



LOGISTICS APPLICATIONS ON ENERGY SUPPLY CHAIN MANAGEMENT: TURKEY MODEL

Ali Saka, (MSSc)

Istanbul Commerce University, Turkey

Murat Çemberci, (PhD)

Istanbul Commerce University, Turkey

Mustafa Emre Civelek, (PhD Candidate)

Istanbul Commerce University, Turkey

Abstract:

Finding necessary resources for energy production geographically, determining the amount of reserve to be found, digging them up, determining distance to market, solutions to transportation issues, creating distribution channels and observing supply demand equilibrium are tasks that are done by supply chain professionals. Many different countries along with multinational corporations create a union of forces to overcome while planning these. Every corporation in the system is responsible for overcoming a certain stage of these tasks, however delivering these resources and goods happen with the collaboration of logistic sector creating a solution partnership. Logistics provide energy supply chains all the required resources, distributing these to a location of function and deliver all these produced goods to required places. In this article, Turkey's involvement to these energy delivery systems is discussed. Difficulties of being part of an existing system can only be overcome with mutual agreement for all parties, coming up with alternative solutions. By evaluating its location as a crossing route for petroleum and natural gas market, Turkey can take a determinant role in this market while providing sellers with certain benefits.

Keywords:

Energy, Energy Supply, Logistics

1. Introduction

International trade between corporations still continue to our day and 21st century corporations have a distribution network that can sell goods in both domestic and abroad. These delivery networks also known as logistic services are organized by these 3PL distribution firms. With the benefits provided by information technology, people no longer need to go to malls, markets or stores to do shopping to obtain their necessities. People now have the opportunity to get what they need wherever they need as supplying these goods are no longer a problem. Concept of electronic trade successfully brought both consumer and producer together without the need for a mediator. From anywhere in Turkey, any good that exists in any place on the earth can be ordered within seconds, paid and it can be traced during the delivery. The issue of going around in stores, looking for goods on shelves and comparing a product with others to find the optimal level of price and quality no longer exists. Cheapest product now reveals itself to us in comparison to other products on our computer screen. This success, while being dependent on electronics trade, is also dependent on functionality of logistic services. It can even be claimed that, the application of electronic trade being so easy in our day is due to well-planned logistic operation systems.

Electronic trade and logistic systems also need to be fed by a resource. Both electricity which is used to make electronic machines work and petroleum which is used for transportation vehicles are energy sources. Almost all devices that are used in sheltering, heating, lighting, production and comfortable life can be operated with energy. Actually, all mobilized objects require energy. The subject of this article is to reveal the economic and political

struggles to obtain these energy sources that are required for these systems to improve human life in modern times and also reveal the activities that Turkey developed in this field.

The energy that operates open/close switches or timer systems or motion sensitive devices that make our life easier are no doubt not obtained very comfortably or easily. Obtaining these resources, processing, pricing and distributing them for the energy sector requires great investments and is spread around globally with logistic solutions.

The reason these establishments are founded is to produce goods and services. Energy is the most important common input with the trait of being used in every input. Energy is such an important factor that lack of energy can make any system break down if it's not considered properly during supply chain management with a supply issue. The reason energy is not considered properly is not the fact that it's viewed as an unimportant input, but the fact that energy suppliers were not able to form a proper distribution logistic network. Countries have started to make investments on suppliers and auxiliary energy production systems to prevent production failures and to provide for future term needs that are caused by the lack of energy. The most important energy source is electricity in 21st century. After electricity, petroleum, natural gas and coal can also be counted as important energy sources. %80 of the electricity production is made by power stations that use petroleum, natural gas and coal as primary resource. The other %20 of this energy is produced by renewable energy sources.

Industrialized countries in west and Far East monopolize on creating a technologic infrastructure required for energy production. The energy needed in order for these countries to maintain their dominance is provided by less developed or developing eastern and Middle Asian countries. These countries have major differences in their economic and political structures and their common political policies are maintained with energy resources required. It's very difficult to talk about permanent successes in energy market. In cyclical, while there are situations where countries can remain dominant in an energy market, quick fluctuations can occur with it as well.

Turkey needs to produce realistic policies in order to have a say in energy market. Geographically, Turkey that holds a geopolitically important location between producing and consuming countries; needs to be involved in this energy supply chain by constructing passageways between these countries being a mutual solution partner to provide security and sustainability. The resource supply system that is fictionalized to provide for Turkey's need for energy relies on importing. Turkey does not have the high technology and productive infrastructure to provide for the needs of international market. The most important advantage for Turkey is its geographical location, being a bridge between producing and consuming countries. Once Turkey manages to value this advantage which make Turkey have a say in energy projects in a good way, it can also boost its power in market. The fact that Ottoman Empire or other countries managed to maintain its economic and political power relied on holding trade routes under surveillance is a political strategy that should be kept in mind.

2. Conceptive Environment

2.1. Energy

Turkish Linguistic Society defines the concept of energy as "the force that appears as heat, light that which exists in matter (Türk Dil Kurumu, 2016).

Dictionary for Turkish Scientific Terms; "Energy is, while one part of it is provided by electricity, petroleum, coal and the other part of it is provided by sources such as wind, water, solar or animals and humans, forces that are mandatory to maintain production (Türkçe Bilim Terimleri Sözlüğü, 2011, p.415) makes a conceptual definition like this.

The concept of energy is also explained by physicists theoretically aside from dictionaries. Einstein claims mass and energy are the same and every matter we are in contact with in the universe is no different than energy and turn physics into something metaphysical by doing so (Nordmann, 1959, p. 93). Einstein determined that, energy equivalent of mass can be obtained by multiplying the mass of an object with square of light speed. He formulized

this remark in his article which he published in 1905 with the name "Is the inertia of an object dependent on the amount of energy it holds?" and theorized it by doing so (Calaprice, 2005); $E = M \times C^2$.

Functional importance of energy should also be discussed along with defining energy theoretically and conceptually.

Energy serves the purpose of being a catalyser in a system which it interacts with by changing at least one factor. Human kind started this process with its muscle power, animal power, water, wind and biomass and took it to a new phase by making machines which unleashes the power within fossil fuels. During industrial revolution which started in 18th century, first energy resource to turn the cogs was coal. Petroleum was discovered in 19th century and used in internal combustible engines, replacing coal as a primary resource for energy. Petroleum is easier to extract storage and use compared to coal and gives more efficiency per mass. With these properties, it started to get in competition with coal (Çınar & Kesici, 2005, p. 166)

Aside from that, petroleum crisis's between 1973-1974 and 1978-1979 made it easier to realize the importance of energy in economic development (Reddy, 1998). With this crisis, the connection between energy consumption and economic development became clearer (Güvenek and Alptekin, 2010, p. 175). Until petroleum crisis occurred, importance of energy as an input in production was not noticed, and this can be seen as a clear indicator to the fact that energy supply chain is managed very well. Accessing energy became as easy as breathing, cheap and widened.

In our day, strategic campaigns are made in the field of politics for energy supply which is an irreplaceable part of economic development. Providing energy necessity in a secure, cheap, constant way sufficiently is one of the basic principles that define foreign policy of countries (Kılıç, 2003, p. 361).

2.2. Energy Sources

In the dictionary of Turkish Linguistic Society the word petroleum is defined as; "Unrefined, naturally flammable fat with a dark colour which has a unique scent and a density between .80-.95, consisting of hydrocarbons".

Petroleum is the unknown energy source of the sacred fire lit in the temples of fire in the name of Hormuz, the fire God in Mesopotamia. The word petroleum has taken under record in Babylonian tablets with the name of "Naptu" around 2000 BC. It has been used as insulation material in the Hanging Gardens of Babylon and it is also known to be used by Sumerians and Assyrians. Petroleum is a Meta which gained enough importance to be a subject in the Code of Hammurabi. In the beginning of the 2nd Century the petroleum was used for militaristic purposes by Hellenics against Roman Empire and it is also taken under record of the name "Greek Fire" in the Ottoman Archives. After 3000 years of its first record in the 10th century AC in the book Professions and Countries written by geographer Ebu Ishak Bin Muhammed El Farsi mentioned petroleum located around Baku with the name "Nafta". This information is confirmed by famous traveller Marco Polo in 1272. The Ottoman famous traveller Evliya Çelebi expressed the importance given to petroleum by the state with the following: "The trade of tar and coal tar has been prohibited to foreign merchants and trade of these matters considered as smuggling." (Parlar & Nebiler, 1996, p. 9-11)

The discovery of petroleum in recent history starts with the mention of traveller Francis Rawdon Chesney about the petroleum and mineral deposits located in Fırat-Dicle basin in Mesopotamia area. In 1850 's petroleum leaking from underground made available to only usage in fabric saturation. (Dinçer, 2016) Edwin Drake opened first oil-well to reach the source of leaking petroleum in August 27 1859. (Cerid, 1965, p. 12) First petroleum refinery facility established by John Davison Rockefeller in 1870 Cleveland, USA to process crude petroleum drained by wells. This enterprise established by Rockefeller is called Standard Oil of Ohio. After this brief history of petroleum, it's useful to mention about its direct relationship with economy.

According to a final model concluded by a study made in 25 OECD member countries by testing structural and diagnostic aspects and with a research plan; it's precipitated that economic growth determines the energy consumption. (Güvenek and Alptekin, 2010)

Leaving a better world to future generations is a problem needs solving in a global aspect by using the resources efficiently in the energy supply chain management. In the report accepted in 1987 by World Commission on Environment and Development(WCED) agreed on accomplishing sustainable development model with the keystone of "not ruling out the needs of future generations while compensating todays".(Spangenberg, 2000; Aksu, 2011) The main point of this model is using the renewable resources and the sustainability of the technology using these resources. (Aykal, Gümüs, & Akça, 2009, p. 78-83)The term sustainability can be made possible by the cooperation in usage of renewable resources and high efficient technology (Sevilgen & Kiliç, 2013, p. 72).

2.3. Energy Supply Chain

Establishments can reduce the cost of inventory efficiently by using Supply Chain Management. Inventory cost, aside from economic costs of goods in inventory, consists of factors such as storage costs, depreciation, insurance, inventory losses and costs of inventory control. According to a research, costs of keeping inventory holds %25 of goods actual value (Christopher, 1998, p.81). Corporations use can reduce the unnecessary cost of inventory management by using "MRP-Material Requirement Planning" and "DRP-Distribution Resources Planning" techniques. Appropriate inventory management can surely regulate a corporation's balance of expenses. For this added value to appear this Supply Chain Management System must be built well. SCM relies on the principle of organizing functions according to customer expectations. According to "Pull Strategy", preference and expectations of the customers are directed to supply chain concepts by pulling strategies with the help of sales centres. Supply, production and distribution modelling is planned according to this affect. "JIT- Just in Time" aims on operating with zero inventories; Models such as "Quick Response" aims on distributing the final product with the fastest way to the customer and "Postponement" are ergonomic methods used in supply chain planning (Bowersox & Closs, 1996). Supply Chain Management can be founded by merging resources and activities of all rings of a chain (Martino & Morvillo, 2008, p. 578). This is defined as merging of different activity process with the main business process that starts from the supplier goes until it reaches the customer (Stock&Lambert, 2001, p. 54; Lambert, Stock & Ellram, 1998, p.504). Competition understanding in 21st century is assumed to be the same with competition between different supply chains (Robinson, 2003, p. 252).

Economic development and growth is dependent on secure energy supply chain management (Üşümezsoy & Şen, 2003, p. 160). Secure supply chain management can only be provided with international corporations working together efficiently. An interruption within energy supply can cause economic crisis in countries that operate on supply and demand. These crises' can spread around the world with a domino effect (USEPDG, 2001, p. 170). Countries are showing effort to keep a secure market for resources to keep a level of welfare and constant maintenance of production activities.

2.4. Connection between Development and Energy

While governments improve their economic development policies, the most important factor is providing the need for energy resource both medium and long term. The reason for this is that, economical profits have become an inseparable part of national interests. Until 21st century, various economic models were used in different periods in the world. Important factors for these periods are distribution and energy resources used in transportation. Firstly, Netherlands trading period can be mentioned. This period is where transportation was done by sea using wind power to far countries and colonies. Starting and finishing point of international trade happened between harbours. Following this, during the period of English trade and industry, railroads were built aside from maritime lines, connecting internal regions between each other with harbours. Coal was the primary resource used in transportation at this period. American dominance period followed the English period. Aside from maritime lines and railroads, highways were also integrated to create a transportation network in a wide geography. Furthermore, airlines carried transportation sector to a new level. This period was named as the "American system" and petroleum was the primary source of energy which is used with internal combustible engines (Üşümezsoy & Şen, 2003, p. 8).

2.5. Sustainability

While making plans for development, it's vital to determine sustainable energy policies. Not able to provide for increasing need of energy with the current resources can cause an economic crisis (Güvenek and Alptekin, 2010, p.

190). While doing development plans in 21st century, one should aim for sustainable and secure energy policies instead of energy supplies (Satman, 2007, p.6). For this reason, developed countries with the need for energy make policies on countries with energy resource to ensure their supply safety. Developed countries use their technological and economic advantage to create pressure on other countries to make their policies happen. By enforcing certain ideas such as globalization, new world order, global warming, international standards, environment and safety protocols, they keep less developed countries with energy resources under pressure.

On the other hand, concept of economic consumption activities is also as important as secure energy supplies. An economic consumption activity is a name given to the method that which energy is used the most efficiently. Japan is the most efficient country in the world when it comes to consuming energy. When we confirm Japan's energy consumption as one unit per its unit GDP, it would be 1.6 units in EU, 2.7 units in USA, 9 units in China (Ata, 2008, p. 88).

Sustainability appears as a necessary concept for all sectors in 21st century. Corporations need to embrace a more sustainable structure by lessening the consumption of fossil fuels, therefore reducing the amount of carbon emission, creating an ecologic sustainable production system. It is assumed to be more beneficial for systems practicality to give priority for technologies related to sustainable energy resources.

3. Global Energy Policies

One of the most basic goals of countries economic policies is growth. Published rate of growth every year represents improvements on that countries economic and social state. Growth means an increased GDP. This increase is directly proportionate to the increase of production output of a country economy. To increase production, input that are used on production should also be increased. Basic inputs are capital, raw materials, work force and energy (Kibritçioğlu, 1998). In this part energy's, as one of the most basic factors of economic growth, market prices that are defined by supply and demand policies will be discussed. The reason for this is that, comparing supply and demand amounts will not be sufficient while defining a meaningful balance of expenses. To know the energy market requires more than the knowledge of supply and demand. In our day, owning energy resources, controlling its production, establishing energy and supervising them have become one of the key principles of countries external affairs. It's no longer a secret that, in many events that occurred in history, usage and control of energy resources has been one of the key motivations (Çınar & Kesici, 2005, p. 166,167). Most powerful countries in global energy market are the ones that are producing and consuming countries. However, in 21st century where logistics also gained a lot of importance, countries that are on transportation routes come into prominence. Furthermore, aside from owned energy resources by the country, the fact that transportation of these resources is also a really important factor effecting supply demand balance and market prices is accepted by global firms (Bayraç H., 2009, p.135).

In planning energy policies, supply demand balance should be determined with analytical methods and should be updated constantly in the direction of political affairs (Pamir A., 2006, p.4). Energy is a really important factor in both supply and demand when it comes to economic indicators. When it's considered on supply, energy is a fundamental input when it comes to capitol, workforce and production using raw resources. Proven and probable reserves, production costs, transportation costs, economics and politics are what determine the energy supply. Factors that affect the energy demand are economic rate of growth, level of welfare, social lifestyle, use of technology and prices (Chontanawat et al., 2006; Bayraç, 2009, p. 118). Increase in energy prices will also affect product prices. This situation can cause an economic recession effecting total demand. Especially highways, airways and costs of chemical substance production increase proportionately, causing a raise in inflation. As the ratio of energy consumption increase in economic systems, rise in petroleum prices pressures the inflation proportionately (LeBlanc & Chinn, 2004, p.8; Bennett, 2003, p.1).

When we look the geopolitical structure of energy, we see that developed countries do not have sufficient energy resources and less developed countries own most of the rich energy resources. Important countries in energy diplomacy, in one side USA, EU and China with developed economy, in other side developing countries like Russia, Saudi Arabia, Iran, Iraq, Venezuela, Azerbaijan, Turkmenistan, Kazakhstan, Mexico, Qatar, Kuwait can be given as

an example. Especially after the cold war, countries that went through political regime changes also had major changes in their external affairs (Çınar & Kesici, 2005, p.165; Kanbal, 2013, p.3). The political view of Arabian countries when it comes to petroleum can be expressed like this: “No matter who it is that drop the petroleum prices, it is no ally of Arabs and can’t claim to be allied to Arabs.” (Cerid, 1965, p.68) The old Soviet Union has a more realistic saying about petroleum: “Petroleum is a valuable substance with far more value on its cost of sales. In importing necessary investment goods, best method of payment is petroleum.” (Cerid, 1965, p.78)

Energy prices can come to a real balance point by increasing sustainable energy resources. By increasing efficiency in energy production and reducing the amount consumed, foreign trade deficit can also be decreased. Usage of nuclear energy will also provide what is required to organizing market equilibrium with supply demand (Üşümezsoy & Şen, 2003, p 59, 60). For sustainable economic growth, providing energy supply safety is a must. Furthermore, harms of carbon emission to environment health should also be investigated thoroughly. Increase of costs by causing environment pollution by using fossil fuels to create energy should also be taken into consideration (Dağdemir, 2003, p.33).

3.1. Market Safety

After discussing matters about the importance of energy, what is raw material safety for the market? What are the political stances of countries that belong with the side of supply demand to provide safety for market? Answers of these questions can be analysed to understand the concept of market safety.

According to Üşümezsoy and Şen (2003); “Safety of energy is providing the required energy with the appropriate price. Market safety is a concept that is based on the principles of availability, accessibility and admissibility.” (p.106). According to Ediger (2007); “Concept of energy security differs based on producing and consuming countries. For demanders, demand security is of utmost importance and for suppliers, its supply safety. Market security can be provided on an environment where producers and consumers can balance each other.” (p.5)

Bayraç reevaluates the situation in terms of demand and came up with two comments (2009); “The concept of energy security can differ according to how developed a country is. While developed countries think of market security with uninterrupted energy supply, developing countries define market safety as cheap energy price.” (p. 119)

These definitions reflect theoretical viewpoints energy market security. We can enlighten this subject furthermore if we talk about explanations where theory and practice come together. In supply planning management, for providing energy security; one should aim to create variable energy resources, increase supply regions, appropriate infrastructure projects must be constructed, putting investments in the right locations for right projects, updating used technologies, giving importance to research and development and increasing information trade and collaboration between the consumer and the producer. Reaching these goals can only happen by careful raw resources market safety planning (Satman, 2007, p.11). Efficiency of energy supply chain can be measured by energy market safety activities.

For economic growth, energy resource supply is one of the most important factors. Especially in transportation sector; petroleum, heating and electrics sector; with the increase in using natural gas the struggles to sharing energy has also increased. Main centre of this struggle is Middle Asia and Middle East axis. An alliance formed between Russia-Germany-Iran and Iraq and an alliance formed by USA-UK-Israel fights to share the energy resources belonging to this region. The purpose of this struggle is energy market supply safety (Üşümezsoy & Şen, 2003, p.192).

3.2. Applications of Energy Supply Chain in Turkey

Turkey’s vision of energy; by making constant energy demand estimates in middle and long term, is to plan projects to oversee the need for energy by defining the location, model and size of the investment. Turkey could increase its power in energy market by being a strategic solution partner and come up with productions of projects that increase the passageways aside from being able to oversee its own demand for energy supply (Republic of Turkey Ministry of External Affairs, 2012). In order to make a full membership to European Union as a part of 2023 vision, pipelines

that provide energy for the Union that pass through Turkish borders; can increase its political strength and make Turkey a strategically important partner (Satman, 2007, p.3). In order to reach these goals, analysing global supplies and demands correctly can also carry a great importance aside from national interests. In global economy model where national borders lost its importance, Turkey belonging to a supply chain integrated with multinational corporations will serve as a catalyser for Turkey to reach its goals. While being parallel to EU laws, the law of Petroleum that came into force with the number 6326, law of Natural Gas that came into force with the number 4646, the law of Electricity Market with the number 6446 and founding of EPDK are formal applications that support these policies (Yorkan, 2009, p.35) (Ültanır, 1998, s. 169-177).

Most of the international trade happens through the seaways. This situation increased the traffic load of Turkish straits and other passage channels in the world. Developments in naval industry provide us with bigger and faster construction of ships. Ship owners who would like to make a bigger profit with bigger ships can cause serious dangers in straits because of its geographical and oceanographic structure (Akai, 2005). %3,7 of world petroleum trade passes through the Turkish straits to reach its actual market. With its energy logistics importance, Istanbul and Çanakkale Straits have a major role to play as it connects Russian Black Sea Harbours to the world market, giving Turkey an important strategic power (TANAP Doğalgaz İletişim A.Ş., 2014). However, using this power for Turkey has been restricted by Montreux Convention.

Because of Turkey's geographical location, its importance in energy diplomacy also increases. To reach and control certain energy resources, political conflicts between Washington, Brussels, Beijing and Moscow still continue (Özbağcı, 2012). In this political field, Ankara, Tehran and Baku have become key suppliers to make a strategic partnership. Especially Moscow monopolizing on raw material pipelines cause a huge threat to energy supply security. For sustainable energy logistics, Turkey can create an alternative corridor since it is located on an appropriate geographical location. Turkey who carries Caspian petroleum to the world market with Baku-Tbilisi-Ceyhan pipelines, carry an important role in creating an important network with TANAP project to carry Caspian petroleum to European Union. In the new world order, it is possible to define Turkey as an energy passageway (Kısacık1, 2013).

The most important deal Turkey has made regarding energy logistics is the pipeline project TANAP which is created to carry the natural gas that is extracted from Şah Sea-2 region of Azerbaijan to Europe. BP is also a third partner to this project deal between SOCAR Corporation belonging to Azerbaijan State and BOTAŞ Corporation belonging to Republic of Turkey. This pipeline project that will be completed in 2019 is estimated to deliver 60billion m³ natural gas from Caspian Sea Region to Europe. This amount is half the amount Russia provides with its Gazprom Corporation to EU (Sönmez, 2015). This transportation project that uses Turkish lands provides EU with energy supply variety. With this project, Turkey's geographical strategic advantage can be used as a strong political and economic aspect.

It is planned to deliver the natural gas that is extracted at Azerbaijan's Caspian Sea Region close to Şah Sea-2 and natural gas that is produced in southern fields be delivered to Europe over Turkey as part of transportation regime with Trans Anatolian Natural Gas Pipeline. TANAP, starting from the Turkgözü village in Posof Town around the city of Ardahan which is located at Turkey-Georgia borderline, passing through Kars, Erzurum, Erzincan, Bayburt, Gümüşhane, Giresun, Sivas, Yozgat, Kırşehir, Kırıkkale, Ankara, Eskişehir, Bilecik, Kütahya, Bursa, Balıkesir, Çanakkale, Tekirdağ and Edirne and lastly connected to the town of Ipsala in Greece. It will also feed a couple natural gas distribution networks which are located in Eskişehir and Thrace region with two exit lines. The pipeline is planned to be 1.850 kilometres long in total (TANAP Doğalgaz İletim A.Ş., 2014). Turkey published a special writing with the number 4505538 at 11.12.2014 date to the extent of project management for Free Transportation Entrance Regimes for TANAP. According to this writing; "At any time or sometimes, every participant of the project has the rights to import or export any material, equipment, machine, tool, auxiliary parts, vehicles, supplies and all other goods (not including liquid fuels or oils) related to project activities on his own name or his own account without being subjected to custom duties or restrictions" (Ministry of customs and trade, 2014).

Other international pipelines planned by Turkey to maintain an energy supply chain are these:

- Trans Anatolian Raw Petroleum Pipeline (TANAP)
- Burgaz-Dedeğaç Pipeline
- Trans Thrace Pipeline
- Pan-European Petroleum Pipeline
- Albania-Hungary-Bulgaria Pipeline (AMBO)
- Neka-Jask Petroleum Pipeline
- Trans-Caspian Pipeline
- Trans-Iran Pipeline
- Middle Asian Petroleum Pipeline (Tozar & Güzel, 2009, p 9-12).

As an indicator showing Turkey in the frontlines with energy policies, would be statements and cooperation policies of globally powerful countries about the role Turkey is meant to play. USA Vice President Joseph Robinette Biden (Joe Biden), in his visit to Turkey in 2014, got involved in the competition for being the energy corridor between Turkey-Russia-Europe. After the published “European Energy Security Strategy” in May and the natural gas outage that happened in Ukraine, he indoctrinated Europe to reduce their dependability on Russia for energy production. To decrease this dependency, he offered a proposal to increase sustainable energy resources and energy saving precautions. By declaring that EU needs to have variable supplies of energy to prevent Russia from using energy as an important tool for its external affairs; he also claimed Turkey to be a valid partner as an alternative line for energy transfer. These suggestions provided by USA no doubt play a strategic key role for Turkey leaving Russia inactive by owning Baku-Tbilisi-Ceyhan petroleum and Baku-Tbilisi-Erzurum natural gas pipelines (Sönmez, 2015).

After these improvements, Vladimir Putin who visited Turkey in 2014 December expressed that the pipeline they will export to Europe will pass through Turkey. With this project, Turkey will have the rights to use %15 of the natural gas that passes through its lands for its own needs. Previously, in Nabucco Project which was decided between Europe and Russia, Turkey’s demand for this was rejected by EU (Okumuş, 2015).

For countries with raw material reserves, there needs to be proper transportation mods to get these goods to market (Yüceer & Cerit, 2001, p. 119). It is also very important to maintain a supply chain security and sustainability for importing countries (Katinka, 2007; Sönmez, 2015). Turkey’s strategic policy is to create a logistics network that would connect countries in both sides existing in supply chain. Turkey sticks up to the policy of being part of a supply chain planning management by connecting Middle East and Middle Asia who hold %70 of world’s petroleum and natural gas reserves to the energy market (Klare, 2004, p. 45; 2009, p. 137; Kısacık, 2012). It can be observed that Turkish External Affairs has always been very pragmatic when it comes to energy. So much that it takes a side against Russia politically with the crisis in Syria. However, there are serious collaborations with Russia when it comes to energy, tourism and economy. Akkuyu Nuclear Plant that is to be built in Mersin is going to be constructed by Russian authorities. Delivering Middle Asia natural gas with European pipelines is done by the Southern Flow Project which is supported by Russia. Biggest supplier of natural gas for Turkey is Russia and Russia started to do a %6 discount for natural that it’s selling to Turkey (Sonmez, 2015). Current pipelines that exist in Turkey:

- Kerkük-Yumurtalık Raw Petroleum Pipelines
- Baku-Tbilisi-Ceyhan Raw Petroleum Pipelines
- Samsun-Ceyhan Raw Petroleum Pipelines
- Russia-Turkey Western Natural Gas Pipelines
- Blue Flow Natural Gas Pipelines
- Azerbaijan-Turkey Natural Gas Pipelines
- Iran-Turkey Natural Gas Pipelines
- NABUCCO Natural Gas Pipelines
- Iraq-Turkey Natural Gas Pipelines
- Egypt-Turkey Natural Gas Pipelines
- Turkmenistan-Turkey Natural Gas Pipelines
- Turkey-Greece-Italy Natural Gas Pipelines
- Trans Anatolian Natural Gas Pipelines

4. Conclusion

Republic of Turkey should obtain required raw materials supply for itself and give weight to infrastructure work to create transportation trade routes to deliver goods to third countries. In our day where logistics have become a structure that adds value to product, instead of allowing transportation routes to pass through Turkey, by creating transportation systems turning Turkey into an energy corridor with proper control will make it more prosperous. A Turkey that gets more of an expert in logistics, with its experience and fund of knowledge, can become a global solution partner in world energy supply system by operating in different geographies. For instance, BOTAŞ could be a corporation that is looked upon by the world for its pipeline projects. Turkish harbours can speed up the flow of energy by improving their intermodal transportation systems. Problems and crises also contain solutions that can be turned into opportunities. The important thing is to approach the problem with a solution. The question that awaits an answer is; can Turkey to solve the problems in Turkey energy supply system?

On the other hand, how Turkey will supply the energy needed and how it will close the foreign trade deficit that rises with the costs is also in the agenda. Common solution to International and national origin energy policies is sustainable energy usage and building of nuclear power plants. Turkey has created alternative projects for both sides and put them into practice. First of them is Akkuyu Nuclear Power Plant. Second one is, by using sustainable energy resources, creating energy production systems. Ever since 2000, it has increased its activities on hydraulic energy, wind energy, solar energy, biomass energy and hydrogen energy.

To give an example, international studies have begun related to hydrogen, which is considered as the source of energy for the future. First of these was building of International Centre of Hydrogen Energy Technologies (ICHEIT) at 23rd October 2003 and was built with a treaty between Republic of Turkey and United Nations Industrial Development Organization (UNIDO). The main purpose of this centre in Istanbul, favourably to international logistic strategies, is to make Turkey a bridge between developing countries, coordinating between researching developing and investing institutions and usage of hydrogen in the future and determining the delivery principles

Aside from energy supplying and producing alternative energy resources, efficient use of energy, saving energy and usage of recyclable products can also partially help solve the energy supply issue implicitly.

References

- Akai, T. (2005). *The Transportation of Oil by Sea*. ABD: Universe.
- Aksu, C. (2011). *Sürdürülebilir Kalkınma ve Çevre*. Güney Ege Kalkınma Ajansı.
- Ata, İ. (2008). *Çin'in Enerji Güvenliği ve Politikalar*. İstanbul: Stratejik Analiz.
- Aykal, F. D., Gümüş, B., & Akça, Y. (2009). *Sürdürülebilirlik Kapsamında Yenilenebilir ve Etkin Enerji Kullanımının Yapılarda Uygulanması*. V. Yenilenebilir Enerji Kaynakları Sempozyumu, (p. 78-83). Diyarbakır.
- Bayraç, H. (2009). *Küresel Enerji Politikaları ve Türkiye: Petrol ve Doğal Gaz Kaynakları Açısından Bir Karşılaştırma*. Eskişehir Osmangazi Üniversitesi Sosyal Bilimler Dergisi, Issue 10 ,p. 115-142.
- Bennett, R. (2003). *10 Facts About Oil Prices*. Joint Economic Committee, Economic Update.
- Bowersox, J. D., & Closs, D. J. (1996). *Logistical Management: The Integrated Supply Chain Process*. New York: McGraw-Hill.
- Calaprice, A. (2005). *The Einstein Almanac*. Baltimore and London: The John Hopkins University Press.
- Cerid, M. (1965). *Petrol Emperyalizmi*. Ankara: Sol Yayınları.
- Chontanawat et al., J. L. (2006). *Causality Between Energy Consumption and GDP: Evidence From 30 OECD and 78 Non-OECD Countries*. UK: SEEC Department of Economics, SEEDS.
- Christopher, M. (1998). *Logistic and Supply Chain Management: Strategies for Reducing Cost and Improving Service*. London: Prentice Hall.
- Çınar, B. B., & Kesici, A. (2005). *ABD'nin Hazar Enerji Politikası ve Türkiye*. İ.Ü. Siyasal Bilgiler Fakültesi Dergisi , 165-167.

- Dağdemir, Ö. (2003). Çevre Sorunlarına Ekonomik Yaklaşımlar ve Optimal Politika Arayışları. Ankara: Gazi Kitapevi Yayını.
- Diñçer, V. (2016). www.listelist.com.
- Ministry of Customs and Trade. (2014). Dated 11.12.2014, numbered 4505538 writing about TANAP Project. Ankara: Republic of Turkey Ministry of Customs and Trade.
- Gümüş, Y. (2007). Lojistik Faaliyetlerin Rekabet Stratejileri ve İşletme Karı İle Olan İlişkisi.
- Güvenek and Alptekin, B. v. (2010). Enerji Tüketimi ve Büyüme İlişkisi: OECD Ülkelerine İlişkin Bir Panel Veri Analizi. Enerji, Piyasa ve Düzenleme, Volume 1, Issue 2 , 172-193.
- Kanbal, B. (2013, 02 13). Türkiye ve Rusya Federasyonu İlişkilerinde Boru Hatları Diplomasisi. Dated 03 29, 2016, International Political Academics: Taken from the adress: <http://politikaakademisi.org/2013/02/13/rusya-türkiye-boru/>
- Karaçay, G. (2005). Tersine Lojistik: Kavram ve İşleyiş. Çukurova Üniversitesi Sosyal Bilimler enstitüsü E-Dergisi, Volume: 14, Issue:1 , 317,332.
- Katinka, B. (2007). Turkey's Role in European Energy Security. Centre for European Reform Essays .
- Kıbrıçoğlu, A. (1998). İktisadi Büyümenin Belirleyicileri ve Yeni Büyüme Modellerinde Beşeri Sermayenin Yeri. A.Ü.S.B.F. Journal, Volume 53 .
- Kılıç, A. M. (2003). Türkiye ve Enerji Gerçeği. Yeni ve Yenilenebilir Enerji Kaynakları Sempozyumu (p. 361-368). Kayseri: TMMOB.
- Kısacık, S. (2012, Aralık 16). Hazar Hidrokarbon Kaynaklarının Dünya Pazarına Aktarılması Bağlamında Rusya-ABD Rekabeti ve Türkiye. Mart 29, 2016 tarihinde Uluslararası Politika Akademisi: taken from the adress: <http://politikaakademisi.org/2012/12/16/hazar-hidrokarbon-kaynaklarinin-dunya>
- Kısacık1, S. (2013, September 25). Türk Dış Politikasında Enerji Koridorlarının Önemi. Dated April 4, 2016 National Politics Academy: Taken from this adress: <http://politikaakademisi.org/2013/09/25/turk-dis-politikasinda-enerji-koridorlarinin-onemi...>
- Klare, T. (2004). Kaynak Savaşları - Küresel Çatışmanın Yeni Alanları. İstanbul: Devın Yayınları.
- Lambert, D. M., Stock, J. R., & Ellram, L. M. (1998). Fundamentals of Logistics Management. McGraw-Hill International Edition.
- LeBlanc, M., & Chinn, M. (2004). Do High Oil Prices Presage Inflation? The Evidence From G-5 Countries,. UC Santa Cruz Economics Department 2000-05 Working Paper Series.
- Martino, M. D., & Morvillo, A. (2008). Activities, Resources and Inter-Organizational Relationships: Key Factors in Port Competitiveness. Maritime Policy & Management , 571-589.
- Nordmann, C. (1959). Einstein ve Kainat. İstanbul: Halk Basımevi.
- Okumuş, O. (2015, July 02). What Did Turkey Lose When EU Lost Nabucco. Dated November 15, 2015: Taken from this adress : <http://www.al-monitor.com/pulse/originals/2013/07/eu-nabucco.html>.
- Özbağcı, Ş. Y. (2012). ABD'nin Kafkasya Politikaları. M. Aydın içinde, Avrasya Üçlemesi III. (p. 163,168). Ankara: Nobel Akademik Yayıncılık.
- Pamir, A. (2006). Enerji Güvenliği, Stratejik Öngörü 2023, Avrasya Stratejik Araştırmalar Merkezi (ASAM). Ankara: Avrasya-Bir Vakfı Yayını.
- Parlar, S., & Nebiler, H. (1996). Petrolün Ekonomi Politikası. İstanbul: Sarmal Yayınevi.
- Reddy, M. (1998). Energy Consumption and Economic Activity in Fiji. The Journal of Pacific Studies, Volume 22 , 81-96.
- Robinson, R. (2003). Port Authorities: Defining Functionality Within a Value-Driven Chain Paradigm. Proceeding of International Association of Maritime Economists Annual Conference, (p. 654-674). Busan.
- Satman, A. (2007). Türkiye'nin Enerji Vizyonu. VIII. Ulusal Tesisat Mühendisliği Kongresi (p. 3-18). İzmir: TESKON.
- Sevilgen, G., & Kılıç, M. (2013). Yenilenebilir Enerji Kaynakları ve Sürdürülebilirlik Endeksi. Uludağ Üniversitesi Mühendislik-Mimarlık Fakültesi Dergisi Volume 18, Issue 1 , 69-80.
- Sönmez, G. (2015). Avrasya Enerji Satrancında Türkiye'nin Yeniden Gündeme Gelen Rolü. Türkiye Politika ve Araştırma Merkezi, Volume 4, Issue 3 , 22-31.
- Spangenberg, J. H. (2000). Sustainable Development Concepts and Indicators. Sustainable Europe Research Institute.
- Stock, J. R., & Lambert, D. M. (2001). Strategic Logistics Management. McGraw-Hill Higher Education.

- T.C. Dışişleri Bakanlığı. (2012, January 24). Türkiye'nin Enerji Stratejisi. March 31, 2016 tarihinde www.mfa.gov.tr: http://www.mfa.gov.tr/turkiye_nin-enerji-stratejisi.tr.mfa taken from adress
- TANAP Doğalgaz İletim A.Ş. (2014, 10 14). Trans Anadolu Doğalgaz Boru Hattı Projesi. November 10, 2015 dated : Taken from the adress: <http://www.tanap.com/tanap-projesi/tanap-nedir/>.
- Tozar, B., & Güzel, E. (2009). Enerji Lojistiği Perspektifinde Hazar Petrollerinin Türk Boğazlarına Etkileri. Dokuz Eylül Üniversitesi Denizcilik Fakültesi Dergisi Volume 1, Issue 1 , 1-13.
- Türk Dil Kurumu. (2016, May 1). www.tdk.gov.tr. May 1, 2016 dated www.tdk.gov.tr: taken from adress : <http://www.tdk.gov.tr/index.php?option=com>
- Turkish Scientific Terms Dictionary. (2011). Enerji. Ankara: Türkiye Bilimler Akademisi.
- USEPDG. (2001). National Energy Policy.
- Ültanır, M. Ö. (1998). Türkiye Açısından Yeni ve Yenilenebilir Enerji Kaynaklarının Yeri 21. Yüzyıla Girerken Türkiye'nin Enerji Stratejisinin Değerlendirilmesi. İstanbul: Tüsiad Raporu Publishing Number: T98-12/239.
- Üşümezsoy, Ş., & Şen, Ş. (2003). Yeni Dünya Petrol Düzeni ve Körfez Savaşları. İstanbul: İnkılap Kitabevi.
- Yorkan, A. (2009). Avrupa Birliği'nin Enerji Politikası ve Türkiye'ye Etkileri. Bilge Strateji, Volume 1, Issue 1 , 24-39.
- Yüceer, B. S., & Cerit, A. G. (2001). Caspian Oil Exports and Their Impact Upon The Tanker Fleet. Developments in Maritime Transport and Logistic in Turkey , 118-134.