

06

ENERGY

The Challenge of Demand

FUNDACIÓN DE LA INNOVACIÓN **BANKINTER**





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The Accenture Foundation collaborates with the **Bankinter** Foundation of Innovation to bring out the report of the Future Trends Forum (FTF) and to help advertise the work of a leader in independent opinion on prospective and innovation. In this sense, the consulting firm endows the FTF with the whole of its intellectual capital and its expertise at making enterprises and institutions to become high-performance organizations.

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Executive Summary



The Energy Problem

Throughout human history, people have always sought new resources to make their lives healthier, simpler, and more enjoyable. In this quest, the discovery of new energy sources has played an important role in the development of society. Each society constructs its own energy system: this will depend to some extent on the particular features of the natural environment and the technology of the age. Today's energy model is built almost entirely on fossil fuels. Given the finite reserves of these energy sources and the repercussions of their use on the environment, this dependency is in danger of impairing the very development of society.

Energy demand could double or triple as the global population increases and the economies of developing countries expand, with new regions moving towards greater economic development and consumption of modern energy sources.

Assuring energy supply and respecting the environment are **challenges** currently being faced by business and governments-and by the general public. Some of the ways that a balance can be struck between supply and demand include intensifying international trade in energy, diversifying sources of supply and encouraging society to be more energy-efficient.

These two energy challenges need to be tackled simultaneously from several different angles: economic, political, social, environmental and technological.

Energy is closely bound up with *economic issues*. The possible exhaustion of fossil fuels could cause increased volatility in energy prices, with a consequent slowdown in global economic growth and a rise in inflation. The cost and availability of energy, therefore, will influence economic development and bring an influx of new investment to facilitate the transition towards energy sustainability.

My Notes

Another aspect that will have a major impact on energy will be *political*. At a domestic level, there is a range of legal instruments governments can use: taxation, incentives, penalisation of detrimental practices, etc. At the same time, stable geo-political relations will also be very important, minimising the risk of energy dependency by maintaining a secure supply.

The *social implication* of the energy problem is of key importance in achieving clean and efficient energy. The first step towards a sustainable energy system is to enhance awareness among society at large.

Finally, given the negative impact of energy consumption and the importance of technological aspects (which hold the key to finally overcoming the challenges), the environmental area needs to be examined very closely if we are to resolve the energy problem before the worst consequences of the current model began to impact society.

Conclusions of the Future Trends Forum on the impact of the energy

Given the magnitude of the problem we now face, we can expect that in coming years, ways will be found of assuring energy supply for developed and developing countries, with greater use of renewable energy, protection of the environment using cleaner energy sources, etc. However, trends indicate that the current situation will continue for some time.

Fossil fuels will keep on dominating the energy scenario, driven by massive consumption levels in developing countries and the present energy dependency of developed countries. Renewable energy sources, according to all forecasts, will continue to account for only a very small share of the energy mix. Indeed, it is the opinion of the FTF experts that this situation will continue until a rise in the price of oil and natural gas forces a move towards more efficient energy use amongst society and an increased participation of renewable energy sources.

This change will be joined to growing environmental concern, new investments in clean and efficient technologies and greater regulation of the public sector. Indeed, national, supranational and international governments and institutions will play the predominant role in the general social move towards more efficient energy consumption; they will initiate the drive for change, seeking to guard against a more critical energy situation.

The experts forecast that energy sustainability will eventually be achieved through new technological advances, though there is a significant divergence of opinion as to when technologies will be developed that are capable of resolving the energy problem. In short, there will be several overlapping scenarios on the road to change, although-as the publication explains in greater detail-precise periods are difficult to calculate.

However, there is also a more positive aspect to this situation: new business opportunities are arising out of the search for energy efficiency in all sectors. Transport and construction (residential and commercial) are two of the areas where the FTF experts predict the greatest business opportunities for investors, but they will not be the only ones; all sectors have energy needs.

At the same time, history teaches us that the greatest strides in innovation tend to come at times of crisis or particular necessity. The FTF experts suggest that the leading reaction to a disproportionate increase in the price of fossil fuels will be innovation.

To conclude, the energy challenges we currently face can only be overcome by involving and addressing the different aspects that influence energy, and their impact on society will depend on business investment, government regulation and environmental management.

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CHAPTER 1

Introduction

1

Introduction



Modern society is immersed in a changing world in which our capacity to adapt to change is fundamentally important. By analysing the impact of new trends, we can gain a better understanding of such change, helping us to adapt better, minimise any negative repercussions and capitalise on any business opportunities it offers.

Bankinter created **Fundación de la Innovación Bankinter** to foment a more innovative attitude in the business sector and to enable actions to be taken in the present that will enable us to take full advantage of the future. It is an ambitious and innovative project, through which Bankinter hopes to stimulate the creation of business opportunities from changes in social surroundings. The project, which boasts some highly prestigious members, is also intended to reinforce Bankinter's commitment to society.

The flagship project of the **Fundación de la Innovación Bankinter** is its "Future Trends Forum" (FTF), a showcase for Bankinter's culture of innovation and commitment to new developments. The forum comprises acclaimed experts from different fields of learning, eminent international scientists and intellectuals. Its distinguished members try to look forward into the immediate future, detecting economic, political, social and technological trends that will impact different sectors and decide what conclusions they should make know to society at large.

The FTF's methodology is based on three essential pillars: a multi-disciplinary approach, neutrality and globality. It seeks to convey all the objectivity of a forum enriched by a range of viewpoints, which remains unbiased and unswayed by interests of any kind.

Notes

The FTF members freely propose, vote and finally decide on a subject, which they then go on to debate in greater depth. The final result of each of these processes is to disseminate the conclusions of this research work among business-people, professionals, senior management and companies and institutions. This takes the form of a series of lectures, touring leading Spanish cities, and this publication.

This book sets out the analyses made by the FTF and its main collaborator, Accenture, on the outlook for energy in the short term. Sections include "Context and current situation"-which takes a detailed look at the current state of different energy sources; "Energy-related challenges and aspects"-which analyses the roots of the energy problem grounded in the situation examined in the previous chapter and its implications on different energy-related aspects;

and, finally, "The FTF view of energy challenges", in which the experts set out their conclusions on the future scenario of energy and the most probable repercussions that meeting these challenges will have in the economic, political and environmental arena.

Once again the **Fundación de la Innovación Bankinter** hopes that this publication will be not only a source of information, but especially a stimulus and a guide for professionals and business people working in different industries who will to some extent be influenced by the problem of energy on all the world's markets.

2

CHAPTER 2

Context and current situation

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Context and current situation



The current situation of energy is one of ever-increasing demand and an energy supply which is still capable of meeting requirements, though it seems to be having difficulty in keeping up with this growing pace. The outlook is not an encouraging one, with the prospect of consumption levels which cannot be met at present energy output.

Energy consumption continues to rise at unsustainable rates as a result of the continuous growth of the global economy and population. The availability of cheap and plentiful primary energy from fossil fuels has helped foster this growth, but the present scarcity of profitable energy supplies has led to a new situation which may put a brake on this growth.

This chapter describes the current energy situation, which is largely based on fossil fuels-although other alternative energy sources now being promoted should not be ignored.

2.1. Overview of the current situation

Definition and Background

Energy is defined as the capacity to perform work. From an economic point of view, the term also refers to energy as a natural resource and the associated technology used to harness it and utilise it for industrial and economic purposes.

Little over a century ago, the main sources of energy were the animal power and man power, together with the heat obtained from burning wood. Human ingenuity had also developed a number of machines which used water power to mill cereals or make iron in forges, and the force of the wind to drive ships and windmills. However, the great revolution came with the steam engine; since then, the large scale development of industry and technology has drastically changed the energy sources that drive modern society.

Table 1 shows the leading technological innovations related to energy development and their impact on energy sources throughout human history.

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