Opportunities and Challenges COVID-19 Poses to the Energy Transition

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Abstract

COVID-19 presents both opportunities and challenges to the energy transition. This article presents a brief overview of the impacts of the pandemic on the energy sector and a reflection regarding three potential instigators of change: mobility, renewable energy sources, and the pace of the economic recovery together with government intervention.

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Introduction

The momentum and strength of the global climate movement was unprecedented before the COVID-19 crisis. The decarbonization of the energy system and the concept of energy transition was a current topic in political speech, the cost of some renewables was continuously falling (making them increasingly an economically viable option), fossil fuel divestment campaigns were emerging, and public support for action on climate change was at an all-time high (Pianta et al., 2021; Kuzemko et al., 2020). However, the macroeconomic and political circumstances under which these frameworks were conceived are no longer the same, as many countries are now addressing three different crises at the same time, the COVID-19 health crisis, the consequent economic crisis, and the climate crisis.

How institutions and policy makers adapt to these new circumstances and re-establish policy agendas, can have severe consequences for the low carbon energy transition. Yet, exogenous shocks, such as disruptive pandemics and extreme weather events, can generate new societal demands (e.g., for environmental sustainability). These new needs drive the existing socio-technical and innovation systems to change, thus transforming institutions and having enduring impacts on society (Sarkis *et al*. 2020; Wesseling *et al.* 2017).

Thus, the COVID-19 era, and its expected severe economic consequences, might compromise the low carbon transition. Yet, one should remember that even though economic stability is one of the factors that facilitates a transition, environmental policy arises as the main determinant for the progress and success towards a low carbon pathway. Thus, if properly managed with good governance, this disruption can lead to large and persistent changes in economic structures, favouring carbon neutrality and shifting the overproduction and overconsumption systems and lifestyles towards a more sustainable future trajectory. Most of post-industrial revolution transitions were not planned or governed. With governments proactively creating conditions to trigger a transition to a low carbon future, the coming energy transition may be substantially shorter than those experienced in the past (Chapman and Itaoka, 2018).

The impact of COVID-19 on the energy sector

Containment measures, such as mandatory lockdowns, quarantines, closure of international borders and restrictions on travel, led to changes in mobility, social and work practices (Hoang et al., 2021; Kuzemko et al., 2020). As a result, and due to the slower pace of economic and production activities, energy and electricity demand dropped considerably. Indeed, the global energy demand in 2020 fell by around 4%, the largest ever absolute decline according to the IEA.[1] The drop in global primary energy demand was as much as three times greater than the impact of the 2008 financial crisis, reversing the increasing trends of the previous years (see Figure 1). Notably, this decrease came mainly from a decrease in coal power,

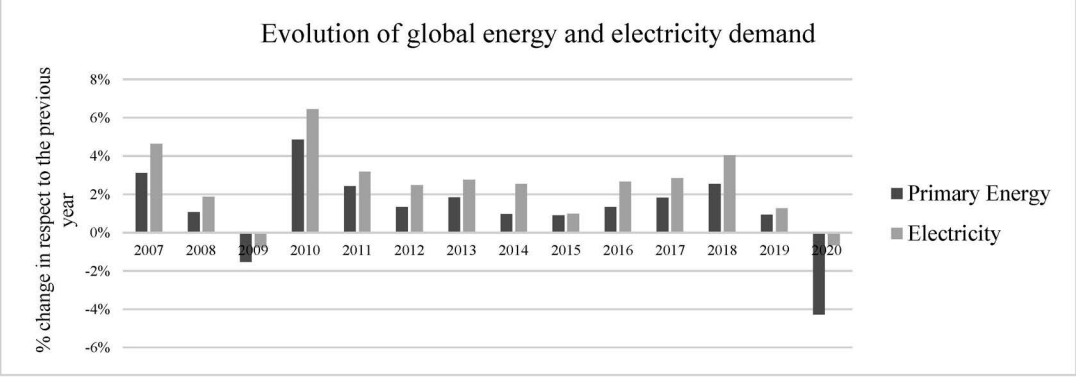

Figure 1 - Evolution of global total primary energy and electricity demand between 2007 and 2020. Source: BP Statistical Review of World Energy 2021.

leaving renewable power demand unchanged due to low operating costs and priority grid access. As a result, the share of renewables within the global energy mix is expected to increase considerably, to a level several years ahead of pre-pandemic expectations (Quitzow et al., 2021; Kanda and Kivimaa, 2020; Kuzemko et al., 2020).

Yet, and despite the increasing share of renewable power, investment in renewables declined along with overall investment in the power sector, with the EIA estimating that total energy investment fall by 20% in 2020.

Thus, and although not necessarily intended, responses to the pandemic have had substantial connections with energy demand and greenhouse gas emissions, which in turn triggered sharp declines and uncertainty in the patterns of electricity consumption, oil consumption, and industrial productivity (Sovacool et al., 2020).

Challenges and opportunities

In this section we cover three potential instigators of change arising from the pandemic: mobility, renewable energies, and the pace of the COVID-19 economic recovery as well as the intervention of governments. Overall, these can have enduring impacts on the energy sector.

Mobility

Global mobility needs and fossil-energy consumption could decrease in a post-COVID world due to changes related with the digitalization of work and other quotidian activities. The reduction of road travel needs by a segment of the population could make the ownership of a car superfluous, facilitating the expansion of shared mobility solutions. However, one should note that, in the short run while the pandemic is still active, these services may experience a slow down as social distance is still a concern (Kanda and Kivimaa, 2020).

Regarding air travel, the mobility regime more affected by COVID-19, domestic and international travel could become more sporadic as the world becomes more digitally connected. Moreover, the development of new infrastructures for alternative transport modes, like super-fast trains and ferry connections, could emerge as a substitute for commercial aviation, if the pandemic progresses as a propeller of landscape change in the mobility sector. However, these scenarios may be compromised if airline companies' bailouts and support for incumbent and high-emitting sectors prevail (Pianta et al., 2021).

Renewable energy sources

The effects of the pandemic on the development and deployment of renewable energy sources presents both challenges and opportunities to the energy transition. On the one side, the decrease in energy demand, due to the containment measures and the redistribution of public funding, as well as tightening fiscal management, postponed and reduced the number of auctions open for new renewable energy projects. Moreover, supply chain disturbances and the interruption of non-essential manufacturing caused delays in the deployment of many projects. Finally, grid integration of new projects was also suspended due to the postponement of non-critical operations. All these occurrences ended up interfering with the rhythm of the transition, lowering the incentive to invest in new renewable energy projects.

On the other side, the inclusion of sustainable investment measures as part of governments' recovery plans can lessen some of the difficulties that clean energy financing schemes are tackling. Indeed, these measures can promote investment in infrastructure, production capacity, as well as innovative business models, leveraging not only the deployment of clean energy sources, but also increasing employment opportunities in the sector. As noted by Pianta et al. (2021) and Hepburn et al. (2020), investing in clean energy can have a multiplier effect on the economy and on the job market. For instance, regarding the job market, every USD 1 million in green spending can create up to 7.49 jobs in renewables infrastructure and 7.72 jobs in energy efficiency, while creating only 2.65 jobs in fossil fuels (Garrett-Peltier, 2017).

Moreover, given that around 80% of countries are net energy importers, sustainable energy investments can increase the resilience and robustness of domestic energy systems, reducing reliance on foreign fossil fuels and contributing to reach carbon emissions reduction targets.

In addition, monetary policy interventions are expected to maintain interest rates at very low levels, which is perceived as favorable investment conditions by policymakers and project developers. Thus, the period of economic recovery can offer increased opportunities for the development of large-capacity renewable energy projects (such as utility-scale solar, onshore, and offshore wind farms, as well as other capital-intensive solutions, such as upgrading energy-efficiency in buildings).

Note that, at some point during the pandemic, historically low oil prices could be seen as a major cost disadvantage over renewable energy sources. Indeed, oil prices fall negative over a brief period in April 2020. However, as of today (August 2021) oil prices are at 2018 levels following several months of rise (see Figure 2), which poses an advantage to the deployment of renewable energy sources, which prices have continuously decreased (see Figure 3).

Economic recovery and government intervention

The speed and magnitude of the economic recovery of countries is highly uncertain and will influence the outlook of the global energy sector for the post-pandemic years.

The effects of an economic rebound on environmental pressures are highly influenced by the structure of the economy. Given that the service sector, which was severely hit by the pandemic,

Figure 2 - WTI crude oil price (2000-2021). Source: https://www.macrotrends.net/1369/crude-oil-price-history-chart.

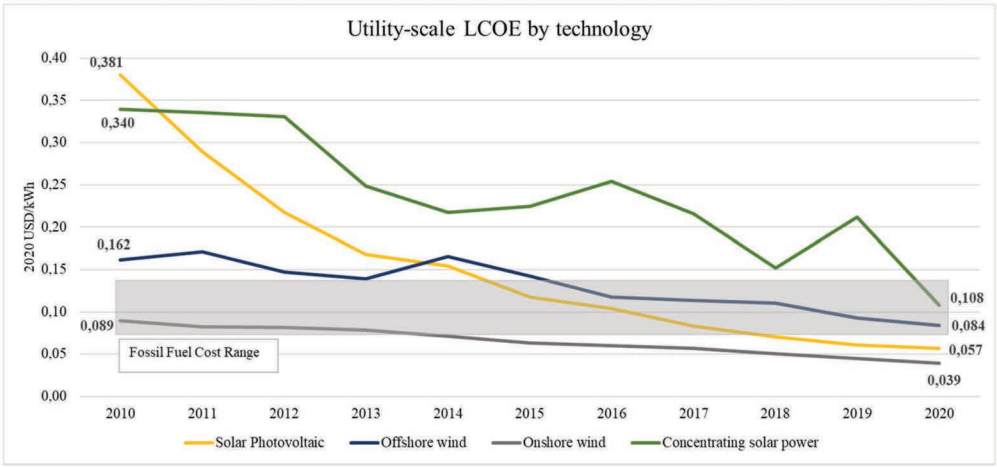

Figure 3 - Global weighted-average utility-scale levelized cost of energy (LCOE) by technology, 2010-2020. Source: IRENA (2021), Renewable Power Generation Costs in 2020, International Renewable Energy Agency, Abu Dhabi.

typically produces less emissions and uses fewer raw materials than most industrial sectors, it can be expected that, in countries where the service sector is dominant, the increase in environmental pressure due to the economic recovery will be smaller than the increase in GDP. In fact, according to the OECD (2021a), there is a projected long-term, and possibly lasting, downward impact of the pandemic on the levels of environmental strain of 1 to 3%, and a slow recovery could double these values.

Regarding government intervention, the pandemic revealed the powerful role governments can have in crisis circumstances. According to Kuzemko et al. (2020), this level of government intervention, not seen in many decades, could be a point of discontinuity with long term trends. Thus, although what happens in the close future will represent to a certain extent the continuation of processes that pre-date the pandemic, there is a chance that this discontinuity will result in an acceleration of trends towards a more sustainable future (versus the lock-in pathway of protecting existing jobs and incumbent industries).

Accordingly, as part of the pandemic recovery effort, governments are introducing large fiscal stimulus. For instance, in Europe the national plans are being complemented with a supranational recovery program, based on measures previously proposed in the European Commission's Green Deal, and with focus on digitalization, clean energy technologies, energy efficiency, and sustainable transportation. China doubled the deployment of renewable energy between 2019 and 2020 and introduced a National Green Development Fund for investment in clean energy infrastructure projects (Quitzow et al., 2021).

Thus, it is clear that many governments are pledging to use the stimulus packages for a green recovery, tackling two crises at once. However, according to OECD (2021b), while globally around USD 336 billion have been allocated towards environmentally positive measures, this value is almost matched by the value allocated to spending on measures classified as having mixed or negative environmental impacts (USD 334 billion). Moreover, spending allocated to clean measures represents only around 17% of recovery budget, suggesting that pandemic recovery packages might not be sufficient to deliver the transformational investments needed.

Conclusion

The pandemic has significantly disrupted lives, businesses, and economies, potentially changing social norms and practices indefinitely. It also introduced a high degree of uncertainty and economic strain which influences the future of a clean energy transition. Yet, if governments take advantage of key initiatives regarding mobility, renewable energy sources and recovery plans to support the clean energy transition, a win-win outcome is conceivable. Thus, the pandemic can become a small window of opportunity to accelerate the decarbonization of the energy system, decoupling economic recovery and environmental pressures.

However, there is no guarantee that governments will seize this opportunity (note that the 2008 financial crisis provided a similar window of opportunity for environmental intervention that was not grasped). The degree in which the pandemic turns out to be an ultimate driver of transition depends on how committed governments are to tackle the climate crisis side by side with the health and the economic crises. Moreover, given the scale of such clean transition, actively introducing green measures in stimulus packages is not sufficient, there is a need to discontinue pro-fossil fuel measures.

Finally, adverse shocks always produce winners and losers, tending to polarize the society. Moreover, the pandemic can potentially worsen the gap between leaders and laggards of the energy transition, exacerbating existing imbalances.

While we recognize the limitations in getting conclusions at a time of rapid change and uncertainty, our objective is to signal the opportunities and challenges the pandemic provides to creating a path of carbon neutrality.

A critical question remains. What actions are required to achieve a more sustainable energy future? Concerning the long run, the question will be how to design policy mechanisms that are shock-proof. The low carbon energy transition will take decades, and there will be more severe shocks.

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Footnotes

[1] Source: https://www.iea.org/reports/global-energy-review-2021.