



Business models for model businesses: Lessons from renewable energy entrepreneurs in developing countries



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HIGHLIGHTS

- Business model canvas used to analyse renewable energy entrepreneurs' businesses.
- Consultants, distributors and integrators are the main business models used.
- Business model characteristics are related to country and regional conditions.
- Entrepreneurs in least favourable policy environments likely to be Consultants.
- Energy entrepreneurship policy should focus on promoting specific business models.

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ABSTRACT

Against the background of mounting research suggesting entrepreneurship as a means of increasing the uptake of renewable energy technologies (RETs) in developing countries, this paper presents the findings of an exploratory investigation into the business models used by renewable energy entrepreneurs in such countries. Forty-three entrepreneurs were interviewed in 28 developing countries and secondary information about country and regional conditions was analysed. We chose the Business Model Canvas as an analytical tool and the findings shed new light on established renewable energy business types. Three different types of businesses were identified – Consultants, Distributors, and Integrators; yet, there is also some overlap between these types. These business types appeared to parallel the life cycle progression of the business, but this requires further research. A key component of the study was to assess whether the types of businesses were related to country-level conditions to assess the impact of regional differences. These comparisons revealed consistencies between country-level characteristics and the entrepreneurs' choice of business model. Conclusions suggest that different regions may support certain business models more than others due to differing levels of government interest in renewables, governance and policy support and the relative ease of doing business.

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1. Introduction

Entrepreneurship is considered a crucial part of the solution to renewable energy diffusion challenges in developing countries (Balachandra, 2011; Balachandra et al., 2010; Rady, 1992). Yet, beyond this realisation, and beyond highlighting factors that encourage (Allan et al., 2015; Emodi and Boo, 2015; IEA-RETD, 2013; Martinot et al., 2002; Pacheco et al., 2010; Reddy, 2015) or inhibit (Provance et al., 2011; Wüstenhagen et al., 2007) entrepreneurship, a holistic account of how renewable energy entrepreneurs structure and operate their businesses in such countries (in

essence, their business models), is absent from the extant research.

Three features of existing research highlight the need for this study. First, existing investigations of renewable energy entrepreneurship have focused largely on single parts of the business model, such as the product or service offered (Boparai and Secretary, 1998; Causey et al., 2009), distribution mechanisms and channels (Richter, 2012, 2013; SustainAbility, 2014), or customer engagement strategies (Loock, 2012; SustainAbility, 2014), for example. A holistic business model approach would demonstrate not only the integration of these individual elements, but also how the businesses themselves are integrated in their respective markets. Second, given the challenges associated with the diffusion of renewable energy technologies (hereafter RETs) in developing countries (Balachandra et al., 2010), rather than conceptualising strategies for overcoming these challenges in absolute terms, such

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an approach provides a framework for comparison between business models – that is, for understanding which business models may be better suited to overcoming certain challenges. Third, with the aim of encouraging renewable energy business (Brew-Hammond, 2010; Provance et al., 2011), it is useful to understand the crucial operational and regulatory needs of such businesses, from the perspective of the entrepreneur.

Therefore, although renewable energy entrepreneurship is already being discussed in several ways, this research contributes a more foundational understanding of the business models chosen and operationalised by renewable energy entrepreneurs in developing countries. By interviewing renewable energy entrepreneurs and by comparing the characteristics of their businesses to patterns in the country-level renewable energy and business data, this paper discusses the potential impacts of the business and regulatory environment on the business models used.

1.1. Renewable energy entrepreneurship

There is now considerable research interest in increasing the uptake of RETs (Aslani and Mohaghar, 2013; Balachandra et al., 2010; Martinot et al., 2002; Reddy and Painuly, 2004; Zyadin et al., 2014). However, despite considerable political and social attention, the commercial use of RETs remains largely restricted to niche markets (Balachandra et al., 2010; Martinot et al., 2002; Meijer et al., 2010), and the diffusion status of most renewable energy technologies has been described as being in the ‘pre-commercial’ and ‘support commercial’ stages of growth (Balachandra et al., 2010), as they lack adequate institutional support. Developing countries still lack the strong regulatory support necessary to facilitate their uptake (Jackson, 2011; Walsh, 2012), so the challenges to the increased uptake of RETs are therefore arguably greater in such countries (Martinot et al., 2002; Sarraf et al., 2013; Sklarew, 2011). Despite these challenges however, much of the growth in renewable energy uptake is still expected in developing markets (IEA, 2013).

On the other hand, several factors have been identified as enablers to the uptake of renewable energies, including certain policy measures (Emodi and Boo, 2015; Reddy, 2015), market incentives (Amoros and Bosma, 2013; WorldBank and IFC, 2014) and the role of new business (Allan et al., 2015; IEA-RETD, 2013; Martinot et al., 2002; Pacheco et al., 2010). In particular, entrepreneurship has been cited as an enabler of the uptake of RETs by driving market- and local economy-level changes that create incentives for their uptake (Brown et al., 2007; Christensen et al., 2012; Loock, 2011; Lovio et al., 2011; Moore and Wüstenhagen, 2004; Pacheco et al., 2010; Wüstenhagen and Boehnke, 2008). Entrepreneurs have been recognised as important early adopters, as they can actively promote the need for RET products and services and catalyse penetration in markets dominated by fossil energy (Balachandra et al., 2010). Indeed, increasing the uptake of RETs in developing countries requires the use of strategies that encourage the participation of SMEs and micro-enterprises (Brew-Hammond, 2010). Renewable energy entrepreneurship, it has been suggested, is especially needed in order to overcome the fossil energy status quo in developing countries (Loock, 2011; Marcus and Anderson, 2013; Reddy, 2015; Schoettl and Lehmann-Ortega, 2011), as entrepreneurs are known to take risks and facilitate innovation and institutional change (Brown et al., 2007; Christensen et al., 2012; Lovio et al., 2011; Wüstenhagen and Boehnke, 2008). Indeed, these may be seen as key ingredients needed to break the hold of incumbent fossil energies and facilitate the spread of renewable energy technologies.

It is also now widely supported that, in developing countries in particular, entrepreneurs and their small businesses are key

providers of RET products and services to rural areas (Boparai and Secretary, 1998; Martinot et al., 2002). Services identified as being provided by renewable energy entrepreneurs in developing countries include supply and maintenance of small-scale technologies and systems, including solar lights and home systems (SHSs) (Boparai and Secretary, 1998; Causey et al., 2009), as well as the provision of microfinance and other means of improving financial access to RET products (SustainAbility, 2014; UNEP, 2012).

This research therefore assumes that, through their ventures, entrepreneurs are important architects of the renewable energy transition in developing countries. The business model, specifically the business model canvas, is a useful tool for analysing and understanding the operations and routines of renewable energy entrepreneurs and is outlined next.

1.2. Business models

Careful business model development has been identified as a crucial consideration for entrepreneurs if they are to overcome the challenges associated with facilitating the uptake of RETs in general (Bohnsack et al., 2014; Richter, 2013), but also specifically in developing countries (SustainAbility, 2014). Indeed, Teece (2010) noted that “business models are frequently mentioned but rarely analysed” (p.192), and also posited that “it is common to see great technological achievements fail commercially because little, if any, attention has been given to designing a business model to take them to market properly” (p. 192). There has been some insight into business models for RETs in general (see IEA-RETD (2013), Richter (2012), Schoettl and Lehmann-Ortega (2011), Boehnke (2007) and Loock (2011) for example). There has also been more business models for sustainability (BMFS) literature focusing on developing countries (Chaurey et al., 2012; Friebe et al., 2013; Kolk and Buuse, 2012; Schrader et al., 2012), specifically for rural off grid villages (Baron, 2004; Blenkinsopp et al., 2013; Jolly et al., 2012; Schmidt et al., 2013), and insights from eminent work on business models that work in developing countries reemphasise the need for innovation and strategies that suit the unique circumstances in such countries, creating value for RET users in these unique contexts (Bradley et al., 2012; Kirchgeorg and Winn, 2006; Prahalad, 2009; SustainAbility, 2014; UNDP, 2008).

This research espouses a general definition of the term ‘business model’ as the “logic of value creation” (Hall and Wagner, 2012). This definition refers to how a business designs and executes its value creation and revenue generation efforts, and is resonant across considerable portions of the business model literature (see Timmers (1998), Hamel (2000), Afuah (2004), Teece (2010) and Casadesus-Masanell and Ricart (2010) for example). In the context of RETs, it refers to entrepreneurs’ motivations and reasons for designing and delivering products and services to users in developing countries in a certain way.

Scholarly ideas about the components of business models remain fragmented and largely inconsistent (George and Bock, 2011; Teece, 2010; Trimi and Berbegal-Mirabent, 2012; Zott and Amit, 2013; Zott et al., 2011). There is as yet no consensus on the theoretical framework or definition of a business model, so illustrative conceptualisations from practice, such as the Business Model Canvas (Osterwalder, 2004; Osterwalder et al., 2010), have attempted to incorporate fragmented constructs in business model theory into a single usable model.

The Business Model Canvas suggests that business models are made up of nine building blocks, as indicated in Fig. 1 (Osterwalder et al., 2010). These nine building blocks, as well as their conceptualised configuration as part of a whole business model, were derived by synthesis of the business model literature. Although these nine building blocks broadly correspond to the main business model elements identified in previous scholarly work, the

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