

# Chapter 5

## Energy Market in the Post– COVID–19 World: Structural Analysis of Critical Factors for China

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### **ABSTRACT**

*The objective of this chapter was to structurally model the high priority factors in the face of the impact of severe acute respiratory syndrome COVID-19 on the energy market. The method was based on interpretive structural modeling, and the matrix of crossed impacts multiplication was applied to classification. A model of 12 factors structured hierarchically in six levels is proposed in which consumption preferences, regulatory and normative modifications, political restrictions, and planning strategies have the greatest influence on the energy market from the perspective of China. As a result of this, it is suggested to move towards greater participation of public and private actors in renewable energy vectors.*

### **INTRODUCTION**

Wuhan (China) was the epicenter of the virus identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the associated infectious disease 2019 (novel coronavirus, COVID-19). The first case was reported on 31 December 2019. On 11 March 2020, the rapid spread of the virus in 114 countries led the World Health Organization (WHO, 2020) to declare it a pandemic and the vulnerabilities of health systems and national economies. Given this, the energy market was no exception, and the persistence of universal non-pharmacological interventions (NPIs), such as voluntary home isolation of people, in addition to low economic activity, triggered a drop in demand. Energy mix, especially some of the most commercialized hydrocarbon-based products, and interruptions in the energy supply chain (International Finance Corporation, 2020). This led to an operational paralysis of different industrial

DOI: 10.4018/978-1-6684-3374-4.ch005

sectors (European Parliament, 2020), and the high dependence that society still has on this type of fuel to function was evidenced (BP, 2020).

Even when pre-COVID-19 oil and gas prices approached record lows due to the economic slowdown in China and record gas production in the United States (BP, 2020), slower growth in demand triggered by COVID-19 is likely to keep oil prices low, although volatility and financial stress in the market can be expected on the way to economic recovery, at least to pre-pandemic levels. However, this sector presents a different reality for each country, particular characteristics that nevertheless maintain inseparable links with changes that have occurred at the international level (Gillingham, Knittel, Li, Ovaere and Reguant, 2020); although it is not possible to know the temporality and all the effects produced by the pandemic in the energy sector.

To think that the impact of SARS-CoV-2 is temporary and that the world will continue inertially with its development is, to say the least, a simplistic view. Countries and their societies will be very different, and energy is one of the cornerstones that will determine the speed, depth, and scope of that transition. In some perspectives, it is argued that the COVID-19 pandemic has marked the end of the era of coal and fossil fuels, to give way to the formulation of public policies aimed at accelerating the process of decarbonization of the energy market and promoting the growth of green energy (Kuzemko et al., 2020). Still, the energy market's future is far from certain, and the impacts of this disruption will imply processes of deep reflection and debate regarding the decisions that must be considered globally as part of international commitments.

In the specialized literature, models for making decisions in situations of high complexity and uncertainty have been documented in various fields of knowledge, among which are those of structured analysis, namely, interpretive structural modeling (ISM) and the matrix of crossed impacts-multiplication applied to a classification (MICMAC) (Keenan and Popper, 2008; Popper, 2009; Popper and Teichler, 2011). Based on the preceding, the research question is: What are the high priority factors based on SARS-CoV-2 and their interrelation in the energy market's future? To respond to this, the objective of the research was to structurally model the priority factors for the future of the energy market. The document was structured in five parts. After the introduction, the theoretical framework on the ISM and MICMAC is included from the perspective of the energy market; the third section describes the research method; in the fourth, the ISM and the strategies that will be considered by the actors involved in the energy market are proposed; and, finally, the last section presents the conclusions.

## **BACKGROUND**

The global crisis linked to SARS-CoV-2 has strongly affected the global energy market and the sectors that, by their nature, are highly interconnected with it (European Parliament, 2020); however, this sector has constantly faced catastrophic uncertainties that are difficult to predict and control (Alizadeh, Lund, Beynaghi, Abolghasemi and Maknoon, 2016; Kruyt, van Vuuren, de Vries, and Groenenberg, 2009), linked to markets, technologies and societies, and they have caused major socio-technical changes or transitions (Filipović, Radovanović and Golušin, 2018; Radovanović, Filipović and Pavlović, 2017). Besides, due to the dependence on energy considered essential for the functioning of any economy, there is a continuous interest of developed and developing countries for an uninterrupted supply, which has transcended geopolitical considerations (Gasser, 2020). From the energy security point of view, various indices and methodologies have been proposed that measure the capacity to face sudden changes in the

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