



ENCOURAGING SUSTAINABLE BEHAVIOR

A toolkit for the Natural Resources Defense Council

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INTRODUCTION

The Fifth Assessment Report by the Intergovernmental Panel on Climate Change states with 95% certainty that climate change is caused by human activity.¹

Although technological advancements will play a major role in mitigating anthropogenic effects, society will also need to alter its behavior to ensure the survival of future generations. Recognition of this fact has led to the emergence of studies that apply social psychology and change-management theories to drive more environmentally-responsible behavior within communities and organizations. The following document seeks to leverage these bodies of research in order to develop a behavior change program for employees of the Natural Resources Defense Council (NRDC).

Research shows that people are creatures of habit and prefer regular routines.² Overriding a habit requires deliberate and strategic interventions that make people more conscious of their behavioral choices. By heightening their awareness, these interventions increase an individual's capacity to change.³

McKinsey & Company published a report in 2003 that highlights the four conditions required to change behavior in an organization.⁴

1 First, the change program should have a mission that employees will support. Cognitive dissonance theory⁵ posits that the perception of an inconsistency between an individual's values and actions creates a state of psychological discomfort. This motivates the individual to seek and implement a strategy to alleviate this aversive state.⁶ Once individuals understand and internalize the purpose of a change program, such as reducing their environmental footprint, they are

more inclined to adjust their behavior accordingly to avoid this psychological anxiety.

2 The second condition is a reinforcement system that provides positive feedback for desired actions. This feedback loop could be in the form of visual progress, praise, or incentives that are closely paired with the behavior. Positive incentives encourage repeated behavior and, if provided over a short period of time, they have been shown to facilitate the development of new habits that may persist after the incentive period.⁷ The more often that new behaviors are performed, the more they are ingrained and become automatic.⁸ In addition, positive incentives have been shown to be more effective than punitive measures, which will be a key consideration in the proposed implementation plan.⁹

A modern form of reinforcement theory is found in the rise of gamification which uses game thinking and mechanics

to engage audiences and solve problems.¹⁰ Gamification has been applied within organizations to engage employees in the workplace to overrule existing habits and stabilize new behaviors by setting appropriate incentives.





3 Gamification breaks down tasks into various subtasks and milestones which is the third condition necessary for behavior change according to the McKinsey report.¹¹ Many change programs make the mistake of requesting employees to behave differently without teaching them how to do

so. For example, a company may urge staff to reduce overall waste, but if employees already recycle, they may not understand how waste reductions can be achieved by reusing certain items, such as coffee mugs, or changing their consumption patterns. By making tasks achievable and easily understood, employees are more likely to engage in desired behaviors.

4 Finally, the fourth condition required for behavior change is the presence of role models.¹² Social norms are informal rules that are enforced through social ramifications or rewards¹³ and are found to guide actions by giving people a general sense of what the majority thinks or does.¹⁴ By instituting role models for the desired behavior, the organization can develop a new set of social norms. As individuals strive to feel connected to a group,¹⁵ they are more likely to shift their behavior to be in accordance with the norm. Role

models exhibiting desired behaviors, such as turning off desk lamps, increase the opportunities for desired behavior to be directly witnessed by others, further motivating behavior change. For pervasive behavior change throughout an organization, it is crucial that not only leadership exhibits the behavior change, but also middle management. Research shows there is greater likelihood that a person will take the desired action when the request comes from someone known and respected.¹⁶

In addition to drawing on behavioral research, it is necessary to understand the current environmental impact of the organization to create a successful behavioral change plan.



ANNUAL TOTALS

TRAVEL

2,400
mT

ENERGY

966,000
kWh

WASTE

21,700
lbs

WATER

850,000
gal.

NRDC CURRENT FOOTPRINT

And Potential Goals

NRDC has made great strides in data collection to track and examine the organization's environmental impact. Existing data provided by NRDC in the areas of travel, energy, waste, and water was analyzed to determine whether baselines and reduction targets could be set. Because some of the data lacks consistency across offices and time periods, it is recommended that NRDC establish consistent measurement systems in each office before sharing the data externally and setting official benchmarks. These measurement systems should include: measuring the amount of waste generated by each office, using the Noveda system to measure energy usage, and measuring the carbon emissions and reasons for travel associated with all employee business trips through the current travel management software. The following is a brief snapshot of the analysis in each impact area.

TRAVEL

MILES TRAVELED by Car, Rail, and Air in Calendar years 2011-2012

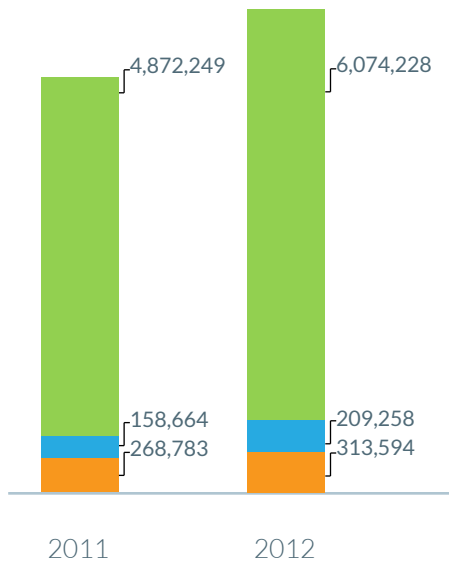


Figure 1

Business travel by NRDC employees is an indirect source of carbon emissions but comprises approximately 82% of the organization's total carbon footprint.

The vast majority of business travel miles were traveled by air, as depicted in Figure 1.¹⁷

A total of 6.3 million miles were recorded during Fiscal Year 2012, equivalent to 2,407 tonnes of carbon dioxide emissions. Figure 2 shows that some departments travel more frequently than others. For example, the Land and Wildlife, International, and Institutional departments were responsible for the most air travel

emissions.¹⁸ As the emissions budget would be set by program area and based on a percent reduction, departments that travel more frequently should be responsible for a larger decrease in their carbon emissions. Travel should be reduced by increasing the use of video- and teleconference services for meetings, which plays an important role in the recommendation. Based on the total air travel emissions and the average length of a round-trip flight (2,765 miles) calculated from NRDC's data, an estimated 1.08 tonnes of CO₂e emissions would be prevented by replacing a typical business trip with a videoconference.

TRAVEL EMISSIONS FROM AIR TRAVEL by program for FY 2012

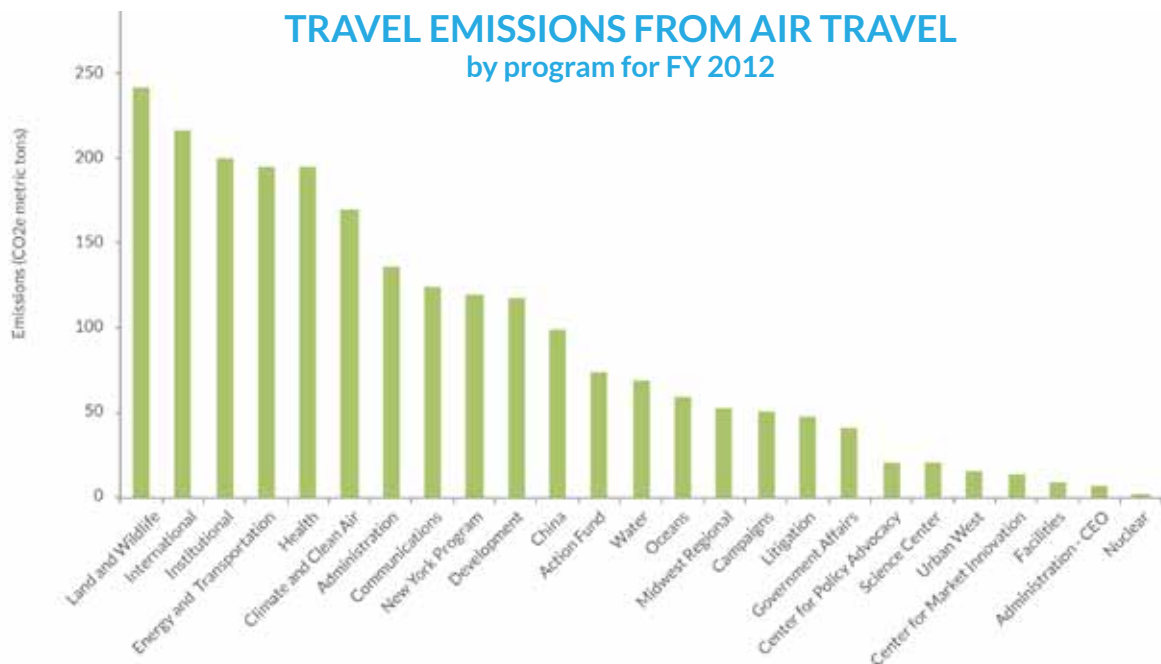


Figure 2

ENERGY

After travel, the greatest share of emissions comes from electricity (12%).

This can most directly be affected by employee behavior through actions such as turning off lights and computer equipment when not in use. In addition to being tied to employee behavior, electricity usage can most easily be measured and compared across all offices. NRDC offices consumed approximately 962,000 kWh in Fiscal Year 2012 and 966,000 kWh in Fiscal Year 2013. Figure 3 compares the electricity

consumption per employee in each office location for a period of two years. The Washington, DC office used the most electricity per employee in 2012. This can be attributed to the office's use of an electric heating system while other fuels were used for heating in the other offices. For the remaining six offices, consumption per employee varies greatly, from 600 to 3600 kWh. The changes in energy consumption between 2012 and 2013 range from a 13% reduction in DC to an increase of 10% in New York. Differences in weather patterns, HVAC systems, infrastructure energy conservation

measures and fluctuating numbers of temporary staff account for some of this variability.

Case studies have shown that information about electricity consumption being communicated to employees¹⁹ can inspire staff to make efforts to reduce consumption. An inter-office competition based on percent reductions per employee could provide additional motivation if each office's employees feel that they have the potential to win. To measure progress, each office's performance should be compared to its performance from the previous year as well as the performance of other offices.

ANNUAL OFFICE ELECTRICITY USAGE per employee

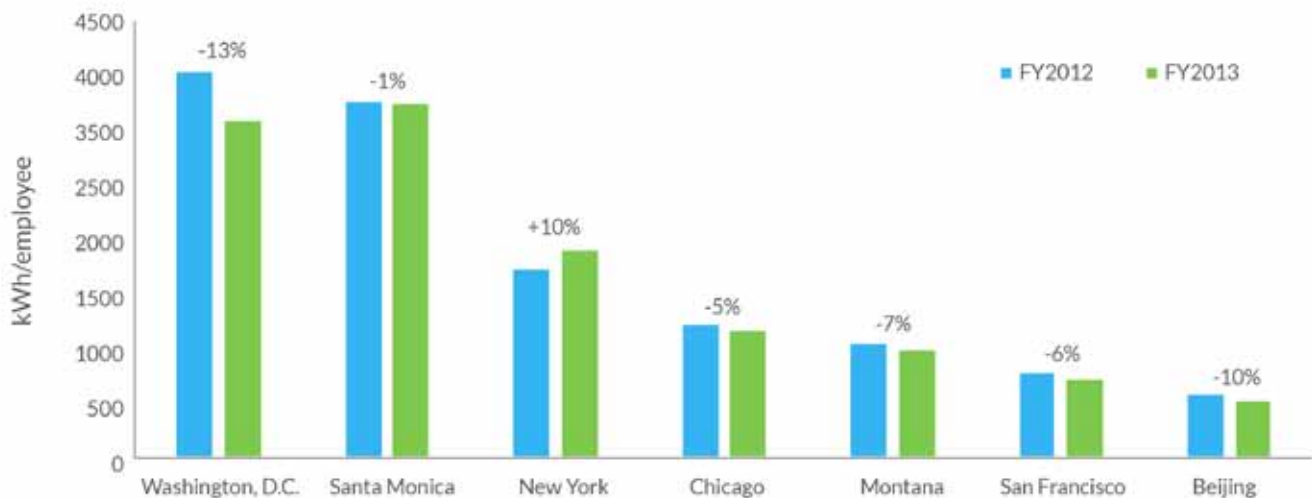


Figure 3

WASTE

Waste data was provided for three offices.

From this data, a comparison of absolute waste generated and waste generated per employee could be conducted (see Figures 4 and 5). The diversion rate, or the percentage of total waste that is diverted from landfill, is a commonly used metric which emphasizes proper sorting of recyclable and compostable materials. Analysis shows the diversion rates in the three NRDC offices averaged 74%, which is well above the

Environmental Protection Agency's stated internal goal of 55% by 2015.²⁰

Surveys completed by the Office Administrators indicated that employees already sort their waste properly in most of the offices, though less confidently in the DC, Beijing, and New York offices. Measuring only the diversion percentage can hide the underlying quantities of each waste type. Therefore, rather than increasing the diversion rate, reducing the absolute quantity of landfill waste is a more appropriate goal for NRDC.

To encourage waste reduction, an inter-office competition should be held with the goal of achieving the greatest percentage reduction in landfill waste per employee. By focusing on the absolute amount of landfill waste per employee rather than the diversion rate, an office would not be rewarded for simply generating high quantities of recyclable waste. An interactive educational event focused on waste reduction can also uncover any confusion among employees regarding sorting rules.



TOTAL WASTE & RECYCLING

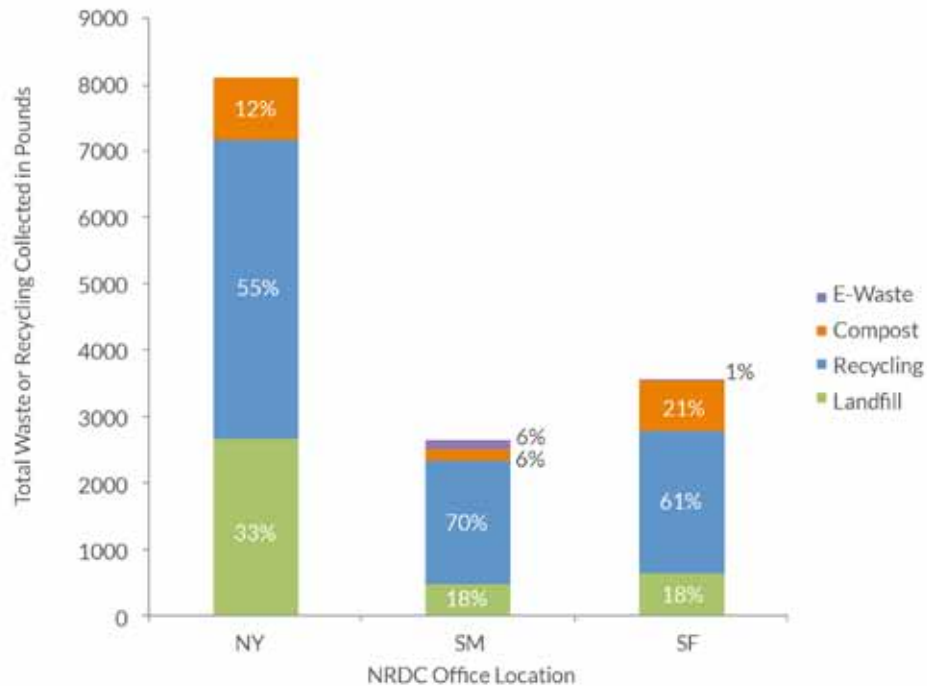


Figure 4

TOTAL WASTE & RECYCLING collected/employee from May to August 2013

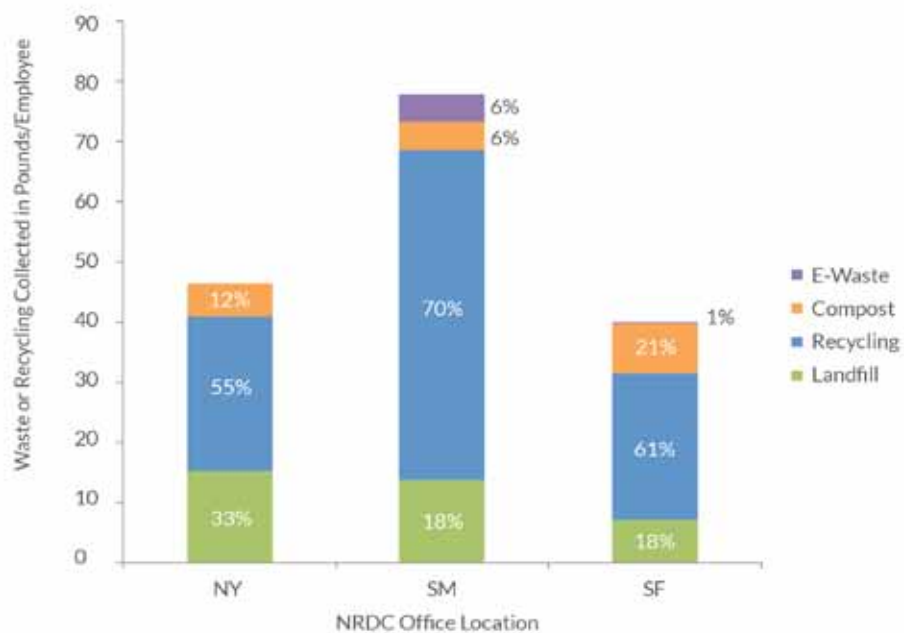


Figure 5

WATER

Water data was only available for the New York, Chicago and Santa Monica offices.

The analysis included a comparison of gallons used per employee, revealing Santa Monica to have the highest water use. This finding was surprising because the Santa Monica office is, unlike other

office locations, equipped with rainwater and graywater systems as well as waterless urinals. This anomaly could be due to the fact that it is the only office with landscaping needs. The influx of interns not accounted for in the employee headcount may also be skewing the gallons-per-employee ratio.

Since most of NRDC's offices

currently have low-flow fixtures in restrooms and kitchens, water usage reduction is not a focus of the behavior change plan. While collecting data may be worthwhile for identifying faulty systems, there is limited potential for additional water savings through behavior change in office environments where infrastructural retrofits have already been installed.





A SUSTAINABLE BEHAVIOR PLAN FOR NRDC

The following implementation plan for NRDC draws on behavioral research as well as the current environmental footprint of NRDC. The plan recommends several strategies for encouraging behavior change in their employees in order to reduce their impact across the areas of business travel, energy, and solid waste.

The proposed plan includes two main strategies.

CARBON EMISSIONS ALLOWANCE

First, reducing carbon emissions from business travel will be addressed through an emissions allowance by program area. Since the majority of NRDC carbon emissions are associated with business travel, particularly air travel, a stronger travel policy is needed to heighten employee awareness

of these emissions and discourage non-essential travel. A preliminary reduction goal should be instituted immediately in conjunction with employee training on video and teleconference services. As part of this, each employee should be obligated to take part in a meeting using one of these technologies. After an initial period of data collection, the emissions allowance should then be set by program directors. This initiative is in line with the research mentioned above which shows that setting goals, measuring and tracking performance, and breaking down large goals into subtasks increases the likelihood of behavior change.

ENERGY & WASTE COMPETITIONS

The second strategy is a series of competitions on waste and energy reduction among employees. By using techniques influenced by

behavioral psychology, this initiative will establish social norms as offices compare their performance and reinforce desired behaviors through feedback systems. The competitions would include kickoff events, such as Dumpster Day for waste and Off-the-Grid-Hour for energy, setting the tone for the competition period and instructing employees on the actions they can take.

These competitions should be driven and supported by volunteer Green Champions in each office. The Green Champions should promote the initiatives and serve as contact points between Office Administrators and all staff. They should also serve as role models and sources of information for their fellow employees regarding environmentally-responsible behavior.

DATA SUMMARY & POTENTIAL TARGETS

Determining potential targets for the program solely using existing NRDC data is difficult as past reductions were achieved through infrastructural changes. The targets below, however, consider the results of comparable initiatives at other organizations and can serve as reference points for what can be achieved through the proposed recommendations.

01 TRAVEL EMISSIONS



The data showed that 200 NRDC employees travel on business trips. If each of these employees replaced one round-trip flight with a video- or teleconference, NRDC could save an estimated 9% of travel emissions per year. This target is similar to results observed at Microsoft, where carbon emissions were cut by 30,000 tonnes over six years, or approximately 11% annually, through a policy of communicating the carbon impacts of travel, promoting online collaboration tools and establishing an internal price for carbon that is charged to the business groups responsible for incurring the emissions.²¹ This 9% reduction is meant to serve as a goal for the initial phase of the initiative. A more accurate benchmark can be set when the travel itineraries and reasons for travel are tracked in a standardized manner.

02 ENERGY



For the electricity portion of the competition, a target range of 4%-12% reduction is suggested. The lower end of this range is based on the analysis of two years' worth of energy data for each office. The upper end of the range refers to the results of similar initiatives using champions at other organizations (through Global Action Plan UK) resulting in an average energy savings of 12%.²² In addition, a competition at Portland Energy Conservation (PECI) achieved a 7% reduction.²³

03 WASTE



Waste data for NRDC is only available for three offices and over a three month period. As an initial goal, the potential reduction that NRDC could achieve is 38%. This is based on the results of waste reduction initiatives in 51 offices through Global Action Plan UK that leveraged champions and saw an average of 38% reduction in waste quantities after 3-5 months.²⁴

Figure 6 summarizes the data from all impact areas and potential targets for the proposed program, in percent reductions as well as absolute numbers. As the waste and water data both existed for only three offices, those figures were extrapolated to the whole organization on a per-employee basis. Detailed calculations behind these values can be found in the spreadsheets accompanying this plan.

Figure 6

	NRDC TOTAL		PER EMPLOYEE		TARGET	POTENTIAL PROJECTED SAVINGS PER YEAR
	2012	2013	2012	2013		
Travel Emissions (tonnes CO₂e)	2,407	*	**	**	-9%	216
Electricity Consumption (kWh)	961,568	966,067	2,200	2,137	-4% to -12%	38,643 to 115,928
Emissions from Electricity Consumption (tonnes CO₂e)	348	346	0.796	0.765	-4% to -12%	14 to 42
Electricity Cost	\$166,048	\$169,274	\$367	\$375	-4 to -12%	\$6,771 to \$20,313
Landfill Waste (pounds)	*	21,711	*	48	-38%	8,250

* No data available

** This will not be calculated by employee

TIMELINE

The timeline in Figure 7 shows how the initiatives should be rolled out over a two year period. While a carbon emissions budget will begin immediately for business travel, it is important that data be collected for the first six months and then evaluated to determine realistic budgets moving forward. Travel should be tracked on an ongoing basis with current results

being shared monthly. More detail on carbon emissions budget is provided on page 21.

The competitions should begin in Quarter 2 of the first year with the energy and waste programs alternating throughout the year in three month increments. This should help to ensure momentum is maintained around the competitions

and to provide timely reinforcement for sustainable behavior. As waste data is incomplete, it is recommended that the energy competition be launched first to allow for a data collection period for waste. The waste program should then be executed in the following Quarter (Quarter 3 of the first year). More detail on roll-out and logistics is provided below.

YEAR	YEAR 1				YEAR 2			
Quarter	1	2	3	4	1	2	3	4
CARBON EMISSIONS ALLOWANCE								
Set 9% initial target and collect data								
Reevaluate and set new budget for Year 2								
Announce new budget for Year 2								
Ongoing tracking and evaluation								
Results								
SUSTAINABOWL COMPETITION								
Waste								
Waste Collection System set-up								
Data Collection								
Kickoff Event								
Waste Competition								
Communication of monthly progress								
Energy								
Noveda System Set-Up								
Data Collection								
Kickoff Event								
Energy Competition								
Communication of monthly progress								

Figure 7

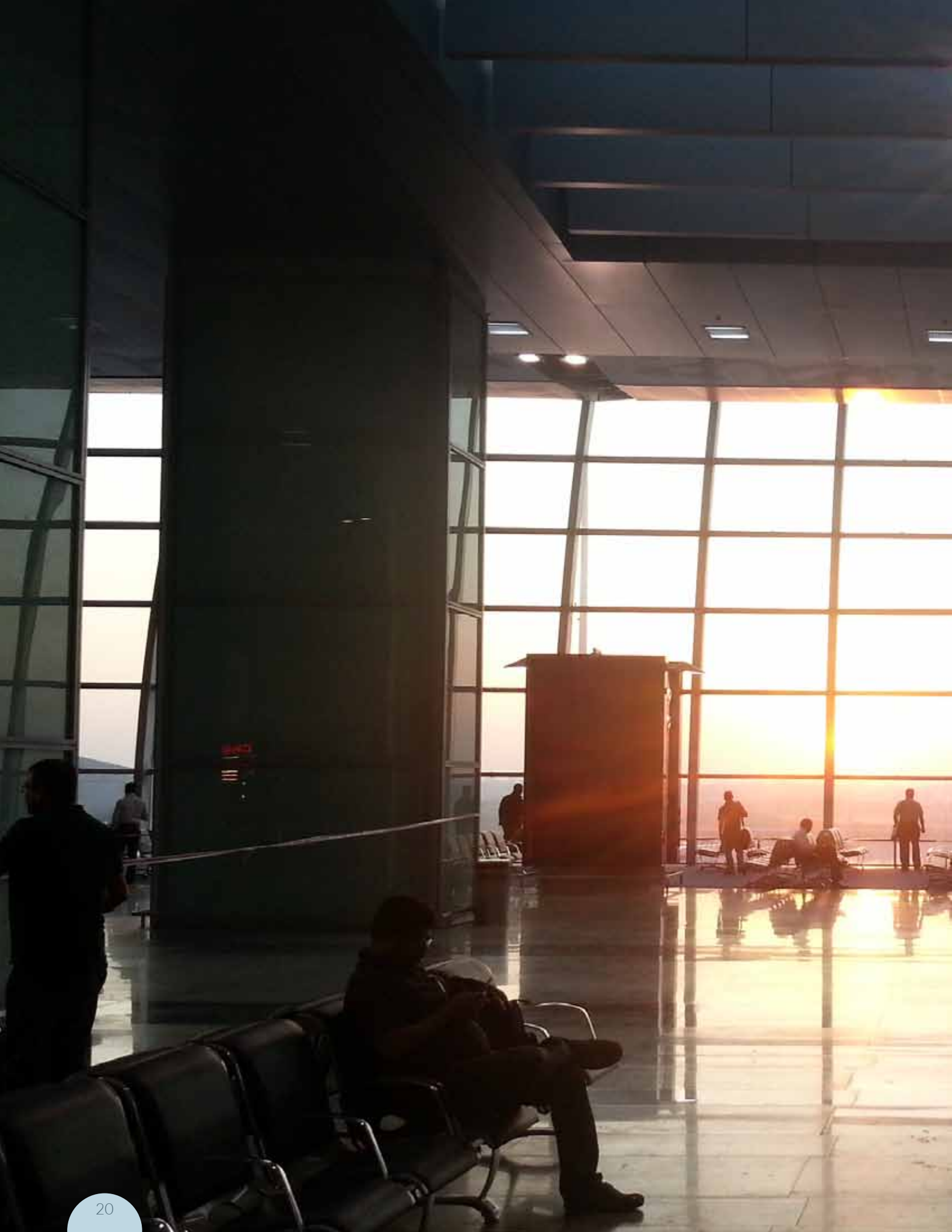
TOTAL ANNUAL BUDGET

The total budget for the proposed behavior change plan involves both fixed costs and variable costs, which depend on the sizes of the offices that win competition awards. The total cost for the first year of the program is broken down in Figure 8.

ITEM	COSTS BY OFFICE							TOTAL
	NY	SM	SF	DC	CHI	MT	BJ	
ONE TIME COSTS								
Competition Set Up								
Dashboard Monitors ¹	\$2,500	\$1,500	\$1,000	\$500	\$500	\$500	\$500	\$7,500
Installation & Connectivity Fees	\$500	\$300	\$200	\$100	\$100	\$100	\$100	\$1,500
Total Competition One-Time Costs	\$3,000	\$1,800	\$1,200	\$600	\$600	\$600	\$600	\$9,000
FIXED COSTS PER YEAR								
Travel Emissions Allowance								
Triplt for Teams (Concur Add-on) ²	-	-	-	-	-	-	-	\$8,388
Dashboard								
Electricity ³	\$106	\$64	\$42	\$21	\$21	\$21	\$21	\$297
Total Fixed Costs Per Year	\$106	\$64	\$42	\$21	\$21	\$21	\$21	\$8,685
VARIABLE COSTS PER YEAR								
Competition Awards ⁴								
Food Events/Parties	\$10,500	\$2,040	\$5,340	\$5,940	\$1,140	\$180	\$1,380	*
Floor Competition Awards (NY only)	\$980	-	-	-	-	-	-	\$980
Dumpster Day Event ⁵								
Nitrile Gloves	\$60	\$12	\$24	\$36	\$12	\$12	\$12	\$168
Tyvek Suits	\$250	\$50	\$100	\$150	\$50	\$50	\$50	\$700
Tarp	\$55	\$11	\$22	\$33	\$11	\$11	\$11	\$154
Off-the-Grid Hour Event								
Lunch & Learn Meals	\$3,500	\$680	\$1,78	\$1,980	\$380	\$60	\$460	\$8,840
Total Variable Costs Per Year	\$15,345	\$2,793	\$7,266	\$8,139	\$1,593	\$313	\$1,913	\$37,362
TOTAL IMPLEMENTATION PLAN COSTS							Min.	Max.
Year 1							\$28,707	\$39,027
Subsequent Years							\$19,707	\$30,027

Figure 8

1. Costs based from 40-inch monitors
 2. Organization-wide that is independent of number of employees by office. Central office should cover.
 3. Assumptions: 1,747 kWh/year to run all 14 monitors at \$0.17/kWh
 4. 1 winning office award and 1 winning floor award for each competition quarter based on: highest % reduction of kWh per employee, or highest % reduction in landfill waste per employee
 5. Dumpster Day involves multiple sets of supplies- one per floor except for SM, and 3 for DC
- *No total as only one office wins every year.



CARBON EMISSIONS ALLOWANCE

In 2013 NRDC employees took 2,125 flights and traveled 5.87 million miles by air. The estimated carbon emissions associated with these flights is 2,299 tonnes.

To help reduce the environmental impacts associated with business travel, a carbon emissions allowance should be created for all employee business trips. Each department will create their emissions allowance budget and the Finance department will provide reports of actual vs. budgeted emissions. This should be integrated into the current financial budgeting process of NRDC. The carbon emissions allowance aligns with initiatives NRDC is currently undertaking:

- 1 Revision of NRDC's employee travel policy
- 2 Launch of Microsoft Lync software for videoconferencing and online collaboration

OBJECTIVE

The overall goal of the initiative is to reduce the carbon footprint associated with business travel by 9% or more through a decrease in the number of non-essential business trips taken by NRDC employees.

This initiative can be achieved through a combination of two approaches:

1 Employee education about the most appropriate option for their meeting needs, which may not require physical travel.

2 Tracking the carbon emissions generated by individual employees and using this data to develop a carbon allowance for each department.

The education component should include informing employees about video- and teleconferencing which can be used to eliminate the need for face-to-face meetings. To allow employees to develop an understanding of the new videoconferencing system, each employee should be encouraged to conduct one videoconference

in the first month of the program. PriceWaterhouseCoopers undertook a similar initiative which led to an increase in the number of online meetings by 112%.²⁵ When travel is necessary, the trip-booking software, Concur's Triplt, which will be discussed in more detail on the following pages, can allow employees to make better-informed decisions on taking less carbon-intensive modes of transportation.

The carbon emissions allowance can provide a data-driven method to help employees and management better understand the environmental impact of current travel behavior and

alternate travel options without eliminating travel altogether. The necessary data for each employee's travel should easily be collected using Triplt software. While data collection has taken place in the past, it is recommended that there be a baseline period to ensure all employees are regularly using the Triplt software and that the data for emissions by program area is on par with data from previous years. After the baseline period, senior management and program directors can work together to create a realistic carbon budget for travel. During the baseline period the reduction target will be 9%, as outlined on page 16.





CASE STUDY: MICROSOFT

Microsoft clearly communicates in their travel policy that the average trip generates 2,200 pounds of carbon. The company has a set policy to travel only when absolutely necessary and to utilize their collaboration tools to communicate, especially internally and among their offices. According to TJ DiCaprio, Microsoft's Senior Director of Environmental Sustainability, "collaboration products and operational control measures have helped us reduce our carbon footprint from air travel by more than 30,000 metric tons."²⁶

IMPLEMENTATION

Before an emissions budget can be finalized, it is important that current travel trends have been recorded and data have been collected to ensure a realistic baseline. A five-step approach should be taken:

- ✓ Collect baseline information
- ✓ Establish budgets
- ✓ Monitor departmental status
- ✓ Make adjustments
- ✓ Assess results

Using the percentage of NRDC a travel miles by program from Fiscal Year 2013, the current emissions breakdown was calculated. With

this data, an initial carbon emissions reduction goal of 9% is proposed, equivalent to approximately 216 tonnes of carbon annually. This goal is based on the reduction that would occur if each of the 200 traveling NRDC employees reduced their travel by one average flight (2,765 miles). Figure 9 on page 24 shows the air travel emissions by program area and the number of average flights that would need to be eliminated to reach the target emissions reduction. If this target is instituted for the first six months, the emissions and number of flights in this table should be halved for that period.

This initiative should be implemented throughout the entire organization as a formal component of the travel policy. Because of this, administration of the carbon budget, much like a financial budget, should be incorporated into the duties of current full-time positions. Departments that would be involved include finance, program directors, information technology (IT), and communications.

To launch the initiative, the Chief Operating Officer (COO) should announce that all employee travel will be booked through Triplt per the new travel policy. This should allow for

CARBON EMISSIONS ALLOWANCE

Figure 9

NRDC 2012 Air Travel Emissions & Emission Targets by Program Area (in Tonnes)

Data Provided by NRDC

DEPARTMENT	DEPARTMENT EMISSION PERCENTAGE	2012 EMISSIONS (TONNES)	EMISSIONS REDUCTION 9% TARGET	TRIPS TO ELIMINATE TO REACH TARGET	ANNUALIZED EMISSIONS ALLOWANCE
Land and Wildlife	10.50%	241	-22.69	-21	219
International	9.40%	216	-20.32	-19	196
Institutional	8.70%	200	-18.80	-17	181
Energy and Transportation	8.50%	195	-18.37	-17	177
Health	8.50%	195	-18.37	-17	177
Climate and Clean Air	7.40%	170	-15.99	-15	154
Administration	5.90%	136	-12.75	-12	123
Communications	5.40%	124	-11.67	-11	112
New York Program	5.20%	120	-11.24	-10	108
Development	5.10%	117	-11.02	-10	106
China	4.30%	99	-9.29	-9	90
Action Fund	3.20%	74	-6.92	-6	67
Water Program	3.00%	69	-6.48	-6	62
Oceans Program	2.60%	60	-5.62	-5	54
Midwest Regional	2.30%	53	-4.97	-5	48
Campaigns	2.20%	51	-4.76	-4	46
Litigation	2.10%	48	-4.54	-4	44
Government Affairs	1.80%	41	-3.89	-4	37
Center for Policy Advocacy	0.90%	21	-1.95	-2	19
Science Center	0.90%	21	-1.95	-2	19
Urban West	0.70%	16	-1.51	-1	15
Center for Market Innovation	0.60%	14	-1.30	-1	12
Facilities	0.40%	9	-0.86	-1	8
Administration - CEO	0.30%	7	-0.65	-1	6
Nuclear	0.10%	2	-0.22	-0	2
TOTAL	100.00%	2,299	(216)	(200)	2,083

easy collection of data and provide a user-friendly tool to help employees select the best travel options.

Simultaneously, video- and teleconferencing should be reinforced and prioritized to reduce the need for travel. IT should conduct a training program for video- and teleconferencing and should be available to assist any employees who are interested in further exploring the technologies available to them. IT should also be responsible for tracking the number of meetings taking place with these technologies and the breakdown by department. This data will help inform future emissions budgeting by program.

For video and teleconference training, it is assumed that any education or training related to the equipment is already built into

the IT department's scope of work. While it is not anticipated that requiring each employee to conduct at least one videoconference during Month 1 will significantly add to the workload, IT must verify that they have the network bandwidth to handle the increased use and provide technical support as necessary.

COLLECT BASELINE INFORMATION

Prior to a budget being created, all business trips for a set period of time should be tracked as well as the route(s) traveled, the method of travel and the reason for travel to begin calculating the carbon emissions by program area. The information will be accessible through the Triplt software. By asking employees to include a reason for travel when booking,

program directors can determine realistically which trips can be eliminated. For example, travel for an industry conference may be more necessary than travel for an internal program meeting. While there is data on business travel from previous years, this trial period will ensure that all employees use the Triplt system to book their travel. By having one booking system in place, a more accurate set of travel data will be collected. In addition, this should allow for a comparison of reported travel to expected quantities based on previously reported data from past years.

Collecting travel and emissions data as well as generating reports is expected to be an automated process through the use of Triplt. The analysis and tracking of carbon



CARBON EMISSIONS ALLOWANCE

emissions data should be conducted by the finance department as the group is already responsible for reconciling employee travel expenses. The finance department should also be responsible for communicating individual and departmental carbon emissions to employees internally. Some effort will be required initially to ensure that the finance department understands the software and is able to clearly present the information to management. Once the process is established, it should require very little additional effort to incorporate the monitoring of carbon emissions.

ESTABLISH BUDGETS

As data becomes available, program directors and senior management can meet to develop a formal carbon emissions budget by department for the subsequent fiscal year. Rather than dividing by office, dividing by program area will fit into the nature of the work of NRDC employees, as well as the current financial budgeting process which occurs by department or program area. Program directors play a vital role in helping to set the targets, and in encouraging their employees to evaluate the necessity of travel and make more responsible decisions on the mode taken when

travel is deemed necessary.

MONITOR DEPARTMENTAL STATUS

During the planning assembly held each month, carbon emissions data should be reviewed and discussed. As part of this discussion, a leader board can be created to show how departments are performing in relation to their budget and other groups. An updated total can also be included in the monthly newsletters received by all employees.

MAKE ADJUSTMENTS

Once the budget is in place, in the final quarter of each year, program directors and senior management





should meet again to go over the emissions amounts by program and see if any adjustments need to be made in the target levels.

ASSESS RESULTS

At the end of each year, individual employees should have their travel incorporated into their performance review discussions with program directors. This can help reinforce with employees the message that the emissions budget goals are as important as financial targets and other existing organizational and operational goals.

The role of the COO and program directors is to communicate the program and work with the

appropriate people within the organization to develop the emissions budget. While not expected to be onerous, the time commitment may vary depending on the level of focus given to this task. There is also expected to be an upfront time commitment to set up the plan that should ease as the program develops.

As this program should be an extension of the budgeting process, NRDC should incorporate the same consequences for not meeting or exceeding targets that are utilized when evaluating financial or operational goals. Additionally, any significant variance to the emission

budget should be communicated and explained to the Board of Directors.

Depending on the results after the first year of implementation, the communications department can publicize the results internally and externally, if appropriate.

A one-page guide for senior management on steps to reduce business travel and create a carbon budget is provided in the Training Materials accompanying this plan.

A proposed implementation timeline broken down by month and department responsible for the action is shown in Figure 10.

CARBON EMISSIONS ALLOWANCE

IMPLEMENTATION TIMELINE BY MONTH

TIMING	ACTION	OWNERS
Month 1	Unveiling and training on video and teleconferencing systems Encourage all employees to conduct one video call	IT
Month 1	Announce to employees that carbon emissions data will be collected and an initial 9% emissions reduction will be targeted across all program areas Reinforce use of video and teleconferencing at all-staff meeting and email follow-up	COO
Months 1-6	Business travel data is collected and analyzed through Concur Triplt	Finance
Each Month	Communicate emissions data to relevant program leaders and employees Review data and current progress at monthly planning assembly	Finance Program Director HR
Month 6	Results examined in meeting with senior management and program directors Using data collected from previous 6 months, travel data from previous years and upcoming business needs, begin to set a carbon budget	Finance Senior Management Program Manager
Month 8	Announce carbon budget for following year to employees	COO
Months 8-24	Emissions data and comparison to budget communicated to program directors and employees Variances to budgets are communicated and explained at Board Meeting	Finance Program Manager
Month 24+	Depending on results, data and savings publicized	Communications

Figure 10

CASE STUDY: CAPGEMINI

IT consulting and professional services firm Capgemini launched their TravelWell initiative in 2008 to reduce their carbon emissions. Led by a cross-functional leadership team, policies and technology were developed to enable employees to reduce their carbon emissions both on business trips and from commuting. This was accomplished through traveling less by using video- and teleconferencing, and traveling differently using lower-carbon forms of transport when travel is unavoidable. Understanding the nature of the consulting business, the company wanted to change behavior to make a difference rather than eliminate travel altogether. Starting in 2013, employees will be subject to an emissions budget for their trips.²⁷

POTENTIAL VENDORS & PARTNERS

Currently, NRDC uses Concur for employee expense reimbursement. Concur has a program add-on, Triplt, which helps to manage employee travel. Triplt is a free service with user based tiered pricing geared to individual travelers. For best results in gathering accurate travel data and calculating carbon emissions for trips, NRDC should invest in Triplt for Teams, an exclusive feature set for companies to better understand and manage employee travel.²⁸

Triplt for Teams is a monthly subscription service that includes a business dashboard to view past

and future travel for the office, trend and spend reporting on travelers, email forwarding to create trips for travelers, and administrative access to a personalized company group, company calendar, and leader board.²⁹

Carbon emissions tracking can be connected to the Triplt for Teams account to automatically deliver metrics, such as the amount of carbon emissions generated by a trip. This should help NRDC monitor the carbon emission generated by employees on business trips and encourage employees to make smart travel decisions. Triplt recommends

using <http://impact.brighterplanet.com/> which works with Triplt's API to tabulate carbon emissions for Triplt itineraries.³⁰

When an employee books a trip, Triplt can show the emissions that will be generated by the trip. In addition, the software enables the employee to sort the choices based on the emissions for each option.³¹ This data can then be aggregated with the miles traveled and cost data to provide a summary of each group's emissions associated with travel.



COMMUNICATIONS PLAN



Initially, all communication about the program will occur internally and should be done by senior leadership led by the COO. The communication would include details on the new policy to book all travel through Triplt, the

start of data collection on carbon emissions and the use of video and teleconferencing.

As data is collected and once the allowance is implemented, the COO should regularly update employees on how much travel is taking place and remind employees on the alternatives available.

The communications team should only be sharing the information publicly depending on the results after the first year (or more) of implementation.

BUDGET

Concur software is currently being used by NRDC employees to submit their business expenses. The organization is in the process of incorporating the use of Triplt to manage employee travel. As the software is already in place, NRDC should only need to upgrade to Triplt for Teams to manage employee travel and carbon emissions.

Triplt for Teams will cost approximately \$8,400 per year, as a subscription for a company of 251-500 users is \$699 per month (approximately \$1.40 per user).

ITEM	COSTS BY OFFICE							TOTAL
	NY	SM	SF	DC	CHI	MT	BJ	
FIXED COSTS PER YEAR								
Travel Emissions Allowance								
Triplt for Teams (Concur Add-on)	-	-	-	-	-	-	-	\$8,388

CASE STUDY: ENVIRONMENTAL DEFENSE FUND

In July 2012, the Environmental Defense Fund (EDF) released their fourth comprehensive greenhouse gas inventory based on data from the 2011 calendar year. Their data showed that the largest source –38%– came from air travel. Their 340 employees traveled over 7.4 million miles on more than 6,000 flight segments during the year, most of which was on segments longer than 1,000 miles. Not only is the data divided by segment length, emissions by department and by route are calculated.³²

By releasing their data publicly, the EDF has demonstrated their commitment and proven their success in this area. Their data has shown reductions, increases and no changes in a variety of areas over the year, but they report the information fairly, accurately and try to explain why the data has shifted or remained the same.

Figure 11 is an example of the data collected and released by the EDF in their yearly report.

DEPARTMENT	METRIC TONS CO ₂ E	% AIR TRAVEL EMISSIONS
Oceans	396	29%
Climate	271	20%
Land, Water, and Wildlife	119	9%
Corporate Partnerships	100	7%
China	103	8%
Development	100	7%
Operations	93	7%
Marketing and Communications	66	5%
Executive Office	58	4%
Office of Chief Scientist	26	2%
Economics	15	1%
Other	5	<1%
Environmental Health	4	<1%
Strategic Partners	3	<1%
Energy	1	<1%
Total Airline Emissions	1,360	100%

Figure 11



GREEN CHAMPIONS PROGRAM

Research shows that role models are one of the most important factors in affecting behavior.³³ Leveraging community members to spread messages and information is more effective than using third parties as messengers because people are more influenced by those they know.³⁴ In particular, people are most interested in and aware of the behavior of people they consider similar to themselves.³⁵ It has also been found that interacting and discussing ideas face to face is more effective than resorting to electronic methods of communication.³⁶

According to NRDC's Chief Financial Officer Sarah Gillman, "NRDC tends to be a more collaborative environment—competition can work and people rally around sustainable practices."³⁷ She continued with the suggestion that it should be easier to drive home behavior change programs if the organization is able to recruit some influential and good standing volunteers to help carry out sustainable initiatives.

Based on the workplace culture at NRDC and supporting research, a volunteer Green Champions program should be created to institute workplace role models for sustainable behavior.

OBJECTIVE ROLE & RESPONSIBILITIES

The objective of the Green Champion program is to have a promoter and driving force behind the sustainable behavior change initiatives. Green Champions should motivate and guide employees towards creating a more sustainably-minded work environment by taking a leadership role on initiatives for energy and waste reduction.

Green Champions should be self-motivated full-time employees volunteering their time and skills. Working under the guidance of the Sustainability Committee, who should act as program advisors, the Green Champions can help institutionalize environmentally-responsible behavior across all NRDC offices by 'leading from the middle' and by helping

diffuse desired practices among employees.³⁸

To ensure maximum efficiency of the program and to not over-burden the volunteers with added work, there should be at least one Green Champion for energy and one for waste at each office. For the larger offices, if possible, there should be multiple impact area Green Champions spread across the

CASE STUDY: UNIVERSITY HEALTH NETWORK

In 2007, Canadian hospital network University Health Network (UHN) launched TLC-Care to Conserve, an energy management program with employee engagement. An essential component of the program was peer champions, a group of environmentally interested, well-known and trusted employees. The peer champions promoted sustainability initiatives in the office, oversaw program implementation in their designated areas, provided timely feedback, and led other employees by example.³⁹ Shona Adamson, UHN external IndEco Strategic consultant, remarked that "the use of peer champions to spread the message is extremely beneficial as it saves time and resources and provides information and prompts from a trusted and credible source."⁴⁰ Under the UHN behavior change program, they achieved a 3.9% energy savings in the first year and 4.2% savings in the second year. In a survey conducted after the second year, there was a noted positive change in employee behavior with regard to turning off computers, task lighting, and other electronics when leaving their desks.⁴¹

various floors. Because of the small size of the office in Montana, one environmentally-conscious person should be able to adequately meet the needs of a Green Champion across both energy and waste. Figure 12 shows the recommended number of Green Champions by office and floor. Based on this proposal, 27 Green Champions are necessary across the seven office locations.

All Green Champions should participate in a training session to provide them with the background, knowledge, and tactics necessary to lead their respective offices and fellow employees in an inter-office competition to reduce energy usage and waste. The competition for each impact area should be launched through two kickoff events led

by the Green Champions. The competition and respective events are discussed in more detail later in this document.

A PowerPoint presentation that can be used for the Green Champions training has been provided to supplement this plan. The presentation includes a description of the Green Champion role, an overview of the competition rules and kickoff events, and suggestions for engaging employees to take an active role in the program.

The Green Champions should take on leadership roles, with logistical support from the Office Administrators, for the events and competitions. They should be responsible for providing the communication materials around the events, leading discussions

during all-staff meetings on competition progress and should encourage employees to participate in activities that reduce energy usage and waste generation. Finally, they should provide feedback on the activities and competitions to the Sustainability Committee and Office Administrators.

Based on feedback from NRDC, it is recommended that Green Champions serve in their role for a year. During this year, the Green Champions should be active for a total of six months, broken down into two three-month intervals to support the alternating schedule for the waste and energy competitions outlined on page 39.

Figure 12

SUGGESTED NUMBER OF GREEN CHAMPIONS ACROSS OFFICES AND FLOORS												
Location	NY					SM	SF		DC	CH	BJ	MT
Floor	8	9	10	11	12		20	21				
# of GC	2	2	2	2	2	2	2	2	6	2	2	1

CASE STUDY: PEPSICO

At the PepsiCo Research and Development facility in Valhalla, NY, site of over 450 employees, Andrei Aroneanu, Environmental and Facilities Manager, broadcasted requests for sustainability volunteers through mass emailing and office signage. For two years, the response was underwhelming. He found that better results were achieved when he switched to one-on-one conversations with employees during regular staff meetings, saying, “Our face-to-face enthusiasm rubbed off on people and that didn’t come through in the e-mails.”⁴² The best incentive or “gift” for an employee is recognition and praise for their achievements from fellow co-workers and top management. In the case of PepsiCo, Aroneanu used to give out small thank you gifts, such as t-shirts, but quickly discovered that “publicly thanking those who make a difference at our Good Morning Valhalla meetings was the best recognition they could possibly ask for.”⁴³

IMPLEMENTATION

Office Administrators will be responsible for soliciting Green Champion volunteers. This recruitment process should be overseen by Director of Facilities and Administration (Anthony Guerrero).

The volunteers can be obtained either by selective or broad solicitation. In either type of solicitation, the initiative’s objective, job description, time commitment, as well as a chosen incentive plan should be stated. Any NRDC employees that previously expressed interest in sustainability can be approached

individually with information on the Green Champion program. Alternatively, to be more inclusive, the Green Champions can be solicited companywide through office signage, emails, newsletters, and/or the monthly staff meetings.

The Green Champions are selected at the discretion of the Office Administrators.

A combination of both methods is recommended to ensure NRDC successfully acquires enough volunteers. While a companywide solicitation may reach more employees, other companies have found this method gathers

fewer than expected volunteers. According to research, the rate of success is much higher with in-person conversations, and a personal request has been found to be the primary reason that people volunteer.⁴⁴

Each Office Administrator should serve as the support person for the Green Champions in their office. The Office Administrator should solicit volunteers to serve as Green Champions and also assist with the communication of messaging around events in the office and provide logistical support during events and competitions.



Where feasible, the Green Champions should also be supported by interns, who can assist in executing the various events and competitions.. According to Toya Lampley, an NRDC office coordinator who handles internship opportunities, internships usually last two to three months. Up to three interns join each office throughout the year, with additional interns joining over the summer.⁴⁵ Unlike full-time employees, interns are generally with the organization on a short-term basis, and knowledge gained through sustainable behavior

training will be 'lost' once their internship is complete. Therefore, while interns would not be suitable to serve as Green Champions, they provide a valuable resource to assist the Green Champions throughout the year with a various tasks.

Reinforcement theory contends that positive reinforcement increases desired behavior by providing extrinsic rewards to employees.⁴⁶ Positive reinforcement strengthens a behavior by providing a consequence an individual finds rewarding.⁴⁷ To recognize

the commitment of the Green Champions, their roles and achievements should be mentioned in the monthly meetings and included in the various newsletters. Another incentive to encourage employees to serve as Green Champions could be a small grant for their own environmental projects. The experience can also allow for the Green Champions to add leadership and volunteer experience to their personal portfolio and provide them with the opportunity to expand their professional network.

COMMUNICATIONS PLAN

Once Green Champion initiatives outlined in this plan. A larger, companywide announcement should be made to inform all employees about the program and which of their fellow employees are serving as resources should they have any questions, concerns, or suggestions. This announcement can be incorporated into NRDC communications materials such as the weekly newsletters, e-mails, office signage new-hire training, and all-staff meetings and should include photos of the Green Champions to make them easily identifiable.

Once Green Champion volunteers have been selected, they should be introduced to one another in an initial meeting organized by the Director of Facilities and Administration. During the meeting, Green Champions should receive training materials to guide them in carrying out sustainability



SUSTAINABOWL

NRDC recognizes the importance of tracking metrics to monitor their environmental impact. For electricity, NRDC has initiated the installation of Noveda, a real-time tracking software tool, in all offices. For waste, offices have started to manually weigh and record their various types of waste. With the knowledge gained from data-intensive tracking protocols, the organization can begin to reduce its impacts.

To ensure that effective actions are being taken to reduce energy consumption and waste generation, the offices should compete in the “SustainaBowl,” a series of ‘office vs. office’ and ‘floor vs. floor’ competitions to engage employees in sustainable actions. While it is acknowledged that there are energy usage variations across offices for a number of reasons independent of behavior, such as different mechanical systems and climate, there is an opportunity to use competitions as a way of encouraging employees to reduce their consumption in these areas. Gamification, when coupled with social features, can be a good way to encourage desired behaviors and habits through positive motivational psychology.⁴⁸ To increase employee engagement, enthusiasm, and momentum for these competitions, office-wide kickoff events that heighten awareness of energy consumption and waste generation should be implemented at the start of each competition period.

The effectiveness of the competitions is based on having



all offices able to participate from the start. As employees see the progress of other offices, they as individuals will seek to behave similarly and attempt to reduce their impact.⁴⁹ In addition, a more competitive environment is established when all offices are able to participate simultaneously. If participation is staggered, it is possible that an office that has already taken part in one energy competition may have a lowered capacity to further reduce energy consumption relative to an office participating in the competition for the first time.

Data should be made available to all employees and with that

knowledge, friendly competitions can be used to reduce the energy use and waste generated by NRDC employees. By presenting data on visual dashboards that track and report performance progress, percent reductions should be realized. Studies have shown that people who use dashboards that provide real-time feedback achieve approximately around 12% in energy savings⁵⁰ and behavioral studies have shown that feedback loops increase the tendency to shift an individual's actions.

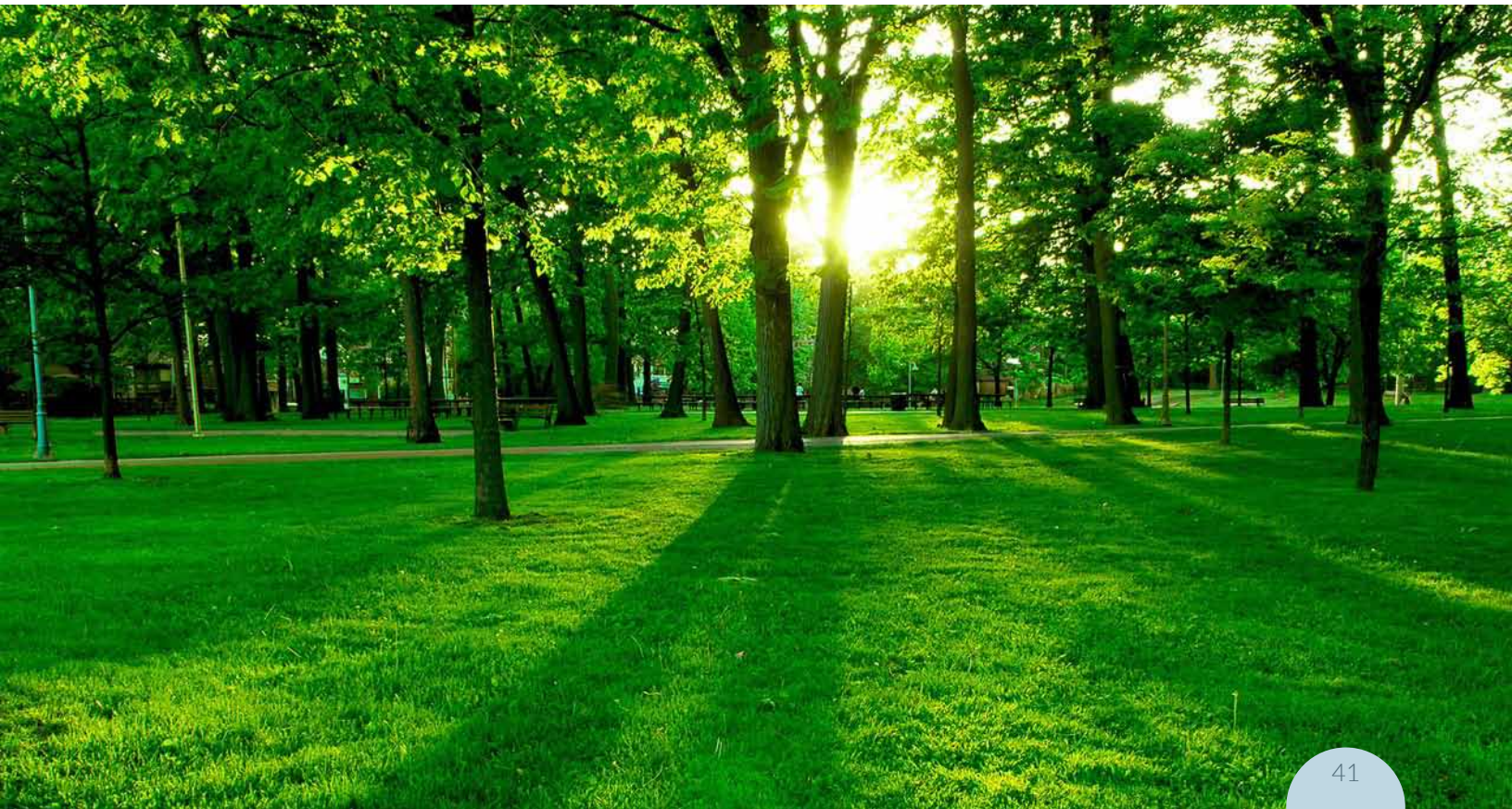
Competitions are an effective tool to engage employees.⁵¹ Throughout the interviews conducted with NRDC

employees, there was consistent positive feedback regarding the effectiveness of internal competitions in driving behavioral change. A previous competition run by the Human Resources department awarded a chair massage prize to employees who completed their performance review in a timely fashion. This tactic was repeatedly referenced in interviews with employees and as Washington DC Office Administrator Sasha Alleyne recounted, “It engaged staff and boosted morale around a task that most people don’t like to complete.”⁵²

OBJECTIVE

The overarching goal of the competition initiative is to reduce electricity consumption and waste generation through:

- ✓ Engaging employees using game mechanics
 - ✓ Encouraging teamwork to achieve reductions
 - ✓ Offering group based rewards to further team building
 - ✓ Coupling competitions with training and skill development
 - ✓ Allowing employees to take on leadership roles and collaborate creatively
- A data display or “dashboard” is a critical component of the competition initiative, and will support the achievement of reductions by:
- ✓ Providing employees a visual representation of real-time consumption
 - ✓ Highlighting organization-wide impacts and areas for improvement
 - ✓ Generating real-time feedback into energy and waste
 - ✓ Tracking progress over time across offices and floors
 - ✓ Displaying data transparently organization-wide
 - ✓ Maintaining awareness about competitions and performance



CASE STUDIES

The case studies *Peci Kilowatt Cup*, *Bayroll Energy Madness Residence Hall Competition*, and *Baylor Energy Madness Residence Hall Competition* demonstrate the effectiveness of initiatives similar to those recommended for NRDC. Each provides insight into the key determinants of success and also provides proxies to establish benchmarks.

COMPETITIONS: PECI KILOWATT CUP

Portland Energy Conservation (PECI) is a non-profit organization that specializes in designing and managing energy efficiency programs for a variety of clients, including government organizations and utilities. Each summer, PECI's main office holds the "Kilowatt Cup," a competition between floors to achieve the largest percent reduction in lighting and plug load electricity consumption in one month. To encourage participation, floor "captains" are recruited and are tasked with motivating employees on their respective floors to conduct energy conservation activities. An electronic dashboard is made available to all employees allowing them to track their progress.

Energy conservation activities included random inspections of cubicles at the end of the business day and leaving "happy-face" stickers on desks of employees that had turned off task lights and monitors. One floor used a pledge system to encourage everyone to participate and sent out reminder e-mails instructing employees to turn off their computers. Another activity provided employees with the support to change energy settings on their computers. Through this initiative, PECI was able to realize a 7% energy reduction for the entire office at the end of its latest competition.⁵³

COMPETITIONS: BAYLOR ENERGY MADNESS RESIDENCE HALL COMPETITION

In an effort to reduce overall energy consumption on campus, Baylor University launched a competition between dorms to encourage students to reduce their energy usage. Progress was measured through a point system and tracked using Energyzone, a web based community platform provided by Noveda. Students were able to earn points through several means, including energy usage reductions and by answering trivia questions related to sustainability and energy.

The program also incorporated student meetings, emails and a model resident bedroom to increase awareness about the program and promote small actions that could be taken to reduce energy usage. At the end of the program, Baylor University was able to reduce energy usage by 5%, saving \$435,000. During the competition phase, 5.1% was saved in the spring semester of 2011 and 6.1% was saved during the fall of 2011.⁵⁴

IMPLEMENTATION

Execution of the dashboard and competition initiatives falls into five categories:

- 1 Data Collection
- 2 Training
- 3 Implementation
- 4 Assessment
- 5 Communication

DATA COLLECTION

Electricity - Once Noveda software has been installed in each office, electricity consumption can be tracked each month for a one-year period. This tracking should be automated as Noveda ties directly into utility meters. Noveda technical support and Office Administrators

must work in tandem to ensure that the software is configured to record energy consumption with consistent start and finish dates each month across all offices. Regardless of utility billing periods for each office, Office Administrators must ensure that the data can be broken down and allocated by month. With consistent

start and finish recording dates, energy consumption across offices in any given month, or consumption within a particular office year-over-year, can easily be compared.

Waste - The dashboards should be configured to display waste information for the same start and finish dates as electricity consumption. Because there is not an automated data collection program in place, Office Administrators will need to manually update the data.

To ensure comparable data is collected across all office locations, the waste measurement data collection process should be uniform across all offices. This synchronization can be accomplished by normalizing data collection in the following ways:

✓ **Scales:** Each office should be equipped with the same (or similar) scale to weigh waste.

✓ **Spreadsheets:** Each office should also have the same spreadsheet templates to be filled out by cleaning staff (weekly—handwritten) and Office Administrators (monthly—electronically).

✓ **Benchmark data:** Once twelve months of data has been collected for each office, it can be used as a benchmark for corresponding months in subsequent years.

TRAINING

The Green Champions for energy should be trained on the Noveda system so they can accurately explain the software to other staff. This training must be conducted by an individual with a solid understanding of the system, either by IT staff or Noveda technical support. Each Office Administrator should also lead a walk-through of his or her particular office for the energy Green Champions to ensure

they have a thorough understanding of the functions of the appliances and building systems that are within NRDC's control.

Green Champions for waste should be trained by Office Administrators in the proper sorting rules for their municipality and waste hauling company. They should also understand the procedures and schedules currently followed by the cleaning staff and how the data is recorded. Additionally, Green Champions for waste must be trained on how to manually enter waste data into Noveda dashboards by either IT staff or Noveda technical support.

Given that the greatest energy consumption generally occurs during increased loads upon HVAC



systems, target areas should alternate seasonally so that the winter and summer competitions focus on electricity, while the fall and spring competitions focus on waste.

Figure 13 highlights the times at which each Green Champion type is active. Green boxes indicate that the Green Champion is active during that Quarter.

For example, the waste Green Champion should be holding kickoff events and the waste competition during Quarter 2 and Quarter 4. During inactive periods, Green Champions serve as a knowledge resource for staff. Training periods begin the first week of each quarter.

IMPLEMENTATION

Competitions - Each impact area competition should begin with a publicized, office-wide kickoff event in which Green Champions and Office Administrators explain the reasons and goals for each competition. Detailed information

on each event can be found on pages 55 and 63.

Green Champions are responsible for directing the competitions and soliciting aid from Office Administrators, who should carry out logistics for various activities. These logistics include: reserving rooms for competition-related meetings/announcements, sending out office-wide e-mails regarding competition progress, and adjusting building systems to accommodate energy saving activities. Green Champions are also tasked with arranging activities among groups of employees that are geared towards energy use and waste reduction.

Following each kickoff event, competitions will run for three months at a time. Due to their size, the New York office and the San Francisco office can hold concurrent competitions between their floors while competing as a whole among

the other offices. Employees in the New York and San Francisco offices have the potential to be rewarded for the overall international office competition, and receive a smaller reward for winning the floor competition. During each initiative, Green Champions have the ability to engage employees in creative and target-specific initiatives, examples of which are described in detail in the Training materials accompanying this plan.

Dashboards - The implementation of dashboards requires collaboration between Green Champions, Office Administrators, NRDC IT and Noveda support technicians.

Office Administrators should identify desired dashboard locations and coordinate the effort between IT staff, Green Champions and Noveda support technicians to install dashboards in office common areas or integrate dashboards into existing displays.

Figure 13

Competition Type	YEAR 1			
	Q1	Q2	Q3	Q4
	Energy	Waste	Energy	Waste
Waste Green Champion				
Energy Green Champion				

DASHBOARDS: CARNEGIE MELLON UNIVERSITY STUDY

A study by Carnegie Mellon University examined how dashboards influence sustainable behavior. Three sites: a university lab, a university office, and a government research lab were used in the study. Dashboards were implemented at all three sites and more than 120 appliances were monitored for 3 to 8 weeks. The dashboard displayed energy consumption data in real time as well as short-term and long-term recommendations for reducing energy usage. At the end of every week, the dashboard analyzed each user's performance and sent him/her a weekly report. After just one month the study found that two sites had significant energy savings, with the university lab achieving a 31.5% reduction and the university office a 30% reduction.⁵⁵

The feasibility of providing real-time data is based on the Noveda software already being integrated across all offices at NRDC. Once Noveda installations have been completed at each office, projected to occur by the end of 2014, the software can automatically provide the capacity for real-time energy usage tracking.

Using this data in conjunction with Noveda's built-in functionality to graphically display statistics, real-time information and analytics can be displayed across all seven NRDC offices on energy consumption, carbon emissions, energy cost savings, and other metrics. All of these metrics can be displayed on dashboards (e.g. tablets or

computer monitors) placed prominently in office common areas. This gives employees access to instantaneous feedback on their energy consumption.

In an interview with Rodrigo Jaramillo, NRDC Director of Information Technology, he stated that he believes the installation of dashboards in common areas and the integration with Noveda software through NRDC's servers is technically feasible and that it should pose no problems.⁵⁶

For waste data collection, the cleaning staff should weigh and record waste on paper spreadsheets weekly. They should then provide this information to the Office Administrator on a monthly basis to

record the data electronically. Each month, each Office Administrator should email their spreadsheet to a central contact, such as Closed Loop Advisors (CLA), for consolidation of organization-wide performance. This spreadsheet should be distributed to all Office Administrators who are responsible for entering the information into dashboards.

Once the protocols for data collection, centralization and dissemination have been established, dashboards should require little more than routine updating of recent data, to be performed by designated employees.



ASSESSMENT

Dashboards are a tool used to communicate waste and energy consumption as well as progress and performance in the competitions. Regularly updated, dashboards can provide instant feedback on consumption reduction measures and provide transparency into each office's and/or floor's actions.

In order to account for fluctuations in the number of employees in each office over time, the following metrics should be used:

- ✓ Electricity – (kWh/employee)
- ✓ Waste to Landfill – (lbs/employee)

The employee headcount should be kept up-to-date by Office Administrators so that the dashboards can display the kWh/employee data. The landfill lbs/employee values may need to be calculated manually and entered into Noveda by Green Champions on a monthly basis.

For the energy competition, the winner would be the office achieving the greatest percent reduction in kWh/employee over the quarter relative to the same quarter of the previous year. This methodology of choosing a winner removes any inherent advantages, such as differences in infrastructure or in the number

of employees at an office location, that one office may have over another in terms of potential for energy reduction. Essentially, offices are compared to their previous year's performance instead of to each other's performance over a concurrent period.

During the waste competition, the winner should be selected based upon the office with the greatest percent reduction in lbs/employee of landfill waste over the quarter. As a full year's worth of waste data has not yet been collected among all offices, the first year of the waste competition should compare the current month's waste to the monthly average of the previous

quarter to track competition progress. After a full year's worth of waste data has been collected, the waste competition can compare the current month's waste quantity to the corresponding month of the previous year. Monthly progress should be displayed in the dashboard to reinforce desired behaviors. The winning office would be determined by the greatest percent reduction over the quarter. For example, the office with the greatest percent

reduction from Q2 of 2013 to Q2 of 2014 is deemed the winner. This is explained further in the "Timing" section.

Note that for both competitions, the New York office can have a simultaneous inter-floor competition taking place independent of the inter-office competition. The requirements for winning should be the same as for the inter-office competition, but applied on a floor-by-floor basis.

TIMING

YEAR 1:

Energy – To allow for a more immediate roll-out of the competitions, energy should be the target area for the first three months, as the previous year's utility bills are already available for each office. This data can serve as the benchmark for comparison until a year's worth of real-time data is collected by the Noveda system for each office.

Waste – While the energy competition is being conducted, waste generation should be measured in all seven offices to establish a baseline. The monthly average of the waste generation data from the first three months (Q1) should be used as the benchmark from which the reductions are calculated for the ensuing waste competition. Monthly updates should provide incremental progress reports during each quarter. For example, after the first month of the waste competition in Month 4, that month's quantity of waste generated should be compared to the average monthly



waste generation during the first quarter. At the end of Month 5, the quantities generated in Months 4 and 5 should be averaged and compared to the monthly average of the first quarter. At the end of the second quarter, the office achieving the greatest reduction percentage from the baseline would win the award. For the next iteration of the waste competition in the fourth quarter, Q2 data should be used as the baseline. Data for Q3 should be collected but not used as the baseline for Q4, lest employees be encouraged to increase waste generation during that quarter while the competition is not active.

YEAR 2:

Energy – As data should have been collected by the Noveda system for the previous year, it should provide a more accurate, normalized representation of electricity consumption per month for each office. As such, utility bills would no longer need to be used for comparison and real-time data from Noveda can be compared to data from the corresponding month of the previous year.

Waste – As data should have

been collected for an entire year, offices can cease comparing the competition month's waste quantities to the monthly averages of previous quarters. Instead, the reduction should be calculated between the current month and the corresponding month of the previous year. Comparing data this way should account for any seasonal variations in waste.

A proposed implementation timeline by month with data collection periods is shown in Figure 14.

COMMUNICATION

Emphasis should be placed on effective communication of goals and performance to employees. This is in response to both NRDC employee feedback from interviews as well as empirical data from case studies.

The following communication measures should be used to maximize employee engagement.

1 Green Champions should communicate specific initiatives to employees in conjunction with Office Administrators. Reminders for contests, events and goal deadlines should be sent via email

calendar invites so that they are visible on calendars through the office email system. Green Champions should regularly communicate progress and results of initiatives, green tips, and competition rules as well as any related news or information that may influence behavior change.

2 Office Administrators should send their office's waste and electricity data to a central consolidating entity such as CLA.

3 Each month, results should be returned to Office Administrators in a template newsletter prepared by CLA that includes statistics and notable results.

4 Office Administrators should work with Green Champions to communicate results to their respective offices through emails and informal discussions.

5 In the monthly newsletter, results and competition winners should be announced. In addition, Green Champions can input competition results into dashboards to be displayed for the following three days.

DATA COLLECTION AND IMPLEMENTATION				
Timing		Action	Owners	Time
				(Hours)
Month 1	Week 1	Ensure Noveda software is available in all offices and is tracking electricity data	IT & Green Champions	2
		Establish uniform recording system for waste and collect waste data for each office weekly.	IT & Green Champions	2
	Week 2	Identify locations for placement of dashboards and procure dashboards	Office Admins & Green Champions	2
	Week 3	Integrate and automate data into dashboard in user-friendly format	Noveda & IT	4
	Week 4	Compile first month's weekly waste data into standardized spreadsheets and forward to CLA	Green Champions	1
Month 2	Week 1	Verify that Noveda electricity data for the previous month is accurate and that weekly waste data among all offices has been collected by CLA	Green Champions & Sustainability Committee	1
		Collect waste data for each office over next four weeks	Green Champions	1
	Week 2	Videoconference training session on competitions for Green Champions and Office Administrators	Sustainability Committee, IT, Office Admins or Green Champions	2
		Email to Green Champions and office administrators to notify and describe upcoming Energy competition	Sustainability Committee	1
	Week 3	Engage relevant staff in preparation for kickoff event	Sustainability Committee and Green Champions	3
	Week 4	Newsletter and email from President announcing the start date for the new competition and kickoff event details	President and Communications Department	2

Figure 14

COMPETITION PHASE				
Month 3	Week 1	Compile second months' weekly waste data and forward to CLA	Green Champions	1
		Collect waste data for each office over next four weeks	Green Champions	1
		Kickoff event (see supporting Training Materialsfor event-specific implementation) - Energy	Green Champions	4
Month 3-Month 5		Energy competition held between offices	All employees	Hours vary each week
		Progress results are announced at the end of each month and distributed to all offices via Newsletter	Green Champions and Communications department	2
		Collect weekly waste data for each office	Green Champions	1
		15 min briefing and progress report on competition status at all-staff meeting each month	Green Champions	0.75
Month 5	Week 3	Email to Green Champions and office administrators to notify and describe upcoming Waste competition	Sustainability Committee	1
	Week 4	Engage relevant staff in preparation for kickoff event	Sustainability Committee and Green Champions	3
		Winning office for electricity competition announced and results distributed via newsletter and implemented into dashboards (to be displayed for three days following announcement of winner). Rewards are given to winning offices	Green Champions & Sustainability Committee	4
		Newsletter and email from President announcing the start date for the competition and kickoff event details	President and Communications Department	2

Figure 14 (Continue)

Month 6	Week 2	Kickoff event to correspond with all-staff meeting (see supporting Training Materials for event-specific implementation) - Waste	Green Champions	4
Month 6-Month 8		Waste Competition held between offices	All employees	Hours vary each week
		Progress results are announced at the end of each month and distributed to all offices via Newsletter	Green Champions and Communications department	2
		15 min briefing and progress report on competition status at all-staff meeting each month	Green Champions	0.75
		Waste data aggregated, and placed into dashboard at end of each month	Green Champions, CLA	3
Month 8	Week 4	Winning office for electricity competition announced and results distributed via newsletter and implemented into dashboards (to be displayed for three days following announcement of winner). Rewards are given to winning offices	Green Champions & Sustainability Committee	4

Figure 14 (Continue)

BUDGET

Figure 15 shows a proposed budget for the dashboard implementation. Detailed information on the budget associated with the kickoff events is included in their proposals on the following pages.

ITEM	COSTS BY OFFICE							TOTAL
	NY	SM	SF	DC	CHI	MT	BJ	
ONE TIME COSTS								
Competition Set Up								
Dashboard Monitors ¹	\$2,500	\$1,500	\$1,000	\$500	\$500	\$500	\$500	\$7,500
Installation & Connectivity Fees	\$500	\$300	\$200	\$100	\$100	\$100	\$100	\$1,500
Total Competition One-Time Costs	\$3,000	\$1,800	\$1,200	\$600	\$600	\$600	\$600	\$9,000
FIXED COSTS PER YEAR								
Dashboard								
Electricity ³	\$106	\$64	\$42	\$21	\$21	\$21	\$21	\$297
Total Fixed Costs Per Year	\$106	\$64	\$42	\$21	\$21	\$21	\$21	\$297
VARIABLE COSTS PER YEAR								
Competition Awards ⁴								
Food Events/Parties	\$10,500	\$2,040	\$5,340	\$5,940	\$1,140	\$180	\$1,380	\$26,580
Floor Competition Awards (NY only)	\$980	-	-	-	-	-	-	\$980
Total Variable Costs Per Year	\$11,480	\$2,040	\$5,340	\$1,140	\$180	\$13,80	\$1,380	\$27,588
TOTAL COMPETITION COSTS							Min.	Max.
Year 1							\$10,457	\$20,777
Subsequent Years							\$1,457	\$11,777

Figure 15





WASTE KICKOFF EVENT: DUMPSTER DAY

To mark the start of each phase of the competition, each office should hold kickoff events in the theme of energy or waste. These events provide opportunities for face-to-face communication of the rules and objectives of competition, and should spark discussion among employees about office energy usage, waste generation, and reduction strategies. As mentioned earlier, disrupting routines in a manner that raises consciousness is a key factor in changing behavior.⁵⁷

WASTE KICKOFF EVENT: DUMPSTER DAY

To kickoff the waste portion of the competition, a Dumpster Day event should be conducted in each office. The event would bring together staff to sort through the solid waste that is generated by their office. This highly visual and interactive exercise can increase awareness of the volumes and types of waste being generated, while highlighting items that can and cannot be recycled or composted. Below is an overview of the proposed event. A one-page guide explaining specific event-day details can be found in the Training Materials provided with this plan.

OBJECTIVE

As the kickoff of the waste reduction portion of the competition, the goal of the event is to encourage overall waste reduction by:

- 1 Increasing awareness of the waste being generated in each office
- 2 Uncovering any confusion regarding sorting rules
- 3 Educating on proper sorting methods within each municipality

Usually engaging employees

visually with their own waste can increase consciousness of how small actions among many people and over long periods of time may add up, and may stimulate a greater sense of personal responsibility. This event should not only increase awareness around the volume of waste being generated, but also on the types of waste, as sorting waste into separate piles can reveal those items that can or cannot be recycled or composted.

By identifying items that they have purchased that end up in the landfill, employees will be encouraged to reconsider future purchases.

This event can also address any confusion regarding sorting rules in each office and offers the opportunity to educate without

singling out specific people. The interactive nature of the event can spark discussions about the most prevalent types of items being discarded, and potential strategies for source reduction.

It is important that employees play an active role in coming up with solutions for waste reduction as it provides a sense of ownership and responsibility. Research shows that providing a means for sharing sustainability ideas, such as through an interactive event, strongly correlates with the effectiveness of sustainable behavior programs. For example, Brighter Planet found that “organizations with a method for employees to share ideas were more than six times as likely to have a very effective program.”⁵⁸



EVENT LEADER

The event should be led by the Green Champions and supported by the Office Administrators and interns, if available.

The role of the Green Champions should be to organize preparatory meetings with Office Administrators and relevant staff, manage the development and launch of communications materials, and run the actual event.

The Green Champions should rely on the Office Administrators to help with logistics such as collecting waste from the office and purchasing the items necessary for the event. The Green Champions should coordinate with the staff member responsible for leading that month's all-staff meeting, and work with the Communications and IT departments to publicize

the event internally. If interns are available, they can assist with posting communication materials and with operations on the day of the event.

Finally, the Green Champions should be responsible for hosting the event, announcing the event activities, moderating discussion, and describing the rules of the waste competition that is being launched.

CASE STUDY: BURT'S BEES

In 2007, Burt's Bees set a goal to achieve zero waste to landfill by 2020 from their manufacturing facilities and administrative offices. The company kicked-off their plan with a Dumpster Day in 2008 that took two weeks of trash from their manufacturing and administrative facilities and dumped it into a parking lot.⁵⁹ Employees were invited to sort through the trash and form three piles: what could be recycled through their existing waste system, what could be recycled if they found an outlet and everything else. After the Dumpster Day they saw an immediate 50% reduction in waste to landfill and also saw cost savings as they reduced their service pick-ups.⁶⁰

IMPLEMENTATION

Dumpster Days should take place at the conclusion of the all-staff meeting on the second Wednesday of the first competition month for waste to ensure high rates of attendance. In the larger offices, New York, San Francisco, and DC, multiple gathering points should be staged so that all employees are able to view the sorting area and feel that they can participate. In New York and San Francisco there can be one gathering on each floor, while in DC there can be three gatherings for the office. This set up should allow each gathering to consist of 30 to 45

employees, except in Chicago and Montana, the smallest offices. The office's total landfill and recycling waste from the day before the event (Tuesday) must be collected in preparation for the event. By excluding the organic waste category, problems with odor should be minimized. Based on waste data analyzed, the quantities of landfill and recycling waste generated in one day should total 20-40 pounds for each gathering of employees. The Chicago office may choose to collect waste from the two previous days (Monday

and Tuesday), and Montana may consider collect seven days' worth of waste in order to have enough material for a worthwhile event. The Green Champion should start preparation for the event a month in advance to ensure that all Office Administrators, cleaning staff, communications teams, IT teams and interns are aware of their responsibilities in the lead-up to the event and on the event day itself. Figure 16 shows an implementation timeline for the Dumpster Day event.

Figure 16

TIMING	ACTION	OWNERS	TIME (HOURS)
Week 1	Hold preparatory meeting with Office Administrator, cleaning staff, and leader of that month's all-staff meeting to introduce initiative, goals, and plan	Green Champions	3
	Contact waste hauler to ensure an understanding of sorting expectations and waste management regulations for commercial buildings	Green Champions	1
	Identify location to store the day's waste on NRDC premises	Office Admin	1/2
	Prepare communications materials	Green Champions & Communications	3

Figure 16 (Continue)

Week 2 – 3	Procure tarps, rubber gloves, Tyvek suits	Office Admin	2
Week 3	Install posters, send out all-staff email and President's newsletter to announce Dumpster Day	Communications & Green Interns	4
Week 4 (EVENT DAY)	Hold meeting with all office Green Champions to reinforce sorting rules for their municipality/waste hauler and walk through logistics of event	Green Champions	2
	Remind Office Administrators and cleaning staff to store previous day's (or multiple days') waste	Green Champion	1
	Ensure event is incorporated into all-staff meeting agenda	Green Champions & meeting leader	1
	Solicit a volunteer to photograph the event	Green Champion	
EVENT DAY	Prepare the gathering space and supplies	Green Champions & Interns	½
	Lead the sorting of waste and accompanying discussion (see Training Materials)	Green Champions	2
Week 5	Contact waste hauler with questions		
	Send out office-specific recap with results, photos, clarification of recycling rules, office-specific steps employees can take to reduce overall waste	Office Admin	½
	Send out NRDC-wide recap and with results, photos, steps employees can take to reduce landfill waste, highlight office with lowest amounts waste per employee	Green Champion & Communications	2
	Publicize results internally and record totals of landfill and recyclables every week	Communications	4
	Post photos internally		

COMMUNICATIONS PLAN

As outlined in the timeline, the event details should be announced in the monthly newsletter by the President prior to the event. Subsequent reminders should be incorporated into the standard communications for the all-staff meeting by the assigned chairperson for that month, at the instruction of the Green Champion.

Communications about the event should include the objective, procedure and solicit interns and volunteers to help out on the day, both with logistics and documenting the event. After the event, results and potential solutions proposed by employees should be communicated to all employees.

POTENTIAL VENDORS & EVENT MATERIALS

For the event, Office Administrators must procure tarps to lay the waste out for sorting as well as rubber gloves and Tyvek suits to protect participating employees. All these items can be purchased online or at a local hardware store.

BUDGET

Figure 17 shows the budget for carrying out Dumpster Day twice a year in each office. The amount of supplies needed depends on the office size.

ITEM	COSTS BY OFFICE							TOTAL
	NY	SM	SF	DC	CHI	MT	BJ	
VARIABLE COSTS PER YEAR ¹								
Dumpster Day Event ⁵								
Nitrile Gloves	\$60	\$12	\$24	\$36	\$12	\$12	\$12	\$168
Tyvek Suits	\$250	\$50	\$100	\$150	\$50	\$50	\$50	\$700
Tarp	\$55	\$11	\$22	\$33	\$11	\$11	\$11	\$154
Total Variable Costs Per Year	\$365	\$73	\$146	\$219	\$73	\$73	\$73	\$1,022
TOTAL DUMPSTER DAY COSTS								
Annual								\$1,022

1. Dumpster Day involves multiple sets of supplies- one per floor except for SM, and 3 for DC

Figure 17





ENERGY KICKOFF EVENT: OFF-THE-GRID HOUR

To encourage competition across NRDC with the ultimate goal of realizing reductions in energy, NRDC should conduct an “Off-the-Grid Hour” event. The event should take place at noon on a given workday at the beginning of the energy portion of SustainaBowl.

ENERGY KICKOFF EVENT: OFF-THE-GRID HOUR

Similar to Earth Hour, “Off-the-Grid-Hour” requires NRDC employees to turn off their computers, task lights, nearby printers and unplugging any devices such as chargers, clocks and lamps for one designated hour during the workday. The event should take place biannually during the summer and winter at noon. During the event hour, NRDC should host a Lunch & Learn for employees with an expert to speak to the importance of energy conservation and ways to save energy both at the office and at home. The energy dashboard using the Noveda system should be unveiled as part of the kickoff event giving employees the opportunity to see the immediate energy savings in real-time from turning off lights and equipment for one hour. The rules of the inter-office competition should also be explained during this session. A one-page guide explaining specific event-day details can be found in the Training Materials accompanying this plan.

CASE STUDY: EARTH HOUR

An initiative that started in 2007 by the World Wide Fund for Nature - Australia, Earth Hour is a pledge campaign that promotes energy conservation and environmental protection. Individuals, businesses, and governments are encouraged to turn off all lights, excluding safety lights, for one designated hour. The goal is to spark behavior change to a more permanent sustainable lifestyle past the one hour event. Earth Hour takes place every year at the end of March from 8:30-9:30PM in 7,001 cities and towns in 153 countries and territories across the globe.⁶¹ In 2012, Earth Hour added a mini competition component to their campaign, “I Will If You Will,” which encourages sustainability challenges among friends, family, and colleagues. According to BC Hydro, during the 2013 Earth Hour, residents of British Columbia “saved 136 megawatt hours of electricity which is equivalent to 1.95% of the provincial electric load.”⁶² Other cities and countries reported similar positive results.

OBJECTIVE

As part of the energy portion of the competition, the initiative serves not only to inform employees on the importance of energy conservation and share tips on energy savings, but also to encourage a transition towards more sustainable behavior change around the office.

CASE STUDY: IBM

According to the 2009 PC Energy Report compiled by software company 1E and the Alliance to Save Energy, “nearly half of US workers who use a PC at their job do not typically shut down their computer at night...wasting \$2.8 billion a year to power 108 million unused machines...emitting approximately 20 million tons of carbon dioxide.”⁶³ To help combat this issue, IBM recommended that their 430,000+ employees only turn on their monitors, computers, printers and other equipment when needed and to turn them off afterwards when not in use. The company also communicated to their employees the energy cost savings of \$1 million per year for the company if they turned off their computers for one hour every day.⁶⁴

EVENT LEADER

The event should be led by Green Champions with logistical and communications support from the Office Administrator as well as interns, if available.

IMPLEMENTATION

The most appropriate date for the event should be determined by the Office Administrators and Green Champions. A suitable location for the Lunch & Learn must also be agreed upon by the Office Administrator and Green Champions.

The Green Champions should prepare in advance for the Lunch & Learn by determining speakers and

discussion topics for the event. The Green Champions are responsible for running the Lunch & Learn activity with the support of Office Administrators.

Office Administrators should inform NRDC employees in their respective offices of the event so that schedules can be planned accordingly. Please see the Communications section for details

on how to execute this efficiently.

The day of the event, all employees should turn off their electrical appliances, including computers, lights, and printers, at noon and gather for the Lunch & Learn activity.

Figure 18 shows an implementation timeline for the Off-the-Grid Hour event.

Timing	Action	Owners	Time (Hours)
2-2.5 months before date	Solicit Green Champions to lead event	Office Administrators & Facilities Manager	3
2 months before date	Consult with office administrators to determine most appropriate day and location for event to take place at noon	Green Champions	1.5
1.5-2 months before event	Determine date, speaker/discussion topics for Lunch & Learn	Green Champions & Facilities Manager & Interns	3
1.5 months before event	Inform NRDC employees in respective offices of the event so staff can plan accordingly.	Office Administrators with the help of Green Champions & Interns	1
Event Day, 12PM	Employees to turn off electrical appliances, participate in the Lunch & Learn activity	All employees	1
12:10-1:10 PM	Energy Kickoff Event/Lunch & Learn activity	Green Champions with the support of Office Administrators	1

Figure 18

COMMUNICATION PLAN

Ideally, all NRDC employees should participate in the event. To help ensure a high attendance rate, Green Champions should alert employees about a month and a half before event day by email and calendar invite. The initial email should be followed up by a reminder a month before the event and then weekly until the event day. The last reminder should be sent

the morning of the event (roughly an hour prior to start - 11AM). Finally, employees should receive a reminder 15 minutes before the event start from the calendar invitation's automatic notification.

After the event, Green Champions should send an email to employees thanking them for their participation, reminders on energy conservation tips, the amount of

energy saved during the one-hour event, and a reminder about the energy data on display throughout the building.

BUDGET

Figure 19 shows the costs associated with holding Off-the-Grid Hour twice a year in each office, budgeting for \$10 per employee for any food and beverages purchased for the Lunch & Learn session.

ITEM	COSTS BY OFFICE							TOTAL
	NY	SM	SF	DC	CHI	MT	BJ	
VARIABLE COSTS PER YEAR								
Off-the-Grid Hour Event								
Lunch & Learn Meals ¹	\$3,500	\$680	\$1,78	\$1,980	\$380	\$60	\$460	\$8,840
TOTAL OFF-THE-GRID COSTS								
Annual								\$8,840

1. Assuming \$10 per meal

Figure 19

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A painting of a forest scene with tall, slender trees and sunlight filtering through the canopy. The style is impressionistic, with visible brushstrokes and a warm, dappled light effect. The trees are dark brown and green, and the ground is covered in a mix of green and yellow foliage.

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