Energy Research & Social Science 27 (2017) 151–162

Contents lists available at ScienceDirect

Energy Research & Social Science

journal homepage: www.elsevier.com/locate/erss

Original research article

Establishing an energy security framework for a fast-growing economy: Industry perspectives from Turkey

Mehmet Efe Biresselioglu[a,*], Cansu Yildirim[b], Muhittin Hakan Demir[c], Sinem Tokcaer[c]

[a] Sustainable Energy Division, Izmir University of Economics, Sakarya Cad. No:156, Balcova, Izmir, Turkey
[b] Department of Maritime Business Administration, Maritime Faculty, Dokuz Eylul University, Cumhuriyet Bulvarı No: 144 35210, Alsancak, Izmir, Turkey
[c] Department of Logistics Management, Izmir University of Economics, Sakarya Cad. No:156, Balcova, Izmir, Turkey

ARTICLE INFO

Article history:
Received 20 July 2016
Received in revised form 12 March 2017
Accepted 12 March 2017

Keywords:
Energy strategy documents
Industrial perspective
Energy security framework
Turkey

ABSTRACT

Energy security is currently one of the priorities in governmental agendas, particularly for fast-growing economies such as Turkey. These economies which typically depend on energy-intense industrial production require a consistent, reliable supply of energy to support their economic development, especially the ones with limited indigenous energy resources. As the Industrial sector plays a major role in energy demand, the successful implementation of energy security strategy also depends on the cooperation of intensive energy consuming industrial companies. Therefore, this paper investigates the interrelationship between Turkish industry's perspective and government's energy security strategy papers, providing a case with the potential to enlighten the process. It also aims to gain insight into the industry sector's view of the energy security in this context, through a qualitative inquiry. An analysis of resulting concepts, and the interaction and interrelation among these enable the development of a Turkish energy security framework based on the views of industrial sector. In addition, a set of policy recommendations are developed following this framework. This study also identifies possible areas of discrepancies between industry and government perceptions, and thus, potentially promoting levels of interaction and understanding between the two key parties.

1. Introduction

The energy issue is a key priority for all countries. All countries strive for adequate energy supply to sustain their economy, enhance new investments, and produce goods to maintain the supply for their overseas markets. Developed economies rely heavily on maintaining a substantial overseas market base to sustain their development, as every country, also strive for adequate domestic and industrial energy supply for daily operations such as heating, cooling, and power generation.

The energy issue is also crucial for fast-growing economies like developed counterparts, especially for these heavily dependent on fossil fuels, such as Turkey, Indonesia, Pakistan, Mexico and South Korea [1]. At this point, it is important to distinguish the developing or emerging economies from fast-growing economies. Unlike other developing economies, fast-growing economies divert foreign direct investments which would otherwise directed to China, and take an important role in the world export market [2]. These countries identified are as potential challengers to BRIC[1] countries, taking part in concepts like Next Eleven (N-11),[2] MINT[3] or CIVETS,[4] due to these countries' young population, and dynamic and diverse economies. In view of this, Grinin [2] identified the shared characteristics of fast-growing economies as having (1) active economic and education policies, (2) a high gross domestic savings rate, (3) an active Foreign Direct Investment (FDI) and technological flows, (4) an export orientation, and (5) the potential to exploit cheap labor. In some cases, the high level of extraction of mineral resources, the diaspora engagement and geographical vicinity to developed economies also emerge as a shared characteristic.

The significance of this issue for such countries is twofold: To begin with, adequate energy supply is vital for current and

* Corresponding author.
E-mail addresses: efe.biresselioglu@ieu.edu.tr (M.E. Biresselioglu), cansu.yildirim@deu.edu.tr (C. Yildirim), Muhittin.demir@ieu.edu.tr (M.H. Demir), Sinem.tokcaer@ieu.edu.tr (S. Tokcaer).

http://dx.doi.org/10.1016/j.erss.2017.03.007
2214-6296/

[1] BRIC is an acronym referring countries Brazil, Russia, India and China.
[2] N-11 is a numeronym including eleven countries, Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, Turkey, South Korea and Vietnam.
[3] MINT is an acronym referring Mexico, Indonesia, Nigeria and Turkey.
[4] CIVETS refer to six countries, Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa.

future demand, both industrial and household in contemporary energy security mentality [3]. Second, energy resources are very valuable assets, both economically and politically [4,5]. Fast-growing economies, especially those with limited indigenous energy resources, which typically depend on energy-intense industrial production, require a consistent, reliable supply of energy to support their economic development [6–9]. Moreover, the energy issue also plays a key role in the economic growth of the fast-growing economies with significant resources, such as the Central Asian region [10], consisting of energy exporter countries including Azerbaijan, Kazakhstan and Turkmenistan. Furthermore, the value of energy assets has become increasingly important over the last few decades. Currently, the share of fossil fuels in global consumption is around 86%, led by oil with 33% and followed by coal with 29% and natural gas with 24% [1]. Few countries have an access to exploitable oil and natural gas reserves within its borders while coal is much more widespread. Therefore, oil and natural gas are more commonly traded than coal, thus making them global commodities. Regardless of whether a country is a net energy importer or exporter, public or private energy companies may need to import or export energy at any time, due to a range of factors, including price fluctuations, peak demand periods, and legal and contractual requirements. This further emphasizes the importance of energy as an economic commodity, of which the industrial sector is the main consumer. The share of the energy supply used by the industrial sector is more than 50% in developing countries. However, there are few studies on the perceptions of intensive users of energy, whether industry or household consumers [11–13], and user perception have rarely been discussed in previous studies on developing and fast-growing economies (e.g. [14]). Therefore, the main aim of this study is to gain insight into the industry sector's view of the energy security in the context of a fast-growing economy, Turkey.

2. Conceptualization of energy security

Energy security emerged an eminent issue in the political agendas of both producer and consumer countries from the mid-2000s [15], due to the combined effects of factors, including increase in global demand, decline in reserves, price fluctuations and the emerging environmental and sustainability concepts. Especially, contracting energy markets, together with increasing political instability in producer countries raised concerns related to the availability of energy in consumer countries, highlighting the dimension of security of supply [3]. Likewise, consumer countries' increasing diversification efforts, combined with utilization of the indigenous resources, including renewables, raised concerns for producer countries, as energy export revenues are the main source of government expenditures, and reduced revenues also possibly hinder overall economic growth [16], highlighting the dimension of security of demand. Accordingly, these concerns draw attention to the point that both parties are crucial in the conceptualization of energy security, acknowledging existing mutual dependency. A classic case of energy security dependency is the relationship between Russia and the European Union (EU). Many accept that although the EU clearly depends on Russian natural gas, Russia also depends the EU for their profitable market [17–20]. Therefore, this finely balanced relationship offers potential security benefits through mutual dependency. In addition, as discussed by Johansson [21], there is a potential for conflicting perspectives on price and exploration rates between producers and consumers, however it is also important to note the strong possibility for cooperation since "the suppliers' quest for supply security is met by the producers' quest for demand security."

To elaborate on this concept, it is important to investigate the energy security phenomenon, becoming an increasing matter of subject in academia, national agencies and international organizations [22]. The definition of energy security, and thus, its scope and dimensions have been frequently debated in the last decade. In their review on energy security definition and dimensions, Ang et al. [23] surveyed 104 studies, identified 83 energy security definitions, and revealed that a broader definition of energy security has emerged in the recent years. Similarly, Brown et al.'s [24] study used four dimensions, namely availability, affordability, efficiency and environmental stewardship, to analyze energy security trends among 22 OECD countries, including Turkey. The two oil crises of the 1970s left the world facing a phenomenon previously unknown, and the Energy security concept was primarily conceptualized as a response. The International Energy Agency (IEA), established in 1974 with the primary aim of 'promoting energy security amongst its member countries' defined energy security as "the uninterrupted availability of energy sources at an affordable price" [25,26]. Thereafter, energy security was initially proposed as "a condition in which a country perceives a high probability that it will have adequate energy supplies at affordable prices" [27]. Another definition proposes that energy security ensures continuity, and maintains the affordability of energy services, and simultaneously reduces the impacts of energy system on the environment [23]. Deese's definition refers to an important, although not in itself comprehensive, aspect now referred to as 'supply security'.

Contemporary perspectives on energy security have been affected by recent developments in the economic and political arena, together with increasing environmental concerns, which have extended the energy security concept. It currently includes the issues of uninterrupted access to energy sources, utilizing a variety of different sources (diversification), freedom from depending on a certain geographic region, self-sufficiency in energy, ensuring the protection from external shocks [28,29]. In addition, emerging related keywords include supply pricing; reliability; and adequacy; which implies the consideration of factors such as the environmental effects of fossil fuels; global geopolitics; and complex trade-offs approach and trade and capital flows [30]. Knox-Hayes et al. [31] recognize the socio-economic dimensions of energy security; defined as "equitably providing affordable; reliable; efficient; environmentally benign; proactively governed and socially acceptable energy services to consumers".

Cherp and Jewell [32] emphasize the significance of the term 'security', whereby the proposed definition of energy security becomes defined as "low vulnerability of vital energy systems". Blumer et al. [33] points to the effect of different perspectives and visions, resulting in the difficulty of establishing a shared understanding of the concepts. They also conclude that the factors that affect the perception of energy security in a country depend on national indicators such as import dependency, energy portfolio diversity, or actual energy service reliability. Cox [34] argues that, rather than trying to agree on a small set of indicators or metrics for a definition, there is a need to understand and incorporate all the competing and conflicting, context-specific perspectives on energy security. This view is supported by a study carried out with key experts in the United Kingdom's energy sector by Sovacool [35], who emphasizes the effect of the cultural dimension on the sense of energy security. All definitions of energy security include dimensions related to national security on one hand, and on the other hand to the emerging concepts of human rights, individual security, energy justice (equity), sustainability and sustainable development. However, the concept is complex, and no single definition is able to account for how the dimensions of energy security are perceived by energy consumers, households, and businesses.

As the preceding discussion suggests, the perspectives on energy security have emerged from a single-dimensional view of 'security of supply', or simply satisfying the energy need, to a more multidimensional framework, that includes economic, environ-