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Ensuring Universal Access to Modern Energy Services in Times of Pandemic Related Disruptions: Legal Challenges and Potential Responses

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The significant disruptions to global energy markets across the world, in light of the COVID-19 pandemic, has shown that without robust law and governance frameworks to mitigate and manage pandemic-related disruptions to energy supply, global efforts to achieve the United Nations Sustainable Development Goals may be stifled.

This article examines legal and governance aspects of designing and implementing disaster risk reduction and resilience (DRRR) frameworks to ensure the security of energy supply in times of pandemic related disruptions. Various legal and institutional challenges that arise with extant DRRR frameworks, such as weak conceptualization of pandemic related risks in extant legislation; preexisting patterns of uneven energy access; gaps in data collection and sharing with respect to pandemic risks; inadequate cross-sectoral coordination amongst institutional actors, and resource limitations are examined in order to identify the ways in which an integrative legal framework on disaster management and resilience planning can help close these gaps.

The study suggests that clear and comprehensive legislation that recalibrate the scope of energy disruptions and improves data collection and cross-sectoral knowledge sharing by relevant institutional actors are significant steps towards protecting the integrity and resilience of modern energy systems in times of disruptive events such as pandemics.

Keywords: COVID-19 pandemic; Disaster; Resilience; Sustainable Development; Multi-Level Governance; Energy Security.

1. INTRODUCTION

The United Nations' Sustainable Energy for All and the associated Sustainable Development Goal (SDG) 7 contains commitments by countries to enhance energy access for the over 1 billion people who do not have access to reliable energy, by the year 2030.¹ Indeed, access to modern energy is crucial to addressing other global challenges such as poverty, famine, and gender inequality.² Prior to the outbreak of the Coronavirus Disease 2019 (COVID-19) pandemic, the challenge of inequitable access to modern energy, or energy poverty, was already escalating in many parts of the world, especially in developing countries in Middle East and Africa (MEA) region.³ Due to growing energy demand resulting from geometric population growth; rise in urbanisation and industrialisation; technology gaps; oil price volatility and reduced levels of finance for energy projects; as well as rising impacts of climate change on energy infrastructure, efforts to achieve energy security, *i.e* availability, accessibility and affordability of energy, had recorded varied levels of progress.⁴ However, significant disruptions to global energy markets across the world in light of the COVID-19 pandemic has further exacerbated these concerns.

The COVID-19 pandemic raises new and complex questions on the impacts of pandemics on energy supply and use. Due to additional stress created by the pandemic, energy utilities across the world have faced increased challenges in maintaining uninterrupted energy supply to homes and essential services.⁵ Furthermore, illness of energy workers,

¹ United Nations, 'Sustainable Development Goals' (*SDG Goals*, 2015) <<https://sdgs.un.org/goals>> assessed 20 January 2021

² Pachauri S, Spreng D. 'Energy use and energy access in relation to poverty' Economic and Political weekly. 2004 Jan 17:271-8; Nalule VR. Energy poverty and access challenges in sub-Saharan Africa: The role of regionalism. Springer; 2018 Aug 27.

³ Olawuyi DS, 'Can MENA extractive industries support the global energy transition? Current opportunities and future directions.'(2021) 8(2) The Extractive Industries and Society 100685.

⁴ Guayo D, Lee Godden L, Zillman D, Montoya M, and Gonzalez J (eds.), *Energy Law and Energy Justice*. (Oxford University Press 2020) 1-10

⁵ Broto VC, and Kirshner J, 'Energy access is needed to maintain health during pandemics'(2020)5 Nature Energy 419-21; Energy Community.

widescale layoffs, supply chain disruptions, payment delays, suspension of non-critical investments and contractual disputes, amongst others have slowed down energy expansion efforts, especially the deployment of renewable energy technologies such as wind turbines, solar panels, and batteries, in many countries.⁶ For example, since China, which is one of the main global suppliers of renewable energy technologies such as batteries, wind turbines and solar panels, has been significantly affected by the COVID-19 pandemic, solar and wind energy projects worldwide have faced delays. These delays continue to disrupt progress on the implementation of low energy access and carbon transition projects. Worse still, scientific studies predict an increase in recurrence of zoonotic epidemics and pandemics, such as malaria, dengue, Middle East Respiratory Syndrome (MERS), severe acute respiratory syndrome (SARS), *Ebola* Virus Disease (EVD), Porcine Epidemic Diarrhea Virus (PEDV), avian and birds influenza, to mention but some, that could result in further widescale shocks and disruptions to global energy markets.⁷

Managing disruptive events, such as natural disasters and extreme weather events, as well as human related disruptions such as sabotage, terrorism, and accidents, has been a central aspect of energy and natural resources law for several decades.⁸ The DRRR concept been well espoused as a framework for promoting resilience to energy disruptions and threats in a timely and efficient manner while preserving

Distribution system operators' response to Covid-19 crisis: Actions taken and concerns expressed. Energy Community Secretariat. 2020. *Can be accessed at* <https://www.energycommunity.org/news/EnergyCommunityNews/2020/04/21.html> (Energy Community 2020a).

- 6 World Bank, 'Coping with a Dual Shock: COVID-19 and Oil Prices' (*World Bank* 2020) accessed at <https://www.worldbank.org/en/region/me-na/brief/coping-with-a-dual-shock-coronavirus-covid-19-and-oil-prices>: Baldwin R, Beatrice W. Mitigating the COVID Economic Crisis: Act Fast and Do Whatever. CEPR. 2020
- 7 OECD, 'Future global shocks: Pandemics. Multi-Disciplinary Issues: International Future Program' (*OECD* 2011)
- 8 Roggenkamp M, 'Protecting Infrastructure in order to Guarantee Supply Security: Critical Infrastructure in the EU' *Energy Networks and the Law: Innovative Solutions in Changing Markets* (OUP. 2012)

and restoring critical and essential supply functions. However, as can be seen with COVID-19, unlike previously studied disruptive events that tend to have a defined geographical scope, pandemic related disruptions can adversely impact the entire global energy value chain at the same time, in the same manner, and can paralyze global energy supply for prolonged and indeterminate periods. Due to this unprecedented and widescale impact, extant legal, regulatory and governance frameworks have struggled in many countries to effectively anticipate, mitigate and absorb the paralyzing impacts of COVID-19 on global energy availability and supply especially at local levels. The COVID-19 pandemic accentuates the need for innovative law and governance approaches that recalibrate the scope of energy disruptions, as well as anticipate, prevent, and respond to such novel global impacts at local levels. Without integrating holistic DRRR frameworks into the energy supply policies and programs, global efforts to achieve SDG 7 on energy for all may be stifled.

This article examines legal and governance aspects of designing and implementing DRRR frameworks to guarantee the security of energy supply in times of pandemic related disruptions. It discusses how countries can use the lessons learned from the COVID-19 pandemic to build holistic laws and policies that anticipate, minimize, and address impacts of future pandemic related disruptions to energy security.

The article is organized into five sections, this introduction being the first. Section 2 explores the significance and contours of the DRRR discourse and its implications for managing pandemic related disruptions in the energy sector. Drawing comparative lessons from MEA countries, section 3 examines specific legal and institutional challenges that arise with managing pandemic related disruptions, such as the weak conceptualization of pandemic related risks in extant energy laws and policies; preexisting patterns of uneven energy access; gaps in data collection and sharing with respect to pandemic risks. Inadequate cross-sectoral coordination amongst institutional actors, and resource limitations are examined in order to identify the ways in which an integrative legal framework on disaster management and resilience planning can help close these gaps. In section 4, some lessons and recommendations are

drawn on the required steps and processes for addressing the identified barriers. Section 5 is the concluding section.

2. THE DRRR DISCOURSE: SIGNIFICANCE AND CONTOURS

The DRRR approach has been widely promoted over the last decade as a framework for enhancing resilience to energy disruptions and threats in a timely and efficient manner while preserving and restoring critical and essential supply functions. This section discusses the drivers and significance of DRRR, as well as its implications for anticipating, managing, and responding to pandemic related disruptions.

2.1 Drivers and significance of disasters and DRRR

Literature focused on understanding various disasters and their impact on infrastructures and societies has been evident as far back as the 1980s.⁹ Generally, disasters refer to sudden and unexpected events that result in significant and widespread disruptions to social, economic, environmental systems.¹⁰ Disasters are classified into three: natural disasters; man-made disasters, and hybrid disasters.¹¹ Natural disasters are triggered by naturogenic or natural processes, and they include earthquakes, floods, hurricanes, natural wildfires, tornadoes, tsunamis, volcanoes, amongst others. Man-made disasters on the other hand originate mainly from anthropogenic or human activity especially industrial and transportation accidents, pollution, explosions, technological

⁹ Britton NR, 'An Appraisal Of Australia's Disaster Management System Following The 'Ash Wednesday' Bush-Fires In Victoria' (1983)45. *Australian Journal of Public Administration* 112-27.

¹⁰ Alexander DE, 'Resilience and disaster risk reduction: etymological journey, (2013)13 *Natural hazards and earth system sciences.*' 2707-16.

¹¹ Shaluf IM, 'Disaster types. Disaster Prevention and Management' *Natural and hybrid disasters—Causes, effects, and management.* *Advanced Emergency Nursing Journal.* 2002 Sep 1;24(3):1-25.

disruptions, sabotage, and acts of terrorism. Examples include the *Deep water Horizon oil blowout in the Gulf of Mexico*, and the *Niger Delta oil spills in Nigeria to mention but a few*.¹² While hybrid disasters are essentially man-made disasters that result from the accidental or negligent triggering of naturogenic processes, for example wildfires caused by human activity.

The main driver of DRRR therefore is to reduce the risks associated with a disaster. For example, while the actual causes of the COVID-19 pandemic are complex and far from settled, its consequences in terms of social, economic, environmental, and energy disruptions have been significant and global. DRRR frameworks include pre-disaster measures that aim to anticipate, prevent, and reduce the occurrence or frequency of disasters on energy supply, especially by protecting energy networks and infrastructure;¹³ as well as post-disaster measures designed to provide timely, effective, and cost-efficient recovery from disasters as they occur in order to reduce their disruptive impacts and ensure early response, recovery, and reconstruction.¹⁴ The importance of planning and managing risks associated with disasters is emphasized in the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030.¹⁵

The second driver of DRRR is the need to provide clear and comprehensive legal and governance frameworks that provide immediate response to disaster risks, while also providing communities affected by disasters with requisite

¹² Mochizuki J, and Chang, 'Disasters as opportunity for change: Tsunami recovery and energy transition in Japan'(2017)21 International journal of disaster risk reduction 331-9(as cited in Olawuyi DS, 'From technology transfer to technology absorption: addressing climate technology gaps in Africa'(2018)36 Journal of Energy & Natural Resources Law 61-84)

¹³ Roggenkamp M, 'Protecting Infrastructure in order to Guarantee Supply Security: Critical Infrastructure in the EU(as cited in Martha M. Roggenkamp, Lila Barrera-Hernandez, Donald N. Zillman, and Inigo del Guay, 'Energy Networks and the Law: Innovative Solutions in Changing Markets' (OUP 2012))

¹⁴ Boyarsky I and Shneiderman A, 'Natural and hybrid disasters—Causes, effects, and management. Advanced Emergency'(2002)24 Nursing Journal. 1-25.

¹⁵ Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) < <https://www.preventionweb.net/files/43291sendaifra-mewo-rkfordrren.pdf>>

social, economic, and political support to bounce back from such risks.¹⁶ Legal frameworks on risks and disasters can provide a basis for suspending or amending legal requirements or obligations for extended periods in order to channel available resources and systems to ensure affordable energy supply is not interrupted for extended periods even in times of pandemics. Many countries already have constitutional provisions, which empower national authorities to exercise emergency powers in terms of emergencies so as to provide accelerated energy access to affected communities. However, such measures are often for a limited period and do not often contain comprehensive provisions that anticipate, prevent, and respond to disaster risks on an ongoing basis. Implementing DRRR frameworks on energy supply can enable policy makers to provide short term energy access to affected communities, design required infrastructure to restore normal energy supply, and more importantly to effectively prevent reoccurrence or future risks.¹⁷

The third driver of DRRR relates to the need for holistic coordination and integrated management of the disaster and other associated risks. Multi-stakeholder partnership and integrated governance have gained increased recognition as important approaches for bringing together a wide range of actors, institutions and stakeholders to address crosscutting and multi-scalar threats that no single institution can tackle alone.¹⁸ Disasters affect diverse and interconnected sectors

¹⁶ Mochizuki J and Chang S, 'Disasters as opportunity for change: Tsunami recovery and energy transition in Japan' *International journal of disaster risk reduction*. 2017 Mar 1;21:331-9.

¹⁷ McGee TK, McCaffrey S, and Tedim F, 'Resident and community recovery after wildfires. In *Extreme Wildfire Events and Disasters*' (2020) Elsevier 175- 184.

¹⁸ Olawuyi D, and Tubondeneyefa Z, 'Review of the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria. (*Institute for Oil, Gas, Energy, Environment and Sustainable Development* 2019) 1-25. 2019 <https://docs.wixstatic.com/ugd/60b422_74da66d41dfa41b2963c73772cfffad1.pdf>; Beisheim M, Simon N. Multi-stakeholder partnerships for implementing the 2030 agenda: improving accountability and transparency. *Analytical Pa-*

and segments of the society. Consequently, integrated response measures involving a wide range of experts, as well as ministries and departments are key in reducing the risks associated with managing such disasters.¹⁹ For example, promptly restoring affordable energy supply in affected communities will require wide-ranging responses from stakeholders in economic, social, environmental, infrastructure, transportation, and other institutions. In order to avoid overlap, lack of coordination and role duplication in disaster response, DRRR advocates a fundamental shift from sectoral and ‘one pipe-at-a-time’ governance approach, to a cross-sectoral, coherent and integrated approach to disaster risk management.²⁰ By providing a framework for integrating the expertise and involvement of various agencies, departments and institutions with energy related functions, a DRRR framework can help policy makers to avoid uncoordinated policy response and overlap between different actors and stakeholders.²¹

The need for coherent and holistic implementation of the SDGs is a fourth and overarching driver of the DRRR discourse.²² SDG 17 recognizes the need for effective partnerships and coordination amongst various actors and sectors as a prerequisite for achieving all of the SDGs, for which we focus on those relating to SDG 7 on energy access and SDG 13 on climate change. Similarly, the need for cooperation between governments, organisations, and civil society is echoed in the International Strategy for Disaster

per for the 2016 ECOSOC Partnership Forum. Analytical Paper for the 2016.

¹⁹ Burns TR, Machado N. Technology, complexity, and risk: A social systems perspective on the discourses and regulation of the hazards of socio-technical systems. *Sociologia, Problemas e Práticas*. 2010(62).

²⁰ Thomalla F, Downing T, Spanger-Siegfried E, Han G, Rockström J. Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation. *Disasters*. 2006 Mar;30(1):39-48.

²¹ Lange W, Sandholz S, Viezzer J, Becher M, Nehren U. Ecosystem-based approaches for disaster risk reduction and climate change adaptation in Rio de Janeiro state. In *Strategies and Tools for a Sustainable Rural Rio de Janeiro 2019* (pp. 345-359). Springer, Cham.

²² Kelman I. Linking disaster risk reduction, climate change, and the sustainable development goals. *Disaster Prevention and Management: An International Journal*. 2017 Jun 5.

Reduction (ISDR). The DRRR approach allows policymakers to have a systemic understanding and view of the various aspects of sustainable development that could be affected by energy disruptions in times of pandemics and other disasters.²³ DRRR frameworks provide coordinated platforms to pursue and implement related international obligations on all aspects of the SDGs. Through information sharing and cooperation between the different stakeholders and institutions responsible for the various SDGs, a country can formulate and implement a multiscale, holistic, and integrated response plan that anticipates, prevents, and responds to threats to energy security.²⁴

The COVID-19 pandemic has accentuated the importance and roles of DRRR frameworks in addressing threats to the SDGs, in focus is SDG 7 relating to energy access.²⁵ Without holistic responses, the pandemic could undo progress made in reducing energy poverty in many parts of the world, especially the Global South with several of the world's energy poorest live. For example, rural communities in the Global South could opt for cheaper inefficient forms of energy such as charcoal that are detrimental to the environment. These reversals will not only escalate the climate change challenges but will also make it hard to achieve SDG 7. For instance, in the Southern African Development Community (SADC) region, it has been reported that more than 153,000 people die each year from household pollution resulting from indoor burning of solid fuels such as traditional biomass for cooking and heating.²⁶

However, despite the rapid ascendancy and potential of the DRRR approach as a framework for promoting integration and coherence in the management of disasters, its application for managing pandemic related energy disruptions has not been extensively considered in the literature. Aside from the fact that the pandemic hardly fits

²³ Olawuyi DS. From technology transfer to technology absorption: addressing climate technology gaps in Africa. *Journal of Energy & Natural Resources Law*. 2018 Jan 2;36(1):61-84.

²⁴ *Supra* Note 22.

²⁵ *ibid*

²⁶ Nalule VR, *Energy poverty and access challenges in sub-Saharan Africa: The role of regionalism*. (Springer; 2018)

into any of the recognized categorizations of disasters, which has made it difficult to apply legal and institutional frameworks on DRRR, COVID-19 has also had sudden global impacts and effects on global energy pricing, demand, availability and supply, more so than to any defined form of natural disaster. With such widespread impact, the abilities of national authorities, institutions and entities to process and exchange large volumes of information on impact and response measures in a timely manner have come under intense scrutiny.²⁷

COVID-19 therefore raises the need to update extant legal and institutional frameworks in order to address gaps that hinder effective responses to pandemic-related disasters. Law and governance frameworks on DRRR, as well as national, regional and international energy policies, will have to be re-defined and reimagined in order to address the sudden, global, indeterminate and widespread nature of pandemic related impacts on energy supply. Some of the key legal and institutional challenges that will have to be addressed are discussed in the next section.

3. LEGAL AND INSTITUTIONAL LIMITATIONS TO IMPLEMENTING A DRRR FRAMEWORK ON PANDEMIC- RELATED DISRUPTIONS

The methodology approach adopted in this study is based on a comparative review and survey of the scope of existing laws, policies and programs on DRRR in global energy markets, especially energy poor countries in the MEA region that have been significantly impacted by the COVID-19 pandemic. This survey relies primarily on published legislation and energy policies in MEA countries with publicly available data and information on DRRR in the energy sector. This has allowed conclusions to be drawn on the key limitations in extant laws and institutions that have

²⁷ Energy Community, 'COVID-19: Security of energy supply monitoring' En- (Energy Community 2020)

hindered effective and holistic response to the impacts of COVID-19 pandemic on energy systems.

3.1 Absence of comprehensive legal frameworks on pandemic-related disruptions

The conceptualization of the nature, scope, and dimensions of energy disruptions unique to a pandemic is an emerging development in global energy markets. Even though several studies had predicted pandemics as unique threats that require innovative legal response measures,²⁸ pandemics are rarely mentioned in existing laws and regulations in energy markets across the world. For much of the last two decades, very few studies and institutions have measured, monitored, and reported on patterns of pandemic related disruptions to energy services. For example, unlike with well recognized forms of disasters, the question whether COVID-19 constitutes an event of *force majeure* with respect to enforcing energy related contracts and mitigating disruptions to energy supply chains remains unclear across all global energy markets.

The result is that responses to the COVID-19 disruptions have been on short term and on a case-by-case basis. Not only has this resulted in significant disputes and litigation, such emergency and reactive measures have not been adequate to provide a basis for developing adequate bounce back measures that would accelerate the recovery of energy markets from disruptions triggered by the pandemic, as well preventing impacts of future pandemics. For example, in Nigeria, the National Emergency Management Agency Act is the overriding legislation that establishes a DRRR framework in Nigeria. However, not only is the legislation silent on the definition of disasters, it focuses mainly on emergency disaster response and less on post-disaster reconstruction, or minimising long term impacts and recurrence.²⁹ In a bid to minimize disruptions to energy

²⁸ OECD, 'Future global shocks: Pandemics. Multi-Disciplinary Issues: International Future Program' (OECD. 2011)

²⁹ Mashi SA, Oghenejabor OD, and Inkani AI, 'Disaster risks and management policies and practices in Nigeria: A critical appraisal of the National Emergency Management Agency Act' (2019)³³ International journal of disaster risk reduction 253-65.

supply during the pandemic, the Nigerian Department of Petroleum Resources (DPR) released a directive that would allow oil and gas workers to work in offshore and remote locations in order to guarantee petroleum distribution and power generation activities. While these measures provide emergency response that minimize energy supply interruptions from the pandemic, they are not comprehensive enough to address long term reconstruction and recovery of the energy sector from the pandemic. Similarly, Poland adopted the *Anti-Crisis Shield Act of 2020*, which empowers the President of the Energy Regulatory Authority to extend deadlines for renewable energy producers, as well as to provide financial incentives to employees in the energy sector during the COVID-19 crisis. However, this emergency law does not provide proactive measures that can minimize impacts of future pandemic related disruptions in a sustainable manner.

Clear and comprehensive legal frameworks could provide a basis for codifying more proactive, rather than reactive, measures for anticipating, mitigating, and responding to the impacts of pandemic-related disruptions on energy supply contracts and services. Not only will such a law clarify whether pandemic related disruptions can be categorized as force majeure events, comprehensive legislation is essential to guide a holistic and integrated domestic-level response to pandemic disruptions in the energy sector. For example, it could define the minimum level of disruptions that could trigger waivers, incentives and alternative supply arrangements for energy related services in an affordable manner, while also triggering the release of disaster response and management funds that could accelerate recovery and reconstruction processes. In the context of pandemic disruptions, reconstruction could include three key phases. First is energy restoration, which entails restoring energy services to where they were prior to a pandemic, with respect to energy affordability, accessibility and availability. In communities where due to supply shortages or hike in energy prices, there have been a shift to biomass and less cleaner energy sources, the energy

restoration phase is important to return such communities back to modern energy access at affordable rates. How quickly energy restoration will occur depends on the length of the pandemic, as well as the depth of the disruption, so energy restoration efforts have to be continuous and long term.

As soon as immediate threats to energy access, affordability and accessibility has been addressed, the energy stabilisation phase is important to monitor, measure and prevent relapse of inadequate access. For example, some emergency measures that have been adopted to guarantee energy access on a short-term basis will need to be replaced with more long term and permanent measures to guarantee energy access. The third phase is the energy consolidation phase, which entails returning to energy programs and policies that were planned before the pandemic. For example, during the COVID-19 pandemic, wider energy justice aspects of energy distribution, especially policies relating to local content, consumer protection, public participation in energy policies, access to remedies and low carbon transition have not the focus of emergency response measures. Without an energy consolidation phase, pandemic related disruptions can undo progress made with respect to energy transition, distributive justice, procedural or participation justice, social justice and reparation justice in the energy sector.³⁰

To effectively ensure reconstruction and recovery of energy markets to the impacts of COVID-19 disruptions, it is important to evolve coherent and transparent national legal frameworks and action plans on pandemic-related disruptions. Contextualizing the unique threats of pandemic related disruptions to energy systems at the domestic level, within a broader energy expansion strategy, will not only help to forestall loss of progress made with respect to energy transition, but could also yield additional benefits that can promote the full realization of extant national visions on energy diversification, energy efficiency, and climate resilience.

³⁰ Guayo D, Lee Godden L, Zillman D, Montoya M, and Gonzalez J (eds.). *Energy Law and Energy Justice*. (Oxford University Press 2020)1-10

3.2 Existing gaps in knowledge with respect to risk anticipation and mitigation

For several of the natural, man-made and hybrid disasters, the triggers and impacts have been well studied and documented. Such increased knowledge on disasters have helped policy makers to develop informed pre-disaster measures that anticipate, prevent and reduce the occurrence, impacts, or frequency of disasters especially their impacts on energy infrastructure. However, with respect to pandemic-related disruptions, a clear and consistent coagulation of knowledge and best practices on their triggers, drivers, and whole range of their consequences may be some time away. As the OECD identified, there is an absence of ‘sufficient interoperable, globally shared information available in real-time about pandemic risk inventories, hazards or threat’ (OECD, 2011). For example, with respect to COVID-19, transparency concerns with respects to the sharing of vital information relating to the origin, number of recorded cases, overall impacts, and scope of spread of the pandemic have made it difficult to develop coherent response measures and frameworks in advance of the next pandemic. Furthermore, the different levels of technical capacity and knowledge, as well as availability of testing, measurement and information monitoring infrastructure in urban and rural areas have made response planning difficult and largely incoherent at national, regional and international levels.

There is a need to map and distil best available information and knowledge on the triggers of pandemics. Such information should be transparently and proactively gathered at various levels and with the wide participation of public stakeholders in order to increase reliability. For example, it will be important to establish fact finding and information verification teams at local, national, regional and international levels in order to secure reliable and best available information and knowledge on the sectoral and overall impacts of COVID-19 at various levels, as well as required interventions to restore energy systems back to pre-pandemic levels. Establishing such independent fact-finding teams could provide opportunities to gather factual, unbiased and multiple accounts of the direct and indirect impacts of the pandemic on energy systems as well as important

measures that could address current and future adverse impacts.

It will be difficult to design effective and responsive plans for future pandemics without such clear and reliable information and data. For example, lessons from the COVID-19 pandemic could enable countries to actively gather more information and knowledge on the impacts of pandemics for rural electricity consumers as well as positive measures to anticipate, prevent and mitigate such threats. Such information can be helpful for future policy analysis and planning. Furthermore, careful analysis and assessment of information gathered, as well as the potential benefits and threats raised by available courses of action and inaction could provide a basis for formulating response measures that address the energy needs of all segments of the society in times of pandemics.

3.3 Preexisting patterns of uneven energy access

Although the impacts of COVID-19 have been global and widespread, its adverse impacts in terms of energy access has been hardest on already vulnerable and energy poor communities, especially in the MEA region where some of the world's poorest people live.³¹ As hospitals and health care institutions across the world depend on affordable electricity to run essential healthcare equipment and facilities, countries and local communities with unreliable electricity supply have been hard hit by increased fatalities. For example, more than 600 million people in Africa (about 50 percent of the entire population) live without electricity. Furthermore, estimates indicate that only 28 per cent of health facilities in Sub-Saharan Africa have access to reliable electricity. With energy disruptions relating to COVID-19, supply interruptions and unreliability of energy access systems have become even more severe across the region.

Even at domestic levels, patterns of inequitable distribution of the benefits and burdens of sustainable energy

³¹ Olawuyi D. 'Energy Poverty in the Middle East and North African (MENA) Region: Divergent Tales and Future Prospects (2020) Energy Law and Energy Justice 254-72

access, especially to minority and marginalized groups have been documented in several studies.³² The pandemic has further highlighted existing energy justice gaps in legal frameworks on energy access. For example, lack of reliable electricity has affected the abilities of first responders, hospitals, and healthcare workers in energy poor communities to effectively handle the volume of cases leading to an explosion of fatalities and disproportionately slower recovery.³³ Due to inequitable access to energy in poor and marginalized communities, global efforts to slow down the COVID-19 pandemic have been complex and challenging.

As can be learned from the COVID-19 pandemic, without an energy justice approach to energy regulation and governance, global efforts to achieve the SDGs, as well as DRRR, will be significantly slowed. An energy justice approach 'aims to build an efficient, inclusive, transparent, and sustainable energy system that balances the needs of all segments of the society, especially vulnerable groups'.³⁴ Effectively responding to pandemic related disruptions will require the expansion of complementary structural and non-structural measures aimed at ensuring energy security and access to all communities and persons irrespective of their status, race, gender and other considerations.

3.4 Institutional limitations

As can be learned from the COVID-19, unlike other forms of disasters that involve comparably limited and defined actors, addressing the impacts of pandemic related disruptions to energy services will require a wide range of actors and institutions across and beyond the energy value chain. For example, health institutions will be required to curb and limit the emergency so essential energy workers can remain active, while infrastructure ministries will be needed to maintain existing energy infrastructure or build new ones.

³² Supra note, 30.

³³ Supra note, 31.

³⁴ Ibid.

Yet, in many countries, especially in the MEA region, problems of inadequate coordination and interoperability amongst various actors remain complex barriers that need to be addressed in order to develop and implement integrated solutions across the various sectors that are affected by pandemic related disruptions.³⁵ COVID-19 raises the need for a comprehensive assessment of the formal mandates and roles of existing institutions to dismantle artificial bifurcations that hinder multi-stakeholder partnership, cooperation and information sharing. To foster institutional cooperation that is required to effectively address pandemics, there is a need to integrate information sharing and interoperability standards and systems across all key sectors. National authorities will need to increasingly adopt a one-institution and open information exchange architecture that interlinks data and information flow that is required by multiple agencies and departments to develop holistic responses.

Lessons learned from COVID-19 can help countries to elaborate and develop cross sector analysis of the key institutions at the municipal, local, and national levels that are involved in responding to pandemic disruptions. Such analysis will examine overlaps, duplications and conflicting mandates that may hinder effective decision making and partnerships amongst relevant institutions, as well as opportunities for streamlining and integrating information collection and sharing amongst the various sectors.

3.5 Resource constraints

Restoring, stabilising and consolidating efforts to achieve universal energy access that have been affected by the COVID-19 pandemic, will require significant financial resources. As the World Bank projects, addressing the economic and social consequences of the pandemic 'will be

³⁵ OECD, 'Future global shocks: Pandemics. Multi-Disciplinary Issues: International Future Program' (*OECD* 2011)

made more difficult by empty government coffers'.³⁶ In the MEA region for example, prior to the pandemic, studies already revealed that an annual electricity investment of about three percent of the region's projected gross domestic product (GDP) will be required over the next thirty years to keep up with growing energy demand (this is three times higher than the world's average energy infrastructure requirement).³⁷ Similarly, studies show that about US\$90 trillion in infrastructure investment is needed globally by 2030 to achieve climate-smart infrastructure.³⁸

However, due to fiscal deficits and economic constraints, especially the economic downturn triggered by the sharp fall in oil prices in 2014, only few MEA countries have been able to meet and sustain the required threshold of energy and climate smart infrastructure investments.³⁹ The slow pace of investment in energy infrastructure expansion projects raises significant long-term concerns of energy poverty in the MEA region. COVID-19 pandemic has exacerbated the preexisting balance of payments deficits and fiscal crisis across the MEA region and could impact energy access response, recovery and reconstruction efforts. For example, the International Monetary Fund has revealed that Nigeria currently has a low fiscal revenue base, which has led to low debt-servicing capacity and limited funding for critical energy infrastructure such as electricity generation and transmission; oil and gas production and pipeline systems; liquefied natural gas facilities; management technology such as advanced electricity metering and distribution systems; and modern

³⁶ World Bank, 'Coping with a Dual Shock: COVID-19 and Oil Prices.' (*WorldBank*.2020)<<https://www.worldbank.org/en/region/mena/brief/coping-with-a-dual-shock-coronavirus-covid-19-and-oil-prices>>

³⁷ Camos D, Bacon R, Estache A, Mahgoub and Hamid M, 'Shedding light on electricity utilities in the Middle East and North Africa: Insights from a performance diagnostic. The World Bank; 2017 Dec 4.

³⁸ Rydge J, Jacobs M, and Granoff I, 'Ensuring new infrastructure is climate-smart. Contributing paper for Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate' (2015) New Climate Economy

³⁹ Olawuyi D, 'Energy Poverty in the Middle East and North African (MENA) Region: Divergent Tales and Future Prospects.' (2020) Energy Law and Energy Justice

power plant control systems and smart building technologies.⁴⁰

To address the resource constraints to energy recovery, stabilization, and consolidation, energy poor countries, especially those in the MEA region will require significant international support (World Bank, 2020). Furthermore, given the importance of SDG 7 to the attainment of several of the other SDGs, countries will need to clearly prioritise energy access projects as essential services that are absolutely required even during a pandemic. Additionally, strong political will and commitment is required to ensure that funds allocated for energy transition technologies and projects are not diverted to other sectors, or corruptly mismanaged.

Another key step will be for countries to address gaps that hinder private sector participation and investment in energy infrastructure projects. Given the paucity of resources available for responding to and preparing for recurring pandemics, countries will need to address legal barriers to public–private partnerships (PPP) in the development of resilient energy projects.

4. EMERGING SOLUTIONS AND WAYS FORWARD IN IMPROVING INTEGRATIVE RESPONSE TO PANDEMIC RELATED DISRUPTIONS IN THE ENERGY SECTOR

The interconnections between SDG 7 and the other SDGs, as well as the crosscutting impacts of pandemic disruptions across multiple sectors, underscore the need for an integrated and coherent response to pandemic risks. Promoting coherence and coordination in the development and implementation of effective DRRR response to pandemic

⁴⁰ Nalule V, 'Transitioning to A Low Carbon Economy: Is Africa Ready To Bid Farewell To Fossil Fuels?', *The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions* (Palgrave Macmillan International 2020)

related disruptions, requires a clear, comprehensive and integrative governance framework that recognizes and contextualizes multi-sectoral and multi-scalar interdependencies. An integrative governance framework will provide appropriate incentives such as linked and coordinated regulation, structural integration of expertise, knowledge and information, as well as holistic programming by actors in sectors and domains that can help move towards successful DRRR implementation.

To effectively develop and integrate DRRR planning into energy policy and planning, five key steps are important for energy policy makers. First, is the need for planners to establish comprehensive laws and regulations on DRRR. To achieve energy security for all, DRRR planning must be a crucial component of energy infrastructure development. As countries relax COVID-19 lockdown and emergency measures, comprehensive DRRR laws and policies are required to anticipate and prevent future energy shocks and disruptions, while also accelerating energy restoration and access in affected communities. Clear and comprehensive legal framework on DRRR are required to establish pre-disaster measures and resilient infrastructure to anticipate, prevent, and minimise the disruptions to energy systems and infrastructure by natural, human-made, and hybrid disasters, with clear recognition and focus on novel pandemic related disruptions. Also, DRRR legislation should clearly include post-disaster response measures and plans that accelerate energy restoration, stabilisation and consolidation across the entire value chain, especially in poor and vulnerable communities. Domestic energy legislation can provide mandatory legal basis and obligation for project planners and stakeholders to specifically integrate pandemic risk mitigation measures into the design, operation, and maintenance of energy infrastructure projects.

Second is the need to adopt national policies and strategies on energy justice. Without an energy justice approach to energy governance, it will be difficult for countries to effectively anticipate, detect, measure, and respond to the impacts of pandemics in energy poorest communities. Many countries already have laws that outlaw discrimination and social exclusions on grounds of race, gender, status, and other factors. However, realizing these rights, as well as ensuring energy access for all, will require

clear and intentional planning approaches. To achieve energy access for all, countries will need to put in place clear and comprehensive national strategies and policies to address all patterns of energy injustice and inequities, to achieve distributive, procedural (or participation), reparation (or restorative) and social justice.⁴¹ In addition to identifying patterns of inequitable energy access, a national strategy on energy justice will clearly identify targeted measures that can help reduce the burdens and costs of energy access in poor communities, while also improving the access of such communities to energy infrastructure, facilities, resources and jobs, especially during pandemics.

Third is the need to improve data collection and cross-sectoral knowledge sharing through investment in innovation. Pre-pandemic preparation and post-pandemic planning will require prompt and multi-sectoral dissemination of large volumes of information and data that can only be achieved through transparent data collection and dialogue. An integrative approach to data collection will aim to capture the impacts of pandemic related energy disruptions across all sectors and communities, rather than focusing on energy systems or urban communities alone. Furthermore, in order to ensure holistic planning and response, national authorities will need to invest effort in developing accessible one-stop information sharing platform that would streamline and simplify the sharing of vital information required for disaster preparedness, response, recovery and consolidation.⁴²

Fourth, energy policy makers will need to prioritise investment in energy technologies and projects aimed at achieving both SDG 7 and SDG 13. Mobilizing the required finance for energy and climate resilient infrastructure development projects will require significant innovation over the next decade. The abilities of countries to successfully leverage private sector investment in the energy sector will be a key determinant for success. There is already a realization of the need to attract private sector investment, especially in the MEA region. For example, during the COVID-19

⁴¹ *Supra*, note 30.

⁴² *Supra*, note 35.

pandemic, Qatar one of the highest natural gas exporters in the world, released its PPP law which aims to attract private sector investments in mega infrastructure development projects across all sectors in the country. These emerging reforms could open up private sector participation in energy infrastructure projects. By enacting these laws, Qatar has sent a positive signal to investors about its recognition, interest, and commitment to accelerating infrastructure development and growth through active sector participation. Other energy producing countries that seek to attract the finance and technology needed to develop and improve their adaptive capabilities to disaster risks will need to provide robust similar legislative foundation for the recognition, financing, and implementation of PPP projects.

Fifth, the COVID-19 pandemic has shown the importance of regional and international cooperation in addressing common threats to energy availability, supply, and pricing. Energy integration and cooperation between countries can provide a platform for jointly addressing current threats and risks. For example, interlinking cross-border electricity networks, as well as scaling up cooperative investments in natural gas supply networks, can help simplify cross-border energy trade, while also helping countries to supply the required energy resources needed to meet demand. A regional knowledge sharing platform could help capture the common challenges, opportunities, and best practices in the design and implementation of energy access projects at regional levels, especially during the pandemic. For example, the European Union Energy Poverty Observatory (EPOV) portal has helped to provide a comprehensive range of information, resources, and knowledge material on energy poverty issues in the EU (EPOV, 2019). Countries in the MEA region can benefit from establishing similar platforms to simplify the exchange of ideas and best practices on energy poverty in the region.

5. CONCLUSION AND POLICY IMPLICATIONS

The COVID-19 pandemic has tested the efficacy and relevance of extant DRRR legislation and strategies to effectively respond to sudden, widespread, global, and

indeterminate risks associated with pandemic related energy disruptions. While extant DRRR legal frameworks have provided emergency measures to stem the impacts of COVID-19 on energy systems, detailed and comprehensive legal responses will be required to provide pre-pandemic measures that anticipates, measures and responds to future pandemic disruptions, as well as post-pandemic measures that accelerates energy restoration, stabilization, and consolidation of progress made with respect to energy transition and energy justice.

Lessons learned from COVID-19 show the importance of an integrative and multicentric approach to designing and implementing holistic DRRR framework for pandemic related disruptions to energy access. However, to ensure that an integrative response framework for pandemic related disruptions moves from theory to successful practical integration and adoption, fragmented legal structures and sector-based programs that stifle the development and application of hybrid and linked rules, procedures and processes across the sectors will have to be comprehensively addressed.