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COVID-19 and Sustainable Energy Development: Agendas for Future Research

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Abstract

The COVID-19 pandemic is having a massive impact on and may fundamentally change the pathways and trajectories of sustainable energy development. This article examines the impact of COVID-19 on Asia's sustainable energy development and proposes agendas for future energy research in response to the pandemic. The review and research agendas are oriented towards achieving the Sustainable Development Goal 7 (SDG 7), ensuring access to affordable, reliable, sustainable and modern energy for all. The following three key questions need to be addressed by researchers: (1) In what ways does COVID-19 make sustainable energy development more important than ever? (2) What are the short- and long-term effects of COVID-19 on sustainable energy development? (3) How can responses to COVID-19 meet the objectives of sustainable energy development?

Keywords: sustainable energy development, COVID-19, pandemic, Asia

1. INTRODUCTION

The COVID-19 pandemic began in Asia and has spread very widely and rapidly throughout the continent, developing into an unprecedentedly catastrophic health, economic, and humanitarian crisis. As governments scramble to fight the pandemic through quarantine, travel and trade restrictions, and lockdown measures, turmoil and disruption across all economic sectors are experienced [1]. Home to the majority of the world's population and accounting for nearly 50% of the global total energy production and consumption [2], the experience of Asia is fundamental to the sustainable energy development of the world. This article examines the impact of COVID-19 on sustainable energy development in Asia and suggests research agendas for energy studies in this new context. Sustainable energy development in this article is defined with reference to the United Nations Sustainable Development Goals 7 (SDG 7): to ensure access to affordable, reliable, sustainable and modern energy for all. As such, two key elements of sustainable energy development are recognized: (1) clean and sustainable energy and (2) accessible and affordable energy.

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2. TAKING STOCK: SUSTAINABLE ENERGY DEVELOPMENT IN ASIA BEFORE THE PANDEMIC

Energy systems need to be less polluting and more sustainable to avoid or to mitigate environmental health problems such as air pollution, anthropogenic climate change, and resource depletion. Energy is also an essential tool that improves the quality of life and drives socio-economic development, especially in marginalized and vulnerable communities.

Prior to the pandemic, sustainable energy transition was undergoing an increased momentum in Asia, although the pace was not yet fast enough to avoid dangerous climate change [3,4]. By the end of 2019, more solar photovoltaics, wind power, hydropower, and biopower capacities had been installed across Asia than in any other continent. China has become the global leader in renewable energy deployment, largely driven by effective and timely policy interventions [5–9]. A significant rise in renewable energy has also been recorded in other places in Asia such as India, Bangladesh, Japan, South Korea, and Southeast Asia [10–14]. Energy efficiency, while receiving much less attention, has also been improving across Asia [15–18].

Asia was also making strong but uneven progress in making energy accessible and affordable before the pandemic [19–21]. Between 2010 and 2018, around 800 million people gained access to electricity worldwide, 80% of which were residing in Asia. Meanwhile, access to electricity in developing countries in Asia has reached 94%. However, affordability is a very different issue from accessibility. In fact, the shift from traditional energy to electricity and clean fuels may increase energy expenditure [22, 23]. Progress in the access to clean cooking has been slowed, with 1.7 billion people (43% of the population) in Asia still relying on traditional biomass, coal, or kerosene in 2018.

3. AGENDAS FOR FUTURE RESEARCH

The COVID-19 pandemic creates challenges, opportunities, and above all uncertainty over the future of sustainable energy development. It also opens up many new research opportunities for energy scholars who seek to make a difference through their scholarship. First, the pandemic forcefully underscores the importance of sustainable energy development. The link between energy and the prevention and treatment of COVID-19 is obvious—health facilities need reliable energy supply for their medical equipment and services such as ventilators and sterilization [24]. Furthermore, at the individual or household level, the imposition of lockdown measures means an increased demand for residential energy consumption [25,26]. Failing to provide cheap and reliable energy can create severe hardship for the marginalized population, as vividly illustrated in the experience of India [24]. The pandemic has exposed or magnified the problem of global inequalities in the access to basic energy services [27]. Improving energy access and affordability is more important and pressing than ever.

The pandemic also provides new insights of the importance of clean energy. There is mounting evidence that exposure to air pollution has a direct impact on COVID-19 infection and mortality [28,29]. This is not surprising, as the association between pollution and health is well established [30]. On the other hand, there is strong evidence showing that the pandemic, and particularly the lockdown measures, are having a significant impact on reducing air pollution [31,32]. Understanding how air pollution declines from COVID-19 is important because it can provide important evidence regarding the health benefits of sustainable energy development.

Second, the impact of the COVID-19 pandemic on sustainable energy development in Asia needs to be better understood. The pandemic has a substantial impact on global energy investment owing to supply chain disruptions, construction delays, reduction in energy demand, and financial

challenges. To certain extent, the impact on renewable energy is not as strong as fossil energy owing to the low operating costs of renewables-based generation. Thus, this reduction in energy demand has resulted in renewables making up a larger share of the power supply. Furthermore, much of the progress on improving energy accessibility in Asia has been made through collaborations between governments and donors. However, the COVID-19 pandemic may shift the government focus or reduce its ability to implement energy access projects. It is therefore very important for academics to continue to champion the necessity of universal energy access and suggests areas of improvement.

Understanding the longer-term impact of the pandemic on sustainable energy development is even more difficult. From an energy production perspective, the impact of COVID-19 depends on how the economy recovers, and particularly on the actions of the government with regard to the economic recovery policies that are beginning to take form in many countries. According to the International Energy Agency [33], “the pandemic has the potential to change the priority of government policies and budgets, developers’ investment decisions, and the availability of financing through 2025 and beyond”. Previous experience, such as that during the global financial crisis, suggests that the focus on economic recovery means that environmental and sustainability concerns typically become secondary [34]. There are now serious concerns that governments may roll-back some clean energy policies or even reintroduce support for fossil fuel industries in order to achieve a faster economic recovery [3]. For example, China may relax its strict coal-fired power plant permitting system, even though by doing so it would substantially increase its carbon emissions.

The long-term impact of the pandemic on energy consumption is even less understood. The literature has long recognized that disasters have a tendency to catalyze the processes of social change [35]. Therefore, despite the relentless effort by the government and companies encouraging consumers to get back to “normal”, it is possible that some fundamental changes in social practices are coming, which may have long-term impact on energy consumption. One example is the virtual revolution and de-globalization which, driven by travel bans around the world, could permanently change mobility patterns and shrink the demand for transportation [36]. The transport sector has long been a very large energy sector in Asia and a prime driver of carbon emissions [37–39]. Therefore, how the pandemic changes social practices and the implications of energy consumption should be studied carefully.

Third, research is urgently needed to contribute to the formulation of responses to COVID-19 that can meet the objectives of sustainable energy development. There are calls for a new green deal claiming that investment in renewable energy can drive economic recovery [40]. However, recovery programs branded “green” need to be examined critically and carefully, as carbon-intensive energy development incompatible with climate emergency is often deceptively termed “green”, “clean”, and “sustainable” [41]. As such, a critical analysis of stimulus packages and recovery plans is needed to detect any contradiction between planned economic recovery and sustainable energy development. Furthermore, policy studies are needed to provide evidence-based support to formulate effective green and sustainable recovery strategies.

Responses to COVID-19 also need to take the issues of energy justice into account [42]. As lockdown measures continue, domestic energy consumption increases, which places more financial burden on households. Furthermore, COVID-19-driven unemployment has been a socially unequal phenomenon, particularly hard for people with precarious work and marginalized communities. As such, the issue of energy affordability among these vulnerable people and communities needs to be examined. There is a significant likelihood that COVID-19 may worsen energy poverty issues, as more people have lost their jobs or have been working less hours, and thus have found themselves under stronger financial burdens. Supportive policies, such as offering free electricity

or reductions in electricity bills, may be needed for an extended period of time [43].

4. CONCLUSION

In summary, this article proposes three key areas of research that are important in achieving sustainable energy development in Asia in the context of COVID-19. First, academic attention is needed to (re)examine the importance of sustainable energy development. Second, studies are needed to identify the short- and long-term effects of the pandemic on sustainable energy development, such as detecting any emerging shifts in the politics of energy production by closely following national recovery plans and stimulus packages. Studies are also needed to examine the fundamental shifts in social behaviors with regard to energy consumption. Third, energy researchers should contribute to the formulation of responses to COVID-19 that meet the objectives of sustainable energy development, especially with reference to the most vulnerable communities.

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