Managing Green Teams
ENVIRONMENTAL CHANGE IN ORGANISATIONS AND NETWORKS

JOHN MOXEN AND PETER A. STRACHAN
CONTRIBUTING EDITORS
THE ROBERT GORDON UNIVERSITY, ABERDEEN, UK

© Greenleaf Publishing 1998
MANY ACADEMICS and industry analysts predict that growing environmental concerns will transform the structure of industry and the relationship between industry and society ‘as profoundly as anything that has taken place since the industrial revolution’.\(^1\) Despite the call for more proactive and sustainable business practices, and industry lauding of such efforts, a closer look at management practices reveals that once getting on the ‘green’ bandwagon, firms have found it difficult to implement environmental policies.\(^2\) A particular problem for firms has been integrating environmental tasks, usually considered secondary to the primary job tasks of most employees, into existing job roles.\(^3\) This integration can be important, since employee participation can lead to innovative solutions and increased rates of environmental improvement.\(^4\)

This chapter explores Saturn Corporation’s Spring Hill manufacturing plant’s experience with worker participation in environmental activities. It describes the evolution of Saturn’s environmental management programme since the opening of the plant in the late eighties. Then, drawing from the concept of habitual routines, it discusses the elements of Saturn’s participative management system that have helped to support employee involvement in waste reduction. It concludes by discussing the implications of this case for firms attempting to integrate secondary tasks, such as environmental performance, into existing job roles.

**Method**

Information in this case is primarily based on one month of fieldwork at Saturn in 1994, which included working on the assembly line, attending various team and
environmental meetings, and interviewing Saturn employees at all levels of the organisation. Saturn is an interesting case for studying policy implementation because of its initial ‘clean-sheet’ approach to management. Industry and academics have looked toward Saturn as an example of creativity and innovation in a number of areas considered critical to firm competitiveness in the automobile industry. Saturn extended its clean-sheet approach to environmental performance and management. Learning from the experience of environmental management at General Motors (GM), Saturn wanted to use the opportunity to ‘do things right’. A primary goal of the programme was to take greater advantage of the knowledge and expertise of the workers on the factory floor.

The History of Saturn and its Approach to the Environment

The Saturn System

In June 1982, GM’s Advanced Product and Design Team was asked to answer the question: ‘Can GM build a world-class quality small car in the United States that can compete successfully with the imports?’ Through a process of global fact-finding and internal negotiation, the Saturn Corporation was developed as a small automotive manufacturer with a number of distinguishing features. The most prevalent of these features is the partnership between Saturn Management and the United Auto Workers (UAW), which calls for the union to be a full partner to management in decision-making through consensus at all levels of the organisation.

The organisational structure at Saturn further defines the management–UAW relationship. Many operating decisions are pushed down to the level of the work unit, which is a team responsible for a particular task in a business unit, such as attaching the doors to the car. The many responsibilities allocated to a work unit are itemised in Saturn’s ‘Thirty Work Unit Functions’, which is meant to guide work units so that they can eventually operate as an independent operating unit. To help perform some of the work unit functions more systematically, each team assigns several ‘point people’, who are responsible for managing a particular aspect of their work unit’s responsibilities. At this time, there is still some variation in the extent to which work units fulfil these functions.

To encourage and enhance team-member involvement in decision-making, Saturn operates under a ‘risk and reward’ incentive system. Under this system, the employees, both union and management, risk a portion of their salary (5% in 1992) only to be received if employees meet a training goal of 5% of the annual work schedule (92 hours). In addition, there is a reward, or bonus, which was initially tied to quality and productivity goals. The financial structure is also designed to push decision-making down in the organisation. Where possible, costs are charged at the level of the work unit, which is responsible for meeting its own budget. Several work units make up a particular work unit area. Where issues affect more than one work unit,
the most common forum for resolving these issues is the decision circle (commonly called ‘D-Ring’ meetings), which is made up of the work unit module advisor and their UAW partner.\textsuperscript{9}

\textbf{Environmental Management Structure}

An important part of the vision for Saturn was commitment to the environment. When Saturn established its initial operating philosophy, commitment to the natural environment was seen as an integral part of this philosophy. In its philosophy, Saturn states:

\begin{quote}
To meet the needs of our neighbors, the communities in which we live and operate we will be good citizens, protect the environment and conserve natural resources [and] we will seek to cooperate with government at all levels and strive to be sensitive, open and candid in all our public statements.
\end{quote}

This statement accurately reflects the approach that Saturn took towards the environment. Focusing on the local community was a purposeful decision made by the initial environmental team at Saturn. Attempting to learn from GM’s history of environmental battles, Saturn wanted to take a more proactive stance towards environmental performance. The team decided that the source of environmental regulation ultimately started with the local community. Therefore, Saturn decided that their approach would be to focus on their ‘neighbours’.

As a result of this focus, a significant amount of effort was put into building good relations with the local community in Spring Hill, Tennessee. Saturn established a six-member Citizen Environmental Council (CEC) in August 1987 to provide community input on environment-related issues. The community representatives in this group were very concerned with Saturn’s impact on the local environment, especially because much of the surrounding land was used for farming. After their concerns were addressed, the group disbanded. In April 1992, Saturn was awarded two 1991 Silver Anvil Awards for Communications Excellence for these efforts from the Public Relations Society of America (PRSA).\textsuperscript{10}

In line with Saturn’s philosophy, a number of steps were taken up-front to ensure that the plant’s impact on the local environment during and after construction was minimised. For example, during construction, Saturn recycled the oil collected from the construction equipment, established an on-site nursery to save the trees, which would usually just be burned, and utilised rock from the local quarry to make the concrete for construction, minimising fugitive dust, increasing safety, and reducing the number of trucks needed for transporting the concrete. Saturn also kept, restored, and maintained on-site ponds for use in emergency fire protection.

Saturn also wanted to take advantage of their clean-sheet opportunity to build a plant that would have minimal emissions in years to come. Goals such as ‘the paperless company’, ‘no visible air emissions’ and ‘zero waste emissions’ were stated by this new organisation and were prominent in the thinking of members of the initial environmental
team. A number of steps were taken in the creation of the plant to reach these goals. Saturn, for example, avoided the use of underground storage and created extensive secondary containment to protect groundwater in Spring Hill, established a system that insured that 90% of direct materials were shipped in returnable containers, and built into the plant opportunities for water conservation. Saturn also became the first company to use Lost Foam Casting for building engine blocks. As recalled by Bill Graham, a metallurgist at Saturn Spring Hill, while designing the Lost Foam process, the engineering team (which included environmental engineers) thought a lot about the environment:

[We] had the goal of making a zero emissions process. This was good economically, but it was also good environmentally—[we] don’t dig a bigger hole [i.e. in extracting virgin material] and we don’t landfill as much...This was not only Saturn’s target, but [my] own target as well...When designing the process [we] had no restrictions and so we thought ‘why can’t we be perfect?’

In many cases, Saturn’s environmental activities went beyond any regulatory requirements. A strong sense of Saturn’s basic philosophy throughout the organisation, as well as leadership support for these proactive activities, was certainly critical in helping Saturn reduce the environmental impact of its manufacturing facility. A top member of the initial environmental team recalls:

[What happened at Saturn was not just because we had a lot of money.] There were other new plants...built in GM and they turned out differently. It depends a lot on the direction you are going when you build the plant...[For Saturn], it was really the environmental principles that drove people—there was a vision from the leadership position. There was also a great amount of empowerment that the people at Saturn had. They really let us design what [we] wanted...I was never more empowered in my life.

Another aspect of Saturn’s success was the strong group of environmental personnel pushing for a more proactive approach to environmental performance. At the time of plant construction, there were over thirty people working on environmental issues. Despite some scepticism from within GM, there was a common understanding within the environmental team that these actions were the ‘right thing to do’. As a former environmental manager remembered:

When [we] made these decisions, there were several nay-sayers in General Motors...People used to say ‘if you do things like this you will upset the apple cart.’...For the people involved, however, this was not new thinking—it just made sense. We felt that what Saturn was doing was good for business and would cost less over the total life-cycle of the product...[We all] had a similar mindset.

In line with the overall organisational philosophy at Saturn, environmental responsibilities were designed to sit low in the organisation. This structure was purposely chosen in reaction to the experiences of General Motors, which suggested that a large centralised environmental group would have trouble implementing waste reduction activities. One environmental manager remembered, ‘[we knew] that the real work always gets done on the floor.’ As can be seen in Figure 1, environmental engineers and
hazardous materials co-ordinators (HMCs) sit within each of the business teams and are in close physical proximity to the manufacturing floor. Environmental engineers at the business unit level have several responsibilities. Besides regulatory activity, environmental engineers work on waste-reduction projects and act as a resource to team members in their respective business units. One of primary jobs of the HMCs is to help employees screen and purchase chemicals.\textsuperscript{11}

The plant 'environmental manager' sits in the engineering services complex (CUC) and has no formal authority over the business units. Placed in a 'resource' position, CUC staff fulfil several roles within Saturn, besides running and maintaining the facilities within the company. For one, the environmental manager acts to provide some consistency between the business units to ensure communication and regulatory compliance. He also acts as the common voice of Saturn to regulators and the local community. The head of CUC then acts as the voice of the environmental staff to upper management, reporting directly to the director of manufacturing engineering and occasionally reporting to the Manufacturing Action Council (MAC).
Building Waste Reduction Routines in Shopfloor Teams

Routines are a critical aspect of proper team functioning. For one thing, team members must be able to predict the responses and behaviours of others to accomplish tasks effectively, if at all. In addition, habitual routines save time, energy and attentional capacity, resources that are highly valuable and almost always in short supply. Those activities not encoded within a habitual routine need to be addressed more strategically and require more conscious attention on the part of group members. Because they make behaviours more predictable, the existence of habitual routines also means that teams need less active management of related tasks. For environmental managers, this would mean less time continually monitoring the activities of teams on the shopfloor. Following the work of Gersick and Hackman, obtaining worker participation in environmental activities requires one of two strategies. The first would be to build environmental problem identification and resolution into the routines of the teams on the shopfloor. The second would be to find mechanisms to draw attention to different environmental opportunities that can not be addressed within the normal routines of the workers.

Gersick and Hackman note that different types of routines may be needed for different situations, depending on the severity and frequency of the changes. The types of waste reduction changes that team members are most able to address are more incremental, such as changes in recycling routines, materials use, or energy use. Unfortunately, according to Gersick and Hackman, these are the most difficult changes to address in a routinised way. The solution to this problem is to create routines that involve attendance to minor performance discrepancies and allow for subsequent routine alteration. This is the type of routine encouraged in firms that are striving for continual improvement or kaisan activities within teams. While Saturn was able to create these types of routines for areas such as quality and cost reduction, they met with lesser success when dealing with environmental issues.

Initial Routine Development

Environmental routines can be developed early in group life or brought into existing routines later on. Gersick and Hackman suggest two ways for routines to be established early in group life: creation and importation. Creation is when members of a new team create new behaviour patterns that have the potential to persist as habitual routines. At Saturn, team members, for the most part, did not create waste-related routines early in life. Importation is when team members follow routines that are introduced or imposed by a non-team members. At the initial stages of Saturn's life, importation was occurring at a minimal level.

To encourage more direct employee participation in environmental activities, the environmental staff made certain decisions regarding plant organisation. Environmental staff
were placed in each of the business units to encourage interaction with team members. As a 'part' of the business unit, environmental staff had access to team agendas; team meetings allowed environmental staff and team members to communicate on a regular basis. The team structure afforded team members the time and opportunity to explore issues that are often considered 'secondary' to production workers, such as safety, budgeting, scrap reduction and housekeeping. Access to time designated for these issues also allowed team members to participate in ad hoc meetings called by environmental staff, creating opportunities for team members to focus attention on waste reduction. These opportunities may have made the team members more aware of environmental issues, as evidenced by the fact that they often led to other voluntary waste-reduction activity.

The plant also undertook a number of actions to create organisational norms that encouraged environmental activities. The environmental staff taught an environmental training class during the initial training session for each team member, as well as a more advanced 'waste reduction' training class, the completion of which could count towards the annual training requirement. This training aimed to teach employees the importance of waste reduction for the environment and how they could look for waste-reduction opportunities within their own work setting. Extensive communication of the plant's numerous environmental successes and rewards within both the plant and the local community reminded workers of the importance of Saturn's environmental profile.

Saturn, however, did not simultaneously create an organisational structure to support environmental routines over time—an important aspect of successful self-managed teams.¹⁶ Waste management, for example, was not directly integrated into the 'Thirty Work Unit Functions' and their associated training requirements. Environmental performance was not consistently reported to team members along with the standard metrics of cost, quality, productivity and scrappage. One engineer would like to have seen more detailed information on plastic waste and re-use. 'Sometimes there is a dollar number that is reported,' he commented, 'but that does not tell how much waste is being produced.' In addition, while team members were recognised and rewarded for superior performance in the areas of cost, quality and scrap reduction, similar recognition procedures were not created for the environmental benefits of process changes.

Integration with more 'primary' aspects of plant performance may have been an important mechanism to help change long-reinforced schema and create organisational norms more supportive of environmental initiatives.¹⁷ Evidence of 'old' mindsets characteristic of GM were made evident during interviews with employees. While most employees cared about environmental issues, for example, they often referred to the environmental function as separate from their own realm of responsibility; statements such as 'they are doing a great job' were often heard. In addition, most employees still viewed the environment as a purely legal issue. 'A lot of people don't want environmental responsibilities under them,' stated one engineer. 'GM has a long history of environmental "dings" and the people are acutely aware of the legal ramifications of
having [environmental] responsibility.' For most of the managers that came from GM, regulatory compliance remained the main criterion for environmental success.

**Routine Development over Time**

Attempts to integrate environmental issues into the work routines of floor workers continued over time. According to Gersick and Hackman, a new routines and their supporting organisational structure can be established later in group life in one of two ways: further importation or evolution. They also note, however, that initial routines are often difficult to change. This observation was borne out at Saturn where, in spite of its initial successes, the environmental team started to find it more difficult to further import environmental routines and make improvements in the actual environmental performance of the plant. Environmental staff, for example, noted that, in the area of paper recycling, where there had previously been significant progress, recycling levels were actually decreasing.

The difficulty experienced by the environmental staff in continuing the importation of environmental routines, such as recycling, can be tied to a change in the organisational priorities at Saturn and subsequent decrease in organisational slack. Organisational slack, explains March, consists of 'resources and efforts directed toward activities that can not be justified in terms of their immediate contribution to organisational objectives'. Of critical importance was that the need to turn a profit increased dramatically in 1992, its third year of production, when Saturn lost an estimated $700 million during that year. At this time, leaders in Saturn communicated extensively to all employees that cost-cutting would be a priority. Supplier policies were altered to focus more on cost savings. Policies were changed so that every month each module had to explain the variance of its performance-to-budget to business team leaders, and the employee reward system was more closely tied to company profit. The organisation responded to these and other changes rapidly. One manager recalled that, in response to these measures, 'The whole company turned around. It was incredible.' An in-house supplier summarised the changes in this manner:

> They are still keeping that Saturn idea—it is just that things are focused more on production and things are more bureaucratic. Six years ago there was a lot of time for philosophising and talk—now we just want to get production going.

In reaction to the overarching concerns of the manufacturing organisation, the environmental staff also began to place greater attention on the cost-reduction opportunities related to waste reduction or management. As recalled by one employee, a critical event in this shift occurred when Waste Management found out that they could recycle sand fines. This drove the costs down from $120/unit for disposal to $14/unit to recycle the material. This event served to focus the attention of the supplier manager on ways to obtain cost reductions through waste reduction and waste recycling. Another on-site supplier recalled:
First, the goal of Saturn was to build a quality car. Then it was to make money. Until making money became the focus, the environmental team didn't look at the financial side of recycling as much—they looked more at the 'green' aspect of it...It was more justifiable to lose money then.

Once Saturn started to focus on cost, Waste Management was also asked to pay more attention to individual wastes in order to better understand their associated costs; the fact that most environmental data are primarily communicated through financial measures is a now a key feature of Saturn's environmental programme.

As Saturn evolved in this manner, both financial and human slack decreased significantly. Once plant construction was completed, the size of environmental staff decreased significantly, including the loss of a high-level environmental champion. Because of their wide extent of responsibility, environmental engineers found themselves working in more of a fire-fighting mode and had less time to work proactively with team members. As one engineer explained her current work situation: 'I place my energy towards who ever is calling and barkin' louder.' Even the advanced waste-reduction training class was made into a video.

Efforts to import environmental routines were also hampered by a relative lack of authority of the environmental staff: a problem that became more prominent once the environmental staff lost its high-level representative. Although environmental progress was faltering, environmental managers were unable to capture the attention of top management in order to institute needed changes. In times of reduced slack, organisations will devote more attention to activities that are failing to meet targets, such as cost, reducing attention devoted to those activities that are meeting targets. An organisation, however, is usually dependent on a select few to define 'failure' in the organisation. Therefore, while possibly more than one organisational goal is not being met, those defined as failures by the powerful in the organisation will become the focus of attention.

This dynamic played a role at Saturn. While top managers saw a gap in Saturn's financial performance, they perceived Saturn's environmental record as superb. Saturn had, for the most part, avoided regulatory problems and won several environmental awards. With no clear guidelines on how to measure environmental 'success' beyond compliance, managers had no reason to pay further attention to environmental issues. Despite this high level of performance, members of the environmental staff were acutely aware of any decreases in the rate of environmental improvements and unfulfilled managerial objectives. Both professional training and functional expertise created mindsets in which failures in environmental progress were clearly identified. As one manager commented: 'When the environment is the only thing that you do, then it is easy to see all the great environmental things that are being done out there that Saturn is not doing.'

The second mechanism for building in waste-reduction routines is evolution, in which patterns of habitual behaviour evolve incrementally over the life of a group. Evolution can occur as the result of a more strategically addressed and 'mindful' activity,
from which team members will either consciously or unconsciously alter their routines. At the floor level, this is the primary mechanism by which changes in environmental routines occur at Saturn.

For this type of evolution to occur, environmental issues must first be brought to the attention of the team members, and, in order to get this attention, environmental managers used the overlap between environmental performance and other performance metrics. For example, even though it was a designated strategy from day one, after 1992 the environmental staff began to place greater emphasis on the cost-reduction opportunities related to waste reduction when selling issues to top managers and team members. Because of team members’ increased sensitivity to cost, once shown the overlap between waste reduction and cost-saving, teams members are more likely to initiate or support waste reduction efforts for their cost benefits.25

Luckily, Saturn was designed with many of the organisational components that support employee participation in areas other than the natural environment,26 allowing several ways in which environmental staff could catch employee attention. Although none of the work unit functions deal directly with waste reduction, several of them do overlap, directly or indirectly, with waste-reduction goals.27 Increased worker participation in areas such as cost and quality often spills over into the area of waste reduction. Increasing first-time quality and decreasing scrap rates for each process, for example, is a high priority within each of the teams. Information on scrap rates of teams and business units are posted throughout the plant, and teams are recognised for scrap-reduction efforts. Often, team members set aside and record problems with scrapped parts. To avoid being charged for the scrapped part, the quality ‘point person’ then tracks the source of damage on the scrapped part and reports this problem to the appropriate team in the plant. By early identification of quality defects, as well as changes in process to reduce scrap, team members not only improve first-time quality and reduce cost, but they indirectly reduce resource use and energy needed to reprocess parts.

Establishing decentralised cost centres, with a long-term goal of financially autonomous teams, further enhanced the ability of the environmental staff to bring attention to cost-reducing environmental activities. Since each team is required to meet its budget, team members have access to the information and skills needed to achieve this goal; the finance ‘point person’ on the team keeps track of the materials used and costs incurred by the team. These issues are then often discussed at weekly team meetings. Often, cost reduction involves reducing the use or waste of a particular material or part. For example, the paint mix team was spending $150,000 on the rags; through rag-waste reduction efforts, team members were able to enjoy a $75,000 cost-saving.

Given the limited attention of workers, suppliers and environmental staff learned how to use existing attention structures of team members both directly and indirectly to focus attention on waste reduction. This led to employee involvement in particular environmental improvements, as well as the evolution of some environmental routines.
Another way suppliers or environmental staff obtained process improvements was to involve themselves with process redesigns that were being initiated for other technical reasons. By acting at this time, they could obtain the attention of team members and managers while it was already focused on a process change. This is a strategy noted by Tyre and Orlikowski, who refer to such occurrences as ‘windows of opportunity’ for those employees attempting to attain the attention of floor workers. In most cases, this strategy was intentional on the part of environmental staff; unless they were able to utilise the existing attention structures in the organisation, there would find it difficult to get workers involved in environmental activities.

Conclusions

This chapter used the case of Saturn to outline the issues involved with the development of environmental routines in self-managed teams. This case suggests ways for organisations attempting to be more environmentally proactive to create successful policies. Organisations need clear measures of performance beyond that of compliance, so that decision-makers can be made aware of ‘good’ and ‘bad’ performance. Active support from powerful members of the organisation is also important, so that employees can feel that action motivated by concern for the environment is legitimate. Management structures must also be changed in a way that supports organisational routines, especially for self-managed teams, and that permanently focuses attention on environmental issues. This could mean continuous training efforts, rewards for environmental improvement, reporting of environmental progress, and allotting time for problem-solving.

New routines of this sort, however, will be difficult to import for teams in which routines are firmly established. The Saturn experience suggests that evolution may be one way to create environmental routines within existing routine structures. To do this, one must capture the attention of team members. A successful strategy for managers that operate in organisations with few slack resources is to use the existing attention structure of team members. In addition, identifying ‘windows of opportunity’ during which routines are being changed, temporarily stopped or questioned may be a way for environmental routines to be imported with less resistance.

Of course, if an organisation is successful in creating environmental routines, they should not be relied on as the only way to involve workers in environmental activities. Reliance on routines can be problematic in two ways. First, performance can slip because members miscode situations. Second, habitual routines can reduce the likelihood of innovating performance processes. These two problems can be addressed with careful management. The first can be addressed through continual monitoring of performance outside of the team. This underlies the importance of good performance measures and occasional performance and management audits. The second problem can be addressed by breaking the team out of their usual mode of operation to look at environmental issues at a new way. ‘Quality circles’ or other cross-functional problem-
solving activities can be one way to do this. Research indicates that even changing the physical location of team members can provide new perspectives that allow them to break out of routine thinking.\textsuperscript{29} Rewards for innovative ideas are yet another way to encourage workers to operate outside of normal routine behaviours. Encouraging innovating thinking in these and other ways is essential for tapping the knowledge-base of team workers, and creating new and better environmental routines.

The lessons learned in this case have broader implications for organisations. As discussed by Zmud and McLaughlin,\textsuperscript{30} pushing down responsibility for any issue considered 'secondary' to most primary work tasks is extremely difficult and often subject to failure. Saturn's experience, for example, seems accurately to mirror the course of events that occur with many corporate safety programmes.\textsuperscript{31} The Saturn experience illustrates one successful path towards routine development for these secondary areas.

Notes

7. See Rubinstein et al., op. cit.
8. Ibid.
11. Saturn is unique in GM in this respect because it requests 100% of the chemical content of incoming chemicals to be revealed.
19. Ibid.; see also Hackman, 'Creating Effective Work Groups'.
20. Although a possible explanation for this trend might be that Saturn had picked the 'low-hanging fruit' with respect to waste reduction ideas, the consensus among the environmental staff was that this is not the case. Employees active in waste reduction think that there are still ample opportunities for waste reduction in the plant.
23. See March, op. cit.
25. Overall, although employees seem to appreciate Saturn's good standing with regard to the environment, team members will usually cite and understand cost reduction to be the primary reason for a particular waste reduction activity.
27. These include: controlling scrap; controlling material and inventory; keeping their own records; constantly seeking improvements in quality, cost and work environment; performing to their own budget; performing housekeeping; maintaining and performing their health and safety programme.
29. See Tyre and Orlakowski, op. cit.