Jeffrey Lu - 23 May 2022

Renewable Energy and Hydrogen Investment as a Means for Energy Security and New Political Alliances: A Policy Paper for the German G7 Presidency

"Progress towards an *equitable* world" – This is the lofty goal that Germany has set for its programme as the leads the Presidency of the G7 in 2022. The G7 Summit will be hosted this year from the 26th to 28th of June at Schloss Elmau in the Bavarian Alps and will host leaders representing many of the world's leading industrial nations. As such, the annual summit will help determine and shape the political responses to global challenges.

It would seem key talking points for the leaders will be on the effects of the Russian-Ukraine war, mainly the resulting volatility of gas and electricity wholesale prices, and the need to gain energy independence and security. The Russian-Ukraine conflict has had far reaching implications on the energy landscape in Europe and around the world; most notably playing a key role in the suspension of the commissioning of the Russian Nordstream 2 natural gas pipeline, the growing sentiment to stop reliance on Russian gas[1, 2, 3], and of the volatile European gas prices which saw a ~6x calendar year increase over 2021 due to supply 'issues'[4]. The decarbonisation of energy will also be a key talking point especially due to the growing need for action to combat climate change and due to the commitments made by countries after the recent Conference of Parties (COP26) in Glasgow.

Within recent years, there has been a lot of excitement around hydrogen and the opportunity for it to compliment renewable energy sources in delivering low carbon, decentralised energy into the worlds more advanced and energy hungry economies. The German G7 Presidency can use the Summit to help forward some of the progressive ideals championed by Germany under Angela Merkel's tenure as Chancellor. Now, Germany and Chancellor Olaf Scholz can use the opportunity of the G7 Summit to rally and forge political allies around the world using renewable energy and green hydrogen as a key focus point. By promoting the use of renewable energy and green hydrogen, Germany and the European Union may be able to regain their independence from a centralised energy provider and strengthen their energy security; whilst helping facilitate the Just Transition by promoting renewable energy in new partner countries and allies.

The five major goals of Germany's G7 Presidency should come to no surprise to those who have been following the progressive policies pushed forward by Germany in the past couple decades.

The five major goals are:

1. Strong alliances for a sustainable planet.

2. Setting the course for economic stability and transformation.

3. Enhanced preparedness for healthy lives.

4. Sustainable investments in a better future.

5. Stronger together.

This policy paper will try to show how renewable energy and green hydrogen could be a key component of some of the five major goals, increase energy security, and ultimately reach the stated goal of "Progress towards an *equitable* world", and facilitate a Just Transition.

Stronger together against centralised energy sources and energy market influence - Problem.

The use of energy as a geopolitical tool has always been relevant to the G7, with core members including the USA, Canada, Japan, UK, Germany, France, Italy, and the EU; all which have had huge pressures to ensure energy security and to reach the Paris Agreement's decarbonisation goals as some of the world's most wealthy and liberal democracies. However, in recent years the use of energy as a geopolitical weapon has been ever more apparent in the European region.

Europe is dependent on Russia for over a third of its gas supply, and Russian gas accounted for 27% of all

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energy consumed in Germany in 2021 [5,6]. And with the completion of the 1,200 km Nordstream2 pipeline in 2021, there is the potential to double the amount of gas flowing from Russia to 110 bcm per year; or over one quarter of the European Union's annual gas consumption[7].

Even before any natural gas has yet to flow through Nordstream2, it has already been used as a strong geopolitical tool to for Russia's strategic and political gain. In 2021, there was an 600% increase in European gas prices, as it is suspected that Gazprom, Russia's state gas company, has been restraining supply to push up gas and electricity prices and thus pressure to expedite the commissioning of Nordstream2[5]. Although, Gazprom; and by proxy Russia, is fulfilling existing contractual obligations, it shows the dangers of relying on such centralised energy sources, especially when they are used for geopolitical gain and not purely for commercial ventures[3,8,9].

However, the Russian – Ukrainian conflict has fast become a critical turning point for Europe's energy future, as the commissioning of the Nordstream2 pipeline has been indefinitely suspended and economic sanctions are being imposed on Russia, adding another level of complexity to this energy-political story. Europe's future energy security is becoming bleaker as it has been shown Russia's political ideology is not conducive to being a reliable and secure energy supplier. The G7 summit is a critical period for Europe and the G7 countries to rally together and create alliances that will help diversify their respective energy sources and insulate themselves from future energy market disruption.

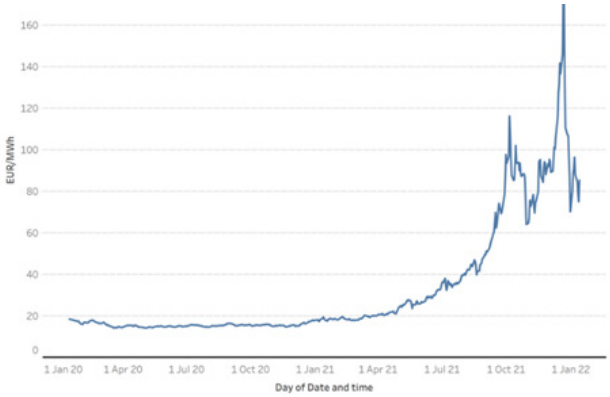

Figure 1: Europe has seen a 600% increase in gas prices as Russia uses its position as Europe's main exporter for political and strategic gain rather than 'normal' commercial gain[10].

Europe now has major concerns for its future energy security due to its dependence on such centralised energy sources, mainly at the hands of Russia. There are significant fears within the EU and G7 sphere that Germany and Europe has become much too dependent on Russian energy despite the growing need to decarbonise, and more importantly, the ideological and political differences of these governments.

Sustainable investments to help build strong alliances and the transformation of the energy landscape - Solution.

Countries within the G7 have realised there needs to be significant increases in renewable energy capacities to both gain energy security, and to decarbonise their energy mix. Renewable energy infrastructure such as wind, solar, and hydro have largely been built in more developed and industrial nations due to their comparatively high costs compared to fossil fuels. These historical high costs of renewables means that only industrial nations have had the economic feasibility to build these technologies within their borders.

However, the potential for greater renewable energy sources often lie within regions outside of the borders of the G7 countries. Regions such as the Middle East, North Africa, India, Latin America, and many others are prime examples of developing nations that have in abundance the potential for renewable energy with ambitions for economic growth. And, although the levelized cost of renewable energy generation has become competitive with fossil fuels under certain circumstances, countries may still not adopt these low-carbon technologies for a variety of factors. Factors such as varying fuel costs, lack of environmental regulations, lack of emissions control systems, lack of tax subsidies supporting renewable energy development, cost associated with stranded assets, costs associated with network upgrades, transmission, and backup, and many other factors means that many countries are unwilling or unable to realise their renewable energy potential due to economic barriers[11].

The idea of a 'Just Transition' at an international level is to ensure that developing countries are not economically disadvantaged by the transition to a low-carbon energy system and the goals of reaching carbon emission targets. It requires developed countries to economically assist developing countries to adopt low carbon energy technology. With an abundance of potential economic and energy partners and

potential allies, it is in the interest of many G7 countries to enable sustainable investment policies that will help facilitate the Just Transition of the energy landscape for mutual benefit.

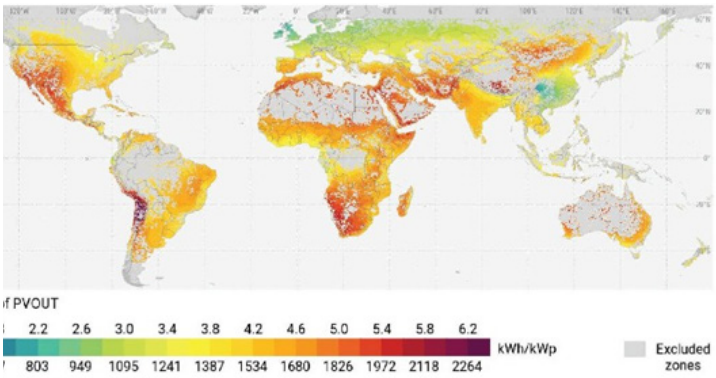

Figure 2: Regions with greater renewable energy potential often lie in regions outside G7 country borders (with the exception of the USA)[12]. The G7 countries can leverage their economic power to help develop renewable energy projects that would benefit themselves and neighbouring countries.

Renewable energy sources have the opportunity of findings its way into Europe, North America, and other G7 countries through hydrogen and its derivatives. Hydrogen and its derivatives seem to be best suited for long distance transportation of renewable energy[13], allowing more efficient production of renewable energy given constraints of finite resources and time. The only missing piece of the puzzle is political willingness and international co-operation.

A scenario devised by the Goldman Sachs Research division sees hydrogen generation's total addressable market having the potential to hit more than $1 trillion by 2050 compared to around $125 billion today. The European Commission has already laid out plans to install 40 GW of renewable hydrogen electrolyzer capacity in the EU by the year 2030, which still falls short of the 350 GW required in IRENA's 1.5°C Scenario[14, 15]. To fully realise the potential of renewable hydrogen, the G7 Summit under Germany's 2022 presidency needs to accomplish two things: to unlock sustainable finance to fund renewable energy and green hydrogen projects around the world; and to establish and strengthen alliances between countries to expedite the renewable energy and hydrogen economy.

Germany's can use its presidency of the G7 as an opportunity to push for much needed policies that enable economic development and political alliances which support a Just Transition and energy security. For developing nations to embrace the adoption of renewable energy, hydrogen and its derivatives, and other low-carbon energy sources; financial policies and mechanisms need to be implemented that see financial resources flow into these countries. Policies and mechanisms such as the EU Just Transition Fund, EU Sustainable Finance Taxonomy, Green Bonds, etc urgently need have their scopes increased to apply to projects outside of country borders ensuring that finite funds are used efficiently. Mechanisms such as green hydrogen purchase power agreements, which guarantees the purchase of green hydrogen for long-term periods (5-20 years), will stabilise the issue of demand and supply for hydrogen and its derivative products and create much needed jobs for both developing and the G7 countries.[16, 17] By taking a more global approach to renewable energy financing, the German G7 presidency can help create opportunities within developing countries that will remove the barriers that currently stopping renewable energy and hydrogen production in these countries.

Finally, creating inclusive policies that achieve the idea of a Just Transition requires collaborative effort between G7 and potential ally countries. Precedent of further collaboration has been set before under the G7 presidency of the United Kingdom; where Australia, India, South Korea, and South Africa were invited as guests in 2021. If the goal of the German G7 presidency is to create stronger alliances, there would be no stronger demonstration of intent than to continue to invite key countries as guests and offer them a seat at the proverbial 'table'. We have seen in a world economy as fragile as ours, that public relations and building personal relationships between world leaders is key to long term economic stability and thus necessary for the energy transition. It would be in the best mutual interest of Germany and the G7 to invite representatives from countries such as Australia, Brazil, Chile, Egypt, India, Morocco, Turkey, and many more countries that have all demonstrated the potential and intent of growing renewables and exporting hydrogen through their national hydrogen strategies[18].

A Just Transition is required to achieve energy security, economic stability, and climate goals - Conclusion.

"Progress towards an *equitable* world" - This lofty ambition for the Germany G7 Presidency is a reflection on the current unjust and turbulent state of the world. The war between Ukraine and Russia has shown to the world that the future of energy security and supply is a tenuous construct, and bad actors have the power to dramatically change the status quo. The developed world is still heavily reliant on fossil energy from centralised sources while developing nations are still unable to commit to establishing renewable energy infrastructure. Political and ideological differences, along with weak financial structures has created a global energy landscape that is full of uncertainty and energy supply and security is used as a political tool.

If governments are serious in achieving the climate goals set by the Paris Agreement, along with the critical goals of energy security and economic stability; the energy landscape must adopt the principles of a Just Transition. A Just Transition will allow the energy landscape to become more decentralised, secure, and decarbonised, whilst allowing developed and developing nations to grow economically. The Summit needs to champion the concrete actions that is urgently required to help both developed and developing nations to realise their renewable energy potential and to establish hydrogen infrastructure for the future economic trade of clean energy. Ultimately, if "Progress towards an *equitable* world" is to be achieved, fair financing structures needs to be implemented to allow developing countries to progress their renewable energy capabilities, and these potential allies must be given a seat at the table and to be treated as *equals*.

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