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THE IMPLEMENTATION OF GREEN ENERGY POLICY IN THE NORDIC COUNTRIES IN TERM OF ENERGY SECURITY: POLITICAL AND REGIONAL COOPERATION APPROACHES

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ABSTRACT

This study aims to analyse the political strategies and policies implemented by Nordic countries, both nationally and in the context of regional cooperation, in addressing to issues of energy security through the transition to green energy actions. Government of Nordic countries have succeeded in demonstrating a model of green energy policy at national and regional levels that is considered effective by many European countries, without having a significant burden on their economic performance. Therefore, it is not surprising that many countries have followed the steps taken by Nordic governments, especially through accommodative policies and regional cooperation by promoting open energy markets. Through mixed qualitative-quantitative research method, it can be shown that regional open market on energy supply and economic incentives for the development of renewable energy are key policies on achieving sustainability in green energy production in the Nordic region. While using qualitative methods, this study demonstrates the effectiveness of political actions and regional cooperation in energy sector as the most effective strategy in achieving energy security, which many other regions in the world are trying to follow.

Keywords: Energy security, green energy, energy policy, sustainable development, common energy market

1) INTRODUCTION

Since 2000 Nordic countries have realized that the progress in renewable energy and the need for a comprehensive regional cooperation in green energy should be the key for their sustainable economy growth. However, the Nordic countries do not share equal potential of renewable energy sources or technological and industrial competence. Yet, today national policies implemented by the five Nordic countries: Denmark, Sweden, Finland, Norway, and Iceland, as well as their regional policies related to non-renewable energy export-import and green energy development technology between these countries, the European Union and other international organizations have given assurance to the energy security of the northern part of European continent. This attainment is due to the influence of the energy transition strategies implemented by the Nordic government which have directly or indirectly affected not only at national or regional level, but also the other European regions, such as the Baltic region, Western Europe, Eastern Europe, and Eurasia (Jorgensen, 2016).

Therefore, the question that should be studied is how the Nordic countries build a common political commitment in dealing with different capabilities, both in terms of investment in industry and the development of technology in producing the so-called green energy, as well as the creating a common market to ensure sufficient regional energy demand and supply. Furthermore, it is obvious that the green energy strategy developed by the Nordic countries have strengthened their political, social, and economic approaches to energy sustainability in long term. This also covers the approaches enforced in the drafting of regulation processes to anticipate public and industrial acceptance of the impacts of national and regional energy transition projects.

Growing concerns about the importance of energy security has emerged in the early 1980s in many Western countries. However, until the beginning of 2000 the awareness on the issue still revolved around sustainable oil and gas supply, with the exception of the Nordic region. Norway and Sweden started the initiative in promoting national and regional political policies in terms of financial economy, investment, international cooperation, renewable energy technology, and other policies related to climate change issues due to the use of not eco-friendly energy. A few years before, Norway, the country with the largest petroleum reserves in the Nordic region in 1993 had already initiated the deregulation of electricity supply from Statnett, Norway's national hydroelectric producer, to be able to supply electricity to other Nordic countries. Sweden welcomed the reform of electricity supply by signing cooperation in open market of energy with Norway through the establishment of the Nord Pool in 1996. Denmark and Finland later joined on this collaboration. In 2000 an integrated electricity network and a shared market for electric energy were established throughout the Scandinavian peninsula. Common electricity tariffs and fair competition in electricity supply have an impact on stable energy tariffs and availability throughout the Nordic region. With the same political interests, the governments of the Nordic countries then not only opened a common market of electricity, but also established regional cooperation to maintain the availability of oil and gas for regional energy consumption. One of which is the establishment of Nordic Energy Research Programme, whose goals are to foster the progress in new energy technologies and the adoption of green energy systems and common energy market. In subsequent developments, the cooperation model extends to the provision of renewable energy as part of the energy transition strategy in the region. Furthermore, with the progress being made, starting in 2021 the Nordic countries, especially Norway, have even been able to supply electricity to the United Kingdom and Germany via an undersea cable network (Hook, 2021).

While it may appear to be going well, progress in green energy policies in the Nordic countries has not been without any challenges. A number of financial crises experienced in the past and reforms in energy consumption that have resulted in changes in economic activities have coloured the process of the Nordic countries towards the development of their energy sector as it is today. In general, it can be seen that the investment programs, taxes, and incentive policy packages implemented in this region have received appreciation from economic actors and their own citizens, thus stimulated positive economic growth. This achievement has prompted many countries, especially those in the European Union, to trail the political and economic measures, as well as social policies in regional level to be taken to ensure the successful transition to renewable energy in the future.

2) METHODS

Your study is conducted with qualitative research methods in defining indicators in energy security risk index of Nordic country members based on global energy security index, and in order to explain political and economic factors being considered by Nordic government to form their energy policies. The samples taken and examined from trading reports and researches provided by the World Bank and the International Trade Center who evaluate comprehensive economic

performance of five Nordic countries, especially in the energy trade and exchange within the region and outside the region.

3) RESULTS

The policies in promoting green energy are often connected to at least three common objectives: the reduction of non-environmental friendly impact of energy, often refers to limitation of use of fossil fuel; the development of technology and energy systems to facilitate green energy policies; and the assurance of national or regional energy security level by reducing dependency to energy imports. Different country and region employ different energy resources and economic characteristics, which also means everyone may apply different strategies to ensure those objectives. Furthermore, very often national energy policy making brings about significant impact to the economy and foreign policies.

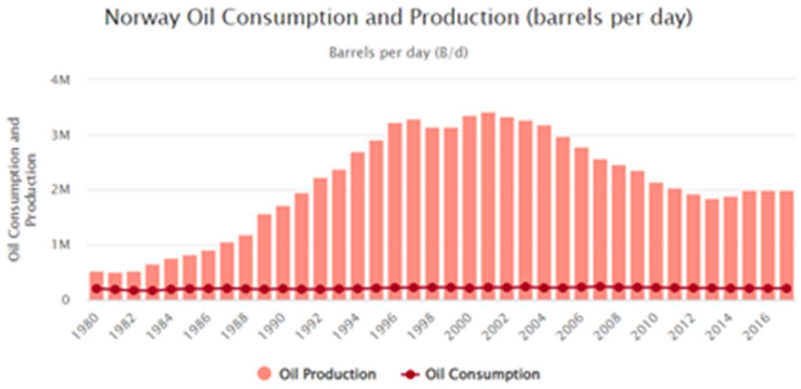

Figure 1. Norway Oil Production from 1980 – 2016 (source: worldometers.info)

For Nordic countries, economic growth is supported significantly by energy supply. However, only Norway and Sweden are blessed with oil and gas resources, while their neighbours may suffer if there is instability of oil and gas supply from Norway or Sweden. The five neighbouring Nordic countries might be among region which will be affected by the environmental defect caused by excessive use of fossil fuel. Norway who represents the top producer of oil in Nordic had ever reached top three oil and gas exporter in 2010 and primary energy sources in the region, but had fallen soon after and affecting significant price shock in the energy market. The decline of its oil reserve was considered the main concern of Norwegian government to reduce its petroleum production. Due to political reform in climate policy and long-term perspective in maintaining oil and gas resources, Norway stabilises its oil production to 2 million barrels per day and considers the transition of its oil revenue to green energy.

Driven by vulnerable conditions, ambition in exploiting renewable energy sources found abundant across the Scandinavian peninsula has emerged among Nordic governments. The most significant step which triggered Nordic citizens to pay more attention on renewable energy was the creation of common market on electricity. Government of Nordic countries saw the use of common energy market as new incentive to national economy and encourage their business actors and citizens to support the policies applying new carbon taxes and subsidies the consumption of renewable energy. Regulations in national and regional level are driven by concessions and strategies to enhance better systems and technology to sustain the green energy culture. Multiple technologies on renewable energy are transferred to Nordic countries who have difficulties to catch up with the integration of the new energy systems. The efforts are funded by joint initiative

of all Nordic governments, mainly by Denmark, Finland, Norway and Sweden. The green energy forms being targeted are hydroelectricity, wind, solar, geothermal, and bioenergy sources.

Wind energy is a potential dominant source of energy already abundant in the region, and considered as the future of green energy to rely on in the future. Meanwhile, hydroelectricity remains primary energy production in the energy market, influencing European energy market due to the new undersea inter-connecting cable network.

The toughest challenge in changing energy policies in the Nordic region stems from the oil crisis in the 1970s which was responded to by the construction of nuclear power plant installations in Sweden. Sweden power plant then covered essential demand of electricity in the Scandinavian peninsula. Norway and Sweden later enforce the imposition of CO2 tax which is used to subsidize investment in bioenergy technology. In 1990, when the Nordic countries were hit by a financial crisis due to the collapse of their banking system and government interventionist policies in the businesses, a package of fiscal and economic reforms, both macro and micro, was implemented to help recover the countries from crisis. This includes reducing subsidies on energy generated from fossil fuel. As a result, the business world moved again to encourage significant economic productivity growth and changes in social behaviour in consuming environmentally friendly energy. In the period 1990-2000 the development of green energy technology in the Nordic region progressed rapidly, sponsored by Swedish and Danish hydroelectric technology innovations and wind power plants to a number of countries in Western Europe. Norway advanced researches in developing bioenergy technology from waste processing, geothermal and solar power plants. Finland has since joined the Nordic countries' cooperation in renewable energy research and began to develop technology in wind power plants to meet household and industrial needs, as well as bioenergy from waste and wood processing industry residues to be used for industrial purposes and public transportation. Iceland also continues to increase innovation and use of energy technologies based on geothermal and hydroelectric to cover 90% of national household and industrial energy consumption in 2007. These efforts have brought the Nordic countries out of the dependence on fossil energy and from importing energy to supply their domestic industries.

Complex interactions between Nordic governments and economic actors, as well as energy-producing industries are the main drivers of progress in terms of region green energy strategies. The result is the integration of green energy needs and markets through regulations and research and development programs that reach the strategic policy level. They did not only follow the formal academic learning phases, but also accelerated the 2020 European energy strategy with the full support from the industries, so that it looks more like a learning-by-doing or learning-by-using processes. This also helps cover countries that have not cope with certain energy technology and its supporting systems, so that the technological gap between Nordic countries could get smaller. These are seen as the main factors which make the Nordic region outperform other regions in terms of energy security. In the context of energy security, the Nordic countries have met the sustainability in terms of energy availability, affordability in price, reliability in supply, and environmental acceptability at the national and regional level. Those four main factors of energy security make the Nordic region in a relatively 'safe' position compared to other European countries. In numbers, the five Nordic countries' renewable energy production is indeed still behind Germany and France. However, as per capita consumption of energy annual report shows that the use of green energy per household and industry in the Nordic region is the highest in Europe. With a population of only 24 million in 2020, the Nordic household consumption of electrical energy per capita is 50 GJ compared to the European average of 20 GJ per capita, and 10 GJ per capita for the world average. (Wrake et al, 2021). However, oil and gas still take part of more than 60% of energy consumption in Norway, Sweden and Finland. They compensate that situation by imposing energy diversification and reducing gradually their dependency rate to oil and gas. Norway maintains its oil consumption only about 10% of its production. Sweden and Finland still depend one-third of their energy consumption on nuclear power plants, but have

opted for more production and consumption of renewable energy with wind, hydropower and biopower. Denmark has proportional energy consumption between oil and gas with electricity produced from nuclear and wind and hydro power. While cutting its need for fossil fuel Danish authorities advances its hydro and wind energy infrastructures. Iceland, meanwhile, is one of the luckiest countries to be able to generate renewable energy for the consumption of 90% of its national consumption, primarily on geothermal, hydro and wind power.

In term of national and regional regulations, each of Nordic country implements sharing of renewable energy resources and strategies in attaining objectives of the climate agenda while providing steady energy policies, such as carbon taxes, incentives on green energy producer certificates, securing regional power market, increasing energy diversification in oil and gas import, as well as promoting energy transition by pashing out more nuclear power plants (Aslani et al, 2012). Major energy exporter, such as Norway and Sweden, will continue their trade-off policies to ensure energy security within greater regional scale to sustain economic growth. Beside funding research in renewable energy within Nordic government, the involvement of international cooperation primarily with European Union, international agencies and neighbouring regions (the Baltics and the UK) in developing cost-effective in energy consumption as well as in new innovation on green energy systems. In term of energy market regulating policies, all Nordic countries agree with *Feed-in-tariff* mechanism to ensure investment and balance market prices of energy in the region (Ilieva, 2014). These have proven the effectiveness of common strategies and policies implemented by Nordic countries in managing their energy security issues amid energy competition and concerns related to potential climate change due to the consumption of fossil fuel.

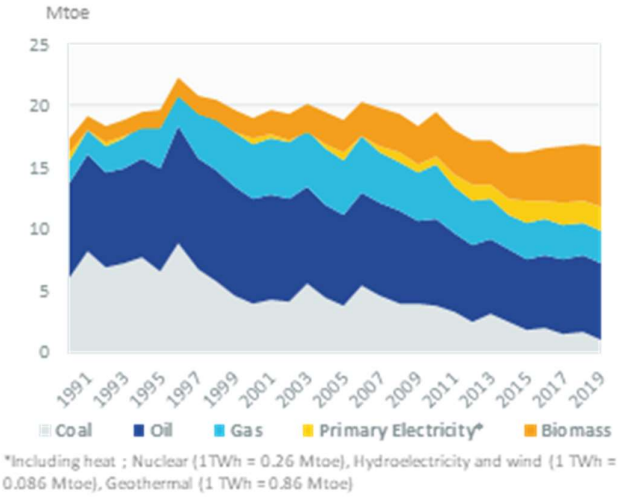

Figure 2. Denmark energy consumption from 1991 – 2019 (source: enerdata.net)

4) DISCUSSION

This paper shows the complexity of energy strategy and policies implemented by Nordic countries in securing their green energy common agenda. Successful policies and regulations of Nordic green energy case have been followed by the Baltics, India, ASEAN, and several other regional governments as a comprehensive model of multinational efforts towards energy challenges in the future. However, for future research, it suggested that additional viewpoints are to be discussed concerning energy threat by the existing competition among nations and the comparison in the technology gap and resources. That will very much useful for promoting political actions in dealing with immediate action prior to imminent energy crisis.

REFERENCES

Ziemba, P.; Becker, A.;Becker, J. (2021) Forecasting and Assessment of the Energy Security Risk in Fuzzy Environment. Energies 2021, 14, 5934. https://doi.org/10.3390/en14185934

Jørgensen, B. H. (2016). Nordic Energy Policy Cooperation: Forum Paper. In ASEAN Energy Market Integration (AEMI) Forum: Energy Security and Connectivity: The Nordic and European Union Approaches ASEAN Energy Market Integration. http://www.asean-aemi.org/energy-security-and-connectivity-the-nordic-and-european-union-approaches/

Hook, Leslie (2021) UK and Norway complete world's longest subsea electricity cable https://www.ft.com/content/399c1c37-3f7a-4770-af13-66741df01135

Roth, Joachim. Laan, Tara (2020) Green Recovery Know-How From the Nordics, International Institute for Sustainable Development (IISD) https://www.iisd.org/articles/green-recovery-nordics

Markus Wrake, et.al. (2021). *Nordic Clean Energy Scenarios: Solution for Carbon Neutrality.* Nordic Energy Research

Iliana Ilieva et al (2014) An econometric analysis of the regulation power market at the Nordic power exchange,

Nordic Energy Research (2013) Renewable Energy Policies in the Nordic Region

Nordic Council of Ministers (2017) Nordic Programme for Co-operation on Energy Policy 2018–2021

Hajiyev, et al (2020) Energy War Strategies: The 21st Century Experience, Energies 2020, 13, 5797; doi:10.3390/en13215797