

Chapter 8

Sustainable Business Model Innovation: Using Polycentric and Creative Climate Change Governance

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ABSTRACT

Establishing a sustainable energy future can justifiably be considered the next frontier in global sustainable development under the agenda laid out in the Sustainable Development Goals (SDGs). The newly adopted Paris Agreement which seeks to hold global average temperature increase to “well below 2°C” above pre-industrial levels inserts additional urgency into this agenda. To realize the commitments outlined in the agreement, implementation of innovative sustainable business models capable of producing strong mitigation and adaptation outcomes is required ‘on the ground’ and needs to be available for subsequent diffusion across different countries, contexts and domains. This chapter explores the value of polycentric climate change governance through an investigation of sustainable business model innovation. An example of a sustainable business model, called the Sustainable Energy Utility (SEU), is evaluated and an assessment of United Nations-based programming to aid future diffusion of such business models is conducted.

INTRODUCTION

The intergovernmental Millennium Development Goals (MDGs) effort, chartered in 2000 around eight aspirational targets for the world to achieve by 2015, has been able to realize impressive results (Galatsidas & Sheehy, 2015). Following the 2015 conclusion of the MDGs, the United Nations introduced a new and more comprehensive set of 17 aspirational goals for sustainable development. Formulated under the rubric of the Sustainable Development Goals (SDGs),¹ this effort builds on the lessons learned from the

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MDGs and lays out targets for 2030. An important development with the new set of goals is the ambition to “ensure access to affordable, reliable, sustainable and modern energy for all”. The inclusion of sustainable energy is significant as access to clean sources of energy is vital to overcome both development and climate change challenges (Kaygusuz, 2011). Indeed, establishing a sustainable energy future can justifiably be considered the next frontier in global sustainable development.

The 15-year agenda laid out in the SDGs is ambitious and will, among others, rely on a globally determined endeavor to mitigate currently ongoing global environmental change processes, particularly climate change. The recently articulated desire to hold global average temperature increase to “well below” 2°C (3.6°F) above pre-industrial levels and to “pursue efforts” to limit temperature rise to 1.5°C (2.7°F) above pre-industrial levels in the newly adopted ‘Paris Agreement’ inserts additional urgency into the agenda (FCCC/CP/2015/L.9). The challenge, as such, is to not only identify pragmatic, innovative, and disruptive practices but to also aid their diffusion around the world in a timely manner. The “structurally weak” and entirely voluntary Paris Agreement (Grubb, 2015), however, did not establish a strong global architecture capable of forcing such identification and diffusion as some dreamed it would earlier in the negotiations.

Therefore, to realize – and, perhaps, exceed – the commitments outlined in the Paris Agreement, innovative implementation of sustainable business models capable of producing strong mitigation and adaptation outcomes will need to take place ‘on the ground’ and be subsequently shared on a global platform for adoption in other contexts (Taminiau & Byrne, 2015). A strategic reconsideration is in order and, throughout this chapter, we highlight the need for ecological governance and explore the value of collective creativity. The chapter sets out the following objectives:

- Describe a proposed re-configuration of global environmental change response strategies that prioritize polycentric collective creativity over collective action (Section 2.0);
- Highlight the need for sustainable business model innovation as a key component of a polycentric collective creativity strategy (Section 3.0);
- Offer an example of a sustainable business model that could change the energy consumption paradigm (one of the key sectors contributing to climate change) (Section 4.0); and
- Assess how United Nations-based programs can be positioned to facilitate the development and diffusion of sustainable business practices in order to contribute to the UN’s objectives of peace, development, *and* global sustainability as outlined in the SDGs (Section 5.0).²

POLYCENTRIC GOVERNANCE AS A STRATEGY TO ADDRESS GLOBAL ENVIRONMENTAL CHANGE

Guided by the success of battling ozone depletion, the theory of ‘collective action’ has long been positioned as the key response option to global environmental change. Essentially, the rationale is simple: local environmental complications required local solutions and, therefore, global environmental challenges require global strategies. For instance, the effort to address the issue of climate change – what can justifiably be called the most challenging environmental problem modern society has encountered – has consistently revolved around ‘collective action’ and has frequently been designated “inescapably global” (Depledge & Yamin, 2011).

Now more than two decades old, the global effort to address climate change through the United Nations Framework Convention on Climate Change (UNFCCC) has reached a point where the rationale of collective action has been drawn into question. Repeated shocks to the process, most notably the failure to craft the much-hoped for agreement at ‘Copenhagen’³ in 2009, has shaken the belief that a collective agreement along the configuration pursued throughout the negotiations is still feasible. In short, the climate change discourse has been a struggle (Jordan, et al., 2015).

The climate change narrative is emblematic for the state of global sustainability in our day and age. For instance, the UN Convention on Biological Diversity (CBD) failed to reach its 2010 target of ‘a significant reduction of the current rate of biodiversity loss at the global, regional, and local level’ and is contemplating how to move forward (Mace, et al., 2010; Secretariat of the Convention on Biological Diversity, 2010). The international community’s commitment to repair the deteriorating conditions of the world’s oceans (Cicin-Sain, Balgos, Appiott, Wowk, & Hamon, 2011) and coral reefs (Chin et al., 2011; Miller & Spoolman, 2012) has similarly been unable to halt degradation. Indeed, continued comprehensive assessment of the sustainability state of the world highlights that, despite substantial progress in some fields, remarkably little progress has been realized even with the deployment of significant political resources (Intergovernmental Panel on Climate Change, 2014; Worldwatch Institute, 2015). Moreover, reframing global sustainability as a ‘nested’ concept of environment, development, and economic progress – rather than the traditional and separate ‘pillars’ of sustainable development – makes clear that continued inability to substantially alleviate these environmental pressures will continue to undo progress in other areas (Griggs, et al., 2013).

Indeed, the latest evidence of ‘planetary boundaries’, ‘tipping points’, and non-linear positive feedbacks, mandates careful reconsideration of international environmental regimes, institutional governance, and regime compatibility with global sustainability trajectories (Steffen, et al., 2015). Ecological response to human-induced change is nonlinear, uncertain, and unpredictable (e.g., Schuur, et al., 2015).⁴ While this “super wicked”⁵ nature of global environmental challenges militates against one-shot, large-scale, top-down response frameworks (Levin, Cashore, Bernstein, & Auld, 2012), the ‘collective action’ thought process seeks problem resolution precisely in such forums (Hare, Stockwell, Flachslund, & Oberthur, 2011).⁶

Impatience with the “painfully slow” process (Neslen, 2015) of establishing effective, top-down regimes,⁷ has prompted the research community to ask “must we wait for global agreement?” (e.g., Ostrom, 2010b; Hoffmann, 2011). Such social inquiry has produced an alternative model relying instead on ‘adaptive’ or ‘polycentric’ governance (Ostrom, 2010a; Galaz, Crona, Österblom, & Folke, 2012; Ostrom, 2014).⁸ The emerging governance model can be considered ‘ecological’, seeking to enhance institutional ‘fit’ with the complexity of Earth’s social-ecological systems (Ostrom, 2014).

The non-linear, uncertain, and unpredictable character of environmental degradation could thus be answered with a dynamic, non-linear, and experimental strategy organized through ‘polycentric’ networks of creative innovation and leadership (Taminiau, 2015; Taminiau & Byrne, 2015). Indeed, significant levels of sub-national and local experimentation can be observed and one of the better known examples is the promulgation of city strategies (e.g., Broto & Bulkeley, 2013).⁹ Successful implementation of such city strategies could yield substantial benefits: a recent report, for instance, put the global economic opportunity for low-carbon urban actions at \$16.6 trillion over 2015-2050 (New Climate Economy, 2015).

While the international community achieved global consensus regarding climate change in the form of the recently adopted Paris Agreement, the agreement itself continues to allow for such polycentric governance as the new strategy moving forward due to its structural weaknesses and nationally de-

terminated climate change commitments. Indeed, the proposed nationally determined contributions are estimated to be insufficient to realize the international commitment (Climate Action Tracker, 2015) and successfully responding to the scale of the challenge will require more transformative innovation and change (Burch, Shaw, Dale, & Robinson, 2014, pp. 472-473). A potential pathway forward is the active identification of ‘creative leadership’ and to assist their further diffusion in order to scale up the response (Taminiau & Byrne, 2015). Here, the widespread diversity of polycentricity, while positioned as one of its key strengths together with iterative learning and experimentation, offers the challenge of navigating a ‘chaotic’ landscape of innovations and leadership examples. Innovations that stand out, due to for instance their capacity to normalize sustainability in business practices or to attract sufficient investment, need to be identified, deconstructed to their core innovative characteristics, and appropriately reconstructed in different contexts around the world keeping in mind local cultures, mind-sets, enabling capacity, and so forth.

As such, we contend that a process capable of identifying pragmatic and leading solutions is required that can subsequently deconstruct such examples of leadership into critical building blocks that can be introduced and adapted to new contexts. In effect, the evolutionary process of polycentric governance, revolving around adaptation to new circumstances and iterative problem-solving, requires the equivalent of a ‘natural selection’ process that can uncover the ‘genetic material’ of the innovation and contribute to its diffusion and further evolution. This line of argument aligns with the ‘ecological’ model of collective creativity as explained by, for instance, Staber (2011, p. 32): “Ecologies evolve in a process of change that populations of units undergo. In biology these units are genes, whereas in the social realm the units may be rules, skills, organizations, or any other entity that is internally cohesive and externally isolated to be able to participate in the evolutionary process”. While various proposals exist for the appropriate unit for such ‘social selection’, Staber positions the ‘idea’ as a key unit for selection: “For an idea to serve as an ecological unit all that is required is that it is identifiable by the person working with the idea and that it *can* be passed on to other people. Whether it *will* be passed on depends on people’s cognitive capacity and the cultural and social environment in which the idea exists” (Staber, 2011, p. 33).

Sustainable Business Model Innovation as the ‘Genetic Material’ for ‘Social Selection’

Trillions of dollars will be injected into the economic system over the coming decades to sustain, rebuild, repair, and expand every aspect of society from the built environment, to the energy grid, to roads and highways, etc. (Dobbs, et al., 2013; Jacobsson & Jacobsson, 2012). Indeed, scaling-up (green) infrastructure investment is a key priority of developed and developing countries alike (see, e.g., Asian Development Bank, 2009; OECD, 2014). This realization positions the further development and diffusion of sustainable business models as a critical component in the polycentric approach. In turn, sustainability is an important consideration in business and investment success (e.g., Mercer, 2011). Indeed, an appropriate response to the global environmental challenge requires a fundamental re-direct of investment flows, to be implemented under sustainable business models (e.g., Jackson, 2009). For instance, several of the sustainable economy features as identified by Jackson (2009) highlight the extent of the required reconsideration of the business model:

- A sustainable economy encourages the minimization of consumption or, at least, establishes firm limitations on personal and institutional consumption of water, energy, etc.;

- A sustainable economy seeks to maximize societal *and* environmental benefit, prioritizing the accomplishment of these goals over the maximization of economic growth; and
- A sustainable economy emphasizes the delivery of function, service, and experience. This is in sharp contrast to the current focus on product ownership.

Positioning the business model as the ‘genetic material’, business model innovation offers options for radical change through the active reconceptualization of the purpose of the business and its value proposition. Redesign of the current business model to one of a sustainable business model could allow for integration of sustainability into the core modus operandi of the business (Stubbs & Cocklin, 2008). In particular, the *energy* infrastructure investment ‘gap’ is not only significant in size (e.g., Fulton & Capalino, 2014)¹⁰ but can also, when investments take place along existing decision-making criteria that neglect sustainability, ‘lock-in’ the currently unsustainable trajectory (e.g., Erickson & Lazarus, 2015). As a major contributor to global environmental change, the energy sector is at the front of the challenge and ongoing discussions on energy business model evolution highlight the need to investigate sustainable business practices that allow for deviation from business-as-usual (e.g., Richter, 2012; Behrangrad, 2015).¹¹

A Case Study Example of a Sustainable Business Model: The Sustainable Energy Utility (SEU)

In the U.S., the business model of the currently dominant conventional energy utility, the investor-owned utility (IOU), evolved throughout the 20th century on precepts of centralization, abundance, growth, technology, and supply (Sovacool, 2011). This evolutionary pathway was firmly supported by the ‘regulatory compact’ (Burr, 2007) which effectively established a ‘co-dependent relationship’ between the IOU and the regulator (Brooks, 2015). However, energy sustainability, operationalized through decentralization, renewable energy, and energy efficiency, conflicts with the established business model (e.g., Hess, 2015) and has spurred a lively debate regarding ‘utility of the future’ or ‘utility 2.0’ concepts (e.g., Nadel & Herndon, 2014). Regulators have developed a portfolio of responses that seek to incentivize or push the conventional utility into action. This ‘carrot’ and ‘stick’ approach has left some wondering whether entirely new business models might be more effective in scaling the sustainable energy challenge (Fox-Penner, 2010; Goldman, Satchwell, Cappers, & Hoffman, 2013).

The options for new business models can be categorized in a variety of ways. Structuring utility business models along variables of profit achievement and profit motivation, Satchwell & Cappers (2015) show that proposed regulatory repairs are not likely to bring about a fundamental reorientation of the ‘utility’: profit achievement largely remains commodity-based and profit motivation continues to focus on asset (e.g., ratepayer base) expansion. A similar line of thinking is offered by Richter (2012) as he identifies two basic options: utility-side and customer-side business models. While utility-side blueprints already exist, customer-side business models are emerging and are considered valuable innovation options (Richter, 2012).

The Sustainable Energy Utility (SEU) has been put forth as a model capable of moving beyond the drawing board as it offers fundamental reorientation of sustainable energy business practices (e.g., Byrne & Taminiau, 2015).¹² The next sections outline an analytical approach to the business model as a unit of ‘genetic material’ using Hamel’s (2000) framework (Section 4.1) and apply this framework to the SEU business model (Section 4.2).

The Business Model as an Analytical Tool

The business model provides a valuable unit for analysis (Magretta, 2002) and can be applied as an analytic tool to deconstruct options for sustainable business practice innovation and subsequent diffusion (Loock, 2012; Pätäri & Sinkkonen, 2014; Richter, 2012). Indeed, core elements of business model constructs can assist in the identification of the promise of the innovation and can spur its diffusion. In terms of the energy sustainability challenge, the business model has been positioned as an analytical tool for, among others, analyzing the Energy Service Company (ESCO) sector (Pätäri & Sinkkonen, 2014), investor preference (Loock, 2012), renewable energy (Okkonen & Suhonen, 2010), micro-generation (Provance, Donnelly, & Carayannis, 2011), energy utility evolution (Richter, 2012), distributed generation (Funkhouser, Blackburn, Magee, & Rai, 2015), and energy efficiency programming (Behrangrad, 2015).

Defining ‘business model’, however, is complex, can be approached from many directions and has introduced confusing and overlapping terminology (Chesbrough & Rosenbloom, 2002; Pätäri & Sinkkonen, 2014, p. 266). Commonly positioned terms are value proposition, target market, value chain, revenue generation mechanisms, customer interface, value network or infrastructure, and competitive strategy (Chesbrough & Rosenbloom, 2002; Chesbrough H., 2007; Kindström, 2010; Richter, 2012). Here, we follow Pätäri & Sinkkonen’s (2014) approach, relying on Hamel’s (2000) comprehensive business model framework to evaluate energy sector innovation and extract core units for selection, the aforementioned ‘genes’ if you will, that could inform business practices around the globe.

Hamel’s framework for business model analysis consists of four ‘major’ components (Hamel, 2000, pp. 70-113).¹³ The ‘core strategy’ (major component 1) outlines the business’ competitive decisions and is comprised of a business mission (objective of the strategy), product/market scope (field in which the business is active in terms of customers, geographies, and product segments), and a basis for differentiation (i.e. what is different compared to competitors?). Within ‘customer interface’ (major component 2), fulfillment and support relate to market access, information and insight cover knowledge exchange with customers, relationship dynamics describe the relationship between the business and the customers, and the pricing structure outlines how customers are charged to the services. ‘Strategic resources’ (major component 3) refers to the competitive advantage available to the business, where core competences (business-based knowledge, skills, and capabilities), strategic assets (business-owned assets), and core processes that transform both core competences and strategic assets into customer value. The ‘value network’ (major component 4) represents the suppliers, partners, and coalitions that strengthen the operation of the business.

Case Study: The Sustainable Energy Utility (SEU)

The SEU originated in a set of research papers by the Center for Energy & Environmental Policy (CEEP, University of Delaware) (Byrne & McDowell, 2007; Byrne, Martinez, & Ruggero, 2009). The SEU is a community-based model of development constructed around energy conservation and community-scale renewables and has the aim to permanently lower the use of source materials, water, and energy in an effort to address concerns about climate change, rising energy prices, inequity of energy availability, and a lack of community governance of energy development (Byrne, Martinez, & Ruggero, 2009). The SEU was first implemented in the United States by the State of Delaware and the District of Columbia (Washington, DC). New versions of the model are being implemented by the Commonwealth of Penn-

sylvania and Sonoma County in California. International application of the model is being investigated by the City of Seoul (South Korea) ¹⁴ and the City of Thane (India) (Gopal, 2013).

Deconstructing old business models and re-constructing a new model is a critical step in transformative innovation (Hamel, 2000, pp. 69-70). In the next sub-sections, we decompose the SEU business model in order to illustrate its strategy. Critically, while the SEU shares business model innovation parameters with other innovations like the Energy Service Company (ESCO) model, the SEU model re-envisions every aspect of utility configuration. This is in line with Hamel's contention that "what is not different is not strategic" and, as such, "it is *entirely* about variety – not just in one or two areas, but in all components of the business model" (Hamel, 2000, pp. 69, emphasis in original).

Core Strategy: Return on Environment

The *business mission*, i.e. the overall objective of the SEU strategy, is the dual goal of reducing human-induced environmental pressure and improving social well-being. The importance of this fundamental goal of *satisficing* should not be understated: the essence of the SEU strategy is to redefine what is efficient. For instance, in contrast, the investor-owned utility business mission, by fiduciary responsibility, is to maximize shareholder value which is often achieved through the increase of sales. Effectively, the SEU strategy, rather than emphasizing the maximization of outputs with the same level of inputs, emphasizes the minimization of inputs for a high quality level of outputs (Byrne & Taminiau, 2015).¹⁵ In terms of Hamel's "from" and "to", therefore, the SEU mission is to establish a business model that departs from the current high-throughput society and pursues a low-throughput world, with associated environmental improvement.

The market scope of the SEU strategy expands beyond the traditional utility perspective as the SEU strategy offers a "total solution" that *matches* performance to customer needs (in contrast to building demand by offering more). In addition, the core strategy of the SEU model differentiates itself strongly from conventional utility products as it establishes a practical and creative capitalization strategy for the *negawatt-hour*¹⁶ as opposed to the kilowatt-hour. The dimension of differentiation, therefore, is that the SEU strategy considers "the use value of a product, instead of its exchange value, as the source of its added value, therefore selling function-based services instead of products" (Steinberger, van Niel, & Bourg, 2009, p. 368). A key component of this capitalization strategy is converting the thoroughly accepted 'energy efficiency gap' – i.e. the combined notion that not using energy is much cheaper than using energy and that the very large potential for energy use reductions is not being exploited (Gillingham & Palmer, 2014) – into an accessible value for its customers.

Strategic Resources and Opportunities: Community Utility

Hamel describes core competencies as skills and capabilities that are a) unique, b) valuable to customers, and c) transferable to new opportunities (Hamel, 2000, p. 75). The key core competency of the SEU strategy is the skill, knowledge, and capability to creatively unlock the vast energy efficiency potential that exists in a high-throughput society (Dobbs, et al., 2013; Gillingham & Palmer, 2014). The puzzle of navigating the legal, financial, and policy labyrinth to unlock existing potential for energy savings is solved, in part, by pledging monetary savings from intervention measures towards initial and high up-front investment costs (Byrne & Taminiau, 2015). A second key component of the puzzle is to raise sufficient levels of capital investment to pay for the intervention measures in the first place. The SEU

strategy addresses this critical barrier – lack of sufficient capital is abundantly cited as a major obstacle to investment – by pooling together the pledged monetary savings from program participants and selling this resource on the capital markets to raise capital (Byrne & Taminiau, 2015).

As such, the community represented by the SEU is the key strategic asset available to the SEU model. In what has been described as a ‘community utility’ function (Byrne & Taminiau, 2015), the SEU relies on the value inherent in the community it serves, i.e. the ‘commonwealth’ of the community, and positions it strategically to address pressing problems (Byrne, Martinez, & Ruggero, 2009). Finally, in terms of core processes, the SEU puts in place a range of contractual engagements that raise investor confidence, *guarantee* energy and monetary savings, pre-qualify local and national ESCOs, standardize and facilitate pooled financing, and arrange detailed monitoring and verification that serves a diagnostic function.¹⁷

Customer Interface: Empowering Sustainable Citizens

Like other performance-based models, the SEU strategy repositions its primary target audience from *consumer* to *customer*. However, the SEU strategy expands on this configuration as it empowers customers to become *sustainable citizens*. Here, too, the difference is paradigmatic: shifting from a producer-consumer relationship to, first, a service provider-customer relationship and, second, a relationship geared towards the empowerment of customers in their pursuit of sustainability is dependent on long-term relationships built on mutual trust.¹⁸ Sustainable citizens are provided with the capability of reducing their energy use – and, thus, environmental damage – in an absolute sense.

The SEU model fulfills and supports the transformation of consumer to sustainable citizen as it, as a community utility, positions itself as an independent representative of the community, pools community members together to gain strength in numbers (and thus a more viable financing position), processes and qualifies the companies that are to implement the energy saving measures (i.e. the ESCOs), and ensures monitoring and verification of savings and disciplines ESCOs if performance falls short of guarantees to the point where any shortfall by contract needs to be compensated. Sustainable citizens are empowered by the ‘one-stop-shop’ model of the SEU, delivering energy, materials, and water savings, risk reduction, and managing, for instance, solar renewable energy credit (SREC) market interaction between individual customers generating solar energy through their photovoltaic installations and the conventional energy utilities that are under public mandate to procure SRECs (for more information, see Byrne & Taminiau, 2015). In terms of pricing structure, as mentioned, energy use for sustainable citizens becomes directly tied to required services (e.g., hot water, cooling, lighting, etc.) rather than product-based interaction (i.e. selling of kilowatt-hours). Moreover, customers reap benefits in terms of energy price stabilization, after-contract (i.e. when debt is paid off) savings, and additional savings beyond the guarantee (which is estimated to be up to two times promised savings (Shonder, 2013; Larsen, Stuart, Goldman, & Gilligan, 2014)).

Value Network: Capital Market Access

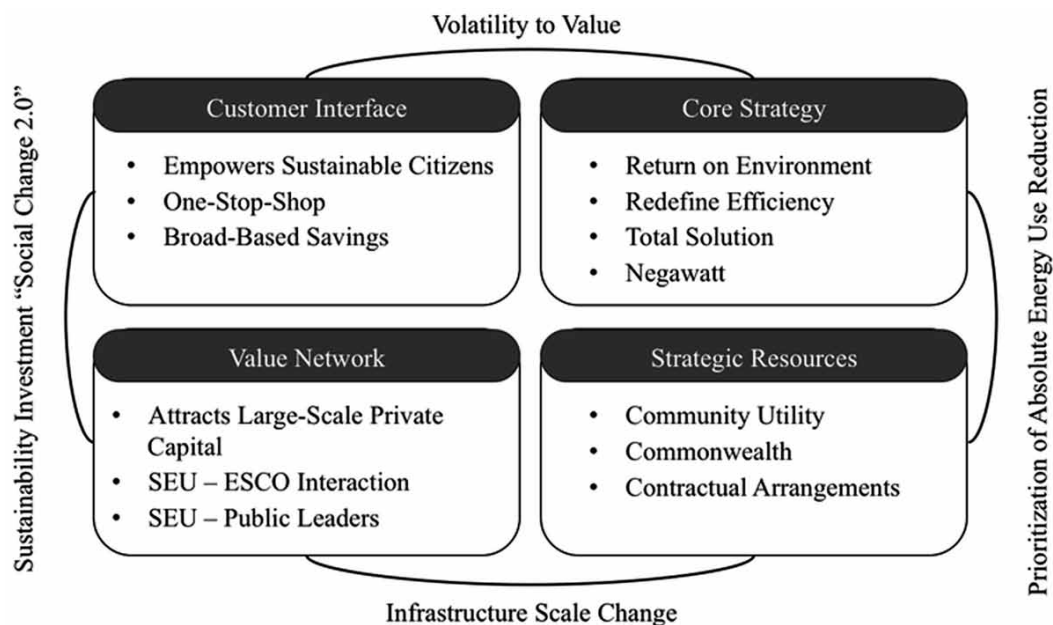
Hamel sees the value network as the asset that “complements and amplifies the [business model’s] own resources” (Hamel, 2000, p. 88). The key value network component of the SEU strategy is its access to the capital markets through the combined deployment of its customer interface, core strategy and strategic resources. The pioneering use of the SEU’s capitalization strategy in Delaware was able to attract a \$72.5 million investment that significantly amplified the SEU’s capability to provide its customers with energy

saving intervention measures. The pooled potential for energy saving that resides in the energy budgets of SEU customers, combined with risk reduction strategies such as guaranteed saving contracts, offers an attractive investment opportunity to investors as evidenced not only by the strong investor interest in the bond offering but also in the Standard & Poor's AA+ rating of the bond. In addition, early evidence with other models supports the hypothesis that "customer intimacy" business models like the SEU, as opposed to lowest price or best technology models, are better positioned to attract investment (Loock, 2012). By tapping into the vast pool of the capital market – the bond market is estimated at \$100 trillion in outstanding debt which is significantly larger than the estimated \$63 trillion equity market) (Climate Bonds Initiative, 2015) and, in 2015, so-called 'climate bonds' and 'green bonds' markets issued \$41.8 billion (Climate Bonds Initiative, 2015) – the SEU is able to scale-up its offering of energy savings to infrastructure-scale change.

Overview of the SEU Business Model

Using a slightly adapted version of Hamel's framework, the customer interface, core strategy, strategic resources, and value network of the SEU business model can be outlined and factors tying the various components together can be identified (Figure 1). The relationships between the various components outline key contributions of the SEU model. First, energy price *volatility* is stabilized through long-term contracts and turned into the key 'negawatt' value proposition. Next, using a redefinition of efficiency, the model prioritizes absolute energy use reductions. Infrastructure-scale change is realized by pooled financing on the capital market. Finally, a reality of "Social Change 2.0" (Byrne & Taminiau, 2015) is established as private capital is directed towards the fulfillment of human needs rather than the maximization of consumption.

Figure 1. SEU business model along adapted version of Hamel's deconstruction



Sustainable Business Model Innovation

Figure 2. Overview of the SEU model and its contribution to the various archetypes (Bocken et al., 2014)

Archetype	Value Proposition	Value Creation and Delivery	Value Capture
Maximize material and energy efficiency	Service-based approach	Improve efficiency, on-site RE	Lower energy use -> cost reduction
Create value from waste	Existing energy 'waste' turned into value	Eliminate life-cycle waste, etc.	Waste minimization -> cost reduction
Substitute with RE & natural processes	On-site RE built into financing	New RE-based value network	Predictable generation, price stabilization
Deliver functionality rather than ownership	Guaranteed savings agreement	Direct customer contact and education	Lowers cost of ownership
Adopt a stewardship role	Broad benefits: e.g., air pollution reduction	Include non-energy benefits in contracts	Green job creation and retention
Encourage sufficiency	Reduce demand-side consumption	Match service delivery with needs	Establishes customer loyalty & trust
Repurpose for society / environment	Sustainability instead of optimality	Societal benefits, e.g., secure livelihoods	Enhances community resilience
Develop scale-up solutions	Max. benefits with vast private capital	Pooled financing, risk reduction	"Deep retrofits"

Another way to look at the SEU as a whole is to consider Bocken et al.'s (2014) concept of the sustainable business model 'archetype'. Figure 2 outlines how the SEU model relates to Bocken's (2014) eight 'archetypes':

1. To maximize material and energy efficiency,
2. To create value from waste,
3. To substitute energy use with renewable and natural processes,
4. To deliver functionality rather than ownership,
5. To adopt a stewardship role,
6. To encourage sufficiency,
7. To repurpose the business for society/environment, and
8. To develop solutions that can reach the appropriate scale.

Diffusion of Sustainable Business Model Innovations: The UN Compact

The reconfiguration of 'collective action' to 'collective creativity' and 'creative leadership' along the lines described above could benefit from another powerful modern reality. This reality is captured in Friedman's (2005) "The World is Flat", describing the changing conditions of society through global-

ization and establishing the reality of the ‘global village’ where “the world went from being small to tiny.” While the process of globalization has contributed to the exportation of many negative effluents of modern society across the world, the ‘global village’ offers a platform for global, real-time communication and knowledge exchange that can facilitate the diffusion of selected innovations and examples of creative leadership. Importantly, international issue networks – such as various UN programs – have been constructed specifically on the notion of a ‘global community’ and could, as such, represent a possible candidate for retooling towards the aforementioned ‘natural selection’ function.

Various initiatives have been deployed by the UN to foster and facilitate sustainable business practices. For instance, the UN Green Economy Initiative assists national transitions to green economies by providing analytical and advisory support. The Green Economy Initiative joined forces with the UN South-South Cooperation program to better assist developing countries. At the core of the South-South Cooperation program is collaboration: developing countries work together on political, economic, social, cultural, environmental and technical issues by exchanging knowledge, skills, expertise and resources. The South-South Cooperation program seeks to foster developing country self-reliance by enhancing creativity and solution-finding capacity and collective self-reliance through the exchange of experiences and the pooling of technical and other resources. An important element within both these initiatives is the recognition that substantial benefits accompany a shift to a green economy in particular for proactive companies that lead their respective industries in the transition to a green economy (UNEP, 2012).

The UN Global Compact was launched in 2000 together with the MDGs and represents an attempt by UN agencies and several NGOs to directly engage the private sector (both companies and business associations) in partnerships through voluntary corporate social responsibility. The initiative was created in a context of heightened perceived gaps in global governance and a period defined by changing UN-business relations (Rasche and Kell 2010). The UN Global Compact has been well received by the business community and the private sector has responded with initiatives such as the World Business Council on Sustainable Development (WBCSD). Overall, the UN Compact’s goal is to establish stable, inclusive, and sustainable markets. To reach this goal, the Compact has introduced ten principles for sustainable business practices, clustered into categories of environment, human rights, labor standards, and anti-corruption. Under these Principles for Responsible Investment (PRI), launched in April 2006, promising social, environmental, and technical innovations are nurtured and connected to broad institutional resources and responses. The PRI program is backed by the United Nations Environment Program Finance Initiative (UNEP FI) and the UN Compact.

UN Global Compact as ‘Social Selection’ Function for Success Story Diffusion

Relationships between the United Nations, its specialized agencies and private sector organizations is multilevel, multi-purpose and multi-issue, making it difficult to advance partnerships in the governance, design, delivery and resourcing of a particular program or cooperative initiative. The described UN initiatives – the UN Compact, the Green Economy Initiative, and the South-South Cooperation—seek to address this weakness by promoting a diversity of partnerships with the private and public sectors to deliver sustainable products and services, facilitate foreign investment, encourage sustainable and responsible business practices, and assist private sector development.

As an aspirational principle-based initiative, the UN Compact helps to establish legitimacy of the corporate responsibility agenda worldwide. As of November 10, 2015, signatories of the UN Global Compact stands at 13,235 (both companies and non-business signatories) based in 170 countries, representing

nearly every industry sector and size, with equal representation from developed and developing countries. As the world's largest corporate sustainability initiative, the UN Global Compact has had noticeable, incremental impact on governments, civil society, companies, and the UN, building a strong base for continued collaboration and partnerships (Rasche and Waddock, 2014). Major and well-respected NGOs have backed it in different ways, for instance by participating in relevant working groups, by engaging in local networks, and by initiating partnerships with businesses and UN agencies (Grajew, 2010; Whelan, 2010). The Compact has developed a solid participant base for engagement.

However, while the UN Global Compact has realized incremental growth of signatories, participant numbers alone are an insufficient proxy measure for impact (Sethi & Schepers, 2014). Real transformational change “is only achieved if qualitative and quantitative growth is balanced – i.e. if more participants engage in the initiative, learn from others, and improve their performance” (Rasche & Waddock, 2014, p. 213). Business practices continue to be characterized by an overwhelming dominance of financial interests over societal and ecological priorities and ad-hoc damage control responses. Some groups have highlighted an emerging promise-performance gap: the program is a “mile wide and half an inch deep: long on promises, short on performance, and mostly silent on transparency and objective reporting” (Sethi & Schepers, 2014, p. 207).

Rasche & Waddock (2014) reject some of the strong criticism leveled against the UN Global Compact by Sethi & Schepers (2014) and position the aspirational and learning-based character of the Compact as a key element of its strategy. This open learning platform nature of the Compact could be advanced by allowing corporations to detail their *transformative* innovations on a “place where issues and ideas that are difficult for companies to deal with independently can be discussed, debated, and incorporated voluntarily” (Rasche & Waddock, 2014, p. 214). This dynamic character of the UN Global Compact offers a potential fit with the polycentric governance strategy discussed in Section 2.0 and the need to accelerate sustainable business model innovation and diffusion. Improving the Compact's capacity to motivate transformational change along financial, environmental, social, and ethical dimensions will require, at least, efforts in six inter-related issues: a) increasing effective participant engagement, b) empowering local networks, c) managing coherence of the global portfolio, d) building more uniformly engaged responsible business practices in support of UN goals, e) strengthening governance frameworks and accountability, and f) developing sustainable funding mechanisms (UNGC, 2015).

We offer that the deconstruction of business model functioning, like was done in this chapter for the SEU, could become a function of a UN-based program like the Global Compact. Such an open learning platform suitably fits with the characterization of polycentricity as an arena in which a multitude of actors and strategies co-exist in the form of a ‘biodiverse’ ecosystem: “the creative process evolves best in ecological systems that are open and heterogeneous and thus provide new opportunities for change” (Staber, 2011, p. 32). The UN-based Global Compact could leverage its strong and global network of participants and use its heterogeneous and open platform for the diffusion of sustainable business models. Efforts in this direction, particularly when considering cross-border interactions, would be well pressed to incorporate the lessons learned from earlier successes of knowledge and technology transfer,¹⁹ including but not limited to:

- Complex and novel innovations are more difficult to transfer but are typically associated with a higher degree of knowledge assimilation in the host country;
- Developing country experience and institutional contexts (i.e. ‘enabling environment’) require capacity-building strategies that expand beyond the innovation itself;

- South-North (as opposed to North to South) and South-South opportunities should not be neglected as growth in innovation capability, particularly in China and India but also elsewhere, represents increasingly more attractive cooperation options (Tawny, Miller, & Bazilian, 2015);
- Deconstructed elements of innovations along the lines proposed above should be reconstructed in a contextually-appropriate manner where pro-poor policy approaches are prioritized over ‘hard’ (i.e. hardware-centric) technology transfer; and
- Certain sectoral applications – like energy efficiency innovations – appear better positioned to include knowledge and technology transfer.

Finally, to avoid the sense of UN endorsement of certain business practices over others network members fulfil the function of both innovative business model identification (through self-reporting their innovation into the platform) and business model ‘social’ selection by marking innovations as potentially useful for their context. Follow-up steps could include that the UN Global Compact brings together idea originators and interested parties to explore the diffusion of the model in different contexts.

CONCLUSION

Upon ratification, the Paris Agreement will become a new cornerstone of global climate change governance. Its voluntary and nationally determined character – unlike previous iterations and attempts at global climate governance which relied on stronger, top-down architectures – continues to facilitate the further development of nascent transnational, national, and sub-national networks and partnerships as a complementary and creative strategy. It appears likely that this polycentric paradigm will be the main pathway with which global climate change will be navigated (Taminiau & Byrne, 2015; Jordan, et al., 2015). The sustainable development conundrum is compounded by the urgency and scale of today’s global environmental change processes. The strategy will therefore have substantial consequences for the prospects of fulfilling the SDG set of targets.

This book chapter maintains that a reliance on collective creativity, innovation, and leadership could help communities scale these challenges. A possible advancement of such a strategy is the development of a platform with strong local networks to allow global diffusion. The UN-based Global Compact is a possible candidate for such a function as it can leverage its over 13,000 signatories based in 170 countries to diffuse new, transformative ideas.

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ENDNOTES

- ¹ The set of targets has the official title of “Transforming our World: the 2030 Agenda for Sustainable Development”.
- ² Arguably, the United Nations successes on overall development and peace-keeping have outpaced its capacity to attain global sustainability. It is of vital importance that similar efforts are invested in global sustainability.
- ³ The supreme decision-making body of the UNFCCC, called the Conference of the Parties (COP), is often referred to by the location in which the annual negotiations were held. Most recently, the 21st installment of the COP (also called COP-21) was held in Paris in December 2015. ‘Copenhagen’ (2009) was the 15th negotiation since the COP forum started.

- ⁴ Schuur et al. (2015) presents the dynamic relationship between climate change and organic carbon stored in the Arctic and sub-Arctic regions' permafrost; aspects of the subsequent feedback loop remain 'poorly understood.'
- ⁵ The term "super wicked" was introduced by Levin et al to introduce a new category of global environmental problems. Key features of a "super wicked" problem are: 1) the problem is urgent and requires responsive problem-solving; 2) everyone contributes to the problem of climate change and everyone is affected, but with different levels of contribution and consequences; 3) there is no central authority to address the problem or, if there is, the central authority is inept; and 4) the future is discounted beyond what the economic tool of the discount rate suggests is considered rational, delaying action. The 'super wicked' concept expands on the previously introduced 'wicked' policy problem that was characterized by: 1) the problem is symptomatic of deeper problems; 2) the problem presents unique opportunities for action that can't be easily reversed; 3) there is no clear set of alternative solutions; 4) the problem presents contradictory certitudes; 5) the problem contains redistributive implications for entrenched interests; and 6) the problem is persistent and insoluble.
- ⁶ Hare et al (2011) contends that the 'collective action problem' is contingent on 'global coordination' and the establishment of an effective system to support global coordination.
- ⁷ Major other concerns have also plagued the negotiations. For example, concerns have revolved around: a) the sustainability performance of negotiation outcomes (such as the 'Kyoto Protocol'), b) the capability to meet justice demands such as removing the existential threat to the poor and c) to ensure that those responsible for the problem of global environmental change are the ones to lead the effort. In particular, the retreat by the United States from the negotiations in the early 2000s has plagued the negotiations for the better part of the last decade.
- ⁸ The polycentric model has been developed in the 1960s but has only recently been applied to address global environmental change, particularly climate change (Ostrom, 2014).
- ⁹ While Broto & Bulkeley (2013) analyzed the rising trend of 'urban climate change experimentation' as an approach to climate governance, it is important to recognize that experimentation is occurring at all levels of government and across national and even continental borders (see, e.g., Galaz, Crona, Österblom, & Folke, 2012).
- ¹⁰ Fulton and Capalino (2014) discusses the gap in 'global investment in clean energy.' The report presented strategies to have the annual investment in this sector increase to the \$1 trillion goal, thereby eliminating the current gap.
- ¹¹ Richter (2012) argues that as renewable energy continues to be adopted, utilities must reappraise their current business model and make advantageous adjustments. To support this energy transition, Richter analyses two generic business models: utility-side business models and customer-side business models. He acknowledges the advent of customer-side business models. Similarly, Behrangrad (2015) considers the demand-side business model. Behrangrad analyzes the relationship between the demand side management ('modifications in the demand side energy consumption pattern to foster better efficiency and operations in electrical energy systems') business model and, segments of a business-as-usual electricity market.
- ¹² The SEU model was developed through a 2007 task force study spearheaded by Dr. John Byrne (Center for Energy and Environmental Policy, University of Delaware, USA) and Delaware Senator Harris McDowell III.

- ¹³ The framework also includes three ‘bridge’ components and four ‘factors’ that are only limitedly described in this chapter in Section 4.4.5.
- ¹⁴ See, for instance, the archives of the 2013 Seoul International Energy Conference at: <http://env.seoul.go.kr/archives/34476> (Korean source).
- ¹⁵ This is a simplistic explanation of a deeper discussion concerning the theoretical underpinning of ‘optimality’ versus ‘sustainability’. For a recent publication on the optimality versus sustainability discussion, see Byrne & Taminiau (2015).
- ¹⁶ This is a term coined by Amory Lovins to describe the unit of energy that is not used (Lovins & Lovins, 1982).
- ¹⁷ For more information on the contractual arrangements of the SEU model, please see the Foundation for Renewable Energy & Environment (FREE) policy brief series, which covers the SEU model but also other topics, at <http://freefutures.org/policybriefs/>.
- ¹⁸ Trust is a critical component of the arrangement: innovations that have insufficiently established relationships on mutual trust encounter difficulty in moments of uncertainty based on, for instance, information asymmetry (Berry & Ormond, 2015). For instance, Berry & Ormond (2015) note that: “Politicization of the conflicts inherent in innovation, cost recovery, and customer options is detrimental to a long- run, open process to advance consumer and societal welfare” (p. 69).
- ¹⁹ For an in-depth review and empirical analysis of this topic, see for instance Gandenberger et al. (2015) or Tawny et al. (2015). Knowledge and technology transfer experiences indicate that, when thoughtfully applied, ideas and technology can be successfully disseminated across borders and sectors. For example, Gandenberger et al. (2015), analyzing the experience with the climate change mitigation-focused Clean Development Mechanism, find that about two-thirds of the evaluated projects indicated a medium to very high level of knowledge and technology transfer.

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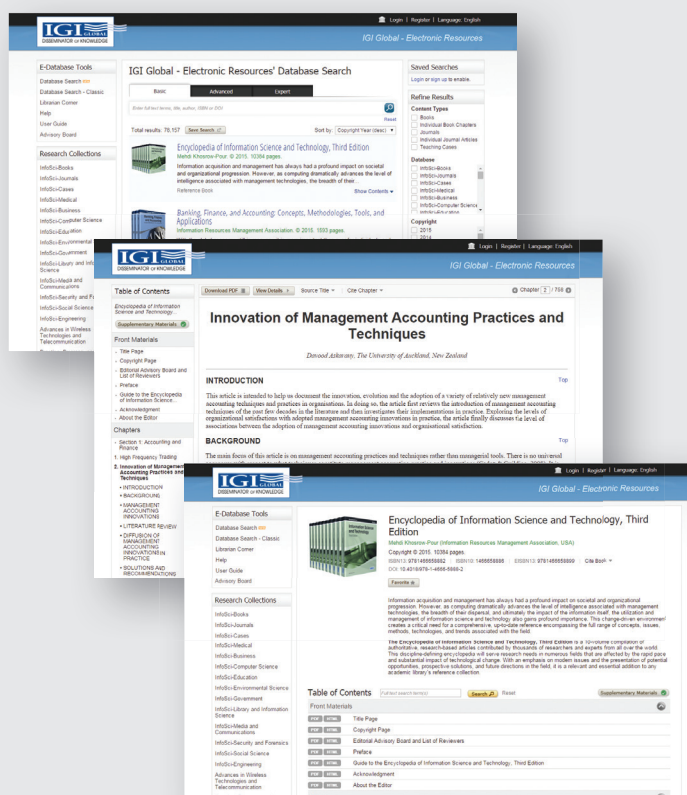
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