

Energy-related COVID-19 Studies – A Bibliometric Analysis with Literature Review

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Abstract

COVID-19 pandemic was declared a global emergency as it changed people's lifestyle socially and economically. Thus COVID-19 does not only have health impact, but impact global economies, energy demand or energy poverty and carbon emissions, and many more. Energy demand and consumption are foremost among global challenges. Specifically, COVID-19 has changed the energy consumption pattern of most homes, organizations, industries, and nations as the energy sector provides fuel for most of the activities in every walk of life. This has brought everyone faced-to-face with the three-sided challenge: COVID-19 health issues, economic issues and climate change. It is projected that countries that were in full lockdown would have 25% decline in energy demand per week and an average of 18% reduction for countries in partial lockdown. It was also assessed that the impact of the 2008 financial crisis on global energy demand is seven times less when compared with the impact of 2020 COVID-19 on global energy demand. Another projection was that demands for oil, coal, gas, nuclear as sources of energy – will drop while that for renewables will increase. Precisely, oil, coal and CO₂ emission are expected to drop by 9%, 8% and 8% respectively. CO₂ emission will be six times larger compared to CO₂ reduction caused by global financial crises in 2009 and two times of all reductions since end of World War II. It is however feared that the rebound effect of emission might be higher than the fall if concerted effort is not made to promote clean and efficient energy technology.

In addition, the International Monetary Fund (IMF) estimated 6% reduction in global gross domestic product (GDP) as a result of COVID-19 in 2020 and a 7% rebound effect in 2021. It was projected that in 2025%, global GDP will drop by 9% due to COVID-19. Aviation, commuting and office-space are respectively projected to drop by 5%, 2% & 1% by 2025. The IMF further affirmed that global energy demand fell by 8% in 2020, and that it will fluctuate below pre-COVID-19 prediction by about (6-8)% till 2050. Also, assessed was that transport energy used will never again attain it 2019 figures; the consumption of steel and construction materials for office building will tremendously reduce.

In the face of this once-in-a-century crisis, there are many possible outcomes for energy use and emission as well as contributing factors. This intriguing interplay of estimates of certain indicators and determinants is very captivating and has sparked-off discussions and surveys at various levels and quarters like similar, previous crises. There is need for a systematic review, visualization, and mapping of existing literature on this subject. This study will review and

present energy-related COVID-19 publications, their findings with the view to answer the following questions: how has COVID-19 affected energy consumption?; what is the trend of energy-related COVID-19 studies?; and what are the gaps in the energy-related COVID-19 studies?. Also, the study will offer recommendations for decision-making. Amongst others, finding will serve as a guide to prospective researchers in this area of interest.

Keywords

Energy, COVID-19, Pandemic and Review.

Biographies

Jude James is a doctoral candidate at the Department of Industrial Engineering, Durban University of Technology, Durban, South Africa. He earned B. Eng in Electrical Electronic Engineering from University of Benin and Master of Science in Advance Control and Systems Engineering from the University of Manchester, UK. He is passionate about education, training and research, and desires to use these as tools to change lives and make the world a better place for all. As a young researcher, he leverages every opportunity available especially to doctoral students at Durban University and across the world to build his research methodology knowledge gap specifically in energy, science, technology, and innovation. Jude has lectured Project Management, Operation and Production Management, Quality Assurance, Operations Research, Entrepreneurship, Engineering Economy and Accounting, Research Methodology, etc. He has published journal and conference papers. He is a Project Management Professional (PMP) and a member of Project Management Institute, PMI, USA.

Victor Okongo Ebin is a management consultant with over a decade experience in strategy, business competitive analysis and operations management. He is also an accredited management trainer within the same areas of management consulting. His research interest in international economics, development economics as well as technology and innovation management. With a multidisciplinary background. His is focused on providing cutting edge analytical models that provide inclusive features to solving management problems. He received his Bachelor of Science degree in Economics from the University of Jos, and a Post Graduate Diploma in Technology Management from the National Centre for Technology Management, and a Master's degree in Technology Management from the Federal University of Technology, Minna in Nigeria

Abubakar Kazeem obtained his Master Degree in Mechanical Engineering, majoring in Production from University of Agriculture- Makurdi, Benue State, Nigeria in 2011 and PhD in Materials Engineering from the Universiti Tun Husain Onn Malaysia (UTHM), Malaysia. He is currently a Research Officer and Head, Science Policy and Innovation Studies Department at the National Centre for Technology Management (NACETEM), Abuja, Nigeria. His Research interest is in Technology Management of Recycled Beverage Cans (TMRBCs), Policy Analysis, and Green Innovations. He has published in leading journals, including Materials Letters.

Emeka Joseph obtained his Bachelor Degree in Geological Sciences from Nnamdi Azikiwe University Awka, Anambra State, Nigeria in 2008 and is doing a PGD program in Technology Management at the moment. He is currently working as a Research Officer with the National Centre for Technology Management, Federal Ministry of Science and Technology, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria. In his current role, he is the assistant Desk Officer on Masters in Technology Management, a Professional Program that NACETEM runs in collaboration with Federal University of Technology, Minna. His Research interest and passion is in Technology Management, entrepreneurship development, environmental management and policy analysis. He has a published work on Integrating Innovation for sustainable development in Africa and Developing a Smart City: essentials, execution and evaluation