

Meta-analyses of the recent energy strategic planning in the framework of sustainability assessment. A review.

M. Tsangas¹, A.A. Zorpas¹

¹Open University of Cyprus, Faculty of Pure and Applied Sciences, Laboratory of Chemical Engineering and Engineering Sustainability, Giannou Kranidioti 33, P.O. Box 12794, 2220, Latsia, Nicosia, Cyprus. Email:

antoniszorpas@yahoo.com; antonis.zorpas@ouc.ac.cy

Presenting author email: tsangasm@cytanet.com.cy

Abstract

Energy is a main element for nature as well as for the global development. It is fundamental for all modern sectors of the economy and supports all economic activities (Atems and Hotaling, 2018). Human operations require energy and it is vital this to be available at the place and on time. There is a variety of energy sources available on earth, either non-renewable such as the fossil fuel existing in gaseous, liquid and solid form and in the form of minerals with nuclear energy potential, or renewable such as wind, solar, hydroelectric, bioenergy, geothermal and energy from the sea (Viswanathan, 2016; Roy and Das, 2018). The main consumers of energy in today's economy is considered to be residential and commercial buildings, industry or more generally the production processes and transportations (Skipka and Theodore, 2014).

However, energy production and consumption is connected to several concerns. Energy resources, whether renewable or non-renewable while abundant, are limited anyway. Technological, environmental, economic or even political reasons do not allow universal access to them. Fossil fuel reserves are located in specific parts of the world with some, such as the Middle East, accumulating a large percentage and the possibilities and costs of generating power from them limit their availability (Seljom and Rosenberg, 2011). Moreover, climate change which is one of the main contemporary global issues is due to the increase of greenhouse gas emissions mainly because of use of energy (Randolph and Masters, 2018; Li, 2018). Nevertheless, it is crucial to achieve a goal of maximum global warming 2° C (O and Kim, 2019). Furthermore, renewable energy sources still have high costs and depend on weather conditions, while the relevant technologies are not sufficiently developed (Roy and Das, 2018). Moreover, due to the global requirement for sustainability, the use of energy shall be sustainable and several relevant targets, have already been set. So, energy strategic planning is important. The planning of the discovery and disposal of energy sources and the manner and time of its conversion into a form of energy that can be used is essential for every organization and society or state.

The United Nations (UN), have adopted Sustainable Development Goals (SDGs), including specific goals for climate action (United Nations, 2021a; b). SDG number 7 aims to ensure access to affordable, reliable, sustainable, and modern energy for all and SDG number 13 requires renewable energy to be further developed. In this framework UN member states including the United States, the European Union and China as well as the other smaller states are called to adopt relevant energy planning strategies and policies, having did it already in many cases. However, there is a question. When the planning is sustainable and how this can be evaluated?

This work presents a systematic review and meta-analyses of the scientific literature that deals with energy strategic planning and the evaluation of its sustainability. Following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021) guidelines, investigates and reports the status of the relevant research of the last years. Initially, the respective works have been recently published, are searched and detected in the Scopus database. In order the search to be complete and effective, key search terms for the scope of the work are rationally chosen and used. An inclusion and exclusion strategy is selected and implemented, guiding to an extended list of papers to be analysed. Afterwards, a classification of them, in terms of spatial and time criteria, is applied. Moreover, the evaluation methods and criteria included in the papers under review are listed and correlated to the objectives of the research as well as to the area and time. Finally, the main results of the literature under review are presented and discussed.

Above analyses results to a number of conclusions. The gap of the research regarding energy strategic planning sustainability assessment under the circumstances is methodically recorded. The used evaluation methods and criteria are analysed and evaluated as a base for further work. In addition, the potential for novel relevant research is detected and suggestions are formed.

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