

Empowering Occupants for Behavioral Change



Barbara Ciesla
HOK | Vice President



Information Visualization in Commercial Buildings
April 13, 2011



Commercial buildings are being designed and constructed to meet the latest sustainable design regulations or green building rating systems

we're seeing a gap – an engagement gap



“buildings don't use energy"



..... people do"



HOK's Occupant Engagement Program



occupant actions
education
empowerment
communication
behaviors
alignment of goals
tools
consciousness
practices

Community-based social marketing

often most effective • community level • direct contact

VS

Conventional Social marketing

public awareness • limited in ability change behaviour

Community Based Social Marketing Tools

social norms guide behavior

commitments are an obligation to fulfillment

prompts are an aid that reminds to carry out an activity

communications persuade the adoption of changes in activities

incentives motivate a more effective fulfillment of an action

barriers ensures effectiveness of other tools

source | adapted from "Fostering Sustainable Behavior" by Doug McKenzie-Mohr & William Smith

TORONTO
DOMINION
CENTRE

Toronto-Dominion Centre – A Case Study



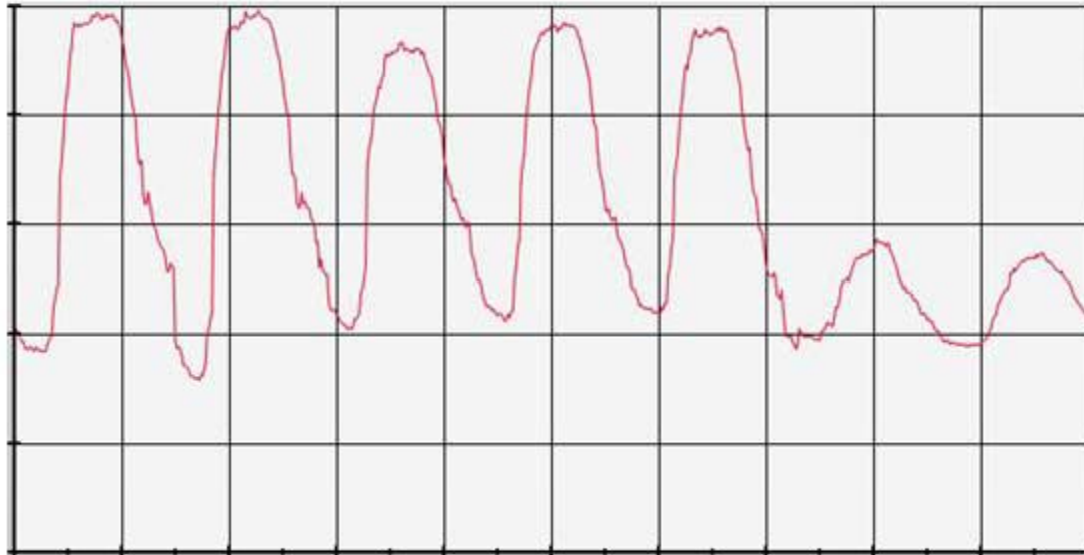
TORONTO
DOMINION
CENTRE



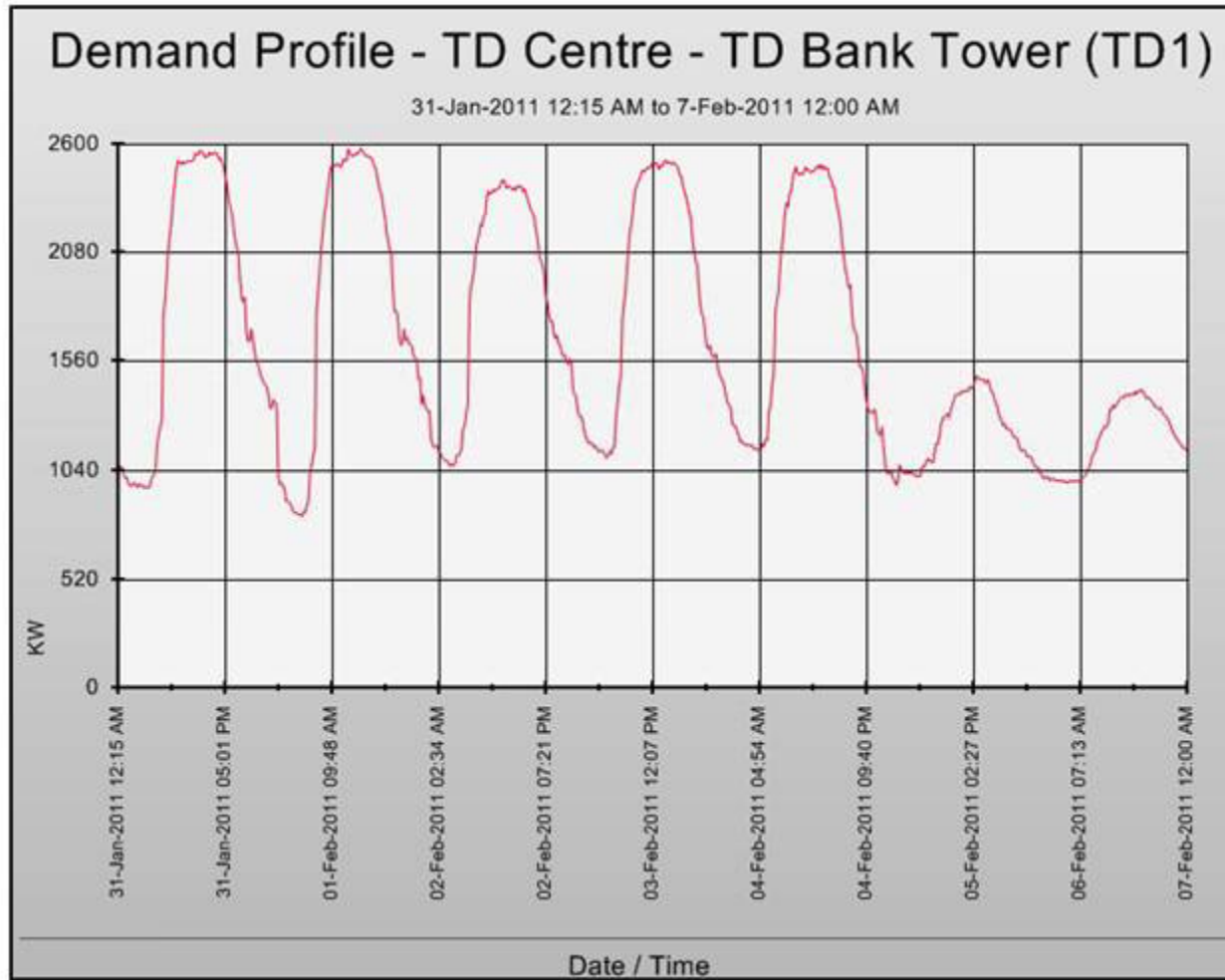
- | Toronto, Ontario in the heart of Canada's financial district
- | designed by Mies van der Rohe and constructed 1967 – 1969
- | Commercial Office complex consisting of 6 towers
- | 90 Tenant companies – Financial, Legal & Investment Firms
- | 21,000 building occupants



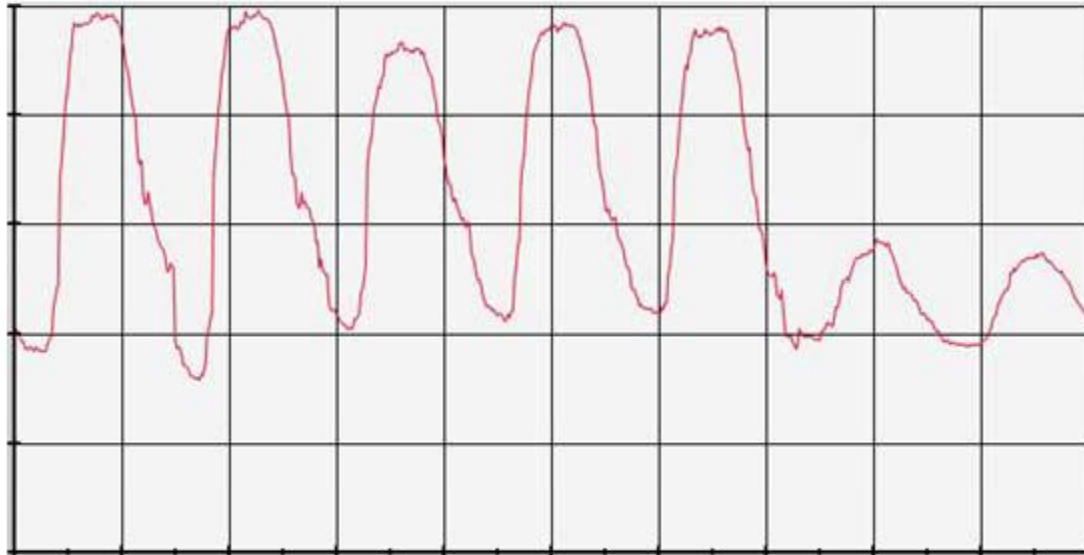
Visualizing Information



TDC – Energy Demand Profile



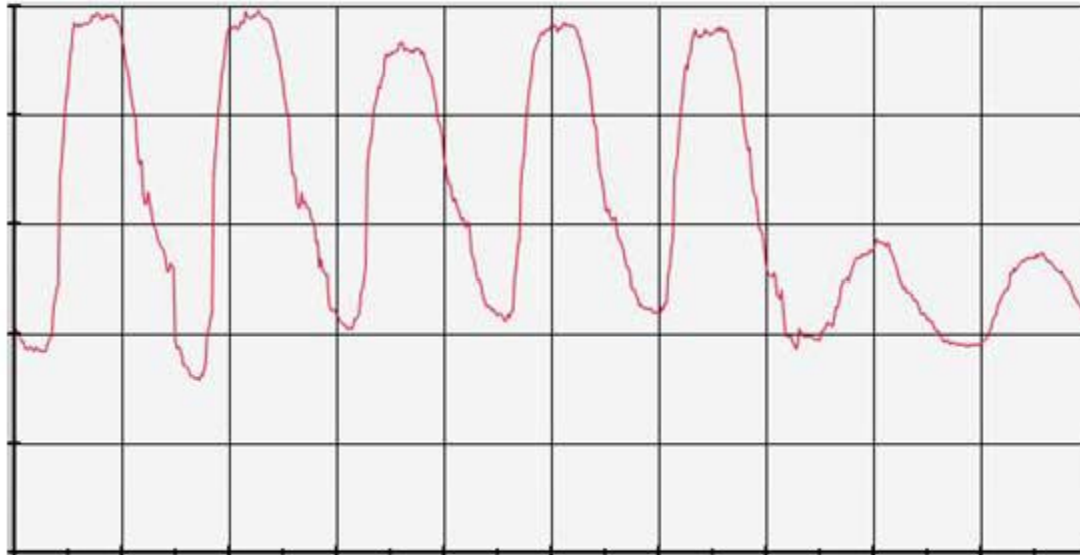
Visualizing Information?



Abnormal ECG
results ?



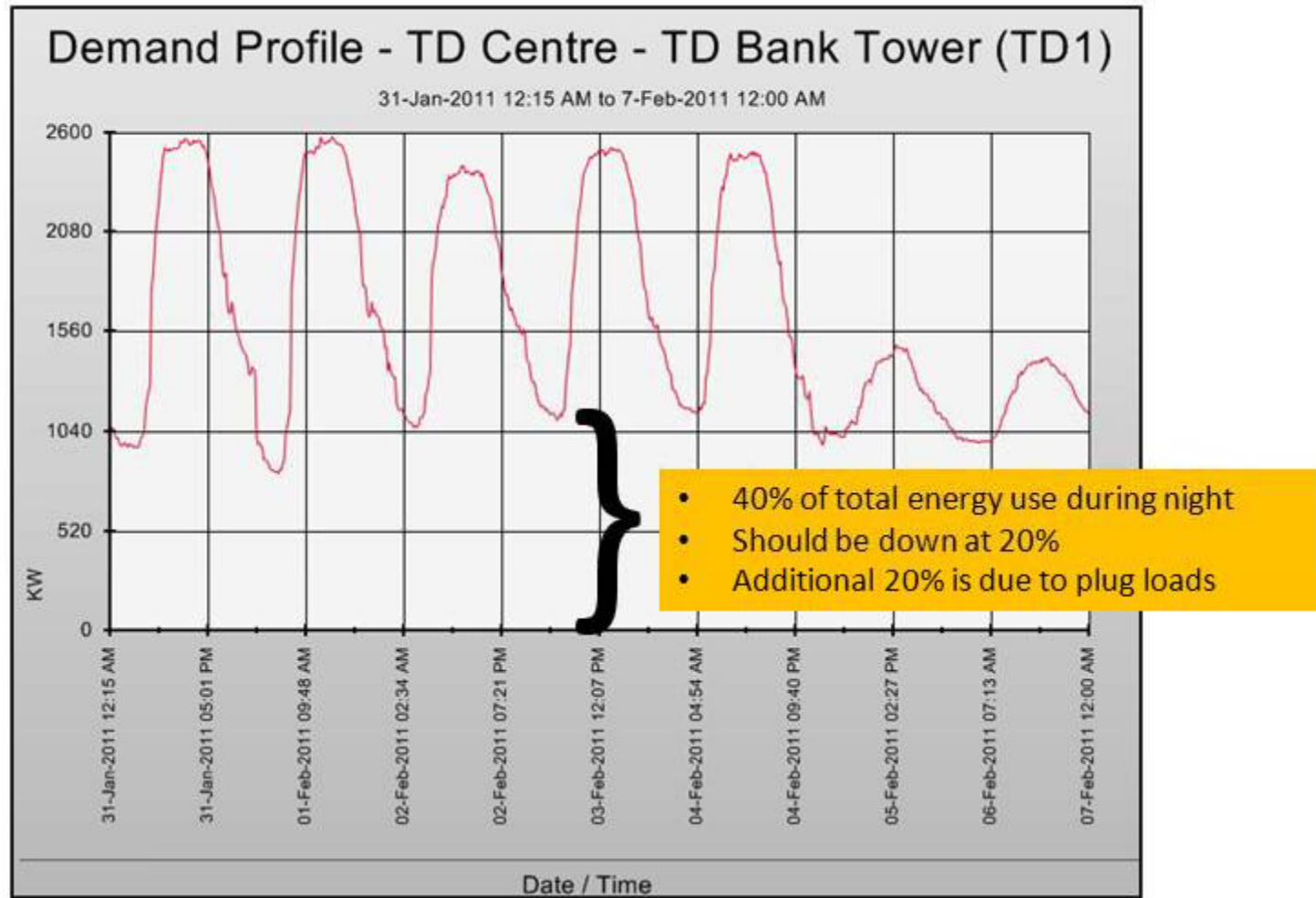
Visualizing Information?



Bad day at the
stock market ?



TDC – Energy Demand Profile



TORONTO
DOMINION
CENTRE



occupant
engagement
program™

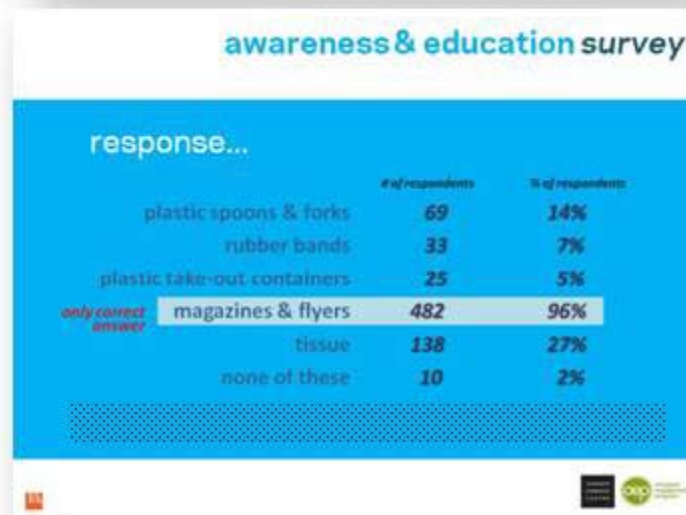
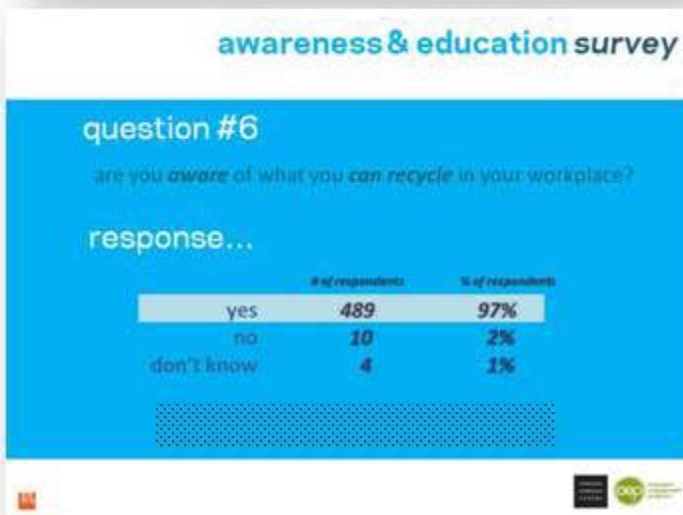
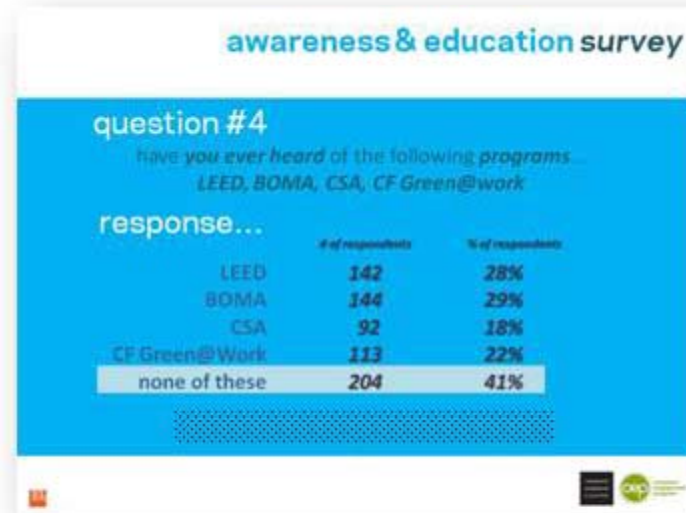
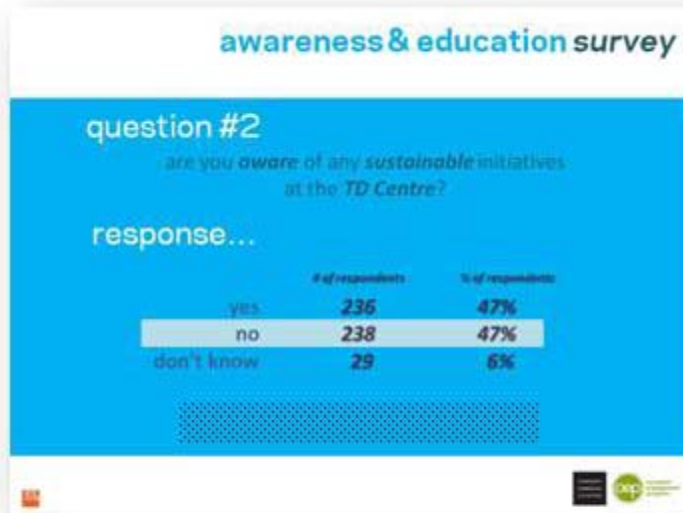
gather



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April 13, 2011



TDC Awareness & Education Survey



TDC Sustainable Initiatives Report

The image displays a grid of 10 pages from the 'TDC Sustainable Initiatives Report'. The pages are arranged in two rows of five. The top row includes the report cover, a 'Step to a High Performance Building' diagram, a '2015' goals page, a 'Sustainability at the Toronto Dominion Centre' overview, and an 'Energy & Emissions' section. The bottom row continues with 'Energy & Emissions' (continued), 'Transportation', 'Indoor Environmental Quality', 'Water', and 'Social Engagement'. Each page features a mix of text, images, and diagrams, with a consistent branding scheme including the TDC logo and a '2015' goal icon.

TDC Green Council



strategize



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April 13, 2011



TDC Green Council Mission



mission

to act as *“the catalyst for change to sustainable green practices and green consciousness”* at TD Centre working towards a vision for a future that is *“reliable, responsive and environmentally sustainable everyday”*



objectives

foundational element in developing & driving engagement program

oversight for all “green” program initiatives

conduit to and representative for larger tenant body

develop & support engagement events

identify educational content needs

alignment with tenant objectives

TDC Green Council Campaigns



oep
occupant engagement program

LEED
Green Building

CAMPAIGN TOPICS

PICK TOP 3

- ENERGY & EMISSIONS
- TRANSPORTATION
- INDOOR ENVIRONMENTAL QUALITY
- WATER
- WASTE
- PROCUREMENT
- PROGRAMS & CERTIFICATIONS



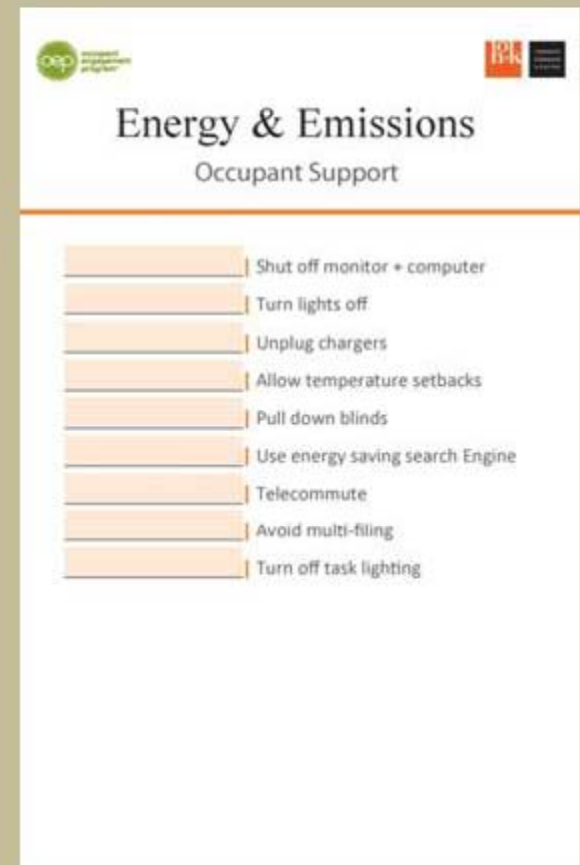
oep
occupant engagement program

LEED
Green Building

Energy & Emissions

Tenant Tie-In

- Plug Load Audit
- Lighting Audit
- Set equipment to power save mode
- Set back temperatures
- Light sensors + motion detectors
- Purchase Energy Star rated
- Remove lights in vending machines
- IT - Reduce screen brightness
- IT - Laptops instead of desktops
- IT - Virtualization
- IT - Spam policy - reduce junk mail
- Electronic faxing
- Daylight cleaning
- Replace Incandescent bulbs



oep
occupant engagement program

LEED
Green Building

Energy & Emissions

Occupant Support

- Shut off monitor + computer
- Turn lights off
- Unplug chargers
- Allow temperature setbacks
- Pull down blinds
- Use energy saving search Engine
- Telecommute
- Avoid multi-filing
- Turn off task lighting

TDC Green Council Campaigns



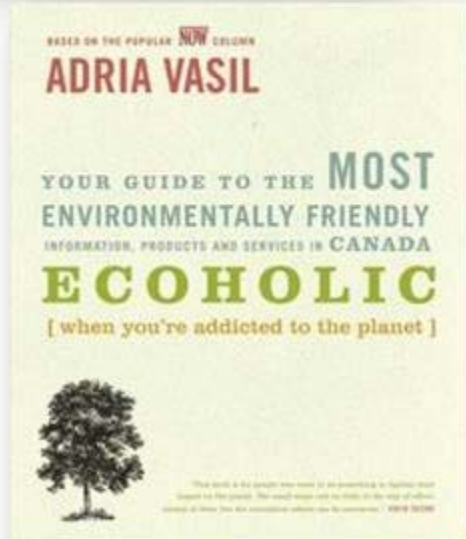
educate



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April 13, 2011

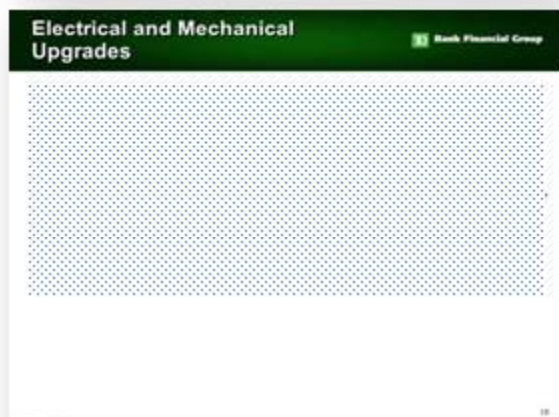


TDC Green Council Materials

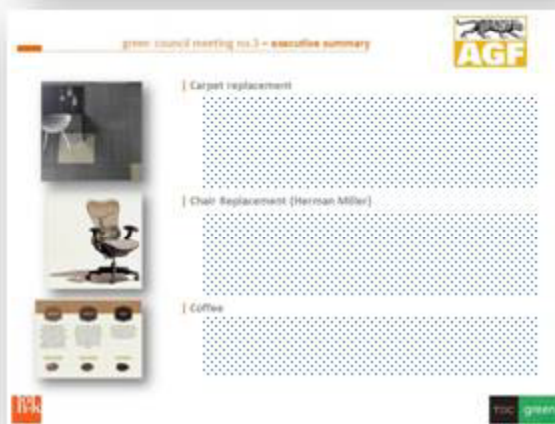


TDC Green Council Presentations

TD Bank



AGF



Ernst & Young



implement



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April 13, 2011



Awareness Campaign

July 2010 – October 2010

BUILDING
SUSTAINABILITY
TOGETHER™ TDC green

Avoid the drip. Report it.

A leaky faucet can waste up to **7,500 litres** of water a year! That's the equivalent of 3,750 large bottles of pop. Please report a leaking faucet!



BUILDING
SUSTAINABILITY
TOGETHER™ TDC green

It's not a sin. Put it all in the bin.

Single-stream recycling means **no sorting** on your part. Feel free to put all recyclables in the same container. They will get sorted off-site.



BUILDING
SUSTAINABILITY
TOGETHER™ TDC green

Turn me off!

Turn off your monitor and computer at night. You are conserving energy and saving **\$100** per workstation per year.



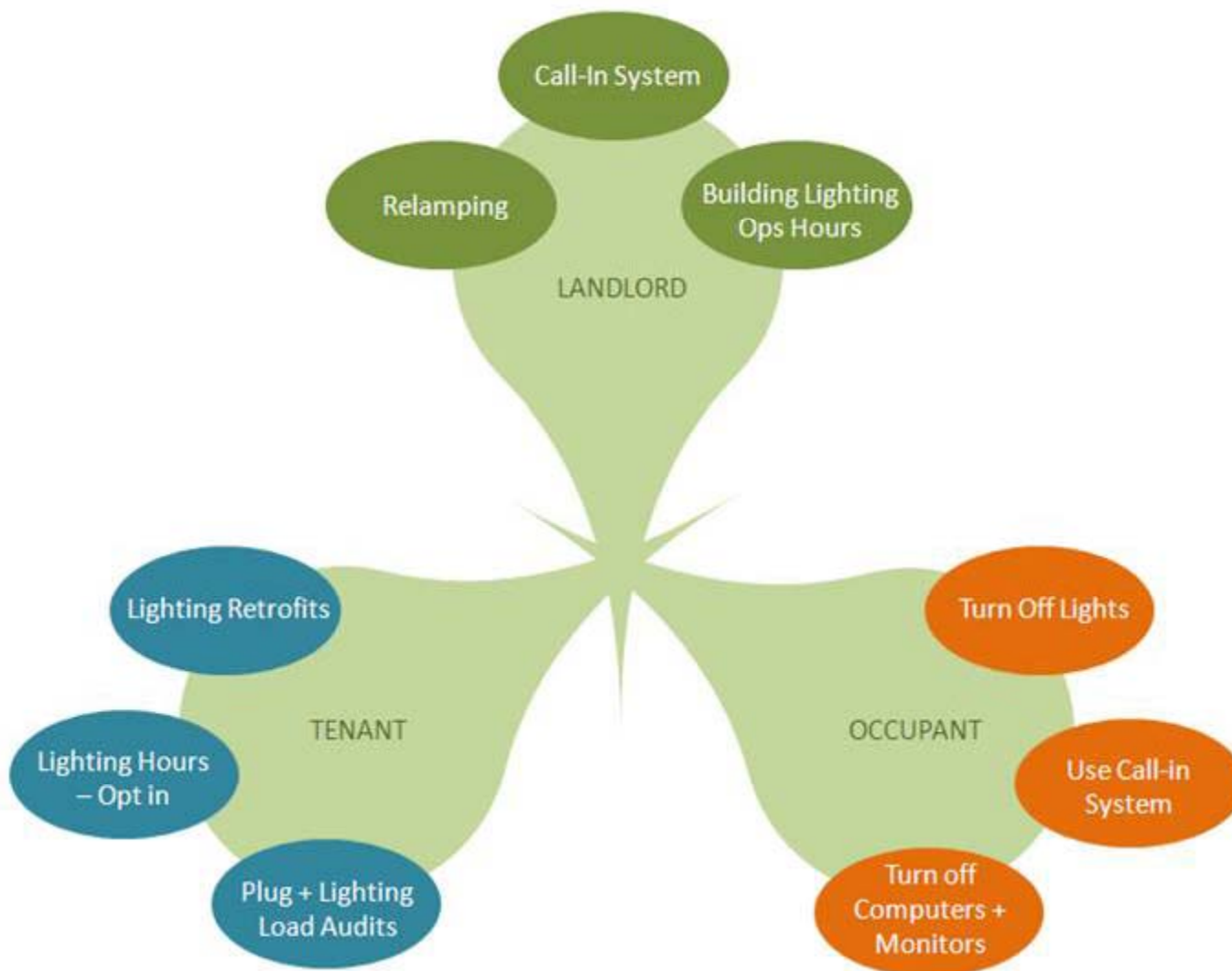
Energy Campaign

December 2010 – April 2011

ENERGY.
everyone is talking about it



TDC Energy Campaign



TDC Energy Campaign – Overview

TDC green Energy Campaign
November 2010 - April 2011

Energy Campaign Overview

The Energy Campaign is the poster initiative being implemented as part of the Occupant Engagement Program at the TD Centre. The Energy Campaign will provide actions and opportunities for Tenant Companies and Occupants (Tenant Employees) to reduce their energy consumption. These activities will be supported by actions the TD Centre has already taken on or is committed to completing.

The campaign focuses on the following areas:

- Call to Action
- Building Lighting Habits
- Switch Off Lights
- Turn Off Computers
- Turn Off TV's
- Turn Off Air Conditioning
- Energy Audit
- Lighting Habits
- Lighting Habits
- Lighting Habits

Building sustainability together™

Together we can do this.

SWITCH THE HABIT
BUILDING SUSTAINABILITY TOGETHER™ TDC green

As one of Canada's leading buildings in sustainable practices, the TD Centre is continuing the drive to reduce our collective energy consumption.

This week the TD Centre will be launching our 'Switch the Habit' Energy Campaign to remind people that changing the little behaviours can make a big difference.

By turning off your computers, monitors and office lights every night we can reduce the TD Centre's energy usage by up to 30%. It's that easy!

Keep an eye out for posters and elevator cab messaging in the upcoming months and join us in preserving our energy resources. Switch your energy consumption habits and help us make the TD Centre a better place to work.

SWITCH THE HABIT building lighting op hours



If every tenant at the TDC reduced their lighting operations by

1 hour

we would collectively save.....

SWITCH THE HABIT building lighting op hours



412,000 kWh of electricity

OR



47 acres of trees

OR



1,200,000 km driven by cars

TDC Energy Campaign – Building Lighting Op Hours

TDC green Energy Campaign
December 2010 – April 2011

LIGHTING SCHEDULE – Turning back the lights

TD Centre is encouraging tenants to evaluate their lighting hours and consider voluntary opt-in to a reduced schedule in an effort to conserve energy.

"Electricity demand for commercial buildings accounts for 44% of total electrical usage"

Buildings account for 40% of global carbon dioxide emissions. Almost half of the electricity demand for commercial buildings is accounted for by lighting (44%), followed by office equipment (23%) and then cooling needs (14%).

Because lighting is the largest energy draw in commercial buildings, finding simple yet effective approaches to reduce demand is fairly easy. A first step would be to reevaluate lighting needs. When walking through the downtown core at night, buildings are lit up and too often there is no one actually in the building. Adjusting building hours to meet business requirements, yet avoiding unnecessary use can have a huge impact. For example, if a tenant with a typical base building lighting schedule of 7am to 6pm reduced by 1 hour each workday, they would save an average of 8% in their energy consumption. Consider the case of TD Centre and all six towers:

If every tenant at the TD Centre
(226 stories, 4.3 million sq. ft.)
reduced their lighting schedule by 1 hour each day
we would collectively save

412,000 kWh of electricity
or
47 acres of trees
or
1,200,000 km driven by car

Building sustainability together™
To learn more please check www.tdcenergy.com

TDC ENERGY - Lighting Schedule

TDC green Energy Campaign
December 2010 – April 2011

LIGHTING SCHEDULE – Opt-in Form

Contribute to energy reductions at the TD Centre.

Name: _____

Opt-in to reduced base building lighting operations hours for their tenant space. It is Contract Fairview is committed to fulfilling all contractual agreements, and lighting operations as defined in tenant leases. This change to operational hours is voluntary by the tenant and can be reversed at any time by contacting your representative.

Operation Hours: _____ a.m. to _____ p.m.

Reduced Hours: _____ a.m. to _____ p.m.

I, _____, acknowledge they have informed and received the appropriate approval to request these changes within their organization. The undersigned also acknowledges they have requested these changes.

Signature: _____

Position: _____

Company: _____

To implement changes, please return this completed form to your
Tenant Relations Representative.

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TDC ENERGY - Lighting Schedule

LIGHTING SCHEDULE - Energy Savings Calculator

FIXTURES

Number of floors occupied (enter 1 if a % of floor area is occupied)	0
Number of fixtures / floor or area	0
Watts / fixture (refer to instructions tab for watts/fixture in building)	25 watts/fixture
Total Existing Wattage (watts)	0

Current weekly operating hours - lights on	0
Reduced operating hours being considered	0
Total Hours Reduced (yearly)	0

ESTIMATED kWh Savings / year	0
ESTIMATED Cost Savings / year	\$0.00

ACTION | Opt in to reduced building lighting hours

TDC Energy Campaign – Lighting Retrofits

LIGHTING RETROFITS - Stepping into a new light

TDC Tenant Case Study | Fraser Milner Casgrain LLP Energy Efficient Lighting

LEED for Commercial Interiors

LEED CI is a certification process that rewards green practices, such as low wattage lighting and low VOC carpets & paints. For more information, visit www.usgbc.org.

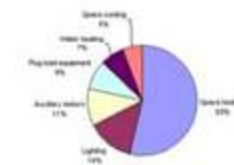
Fraser Milner Casgrain LLP (FMC) is a law firm with over 500 lawyers in six offices across the country. FMC provides legal counsel to both public and private clients of all sizes. FMC also offers support to new law professionals as well as the local community. In line with its value of contributing to the community, a commitment to forward thinking environmental initiatives informed the decision to pursue LEED for Commercial Interiors (CI) in their new space at the TD Centre. The following is a case study of how Fraser Milner Casgrain stepped into a new world of lighting and helped the environment along the way.

"LEED Certification reflects and embraces our core values"
-John Eivett | FMC

ENERGY – Lighting Initiatives

After heating, lighting is the largest consumer of energy in a commercial space. Over one quarter of all energy consumed is used just to keep the lights on. This represents a great opportunity for energy and cost savings.

Lighting is considered the low hanging fruit of energy reduction measures with return on investment typically less than 10 years. As electricity costs increase, payback could be achieved even sooner. Lighting is also where Landlord and Tenant can work together to achieve mutually beneficial results.



Source: Energy Use Data Handbook, Natural Resources Canada's Office of Energy Efficiency

In the following pages, you will find helpful information about fellow tenants, the state of lighting technology, financial incentives and communications your organization can use in encouraging employees to take action.

Enclosed, you will find information to help you build a solid case for energy efficiency.

Included in this package are:

- TDC Tenants
- Osram Sylvania
- BOMA | LEED
- Communitas
- TDC
- TDC
- TDC
- TDC

For more information, please contact your Tenant Relations Representative.

OSRAM SYLVANIA – A vision for the future

When it comes to sustainable team work, TD Centre and its Tenants are a great example. Many Tenant/Landlord collaborations for lighting retrofits have already resulted in reduced energy demands. TD Centre would like to continue these efforts by keeping Tenants informed and support those who may be considering lighting changes in the near future. The following report is provided by Osram Sylvania, an industry leader in creating energy efficient lighting solutions. It identifies opportunities for improving efficiency in your non base-building lights while addressing evolutions in technology, in particular the increased use of LEDs in office settings.

If you would like to discuss a lighting retrofit project in your space, contact your Tenant Relations Representative.

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For more information please visit www.tdcentre.ca



LIGHTING INITIATIVES

BOMA – Incentives for Tenants

CASE STUDY | Toronto Law Firm

A Downtown Law Firm took advantage of the original BOMA CDM Program, which began with a mandatory energy audit to determine their performance baseline. A lighting retrofit plan was developed for the installation of 230 motion sensors in boardrooms and offices. Both the energy audit and capital costs were eligible for the BOMA incentives. This small, but significant action resulted in energy and cost savings.

Savings = 450 000 kWh & \$45 000 annually

ACTION | Plan for high efficiency lighting upgrades of non-base building lighting

TDC Energy Campaign – Midnight Audit Reports

tdc green Energy Campaign
October 2010 - April 2011

**MIDNIGHT AUDIT RESULTS
TD CENTRE**

TEENANT

As one of Canada's leading buildings in sustainable practices, the TD Centre is continuing to reduce our collective energy consumption. In support of these ongoing efforts, Cadillac Fairview conducted a Midnight Audit investigating after hours energy use. The information provided by this audit will inform decisions regarding lighting retrofits, equipment choices and tenant engagement.

MIDNIGHT AUDIT SUMMARY

The Midnight Audit was carried out over a three night period off time by Cerma Industries Inc. The audit involved visiting all floors of all TD Centre towers and documenting tenant energy use through measurement and visual inspection.

The goal of the Midnight Audit was to identify opportunities for energy savings. Equipment overrides, improper lighting levels and office equipment left on were all documented and savings reported.

ANNUAL ENERGY SAVING OPPORTUNITIES IN YOUR SPACE

	Annual Savings	
	kWh	\$
Tenant Equipment & Elevator Lobby Lighting & Other	X	X

Current Lighting Schedule

Weekday On	Weekday Off	Saturday On/Off	Sunday On/Off	Weekday Total	Weekend Total	Weekly Total
X	X	X	X	X	X	X

TD Centre is asking Tenants to review their current business operating hours and lighting to identify any opportunities to reduce overall energy consumption. Cadillac Fairview

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midnight audit summary

annual saving opportunities

current lighting schedule

	LIGHTS NOT CONTROLLED (kWh)	TENANT EQUIPMENT (kWh)
Tower 1	64,681	472,383
Tower 2	14,636	223,852
Tower 3	20,850	135,990
Tower 4		396,344
Tower 5	20,941	70,910
Tower 6		449,904
TOTAL	121,108	1,749,383

ACTION | Review audit results and take action

TDC Energy Campaign – Electronic Mystery Audit

 TDC green Energy Campaign
December 2010 – April 2011

ELECTRONICS MYSTERY AUDIT

We're building sustainability together™ at the TD Centre and you're invited!

You've heard about all the great initiatives already underway as part of the Energy Campaign and its focus on reducing energy consumption. Now you and your organization have the opportunity to become directly involved.

Enclosed is all you will need to **organize your own Electronics Mystery Audit**. This is not only a way to identify opportunities for energy savings within your own organization, but it is also a great way to engage employees that are eager to make a difference. You can also win an iPad by doing your part to help conserve energy at the TD Centre! Just be sure to get all eligible ballots in and audits complete before April 30, 2011.

The GOAL
Bring awareness to the sources of energy use and engage building occupants to complete simple tasks that contribute to energy use reduction.

What's NEXT?

- Review this package. If you have any questions, please contact your Tenant Relations Representative for clarifications before creating and meeting with your Audit Tiger Team.
- Identify areas/floors/departments in your organization where an Electronics Mystery Audit would be beneficial.
- Communicate the Electronics Mystery Audit to your organization's leadership for their awareness and support.
- Create an Audit Tiger Team made up of employees looking to be engaged. They will need to volunteer their time. To successfully complete this audit please allow for two separate evenings. Some additional time may be required for tabulation. (Allow 1 hour per floor per/person for the audit)
- Meet with your Audit Tiger Team to provide an overview of the TD Centre's Energy Campaign and details of the Electronics Mystery Audit.
- Schedule dates for your initial benchmarking audit as well as a follow-up audit. A comparison of the two audit results will show any reductions. Dates should be set within TD Centre's Energy Campaign, which runs December 1, 2010 – April 30, 2011. Please note, that this package can be utilized at any time however, in order to be eligible for the draw all audits must be complete and submitted on April 30, 2011.
- Order printed material as described below from your tenant relations representative.
- Conduct audit.

Building sustainability together™
For more information please check www.tdcentre.com

 TDC ENERGY – Electronics Mystery Audit

 TDC green Energy Campaign
December 2010 – April 2011

Tools for success

T1 | Electronics Mystery Audit Instructions

Please note, for accurate results, no notice should be given to employees.

Pre-Audit

- Identify areas in your organization where an Electronics Mystery Audit would be beneficial. These could be a department, a floor or your entire organization.
- Develop a Tiger Team of volunteers. Hold a meeting with the volunteers and discuss details of the audit and gather input. Do not provide audit details prior to the first meeting to ensure the audit is a surprise to the majority of your employees.

C2 | Sample Script for communications to your organization's leadership

Please use and adapt the below text for communications to your leadership.

As part of the Energy Campaign being implemented by Cadillac Fairview at the TD Centre, all Tenants are being provided with tools to investigate aspects of our own energy use. The Energy Campaign is an extensive program of events, messaging and Tenant participation that will support the reduction of energy use at TD Centre. It runs from December 1, 2010 to April 30, 2011.

The tools provided support an electronics audit to be carried out at the end of a regular work day. A small group of employee volunteers will count the number of computers, monitors and

ACTION | Conduct an Electronics Mystery Audit

TDC Energy Campaign – Electronic Mystery Audit

WIN an iPad



Electronics Mystery Audit Worksheet

Area Audited: _____

Equipment	Use this area to track numbers of electronics left on		Total
Monitor	CRT		
	LCD		
Computer	Desktop		
	Laptop		
Cell Phone Charger			

Print this worksheet for all EM
Once completed, enter line item
Once Audit 1 and Audit 2 have been

Building sustainability together
For more information please check www.tdcenergy.com

TRACKING for Audit No. 1

Equipment	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	TOTAL	Energy (kWh)
Monitor	CRT	0	0	0	0	0	0	0.00
	LCD	0	0	0	0	0	0	0.00
Computer	Desktop	0	0	0	0	0	0	0.00
	Laptop	0	0	0	0	0	0	0.00
Cell Phone Charger	0	0	0	0	0	0	0	0.00

ESTIMATED After Hours Electronics Energy Use (expressed in kWh/year) 0

ESTIMATED Cost of After Hours Electronics Energy Use \$0.00

Please submit completed audit results (1 & 2) by April 30, 2011

ASSUMPTIONS:

- Business Operating Hours of 8:00am - 6:00pm = 14hrs of after hour use
- Calculations use average electronics consumption as per the EPA (U.S. Environmental Protection Agency)
 - Monitor - CRT = 80 watts
 - Monitor - LCD = 20 watts
 - Computer - Desktop = 120 watts
 - Computer - Laptop = 30 watts
 - Cell Phone Charger = 1.6 watts

For more information on electronics use visit:

<http://michaelbluejay.com/electricity/computers.html>

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NAME: _____

COMPANY: _____

EMAIL OR PHONE NUMBER: _____



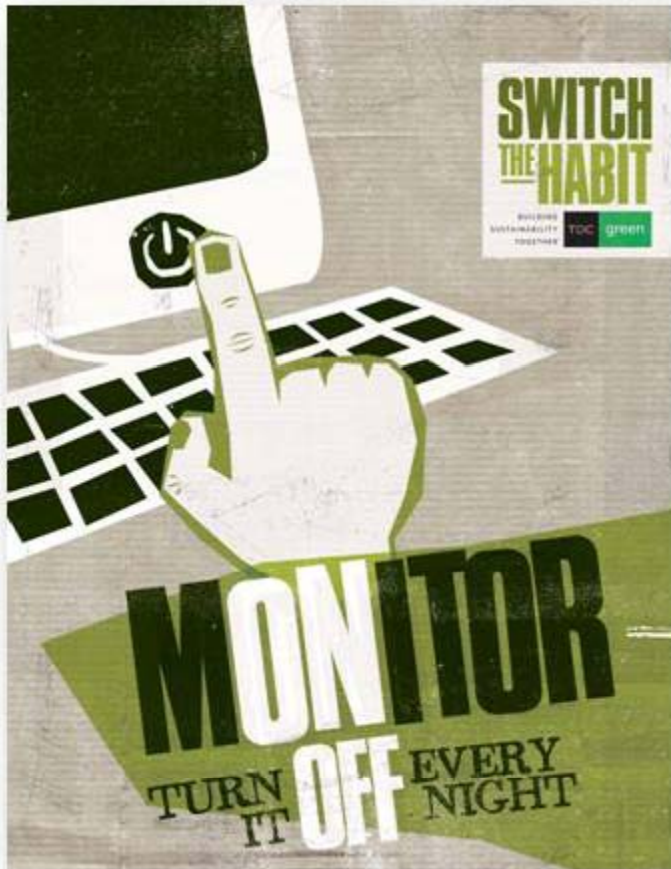
ACTION | Conduct an Electronics Mystery Audit



Information Visualization in Commercial Buildings
April 13, 2011

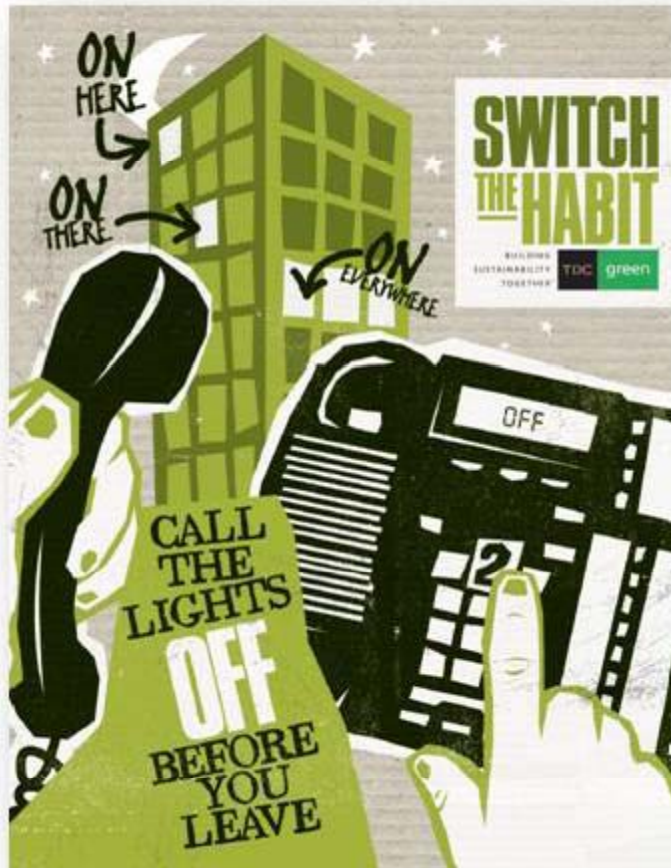


TDC Energy Campaign – Behavior – Turn Off Your Monitor



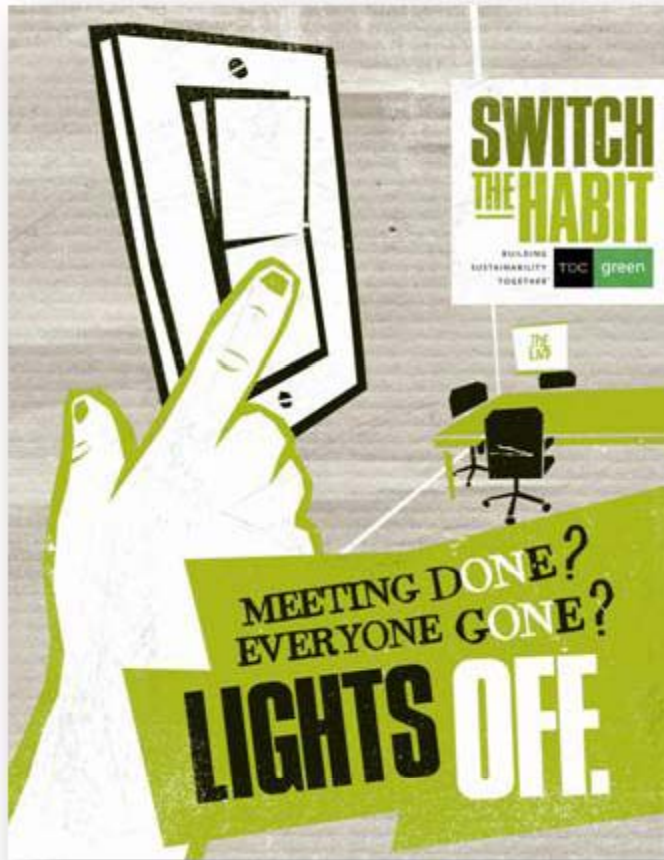
ACTION | Turn Off Your Monitor

TDC Energy Campaign – Behavior – Call Off the Lights



ACTION | Use the Call-In System to Turn Off the Lights

TDC Energy Campaign – Behavior – Turn Off the Lights



ACTION | Turn Off the Lights when Leaving a Room

TDC Energy Campaign – Communications



Waste Campaign

June 2011 – October 2011

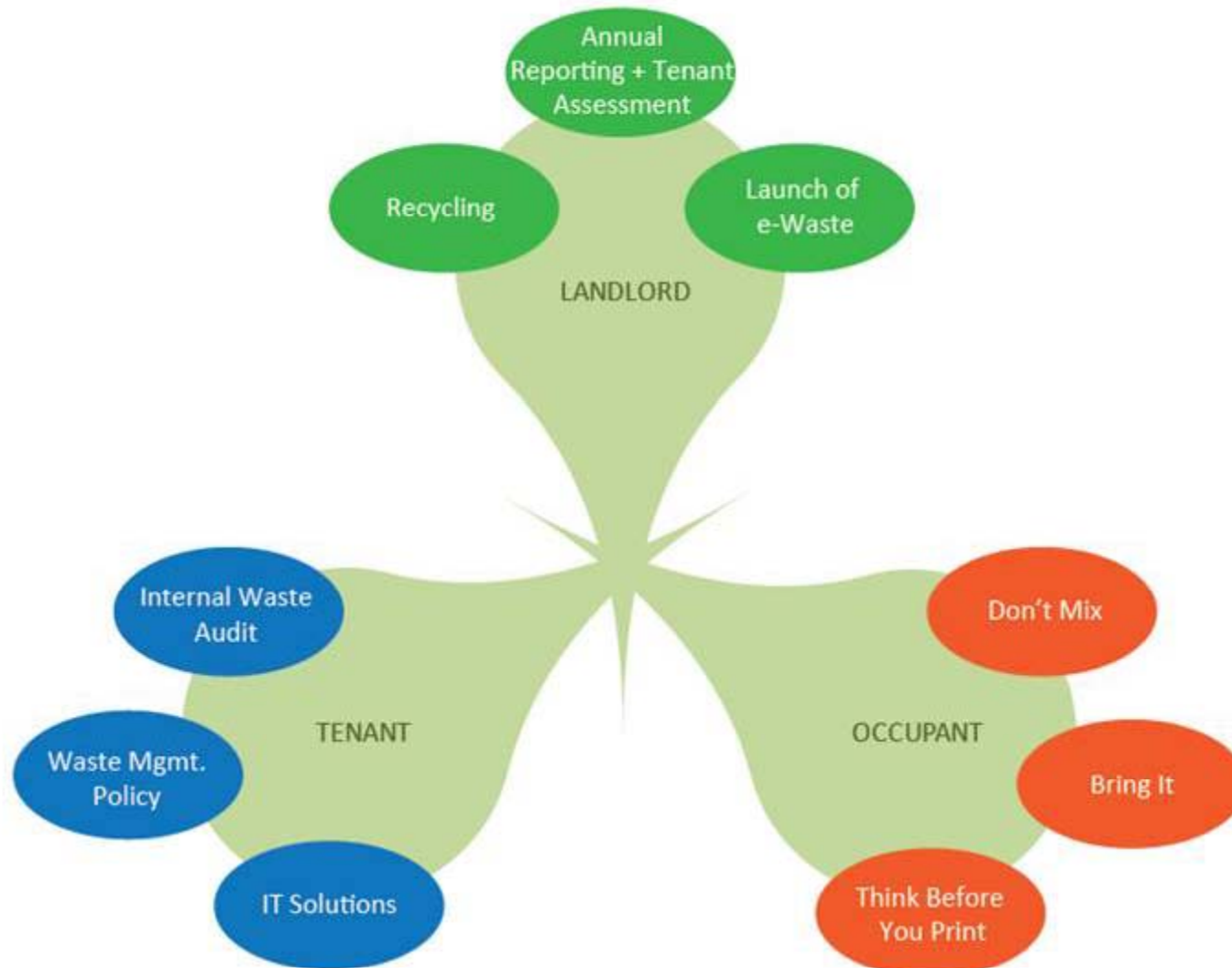


zero-landfill

vs.

zero-waste

TDC Waste Campaign – Overview



TDC Waste Campaign – Why?

question #6

are you *aware* of what you *can recycle* in your workplace?

response...

	# of respondents	% of respondents
yes	489	97%
no	10	2%
don't know	4	1%

response...

	# of respondents	% of respondents
plastic spoons & forks	69	14%
rubber bands	33	7%
plastic take-out containers	25	5%
<i>only correct answer</i> magazines & flyers	482	96%
tissue	138	27%
none of these	10	2%

measure



Information Visualization in Commercial Buildings
April 13, 2011



TDC Energy Campaign – Measurement



- OVERALL** | complex wide energy use pre & post campaigns; normalized for time of year and system upgrades/operational changes
- RELAMPING** | energy reductions achieved with property wide relamping; expressed bi-annually
- LIGHTING HOUR OPT IN** | company + building + property wide energy reductions achieved with lighting hour schedule changes
- CALL-IN SYSTEM** | % of system use increase
- MIDNIGHT AUDIT REPORTS** | addressing energy use items noted in reports – *dependent on tenant feedback*
- LIGHTING RETROFITS** | energy reductions achieved with non-base building lighting retrofits – *dependent on tenant feedback*
- ELECTRONICS MYSTERY AUDIT** | energy reductions realized between audit 1 and 2 – *dependent on tenant participation & feedback*

TDC Online Portal



Feedback Tools



Tenant Engagement



| partnerships between LANDLORD + TENANT

Tenants are:

| engaged in participation beyond meetings

| sharing their business case

| acting as advocates

| reaching out to each other

| inspired to green their own spaces

| putting themselves forward to pilot programs –
energy, waste, daytime cleaning

| targeted communications to CxO for ongoing support

Tenant Engagement



“I want you to know that you are impacting change at AGF and we are reaping the financial and green rewards. As they say, the teacher will come when the student is ready. We are learning a lot and even better, have been able to apply it.”

Nicole Popovich
Vice President, Institutional Development



Barbara Ciesla

HOK | Vice President

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Information Visualization in Commercial Buildings
April 13, 2011

