TABLE OF CONTENTS

FOREWORD 3

ACKNOWLEDGEMENTS 5

TABLE OF CONTENTS 7

LIST OF ILLUSTRATIONS 17

LIST OF TABLES 18

MAPS 21

INTRODUCTION 29

OVERVIEW 31

THE REGION 31

RESERVE BASE 32

PRODUCTION AND EXPORT POTENTIAL 32

IMPORTANCE AS ALTERNATIVE SOURCE OF SUPPLY 34

OIL AND GAS IN THE ECONOMIC DEVELOPMENT OF THE REGION 34

INVESTMENT 35

The Energy Charter Treaty 36

OIL AND GAS EXPORT ROUTES 36

Inherited infrastructure 36

The need for new pipelines 37

Multiple pipelines 37

Export markets 37

Transit and the Energy Charter Treaty 38

Selected oil and gas export proposals 38

Proposals for oil exports 38

AIOC oil pipelines from Azerbaijan 38

CPC oil pipeline from Kazakstan to the Black Sea via Russia 38

CAOP oil pipeline from Turkmenistan to Pakistan via Afgahanistan 39

CNPC pipeline from Kazakstan to China 39

Trans-Caspian oil pipeline from Kazakstan or Turkmenistan 39

Non-pipeline alternatives 39

Proposals for gas exports 40

Gas pipeline from Turkemistan to Turkey via Iran 40

Gas pipeline from Turkmenistan to Iran 40
Trans-Caspian gas pipeline from Turkmenistan 40
Gas pipeline from Turkemistan to Pakistan via Afghanistan 40
Gas pipeline from Turkmenistan to China 40
The Turkish Straits 41
Iran 41
ENVIRONMENT 42
LEGAL STATUS OF THE CASPIAN SEA 43

PROJECTIONS OF OIL AND GAS PRODUCTION, DOMESTIC DEMAND AND EXPORTS 45
SUMMARY 45
SUPPLY SCENARIOS 46
Azerbaijan 46
Kazakstan 48
Turkmenistan 49
Uzbekistan 50
DOMESTIC DEMAND AND EXPORTS 50
Summary 50
Azerbaijan 54
Kazakstan 54
Turkmenistan 55
Uzbekistan 56
NOTES ON METHODOLOGY 56
Energy demand estimates 56
Energy 56
"Non-energy industry" and "non-industry" 57
Activities in the household sector 58
Energy export estimates 58
Specific assumptions and data biases 58
Losses 58
Heat and electricity demand 59
Value added per unit of energy output 59
Net indirect taxes 60
Energy use per unit of value added in non-energy industry 60
Households 60
STATISTICAL ANNEX 63

MARKETS FOR CASPIAN REGION OIL 85
SUMMARY 85
WORLD OIL MARKET OUTLOOK 86

Introduction 86
Growing dependence on Persian Gulf oil 86
Asia-Pacific demand 86
New alternative suppliers 87
World oil demand 87
Demand outlook 87
World oil supply 88
Gulf-OPEC 88
Russia 89
Atlantic basin 89
Supply outlook 89
FUTURE WORLD OIL TRADE 89
Overview 89
Mediterranean markets 91
Black Sea markets 93
The Chinese market 94

MARKETS FOR CASPIAN REGION GAS 97

SUMMARY 97
MARKETS FOR CENTRAL ASIAN AND TRANSCAUCASIAN GAS 97
Former Soviet Union 98
Ukraine 99
Russia 100
Turkey 101
Iran 103
Central and eastern Europe 104
Western Europe 106
Pakistan and India 108
Pakistan 108
India 109
China and Japan 109
Summary 111
COMPETITORS 111
Established competitors in western Europe 111
Norway, Netherlands and United Kingdom 111
Russia 112
Algeria 114
New competitors in Europe and elsewhere 114
Iran 114
Middle Eastern and African competitors 115
Asian competitors 117
PROSPECTS FOR LNG AND LPG EXPORTS 117

INVESTMENT FRAMEWORK 121

OPPORTUNITES FOR PRIVATE RISK INVESTMENT IN THE OIL AND GAS SECTOR 121
Activities open to all qualified companies 122
Licensed activities 122
Joint ventures 122
Purchase of privatised assets 123

LEGAL CONTEXT FOR INVESTORS 123
Standard assurances for foreign investment 123
Additional guarantees 124
Petroleum exploration and production regimes 124
Independent arbitration 125
Land 126
Incorporation 126
Taxes 127
Accounting 127
Pipeline regulation 127
Price controls 127
Social obligations 128
Privatisation 128

INVESTMENT CONTEXT BY SUB-SECTOR 129
Oil and gas production 129
Petroleum storage and transmission 129
Oil refining 129
Oil product distribution 130
Oilfield equipment and services 130

ENERGY CHARTER TREATY 130

MARINE TRANSPORTATION IN THE CASPIAN AND BLACK SEAS AND THE TURKISH STRAITS 133

THE TURKISH STRAITS 133
New rules and recommandations for the Straits 134
Oil flows through the Turkish Straits 135

Bypassing the Straits 136

MARINE TRANSPORTATION IN THE CASPIAN AND BLACK SEAS 136
Caspian Sea 137
Kazak oil exports 137

Turkmen oil exports 138
Azeri oil exports 138
Port constraints 138
Overview of selected Caspian oil ports and expansion plans 139
Tanker capacity 140
Volga-Don canal and river system 141
Black Sea routes 141
Kazak oil exports 142
Turkmen and Azeri oil exports 142
Proposed export pipelines to the Black Sea 142
Overview of selected Black Sea ports and plans for their expansion 143
Selected import capacity in the Black Sea 144

LEGAL STATUS OF THE CASPIAN SEA 147
BACKGROUND 147
THE RESPONSE OF THE OTHER LITTORAL STATES 148
INTEREST 149
FURTHER DEVELOPMENT OF THE RUSSIAN POSITION 150
BORDER DISPUTES 150

COUNTRY CHAPTERS

AZERBAIJAN 151
SUMMARY 151
ECONOMIC BACKGROUND 152
The first years of stabilisation and transition 153
Structural reforms 153
Price and trade liberalisation 153
Privatisation and demonopolisation 154
Payment arrears 154
The Banking system 154
Long term outlook 155
OVERVIEW OF THE ENERGY SECTOR 155
Electricity 155
Coal and shale 156
ORGANISATION OF THE OIL AND GAS SECTOR 156
OIL RESERVES AND PRODUCTION 157
Oil reserves 157
Oil production 157

Oil fields 158
Oil prices 159

OIL REFINING 159
Refineries 161
Azerneftyag refinery 161
Azerneftyyanadjag refinery 161
Environmental concerns at the refineries 161
Distribution of oil products 161
Consumption of oil products 161

OIL TRANSPORTATION AND TRADE 162
Crude exports 162
AIOC pipelines 162
The northern route 163
The western route 164
Ceyhan route 164
Main oil 165
Exports of oil products 165
Oil storage 166

GAS RESERVES AND PRODUCTION 166

GAS PROCESSING, TRANSMISSION AND DISTRIBUTION 168
Gas processing 168
Gas transmission and distribution 168
LPG 170
Gas consumption 171
Gas pricing 172
Non-payments for gas 172

GAS TRADE 172
Gas transit 173

INVESTMENT 174
Offshore investments 175
Azeri, Chirag and Guneshli 175
Karabakh 176
Shakh Deniz 177
Dan Ulduzu and Ashrafi 177
Lenkoran Deniz and Talysh Deniz 178
Yalama 179
Oguz 179
Apsheron 179
Nakhichivan (D-3) 180
Inam 180
Kyurdashi 180

Major offshore deals under negotiation 181
South Caspian Archipelago 181
Shallow Guneshli 181
Yanan Tava-3, Atashgah and Muga Deniz 181
Umid 181
Abikh Bank 181
Kyapaz 182
Offshore tender 182
Onshore investments 182
Legislation 184
Rights to land 184
Investment protection 184
Concessions/licensing regime 185
Privatisation 186
Privatisation - general procedures 186
Prospects for equity investment in the oil and gas sub-sectors 187
Taxation 188
ENVIRONMENT 189
OILFIELD EQUIPMENT AND SERVICES INDUSTRY 189
Fabrication yards 190
Seismic services 192

KAZAKSTAN 193
SUMMARY 193
ECONOMIC BACKGROUND 195
Macro economic policies during the first years of transition 195
Price, trade and foreign exchange liberalisation 196
Privatisation 196
Non-payment 197
The financial sector 197
The tax system 197
IFI loans 197
Technical assistance 198
New national capital 198
OVERVIEW OF THE ENERGY SECTOR 199
Coal 199
Electricity 200
ORGANISATION OF THE OIL AND GAS SECTOR 201
OIL RESERVES AND PRODUCTION 203
OIL REFINING 204
Atyrau 205

Shimkent 206
Pavlodar 208
New refineries 209
Oil product consumption 209

OIL TRANSPORTATION AND TRADE 209
Planned internal oil pipelines 210
Oil transportation tariffs 211
Oil export 211
Oil pipeline quotas 212
Oil export by rail 213

Proposed oil export pipelines 213
Caspian Pipeline Consortium 213
Project details 215
Rights of way 215
Capacity quotas 215
Evolution of CPC provisions 216
Projected tax revenues 217
Shares in the CPC and financing plans 217
CPC administration 217

CNPC pipeline to China 218
Via Turkmenistan to Iran 219
Transcaspian pipeline 219
Via Azerbaijan and Georgia 219
Swaps with Iran 220

GAS RESERVES AND PRODUCTION 221

GAS PROCESSING, TRANSMISSION AND DISTRIBUTION 222
Gas transmission 223
Investment needs 225
Gas distribution 226

GAS TRADE 226

INVESTMENT 227
State Committee for Investments 229
Foreign investment methods 229
Major exploration and production projects 230
Tengizchevroil 230
Kazak Shelf 231
Karachaganak 232
Uzen 233
The Temir blocks 233
Other major joint ventures in the oil and gas sector 234
Privatisation 235
Legislative basis 235
Privatisation in practice 236

Major privatisations 237
Yuzhneftegaz (Hurricane Kumkol Munai) 237
Aktobemunai (Aktyubinskneftegaz) 237
Karazhanbasmunai 238
Mangistaumunaigaz 238
Stock exchange 238
Management contracts 239
Investment legislation 239
Law on foreign investments 239
Petroleum act (licencing regime) 239
Taxation 241
Accounting system 242

TURKMENISTAN 243
SUMMARY 243
ECONOMIC BACKGROUND 244
The first years of transition 244
Restructuring and privatisation 246
OVERVIEW OF THE ENERGY SECTOR 246
Electricity 247
ORGANISATION OF THE OIL AND GAS SECTOR 248
OIL RESERVES AND PRODUCTION 249
OIL REFINING 250
OIL TRANSPORTATION AND TRADE 250
Proposed oil export pipeline via Afghanistan 251
GAS RESERVES AND PRODUCTION 252
Major gas fields 253
Gas production costs and prices 253
Gas consumption 254
GAS TRANSMISSION AND DISTRIBUTION 254
New gas export pipeline projects 255
Gas pipeline to northern Iran 255
Turkmenistan-Iran-Turkey 255
Trans-Caspian 257
Via Russia to Turkey 257
Turkmenistan-Pakistan gas pipeline projects 258
Turkmenistan-China-Japan gas pipeline project 259
GAS TRADE 260

INVESTMENT 261
Foreign investment projects 261
The State Investment Agency and the Competent Body 262
Offshore tender 262
Investment legislation 263
Law on Foreign Investments 263
Law on Concessions 264
Law on Hydrocarbon Resources 264
Model PSA and JV agreements 265
Dispute settlement 266
Registration of foreign investors 266
Privatisation 266
Taxation 266
Free Enterprise Economic Zones 267
Accounting 267

UZBEKISTAN 269

SUMMARY 269

ECONOMIC BACKGROUND 270
Initial reform efforts 270
Inflation 271
Budget deficit 271
Banking 271
Privatisation 272
Trade 272
Multilateral assistance 273
International economic relations 274

OVERVIEW OF THE ENERGY SECTOR 275
Electricity 277
Energy prices 278

ORGANISATION OF THE OIL AND GAS SECTOR 278

OIL RESERVES AND PRODUCTION 279
Exploration 280
Production 281

OIL REFINING 282

OIL TRANSPORTATION AND TRADE 283
Oil transportation 284
Proposed export pipelines for oil 285

GAS RESERVES AND PRODUCTION 285

GAS PROCESSING, TRANSMISSION AND DISTRIBUTION 287
Gas storage 288

Natural gas consumption 289

LPG 290

GAS TRADE 290

Proposed export pipelines for gas 291

INVESTMENT 291

Recent investment activity in the oil and gas sector 291
Uzmaloil 292
Kokdumalak field compression station 292
Karaulbazar refinery 292
Ferghana refinery 292
Ferghana lubricant plant 292

Planned investments in the oil and gas sector 293

Privatisation 294

Legislation relevant to oil and gas investment 294
Enterprise Tax Law of 1991 294
Access to land 295
Protection of foreign investment 295
Petroleum licensing 296
Taxation 296

LIST OF ILLUSTRATIONS

Maps[1]

Map 1 Selected Central Asian and Transcaucasian oil and gas pipelines 21
Map 2 Azerbaijan: Major oil and gas infrastructure 22
Map 3 Major fields offshore Azerbaijan 23
Map 4 Kazakstan: Major oil and gas fields and infrastructure 24
Map 5 Turkmenistan: Major oil and gas fields and infrastructure 25
Map 6 Uzbekistan: Major oil and gas fields and infrastructure 26
Map 7 Crude oil and product shipments across the Caspian Sea (1997) 27

Overview

Figure 1 Oil production, domestic consumption and net exports (high case) 33
Figure 2 Gas production, domestic consumption and net exports (high case) 33

1. Maps for this report have been prepared by the International Energy Agency exclusively for the convenience of readers. The boundaries shown on maps in this report do not imply, on the part of the International Energy Agency, any judgement on the legal status of any territory or any endorsement of such boundaries.

Markets for oil Caspian region oil

Figure 1 Russia: the investment imperative 88
Figure 2 US crude oil imports from Latin America and the Middle East 90
Figure 3 Middle Eastern crude oil exports to Asia, the US, and western Europe 91
Figure 4 Western European imports from the FSU and Middle East 92
Figure 5 Turkey's dependence on oil imports 94
Figure 6 China: crude oil production & consumption 95

Azerbaijan

Figure 1 Azeri average oil production rates 158

Kazakstan

Figure 1 Kazak refinery output (1Q97) 205
Figure 2 Atyrau refinery output 1991-1994 206
Figure 3 Shimkent refinery output: Summer (April-September 1997) 207
Figure 4 Shimkent refinery output: Winter (October 1996-March 1997) 207

Uzbekistan

Figure 1 Uzbek primary energy consumption in 1996 276

LIST OF TABLES

Overview

Table 1 Caspian region production 33
Table 2 Caspian region net exports 33

Projections of oil and gas production, domestic demand and exports

Table 1 Azerbaijan: selected oil and gas projects 47
Table 2 Kazakstan: selected oil and gas projects 49
Table 3 Oil production, domestic consumption and net exports (high case) 51
Table 4 Oil production, domestic consumption and net exports (low case) 51
Table 5 Gas production, domestic consumption and net exports (high case) 52
Table 6 Gas production, domestic consumption and net exports (low case) 52
Table 7 Annual GDP growth (high case) 63
Table 8 Annual GDP growth (low case) 63
Table 9 Energy sector share of GDP at current energy prices (high case) 63
Table 10 Energy sector share of GDP at current energy prices (low case) 63
Table 11 Energy sector share of energy demand (high case) 64
Table 12 Energy intensity (high case) 64
Table 13 Energy use per head (high case) 64
Table 14 Income per head (high case) 64
Table 15 Ratio of energy production to energy consumption (high case) 65

Table 16 Azerbaijan: summary of high and low scenarios 65
Table 17 Azerbaijan: economic and energy indicators (high case) 66
Table 18 Azerbaijan: economic and energy indicators (low case) 68
Table 19 Kazakstan: summary of high and low scenarios 70
Table 20 Kazakstan: economic and energy indicators (high case) 71
Table 21 Kazakstan: economic and energy indicators (low case) 73
Table 22 Turkmenistan: summary of high and low scenarios 75
Table 23 Turkmenistan: economic and energy indicators (high case) 76
Table 24 Turkmenistan: economic and energy indicators (low case) 78
Table 25 Uzbekistan: summary of high and low scenarios 80
Table 26 Uzbekistan: economic and energy indicators (high case) 81
Table 27 Uzbekistan: economic and energy indicators (low case) 83

Investment framework

Table 1 Selected taxes affecting investments in the oil and gas sector 127

Marine transportation in the Caspian and Black Seas and the Turkish Straits

Table 1 Number and tonnage of ships passing through the Strait of Istanbul 133
Table 2 Number of collisions in the Strait of Istanbul 135
Table 3 Oil transported through the Turkish Straits in 1996 135
Table 4 Capacity of selected Caspian Sea ports 137
Table 5 Estimated oil tanker capacity in the Caspian Sea 140
Table 6 FSU crude oil exports via the Black Sea, 1995-1997 142
Table 7 Information on selected key ports for the transit of Central Asian and Transcaucasian oil 145

Azerbaijan

Table 1 Azeri oil refining 1992-1995 160
Table 2 Azeri oil product consumption 1992-1995 162
Table 3 Azeri crude and product exports in 1997 165
Table 4 Azeri crude and product imports in 1997 166
Table 5 Azeri natural gas production, trade and consumption 167
Table 6 Azeri natural gas consumption 171
Table 7 Socar's share in offshore PSAs 174
Table 8 Mobile offshore drilling rigs 191

Kazakstan

Table 1 Technical assistance (as of mid-1996) 198
Table 2 Electricity consumption, production and imports 200
Table 3 Share (%) owned by Kazakoil in various companies, as of October 1997 202
Table 4 Reserves of principal Kazakoil production associations 203
Table 5 Oil output of principal Kazakoil production associations 204
Table 6 Oil pipeline capacity and use in 1995 and 1996 210
Table 7 Pipeline deliveries of oil originating in Kazakstan in 1996 210
Table 8 Kazak gross exports of crude oil and condensate by pipeline 212
Table 9 Shares in the CPC as of November 1997 214

Table 10 CPC Pipeline quotas 216
Table 11 Major gas transmission pipelines in Kazakstan 223
Table 12 New gas transmission lines proposed by Kazakgaz 225
Table 13 Kazak gas distribution companies 226
Table 14 Kazak gas production, export and import 227
Table 15 Foreign direct investment in Kazak oil and gas sector 228
Table 16 Shares owned by Kazakoil in joint ventures with foreign firms 228
Table 17 Distribution of shares in Tengizchevroil 230
Table 18 Distribution of shares in Karachaganak PSA 232
Table 19 Excess profits tax 242

Turkmenistan

Table 1 Comparisons of TPES per capita (1994/1995) 247
Table 2 Turkmen crude oil and refined product exports by destination, 1996 251
Table 3 Turkmen gas exports by destination, 1995 and 1996 260

Uzbekistan

Table 1 Energy supply, demand and net exports: 1997-2010 277
Table 2 Oil reserves estimated by Uzbekneftegaz as of 1 January 1996 280
Table 3 Kokdumalak reserves 280
Table 4 Crude oil and condensate production: 1990-1996 281
Table 5 Projected oil supply, demand and net exports: 1997-2010 284
Table 6 Natural gas production: 1990-1996 286
Table 7 Projected natural gas supply, demand and net exports: 1997-2010 289
Table 8 Exports of Uzbek gas by country: 1991-1996 290