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Perspective

Speculating the Significance of Oil Pricing Strategies towards Achieving a Sustainable Energy Transition to the Decentralised Generations

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ABSTRACT

After emerging negative the consequences of oil price crises in the middle of 80s and afterwards in the transition towards more sustainable energy use in terms of the reduction of fossil fuels, the governments and political parties have set determined targets to be achieved. After critiquing the oil pricing strategies upon liberalism/neoliberalism and constructivism schools of thoughts, as the illustrative political frameworks which can be the stimulator of the transition, there will be discussed that energy companies can facilitate the technologies, particularly with solar energy in the bloom of implementing PV panels which can be an alternative to accelerate further expand on the grids and generating as much renewable energy as feasible. Although, transitioning towards a decentralised energy system can be a secure way to ensure reliable energy services and mitigate climate change, however, it has not been without challenges. The results and recommendations provided critical insights on how to promote innovative development and characteristics garner more success in a community's ability to a balanced transition to decentralised energygeneration.

Key words: Energy Transition; Oil Pricing; Decentralised Energy Generation; Liberalism; Solar Energy

INTRODUCTION

The perspectives of International environmental energy policy on the oil pricing consensus, it is apparent that the price of oil in 1986 and 2020 -amid the COVID-19 pandemic- has had the catastrophic falls and consequently caused the acceleration in energy competition at all stages of the companies' value chains and put profits under considerable pressure. The energy industry has included a more significant network between the supply chains, producers and stakeholders, the debate on the consequences of the price of energy-mainly oil- provokes the variant of socio-politic considerations and technological strategies behind the economical bargains. As an instance, the price dispute in the dialogue between the OPEC and Russia over proposed oil-production reminds that attaining a precious balance between different kinds of the energy resources, mainly the oil industry, is inevitable. The price dispute has been one of the primary objectives and effects of the continuing global stock-market crash. The transmutation in the energymarket from stability to uncertainty and turbulence has devised a far more hostile environment. However, the primary strategies remain unchanged. Expanding market share and extending its profit at the expense of the others and others enduringly out of businesses by undercutting the other's price on sale to somewhere. With this said, the intention can be maximised the country's profits on oil sales based on countries gross national products. The occurrence of overland delivery from other producers makes it impossible how to keep selling oil on a precisely low price. Concurrently, an active market can be created by leaps in acquisitions and leveraged buyouts but also for corporate control that constrained top managements to enhance returns to shareholders.

The effectiveness of the multidivisional form in organising activities span multiple product markets by which multiple countries rest upon its efficiency as a coordinating device and also as an arrangement for goal alignment. In particular, on the one circumstance, policymakers examining alternative energy projects like renewable sources which are famous for high initiation costs can also estimate their potential to reduce armed conflict and its associated costs in their cost-benefit analysis. Conversely, new internal instability for these oil producers can be determined by the conversion in international dependence on oil producers would charge for a renewal of relationships at local and global levels.

COMPRISING THE POLITICAL THEORIES ON THE NEXUS BETWEEN MARKET AND ENERGY AFFAIRS

Not surprisingly, Adam Smith has described what is wrong with environmental degradation out initial needing to solve contentious

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issues about intrinsic values. He thus contributes a transparent description of why environmentalists respond the way they do about nature and an environmental-philosophical defence of the importance of those feelings in ethical evaluation and deliberation [1]. Linking to the theories which often competing for paradigms that have been committed to perceived divisions in the field of energy security, represents an ontological foundation which has comprised the aim of this review. These included within reviews on constructivism, optimistic/rationalist-liberal and neoliberal accounts [2].

The tendencies as jointly supportive in the analysis of international politics, the divergent paths can manifest hierarchically arranged descriptions of the different political and economic components of energy affairs, respectively, sympathising either the inter-state political or transnational economic structures of the global energy system in their evaluations. Foremost of focusing on geopolitics and state power, raising win-win games in global energy lead to maintain the role of markets which can be strengthened by liberal market approaches. [3]. Meanwhile, Liberal perspectives of energy security and international energy relations express a robust ontological connection with more widespread liberal international thought, and it occasions credit in the functioning of markets and the potential for international institutional cooperation, the bilateral beneficial solutions between both economic actors and states can be achieved.

Liberal market accounts of international energy relations point to inscribe more stress on interdependence and institutions and economists placing a greater focus on market dynamics. Firstly, the broader liberal paradigm informs national or regional energy policy, the more the number of interested actors is likely to increase, and considering the complexity of regulations is also apparent. The pivotal regions such as the EU retain on pushing the liberalisation agenda, and even China has started to introduce – though hesitantly – components of liberalisation in their energy sector. Indeed, decarbonising strategy towards the global energy infrastructure can propose a potential for a more decentralised energy generation. Although the energy transition claims decentralised and 'smart' infrastructure solutions, it also provides energy representatives with multiplied simultaneous roles while they will become both producers and consumers of energy. Liberal and neoliberal-institutionalist theories emphasise the importance of self-interested behaviour, the asserting power can also shape the political institutions, and striving for influence upon the institutions. Price control legislation, as the frame of discussion, is no longer replenished. However, the conditions in the short run have recapitulated to worsen; meanwhile, the administration would intend new policy approaches to reinforce the ailing popularity as elections approached.

Evaluating the progress of constructivism in energy security and political economy conflicts can argue that there is no denying that neorealists and neoliberals assume that the correlation between the energy market actors and energy security accruals would not be perceived as a zero-sum game. The global oil market can interfere with the consequence of this cooperation that occurred in higher energy security. An essential remaining challenge for energy security has assured further development of liberal energy [3]. An object of security has been offered by Constructivists to progress the frame and extend the range of actors are involved in assuring security for all individuals [4]. The researches propose that the basic features of international relations, including energy-related dilemmas, are volatile.

International relations besides economic welfares are created and reproduced by the actors who are involved which suggest that top-down rationalist approach alone is not decent and has to be compensated or complemented with others. There would be offered "second-best" policy mechanisms [5], primarily at the stages of current energy transition [6]. The energy security approaches in constructivism to underline the need to see and pursue common interests and shared values. The approaches can sustain communications, interpersonal contacts and declare trust in subduing conflicts, necessarily in energy-related items [7]. The energy policy-making progress typically observed as defined by technical and economic perspectives that constructivists believe that frames would shape and promote particular understandings of the world [8]. Although stakeholders can postulate the everchanging nature of energy security decisions, constructivism and the international political economy appear to be more balanced. It is worth mentioning that constructivism depends on subjective interpretation of each actor, in International political economy energy security prepositions may substitute in terms of changing political priorities. Hence, the approaches require the determination and predictability of energy security considerations.

CONSIDERING THE TRANSITION BETWEEN CENTRALIZED AND DECENTRALISED ENERGY GENERATIONS

Discussing the power politics upon the centralised and decentralised energy transition can illuminate that the relevance of the theory of technological energy politics outlined when the physical power to run an economy was regardless from the renewable resources, the economic and political power favoured to be more widely distributed. The theory underlies the energy democracy movement's approach to renewable energy activism [9]. The reciprocity of strategies relates to a centralised energy-politics, which is characterised as weakly democratic [10]. Decentralised energy technologies can offer more comprehensive inherent flexibility and can more promptly organise and facilitate distributed political and economic power. As an instance, those drawing directly from renewable and primary sources assembled from continuous flows of solar energy on Earth.

However, at this age of oil, decentralised politics and decentralized energy systems can cooperate within the actual context of centralized energy-politics. Although Renewable energy transitions categorised renewable energy generations, democratic politics all currently endure under centralised energy politics. The transition can imply that more reliable forms of democratic engagement with energy, are obliged to moderate the tendency for centralised sorts of power. When that existing power dynamics can be presumably sustained, the interpretation would either to delay the deployment of renewables or to extend present exemplars into new energy regimes through a centralised model of renewable development. Thanks to the ineffective forms of democracy, which may delay the transition or elicit centralisation because of the climate emergency, the persistent of local resistance to renewables can reveal a missed opportunity to redistribute political and economic power.

Ultimately, one can conclude neither of the described classical energy security concepts could have covered the diversity of international energy relations which have fundamentally changed since the 1980s. Presuming that fossil fuels control the world energy balance, renewable sources are barely noticeable but have not had a vital impact on energy security. Nevertheless, there is

no exaggeration to illuminate that renewables are the fastest-growing segment of the global energy sector, and it has expected to be continued [11]. The situation has been subject to energy security studies which have a direct impact on national and international energy policies. Accordingly, the discussion has centred on whether it represents that energy security concepts are examined in order to speculate the express transformations that occur in research and development. It seems to be the fact that whenever technology foresight provides shreds of evidence to decision-makers and researchers who want to anticipate future shifts in the energy sector and socio-economic areas; meanwhile, it would determine its development. Forethought studies of various energy resources characteristics constitute economic, technological or policy regulations are the inherent elements of contemporary energy security policy and planning.

EMPHASISING THE IMPLEMENTATION OF RENEWABLE RESOURSES PRIMARILY WITH SOLAR ENERGY APPLICATION

In order to slow down the process of global warming, as well as mitigate the consequences of climate change, Germany has set goals to transition away from fossil fuels towards green energy usage [12]. Reshaping this fossil-based energy system is supposed to decrease effects of climate change, reduce greenhouse gas emissions and air pollution, as well as decrease the depletion of natural resources [13]. It is argued that a way to tackle this challenge is by decentralizing the energy system. These small-scale systems can either be down-scaled technologies seen in centralized systems with improved efficiency, or are mostly based on renewable energies. They provide options to utilize multiple energy sources and operate close to the destination. This significantly reduces transmission losses and can overcome uncertainties in supply related to centralized energy sources [14]. Centralized systems are highly integrated, which can make them vulnerable to disturbances in the supply chain. Transitioning towards a decentralized energy system could be a secure way to ensure reliable energy services and mitigate climate change [9]. This transition is, however, not without some challenges. The current infrastructure is designed for a centralized system and in order to ensure a reliable network of smaller grids would require major changes and large sums of capital [15].

In 2001 the Dutch ministry for Housing, Planning and the Environment (VROM) stated that government intervention in transitions hasexisted for an extended executive planning. Herewith 'transition' and its supervision by the government was introduced as a policy concept in the Netherlands [16-18]. Furthermore, the EU strives for environmental criteria to be recognised in project financing and in public investments, to assure that public funds are used in a way that supports sustainable activities and the development of sustainable businesses such as phasing out fossil fuels subsidies [19]. As in energy report it has been noticed that market parties themselves would not be able to convey on the transition to a more sustainable energy system themselves and that the Dutch government has devised the right circumstances for the transition to happen [20].

The electricity system does not only consist of the physical infrastructure but is also strongly influenced by social structures, making it a socio-technical system [21]. These physical infrastructures "...co-evolve with socio-economic institutions, actors and social norms" [9]. When looking at a transition towards a decentralised system, these factors need to be taken intoaccount because they can pose technological, social, economic and political challenges. Besides these challenges, several barriers could also withhold a transition towards a more decentralized energy system. Decentralised Energy Generation (DEG) has a number of environmental and economic advantages over centralized energy generation. Centralized plants supply energy for the large grid which requires energy to be transferred over extensive distances, with the necessary transmission losses. Additionally, these plants separately produce heat and energy as opposed to cogeneration. DEG provides possible solutions. A variety of techniques is known to effectively use cogeneration, reducing energy losses by 10-30%. Examples of these techniques are turbines and fuel cells, which largely run on the incineration of fossil fuels. Generating energy on a more local scale allows for generation closer to the source, which minimize transmission losses up to 20% [22].

Figure 1 displays the anticipated electricity production in the Netherlands, which has been provided by the government. The share of electricity from renewable sources will develop from 13% in 2015 to 54% in 2035, assuming that the national subsidies for electricity production from renewable sources are continued. More often the focus is on renewable energy generation such as wind turbines and photovoltaic (PV) panels, the latter being the most common. (Photovoltaic; the conversion of solar radiation to electric energy). Being subject to climate- and weather conditions, these methods come with a certain degree of uncertainty. Reliability is paramount, therefore connection to the grid is usually required to ensure backup power. Depending on the amount of energy required, a combination of techniques can be used for compensation. The local grid may be managed by the citizens of Searbeck, they do however depend on the national grid to take up surplus production [13].

Altering the grid requires not only large financial sums, but also compromises the availability and reliability of the grid. This transition, therefore, cannot happen all at once but should be carefully guided, ensuring that power remains constant. Even though a decentralised system can be used to overcome stability issues, it is not without challenges. Issues may arise with bidirectional flow of power (power flowing back from the source) and this can put too large of a strain on the equipment such as cables and transformers. Additionally, short circuits may occur, which is unintentional flows of electricity between closely located outlets of different circuits. Frequent changes between charges of sources (on/off) and variability in power source and voltages thereof can affect power quality and stability. Nonetheless, these issues can be overcome with careful design and mapping of the grid(s), provided the proper resources to do so[15].

Renewable technologies such as wind turbines and solarpanels are subjected to their geographical location, and local climate [23]. The availability of sunlight also affects these renewable technologies. During the day, PV systems can overproduce, while producing nothing during the night. This may result in surplus electricity being sold for a low price, while at night it is bought back for a higher price from the energy supplier. This may be the case in locations with abundant sunshine. Areas with more frequent cloudy weather may experience an intermittent availability of sufficient electricity [24]. With the variety of renewable sources for power and light as well as wind and solar energy, geothermal energy and energy from water, the potential of these sources is supposed to be between 500 and 750 petajoules in 2050, primarily based on solar and wind energy. Solar energy is fitting for roofs, with the

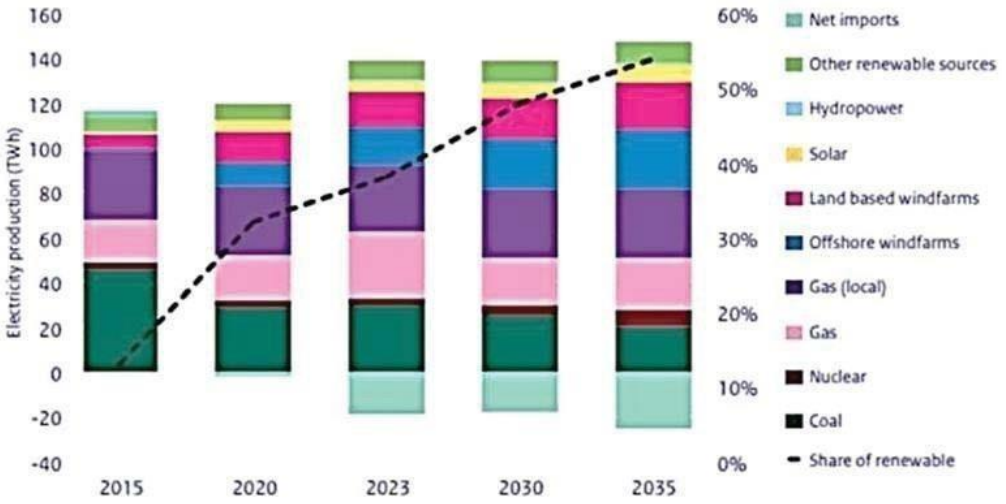

Figure 1: Current and expected electricity production in the Netherlands (The Ministry of Economic Affairs, 2016).

additional advantage that the public and businesses can promptly execute this solution.

When solar panels have to be installed on all suitable roof surfaces, then they would simultaneously deliver 180 petajoules of energy. Since solar energy is an occasional energy source the risk of imbalances between the supply and demand still remains. The current system is capable of managing this imbalance. Nonetheless, when the solar energy is produced, the increasing economic sense can recapitulate imbalances and stimulate system need to be modified by the phenomenal strategies. Another issue is the availability of beneficially oriented surfaces for PV panels [25]. An example of large scale use of solar panels are so called 'Solar Pastures'; large areas of land covered in solar panels. To meet electricity demands, large areas are required and rooftops alone might not provide sufficient suitable surfaces [26].

POINTINGONTHETECHNICALOPPORTUNITIES OF SOLAR ENERGY GENERATION

Renewable grids are often modular, meaning they can adapt to energy demands. Grids can be easily expanded by placing new turbines or solar panels. Renewable technologies have seen impressive improvements in recent years, and more possibilities are being explored. For solar panels this includes flexible panelswhich can allow optimal use of curved surfaces and thereby significantly increase available space. Pastures, for example, can be reserved for other usage. They can be sustained by multiple resources, so a combined system of solar panels and wind turbines can provide electricity during the day- and night time [22].

Examples exist on the small-scale, such as net-zero buildings. "Net Zero Energy Building (NetZEB) concept may be defined as a building that over a year is neutral (i.e., it delivers as much energy to the supply grids as it uses from the grids) when energy efficiency measures are successfully combined with energy renewable sources." [27]. These buildings use renewable energy, primarily solar panels, to reduce the heating- and electricity loads by optimized efficiency of energy use. Integrating PV technology in the design of the building allows for optimum use, also for indoor climate control. The system allows generated heat, from the conversion of solar radiation to energy, to be recovered and applied. This minimizes surplus electricity being sold back to the grid. Generally, PVpanels can only transmit about 15–20% of solar radiation to electricity, not fully utilizing what they catch. Hybrid photovoltaic modules can propel to higher efficiency and reduce the use of space and dissipated heat, increasing the yield [28]. For the average household these systems have a payback period of 7 years. Upon that, solar batteries provide means to store energy that is generated during the day, to be used at hours when less sunlight is available [24]. Renewable technologies involve less external costs compared to fossil fuels, such as costs from pollution and human health effects. Moreover, installation and deployment of renewable energy sites tends to move along quicker compared to fossil fuel sites, due to for example political or legislative issues, so development can be quickly initiated [22].

None of the dynamics discussed above operate in a void. The localized nature of decentralized energy relies both on locally specific technologies as well as local acceptance of these technologies. Ensuring power quality and stability remains a constant technological challenge in transitioning to decentralized energy generation.While success has been seen in utilizing specific technologies and in combining different technologies (use of PV panels, biomass and natural gas), the ability for small-scale localized technologies to be unutilized effectively is directly related to the economic and political investment as well as social buy in of the community in question. What is more, the approach is societal feasible and an acceptable solution for a smaller scale. Another drawback of our solution is that the transition is only profitable in "poorer" communities, as their economic situation is more closely tied to traditional energy industries and thus there is less incentive to transition to renewables. Another critical aspect of the argument is the funding provided by the national government. This money has to come from other budgets, which might not be possible or a priority set by the national government.

None of the dynamics discussed above operate in a void. The localized nature of decentralized energy relies both on locally specific technologies as well as local acceptance of these technologies. Ensuring power quality and stability remains a constant technological challenge in transitioning to decentralized energy generation. While success has been seen in utilizing specific technologies and in combining different technologies (Searbeck's use of PVpanels, biomass and natural gas), the ability for small-scale localized technologies to be unutilized effectively is directly related to the economic and political investment as well as social buy in of the community in question. These instruments have been seen as largely successful in establishing an environment thatpromotes

community energy initiatives. With the political power placed in municipalities, community buy-in is essential in the transition to decentralized systems.

Conclusion

The economic turbulence of the early 70s due to the oil crises, had given us legal and institutional opportunity to persuade the influence of social actors and autonomies who represent environmental protection affairs. With the establishment of the positioning green liberal in political parties in EU, the stewardship in general on environmental policies has been increasingly dominant (Weidner, 1997). Since then, the controversy has continued regarding the application of centralised and decentralised energy generation. The discussion is particularly centred on utilizing both policies to obtain a precious balance between energy resources. Due to various geographical & environmental situations and unprecedented probabilities concerning global climate change which can stimulate decentralised energy generation, the acquisition of renewable energy resources should be designed expressly unique for every area. Local self-government is also an important feature. If more power is given to the local governments, local environmental organisations would hugely benefit. This is because a local government can better estimate a region's needs in terms of environmental protection. If an energy transition would take place, and more infrastructure would be built, a local government is situated better to work together with the environmental agencies to find the best (and least harming) location as opposed to a national government. It is thus in their interest to support our recommendation. They could act as advisors and support decision-making.

The participation of local and regional agencies has increasingly been recognized as prosperous in the transition to decentralised energy. However, the recommendation at the local level represents a high impact on energy cooperatives. An indestructible relation between municipalities and environmental agencies is the cement which can seal the technical and Social aspects to achieve a more sustainable transition. By publicizing the frame of Net-zero energy performance of stabilizing the energy demands among the industry and everyday lives of people, It can be utilised the incumbent resources but also incidentally facilitate the availability of energy consumption. This includes using platforms to utilise different types of renewable energies mainly solar cells, biogas & waste to energy, and wind power. Environmental agencies thus have a key role to organise and unify NGOs, private sectors, companies and business firms due to their wide connections. No matter the hierarchy, policies, laws, or obligations to regulate processes, in the end, we are responsible for making a change.

Residents could contribute via funding, as well as by setting up initiatives to generate renewable energy. Businesses can work together with these residents to set up the initiatives. The energy companies could provide the technology to further expand the grids and therefore the provision of clean energy. Both residents and businesses want to keep the financial barriers as low as possible, and will most likely choose the least costly option. Energy companies will only invest in renewable sources if this turns out to be profitable, so for our recommendation that this can be guaranteed. With the investment of the national government, the financial barriers could be low enough for residents, local businesses and energy companies to cooperate. Environmental organisations and activists would influence the different local aspects and are a modulator in this context. The resilience of renewable energy assets returns to oil price uncertainty effects which may stem from the fact that the economics of the renewable energy sector has enhanced very competitively in recent years, and therefore renewables can contend successfully with oil, even when the price of oil fluctuates around the recent low levels. Another expedient interpretation might be the fact that oil is not predominantly used in electricity generation, meanwhile any possible spillover impression from oil to other primary sources of electricity generation such as it seems not to be prominent enough in order to transform renewables indirectly.

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