Working Paper

Field Structuration Around New Issues: Clean Energy Entrepreneurialism in Emerging Economies

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Ross School of Business Working Paper
Working Paper No. 1180
November 2012

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ABSTRACT

This research examines how the structure of an organizational field takes form as an entrepreneurial venture arises and is legitimized. Case studies illustrate start-ups initiating clean energy adoption in underdeveloped economies in poorly electrified regions. This research proposes that in the absence of legitimacy-building mimetic, normative and regulative mechanisms, unique types of endorsements legitimize new firms. The structure of the field is initiated by an entrepreneur and legitimation occurs through: 1) a positive collective vision, 2) prominent, endorsing funding partnerships, 3) alliances with influential community leaders, and 4) international connections related to reverse innovation, thus coalescing the local organizational field.

INTRODUCTION

Recent research has argued that entrepreneurial business model and technology innovations applicable to clean energy are increasingly driven by developing economies. In addition, evidence is emerging that reverse innovation (frugal reinvention of technologies from developed country origin) is scaling and has the potential to offer clean energy solutions for the West (Talukdar et al., 2010; The Economist, 2010; Eyring, Johnson, and Nair, 2011). Given this premise, how does entrepreneurialism operate to influence renewable energy adoption in areas off-grid or undersupplied by grid electricity? Moreover, how does the local entrepreneur leverage indigenous resources and support structures to develop new technology ventures and scale market adoption domestically or through export mechanisms? This research theorizes on the structure of and interrelationships of organizational and individual actor influences within an

organizational field that support local entrepreneurship in renewable energy, and local community adoption of the energy source.

The context is an off-grid community or one undersupplied with electricity in a developing or emerging economy that does not have a government directed energy sector. Thus, government could be an influencing actor, but it does not play a strong role in the local energy decision; instead, the decision is market and/or community- consensus driven. If this latter market-driven condition were not established, then how the field formed would not be in question since government would drive it, as in China. For example, the Chinese government has motivated energy source changes by distributing bio-gas stoves, mini-hydro generation, and biodigesters, primarily in rural areas (Hawkes, 1986; Cheng, 1997; Edwards et al., 2004); the Chinese government is behind all energy policy whether traditional/renewable and urban/rural (Kempener, Anadon, Condor, 2010) so, in this type of command and control setting, it is difficult to make attributions to the formation of local organizational fields around entrepreneurial ventures; it is too hard to distinguish between free agent and government initiations.

The theoretical question we investigate is, "How does the structure of the organizational field take form as a new firm arises in a community and what constellation of actors influences local adoption of the firm's offerings?" This work contributes to institutional theory (DiMaggio and Powell, 1983; Meyer and Rowan, 1977) by further developing the area of contested practices (Oliver, 1991; Kitchener, 2002; Sanders and Tuschke, 2007; Pache and Santos, 2010) and field level change around issues (Hoffman, 1999). Scott (2001: 84) describes the concept of an organizational field as "a community of organizations that partakes of a common meaning system, and whose participants interact more frequently and fatefully with one another than with others outside the field." Additionally, fields may be "…formed around the issues that become

important to the interests and objectives of a specific collective of organizations" (Hoffman, 1999: 352).

Early work by Hoffman (1999) was tested in the context of the US chemical industry that had a long history of polluting. Motivating change in that context towards cleaner practices was very challenging and occurred slowly over decades. The chemical industry has been resistant to adopting environmental practices and most of the work in the area of contested practices examines controversial change that results in heterogeneity rather than homogeneity in the field, warring factions, and even breakups of firms (Oliver, 1991; Hoffman, 1999; Sanders and Tuschke, 2007; Pache and Santos, 2010). In addition to Hoffman's (1999) work, Farjoun (2002) studies the turbulent online database industry and finds that change in an industry is affected by path dependence and constant conflict of opposing forces. Historical context affects adoption and firms are imprinted by their originations (Katila, Chen, and Piezunka, 2012). Delmas and Toffel (2004) combine institutional and stakeholder theory to examine the drivers of adoption of environmental management practices beyond those required by regulation; coercive and normative forces from various stakeholders are posited; however, the theory development is contextless and such wide generalizability is unlikely. Kitchener's (2002) study examines uncritical adoption whereby particular actors are very strategic in their approach to convince others of the legitimacy of changes without strong bases of evidence. The study uncovers the antecedents of myth construction in a qualitative case study of professional services firms when adoption of mergers is desirable by some; thus, actors in the field are convinced of a myth, that mergers are a positive path for firms, without substantial evidence. His research demonstrates how controversy may be avoided around an issue that would otherwise be contested.

In contrast to these other studies of long histories of controversy around a change, this study examines how the structure of the organizational field takes form as a new issue of interest to a community arises. The issue does not have such a history of controversy because it is relatively new in an off-grid/undersupplied community of a developing or emerging economy. Although the energy supply issue will be of great common interest to such a community, it is not clear at first whether the issue could become controversial even without having much of a history in the region. We study how various actors come together around or become influential on a decision to adopt through some existing cases. This builds on Hoffman's (1999) work that recognized that fields form around issues. We theorize on the influential interrelationships that form and what the structure of the field looks like when faced with a new issue and its solution.

If the solution is the birth of a new clean energy business, how do these firms build legitimacy to support their survival (Meyer and Rowan, 1977; DiMaggio and Powell, 1983)? Legitimacy is defined as, "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995: 574). Legitimacy helps new firms get over the liabilities of newness and foreignness and is considered a critical facet for a young firm's survival (Stinchcombe, 1965; Zaheer 1995; Turcan, 2011). Previous literature has considered mechanisms such as conformance, selection, manipulation, creation, and mimicry that support legitimation (DiMaggio and Powell, 1983; Oliver, 1991; Suchman 1995; Zimmerman and Zeitz, 2002; Turcan, 2011; Miller, 2012) but many are not operative in the remote contexts of this research, as will be briefly explained. For example, conformance to rules when there really are no relevant rules for such a new industry, except that the government has to allow the entry of the new energy firms, cannot, therefore, build a firm's legitimacy (Suchman 1995). Also, the

entrepreneurs in these types of locations are not generally financially or politically free enough to select their environment, as compared to, for example, Silicon Valley, where they would find a supportive place for their innovations (Suchman, 1995). Instead, they choose to improve the environment that they are in. Therefore, manipulation is a possible approach that an entrepreneur may use, exemplified by developing relationships with other entities, as will be elaborated upon later (Oliver, 1991; Suchman, 1995). Creating new innovations can also build legitimacy and this is addressed in conjunction with a new firm's involvement in reverse innovation, also discussed later.

Mimetic isomorphism is difficult because there are few or no relevant previous models to copy in this context. After structuration occurs such that an organizational field emerges, theory suggests that organizations homogenize through mimicry (DiMaggio and Powell, 1983). Organizations adopt the same innovations and as the innovations spread, they gain legitimacy, thus leading to more adoption (DiMaggio and Powell, 1983). The innovations are normatively sanctioned such that higher performance is not necessarily what is legitimized (DiMaggio and Powell, 1983). However, in this research, in the locations where firms start up, there are no previously established alternative energy sources and possibly, no reliable energy sources at all. Very aptly, the entrepreneurship literature characterizes emerging industries as uncertain and full of causal ambiguity (Lippman and Rumelt, 1982; DiMaggio and Powell, 1983; Starr and Macmillan, 1990; Miller, 2012), and in the context in which there is no mature industry, these aspects are heightened. However, previous research also suggests that there are benefits in new markets for entrepreneurial technology firms such that they have more control than if they arise in established markets (Hart and Christensen, 2002; Morey et al., 2011; Katila et al., 2012). In other words, an undeveloped market does not contain competitors and entrenched consumers

(Hart and Christensen, 2002; Morey et al., 2011; Katila et al., 2012). In any case, a new firm's legitimacy develops through other influences, aside from mimetic isomorphism and some of the other mechanisms, as will be discovered through the cases. Generally, the mechanisms proposed here are endorsements of types unique to the context. Thus, this work also contributes to research on emerging industries in entrepreneurship (Aldrich and Fiol, 1994; Granovetter and McGuire, 1998; Sine and David, 2003; Miller, 2012), in addition to the contested practices literature.

The firms in past studies of contested practices, whether a field level study or one that examined intra-organizational issues, were in mature stages of the organizational lifecycle, i.e. large corporations with established markets, not small entrepreneurial firms as in this research (Hoffman, 1999; Sanders and Tuschke, 2007; Delmas and Toffel, 2008; Delmas and Montes-Sancho, 2010). In accordance with previous research in entrepreneurship, we define entrepreneurial firms as those, "that start from weak market positions with few resources" (Katila et al., 2012: 117). Most studies in contested practices have been in the US context and the occasional study has been European, such as Kitchener's (2002), set in the large German firm context. In contrast, this study examines new firms that have no other similar local competition and that grow out of a local developing or emerging market community (Martinot et al. 2002). Thus, they are much more embedded in their organizational fields than are large firms and they find it difficult to make unilateral decisions that also affect the community (Martinot et al., 2002; Greenwood and Suddaby, 2006). This is a theoretical explanation for why the study is likely positioned in a more cooperative situation of adoption than in previous research.

In this research, the issue that results in field formation is adoption of a clean energy supply by local firms and/or the local developing community that results in some significant and broader beneficial changes such as local economic development, firm expansion, or significant

change in the local standard of living (UNDP, 2000). The field includes many interested stakeholders such as various levels of government, community members and organizations, non-governmental organizations (NGOs), and firms in emerging economies that influence and may jointly decide upon an energy supply. Local entrepreneurial firms, through their energy innovation, may even invent, generate, distribute, and/or install the sustainable energy supply. Since energy becomes part of the local infrastructure, the choice of the type of energy source is not necessarily at the sole discretion of any single stakeholder and patterns of initiation are not obvious. The choice has direct consequences to many interdependent stakeholders (Schmitt, 2009); therefore, they must consider each other. They have multiple concerns including climate change, energy security, and local economic development (Martinot et al., 2002; Morey et al, 2011; UNEP, 2011).

We examine the structure of the organizational field of stakeholders such that a new firm and/or configuration of actors within a field become influential enough to sway a community decision. Is it a leader organization, a dominant coalition, or a consensus amongst actors, as some possibilities, that develops in the field to influence a decision? The energy solution is particularly consequential to local economic development (Allderdice and Rogers, 2000; UNDP, 2000) and small and medium sized firms are critical to this development (de Vries et al., 2010). Growing firms require a stable energy supply, but this energy will also supply the local community (Allderdice and Rogers, 2000). Moreover, entrepreneurial firms may provide social benefits to the local community and this may reciprocally lead to benefits for these firms that enhance their growth since they are so embedded in their local environments, as will be exemplified by cases presented in this paper.

In various ways, the local firm may signal its intent to be a good citizen, or socially responsible, within its community (Matten and Crane, 2005). Previous literature has elaborated on symbolic management, behavior that communicates subjective social meanings, used to build legitimacy and ultimately garner resources (Zott and Huy, 2007). However, symbolic actions fall into categories including: building personal credibility, professional organizing, organizational achievement, and stakeholder relationships, as theorized in the British firm context (Zott and Huy, 2007). Although there may be some analogues in the developing and emerging market context within the latter category of stakeholder relationships, the British context is so different that our context calls for additional research. In our context, powerful stakeholders may recognize the value that a new firm offers, whether through its good citizenship or its direct business value and consequently, link or associate with the entrepreneurial firm in various ways. Thus, the new firm gains legitimacy through endorsements and improves its reputation (Rao, 1994; Suchman, 1995; Stuart, Hoang, Hybels, 1999). This legitimacy and resulting reputation increases the life chances of the young firm (Rao, 1994; Suchman, 1995; Stuart et al., 1999).

RESEARCH CONTEXT: AREAS OF EMERGING AND DEVELOPING ECONOMIES OFF-GRID OR UNDERSUPPLIED BY ELECTRICITY GENERATORS

The context for this theory is emerging and developing markets in remote areas where electricity has been undersupplied, not being widely available or reliable (Hart and Christensen, 2002). In these types of regions of rapidly growing populations, also facing damaging impacts of climate change, the energy source issue is more critical and prevalent than in industrialized nations where widely accessible and reliable energy has been a precursor to industrialization. In

addition, in underdeveloped regions, many firms are small and young, not having any existing similar local energy firms or models to mimic (Hart and Christensen, 2002; de Vries, 2010;). Emerging markets are rapidly growing economies, still requiring development, but generally viewed as further along the development path than developing nations. Classifications are not well established, but World Bank gross national income (GNI) classifications tend to be used such that many of the emerging economies fall into the upper middle income category whereas, developing countries fall into lower income categories. Energy supply can be a new issue in areas of both types of countries, but is less likely new in developed nations. Our context offers a reduced history of industry conflict on the subject of energy (Hart and Christensen, 2002). Although these countries have plenty of development history, they are not histories consisting of advanced economic development including firms and the required supporting infrastructure (Martinot et al., 2002; Perkins, 2003; Morey et al., 2011; UNEP, 2011). Therefore, when the local goal transitions from subsistence to economic development, infrastructure issues that affect the growth of firms and the entire local community, such as the choice and provision of energy supply, are relatively new (Martinot et al., 2002; de Vries, 2010; Talukdar et al., 2010; UNEP, 2011).

The same issues are not new in the US context where industries are large and established (Sine and David, 2003). Polluting industries have been confronted with requests to change after they have long adopted old habits hard to change (Hoffman, 1999). Theory suggests that larger firms are less often as deeply embedded as small firms are within their local communities (Greenwood and Suddaby, 2006), although this is not a rule. For example, Dow Chemical in Midland and P&G in Cincinnati may be a couple of representative exceptions; they reciprocally rely on each other for an employment pool and tax revenues. The reasoning behind the

theoretical view is that large firms have more resources and clout and will act independently (Greenwood and Suddaby, 2006). This may explain why it is the larger ones that engage in battles with communities to avoid adoption of environmental management systems and the related transparency (Hoffman, 1999; Delmas and Toffel, 2008; Reid and Toffel, 2009; Delmas and Montes-Sancho, 2010). As explained by the following citation, conversion to renewables is not generally such a contentious issue in the South nations as in the industrialized North. Of course, this will vary by the country and local community, but it is generally true according to the excerpt below that explains why.

> …the long-term nature of the renewables option would allow a more gradual and less disruptive transition away from dependency on fossil fuels. Engendering support for renewables was, consequently, somewhat less onerous. The consensus is bolstered by mounting evidence indicating that while fossil fuels will, in the long-term, be exhausted or become uncompetitive in cost (as more costly reserves are exploited), renewables constitute a reliable and ecologically sound long-term alternative for virtually all countries of the South including many of the present oil-exporting developing nations which have abundant and unexploited solar, wind and hydro resources (Karekezi, 2012).

Climate change will and is disproportionately affecting the South, partly due to dependence on rain-fed agriculture and potable water supply shortages, so these countries expect direct consequences if they do not convert to clean energy (Graham and Johnson, 2000; Dutz and Sharma, 2012; Karekezi, 2012). Air pollution from carbon emissions is another problem (WEC,

2001). These issues have not been lost on the international community and, for example, the US Department of Energy has reserved funds to support early stage radical energy solutions that private investors would find too risky (Dutz and Sharma, 2012). However, the emphasis is on entrepreneurialism and allowing the market to determine technology winners. Moreover, most energy installations will be based on catch-up innovation (Dutz and Sharma, 2012).

Developing countries offer varying contexts for case studies that support theory building. As implied earlier, it is not obvious how the structure of the field will develop. The entities that comprise the field may take varying approaches to problem solving on the issue of local energy supply choice, especially when the supply is off-grid, leaving more opportunities for entrepreneurial firms to exploit critical needs. For example, in contrast to many developing countries, Brazil has connected or will successfully connect most of the country to grid-supplied electricity and only remote areas in the Amazon will require stand-alone renewable energy sources, providing opportunities for independent power producers (IPPs) (Niez, 2010). China is expected to use decentralized supplies to electrify those remaining without power (Hawkes, 1986; Cheng, 1997; Edwards et al., 2004; Niez, 2010). The country is encouraging foreign direct investment (FDI) in renewable energy and has put limitations on future coal-fired plants (Niez, 2010; Kempener et al., 2010). India has liberalized its energy industry such that state utilities have been unbundled, separating generation, distribution, and transmission (Niez, 2010). Either grid extensions or stand alone systems are being encouraged with a goal that everyone will have power by 2012 (Niez, 2010). Also, electrification of South Africa in its urban segregated townships, informal settlements, and rural areas is considered a stepping stone towards eliminating historical ethnic inequalities (Niez, 2010). In non-grid areas, the country has enlisted six private solar energy firms to build solar homes (Niez, 2010). Otherwise, the country is reliant

on coal for grid electricity and also exports it (WEC, 2001; Niez, 2010). Other countries such as Bolivia and Vietnam are introducing off-grid biogas projects (de Vries, 2010). Also, Bolivia, Tanzania, and Uganda are implementing off-grid solar energy.

EMERGING VALUE CHAIN ACTORS AND RENEWABLE ENERGY TECHNOLOGY (RET) ENTERPRISE DEVELOPMENT IN DEVELOPING COUNTRIES

For innovative entrepreneurial ventures that offer non-traditional, clean renewable energy - not oil, gas, coal, and nuclear - the power supply model, usually established by governments, must allow entrepreneurial participation. Four power models include: 1) the monopoly model, 2) the single buyer model, 3) the wholesale competition model and, 4) the retail competition model (Deloitte Touche Tomatsu, 2004)[1]. The latter three models offer opportunities for independent power producers and, as ordered in the list, they progressively encourage more competition (UNDP, 2000; Deloitte Touche Tomatsu, 2004). The problem with the monopoly model is that all generation is controlled by a single power company. The main goal of power market reforms in developing nations has been to attract investment to improve service quality, reliability and geographic coverage. In contrast, the industrialized world has been breaking up monopolies to encourage competition with the hope of reducing consumer prices. Research recommends that the South develop decentralized power models that will work better in their contexts of differing institutional and regulatory environments and smaller markets (Deloitte Touche Tomatsu, 2004). India is doing this to promote rural electrification (Niez, 2010). However, even with improved models, the regulators must recognize the independents as legitimate, not encumber them with

[1] See the The Deloitte Touche Tomatsu (2004) report for descriptive details of each model.

difficult contractual requirements, and allow them to sell their power at a reasonable price (UNDP, 2000; Karekezi, 2012).

In developing countries, the development of renewable energy resources including biomass, wind, hydropower, solar and geothermal has slowly progressed over the years, although many countries have found ways to promote sustainable technologies and products for cooking, water pumping, lighting, industrial heating and power generation, generally following the energy ladder from biomass-based to renewable technologies (UNDP, 2000). Given the targets set for achieving the Millennium Development Goals (MDGs) by 2015, practical efforts have been initiated to develop programs for deploying renewable energy technologies (RETs) to meet the challenges of increasing energy demand and widening energy access to under-served communities (Thiam, 2011). These programs, however, face major challenges including weak institutions, inadequate capital, low technological development, poor capacity and poor investment incentives for market-based scale-up (UNDP, 2000). Despite the view that RETs can offer new employment opportunities and create possibilities for local manufacturing of equipment, existing policies and regulatory frameworks have provided limited resources to stimulate market growth. Furthermore, a sizeable proportion of renewable energy projects implemented in Africa, particularly those driven by donor funding and through carbon finance have largely been unsustainable after project funding is exhausted. The absence of enabling policies and financial support to stimulate technological progress and market scale-up has resulted in further curtailment. In this regard, there is a need for building up technological capacity and investment incentives to meet the challenges of sustainable development in RETs and markets in Africa and other developing economies (OECD, 2010; World Bank, 2010).

Although often commercially available, several RETs in Africa, BRIC countries and the Caribbean are still in transition, with a continuing need for demonstration and validation. Furthermore, except in some niche markets, many climate technologies are more costly than conventional energy sources (UNDP, 2000; Sawin, 2004). As in developed countries, substantial cost reductions can be achieved for most technologies through public investment incentives including low interest loans, micro-finance credits, tax relief, and favorable lending schemes, in which banks guarantee the cash flow of a project thus reducing investor risk (OECD/IEA, 2004). Skilled people are also required to support industrial growth and encourage a culture of market-driven innovation. Therefore, a combination of instruments and effective frameworks are essential for successful RET development, capacity enhancement, research and development (R&D) for market scale-up (Hammond et al., 2008).

Although the benefits of alternative energy seem clear from the perspective of economic development and reverse innovation export models, such that developing countries' innovations are found useful in developed countries, many barriers to entrepreneurial innovation in energy for developing countries exist. Capital costs and a lack of institutional support still prevent local power at remote locations (Niez, 2010). However, distributed renewable power is cost-competitive (Thiam, 2011). The main problems have been listed as: 1) institutional deficiencies, 2) pricing distortions, and 3) limited information on the renewable energy resource base (WEC, 2001; Thiam, 2011). Some particular examples are provided. In Kenya, the ethanol program has experienced government control over prices, making them so low that the program reports losses (Karekezi, 2012). Also, in Tanzania, they have determined, through a biogas pilot project, that large-scale replication of this type of clean power generation could supply over 10% of Tanzania's total electricity supply needs. However, it is held back by institutional and economic

limitations (Global Environment Facility, 1993; Karekezi, 2012). Tanzania has liberalized the power industry, yet there are still blockages and many countries still have power monopolies in place that prevent independents from entering the market. Even when there is market openness including subsidies to promote alternative energy, other barriers to installation include the high cost of end-user devices, end-user connection fees, prohibitive safety regulations, and insufficient skills and information (Stockholm Environment Institute, 1994; Niez, 2010; Karekezi, 2012). For example, in India, skilled labor for solar PV installation maintenance and operation is in short supply (Niez, 2010). When barriers like these arise and power is needed, countries import outdated Western conventional technologies (Karekezi, 2012).

Central to overcoming the market scale-up challenge is the development of microenterprises and entrepreneurial business development along the value chain that enables value creation for all stakeholders (Blackman, 1999; London and Anupindi, 2012). Renewable energy for income generation is an exportable economic development model that has enabled other countries and regions to make leapfrog technology choices, and allowed companies to innovate (Hart and Christensen, 2002; Perkins, 2003). Examples include the widespread adoption of solar technologies, biofuels, microhydropower, and LED lighting. Biofuels for local transport and export in Latin America and Southeast Asia (Brazil, Argentina, Malaysia and Indonesia) are fully integrated as an industry that has become emulated elsewhere, sometimes with environmental tradeoffs (forestry depletion). Small hydro has become an established approach to power industrial activities in India, Thailand, Nepal and Sri Lanka. Brazil, China and India, have developed significant RET manufacturing capabilities, as well as the design innovations associated with key technologies and processes, and are exporting to the West. China has not only mastered but also scaled hydro, wind (below 750 kW) and solar (70% of world urban PV

lighting systems, first in world solar water heaters) technology manufacturing and is a leader in the fields of design, engineering, management and facilities manufacturing of hydropower in the world. Brazil is the world leader in bio-ethanol while India leads the world in small-scale modern biomass systems and also has significant capabilities in wind and solar. Malaysia and Indonesia are developing their own designs of biofuel technologies and may soon rank in the top echelons of the industry. This has resulted in South-to-North trade opportunities, as well as in increased deployment and scaled adoption of climate technology models locally. Africa is lower on the energy ladder, and thus cooking is where income levels are recognized as a major determinant of progression to modern energy systems (Ouedraogo, 2006; Chambwera and Folmer, 2007). Success in achieving Millenium Development Goals will therefore be closely linked to identifying the value chain actors, and capitalizing on local value creation in the development of climate technology solutions for income generation (Brew-Hammond, 2007).

Few institutional theory studies of adoption have been conducted in an emergent and turbulent context, in the sense that many developing economies are quickly and unpredictably changing. From emerging actors on the microenterprise value chain to the identification of new economic opportunities for revenue generation and export of indigenous innovation, the motivations that influence field structuration around renewable energy decisions in developing countries are multifaceted. Using case studies, we demonstrate that emerging collective visions for value-added entrepreneurial solutions, innovative funding and technology development partnerships, and relationships with influential stakeholders are key enablers towards local energy choices.

THEORETICAL DEVELOPMENT

To address the research question in our context, four propositions are developed. This research uses case studies and previous research to advance some answers in the context of renewable energy in off-grid or poorly connected (rural) areas of developing economies. The structure of the field is made up of many actors and it could be a leader organization, a dominant coalition, or a consensus amongst actors, as previously mentioned, or some other constellation of actors that emerges to influence a decision on an issue like alternative energy adoption.

{Place Figure 1 about here}

Local collective vision of a better solution

In a case study by Schmitt (2009), "Craft Skills, East Africa Limited", it describes an entrepreneurial start-up in Kenya that builds wind power generation devices from local materials to supply energy to small, dispersed off-grid African villages. This paragraph is a summary description of Schmitt's (2009) case that highlights relevant facts for this research. Schmitt (2009) explains that in some cases, an entire village is wired with electricity by Craft Skills' equipment and in other cases, the electricity is used for water pumps, supplying agricultural irrigation and clean drinking water. The main customers are small stores and community groups. Villages that are powered become part of the global community through mobile communications (cell phones) and customers' electricity demand grows. When villages have power, constituents can become customers of firms like Safaricom, a telecommunications provider that expands as its customer base grows. This larger firm fills an institutional void (Chung and Luo, 2012), a lack of energy infrastructure that the utility has not provided, as it adds charging stations to cellular base station sites. Craft Skills' wind turbines prove to be successful even in what the case

describes as a low trust society because of, for example, the regular bribery required when dealing with government. In this case, the founder of Craft Skills had electrification under British rule, but lost it with Kenya's independence from Britain. This desire and vision of the founder for the return to a higher standard of living, having some electrical background, started it all for Kenya and other locations on the African continent.

In this case, the structure of the organizational field is initiated by a leader with vision, borrowed from previous days when he had electricity except that he has come up with a modern idea for wind power generation. However, he needs friends who will agree to work with him on this vision of wind power so as to build the firm from scratch. Also, the customers are small, not large firms, including communities that must also build a collective vision in order to motivate the accumulation of capital to purchase wind power generation equipment. Without these local customers, the entrepreneurial firm could not survive. They must believe that the electricity from the wind power will prove to be a valuable investment as they do not have slack resources to expend on mistakes (Cyert and March, 1992; UNDP, 2000; Thiam, 2011).

Part of a successful entrepreneur's repertoire of skills is relationship building and previous research has outlined quite specifically how "social assets" may be developed (Starr and MacMillan, 1990). For example, by creating opportunities for friends to work to with him, enabling them to demonstrate their skills, the founder of Craft Skills builds social assets (Starr and MacMillan, 1990); having strong relationships with his co-workers keeps the business together. Moreover, by being part of the local community, the entrepreneur appears to demonstrate his commitment to solve a problem of a lack of electricity for the community. Solving problems is considered another approach to building social assets, so he draws in the small stores and community groups such that they are more likely to trust in and buy-into his

vision (Starr and MacMillan, 1990). Having built the local networks, the entrepreneur generates positive sentiments for the venture for future support and tolerance when something goes wrong (Starr and MacMillan, 1990).

In contrast to this case, in South Africa, a problem has been that people do not envision renewable solar energy as a permanent option even though the country has one of the best solar regimes in the world (Niez, 2010). Renewable energy in South Africa is labeled "rural energy" such that all applications are perceived negatively, as second class (Niez, 2010). Convincing people to accept new technology over a grid connection is a common problem (Wimmer, 2002). Moreover, the International Energy Agency specifically recommends that involving rural community members in decision making substantially enhances the success of electrification efforts (Niez, 2010). If they are involved, they understand and learn the value of the projects, gaining buy-in (Graham and Johnson, 2000). Thus, positive local community beliefs in these projects are crucial for their long term adoption (Thiam, 2011). In South Africa, there is no local entrepreneurial leader to build a symbolic social connection between the people and the new system that would otherwise be associated with the local "hero".

Also, notice that in the case, it is not large firms or government support, especially noting that the utility seems to have forgotten its function for a large part of the population, that are behind adoption of wind energy. Larger institutions are absent except that the Kenyan government must be supporting a context that allows IPPs. In general, it is widely viewed that economic development is very much driven by new ventures and this case is an illustration of that (Carter et al., 1994; UNDP, 2000). The entrepreneurial firm, Craft Skills, fills one void – the supply of mobile, affordable clean energy. Smaller firms seem to be successful at these types of innovative differentiation strategies over cost leadership approaches (Carter et al., 1994).

Aside from this case, other international development organizations supporting the introduction of off-grid renewable energy also view the visionary entrepreneur as necessary (Graham and Johnson, 2000; de Vries, 2010; Dutz and Sharma, 2012). In the Craft Skills case, following the entrepreneurial entrant, demand for electricity increases, mobile phones are in demand and a telecommunications firm further fills the institutional void that the utility and government (seem to have forgotten or) cannot fill. In contrast, in South Africa, this chain of events has not happened such that solar rural electrification has not led to further renewable adoption and the related economic development; renewables stop at rural household electrification (Niez, 2010). Thus, the structure of the organizational field has not formed to build a vision supportive of renewables. It does not include players such as telecommunications or other firms and organizations to support the vision (Niez, 2010). Overall, this analysis suggests that although, in the Craft Skills case, renewable adoption required an innovative leader to begin field formation, other local players had to collectively adopt the vision of wind power including scarce employees, having directly related skills, and small, local customers.

Proposition 1: When a new issue arises, the relationship between an entrepreneurial firm and the local adoption choice is moderated by a local positive collective vision of the firm's solution.

Supportive funding and development partnerships

The next case comes from Bihar, India, a city of 80 million people where 85% do not have an electrical grid connection (Norbu, 2011). This context is different from the previous case of small, dispersed African villages; however, rural areas of India are considered low density for the purposes of grid electrification (Niez, 2010). In Bihar, when people have an electricity connection, it is to a dirty, unreliable government run coal-fired plant (Norbu, 2011). Diesel

generators have been the only competition (Norbu, 2011). This case of entrepreneurs inventing simple, clean, affordable energy using rice husks is summarized in the following paragraph.

Three students, two from the University of Virginia, and another engineering student in Bihar together with another local from Bihar researched possible renewable energy options. One of the students discovered a way to develop a 100% biomass-based power plant using waste rice husks; the first power plant became operable in the 2007/08 time period with the backing of Samta Samriddhi Foundation; thus, HPS was an entrepreneurial NGO that became a self-sustaining business (Dichter, 2010; Norbu, 2011). Local farmers provide the rice on contract and three villagers are in charge at each power plant. Farmers' discarded, unused rice husks release methane, but with the new system, the only byproduct is ash that can be used in cement. Via small power grids, the plants power local households and can scale up or down as demand changes. Also, households are given two compact fluorescent light bulbs and unlimited cell phone charges. This system costs less than the dirty alternatives, kerosene lanterns and diesel generators, for off-grid customers.

The firm has found it important to maintain good relationships with local elders who are influential so that the firm can collect payments, reduce fraud as for example, electricity theft is extensive (WEC, 2001; Niez, 2010; Gadl and Knobloch, 2011), and encourage upkeep of the systems. Also, the firm has been building the power plants for free to build good will with the local people. Finally, in 2008, Husk Power Systems (HPS) was able to attract the Acumen Fund and The Shell Foundation to provide additional technical and financial assistance. The case acknowledges that the business environment, including stronger law and order, has improved in Bihar. Moreover, the government is working with HPS to get into the carbon credit market. HPS, by expanding at two plants per week, has improved the standard of living while engaging in

other corporate social responsibility (CSR) initiatives such as helping rural women to find jobs, job training, and paying for some children's education through a foundation. What follows is an analysis of organizational field formation.

First, this case illustrates how external non-market partnerships can be supportive, whether they are engineering students from a foreign country, the United States in this case, or charitable and responsible investment funding partnerships that may help a promising social enterprise expand. Previous entrepreneurship research has considered additional types of partnerships for technology startups such as those with universities or research institutes and participation in venture associations (Lee, Lee, Pennings, 2001). Lee et al. (2001) do not posit that these types of ties represent endorsement advantages. Instead, universities provide development knowledge and an employee resource pool whereas venture associations build a founder's network through social capital construction (Lee et al., 2001). In regions of this research, universities may not be accessible or too underdeveloped to assist entrepreneurs, if they exist, and venture associations do not exist since there is little industry. A reliable electrical supply is required infrastructure to prompt industry and although government may sometimes support and, thereby, endorse small business by, for example, supplying easier access to funding (Lee et al., 2001), off-grid area firms are often not supported this way, as is illustrated in this case.

A recent study on partnerships in development finance and sustainable energy records multiple cases of successful alliances between microfinance and technology firms (Devine, Sheldon, and Smith, 2010). The report defines development finance as funds offered to institutions and projects intending to lessen poverty and provide access to financial and other required services for poor and low-income households (Devine et al., 2010). The funds may be in

the form of loans, equity or grants (Devine et al., 2010). Social investors including the public and multilateral investors have provided funds for solar-powered home lighting and bio-energy production facilities, for some examples (Devine et al., 2010). Also, the International Energy Agency reports that secure and dedicated funds are required after initial implementation of stand-alone systems or else there is likely to be de-electrification as has happened in China (Niez, 2010). The report also emphasizes the importance of the private sector in electrifying remote villages when stand-alone systems are required (Niez, 2010).

In the current case, the Samta Samriddhi Foundation, the Acumen Fund, and The Shell Foundation are mentioned as investors in Husk Power Systems. Moreover, extensive CSR initiatives and good will building are offered in parallel with the business solution; the Samta Samriddhi Foundation helped HPS with these initiatives such as children's education. These activities build trust with customers and thus, help to distribute and maintain the energy solution (Zott and Huy, 2007). Thus, the evidence from the Husk Power Systems case and other information presented illustrates the need for technology entrepreneurs as leaders, but also that responsible investment partners are helpful and necessary for wider and longer term adoption.

When a new issue arises, such as the need for transformative energy solutions, a leader entrepreneur is at the forefront. However, a small company like HPS will have a hard time obtaining attention from a population of 80 million people and the Indian government that is running coal burning power plants. Niez (2010) explains that in India the costs of rural electrification, corruption, a lack of political will, and mismanagement have prevented utilities from engaging in rural projects. As the HPS case illustrates, in areas of large off-grid populations, like those of India, funding partners can help scale up the business as a whole so that it has the resources to gain broader attention and acceptance. Engaging in the good will

initiatives are costly, but necessary to encourage adoption in more populous areas where direct communication with each household is time consuming, if not impossible. By word-of-mouth, good news of free light bulbs and unlimited cell phone charging encourages Indians to find HPS rather than HPS having to knock on everyone's door; it is a pull rather than a push marketing strategy.

This discussion illustrates that the structure of the organizational field requires a leader firm and a general consensus that the venture is worthwhile. It is not a dominant coalition of powerful players that takes charge in this case. Funding agencies' involvement signals a wider consensus because those like The Shell Foundation are large, international bureaucracies, requiring internal consensuses to release funds on behalf of a small firm like HPS. Each funding agency's version of due diligence is done. This not only enables the small firm in terms of resources, but it also provides it with a legitimating endorsement (Rao, 1994; Suchman, 1995). Although many off-grid Indians may not be motivated by such an endorsement, the Indian government does take notice and this gives the small firm a boost so as to gain the government's support, illustrated in the case with the carbon credit initiative. The government, however important, is a laggard that only responds after a small firm gains notice through significant funding partnerships. Thus, the following proposition recognizes the leadership of the new firm together with the importance of funding partnerships for broader adoption in the Indian context of larger and higher density populations.

Proposition 2: When a new issue arises, the relationship between a local entrepreneurial firm and choice of a local energy supply type is moderated by prominent non-market funding partnerships.

Local relationships with influential actors

The case of Husk Power Systems is also illustrative of a unique cultural characteristic in many developing economies: the influence of local community elders. In the industrialized world, our communities are not that tight, or collectivist, so as to recognize and make community elders influential (Hofstede, 1983). Developing countries have local, traditional hierarchies and leadership positions that remain in place even after urbanization impinges and modern capitalistic systems enter, thus these socio-political systems are to be respected and can create barriers for new technological systems otherwise (Payne, 1963; Oommen, 1970; de Jonge, 1979). Although HPS can offer many material incentives to off-grid Indians to adopt the cleaner energy supply, local individual and group level support is required also for after sales issues. Particularly, HPS builds and maintains good relationships with local influential elderly villagers so that the power systems will be well cared for by the locals, collections will go more smoothly, and fraud will be reduced (Starr and Macmillan, 1990; WEC, 2001). These relationships are likely fostered by the other CSR initiatives mentioned in the case such as job training and education because they are less directly associated with the business. Thus, the firm does not appear so opportunistic and some trust is built with the local leader and people who know about and/or benefit from the initiatives (Starr and Macmillan, 1990; Zott and Huy, 2007).

LG Electronics is an example of a large firm that has capitalized on CSR to build trust as it has internationalized around the world (Ramaswamy, 2007); LG locates in rural areas, builds schools, health care facilities, and sponsors popular activities like sports, for just a few examples (Ramaswamy, 2007). Ultimately, the positive relationships support increased adoption as they increase the likelihood of the longevity of the firm. The firm cannot continue to attract more customers if its existing customer base does not sustain it.

The elderly villagers act as endorsers from the point of view of the Indian customers (Rao, 1994; Suchman, 1995). In the previous section, the international funding sources were visible endorsers from the point of view of other bureaucracies, like the Indian government; this type of endorsement is unrecognized and irrelevant to a majority of Indian customers. They trust their village elders. Thus, this is another word-of-mouth approach that endorses HPS to its customers so that they will appreciate the benefits the firm brings to the community. In the long term, customers will care more about the after sales issues because they value the firm (Starr and Macmillan, 1990; Zott and Huy, 2007). Customers adopt this view because of trusted and respected elders' understanding and communication of the value of HPS to their communities. Other research also supports the contention that having village leaders and users' understanding and involvement in the dissemination process more cost-effectively aids the implementation of sustainable solutions (Payne, 1963; Oommen, 1970; Wimmer, 2002; Karekezi, 2012).

In consideration of how the structure of the organizational field takes form, this discussion suggests that there is an alliance of leaders required to build a supportive long term oriented customer consensus. The entrepreneurial firm leads by offering its technology, but to maintain a sustainable base of customers so as to increase adoption over the long term, trusted local leaders – community elders in the case presented – are required allies. As allies, they disseminate information and build consensus with the local community regarding the importance of the continuance of the entrepreneurial firm. Niez (2010) explains that community decision makers may be required to dispel myths that renewable energy is "second class", as in South Africa. Thus, customers will care to pay their bills and see to the maintenance of the equipment, whether they are employees or onlookers who ensure that reckless damage is not done to the

equipment and that it is not abandoned when there are malfunctions. A proposition conveying the importance of the influential relationships is offered below.

Proposition 3: When a new issue arises, the relationship between a local entrepreneurial firm and adoption of a local renewable energy supply is moderated by the firm's maintenance of relationships with local influential actors.

International recognition through reverse innovation

A recent report by the Clean Energy Group concluded that developing countries will be a new source of technology innovation, such that climate solutions will not only depend on North-to-South technology transfer (Morey et al., 2011). A World Bank report mentions that nine emerging economies (Argentina, Brazil, China, Hungary, India, Malaysia, Mexico, the Russian Federation and South Africa) are standing out for their green-tech innovation capacity, accounting for almost 80 percent of all US green patent grants attributed to developing countries between 2006 and 2010 (Dutz and Sharma, 2012). The developing world context can be more conducive to the invention and scaling of disruptive new climate technologies than developed economies, based on previous learning in economic sectors such as agriculture, mobile communications, and pharmaceuticals. The rationale is that frugal innovations, in the absence of existing infrastructure, result in more rapid adoption at scale, the development of an entrepreneurial ecosystem that sustains it, and strategic corporate investment aimed at reinventing the product for markets of the North (Christensen, 2009; Govindarajan and Ramamurti, 2011). This does not necessarily mean that frugal innovations are of low quality, rather, these products are designed to different price-performance characteristics or the manufacturing process was redesigned to drive down cost. Therefore, technology transfer occurs

South-North and South-South, such that South nations have become leading exporters (Brewer, 2008), and this phenomenon is related to reverse innovation (Govindarajan and Ramamurti, 2011).

We define reverse innovation (RI) as the translation of need-based innovations in developing countries into value-added innovations for industrialized countries in need of disruption of legacy practices and products. These products are designed in developing markets for mature markets. For some examples, India has been exporting oil extraction machines for use in refining feedstocks used in biofuels, Mexico exports solar hot water heaters and clean coal technology, and China exports heat pumps, solar and wind power technology and compact fluorescent lamps, Malaysia is also strong in solar energy, and Indonesia exports compact fluorescent lamps (Steenblik, 2006; World Bank, 2007; Brewer, 2008). Young, entrepreneurial firms from the aforementioned and other developing or emerging economies are in a position to offer promising energy products and services (Dutz and Sharma, 2012). Businesses that begin modestly using imported technology and service ideas and concepts in off-grid and other areas may find that business value extraction and scalability increases substantially when they engage in reverse innovation, often in collaboration with a partner in the North. Firms can take a variety of steps to seek out international markets when located in a country in which expansion is difficult for a variety of possible reasons. The lack of energy infrastructure at home is a symptom of difficulties.

Previous theory on reverse innovation is rare since it is a relatively new phenomenon (Govindarajan and Ramamurti, 2011). Selling innovations into developed markets is possible through a variety of routes such as trade, international partnerships, and foreign direct investment. Recent literature in internationalization of new ventures (INVs) discusses how small

firms internationalize (Coviello, 2006; Turcan, 2011). Turcan (2011) focuses on legitimation through manipulation strategies over the dotcom bubble time period (1999 to 2001) in Scotland, linking legitimation to the environment in which the INV operates, pertinent to our research. Other research by Duschnitzsky and Shaver (2009) examines cases where young firms lack a track record of alliances such that disclosure of their inventions becomes an important issue to potential corporate partners who need reassurance (Duschnitzsky and Shaver, 2009). A new venture may fear imitation, thus preferring a venture capital (VC) partner (Duschnitzsky and Shaver, 2009). Although the intellectual property issue is possible in our context, the very small start-ups considered in this research in developing and emerging markets, are unlikely to be on the radar screens of large investors, whether VCs or corporations (Higgins and Gulati, 2006). Thus, other previous literature in entrepreneurship considering VCs as legitimizing partners is not applicable in this context (Lee et al., 2001; Stuart and Sorenson, 2007).

Moreover, the new firms of this research are not close to the IPO (initial public offering) stage, as firms are in other literature wherein top management teams (TMT) bestow legitimacy (Higgins and Gulati, 2006). Previous work on TMT in biotechnology entrepreneurship, pre-IPO, suggests several dimensions on which small firms may gain legitimacy through resource, role and endorsement legitimacy. Resource legitimacy is attained because of management's downstream employment affiliations (i.e., a pharmaceutical firm is downstream from a biotech firm) that may offer access to social and human capital. Role legitimacy is related to other positions that management may hold or have held, related to their current positions in the upcoming firm so as to signal relevant experience (Higgins and Gulati, 2006). These are not possible mechanisms in the context of this paper; the entrepreneurs and their new firms in our

cases are largely unknown to the corporate community and essentially, rise from obscurity[2]. They are in their infancy, trying to gain initial buy-in and notice for their products or services. Although this research considers endorsement mechanisms for legitimacy building, it is not the kind in Higgins' and Gulati's (2006) work in which endorsements are from institutional investors and underwriters. Therefore, the situation continues to beg the question of how obscure firms gain legitimacy. Our previous propositions developed some non-market driven answers. What about purely market driven endorsements?

We propose that by seeking international attention, possibly by expanding into a developed country market, thereby, reverse innovating, a young firm gains legitimacy. Although a small firm may not attract investment, its products or services could be interesting to international buyers. This is illustrated with the Suzlon case. Suzlon is an Indian wind power firm that was started by an entrepreneur, Tulsi Tanti in 1995, who first ran Suzlon as a textile company (Baker, 2007). His firm needed a lower cost and more reliable alternative source of energy compared to the existing problematic power grid and he realized that clean energy would benefit all of India (Karmali, 2006). The firm was relatively unknown, but managed to obtain a contract with DanMar and Associates in Minnesota, USA in 2003, a couple of years after the textile manufacturing was sold (Karmali, 2006; Baker, 2007). In gaining this contract, Suzlon beat out European rivals' offerings through lower price, higher efficiency, and technology that better suited the wind environment of the US Midwest (Karmali, 2006). Repeat orders followed (Karmali, 2006). This lent credibility to Suzlon through an endorsement of its quality and technology, not only because it beat out perceived high quality European products, but also

[2] Many cases of RI also begin with large North corporations partnering with small South firms, reinventing products in the South that were originally from the North, and bringing them back to their industrialized home countries. For example, GE has been in China, Tata Energy has been in Africa, and P&G has been in Latin America; however, we identify the products as belonging to the large corporations rather than the local entrepreneurs and this research is focused on the latter's growth in the interest of underdeveloped nation home-grown development.

because a US firm, from a most prominent developed nation, chose its products. Later, Suzlon accumulated greater successes and is today a multi-national corporation, but this earlier international support was important for wider adoption of its wind energy products in India. If a US firm buys Suzlon's products then the products appear world-class and thus, local Indian adoption increases. By 2006, Suzlon had 35% of the Indian market, representing 90% of its sales (Karmali, 2006).

Proposition 4: When a new issue arises, the relationship between a local entrepreneurial firm and adoption of a local renewable energy supply is moderated by developed country endorsement through reverse innovation.

CONCLUSIONS AND IMPLICATIONS

Through an examination of a new issue - alternative energy adoption in areas where there is no reliable electricity supply in developing and emerging economies, this work has proposed various constellations of actors who influence local decisions. These descriptions explain how the structure of the field takes form and extends previous literature that has recognized that fields form around issues (Hoffman, 1999). In addition, this contribution to explaining change, from an institutional theory perspective, is proposed under different circumstances compared to previous research in contested practices that has primarily considered large firms in the industrialized world (Oliver, 1991; Kitchener, 2002; Sanders and Tuschke, 2007; Pache and Santos, 2010). Here, firms are small, entrepreneurial start-ups in developing contexts. Thus, the context is turbulent, but also open to change (Dosi, 1982; Tushman and Anderson, 1986).

This paper suggests that the structure of the field forms so as to support the adoption of a particular decision through initial entrepreneurial leadership together with endorsing parties related to the developing world context including: 1) a positive local collective vision, 2) prominent funders engaging in responsible or charitable investment, 3) alliances with leaders trusted by the locals, and 4) international recognition through reverse innovation. This theory has been applied in a particular context, but remote areas of the developing world are large spaces that offer multiple and varied locations for entrepreneurial experiments. Openness to entrepreneurial competition is crucial because it produces possibilities for transformative change.

This theorizing is useful to policy makers in influencing energy supply decisions so that clean alternative energy may be an early outcome decision. Emerging economies such as Brazil, Russia, India, and China, South Africa and many others are growing rapidly with large populations to satisfy. In that process of growth, all types of actors including individuals, households, and organizations are using polluting energy sources that result in carbon emissions causing climate change. After polluting utilities are entrenched and firms that supply them with fossil fuels reach a mature stage, it is very hard to change legitimized institutionalized myths and taken-for-granted habits, as we have seen in the West (Meyer and Rowan, 1977; DiMaggio and Powell, 1983). In countries that do not have powerful established energy players, entrepreneurial firms may experiment to discover viable cleaner, alternative energy technologies that match particular local environmental conditions. Some of these successful experiments could be scaled up to become large scale energy supplies that gain legitimacy early on so as to become permanent before other polluting power can make inroads. First-mover advantages are won, as long as the new systems are sustained with funding and upkeep. As power monopolies are broken down and other barriers to entrepreneurs are removed, this optimistic scenario could

become realistic. Moreover, reverse innovation could mean additional economic development and broader adoption of alternative energy through exports.

Understanding the process of field formation and the moderating mechanisms influencing decisions can enlighten strategies for motivating technological transformations. If a renewable energy choice is desirable from the point of view of a national policy maker, support for the development of an entrepreneurial ecosystem is important. Broader consensus-building is also required and governments can support information dissemination to all stakeholders so that they may understand and accept a vision of clean alternative energy. Experts have suggested that long-term renewable energy government programs, training, financing mechanisms, and innovative dissemination strategies are needed (Dutz and Sharma, 2012; Karekezi, 2012).

Future research should emphasize case studies that examine the beginnings of firms in their organizational fields, and their evolution as legitimation occurs, to support empirical testing of hypotheses. Also, future research could consider how organizational fields evolve over longer periods of time, following an initial start of an entrepreneurial firm. For example, studies could examine the long term sustainability of renewable power installations and how they are maintained, altered, or replaced. An additional line of research is how, after sustainable technologies are adopted, they can evolve into broader adoption markets and technology platforms. For example, Broad Group integrated an air pollution meter into a mobile phone, thus acting like an education mechanism building collective awareness among citizens, leading to grass roots change (Wood, 2012). Thus, the organizational field is stabilized with strong and multiple structures - social, technological, institutional, and otherwise, to maintain a clean energy direction.

This paper has examined off-grid adoption of renewable energy in the developing world, where services are rarely emphasizing clean energy. Brazil is a case where hydro is a major source for grid electrification (Niez, 2010). In contrast, in South Africa, the stand-alone solar program is viewed as temporary and second class even though it is a viable alternative to provide a major portion of its power needs. It is currently using coal for grid electrification (Niez, 2010). The question then is whether, after demonstrative successes of renewable generation in rural off-grid areas and viable cases of scalability through reverse innovation, mature markets in the developed world can be disrupted to shift value towards distributed low emission technologies.

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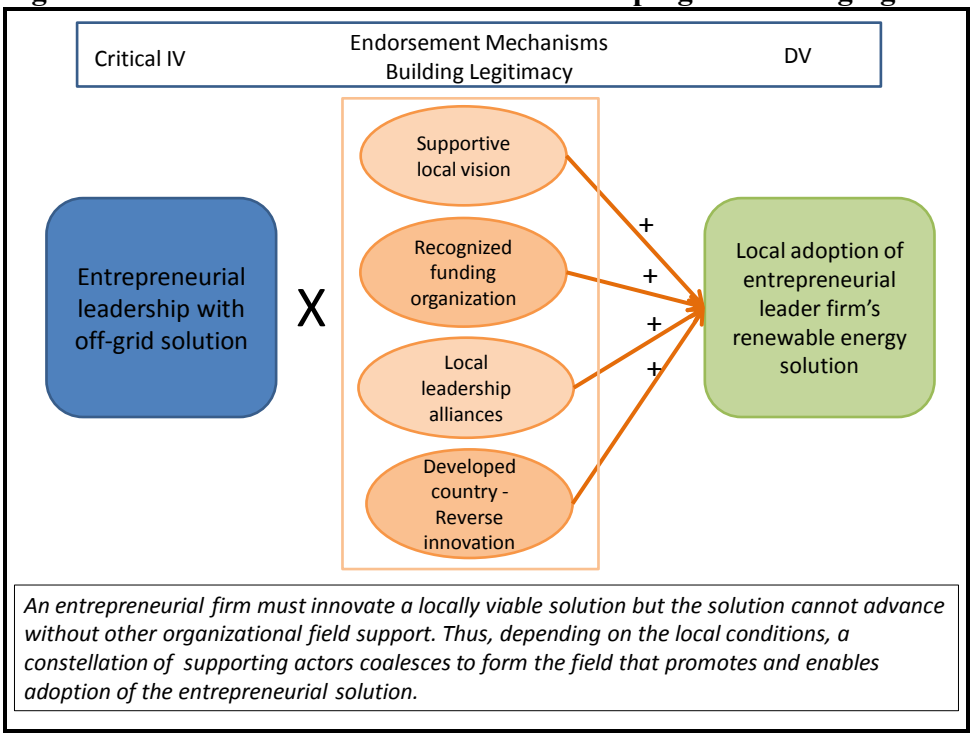
Figure 1: Endorsement Mechanisms in Developing and Emerging Economies



An entrepreneurial firm must innovate a locally viable solution but the solution cannot advance without other organizational field support. Thus, depending on the local conditions, a constellation of supporting actors coalesces to form the field that promotes and enables adoption of the entrepreneurial solution.