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ENERGY SECURITY OF PAKISTAN

Resource Scarcity: Thinking beyond Norm

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Chairman Joint Chiefs of Staff Committee

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ABSTRACT

The contemporary notion of security is multi-dimensional and complex. Elucidating on the theory of energy security, three key dimensions have been explored: 1) the concept of energy security as an element of national security, 2) the relationship of energy security and geo-strategy and, 3) the relationship of energy security and geo-economics. The analysis of energy security dynamics of Pakistan reveals multiple challenges such as lack of integrated energy planning capacity and capability, imbalanced energy mix with heavy reliance on energy imports, the supply-demand gap, need for improved sustainability and affordability in the power sector, absence of energy conservation culture, deficiency of human capital in the energy sector, and issues of corruption and commissions in energy sector projects. In reference to developing a more balanced energy mix, it is imperative to increase the share of nuclear energy as well as other alternative energy resources in Pakistan. To meet the growing demand of Pakistan's energy, we need a multi-prong approach comprising an all-encompassing energy eco-system.

TABLE OF CONTENTS

About The Author	i
Abstract	ii
Introduction	2
Energy Security – Theoretical Framework	2
Energy Security and National Security	2
Energy Security and Geo-Strategy	4
Energy Security and Geo-Economics	5
Nuclear Energy	5
Energy Security Dynamics of Pakistan	6
Conclusion	7
Notes	8

INTRODUCTION

In light of the relevance and significance of the subject of energy security for Pakistan, the main objective of this writing is to highlight the relationship between energy and security, outlining the issues and challenges to the energy security of Pakistan and to give directions for improved energy security policy. To elucidate the theory of energy security, I have explored three key dimensions of the theory:

1. The concept of energy security as an element of national security
2. The relationship between energy security and geo-strategy
3. The relationship between energy security and geo-economics

While highlighting the key issues to the energy security of Pakistan, I have covered in detail the topic of nuclear energy, in recognition of its significance for the future energy mix of Pakistan. I have ended this monograph with a description of the energy security dynamics of Pakistan, providing policy directions and practical solution to the issues highlighted herein.

ENERGY SECURITY – THEORETICAL FRAMEWORK

Energy Security and National Security

The contemporary notion of security is multi-dimensional and complex. In general terms, security is of paramount necessity to existence and survival of any nation-state. Yet there is no premium or common understanding of what constitutes security – a definition that can satisfy every age and section of human society. In the realm of post-modernist international relations, the construct of security has become even more byzantine. Hence, when Berry Buzan – the world-renowned academic on International Security – reiterated the concept of security, he defined it as neither power nor peace but something in between.¹ The abstraction and subjectivity of the concept are, hence, well recognized.

The traditional notion has always embodied security as freedom from want, fear and protection from anything hostile and harmful. In the pre-WWII Westphalian order, the dominant security concept was Balance of Power and enduring Great Game.² However, post-1945 this notion has transformed into a more muddled yet inclusive concept of national security. It is the ability and freedom enjoyed by any sovereign state, including Pakistan, to make decisions without any external interference. However, this absolute sense of security is impossible to achieve in the present globalized world, due to multiple interdependencies.

A holistic concept of national security incorporates infinite verities of securities, including but not limited to human security, military as well as non-military security, traditional and non-traditional security, economic security, environmental security, food security and, of course, energy security, which is the focus of this monograph.³

Throughout the history of mankind, the foundation of civilization has rested heavily on their energy needs. The Industrial Revolution of the 17th and 18th

century of Europe and the USA was powered with coal and, subsequently, with discoveries of hydrocarbons such as oil, gas and other petroleum products as new sources of energy of that time. The Industrial Revolution incited a massive need for energy resources and raw materials, leading Europeans to scramble for resources of Africa and Asia through colonization.⁴ In particular, the demand for coal increased dramatically in the post-industrial world.⁵

The construction of the Suez Canal, which is considered a turning point in the global politico-economic history, was aimed to ensure an uninterrupted flow of two things: energy and trade. The closure of Suez Canal in 1956 and the first mega global oil crisis in 1973, due to the Arab Oil Embargo and the resultant events of 1979 attracted people's attention to energy security and the possible shocks therein.⁶ The first oil crisis led, therefore, to the creation of an international energy agency, which defined the concept of energy security based on the stability of oil supply and its price.⁷

Over the past several decades, the world has changed dramatically with respect to resource scarcity driven social, political, and economic tensions and consequential conflicts. The rapid rise of emerging markets, mostly in our neighborhood, growing dependence on energy resources, and fluctuating energy prices have caused renewed concerns about national energy security and Pakistan is no exception. The global resource scarcity and increasing human energy appetite have germinated the trends of guaranteeing energy security by many regional and global players. To me, the energy security is the affordable, sustainable, safe, reliable, and accessible availability of energy resources for any nation. For many countries, energy security implies ensuring the safe supply and transportation of energy through safe routes and increasingly safe pipelines. For others, the affordability and abundance of supply to meet the demand is the top priority. For yet another few, developing a moving forward towards sustainable and low carbon energy sources to avoid environmental catastrophes is a major prime goal of energy security. The energy security perspective, therefore, varies as one's position in the energy changes. The perfect energy posture is the country's self-sufficiency and self-reliance – an idealistic notion, yet worth pursuing.

Global powers of the current world have synchronized their energy security with their national security and there is no reason why Pakistan should not do the same. In 2014, the European Commission has unveiled its energy security strategy which says that the European Union's prosperity and security hinges on the stable and abundant supply of energy.⁸ The US National Security Strategy and the US Defense Strategy also stress the need for energy security.⁹ Unprecedented rapid economic growth in emerging markets have fueled the demand of energy to the level that it has outstripped the domestic supply of energy resources in those emerging powers. These countries are endeavoring to achieve their energy security through continental and maritime connectivity, investment in overseas energy exploration and development projects, construction of transnational energy pipelines, plan for strategic petroleum reserves, expansion of refineries to process crude supplies from the Middle East, development of natural gas industry, and gradual opening of on-shore and

off-shore green areas to foreign companies. Energy security, economic security, and military security are, therefore, intertwined as no country in the world can ensure its energy security without possessing adequate capabilities on other accounts.

Energy Security and Geo-Strategy

In the power contestation between the great powers, a core element remains of strategizing assured and abundant supply of energy for these superpowers, their allies, and their partners. According to some analysts, oil and gas pipeline matrix superimposed on geographical maps pictures the current geo-strategic situation of the world.¹⁰ Whether it is the connection between Europe and Central Asia or Central Asia and South Asia; or the domination of oceans, be it Pacific, Atlantic, or the Indian Ocean; or initiation of new geographical constructs, such as the Indo-Pacific, they all reflect geostrategic paradigms based upon energy and its domination. And energy, therefore, is the primary fuel for social and economic development.

However, one cannot oversee the environmental and technological impacts of energy-related activities. As the world is quickly burning up the advanced but finite amount of fossil fuels, many large economies of the world have already peaked in fossil fuel extraction and production and others are dreaming to achieve so.¹¹ Current estimates show that about 1.5 trillion barrels of crude oil reserves have been left in the world, and over 34 billion barrels of oil are used every year.¹² Now regardless of the exact quantities, the fact remains that the supply of fossil fuel is dwindling. All powers are energy hungry: the greater in lines of technology the more energy-starved countries become. The demand is increasing, and at such a high rate that it is estimated that the world has less than 100 years of oil and gas left.¹³

In addition, maintaining affordable oil prices is a major challenge. According to current estimates, more than 80% of the world's proven oil reserves are located in OPEC countries and the bulk of OPEC oil reserves in the Middle East amounts to over 66% of the OPEC's total.¹⁴ Even global economic powers feel that they require affordable and sustainable energy to be competitive. Hence, to be competitive in the world, a country not just requires energy supply; it requires affordable and sustainable energy. This fossil fuel dependency and wasteful use of resources has and will worsen the climate change, which already threatens to endanger many world ecosystems including rising sea levels to an alarming point and affecting food production, possibly leading to resource scarcity driven instability, and may I dare say conflict.

The manifestation of this geostrategy and its linkage with energy can be seen from the fact that military power has been used and is being used in the world to ensure uninterrupted, sufficient, and affordable access to energy, by the energy importers and exporters alike. The purpose is simply to secure their energy sovereignty and to protect their energy assets against any perceived threats. The concept of forward-basing and military outposts is one good example of this as one of their purposes is to secure trade and energy routes. This deployment is to

protect the flow of oil and other resources like gas from Gulf and Central Asia to these power and their allies around the world. Conflict in various regions around the world has a strong energy imprint.

Energy Security and Geo-Economics

Traditionally, power domination was based on industrial progress of the states, which was also ensured by access to energy resources and ensured trade routes. Later, when the balance of power shifted across the Atlantic, the domination of the two superpowers in the twentieth century was similarly dependent upon their access to the rich energy resources in the Middle East and Central Asia. The trend even continues to date. The power supremacy reflected in its economic domination is still largely dependent on access and control of oil-rich regions and their routes. Thus the policies of superpowers have also been correspondingly remodeled to ensure energy security. With the perceptible shift in the World's economic center of gravity from West to East, the emerging powers are also in need of abundant energy resources to fuel their economies and to move forward their industries. As the world moves towards an era of trade wars and protectionism, this will become more pronounced.

Affordable energy prices also remain a challenge. Any conflict, especially in energy-rich geographical regions, has the potential to push the prices. This will have serious consequences and repercussions not only for the global and regional economies but also for economies of developing countries like our own. The golden network of pipelines, crisscrossing across the continents has become an important tool in the hand of both the emerging and established powers. There has also been a scramble by great powers to invest and develop their energy resources in Africa, Central Asia and, even in the Arctic. The prominent example includes TurkStream, running across the Black Sea, from Russia to Turkey; Nord Stream, running from Russia to Germany and Europe; a network of pipelines from Central Asian Republics to feed the growing appetite of emerging powers, and many more.

Pakistan has its own relevance to the energy security of the region and beyond, but especially in South Asia; both from geostrategic and geo-economic angles. Pakistan is at the center of various pipeline routes in these domains. These include Turkmenistan, Afghanistan, Pakistan, and India (TAPI) pipeline, and the Iran Pakistan (IP) Pipeline, to name a few. India's decision to pull out from Iran Pakistan Pipeline was not based on economic factors but geopolitical concerns.¹⁵

NUCLEAR ENERGY

In view of the increasing demand of electricity and the growing awareness of environmental effects of energy production through petroleum products, there is a clear need for new generating capacities around the world, region and in Pakistan to replace old fossil fuel units. Nuclear Energy now provides about 11% of the world's electricity from over 450 nuclear power reactors. Globally, about 60 more reactors are under construction, having electricity production capacity as

equal to about 16% of existing capacities, while some 150-160 nuclear power reactors are in the planning stage.¹⁶ In ten European countries, more than one-third of energy demands are met through nuclear resources.¹⁷ 16 countries depend on nuclear power for at least one-quarter of their electricity. France, for example, gets more than three-quarters of their electricity from nuclear energy. Japan, also relies on nuclear power, for more than a quarter of its electricity needs. By the grace of Almighty, by 2030, Pakistan will be able to raise nuclear power to the level of 8800 MW,¹⁸ which will contribute to a much-needed surge in the share of nuclear energy in the future energy mix of Pakistan.¹⁹

ENERGY SECURITY DYNAMICS OF PAKISTAN

Pakistan enjoys a very important geopolitical position, of being at the intersection of South East Asia, Central Asia, and South Asia and, hence, is naturally located at crossroads of energy flows. Ironically, however, Pakistan is not self-sufficient in energy resources and currently depends largely on imports. With the increasing demand of energy, this dependency is likely to grow. Our import bill is also surging with the increasing energy demand and fluctuating energy prices. Pakistan's indigenously discovered energy resources are limited. The local reserves of oil and gas are continuously depleting. Pakistan indigenous crude oil production, therefore, currently meet only 15% of our daily requirements. The remaining 85% of crude oil and petroleum products are imported.²⁰

Pakistan has a huge supply-demand gap in natural gas, as well. We are importing LNG at a cumulative sum of about 3 billion cubic feet per day. This is likely to increase further if no practical measures were taken to produce natural gas through local reserves. We are also importing 7 million tons of coal annually, which cost our economy a burden close to Rs.100 bn. Despite increase in power generation capacity, the country's power sector continues to be in a challenging state and therefore, facing a million issues both of sustainability and affordability. Saudi Pipelines, IPI and TAPI are critical for energy security but, to make them a reality, we have to deal with multiple challenges on account of international politics, financial constraints, and above all, the situation in Afghanistan. Pakistan's total circular debt is well over one trillion. This reflects the challenges across the spectrum of the energy supply in Pakistan.

We are in the initial stages with regard to developing an alternative energy paradigm. Pakistan's energy mix is currently 64% thermal, 30% hydro and about 6-8% nuclear, which is not ideal. Renewable energy currently accounts for less than 3% of this mix.²¹ Therefore, it is a matter of strategic fact that Pakistan has existential energy challenges. In addition to the aforementioned issues, the major causes and challenges for Pakistan energy sector are:

- lack of integrated energy planning capacity and capability
- an imbalanced energy mix, with heavy reliance on gas and oil
- non-utilization of vast indigenous resources, including those of coal, hydel, other renewables
- lack of effective project structuring, planning and implementation of identified and viable projects

- inadequate primary energy sources, access to and local availability of development
- issues of corruption and commissions in various projects
- the absence of a strategic culture of energy conservation promoting the use of daylight and other energy saving system

Finally, there is another very important factor that has been not given due attention: our education system is insufficient in equipping our youth with knowledge and skills to work in the energy sector. Majority of our universities are not offering energy studies, courses or/ and degree program; thus are not producing bachelors, masters or PhDs in energy-related fields. The limited ones that offer such study programs do not make enough contribution to the economy of Pakistan.

CONCLUSION

Over of the foundation of Pakistan's energy dynamics described above, I would conclude by chartering a vision for the future of energy security in Pakistan. To meet the growing demand of Pakistan's energy, we need not a singular but a multi-prong approach, we need an all-encompassing energy eco-system, comprising of a strategic energy culture and thought, a national energy narrative, a national social energy outlook, and energy supportive education to develop human capital system and also a system of incentivizing the energy sector and human resource development for it. First, we need to have the right methodology and structure to go about the energy business. We also need to have the right energy mix and reduced dependence on fossil fuels. We need more indigenous resources whether they are hydel, renewable, nuclear or coal. Our energy and electricity cost at this moment is very high, which has seriously impacted on our economy, in general, but imports in particular. We need to diversify our import energy destination. I believe that IP, TAPI, and CASA are part of the same diversification plan.

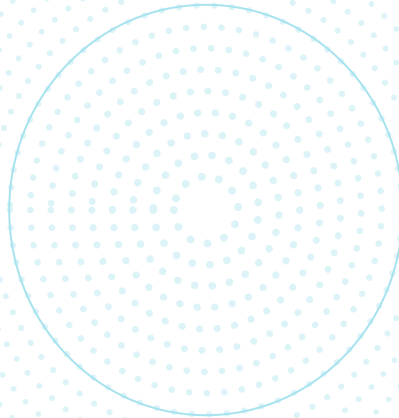
We also need to conserve the unnecessary use of energy and divert the same to run our industry. Our energy losses, our energy pilferage, our energy circular debt, all need to be diligently handled in a methodical manner at priority. There is also a need to introduce efficiency for industrial machinery, transport, and household appliances. The culture of conservation may need to be promoted through a change in strategic culture. To conclude, let me say, to realize a dream of energy security of Pakistan, for Pakistan to be a self-reliant nation, we need to develop an energy structure, an energy policy on a mid-term and long-term basis. The policy must not only be based on quality human capital but also on expertise to plan, design, engineer, manufacture, commission and operate energy plants, distribution systems, and the whole energy ecosystem. Pakistan requires Pakistani solutions to Pakistani energy problems.

NOTES

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17. *Ibid.*
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19. It is important to clear here that despite my emphasis on nuclear energy, I do not support an energy mix tilted toward nuclear resources. Pakistan requires a balanced and inclusive mix of energy and nuclear energy should be part of that mix.
20. Pakistan Economic Survey 2017-18 (Ministry of Finance, 2018), 210
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