

Review Article

Assessment of Different Business Models for Renewable Energy

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Abstract: The aim of the paper is to assess various business models and how they are established to extract the business activity maximum value within a specific framework. The research is primarily supported by inclusion of the available literature within the field as well as relevant professional and academic publication to enhance currency and relevance to application, as well as identification of trending developments and issues. The research concluded that governments should further promote the commercial aspect of new and renewable energy when developing new technology through fiscal, financial, regulatory and other means. Furthermore, the regulatory environment has massive impact in influencing the various models to be developed and such, incentives are necessary to enable a successful business model implementation and application.

Keywords: Business models, renewable energy, new technology, implementation, application.

INTRODUCTION

Business models have become increasingly popular concept in management theory and practice. There are various definitions of business model. For instance, whilst it is described as a business create value [1-4]; it is also defined as a method that enables business to be done when a company can sustain itself and generate revenue [5]. Business model can vary from being relatively simple (when actor takes advantage of existing incentive scheme for RET) to being complex (such as ESCOs – information and advice, implementation, operation and maintenance).

Business model should not be confused with a business case. Whilst a business case captures the logic and reasoning for initiating an activity such as investment in RET in the built environment for instance, the business model would describe the structure and strategy behind a business case. It includes elements like value proposition, key activities, key resources, cost structure and revenue streams.

Whilst business models can help address most of the barriers such as low priority of energy issues, awareness and permitting processes, most of the business models analysed eventually prompt development of cost-effective technologies. Thus there is the need for strong complementary role of policy makers to support business models.

Thus, the concept of business model is now applied to an ever wider range of sectors and topic [6, 2 7. 8].

Business Models – Motivation

The framework for creating value; it includes both the ownership (which focuses on financing and risk mitigation concerns) and service (focusing on provision of specified services and highlight different methods of operation and maintenance) models. Or business models to be effective, the following considerations are key: product or service considerations, scale of the project, consumer, and regulatory environment.

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Policy makers play vital role in complementing business models. In addition to the complementary role of the policy makers, business models are able to address most of the barriers that prevent development of the RET. These barriers are categorised as market and social, regulatory, information failures and financial.

Business models help to structure an initiative in a way that leads to a positive business case, one that leads to initiating the activity. Business model can therefore be defined as a strategy to invest in RET/EE measures, which creates value and leads to an increased penetration of RET/EE measures in built environment. The focus of research on business models is on the company's strategic level including non-corporate actors [5, 9, 7].

Types of Business Models

There are two generic choices of business models for renewable energy – customer-side and utility-side business models. Whilst the customer-side is based on a large number of small projects, which are still in their early stage of development; the utility-side business model is centred on small number of larger projects where there are plans and benefits for the organisations for utilities with revenue potentials and risk avoidance [10, 11, 9].

However these models are classified as ownership and service business models

- The ownership business model includes public-private partnerships (PPPs), multiparty ownership, and lease or hire purchase ownership and dealer credit business models.
- Service business models comprise user co-operative, and energy performance contracting.

Examples of the business model are decentralised systems, centralised grid-scale systems and energy efficiency (IEA – RETD, 2012)

Broad Categories of Business Models

IEA-RETD [8] have categorised business models into three main categories: product-service-systems/ energy service companies (ESCOs), Business models based on new revenue model, and business models based on financing schemes.

Product-Service-Systems / Energy Service Companies (ESCOs)

- Energy supply contracting (ESC) – supplies useful energy such as electricity, hot water and steam
- Energy performance contracting (EPC) – delivers energy savings
- Integrated energy contracting (IEC) – hybrid of ESC and EPC.

Business models based on new revenue model

- Making use of a feed-in remuneration scheme
- Developing property certified with a green building label
- Building owner profiting from rent increase after implementation of energy efficiency measures

Business models based on financing schemes

- Property assessed clean energy (PACE) financing – works in existing residential and commercial buildings
- On-bill financing – works well in free-standing residential and small commercial buildings
- Leasing of renewable energy equipment
- Business models based on energy saving obligations.

The recommendations for policy makers in supporting the deployment of renewable energy technology and/or energy efficiency by stimulating business models are as follows:

- Analysing cost-effectiveness
- Supporting cost-effective RET in existing and new buildings by stimulating ESCO models and business models on on-bill or PACE financing
- Rented buildings – to change rental regulations to increase rent after RET or EE have been installed

Thus the business model opportunities are necessary for

- Facilitating access to capital
- Financing upfront cost
- Outsourcing of technical and economic risks, and
- Offering a wide range of energy related services.

Further, public buildings owners could also play a vital role by serving as a role model for driving the implementation of targets for RET/EE measures in built environment, and using suitable business models. Similarly, the local government can be proactive by applying voluntary 'green' building labels and directly supporting energy contracting business models.

Using Business Models to Address Barriers

It is a fact that business models cannot address all barriers. This is because for instance, ESCOs do not work for small buildings due to the high associated transaction costs. Individual owners tend to have relatively little interest and knowledge in energy-related issues (but comprehensive packages could take away the hassle actor); allowing building owners to outsource energy services. Since there is little information on the extent to which energy services are offered across IEA-RETD member countries, there is the need for further research in this area especially on the role of policy makers in supporting innovative, new approaches. This would enable expansion of energy suppliers in offering energy services to customers. Further, green building certification scheme should be introduced as studies have shown that the scheme is only applicable in the USA. Studies on innovative financing scheme such as soft leases would encourage to lower interest loans.

Since large scale adoption of renewable energy requires utilities to consider the business models and how to take advantage of the energy transition through relevant adjustment, policy makers are expected to monitor closely the development of utilities business models in the energy industry. Further, they should have direct impact on future growth due to the fact that regulatory framework determines the renewable energy models.

The policy interventions that would help address barriers for an increased deployment are direct incentives – both subsidies and preferential pricing, and changing the regulatory framework – obligations and minimum technical standard [12, 10, 13, 9, 14, 7].

Business Strategies

A business model strategy is to invest in renewable energy technology and energy efficiency measures, in order to create value and increase penetration of RET in built environment. Business models support the development of nearly zero energy building or energy plus building. Business models can work for existing buildings as building codes or obligations tend to be limited to new buildings and substantial renovation.

In terms of analytical framework, the business model enables analysis of the corporate strategy in dealing with the organisation's competitive environment, defining the market position, and ensuring competition is advantageous and sustained, where possible [10, 11, 9].

The strategy is based on researching on business models at the company level., and making use of a feed-in remuneration scheme to review the following: Description, market segments, applicable technologies, actors, organisational and financial structure, existing markets and policy context – using SWOT analysis to determine the strength and weaknesses, opportunities and threats; and discussion and conclusions.

The actors involve in building a business model are: Building owner, government and other actors such as in financing schemes [1, 3, 7, 8].

Tools and Techniques

The business models methodologies to be used are: Analysis of organisational and financial structure, policy context and SWOT analysis whereas the analytical techniques are comparative analysis of the business model – organisational and financial structures and SWOT analysis.

ESCOs have an intrinsic incentive to minimise life-cycle cost and financial incentive to maximise the amount of ECMs. Outsourcing of risks related energy supply and management may be important added value to building works. ESC is more suitable for implementing RET compared to EPC, whilst independent market facilitators such as energy agencies can strongly support market growth of ESCO model [14, 8].

SUMMARY AND CONCLUSIONS

Business models are seen as a means to an end [12]; they are established to extract the business activity maximum value within a specific framework. The government should hence promote the commercialisation of new and renewable energy when developing new technology through fiscal, financial, regulatory and other means. The regulatory environment has massive impact in influencing the various models to be developed and a such, incentives are necessary to enable a successful business model implementation and application[15, 16, 9, 12].

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