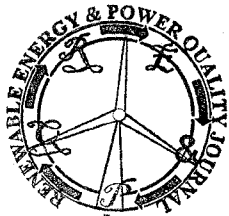


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Global Prospective Electricity Systems Generation to the year 2025

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Abstract. This article presents a prospective study on the power systems and its primary energy sources in the world until 2025. The implementation of strategic planning was made by tools such as SWOT and SPACE matrices. The methods used in the prospective study were MACTOR and SMIC, which allowed prospective analysis of systems of electricity generation by 2025. For the development of the study was required to consult relevant information from the last 30 years in the energy aspect of the different regions of the world, as well as research on technological development in electricity generation. This article can be a valuable tool in the planning of energy resources as it addresses the experiences of other countries.

Key words

Prospective, DOFA, PEEA, energy resources, electrical systems generation, MACTOR and SMIC.

1. Introduction

Currently, the dependence of the society for conventional energy resources in order to produce electricity is a major concern. In this context situations such as the oil crisis of the 70's, the recent increase in oil prices in the early twenty-first century, the growing concern about environmental degradation, in addition to the constant changes in prices of energy mix global states a need for checking what countries are doing to deal with adverse situations in the supply of energy.

The global economic crisis in the last quarter of 2008 has caused great changes in international markets particularly in the financial markets. The rapid economic growth in several countries stopped what has caused financial problems in the implementation of development policies. The effect of this global crisis has been reflected in a reduction for electric demand, which provoked adverse economic consequences to the world.

Therefore, planning in order to achieve certain objectives is so complex, since there are many possible events, including pandemics, terrorist attacks or technological advances which can have a major influence on the outcome of the planning. Then, it is necessary to evaluate the factors that may affect the sustained and adequate evolution of power systems. This situation highlights the importance of using modern techniques for strategic planning and foresight that allow identifying trends and driver of change in power systems.

First section shows a comprehensive review of the current state of power systems in different regions and countries according to their economic and political importance. The second section presents the developed methodology for the implementation of strategic planning and prospective analysis. In third section, the implementation of the proposed methodology is showed. Finally, it is proposed some elements for discussion about the possible development of power systems.

2. Current status of power systems in the world

The development of electricity production in the world since 1980 until 2006 is presented in Fig. 1. It shows that the increase in electricity demand has been remarkable over the last 30 years, where the economic growth in many countries have contributed to this increase in energy consumption, specially electricity.

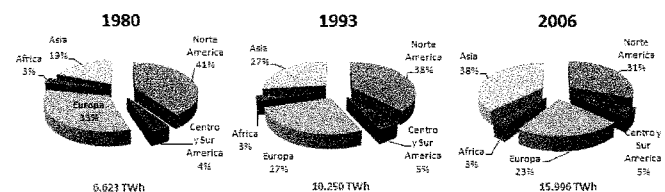


Fig. 1. Development of global electricity production from 1980 until 2006. Source: EIA [1].

A. Power generation in Asia

Asia is the most extensive and populated continent of the world with approximately 45 million km², that represents 8.65% of the total of the terrestrial surface, and, 4 thousand million habitants that cover 60 % of the human population roughly. Asia has the largest reserves of minerals in the world, and it concentrates the greatest worldwide economic growth. Globally, on this continent is made the highest investment in science, technology and education, which is reflected in a steady growth in different economic sectors.

Cooperation between government and industry, as well as the growing technological development placed several Asian countries among the most successful in the global economy. Figure 2 shows the evolution of electricity consumption from 1980 until 2006. China is the country with the highest demand for electricity, among other reasons because it has the highest population density in the world. Since 1980 economic growth is notable mainly due to the reform of economic policies adopted by China in 1979 which allowed the opening of international markets. Electricity consumption in 1980