ENERGY MARKETS AND PRICING POLICIES

B. S. Fisher and M. D. Hinchy
Australian Bureau of Agricultural and Resource Economics, Canberra, Australia

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Contents

Summary

In this article, the pricing of three energy commodities (oil, coal, and electricity) is considered. The criteria used to select these commodities were their relative importance in terms of final energy consumption and whether common issues relevant to a number of countries were involved in pricing.

Oil is the dominant energy source in the world and the most heavily internationally traded energy commodity. There has been long standing controversy about the international pricing of oil since OPEC was formed and various models have been proposed. No single model need be valid for all periods of time. It is argued that there is evidence of increasing coordination among OPEC members since 1996. Such coordination became most apparent during 2000 when oil prices rose sharply and OPEC announced it intended to maintain price within a given band. It is suggested that the possible reduction in growth of demand for oil resulting from OECD action to curb climate change may have acted as a unifying force on OPEC members. If this is correct then it follows that any weakening in the resolve of OECD members to undertake such action may have the reverse effect. The result would be lower oil prices and higher carbon dioxide emissions in the absence of any new OECD policy measures.

In the case of coal there is also dispute about the most appropriate model to describe the operation of the "world" market. Some writers have argued that the United States acts as "swing" producer for the world with changes in exports from that country tending to stabilize world prices. It has been suggested that Saudi Arabia at times has played this role in the world oil industry. However, there are major differences between the relative positions of the two countries in the respective industries. Saudi Arabia is the lowest cost oil producer in the world and the bulk of its production is exported. In contrast, the United States has the highest production costs of the major exporters and the bulk of its production is consumed domestically. It may be more appropriate to describe the United States as the "marginal" exporter. Transport costs on coal effectively segment the market into an "Atlantic" and a "Pacific" market. The bulk of exports from the United

States go to Europe whereas Australia (the largest exporter in the world) is the dominant supplier to the more rapidly growing Pacific market. In the case of coking coal there is evidence that collusion among buyers may result in lower prices than would occur under ideal competitive conditions.

In the case of electricity, many countries are at different stages of the reform process to promote greater competition in generation. In the past, the significant decline in unit production costs with the scale of coal fired generating plants led to the view that generation was a "natural monopoly." However, plant scale has a much less significant influence on unit costs with some more recently developed technologies such as combined cycle gas generation. At many locations throughout the world, natural gas can be delivered at prices that make the unit costs of gas fired generation with relatively small scale plants competitive with those of large scale coal fired plants. The introduction of greater competition in generation has often resulted in significant productivity gains in generation. However, the decline in prices to final users has often been less than anticipated. In many cases it appears that generators were able to exercise some degree of market power, especially in tight supply situations. While the net benefits of reform are usually assessed to be positive, reducing the ability of generators to exercise market power remains a central issue.

1. Introduction

Oil is the dominant energy source in the world whether measured in terms of total primary energy supply or source of final energy consumption (see Figures 1 and 2). Oil is also the most heavily internationally traded primary energy source and the crude oil market comes closest to approximating an integrated world market among the primary energy commodities. Thus, oil pricing is an essential component of any discussion of energy pricing. Coal ranks second to oil as a source of primary energy supply but is only fifth in terms of sources of final energy consumption. The reason for this difference in rankings is that a large part of world coal production is consumed in electricity production and electricity, rather than the coal consumed in its production, is regarded as the source of final energy consumption. Pricing of both coal and electricity will be discussed below. In the case of electricity there were significant actual or planned changes in electricity pricing in many countries in the last decade of the twentieth century.

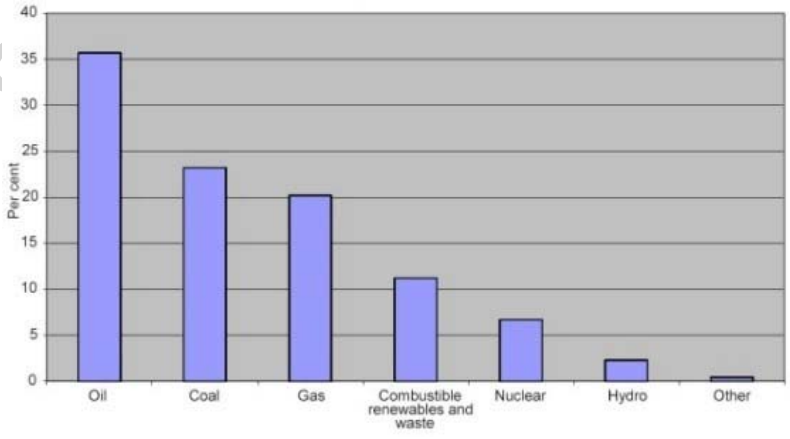

Figure 1. Sources of World Total Primary Energy Supply, 1998 (Source: International Energy Agency)

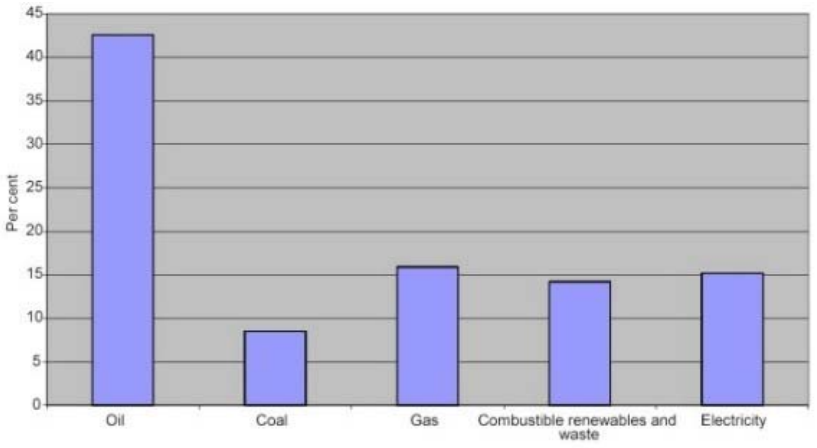

Figure 2. Source of World Final Energy Consumption, 1998 (Source: International Energy Agency)

Natural gas ranks third after coal as a source of total primary energy supply and also in terms of sources of final consumption. It ranks second to oil in terms of the proportion of world production traded internationally. However, a large proportion of international trade occurs through pipelines specifically constructed to link different countries. Pricing tends to be influenced by local factors. Nevertheless, there is a small but rapidly growing volume of sea borne trade in liquefied natural gas. The ability to deliver such gas to any suitably equipped port would be expected to increase the degree of integration in the world market. There is limited international trade in other primary energy sources (combustible renewables and waste, hydro, and nuclear) and again pricing details tend to be country specific.

In this article, only the pricing of oil, coal, and electricity are considered since these commodities raise general issues affecting a number of countries.

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Biographical Sketches

Brian Fisher was first appointed ABARE's Executive Director in November 1988. During 1984–85, Dr Fisher was Chief Research Economist, then Deputy Director, of the former Bureau of Agricultural Economics. He was appointed to the chair in Agricultural Economics at the University of Sydney in 1985, becoming Dean of the Faculty of Agriculture at the University in 1987.
Dr. Fisher has been the government board member on a number of statutory corporations, including the Australian Wool Realisation Commission, Wool International and the Australian Animal Health Council. In 1995 and 1996, he was the Chairman of the Board of the Australian Animal Health Laboratory. In 1993 Dr. Fisher was appointed one of the experts completing the socioeconomic assessment of climate change for the United Nation's Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report. Dr. Fisher played an integral role in the international climate change negotiations as economic adviser to Australia's negotiating team in the lead up to, and at, the third Conference of the Parties in Kyoto. He fulfilled that role at the fourth Conference of the Parties in Buenos Aires in November 1998 and did so again at the fifth Conference of the Parties held in Bonn in November 1999. He is currently engaged as one of the experts completing the IPCC's Third Assessment Report.
Dr Fisher has published over 190 papers and monographs. He received the Farrer Memorial Medal in August 1994 and became a fellow of the Academy of Social Sciences in Australia in November 1995. Dr Fisher holds a Ph.D. in agricultural economics from the University of Sydney.

Mike Hinchy is a Senior Economist at the Australian Bureau of Agricultural and Resource Economics. During the past ten years he has specialized in the economics of climate change writing numerous papers on emission trading schemes and general equilibrium modeling of the impacts of policies to combat climate change. He has been a contributing author to the Second and Third Assessment Reports of the Intergovernmental Panel on Climate Change. He has published over 60 papers and research monographs. He holds the degrees of B.Ec. (Hon.) from the University of Sydney and M.Sc. from the University of Cambridge.