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DEFENSE RESOURCE PLANNING IN THE CONTEXT OF ENERGY EFFICIENCY

Ebru CAYMAZ *

Fahri ERENEL **

* Marmara University, Department of Organization and Management, Istanbul, Turkey.

** Asst. Prof., (R) Brig.Gen. TU A, Istanbul Kemerburgaz University, Department of International Logistics, Istanbul, Turkey.

Abstract
National security depends on accessibility of energy resources according to their type, amount and military necessities where they are located. Military institutions, as the guards of national security, have to consider limited energy resources and dependence on foreign resources while planning the resources. The literature review has shown that the strategic dimension of energy and the security of energy supply are constantly emphasized. It is also seen that main emphasis is still on fossil resources as if they are infinite. In this study, countries which place major emphasis on energy while planning defense resources and adapt innovative methods to develop defense systems and modernization are examined in detail. It is aimed to reveal the significance of alternative energy resources and present different methods to ensure energy sustainability in DRM.

Key words: Energy, Resource Planning, Defense Resource Management, National Security.

1. Introduction

Energy is a strategic resource which has different applications related to security, economy, geostrategy, operations and environment. The strategic significance of energy has been admitted by the countries that consume energy on a big scale. Energy and forms of energy consumption affects national security directly as well. National security, depends largely on types, amounts and military requirements energy and accessibility of energy locations when needed. In addition to this, global energy competition results in tighter controlling of these resources and hence, even the smallest security service providing organizations are affected negatively. For this reason, diversifying energy resources avoids difficulties in crisis times as well as dependence on other countries and regions.

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The security of energy is a quite important argument, having no independence in terms of energy, is considered as a threat to military, diplomacy and economy of a country. The way energy is used, its form and its cost are the determiners of efficiency degree of armed forces. Growing dependence on energy and insufficiency of energy resources show us the fact that defence resources planning should include energy planning too. In this study our main aim is to draw attention to the dependency of fossil fuels within the context of national security and discuss the alternative methods to minimize this dependency. It is aimed to reveal the significance of alternative energy resources and present different methods to ensure energy sustainability in DRM.

2.Literature Review

With the invention of steam and the internal combustion engine, warfare has become significantly efficient as armies and navies gained ability to travel great distances and use engine powered warships, armored personel carriers, tanks, and fighter aircraft. The discovery of oil and its application as a fuel has resulted in a dramatic mechanization of armed forces, particularly between World War I and World War II, to power the engines of the tanks, transports, and other drivable vehicles.

During the modern age of warfare, the use of fossil fuels to power armed vehicles has increased and thus the dependence of fossil fuels has created a great risk. In a Deloitte study it is found that there has been a increase in the dependence on fossil fuels since World War II. With the level of consumption rising dramatically over time, a concern about "the dependence on oil derived from foreign sources as well as the economics of acquisition" has emerged. As a result, economic power and national security are more depended on imported oil. As the dependecy grows, the fundemental stability of the global oil market is being affected by inadequate investment in expanded oil production capacity, constant geopolitical instability, and rapidly growing demand in emerging market economies [1, 2, 3].

In literature review, it is noticed that USA Defence Department (DoD) is the organization which allocates the highest budget for defence planning and puts special emphasis on energy issue while planning resources. When its Fiscal Year (FY) 2010 Report is examined, we see that there are sub-goals which is particularly important for our research context. These are:

- "**Energy Efficiency**: The Department will reduce facility energy intensity by %3 each year from FY 2006 through 2015, and by 1.5 % per year from FY 2015 through 2020.
- **Renewable Energy**: DoD will produce or procure 18.3 % off all energy consumed within its facilities during FY 2020 from renewable energy sources (thermal as well as electrical).
- **Vehicle Fleets**: DoD will reduce the use of petroleum products by non-tactical vehicle fleets by 2 % annually, relative to FY 2005, for a total 30 % reduction by FY 2020.

- **Landfill Gas**: Ten landfill gas capture facilities will become operational by FY 202 for the production, capture and use of methane from landfills (both these owned by DoD as well as through arrangements with landfills owned by other parties)."

In order to ensure both sustainability and an energy resilient resource management process, these strategies are embedded in management approaches and best practices: sustainable procurement, environmental management systems, high performance sustainable buildings, and coordination with regional and local planning [3,4,5].

Although energy dependency poses a great risk for armed forces and especially lessons learned from Operation Iraqi Freedom present us the fact the issue of fuel supply is the greatest priority, recent researches generally focus on security of fuel supply with a limited point of view as if the resources are infinite. There is relatively a small number of studies which discuss the alternative methods for armed forces to overcome fossil fuels dependency. As DoD has declared its mission to be a leader in this field, we chose to examine documents published by them.

When we examine the reports in detail, we see that the U.S. Army accounts for 36 percent of total DoD facility energy use and thus it has prioritized saving energy on its bases and facilities. It is pointed out that military installations hold significant opportunities for energy efficiency and renewable energy as a means of cutting costs, emissions and risks associated with reliance on traditional energy sources [6, 3]. In this context a 500-megawatt solar power generation plant at Fort Irwin (California) is established which will help power the base and reduce the facility's vulnerability to power disruptions. The Army has named Fort Irwin a "net-zero plus" installation and hopes to end the base's dependence on the public electric grid within a decade [7]. A transition to the use of 4,000 electric vehicles during the next three years has been initiated which provides the Army one of the world's largest electric fleets. This will help avoid emitting more than 100,000 tons of carbon dioxide and cut the use of liquid fossil fuels by more than 11 million gallons [3]. Furthermore, Secretary of the Navy Ray Mabus has indicated that the service would invest $550 million in energy-efficiency efforts that would yield $400 million a year in savings [8].

The Air Force, which is the DoD's largest energy user (spending $9 billion on energy), has created a comprehensive energy program and policy, Air Force Energy Plan 2010 to reduce energy use. The objective is expresses as "to make energy a consideration in all that we do". The plan focuses on three significant goals; Reduce demand, increase supply and change the culture [9, 10,11]. In this context, investments made as well as plans/programs and projects run prove we can say that DoD achieves the mission of being a leader in this field and can be taken as an example.

3. Conclusion

In literature, it is seen that energy issue has been dealt only in terms of its strategic dimension and supply security and it has not been emphasized in defence resources planning process except for Research&Development studies. We can conclude that the US military has embraced the strategic and operational imperatives of energy efficiency and the use of alternative

energy systems at both facility and operational levels. However, the twin threats of energy dependence and climate change are stil recognized by only a small number of armed forces. Even U.S. government's progress on energy management has been most significant at the facilities level and it cannot be considered as sufficient in this rapid transformation era. Today's military leaders clearly understand the fact that forward-looking approaches to energy and climate both save lives and money and reduce emissions. When we discuss what have been done so far, we can clearly see inadequacies as well.

Regarding the fact that oil resources have nearly 49 years of lifetime left, armed forces should take precautions like the U.S army has done; put an emphasis on other dimensions besides energy supply security; embody this issue in resource planning with a comprehensive manner. Besides, all the executions in this area should be supported by legal regulations and discussed in academic studies.

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