

Objectives

The energy sector is in turmoil with multiple possible scenarios, with huge economic, social, political, environmental, and technological implications. The big question is, what could be the potential role of biofuels for transport in this emerging and mixed energy scenario, and more specifically in Brazil? In the very short term, this uncertainty will translate in greater increase of oil and gas and renewables (RE) in general, as there are few realistic alternatives. But in the longer term, it must be non-fossil fuels. The emerging global consensus is that the future **MUST** be renewables. The question is, how long will take this transition phase?

The Russian war on Ukraine represents a major energy and geopolitical shift, although such impacts will be unequal around the world. For example, and as stated in chapter 1, in Europe given its high dependency on Russian fossil fuels there is a political scramble to reduce such dependency as a matter of urgency, which could be translated in an urgent search for energy alternatives, especially RE. Other countries are also increasing RE but as a response to high oil prices e.g., India which is increasing gasoline-ethanol blend to reduce costly oil imports. Thus, there will be a variety of technological, economic, and energy alternatives and policy decisions, depending on the country.

During the oil crisis of the 1970s, Brazil showed a great vision by setting up a national ethanol fuel program, a unique project at national level, that served as a school and was envy of many countries.

This initiative put Brazil in a unique historical footage e.g., a considerable know-how on alternative fuel for transport, as well technological, agricultural, economic, environmental, and social benefits. Thus, the key question we need to ask is what could be the new role of biofuels in the emerging energy paradigm in the country? What

lessons can be applied from its unique historical experience? What lessons are there for other countries?

The book examines such questions in detail and tries to provide answers as accurate as possible within this highly uncertain future scenario. Science and technology are advancing so quickly, that options that seem unfeasible today could become a reality tomorrow. And even technologies seem feasible today, could easily be obsolete tomorrow.

The main challenge for Brazil is political rather than technological, social, or economic, since the country has the scientific and technological know-how, natural and human resources, and research capability to deal successfully with various energy future scenarios. But there are clearly some important scientific and technological gaps, and the need to rethink present economic biofuels-related models that will require political actions. When this is the case, the corresponding recommendations are made.

This book will try to answer some of these questions particularly with a wide readership in mind. To inform the international community about the historical development of biofuels in the country, the new emerging reality, and perspectives and potential impacts of new biofuels scenarios.