Colombian Petroleum, 1920–1940," *Canadian Journal of History*, 9 (August 1974), pp. 179–96; Rippy, "US and Colombian Oil," pp. 19–35; Chester, *US Oil Policy*, pp. 144–7; Wilkins, *Multinational Enterprise*, pp. 255–72.

56. J. Foreman-Peck, *A History of the World Economy: Inernational Economic Relations since 1850*, Brighton: Wheatsheaf Books (1983), p. 213; for a concise analysis of the worst years of the depression, see P. Fearon, *The Origins and Nature of the Great Slump, 1929–1932*, Atlantic Highlands, N.J.: Humanities Press (1979).
57. For the above three paragraphs: S. Takahashi, *Japan and World Resources*, Tokyo: Kenkyusha Press (1937) and Royal Institute of International Affairs, Information Department, *Raw Materials and Colonies*, New York: Oxford University Press (1936) summarize the conflicting positions of the Axis powers and their antagonists. See also, Schumpeter, *Industrialization of Japan*, pp. 43–4, 373–5, *passim*; Takahashi, *Japan*, p. 29; C.C. Concannon *et al.*, *World Chemical Developments in 1935*. US Department of Commerce. Bureau of Foreign and Domestic Commerce. Trade Information Bulletin No. 832, Washington, DC: GPO (1936), pp. 19, 23, 29, 36; M. Erselcuk, "Japan's Oil Resources," *Economic Geography*, 22 (January 1946), p. 16; Anderson, *Standard-Vacuum*, pp. 80–7; Chester, *US Oil Policy*, pp. 297–301; *World Petroleum*, 13 (January 1942), pp. 23–7.

4

Energy flows in a politically polarized world

World War II strongly influenced the energy future of the world. To the victor come the spoils. Had the war commencing in 1939 been concluded on terms favorable to the Axis powers, one might imagine them in possession of the Soviet Union's Baku fields, much of the Middle East, and the Netherlands East Indies. What an impact such an outcome would have had on the Allied powers and on the giant firms that dominated the world oil industry. Far more was at risk than oil or other natural resources, but one can still conjecture that the economies and societies of Britain, the USA, and other nations would have evolved quite differently had the Axis dictated terms of access to Middle East oil.

Energy and World War II

Each of the major belligerents committed substantial resources to securing a fuel supply sufficient for the prosecution of a highly mobilized conflict fought on distant and shifting fronts. Germany and Japan, without domestic oil reserves and the latter without adequate coal, planned campaigns to conquer fuel-producing regions while investing heavily during the 1930s in the development of synthetic fuel technologies. In both nations the production of coal, the chief feed stock for synthetics, enjoyed high priority.

Neither Britain nor the United States made provisions before 1939 for an emergency fuel supply. The UK felt reasonably secure. British companies controlled the largest oil fields in the Middle East and operated successfully in safe regions in the western hemisphere. A more than adequate domestic coal supply was available. For its part, the USA

possessed large and accessible petroleum and coal reserves and dominated the oil industries of South America and Saudi Arabia, the latter's potential still unrecognized. The USSR, with enormous productive potential in all fuels, experienced the destruction or seizure of much of its western based coal industry and its Baku oil fields. With great effort and the provision of several lend lease refineries by the USA, the Soviet Union produced and refined about 60 percent of its petroleum needs.[1]

The belligerents grossly miscalculated their energy requirements. Germany and Japan possessed stocks and access to supplies sufficient only for a relatively short war. Germany's conquests in Europe added the sizable coal production of Poland and France, some part necessarily devoted to sustaining the conquered populations, the oil fields of Romania, and the Maikop fields of the northern Caucasus, the latter so thoroughly destroyed by retreating Soviets that they added nothing to the oil stock of the Third Reich. Neither did the other conquests yield more than marginal increments to fuel supplies. By 1943, heavy and sustained Allied air attacks pulverized Germany's fuel industry, particularly the synthetics complex, and its transportation links. Oil became desperately short by 1944. Shortages of aviation gasoline severely hampered the operation of the Luftwaffe during the last year of the war. As labor productivity declined, partially due to malnutrition among miners, coal production in occupied France and Belgium fell off severely by 1943. Maintenance and transportation services also became increasingly inadequate. Forced labor in German mines maintained the labor force at adequate levels, but dreadful working conditions resulted in low productivity. Falling supplies of coal in 1943 and 1944 hamstrung the production of iron and steel and synthetic fuels.

Japan launched its war against the USA and other European states with a natural resource base more limited than that of Germany. The need for oil determined that Japan would strike south to seize the Netherlands East Indies. Japan's hopes rested on the fatally optimistic assumption that the USA would not persist in a long and costly struggle. With a much less developed synthetic fuel industry than Germany, Japan depended upon ocean transport for the bulk of its oil and some of its coal. American control of the sea lanes by late 1944 placed virtually each Japanese oil tanker at risk. By early 1945, Japan's oil stocks had dwindled to under one million barrels. An almost total blockade of the home islands by US naval and air forces denied Japan access to the oil of Southeast Asia. Shortages of oil and coal severely constrained war industries. Perhaps even more deadly in 1945 was the looming specter of widespread starvation.[2]

British complacency in 1939 about fuel supplies gave way to despair by 1940. As German planes pounded the UK, submarines sunk an

increasing tonnage of tankers. The intercession of the USA in 1940 through the exchange of American destroyers for bases in British possessions, the Lend Lease Act of March 1941, and the transfer of fifty oil tankers to Britain in May 1941 relieved the situation. Petroleum stocks climbed well above the danger zone. Although Nazi submarines destroyed an enormous tonnage of tankers after America's entry into the war, supplies from America were not jeopardized. The destruction of Axis armies in North Africa in 1942 eliminated the threat to the Suez and the Persian Gulf oil fields. Thereafter, American production supplemented by Venezuelan and Middle Eastern oil provided more than adequate fuel to Allied forces.

Military demands for fuel compelled the heavy intervention of the British and American governments in their energy industries. In the USA, a complex of federal agencies successfully maintained adequate production of fuels, particularly aviation gasoline and chemical feedstocks for synthetic rubber, distributed fuels to the Allies and to domestic wartime industries without totally denying supplies to non-critical industries or the civilian sector, and moderated inflationary pressures. But these agencies and the policies they implemented were swiftly abandoned in 1945 and 1946. America preferred, as in 1918, to return to an essentially unregulated regimen for petroleum and coal.[3]

A prewar heritage in the UK of intermittent government intervention in the coal industry and in the energy utilities combined with severe wartime conditions to propel Britain toward national ownership. Beginning in 1939 all energy was strictly rationed, far more so than in the USA. By 1943, the Ministry of Fuel and Power controlled coal prices and miners' wages, an intervention necessitated by inflationary pressures, labor scarcity, and other operational problems. The government operated the mines while the mine owners retained financial responsibility. The Labour Party called for the immediate nationalization of coal. While the Conservative Party resisted this demand, it supported continuing state authority to compel industry rationalization. Labour's electoral victory after the war led immediately to the nationalization of coal and the electric and gas utilities.[4]

While petroleum remained in private hands in both Britain and the USA, the foreign policies of both nations presumed continued access to cheap oil, thus assuring a competitive/cooperative Anglo-American relationship concerning foreign fields. Britain's dependency upon foreign oil was total but the national energy mix during and immediately after the war still reflected the dominance of coal which, in 1950, provided 90 percent of total primary energy requirements.[5] America's consumption of oil was far greater, with all but a fraction supplied domestically. In both nations, knowledgeable government and oil

industry officials foresaw a dramatic rise in domestic oil consumption. Americans worried that domestic oil demand might outstrip additions to reserves, thus reducing the margin of oil security. Both governments also evinced vague fears about Soviet intentions in the Middle East and about the nationalistic aspirations of both independent and colonial oil producing countries. The USA and the UK attempted individually and cooperatively, under the untrusting eyes of France and other nations, to guarantee Anglo-American domination of the key foreign oil fields, safeguard private investments abroad, and assure private investors further opportunities in secured areas. One need not assert that postwar Anglo-American policies marched to a tune orchestrated by the powerful oil companies to recognize that concern about oil supply and investments contributed to the shaping of policy.[6]

Two specific oil policy initiatives—the Petroleum Reserves Corporation and the Anglo-American oil treaty—make clear the evolving purposes of both governments and reflect, as well, the inability of the US government radically to alter its traditional oil policies. Both programs demonstrated American awareness of the great significance of Persian Gulf oil wealth, a gnawing doubt about the extent of domestic oil reserves, suspicions about the intentions of the MNOCs operating in that area, and skepticism about the willingness of Britain to allow US companies to participate in Iraqi and Iranian production.

The Petroleum Reserves Corporation (PRC) issue involved a contract between PRC and the Aramco partners in 1943 providing government financing of a refinery and a pipeline to the Mediterranean Sea in exchange for an exclusive federal oil reserve. Arousing intense opposition from independent oil companies and others hostile to federal intrusion in the oil industry, the idea was abandoned. But the larger objectives of national security and security for American oil interests survived in a new policy, that of hammering out an oil treaty with the UK that would preserve and enlarge American participation in the world oil industry.

Between 1944 and 1947, American and British negotiators concluded two agreements, both of which suffered defeat in the American political arena at the hands of a coalition of domestic oil companies and opponents of American entanglement in such international arrangements. The agreements themselves suited the interests of both governments by establishing a mechanism to assure bilateral control over Middle Eastern fields by American and British firms.

Britain gained the implicit commitment of American power to defend the fields. Grave doubts about the devotion of the MNOCs to the national interest motivated American negotiators, particularly Harold L. Ickes, Secretary of Interior (1932–46). To Ickes, the political ramifications of Middle Eastern oil required an active federal presence to counterbalance the egocentric multinationals. For the American MNOCs, the proposals offered equal participatory opportunities in areas dominated by the Anglo–Iranian Oil Company (AIOC) and the Iraq Petroleum Company (IPC). For AIOC, the accord minimized the risk of dangerous price competition and political turmoil in the Middle East, a threat attributed to Soviet machinations. However, the US Senate rejected the treaty in 1947.[7] Agreements relative to Middle Eastern oil would depend in the short-term on inter-firm arrangements. Over the long-term, the resounding impact on the producing governments of nationalism, anti-Zionism, and calculations of national self-interest would radically alter the shape of the Middle Eastern oil industry.

Anticipating a Nazi drive toward Middle Eastern oil fields, in 1941 British troops seized the fields of Iraq and Iran, including the great Abadan refinery. Thereafter, Anglo-American forces assured the security of Persian Gulf production. By the end of the war, Iranian, Iraqi, and Saudi oil production reached 27 million metric tons (mmt), an 88 percent increase over 1941, and provided about 10 percent of Allied oil needs.[8] When the Axis collapsed in 1945, the fields of Iran and Saudi Arabia were poised to enter an era of explosive production. Allied victory solidified the position of the MNOCs in that region, permitted their return to areas occupied by the Axis, excepting eastern Europe, and appeared to strengthen their bargaining position in Latin America. For a time the MNOCs exercised an informal governance over overseas oil. But this restored hegemony engendered the intense antagonism of host governments toward the MNOCs and their home governments.

Trends in world and regional energy use to 1960

However measured, world energy consumption soared after World War II. Between 1945 and 1950 primary commercial energy use rose by 25 percent, comparable to the growth rate of the 1920s. From 1950 to 1960 energy use rose by 55 percent (Table 4.1). During the first fifteen postwar years, total primary energy requirements (TPER) advanced by 1,600 million metric tons oil equivalent. This enormous leap in energy use, accelerating through the 1960s, occurred within particular national contexts and was, therefore, constrained by unique circumstances.

Energy consumption stormed ahead in the most highly industrialized countries of western Europe, Japan, the United States, and the Soviet Union. The USA assumed the key role in the political and economic reconstruction of western Europe and Japan, motivated by

Table 4.1 World total primary commercial energy requirements, 1938–70 (million metric tons oil equivalent)

	Mmtoc	Percent				
	TPER	Solid fuels	Oil	Natural gas	Hydro-electric	Nuclear
1938	1217	72	21	6	1	0
1945	1600	66	23	10	2	0
1950	2059	62	25	12	1	0
1961	3185	48	33	16	2	<1
1970	5170	33	45	20	2	<1

Sources: Constructed from J. Darmstadter *et al.*, *Energy in the World Economy: A Statistical Review of Trends in Output, Trade, and Consumption Since 1925*, Baltimore: The Johns Hopkins University Press for Resources for the Future (1971), p. 652; Gilbert Jenkins, *Oil Economists' Handbook 1985*, London: Elsevier Applied Science Publishers Ltd (1985), p. 76; *BP Statistical Review of World Energy*, June 1986.

humanitarianism, fear (obsession in the view of some) of global communist expansion, and economic self-interest. Conversely, the less developed nations, many gaining their independence after the war, failed to achieve self-sustained growth. They remained mired in economic backwardness, characterized by high birth rates, declining death rates, marginal and primitive agriculture, grossly inadequate employment opportunities, an elitist and exploitive political leadership, and dependence upon the technological, managerial, and capital inputs of wealthier countries, including the former colonial masters. Only a minority of the world's population, then, enjoyed the fruits and encountered the frustrations of a more energy intensive round of life.

The more highly developed nations, without exception, if at differing paces, adopted oil intensive patterns of energy use. This emerging energy regime damaged coal industries in the West while stimulating the expansion of the global oil industry, still dominated by a handful of American, British, French, and Dutch multinationals. Within this context, the critical factor was the shift of the USA from a net oil exporter to a net oil importer. This shift further consolidated the producing power of the MNOCs operating in the Middle East even as it evoked noisy political controversy in the USA. Middle Eastern governments quickly challenged the MNOCs and forced a drastic revision of the oil pricing system. Permeating all of this in the West were consumer preferences and governmental efforts to define the national interest with regard to a particular energy mix. An array of international and regional military/political/economic organizations operated on the fringes of the energy arena. The United Nations Organization, the Arab League, the European Coal and Steel Community (the European Economic Community in 1957), and the Organization of Petroleum Exporting Countries (OPEC, established in 1960) sought with varying degrees of success to intervene in energy issues.

The extraordinary rise in world energy use occurred during years of unprecedented general economic growth, the one both cause and effect of the other. The total value of world exports more than doubled from 1945 to 1958, reaching $109 billion, and had doubled again by 1967 while energy's share of world trade advanced from under 9 percent during the early 1950s to almost 10 percent in 1965. At that time the value of exported mineral fuels exceeded $18 billion.[9]

To appreciate the transformation in the composition of energy entering world trade requires greater specificity. Table 4.2 traces the demise of coal as the leading energy export, accomplished prior to World War II, and the remarkable relative position achieved by oil by 1965. Table 4.2 establishes the largely domestic character of the world coal industry in contrast to the predominantly international reach of the oil industry. By 1965, only 7 percent of mined coal entered foreign trade compared with 60 percent of oil production, a volume covering 89 percent of all energy exports.

Soaring statistics characterize analyses of world trade in general and of energy traffic in particular. Aggregate energy figures and the conclusions they support obfuscate the limited scope of energy traffic. Relatively few nations measurably participated or profited from energy trade. The favored nations, all intensive users of commercial energy, owned large shares of world trade and manufacturing output. As late as 1970, non-commercial (organic) fuels composed at least 35 percent of TPER in Brazil, India, Indonesia, and South Korea.[10]

Measurements of global energy trade are of marginal value unless

Table 4.2 Energy and world trade, 1925–65 (percent)

	1925	1938	1950	1960	1965
Commercial energy exports as percentage of world energy production	14	16	18	23	28
Coal exports as percentage of world energy production	9	7	4	3	3
Crude/refined oil exports as percentage of world energy production	4	9	14	20	25
Exports as percentage of total energy exports for:					
Oil	32	56	76	87	89
Coal	68	43	24	13	10
Exports as percentage of total production for:					
Oil	30	40	46	53	60
Coal	11	10	7	7	7

Source: Constructed from Darmstadter, cited in Table 4.1, pp. 224, 423

Table 4.3 National–regional shares of world primary energy production, 1925–65 (percent)

	1925	1938	1950	1965
USA	49	39	44	31
Western Europe	34	32	19	10
USSR	2	9	11	18
Middle East	<1	1	5	11
Latin America	3	4	6	7
Eastern Europe	4	5	7	6
All others	7	10	8	17

Source: Same source as Table 4.2, pp. 224–62.

framed comparatively. Production of mineral fuels occurred within certain countries and specific fuels passed to individual markets. The number of national or institutional actors that influenced those transactions were few. A handful of nations consumed the bulk of the world's energy. In 1950 and 1970, the USA and Canada, OECD-Europe*, the USSR, and Japan accounted for 80 and 73 percent, respectively, of global TPER.[11] Similarly, the USA, USSR, and a few Middle Eastern states contributed 60 percent of the world increase in primary energy production from 1950 to 1965. As Table 4.3 suggests, the locus of world energy production shifted to those nations with substantial oil reserves.

Energy in western Europe after World War II

World War II left continental Europe in a shambles, with much of its industry and infrastructure destroyed, with the eastern regions about to be isolated from the western by force of Soviet arms, and with its potentially most powerful state utterly prostrate and soon to be divided into an eastern and a western Germany. By the mid 1950s, western Europe had risen from the ashes and was poised on the brink of remarkable economic growth. A transformed energy mix accompanied European recovery, one that further cracked the foundations of the coal industry, greatly expanded the market power of the oil industry, and intensified each nation's dependence upon energy imports.

Table 3.1 depicts the centrality of coal in Britain, Germany, and France in 1938. For the nations that formed the European Coal and Steel Community (ECSC) in 1952—Germany, France, the Benelux

* Including Austria, Belgium, Denmark, Finland, West Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom. Unless otherwise specified, references to western Europe include the above nations.

nations and Italy—coal provided 87 percent of TPER in 1937, 81 percent in 1950, and 74 percent in 1955. In Britain, coal accounted for 85 percent of TPER in 1955. Crucial to European recovery, then, was reconstruction of the coal industry which had suffered severe damage toward the end of the war. An impressive effort through 1947 reconstructed and equipped the mines of Belgium, France, the Netherlands, and West Germany, but only in France did production equal prewar output. Shortages of coal caused widespread suffering during the winters of 1945–8 while seriously impeding the rebuilding of electric utilities and the iron and steel and other heavy industries.

The coal producing nations devised individual and collective strategies to overcome the bottlenecks and were joined in this campaign by the USA. Despite the frequent and debilitating strikes that wracked the American coal industry in 1946–8, the USA shipped a significant tonnage of coal to ECSC states during this emergency. In 1947, US coal provided 94 percent of ECSC coal imports. To coordinate these deliveries, the USA and the UK made use of the European Coal Organization (ECO), set up in 1945. ECO possessed full allocative powers, duties absorbed after 1948 by administrative units involved in the Marshall Plan. Britain and France nationalized their coal industries in 1946. British occupation forces terminated the prewar Ruhr coal cartel but ultimately failed to prevent the concentration of German coal output in the hands of a few large mining and steel companies.

These initiatives notwithstanding, European economic recovery required the massive input of the Marshall Plan. Marshall Plan funds permitted the large scale reconstruction of the coal industry and the achievement of coal sufficiency by the late 1950s. Thereafter, the national coal policies of Britain, France, and West Germany and the coal stabilization programs of ECSC proved incapable of resisting a slippage in coal demand that began during the late 1950s and early 1960s (Tables 2.2 and 4.4).

In the UK, inadequate capital investment in new mines and new equipment prevented the industry from meeting demand and kept coal prices relatively high, thus attracting imports from the USA. British coal exports withered away to insignificance (see Table 3.3). West Germany's increasingly efficient coal industry produced a surplus for export to its ECSC partners, particularly France. But Germany also imported a sizable tonnage; in 1960, for instance, imports equaled 38 percent of exports. As was the case before the war, French coal production fell short of domestic demand by 25 to 30 percent with the deficit supplied primarily by the USA and Germany. Overall, ECSC members required more coal than they produced.

American coal remained competitive in Europe during the 1950s

Table 4.4 Coal production in world and selected nations, 1945–73 (million metric tons)

	1945	1950	1955	1960	1965	1973
World[1]		1861	2191	2486	2861	3029
USA[2]	578	516	465	416	512	543
UK	186	220	225	197	191	130
West Germany[1]	70	188	223	240	239	222
France	35	53	57	58	54	36
USSR[1]	149	261	390	510	578	615
East Germany[3]	108[4]	137	201	225	251	246
Poland	49[4]	83	101	114	142	195

[1] All coals
[2] Bituminous only
[3] Brown coal or lignite equivalent
[4] 1946

Sources: Darmstadter, cited in Table 4.1, p. 191; U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970. Bicentennial Edition. Part 1*, Washington, D.C.: USGPO (1975), p. 589; B.R. Mitchell, ed., *European Historical Statistics*, 2nd revised edition, London: Macmillan (1981), pp. 365–8, 386–8; A.R. Griffin, *The British Coal Mining Industry: Retrospect and Prospect*, Buxton, Derbys: Moorland (1977), p. 186.

despite the distance; from 1947 through 1958, the USA supplied from 44 to 65 percent of annual imports. After World War II, US aid packages fostered the use of American coal. As this political advantage waned, the rapid mechanization of American mines and the progress of strip mining raised productivity to levels far superior to even the most advanced German mines. While coal prices in the USA declined markedly from 1947 through 1960, domestic coal became more dear in western Europe. The higher fixed costs of European coal mines were partially attributable to ECSC and national efforts to protect the standard of living of miners by supporting prices. Western European nations did not consider reducing the number of miners by scaling down national coal industries. Coal was still viewed as essential to national security. Miners still possessed considerable political clout. Into the 1960s, then, the European coal industry could neither defend itself against foreign coal nor, and more threatening in the long run, counter the price and efficiency advantages of fuel oil.[12]

Between 1945 and 1953, even before the sudden reversal of coal industry fortunes in western Europe, oil consumption advanced sharply. OECD-Europe's coal use increased by some 100 mmt between 1948 and 1960, or by 24 percent, but coal's share of TPER fell from 83 percent in 1950 to 61 percent in 1960 (Table 4.5). Over the same period, oil's share moved from 14 to 30 percent and natural gas from less than 1 percent to almost 3 percent. In the Netherlands, oil use equaled coal use by 1960.[13]

Favorable oil prices relative to coal prices, the convenience of oil for

residential and industrial purposes, and the flood of Marshall Plan dollars accelerated an energy use transition initiated prior to the war. Competitive oil prices generated positive responses among consumers. Several factors help explain the attractiveness of oil prices: the availability of Middle East oil (not so secure as Europeans learned during the 1950s), the abandonment of a price system designed to protect the overseas marketability of US oil, the construction of a European refining industry that quickly reduced the need to import more expensive refined products, and, as some insist, the effort of the US government to

Table 4.5 Total primary commercial energy requirements of selected countries, 1950–75 (percent)

	1950	1955	1960	1965	1973	1975
OECD–Europe						
Solid fuels	83	75	61	45	23	23
Liquid fuels	14	21	30	45	59	55
Natural gas	<1	<1	2	3	10	13
Hydroelectric	2	3	3	3	6	6
Nuclear	0	0	<1	<1	1	1
UK						
Solid fuels	92	85	74	62	37	38
Liquid fuels	8	14	25	35	48	44
Natural gas	0	0	0	<1	11	15
Nuclear	0	0	<1	2	3	3
West Germany						
Solid fuels	95	90	76	57	32	31
Liquid fuels	4	9	23	41	55	51
Natural gas	0	<1	<1	2	10	14
Nuclear	0	0	0	0	1	2
France						
Solid fuels	77	68	54	41	17	17
Liquid fuels	20	29	32	46	68	63
Natural gas	<1	<1	3	4	8	10
Hydroelectric	3	3	10	9	6	8
Nuclear	0	0	<1	<1	2	2
Italy						
Solid fuels	49	33	19	15	9	8
Liquid fuels	32	42	56	62	72	74
Natural gas	4	14	15	8	9	11
Hydroelectric	15	11	10	14	9	7
Nuclear	0	0	0	<1	<1	<1
USA						
Solid fuels	42	31	25	25	21	21
Liquid fuels	38	43	42	42	44	45
Natural gas	19	25	29	30	30	28
Hydroelectric	1	1	3	3	4	4
Nuclear	0	<1	<1	<1	1	2

Table 4.5 (cont.)

	1950	1955	1960	1965	1973	1975
USSR						
Solid fuels	77	76	52	44	36	34
Liquid fuels	20	20	30	35	37	39
Natural gas	3	3	8	19	23	24
Hydroelectric	<1	<1	1	1	4	3
Nuclear	0	0	0	<1	<1	<1
Japan[1]						
Solid fuels	70	68	53	34	17	18
Liquid fuels	21	22	31	53	75	71
Natural gas	<1	<1	<1	1	1	2
Hydroelectric	9	9	15	13	5	6
Nuclear	0	0	0	0	0	2

[1] TPER figures would be lower if firewood and charcoal use were included. In 1953, in Japan, wood and charcoal provided at least 8 percent of energy supply. In Russia, in 1955, wood provided at least 7 percent of energy supply.

Sources: Largely constructed from J. Darmstadter *et al.*, cited in Table 4.1, Table 11, and IEA, *Energy Balances of OECD Countries, 1970/1982*, Paris: OECD/IEA (1984), pp. 387–9, 404, with occasional reference to annual issues of *BP Statistical Review of World Energy*.

restrict oil imports, this shortly after the USA became a net importer of oil.

Oil formed the largest single commodity in the dollar budget of most Marshall Plan recipients.[14] Few dispute the necessity of such a massive infusion of money into Europe in 1947–8, both as a humanitarian act and as a program that served the political and economic interests of western Europe and the USA. Certainly it stabilized and then induced growth in the North Atlantic economies, an achievement closely associated with US-led efforts to remedy severe foreign exchange shortages and worrisome balance of payments deficits that developed during and after the war.

American firms, drawing oil from the Middle East, supplied at least 70 percent of funded oil to Europe, paid for in dollars. To ease the acute dollar shortage which plagued the UK and other European nations, the Economic Cooperation Administration (ECA) campaigned with some success to force American MNOCs to reduce prices on Marshall Plan crude delivered to Europe. The US Department of State, pursuing a somewhat contradictory purpose, spearheaded American efforts to pry open British dominated sterling markets for the sale of "dollar" oil. Britain, desperate to preserve dollars, wished to replace "dollar" oil with "sterling" oil. ECA did not wholly subscribe to the State Department position which better served the interests of American MNOCs than the objectives of the Marshall Plan. Related to the sterling drain and impinging upon US oil interests was the issue of European refinery construction. ECA argued that such a program would reduce the dollar drain by substituting cheap crude for expensive refined products. The resistance of US refinery interests successfully restricted the application of Marshall Plan funds to refinery construction. European refining expanded nonetheless. These developments further eroded the justification for the so-called Gulf oil price system and, by widening the access of Europe to Middle Eastern oil, vastly increased the value of the concessions of the MNOCs.[15]

Western Europe, by the 1950s, had recovered from the worst effects of depression and world war. Gross national products rose steadily, driven principally by a dynamic manufacturing sector. By 1960, primary energy consumption in OECD-Europe exceeded use in 1950 by 43 percent, compared with a US growth rate of 26 percent. While 1960 *per capita* energy use in the USA was at least double that of any Western European nation excepting Britain, such highly industrialized states as Belgium, France, and West Germany produced a larger volume of gross national product per energy input than did the USA, attesting to superior energy use efficiency in those states. Accompanying accelerated economic growth and energy use was a persistent shift from oil to coal and slight increases in total natural gas and hydroelectric use.

The energy mix of European and other industrialized nations is summarized on Table 4.5. Substantial differences are apparent; compare Italy to the norm for OECD-Europe. The dissimilar patterns stem from the varying natural resource endowments of each nation. Italy, with little coal, emphasized hydroelectric development (the largest component of the "other" category) and quickly shifted to oil. France nationalized coal and the electric and gas utilities, and focused on reducing coal imports by the expansion of domestic coal mining and hydroelectric capacity. Still, French coal production remained inadequate and costly while oil seemed cheap and plentiful. France, therefore, adopted a goal of energy independence during the 1960s, emphasizing control of foreign oil fields, continued expansion of refinery capacity, and, finally, nuclear power. Germany and Britain, without domestic oil or gas, both of which the USA and USSR had in abundance, continued to rely primarily upon coal until the late 1960s. Both shored up the coal industry through various subsidies and protection against oil competition. Nonetheless, as Table 4.4 shows, coal production in Britain fell off substantially after 1955–6 while it plateaued in West Germany. In both countries and in the USA as well, electric generation emerged as the largest single market for coal but it was never immune from the competition of natural gas and fuel oil. During the 1960s, Britain, Holland, and Norway launched ambitious exploration ventures in the North Sea.

Substantial oil and natural gas fields were discovered. Dutch gas became a factor in the European energy mix during the 1960s and British and Norwegian oil during the 1970s.

The Treaty of Rome, creating the European Economic Community in 1957, committed the Common Market to a common energy policy. Critical differences in national energy wealth, as between the coal producers and the non-coal producers, obstructed the formulation of a unified approach to energy. Members desired cheap and secure energy but could not discover an acceptable policy to attain that objective. The problem of coal overcapacity and shrinking markets remained unresolved through the 1960s. Members protected their key energy industries without regard to the collective good, none volunteering to dilute full sovereignty over those crucial sectors.[16]

The recognition of dissimilarities in national energy use should not obscure the relentless progression toward rough congruence depicted on Table 4.5. Energy users in western Europe had fewer options from which to choose — and Japan fewer yet — than consumers in the USA or Soviet planners. But the choices became ineluctably convergent by the mid-1960s. There are only so many ways to produce energy economically. Thus, the generation and use of electricity, whatever the primary energy employed, exploded in the industrial countries after World War II, a process replicated by the lesser developed countries as expeditiously as possible. Nation pursued nation along roughly parallel paths.

The energy mix of Japan

Japan possesses the poorest energy and non-fuel mineral resource base of the world's fully industrialized economies. Troublesome import dependency, a factor in Japan's decision in the 1930s to acquire an empire, intensified after World War II. If only commercial fuels and hydropower are considered, Japan in 1950 imported almost 30 percent of TPER, a proportion rising to 40 percent by 1960 and 86 percent in 1970. Policy choices of a radical nature emerged in Japan during the 1960s, resting on assessments of national economic performance during the late 1950s.[17]

American occupation of a devastated Japan democratized Japanese politics. American policy also consciously aimed at the further consolidation of the power of multinational corporations, proffering direct benefits on the oil companies. Under American supervision, the reconstruction of Japanese industry hastened the shift to fuel oil and away from coal. American firms supplied the fuel oil. However, and pregnant with meaning for the future, the USA failed to destroy the zaibatsu. Once Japan became master of its own house, the zaibatsu reasserted their dominion in all leading industrial sectors, including the petroleum, electrical equipment, and nuclear industries. Japanese managers speedily rebuilt iron and steel using only the newest technologies. Concurrently, intense efforts and channeled investments flowed into the shipbuilding, chemical, auto, and electrical equipment industries, all of which fell under the sway of reborn zaibatsu.

The consequences for energy use in Japan were momentous, fully apparent as the catalytic effects of the Korean War propelled the economy into a great boom, underwritten in large part by swelling export earnings. The Japanese coal industry responded feebly to rising demands from industry, especially for coking coal for steel, and coal shortages caused occasional crises in electric generation. By 1960, such conglomerates as Mitsubishi were fully committed to petroleum as the leading industrial fuel and were importing growing volumes through subsidiary trading firms. As a result of occupation policies American oil companies reaped substantial rewards from this surge in oil consumption.[18]

The US government prohibited the operation of Japanese refineries until 1949 and then pressured the Japanese to permit the MNOCs to participate in refining on a 50:50 basis, an exaction not imposed upon Germany. American capital flowed into Japan and the American MNOCs secured the right to supply the required crude oil. Only gradually during the 1960s did the powerful Ministry of International Trade and Industry (MITI) assert national control over the participation of foreign firms in the oil industry. By this time, Japan was securely bound to oil (Table 4.5).

The security implications of oil import dependence fostered Japanese initiatives during the late 1950s and early 1960s to modernize the electric power industry, limit the freedom of electric utilities to import foreign electrical equipment, encourage research and development in nuclear power, nurture energy conservation practices, and support Japanese-owned ventures in foreign oil exploration and discovery. Not all of these policies bore immediate fruit. The Japanese surrendered to the siren-song of cheap oil during the 1960s. Nonetheless, they reflected the aims of successive governments. When an energy crisis struck in 1973, the Japanese government, directly connected through MITI to the powerful zaibatsu, wielded sufficient power to buffer the economy from the worst of the oil price shock. Japan's OECD colleagues could not make such a claim.[19]

The energy mix of the Soviet bloc

With its armies in place, the Soviet Union quickly imposed its rule over eastern Europe. From the Baltic States to Poland and south to Bulgaria, Soviet power forced the integration of eastern European economies with its own. Resources and technology from the bloc nations flowed eastward, some simply expropriated as the reward of victory and some gained on terms imposed on the powerless, to contribute to the massive task of rebuilding the Soviet economy. Such was the devastation visited on the USSR by advancing and retreating Nazis, that the ill effects of the war lingered on for decades, with recurrent shortages of critical goods and glaring industrial and agricultural inefficiencies exacerbated by a rigid economic system.

For all the difficulties facing the nation after 1945, not the least being the bloody paranoia of Joseph Stalin and the gulf separating East and West, the Soviets reconstructed their economy and greatly expanded primary energy production. In the immediate postwar years planners concentrated on the coal industry but peat and wood remained important supplemental fuels. Transportation inadequacies, lack of modern equipment and spare parts, and, perhaps, the insecurities of Stalin's last years hampered the rehabilitation process. But sheer muscle power, some no doubt belonging to forced laborers, pushed production up-

Table 4.6 World crude oil production, 1945–70 (million metric tons)

	1945	1950	1955	1960	1965	1970
World	365	528	781	1066	1536	2322
USA	238	274	345	357	396	488
Venezuela	45	78	109	145	176	188
USSR	21	38	71	150	248	354
Iran	18	32	17	54	96	194
Mexico	6	10	12	14	16	25
Romania	6	4	11	12	13	14
Iraq	5	6	35	49	67	79
Saudi Arabia	3	26	49	63	103	180
Canada	1	4	18	26	41	64
Indonesia	<1	7	12	21	25	43
Algeria	<1	<1	<1	9	29	52
Kuwait	0	17	55	83	110	138
China			<1	3	7	20
Nigeria			0	<1	14	55
Libya				0	62	168
United Arab Emirates				0	14	39
Above percentage of world production	95	94	94	93	92	90

Source: DeGolyer and MacNaughton, *Twentieth Century Petroleum Statistics*, Dallas, Texas: DeGolyer and MacNaughton (1984), pp. 4–11.

ward. By the mid-1950s, the Soviets prepared to mineralize thoroughly their energy system, initiating a great campaign to exploit oil and natural gas resources. Coal production—Table 4.4—rose by 242 percent between 1945 and 1965. Oil production, at 21 million metric tons in 1945, shot upwards, reaching 248 mmt in 1965 (Table 4.6). Natural gas production also surged ahead after 1955, climbing from about 9 billion cubic meters (bcm) to 45 bcm in 1960 and 128 bcm in 1965.[20]

The changing Soviet energy mix displayed in Table 4.5 mirrored these production gains. But unyielding bottlenecks somewhat constrained output. While enormous reserves of fossil fuels existed, their distance from centers of population and industry severely challenged the capabilities of the delivery system. Electric power generation lagged sadly behind demand because of coal shortages—a prompt for the development of nuclear power. Throughout the Soviet coal industry, mechanization, and, therefore, labor productivity, lagged behind western standards. The key oil fields of the Urals–Volga region produced low quality crude necessitating the opening of the far distant oil and gas fields of Siberia and the construction of thousands of miles of pipeline by a pipeline industry hampered by technological and materials shortcomings. Similarly backward technologically, the refining industry produced inferior products, particularly lubricants, compared with western or even Romanian refineries.[21]

Eastern Europe depended far more heavily upon coal than the USSR or western Europe. In 1965, solid fuels composed 82 percent of TPER, a substantially greater coal dependency than in western Europe (Table 4.5). Only Romania possessed significant oil reserves, but these were rapidly depleted by the Soviet Union which disposed of at least 60 percent of Romanian production, obtained at a fraction of the world price. Into the 1950s, eastern European resources, technologies, captive scientists and technicians, and manufactured goods streamed into Russia. This traffic was conducted under the terms of bilateral trade agreements, or Soviet reparations imposed upon such formerly hostile countries as Czechoslovakia, Hungary, and Romania. So great were internal Soviet needs, that bloc countries received relatively little in return, and that on unfavorable terms. Western European nations, economically more advanced than all but Czechoslovakia prior to the war, sped far ahead of eastern Europe, which lacked a generous Uncle Sam.

Persistent energy scarcity obstructed eastern European modernization. The use of bloc resources to strengthen the Soviet economy contributed to the backwardness of all bloc economic sectors as did the national totalitarian political regimes. The properties of foreign oil companies in Romania were nationalized in 1948 under the aegis of

Sovrompetrol, a joint Soviet–Romanian company fastened on Romania in 1945 for the purpose of funneling oil to the USSR. Denied foreign capital and technology, neither of which the Soviets could (would) furnish, crude production fell during the late 1940s, reaching prewar levels only in 1953. Existing fields were pumped vigorously, but new drilling equipment was unavailable, exploration languished, and reserves declined.[22]

The captive resources of eastern Europe contributed to the diversification of a Soviet energy mix that moved toward a three-fuel balance during the 1960s (Table 4.5). Soviet oil exports, initially to bloc and allied countries, but then to the general world market, rose dramatically from the late 1950s through the 1960s, precipitating an adverse reaction from the USA and her allies. Americans, in particular, accused the Soviets of dumping oil in order to disrupt western markets and otherwise sow confusion and discord in the West. All of this reflected the impressive performance of the Soviet energy sector, accomplished partly at the expense of bloc members.[23]

The Soviets did not escape certain final costs. Dissidence in the leading bloc states forced concessions to national economic aspirations. Resources, notably oil, began to flow in large volumes from Russia to its partners. In the 1970s, Soviet officials complained loudly about the oil drain and fretted about the intrusion of western capital and influence. Such was the outcry that one would think that the captives had captured the captor.

The US energy mix

America's seemingly insatiable energy appetite developed well before World War II. Somewhat dampened by the depression and the war, energy use gathered momentum after 1945. Tables 3.1 and 3.2 documented the gross prewar trends. Although the USA share of world TPER declined steadily from 47 percent in 1929 to 40 percent in 1950 and 30 percent in 1970 (Table 6.1), America's share of world oil consumption remained above 60 percent in 1950, but had declined to 38 percent by 1965. To maintain this reduced share of oil use in 1965, Americans required 236 mmt more than consumed in 1950. Western Europe's total annual consumption only equaled 236 mmt in 1962. US *per capita* consumption of primary energy exceeded global *per capita* use by 7.6 times in 1929 and was still 6.6 times greater in 1970 (Table 6.4). Domestic production of primary energy supplied all but a fraction of TPER: 95 percent in 1950 and 91 percent in 1970.[24]

From 1945 well into the 1960s, as the mantle of US economic and military power enveloped the so-called free world, US energy and economic policies emphasized the cheapness and abundance of energy supplies.[25] American foreign policies focused intensely on the containment of international communism, exemplified by the Truman Doctrine, the Marshall Plan, the creation of the North Atlantic Treaty Organization, and the commitment of US forces in Korea. These strategies affected oil, but they were hardly oil-driven. Energy formed only one of myriad considerations during the presidential administrations of Truman, Eisenhower, Kennedy, and Johnson.

To mold a reasonable generalization that integrates energy matters with foreign policy, one must emphasize an unflinching dedication to anti-communism, global free trade, and free enterprise. In the view of American policy makers, the achievement of those *overarching goals* would benefit all American industries at home and abroad. Thus, the Truman Doctrine in serving notice to the Soviets that communist conspiracies would be strenuously resisted also reassured American investors of the security of their Persian Gulf properties. Nothing in this implied federal subservience to the MNOCs.

During and after the war, the USA adopted a conciliatory attitude toward both the Mexican and Venezuelan governments, the former having nationalized oil before World War II and the latter, in 1948–49 and again after 1958, maneuvering to obtain a better deal from the MNOCs. In these and other Latin American states, the US government refrained from applying full leverage to protect American firms from the nationalism of host governments. The USA, particularly after the Cuban Revolution in 1959 and the rise of Fidel Castro to power, dedicated itself to arrest the spread of communism even if this mandated recognition and support of governments that threatened foreign investments or that trod upon civil liberties. In Latin American and elsewhere, the USA responded passively to the nationalization of American interests. The USA exerted little influence over its multinationals and often remained uninformed of multinational policies until after the fact, as was the case in the Middle Eastern price cuts of 1959–60.[26]

After the war, the US government assigned energy policy a low priority and eschewed the formulation of a coherent national energy policy. Instead, successive administrations tinkered with energy on a fuel-by-fuel basis, only rarely considering the effect of any one fuel policy on the other primary energy sources. Efforts to deregulate natural gas succumbed to Truman and Eisenhower vetoes. That the artificially low natural gas prices fixed by the Federal Power Commission and by dozens of state and municipal regulatory bodies robbed the coal industry of markets, encouraged wasteful use of a premium fuel, and acted as a disincentive to the development of new reserves seemed

a matter of supreme indifference to everyone save the gas industry. Electricity remained highly regulated. Prices were kept low, partially by using cheap natural gas and fuel oil as boiler fuels. Electricity use shot upward; US *per capita* consumption rose from 1,136 kwh in 1937 to 5,947 kwh in 1965, 2.6 times greater than average EEC consumption.

Analysts of US energy policies have lavished especial attention on the emergence of the USA as a net oil importer after 1948 and on the imposition of voluntary oil import quotas in 1955 and mandatory quotas in 1959. Suffice it to remark here that quotas were adopted at the behest of the domestic oil industry and aimed at raising domestic production, stimulating exploration, and shoring up domestic prices, all of which, it was argued, were necessary to national security. A rare breed these quotas, perhaps the only fully implemented federal energy policy before the 1960s. This, rather than their intrinsic importance, may partly explain their magnet-like attraction for analysts.

Perhaps more important in the long run, defense considerations stymied research on the peaceful application of nuclear energy until President Eisenhower's Atoms for Peace address at the UN in 1953 partially raised the lid of secrecy. This new tack encouraged the private sector and the Atomic Energy Commission to cooperate in research and development. While private sector markets for nuclear reactors failed immediately to materialize in the USA or in Europe, the new policy did promote bilateral agreements and led to subsequent payouts. Prior to the speech, the tightly veiled nature of atomic research fostered the pursuit of dead ends and less efficient reactor technologies. By the mid-1950s, the USA, France, Britain, and the USSR were committed to their own schemes, as Canada and Sweden would be soon after. Once the USA adopted a policy of promoting nuclear power it pursued this goal without regard to its impact on coal, with inadequate attention to reactor safety and siting, and with callous indifference to the inevitable need to dispose of irradiated waste and obsolete equipment.

Great publicity and ballyhoo attended the "freeing" of nuclear energy for peaceful uses. The American public, however, received little information about costs, about federal subsidies, about the concentration of research funds and knowledge in very few firms, about who should own and pay for nuclear plants, or about safety and environmental impacts. Scientists and government officials in the USA and elsewhere apparently believed the general public incapable of understanding such complex technical issues.

The forces governing the energy mix of the USA were well recognized prior to the war. Coal's share declined after World War I as oil and

natural gas use spread. This process was essentially complete by 1955 (Table 4.5). Overall, the US energy mix reflected the domestic availability of fossil fuels and consumer preferences for gas or oil rather than coal, choices abetted by gas prices that were fixed too low and by access to cheap oil. The absence of focused energy policies in the USA encouraged results similar to the more comprehensive policies of European nations, that is a growing dependence upon oil imported from potentially insecure countries and a coal industry in disarray.[27]

The energy mix of the lesser developed countries (LDCs)

Dozens of former colonial peoples trod the exhilarating but painful path to independence after World War II. Other peoples, possessed of sovereignty for generations, as in Latin America, labored under economic, social, and political disadvantages hardly less burdensome than those shouldered by the recently liberated. In some countries, Indonesia and Algeria for example, independence only came as a result of bloody revolutions. In few places did independence pour forth the sweet fruits of economic prosperity and political stability. Decades, if not centuries, of exploitative colonial rule had not prepared the newly free nations for the competitive conditions of the modern world. Internal divisions, based on class, race, and tribe, precluded the evolution of political stability and spawned recurring coups and counter-coups. Overwhelmingly rural and agricultural, engaged in primitive, subsistence farming, enmeshed in a colonial economy even after independence, with high fertility rates and declining death rates unaccompanied by the creation of sufficient employment, these peoples remained mired in abject poverty.

The energy mix of the LDCs reflected their economic backwardness. Indonesia, with significant oil reserves, depended in 1970 upon non-commercial (organic) energy sources for 75 percent of its total energy requirements, a proportion that remained over 50 percent in 1982. Brazil, energy dependent, consistently used non-commercial fuels for over 30 percent of TPER from 1970 through 1982, a share that exceeded 50 percent until the mid-1960s. In 1970, India relied on traditional organic fuels – wood, cow dung – for 90 percent of its energy and managed to reduce that figure to 70 percent by 1983.

Raising the *per capita* consumption of commercial energy necessitated the introduction of new technologies, both large and small. More easily accomplished in urban areas than rural, LDC governments naturally focused their efforts on the cities, foolishly permitting rural

areas to stagnate. Nothing seemed to work. Shortages of funds, ignorance of technologies, autocratic governments, landed elites, a smothering illiteracy, and on and on, obstructed steady progress. Within each LDC a few benefited from modernization, but most did not. Rural villagers unable to make a living on their small plots fled to the permanent unemployment and cultural despair of life in Lagos, São Paulo, or Manila.[28]

The wealthy nations of the West provided insufficient development aid via bilateral arrangements or through such institutions as the International Bank for Reconstruction and Development (World Bank) and the International Monetary Fund. The World Bank preferred to support giant projects when less complex and smaller-scale technologies might have been more suitable. Into the 1970s, the World Bank refused to lend money to national oil companies, always advocating development through private enterprise. Neither India nor Brazil, seeking a modicum of oil independence through state ownership of production and refining, were able to secure financing from the West. Electrification efforts in the LDCs received support if the utility was privately owned, which usually meant that it was a subsidiary of a British or American holding company.

For the most part, the energy importing LDCs remained captive markets for the MNOCs. India, countries in West Africa, and other LDCs entered into importing and refining agreements with the MNOCs when weak and ignorant of the oil industry. Competition was eliminated and prices kept high. India's effort to break this stranglehold by building national refineries and importing Soviet oil at cheaper prices encountered stiff MNOC resistance. The question for India (and other LDCs), as Dasgupta suggests, was the binding nature of agreements concluded when India possessed neither knowledge nor leverage and which fastened disadvantageous terms on the nation.

During the 1950s, a mixed response to that question emanated from the LDCs. Iran answered with a resounding "no" and nationalized the oil industry in 1950. This step was not emulated by other Middle Eastern nations. Host government resentment smoldered for a time. Latin American states waffled, motivated on the one hand by nationalistic pressure for state control over resources and key economic sectors, and, on the other hand, by a persistent and increasing need for foreign capital. India forced the American & Foreign Power Company to relinquish control of its electric plants; confiscations occurred in Colombia and Argentina. By 1960, national oil companies in Latin America operated in Colombia, Peru, Uruguay, Venezuela, Argentina, Bolivia, Chile, and Mexico.[29] A stiff and ill-wind blew into the face of the international energy companies.

The post World War II oil boom

Into the 1960s American and British commentators on oil affairs wrote with exuberant optimism of the fantastic upsurge in oil consumption and of the performance of the oil companies in filling that demand. Observers were particularly attentive to the benefits bestowed by the MNOCs upon the producing nations in the form of wages and social and welfare services. This positive appraisal was dampened only by an amorphous fear of Russian aggression in the Middle East and distrust of producing government intentions regarding concessionary terms.[30] Non-westerners penned less charitable assessments of western and MNOC policies in the Middle East, questioning their motives and their performance and accusing them of ignorance of and indifference to the aspirations of producing states.[31] To such criticisms, the MNOCs responded by emphasizing the sanctity of contracts, the Russian menace, and the inability of host states to manage an industry as complicated as oil.

For a time after World War II, the industry's impressive growth deflected criticism. Global withdrawals more than doubled from 1945 to 1955 and almost doubled again by 1965 (Table 4.6). As Table 4.2 demonstrates, oil ruled global energy exchanges after the war. The 53 percent of total oil production exported in 1960 equaled 87 percent of total energy exports and was accompanied by a dramatic transformation in national roles.

Oil production in the USA declined from 52 percent of world output in 1950 to under 20 percent after 1970. In 1973, the USSR surpassed the USA as the largest producer. US liftings, although rising, were inadequate to domestic demand. Formerly the leading exporter, the USA became a net importer in 1948. By 1960, US exports and imports of oil formed 2 percent and 21 percent, respectively, of the world total. Simultaneously, America's production-reserve ratio fell off again after 1958, following a trend visible since World War I. Oil lifted from the well-worked American fields cost much more per barrel than oil taken from Venezuela or the flush fields of Saudi Arabia or Kuwait. From 1953 to 1962, a $42 billion investment in domestic fields added 4 billion metric tons to reserves; in the Middle East, an investment of $2 billion added over 19 bmt.[32]

While domestic American producers inveighed against New Deal production regulations, the rising costs of exploration and production, and the competition of cheaper foreign oil, the MNOCs focused their efforts overseas. The average daily output of a Middle Eastern well reached 3,860 barrels in 1958 compared with 250 in Venezuela and 12 in the USA. Middle Eastern fields produced 28 percent of world

production in 1965, compared with 7 percent in 1938. Those fields contained 61 percent of world proven reserves. Kuwait, Saudi Arabia, Iran, and Iraq, each the preserve of a consortium of MNOCs, led the way (Table 4.6), exporting, in 1960, 233 mmt of oil, or just over one-half of all oil moving in international trade.[33]

Venezuela reigned as the premier oil producer in Latin America, with Mexico a distant second (Table 4.6). Venezuela produced 80 percent of Latin American oil in 1960 and accounted for over 90 percent of regional exports, a large portion in the form of crude transfers to refineries in Aruba and Curacao. Regional demand for oil was far greater in Latin America than in the Middle East; thus a rising proportion of oil remained in the region after World War II. The most marked trend, however, was the growing global marginality of Latin American oil. Between 1950 and 1960, the volume of Venezuelan oil entering the USA rose by over 8 mmt, but the share fell from 69 percent to 51 percent. The Middle Eastern contribution rose from 21 to 30 percent. The position of Venezuela in the US market suffered further attenuation in subsequent years. In Europe and Latin America, competition from cheaper Middle Eastern oil steadily eroded Venezuelan sales during the 1950s and thereafter. Within the region, oil producing but importing nations such as Argentina, Brazil, and Mexico strove to reduce oil imports by developing production capacity. Only marginally successful, they shifted from Venezuela to the Middle East for oil. Brazil, by 1960 the region's largest importer, trimmed its purchases from Venezuela by 25 percent during the 1960s while quadrupling its imports from the Middle East. The shift away from Venezuela intensified during the 1970s.[34]

Following World War I, an outraged western oil industry had watched helplessly as the Soviet Union nationalized its oil industry, refused to compensate former owners, and revitalized the industry in the face of invasion, civil war, and boycotts. Soviet oil production plummeted during World War II but recovered quickly, increasing by 3.4 times from 1945 to 1955 and more than doubling again by 1960 (Tables 2.7 and 4.6). New fields discovered in the Volga–Urals region and developed at great expense supplied 58 percent of total production in 1955 and 71 percent in 1965. Pushing further east into the incredibly difficult topography of the Siberian and Central Asian fields challenged the technological capabilities of the nation during the 1980s. Despite severe obstacles, Soviet exploratory drilling, accounting for some one-third of total oil industry investment, added substantially to Soviet reserves. By 1983, Russia held three times the reserves of the USA and 13 percent of world reserves.[35] The reappearance of Russian oil in western European markets in the 1950s, reflecting production successes and foreign exchange needs, caused consternation within some circles of NATO. What were Soviet intentions?

The multinational oil companies

In 1965, western Europe, the USA, and Japan purchased two-thirds of the $17.9 billion in mineral fuels entering world markets, receiving 598 mmt of oil compared with 191 mmt in 1955. OPEC members sold 51 percent of the value of fuel. Fully integrated MNOCs produced, refined, and marketed virtually all of the oil sold by OPEC states and others, excepting the USSR.[36]

The eight firms appearing in Table 4.7 lifted some 165 mmt in 1950, a volume constituting 85 percent of world producton, excluding the USA, Canada, the Soviet bloc, and China, and 100 percent of Middle Eastern, Indonesian, and Venezuelan production. Table 4.7 summarizes the non-US production and refining shares of the MNOCs. Although their portion gradually narrowed, the MNOCs retained a strong predominance. SONJ produced 74 mmt in 1950 (14 percent of world total) of which 50 mmt originated outside of the USA. SONJ's global share equaled 13 percent in 1965. SONJ, BP, and RDS produced 71 percent of non-US oil in 1950 and 56 percent in 1966 while the remaining five listed in Table 4.7 withdrew 23 percent in 1950 and 44 percent in 1966. As of the late 1950s, these MNOCs sat on 92 percent of proven reserves, owned 75 percent of world refining capacity, and marketed over 70 percent of oil products.

The MNOCs retained the organizational configuration described earlier, adding to it as units were created to reflect entry into new concessions or marketing areas.[37] The MNOCs listed on Table 4.7 wielded enormous financial strength, owning almost 40 percent of world fixed assets in petroleum of $97.2 billion in 1960, of which SONJ accounted for $10.6 billion. While SONJ's share of global fixed assets declined, the value of its holdings doubled from 1950 to 1960. To the assets of these giants could be added those of five additional firms, four of which were American—Standard Oil of Indiana, Phillips Petroleum, Continental Oil Co., and Marathon Oil Co.—and one, Petrofina, a Belgian firm. Together these five possessed assets worth $10.1 billion in 1966, $3 billion less than SONJ reported for that date.[38]

Investments in the petroleum industry soared after World War II (see Table 3.8 for US direct investments abroad). Annual total investments of $2.7 billion in 1946 reached $8.2 billion in 1955, for a ten-year total of $56.2 billion, of which the US oil industry received $38.1 billion. US direct investments abroad from 1946 to 1960 rose from $7.2 billion to

Table 4.7 MNOCs' shares of crude production and refinery throughput, 1950–66 (million metric tons)

	1950		1957		1960		1966	
	Production	Refining[2]	Production	Refining[2]	Production	Refining	Production	Refining
SONJ	50	38	79	67	96	88	158	150
BP	40	30	50	30	75	45	125	80
Shell	23	44	61	79	80	97	120	137
Gulf	20	3	51	8	59	15	89	29
Texaco	10	20	24	25	40	33	72	58
SOCAL	10	6	26	13[3]	28	16	74	26
Mobil	6	5	17	15	29	22	48	42
CFP	2	na	9	na	na	na	36	na
Above total[2]	165	146	317		407		722	
Percentage of production[1]	100		100					
Percentage of production[2]	85	72	81	68	72	53	76	61

[1] Including Iran, Iraq, Saudi Arabia, Kuwait, Qatar, Indonesia, and Venezuela
[2] Excluding USA, Canada, USSR, eastern Europe, and China except where otherwise noted
[3] Eastern hemisphere only

Sources: Constructed from data in E. Penrose, ed., *The Large International Firms in Developing Countries: The International Petroleum Industry*, London, Allen and Unwin (1968), pp. 78, 98, 107, 115–33, and M.G. Adelman, *The World Petroleum Market*, Baltimore: The Johns Hopkins University Press for Resources for the Future (1972), pp. 80–1.

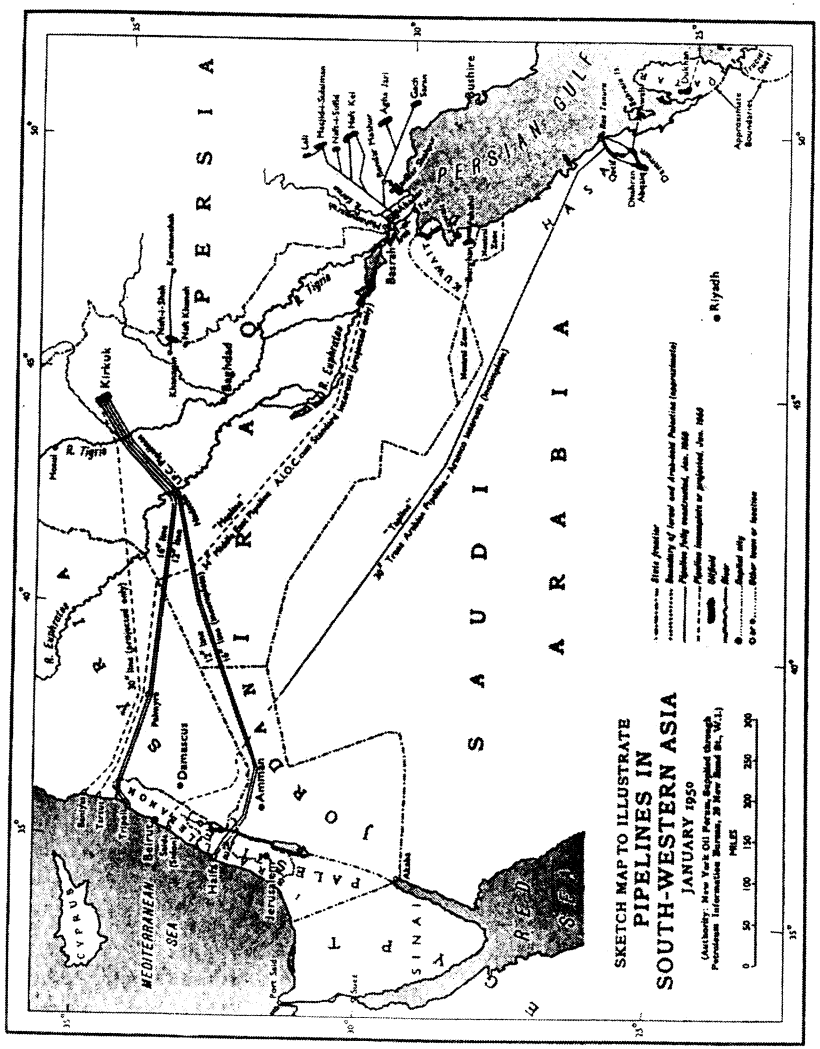
$31.8 billion with petroleum's portion climbing from 15 to 34 percent and reaching $10.8 billion in 1960. Then, from 1955 to 1970, the industry invested some $215 billion in the search for and marketing of oil. The share devoted to production in the USA fell off sharply in response to more lucrative opportunities elsewhere.

The investments of individual MNOCs cannot be tabulated but reference to capital expenditures hints at their magnitude. From 1950 to 1966, SONJ's capital expenditures totaled $13.9 billion out of a net income of $21.8 billion. Standard's income–expenditure ratio averaged 0.63 over that period, reflecting its self-financing capability and its low long-term debt, a characteristic of other giant oil companies as well. In 1960, the firms listed in Table 4.7 provided 30 percent of a total global oil investment of $10.8 billion.[39]

Suffocation by numbers? Perhaps! But such figures, at the least, capture the essence of aggregate and individual Big Eight dominance. Few observers, excepting oil industry officials and inveterate advocates of giant enterprise, perceived such control of the industry as a natural consequence of economies of scale and as a boon to consumers.[40] Adelman, Al-Otaiba, Leeman, Luciani, Odell, Penrose, among others, each specified the political and institutional forces that permitted the evolution of such concentrations of power in the oil industry.[41]

Historically, the early concessions in Latin America and the Middle East resulted from the application of overwhelming US and European economic and political pressure on the weak governments in those areas. Ruling cliques in Turkey and Persia (and then Iraq and Iran), Saudi Arabia, Venezuela, and Mexico, entranced by visions of immense royalties and other payments, turned the national patrimony over to foreigners on terms wholly favorable to the MNOCs. Furthermore, western governments deliberately fostered the emergence of such giant firms as AIOC and RDS. In the USA, anti-trust legislation and occasional anti-trust indictments failed to retard industrial concentration at home or abroad. Rarely were American MNOCs inconvenienced by anti-trust proceedings. In an oblique way, then, the US government fostered the evolution of the highly concentrated structure of the post World War II oil industry.

Into the 1950s, Big Eight concessions in the Persian Gulf encompassed the entire producing area with the only significant deviation occurring in Iran as a result of the revolutionary turmoil of the early 1950s. The concessionary status in 1950 was as follows: Iran, AIOC with 100 percent; Iraq, IPC, a consortium of all the firms listed in Table 4.7 except Texaco, Gulf, and SOCAL with 100 percent; Kuwait, divided between Gulf and BP; Saudi Arabia, exploited by Aramco, a joint venture of SOCAL and Texaco (the original partners) and SONJ and



Map 4.1 Middle Eastern pipelines, 1950. (*Source:* Olaf Caroe, *Wells of Power: The Oilfields of South-Western Asia. A Regional and Global Study*, London: Macmillan (1951), facing p. 94. Reprinted with permission.)

Socony–Vacuum (soon Mobil); and Venezuela, where SONJ, RDS, and Gulf accounted for 78 percent of production.

The production and marketing capacity of each MNOC determined its attitude toward consortium participation. SOCAL and Texaco, awash with Saudi oil, gained stability and much needed capital by taking in SONJ and Socony–Vacuum. SONJ's agreement with AIOC to purchase a large volume of crude over twenty years defused AIOC's opposition to the expansion of Aramco. The Gulf–BP partnership in Kuwait protected each from the market competition of the other. In 1947, Gulf and RDS negotiated a contract in which the crude-long Gulf produced huge quantities for the crude-short RDS. The latter refined and marketed that crude and the two divided the profits evenly. As RDS and BP already marketed jointly, RDS functioned as a *de facto* partner in the Kuwait concession. No less than the Aramco relationship, the Kuwait arrangement and other market sharing agreements constrained competition in many parts of the world.[42]

The MNOCs also controlled the transportation of crude by tanker and pipeline with almost 90 percent of carrying capacity owned by the Big Eight. A spectacular expansion of total tanker tonnage and in the size of tankers occurred after World War II. By 1960, deadweight tonnage reached 64 million long tons and tankers of over 100,000 dead weight tons (dwt) were being launched. Pipelines such as Aramco's Tapline, connecting Saudi Arabia and the Mediterranean, were completed. Some 65 percent of Middle Eastern oil moved toward Europe via the Suez Canal and the Mediterranean pipelines, routes vulnerable to closure by the transit states. The remaining 35 percent was shipped via the Indian Ocean. Into the 1950s, the MNOCs successfully thwarted penetration of this near monopoly. A Saudi Arabian scheme to create a national tanker company fell afoul of Aramco opposition. The MNOCs successfully repelled producing state efforts to enter downstream operations until the 1970s.[43]

Consortia and contractual arrangements afforded each MNOC member intimate knowledge of the operations of its partners and greatly reduced the possibility of an intra-Big Eight oil war. The MNOCs, an oligopoly, globally, but exercising monopolistic power in the Persian Gulf fixed the revenues of producing states by controlling liftings and by defending a price structure that served their collective interests. The American multinationals justified their performance through recourse to free market arguments. Few, outside America, believed them.

The hegemony of the MNOCs did not go unchallenged during the 1950s and challenges intensified during the 1960s. Independent oil companies such as Continental and Phillips sought concessions in Libya and other newly discovered oil fields. Long on crude but short on markets,

partly as a result of the US import quotas, the new producers competed with the MNOCs in Europe. State oil companies proliferated after World War II, following the precedent of Argentina, France, and Mexico. Some, such as Italy's Ente Nazionale Irdocarburi (ENI) sought concessions in the Middle East. With government encouragement and protection, Japan launched an exploration venture in Saudi Arabia that discovered a rich field in 1959. French state companies monopolized production in colonial Algeria. National and private sector firms slowly whittled away at MNOC control over production. But the most dire threat to MNOC monopoly originated in the key producing states. At first demanding a larger financial share from their oil wealth, they next asserted their right to equal participation in their oil industry, and eventually asserted full control over all phases of the industry.

The price of oil

In 1959 and 1960, the MNOCs unilaterally reduced the posted price of crude. This radical step followed several years of selling at concealed discounts from the posted price. The price cuts, inimical to the interests of Middle Eastern producers and to Venezuela whose revenues were linked to the price of oil, precipitated the formation of OPEC.

Free market theorists and MNOC officials offered a market-driven explanation for crude oil production and prices. They argued that supply (and the exploratory endeavors undergirding supply) and price, its minimum level determined by the cost of production, fluctuated in conjunction with the demand of the moment. Producers, attuned to market logic, would always produce the next barrel of oil that had a purchaser. Because substitutes for such products as motor fuels and lubricants were lacking, the price elasticity of oil was low. The purchaser would always be there. Refiners, for instance, ran at full capacity regardless of price. Consumers lacked the flexibility of energy substitution. Inherent to this interpretation was the operation of a free market in which competition moderated price. Producers, whether private sector or state, set prices rationally to reflect supply and demand factors rather than establishing prices that conformed to institutional, political, or ideological imperatives.

A free market in oil has never existed. Posted prices,* a convention invented by Rockefeller's Standard Oil Company, were only loosely related to actual costs of production which were only imperfectly

* Posted prices, set by the largest producers of crude, established the price buyers would pay for crude. The dominant buyers were also the largest producers.

known. The old Standard Trust utilized prices to drive competitors from business. The posted price system evolved into the Gulf-plus system whereby MNOCs fixed the price of internationally traded oil at the price of US Gulf Coast crude plus the cost of delivery from the Gulf. The landed cost of Persian Gulf oil to Japan equaled the price of more expensive Gulf Coast oil shipped over a much greater distance. The Gulf plus system, adopted at Achnaccary in 1928, prevailed during a time of weak and unorganized opposition to the MNOCs and when the US served as the world's leading exporter. However serviceable to the MNOCs, the Gulf system did not reflect market-driven pricing.

The Gulf system collapsed under the pressure of exploding Middle Eastern production and the transition of the USA from exporter to importer. The cost of Middle Eastern production rose less rapidly after World War II than production costs in the USA and then actually fell. The disassociation of Middle Eastern crude prices from Gulf prices quickly followed, matching the interests of the MNOCs who imported Middle Eastern oil into the USA and somewhat reducing import costs in Europe and Japan. But the abandonment of the obsolete Gulf system did not usher in an era of free market prices. It was simply replaced by a new system that conformed to MNOC interests.[44]

Price inelasticity favored the producers who were also the transporters, refiners, and marketers. The MNOCs, frequently partners in production and marketing, manipulated production within their concessions and avoided price competition in world markets. The price of Middle Eastern crude during the 1950s fluctuated in response to the institutional needs of the MNOCs, but always guaranteed the companies an immense profit per barrel as production costs declined and liftings rose. The cash dividends of SONJ rose by 145 percent from 1950 to 1956 and by another 66 percent over the next decade while RDS's cash dividends tripled between 1955 and 1966. After the war, posted crude prices peaked in 1947 at $2.20 per barrel and did not again reach that level until 1971. Between those anchor years, prices first fell through 1952, rose in response to the Iranian Crisis, the Korean War, and the Suez closure, fell in 1959–60 and then held firm at $1.80 per barrel from 1960 to 1970.[45] But posted prices from the mid-1950s through the 1960s inaccurately defined the price paid for oil.

The great bulk of Middle Eastern and Venezuelan crude passed to affiliates of the producing unit at a nominal, book-keeping, price that corresponded with the posted price of the moment. This price was not meaningful since the holding companies manipulated the book returns of downstream affiliates to meet corporate interests. Increasing quantities of oil were sold on long-term contracts to other MNOCs, an example being the Gulf–RDS contract noted above. Large discounts

from posted prices characterized these sales. Spot market (open or arms length market) prices also diverged radically from posted prices, perhaps by as much as $0.35 to $0.50 per barrel. When independent oil companies became significant players in international markets, discounting became rampant, a practice further encouraged by the appearance of cheap Soviet oil and by the imposition of import quotas by the USA. Posted prices, then, were artificially high. They failed to reflect other price-shaving devices such as freight rate bargains that also lowered the terms of sale. Through the 1950s, the MNOCs jealously protected their power to manage prices.

Until the 1970s, most oil moved under contract. As ascending independent production sought buyers, spot markets for non-contract oil became more important. The largest spot market emerged at Rotterdam, the point of entry for crude purchased by an enormous number of giant refiners and other processors. With the breakdown of the old pricing system and the capture of the MNOCs by the producing countries—part of the drama of the post-1973 years—spot market prices became the key determinant of contract prices.

The subtle tactics employed by a handful of firms impinged hardly at all on the final price of oil products (minus such variables as import duties or excise taxes) relative to which there was little real competition. Shell and Esso (SONJ) regular gasoline cost the same within any given market area and were of equivalent quality. In uncontested markets, often uncontested because of an agreement among particular MNOCs, product prices were notably higher than in contested markets. Crude oil in Saudi Arabia and Kuwait could be produced at $0.10 per barrel compared with $1.51 in the USA, yet US crude prices in the 1950s were only $0.40 to $0.60 per barrel higher. Obviously, the MNOCs enjoyed great latitude in determining the posted price. The internal needs of the firms and agreements between firms provided criteria for establishing prices. An internal logic prizing stability and order prevailed over a market logic seeking enlarged market shares through price competition.

The MNOCs, as producers of the crude they bought, decided the timing and the dimension of price changes. From 1954 to 1960, world oil production jumped from 697 mmt to slightly over 1 bmt, an increase in volume almost two times larger than the increase from 1948 to 1954. As production surpassed demand, the US import quotas, said to restrict supply in that market, and Soviet exports exerted competitive pressure, especially in the European market. Companies new to international trade sought and gained concessions throughout the Middle East. The MNOCs reacted to the future threat of that production. Slack demand prompted the MNOCs to lower the posted price of Middle Eastern and Venezuelan oil in 1959 and 1960 without consulting the host governments, a grave error as it turned out. Outraged producing states quickly formed OPEC. Host governments, whose revenues were linked to posted prices, complained bitterly and concocted plans to restore revenues by gaining a larger share of oil wealth. This was the first step to wholly dispossessing the MNOCs.[46]

Trends in marketing to 1960

The oil markets of the USA, western Europe, and Japan absorbed two-thirds of world oil exports in 1955 and over three-quarters in 1965. The UK, France, West Germany, and Japan, lacking domestic production, contrived to reduce the cost of imports by developing a refining industry that met domestic needs. The USA engaged in a rancorous debate over the national security implications of foreign oil imports.

Demand for oil accelerated so sharply in the USA after World War II that imports exceeded exports in 1948. By 1959, net imports of 90 mmt equaled 18 percent of total demand. Refined products composed 44 percent of total imports, the larger part refined in the Caribbean refineries of MNOCs from Venezuelan crude. Venezuela crude accounted for 47 percent of crude imports and Middle Eastern for 30 percent. In 1950, virtually all of this oil was shipped by US MNOCs to their American affiliates for refining and marketing. SONJ and Gulf accounted for 41 percent of total imports in 1950. Eight other major firms shared 57 percent. By 1957, a number of new firms had entered the importing business, shaving the portion of the ten largest MNOCs to 64 percent.

In America, the high cost independent domestic producers and refiners without access to foreign oil bitterly opposed this invasion, charging the MNOCs with conspiracy to drive independents from the market. The coal industry jumped into the fray, blaming enormous dollar and tonnage losses on imported oil dumped at cutrate prices into coal's traditional markets. Skillfully appropriating the national security argument, the independents struck a sensitive nerve, as the Eisenhower administration was agonizing over the implications of the Iranian Revolution, the Suez closure, the Soviet threat in the Middle East, and Arab antagonism toward the US–Israel connection. These considerations, far more than independent rhetoric about MNOC conspiracy, convinced the Eisenhower administration that domestic production, the only truly secure source, demanded protection. Initially eschewing compulsion, the administration implemented voluntary import quotas which operated ineffectually from 1956 to 1959. A mandatory system went into effect in 1959.[47]

While the US market for imported oil increased by two times from 1955 to 1965, western European imports tripled and those of Japan multiplied by eight times. Within Europe, the UK, West Germany, France, Italy, and the Benelux states accounted for about 90 percent of imports. As noted earlier, western Europe developed a large refining complex during the 1950s so as to shift from costly refined imports to cheaper crude imports from the Middle East and thus realize significant savings in import bills. The USA possessed 55 percent of refinery capacity in 1952 and 39 percent in 1960; western Europe's share improved from 11 to 18 percent. By 1970, Europe's refining capacity accounted for 28 percent of world capacity, compared to 25 percent for the USA. In the non-Soviet bloc and non-US world, the MNOCs listed on Table 4.7 owned 67 percent of capacity. Into the late 1960s, those MNOCs handled an only slightly smaller percentage of total crude runs. European nations depended upon the MNOCs for initial refinery construction, employing a variety of tactics to induce MNOC cooperation.

West Germany did not intervene in the domestic oil market until the mid-1960s when it sought to mitigate the effects of oil use on its coal industry. France employed state power in all energy sectors. French regulations stipulating that foreign marketers obtain at least 90 percent of their product needs from local refineries compelled the foreign firms to build refineries in France. Import licenses and quotas protected CFP's share of the French market. France also attempted with minimum success to induce foreign refiners to increase crude oil purchases from the franc zone. Whether in response to these directives or not, French refining capacity expanded by 180 percent from 1955 to 1965. Britain permitted BP, RDS, and SONJ to expand refining at their own pace. UK refining capacity more than doubled between 1952 and 1960, doubling again by 1970. RDS, BP, and SONJ owned 98 percent of refinery capacity into the 1970s.

Britain's refiners developed substantial product markets in western Europe, particularly in West Germany, Sweden, and Italy, and in Japan. Three MNOCs divided Britain's market while many more sought German customers. In these markets, crude and products originated for the most part with MNOCs who engaged in product competition but evinced little interest in active price competition.[48]

Refining and marketing in postwar Japan evolved under the self-interested supervision of the USA. Policies were imposed that guaranteed US firms a substantial share of the product market and which endowed the US MNOCs with the right to supply the crude needs of the refineries jointly owned by the MNOCs and Japanese firms. As a result,

about 80 percent of Japanese crude imports were supplied by US MNOCs. Ultimately, Japan reduced its foreign exchange drain by developing the refining sector. Remarkable growth occurred upon termination of the occupation. A capacity of 10 mmt in 1955, smaller than Iran's Abadan refinery, attained 88 mmt by 1965, inferior only to the USA and the USSR. By 1960, four of Japan's largest refineries were wholly owned by nationals. During the 1960s, the government intervened directly to bring all phases of the petroleum industry under comprehensive regulations and to develop Japanese-controlled foreign oil fields. Spectacular success eluded the latter strategy; only 10 percent of Japan's oil imports originated from its Saudi Arabian concession in 1974. Japan remained dependent upon Middle Eastern oil sold by MNOCs.[49]

Cold War jitters assured a paranoid reaction to the appearance of Soviet oil in western markets. Between 1951 and 1959, Italy, Sweden, Greece, Austria, India, and Japan received Russian oil, amounting to about one-half of Soviet exports. Altogether, Soviet exports to the West constituted about 5 percent of world imports, but in the eyes of the US government the implications loomed larger. Some foresaw dumping of cutrate Soviet oil to disrupt western firms and damage western economies. Others perceived Soviet oil as a weapon to divide NATO. As interpreted by H. Williamson, Soviet oil exports reflected the "everpresent possibility of a Russian attempt to undermine the free world petroleum industry."[50]

A simpler and less conspiratorial explanation for Soviet exports suffices. The Soviets produced a surplus and they needed foreign exchange in order to finance the purchase of machinery and technology. Western Europe required oil and responded favorably to offers from the Soviets. To the French or Italians, particularly after the Suez Crisis of 1956, the USSR appeared a more secure source of supply than the Middle East. Moreover, the importers wished to diminish their dependence upon the American MNOCs. Thus, the exchange offered benefits to both parties.

Soviet oil sales corresponded with a general improvement in western European trade with the Soviet bloc. However, the USA, during the John F. Kennedy presidency, succeeded in gaining the cooperation of its NATO allies in reducing the trade of strategic items to Soviet countries. Europeans lacked enthusiasm for this policy and frequently circumvented it. Soviet oil sales, at low but not giveaway prices, contributed to the pressures that prompted the MNOCs to reduce their posted price in 1959–60. That single act disrupted the oil industry in the Middle East more than anything done or contemplated by the USSR.[51]

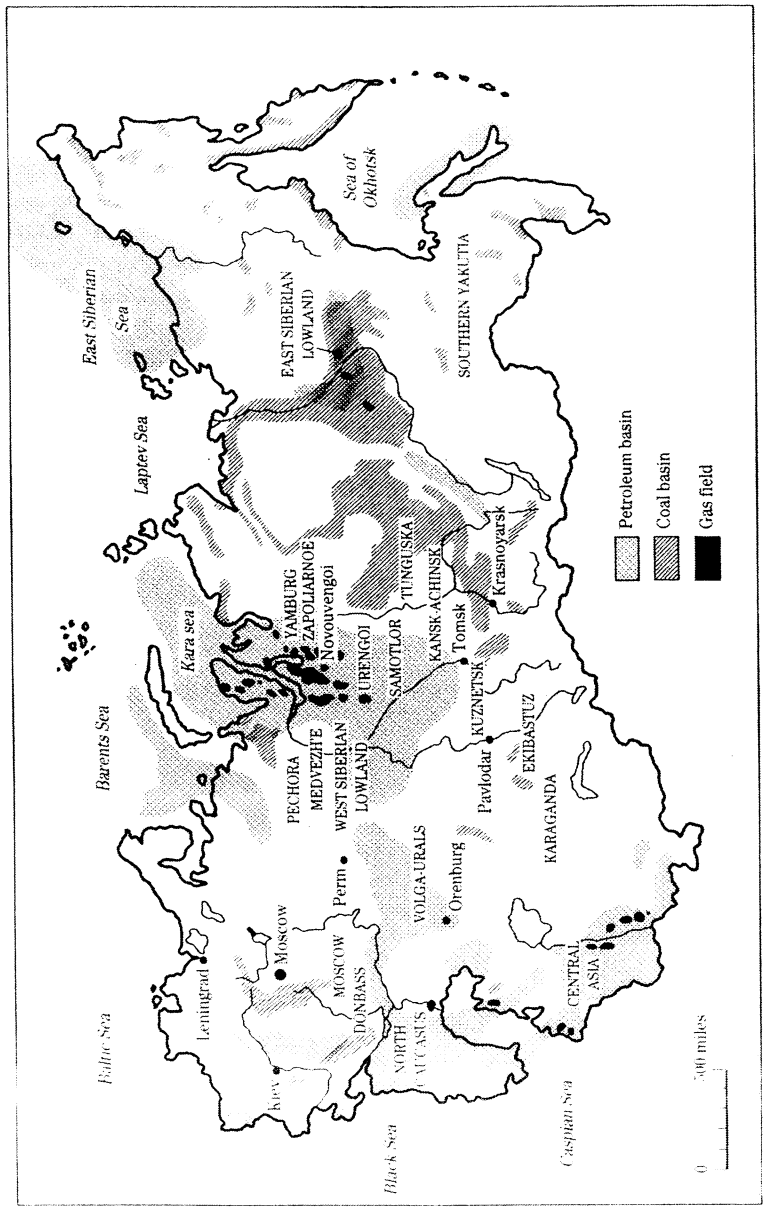
The discontented producing LDCs

The MNOCs obtained the bulk of their oil after World War II from societies caught in a vortex of nationalistic fervor. The major producing states of Iran, Iraq, and Saudi Arabia, nominally independent but virtual dependencies of Britain before the war, cast off that inferior status and pursued their own national and regional goals. Elsewhere in that region, Kuwait and future producing states in north Africa would achieve independence by 1962. Algeria won its independence through armed struggle, as did Indonesia. Long established and fully independent states such as Venezuela and Mexico struggled to assert their national rights against the economic and political might of the USA.

Autocratic Middle Eastern regimes, frequently claiming an ancient heritage, sought to absorb the proto-nation into the regime or dynasty. Unlike the nations of Latin America, Middle Eastern states lacked strongly articulated demand for political democracy. Other imperatives moved those governments, none exciting fervor equal to anti-Zionism which must be considered an intrinsic component of their nationalism. Entrenched and apparently powerful regimes in the Middle East—Iran, Egypt, Iraq, Libya—disintegrated in a nationalist and anti-Zionist whirlwind, replaced by equally autocratic, if secular, strongmen. These regimes all escalated their demands against the oil companies. So, too, did the intermittent democratic governments of Venezuela. It was the totalitarian cliques in Venezuela that courted and feted the MNOCs.

Middle Easterners perceived the MNOCs from a different perspective than Latin Americans. In part, the distinction stemmed from cultural factors, in part from developmental potential and objectives. Most important, the MNOCs and the USA stood condemned in the Middle East as the allies of Zionism. In Latin America, democracy's advocates identified the oil oligopoly as hostile to free government and national goals. National self-interest, however defined by the contending political groups in Latin America, determined policies toward the multinational corporations. Transnational loyalties in the Middle East and inward-looking nationalism in Latin America, as well as economic markers, targeted the adversary.

The special requirements of economic modernization in Latin America and the Middle East clashed with political and ideological realities. Americans and Europeans lived in societies that recognized the primacy of private property, of contracts, and of individual rights. The peoples of Latin America and the Middle East exalted other values. Expropriation and nationalization strengthened the collectivity and asserted national sovereignty. However much those peoples were oppressed and exploited by their rulers, however meagerly



Map 4.2 Soviet energy fields. (*Source*: E.A. Hewitt, *Energy, Economics, and Foreign Policy in the Soviet Union*, Washington, D.C.: Brookings Institution (1984), p. 30. Reprinted with permission.)

nationalization advanced standards of living for the masses, the act was a legitimate expression of national integrity. This final solution might also be essayed prematurely, the child of ideological compulsion rather than rational economic calculation.

From the perspective of the MNOCs, the birth of Israel in 1948 and its quick recognition by western governments loomed as events designed to subvert their carefully nurtured dominance in the Middle East. Distancing themselves from Israel by abandoning her as a terminal for a Persian Gulf–Mediterranean pipeline and as a market or by not assigning Jews to jobs in the producing countries left unresolved the larger question.[52] Would Arab hatred of Israel and the equation of Zionism with imperialism drive Middle Eastern governments to acts that contradicted their economic interests?

The Arabian Peninsula producers evolved an agenda after 1948 that balanced precariously between demonstration of ardent anti-Zionism and the exigencies of national economic development. Whichever way policy tilted, furthering this agenda conflicted with the status quo. From 1948 through the Suez War of 1956, a tilt first in one direction and then in the other occurred, but for the most part the essence of Arab oil policy resembled the programs of Venezuela and Indonesia. Producers demanded as large a share of proceeds from oil as was politically realizable at a given moment, pressing forward step by step toward that day when full operational control could be established. At issue were rates of withdrawal, exploration, concessionary terms, including economic rents, pricing, the training of local personnel, and downstream development.

Oil nationalism emerged prior to World War I, achieving some successes during the interwar years, particularly in Argentina and Mexico, but serving in Iran and Iraq and the new producing states of Saudi Arabia and Kuwait largely as rhetorical devices. The AIOC and IPC as well as SONJ and RDS in Venezuela and Mexico asserted the sanctity of long-term concessionary contracts while accepting the necessity of renegotiating royalty and tax formulas and acknowledging host state ownership of sub-surface minerals. MNOCs admitted the theoretical right of nationalization at the conclusion of a concessionary contract but did not anticipate such results. Mexican nationalization failed to instill in the MNOCs a sense of foreboding or even of caution.

From 1945 into the late 1950s, a raging nationalism assaulted colonialism, feeding the ambitions of producing governments to function autonomously, win greater control over the oil industry, and realize higher oil revenues. The renegotiation of monetary terms occurred with increasing frequency during this period as the gains made by one state became the minimum demands of other states. Failed

negotiations in Iran triggered a revolution, nationalization, and a counter-revolution. Egypt's daring nationalization and closure of the Suez Canal in 1956–7 satisfied both nationalistic and anti-Zionist injunctions, as well as inflating the domestic and Pan-Arab credibility of President Nasser. By 1959–60, widening fissures radiated throughout the structure of the international oil industry.

The Latin American experience is less susceptible to generalization. Oil alone drew multinational firms to the Middle East while agricultural and mineral products as well as such large urban markets as São Paulo and Rio de Janeiro, Caracas and Buenos Aires attracted a melange of international corporations to South America. Further along the tortuous path of economic development than all Middle Eastern states save Iran, states such as Argentina, Brazil, and Venezuela required the constant infusion of multinational capital, technology, and management expertise. Goodsell emphasizes the hardening stand of Latin America toward foreign companies, citing several examples of nationalization and of stringent controls imposed on multinational operations. But inconsistency appeared as well. Venezuela as the largest producer and Argentina and Brazil as the most developed states wavered in their posture toward the MNOCs, now hostile, now receptive. A short-lived, democratically oriented government in Venezuela forced a larger payoff from the oil companies. But this government fell in 1948 and was succeeded by a decade long dictatorship that treated MNOCs tenderly. The necessity of attracting private capital counseled moderation but pervasive nationalism demanded activism.[53]

In 1948, a democratic government in Venezuela imposed a tax system on the MNOCs which divided operating profits on a 50:50 basis. SONJ, RDS, and Gulf accepted this change without protest while fearful of greater exactions in the future. Venezuela's success in 1948 stimulated Middle Eastern governments to confront the MNOCs with similar demands. While the Venezuelan precedent buttressed the Arab case, the Arab producers prior to the Venezuelan contract had launched aggressive campaigns for a larger share of the take. Negotiations between Saudi Arabia and Aramco spanned the years 1946–9, with Saudi officials insisting that Aramco could afford to pay more. The Iraqi government criticized IPC for the slow development of the industry, demanding higher production and revenues. In 1950, Saudi Arabia and Aramco concluded a 50:50 arrangement which was replicated in Iraq and Kuwait and which replaced the fixed per ton royalty.

For the MNOCs, the 50:50 arrangement seemed the simplest solution for several reasons. The impact of the higher payments was softened for the American firms by the decision of the US government to grant a $1 credit on domestic income taxes for each $1 paid in taxes to a foreign

government. Secondly, production was rising to meet the voracious demand of major consuming regions while costs declined. As SONJ's Middle Eastern liftings rose from 12 percent of total production in 1950 to 23 percent in 1960, its net income doubled. Finally, the MNOCs proclaimed the 50:50 agreement a principle, equitable to both parties and conducive to continued capital investment. But hardly had the new arrangements taken hold than host governments advanced additional claims against the companies and secured superior terms from the independents and state owned oil firms. Host governments denied the immutability of the 50:50 arrangement, none more so than Iran's.[54]

Longrigg considers Iranian nationalism misguided and irrational. Fesharaki portrays Muhammed Khan Mussadiq as a ruthless dictator. Shwadran views Mussadiq as an ambitious but patriotic politician. Mussadiq and nationalism coalesced in 1950, disrupting the oil industry until 1954. The crisis in Iran began when AIOC and Iran reached an impasse in renegotiating the terms of the AIOC concession. The national legislature, dominated by ardent nationalists, was determined to force terms on AIOC rather than negotiate. AIOC, amenable to a 50:50 division, refused to budge from the letter of past contracts. The uncompromising position of both parties precipitated the overthrow of the government, the ascension of Mussadiq to power, and the nationalization of AIOC.[55] Iran employed nationalization as a weapon against AIOC and Great Britain rather than as a strategy to achieve economic modernization. The Iranian example did not change the opinions of those who taught that market driven forces precluded actions that damaged economic self-interest.

Old regimes inevitably label as Jacobins dangerous challengers. In this unequal contest between a new, isolated, and naive Iranian regime and a coalition of MNOCs and the USA and British governments, Mussadiq's opponents deftly cast him as a Soviet tool, equating opposition to the West with support for the USSR. Levy, Hassmann, and Chester assumed that the Soviets pursued a policy in the Middle East designed to force Western abandonment of its regional interests. In fact, little evidence exists to support this contention. The first Iranian Revolution was home-grown. Communists in Iran supported but hardly controlled Mussadiq's government. Far more disruptive were the Arab–Israeli wars, the invasion of Suez by Britain, France, and Israel, the war in Algeria, the policies of the MNOCs, and the myopic and decidedly unsympathetic western response to LDC nationalism.[56]

In the short-term, the Iranian Revolution and nationalization severely damaged both the Iranian oil industry and the national economy. After the withdrawal of AIOC personnel in 1951, Iranian production fell from 38.1 mmt in 1950 to under 3 mmt in 1952, 1953, and 1954 and only

surpassed the 1950 figure in 1957. The great Abadan refinery was virtually inoperative during the revolutionary ferment, depriving European and Asian markets of some 20 mmt annually for three years. Moreover, the MNOCs, with the blessing of the US government, imposed an effective boycott on Iranian oil. The shortfall was barely felt in oil markets. Production from Iraq and Kuwait climbed from a combined total of 24 mmt in 1950 to 80 mmt in 1954 while Saudi Arabian production increased by 20 mmt. This surge in withdrawals, in addition to advances elsewhere more than compensated for the absence of Iranian oil.

In 1953, Mussadiq fell to an army coup, contrived as some assert by America's CIA. Negotiations then recommenced between the Iranian government of the restored Shah and, at the insistence of the USA, a consortium of oil companies in which American firms were well represented. The USA exploited this opportunity to appropriate for Americans firms 40 percent of the old AIOC holdings. The Iranian Consortium consisted of BP with 40 percent, RDS, 14 percent, CFP, 6 percent, Gulf, Mobil, SOCAL, SONJ, and Texaco, each with 7 percent, and a group of eight American independents, organized as Iricon Agency Ltd, that held the remaining 5 percent.

The Consortium operated under a contract with the National Iranian Oil Company (NIOC) which owned all the oil in Iran. While the nation's oil moved through the Consortium, NIOC rapidly improved its skills. In 1957, a law endowed it with broad discretionary authority in planning for future oil development. Shortly thereafter, NIOC signed pioneering joint venture exploration and development contracts with Italy's ENI and Standard Indiana. During the 1960s, Saudi Arabia, Kuwait, and other states emulated these agreements. The Consortium appeared to exercise firm control over Iranian oil. Iran won nothing financially that had not been offered in 1949, that is a 50:50 split. But during the 1960s, NIOC expanded its purview, undertaking marketing, acquiring tankers, and concluding new joint venture contracts that mandated the sharing of technology and that improved Iran's take of oil. By the 1970s, NIOC possessed the necessary experience and skills to operate without the Consortium.[57]

Hardly had the Iranian Consortium restored normal operations than Egypt nationalized the Suez Canal in July 1956 and, in November, Britain, France, and Israel invaded with the intention of capturing the canal. President Nasser blocked the waterway through which passed nearly one-half of Middle Eastern oil. Simultaneously, the Syrian army blew up the IPC pipeline to the Mediterranean. Together, the two transportation systems carried some 85 percent of western Europe's oil supply. An acute, if temporary, oil shortage buffeted Europe.

exacerbated in Britain and France by the imposition of an oil embargo by Saudi Arabia which Aramco could only obey. Prices rose. Only strenuous efforts by the MNOCs to marshal additional tankers for the long haul from the Persian Gulf, the renewal of European purchases in the western hemisphere, and transfers of American stocks to Europe prevented a scarcity of crisis proportions. Western Europe, with rationing imposed in several countries, made do with 80 to 85 percent of its normal oil supply.[58] In 1958, Suez traffic was resumed. The crisis ended, and memory of it soon faded.

Walter J. Levy perceived the Suez crisis as radically changing the context of the world oil trade.[59] But normal supplies for western Europe, by-passing the Suez, had been restored by 1957. The affected nations neither reformed their energy use practices nor moderated their oil dependency. In Britain, for example, shortages failed to stimulate interest in the coal industry. The USA and its European allies did not prepare plans for future contingencies. The Suez closure in 1956 was considered an aberration. But it was not; the past arrived again in 1967. The MNOCs and their governments ignored the lessons of the Iranian Revolution and the Suez closure. The MNOCs were powerful. However, during the late 1950s, host demands and the appearance of new oil firms in the Middle East demonstrated that the MNOCs no longer occupied unassailable heights.

NIOC denied new concessions to the Consortium, preferring to contract with newcomers so as to reduce the Consortium's hold on the industry. Iraq engaged the IPC in a vituperative controversy from 1958 to 1962 in which Iraq dictated terms and IPC slowed down production. In 1958, the government of Rómulo Betancourt replaced a dictatorial regime in Venezuela. Betancourt championed an oil policy that would diminish the autonomy of the foreign concessionaires and that envisaged the creation of an organization of oil exporting countries. Before its fall, the military junta raised the 50:50 division to 60:40, thus disabusing the oil firms of their faith in the immutability of the 50:50 arrangement. Betancourt urged Middle Eastern producers to adopt the new split.

Meanwhile, independent and state-owned or state-encouraged oil firms competed with the MNOCs for concessions. ENI in Iran, the Arabian Oil Company (Japanese) in off-shore Saudi Arabia and Kuwait, the Ohio Oil Company, Amerada Petroleum Company, and Continental Oil Company, partners in Libya, among others, won concessions by awarding superior financial and participatory terms to the hosts. RDS, in 1960, joined Kuwait in the first MNOC–host partnership to develop an off-shore concession.[60]

More exacting financial terms, joint ventures, the receptivity of host

governments to independent and state oil company offers, the intensification of nationalistic rhetoric, the Iranian and Egyptian examples, the coalescence of LDCs into a loose anti-western bloc, thus formalizing the so-called north–south dichotomy, the willingness of anti-communist states to turn to the USSR for aid in an effort to apply leverage against the US. . . . How many signs were necessary to force recognition among the MNOCs that times had changed and to elicit a more balanced reply to LDC grievances?

The MNOCs, model capitalistic organizations, lacked the intellectual flexibility to evaluate external stimuli that controverted their simple-minded economic faith. People or institutions or nations that refused to maximize economic gain, that chose ideological goals over market goals, thus imperiling the beneficial results of MNOC investments, were incomprehensible to them. How else to explain their abrupt lowering of the posted price of oil in 1959 without consultation with either their home or host governments?

For the MNOCs, large surpluses of oil seeking market outlets required a price reduction. No matter that reduced posted prices lowered the revenues of producing state governments. No matter that this occurred just as the USA imposed mandatory import quotas. No matter that the Arab League (1945), seeking to politicize oil, had created in 1951 an Arab Oil Exporting Committee to foster Arab control over oil and the use of oil power against Israel. In 1959, the Arab League sponsored the first Arab Petroleum Congress in Cairo, with Iran and Venezuela in attendance. High on the agenda, and vigorously promoted by Venezuela, was the creation of a permanent oil-coordinating body. One year later, participants in a conference in Baghdad established OPEC.[61]

Conclusion

The West and Japan careered down the road of energy import dependency. For OECD-Europe and Japan in 1960, the percentage of net imports to TPER reached 35 and 40 percent, respectively, rising to 45 and 67 percent just five years later.[62] But the West, and particularly the USA, mesmerized by the cheapness of oil, ignored the rumblings of LDC producer states. Wilson poses a germane question: can oil (energy) issues be dichotomized into categories of foreign policy problems and domestic problems?[63] The USA did this by opting for oil import quotas. Europeans and Americans, MNOCs and governments, discounted the menace of thwarted nationalism throughout the Third World while neglecting to relate the anti-Zionist compulsion of Arab

states to the security of oil flow. Cold War warriors in the USA accused the Soviets of fomenting instability in LDC states, immediately labeling Mussadiq and Nasser as puppets of the USSR.

The price reductions of 1959 and 1960 reflected the great power of the MNOCs. But their ability to act unilaterally in production and price faced implacable challengers, both within the industry and without. Price reductions, notwithstanding, the MNOCs wielded less power in 1960 than in 1945. If the US government consciously depended upon American MNOCs to so manage affairs in producing areas that sources of supply remained secure, it was tied to an unreliable agent. A realignment of power had transpired, with OPEC a sign of the times. Some westerners sensed the drift and voiced warnings to a disinterested public. In Britain, an energy planning unit doubted the advisability of aggravating the nation's oil dependence upon producers that evidenced frightening instability. But this message emphasized new and reliable sources of oil rather then energy use diversification.[64] As a rule, only those with a particular stake in such forms of energy as coal or natural gas deplored the absence of diversification.[65]

Supply-siders ruled during the 1960s as they had in the past, exercising command from conference rooms in Washington, D.C., London, Amsterdam, and New York, and newly armed with the beguiling possibility of infinite energy through nuclear power. Oil in abundance existed. The optimism of supply-siders refused to accord any validity to either warnings of resource scarcity or of collective action by oil producers to withhold supplies.

Notes

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2. For the above two paragraphs: Milward, *German Economy*, pp. 49–52, 158–60, 168–89; S. Olsson, *German Coal and Swedish Fuel, 1939–1945*, Gothenburg: Institute of Economic History of Gothenburg University (1975), pp. 100–28; Anderson, *Aramco*, pp. 194–5; J.B. Cohen, *Japan's Economy in War and Reconstruction*, Minneapolis: University of Minnesota Press (1949), pp. 131–47, 386; M. Erselcuk, "Japan's Oil Resources," *Economic Geography*, 22 (January 1946), p. 14.
3. J.G. Clark, *Energy and the Federal Government: Fossil Fuel Policies, 1900–1946*, Urbana: University of Illinois Press (1987), see Chapters 12–14.
4. M.W. Kirby, *The British Coalmining Industry, 1870–1946. A Political and Economic History*, Hamden, Conn.: Archon Books (1977), pp. 177–92; L. Hannah, *Electricity before Nationalisation: A Study of the Development of the Electricity Supply Industry in Britain to 1948*, Baltimore: The Johns Hopkins University Press (1979), pp. 301–6; Hancock, *British War Economy*, pp. 154–6, 175.
5. J. Darmstadter *et al.*, *Energy in the World Economy: A Statistical Review of Trends in Output, Trade, and Consumption Since 1925*, Baltimore: The Johns Hopkins University Press for Resources for the Future (1971), p. 107.
6. P.F. Cowhey, *The Problem of Plenty: Energy Policy and International Politics*, Berkeley: University of California Press (1985), pp. 96–100, portrays the US government as the initiator of the post World War II oil regime. M. Wilkins, *The Maturing of Multinational Enterprise: American Business Abroad from 1941 to 1970*, Cambridge: Harvard University Press (1974), pp. 286, and D.S. Painter, *Oil and the American Century, The Political Economy of U.S. Foreign Oil Policy, 1941–1954*, Baltimore: The Johns Hopkins University Press (1986), pp. 52, 95–6, 206, offer necessary qualifications to Cowhey's view.
7. For PRC and the treaty: Anderson, *Aramco*, pp. 68–71, 98–100, 125; B. Shwadran, *Middle East Oil and the Great Powers*, N.Y.: Praeger (1955), pp. 318–32; Clark, *Energy and the Federal Government*, pp. 346–7; 385–6; P. Odell, *Oil and World Power*, 8th edn, Harmondsworth, Middlesex: Penguin (1986), pp. 202–5; O. Caroe, *Wells of Power: The Oil-fields of Southwestern Asia, A Regional and Global Study*, London: Macmillan (1951), pp. 113–20, 222–7.
8. S.H. Longrigg, *Oil in the Middle East: Its Discovery and Development*, London: Oxford University Press (1961), pp. 119–27; De Golyer and MacNaughton, eds, *Twentieth Century Petroleum Statistics, 1984*, Dallas: De Golyer and MacNaughton (1984), pp. 4–5, 9.
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10. International Energy Agency, *Energy Balances of Developing Countries 1971/82*, Paris: OECD/IEA (1984), pp. 14–25, 315, 318, *passim*.
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21. Hassmann, *Oil in the Soviet Union*, pp. 33–5, 133; R.W. Campbell, *The Economics of Soviet Oil and Gas*, Baltimore: The Johns Hopkins University Press for Resources for the Future (1968), pp. 8–14, 23–38, 159–60, 168–9; E.A. Hewitt, *Energy, Economics, and Foreign Policy in the Soviet Union*, Washington, D.C.: Brookings Institution (1984), pp. 31–5; G. Modelski, *Atomic Energy in the Communist Bloc*, Carlton: Melbourne University Press (1959), pp. 100–1.
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