Unleashing sustainability transformations through robust action

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ABSTRACT

Shifting to dramatically more sustainable systems is an unconventional or wicked problem, encompassing multiple actors, disciplines, and values. Yet to date, sustainability initiatives have been tackled primarily by means of conventional managerial approaches. We contend that these approaches are ill-suited for achieving sustainability transformations. We propose an alternative approach founded upon the sociological concept of robust action. In robust action, leaders embrace ambiguity (rather than striving for clarity), focus on short-term accomplishments (rather than long-term goals), and are satisfied with oblique movement (rather than linear progress). We elaborate on three robust strategies—participatory architecture, multivocal inscription and distributed experimentation—and investigate their effectiveness in three sustainability related contexts: wind power, sustainability reporting and microcredit. We conclude by discussing the applicability of robust action to other contexts, and the complementarities between robust action and other forms of leadership towards sustainability.

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1. Introduction

Sustainability, commonly defined as meeting the needs of the present without compromising the ability of future generations to meet their needs (WCED, 1987), is increasingly a cardinal concern for many stakeholders (Markard et al., 2012). Governments and international organizations have long been interested in sustainability, resulting in significant investments in poverty alleviation, economic development and environmental protection efforts, among others. More recently, individuals, corporations, nonprofits and other actors also have become involved in such efforts. This engagement has fostered a range of activities, including social entrepreneurship (e.g. Grameen Bank, Kickstarter), standard setting initiatives (e.g. Global Reporting Initiative, LEED), institutional redesign (e.g. B Lab, 1% for the Planet), and private transnational governance initiatives (e.g. Forest Stewardship Council, Fair Labor Association), among others. Speaking to this diversity, Paul Hawken, in his book *Blessed Unrest*, observed that sustainability concerns have given rise to the largest movement in world history, involving on the order of one million organizations globally (Hawken, 2007).

At the same time, the organizations that comprise this movement, which typically have little formal power, authority or resources, are confronted with numerous technical, relational and temporal challenges related to sustainability (Garud and Gehman, 2012). Nonetheless, their relatively small-scale localized efforts have in some cases generated grand-scale outcomes, several of which have been well publicized and justifiably lauded (e.g. Miller et al., 2012; Prahalad, 2005; Yunus, 1999). Clearly, there is much to be learned by studying individual success stories. Moreover, with the growing amount of studies and evidence already amassed, consolidation of existing cases into a cohesive and coherent leadership framework is not only the next logical step but a worthy objective of research (Colquitt and George, 2011; George, 2014; Margolis and Walsh, 2003).

In this paper, then, we draw upon prior research in a variety of settings and contexts to describe and substantiate a model of leadership by means of which individual organizations can foster grand-scale sustainability transformations. We first motivate our departure from orthodoxy by observing that "unconventional" thinking appears central to many of the success stories of sustainability transformations. We then build upon recent theoretical work that has proposed "robust action" as a viable approach to tackling grand challenges (Ferraro et al., 2015), while noting the

relative paucity of empirical analysis in that study. Here, we seek to provide initial evidence of the viability of the robust action approach by extending and elaborating three key robust strategies—participatory architecture, multivocal inscription and distributed experimentation—and then investigating their application in three exemplary case studies: wind power, sustainability reporting and microcredit.

Our study employs an exploratory (rather than hypothetico-deductive) approach. We proceed by analyzing, through the lens of robust action, these three well-known success stories in order to discern the extent to which leadership activities consistent with robust action were pursued. Through a theoretically grounded re-examination (e.g., Allison, 1972) of existing empirical cases, our analysis underscores the possibility that robust action can be effective for organizational actors engaged in systemic sustainability transformations. We conclude by examining some contingencies governing the likely effectiveness of robust action, and the extent to which it might complement other sustainability approaches, namely common pool resource management (Dietz et al., 2003; Ostrom, 1990) and the framework for strategic sustainable development (Ny et al., 2006; Robèrt et al., 2002).

2. Conventional management and its limitations

Conventional management is often construed as a relatively linear and orderly activity, typically conducted by a "rational" planner who strives to attain well-defined targets or solutions. Established in the mid-twentieth century as a discipline through the pioneering work of Herbert Simon, Igor Ansoff and others (Andrews, 1971; Ansoff, 1965; Chandler, 1962; Simon, 1947), advocates of conventional management have developed and refined a methodical, well-defined process through which organizational goals can be attained. A recent exemplar of conventional management is the Balanced Scorecard:

A company begins by developing a strategy statement and then translates it into the specific objectives and initiatives of a strategic plan. Using the strategic plan as a guide, the company maps out the operational plans and resources needed to achieve its objectives. As managers execute the strategic and operational plans, they continually monitor and learn from internal results and external data on competitors and the business environment to see if the strategy is succeeding. Finally, they periodically reassess the strategy, updating it if they learn that the assumptions underlying it are out-of-date or faulty, starting another loop around the system. (Kaplan and Norton, 2008: 65)

This managerial approach, which proceeds in an orderly manner from planning to acquisition of resources to execution while monitoring, learning and improving is a curricular mainstay among business schools and management faculties worldwide, as well as countless corporations and other entities (Cabantous and Gond, 2011; March, 2011; Mintzberg, 2004).

Many scholars have, however, noted the limitations of these approaches (e.g. Rittel and Webber, 1973). A first set of objections arises from simple observation: empirically, managers seldom resolve problems as prescribed (Mintzberg, 1973). Planning and management, as enacted by managers, is, in reality, more likely to be emergent, as opposed to deliberate, occurring alongside or even subsequent to action, as opposed to preceding it (Cohen et al., 1972; Mintzberg, 1987). A second set of objections suggests that rational planning is too narrowly prescribed, overly oriented towards exploitation of existing competencies rather than exploration of new innovations (March, 1991). Indeed, innovation is difficult to generate hierarchically; in organizational contexts it tends to

emerge at the nexus of non-hierarchical links of multiple organizational types employing diverse populations of experts (Garud et al., 2013; Powell et al., 1996), making its management via conventional paradigms extremely challenging. Overarching these knowledge and control limitations, and perhaps even more problematic, is the tendency of managerial attention to be directed towards near term objectives and narrow incentive structures rather than towards multifaceted goals (Dobbin and Jung, 2010; Reich, 2008; Slawinski and Bansal, 2015).

In short, organizations are too complex, contingencies too numerous, and unexpected developments too frequent for one or a small number of persons to plan and manage with a clear grasp of causes and effects. When managers grapple with large, intricate and long-term scenarios, their planning capabilities become increasingly limited:

Would Boeing really have benefited from careful analyses in the mid-1960s of the prospective return on investment from development of the 747? An analyst would have had to anticipate the oil shock, the globalisation of world markets and the development of the aviation industry through to the end of the century. Anyone who has built models of these kinds, or scrutinised them carefully, knows that the range of possible assumptions is always wide enough to allow the analyst to come up with whatever answer the person commissioning the assessment wants to hear. (Kay, 2004)

The inevitable inability to plan and manage "conventionally" for such long-term scenarios is even more apparent when one considers the pursuit of sustainability. Large scale sustainability issues like poverty, illiteracy and social justice as well as climate change, biodiversity loss and other forms of environmental degradation are essentially wicked problems, in which "one cannot understand the problem without knowing about its context; one cannot meaningfully search for information without the orientation of a solution concept; one cannot first understand, then solve" (Rittel and Webber, 1973: 162). These problems are vaguely defined, rather than specific; goal attainment cannot be unambiguously articulated; interdependencies are the rule rather than the exception; and, span of formal control is lesser than the scope of the challenge (Cash et al., 2006).

Conventional management is largely ineffective for resolving wicked problems not merely because the sheer amount of data that needs to be processed and analyzed is overwhelming, but also because trade-offs are inevitable, preferences and values are unknown and often conflicting, stakeholders appear and disappear over time, boundaries are unclear, hierarchy is absent, more than one "planner" is attempting to solve "the problem," and activities designed to resolve the problem modify the problem itself (Dietz et al., 2003; Lindblom, 1958; Reinecke and Ansari, 2015; Verweij et al., 2006). The necessary preconditions underlying the applicability of conventional management simply do not exist in the context of wicked problems, not only at the level of individual organization, but perhaps even more importantly, at the level of public policy and regulations (Dorf and Sabel, 1998; Sabel and Zeitlin, 2012). But in that case, how can organizations help foster large-scale sustainability transformations?

3. An alternative model

Noting that conventional management approaches appear to be falling short when applied to the domain of sustainability, Ferraro et al. (2015) recently theorized an alternative model for addressing *grand challenges*, based on the premise that "the fundamental principles underlying a grand challenge are the pursuit of bold ideas and the adoption of less conventional approaches to tackling
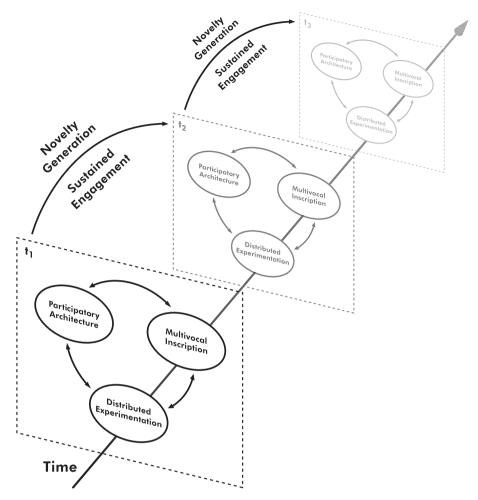
Fig. 1. Theoretical model of robust action strategies.
Source: Adapted from Ferraro et al. (2015)

large, unresolved problems" (Colquitt and George, 2011: 432). In particular, they proposed that grand challenges such as climate change, water scarcity, poverty alleviation, and the safeguarding of human rights share three key analytical facets or dimensions. First, they are complex, involving a large array of systems, institutions and networks, and are thus given to multiple possible apprehensions by different actors. Second, they are fundamentally uncertain; their consequences cannot be broken down into a simple model of possible future states of the world with corresponding probabilities since it is impossible to imagine all possible states, let alone assess their probabilities. And third, they are evaluative, in that they cut across conventional epistemic, professional and ideological boundaries. Because of this, it is not easy to label them as solely social, economic or environmental issues, and different constituents may disagree about what the core problem actually is.

In theorizing how an unconventional management approach can yield systemic change on these issues, Ferraro et al. (2015) proposed applying the sociological concept of robust action. Robust actions have been defined as "noncommittal actions that keep future lines of action open in strategic contexts where opponents are trying to narrow them" (Padgett and Powell, 2012: 24). In particular, robust action is generative, in that it allows and even promotes a large set of further actions to be taken, thus remaining adaptive, particularly in the face of complexity and uncertainty.

In their analysis, Ferraro et al. (2015) argued that three strategies are essential for successfully harnessing the power of robust action:

participatory architecture, multivocal inscription and distributed experimentation (see Fig. 1 for a visualization). Building on the concept of hybrid forums (Callon et al., 2009), participatory architectures are structures that enable not only initial engagement, but, more meaningfully, prolonged engagement, thereby enabling varied and diverse actors to interact. Sharing an affinity with boundary organizations (Guston, 2001; O'Mahony and Bechky, 2008), these forums allow for different evaluative criteria, distributed authority, and lateral accountability (Stark, 2009). Moreover, these architectures enable actors to meaningfully engage with counterparts, even when relations between them are publicly adversarial (Bartley, 2007; Furnari, 2014; Mair and Hehenberger, 2014).

While sustaining the engagement of participants is important, it is not necessarily sufficient to yield action. To promote action, guidelines, norms, routines and artifacts must be developed. Collectively, they can be understood as inscriptions (Latour, 1999).[1] To make them useful and attractive to large numbers of actors, inscriptions must be multivocal; that is, they must be capable of sustaining different interpretations among various audiences. The key is to generate artifacts that can be interpreted flexibly (Pinch and Bijker, 1987). For instance, the term

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[1] According to Latour (1999: 306) *inscription* "refers to all the types of transformations through which an entity becomes materialized into a sign, an archive, a document, a piece of paper, a trace."

sustainable development itself "means so many different things to so many different people and organizations" (Robinson, 2004: 373). But rather than a shortcoming, this attribute has sparked additional enrollment, providing "some common ground for discussion among a range of development and environmental actors who are frequently at odds" (Sneddon et al., 2006: 254). In other words, multivocal inscriptions support discourse and co-ordination within and between multidisciplinary communities, without requiring explicit consensus (Bechky, 2003; Bowker and Star, 1999). To the extent that these inscriptions allow for multiple plausible interpretations, they foster new forms of solutions, and support the participation of still more stakeholders (Beunza and Stark, 2004; Kaplan, 2011).

A particular strength of multivocal inscriptions is their ability to engender diverse responses, thereby supporting the third robust strategy: distributed experimentation. Because sustainability is complex and multifaceted (i.e., a wicked problem), there are potentially multiple solutions and pathways that can be pursued. Accordingly, there is no way of knowing in advance how best to proceed, suggesting that top–down approaches have limited potential. Instead, distributed experimentation, initiated and implemented through participatory architectures, may generate a variety of effective responses. Successful experiments can be conceptualized as small wins that generate momentum:

> Once a small win has been accomplished, forces are set in motion that favor another small win. When a solution is put in place, the next solvable problem often becomes more visible. This occurs because new allies bring new solutions with them and old opponents change their habits. Additional resources also flow toward winners, which means that slightly larger wins can be attempted. (Weick, 1984: 43)

These small wins can take many forms, ranging from personal satisfaction to organizational financial returns, and are determined in each context by the participants themselves, not necessarily in full accordance with each other. Their potency is in the affordances they provide participants to pursue successive, larger wins. Moreover, iteration, repetition, and continuous learning help actors maintain engagement and pursue additional experimentation (Dietz et al., 2003; Simon, 1996).

In sum, Ferraro et al. (2015) argued that participatory architecture, multivocal inscription and distributed experimentation are potentially robust strategies for tackling major issues related to sustainability. Although they posited that this model *may* be effective in linking small scale actions to large scale outcomes by fostering novelty generation and sustained engagement, they did not offer evidence that it *would* be effective. In particular, their leadership model is susceptible to lethargy, dithering and ineffectiveness while systemic transformations to sustainability are monumental undertakings that are becoming increasingly urgent. Here, we seek to expand upon this model using empirical evidence from prior academic literature, and attempt to gauge its effectiveness.

4. Putting robust action to work

How likely is it for small wins to generate grand scale transformations? Prior studies suggest that robust action can in fact bring about tremendous changes. For instance, Hargadon and Douglas (2001) showed how Edison and his team applied the precepts of robust action by designing the light bulb and its accompanying electric system to superficially follow the templates of the dominant gas industry in order to appear familiar to the public. Instead of extolling the superiority of electric lighting, they hobbled it, content to displace gas lighting one building and one city block at a time.

> This evidence suggests that Edison triumphed over the gas industry not by clearly distinguishing his new system from but, rather, by initially cloaking it in the mantle of these established institutions… At the same time, by structuring his system as he did, he also maintained its ability to evolve beyond that limited understanding and use. (Hargadon and Douglas, 2001: 479–480)

In similar fashion, demonstrating how small wins can engender transformative change, Rao (2008) illustrated how distributed, grassroots actors have paved the way for radical innovations, ranging from mass market automobiles, to craft microbreweries, to nouvelle cuisine in France (see also Kay, 2012; Sims, 2011).

Clearly, robust action can work. But is there any evidence that such an approach could work in the case of sustainability challenges? In the sections that follow we take up this question by considering three exemplary case studies: wind power, sustainability reporting and microcredit (see Table 1 for an overview). Collectively, these three cases allow us to examine robust action across a range of sustainability challenges, including energy and the environment, corporate governance and accountability, and poverty alleviation and development. In other words, our three cases are revelatory settings (Patton, 2002; Pettigrew, 1990) for investigating the potential and limitations of robust action. In each

Table 1
Summary of sustainability transformations through robust strategies.

Case	Grand challenge	Robust strategies			Scaling impact
		Participatory architecture	Multivocal inscription	Distributed experimentation	
Wind power	Energy	Association of users *Enrolling stakeholders from across diverse domains*	Interdisciplinary design *An eclectic mix of professional and practical approaches*	Technological prototypes *Installing wind turbines based on a trial-and-error approach*	Emergence of wind power trajectory *Feasibility of renewable energy on electric grid scale*
Sustainability reporting	Organizational accountability	Governance rules *Integrating all relevant and interested actors*	Financial reporting analogy *Maintaining diffuse and ambiguous goals through use of analogy*	Heterogeneous reporting practices *Providing general guidelines that allow organizations to be selectively transparent*	Institutionalization of sustainability reporting *Linkage between organizational strategy and sustainability virtually undisputed*
Microcredit	Poverty	Transparent competition *Strategies and approaches of providers are easily observable and widely shared*	Hybrid logics *Blending development and banking logics*	Business model heterogeneity *Implementing multiple models of supply and demand*	Inclusive finance *Can strengthen an entire national financial system*

case study we consider the extent to which distributed experimentation, participatory architecture and multivocal inscription were involved, as well as the extent to which grand scale sustainability transformations have been achieved.

4.1. Wind power

Due to concerns about sustainability and climate change, energy is one of the most pressing challenges of the twenty-first century. Over the last 40 years, wind power has emerged as an option for dramatically reducing human dependence upon fossil fuels. As early adopters, Denmark and the United States provide an interesting contrast. In 2013, Denmark generated over 33% of total demand (or 11.1 TWh) from wind power, up from a mere 6% in 1996 (Karnøe, 1999; Vittrup, 2014). The United States led the world in absolute production, generating 168 TWh (or 4% of energy demand) from wind power (Energy Information Administration, 2014).

However, Denmark and the United States have followed very different paths. In comparing the historical evolution of wind power in these two countries Garud and Karnøe (2003) showed that Denmark pursued a low-tech "bricolage" strategy, whereas the United States pursued a high-tech "breakthrough" strategy. The authors concluded, "a bricolage approach that begins with a low-tech design but ramps up progressively is able to prevail over a high-tech breakthrough approach" (Garud and Karnøe, 2003: 296). Drawing on prior research, we revisit Denmark's emergence as a wind "super-power."

4.1.1. Participatory architecture

Starting in the 1970s, a wide variety of Danish actors became involved in wind power. For instance, owner–users initiated a series of "wind meetings" (Garud and Karnøe, 2003; Karnøe, 1990). Held several times each year, these meetings provided a forum for sharing knowledge and expanding networks. Focused on enrolling stakeholders from six different domains, an association was established:

> *1) with politicians to create a regulatory framework; 2) with wind turbine producers to make design improvements; 3) with electrical utilities associations to establish payments and conditions for grid connection; 4) with insurance companies to cover component failures; 5) with consultants to seek assistance for individuals and cooperatives in making investments in wind turbines; and 6) with the government to provide national planning tools and regulations for local siting of wind power such as landscape classification.* (Karnøe and Garud, 2012: 739–740)

The association established a wind turbine test station that was used to certify wind turbine designs. Certification was required in order to benefit from a government subsidy worth 30% of the total cost of a wind turbine. Consequently, producers were forced to interact with the test station, which in turn "facilitated numerous iterations of designs, construction, tests and problem-solving prior to the approval of a new turbine" (Garud and Karnøe, 2003: 290). Over time, those involved in the industry constituted a "specialized industrial network of users and suppliers" (Karnøe, 1990: 120).

By comparison, NREL, the test station's counterpart in the United States, was unable to develop extensive, on-going, trusting relationships with domestic wind turbine firms. Additionally, in the United States, wind turbine engineers were "insulated from the hands-on problems encountered in turbine construction and maintenance" leading to dampened and delayed feedback between users and producers (Garud and Karnøe, 2003: 287–288). Engineers were discouraged (and in some cases prohibited) from talking with their peers for fear of disclosing trade secrets. Teams had little continuity from one generation of turbines to the next. Supplier relationships were one-time or short-term, motivated by profits rather than learning (Garud and Karnøe, 2003). Compared with Denmark, there were no mechanisms for information disclosure. When American turbines later began failing in large numbers, the only feedback came in the form of lawsuits (Garud and Karnøe, 2003).

4.1.2. Multivocal inscription

Initially, many of those who became involved in the Danish wind turbine industry had prior experience with agriculture machinery. This led them to frame wind turbines as a series of practical problems. Because they lacked theoretical knowledge of turbine aerodynamics, they frequently solved problems by "throwing metal" at them, resulting in heavy-weight low-speed designs that "unintentionally reduced design risk by insuring that internal weight overshadowed aerodynamic loads" (Garud and Karnøe, 2003: 285; see also Karnøe, 1990). Early customers, who were "owner-operators," also contributed to this bottom-up approach. Namely, in order to protect their investments in wind turbines, "early owner-users mobilized … to seek design features that would enhance the safety and reliability of wind turbines" (Garud and Karnøe, 2003: 282). As a result, Denmark's wind power sector consolidated around an "unsophisticated," pliant design process that brought together multiple communities, including producers, users, regulators, and so forth, each of whom had different reasons for getting involved, and different ways of contributing to the unfolding work.

By comparison, designs that had proven acceptable in the Danish context were criticized by proponents of wind power in the United States as being "too simplistic" (Garud and Karnøe, 2003: 283) and "old-fashioned" (Karnøe, 1999: 161). For instance, the well-known "Juul/Gedser" design that was repeatedly licensed and copied in Denmark was rejected in the United States. After all, "why spend government money on a wind turbine that already exists" (Karnøe, 1999: 162)? Instead, those in the United States approached the problem more narrowly and specifically "from an engineering science knowledge base, conceptualizing problems in terms of the formal, theoretical language of aerodynamics and structural dynamics" (Garud and Karnøe, 2003: 286). Some in the United States advocated for a moderately sophisticated three-bladed light-weight design (Garud and Karnøe, 2003: 283), prompting the head of NREL to exclaim, "with time, the light-weight, cost-effective turbine will win the race" (Garud and Karnøe, 2003: 291). But this engineering and theory driven mindset backfired in several notable ways. For instance, one reason that American designs worked in theory, but not in practice, was due to flawed assumptions about wind loads. Whereas aerospace-derived models assumed steady wind flows, in reality wind loads were variable (Garud and Karnøe, 2003: 287).

4.1.3. Distributed experimentation

Due to the participatory nature of the Danish wind sector, it employed people from diverse backgrounds: blacksmiths, fitters, carpenters, electricians, and even school teachers. Consequently, "instead of pursuing a design intensive R&D approach, [Danish] firms deployed prototypes designed with simple engineering heuristics to engender a process of trial-and-error learning" (Garud and Karnøe, 2003: 282). Cumulatively, "hundreds of experiments were carried out" (Karnøe, 1990: 113) and by the end of the 1980s, several hundred wind turbines had been installed. This initial momentum, and its portrayal in a variety of books, movies and academic articles, in turn fueled more debates and experiments (Karnøe and Garud, 2012).

Additionally, because these installations were dispersed throughout Denmark and operated under different conditions, they created multiple learning opportunities. "Learning from multiple installation sites, in combination with learning on the shop floor, became the bases for design scale-ups" (Garud and Karnøe, 2003: 295). But even as the industry was gaining momentum, for individual firms, the process could be ruthless. For instance, Riisager, developer of the first commercial wind turbine, saw its market share plummet from of 75% in 1979, to 11% in 1980, and finally to just 1% in 1982 (Karnøe, 1990).

In comparison, following the 1973 energy crisis, wind power also attracted considerable interest in the United States, resulting in more than $486 million in federal funding for research and development between 1974 and 1992. However, the United States opted for a "linear top–down orientation and the quest for a breakthrough" (Garud and Karnøe, 2003: 283; see also Karnøe, 1990). Perhaps surprisingly, compared with the Danish experience, in the United States these endeavors had "very limited exposure to real economic market criteria" (Karnøe, 1999: 156). Large engineering firms were the dominant actors and they favored the use of helicopter rotor blades as a design foundation, an approach that was eventually discovered to be inferior. Similarly, American producers rejected the dispersed market and focused instead on the "wind farm" concept that emerged in California, thereby limiting the amount of experimentation that was possible.

4.1.4. Scaling impact

The development of wind power in both Denmark and the United States was triggered in the 1970s by a confluence of political, cultural and economic factors, including "increased environment concern, the OPEC embargo, the nuclear power debate, and some elements of 'small is beautiful' arguments about decentralization and zero-growth" (Karnøe, 1999: 153). The Danish wind turbine industry started small, and developed a series of "scale-ups" from 15–30 kW in 1974, to 45–55 kW in 1980, to 75–100 kW in 1985, to 100–180 kW in 1987, to 180–450 kW in 1989 (Karnøe and Garud, 2012). Along the way, the wind turbine was transformed from a clunky, domestic source of power, into a sophisticated, utility-scale energy option. By the 1990s, the Danish wind turbine industry was ready to dominate in new markets such as Germany, the United Kingdom and Spain (Karnøe and Garud, 2012). By comparison, the American approach required a leapfrog breakthrough that failed to materialize.

Despite their similar starting points, the two countries followed very different paths. By most measures, such as reduction of greenhouse gas emissions and economic impact, Denmark has attained greater success with wind power than the United States. Its competency in wind energy is a key component of Denmark's "Energy Strategy 2050," which targets a fully fossil fuel-free economy. Whereas the United States has remained relatively locked-in (Arthur, 1989; David, 1985) to a fossil fuel driven electricity system, Denmark has created its own path (Garud et al., 2010), potentially shedding further light on where triggers for sustainability transformations may be located. Of course, as wind power technologies continue to develop, manufacturing scales up and installation expands, it remains to be seen whether Denmark will retain its leadership position. Yet, its employment of robust action played a key role in setting in motion the technological trajectory and global market acceptance of wind power as a viable source of energy.

4.2. Sustainability reporting

For years, a diverse group of actors has endeavored to improve the transparency and accountability of multinational enterprises, especially with regard to sustainability-related environmental, social and governance issues. A variety of such efforts have come and gone, including the OECD's Guidelines for Multinational Enterprises (1976), the Sullivan Principles (1977), the ILO's Tripartite Declaration of Principles Concerning Multinational Enterprises (1977) and the Valdez Principles (1989). Against this backdrop, the Global Reporting Initiative (GRI) stands out as a success story.

The GRI is a transnational governance body that sponsors a reporting standard that provides organizations a blueprint for measuring and reporting factors related to sustainability. The standard provides a set of reporting principles and specific indicators that organizations are encouraged to utilize in order to facilitate comparability. Currently, the GRI is the *de facto* standard for sustainability reporting, and is utilized by a majority of the world's largest corporations as well as many other for-profit, not-for-profit and governmental organizations.

4.2.1. Participatory architecture

Since its introduction in the 1990s, the GRI has emphasized multi-stakeholder engagement. Its inclusivity has been described as "unlimited in size and composition" (Brown et al., 2009b: 573). Its two primary organizational sponsors were Ceres, an American nongovernmental organization comprised of environmental organizations, socially responsible investment professionals, institutional investors, and labor and religious organizations; and the United Nations Environment Program (Etzion and Ferraro, 2010). As articulated by its co-founder and CEO, Allen White, a key priority for the GRI was to "find a place for each and every person who seeks to, or should, contribute" (Waddock and White, 2007: 41). In practice, active participants include international consultancies such as AccountAbility and SustainAbility; major global accountancy firms; large multinational corporations and banks; international business associations such as the World Business Council for Sustainable Development, CSR Europe, Business for Social Responsibility, the Prince of Wales Business Leaders Forum, and the International Chamber of Commerce; and some civil society organizations, such as UK-based Forum for the Future (Brown et al., 2009b). Importantly, these participants became involved at different hierarchical levels in the organization, including various elected and non-elected technical, advisory, governance and oversight working groups, committees and councils.

4.2.2. Multivocal inscription

The GRI purposely maintained ambiguous goals, thereby preserving an open roadmap for progress. The emphasis was on resolving specific, narrowly defined problems that needed to be overcome in order to develop a guideline for reporting on sustainability. According to Bob Massie, one of the GRI's co-founders:

> You do not need to agree on the first principles. In fact, it is better to avoid having an explicit discussion of core values and the fundamental views on the social order. Instead, you focus on more instrumental ideas. This way people can agree on the actions at that level, they may even be willing to try to understand each other on the core level. (Brown et al., 2009a: 194)

One particular technique emphasized by the GRI was its recurrent use of analogy to create comparability between sustainability reporting and the more familiar concept of financial reporting (Etzion and Ferraro, 2010). This analogy highlighted the principles that underlie financial reporting, such as relevance, timeliness and understandability. However, rather than constraining the nature of sustainability reporting, this inscription was multivocal and allowed users to pursue their own understanding of what these principles entail in the context of sustainability.

4.2.3. Distributed experimentation

While the GRI provided guidelines for sustainability reporting, it did not stipulate templates, enforce conformity or become directly involved in auditing. This yielded significant heterogeneity in sustainability reports, as users learned about sustainability reporting by doing. Some of this experimentation was somewhat superficial, as exemplified by great diversity in report titles, page lengths and indicators used (Roca and Searcy, 2012). Organizations have utilized stand-alone reports, annual reports, financial filings, websites and social media to disclose sustainability performance, including interactive dashboards and social media platforms, which allow users to create customized "report experiences" (Ceres, 2012).

More fundamentally, and as a direct result of multivocal inscription, users grappled with the substantive issues of what a sustainability report should encompass. For example, a key principle for the GRI and also for financial reporting is materiality—determining the salient aspects of performance that are most relevant for report readers. As users came to grips with this concept in the context of sustainability, they experimented with different models for determining and articulating the materiality of report content. This included user development of materiality matrices as decision-making tools for determining report content (Etzion and Ferraro, 2010). In later years, as the advantages and disadvantages of materiality matrices became evident, further experimentation ensued. For example, SAP developed an approach to materiality more closely aligned with their overall business strategy (SAP, 2012). Other organizations, such as the International Integrated Reporting Council (IIRC), were founded to establish sustainability accounting standards leading to the development of additional definitions of materiality, which advocate a much tighter link between financial and sustainability materiality than previously espoused (Eccles and Serafeim, 2013).[2]

4.2.4. Scaling impact

By early 2014, over 6000 organizations had produced more than 14,000 sustainability reports using the GRI framework, and the fourth major revision of its framework, known as the G4 Sustainability Reporting Guidelines, had been published. At the same time, various actors were advocating for tighter integration of financial and sustainability reporting, recognizing that a powerful lever for shifting corporate priorities remains the financial bottom line. In this domain, various far-reaching experiments are now occurring, including development of an environmental profit and loss statement that attempts to monetize the ecosystem services upon which a company and its entire value chain rely. Initially pioneered by Puma, the idea has been pursued by others, such as Novo Nordisk. Additionally, buoyed by the GRI's success, dozens of countries and stock exchanges have implemented mandatory sustainability disclosure guidelines, some of which explicitly reference the GRI guidelines (KPMG, 2013).

Intriguingly, Allen White and others have insisted that the GRI alone has not and cannot do enough to meaningfully alter corporate behavior and substantively increase planetary sustainability (Levy et al., 2010; see also Behnam and MacLean, 2011; Waddock and White, 2007). In large part we agree with this assessment, but rather than perceiving it as a limitation or failure of the initiative, we perceive the GRI as having created avenues for expansion. Indeed, White and others have continued to push the organizational accountability agenda even further, through initiatives such

as IIRC, SASB and the Global Initiative for Sustainability Ratings (GISR), and by pursuing institutional change that goes to the heart of the role of the corporation in society. In our view, these initiatives support fundamental transformations in the "rules of the game" (Hoffman and Jennings, 2015; Jepperson, 1991), fueled by experience accumulated through the GRI project and the now taken-for-granted view (unheard of before the GRI attained initial acceptance) that not only does sustainability matter, but it can and should be tracked, analyzed and disclosed.

4.3. Microcredit

Poverty alleviation and economic development are long-standing challenges. For decades, developed countries have sought to ameliorate these conditions through top—down financial aid. However, more recently a new strategy has emerged in the form of microcredit. Microcredit is a form of financing based on the issuance of small, unsecured loans to individuals or groups in order to help borrowers start or expand business activities. Its raison d'être is the provision of capital to the so-called unbanked: people who lack access to conventional financing opportunities. Popularized following the success of Grameen Bank, which was founded in 1983, microcredit diffused rapidly over the ensuing three decades, expanding from its initial focus on the extremely poor in Bangladesh to the poor throughout Asia, Latin America, Eastern Europe and sub-Saharan Africa. Roughly 200 million borrowers utilize microcredit services provided by hundreds of institutions each year (Reed, 2013).

4.3.1. Participatory architecture

Microcredit services are offered by commercial banks, non-bank financial institutions, credit unions, rural bank initiatives and NGOs (Conning and Morduch, 2011). These actors interact frequently, particularly through summits and conferences that facilitate diffusion of technology, practices and expertise. In addition to the lenders themselves, donors, academics and members of the nongovernmental development and aid communities attend such gatherings (Armendáriz and Labie, 2011). Participatory architectures are particularly evident on the supply side of microcredit as vividly exemplified by Microvest I, a $60 million fund founded in 2003, chaired by W. Bowman Cutter (a former managing director at venture capital firm Warburg Pincus) and financed by three non-profits: Mennonite Economic Development Associates, the humanitarian organization CARE, and a fund set up by the French Committee against Hunger and for Development (Conning and Morduch, 2011).

Yet, this architecture is not as evident in the structures and operations of the microcredit providers themselves. Individual microcredit organizations generally target distinct populations, thereby reducing the extent of participation of diverse actors. Cull et al. (2009) found that commercial lenders typically have for-profit status, and focus on individual lending, larger loan sizes and fewer women customers, and that their balance sheets show lower costs per dollar lent, higher costs per borrower, and greater profitability (see also Zhao and Wry, 2011). In contrast, nongovernmental microfinance organizations are more likely to employ group lending methods, allocate smaller loans, serve more women, rely more on subsidies, and show less profitability. This segmentation suggests that while the sector as a whole is diverse and promotes knowledge transfer, perhaps it is not truly participatory.

4.3.2. Multivocal inscription

The concept of microcredit lends itself easily to multivocal inscription. In particular, it can be invoked by actors in the domains of aid and development as an effective means to alleviate poverty.

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[2] The IIRC was founded in 2010 as collaboration between the GRI, The Prince's Accounting for Sustainability Project (A4S), and the Sustainability Accounting Standards Board (SASB). It was then incorporated in July 2011, and accredited by the American National Standards Institute.

Due to inherent comparisons with traditional banking, credit and finance, it also appeals to actors in the financial industry. And indeed, microcredit attracts lenders from both the for-profit and not-for-profit sectors: roughly 60 percent of lenders are not-for-profit organizations, although they control only some 30 percent of assets (Conning and Morduch, 2011).

Resonating with the concept of hybridity (Callon et al., 2009), Battilana and Dorado (2010) argued that successful microcredit providers are hybrid organizations, blending two complementary logics—development and banking—into their value systems and identities. In doing so, they are able to effectively manage internal tensions around potential conflicts between banking and development. Hybridity also enables the employment of tools, practices and metrics from the for-profit banking sector, without losing sight of the overarching purpose of social betterment that microcredit organizations seek to promote (Zhao, 2012).

4.3.3. Distributed experimentation

Perhaps most striking in the evolution of microcredit is the experimentation that has taken place. Central among the experiments has been the target population. Microcredit originated with group lending practices that employed joint liability contracts in a "solidarity group" model (Armendáriz and Morduch, 2010), but over time has expanded to include "village banks," which are similar yet larger groups that also employ internal lending practices, as well as individual lenders (Armendáriz and Labie, 2011).

Even more experimentation has occurred on the supply side, where various mechanisms have been harnessed to increase the supply of capital. These include Internet based services such as Kiva.org, that allow individuals to lend small sums to specific entrepreneurs, and the now defunct MicroPlace, owned by eBay, which allowed individuals to use PayPal to bundle small investments with other individuals and fund microcredit organizations in the developing world (Khavul, 2010). Microcredit has also begun experimenting with more sophisticated financing mechanisms, such as securitization of loans and their subsequent sale as debt securities to institutions as varied as mutual funds, private equity firms and investment banks (Conning and Morduch, 2011).

4.3.4. Scaling impact

The impact of microcredit is a hotly debated topic, and the evidence so far is inconclusive. Perhaps unsurprisingly, many studies suggest that microcredit works for some (but not all) borrowers, depending both upon the performance indicators used, and various contingencies such as country, type of lending and size of loan (Karlan and Goldberg, 2011). Others point to mission drift (Mersland and Strøm, 2010) and problems of over-indebtedness which eventually ensnares some borrowers, even leading to suicide in some cases (Guérin et al., 2013). An entire microcredit subsector imploded in the Indian state of Andhra Pradesh in 2011, and this failure was ascribed to misguided changes in regulatory policy (Maes and Reed, 2012).

But, from a broader perspective, microcredit has generated several profound, positive effects. Based on its uptake and diffusion, microcredit spawned the larger field of microfinance, which now encompasses a range of services including credit, savings, insurance, mortgages, and retirement plans, all of which are denominated in small amounts, making them accessible to individuals previously shut out from formal means of borrowing and saving (Conning and Mordoch, 2011; Khavul, 2010). Examining outcomes other than improved economic conditions, Sanyal (2009) found that group lending to women in India through microcredit had dramatic positive "unintended" consequences in terms of generating collective social action. In some cases, effects were observed in domains far removed from the realm of microfinance, in the form

of mobilized responses to domestic violence against women, support of anti-liquor campaigns, and acquisition of public goods for local communities.

Perhaps most interesting in this regard is the case of microcredit in Bolivia, as thoroughly documented by Gonzalez-Vega and Villafani-Ibarnegaray (2011; see also Dorado, 2013). In Bolivia, microcredit emerged as a way to provide financing for the urban (as opposed to the rural) poor, and evolved through continuous innovation, adaptation and experimentation rather than through adoption of best practices from other geographies. The key player that led the initial microcredit revolution was BancoSol, the world's first private commercial bank specializing in microfinance. Very quickly, several competing institutions emerged, employing different lending models and target populations, allowing "experiments [to be] tested and contrasted" (Gonzalez-Vega and Villafani-Ibarnegaray, 2011: 207). This experimentation and diversity led to the realization that group-lending—a cornerstone of the conventional microcredit philosophy—is less suited to the Bolivian context than individual loans.

Moreover, even though BancoSol was a for-profit entity, others experimented with non-profit forms. The success of some of these organizations led to the development of tailored regulatory guidance, which among other innovations, allowed non-profits to provide training, health and other non-financial services alongside financial offerings. By many parameters, including number of clients and regions served, loan repayment rates, liquidity risk and growth, the microcredit sector in Bolivia vastly outperforms the traditional banking sector. As such, through the provision of high-quality and low-cost services, the Bolivian microfinance sector has contributed not only to providing financial access and non-financial services to many Bolivians, but to strengthening the country's entire financial system.

5. Discussion

In this concluding section, we reconsider what the three case studies collectively reveal about the potential strengths and limitations of robust action for advancing sustainability. We then briefly compare robust action with two other well-known sustainability approaches: common pool resource management (Dietz et al., 2003; Ostrom, 1990) and the framework for strategic sustainable development (Ny et al., 2006; Robèrt et al., 2002). Although our comparison is necessarily brief, it highlights some notable points of contact and points of difference, and suggests some areas for future research.

5.1. Robust action strategies for sustainability

In this paper, we conceptualized sustainability as a grand challenge, a manifestation of a wicked problem characterized by complexity, uncertainty and evaluativity. We then introduced recent work that has proposed robust action strategies for dealing with such situations (Ferraro et al., 2015). In an effort to explore the usefulness of this approach, we developed detailed case studies of wind power, sustainability reporting and microcredit. In each case, we examined the role of distributed experimentation, multivocal inscription and participatory architecture. Given the theme of the special issue, we were especially sensitive to understanding how robust action strategies targeting small wins and low hanging fruit might generate large-scale, or field-level sustainability transformations.

Comparing these three disparate contexts, we see an accretive process (Dorado and Ventresca, 2013; Garud and Karnøe, 2001). Emergent concerns such as renewable energy, corporate accountability, and poverty alleviation gave rise to local, situated

experiments. As would be expected, some experiments were more successful than others. Rather than centrally planned or imposed, these experiments were distributed across heterogeneous actors, such as producers, consumers, regulators, competitors, activists, enthusiasts, academics and others. This process frequently resulted in the formation of new organizations and forms, and these new actors subsequently became involved in shaping the path even as it was emerging. As different options circulated, some generated "momentum" (Hughes, 1993); that is, they began to become enmeshed with different groups, thereby generating interest among additional stakeholders and promoting expanded enrollment (Callon, 1986). Taken together, our case studies of wind power, sustainability reporting and microcredit suggest that utilization of the three robust action strategies enabled breakthrough, field-level sustainability transformations.

The three cases also highlight some key differences that may be worthy of further research. For instance, despite its widespread adoption, the Global Reporting Initiative suggests there are some limits to what robust action can achieve in terms of substantially altering the role of the corporation in society. Despite the GRI's success, multinational corporations have not been transformed wholesale. At the same time, the GRI appears to be serving as a platform for additional experimentation, setting in motion the possibility of additional wins. In particular, the GRI increasingly integrates sector-specific or measure-specific standards into its guidelines, such as the WRI and WBCSD's Greenhouse Gas Protocol, and the International Labor Organization's Conventions. Complementarily, other private transnational initiatives such as ISO 26000, AA1000, SA8000, and the UN Global Compact integrate the GRI into their guidelines. Cumulatively, the net effect is the creation of a dense, highly participatory network that promotes an ever-expanding toolkit for fostering corporate sustainability and enabling further experimentation.

The wind power case study is an impressive example of how a small wins strategy may yield faster results than alternative trajectories, such as the breakthrough strategy explicitly pursued in the United States. Indeed, despite its humble beginnings, wind power is now deeply embedded in Denmark, to the point where it has become part of the country's identity, setting up the possibility that the country could be completely "fossil fuel-free" by 2050. Perhaps most importantly, it provides a vivid counterexample to the "Apollo Moonshot" and "Manhattan Project" paradigms, which call for top–down, coordinated, war-scale mobilization to resolve grand challenges. This is not to say that hierarchy is flawed per se, but rather to highlight the value of distributed authority, lateral accountability and mutual monitoring (Stark, 2009). Similarly, the microcredit case shows how relatively *laissez-faire* policies—not top–down directives—enabled various alternatives to be deployed, some of them quite successfully. Reminiscent of Denmark's experience with wind power, there is emerging evidence that Bolivia's small win approach is leading to breakthrough transformations that not only impact those at the bottom of the pyramid, but an entire society.

On the whole then, these three cases provide a variety of evidence in support of robust action. Nothing in these cases suggests that robust action cannot help resolve other seemingly intractable sustainability problems, such as creating rural telecommunications networks, ensuring a clean water supply, and providing quality healthcare. At the same time, robust action might not succeed in resolving all sustainability challenges, and of course a set of successful case studies cannot provide a definitive answer as regards generalizability. Several constraints may curtail the effectiveness of such an approach. A very real potential pitfall with robust action is the inclusion of skeptics or actors with plainly contradictory interests who may try to sabotage or undermine progress toward

sustainability, as has happened in the case of climate change (Garud et al., 2014; Grundmann, 2012). To be effective, robust action must be applied in a manner that insures heterogeneous participation on the one hand, but does not succumb to fragmentation or cooptation on the other. One specific avenue for future research is to investigate the effective management of different participatory architectures, and to explore how these architectures evolve over time.

A second shortcoming of local action relates to the time it takes to harness social learning and translate it into action. The mechanisms we identified—participatory architecture, distributed experimentation, and multivocal inscriptions—take time to bear fruit, and action might stall or be pursued lethargically. Coordination of effort and knowledge, in the traditional sense, may prove to be difficult, given the many "false starts" and "dead ends" that are endemic to sustainability journeys (Garud and Gehman, 2012). If so, change may not occur fast enough to respond to urgent sustainability challenges. This conundrum opens up a potentially larger research agenda around the paradox of "steering the unsteered," (Shove and Walker, 2010) or providing enough structure to ensure progress, while concurrently encouraging divergent perspectives as a source of novelty generation. Finally, to the extent that robust action appears to be working at a local level, it is unclear whether such local solutions will coalesce into a global solution. Our case studies provide some evidence of how such scaling-up might occur, but ultimately this is an empirical question for further research.

5.2. Comparison with other sustainability approaches

In this regard, it is beneficial to explore whether robust action can be applied in conjunction with other sustainability approaches such as common pool resource management (Dietz et al., 2003; Ostrom, 1990) and the framework for strategic sustainable development (Ny et al., 2006; Robèrt et al., 2002). Below we highlight some similarities and differences between robust action and these approaches for addressing sustainability challenges (see Table 2 for an overview). It is in examining the extent to which robust action and these other leadership approaches can be aligned that we believe the greatest potential for future research lies.

Research on common pool resource (CPR) management, or "governing the commons" (Ostrom, 1990) has in recent years expanded from its original contexts — such as small-scale fisheries and management of grazing lands — to large-scale sustainability concerns. Ostrom and colleagues have suggested that the mechanisms which encourage self-managed groups to work on a continuous trial-and-error basis and generate sophisticated, effective solutions are also applicable for larger systems (Dietz et al., 2003; Ostrom, 2009). Somewhat similar to the ideas we have espoused above, CPR management can successfully engage with global challenges if these can be accurately construed as the sum of numerous local problems. Thus, Ostrom suggested aggregating wins on multiple local geographies as a possible solution for global issues, such as sustainable oceanic ecosystems (Ostrom, 1990: 27).

Yet, where Ostrom and colleagues essentially direct their efforts towards improving public policy, robust action does not focus narrowly on re-shaping governance structures. Instead, the focus is on leveraging general operating mechanisms that are useful across various contexts and that engage multiple constituencies. Notwithstanding, CPR management can potentially inform robust action with regards to the prevention of cooptation, because the architecture it proposes allows for accountability to flow in all directions, not just top–down or bottom–up. It also can be effective in promoting urgency, by directly involving those whose livelihoods are at stake, and for whom meaningful action is imperative.

Table 2
A comparison of leadership approaches for advancing sustainability.

	Conventional management	Common pool resource management	Framework for strategic sustainable development (FSSD)	Robust action
Typical contexts	Hierarchical organizations	Commons (i.e., non-excludable, rivalrous goods)	Sustainability, at organizational and supra-organizational levels	Grand challenges (e.g. climate change, poverty)
Participants	Managers of an individual organization	Resource users and regulators at overlapping levels of jurisdiction	Organization or community members	Multiple and changing constituencies
Ultimate goals	Accomplishing organizational mission; survival	Maintaining viable common pool resources	Predetermined through system conditions	Emergent
Theory of action	Instrumental action	Institutional (rules and norms)	Game theoretic backward-induction	Novelty generation, sustained engagement
Model of authority	Hierarchical control (top—down)	Adaptive governance (both top down and bottom up)	Top down definition of success, participatory backcasting	Weak formal authority, or none at all
Examples of success	General Electric, Shell, DuPont, and others	Fisheries, oil fields, grazing lands	Electrolux, Whistler, and others	Wind power, GRI, microcredit, and others
Exemplary citations	Andrews, 1971; Ansoff, 1965; Chandler, 1962; Simon, 1947	Dietz et al., 2003; Ostrom, 1990, 2009	Ny et al., 2006; Robèrt et al., 2002, 2005; 2013	Ferraro et al., 2015; Leifer, 1991; Padgett and Ansell, 1993

Another notable approach to sustainability is the Framework for Strategic Sustainable Development (FSSD) (Ny et al., 2006; Robèrt et al., 2002, 2005, 2013), which has been deployed effectively over the past decades in a variety of organizations and communities. The FSSD is founded upon a rigorous, science-based conceptualization of sustainability: the FSSD sustainability principles are derived from a planetary perspective and serve as boundary conditions within which possible solutions within sectors can be harmonized at a global scale.[3] The FSSD does not prescribe specific actions to address the planetary constraints it identifies, but it does grant science a position of epistemological primacy, sidestepping the fundamental challenge that the pursuit of sustainability entails: translating scientific consensus into political and social action. Recent research emphasizes that effective action is more likely to emerge by confronting and debating the different frames we use to understand sustainability than by insisting on adherence to one dominant frame (Garud and Gehman, 2012; Nisbet, 2009). Robust action builds explicitly on this evidence by employing multivocal inscription to sustain long term engagement and to create opportunities for novelty generation.

Yet, here too, there are important potential linkages that can inform future theorization. For example, the FSSD's use of backcasting strategies to stimulate group creativity certainly resembles distributed experimentation, providing pathways for translating small wins into major advances. Moreover, the FSSD provides important architectural principles for engaging various constituencies in processes of visioning and innovation. Accordingly, an interesting topic for future research is whether or not robust action in combination with FSSD can strengthen the effectiveness of both approaches.

6. Conclusion

At first glance, the counterintuitive nature of robust action, its potentially unhurried pace, and its perceived lack of conviction and ideology may seem to pose a poor antidote to the sustainability crisis. Nevertheless, several decades of real-world experience with conventional management approaches reveal that traditional leadership has, by and large, not been effective in promoting sustainability. The case of climate change is paradigmatic. Despite an overwhelming scientific consensus, we have so far failed to act

collectively to address the problem, not because we did not know what needed to be done, but because we employed conventional management frameworks (Jamieson, 2014). Precisely because our failure in combatting climate change and other sustainability issues is so apparent, it is imperative to thoroughly understand the shortcomings of current management models and, armed with that knowledge, change our approaches accordingly.

We believe that leadership through robust action may be particularly well suited to our times, not only because the sustainability crisis is so dire, but also because our organizational and social landscapes themselves are undergoing seismic shifts, rendering traditional models of leadership less effective. At present, organizations are less central in our economies (Davis, 2009, 2013), giving rise to fluid networks of affiliation oriented to goal attainment, as opposed to the lumbering hierarchical monoliths that towered over the twentieth century landscape. Similarly, nation-states are weaker, no longer as dominant as they once were in shaping policy (Habermas, 2001; Scherer and Palazzo, 2011). A large number of national and transnational issues are thus increasingly resolved through private regulatory processes and multi-stakeholder initiatives (Bartley, 2007; Mena and Palazzo, 2012), rather than through the traditional nation-state tools of fiat and redistribution. Technology, with the Internet of course as its defining feature, promotes unlimited accessibility to knowledge and ideas, thereby spurring decentralized innovation. Younger generations are bringing energy, commitment, and collaborative problem solving skills to problems that they increasingly understand are central to their futures. But the combined forces of local, distributed and engaged actors, together with the enabling power of technology, will not translate into effective solutions, unless we devise a template that explains how emerging local solutions can scale to address the global challenges we face (Morozov, 2013). In this reality of changing societal and organizational conditions, it is important to apply a framework that unflinchingly departs from accepted leadership dogma, and that is in fact tailored to this era in human history. Robust action fits the bill.

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[3] We thank one of our reviewers for precisely clarifying the core tenets of FSSD.

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