



QKA
GREEN

QKA Green Operations Plan 2011



Goals

The overall goal for 2011 is to reduce electrical and mechanical use, improve office indoor air quality and reduce the transportation component of QKA's Carbon Footprint. As goals for the upcoming year are defined, the economics of each decision will be considered in order to gain the highest ecological benefit for our money. This plan will confirm reductions from the 2007 plan and develop specific office goals for the future to aid QKA's efforts to reduce our impact on the planet.



Analysis

To begin the process of lowering the QKA Carbon Footprint, we consulted data from the Carbon Footprint calculated in 2007 and compared it to data collected from 2010. We used templates and standard methods from the Greenhouse Gas Protocol Initiative, as well as data from the PG&E database to determine the office footprint. Activities directly related to QKA business activities only were considered, including heating, electricity, and transportation. For example, the carbon impact of employee commutes is not considered in this analysis, as this carbon is in the footprint of the individual. This plan will provide ideas for supporting green choices by employees, but will not mandate personal decisions.

QKA Carbon Footprint 2007

Car Travel	50.7 tonnes	50.4%
Air Travel	13.5 tonnes	13.4%
Electricity	32.89 tonnes	32.7%
Natural Gas	3.6 tonnes	3.5%
TOTAL	100.69 tonnes	

(tonnes = metric tons = 2,204 lbs)

QKA Carbon Footprint 2010

Car Travel (Prius)	3.2 tonnes	3.4%
Car Travel (Other)	66.0 tonnes	69.5%
Electricity	23.97 tonnes	25.2%
Natural Gas	1.75 tonnes	1.8%
TOTAL	94.92 tonnes	

% Change

Travel increased 7%
Electricity decreased 27%
Natural Gas decreased 51%

While car travel increased due to the distance of current projects, office emissions decreased 30% in 3 years.

**Overall 6% decreased
from 2007 to 2010**

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Transportation

Changes from 2007:

While air travel no longer factors into the transportation data, travel to job sites has increased dramatically, representing 73% of total emissions. As a result, we did not achieve our goal from 2007 of reducing emissions from transportation by 50%. The new Toyota Prius (purchased in 2008) has an efficiency of 46 miles per gallon and has had a tremendous impact in reducing gas use, but travel still accounts for a significant portion of QKA's Carbon Footprint.



Goals:

Our goal is to reduce carbon emissions due to transportation output, which will have the added benefit of reducing costs. The carbon output of office transportation will continue to be tracked.

Current Analysis:

For the 2007 analysis, we added the mileage on the company car to the mileage that we paid out to employees as reimbursable expenses and used the average US car mileage rate of 19 mpg to calculate the transportation portion of the QKA carbon footprint. For the 2010 analysis, the Prius was calculated separately from employee cars since its efficiency is so much greater than that of an average vehicle.

Actions:

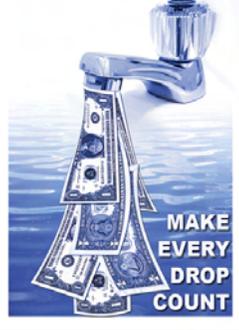
Within the past few years, QKA has taken on more projects that are farther away, requiring more travel by car. These transportation costs are part of doing business and may not be able to be reduced. However, steps can be taken to ensure that all trips are necessary and as efficient as possible.

- Use the Prius as first choice for company travel. The Toyota Prius (46 mpg) is more than twice as efficient than the average American car (19 mpg) and accounted for 16,669 of the total 160,079 miles logged in 2010. While it represents 10.5% of total miles, the Prius represents only 4.6% of emissions from transportation (3.2 tonnes of CO₂) and should be used whenever possible.
- Optimize travel to job sites: reduce trips by sharing rides, conference calls, or video chat. If someone has a scheduled trip to a particular job site or one close by, they may be able to gather information or deliver items for another project.
- Continue to avoid air travel.

Although personal employee commutes were not included in the company carbon footprint, QKA can take steps to support and encourage greener commute options.

- Promote the City of Santa Rosa Free Ride program that QKA already participates in, which provides incentives to employees within the City of Santa Rosa to carpool, bike, walk, or take public transit.
- Develop short survey e-mail to evaluate employee commutes and investigate the feasibility of carpools and other commute options.
- Participate and promote Bike to Work programs.
- Advocate for more bike parking near the office.
- Research bicycle bonus/subsidy programs for employees.
- Look into opportunities to provide and/or subsidize shower facilities.
- Encourage everyone to eat lunch locally instead of driving to buy food.

WATER COSTS



Changes from 2007:

There have not been any significant changes in water use research since 2007 as it does not represent a significant part of our Carbon Footprint.

Goals:

Although water use does not contribute directly to our Carbon Footprint, it is an important ecological concern—especially in California. Our goal is to lessen QKA water usage by reducing runoff outside the building as well as continue to research new methods of water conservation.

Current Analysis:

No analysis has yet been done on QKA water use. A short analysis of our utility bills should provide us with our water use over the past year.

Actions:

- Look into replacing all toilets with dual flush, low-flow models and replace the urinals with waterless models.
- Research methods to reduce water use and talk to local provider for suggestions.
- Research incentive programs with rebates provided to businesses who install high-efficiency urinals and other water conservation appliances. The City of Santa Rosa offers rebate incentives to businesses who take efforts to conserve their water use which is an excellent way to save money and to contribute to the environmental efforts locally.
- Reduce water runoff by adding appropriate low maintenance plants to roof.



Changes from 2007 and Future Goals:

Energy use represents 25% of our Carbon Footprint and is QKA's second largest environmental impact. We surpassed our goal of lowering our energy use by 25% in three years by lowering it 27%. In the next three years, we hope to lower energy use by using more efficient lighting strategies throughout the office and reducing office equipment plug loads.

Current Analysis:

Analysis of the Carbon Footprint for energy use in 2007 and 2010 was done using the GHG spreadsheet downloaded from the Greenhouse Gas Protocol Initiative along with an analysis of QKA PG&E bills. Below is a summary of the analysis from 2010, showing both gas and electricity use per employee per day.

BILL	# Days	# Workers	GAS		ELEC		GAS		ELEC	
			Therms	Avg/day	Kwh	Avg/day	Therms /person /month	Therms /person /day	Kwh /person /month	Kwh /person /day
Jan Totals	33	45	116	3.5	7,472	226.4	2.57	0.078	166.0	5.03
Feb Totals	30	45	49	1.6	7,043	234.8	1.09	0.036	156.5	5.22
March Totals	32	49	42	1.3	7,649	239.0	0.86	0.027	156.1	4.88
April Totals	29	49	34	1.2	6,942	239.4	0.69	0.024	141.7	4.89
May Totals	30	50	4	0.1	6,819	227.3	0.08	0.002	136.4	4.50
June Totals	31	50	4	0.1	7,378	238.0	0.08	0.002	147.6	4.76
July Totals	31	50	5	0.2	8,776	283.1	0.10	0.004	175.5	5.66
Aug Totals	31	50	6	0.2	9,395	303.1	0.12	0.004	187.9	6.06
Sept Totals	29	50	4	0.1	8,980	309.7	0.08	0.002	179.6	6.19
Oct Totals	29	49	6	0.2	8,359	288.2	0.12	0.004	170.6	5.88
Nov Totals	29	49	24	0.8	7,587	261.6	0.49	0.016	154.8	5.34
Dec Totals	33	49	31	0.9	8,107	245.7	0.63	0.018	165.4	5.01

Grand Total 2010	GAS		ELEC		GAS	Avg Therms	ELEC	Avg Kwh
	Therms	Avg/day	Kwh	Avg/day	Therms /person /year	/person /day	/person /year	/person /day
	325	0.85	94,507	258.03	6.91	0.018	1938.1	5.29
METRIC TONS CO2	1.75	0.0048	23.97	0.07	0.037207692	0.000101939	0.491554046	0.001346723

Compare to 2007 results:

	<u>2007</u>	<u>2010</u>
Gas therms	871	325
Gas Tonnes CO2	3.62	1.75
Electricity kwh	84,507	114,008
Electricity Tonnes CO2	41.18	23.97

From this data we drew the following conclusions:

- Lighting and plug & cooling loads represent the bulk of our electricity use—approximately 6,000 - 9,000 kwh per month—depending on electric lighting and air conditioning use during summer months.

This analysis should be completed on an annual basis and compared to previous years to track our conservation progress. In addition we would like to perform more detailed analysis of the energy use to scientifically separate lighting, cooling and plug electricity use. That would give us a better understanding of when we are using energy in each area and the amount of conserved.

Actions:

- Mechanical System:
 - The mechanical system was evaluated by a mechanical engineer in 2011. The evaluation should be reviewed and any performance issues addressed.
 - If new mechanical units are required, efficient Energy Star units should be selected.
- Lighting System:
 - In 2009, a plan was developed to add daylight sensor lighting controls to the office. It was determined that it was not cost-effective to implement at this time, but should be reviewed with each update of the Green Operations Plan to evaluate whether its cost-effectiveness has changed.
 - Take advantage of natural lighting from skylights: turn off overhead lights when sufficient daylight is present.
 - As existing task lighting is replaced, purchase fixtures that are more efficient and provide light with better color rendering index. This will continue to reduce the need for the overhead lights and give everyone more control over personal light levels.
 - Disconnect some of the office lights or separate lights to minimize office lighting, especially during peak sunlight hours.
- Plug Load Management:
 - Send out friendly e-mail reminders of the QKA policy requiring shut down of computers at night and on weekends except when updates are to be installed or remote access is required. Encourage QKA employees to turn this into a habit through incentive rewards.
 - Purchase/install accessible surge protectors at each workstation to facilitate shutting everything down at night.
 - Put office machines (copy machines, printers and plotters) on surge protectors and create a QKA policy for the last person out to shut them off, and the first one in to turn them on.
 - Look into possibility of master switch to shut all major office equipment down, possibly via a connection with the security system. Ask QKA vendor Aloha Electric about RF switching possibilities.
- Install occupancy sensors in the restrooms at the light switches in addition to separating fan and light switch functions.
- Create QKA policy to purchase only Energy Star appliances and consider energy use when making office purchasing decisions.
- Evaluate the cost of purchasing green power for all or a portion of the office energy supply. It would be a 14% increase in electricity cost to purchase 100% wind power.
- Evaluate the possibility of PV generation on the roof of the office. This evaluation has already been done once and determined that our roof was not suitable for PV's. This was mainly due to shading from buildings to our west and south and the roof area already taken up by skylights and mechanical units. However, it may be worthwhile to take a second look in the future.



Changes from 2007:

A number of office supply changes have been put into effect as a result of the 2007 Green Operations Plan. QKA now uses recycled copier paper, toilet paper and paper towels. Cleaning supplies are eco-friendly and a water filter was installed to eliminate the use of bottled water.

Goals:

The goal is to reduce the amount of things we buy as well as purchase the most environmentally responsible products available for the office. As always, cost, quality and overall effectiveness will be considered when making purchases, but our goal is to consider the environmental impact on equal footing with these concerns.



Current Analysis:

A recent analysis of a week's typical kitchen trash revealed 30% compostable and 30% recyclable. A sign was posted and an e-mail sent letting everyone know what is recyclable in our area. It would be useful to quantify how many food/beverage/office supply products are purchased and what is recyclable. We will work with the Administrative Staff and suppliers to get this information. In addition to immediate office consumables, we should conduct a study on our shipping methods and the amount of documents and other material shipped daily which, while it was not researched to add to our data, represents an important component of our Carbon Footprint.

Actions:

- Paper:
 - Strongly encourage ways to reduce printing and reuse paper possibly by designating one tray in the printer as used paper to maximize use. Evaluate different kinds of recycled copier paper. Choose the one that has the highest post-consumer recycled content while still meeting quality needs. Hopefully this will be 100% post consumer recycled content. Use paper with chlorine-free bleaching.
 - Purchase plotter paper and colored paper with a minimum 30% recycled content.
 - Make the default setting on printers and copies double sided (duplex).
 - Change standard specification book binding for printing on card stock cover and chip board back instead of plastic covers and back.
- Kitchen and Bath Supplies:
 - Paper towels: 100% recycled content with a minimum of 40% post-consumer.
 - Minimize disposable utensils: buy only recycled, biodegradable or compostable versions.
 - Buy unbleached or re-usable coffee filters and buy Fair Trade and/or organic coffee.
 - Hand soap should not be anti-bacterial.
 - Bathroom tissue: 100% recycled and a minimum of 20% post-consumer recycled content.
 - Plastic trash bags: 10-100% post-consumer recycled content.
- Office Supplies:
 - Binders: Plastic covered paperboard: plastic (typically vinyl) at least 25% total recycled content; paperboard 90% recycled content, with 75% post-consumer. Paper-covered paperboard: 90% recycled content with 75% post-consumer. Cardboard: 100% post-consumer content. Solid plastic: HDPE, 90% post-consumer

Office Consumables

- content; PET, 100% post-consumer content; other plastics, at least 80% post-consumer content.
- Clipboards must have 100% total recycled content with at least 50% post-consumer.
- Highlighters and markers must be water-based, certified AP non-toxic, conforming to ASTM D-4236. When purchasing dry-erase or permanent markers, choose "low odor" or choose refillable.
- Correction fluid must be water-based, non-toxic and ozone-safe.
- Envelopes (large) Kraft Paper: 50% total recycled content with at least 30% post-consumer. Paper: 50% total recycled content with at least 30% post-consumer. Alternative Fiber: 50% "tree-free" content, with the balance post-consumer recycled content. Plastic: 25% total recycled content, all post-consumer.
- File folders must have 100% total recycled content with at least 30% post-consumer fiber.
- Index Cards must have 100% total recycled content with at least 50% post-consumer.
- Labels must have 50% total recycled content with at least 30% post-consumer.
- Pens must be refillable as the first choice, preferably with the construction materials containing recycled or biopolymer content Single-use must be 100% total recycled content with at least 50% post-consumer, or choose biopolymer for pen barrels that is also biodegradable.
- Pencils must have 100% total recycled content with at least 60% post-consumer.
- Presentation Transparencies must have 50% total recycled content with at least 25% post-consumer.
- Self Stick notes must have 100% total recycled content with at least 30% post-consumer.
- Toner Cartridges must be re-manufactured.

Actions (continued):

- Adopt the product requirements above as QKA purchasing standards for future office purchases.
- Create a purchasing list with products for each type of consumable listed above. Find products that meet the requirements. Order samples and test them out to find the best applicable product. Create a list of approved products and where and how they are purchased. Try to purchase with existing vendors where possible, but select new vendors as necessary to find acceptable products.
- Research availability of recycled content plotter paper for us and Draftech.
- Increase size of recycle can in the kitchen to promote recycling and create a sign showing what can and cannot be recycled. Continue to investigate compost ideas.
- Provide office updates with what has been purchased and new changes that are occurring. Email biweekly reports with a new topic each time including eco-driving, conserving water, green/sustainable updates locally and around the world, etc.
- Research how to become a certified Santa Rosa Green Business to promote green building and more marketing opportunities.

"Becoming a Green Business is a no-brainer -- a win-win situation that saves you money and protects the environment. Customers appreciate our being a Green Business."

Local Green Business Owner



**GREEN BUSINESS
PROGRAM**



Changes from 2007:

One of the most important steps taken towards improving the air quality was the Indoor Air Quality Assessment completed by a mechanical engineer. While more plants and fans have been introduced to the office, not much has altered since 2007.

Goals:

Indoor Environmental Quality does not directly contribute to our Carbon Footprint, but it is extremely important. A better indoor environment improves employee performance and happiness, and reduces sick time. As it is part of our mission statement to create the best possible place to work, we need to take a more active role in ensuring this happens. Our goal is to increase user comfort and indoor air quality.

Current Analysis:

We have not made any significant changes based on the results of the Air Quality Assessment of the office and we must review the report to implement HVAC changes suggested. Comfort levels throughout the office have not been resolved especially with circulation and office temperature. The employee survey conducted in 2007 on personal comfort resulted in adjusting the air conditioning system but with no positive results. We need to think of new solutions to solve this problem since the west side still experiences ventilation problems.



Actions:

- Find new ways to circulate and bring in fresh air throughout both buildings. Implement mechanical system analysis suggestions.
- Develop office planting plan. Plants improve indoor air quality and generally improve a space. This is only true, however, if the plants are alive and don't cause allergies. Look into selecting plants based on their abilities to remove toxins identified in IAQ report.
- Evaluate use of personal electric heaters while air conditioning is on.
- Evaluate UV transmission through skylights.
- Adopt green housekeeping procedures including use of environmentally preferable cleaning products. Green Seal Standard GS-37 products should be used wherever possible.
- Carpet Cleaner must be biodegradable and must not contain butyl cellulose.
- Continue to use green cleaning products. Evaluate cleaning products for impacts on indoor air quality.

Office Construction

Goals/Current Analysis:

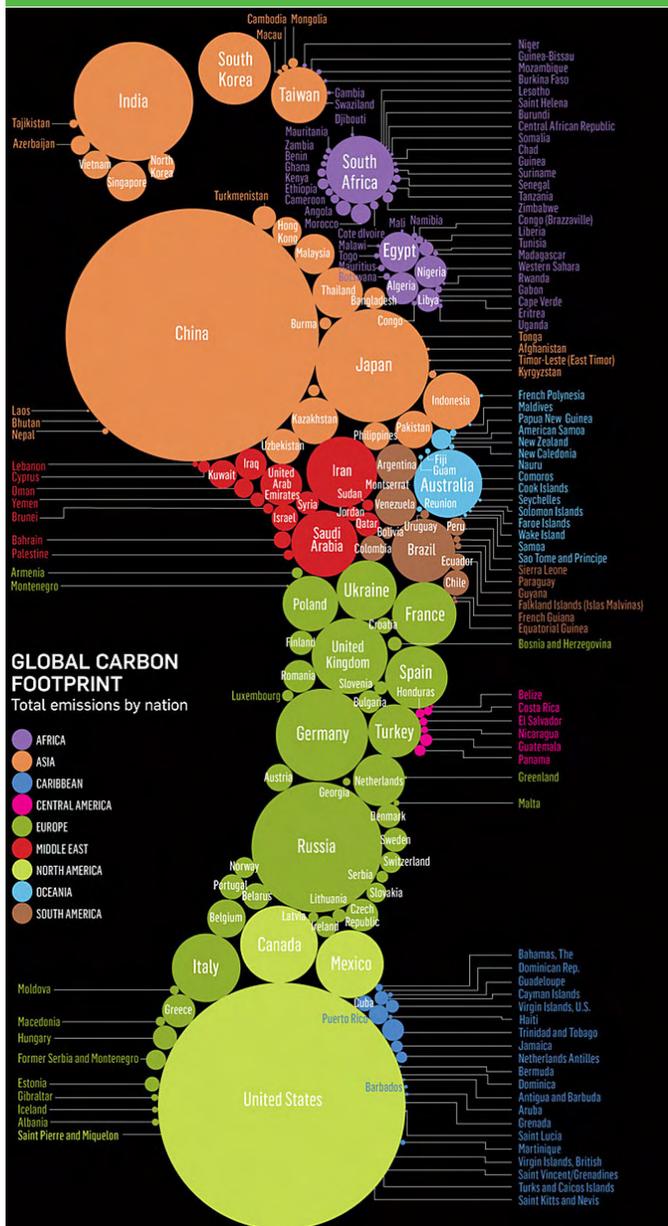
No remodeling or construction at the QKA office is planned at this time, but any future work should be done to green building standards.

Actions:

- All future renovations should be done to LEED Silver Standards or higher.
- Consider environmental impact whenever making purchases of office furniture or other equipment.
- Add QKA policy to design all future construction projects to LEED Silver standards and incorporate green design strategies.



Conclusions



We have met the majority of our office goals from 2007 and took an active role in reducing our carbon emissions. This year we have set new goals to increase our office efforts to lower QKA's Carbon Footprint.

To put our Carbon Footprint in perspective (includes office energy & gas use + total company mileage), our carbon emissions totaled approximately **202,000 lbs** of CO2 per year, equivalent to burning **10,400 gallons** of gasoline.

The average American has a Carbon Footprint of **22,940 lbs** of CO2 per year while the average global person has a Carbon Footprint of **8,750 lbs**. These figures alone show how far behind the United States is in terms of green thinking, minimizing energy use, and consumption.

As a business in Northern California, we have many resources within our reach and we must do our part to contribute to the movement.

"Every little action helps when multiplied by millions of actions combined... This is the wake up call. Listen to the alarm and do your bit to help."