Energy Sector Strategies For Business Model Innovation: Exploiting Synergy For Competitive Advantage

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ABSTRACT
The purpose of this article is to explore strategies for business model innovation in the energy sector in North Macedonia. The two main theoretical frameworks – the resource-based view and the industrial model will be used to explore the potential for strategic shift in the companies operating in the renewable energy market. It includes a conceptual overview on the external factors, Porter's five forces, and internal factors such as the resources and capabilities. Key findings of the paper show that renewable energy generation and selling is driven by the dynamism of technological advance and climate change related policy solutions, but is also highly affected by climate change and political developments in the country and the region. The practical implications of this article show that maintaining market competitiveness by the renewable energy generation companies requires migration to more efficient technologies for electricity generation. The companies need to adapt to the policy shift aimed towards reliance on domestic sources for electricity generation, in response to the political turmoil in Europe affecting regional and national energy markets

KEYWORDS: *business strategy, renewable energy business model, competitive advantage, external and internal factors, North Macedonia*

INTRODUCTION

The purpose of this paper is to explore strategies for business model innovation in the energy sector in North Macedonia (the Country). It aims at exploring the potential for strategic shift in a company operating in the renewable energy market in the Country, by considering the industrial view approach and the Resource-Based View (RBV) approach in developing the company's business strategy operating in the renewable energy market. The paper is divided into two parts: (i) a review of the related literature focusing on key strategic concepts (the industrial view and RBV approach) and (ii) the case study of a North Macedonian registered company, operating five small hydro power plants (the Company), critically assessing the Company's strategy in the light of the industrial view and RBV approaches. The literature and the data collection for the case study have been performed by desktop document research of the relevant scientific articles, books and the Company's documents (provided to the researcher by the Company), supplemented by interviews and observation of the Company's staff and procedures performed in their business premises.

MATERIALS AND METHODS

Industrial organization model

In the strategy field, the Industrial Organization (I/O) model acknowledges that the strategic movements of companies are impacted by external factors (Hitt et al, 2007). From this perspective and to analyze particular industries and sectors, the Harvard professor Michael E. Porter's developed five forces framework has been used to emphasize the importance of five external forces in the strategic positioning of the firms. These are the power power, the customer power, the threat of (product/service) substitutes, the potential entry of new competitors and the rivalry of competing firms. As such, this framework constitutes an integral part of the collusion-based theories, as opposed to the RBV being part of the competence-based theories in business strategy.

Looking from the perspective of the pitfalls, contemporary scholars (Afuah, 2009) argue that the five forces analysis only measures the average profitability of an industry, and by no means the specific companies' profitability, arguing that a company's profits can only be measured if both external and internal factors are considered. Hence, the extensive reliance on the I/O model and external factors may prove inappropriate in analyzing the strategy and business model of specific company.

In the practical sense, one of the caveats is that the managers of established companies typically focus too much on defining how their companies can capture value and too little on the methods needed to create value, due to the fact that capture-focused techniques (such as the five forces model) have been shown to be particularly successful in long-established and stable businesses and have thus been entrenched in the planning process (Collis, 2021). Hence, a potential solution would be, as Drnevich & Croson (2013) suggest that: "the economic profit mechanism for the firm in competence-based perspectives focuses on the balance between value creation and value capture" (p.493).

Also, recent technological developments have driven competition among the firms and industries at unprecedented levels, which is very much the case for the energy sector, and especially the stellar progress of a once fledgling, but these days very strong and well-rooted renewable energy industry. The factors of digitalization, globalization and deregulation of markets, have not been given full consideration in Porter's five forces

framework, although they are contributing to insecurity, expansion and dynamism of the network, and have enormous influence in the competitiveness of the companies and whole industry sectors (Adelakun, 2020).

Resource-based approach

The second relevant model used for the topic and overall, for the strategy field is the RBV approach.

The RBV model as its name suggests relies on the company's resources and capabilities and in that sense has an important applicability as it has a very "personal" (meaning company) angle. Grant (1991) defines and differentiates the resources and capabilities the following way: "there is a key distinction between resources and capabilities. Resources are inputs into the production process—they are the basic units of analysis. The individual resources of the firm include items of capital equipment, the skills of individual employees, patents, brand names, finance, and so on", while "a capability is the capacity for a team of resources to perform some task or activity" (p.118). Consequently, although resources are feeding the company's capabilities, it is the capabilities which represent the critical cause of a company's competitive advantage (Grant, 1991).

Still, in dynamic markets (such as the energy markets), the resources of a company should also adapt from time to time, so that they can keep pace with market dynamics (Madhani, 2010), which is another word for developing a company's capability, given the resources. Frankel et. al (2019), conclude that winning strategies of renewable energy companies will be determined by their ability to adapt to market changes, and maintain focus on commercial management, handling merchant risk and the implementation of flexible business models.

CASE STUDY RESULTS

Market overview

The case study presented in this paper portrays a local, North Macedonian company operating in the energy sector in the country.

We will try to address the strategic challenges this company faces in the ever-changing, and fast developing energy markets. In the beginning, it is important to understand that the term "energy markets" is very wide and incorporates a number of separate and niche markets, some of which are regulated by a sectorial regulator and some of which are regulated by the laws of the free market. Then again, among some of the "energy markets" there is common overlapping and interdependence as this paper will describe in greater detail. Finally, the geographical borders, in other words country borders of "energy markets" (or at least some of them) are becoming more and more blurred, with a tendency to become fully regionally integrated, as may be seen from the coupling of power exchanges in the South-East Europe (SEE) region, the regionalization of the electricity balancing and ancillary services and in certain aspects, the development of large infrastructure facilities serving more countries at once (as in the case of liquified natural gas terminals and gas-powered electricity production facilities), or internationally organized auctions or tenders for the installation of new renewable electricity generation facilities, being open for participants from adjacent countries and SEE.

Simplified, some of the markets are the following: (i) the (renewable) electricity generation market; (ii) the electricity balancing services market; (iii) the organized elec-

tricity market (the power exchange); (iv) the natural gas market; (v) and the natural gas storage market.

Bearing in mind that the Company is operating in the (renewable) electricity generation market, the case study shall primarily focus on those markets with an electricity prefix, but also have a closer look at other energy markets, whose market dynamics and regulatory constraints and developments may have an influence on the overall operations of the Company and its business strategy.

Business model

The observed Company is a small, family-owned company with ten employees, characterized by a group decision-making process. The decisions are brought with consensus among the owners of the Company. The Company operates five small-hydro power plants (SHPPs) in the Country, totaling less than 5 MW installed capacity. It has been operating these SHPPs since 2015 under the long-term (20 years) concession agreement for water, with a guaranteed subsidy, namely the Feed-in Tariff (FiT) by 2035, with the possibility for an extension beyond 2035, after negotiating the terms and opting out from the FiT scheme. Nevertheless, the eventual continuation of the operation of the SHPPs is uncertain and subject to negotiations with the government of the country. The business is highly automatized, characterized with practically non-existing labor intensity levels and very straightforward operations. According to the Company financials (the data was unofficially shared with the researcher) the turnover of the Company in the first two years was around EUR 1 million/year, but recently it dropped to around EUR 0.7 million/year, which is, according to the estimates of the Company owners the result of the combination of the over-dimensioned technical design of the SHPPs and the negative effect of climate change on the water resources, which are decreasing over the years and negatively reflecting electricity generation and the Company's turnover.

The SHPPs are operated under the design-build-operate-transfer scheme, meaning the Company is required to turn the SHPPs back to the state once the concession period lapses. Therefore, to stay at the market of electricity generation the Company needs to further invest in other electricity generation capacities and/or expand its business in other energy related niche markets. Maintaining and operating its existing assets (the 5 SHPPs) operating under the highly regulated FiT regime under which the electricity is off taken at pre-agreed long-term prices is unsustainable in the long-term, especially when the concession period lapses in 2035. This may be attributed to two (2) reasons:

(i) Selling the generated electricity under the pre-determined price, instead of selling it on the open market, prevents the Company from gaining extra profit from its sales, given the current and forecasted electricity prices for the upcoming years. With the diminishing turnover, the Company will only be in position to repay the loans provided by the banks for construction of the existing five SHPPs and achieve small profits at the end of the twenty-year concession period. These profits are insufficient for additional investments in electricity generation projects which requires ensuring at least 20 per cent of capital for structuring a project financing deal with financing institutions/banks. The 20 per cent capital and 80 per cent debt ratio for financing electricity generation projects is in accordance with industry best practice in financing and development of energy projects and, depending on the country and business risk may often be increased to 30 per cent-70per cent per cent ratio. Recognizing that the Company is developing greenfield WPP of 36 MW installed capacity (total investment of EUR 55 million) the required capital portion for ensuring the project finance is expected to be in the range of EUR 11-16.5 million.

(ii) Effectively, there is no competition under the existing business model, as the electricity sales are all under regulated prices. Given the strong competition at the open market of electricity sales and fast-growing advancements in technology, one can expect that the longer the absence of the competition, the more difficulties and challenges the Company will face once returning to the competitive markets.

Still, the level of the FiT is dependent on the generated electricity in other words, the more electricity is generated during a month, the lower the transfer of FiT payments by the state-owned company operating the electricity market, which creates uncertainties linked to loan repayments to creditors. Additionally, over the last few years, the business of generating electricity from the SHPPs has become costlier due to the effects of climate change and increased drought combined with a larger number of drier years. The uncertainty of the business is growing given the increased pressure of different environmental groups protesting against the use of water for electricity production (instead of its usage for drinking, irrigation or simply leaving it to the nature) by the SHPPs.

Consequently, the choice of the Company to operate in the SHPPs niche market, brings its consequences, that is to have a smaller, although more stable turnover. The company is struggling to transition from one competitive advantage to another, which will lead towards the opening up of additional market opportunities and increased profit.

DISCUSSION-THE NEW STRATEGY

As a result of these issues, the Company has formulated a new strategy to ensure it maintains and furthers its position as a reliable and important electricity generation market player, having in mind that their existing business model is hardly contributing to it. Namely, the intermittency of electricity generation from water (which decreases in summer-due to natural droughts - when there is increased electricity demand) in combination with a limited (20 years) electricity generation under the concession agreement, it is clearly unsuitable for achieving its new strategic goals.

Anticipating future market challenges, the Company has during last several couple of years invested in the development of the large 36 MW Wind Power Plant (WPP) in the eastern part of the country, a site that has the potential for increasing the installed capacity to 50 MW, which is also the maximum allowed capacity of the WPPs in the country, established by means of regulation. In addition, the WPP committed site also has the potential for the development of an additional >10 MWs of Photo-Voltaic (PV) power plant, which may be considered a perfect combination of the power plants, producing relatively stable electricity flows in winter (due to the WPP) as well as in summer (due to the PV power plant), but also during the day (due to the daylight), as well as during the night, when typically, the wind blows more persistently.

The development of the WPP is under the FiT scheme, which should provide stable financing and loan repayment of the site, however, it may also be considered as major limitation for the maximization of profits. The Company is now considering whether to opt-out from the FiT scheme and instead sell electricity on the open market, and in that perspective maximize its profits by combining the commercial sale of electricity generation from the WPP and the PV power plant.

The Company strategy for the next 10-15 years is based on two pillars:

(i) A move from SHPP based renewable energy generation to a technologically more

advanced renewable energy generation, namely wind and sun resource-based technologies and

(ii) Migration from a support-based FiT system to the open market sales of generated electricity.

The following briefly elaborates future prospects of the strategy and critically assesses the strategy given the context of the industrial environment and the company's competitive resources and capabilities, in other words, in the context of the I/O model and the RBV approach. The conclusions are integrated under the following two sub-headings.

CONCLUSION

The importance of external (industry) factors on the competitive advantage of the Company

The key economic forces that are in support of the Strategy are the surge in the electricity price on European and regional markets, expressed in price fluctuation, taking a single (upwards) direction. This takes into account the fact that the electricity price per MWh has dramatically increased between 2015 and 2020 when it was fluctuating in the range of EUR 30-60/MWh to EUR 100-350/MWh in 2021 and2022 (the data has been interpreted from HUPX-the Hungarian Power Exchange, being most relevant for price formation in the country and the SEE region). The forecasts are that the electricity price will never be lower than EUR 100/MWh in the forthcoming decade and onwards. Compared to the guaranteed FiT paid for wind generated electricity in the Country (EUR 89/MWh), existing and forecast prices, ensure bigger profits. The key reasons for electricity price increases are explained further on.

Consumption patterns are in the direction of the use of clean energy, that is energy generated from renewable sources, as opposed to the highly polluting coal-based version of generating electricity. Companies and individuals are becoming much more inclined towards voluntarily using clean energy, even in situations where there are no taxes imposed on CO^2 emissions.

Pollution control also plays an important role as a natural environmental factor, as more and more countries in the region including North Macedonia will be imposing tax and other fiscal burdens on CO^2 emissions as of 2025, onwards.

However, despite the general political trend of abandoning coal and nuclear-based electricity generation in the EU and the region, and its replacement with clean energy production, there is the risk of reverting back to more stable, country-based energy resources such as coal-based thermal-power plants and/or nuclear generation, because of the recent political turmoil in Eastern Europe and the need to replace current imports with domestically produced electricity. Countries are expected to continually insist on energy independency, albeit this may also be an argument in favor of increasing capacities of renewable energy-based electricity in the country.

From a technological point of view, the intermittency and volatility of renewable energy generation is improving and there are opportunities to combine it with storage (batteries) capacities, maximizing profits and ensuring a presence not only in the electricity market, but also on balancing the electricity market. Some of the potential competitors on the SEE market are already formulating and implementing their strategies in this direction.

In the context of Porter's developed five forces model, the new strategy of the Company will not result in strong rivalry from the competing firms. At this very moment, the appetite for clean, renewable energy is huge, as well as the appetite for energy, even if it is coal based. As it takes at least three to five years to develop renewable energy facility or power plant producing electricity (including necessary measurements, construction and procuring technical equipment), and knowing from the business intelligence in the country that only a relatively small amount of companies are developing new generation facilities, as David and David (2017) conclude that rivalry force as: "usually the most powerful of the five competitive forces" (p. 230) is almost non- existant at the moment nor in the short to medium term. Similarly, the risk of the potential entry of new competitors is very limited and may only happen in the case of the huge number of existing small renewable energy producers joining and playing an aggregator's role in the market. Even this scenario is relatively implausible given that, a very large number of electricity producers should simultaneously agree on opting-out from the FiT scheme, which offers relative protection from the volatility of the markets.

While the development of the substitute products (e.g. large gas-powered power plants) seemed realistic at the moment of formulating the new Company's strategy, recent political and economic developments in Eastern Europe are thwarting the prospects of development of large scale gas-powered power plants which can produce large quantity of electricity, with minimum CO^2 emissions at low price satisfying industry and country/SEE electricity demand.

From a mid-term perspective, the development of a gas-powered power plant still represents a risk of substitutable product, although gas prices have grown five to ten fold over the last six months (data interpreted from HUPX), thereby questioning the profitability of gas-powered electricity in the case of the stabilization of electricity prices. Moreover, the development of much needed infrastructure and securing a long-term gas supply from non-malign sources will require three to five years, as a minimum. It is more realistic and therefore likely that this would span over a five to ten year timeline.

Furthermore, the buyer's power is very limited, having in mind that the electricity would be sold on the open-market and would involve power exchange in the Country or SEE. However, performing bilateral sales of the generated electricity under a pre-agreed long-term corporate power purchase agreement (for agreed quantities at market rates that may include rebates), may increase the buyer's power but limit the selling options for the Company. Hence, this option should be considered very carefully and be applied only for a smaller portion of the Company's generated electricity to ensure stable and predictive cash-flows at any market conditions.

Finally, the weakest point of the new strategy is perhaps over looking things from the power supplier's perspective. While the supplying of resources, wind and sun respectively, have been adequately assessed and can ensure the forecasted electricity generation of the Company, the major risk to the implementation of the Company's strategy comes from the concentration of equipment suppliers and their long lines of orders, which may result in delaying the construction of the planned WPP and PV power plant. This may especially be the case for smaller orders, such as wind turbines for around 36 MW may be considered.

Performed SWOT analysis by the authors illustrates the environmental changes (the external factors) the Company faces against its internal capacities (the resources and capabilities), relative to its competitors.

Table 1: Company's SWOT analysis matrix.

Source: Own elaboration.

Environmental change (opportunities and threats)							
	Climate change affecting water	Technology advancements/storage capacities	Complex and changing competitive markets	Pressure from environmental groups/NGOs	Increased demand for clean electricity at higher price	Delays in procuring technical equipment and wind turbines	+ -
Strengths							
Experience in project development and handling stakeholder relations	+2	0	0	+2	0	0	+4 0
Strong potential energy resource sites for wind and solar	+4	+3	+4	-2	+5	-4	+16 -6
Weaknesses							
Limited staff exposure to competitive electricity markets	0	-2	-4	0	-3	0	0 -9
Single source reliance (water)	-4	0	0	-4	0	0	0 -8
Environmental change scores	+6	+3	+4	+2	+5	0	
	-4	-2	-4	-6	-3	-4	

The importance of Company's competitive resources and capabilities (the internal factors)

The Company's new strategy does not consider its internal resources in any great detail. The existing physical resources are sufficient for the present business model. However, the implementation of the new strategy can only be realized by selling existing SHPPs and related facilities and the construction of WPP and later on a PV plant, which in combination with the existing location should be sufficient. Modern project financing and development schemes in the area of infrastructure, are done by turn-key contracting with experienced engineering, procurement and construction companies.

The human resources of the Company, are very strong in the areas of the maintenance of the power plants, having in mind almost a decade of experience in the business, which in combination with the intelligence, knowledge of the business and personal skills appear to be the strongest dimension of internal resources. Nevertheless, the strategy requires different skills of Company employees (existing or newly employed ones). It is advised that they go through a thorough training process on forecasting electricity production, the functioning of power exchanges and the dynamics of electricity contracting and sales to be fit for the new strategy, as a result of the shift in

the business model from a FiT model to a free-market electricity selling model. As David and David (2017) argue, "intangible resources are often more important for gaining and sustaining competitive advantage" (p.181).

The new strategy will require the adoption of a new organizational structure, establishing more complex information systems and streamlined planning and decision-making processes. Exposure to market forces requires a different skill set of the staff and management as well as market-oriented thinking and perception.

Table 2 shows the analysis performed by the authors presenting future options with a potential to address the combination of internal and external factors affecting Company's business.

Table 2: Company's TOWS matrix.

Source: Own elaboration (adapted from Weihrich, 1982).

	Strengths	**Weaknesses**
Opportunities	a. Exploit other potential energy resources/shift towards wind and solar electricity generation to address the climate changes b. Focus long-term on wind and solar resource to satisfy increased demand for clean electricity at higher price c. Use wind and solar resources to improve long-term competitiveness by investing in storage capacity	a. Employ experienced staff and train them to take advantage of the complex and changing competitive markets and in understanding of electricity selling options b. Establish new organizational structure and business processes
Threats	a. Build on the stakeholder relations experience of the staff in handling the pressure of environmental groups related to environmental studies for birds and bats b. Use project development experience of the staff to minimize delays in the procurement of technical equipment	Sell-out/decrease reliance on SHPPs to minimize negative climate change effects and to offset the pressure from environmentalists

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