
- 20 percent reduction in scope 3 emissions from all other categories, focusing on purchased goods, purchased services, and partners.

Because we had not yet implemented reduction projects in 2011, these inventory results do not show concrete progress toward our goals. However, they do crystalize the areas we need to focus on to achieve reductions and meet our targets. The inventory results also reveal the challenges we face moving forward as we balance organizational growth with our dedication to reducing absolute GHG emissions.

Each year we will complete our GHG inventory, update our inventory report,¹⁹ and highlight progress in reaching our goals. Additionally, we will document our shortcomings and discuss how we plan to improve our efforts. The following section outlines projects related to each reduction target.

Electricity Reduction Strategy

As demonstrated by the increases in electricity use in all our offices, as WRI grows we will need to ensure our office design is energy efficient. Reducing electricity demand in part depends on our ability to maintain or limit our office footprint growth. This might entail modeling potential energy saving projects that can be implemented in our building, and piloting more flexible work arrangements that require less office space per person.²⁰ Being able to anticipate staff growth and manage space without increasing square footage or constructing new designs will be key as WRI continues to grow domestically and internationally.

For the D.C. office, we use a ratio-utility billing system from our building management company to estimate our total purchased electricity data. This presents a serious challenge for us because we lack specific data for WRI's activities. Any reduction success will be distributed between all the occupants of our building. We have two options to address this lack of sensitivity in our data collection. The first, and preferable, method is to establish accurate data collection systems through the installation of electricity sub-metering in our building. We are currently exploring this possibility with our building management company. The second strategy is to estimate the reduction potential of each project or installation and use those projections to piece together a total reduction expectation. We can also partner with our building management company and building owners on larger, building-wide initiatives.

While the emissions generated by the D.C. office are much greater than the two office locations in China (in the same building), emissions reductions in the China offices are possible and could help guide other tenants. WRI's China office purchases electricity on a pre-paid credit system. Electricity credits (MWh) can be purchased in a bundle and when the account gets low, more credits are purchased. Monthly monitoring of the pre-paid account could provide insight on electricity use fluctuations due to occupancy and weather, for example. This would also allow the China office to respond more quickly to unusual energy use rather than identify it retroactively when the pre-paid bundle is depleted faster than normal. This additional information can reduce emissions through informing behavioral changes (e.g., dressing casual on hot days) and quickly troubleshooting equipment malfunctions that waste unnecessary energy.

For our D.C. office, the building landlord purchases renewable energy credits (RECs) that cover the full energy use of the building; however, we do not currently subtract these from our scope 2 emissions. The GHG Protocol is drafting a guidance document that specifically outlines how to account for renewable energy. Once published, we will reevaluate whether our RECs can be subtracted from our GHG inventory and if so, we

will update the reduction target to focus on energy consumption.

Business Travel Reduction Strategy

Our strategy for achieving a 20 percent reduction in business travel is to pair increased telepresence capacity with a higher degree of travel efficiency. Telepresence includes video conferencing and other virtual platforms that allow participation without travel. WRI currently does not have a video conference system sophisticated enough to support wide adoption of telepresence in lieu of business travel. We are working to update our systems so this can become a viable business travel alternative. We will also need to address the technological capacity of those we are trying to contact. Not all the organizations we work with have access to video technology or reliable internet. Developing capacity in these locations will become more important as WRI's own videoconferencing capacity increases.

We also recognize that staff cannot effectively attend all meetings and conferences virtually. For unavoidable travel, we plan to implement policies and best practices that help us be as efficient as possible. For example, we plan to integrate features into our travel booking system that show users the least GHG-intensive way to get from point A to point B. Guide-

Our strategy for achieving a 20 percent reduction in business travel is to pair increased telepresence capacity with a higher degree of travel efficiency.

lines on identifying the value of trips can help staff determine whether possible trips are necessary or if similar outcomes could be achieved through alternative means.

Improving the tracking of WRI's business travel data and using it to identify travel trends, such as frequent destinations and staff overlap, could help us travel more efficiently and highlight potential locations for short-term relocation or local hires.

From our engagement with other NGOs, we know that we are not alone in struggling to reduce business travel without compromising the impact of our work. Compounding this challenge is the expected growth of WRI's budget and staff over the coming years. These challenges may require us to invest time and effort in collective action with other travel consumers and providers to increase the efficiency of the entire system, in order to meet reduction targets. One idea is to partner with or prioritize airlines and aircraft manufacturers that have made their own GHG reduction commitments or are working with innovative efficiency methods, such as alternative fuels.

Other Scope 3 Reduction Strategy

Achieving a 20 percent reduction in scope 3 emissions by 2020 will require engagement and cooperation from our partners and providers. We have identified partners with whom we will pilot an engagement strategy and we will expand the pilot to additional goods and services providers. Partners and providers, with whom we have a good relationship and who contribute significantly to our inventory, will participate in the initial pilot. During engagement, the first step is to collect primary data related to each participant's corporate inventory.²¹ This will help us update our inventory results with more specific data. We will then work with participants to set and achieve reduction targets.

Although it will take time, effort, and cooperation, reductions achieved by our partners and providers will have a positive impact on our scope 3 inventory and help us achieve our reduction target. Additionally, we hope that our partners and these companies and organizations see the benefit of measuring their GHG inventory, setting their own GHG reduction targets, and engaging with their own supply chain. This trickledown effect can have a large positive impact on global GHG emissions.

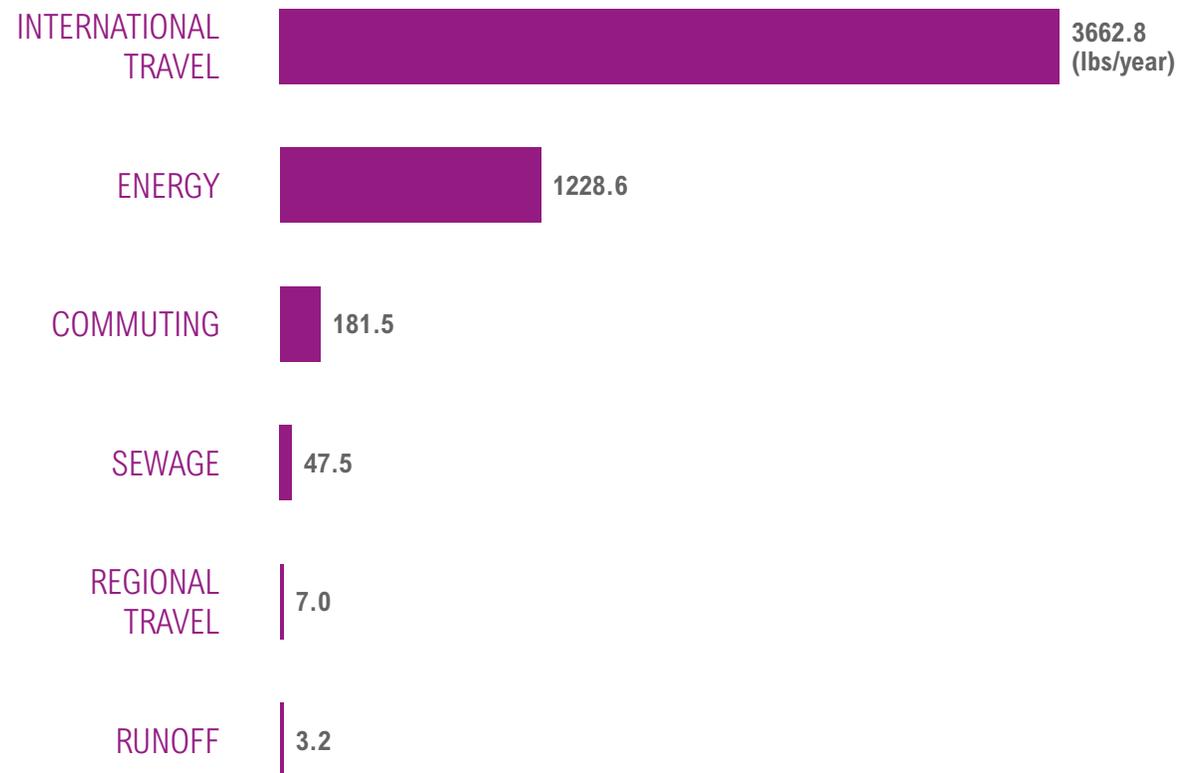
Though our partners and providers account for the vast majority of our "other scope 3" emissions (71 percent), we still will include reduction activities focused on other scope 3 sources. Employee commuting could be reduced by providing incoming staff with low carbon commuting options, shared car and biking resources, and walking- and biking-friendly neighborhood details. Also, our upstream emissions from purchased electricity (scope 3, category 3) will be reduced as we make strides toward our purchased electricity emissions target.

OTHER SUSTAINABILITY EFFORTS

Nitrogen Footprint

As part of our ongoing effort to quantify WRI's environmental impacts, we have completed a nitrogen footprint for 2011, which quantifies our Washington, D.C. office's nitrogen contribution to our local watershed (the Chesapeake Bay) as well as our global impact from international business travel. The Chesapeake Bay is polluted with excessive levels of nitrogen that result in oxygen-depleted "dead zones." Each summer more than 80 percent of the Bay and its tidal rivers do not have enough oxygen for healthy marine life. By learning about its contribution to the nitrogen problem in the Chesapeake Bay, WRI can take steps to voluntarily reduce our impact.

Figure 7 | WRI's 2011 Nitrogen Footprint



Using a tool developed by WRI's People and Ecosystems program, we found that WRI's business activities contributed 5,131 lbs. of nitrogen to our environment. Business travel (air, rail, and rented/reimbursed car travel) accounts for 72 percent of our nitrogen footprint due to the content of NO_x in fuel exhaust.²² The NO_x emissions from the combustion of fuel to produce our purchased electricity account for 24 percent, followed by our employee commuting (4 percent), and sewage treatment (1 percent) (see figure 7). Nitrogen runoff from our office building is negligible, due in part to the installation of a green roof by the American Psychological Association, CBRE (our management company), and WRI staff. The green roof's soil and plants filter and trap nitrogen commonly found in rainwater as a result of car exhaust, fertilizers, and other industrial activities.²³ The increase in purchased electricity, attributed to the addition of 6,000 square feet at our D.C. location, contributed 2,400 more pounds of nitrogen between 2010 and 2011 due to the nitrogen content of power plant emissions. While there are no absolute reduction targets in place to reduce our nitrogen impacts, we project that our overall impact will decrease over time as a result of our GHG emissions reduction activities associated with business travel and electricity use.

Metrics and Reporting

WRI has been accounting for GHG emissions for a decade. Moving forward we want to develop appropriate metrics and improve our strategies for managing our other environmental and social impacts too. Over time, we hope to increase the number of sustainability metrics recorded and reported, transforming the annual update of our various inventories into a comprehensive sustainability report. This report could focus on WRI's four primary objectives: climate protection, governance, markets and enterprise, and people and ecosystems (full details on our four goals can be found here), and how WRI is "walking the talk" to harmonize our internal operations with our external objectives and work.

Communication

Internal and external communication is key to enabling WRI to learn, lead, and push sustainable management forward. In 2011, WRI established a communication network of staff at other NGOs and like-minded organizations to discuss and share knowledge on sustainability issues. The Sustainability Managers Roundtable (SMRT) is made up of roughly 15 NGOs (environmental and advocacy) and development banks. SMRT participants join a webinar once every two months to discuss

topics such as GHG accounting methodologies, target setting, and reducing business travel emissions. We will continue to host and participate in webinars to share information and work to collaborate with our SMRT partners on publications or blogs.

CONCLUSIONS

As an environmental organization, WRI takes its sustainability commitments seriously. Supporting organizational sustainability not only embodies our commitment to the environment, but helps to advance our external goals as an institute. As WRI and other organizations work to refine sustainability metrics, we strive to incorporate those changes into our own activities. By committing to absolute reductions and a full value-chain inventory, WRI is “walking the talk” with our own operations.

In 2010 we set absolute reduction targets, and in 2011 we further refined our inventory methodology and updated our base inventory to reflect the current best practices in GHG accounting.

While methodology refinement and confidence in our data is important, we also must address the challenges of meeting our absolute reductions. WRI has been growing both domestically and internationally and our growth is projected to continue. Like

other companies and organizations around the world, we need to learn how to balance growth with absolute GHG reductions. Two years of full-value chain inventories have helped us understand our largest emissions sources; moving forward, we will develop a strategy to produce the maximum impacts with the available resources.

Each annual inventory report will highlight the year’s reduction efforts and the extent of reductions produced by specific projects. We will also continue to expand this report to include a wider range of sustainability metrics, in order to provide a more holistic understanding of WRI’s impacts, both negative and positive. We continue to share our experiences through work with other NGOs and like-minded institutions, and through our “[WRI’s Sustainability Initiative](#)” webpage at [WRI.org](#), blogs, and other periodic updates.

Despite the challenges, WRI is determined to aggressively pursue activities that reduce our environmental impact while advancing our mission to catalyze broader positive changes in the world. Our overarching goal is that the success of WRI’s Sustainability Initiative will motivate others to do the same.

ENDNOTES

1. WRI has conducted a Greenhouse Gas Inventory annually since 1999. In 2010 we redefined our base year after completing the first full value chain inventory (scopes 1, 2, and 3).
2. Partners include other NGOs and organizations to which WRI provides money (in the form of a sub-grant) to work together on a variety of projects.
3. For more details on our absolute reduction targets, please see our 2010 Organizational GHG Inventory at http://pdf.wri.org/2010_organizational_ghg_inventory.pdf.
4. IPCC, Climate Change 2007, Fourth Assessment Report; IPCC, 2012: Summary for Policymakers in Managing the Risks of Climate Change Adaptation.
5. IPCC, Summary for Policymakers in Climate Change 2007: Mitigation, Fourth Assessment Report.
6. James Bradbury and Sarah Parsons. "By the Numbers: The Hottest Year on Record." WRI Insights (blog). World Resources Institute. January 9, 2013. <http://insights.wri.org/news/2013/01/numbers-hottest-year-record>.
7. Offsets are credits (in the form of emissions trading or funding of emissions reductions) that can be purchased in the quantity of inventory emissions. See the GHG Protocol's "A Corporate Accounting and Reporting Standard" and "The GHG Protocol for Project Accounting" for more information on offsets.
8. Absolute reductions are total GHG emissions reduced and are not normalized to institute growth.
9. The objective of the Sustainability Initiative is to enhance WRI's ability to achieve results by putting our mission and goals into practice. This effort is led by a sustainability manager and the resources to support the work are collected through a carbon tax on business travel and energy use. This report highlights one activity under this initiative: achieving absolute GHG reductions from our own activities.
10. The GHG Protocol is a joint partnership between WRI and the World Business Council for Sustainable Development. More information on the GHG Protocol as well as free downloads of the standards and tools are available at www.ghgprotocol.org.
11. National Energy Technology Laboratory (2008), Development of Baseline Data and Analysis of Life Cycle Greenhouse Gas Emissions of Petroleum-Based Fuels, <http://www.netl.doe.gov/energy-analyses/pubs/NETL%20LCA%20Petroleum-based%20Fuels%20Nov%202008.pdf>.
12. WRI leases its office space, copiers, and printers. Electricity use is included in scope 2, and any maintenance of the copiers and printers is included in category 1.
13. The Greenhouse Gas Protocol Corporate Standard requires the separate reporting of each GHG for scopes 1 and 2. This is not a requirement of scope 3.
14. WRI's 2010 inventory uses GWP factors from the 4th assessment report, published by the Intergovernmental Panel on Climate Change (IPCC) in 2007. WRI's previous inventories used GWP factors from the IPCC second assessment report (SAR).
15. HFC – 134a and R-410 A are types of refrigerants.
16. IPCC, Climate Change 2007, Fourth Assessment Report; IPCC, 2012: Summary for Policymakers in Managing the Risks of Climate Change Adaptation: 7:20.
17. Scope 3, category 1, includes all purchased goods and services not already included in categories 2–8. For example, purchased air travel is included in category 6, business travel.
18. Partners include other NGOs and organizations with which we share responsibility for projects or provide funding to accomplish work that complements or supports our own (sometimes referred to as sub-grantees).
19. In some cases we may decide to publish a full inventory report every 2 years which covers two annual inventories.
20. Rebound effects will be considered when determining emissions savings from flexible work arrangements. Rebound effects occur when staff working at home run appliances or HVAC systems that otherwise would be off during the day.
21. Over time, we may want to collect product-level data from partners and providers; however, corporate inventory data are often easier to calculate and more readily available and therefore are sufficient to help build the engagement program.
22. It is important to note that the 2010 and 2011 Nitrogen Inventories have data gaps that impacted the air travel emissions in the GHG inventories. However, because the nitrogen impact is calculated using mileage data, which would add another layer of relationships between financial costs and environmental impact as well as increase the uncertainty in the resulting data, the recalculation has been left out of the nitrogen inventory.
23. Oberndorfer, Erica et al. 2007, Green Roofs as Urban Ecosystems: Ecological Structures, Functions, and Services, BioScience, Vol. 57 (10), pp. 823-833.
24. Economic Input-Output Models-Carnegie Mellon (<http://www.eiolca.net/Method/LCAapproaches.html>)
25. This includes any travel booked and paid for by WRI for a partner or outside individual to attend a meeting or conference.
26. WRI leases its office space, copiers, and printers. Electricity use is included in scope 2, and any maintenance of the copiers and printers is included in category 1.

APPENDIX A: CALCULATION METHODOLOGY FOR WRI'S 2011 INVENTORY

The following general formula was utilized to calculate emissions in WRI's inventory:

$$\text{Activity Data} \times \text{Emissions Factor} \times \text{Global Warming Potential (GWP)} = \text{CO}_2 \text{ equivalent (CO}_2\text{e) Emissions}$$

Activity data | A quantitative measure of a level of activity that results in GHG emissions.

Emissions factors | A factor that converts activity data into GHG emissions data (e.g., kg CO₂ emitted per liter of fuel consumed, kg CH₄ emitted per kilometer traveled, etc.).

Global Warming Potential (GWP) | A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO₂. The GWP values utilized in this inventory were from the Intergovernmental Panel on Climate Change's (IPCC) fourth assessment report (2007).

Scope 1 – Emissions from Staff Refrigerators

Overview and Activity Data |

Calculating the emissions from WRI's refrigerators required an inventory of our systems and estimation equations from The Climate Registry's General Reporting Protocol (GRP) v 1.1 (2008).

Activity data= Total full charge (capacity) of the equipment= 1.02 kg

Calculation

Formula (The Climate Registry's GRP v 1.1):
Total Annual Emissions (metric ton [mt]) = $[(C_N \times k) + (C \times x \times T) + (C_D \times y \times (1 - z))] \div 1,000$

C_N = Quantity of refrigerant charged into new equipment = 0 kg

C = Total full charge (capacity) of the equipment = 1.02 kg

T = Fraction of the year the equipment was in use = 1 year

C_D = Total full charge (capacity) of equipment being disposed of = 0 kg

k = installation emissions factor = 0 kg

x = operating emissions factor = 0.5%

y = refrigerant remaining at disposal = 0%

z = recovery efficiency = 0%

Inventory of Refrigeration Equipment at WRI's Washington, D.C. Office

TYPE OF EQUIPMENT	# OF UNITS	CAPACITY (oz)	CAPACITY (kg)	REFRIGERANT USED	GWP
GE Profile™ ENERGY STAR® 22.2 Cu. Ft. Bottom-Freezer Drawer Refrigerator	2	4.06	0.12	R-134A	1430
GE Spacemaker® 4.4 Cu. Ft. Compact Refrigerator	1	2.12	0.06	R-134A	1430
GE ENERGY STAR® 22.1 Cu. Ft. Side-By-Side Refrigerator with Dispenser	1	4.75	0.13	R-134A	1430
Danby ENERGY STAR® 4.4 Cu. Ft. Compact All Fridge	1		0.5	R-134A	1430
U-Line Icemaker	1	3.25	0.09	R-134A	1430

Results

Refrigerant utilized = R-134A (also known as HFC-134A)

GWP of HFC-134A = 1430

Total annual refrigerant emissions = 5.1E-06 mt of HFC-134A

Total from refrigerators = 7.3E-03 mt CO₂e

*Emissions factor of 0.5% obtained from The Climate Registry's General Reporting Protocol Version 1.1

0.5% = operating emissions factor X % of capacity/year

Limitations | These calculations are only for the Washington, D.C. office and do not include any refrigerant utilized in the Beijing office. The D.C. office has approximately 12 times the number of staff as the Beijing office does, so any Beijing emissions are likely to be negligible.

Emission Factor Change from 2010 Inventory

| We have adjusted the GWP for HFC-134a from 1,300 as reported in the IPCC Second Assessment Report to 1,430 as reported in the 2007 IPCC report. This adjustment reflects a change in commonly used GWP factors and now more accurately reflects best knowledge and practice. Our adjustment impacts only our scope 1 emissions from annual refrigerant emissions. The emissions from fugitive refrigerants increase from .0066 mt CO₂e to .0073. This change is considered insignificant, thus we will not update our 2010 inventory but our 2011 and future inventories will use the 2007 IPCC GWP for HFC-134a.

Total scope 1 = 0.21 mt CO₂e

Scope 1 – Emissions from Diesel Generators

Overview and Activity Data

| The building in which WRI's Washington, D.C., office is located has a diesel generator on the roof that is used in case of electricity outage. The building manager provided activity data, and the square foot ratio is used to allocate WRI's portion.

Activity data: 90 gallons of diesel utilized in entire building in 2011 (data received from building manager).

Diesel utilized in WRI building in 2010 = 90 x 0.22 = 20.1 gallons.

Calculation

The WRI (2008) GHG Protocol tool for stationary combustion, version 4.0 (worksheet available online at <http://www.ghgprotocol.org>) was utilized to calculate the emissions released in 2011 from the diesel genera-

tor operated in the building housing WRI's Washington, D.C. office. Emission factors utilized in the tool are from the 2006 IPCC guideline for National GHG Inventories.

Limitations | These calculations are only for the Washington, D.C. office and do not include any diesel generators utilized in the Beijing office. The D.C. office has approximately 12 times the number of staff as the Beijing office does, so any Beijing emissions are likely to be negligible. Also, the use of an allocation factor based on square footage is not as accurate as sub-metering the use of diesel generator systems for WRI's own operations.

Results – Emissions from Diesel Generators

CO ₂ (mt)	CH ₄	N ₂ O	TOTAL (mt CO ₂ e)
0.20	N/A	N/A	0.20

Total scope 1 = 0.21 mt CO₂e.

Scope 2 – Purchased Electricity (D.C. Office)

Overview and Activity Data | WRI's office spaces are not metered separately and therefore the electricity purchase data for the entire building was used and allocated using the square foot ratio. Electricity utilized by the entire building in 2011 was 5,676,988 kWh. Using the 0.223 ratio, WRI's electricity usage for 2011 was estimated to be 1,266 MWh.

Calculation

Emissions factors for sub-region RFC East (the region where WRI's Washington, D.C. office is located) were used from the U.S Environmental Protection Agency (EPA) Emissions & Generation Resource Integrated Database (eGRID).

Emissions Factors (mt GHG / MWh):
 CO₂: 0.516
 CH₄: 1.373E-05
 N₂O: 8.488E-06

Total D.C. office purchased electricity = 659 mt CO₂e

Limitation | The use of an allocation factor based on square footage is not as accurate as sub-metering the electricity use for WRI's own operations.

Results – Purchased Electricity (D.C. Office)

ACTIVITY DATA MWh	mt CO ₂	mt CO ₂ e (CH ₄)	mt CO ₂ e (N ₂ O)	TOTAL mt CO ₂ e
1,268	654.9	.4	3.2	658.67

Note: Multiplied the emissions factors by total MWh and GWP.

Scope 2 – Purchased Electricity (Beijing Office)

Overview and Activity Data | To calculate the scope 2 emissions from the Beijing office, activity data were calculated based on a pre-paid electricity rate. Electricity usage in 2011 = 19.0 MWh.

Calculation

Emissions factors for China were provided by the U.S Department of Energy, Energy Information Administration.

Emissions Factors, China (mt GHG / MWh):
 CO₂: 0.839
 CH₄: 0.01458
 N₂O: 0.01841

Total Beijing office purchased electricity = 16.1 mt CO₂e

Limitations | The China emissions factor is not localized and may not be accurate to the electricity mix in Beijing.

Results – Purchased Electricity (Beijing Office)

ACTIVITY DATA MWh	mt CO ₂	mt CO ₂ e (CH ₄)	mt CO ₂ e (N ₂ O)	TOTAL mt CO ₂ e
19.0	15.9	0.01	0.1	16.1

Note: Multiplied the emissions factors by total MWh and GWP.

Total scope 2 = 675 mt CO₂e.

Scope 3

The following Scope 3 categories were accounted for in WRI's 2011 Inventory.

- **Purchased Goods and Services** | Extraction, production, and transportation of goods and services purchased or acquired by WRI, not otherwise included in Categories 2 through 9. In WRI's inventory, this category included any applicable emissions from capital goods, transportation and distribution, and leased assets (e.g., printers and copiers).
- **Fuel- and Energy-related Activities** | Extraction, production, and transportation of fuels and energy purchased or acquired by WRI, not already accounted for in scope 1 or 2.
- **Waste Generated in Operations** | Disposal of waste generated in WRI's operations.
- **Business Travel** | Transportation of WRI employees for business-related activities.
- **Employee Commuting** | Transportation of WRI employees between their homes and WRI's office.
- **End-of-life Treatment of Sold Products** | Waste disposal/treatment of publications distributed by WRI.

CATEGORY 1: PURCHASED GOODS AND SERVICES

Overview and Activity Data | Category 1 was calculated using financial activity data. WRI's accounting department provided FY 2011 data summed by vendor for all goods and services purchased.

Calculation

The Carnegie-Mellon University Economic Input-Output (CMU EIO) Life Cycle Assessment (LCA) tool was utilized to calculate emissions from WRI's purchased goods and services in 2010. This tool is available for free at <http://www.eiolca.net/>. Input-Output tables traditionally represent the monetary transactions between industry sectors in mathematical form. Environmentally Extended Input-Output (EEIO) models indicate what goods or services (or output of an industry) are consumed by other industries (or used as input).²⁴ EIO tables utilized in life cycle assessment (LCA) additionally calculate the average emissions of pollutants associated with spending a certain amount of funds on a particular industry. This is the methodology utilized by the CMU EIO tool.

To align the activity data with the EEIO tool, we had to identify the service or good provided by each vendor, and then group this service or good into predefined sectors based on NAICS sector codes. All vendors for which spending totaled less than \$6,000 were excluded due to estimated insignificance, and charges on the corporate credit

card were excluded due to data collection limitations. Because it is not possible to know how much of the credit card charges are already counted in scope 3 (e.g., business travel), we estimate that 5 to 15 percent of purchased goods and services are not captured in this inventory. The following information was entered into the CMU EIO tool for each good or service that was purchased by WRI in 2011:

- The detailed sector that each good or service is a part of;
- The model to be used for the analysis (the US 2002 Benchmark producer price model was used);
- The amount of economic activity in the sector, i.e., the amount of money spent on purchasing that good or service.

Results

The results can be grouped into three main categories: purchased goods (food, office supplies), purchased services (consulting, design, printing), and services purchased from partners and sub-grantees (money provided as part of project work).

Limitations | Financial activity data are secondary data. It is difficult to account for emissions reductions without primary activity data. The credit card charges are excluded.

Results – Category 1

SUB-CATEGORY	mt CO ₂ e
Partners and sub-grantees	2334
Purchased goods	119
Purchased services	1107
Total Category 1 (purchased goods and services)	3,560

CATEGORY 3: FUEL- AND ENERGY-RELATED ACTIVITIES

Overview and Activity Data | The data from scope 2 are used to calculate this category.

Calculation

Washington, D.C. Office Electricity

- Total pro-rated usage for D.C. office = 1,266 MWh (please refer to scope 2 calculations)
- Cradle-to-gate emissions factors for RFC East (eGrid sub-region) = 0.78 kg CO₂e/kWh (obtained from Carbon Trust Footprinter)
- Combustion emissions factors for RFC East = 0.52 kg CO₂e/kWh
- Upstream emissions factors for RFC East = Life cycle emission factors for RFC East (eGrid sub-region) – combustion emissions factors for RFC East = 0.78-0.52 = 0.26 kg CO₂e/kWh

Beijing Office Electricity

- Total usage for Beijing office = 19,000 kWh (please refer to scope 2 calculations)
- Cradle-to-gate emissions factors for China = 0.92 kg CO₂e/kWh (obtained from Carbon Trust Footprinter)
- Combustion emissions factors for China = 0.84 kg CO₂e/kWh
- Upstream emissions factors for China = Life cycle emission factors for China – combustion emissions factors for RFC East = 0.92 – 0.84 = 0.08 kg CO₂e/kWh

Results

Washington, D.C. Office Electricity

- Total kWh pro-rated usage for 2011 x upstream emissions factors for RFC East / 1000 = 334 mt CO₂e

Beijing Office Electricity

- Total kWh pro-rated usage for 2011 x upstream emissions factors for China / 1000 = 1.5 mt CO₂e

Total category 3 = 335 mt CO₂e

Limitations | Upstream cradle-to-gate emissions associated with diesel fuel were not included in this category. The total combustion emissions for diesel fuel in scope 1 were 8.05E-01 CO₂e, and therefore the upstream emissions were assumed negligible. The combustion and cradle-to-gate emissions factors are from different sources so some uncertainty was introduced when those values were subtracted from each other. Additionally, the China emissions factors are not localized and therefore not as accurate.

CATEGORY 5: WASTE GENERATED IN OPERATIONS

Overview and Activity Data | WRI's Washington, D.C. office utilizes single-stream recycling and the building's management company provides monthly recycling data reports. Applying the conversion factor of 0.223 (WRI sq. ft./Total building sq. ft.) to the recycling data from 2011, we were able to estimate the amount of waste recycled and generated by WRI.

Calculation

Following the guidance given in the Scope 3 Standard on accounting for emissions from recycling, the emissions associated with recycling are not reported in category 5. Therefore, we used the following emissions factors to estimate the emissions associated with the total waste residue.

These data are for average treatment of waste in Great Britain from the Carbon Trust Footprinter tool.

- Average (Waste treatment) = 0.044 kg CO₂e/kg waste
- Waste generated in operations = Total Residue X Average (Waste treatment) X (1 kg/2.2046 lb)*(1 kg/1000 mt) = 0.1 mt CO₂e
- Total category 5 = 0.1 mt CO₂e

Limitations | The emission factors data could be improved in a future inventory with similar data from the United States (at the time of this inventory report, those data could not be located).

Results – Overview of Waste Generated

DEBRIS CATEGORIZATION	TOTAL (lbs)	RECYCLED (lbs)						WASTE (lbs)
	INBOUND WEIGHT	OFFICE PAPER	CARDBOARD	MIXED PAPER	PLASTIC CONTAINERS	ALUMINUM CANS	GLASS	RESIDUE
Total debris generated in 2011	156,400	66,060	38,240	25,900	4,980	1,020	440	19,760
WRI's estimated contribution	34,878	14,732	8,528	5,776	1,111	227	98	4,407

CATEGORY 6: BUSINESS TRAVEL

Overview and Activity Data | Flight and rail travel booked by WRI staff through the CONCUR travel site in 2011 were utilized as the activity data for calculation of emissions from business travel.²⁵ WRI traveled a total of 9,200,000 miles by plane in 2011, and 22,000 miles by train.

Calculation

Calculations for air travel in 2011 differ slightly from all subsequent inventories due to inconsistencies in data collection during WRI's transfer to the CONCUR online system. As a result, the air travel emissions for 2011 required estimation using the finalized financial data (travel actuals) from FY2013 adjusted to 2012 US dollars. The process for recalculation is listed below and more details can be found in Appendix B: Updates to WRI's 2010 Inventory.

Adjusted Travel Actuals_n (2012 US dollars)
x (2012 average % of budget spent on
airfare) = Airfare Costs_n

Airfare Costs_n x (average international
travel costs_{n+1} - average international travel
costs_n) (see Appendix B: table 4 - 1) =
Adjusted Airfare Costs_n

Adjusted Airfare Costs_n x mt CO₂e/\$spent
on airfare (2012) = recalculated air travel
emissions_n

- Where n equals the year in question (e.g., 2010, 2011)

Rail travel was calculated using emissions factors from DEFRA, the Environmental Protection Agency (EPA), and the Intergovernmental Panel on Climate Change (IPCC) 2006 guidelines for National GHGs. Calculations were done each quarter.

Results

- Total mt CO₂e from air travel = 1,054.7
- Total mt CO₂e from rail travel = 2.6
- Total mt CO₂e from business travel (air and rail) = 1,057.4

CATEGORY 7: EMPLOYEE COMMUTING

Overview and Activity Data |

WRI surveys its Washington, D.C. staff annually to obtain data on commuting patterns. The number of staff who answered the survey in 2011 was 140 and the total number of staff present at that time was 190. A scaling factor of 1.33 (190/143) was applied to the activity data collected to estimate commuting for all staff. Staff traveled approximately 32,000 miles by bus; 170,700 by metro; 121,100 miles by commuter rail; 60,800 miles by car (or 2,600 gallons of fuel); and 43,400 miles walking or biking.

Calculation

The GHG Protocol tool for transport or mobile sources was utilized to calculate the emissions from employee commuting. The tool utilizes emissions factors from DEFRA, EPA, and IPCC 2006 guidelines.

A distance-traveled approach was used to calculate emissions from employees commuting by bus, metro, and commuter rail while a fuel-based approach was utilized for calculating emissions from commuting by car.

Results

Total for category 7 = 76 mt CO₂e

CATEGORY 12: END-OF-LIFE TREATMENT OF SOLD PRODUCTS

Overview and Activity Data | As a global environmental and development think tank, WRI does not sell any conventional “products.” However, WRI does produce publications as part of its work, and the end-of-life treatment of these publications was estimated and included in the 2011 inventory. The following conservative assumptions were made about the number and weight of publications:

Full Reports

- In 2011 WRI produced 14 reports, and it was assumed 2,000 copies of each were produced for a total of 28,000 copies printed in 2011.
- It was assumed that each weighed .59 kg. Hence 28,000 publications weighed approximately 16,510.9 kg.

Issue Briefs

- In 2011 WRI produced 13 issue briefs, and it was assumed 150 copies of each were produced, in office, for a total of 1,950 copies printed in 2011.
- It was assumed that each weighed .42 kg. Hence 1,950 publications weighed approximately 819.0 kg.

Working Papers

- In 2011 WRI produced 12 working papers, and it was assumed 150 copies of each were produced, in office, for a total of 1,800 copies printed in 2011.
- It was assumed that each weighed 0.37 kg. Hence 1,800 publications weighed approximately 666.0 kg.

Conservative assumptions were made to get the worse-case scenario estimate for this category.

Calculation

EPA statistics for municipal solid waste generation, recycling, and disposal in the United States for 2009 indicate a 34 percent average recycling rate for all materials and a 74 percent recycling rate for office-type paper. Because it was not clear whether publications would qualify as office-type paper, we assumed the conservative value of 34 percent recycled and the rest disposed of in a landfill. The total mass of publications in 2011 assumed to eventually be disposed of in a landfill is 17,996 kg.

Based on EPA GHG Inventory statistics, 58 percent of U.S. landfills have some methane recovery. Emissions factors for landfill of paper and textiles, with recovery (1.45 kg CO₂e/kg waste) and without (2.5 kg CO₂e/kg waste) were obtained from the New Zealand Ministry for the Environment, 2008.

Results

Total for category 12 = 23 mt CO₂e

Limitations | The United States-only estimates for recycling rates that are used in this report are likely not accurate since our publications are distributed worldwide. The data from New Zealand landfills may not be an accurate representation of the average global disposal of our publications. We made no assumptions about waste being incinerated with or without energy recovery because no emissions factors data were located, although it is likely that some portion of publications are disposed of in this way.

APPENDIX B: UPDATES TO WRI'S 2010 GHG INVENTORY

Shift to Fiscal Year

Due to refining our data collection and calculation methods, we have updated our 2010 inventory to reflect our shift from calendar year to fiscal year data collection and a change in our air travel emissions. This required recalculating our scope 2 and scope 3, categories 3 (upstream emissions from purchased electricity) and 6 (business travel). Some portions of our 2010 base year could not be adjusted to a fiscal year because our prior inventory (2009) did not account for our full value change and the necessary data is not available for this year. This includes our scope 1 emission sources as well as scope 3: categories 5 (waste), 7 (employee commuting), and 12 (end-of-life of publications).

Adjusting 2010 Air Travel Emissions

The following section outlines how we estimated the missing airfare emissions from our 2010 and 2011 inventories. We then used this information to recalculate our 2010 base year inventory.

Overview and Activity Data

Recalculating the air travel emissions in our 2010 and 2011 inventories.

Assumptions

1. WRI's air travel emissions are directly related to total money spent on airfare, essentially the greater amount of funds spent on airfare, the greater the resulting emissions.
2. In 2011 and 2012, an average of 59 percent of WRI's travel budget was spent on airfare. This average is assumed for 2010.
3. The 2010 and 2011 travel expenditures (referred to as travel actuals) were adjusted to account for increases in average travel costs in order to normalize the budgets to 2012 travel dollars.

Calculation

Activity data = Travel Actuals_n

Formulas:

Adjusted travel Actuals_n (2012 US dollars) x (average % of budget spent on airfare: 2012) = Airfare Costs_n

Airfare Costs_n x 0.095 (average international travel costs_{n+1} - average international travel costs_n) (see table 4 - 1) = Adjusted Airfare Costs_n

Adjusted Airfare Costs_n x mt CO₂e/\$spent on airfare (2012) = recalculated air travel emissions_n

Where n equals the year in question (e.g., 2010, 2011)

Airfare Cost Increases in 2011 and 2012

ORIGIN OF FLIGHT	AVERAGE % INCREASE IN TRAVEL COSTS	
	2010 – 2011	2011 – 2012
North America Short Haul (Economy)	4	3.5
North America Long Haul (Economy)	5	2
EMEA Short Haul (Economy)	6.5	2
EMEA Long Haul (Economy)	7	3.75
LATAM Short Haul (Economy)	5	5
LATAM Long Haul (Economy)	5.5	4
APAC Short Haul (Economy)	5.5	3
APAC Long Haul (Economy)	7.5	7
Average Percent Increase	5.75	3.8

Source: AmericanExpress.com's Global Business Forecast, 2011.

Results

$\$2,168,532.53 \times 0.597 = \$1,294,167$
 $\$1,294,167 \times 0.095 = \$1,417,517.72$
 $\$1,417,517.72 \times .00088 = 1,247.0 \text{ mt CO}_2\text{e}$

The estimated emissions for 2010 = 1,247 mt CO₂e

Limitations | These calculations are estimations of missing data and are not as accurate as direct activity data. In order to recreate missing data, assumptions about increasing airfare costs and the relationship between the financial cost of a plane flight and the GHG emissions had to be made.

Updated 2010 Inventory with Fiscal Year and Air Travel Adjustments

SCOPES AND CATEGORIES	METRIC TONS (mt) CARBON DIOXIDE EQUIVALENTS (CO ₂ e)
Scope 1: Direct emissions from owned / controlled operations	16
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating, and cooling	592
Upstream (purchased) scope 3 emissions	
Category 1: Purchased goods and services	2559
Category 2: Capital goods	Accounted for in category 1 (purchased goods and services)
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)	293
Category 4: Upstream transportation and distribution	Accounted for in category 1 (purchased goods and services)
Category 5: Waste generated in operations	<1
Category 6: Business travel	1252
Category 7: Employee commuting	107

SCOPES AND CATEGORIES	METRIC TONS (mt) CARBON DIOXIDE EQUIVALENTS (CO ₂ e)
Category 8: Upstream leased assets	Accounted for in scope 2 and category 1 (purchased goods and services) ²⁶
Downstream (sold) scope 3 emissions	
Category 9: Downstream transportation and distribution	N/A
Category 10: Processing of sold products	N/A
Category 11: Use of sold products	N/A
Category 12: End-of-life treatment of sold products (publications)	28
Category 13: Downstream leased assets	N/A
Category 14: Franchises	N/A
Category 15: Investments	N/A (Improving the sustainability of our investments is being addressed independent from our GHG inventory)

ACRONYMS

CH ₄	Methane
CMU EIO	Carnegie-Mellon University Economic Input-Output
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DEFRA	Department for Environment, Food and Rural Affairs
EEIO	Environmentally Extended Input-Output
eGRID	Emissions and Generation Resource Integrated Database
EPA	Environmental Protection Agency
ft	Feet
GHG	Greenhouse Gas
GRP	General Reporting Protocol
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
HVAC	Heating, Ventilation, Air Conditioning
IPCC	Intergovernmental Panel on Climate Change
kg	Kilogram
KWh	Kilowatt hour
lbs	Pounds
LCA	Life Cycle Assessment
mt	Metric Ton
MWh	Megawatt hour
N ₂ O	Nitrous Oxide
NGO	Non-Governmental Organization
oz	Ounce
PFC	Perfluorocarbons
RAC	Refrigeration and Air Conditioning
RECs	Renewable Energy Credit
SF ₆	Sulfur Hexafluoride
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute

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