

Chapter

15



Cumulative Impacts

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15.1 INTRODUCTION

Sakhalin II is not the only industrial project on the island. This chapter describes current and planned projects and considers the potential cumulative effects of implementing them. It focuses in particular on Sakhalin I, which is of a similar size to Sakhalin II and is likely to have similar impacts, in some cases within the same geographical area or communities.

15.2 SAKHALIN INVESTMENT PROJECTS

The Sakhalin Oblast is currently making efforts to improve the region's investment climate, in particular by:

- Minimising political risks by promoting stability, predictability and transparency in the work of regional and local authorities,
- Improving regional legislation in order to attract investment,
- Improving organisational mechanisms to enhance the efficiency of investment policy work,
- Promoting growth in market infrastructure institutions (banking, insurance, *etc.*),
- Promoting development of industrial and social infrastructure, and
- Providing information support.

An Investment Advisory Board was set up within the regional administration in October 2001 with 20 people, including six representatives of foreign companies - SEIC, BP, the American Business Centre (ABC) and others. The administration has also set up the Sakhalin Investment Promotion Agency (SIPA).

SIPA has a list of 35 investment projects on Sakhalin, worth a total of US\$35 million (this does not include offshore oil and gas projects). Some have already secured investment; others need to be developed further. Most of the projects will be completed in the next 10 years.

Many of the projects are of regional significance and their implementation could help resolve a range of infrastructure problems on the island. About 45% are associated with logging, timber processing and the coal industry. About 20% focus on the food industry (including fishing) and others include development of construction, electrical energy, transport and tourism.

Additionally, the regional administration has developed a paper on 'Integrated Infrastructure Development during Exploitation of the Sakhalin Offshore Oil and Gas Fields'. The aim is to facilitate the establishment of local processing facilities for hydrocarbon resources. It is hoped that this will strengthen the tax base and create jobs. Implementation of the proposal is estimated to cost US\$1,026 million.

The largest projects on the SIPA investment list are presented in Table 15-01.

TABLE 15-01: INVESTMENT PROJECTS IN SAKHALIN REGION (BY ECONOMIC SECTOR)

Sector	Project	Location	Goal	Project Organiser	Total Cost	Investment Required	New Jobs	Completion Period	Payoff Period
Construction	Construction of a tunnel/bridge crossing to mainland Russia	Sakhalin	Improving transportation links between Sakhalin and the mainland			US\$4.5 bln.	36,000		25-40 yrs
Construction	Conversion of railroad to mainland wide rail gage	Sakhalin	Modernisation of the Sakhalin rail system	Russian Rail Ministry	About US\$1.3 bln.	About US\$1.3 bln.			
Construction	Construction of a cement plant	Pobedino	Revival and modernisation of the cement industry	Sakhcement Ltd.	US\$60.0 mln.	US\$60.0 mln.	150	3 yrs	13 yrs
Construction	Construction of a basalt fibre products plant	Yuzhno-Sakhalinsk	Setting up new production	Stroydetal Ltd.	US\$35.0 mln.	US\$35.0 mln.		2003-2004	3 yrs
Construction	Construction of a tunnel/	Sakhalin	Improving transportation			US\$4.5 bln.	36,000		25-40 yrs
Transport	Development of the Boeing 737-700 by 'SA' airlines	Yuzhno-Sakhalinsk	Expansion of existing air transport production, technical upgrading	State enterprise 'Airline company 'Sakhalin Airways''	US\$81.2 mln.	US\$13.7 mln.	140	15 yrs	12 yrs
Transport	Purchase of two coal transportation vessels	Sakhalin	Expansion of coal production	Joint stock company (JSC) 'Sakhalin Steamship Lines'	US\$5.0 mln. US\$5.0 mln.	US\$5.0 mln. US\$5.0 mln.		5 yrs 5 yrs	3 yrs 5 months
Power	Expansion of the Nogliki gas fired power station	Nogliki	Development of electrical power industry	JSC 'Nogliki' gas fired power station'	US\$44.4 mln.	US\$44.4 mln.		2 yrs	7 yrs
Fishing	Construction of a plant for waste-free processing of deep-sea crabs, shrimps and other marine products	Korsakov	Creation of new high - technology modern production and development of the fishing industry	JSC 'Research and production complex 'BINOM - Center''	US\$16.3 mln.	US\$6.4 mln.	280	5 yrs	4.5 yrs

TABLE 15-01: INVESTMENT PROJECTS IN SAKHALIN REGION (BY ECONOMIC SECTOR) (Continued)

Sector	Project	Location	Goal	Project Organiser	Total Cost	Investment Required	New Jobs	Completion Period	Payoff Period
Coal	Development of coal strip mine 'Soltsevskeye'	Shakhtersk, Uglegorsk District		JSC 'Sakhalin Coal Corporation'	US\$14.2 mln.	US\$2.0 mln.		2002-2004	3.2 yrs
Coal	Purchase of technical equipment for coal mine	Udarny, Uglegorsk District		Ostrovnyaya Mine Ltd.	US\$4.9 mln.	US\$4.9 mln.		2001-2007	4 yrs 10 months
Coal	Purchase of technical equipment for coal mine	Shakhtersk,		Shakhterskoye Mine	US\$4.7 mln.	US\$3.4 mln.		2006	5 yrs
Coal	Purchase of technical equipment for coal mine	Bykov, Dolinsk District		Bykovugol (Bykov coal) Ltd.	US\$4.3 mln.	US\$4.3 mln.	126	6 yrs	4 yrs 4 months
Coal	Purchase of technical equipment to increase open-cast mine capacity	Tymovsk District	Expansion of existing coal production for domestic and foreign markets; building capital to develop the industry	Tymovsk (coal company) Ltd.	US\$3.2 mln.	US\$2.2 mln.	31	5 yrs	3 yrs
Coal	Open-cast mine development	Poronaisk		Poronaiskugol Ltd.	US\$2.4 mln.	US\$1.8 mln.	200	2005	2.8 yrs
Coal	Introduction of new technology in a coal mine	Aleksandrovsk-Sakhalinsk District		Mangidayugol Ltd.	US\$2.3 mln.	US\$1.9 mln.		5 yrs	3 yrs
Chemicals	Production and marketing of multicoat polymeric packs	Yuzhno-Sakhalinsk industrial infrastructure		Evrifa-2 Ltd.	US\$2.6 mln.	US\$2.3 mln.		4 yrs	2 yrs 3 months
Wood processing	Furniture production	Tomari		Tomarimebel Ltd.	US\$1.5 mln.	US\$1.3 mln.		1 yr	3 yrs 10 months
Timber	Modernisation and application of low impact and environmentally benign technologies in enterprises timber	Aleksandrovsk-Sakhalinsk, Uglegorsk, Tymovsk, Nogliki, Smirnykh, Tomari Districts		Chozeniya Ltd.	US\$1.4 mln.	US\$1.2 mln.		1 yr	3 yrs 9 months
Tourism	Establishment of a tourist base/camp site on Moneron Island	Moneron Island, Nevelsk	Development of existing tourist spot; provision of additional tour services to foreign/Russian tourists	Administration of Nevelsk and Nevelsk District	US\$1.2 mln.	US\$1.2 mln.		1 yr	10 yrs

Source: Sakhalin Investment Promotion Agency, October 2002.

15.3 OFFSHORE OIL AND GAS PROJECTS

15.3.1 Summary

The Sakhalin offshore oil and gas projects are based on nine licence areas on the Sakhalin shelf, as shown below:

TABLE 15-02: SAKHALIN OFFSHORE OIL AND GAS PROJECTS

Sakhalin Projects	Planned Start of Industrial Production, year	Expected Recoverable Resources		Maximum Annual Production Level		Interested companies
		Oil, mln. tons	Gas, bln. m ³	Oil, mln. tons	Gas, bln. m ³	
Sakhalin I	2005	307	485	6.0	11.0	ENL (operator), SMNG-Shelf, RN-Astra, SODECO, ONGC Videsh, Ltd. (shareholders)
Sakhalin II	1999	140	408	7.9	16.4	SEIC (operator), Shell, Mitsubishi, Mitsui (shareholders)
Sakhalin III, Kirinsky block	2010	324*	873	24.4	–	Pegastar (operator), Exxon-Mobil, Texaco, Vostokshelf, SMNG-KMK and Rosneft (shareholders)
Sakhalin III, East-Odoptinsky block	2014	284	780	6.0	0.9	Exxon-Mobil and Rosneft-SMNG
Sakhalin III, Ayashsky block	2014			9.1	1.0	Exxon-Mobil and Rosneft-SMNG
Sakhalin IV, Astrakhanovsky and Shmidtovsky blocks	2014	50+145*	430+280		4.3	Rosneft, Rosneft-SMNG and BP (Astrakhanovskaya structure)
Sakhalin V, Kaigan-Vasukansky blocks	2010	600	600	35.5	34.2	Rosneft, Rosneft-SMNG and BP
Sakhalin V, East-Shmidtovsky block		500	130			TNK
Sakhalin V, Yelizavetinsky block		100**				Open acreage
Sakhalin V, Khanduzinsky block		40**				Open acreage
Sakhalin VI, Pogranichny block		175	170			Petrosakh (ALPHA Bank) and Rosneft, possibly Exxon-Mobil and Texaco
Sakhalin VII, Terpeniya and Aniva bays		300**				Open acreage
Sakhalin VIII, Northern Tatar Strait		100**				Open acreage
Sakhalin IX, Southern Tatar Strait		160**				Open acreage

* Including gas condensate ** Toe (ton oil equivalent)

Sources: Sakhalin Region at the Turn of the 21st Century. Jubilee Collection. Yuzhno-Sakhalinsk: Sakhalin Regional Statistics Committee, 2001; Sakhalin Investment Promotion Agency, October 2002; www.oilcapital.ru; www.rosneft.ru

15.3.2 Sakhalin I and Sakhalin II

Sakhalin I and Sakhalin II are the only two offshore oil and gas projects currently being implemented under PSA agreements. The following table compares the Sakhalin I and Sakhalin II project descriptions:

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TABLE 15-03: SAKHALIN I AND SAKHALIN II PROJECT DESCRIPTIONS

Project Details	Sakhalin I	Sakhalin II
Total Investment	US\$12 billion	US\$10 billion
Operator	Exxon Neftegas Limited, an affiliate of Exxon Mobil (USA)	Sakhalin Energy Investment Company Ltd.
Shareholders	'Sakhalinmorneftegas-Shelf' (Sakhalin) RN-Astra (Russia) Sakhalin Oil and Gas Development Co., Ltd. (SODECO) (Japan) ONGC Videsh Ltd. (India)	Shell (UK/Netherlands) Mitsubishi (Japan) Mitsui (Japan)
Fields	The Sakhalin I Project has three fields, located on the northeastern shelf: Chaivo, Odoptu and Arkutun-Dagi.	Two fields approx. 15km offshore of northeastern Sakhalin: Piltun Astokhskiye (mainly oil and condensate) and Lunskiye (mainly gas). Together, the fields contain approximately 600 million tonnes of crude oil and over 700 billion cubic metres (24 trillion cubic feet) of gas.
Project infrastructure	Orlan platform Chaivo onshore Wellsite Chaivo, Odoptu and Arkutun-Dagi OPFs Odoptu onshore Wellsites 1 and 2 pipeline gathering system Crude Oil Export System (incl. DeKastri export pipeline and DeKastri Marine Terminal) Other facilities Infrastructure improvements	Molikpaq platform Vityaz complex Offshore and onshore oil and gas pipelines Lunskiye OPF Booster station #1 Castello booster station #2 LNG plant Other facilities Infrastructure improvements
Russian Content	More than \$1.4 bln. of contracts awarded to Russian companies to date	\$0.8 bln. of contracts awarded to Russian companies as of end September 2002.
Landmarks	Project commencement, 1996 October 2001: Sakhalin I Project declared commercial by the Sakhalin I consortium, enabling it to move from exploration to development. February 2002: consortium received approval for its 2002 budget, totalling US\$726 million	Project commencement, 1996 First oil was produced using Molikpaq in 1999.
Project Phases		
Phase 1	Began early 2002 with about US\$4 billion investment. Focus on major oil deposits in Chaivo and Odoptu fields. Limited gas production to help meet domestic demand. Oil to be transported by pipeline to tanker terminal at DeKastri on the mainland. First oil expected late 2005 (Chaivo) and early 2007 (Odoptu).	Phase 1 is developed around the Molikpaq offshore production platform and produces oil during the ice-free months of the year (about 180 days). Oil is transferred from the Molikpaq to a floating storage and offloading unit, then to oil tankers for shipment to markets in Asia. Peak output is 90,000 barrels of oil per day (4 million tonnes per year).
Phase 2	Major gas export to China/Japan. Construction of an undersea natural gas pipeline to Japan, maybe with a pipeline spur into Yuzhno-Sakhalinsk to help meet regional gas needs.	See Chapter 1 and Appendix F.
Phase 3	Development of Arkutun-Dagi field, north of Piltun.	
Phase 4	Late-life gas development: Arkutun and Odoptu gas production to be extended. Phase 4 will enable gas production to continue beyond 2050.	

15.3.2.1 Project Schedules and Locations

Sakhalin I started up in the same year as Sakhalin II (1996) and plans to end in the same year (2045). Sakhalin I plans oil extraction from 2005, while Sakhalin II started oil production in 1999 and plans LNG production from 2006.

The main areas subject to direct cumulative impacts from the Sakhalin II and Sakhalin I projects will be southern Sakhalin, where offices are located and transport infrastructure will be heavily used, and Nogliki District, where a considerable amount of project infrastructure will be constructed by both projects.

The Sakhalin I pipeline will cross Okha and Nogliki districts, extending from east to west and across the Tatar Strait to the Russian mainland. The Sakhalin II pipeline will pass through Okha and Nogliki Districts and extend to the south of the island.

15.3.2.2 Land Needs and Infrastructure Upgrading

Some Sakhalin I and Sakhalin II project activities (construction, operation and infrastructure up-grading) are expected to be concurrent, which means that construction schedules will need to be agreed and discussed by the two projects and with local populations in advance, so as to minimise the impact on local communities.

Some infrastructure, *e.g.*, roads, bridges, Nogliki airport, is likely to be used by both projects, thus increasing the related impacts (*e.g.*, traffic volume, accidents, noise, dust). In some cases both projects will be constructing facilities in the same community, and the additional increase in numbers of incoming workers and related social impacts will need to be considered by both projects when planning social monitoring and mitigation procedures.

15.3.2.3 Project Revenues

Payments from Sakhalin I and Sakhalin II have been made since 1996, in accordance with the PSAs. Sakhalin II revenues are discussed more in Chapter 10. The following table compares the types of payments that the two Projects have paid or are due to pay according to the PSAs.

TABLE 15-05: TYPES OF PAYMENTS FROM SAKHALIN I AND SAKHALIN II PROJECTS ACCORDING TO THE PSAs

Type of payment	Sakhalin I	Sakhalin II
Commencement Bonus	US\$15 mln. (paid in 1996)	US\$15 mln. (paid in 1996)
Development date bonus		Piltun-Astokh: US\$15 mln. (paid 1997) Lunskoye: US\$20 mln. (to pay in 2003)
Payments for use of marine area	US\$50-400 per 1km/year	
Payments for right to carry out geological resource survey (rentals)	US\$150-225 per 1km marine area/year (during geological survey)	
Bonus at start of selling hydrocarbons, for every cost-effective field	Chaivo: US\$15 mln. Odoptu field: US\$10 mln. Arkutun-Dagi field: US\$20 mln.	
Royalty payments	8% of hydrocarbons or extracted hydrocarbon cost	6% of hydrocarbons or extracted hydrocarbon cost
Repayment of state geological surveys	US\$71 mln.	US\$80-160 mln. (US\$52 mln. paid as of Dec. 2002)
Payments to the Sakhalin Development Fund	US\$100 mln.	US\$100 mln. (US\$20 mln. paid annually from 1997-2001)

Source: Types of Payments Paid by Sakhalin I and Sakhalin II Projects - Adventure of the Century or Paradoxes of the Sakhalin Shelf: Report Materials of the Auditing Chamber of the Russian Federation, Moscow, 2001

The table below shows the revenues paid to the Russian federal budget so far by Sakhalin II and Sakhalin I in accordance with the PSAs.

TABLE 15-06: REVENUES TO THE RUSSIAN FEDERATION CONSOLIDATED BUDGET, 1999-2001

Projects	Payments (thousand US\$)		
	1999	2000	2001
Sakhalin II	24,000	36,000	43,040
Sakhalin I	460.8	230.4	230.4
Total	24,460.8	36,230.4	43,270.4

In 2001, payments to the Sakhalin regional budget totalled US\$32,338.2 thousand (\$32,200 thousand from Sakhalin II and \$138.2 thousand from Sakhalin I).

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15.3.2.4 Russian Content, Employment and Business Opportunities

Both projects are committed to a certain level of Russian Content. As of November 2002 the value of contracts awarded to Russian companies by both projects totals more than US\$2 billion.

For both projects the peak employment level is expected to coincide with the same year (2004) with more than 3,000 people employed by Sakhalin I, and about 13,000 by Sakhalin II. A workforce possessing similar professional skills and qualifications will be required for implementation of these two projects. Impacts on the local labour force and local enterprises competing for that labour force (e.g., labour shortages, wage inflation) will be intensified.

15.3.3 Summary of Potential Cumulative Effects

The cumulative effects of implementing several large industrial projects concurrently on Sakhalin may intensify the following Project impacts, which are discussed elsewhere in this SIA. These will be monitored as part of the SIA process:

- Economic benefits,
- Regional/local dependency on oil/gas industry, further decline in economic diversity,
- Increase in housing prices and shortages of accommodation,
- Increase in demand for local goods and services,
- Local business and supply opportunities,
- Increase in cost of goods and services, and
- Environmental impacts.

SEIC will also consider collaboration with other companies on sustainable development initiatives and monitoring programmes.

The following table describes both positive and negative cumulative impacts that may require specific joint mitigation issues, or provide opportunities for discussions between Sakhalin I and Sakhalin II on Project activities and mitigation measures. Suggested mitigation measures are also listed within the table.

TABLE 15-07: CUMULATIVE IMPACTS

Source	Positive Impact	Negative Impact
Infrastructure Upgrading and Land Needs	– Infrastructure upgrading as part of Sakhalin projects	– Additional load on infrastructure – Increased noise, road accidents, dust, etc. – Reduced access to reindeer pastures and resource harvesting grounds.
Influx of workers into local communities	– Increased market for local goods and services	– Increase in social conflicts, crime, prostitution. – Increase in health threats. – Increased load on recreational facilities.
Labour Force Demand	– Long-term increase in compatibility of the existing local labour force for oil and gas industry through focused training and education programmes supported by oil industry and government	– Deficit of labour force, especially of construction specialities. – Shift of workers from existing enterprises to the oil industry, due to higher wages. – Inflation of wages due to competition over limited labour force.