Natural Gas Production in Russia: 2008–2020
Contents

Author ............................................................................................................................................. 3

Chapter 1. Current State of Gas Production in Russia .............................................................. 19
  1.1. Brief history of gas production in Russia before 1992 .............................................. 19
  1.3. Modern structure of gas production in Russia. Classification of Russian gas companies in 2008 ................................................................. 28
  1.4. Russia’s modern resource base ............................................................................... 32
  1.5. Distribution of the reserves among subsoil users .................................................... 45

Chapter 2. Current Natural Gas Production Policy of the State ................................................. 53
  2.1. Gas production in Russia’s Energy Strategy until 2020 ............................................ 53
  2.2. Subsoil-use laws in Russia ....................................................................................... 57
    2.2.1. Subsoil Law ........................................................................................................ 57
    2.2.2. Gas Supply Law ................................................................................................ 64
    2.2.3. Mineral Extraction Tax (MET) ........................................................................ 67

Chapter 3. Current and Prospective Production in Gazprom’s Existing Fields ......................... 71
  3.1. Gazprom’s production in the Nadym-Pur-Taz Region ............................................. 72
    3.1.1. Urengoygazprom (Gazprom Dobycha Urengoy) ............................................ 73
    3.1.2. Nadymgazprom (Gazprom Dobycha Nadym) .................................................. 87
    3.1.3. Yamburggazdobycha (Gazprom Dobycha Yamburg) ....................................... 93
    3.1.4. Noyabrskgazdobycha (Gazprom Dobycha Noyabrsk) .................................... 103
    3.1.5. Purgazdobycha ................................................................................................. 110
    3.1.6. Severneftegazprom ............................................................................................ 112
    3.1.7. Achimgaz ......................................................................................................... 120
    3.1.8. Purgaz ............................................................................................................. 122
    3.1.9. Northgas ......................................................................................................... 125
  3.2. Producing enterprises of OAO Gazprom outside the Nadym-Pur-Taz Region ....... 131
    3.2.1. Astrakhangazprom (Gazprom Dobycha Astrakhan) ....................................... 131
    3.2.2. Orenburggazprom (Gazprom Dobycha Orenburg) .......................................... 138
    3.2.3. Stimul ............................................................................................................. 146
    3.2.4. Severgazprom (Gazprom Dobycha Ukhta/ Gazprom Pererabotka) .............. 148
    3.2.5. Tomskgazprom (Vostokgazprom) .................................................................. 152
    3.2.6. Svmorneftegazgazprom .................................................................................... 158
  3.3. Analysis of gas production potential in the current gas production regions of Gazprom until 2020 ................................................................. 162
    3.3.1. Production from the existing fields of the Nadym-Pur-Taz Region .............. 162
    3.3.2 Gas production from the existing fields outside the Nadym-Pur-Taz Region ... 164
    3.3.3. Consolidated forecast of gas production from the existing fields controlled by Gazprom (NPTR and non-NPTR). Scenario 1......................... 165

This work may not be photocopied or otherwise reproduced in any form or for any purpose without prior knowledge and consent of RPI
3.3.4. Scenario of inclusion of Enineftegaz and Sibneftegaz in Gazprom’s portfolio.

Scenario 2 .................................................................................................................. 167

3.4. Gas production potential in the current gas production regions of Gazprom ...... 176

Chapter 4. Independent Gas Producers ............................................................................. 177

4.1. Itera ............................................................................................................................ 177

4.2. NOVATEK .................................................................................................................. 180

4.3. Gas production by oil companies ............................................................................. 196

4.3.1. LUKOIL ............................................................................................................... 197

4.3.2. Rosneft .................................................................................................................. 208

4.3.3. TNK-BP .............................................................................................................. 216

4.3.4. Surgutneftegaz .................................................................................................. 223

4.3.5. Other producers ............................................................................................... 227

4.4. Production potential of independent producers ..................................................... 227

Chapter 5. Promising Regions in Terms for Long-Term Gas Production Development

Until 2020 ............................................................................................................................ 229

5.1. Rationale for production in new areas ..................................................................... 229

5.2. Yamal Peninsula: development prospects .............................................................. 229

5.3. Development of the Shtokmanovskoye field ........................................................... 259

5.4. Development of the Ob and Taz Bay fields .............................................................. 279

5.5. Eastern Siberia and Russian Far East ....................................................................... 284

Chapter 6. Factors Influencing Gas Production Growth in Russia .................................. 316

6.1. Demand factor ........................................................................................................ 316

6.2. Import factor ............................................................................................................ 337

6.3. Gas transportation system development ................................................................. 341

Chapter 7. Russian Gas Production Growth Scenarios Out to 2020 ............................. 344

7.1. Russian company production capacity and investment requirements .................. 344

7.2. The Base Scenario (Blue Scenario) ....................................................................... 348

7.3. Moderate Scenario (White Scenario) .................................................................... 353

7.4. Alternative scenarios ............................................................................................ 359

Conclusions ..................................................................................................................... 364
Map

Map 1.1. Main oil-and-gas provinces of Russia and Federal Districts .............................................. 38
Map 3.1. System for the transportation of gas produced by Gazprom Dobycha Urengoy ........ 82
Map 3.2. Fields licenses for which are held by Nadymgazprom and the adjacent gas transportation infrastructure ................................................................. 90
Map 3.3. Fields licenses for which are held by Yamburggazdobycha and the adjacent gas transportation infrastructure ................................................................. 98
Map 3.4. Fields with licenses held by Noyabrskgazdobycha and the adjacent gas transportation infrastructure ................................................................................. 107
Map 3.5. Gas transportation infrastructure for gas supplies from the South-Russkoye field ............................................................................................................. 116
Map 3.6. Nord Stream pipeline route .............................................................................................. 116
Map 3.7. Astrakhanskoye field and gas transportation directions ................................................... 136
Map 3.8. Transportation routes for gas produced by Orenburggazprom ...................................... 143
Map 3.9. System for the transportation of gas from the fields of Tomskgazprom ....................... 156
Map 3.10. Gas fields of Enineftegaz and Snbneftegaz ....................................................................... 167
Map 4.1. Fields of NOVATEK ......................................................................................................... 183
Map 4.2. System of gas transportation from NOVATEK’s fields .................................................... 191
Map 4.3. NOVATEK’s gas supplies to principal industrial regions .................................................. 192
Map 4.4. LUKOIL’s gas reserves .................................................................................................... 198
Map 4.5. LUKOIL’s fields in Western Siberia .................................................................................. 200
Map 4.6. LUKOIL’s Caspian fields ................................................................................................ 201
Map 4.7. Model of gas and condensate transportation from the Bolshekhetskaya depression fields ...................................................................................................... 204
Map 4.8. Rosneft’s fields in Russia .................................................................................................. 211
Map 4.9. Kharampurskoye field with possible gas transportation directions .................................. 213
Map 4.10. TNK-BP’s fields in Russia ............................................................................................... 218
Map 4.11. Surgutneftegaz’s fields in Western Siberia ....................................................................... 225
Map 5.1. Gas fields of the Yamal Peninsula ..................................................................................... 231
Map 5.2. Obskaya-Bovanenkovo railroad under construction ...................................................... 239
Map 5.3. Principal and supplementary gas transportation routes from Yamal fields ................. 245
Map 5.4. Vidyaevo and Teriberka sites ......................................................................................... 271
Map 5.5. Model for the pipeline transportation of gas from the Shtokmanovskoye field ...... 272
Map 5.6. Ob and Taz Bay fields ...................................................................................................... 280
Map 5.7. Transportation of gas from the Ob and Taz Bay fields .................................................... 283
Map 5.8. Kovyktinskoye gas and condensate field ....................................................................... 286
Map 5.9. Chayandinskoye field ..................................................................................................... 295
Map 5.10. Yurubcheno-Takhomskoye field ................................................................................... 298
Map 5.11. Sobinsk and Paiginskaya group of fields ........................................................................ 300
Map 5.12. Sakhalin-1 Project ....................................................................................................... 303
Map 5.13. Infrastructure of the Sakhalin-2 project ......................................................... 308
Map 6.1. Trans-Caspian gas pipeline project ................................................................. 338
Map 6.2. Central Asia-Center gas pipeline ................................................................. 339
Map 6.3. South Stream pipeline .............................................................................. 342
Map 6.4. Plans to develop Eastern Siberia and Far East transportation routes ............. 343
Charts

Chart 1.1. Distribution of natural gas reserves in the USSR in the early fifties ....................... 20
Chart 1.2. Gas production in the USSR from 1970 to 1990 (bcm) .............................................. 22
Chart 1.3. Production and reserves growth in Russia from 1991 to 2001 (bcm) ....................... 23
Chart 1.4. Sales growth in the European market from 2001 to 2007 (USD billion) .................. 26
Chart 1.5. Dynamics of Gazprom’s market capitalization (USD billion) ................................. 27
Chart 1.6. Russian gas market in 2008 ...................................................................................... 29
Chart 1.7. Gas production in Russia from 2002 to 2007 (bcm) ................................................. 30
Chart 1.8. Structure of natural and associated gas production in Russia 1999-2007 ............... 31
Chart 1.9. Distribution of proved gas reserves in the world as of 01.01.2007 .......................... 35
Chart 1.10. State of gas reserves development in Russia ......................................................... 36
Chart 1.11. Distribution of proved gas reserves throughout North-Western Federal District ... 40
Chart 1.12. Distribution of proved gas reserves throughout Southern Federal District .......... 41
Chart 1.13. Distribution of proved gas reserves throughout Volga Region Federal District .... 42
Chart 1.14. Distribution of proved gas reserves throughout the Ural Federal District .......... 43
Chart 1.15. Distribution of proved gas reserves throughout Siberian Federal District .......... 43
Chart 1.16. Distribution of proved gas reserves throughout the Far Eastern Federal District ... 44
Chart 1.17. Distribution of proved gas reserves throughout the Sea Shelf Plates .................. 45
Chart 1.18. Distribution of proved gas reserves of Russia ....................................................... 45
Chart 1.19. Dynamics of Gazprom’s natural gas reserves in 2002-2007 (tcm) ....................... 46
Chart 1.20. International audit of selected Gazprom’s gas reserves in comparison with the Russian classification system (tcm) ................................................................. 46
Chart 1.21. Distribution of Gazprom’s gas reserves throughout Federal Districts of Russia in 2007 .................................................................................................................. 48
Chart 1.22. Gazprom’s largest gas fields (ABC1 category) as of 31.12.2007 (tcm) ................. 48
Chart 1.23. The number of licenses for exploration and development of hydrocarbons (units) .......................................................................................................................... 49
Chart 1.24. Results and forecast of Gazprom’s reserve increment based on the assets and as a result of exploration work in 2007-2010 ................................................................. 50
Chart 1.25. Development of proved reserves of independent gas companies (tcm) .......... 51
Chart 2.2. Actual (2001-2007) and forecast gas production by Gazprom and independent producers in 2010 and 2020 .............................................................. 54
Chart 2.3. Gas production forecast by region (bcm) .................................................................. 55
Chart 2.4. Gas price forecasts in the Energy Strategy and Gazprom’s current estimates from 2005 to 2010 ............................................................................................................ 56
Chart 2.5. Natural gas MET changes in 2004-2007 (Russian Roubles) .................................. 68
Chart 3.1. Gazprom’s gas production from 2000 to 2007 (bcm) .............................................. 71
Chart 3.2. Gazprom’s gas production within and beyond the Nadym-Pur-Taz region from 2000 to 2007 (bcm) ................................................................................................. 72
Chart 3.3. Schedule of commissioning of IGPFs and gas production growth in the Urengoygas field (bcm) .......................................................... 75
Chart 3.4. Gas production of Urengoygas from 2000 to 2007 (bcm) ................. 76
Chart 3.5. Gas and condensate processing by West Siberian integrated processing plant .......... 80
Chart 3.6. Production at Urengoy gas processing plant in 2007 (thousand tonnes) .......... 80
Chart 3.7. Production at Surgut gas processing plant in 2007 (thousand tonnes) ........... 81
Chart 3.8. Gas production potential of Gazprom Dobycha Urengoy from 2007 to 2020 (bcm) 83
Chart 3.9. Percentage of old and new fields of Urengoygas from 2007 to 2020 .......... 84
Chart 3.10. Prospects for changes in the wellhead prices of Gazprom Dobycha Urengoy (nominal USD per 1,000 cubic meters) .............................................. 85
Chart 3.11. Nadymgas’ gas production from 2000 to 2007 (bcm) .......................... 89
Chart 3.12. Gas production potential of Gazprom Dobycha Nadym from 2007 to 2020 (bcm) .............................................................. 91
Chart 3.13. Prospects for changes in the wellhead prices of Gazprom Dobycha Nadym (USD per 1,000 cubic meters) .............................................................. 92
Chart 3.14. Composition of gas from Cenomanian reservoir of the Yamburgskoye gas condensate field ......................................................... 94
Chart 3.15. Composition of gas from the Zapolyarnoye field .................................... 95
Chart 3.17. Gas production potential of Gazprom Dobycha Yamburg from 2007 to 2020 (bcm) .............................................................. 99
Chart 3.18. Percentage of old and new fields of Gazprom Dobycha Yamburg from 2007 to 2020 .............................................................. 101
Chart 3.19. Prospects for changes in the wellhead prices of Gazprom Dobycha Yamburg (USD per 1,000 cubic meters) .............................................................. 102
Chart 3.20. Gas production of Noyabrskgazdobycha from 2000 to 2007 (bcm) ............ 106
Chart 3.21. Gas production potential of Gazprom Dobycha Noyabrsk from 2007 to 2020 (bcm) .............................................................. 108
Chart 3.22. Prospects for changes in the wellhead prices of Gazprom Dobycha Noyabrsk (USD per 1,000 cubic meters) .............................................................. 109
Chart 3.23. Business model of operation of Purgazdobycha ........................................ 110
Chart 3.24. Gas production potential from the West-Tarkalsinskoye field from 2007 to 2020 (bcm) .............................................................. 112
Chart 3.25. Model for the transfer of title to the South-Russkoye field development from 1993 to 2001 .............................................................. 114
Chart 3.26. Stakes in Severneftegazprom held by project participants in voting shares ... 117
Chart 3.27. Business model of Severneftegazprom ................................................... 118
Chart 3.28. Gas production potential in the South Russkoye field from 2007 to 2020 (bcm)... 119
Chart 3.29. Business model of Achimgaz from 2007 ................................................... 121
Chart 3.30. Gas production potential of Achimgaz to 2020 (bcm) ................................ 122
Chart 3.31. Business model of Purgaz ................................................................. 124
Chart 3.32. Gas production potential from the Gubkinskoye field of Purgaz from 2007 to 2020 (bcm) ................................................................. 125
Chart 3.33. Current allocation of shares in Northgas .................................................. 127
Chart 3.34. Gas production of Northgas from 2001 to 2007 (bcm) ............................... 128
Chart 3.35. Gas production potential in the North-Urengoyskoye field from 2007 to 2020 (bcm) ................................................................. 130
Chart 3.36. Composition of gas from the Astrakhanskoye field .................................... 132
Chart 3.37. Gas production of Astrakhangazprom from 2000 to 2007 (bcm) ................. 133
Chart 3.38. Process flow chart of Astrakhan integrated plant ....................................... 134
Chart 3.39. Gas processing at Astrakhan GPP and production of hydrocarbon liquids ...... 135
Chart 3.40. Production potential of Gazprom Dobycha Astrakhan from 2007 to 2020 (bcm) .............................................................................. 137
Chart 3.41. Prospects for changes in the wellhead prices of Gazprom Dobycha Astrakhan (USD per 1,000 cubic meters) ............................................. 138
Chart 3.42. Composition of gas of the Orenburgskoye field .......................................... 139
Chart 3.43. Gas production of Orenburggazprom from 2000 to 2007 (bcm) ...................... 140
Chart 3.44. Process flow chart of the Orenburg Gas Processing Plant .............................. 141
Chart 3.45. Gas production potential for the Orenburgskoye field from 2007 to 2020 (bcm) 144
Chart 3.46. Gas production of Stimul from 2003 to 2007 (bcm) ...................................... 147
Chart 3.47. Gas production of Severgazprom from 2000 to 2007 (bcm) ......................... 150
Chart 3.48. Processing at Sosnogorsk GPP ................................................................. 151
Chart 3.49. Gas production potential from the fields of Severgazprom from 2007 to 2020 (bcm) .............................................................................. 152
Chart 3.50. Gas production potential of Tomskgazprom from 2000 to 2007 (bcm) .......... 155
Chart 3.51. Gas production potential of Tomskgazprom from 2007 to 2020 (bcm) .......... 157
Chart 3.52. Gas production of Kubangazprom from 2000 to 2007 (bcm) .......................... 161
Chart 3.53. Gas production potential of Gazpromtransgas Kuban from 2007 to 2020 (bcm) .............................................................................. 161
Chart 3.54. Gas production potential of Gazprom’s companies in the Nadym-Pur-Taz Region (wholly owned by Gazprom) from 2007 to 2020 (bcm) .......... 162
Chart 3.55. Gas production potential of Gazprom’s companies in the Nadym-Pur-Taz Region (in which Gazprom holds 50 percent or more) from 2007 to 2020 (bcm) .......... 163
Chart 3.56. Total gas production potential of Gazprom’s companies in the Nadym-Pur-Taz Region from 2007 to 2020 (bcm) .............................................................................. 164
Chart 3.57. Total gas production potential of Gazprom’s companies outside the Nadym-Pur-Taz Region from 2007 to 2020 (bcm) .............................................................................. 165
Chart 3.58. Consolidated forecast of gas production from the existing fields controlled by Gazprom (NPTR and non-NPTR) from 2007 to 2020 (bcm) .......... 166
Chart 3.59. Gas production of Arcticgas, 2002-2007 (bcm) ............................................ 169
Chart 3.60. Gas production potential of Sever Energiya from 2010 to 2020 (bcm) .......... 171
Chart 3.61. Gas production potential of Sibneftegaz from 2007 to 2020 (bcm) .................. 172
Chart 3.62. Consolidated forecast of gas production from the existing fields of Gazprom according to Scenario 2 (NPTR and non-NPTR) from 2007 to 2020 (bcm) .............. 173
Chart 3.63. Share of enterprises in which Gazprom owns 50 percent or more in Gazprom’s total production (NPTR and non-NPTR) according to Scenario 2 from 2007 to 2020 .......... 174
Chart 3.64. Consolidated forecast of gas production from the existing fields of Gazprom according to Scenario 2 (NPTR and non-NPTR) from 2007 to 2020 (bcm) .......... 175
Chart 4.1. NOVATEK’s equity structure as of December 31, 2007 ............................................. 181
Chart 4.2. Natural gas reserves (bcm) ........................................................................................ 184
Chart 4.3. NOVATEK’s gas production 2000 to 2007 (bcm) ....................................................... 186
Chart 4.4. Gas production in the Yurkharovskoye field (bcm) ................................................... 187
Chart 4.5. Gas production in the Vostochno-Tarkosalinskoye field (bcm) ......................... 188
Chart 4.6. Gas production in the Khancheiskoye field (bcm) ................................................. 189
Chart 4.7. Production indicators of Purovsky Plant (thousand tonnes) ..................................... 190
Chart 4.8. NOVATEK’s gas production potential from 2007 to 2020 (bcm) ............................ 193
Chart 4.9. NOVATEK’s capital expenditures in connection with exploration from 2008 to 2015 (USD million) ................................................................. 194
Chart 4.10. Gas production by oil companies 2000 to 2007 (bcm) ............................................. 197
Chart 4.11. Regions of LUKOIL’s gas production ................................................................. 197
Chart 4.12. LUKOIL’s gas production 2000 to 2007 (bcm) ......................................................... 199
Chart 4.13. Gas production in the Nakhodkinskoye field from 2004 to 2007 (bcm) .......... 202
Chart 4.15. Gas production of North Caspian fields 2009 to 2020 (bcm) .................................... 206
Chart 4.16. LUKOIL’s gas production potential 2007 to 2020 (bcm) ........................................ 208
Chart 4.17. Regions of Rosneft’s gas production ................................................................. 209
Chart 4.18. Rosneft’s gas production from 2000 to 2007 (bcm) .............................................. 209
Chart 4.19. Gas production potential of Rosneft from 2007 to 2020 (in European Russia) (bcm) ........................................................................................................ 215
Chart 4.20. Regional breakdown of TNK-BP’s gas production .................................................... 216
Chart 4.21. TNK-BP’s gas production from 2002 to 2007 (bcm) .................................................. 217
Chart 4.22. Rospan’s gas production from 2001 to 2007 (bcm) .................................................. 219
Chart 4.23. TNK-BP’s gas production potential from 2007 to 2020 (European Russia) (bcm) .. 222
Chart 4.24. Surgutneftegaz’s gas production from 2001 to 2007 (bcm) ...................................... 224
Chart 4.25. Surgutneftegaz’s gas production potential from 2007 to 2020 (bcm) .................... 227
Chart 4.26. Gas production potential by asset of oil companies and independent gas producers (current boundaries of the UGSS) from 2007 to 2020 (bcm) ............... 228
Chart 5.1. Gas reserves of the Bovanenkovskoye and Shtokmanovskoye fields, the Ob and Taz Bays, the Achimov Formation of the NPTR (tcm) ........................................ 230
Chart 5.2. Gas production in Yamal to achieve 250 bcm as estimated by Gazprom (bcm)..... 233
Chart 5.3. Schedule of gas production in the Bovanenkovskoye field from the date of its planned commissioning until 2020 (bcm) ......................................................... 243
Chart 5.4. General schedule of development of the Kharasaveiskoye field reservoirs (bcm per year) ............................................................................................................ 250
Chart 5.5. Yamal field licensing phases ........................................................................................................... 257
Chart 5.6. Shareholders of Shtokman Development AG ...................................................................................... 263
Chart 5.7. Forecast gas sales during the first phase of Shtokman project ................................................................... 264
Chart 5.8. Business model of the first phase Shtokman project ........................................................................... 265
Chart 5.9. Model of subsea development of the Shtokmanovskoye field ........................................................... 267
Chart 5.10. Two concepts of the Shtokmanovskoye field development (70 bcm and 95 bcm) ........................................................... 268
Chart 5.11. The development schedule of phase one of the Shtokmanovskoye field ................................................... 269
Chart 5.12. Most attractive terminals for LNG delivery from Shtokman (cost components include shipping, regasification and local pipeline costs, as a percentage of the best option) .............. 275
Chart 5.13. General plan of development of the Ob and Taz Bay fields (bcm) ................................................... 282
Chart 5.15. Resource base of the Kovyktinsky and Khandinsky license areas controlled by Rusia Petroleum (bcm) ............................................................................................................ 288
Chart 5.16. Current shareholding structure of Rusia Petroleum ........................................................................... 289
Chart 5.17. Potential distribution of gas from the Kovyktinskoye field under the international feasibility study project (bcm per year) ...................................................................................... 290
Chart 5.18. Possible parameters of the Kovyktinskoye field development ........................................................................... 291
Chart 5.19. Regional scenario implementation schedule ........................................................................... 292
Chart 5.20. Gas supplies from the Kovyktinskoye field according to regional scenario (bcm) .................................... 293
Chart 5.21. Composition of gas from the Chayandinskoye field ........................................................................... 296
Chart 5.22. Possible options of gas production in Chayandinskoye (bcm) ........................................................... 297
Chart 5.23. Proved crude oil, gas and condensate reserves of the Sobinskoye and Paiginskoye fields ............................................................................................................ 301
Chart 5.24. Possible annual gas production in Sobinskoye and Paiginskoye fields ........................................................... 302
Chart 5.25. Current shareholders of the Sakhalin-1 project ........................................................................... 304
Chart 5.27. Composition of gas from the Chaivo field ........................................................................... 305
Chart 5.28. Sakhalin-1 gas production in 2005-2008 (bcm) ........................................................................... 306
Chart 5.29. Investment in Sakhalin-1 project (USD billion) ........................................................................... 306
Chart 5.30. Potential gas production under the Sakhalin-1 project until 2020 (bcm) ................................................... 307
Chart 5.31. Shares in Sakhalin Energy before negotiations with Gazprom ........................................................................... 309
Chart 5.32. Current owners of Sakhalin Energy ........................................................................... 310
Chart 5.33. Oil, gas and condensate reserves of the Sakhalin-2 project fields ........................................................................... 310
Chart 5.34. Piltun-Astokhskoye gas composition ........................................................................... 311
Chart 5.35. Lunsoye gas composition ........................................................................... 312
Chart 5.36. Sakhalin-2 gas annual production potential (bcm) ........................................................................... 313
Chart 5.37. Sakhalin-3 gas annual production potential (bcm) ........................................................................... 315
Chart 5.38. Forecast output in the current fields in operation in the Far East (bcm) ................................................... 315
Chart 6.1. Natural gas consumption in Russia in 2007 by sector (without transportation gas) ................................................................. 316

Chart 6.2. Gas consumption growth trend and average gas prices for industry and households in 2000-2007 ................................................................. 317

Chart 6.3. Gas demand in Russia in 2008-2020 (bcm) ................................................................. 321

Chart 6.4. Gazprom gas exports from Russia (bcm) .............................................................................. 323

Chart 6.5. Gazprom gas exports to Western and Central Europe in 2007 (bcm) .............................. 325

Chart 6.6. Natural gas exports to CIS and Baltic States in 2007 (bcm) .............................................. 329

Chart 6.7. LNG self-contracting model ............................................................................................ 331

Chart 6.8. Global market demand forecast for Russian gas, by scenario, in 2010-2020 (bcm) 334

Chart 6.9. Global market and domestic demand forecast for Russian gas, by scenario, in 2008-2020 (bcm) .............................................................................. 335

Chart 6.10. Global market and domestic demand forecast for Russian gas, for Europe and Asia for the White scenario (bcm) ........................................................ 336

Chart 6.11. Global market and domestic demand forecast for Russian gas, for Europe and Asia for the Blue scenario (bcm) ................................................................. 336

Chart 6.12. Natural gas reserves of Kazakhstan, Turkmenistan and Uzbekistan (tcm) ..................... 340

Chart 7.1. Russian gas production growth potential (bcm) .................................................................... 346

Chart 7.2. Investments in production facilities by region (USD billion). Maximum case .................. 347

Chart 7.3. Investments in production by Gazprom and other producing companies (USD billion) ............................................................................................................ 347

Chart 7.4. Balance between demand under the Blue Scenario and production potential (bcm) .................................................................................................................. 348

Chart 7.5. Russian gas production (bcm). The Blue Scenario .......................................................... 351

Chart 7.6. Investments in production assets by region (USD billion). The Blue Scenario .................. 352

Chart 7.7. Investments in production by Gazprom and other producing companies (USD billion). The Blue Scenario ................................................................................. 353

Chart 7.8. Balance between the demand under White Scenario and production potential (bcm) .................................................................................................................. 354

Chart 7.9. Russian gas production (bcm). The White Scenario .......................................................... 357

Chart 7.10. Investments in production assets by region (USD billion). The White Scenario ............... 358

Chart 7.11. Investments in production by Gazprom and other producing companies (USD billion). The White Scenario ..................................................................................... 359
Tables

Table 1.1. Short list of acquired or regained assets ................................................................. 25
Table 1.2. History of Gazprom’s credit rating as of the end of 2003 till 2007 ....................... 27
Table 1.3. Trend of natural gas and associated gas production by the independent gas producers and Oil Companies in Russia in 2000-2007 (bcm) .................................................. 32
Table 1.4. Classification of oil and gas reserves adopted in Russia and the USA .................. 32
Table 1.5. Distribution of natural gas reserves in Russia by Federal Districts ....................... 36
Table 1.6. Ratio of gas production and gas reserve increment ............................................... 47
Table 2.1. Recoverable reserves of the federal category fields .............................................. 57
Table 2.2. Federal category gas fields ..................................................................................... 57
Table 2.3. Federal and regional governments’ powers ........................................................... 59
Table 2.4. Subsoil blocks use periods ..................................................................................... 62
Table 2.5. Gas resources auctions proposed for 2008 .......................................................... 64
Table 2.6. Current MET rates ............................................................................................... 69
Table 3.1. Basic Fields of Urengoygazprom ......................................................................... 74
Table 3.2. Planned gas production from the new zones developed by Urengoygazprom from 2000 to 2007 .................................................................................................................. 77
Table 3.3. Cost-plus from Urengoy field to the Belarus border, Ukrainian border, Nord Stream pipeline entry point, Blue Stream pipeline entry point (nominal USD per 1,000 cubic meters) ........................................................................ 86
Table 3.4. Basic fields of Nadymgazprom ............................................................................ 88
Table 3.5. Basic fields of the Yamburggazdobycha ............................................................... 93
Table 3.6. Planned production from the Yamburggazdobycha fields ..................................... 97
Table 3.7. Cost-plus from Yamburg to the Ukrainian border and Blue Stream pipeline entry point (nominal USD per 1,000 cubic meters) ........................................................................ 102
Table 3.8. Basic fields of Noyabrskgazdobycha ..................................................................... 104
Table 3.9. Gas production from the fields of Noyabrskgazdobycha ...................................... 106
Table 3.10. Cost-plus from South-Urengoyskoye field to the Nord Stream pipeline entry point and Belarusian border (nominal USD per 1,000 cubic meters) ................. 119
Table 3.11. Geological reserves of the North-Urengoyskoye field ....................................... 127
Table 3.12. Cost-plus from Orenburgskoye field to the Ukrainian border and Blue Stream entry point (nominal USD per 1,000 cubic meters) ........................................... 145
Table 3.13. Basic fields of Severgazprom ........................................................................... 149
Table 3.14. Basic fields of Enineftegaz .................................................................................. 168
Table 4.1. Equity gas production of Itera Group in the early 2000s ....................................... 178
Table 4.2. Itera’s reserves in the early 2000s (bcm) ............................................................. 178
Table 4.3. Structure of the upstream and processing assets of NOVATEK (as of beginning of 2008) .......................................................................................................................... 182
Table 4.4. Basic fields of NOVATEK................................................................. 183 
Table 4.5. Owners of licenses for the principal fields of NOVATEK ......................... 184 
Table 4.6. Capital expenditures in NOVATEK’s principal fields from 2008 to 2015  
(USD million) ................................................................................................. 194 
Table 4.6. Capital expenditures in principal fields from 2008 to 2015  
(USD million) (Continuation) ........................................................................ 195 
Table 4.7. Cost-plus from Yurkharovskoye field to the Ukrainian border and Dzhubga  
(nominal USD per 1,000 cubic meters) ................................................................ 196 
Table 4.8. Basic fields of LUKOIL (Russian classification) ...................................... 199 
Table 4.9. Rosneft basic fields (Russian classification) .............................................. 211 
Table 4.10. Cost-plus* from Kharampurskoye field to the Ukrainian border and Dzhubga  
(nominal USD per 1,000 cubic meters) ................................................................ 215 
Table 4.11. Rospan basic fields (Russian classification) ............................................ 218 
Table 4.12. Cost-plus from Vostochno-Urengoiyskoye field to the Ukrainian border and  
Dzhubga (nominal USD per 1,000 cubic meters) ................................................ 223 
Table 4.13. Surgutneftegas basic fields .................................................................... 224 
Table 5.1. Production potential of the basic groups of Yamal fields ....................... 232 
Table 5.2. Gas reserves of the Bovanenkovskoye field (bcm) ..................................... 235 
Table 5.3. Composition of natural gas from the Bovanenkovskoye field .................. 235 
Table 5.4. Cost-plus from Bovanenkovskoye field to the Nord Stream pipeline entry point  
and Belarusian border (nominal USD per 1,000 cubic meters) ............................. 248 
Table 5.5. Gas reserves of the Kharasaveiskoye field (bcm) ....................................... 249 
Table 5.6. SWOT analysis of the Bovanenkovskoye and Kharasaveiskoye  
field development project .................................................................................. 252 
Table 5.7. Yamal fields included in the list of non-licensed strategic fields............... 256 
Table 5.8. Resource base of Yamal blocks to be licensed in the future broken down by Group  
 ................................................................................................................................... 257 
Table 5.9. Cost-plus from Shtokman to the liquefaction plant loading arm and Nord Stream  
pipeline entry point (nominal USD per 1,000 cubic meters) ................................ 277 
Table 5.10. SWOT analysis of the Shtokman project ................................................ 278 
Table 5.11. Reserves of the Ob and Taz Bay fields .................................................... 279 
Table 5.12. Cost-plus from Ob and Taz Bay fields to the Ukrainian border and Dzhubga  
(nominal USD per 1,000 cubic meters) ................................................................ 284 
Table 5.13. General characteristics of the Kovyktinskoye field ................................. 287 
Table 5.14. Composition of gas from the Kovyktinskoye field .................................... 289 
Table 5.15. Cost-plus from Kovyktinskoye field to the Ukrainian and China borders  
(nominal USD per 1,000 cubic meters) ................................................................. 294 
Table 5.16. Cost-plus from Sakhalin-1 to China border (nominal USD per 1,000 cubic meters) 307 
Table 5.17. Cost-plus from Sakhalin-2 to the liquefaction plant loading arm  
(nominal USD per 1,000 cubic meters) ............................................................... 314 
Table 5.18. Cost-plus from Sakhalin-3 to China border  
(nominal USD per 1,000 cubic meters) ................................................................ 314 
Table 6.1. Unified Gas Supply System in 2007 ........................................................ 341