

Global Energy Security and European Union: A Review

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ABSTRACT

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Energy supply security is a vital aim of energy policy in countries across the globe. Global energy security is one of the main concerns as it depends on the concentrations of the energy supplies political pressure from energy exporters. In Europe's case, energy security has been of large concern by the gas crisis which resulted from gas prices and debts that caused the halt in Russian gas flowing through Ukraine's pipelines. The crisis coincidentally happened during the increasing concerns in the nationalism resource of energy exporters as well as the circumstance involving high oil prices. Europe's economies were a huge concern as it was susceptible of energy exporters' political pressure and the rivalry with the resource demanding China. Energy security, however, is still confused as it is shown in political actions. The focus of energy security in the U.S. has originally been to reduce the susceptibility of it towards political manipulation and that has tipped the politicians to voice out for the independence of energy increasing shares of renewable energy. The plan of energy independence in Brazil, however, had come to a reality as there were timeframes of politician represented a rising share in fossil fuel supply imports and lowered shares of renewable energy as to encourage energy security. For other countries, the energy security they went for was the protection of the poor in countering the products price instability while others highlight the prominence of defending the economy in contrast of the disturbance in energy service supplies which is done by letting the prices of products to increase in times of shortage. The paper will define the energy security better in terms of the European Union as to shed some light on the issue. It will review the European Union and the global energy security whilst including the implication of oil market which will be concentrated in terms of EU, elaboration of the energy security of EU in context of foreign relation, the physical security issues and challenges faced by EU, and the elaboration of energy policy of EU.

Keywords:

European Union, global energy security,
energy security

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1. Introduction

European Union (EU) was formally formed in 1993 via Maastricht Treaty and consists of 28 European countries [1–5]. It was aimed on enhancing the European political and economic incorporation by establishing a single currency which is the euro [6, 7]. Also, it was designed to unify the foreign and security policy as well as the citizenship rights by proceeding collaboration within areas of asylum, immigration, and judicial matters [8].

The EU is known to be dependent on energy imports from other countries namely Russia as shown in Table 1 [9]. In between 2005 and 2015, EU’s percentage of dependency on energy supplies from non-member countries rose by 12.0 percentage for natural gas, 6.4 percentage for crude oil, and 3.4 percentage for solid fuels [10]. The EU’s security of primary energy sources may be left vulnerable if a high percentage of imports are focused among relatively few associates [11].

Table 1

The percentage of external suppliers to the EU in 2015 [12]

External suppliers to the EU - 2015					
Solid fuels		Crude oil		Natural gas	
25.8%	Russia	27.7%	Russia	29.4%	Russia
21.3%	Colombia	11.4%	Norway	25.9	Norway
14.0%	United States	8.0%	Nigeria	8.8%	Algeria
8.1%	Australia	7.5%	Saudi Arabia	6.1%	Qatar
6.9%	South Africa	7.2%	Iraq	1.7%	Libya
3.1%	Indonesia	6.2%	Kazakhstan	1.6%	Nigeria
1.4%	Canada	4.9%	Azerbaijan	0.5%	Trinidad and Tobago
0.4%	Mozambique	4.0%	Algeria	0.2%	Peru
0.4%	Ukraine	4.0%	Angola	0.2%	Turkey
18.6%	Others	18.9%	Others	25.5%	Others

In the meantime of EU depending on energy imports for their energy security, Russia, Saudi Arabia, Iraq, and Iran in total holds half of the world conventional oil reserves [13]. Concerning the concentration of conventional oil reserves on their side, the countries decline to accept foreign direct investment (FDI) [14, 15]. This results in the meticulous development of the demanding energy resources globally in the control of National Oil Companies to be ambiguous [16].

As mentioned previously, the Middle East holds the majority of the world conventional oil reserves and a little less than half of the world conventional natural gas reserves [17–20]. By 2030, the global energy demand is expected to increase by more than 50% and without the expansion of

oil production to cover the demand, the energy supplies will have to come from lesser and politically less stable countries compared to today [21]. Thus, increasing the existing energy security concerns.

This paper will review the topics on global energy security and European Union. In Section 2, the implication of oil market will be concentrated in terms of EU. Section 3 will be focused on elaborating the energy security of EU in context of foreign relation. The physical security issues and challenges faced by EU will be unfolded in Section 4. The energy policy of EU is elaborated in Section 5 while the summarization of this paper will be in Section 6.

2. Oil Market

2.1 Implication of Oil Market

Geopolitical competition for oil and gas has the potential to become a destabilizing force in many producer regions with undiversified economies. Increasingly, bilateral energy relations are becoming a top priority for many consumer countries concerned about rising oil prices and their desire to limit the proportion of their import needs that are exposed to the spot market [22]. Higher prices in particular are changing the context of energy for Europe in many ways, and for the countries on both ends of the oil value chain, price volatility has become an additional issue [23]. However, for some reason, there is a drop of oil price in EU which will be explained in based on figure 1.

Even though there is a lost revenue for European oil producer, the EU economy will still be better off in the long run as a result of lower oil price. To meet EU oil needs, they have to import 88% of oil, which in result will benefit overall demand form lower oil prices. Reduction in the volume of EU oil imports would lower the EU's oil bill by €29 bln in 2030 in our Technology Potential scenario, and the consequent reduction in oil prices would shave a further €12 bln from the bill [3,4]. Reducing oil prices increase real incomes, decrease inflationary pressure on consumers, and allowing for better expenditure on other goods and services that deliver greater domestic value-added for the European economy. Based on the analysis of oil market, with lower oil prices, EU average incomes would be increased by 0.3% in 2030 and 0.9% higher by 2050, relative to business-as-usual. EU gross domestic product (GDP) would be increased by 0.2% in 2030 and 0.5% higher by 2050 [26]. Thus, this would drive a 0.2% increase in employment by 2050, which means that they will be 400,000 extra jobs will available. Most of them would be in the service sectors, reflecting typical household consumption patterns.

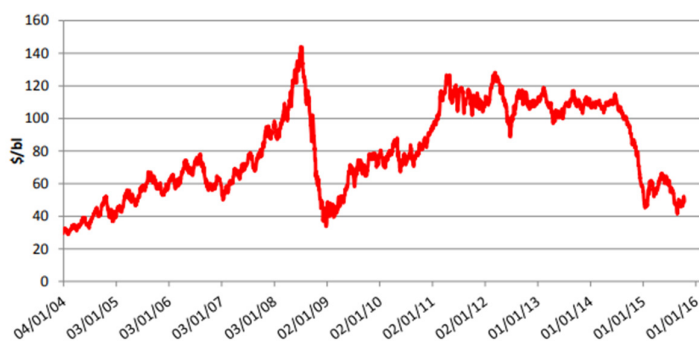


Fig. 1. Annually oil price (Current, US\$) [27]

Based on figure 1 since the summer of 2014 the global price of crude oil shows a steep decrease which has not been seen since 2008. The maximum drop took place between June 2014 and January 2015 which is about 60% decrement, with a stabilization around 50 \$/bl [28]. This price drop maintains for about a year until 2016 which is different from 2008 which oil price drop drastically for about 75% but slowly increase until the end of 2011. The steep fall in price was then followed by a steady recovery to high levels that cumulated in 2012 around 120 \$/bl.

Denmark is the biggest crude oil producer and net exporter in the EU. The amount of crude oil produce in Denmark can be exported to United Kingdom (UK) and Sweden since the production of crude oil is much greater than the local consumption [29]. UK is also one of the biggest crude oil producers over 40000kTOE in term of absolute quantities. However, in order for UK to meet the domestic demand, they need to import additional oil. It appears that highest value of net import of crude oil relative to GDP situated in Lithuania and Bulgaria [30]. Based on Figure 2, the refineries which represent by the yellow dot is in fact correlated with the demand of crude oil.

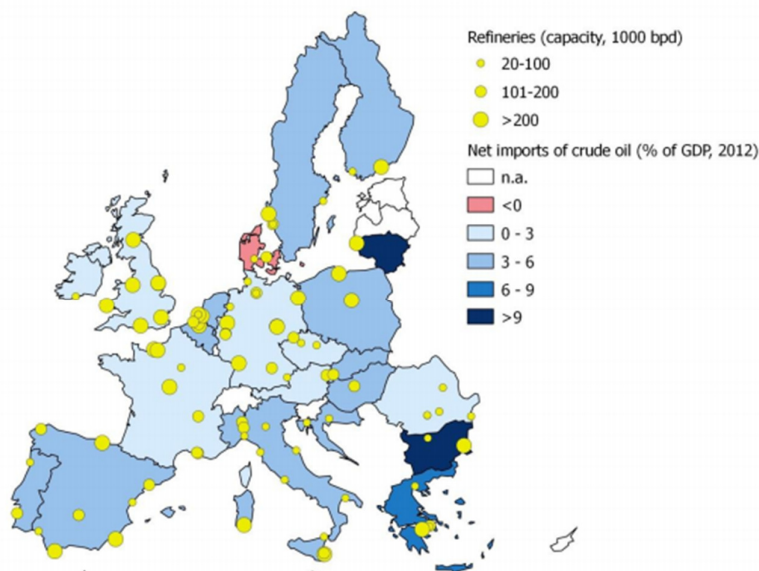


Fig. 2. Crude oil import and refineries

2.2 Scenario

In the absence of certainty on how the oil price might develop in the coming years and how this may affect the evolution of oil demand and import cost by 2020, three scenarios were analyzed with the energy model POLES-JRC [31]:

10% Scenario: Under this hypothesis we assume that the whole range of oil production costs are entirely covered by the (endogenous) oil price⁸, as it was the case in 2005- 2013. As a consequence of this, drilling and extracting activity would lead the price at a fairly high level in the coming years (around 80 \$05/bl), which is only 10% lower than the levels in June 2014 (and close to the average 2011 price).

40% Scenario: In this scenario, it is assumed that the top 5% most expensive percentile oil resources extraction costs remain uncovered by oil price8 (i.e. the most expensive non-conventional resources would continue to operate with losses). This scenario leads to a 2015 price 40% lower than the June 2014 level.

50% Scenario: The price is 50% lower than the June 2014 level. This scenario is consistent with the "50% Scenario" analyzed in Section 2, driven by increased production from Gulf swing producers, and the one discussed by Arezki and Blanchard (2014). Figure 6 below gives the potential evolution of the yearly-averaged oil price up to 2020 for these 3 scenarios and shows how these would compare to the daily price of 19th June 2014 and the average price in 2015 (data up to 13th October 2105) (as well as the period back to 1990).

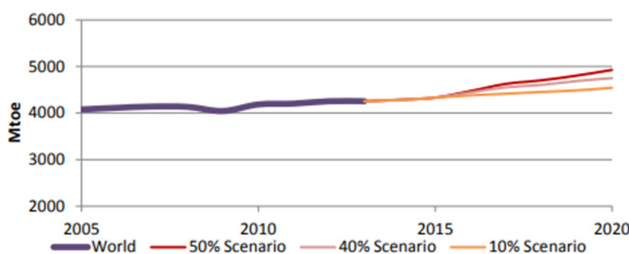


Fig. 3. Oil demand market (World and 3 scenario)

Market stability is clearly an important goal for the European Union. As a major consuming alliance, they EU has a critical role to play in addressing immediate global needs within the energy market, including the need for more investment, especially in refining, improving the quality of oil market information and the transparency of data, Cooperation and dialogue between producers and consumers and the increased burden of higher energy prices on poor, oil importing countries [32].

3. The European Union's Energy Security in context of Foreign Relations

As the world population increases, dynamic economic growth especially in China and India, and the spread of prosperity are stimulating a rising demand for energy. Therefore, it has become an increasingly important and defining the policy issue as the growing competition for access to limited resources has altered the global economy. However, high energy prices and the lack of spare capacity, particularly in the oil market, have made the global economy sensitive to energy disruption. Energy security, in terms of supply and stability of price, is intertwining with geopolitics and international relations.

As a major economic power, the role of the EU and the way it seeks to address its increasing dependence on imports will be crucial. The Union currently imports nearly 50% of its energy consumption, a figure which is expected to rise to 70% by 2030, yet it does not have a common, effective energy strategy and policy. The relation between EU's and Russia form a central element of its energy security, the way that it manages this relationship now and in the near future will be important to its long-term energy security[33].

The EU-Russia strategic partnership have been developing a formal energy dialogue which has led to a true partnership includes offering a wider prospects which go beyond the narrow questions

of energy trade and extend to transport-related problems and to the environmental impact of the energy sector. However, the strategic EU-Russia partnership is often considered hollow and flawed, and too few of its plans come to realization. Relations became fractious and difficult in 2004, with disagreements over Moscow's handling of the terrorist attack in Beslan, the elections in Ukraine and concerns in EU Member States about the Russian government's increasingly authoritarian approach[34–36].

Russia is the EU's main supplier of hydrocarbons and the Union is the main market for Russian hydrocarbons. The EU-25 imports 50% of its gas and 30% of its oil from Russia, while Russia exports more than 50% of its energy to EU-15, and this mutual relationship is expected to grow recognition that Russia and the EU are natural partners in the energy sector and have mutual interests in enhancing the continent's energy security is to provide a forum to discuss questions of common interest in the energy sector and to bind Russia and the EU into a closer relationship. It also aims to contribute to security of energy supply and energy demand; foster cooperation on energy-saving measures; rationalise production, transport infrastructures and electricity connections; facilitate investments; and improve relations between producer and consumer countries[37].

For its part, Russia has sought to be a cooperative partner and there have been no signs that it is using its energy resources as a lever over the Union. Actually, the EU officials and experts agree the opposite has been the case, pointing out that Russia has never suggested curtailing its energy supplies to the Union, in particular to the EU-15. The Union also believes that the energy dialogue has helped to integrate the energy market through a number of measures, including the interconnection of electricity grids; agreement on regulatory principles for internal markets and long-term supply contracts; and enhanced cooperation in the nuclear energy field and in advanced energy technologies[38–40].

However, problems and differences remain, and the two sides have differing interpretations of the relationship and their priorities. Russia seeks support to modernise its energy sector and protect itself, while the EU wants Russia to reform and open up its market by creating a more positive business climate. It is clear that EU-Russia energy cooperation is a 'greater glue' to certain other paradigms. One of the challenges in the near future will be to organise a proper, representative and coherent EU-Russia energy dialogue.

Russia is the world's leading producer and exporter of gas, and its second largest producer and exporter of oil. Its discovered and projected reserves are considered to be among the largest on earth, with its gas reserves estimated at approximately 47 trillion cubic metres and oil reserves estimated at in excess of 100 billion barrels.

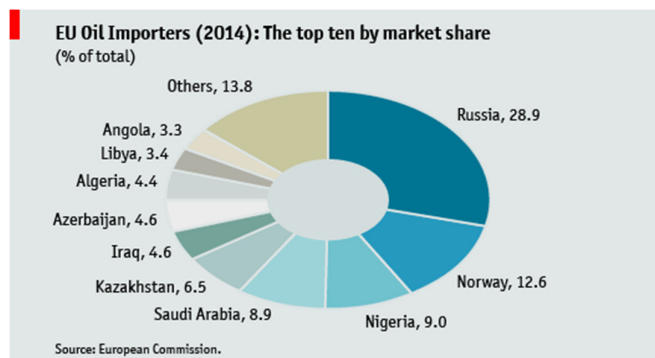


Fig. 4. The European Union oil importers in 2014

In addition, western Siberia is the world's richest hydrocarbon province and there are also, potentially enormous reserves in other regions which have yet to be exploited or even fully explored, such as east Siberia, the Komi Republic, Nenets Autonomous Okrug and the Barents region. Overall, there has been a major increase in Russian production and export since the late 1990s, with its oil exports reaching a new post-Soviet high of 9.53 million barrels per day (mbpd).

There are three points that should be considered in relation to Russian supplies to the EU. First, the Union's oil supplies are already diversified, with imports coming from the Middle East as well as Russia, and the Union has three key gas suppliers, even though Russia is its main source. The oil will remain the single most important element of the EU's energy mix. Diversifying away from Russia is not the key here: in fact, the Union could consider slightly increasing its share of Russian oil in order to improve the security of supply[41, 42].

Second, EU should assess carefully the alternative suppliers for both oil and gas. It is uncertain whether the main alternatives such as Iran, Nigeria, Venezuela, Algeria and Libya are much more stable, friendly and trustworthy than Russia. Third, in consideration of the costs, change in suppliers involves infrastructure and contract costs. However, if exporters like the Libyans and Nigerians are willing to sell their gas at a price which reflects well-head costs that would make them competitive with the Russians.

These cost risks do not mean that the EU should not seek variety in its hydrocarbon suppliers. It should, as an important part of its energy strategy is diversity of source. However, this requires careful, sober planning in the long-term context and should not be initiated as a mindless reaction. As long as substitutes such as nuclear energy and renewables energy remain comparatively expensive, oil and gas will remain the world's most important sources of energy. In the context of geostrategic scrambles for diversification, only new energy sources can provide a real alternative.

4. Physical security issue and challenges

Energy security issues is one of the main concern for the EU country to maintain the energy supply so the future. Since our nation is depends on benefits of technology in daily life, make it needed of energy is growing rapidly. But the energy is limited sources makes the threats from others such as terrorist and criminal that always take a change to steal our energy sources to gain their own benefits. We can say that, the technology is not 100% can guarantee the security of energy but, technology is still needed for security of energy[43]. Many EU country still in top of energy security factor because of their advance in technology development and high quality of manufacturing. Physical security protection in industry is largest market size estimation about total of 103 billion dollar for the global market[44]. Still, there are several physical security issues and challenges that EU country had encountered.

4.1 Act of Terrorism

The crisis of the act of terrorism not only happens on the country border but also causes by individual or groups that have their own belief for the political aim. Those people used terror as threat to the democratic value in the society by targeting innocents people and disturb right and freedom of our citizen. There are many accidents happens involving terrorism, in march 2014 trains bombing in Madrid causes death of 52 people and over 700 people injured. Meanwhile, bombing in London Subway in 2005 causes death of 191 people and 1800 injured people[45, 46]. In the Internal energy security strategy European has stated condemned terror as main threat for EU internal security. The

environment and security landscape are also one of the instability and conflict at eastern border though of EU.

Since terrorist attack given impact to the securing energy in EU country, they have built some way to combating terrorist threats to ensuring own security. Other than that, arm, people, and drug trafficking will increase with EU border fluidization plan[47–50]. The other factor of development that worrying European security environment is natural disasters, organized crimes, non-democratic regimes, declining energy, global economy, pandemics and weapon of mass destruction. Cyber-attack also has become one of the most important concern for EU. In March 2015, EU's security expert has issues to increases the cyber defense for more solid protection against cyber-attack that able to affect industries, business, and policies[51]. But, the terrorist still first top of the list as key threats to EU country and the way to against it is by doing legal framework, tangible result, involved actors and tools, and concrete actions.

In legal framework, Cologne European Council 1999, Treaty of Lisbon has issued the important documents which is "EU Counter Terrorism Strategy" for tackle terrorism. In that document have four main pillar objectives is for prevention, protection, pursuit and response. Also, there another strategic document "EU Counter-Terrorism policy main achievements and Future challenges" that related to these four pillars which is focus on main achievement and future challenges. Meanwhile, others act that help to fight terrorism are "Revised Strategy on Terrorist Financing (2008)" and "Report on the EU Action Plan on combating terrorism (2011)"[52–54].

In EU Counter-Terrorism Strategy and Action Plan implementing has defined the actions to fight terrorism for the concrete actions. There are about 140 difference action points that have been implement in 2007 and complete overview. Next 50 addition of action points is added in November 2009 that focus on control over illegal arms and explosives in the Balkans. Also, it's to support the adoption of a Comprehensive Convention on Terrorism. Next, for the involved actors and tools that used for fight against terrorism is Joint Situation Centre (SITCEN), European Arrest Warrant, European Evidence Warrant, Joint Investigation Teams, VIS and SIS II, Financial Action Task Force, European Network of Experts on Radicalisation (ENER), European Defense Agency, Europol, Eurojust, and EU Satellite Centre[21], [55]. As for the tangible result, the failed or foiled result of the terrorist attack is counted. Based on TESAT report, in 2011 there are about 174 failed attack and increases for 2012 to 219. But in 2013 this number is decrease to 152 failed foiled attack. Since the number of attack to government facilities continue to decrease, the EU Strategy and Action plan to fight against terrorism more proactive and efficiently to obtain significant result. This will help to discouraging the terrorist activity and it's their plan.

4.2 Citizens' Responsibilities Factor on Countering-terrorism

Based on the four mains pillar in the EU Counter-Terrorism Strategy to respect human right to allowing citizens to live freedom, justice and security country. For the four pillar is to PREVENT people or citizens from turning to the terrorist to stop the future generations from expending. Next is to PROTECT the citizens and infrastructure by reducing damages of the attack from terrorist, then is to PERSUE and investigate terrorist and stop all terrorist travel, communication, funding and material. Lastly is to RESPOND in organized way by preparing minimization and management of the consequences of a terrorist attack[56]. Also improving plan to deal aftermath by taking into possible amounts of victims.

Some citizens don't know about the European security Strategy and lack of information about current update of act of terrorism, because of lack of source of information. As citizen, they should

concern about latest event of what happening in EU country. This could avoid them from influenced about act of terrorism. Based on the review from 115 citizens, majorities of them do not know the true meaning of concept of security and their concern about stability of current security environment is lacking[57]. With lack of awareness about the current info, could lead to terrorist influence the citizen to join their cause. So, to prevent the terrorist from recruiting citizen is by cutting or disrupting the source of the individual and network that draw people to terrorism. To doing this we need to ensuring voices of the mainstream opinion prevail over those extremism by promoting justice, democracy, security and same opportunities to everyone.

5. EU Energy Policy

European Union energy policy has been made for many years but only was approved by the European Council on 2005. During the EU Treaty of Lisbon they have legally includes an agreement regarding of energy supply and changes to the energy policy within the EU [58, 59].

5.1 Energy Union

European Commission make the Energy Union Strategy as a project to coordinate the transformation of European energy supply with the aim to provide secure, sustainable, competitive and affordable energy [60]. The idea was introduced by the President of the European Council, Donald Tusk when he was the Prime Minister of Poland. Since the European Coal and Steel Community, the Energy Union was the biggest energy project [61]. This policy was very important due to the EU strong energy supply reliance on Russia. Therefore, the European Council decide to build an Energy Union with five priority dimensions with a forward-looking climate policy with the basis of the Commissions framework strategy [62]. The five priorities were the energy security, solidarity and trust, a fully integrated European energy market, energy efficiency contributing to moderation of demand, decarbonizing the economy and research, innovation and competitiveness [63–65].



Fig. 5. Biscay Gulf France-Spain interconnection [70]

The all member states have a target by 2020 which needed them to put downward pressure onto energy prices, decrease the need of building new power plant, mitigate the risk of black-outs event, increase the reliability of renewable energy and enrich market integration. On January 2018, the EU Member State agreed on the Commission's proposal to invest €873 million in clean energy infrastructure and the project have been supported financially by Connecting Europe Facility [66], [67]. The project consists of the construction of Biscay Gulf France-Spain interconnection, SüdOstLink, and CyprusGas2EU. The CyprusGas2EU was invested around €101 million to introduce natural gas to Cyprus in order to end the current energy isolation of the Member State which is still in planning stage [68]. The investment consists of a Floating Storage and Regasification Unit (FSRU), a jetty intended for the unit's safe mooring, a shelter for the FSRU/LNG Carrier, a jetty borne pipeline and an onshore gas pipeline, an onshore storage array and a metering station at the Lemesos Port, Terminal 2 (Vassilikos) [69].

The Biscay Gulf France-Spain interconnection is a new link of 280km long off-shore section and a French underground land section that will increase the capacity between both countries from 2.8GW to 5GW [71].

5.2 European Strategic Energy Technology Plan

The European Strategic Energy Technology Plan (SET-Plan) aims to increase the development and deployment of low-carbon technologies. It pursues to improve new technologies and cut down the costs by managing national research efforts and helping to finance projects [72]. The SET-Plan fulfill one of the five dimensions of the Commission's Energy Union strategy which they aim to encourages research and innovation efforts across Europe by support EU technologies transformation to a low-carbon energy system [62, 73]. The SET-Plan includes the SET-Plan Steering Group, the European Technology and Innovation Platforms, the European Energy Research Alliance, and the SET-Plan Information System (SETIS).

5.2.1 SET-plan steering group

The EU countries high-level representatives, as well as representatives from Norway, Iceland, Turkey, and Switzerland forms the EU Steering Group on Strategic Energy Technologies (SET- Plan Steering Group). This ensures an improved national and EU level alignment among the different research and innovation program, including the priorities of SET Plan. Furthermore, this also increases the national program cooperation in order to avoid duplication and heightens the public investment impact [74].

5.2.2 European technology and innovation platforms

The SET Plan implementation is supported through the establishment of European Technology and Innovation Platforms (ETIPs) by prompting EU countries, industries, and researchers in essential areas. ETIPs also supports and promotes the uptake of fundamental energy technologies market by pooling skills, funding, and research facilities [75, 76].

5.2.3 European energy research alliance

The major aim of European Energy Research Alliance (EERA) is to hasten the development of new energy technology through the cooperation and collaboration on pan-European program. EERA leads staggering 175 different research corporations from 27 countries to get involved in 17 joint programs. Furthermore, it also portrays a significant part in promoting coordination among the energy researchers in accordance to the SET Plan objectives [77].

5.2.4 SET-plan information system

The EU's SET-Plan Information System (SETIS) contribute information on low-carbon technologies state. It also operates to assess the impacts and implications of energy technology policies, evaluate the benefits as well as the costs of the technological options, and estimate the cost of implementation. This information is vitally effective for the European Industrial Initiatives, the European Energy Research Alliance, private companies, international organizations, trade associations, and financial institutions [78, 79].

5.3 The Framework Program for Research and Technological Development

The Framework Program for Research and Technological Development, which is also known as Framework Program which abbreviated to from FP1 to FP7 with "FP8" is named as "Horizon 2020" are classification of funding program which were implemented by the European Union in order to promote and encourage research in the European Research Area (ERA) [80]. Its objectives and course of actions vary between each funding period. The focus of FP6 and FP7 was in technological research, meanwhile the focus of Horizon 2020 was in innovation, delivering faster economic growth and delivering end users' solutions – primarily to governmental agencies [81].

5.3.1 Horizon 2020

Horizon 2020 is a funding program for the eighth Framework Program in which focuses in research, innovation, and technological development. The modified program name is "Framework Program for Research and Innovation" [82]. This program is carried out by European Commission, which is the EU executive body, either by sundry internal directorate general (DGs), which include, but not limited to, the directorate general for communications networks, content and Technology, or the directorate general for research and innovation (DG RTD), or by executive agencies such as the Executive Agency for SMEs (EASME), the Research Executive Agency (REA), or the ERC Executive Agency (ERCEA). The objective of the framework program is to realize the European Research Area (ERA) by avoiding duplication through pooling research funding and coordinating national research policies in some areas. Horizon 2020 is portrayed as a policy medium to execute and establish other high-level EU policy initiatives, such as Innovation Union and Europe 2020. An approximated €80 billion of funding is provided by the program which runs from 2014–2020 provides, a relatively 23 per cent increment than the previous phase [80, 81, 83, 84].

Through open and competitive calls for proposals, the grants to research and innovation projects are provided by the Horizon 2020 whereby any legal entities from any country are eligible to submit their project proposals. Participants from outside of the European Union is encouraged to apply. Meanwhile, Participants from European Union member states and correlated countries to the

Horizon 2020 are automatically funded. For the purposes of this framework program, associated countries have signed a legal association agreement. A total of 14 countries are associated to Horizon 2020 up to this day. However, due to the 2014 referendums held by Switzerland, Switzerland is considered as "partly associated". Swiss organizations persist to be active Horizon 2020 participants although their participation is occasionally funded by the country. Israel is also an associated country to Horizon 2020. In order to improve transparency, create greater efficiency, and accelerate innovation, Horizon 2020 supports an Open access to the result of the researches [85].

On the other hand, in order to achieve a truly sustainable development, Horizon 2020 also implements the European environmental research and innovation policy – aimed at defining and turning the agenda for greening the economy and the society as a whole, into reality [86, 87].

Three main research areas known as pillars consisted in the program. The first pillar, Excellent Science, which focuses on basic science, has an amount of 24-billion-euro budget. Meanwhile, the second pillar, Industrial Leadership, has a budget of roughly 14 billion euro and managed by DG Enterprise which based Europe 2020 and Innovation Union strategies. Lastly, the third pillar, Societal Challenges, funds potential social and economic solutions [88].

The goal of the industrial pillar is to obtain methods to modernize the European industries which has previously suffered from a fragmented European market [89]. The goal in societal challenges is the implementation of solutions, while less its technology development [90].

6. Conclusion

The energy security is an ongoing concern for EU and the rest of the world. Europe's future economic and political stability will be affected negatively if the energy security concern increases and the global energy demand would not be able to be met as of the inadequacies of the world energy systems, shortcomings in energy policies, inadequate investments or imperfect political stability in oil and gas yielding countries, crisis in terms of economic and political in countries and areas outside of Europe. The EU will only have one choice in terms of a political answer which is to voice out in unification of its energy foreign policy, vary the range of national energy mix and imports. Also, the EU will have to speak out its strategies on enhancing the energy efficiency and security in a greater degree. The globalization has blurred out the boundary lines once put up before between domestic, foreign and economic policies. Regional and domestic political stability will influence the global economic stability and the economic factors. The policies which disregard the meticulous analyses of various regional and domestic stability factors could be shown as tremendously imprudent and being rewarded with financial and political costs within the middle and long-term future by energy companies alike and governments. The relation of the globally planned conventional energy security conceptions which depends only on economic aspects and regional and domestic political stability stresses on new rational with respect to the energy source security and foreign security policies.

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