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A strategic-integrated approach for sustainable energy deployment

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Abstract

Recent global trends in societies modernization and lifestyle change alter a dramatic concern about global collaboration in term of climate change mitigation and sustainable development. Overcome these challenges, viable strategies are known exigence. Historically, strategy-making, policy-development, procedures-shaping, and future outlook have been a matter of interest since many decades ago. At the edge of transition in the 21st century within competitive energy production markets, optimum strategy inevitably requires at various levels from single corporate (utility) to national and international levels. However, strategy-making and sustainable energy have been studied from different perspectives, but still, there is little attention paid for a multi-dimensional strategy-development. This study tried to cover managerial, technical, economic, sustainability and efficiency dimensions, to put forward with a viable-competitive framework. The proposed framework can be a concise guideline for policymakers, energy practitioners, and researchers at this domain. In addition to the proposed framework, this study explores a systematic approach that how to initiate and deliver it to a success plan. As well as this study differs strategy from policy in term of development and application.

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Keywords: Strategic management; Sustainable development; Sustainable energy; Energy deployment planning; Strategy vs. policy

1. Introduction

Global warming and sustainable development are known indispensable exigency of life at the age of global transition, therefore, these phenomena remain a continuing matter of interest within multi-disciplinaries. In reality, sustainable energy deployment has a multilateral impact at regional and global levels with social, ecological, health, and economic consequences. Defining indicators, measuring energy poverty, enabling sustainability pillars adaption case by case in accordance to supply and demand infrastructures are known exigence [1]. An open strategy

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attributes with transparency of process and inclusiveness of stakeholders' engagement at the formulation phase [2]. Historically, from 1950 to 1970, four pyramids of forces (social, cultural, organizational, technological) were introduced for strategy deployment [2]. While formulation of an energy system requires many other factors to be investigated within multi-dimensional approaches.

This study initiates strategy development for sustainable energy production, whilst some least developing countries suffer from lack of energy strategy and policies [3,4]. Meanwhile, an urgent need for sustainable energy deployment strategy and policies follows with open-door immature policies that comprise a significant economic and technical losses [5]. More importantly, energy policies in some developing countries cannot cope with citizen demand and global anticipation in term of sustainable development [6–10]. Therefore, in a general term, the outlook of this study is based on the evolution of the state of the art of a novel paradigm framework for sustainable planning of energy deployment and provision from multi-oriented approaches perspectives, comprises technical, social, environmental, institutional, business, management, policy, and cultural factors. Besides, this study following the below foremost objectives from strategic management and sustainability-oriented perspectives:

- To highlights particularities and influences of top, middle, and low levels engagements in strategic planning.
- To assess challenges, evaluate threats, identify opportunities and suggest contributing solutions enabling strategic approach in an accepted transdisciplinary manner instead of traditional methods.
- To draw an emerging multi-disciplinaries roadmap, with a special account of sustainability, efficiency, economic, and political attributes.
- To salient the role of policy-makers and energy experts in term of transdisciplinary decision-making for a sustainable long-term solution.

2. Theoretical background

All Strategies refer to a collection of related process, methodologies, actions, and overall endeavors that stakeholders improve their service, product, or any deliverables in term of performances. Competitive-prosperous planning necessitates indispensable tools and techniques in conformity of scientific and practitioner principles.

Observably, a strategy formulates at top management level. Whereas, results come from execution and implementation of a strategy associated with middle and lower levels managers and practitioners [11]. Indispensably, appropriate use of tools and techniques can assure success of a strategy by distinguishing of type and purpose of a strategy. Historically, the open strategy is discussed repeatedly in the literature [12–17]. Definitely, an open strategy with many merits (variety of idea, well-engagement, aligning planning and execution, and competitiveness), can be demonstrated with some shortcoming as well. Therefore, for hiring a strategical approach, recognition of the appropriate type (open or close [13]) for a specific implementation purpose (static or dynamic) is known as exigence. An open strategy promises transparency and engagement between internal and external stakeholders in term of strategic endeavors [17]. So far studies are mainly explored strategy dimensions, dilemmas, dynamics, application, frameworks, and different approaches, with too little attention to strategic management associated with sustainability pillars. This paper address an exhaustive framework in term of a strategic-integrated solution for long-run sustainability.

Satyro et al. [18] list ten foremost factors for a strategy formulation as “(1) the understanding of the competitive context; evaluation of (2) opportunities, (3) threats and (4) risks; (5) customers; (6) competitors; (7) evaluation of the resources to win and/or maintain competitive advantage; (8) formulation of alternatives of competitive strategy; (9) check the consistency of the formulated business competitive strategy, and (10) evaluation of the outputs to check process and strategy”. Steensen [19] broke down strategy into five categories: realized strategy, shared strategy, learning strategy, false strategy, and hidden strategy. There are mainly five categories of strategic approaches from business and management standpoint competitive strategy, corporate strategy, business strategy, functional strategy, and operating strategy [18,19].

Competitive strategy deals with the external situation and its internal influence on approached plan. Corporate strategy refers to long-term planning, design by top management at the organization level. Business strategy formulates in view of competitive and corporative strategies. Functional strategy targets a technical or business domain with specific anticipation. At last, an operation strategy facilitates operating units to achieve immediate goals.

3. Strategy-making for competitive advantages

In a constrained-competitive world, recognizing opportunities and more importantly their optimum employing have remained a challenge for strategy and policymakers. Strategy and policy developers are in a general consensus that “strategy-making is dominated by the active search for new opportunities” [20].

Ordinarily, the term of policy-making is used in government framework comparatively equivalent to strategy-making approaches. Whereas, these terms convey different objectives within the specific scope in the same way [20]. At the meanwhile, strategy-making can be classified from strategy behavior standpoint: Entrepreneurial model, adaptive model, and planning model [20]. These model can be exploited in the presence of defined characteristics (decision, motive, judgmental, choice, the vision of direction, decision horizon, etc.) fit the specific model. Hart [1] proposed various strategy-making modes (command, symbolic, rational, transactive, and generative) based on organization levers (mission, vision, goals, strategy, structure, systems, and people).

Obviously, for a sustainable energy transformation, there is no way except relying upon renewable energy deployment and energy-efficient supply and utilization. For many available options to achieve strategic sustainability goals, the first and foremost need is primary information for strategy development. To conform with the viable strategy-making process, a systematic data collection and analysis in conformity of a hierarchy is essential. Data hierarchy from initial data/information to useful data conversions are illustrated in [21] as information, primary data, analyzed data, indicators, and indices. However, in literature, a clear difference between strategy and policy is not reported, strategy refers to a comprehensive plan of organized and flexible competitive procedures to achieve goals at different levels [22–24]. While, policy refers to a set of rules and regulations with limited flexibility for decision-making in term of action principle than an action plan [22–24].

4. Strategy attributes

The term of sustainability shapes the world with a clear moral affinity rather legal responsibility. That incites communities to balance five pillars of sustainability (listed below), to meet the present needs without declining of the future demand [25]: technical sustainability, economic sustainability, institutional sustainability, environmental sustainability, and social sustainability. Some criteria for a sustainable energy system modeling are proposed in [25] such as interpretation potential, simplicity and accuracy, scientifically and theoretically validity, broadness in term of trends change over time, sensitivity and flexibility against scenario changes, comparativeness in accordance benchmark, and etc.

Sustainability implication is not limited to strategy and policy development at project to portfolio levels, it shall consider to be applied throughout the process at any decision-making perspective (policy-oriented, objective-oriented, and problem-oriented) of an energy system [26].

5. The proposed framework

For establishing a synergetic global consensus for sustainable development and clean energy poverty reduction, the hierarchy of a strategic approach can contribute to this trend [27]. Simultaneously with multi-dimensional strategy-making, proper decision-making impels to success [28].

A sustained-competitive strategy enables an energy utility or an organization to maintain above-average profitability in view of long-term services [29,30]. To put forward with successful implementation of a strategy, the business model that conceptualized how a strategy should lead toward achieving competitive advantages within sustainability pillars [31]. Therefore, in the proposed framework (Fig. 1) the business model is at the center of focus.

The proposed framework establishes an interrelated relationship among tree disciplinary that provides a systematic roadway in a synergetic manner. Also, this framework enables potential implementation and estimation of required resources (human, budget, tools, techniques, procedures, methodologies, and so on) at different stage of strategy development. Indeed, all these levels are in competing or overlapping conceptual interactions to achieve a goal. In addition, the proposed framework can be integrated level by level based on available options. For instance, at global-level strategies, the Sustainable Development Goals (SDGs) 2030 agenda (2015) and The Paris Agreement is an agreement Convention on Climate Change (2016) can be a benchmark for global contribution within sustainable development aim. At corporate-level to operation-level various indicators and measure can be defined in adapt

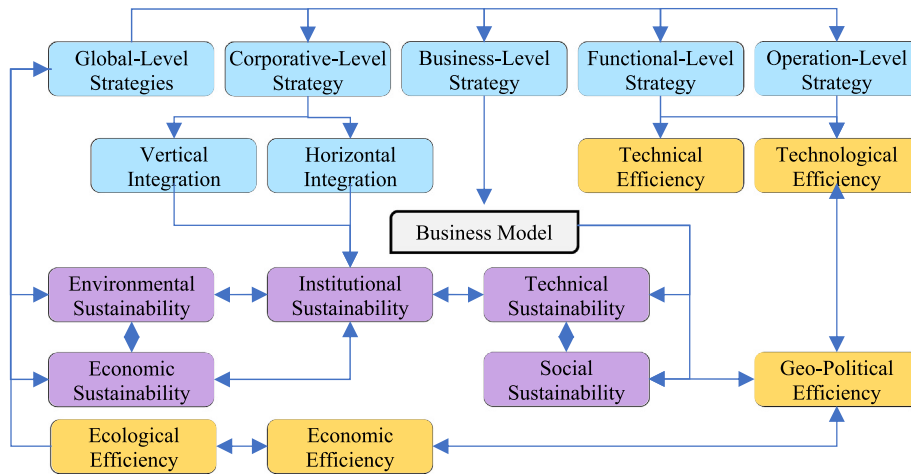


Fig. 1. A multi-dimensional strategy-making model for sustainable energy deployment.

to the level goals within optimum authorities of resources. Definitely, breakdown of strategy development process along with sustainability and efficiency criteria can lead to comprehensive strategy-making endeavors.

Due to the broadness of the proposed multi-dimensional approach, an exhaustive investigation of this subject will be conducted in the future. At this stage, the authors pointed out the salient points of strategy-development methodology within the limited elaboration of details. Various scenario of strategy-making can be demonstrated with merit and demerits that will be addressed in the upcoming studies.

6. Conclusion

A resilience strategy-making for sustainable energy provision and deployment refers to a set of multi-dimensional decision-making. Which it induces to tenacity to meet national, regional, and international anticipations in ways that ensure sustainability within competitive advantages. This paper proposed an exhaustive framework that systematically integrates sustainability, management, economic, social, technical, institutional, and environmental aspects within a concise roadmap. In addition, this study explored difference between strategy and policy, modeling decision-making process, and implementation of these concepts within an exhaustive roadmap framework. This short study can be counted as a digest roadmap for strategy and policy developers and practitioners, as well as researchers for a real-life application.

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