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Chapter 11

Organizational Change

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"Implementation and organizational change are the key issues the sustainability agenda is demanding action on" (Millar, Hind, & Magala, 2012, p. 491). This chapter sets out to provide insight into how organizational change principles may be employed as a means of enacting Work Pro-Environmental Behaviour (WPEB) more broadly across an organization and addresses the current lack of clarity on how specifically to implement corporate sustainability (Linnenluecke & Griffiths, 2010). We argue that organization-wide change promotes a proactive approach to engaging with and addressing the environmental sustainability agenda within organizations.

Efforts to promote WPEB can be considered as one part of a wider process of organizational change whereby organizations seek to implement new ways of working to deliver greater environmental sustainability (Davis & Challenger, 2009; Dunphy, Benn, & Griffiths, 2003; Post & Altman, 1994). The role of individuals is paramount to successful organizational change, whether it be through involvement in designing initiatives, leading change, accepting changes to working practices or cultivating a shared culture; whilst all of these areas influence WPEB, they also ultimately contribute towards the organization's wider environmental sustainability (Andersson & Bateman, 2000; Bansal, 2003; By, 2005; Kotter, 1995; Weick & Quinn, 1999).

In this chapter we make the link between wider organizational change theory and environmental sustainability concepts and research. There is a need to integrate these literatures and to move beyond what have often been technological,

infrastructural or environmental management led change programs toward more balanced organization-wide change initiatives that involve users and promote WPEB (Bansal & Gao, 2006; Davis, Challenger, Jayewardene, & Clegg, 2014). This is crucial as organizations are unlikely to be able to achieve environmental sustainability through technology innovation alone (DuBois, Astakhova, & DuBois, 2013), human behavior is key to long-term change (Steg & Vlek, 2009; Young et al., In Press). There are clear parallels to the failures experienced with technology led business change initiatives in general (e.g., Baxter & Sommerville, 2011; Clegg & Shepherd, 2007), where technological innovations have often turned out to be much less effective in practice than when they were conceived (e.g., Broadhurst et al., 2010 Thompson, Pithouse & Davey, 2010; Eason, 2007), and in the introduction of more energy efficient technologies, e.g., the poor energy performance exhibited in some new commercial buildings with automated heating and ventilation systems (e.g., Wener & Carmalt, 2006).

We acknowledge from the outset that it would have been possible to write individual chapters, and in some cases whole books, on the themes that we identify within this chapter. However, our intention is to highlight what we believe are the most salient aspects of change management that are relevant to promoting WPEB and environmental sustainability within organizations, as well as to identify key themes and challenges that face those researching or practicing in this area. In so doing, we hope that this serves as a useful introduction and starting point for those considering applying a change process to support WPEB.

To frame the topic, the chapter begins with a definition of environmental sustainability and its link to organizational change. Next, four key areas of change management are focused upon, namely: organizational culture; leadership and change

agents; employee engagement; and differing forms that change may take. These factors were selected based on their relatively consistent inclusion within key organizational change models (e.g., Burnes, 1996, 2004; By, 2005; Clegg & Walsh, 2004) along with their initial success in driving WPEB (e.g., Fernandez, Junquera, & Ordiz, 2003; Harris & Crane, 2002; Robertson & Barling, 2013). The role of each concept in supporting organizational environmental change is discussed, together with relevant research evidence drawn from the corporate sustainability; WPEB; management and organizational change literatures. Then, Socio-Technical Systems Thinking (STST) (e.g., Cherns, 1976, 1987; Clegg, 2000) is offered as a framework with which to approach the design and implementation of holistic organizational change. Finally, we outline a number of key research developments that are required to aid progression within this domain and offer key practical recommendations for enacting organizational change for environmental sustainability.

Defining Environmental Sustainability Within the Workplace

Pro-environmental behavior has been defined as *"behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world"* (Kollmuss & Agyeman, 2002; pp.240). Within an organizational context, Ones and Dilchert (2012) define employee green behaviors as *"scalable actions and behaviors that employees engage in that are linked with and contribute to or detract from environmental sustainability"* (pp.87). They have categorized these behaviors as working sustainably (e.g., creating sustainable products and processes); influencing others (e.g., educating and training for sustainability); avoiding harm (e.g., preventing pollution); conserving (e.g., reusing); and taking initiative (e.g., lobbying and activism; Ones & Dilchert, 2010). Within this chapter, in addition to these WPEBs we also consider environmental sustainability in its wider sense and draw upon research

that has sought to impact on organization's overall environmental performance.

Environmental sustainability within organizations broadly refers to seeking a balance between industry growth and preserving the natural environment for future generations (e.g., Jennings & Zandbergen, 1995; Ramus, 2002). However, the concept of environmental sustainability within organizations is also often defined within a broader framework of sustainability, corporate sustainability or sustainable development which all tend to integrate environmental, social and financial considerations, referred to as the 'triple bottom line' (Vanclay, 2004). Whilst some researchers emphasize the environmental dimension as most important (e.g., Starik & Rands, 1995), others subsume the environment under the social component (e.g., Sekerka & Stimel, 2011). Due to a larger proportion of research carried out on sustainability, this chapter includes research that focuses on both environmental sustainability and sustainability more generally (within organizations).

Organizational Culture

When implementing any change initiative a consideration of the organizational culture is necessary (Weick & Quinn, 1999). Whilst there are varying definitions across the literature, many scholars adopt Schein's (2010) three-level model of culture that outlines 1) a 'surface level' representing the visible artifacts including published reports and communications; 2) the 'value level' which are the values, norms and ideologies of organizational members; and 3) the 'underlying level' described as the organization's core assumptions that determine both thinking processes and behaviors. Schein (2010) posits that it is this final underlying level that fully captures the '*essence of a culture*' (pp.32). Researchers have consequently argued that in order for an organization to become sustainable, its underlying values and assumptions must be in line with sustainability issues (e.g., Russell & McIntosh,

2011). This next section reflects on research that has explored 1) how an organization's culture influences the way in which it responds to environmental sustainability; 2) how organizations might successfully enact environmental culture change; and 3) the influence of subcultures within organizations.

Organizational Culture and Responses to Environmental Sustainability

Russell and McIntosh (2011) present a typology of organizations based on their paradigmatic views and subsequent responses to sustainability. Building on previous classifications (e.g., Carroll, 1979), they discuss the importance of culture as organizations progress from a 'reactive' to a 'proactive' state (see also Colby's, 1991, five category typology of environmental management). They outline five classifications: towards one end of the spectrum 'Reactive' organizations tend to emphasize purely economic priorities whilst ignoring sustainability issues; 'Defensive' organizations do only what is required to meet legislation; and 'Accommodative' organizations accept their social and environmental responsibilities and begin to integrate environmental issues into corporate strategy, although often external pressures serve as the main driver (Lee, 2011). At the other end of the spectrum organizations are more 'Proactive'; however, whilst actively engaging in sustainable management some argue organizations in this category do not act out of any moral obligation but are keen to be leaders in their industry (e.g., Carroll, 1979). Finally, Russell and McIntosh (2011) introduce 'sustainable' organizations, which have a longer-term perspective fully embedding sustainability principles within their values.

There is some debate in the literature regarding whether organizations need to have an underlying moral commitment to sustainability for associated behavior to be carried out (Russell & McIntosh, 2011; Stoughton & Ludema, 2012). Lenninleucke

and Griffiths (2010), for example, present a range of organizational culture types with varying values and assumptions who may all pursue corporate sustainability but for different reasons. There is also some empirical evidence supporting the view that organizations can successfully enact sustainable practices without changing their core values (e.g., Fineman, 1997; Fineman & Clarke, 1996). Crane (2000) refers to this as the 'amoralization' of corporate greening. Others, however, have emphasized the need for organizations to embrace a more 'radical' paradigm shift in corporate culture developing an entirely new value system aligned to green issues (e.g., Crew, 2010; Fernandez et al., 2003; Galbreath, 2009; Harris & Crane, 2002; Johnson & Macy, 2001; Stead & Stead, 1994; Welford, 1995). This is supported by mounting empirical evidence that corporate environmental values directly relate to workplace environmental behavior (e.g., Andersson, Shivarajan, & Blau, 2005; Nilsson, von Borgstede, & Biel, 2004; Ramus & Steger, 2000; Sharma, 1999). Furthermore, by fully embedding sustainability, organizations are less at risk of *green washing* or appearing to merely bolt on sustainability to existing initiatives that may impede employee buy-in and engagement (Lazlo & Zhexembayeva, 2011).

How to Enact Organizational Culture Change Towards Environmental Sustainability

Whilst research on organizational culture change towards environmental sustainability has been criticized for failing to provide practical suggestions for *how* to enact such change (e.g., Harris & Crane, 2002; Newton & Harte, 1997), there are some notable exceptions emerging from the literature. For example, linking culture to Human Resource Management (HRM) practices including selection and recruitment, training, performance appraisal and rewards (Fernandez et al., 2003; Renwick, Redman, & Maguire, 2013; see also below section on Engagement and Chapter 13);

ensuring buy-in and leadership support from senior management (e.g., Andersson & Bateman, 2000; Linnenluecke & Griffiths, 2010; Ones & Dilchert, 2012; see also, the section below on Leadership and Change Agents and Chapter 8); having a clear environmental policy, mission and strategy statements, which are effectively communicated (Post & Altman, 1994; Ramus & Steger, 2000); appointing key change agents or champions across the organization (e.g., Andersson & Bateman, 2000; Heijden, Cramer, & Driessen, 2012; see also, section below on Leadership and Change Agents); and fostering a learning culture that promotes innovation and creative thinking around how the organization can successfully move towards a more sustainable future (Crews & Woman, 2010; Ramus, 2001).

The Presence of Subcultures

Whilst most definitions of organizational culture refer to a homogenous, unified set of shared values and norms (e.g., Schein, 2010), more recently a number of researchers have pointed to the existence of more fragmented subcultures within organizations influencing the extent to which sustainability issues are diffused throughout an organization (e.g., Harris & Crane, 2002; Howard-Grenville, 2006; Linnenluecke & Griffiths, 2010; Stoughton & Ludema, 2012). These subcultures can form across departments (e.g., Sackman, 1992), hierarchical levels (e.g., Riley, 1983), personal networks and/or demographic groups (Suls, Martin, & Wheeler, 2002). Importantly these different subcultures have been found to influence the way in which sustainability is interpreted (e.g., Linnenluecke, Russell, & Griffiths, 2009) as well as how problems are addressed and what strategies for action are adopted (e.g., Howard-Grenville, 2006). These findings suggest that taking a unitary top down approach to environmental culture change is unlikely to be successful given the presence of these intra-organizational differences. Instead, initiatives may be more effective if tailored

to the different groups throughout the organization as well as involving employees

from each group with any change intervention (Harris & Ogbonna, 1998;

Linnenluecke et al., 2009).

Leadership and Change Agents

The critical role of leaders in guiding, supporting and structuring

organizational change initiatives along with generating a shared vision, reinforcing

company values and building consensus is well recognized within the literature (e.g.,

Ferdig, 2007; Schein, 2010; Schneider, Ehrhart, & Macey, 2013; Weick & Quinn,

1999). It is therefore perhaps not surprising that initiating any change towards

environmental sustainability within organizations similarly relies on good leadership

(Millar et al., 2012; Stead & Stead, 1994). However, there is still some confusion in

the literature regarding who actually takes on the role of a leader within an

organization (Schein, 2010). Whilst the role typically falls with the CEO, a head of

department or manager, Schein (2010) highlights how *'anyone who facilitates*

progress toward some desired outcome is displaying leadership'. In line with this,

many researchers have argued that anyone in the organization can become a

'sustainability leader' or key environmental change agent regardless of their role or

position (Ferdig, 2007; Post & Altman, 1994). This next section will explore some of

the research that has looked at 1) the role of leaders in promoting WPEB and then 2)

the role of employees as key change agents for environmental sustainability.

The Role of Leaders

The influence of top management in driving forward environmental

sustainability stems from their ability to direct corporate strategy along with

organizational policies, programs, budgets and reward systems (Branzei, Vertinsky, &

Zietsma, 2000). However, as well as having the capacity to steer the organization at

the corporate level, they also have been found to personally carry out WPEBs to a greater extent compared to non-managers (Ones, Dilchert, & Gibby, 2010); and their WPEBs have been found to influence other organizational members' WPEB (e.g., Ones & Dilchert, 2012; Ramus & Steger, 2000). In a recent special issue in the *Journal of Organizational Behavior* on the topic of environmental sustainability within organizations, Robertson and Barling (2013) looked at the role of environmentally-specific transformational leadership (ETFL). ETFL encompasses sharing environmental values with employees, convincing followers they can achieve WPEBs, helping employees consider environmental issues in new and innovative ways, and establishing relationships with employees through which they can exert influence. Not only did they find that leaders' WPEB directly influenced both employees' environmental passion and their WPEBs (consistent with social learning theory; Bandura, 1977), they also found that ETFL increased employees' environmental passion which had subsequent effects upon their WPEB. Reflecting traditional organizational change successes (e.g., Weick & Quinn, 1999), leaders therefore, serve to influence and support employees' WPEB as well model the desired WPEB themselves.

Whilst a number of motivations may be driving leader's WPEBs and associated strategic decision-making including, for example, government regulations, consumer demands, external pressure groups and market competition, there is increasing evidence that the organizations which most successfully implement environmental practices and innovations have leaders who show a persistent commitment to improved environmental performance stemming from personal eco-centric cognitions such as pro-environmental values and attitudes (e.g., Bansal & Roth, 2000; Branzei, Vertinsky, & Zietsma, 2000; Burger, 1999; May & Flannery,

1995; Shrivastava, 1995; Stead & Stead, 1994), as well as previous experience with

environmental issues from past roles (Walls & Hoffman, 2013).

The Role of Employees

Whilst traditional leaders of organizations may play a prominent role in

directing sustainability efforts within an organization, many recognize that any

employee who is able to successfully engage with others regarding sustainability

issues can become a 'sustainability leader', environmental champion, or change agent

(e.g., Andersson & Bateman, 2000; Crane, 2000; Fineman & Clarke, 1996; Post &

Altman, 1994). Ferdig (2007) refers to these employees as '*everyday leaders…who*

take up power and engage with others to make a sustainable difference to

organizations' (p.33). Sustainability leadership is therefore often dispersed across the

organization rather than being held by a single individual helping to diffuse

sustainability issues more widely (Redekop & Olson, 2010).

In the organizational change literature, traditional change agents use advanced

interpersonal, networking and influencing skills to mobilize change and elicit

cooperation and consensus from diverse departments whose ways of working and

personal interests may be challenged by the change initiative (Hartley, Benington, &

Binns, 1997; Weick & Quinn, 1999). Environmental change agents enact this same

role promoting WPEB like any other change initiative and playing an active role in

both facilitating the flow of environmental information across all employees and

'sense-making' any new initiative or sustainability framework to enable shared

understanding (Heijden et al., 2012; Post & Altman, 1994).

As well as communicating environmental issues and initiatives to other

employees, environmental change agents may also need to persuade top management

of the value of a proposed initiative for both the organization and wider society

(Fineman & Clarke, 1996; Post & Altman, 1994); For example, it was the employees at Interface Inc. who presented Ray Anderson, the CEO, with relevant reading material around environmental issues and asked him to articulate his environmental vision (DuBois et al., 2013). Through this process, he transformed his approach to conducting business successfully, directing the carpet manufacturing company from a resource intensive firm towards sustainability (DuBois et al., 2013).

Andersson and Bateman (2000) used both interview and survey findings to develop a framework for successful championing behaviors including how to identify, package and sell environmental issues to management. Whilst acknowledging that behaviors would need to be adapted to suit different organizational contexts and cultures, their framework highlights the need to appropriately: 1) Research the environmental issue, gathering background information and discussing this with others; 2) Frame the environmental issue, for example as an urgent problem with financial and reputational opportunities; 3) Present the issue in a traditional business-like manner using formal language and protocol; and finally 4) Sell the environmental issue by, for example appealing to management's aspirations and goals and forming coalitions with other respected employees. In line with traditional organizational change processes, both change agents and top management commitment are therefore integral to the success of any environmental change initiative to ensure the environmental message is clearly communicated and disseminated to all employees.

Worker Engagement and Involvement

Employee engagement is recognized within numerous theories of organizational change as key to gaining acceptance of new ways of working or shifts

in business practices (Armenakis & Bedeian, 1999; Burnes, 1996; Kanter, Stein, & Jick, 1992; Kotter, 1995; Luecke, 2003; Weick & Quinn, 1999). Indeed, a failure to engage or involve staff during change processes has often been associated with unsuccessful outcomes (Holman et al., 2000). The principles of engagement and involvement may hold open the prospect of more successful implementation and better design of organizational change programs directed at increasing environmental sustainability and WPEB change (Ramus, 2001; Young et al., In Press). This section will 1) examine how employee engagement may be a necessary aspect of environmental change and consider research that has employed techniques to engage staff, and 2) discuss the distinction between engagement and involvement.

Engagement

Engaging employees in the change process is considered a key aspect of enacting change and subsequently sustaining it (Kanter, 1983; Pasmore, 1994). Engaged employees can be a valuable resource in helping to build readiness for change and through *"doing more of what needs to be done, changing what needs to be changed"* (Macey & Schneider, 2008, p.18) within organizations attempting to increase their environmental sustainability.

Organizations are using a range of techniques to engage staff and motivate employees in environmental sustainability initiatives and change programs (Cox, Higgins, Gloster, Foley, & Darnton, 2012; Osbaldiston & Schott, 2012; Young et al., In Press). Similarly to individual behavior change initiatives in the workplace and at home, we can expect engagement to be gained through the use of a number of differing techniques to appeal to a range of individuals (Unsworth, Dmitrieva, & Adriasola, 2013) – see Chapter 10.

The use of communications and provision of information is the most common engagement technique employed in this domain (Osbaldiston & Schott, 2012) and this is reflected in studies that have sought to build engagement into change programs (e.g., Handgraaf, Van Lidth de Jeude, & Appelt, 2013; White, 2009). The value of such an approach in supporting large scale organizational change in general was demonstrated by Schweiger and Denisi (1991) who showed that the use of communications channels (e.g., telephone hotline, newsletters, staff meetings) directed at keeping employees informed of progress on a merger significantly reduced negative effects on employees (e.g., stress, turnover intent) compared to employees who were not party to ongoing communications. These general principles have likewise been supported in relation to environmental sustainability, for example, McMakin, Malone, Lundgren (2002) used a variety of communication channels (including focus groups, informational leaflets, videos, together with formal feedback and communications through the military chain of command) to successfully engage military personnel and families in energy reduction. Similarly, Procter and Gamble sought to keep staff engaged in their ongoing sustainability program through the use of newsletters, podcasts and site wide events (White, 2009).

Establishing open and continuing communications during periods of change enables organizations to communicate their vision and keep employees informed of planned change – with the aim of reducing resistance and worker uncertainty (Weick & Quinn, 1999). Such communication also establishes a channel to enable employees to share their thoughts and opinions on proposed changes, which has been recognized as a key requirement for successful change (Morrison & Milliken, 2000; Dowie, 1998).

A variety of incentives have also been offered by organizations to engage staff in desired environmental change, for example, cash incentives or days off for performing actions such as changing travel mode (Cox et al., 2012). Monetary incentives have been found to help build engagement in environmental initiatives and drive impressive changes in working practices within the construction industry (Chen & Wong, 2002; Li & Wong, 2003). Non-monetary rewards have also been successfully employed, for example, environmental gifts and public status have been used as rewards for engaging in an environmental sustainability program in the automotive industry (Davis et al, 2014). Interestingly, Handgraaf, van Lidth de Jeude and Appelt (2013) found that public rewards were more effective than private rewards and non-monetary rewards were more effective than monetary rewards in reducing energy use in a Dutch organization. Despite these successes, however, how well rewards can sustain engagement and change over time is unclear. Potential alternatives in the form of feedback and goal-setting (Locke & Latham, 2004) have helped to deliver employee engagement and motivate them to take part in workplace environmental sustainability programs over the medium term (e.g., Lingard, Gilbert, & Graham, 2001; Siero, Bakker, Dekker, & Van Den Burg, 1996).

If employees are not adequately engaged in the change process they may potentially resist and undermine changes that are asked of them (e.g., By, 2005; Davis, Leach, & Clegg, 2011; Weick & Quinn, 1999). Indeed, institutionalizing environmental sustainability, changing associated culture and practices, will require individuals not only to understand the proposed changes but also to want to adapt and actively engage in WPEB to help to create a green organization.

Involvement

As previously discussed, many organizational efforts to "green" have been technologically or process led (Bansal & Gao, 2006; Davis & Challenger, In Press). Even amongst people led change programs there is a danger that it can become a process that is decided from on high and simply imposed on or implemented toward those employees below (Clegg & Shepherd, 2007; Guy, 2006). Although employee engagement goes some way to counter potential employee resistance, it doesn't necessarily mean that a change program is employee led.

Involvement of employees from an early stage and enabling meaningful participation in decision-making can support a more "bottom-up" and emergent form of change (Armenakis & Bedeian, 1999; Burnes, 1996; Kanter et al., 1992; Weick & Quinn, 1999; Woodman, 1989). This is congruent with what has been described as "pull-based user-owned change" (Clegg & Walsh, 2004, p. 235), whereby end users pull the change project through to successful completion by taking ownership of, and having input into, the process, ensuring that it meets their needs. This form of change caters to the general desire for control (e.g., Bandura, 1997; Karasek & Theorell, 1990) and the observation that employees require influence in addition to simply information about the changes that are affecting them to maintain interest and support (Heller, Pusic, Strauss, & Wilpert, 1998).

An employee led change process with high involvement also acknowledges that employees themselves hold information valuable to the design and implementation of environmental sustainability within organizations (Davis & Challenger, 2009; Rothenberg, 2003; Young et al., In Press). Employees often possess tacit knowledge about how organizations work in reality and how changes to practices may best be implemented (Bansal, 2003; May & Flannery, 1995). However, whilst "pull-based", user-driven change, may be highly desirable (Heller et al., 1998), there

can be difficulties in practically facilitating employee involvement in change

processes. A key constraint can be the time requirements on project staff to

meaningfully involve large numbers of employees in the process or in managing

expectations and varying skills levels (Adams & McNicholas, 2007; Kujala, 2003).

Such difficulties are not insurmountable, however, and careful planning and a

considered mix of face-to-face and electronic facilitation techniques may be highly

effective in supporting meaningful employee involvement.

The Form of Change

The previous sections have demonstrated the many interlinking factors and

considerations that are involved in supporting successful organizational change. We

have considered the organizational culture, the role of both leaders and change agents,

together with the need to engage employees in successful environmental sustainability

programs. These levers of change relate to differing views regarding how to approach

organizational change, with two major perspectives dominating the literature

(Armenakis & Bedeian, 1999; By, 2005; Weick & Quinn, 1999) namely the planned

approach and the emergent approach. In this section we will: 1) discuss each of these

perspectives in turn and 2) briefly reflect upon the potential middle ground of a

contingency approach.

Planned Change

The planned approach to change grew out of the early work of Lewin on

organizational change and Lewin's (1946, cited in Burnes, 2004) 3-step model of

change. The 3-step model describes organizational change as discrete steps whereby

(1) the current static state of the organization is unfrozen and old behaviors and

processes are discarded, (2) action is then taken to move the organization to the next

level or state and then (3) the organization is refrozen at the new level with the change

accepted (Burnes, 1996; By, 2005). There have been many extensions and developments of this basic model (e.g., Bullock & Batten, 1985) however, the underlying premise that organizational change is a planned process led by management is consistent (Weick & Quinn, 1999).

This approach to change can be viewed as highly dependent upon the skills and knowledge of top managers, relying on them to initiate change and actively drive the process within the organization from the top-down (Burnes, 1996). This approach may not lend itself to the bottom-up, employee led aspect of change discussed earlier, however, employee engagement and consultation in the process is encouraged (Kanter et al., 1992). A planned approach to change may be particularly helpful in situations where an organization is responding to very specific environmental challenges and the objectives are clear to the management team involved. However, the reliance upon leaders for initiating and setting the parameters of the process means that the change initiatives may not be as responsive to the external environment, as flexible or open to innovation as under an emergent approach and unable to produce the sorts of transformational change that may be necessary to adapt to climate change (e.g., Burnes, 2004; By, 2005; Dunphy & Stace, 1993).

Emergent Change

In contrast, models of emergent change (e.g., Kanter et al., 1992; Kotter, 1996; Luecke, 2003) stress that organizational change should not be wholly preplanned and conducted over a fixed time period (Burnes, 2004) - rather change should be an ongoing process in response to the evolving environment and business landscape (By, 2005). This perspective envisages a more active role for employees, with a largely non-directive, bottom-up initiation of change responses. Employees have a role in interpreting the situation and responding to change, driving emergent changes in the

organization (Weick & Quinn, 1999). Managers' roles in this form of change can be seen more as facilitators, leading change but not necessarily defining it, helping to foster a learning culture that promotes innovation (Burnes, 1996; Crew, 2010).

The iterative and adaptive process supported by an emergent approach may provide a means for responding to the complex and evolving nature of environmental sustainability in particular (DuBois et al., 2013; Dunphy & Stace, 1993), for example, changes in legislation, pressure groups and shifting agendas. Such responses, are, however, predicated on employees possessing or obtaining the necessary skills or knowledge to respond to the environmental challenges that they encounter. Furthermore, the flexibility which an emergent approach offers, through being bottom-up, may also result in employees' attention being focused on particular challenges that they have identified and not the environmental issues that management foresee as obstacles to future growth (c.f., Burnes, 1996).

Contingency or a Middle Ground

It has been suggested that there is not one best way or approach to managing and supporting organizational change (Burnes, 1996), nor are there sets of universal rules to guide the way (Pettigrew & Whipp, 1993). A contingency approach offers a middle ground, suggesting that the form of change most appropriate to an organization will be contingent upon the situational variables that an organization faces (By, 2005). The general principle suggests that the form of change an organization adopts may vary over time as the organization or its situation varies (Dunphy & Stace, 1993).

Despite criticisms regarding potential difficulties in moving between differing forms of change (Burnes, 1996), it is suggested that it is likely that the form most appropriate to an organization will depend upon the environmental sustainability

change they are seeking to promote, e.g., to adapt production processes to meet specific upcoming environmental regulation, encourage individuals to change their travel habits, to innovate new products, or to revolutionize their whole way of business. A combination of top-down and bottom-up is probably the most common solution to help meet differing needs and outcomes – see Table 1 for a comparison between these different forms of organizational change.

[INSERT TABLE 1 ABOUT HERE]

A Socio-Technical Approach to Organizational Change

Although the previous sections have highlighted aspects of organizational change theory that are relevant to the promotion and management of wide-scale environmental change within organizations, there is limited specific guidance regarding how to go about designing environmental change initiatives. Indeed, a consistent criticism of the organizational change literature in general is the lack of a valid framework for pursuing organizational change (By, 2005). Socio-technical systems thinking (e.g. Cherns, 1976, 1987; Clegg, 2000) offers well established sets of principles and frameworks that can be applied to the design of organizational interventions and change programs directed at encouraging environmental sustainability within the workplace. This seems particularly relevant as environmental sustainability has been identified as highly systemic in nature (DuBois et al., 2013; Schrader & Thøgersen, 2011; Starik & Rands, 1995) and the complex issues involved makes it suited to a socio-technical approach.

This section will 1) briefly introduce the concept of socio-technical systems thinking and 2) introduce a framework for approaching and analyzing change.

Introducing Socio-Technical Systems Thinking

Socio-Technical Systems Thinking (STST) suggests that an organization can be considered as a complex system, consisting of numerous inter-related parts (Trist & Bamforth, 1951; van Eijnatten, 1997). For example, we would usually expect an organization to include: people – who may have differing skills, attitudes and perspectives; work processes; set goals and objectives; shared culture, and; various technologies; all taking place within physical infrastructure and buildings (see, Davis et al., 2014). No organization exists in isolation and we would anticipate the regulatory and economic environments, together with stakeholder interests, to influence various parts of the system, e.g., environmental regulation may set minimum standards for the work buildings and production processes in use. Figure 1 below provides a simple, yet powerful, conceptualization of a generic organizational system, with interdependencies represented by lines between the nodes.

[INSERT FIGURE 1 AROUND HERE]

STST argues that attempting to alter any part of this system, be it the introduction of a new technology, a new rewards system, or a business change program without considering the implications on the other parts of the system is likely to limit the effectiveness of the change (Hendrick, 1997). At its heart STST concerns acknowledging the inter-relationships amongst different parts of the system, to pursue jointly optimized design, whereby both social and technical factors are simultaneously considered in the process (Cherns, 1976; Trist & Bamforth, 1951). This is of particular relevance to environmental sustainability, given the dominance of organizational initiatives that are rooted in technological (e.g., more efficient IT hardware), systems standards (e.g. ISO14001/EMAS), or buildings (e.g., Energy Performance of Building Directive, EPBD) based solutions and change. These initiatives and approaches rarely take account of employee behavior (e.g., Bansal &

Gao, 2006; Davis et al., 2014) and their role in supporting wider organizational change is neglected. A STST approach to change management could help to not only improve the implementation of technical innovations (e.g., helping to predict how employees will react or behave within more sustainable buildings that may affect their subsequent environmental performance, Davis et al., 2011; Wener & Carmalt, 2006), but also to harness these technologies to help drive wider organizational change (e.g., to implement new smart meters to connect employees to their resource use or to act as the basis for competition).

If we seek to achieve meaningful and lasting change directed at greening whole organizations, then we need to examine how human behavior is embedded within the system and ensure that we both remove organizational or technological barriers wherever possible and identify strategies that make the system supportive of intended behaviors and culture.

Applying a Socio-Technical Framework

The general principles of socio-technical systems thinking provide useful guidance regarding how to approach the process of organizational change and design (e.g., Cherns, 1976, 1987; Clegg, 2000; Mumford, 1983). Techniques such as scenarios planning (e.g., Axtell, Pepper, Clegg, Wall, & Gardner, 2001), ETHICS (Mumford, 1995) and the socio-technical hexagon framework presented in Figure 1 offer specific structures for involving staff and other stakeholders in the process of organizational design and managing change. Common across these frameworks is the emphasis upon multi-disciplinary inputs to change, acknowledging that no one discipline holds all the answers to any particular problem (Clegg, 2000), and flexibility, to enable the process to reflect the organizational context and stakeholder interests. Each framework offers its own steps for tackling change.

The hexagon framework in particular has two potential uses here, it can be used to help analyze existing change programs and to involve staff in planning new initiatives (Davis et al., 2014). In both cases we can use it to consider inter-relationships between various factors involved in a change and the wider system, as well as identify potential conflicts and gaps in coverage. For example, through mapping elements of an existing change process onto the diagram, barriers to change may be identified, e.g., rewards metrics that act as a disincentive to employees to pursue environmental goals. The framework promotes the identification (and removal) of conflicts to desired change and the inclusion of additional initiatives to address gaps in coverage across the organizational system, supporting the design of more holistic change programs (see, Challenger, Clegg, & Robinson, 2010 and Davis et al, 2014, for guidance regarding applying the hexagon framework).

To illustrate this approach applied to analyzing an existing change program, we have used the hexagon to help map and understand a global manufacturer's environmental change program at one of their UK production plants (see, Davis et al., 2014). Figure 2 captures and identifies the various approaches and techniques that the company has implemented to support environmental sustainability across the whole plant. The systems diagram illustrates the key steps that the organization has taken, which aspects of the system these steps have targeted, where the inter-relationships lie and where least attention has been paid. It forms the basis for structured discussions with stakeholders and a framework for planning future program extensions.

[INSERT FIGURE 2 HERE]

The analysis demonstrates that culture and goals have received less attention than the more technological or process driven aspects of the change program. The steps the organization has taken as a whole have primarily attempted to address core

technology, infrastructure and training issues relating to WPEB and environmental sustainability. The organization is now increasing the ambition of its employee engagement program to help widen and embed the organizational change, involving and capitalizing upon their human resources – building upon the technological investments already made. The analysis has helped to map the breadth of current initiatives and made explicit inter-relationships, as well as where efforts may be used to better reinforce one another (e.g., using the investment in buildings to emphasize environmental goals). Preliminary analysis has demonstrated the value of a holistic approach to change, with staff showing very high levels of engagement with the employee WPEB change program, positive pro-environmental attitudes site wide, ISO14001 certification and the site has won sustainability awards for its efforts.

The STST framework offers guidance for approaching and designing change initiatives aimed at achieving greater environmental sustainability and WPEB. The way of thinking promotes a holistic approach to change and may lessen the chance that initiatives within an organization are either fragmented (being led by various departments or specialisms), fall into the trap of being technologically led at the expense of social issues, or that behaviorally orientated change programs fail to recognize technological barriers or support (Davis et al., 2014; Young et al., In Press).

Future Research Directions and Practical Implications

This chapter has highlighted some central links across key success factors in traditional organizational change and environmental sustainability efforts within organizations. The literature on four key areas of change management have been reviewed, each of which it is argued requires simultaneous consideration if environmental change initiatives are to be successful: organizational culture; leadership and change agents; employee engagement; and choosing the right form of

change that best suits the organization (see, Figure 3). Building upon this, STST has been offered as a framework that may aid the design and implementation of organizational change. Following on from this review, the current section proposes five key directions to help develop research in this area and then provides four main practical implications for organizations wishing to support environmental change.

Future Research Directions

Firstly, more research is required that measures the extent to which environmental change initiatives have been successful. This would serve two purposes: (1) provide support for investment in further (successful) change initiatives by organizations; (2) enable competing change management approaches to be tested and aid theorization. To assess the efficacy of change programs, success criteria need to be carefully chosen to reflect the aim of improving environmental sustainability. For example, a distinction needs to be made between simply the number of new initiatives being introduced and the subsequent impact on the environment (Ones & Dilchert, 2012). Furthermore, if the aim of a change program is to embed environmental sustainability across an organization then it may be necessary to look below the organizational level and measure individual employees' WPEB (c.f., Weick & Quinn, 1999), as "the successful implementation of organizational environmental sustainability strategies ultimately depends upon the collective array of behavior changes from individual employees" (DuBois et al., 2013). Researchers also need to look beyond self-report measures to make better use of objective environmental data (e.g., energy performance data, product lifecycle analyzes, waste sent to landfill) or longitudinal behavioral data (e.g., diary studies, Robinson, 2010 – see Chapter 5) to support their validations.

Secondly, more research is needed to better understand what an environmentally sustainable organizational culture looks like and even whether a truly sustainable organization is possible to achieve. Russell and McIntosh (2011) highlight how there is little empirical evidence to demonstrate whether organizations *can* move to the level of the sustainable organization. Research is required to uncover how to move beyond compliance with environmental legislation and/or superficial efforts for sustainability (e.g., presence of relevant cultural artifacts, Schein, 2010), toward the adoption of voluntary proactive efforts with sustainability fully embedded into organizational values. One line of enquiry may be to explore cultural fragmentation across the organization. Whilst some researchers have begun to unpack the complexities of subcultures within organizations and how they influence the uptake of sustainability issues (e.g., Harris & Crane, 2002; Howard-Grenville, 2006), exploring how best to utilize subcultures, and in particular dominant subcultures, to better diffuse cultural change throughout the organization may be one useful avenue for future empirical research.

Thirdly, it is unlikely that employees, including organizational leaders and environmental champions, consider environmental issues solely at work. An area of research that is currently underdeveloped is the potential spillover of environmental attitudes and behaviors across work and non-work domains (Muster & Schrader, 2011). Whilst there is some initial evidence for such spillover (Berger, 1997; Tudor, Barr, & Gilg, 2007), more research is needed to uncover how organizations can facilitate a stronger link between environmental sustainability at work and during non-work time to positively impact corporate cultures, employee and leadership engagement and subsequent environmental change initiatives. For example, asking employees to contribute towards green initiatives by considering their experiences

from their non-work life may increase engagement. Similarly, by incorporating

environmental behaviors that can be carried out during work *and non-work* time into

workplace green initiatives, employees might start to consider environmental issues

across multiple social contexts thereby helping to develop more consistent

environmental values and behavioral patterns. This stream of work may require new

or amended self-report measures of WPEB, to enable researchers to measure general

behaviors that employees could choose to engage in across a range of contexts.

Fourthly, action research (e.g., Cassell & Johnson, 2006) should be applied to

the study of environmental sustainability change. The approach offers researchers the

opportunity to gain a greater understanding of the nature of change over time and to

achieve direct impact on practice (Susman & Evered, 1978). For example, Adams &

McNicholas (2007) adopted an action research methodology enabling them to observe

and delve into a change process directed at improving sustainability reporting and

provide feedback that inputted back into the change process. The realization of such

mutually beneficial relationships is likely to be best supported by long-term

cooperative relationships between organizations and researchers – these are

challenging relationships to develop and maintain, however, the potential returns in

theoretical insight and practical impact are significant.

Finally, we propose that research needs to more fully uncover the conceptual

distinctions between traditional organizational change initiatives and environmental

change initiatives specifically. This is similar to Lueneberger and Goleman's (2010)

call for executives to understand how sustainability issues differ from other corporate

initiatives. Whilst it is asserted that change management techniques should be broadly

applicable to the management of environmental sustainability, the nature of the topic

may require certain adaptations in how change is supported or engagement achieved.

This would be comparable to the differences that are observed in the efficacy of behavior change techniques across differing WPEBs (Osbaldiston & Schott, 2012; Steg & Vlek, 2009).

Practical Implications

This review has highlighted a number of implications for practice. However, in this subsection we identify the recommendations that are thought to offer greatest impact on practice (see, Figure 3), namely that organizations should: 1) cultivate the right corporate culture; 2) select in and train up leaders and employees who value environmental sustainability; 3) fully engage their employees; 4) take a contingency approach to organizational change towards environmental sustainability; and 5) take a multidisciplinary approach which utilizes socio-technical systems thinking. These will briefly be considered in turn.

[INSERT FIGURE 3 ABOUT HERE]

Firstly, whilst this chapter has highlighted the debate in the literature as to whether organizations need to change corporate values to improve environmental performance, due to the steadily increasing number of papers showing direct links between an organization's environmental values and employee WPEB (e.g., Andersson et al., 2005; Nilsson et al., 2004; Ramus & Steger, 2000; Sharma, 1999), we argue that organizations should embed environmental sustainability into their underlying assumptions and values.

Secondly, HRM practices should be linked to an environmental sustainability-driven organizational culture by, for example 1) recruiting new employees and leaders into the organization who value environmental sustainability; 2) providing relevant training to employees and leaders to increase environmental awareness, knowledge and skills. This could include training around environmentally-related

transformational leadership and management behaviors that facilitate environmental innovations along with how to successfully champion and communicate environmental ideas; and 3) rewarding environmental efforts via formal (e.g., performance management) and informal channels (e.g., praise and recognition, c.f., Renwick et al., 2013).

Thirdly, there are a number of strategies that organizations can incorporate to ensure employees are aware of, and engaged with, green issues. Employee involvement has been labeled one of the most successful avenues for continued engagement (Renwick et al., 2013); encouraging employees to help in the design and implementation of any change initiative is likely to be critical to its success. Setting up organizational green teams and identifying green champions may also help facilitate the diffusion of environmental sustainability as well as targeting and tailoring initiatives to the different subcultures present within an organization.

Fourthly, this chapter has highlighted the differing approaches to managing change that organizations could follow when preparing to promote environmental sustainability and WPEB, ranging from planned to emergent and contingency forms of change (Burnes, 1996; By, 2005). A contingency approach offers companies the most flexible approach to the management of change, enabling leaders to adapt their plans in response to changing circumstances and should permit a practical mix of both top-down and bottom-up activities within a broad environmental sustainability change program.

Finally, we argue that any approach to environmental sustainability should adopt a systems view, taking into consideration the varied influences upon organizational environmental performance. Applying STST frameworks that promote bringing together multiple stakeholders, approaching change from a multi-disciplinary

perspective in a flexible and on-going manner maximizes the chance of social and

technical issues receiving equal weighting and for the design of holistic initiatives.

Conclusion

This chapter has highlighted the potential for organizational change to be used

as a means of supporting environmental sustainability and promoting WPEB. In

particular, prominent aspects of organizational change, namely: organizational

culture; employee engagement; leadership and change agents; and differing forms of

change, have been identified as key components to focus on when managing change

in this area. The danger of allowing change to become technology led has been

discussed and STST offered as means of approaching holistic change. This chapter

has outlined some promising future directions for creating organization-wide change;

we hope researchers and practitioners in the area act now to capitalize on the potential

that these opportunities hold in helping to create a more sustainable future.

References

Adams, C. A., & McNicholas, P. (2007). Making a difference: Sustainability reporting, accountability and organisational change. *Accounting, Auditing & Accountability Journal, 20*, 382 - 402.

Andersson, L. M., & Bateman, T. S. (2000). Individual Environmental Initiative: Championing Natural Environmental Issues in U.S. Business Organizations. *Academy of Management Journal, 43*, 548-570.

Andersson, L. M., Shivarajan, S., & Blau, G. (2005). Enacting Ecological Sustainability in the MNC: A Test of an Adapted Value-Belief-Norm Framework. *Journal of Business Ethics, 59*, 295-305.

Armenakis, A. A., & Bedeian, A. G. (1999). Organizational Change: A Review of Theory and Research in the 1990s. *Journal of Management, 25*, 293-315.

Axtell, C., Pepper, K., Clegg, C., Wall, T. D., & Gardner, P. (2001). Designing and evaluating new ways of working: The application of some sociotechnical tools. *Human Factors and Ergonomics in Manufacturing, 11*, 1-18.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman & Company.

Bansal, P. (2003). From Issues to Actions: The Importance of Individual Concerns and Organizational Values in Responding to Natural Environmental Issues. *Organization Science, 14*, 510-527.

Bansal, P., & Gao, J. (2006). Building the Future by Looking to the Past: Examining Research Published on Organizations and Environment. *Organization Environment, 19*, 458-478.

Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal, 43*, 717-736.

Baxter, G., & Sommerville, I. (2011). Socio-technical systems: From design methods to systems engineering. *Interacting with Computers, 2*, 4-17.

Berger, I. E. (1997). The Demographics of Recycling and the Structure of Environmental Behavior. *Environment and Behavior, 29*, 515-531.

Branzei, O., Vertinsky, I., & Zietsma, C. (2000). *From green-blindness to the pursuit of eco-sustainability: An empirical investigation of leader cognitions and corporate environmental strategy choices.* In S. Havlovic (Ed.), Academy of Management Best Paper Proceedings. Toronto, ON: Academy of Management, ONE: C6

Broadhurst, K., Wastell, D., White, S., Hall, C., Peckover, S., Thompson, K., Davey, D. (2010). Performing 'initial assessment': Identifying the latent conditions for error at the front-door of local authority children's services. *British Journal of Social Work, 40*, 352-370.

Bullock, R. J., & Batten, D. (1985). It's just a phase we're going through: A review and synthesis of OD phase analysis. *Group & Organization Management, 10*, 383-412.

Burger, J. M. (1999). The foot-in-the-door compliance procedure: A multiple-process analysis and review. *Personality and Social Psychology Review, 3*, 303-325.

Burnes, B. (1996). No such thing as ... a "one best way" to manage organizational change. *Management Decision, 34*, 11-18.

Burnes, B. (2004). Kurt Lewin and the Planned Approach to Change: A Re-appraisal. *Journal of Management Studies, 41*, 977-1002.

By, R. (2005). Organisational Change Management: A Critical Review. *Journal of Change Management*, 5, 369-380.

Carroll, A. B. (1979). A Three-Dimensional Conceptual Model of Corporate Performance. *Academy of Management Review, 4*, 497-505.

Cassell, C., & Johnson, P. (2006). Action research: Explaining the diversity. *Human Relations, 59*, 783-814.

Challenger, R., Clegg, C. W., & Robinson, M. A. (2010). *Understanding Crowd Behaviours Volume 1: Practical Guidance and Lessons Identified*. London, UK: TSO.

Chen, Z., Li, H., & Wong, C. T. C. (2002). An application of bar-code system for reducing construction wastes. *Automation in Construction, 11*, 521-533.

Cherns, A. (1976). The Principles of Sociotechnical Design. *Human Relations, 29*, 783-792.

Cherns, A. (1987). Principles of Sociotechnical Design Revisited. *Human Relations, 40*, 153-161.

Clegg, C. W. (2000). Sociotechnical principles for system design. *Applied Ergonomics, 31*, 463-477.

Clegg, C. W., & Shepherd, C. (2007). The biggest computer programme in the world ever! Time for a change in mindset? *Journal of Information Technology, 22*, 212-221.

Clegg, C. W., & Walsh, S. (2004). Change management: Time for a change! *European Journal of Work and Organizational Psychology, 13*, 217-239.

Colby, M. E. (1991). Environmental management in development: The evolution of paradigms. *Ecological Economics, 3*, 193-213.

Cox, A., Higgins, T., Gloster, R., Foley, B., & Darnton, A. (2012). The impact of workplace initiatives on low carbon behaviours. Edinburgh, UK. Retrieved

August 25, 2013, from http://www.scotland.gov.uk/Resource/0039/00390309.pdf

Crane, A. (2000). Corporate greening as amoralization. *Organization Studies, 21*, 673-696.

Crew, D. E. (2010). Strategies for implementing sustainability: Five leadership challenges. *SAM Advanced Management Journal, 75*, 15-21.

Crews, D. E., & Woman, T. (2010). Strategies for Implementing Sustainability: Five Leadership Challenges. *SAM Advanced Management Journal, 75,* 15-22.

Davis, M. C., & Challenger, R. (2009). Climate Change: Warming to the task. *The Psychologist, 22*, 112-114.

Davis, M. C., & Challenger, R. (In Press). Environmentally sustainable work behaviors. In P. C. Flood & Y. Freeney (Eds.), *Volume 7: Encyclopedia of Organizational Behavior,* in the *Wiley Encyclopedia of Management* (3rd ed.), Cary L. Cooper (Ed. in chief). Chichester, UK: Wiley.

Davis, M. C., Challenger, R., Jayewardene, D. N., & Clegg, C. W. (2014). Advancing socio-technical systems thinking: A call for bravery. *Applied Ergonomics*, *45*(2), 171-180.

Davis, M. C., Leach, D. J., & Clegg, C. W. (2011). The Physical Environment of the Office: Contemporary and Emerging Issues. In G. P. Hodgkinson & J. K. Ford (Eds.), *International Review of Industrial and Organizational Psychology* (Vol. 26, pp. 193-235). Chichester, UK: Wiley.

DuBois, C. L. Z., Astakhova, M. N., & DuBois, D. A. (2013). Motivating behavior change to support organizational environmental sustainability goals. In A. H. Huffman & S. R. Klein (Eds.), *Green Organizations: Driving Change with I-O Psychology* (pp. 186-208). Hove, UK: Routledge.

Dunphy, D., Benn, S., & Griffiths, A. (2003). Organizational change for corporate sustainability. London, UK: Routledge.

Dunphy, D., & Stace, D. (1993). The Strategic Management of Corporate Change. *Human Relations, 46*, 905-920.

Eason, K. (2007). Local sociotechnical system development in the NHS National Programme for Information Technology. *Journal of Information Technology, 22*, 257-264.

Ferdig, M. a. (2007). Sustainability Leadership: Co-creating a Sustainable Future. *Journal of Change Management, 7*, 25-35.

Fernandez, E., Junquera, B., & Ordiz, M. (2003). Organizational culture and human resources in the environmental issue: A review of the literature. *International Journal of Human Resource Management, 14,* 634-657.

Fineman, S. (1997). Constructing the Green Manager. *British Journal of Management, 8*, 31-38.

Fineman, S., & Clarke, K. (1996). Green stakeholders: Industry interpretations and response. *Journal of Management Studies*, *33*, 715-730.

Galbreath, J. (2009). Drivers of Corporate Social Responsibility: The Role of Formal Strategic Planning and Firm Culture. *British Journal of Management, 21*, 511-525.

Guy, S. (2006). Designing urban knowledge: Competing perspectives on energy and buildings. *Environment and Planning C: Government and Policy, 24*(5), 645-659.

Handgraaf, M. J., Van Lidth de Jeude, M. A., & Appelt, K. C. (2013). Public praise vs. private pay: Effects of rewards on energy conservation in the workplace. *Ecological Economics, 86*, 86-92.

Harris, L. C., & Crane, A. (2002). The greening of organizational culture: Management views on the depth, degree and diffusion of change. *Journal of Organizational Change Management, 15*, 214-234.

Harris, L. C., & Ogbonna, E. (1998). Employee responses to cultural change. *Human Resource Management Journal, 8*, 78–92.

Hartley, J., Benington, J., & Binns, P. (1997). Researching the Roles of Internal-change Agents in the Management of Organizational Change. *British Journal of Management, 8*, 61-73.

Heijden, A. V. D., Cramer, J. M., & Driessen, P. P. J. (2012). Change agent sensemaking for sustainability in a multinational subsidiary. *Journal of Organizational Change Management, 25*, 535-559.

Heller, F., Pusic, E., Strauss, G., & Wilpert, B. (1998). *Organisational participation: Myth and reality*. Oxford, UK: Oxford University Press.

Hendrick, H. (1997). Organizational design and macroergonomics. In G. Salvendy (Ed.), *Handbook of human factors and ergonomics* (pp. 594-637). New York: John Wiley & Sons.

Howard-Grenville, J. A. (2006). Inside the "Black Box": How Organizational Culture and Subcultures Inform Interpretations and Actions on Environmental Issues. *Organization & Environment, 19*, 46-73.

Jennings, P. D., & Zandbergen, P. A. (1995). Ecologically Sustainable Organizations: An Institutional Approach. *Academy of Management Review, 20*, 1015–1052.

Johnson, D. B., & Macy, G. (2001). Using environmental paradigms to understand and change an organization's response to stakeholders. *Journal of Organizational Change Management, 14*, 314-334.

Kanter, R. M. (1983). *The Change Masters: Corporate Entrepreneurs at Work*. London, UK: International Thomson Business Press.

Kanter, R. M., Stein, B. A., & Jick, T. D. (1992). *The Challenge of Organizational Change*. New York, NY: The Free Press.

Karasek, R., & Theorell, T. (1990). *Healthy Work: Stress, productivity, and the reconstruction of working life*. USA: Basic Books.

Kotter, J. P. (1995). Leading Change: Why Transformation Efforts Fail. *Harvard Business Review, 73*, 59-67.

Kotter, J. P. (1996). *Leading Change*. Boston, MA: Harvard Business School Press.

Kujala, S. (2003). User involvement: A review of the benefits and challenges. *Behaviour & Information Technology, 22*, 1-16.

Lazlo, C., & Zhexembayeva, N. (2011). *Embedded Sustainability: The next big competitive advantage*. Sheffield, UK: Greenleaf Publishng.

Lee, M. P. (2011). Configuration of external influences: The combined effects of institutions and stakeholders on corporate social responsibility strategies. *Journal of Business Ethics, 102*, 281-298.

Li, H., Chen, Z., & Wong, C. T. C. (2003). Barcode technology for an incentive reward program to reduce construction wastes. *Computer-Aided Civil and Infrastructure Engineering, 18*, 313-324.

Lingard, H., Gilbert, G., & Graham, P. (2001). Improving solid waste reduction and recycling performance using goal setting and feedback. *Construction Management and Economics, 19*, 809-817.

Linnenluecke, M. K., & Griffiths, A. (2010). Corporate sustainability and organizational culture. *Journal of World Business, 45*, 357-366.

Linnenluecke, M. K., Russell, S. V., & Griffi, A. (2009). Subcultures and Sustainability Practices: the Impact on Understanding Corporate Sustainability. *Business Strategy & the Environment*, *452*, 432-452.

Locke, E. A., & Latham, G. P. (2004). What should we do about motivation theory? Six recommendations for the twenty-first century. *Academy of Management Review, 29*, 388-403.

Luecke, R. (2003). *Managing Change and Transition*. Boston, MA: Harvard Business School Press.

Lueneburger, C., & Goleman, D. (2010). The change leadership sustainability demands. *Sloan Management Review, 51*, 49-55.

Macey, W. H., & Schneider, B. (2008). The Meaning of Employee Engagement. *Industrial and Organizational Psychology, 1*, 3-30.

May, D. R., & Flannery, B. L. (1995). Cutting waste with employee involvement teams. *Business Horizons, 38*, 28-38.

McMakin, A. H., Malone, E., & Lundgren, R. E. (2002). Motivating residents to conserve energy without financial incentives. *Environment and Behavior, 34*, 848-863.

Millar, C., Hind, P., & Magala, S. (2012). Sustainability and the need for change: Organisational change and transformational vision. *Journal of Organizational Change Management, 25*, 489-500.

Morrison, E. W., & Milliken, F. J. (2000). Organizational silence: A barrier to change and development in a pluralistic world. *Academy of Management Review, 25*, 706-725.

Mumford, E. (1983). *Designing secretaries: The participative design of a word processing system*. Manchester, UK: Manchester Business School.

Mumford, E. (1995). *Effective systems design and requirements analysis: The ETHICS approach.* Basingstoke, UK: Macmillan.

Muster, V., & Schrader, U. (2011). Green Work-Life Balance: A new perspective for Green HRM. *German Journal of Research in Human Resource Management, 25*, 140-156.

Newton, T. I. M., & Harte, G. (1997). Green business: technicist kitsch?*. *Journal of Management Studies, 34,* 75-98.

Nilsson, A., von Borgstede, C., & Biel, A. (2004). Willingness to accept climate change strategies: The effect of values and norms. *Journal of Environmental Psychology, 24*, 267-277.

Ones, D. S., & Dilchert, S. (2010). A taxonomy of green behaviours among employees. Shades of green: Individual differences in environmentally responsible employee behaviours. Paper presented at the symposium conducted at the annual conference of the society for *Industrial and Organizational Psychology*, Atlanta, Georgia.

Ones, D. S., & Dilchert, S. (2012). Environmental Sustainability at Work: A Call to Action. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 5*, 503-511.

Ones, D. S., Dilchert, S., Biga, A., & Gibby, R. E. (2010). *Managerial level differences in eco-friendly employee behaviors*. Paper presented at the Annual Conference of the Society for Industrial and Organizational Psychology, Atlanta, Georgia.

Osbaldiston, R., & Schott, J. P. (2012). Environmental Sustainability and Behavioral Science. *Environment and Behavior, 44*, 257-299.

Pasmore, W. A. (1994). *Creating strategic change: Designing the flexible, high performing organization.* New York: Wiley.

Pettigrew, A., & Whipp, R. (1993). *Managing change for competitive success.* Cambridge, UK: Wiley-Blackwell.

Post, J. E., & Altman, B. W. (1994). Managing the Environmental Change Process: Barriers and Opportunities. *Journal of Organizational Change Management, 7*, 64-81.

Ramus, C. A. (2001). Organizational support for employees : Encouraging creative ideas for environmental sustainability. *California Management Review, 43*, 85-105.

Ramus, C. A. (2002). Encouraging innovative environmental actions: What companies and managers must do. *Journal of World Business, 37*, 151-164.

Ramus, C. A., & Steger, U. (2000). The Roles of Supervisory Support Behaviors and Environmental Policy in Employee "Ecoinitiatives" at Leading-Edge European Companies. *The Academy of Management Journal, 43*, 605-626.

Redekop, B. W., & Olson, S. (2010). *Leadership for Environmental Sustainability.* New York: Routledge.

Renwick, D. W. S., Redman, T., & Maguire, S. (2013). Green Human Resource Management: A Review and Research Agenda. *International Journal of Management Reviews, 15*, 1-14.

Riley, P. (1983). A structurationist account of political culture. *Administrative Science Quarterly, 28*, 414–437.

Robertson, J. L., & Barling, J. (2013). Greening organizations through leaders' influence on employees' pro-environmental behaviors. *Journal of Organizational Behavior, 34*, 176-194.

Robinson, M. A. (2010). An empirical analysis of engineers' information behaviors. *Journal of the American Society for Information Science and Technology, 61*, 640-658.

Rothenberg, S. (2003). Knowledge Content and Worker Participation in Environmental Management at NUMMI. *Journal of Management Studies, 40*, 1783-1802.

Russell, S.V., & McIntosh, M. (2011). Organizational Change for Sustainability. In N. M. Ashkanasy, C. P. M. Wilderom & M. F. Peterson (Eds.), *Handbook of Organizational Culture & Climate* (2nd ed.). Sage.

Sackman, S. A. (1992). Culture: The missing concept in organization studies. *Administrative Science Quarterly, 41*, 229-240.

Schein, E. H. (2010). *Organizational culture and leadership*. San Francisco: Jossey-Bass.

Schneider, B., Ehrhart, M. G., & Macey, W. H. (2013). Organizational climate and culture. *Annual Review of Psychology, 64*, 361-388.

Schrader, U., & Thøgersen, J. (2011). Putting Sustainable Consumption into Practice. *Journal of Consumer Policy, 34*, 3-8.

Schweiger, D. M., & Denisi, A. S. (1991). Communication with Employees Following a Merger: A Longitudinal Field Experiment. *Academy of Management Journal, 34*, 110-135.

Sekerka, L. E., & Stimel, D. (2011). How durable is sustainable enterprise? Ecological sustainability meets the reality of tough economic times. *Business Horizons, 54,* 115-124.

Sharma, S. (1999). Managerial Interpretations and Organizational Context as Predictors of Corporate Choice of Environmental Strategy. *Academy of Management Journal, 43*, 681-697.

Shrivastava, P. (1995). The Role of Corporations in Achieving Ecological Sustainability. *The Academy of Management Review, 20*, 936-960.

Siero, F. W., Bakker, A. B., Dekker, G. B., & Van Den Burg, M. T. C. (1996). Changing organizational energy consumption behavior through comparative feedback. *Journal of Environmental Psychology, 16*, 235-246.

Starik, M., & Rands, G. P. (1995). Weaving an Integrated Web: Multilevel and Multisystem Perspectives of Ecologically Sustainable Organizations. *The Academy of Management Review, 20*, 908 - 935

Stead, E. W., & Stead, J. G. (1994). Can humankind change the economic myth ? Paradigm shifts necessary for ecologically sustainable business. *Journal of Organizational Change Management, 7*, 15-31.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology, 29*, 309-317.

Stoughton, A. M., & Ludema, J. (2012). The driving forces of sustainability. *Journal of Organizational Change Management, 25*, 501-517.

Suls, J., Martin, R., & Wheeler, L. (2002). Social Comparison: Why, with whom and with what effect? *Current Directions in Psychological Science, 11*, 159-163.

Susman, G. I., & Evered, R. D. (1978). An Assessment of the Scientific Merits of Action Research. *Administrative Science Quarterly, 23*, 582-603.

Trist, E. L., & Bamforth, K. W. (1951). Some Social and Psychological Consequences of the Longwall Method of Coal-Getting: An Examination of

the Psychological Situation and Defences of a Work Group in Relation to the Social Structure and Technological Content of the Work System. *Human Relations, 4*(1), 3-38.

Tudor, T., Barr, S., & Gilg, A. (2007). A Tale of Two Locational Settings: Is There a Link Between Pro-Environmental Behaviour at Work and at Home? *Local Environment, 12*, 409-421.

Unsworth, K. L., Dmitrieva, A., & Adriasola, E. (2013). Changing behaviour: Increasing the effectiveness of workplace interventions in creating pro-environmental behaviour change. *Journal of Organizational Behavior, 34*, 211-229.

van Eijnatten, F. M. (1997). Development in Socio-Technical Systems Design (STSD). In P. J. D. Drenth, H. Thierry & C. J. de Wolff (Eds.), *Handbook of Work and Organizational Psychology. Volume 4: Organizational Psychology* (pp. 61-88). Sussex, UK: Lawrence.

Vanclay, F. (2004). The triple bottom line and impact assessment: How do TBL, EIA, SEA and EMS relate to each other? *Journal of Environmental Assessment Policy and Management, 6*, 265-288.

Walls, J. L., & Hoffman, A. J. (2013). Exceptional boards : Environmental experience and positive deviance from institutional norms. *Journal of Organizational Behavior, 34*, 253-271.

Weick, K. E., & Quinn, R. E. (1999). Organizational Change and Development. *Annual Review of Psychology, 50*, 361-386.

Welford, R. (1995). *Environmental Strategy and Sustainable Development: The Corporate Challenge for the Twenty-First Century*. London, UK: Routledge.

Wener, R., & Carmalt, H. (2006). Environmental psychology and sustainability in high-rise structures. *Technology in Society, 28*, 157-167.

White, P. (2009). Building a sustainability strategy into the business. *Corporate Governance, 9*, 386-394.

Woodman, R. W. (1989). Organizational change and development: New arenas for inquiry and action. *Journal of Management, 15*, 205-228.

Young, W., Davis, M., McNeill, I. M., Malhotra, B., Russell, S., Unsworth, K., & Clegg, C. W. (In Press). Changing Behaviour: Successful Environmental Programmes in the Workplace. *Business Strategy and the Environment*.
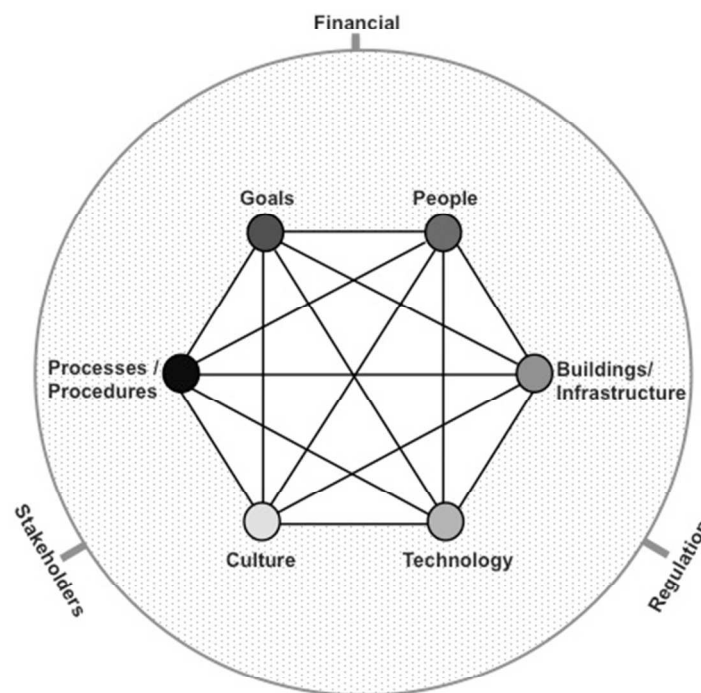
Figure 1: Socio-technical system, illustrating the interrelated nature of an organizational system, embedded within an external environment (from, Davis et al., 2014).

Develop a global environmental sustainability commitment, with specific targets.

Develop an employee environmental program with specific target actions.

Encourage employees to identify wastage and to suggest environmentally focused innovations in processes.

Provide opportunity to learn fuel-efficient driving.

Provide opportunity to participate in cycle to work and lift share scheme.

Goals

People

Provide environmental briefings to feedback high-level progress.

Use visual prompts to remind employees to turn off lights.

Create a nature reserve and wildlife habitat.

Processes/Procedures

Buildings/Infrastructure

Harvest rain water from roofs.

Establish a training scheme on site environmental processes, e.g., waste management.

Ensure processes conform to ISO 14001.

Equip facilities to recycle waste water.

Install recycling receptacles throughout plant.

Permit "shut off" of process equipment and lighting to minimize base load consumption.

Culture

Technology

Reward employees when environmental targets achieved.

Hold community and staff events to highlight environmental efforts and to engage in environmental activities.

Install solar photo voltaic system.

Introduce robotics to reduce VOC emissions.

Introduce water borne paint system.

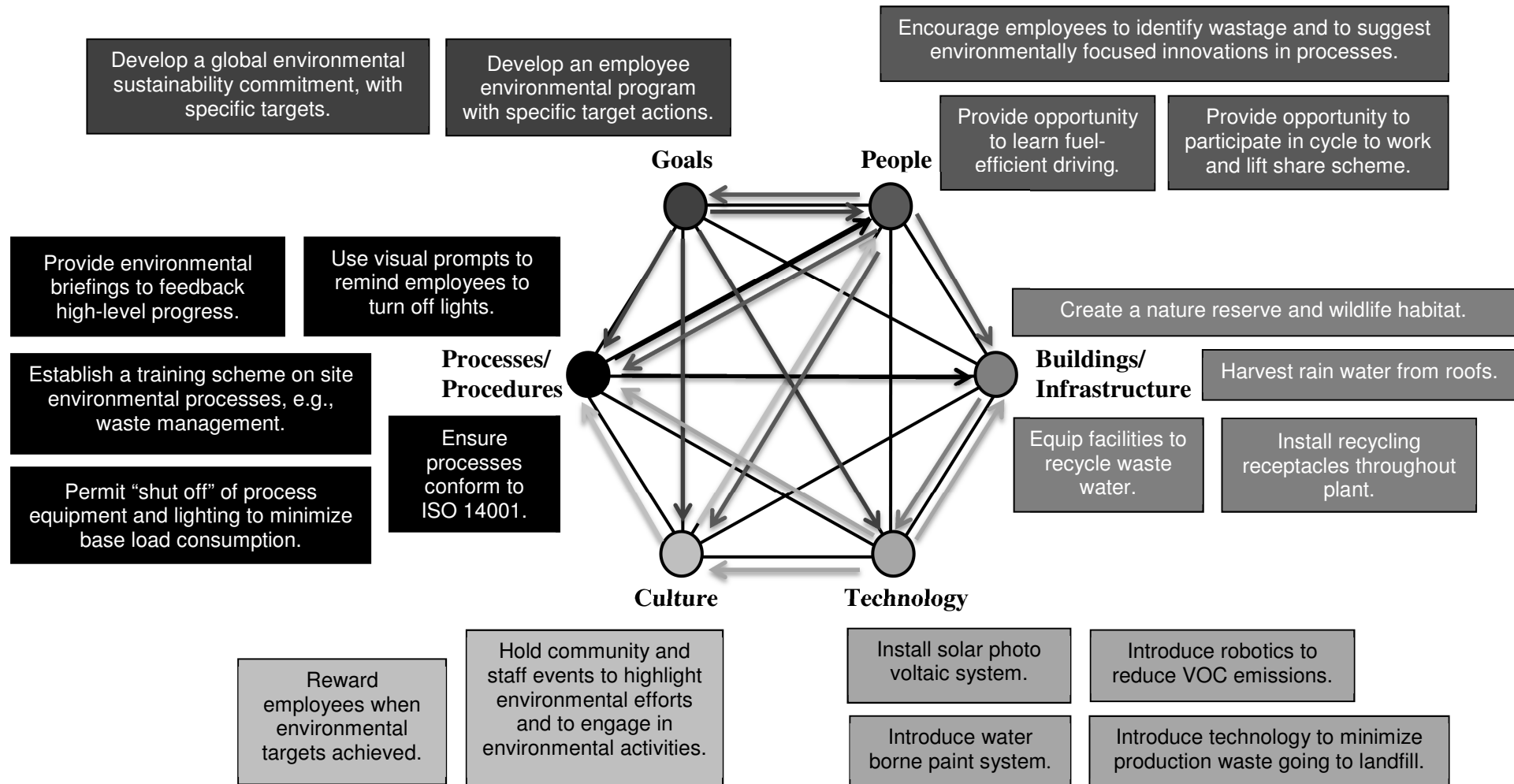Introduce technology to minimize production waste going to landfill.

Figure 2: Approaches and initiatives implemented to support greater environmental sustainability at a major UK manufacturing plant (from, Davis et al., 2014).
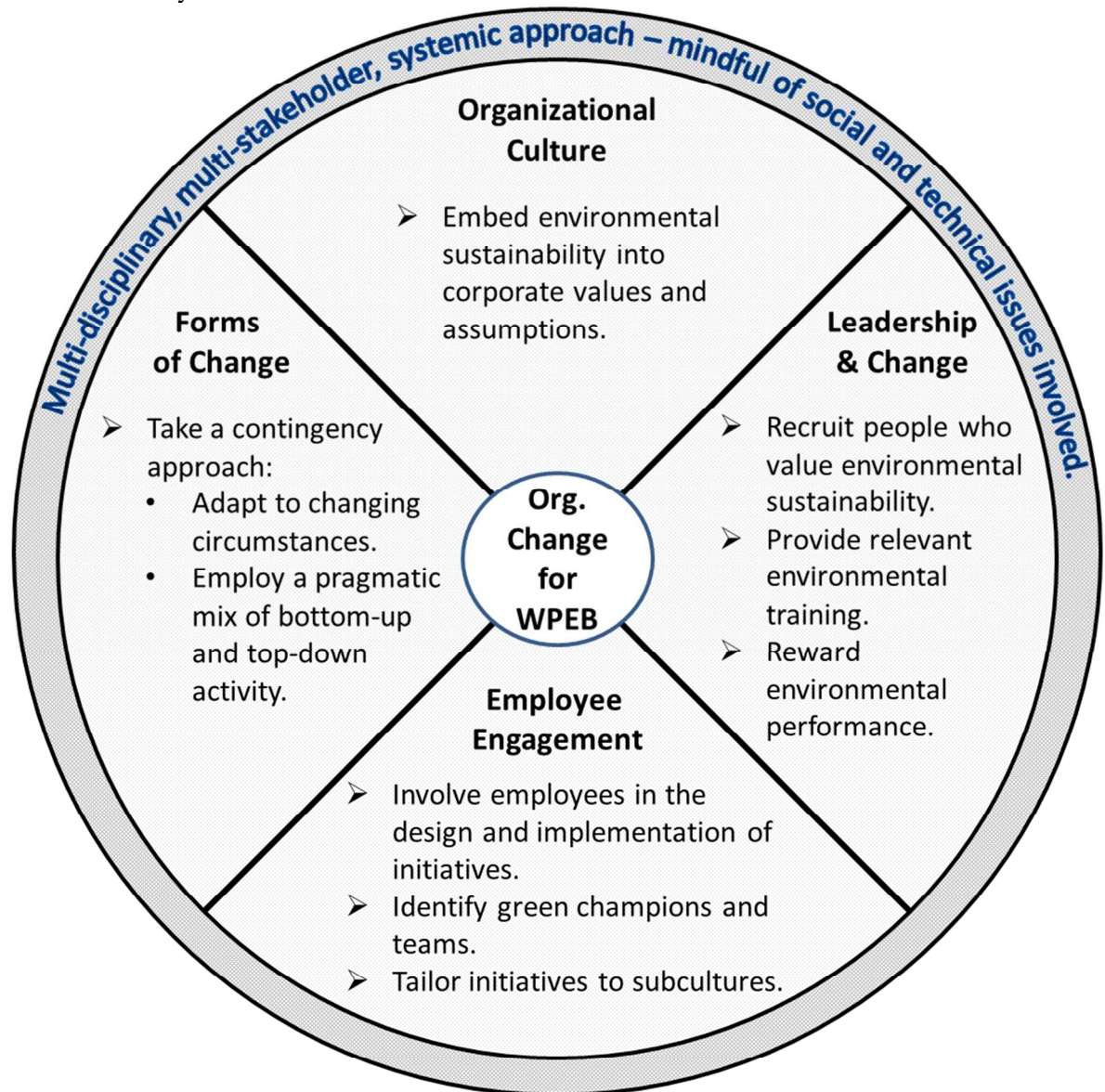
Figure 3: Summary of the approaches and practical steps for managing organizational change for WPEB.