

# Using TLC to Reduce Energy Use

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## ABSTRACT

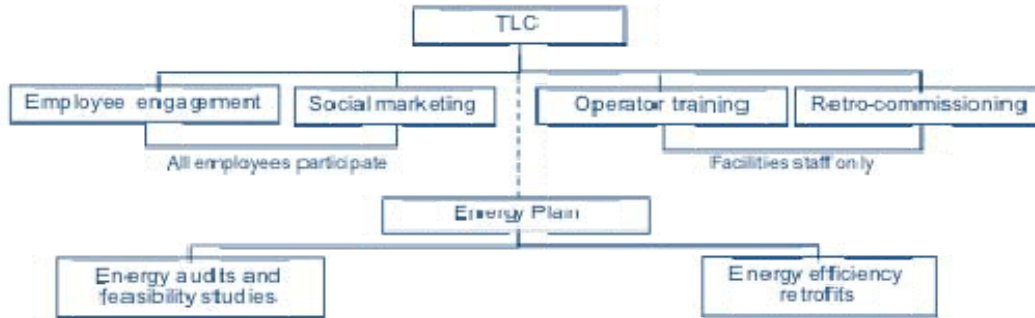
The University Health Network has piloted a unique and comprehensive energy management and engagement program in their three downtown Toronto hospitals over three years (2008-2010). The program engaged all members of the hospital community to work together to make behavioral, process and equipment changes to increase awareness and reduce consumption of energy and production of greenhouse gases. The program, called Thermostats, Lights and Controls (TLC) - Care to Conserve, consisted of six components: social marketing, employee engagement, operator training, retro-commissioning, comprehensive energy plans and detailed energy audits and retrofits. TLC achieved success in both saving energy and enhancing energy conservation behaviors. In year one, the TLC program resulted in a 3.9% reduction in energy consumption in Toronto Western Hospital (TWH). In year two, these energy savings at TWH improved to 4.2%. The total energy savings for TLC in the first two years of the program (at both TWH and Toronto General Hospital) is 1.4%. This translates into a total greenhouse gas savings of 416 metric tons of CO<sub>2</sub> equivalents. Based on pre and post implementation surveys, it was found that staff were more likely to engage in energy saving behavior after the implementation of TLC. This was particularly true for the targeted behaviors of turning off monitors and computers when stepping away from a workstation, turning off electronics and personal appliances when not in use and turning off task lighting. The surveys also showed that following the implementation of TLC, employees thought it was more important to engage in energy-saving behaviors.

## Introduction

In 2007 the University Health Network (UHN) received funding to pilot a comprehensive energy management and engagement program in their three downtown Toronto hospitals – Toronto Western Hospital (TWH), Toronto General Hospital (TGH) and Princess Margaret Hospital (PMH) - over three years. This energy management and engagement program was a tool for engaging all members of the hospital community to work together to make behavioral, process and equipment changes that will increase awareness and reduce consumption of energy and production of greenhouse gases.

This program, called Thermostats, Lights and Controls (TLC) - Care to Conserve, (from now on referred to as TLC or the TLC program) consisted of six major components: social marketing (SM), employee engagement (EE), operator and senior manager training, retro-commissioning of equipment (RCx), production of an energy plan and detailed energy audits and retrofits. A schematic representation of the TLC program is shown in Figure 1 below. This program married technological and equipment changes through RCx, operator training and audits and retrofits with more behavioral approaches to saving energy – social marketing and employee engagement. This paper will focus on the behavioral aspects of the program, social marketing and employee engagement, and where overlap between the behavioral and technical approaches exists.

**Figure 1 Schematic Representation of the TLC Program**



The TLC program was designed and implemented by a project team, which consists of staff from the UHN Energy and Environment Department (UHN) and external consultants (IndEco Strategic Consulting (IndEco), Finn Projects and the University of Toronto Sustainability Office). The project team also worked in collaboration with energy teams at each of the three hospitals, which are comprised of senior facilities staff from the hospitals and UHN to design and implement the program. IndEco, in addition to a leadership role in the design and implementation of social marketing and employee engagement components, provided overall project coordination and management, which encompassed the management the TLC program including the activities of the project team and energy team.

## **Program Design**

### **Program Branding**

Prior to development of the TLC program a clearly defined brand was established based on a healthcare theme. Branding is the process of creating identity for a product (Aacker, 1996). In the case of public health campaigns branding aims to give a campaign long-term value enabling its target audience to associate with the campaign and to adopt its use and sustain it (Basu and Wang, 2009). According to McDivitt (2003) branding can provide a more thoughtful approach to behavior change and can get social marketers out of their usual way of doing business. The brand for the TLC program included: a program name (TLC – Thermostats, Lights and Controls), a tagline (Care to Conserve), a program logo and an overall look for program materials. The program logo and tag line is shown in Figure 2 below. These brand elements attempted to blend both the healthcare and energy themes so that staff would make the connection between the two. The healthcare theme was continued in the images used in the social marketing and employee engagement materials (e.g. the use of doctor and nurse images).

As the pilot continued, this focus on healthcare images was maintained and expanded in an attempt to capture some of the other roles of hospital staff including administrators, researchers and lab technicians, and housekeeping and facilities staff so that these staff could relate to the program and make the linkage between energy use and their specific job. This brand was employed consistently across all components of the TLC program so that hospital staff were presented with a single unified energy program. From the employees perspective they are not aware whether they are participating in social marketing or employee engagement, to them it is all just TLC.



## **Social Marketing**

Social marketing (SM) is the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of society which they are a part (Andreasen, 1994). The SM component of the TLC program is designed to reduce energy consumption in the hospital using social marketing tools that encourage staff and residents to make simple changes in their daily energy behaviors. The social marketing tools developed for TLC include detailed discussions of the environmental impact of specific behaviors, implementation strategies for changing that behavior (energy conservation), and an assortment of ‘action tools’, such as e-mails, banners and posters etc., which are used to promote and prompt changed and sustained behavior. These tools are based primarily on the social marketing principles of psychologist Dr. Doug McKenzie-Mohr presented in his book *Fostering Sustainable Behavior*. For the TLC program these behaviors included: more efficient use of lighting, computers and monitors and personal appliances.

A range of materials and tools were designed and employed in the TLC program to encourage behavior change that result in energy savings. Rather than relying on one approach, a range was employed so that different techniques can be tested in the pilot phase. The types of tools employed and how they were disseminated are described below. These materials and tools were selected as, based on their experience implementing SM campaigns in other large institutional settings, the SM experts (University of Toronto Sustainability Office) on the project team thought that these materials would be the most effective in encouraging behavior change with regards to energy use in the hospitals. These were also the tools that UHN staff thought would work best in a healthcare setting given some of the unique challenges including: restrictions on posting materials, many competing activities and campaigns (e.g. hand washing, infection control) and an extremely busy, high stress environment.

**Social marketing campaigns.** In addition to a range of materials two types of social marketing campaigns were developed: a Kick-off Campaign and a Sustainable Campaign. The Kick-off Campaign took place the first time the program is introduced into an area (e.g. department of floor) of a hospital. The Kick-off Campaign was resource intensive and involved implementing all aspects of the social marketing campaign with a great deal of hands on assistance from members of the project team. This Kick-off campaign was designed to be implemented on a floor or department for about a year.

The Sustainable campaign is introduced to an area of the hospital that has already received the Kick-off campaign. The Sustainable Campaign as the name suggests was intended to be sustained over the long-term. The Sustainable Campaign was designed to be implemented by the social marketing champions for each of the areas. The project team provided support to the champion through e-mail reminders and the provision of materials. In the Sustainable Campaign the champions were encouraged to develop their own materials and events based on templates and resources provided by the project team. The two types of campaigns were developed as the project team, in particular, staff members from UHN, were concerned about the

ability to successfully implement the resource intensive Kick-off Campaign once the program was rolled out more extensively throughout the hospitals. The intent of the Sustainable Campaign was to take some of the onus off the project team and place more of the responsibility for program implementation onto the volunteer social marketing champions.

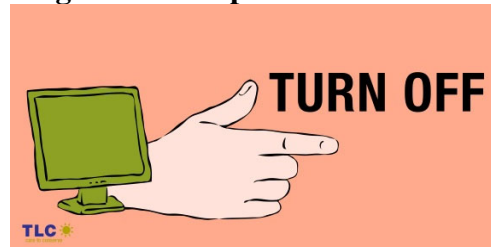
**Social marketing champions.** Social marketing champions were recruited for each of the Kick-off implementation sites. These champions were staff that were keen to participate in the program and that were well-known and trusted within their work area (e.g. floor or department). These champions were recruited during visits to each of the Kick-off floors by project team members and through previous contact with the project team with regards to other energy and environmental matters. Green Team members, which are members of the hospital's environmental team working on the floors or in the department, were also approached to be champions. These champions were asked to fulfill a number of roles during the implementation of the social marketing component including disseminating program materials, providing feedback to the project team on the program and leading by example. As mentioned above the role of the social marketing champion increased as their work area moved from implementing the Kick-off to the Sustainable Campaign. At that point the champion became the main delivery agent for the program with the assistance of the project team.

**Program pledge.** A program pledge was employed as individuals are more likely to follow through with an action if they make a commitment to do so (McKenzie-Mohr, 1999). In the first year of the program, program pledges were placed in a high traffic area of each of the test sites. This pledge took the form of a large laminated poster that staff could sign. This pledge involved staff signing the pledge to declare that he/she would participate in the TLC program by conserving energy and that the staff member was committed to a more sustainable workplace. To encourage staff to sign the pledge the signatures of senior managers were placed on the pledge prior to posting. This method was used to encourage the staff to make a public commitment to the program and to act as a social norm. A social norm is a tool that encourages individuals to act a certain way by demonstrating that other members of the community are behaving the same way (McKenzie-Mohr, 1999). Only a small number of signatures were obtained using this method. Feedback from staff suggested that many staff were not aware of the pledge and those that were aware were uncomfortable publicly declaring their commitment to the program. To avoid this lack of participation in second and third years of the pilot, the pledge was included as part of the pre-implementation survey distributed to staff at TGH and PMH. Employing this pledge method eliminated the use of norms to encourage behavior change, however it still encouraged staff to make a commitment to the program, all be it not publically. Making a commitment is still shown to encourage individuals to follow through with an action (McKenzie-Mohr, 1999). When the pledge was disseminated using this method 89% of those surveyed signed the program pledge. The survey was completed by approximately 10% of all hospital staff. The pledge was also been placed on the TLC website which is under development. Traffic to the TLC website has been relatively high, but the only a small proportion of those visiting the site have signed the pledge and committed to the program.

**Stickers.** A series of stickers was developed to act as action specific prompts. Prompts are reminders, visual or auditory, that encourage individuals to take a desired action (McKenzie-Mohr, 1999). These stickers prompted staff to turn off the equipment targeted by the TLC

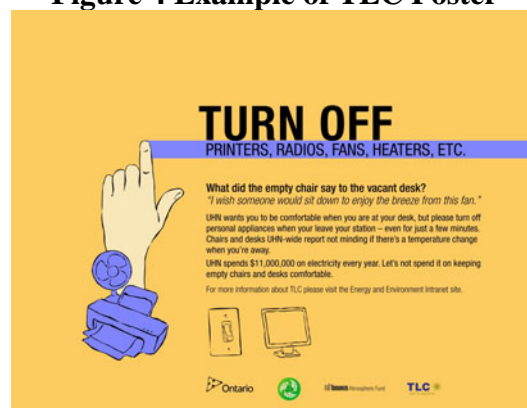
program including lighting, computers and monitors and personal appliances. Staff were encouraged to place these stickers on pieces of equipment in their work area to remind themselves and others to turn off this equipment when it is not in use. A postcard that explains the intent of the stickers and where they should be placed accompanied the stickers. An example of a sticker for encouraging staff to turn off computers and monitors is shown in Figure 3 below.

**Figure 3 Example of TLC Sticker**



**Posters.** A series of three posters was developed which highlighted energy saving actions that staff could undertake. Again these posters were designed as prompts to encourage specific behaviors. The behaviors targeted in these posters were: turning off lighting, computers and monitors and personal appliances including radios, fans, printers. These posters provided staff with information on what energy saving actions they should take and why these actions should be taken. The posters also attempted to address barriers to energy saving activities that had been identified such as permission to turn off equipment. The poster encouraging staff to turn off personal appliances is shown in Figure 4 below. The posters were employed for the Kick-off Campaign and were distributed at evenly spaced intervals throughout implementation of the program by the project team. For the Sustainable Campaign the champions are encouraged to develop their own posters using a template and information provided by the project team. Some of the more engaged social marketing champions have developed and posted their own materials. When allowing staff to develop their own materials care must be taken to ensure that they adhere to the appropriate messaging otherwise the program message can become lost or confused.

**Figure 4 Example of TLC Poster**



**Banners.** A series of large vertical, retractable banners were developed which provided staff with information about the goal (15% reduction in energy use) of the SM campaign and what actions could be taken to achieve this energy saving goal. Again these actions were consistent with and reinforced those on the other program materials. These banners were placed in high

traffic areas at the Kick-off sites. Champions can also request to use these banners as part of their Sustainable Campaign. The banners were also used for hospital wide events such as Environment Day or the Provincial Energy Conservation Week. Examples of the banners are shown in Figure 5 below. These banners attempt to capture some of the other roles of hospital staff including administrators, researchers and lab technicians, and housekeeping and facilities staff. This was done as individuals are more likely to engage in a behavior if they see themselves reflected in the material being presented.

**Figure 5 Vertical Banner Images**



**Kick-off event.** A kick-off event was held to launch each of the Kick-off Campaigns and to generate interest and excitement in the program. Staff for each department or floor were invited via their social marketing champion to attend the event. The kick-off event was generally added to the agenda of an already scheduled meeting so that staff do not have to take additional time out of their busy schedules. At these events the project team made a short presentation about the TLC program, why it is important and what staff members could do to participate. Attendees were also given program materials including stickers and employee engagement postcards (described later).

**E-mails.** Since preparing and sending e-mails is not very labor or resource intensive, e-mails were employed in a number of ways for the social marketing campaign. For example, e-mails were sent to the social marketing champions receiving the Kick-off Campaign asking them a question about the content of the TLC posters; a prize was given to the champion that recruited the most staff to respond to the e-mail. E-mails that provide energy saving tips for different seasons (summer, winter etc.) were also sent as part of the Kick-off and Sustainable Campaigns.

E-mails are more useful for information that can be distributed hospital or UHN wide as department or floor e-mail lists are not available in most cases. The use of e-mails as social marketing tool have not been particularly successful to date for the most part as they are just one of many e-mails staff receive and they are very easy to ignore. Going forward e-mails will be used to remind champions to implement measures as part of the Sustainable Campaign rather than as a distinct social marketing tool.

## **Employee Engagement**

In the context of TLC, employee engagement is a marketing and communication tool or framework used to assist the hospital in identifying and implementing energy conservation actions. The difference between employee engagement and other types of communication tools such as social marketing is that employee engagement allows for the two-way flow of information regarding energy and energy efficiency. In employee engagement not only do staff receive messaging on energy conservation, but they also have opportunities to provide their ideas for improvements in energy efficiency. Peers then evaluate these ideas and the most appropriate energy measures are implemented. The results of implementing the measures are then reported back to the employees in a timely fashion to motivate them. Employees are subsequently rewarded for their efforts. This process allows staff to become more aware of energy use and conservation and allows them to take ownership of the ideas and their implementation. Communication with staff submitting ideas is very important. This is done to let them know that their ideas are valuable and being considered. In the TLC program staff were contacted via e-mail by a member of the project team about their idea upon receipt of the idea. This included thanking them for their submission and informing them of the next steps. Staff were then contacted, again via e-mail, once their idea was evaluated to let them know the outcome, what actions if any would be taking place and to inform them of any reward they may have earned.

A range of materials and tools were designed and employed to promote the employee engagement component of the TLC program. The employee engagement program was promoted so that staff are aware that they can submit energy saving ideas and where and how they can provide their suggestions. The types of tools employed and how they were used are described below. The materials developed to promote the employee engagement program were selected as the social marketing experts on the project team thought that these materials would be the most effective in promoting the employee engagement program and in encouraging staff to submit their energy saving ideas. UHN staff also thought that these materials would work best in a healthcare setting given some of the unique challenges. A range of different materials and tools were also employed so that one approach was not relied on and so that different materials and tools could be tested in the pilot phase.

**Postcard.** To promote the employee engagement program a postcard was distributed to all employees. This postcard allowed staff to write down their energy saving ideas and submit them to the project team via intradepartmental mail. In the first year of the pilot this postcard was distributed all employees with their pay stubs. This method of distribution was selected as it was one of the only ways available to distribute materials hospital-wide in which all staff were guaranteed to receive a copy. This method of distribution was administratively difficult and did not solicit the number of energy saving ideas anticipated. The postcards are still being employed, as the postcard themselves were will received by hospital staff, however they are now being

distributed via the UHN project team and the social marketing champions at various activities and events including the social marketing kick-off meetings. An example of the postcard is shown in Figure 6 below.

**Figure 6 Example of Postcard Image**



**Promotional package.** A promotional package was also developed to promote the employee engagement program. This package was provided to social marketing champions, members of other existing energy or environmental groups in the hospital (e.g. Green Team members) and to other staff members that expressed an interest in becoming more involved in TLC. This promotional package provided a toolkit that keen staff could use to promote the EE program to their colleagues. The promotional package included the following materials:

- An introductory letter – thanking staff for their participation and providing information about how to use the promotional package;
- A generic e-mail – about the employee engagement program that participating staff can send to their colleagues;
- FAQs – a list of questions and answers about the employee engagement program that participating staff can use to address any questions they may receive regarding the program;
- Talking points – a short speech that participating staff can relay to their colleagues either during a meeting or just in conversation;
- A flyer poster – a small (8½ x 11) poster promoting the employee engagement program that can be photocopied and posted by participating staff in their work areas; and
- A stack of employee engagement postcards for them to distribute at their discretion.

**Feedback, recognition and rewards.** An important part of an employee engagement program is to provide feedback, recognition and rewards to staff to promote the program, encourage further participation and allow them take ownership of the energy saving ideas. Program feedback was provided to staff (in the form of an e-mail) upon receipt of the idea and once a decision was made about whether or not to implement the idea. Those that submitted an idea were also recognized through publication of their names in the hospital newsletter. Rewards were

also offered to all staff that submitted an idea as they were entered into a draw to win a prize. Rewards were also provided to those staff that submit the most innovative ideas as determined by the UHN project team.

**Facilities specific work order process.** A distinct employee engagement process was designed and implemented for the facilities staff at the UHN hospitals. This employee engagement process utilizes the existing work order system employed by the hospitals to identify, track and monitor all projects in the hospitals including those related to energy. To incorporate the employee engagement process the work order system was modified to include a field that facilities staff could use to identify TLC projects – those related to saving energy. This facilities specific employee engagement process was developed because facilities staff are in a unique position to be able to identify energy saving opportunities as they are working in all areas of the hospital and working with the hospital's major energy consuming equipment. This facilities specific employee engagement process is promoted using some of the tools described above. Explaining and promoting use of the process is also incorporated into the operator training component of the TLC program.

## **Program Implementation**

In the first year of the pilot (June 2007 – June 2008) the TLC program was introduced at TWH and the social marketing, employee engagement, RCx and operator training components were designed and implemented. The social marketing campaign was piloted in four areas of the hospital while the employee engagement program was implemented hospital wide. The first year of this pilot culminated in the development of a comprehensive and integrated energy management plan for TWH. This plan created a framework for all energy management activities taking place at TWH including, but not limited to, continued development and implementation of the TLC program components including the comprehensive audit and retrofits.

In year two of the pilot (June 2008 - June 2009) the comprehensive audit and retrofits were conducted at TWH and the other program components (social marketing, employee engagement, operator and senior management training and retro-commissioning) were enhanced, and continued to be implemented at the hospital. The social marketing and employee engagement campaigns were refined, as described throughout the discussion of the individual tools employed. The social marketing campaign was introduced to additional areas of the hospital and the employee engagement continued its reach to the whole hospital. These program components were also rolled out to Toronto General Hospital in year two. Again the social marketing program was only piloted in four areas of TGH. The second year saw the development of the Kick-off and Sustainable Campaigns. At the end of the second year an energy plan was developed for TGH, while the TWH plan was revised and updated.

In the third, and final year, of the pilot (June 2009 – June 2010) the program was maintained at Toronto Western and Toronto General Hospitals and the social marketing, employee engagement, RCx and operator training components were rolled out to Princess Margaret Hospital. The employee engagement program was implemented hospital wide in all three hospitals. The social marketing component was kicked-off in three areas of PMH, including for the first time in the pilot an inpatient area. In the other two hospitals additional areas received the Kick-off Campaign and those that had been kicked-off continue to receive

support for their Sustainable Campaign. The third year saw the development of an energy plan for PMH and an update and review of the TWH and TGH plans.

In the long term, 2011 and beyond, the TLC program will continue to be improved and all components implemented at the three sites. The employee engagement program will continue to be implemented hospital wide at all three sites, including the facilities staff specific process. The social marketing component will be kicked-off in those areas that have yet to receive the campaign and sustained in all other areas of the hospital with the goal being a sustained social marketing campaign across all areas of the hospital for all three sites.

## **Measurement and Results**

For all aspects of the TLC program both the energy savings achieved and the behavioral and attitudinal changes of the staff are measured. For the social marketing component the energy savings are determined through a range of methods including through the installation of submeters for a specific floor or department, through engineering calculations and through examining deviations from established baselines. The energy savings associated with the employee engagement component are determined on an idea by idea basis - the energy savings achieved through the implementation of an idea, for example installation of motion sensor in a store room, is calculated either using direct measurement with a submeter or through engineering calculations.

In year one, the TLC program resulted in a 3.9% reduction in energy consumption in TWH. In year two, these energy savings at TWH improved to 4.2%. The total energy savings for TLC in the first two years of the program (at both TWH and Toronto General Hospital) is 1.4%. This translates into a total greenhouse gas savings of 416 metric tons of CO<sub>2</sub> equivalents. The energy savings associated with the pilot as a whole will be calculated at the end of the three year pilot in June 2010. The increase in energy use at TGH was due to new energy intensive equipment coming on-line and due to renovations that resulted in major heat losses during the winter months.

The behavioral and attitudinal changes of staff are measured via comprehensive surveys delivered prior to and following implementation of the social marketing and employee engagement campaigns. All staff are surveyed with regards to social marketing and employee engagement components; those staff that have been exposed to either the Kick-off or Sustainable Campaigns are identified in the survey through questions about the building, floor and department in which they work.

Based on these surveys (implemented in years 1 and 2 at TWH and TGH hospitals respectively), it was found that staff were more likely to engage in energy saving behavior after the implementation of TLC. When asked whether they are likely to engage in a range of targeted activities respondents reported a positive change in behavior for all activities after the implementation of the TLC program. This positive change in behavior was significant (at the .05 confidence level) for the activities of turning off monitors and computers when stepping away from a workstation, turning off electronics and personal appliances when not in use and turning off task lighting. The surveys also showed that following the implementation of TLC, staff thought it was more important to engage in energy-saving behaviors. Attitudes improved towards all targeted activities. This change in attitude was significant, at the .05 confidence level for turning off personal appliances and at the .01 confidence level for turning off lights in common areas. The survey results also showed that social norms towards energy conservation behavior

were stronger after implementation of TLC for all activities except for one (turning off monitors when stepping away from a workstation). However the change in social norms was not significant at the .05 confidence level or higher. It was also found that social norms were underestimated in both the pre and post implementation surveys, which indicates that staff underestimate how important partaking in energy savings activities is to their peers and that staff think energy savings is more important to them than it is to others. The survey also showed that the degree of perceived control increased for all categories except for one (saving energy in the workplace). However this change in perceived control was not significant for any of the targeted activities. This suggests that staff feel that their control over energy saving activities is increasing yet there are still barriers to them changing their targeted energy behaviors.

## **Summary and Conclusions**

The success of the component of the TLC program to date is due to the types and range of materials and tools employed. 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. Selecting the office areas and clinics as the initial pilot sites also contributed to the success of the campaign as this allowed the materials to be tested in a more receptive environment prior to roll out to those areas of the hospital that are more difficult to engage for example the inpatient areas. The success of the campaign was also due in part to the materials that were employed, in particular the large, highly visible and visually appealing posters and banners. The simplicity and consistency of the message was also an important factor in the success of the campaign. All materials reinforced the same basic actions of turning off lights, computers and personal appliances.

The promotional materials produced for the employee engagement program are also working extremely well to solicit a large, yet manageable number of ideas from hospital staff. This is again due to the types and range of materials and tools employed and their highly visible and visually appealing nature. The facilities specific employee engagement process is working particularly well to garner a large number of implementable ideas and projects. This process has also allowed facilities staff to appreciate what an important role they play in the program and in identifying energy saving opportunities.

The behavioral components (social marketing and employee engagement) of the TLC program have saved large amounts of energy and reduced GHG emissions in just the first two years of implementation. This potential is only enhanced by incorporating these components into a larger, more comprehensive energy management and engagement program which includes more technical energy saving measures such as RCx, training and audits and retrofits. The elements of the TLC program, such as the social marketing and employee engagement components presented here, can be developed and implemented in isolation however a comprehensive and integrated approach to energy management is recommended.

The tools and materials developed as part of these behavioral components are essential to the program's success. These materials have achieved the desired results, however, there is room for improvement. The tools and materials employed in the pilot of TLC, and presented in this paper, represent an important and valuable foundation upon which to build the TLC program in future years and from which to develop and implement similar programs in other healthcare and institutional facilities.

Important and very valuable lessons were learned from designing and implementing the social marketing and employee engagement components of the TLC program in the pilot. These lessons should be taken into consideration when developing an energy conservation program for a hospital or any other large institutional facility.

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