

Creation of mid-scale LNG production and logistics complex in the Sakha Republic (Yakutia)



FAR EAST INVESTMENT
AND EXPORT AGENCY

Sakhatransneftegaz



Project Resume

Background:

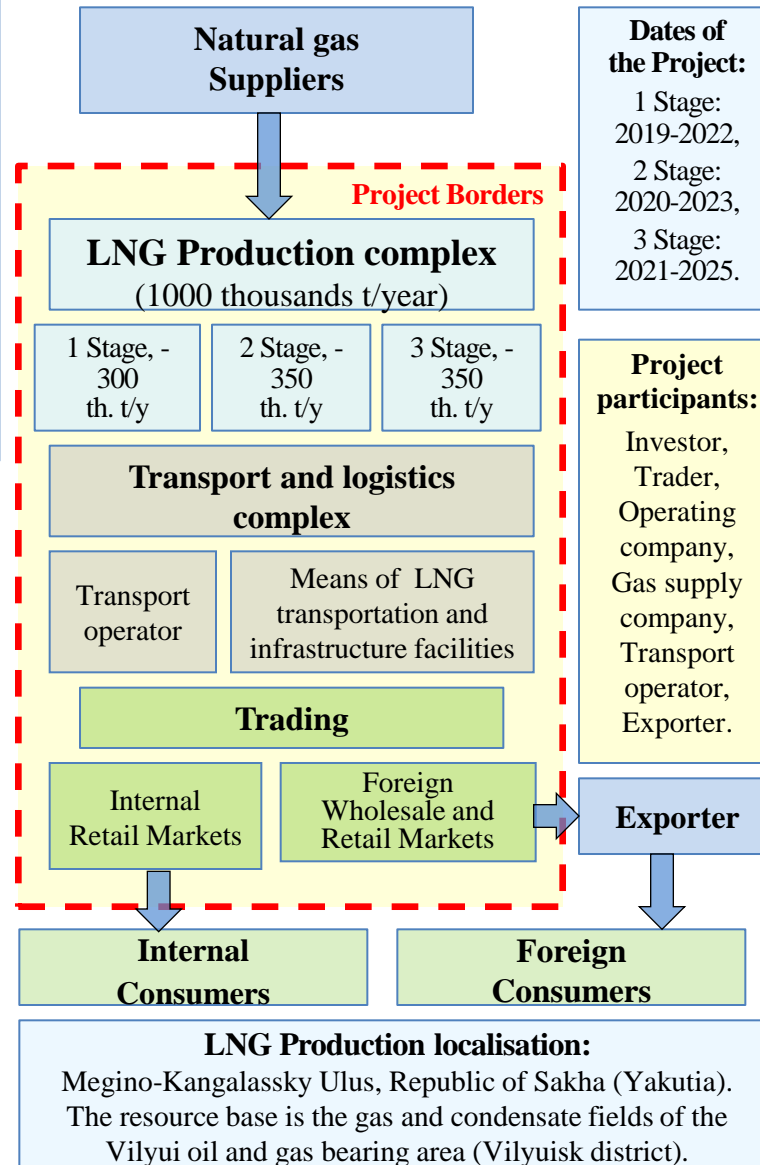
1. Implementation of development programs for LNG territorial infrastructure in the east of the Russian Federation.
2. Advanced development of LNG retail markets in the PRC.
3. Availability:
 - resource base and gas transportation system with sufficient capacity,
 - proven technologies for Mid Scale Production and Transportation of LNG.
 - sustainable demand for LNG and transport routes for delivery to prospective consumers.

Goals:

Creating a business with a capitalization about \$500 mln by 2027-2030.
Creating a base for the development of territorial LNG markets in the operational area of the Project, implementation of related Projects.

Main Objectives:

1. Phased creation of LNG production, total - about 1000 thousands t/y;
2. Creation of transport and logistics infrastructure, incl. for deliveries to the border provinces of China.
3. Creating a trading business in the Russian Federation and in the territories of neighboring countries.
4. Participation in the infrastructure support of basic consumer projects aimed at the development of the LNG distribution network.



Dates of the Project:

1 Stage: 2019-2022,
2 Stage: 2020-2023,
3 Stage: 2021-2025.

CAPEX,

incl. VAT 20% (\$ mln.)

CAPEX structure	1 Stage	2 Stage	3 Stage	Sum
Production	410	360	360	1130
Logistics	40	40	40	120
TOTAL:	450	400	400	1250

Project participants:

Investor,
Trader,
Operating company,
Gas supply company,
Transport operator,
Exporter.



EQUITY:

Investments Efficiency (IRR, \$, %, no less)

EQUITY structure	1 Stage	2 Stage	3 Stage
Production	11	12	12
Logistics	10	10	10

Pricing in the domestic market of China

LNG pricing in the PRC (municipal fuel)

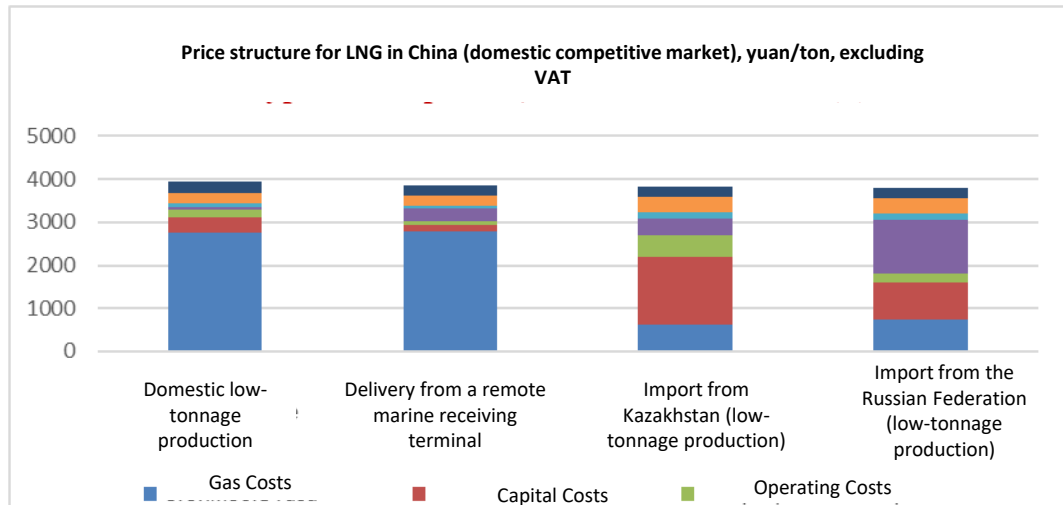
Since 2017, the main mechanism of pricing for pipeline gas and LNG in the domestic competitive market of the PRC is exchange trading. The main trading platform is Shanghai Oil and Gas Exchange (SHPGH, www.shpgx.com). According to the results of the tenders, market prices are formed on the main supply bases and distribution terminals. At the same time, the maximum allowable prices at the entrance to the territorial gas distribution systems (fuel for household needs) are regulated by the state.

For their evaluation determined on the basis of current values for alternative fuels — fuel oil (FO) and liquefied petroleum gas (LPG) — P_{max} , with a 13% VAT, the formula can be used:

$$P_{max} = 0,85 \times (0,6 \times P_{FO} \times 1,25 + 0,4 \times P_{LPG} \times 1,5) \times 1,13$$

The PRC average value of the maximum allowable price for LNG (used as fuel for household needs) at the entrance to the territorial gas distribution systems, as of 2018, is **about \$ 412/ton**.

The highest value is in the city of Shanghai - **about \$ 503/ton**, the smallest - in Xinjiang Uygur AR - **about \$ 267/ton**.



The presented price structure in the PRC is based on estimates and is determined under the following conditions:

- the wholesale price for pipeline gas in the PRC for an industrial manufacturer under a long-term contract (domestic production + imports) is 1770 yuan per thousand m³,
- the wholesale price for LNG at the remote receiving sea terminal in the PRC is 2800 yuan/ton.
- prices for natural gas of the Republic of Kazakhstan (Western Kazakhstan) - 3500 rubles/thousand m³, in the Russian Federation (Sverdlovsk region) - 4530 rubles/thousand m³).

The data are subject to clarification during the development of the feasibility study.

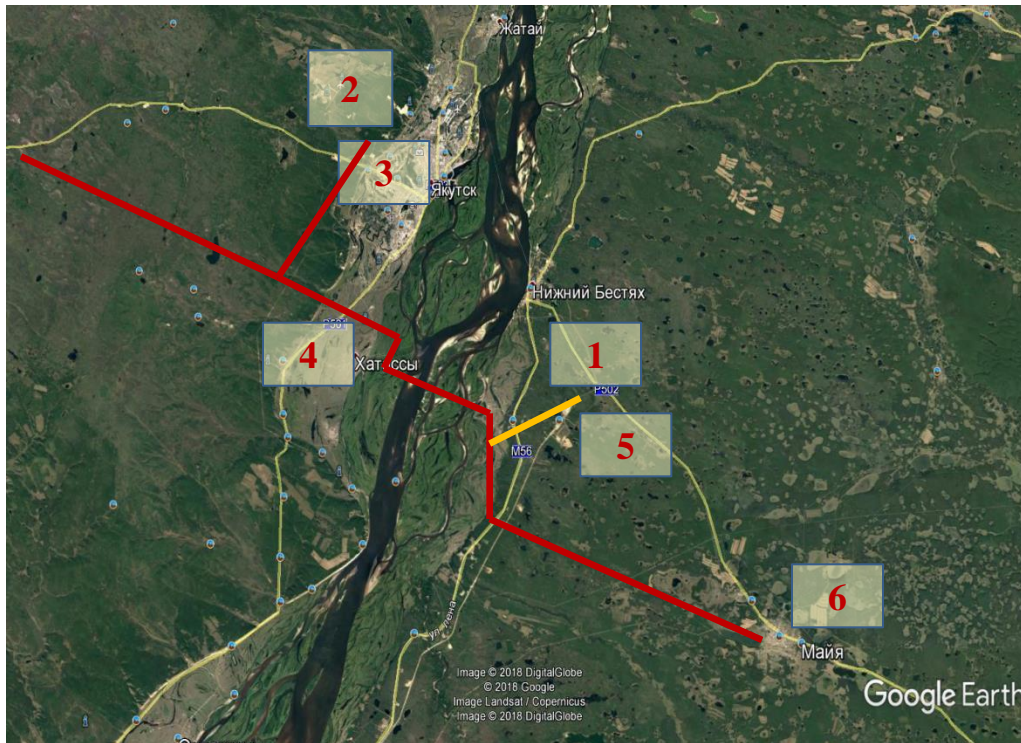
Features pricing for LNG used in the PRC as a gas engine fuel.

The indicative price point is formed as 50% of the average weighted price of diesel fuel and gasoline from the current level (o.h.92).

Sales plan

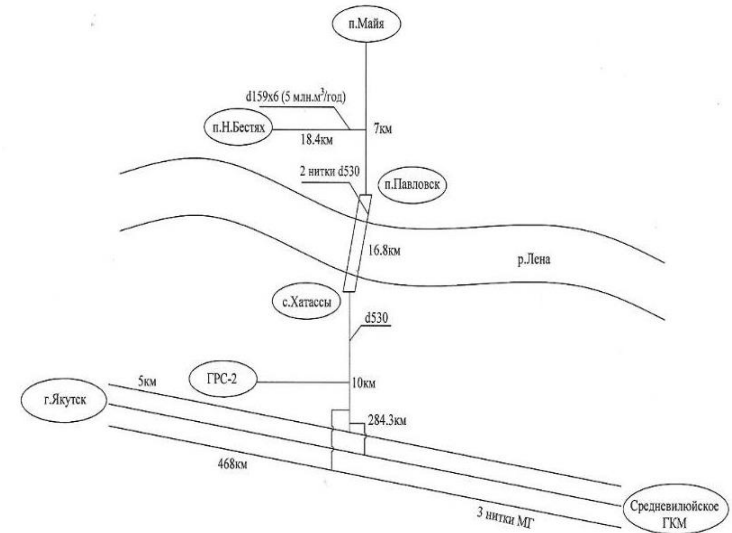
Sales plan excluding VAT												
RF constituent entity	2023				2025				2030			
	Capacity, thousand tons per year	Sales volume, per year, thousand tons	Price (EXW), US\$/t	Revenue, per year, US\$ mln.	Capacity, thousand tons per year	Sales volume, per year, thousand tons	Price, US\$/t	Revenue, per year, US\$ mln.	Capacity, thousand tons per year	Sales volume, per year, thousand tons	Price, US\$/t	Revenue, per year, US\$ mln.
RF domestic market												
Amur Region	300	5	340	1.7	750	10	350	3.5	1,000	20	370	7.4
Republic of Buryatia		5		1.7		10		3.5		20		7.4
Zabaikalsky Territory		5		1.7		10		3.5		20		7.4
Primorsky Territory		5		1.7		50		17.5		100		37.0
Republic Sakha (Yakutia)		20		6.8		40		14.0		50		18.5
Khabarovsk Territory		5		1.7		15		10.5		30		11.1
TOTAL:	45			15.3		135		52.5		240		88.8
Foreign market (China)												
Supplier	Basis of supply to China	Sales volume, per year, thousand tons	Price, CIP Heihe, US\$/t	Revenue, per year, US\$ mln.	Sales volume, per year, thousand tons	Price, US\$/t	Revenue, per year, US\$ mln.	Notes	Sales volume, per year, thousand tons	Price, US\$/t	Revenue, per year, US\$ mln.	Notes
Trading company (off-taker)	CIP Heihe	270	320	86.4	615	330	203.0		785	350	274.8	
TOTAL:		270		86.4	615		203.0		785		274.8	
Revenue at foreign and domestic markets total, per year				101.7			255.5				363.6	

LNG Plant location



1 – localization of LNG production, in the area of the Nizhny Bestyakh railway station,
2 – Yakutsk Gas Processing Plant of Sakhatransneftegaz JSC, Yakutsk, **3** – Yakutskaya SDPP-2 (State District Power Plant), **4** – Khatassy village, **5** – Pavlovsk village.
6 – Maya village,
Red lines show the gas pipelines passing scheme as part of the gas pipeline system. Nizhny Bestyakh railway station gas pipeline branch to be reconstructed is marked yellow.

Connection diagram of gas pipeline system



Characteristics of gas pipelines:

- Main gas pipeline Sredneviluyevsk gas condensate field – Yakutsk Gas Processing Plant, – 2 DN530, 468 km + 1 DN720, 384 km,
- gas pipeline branch to Khatassy village, DN530, 21 km.
- Khatassy – Pavlovsk (underwater line over the Lena river) - 2 DN530, 16.8 km,
- Pavlovsk – Maya, – DN530, 29.9 km,
- gas pipeline branch to Nizhny Bestyakh railway station, DN-159, 18.4 km.

Resources for production



Gas reserves

Field	Gas reserves, million m ³
Mastakhskoye gas condensate field	29,461
Sredneviluyyskoye gas condensate field	161,022
Tolonskoye gas condensate field	43,978
Sobolokh-Nejelinskoye gas condensate field	64,805
Srednetyungskoye gas condensate field	165,410
Badaranskoye gas condensate field	6,100
Nedzhelinskoye gas condensate field	2,600
TOTAL by district	473,376

Gas composition

Component	vol. %
oxygen	0.0072
nitrogen	0.5037
carbon dioxide	0.0375
methane	93.87
ethane	4.480
propane	0.9197
iso-butane	0.07812
n-butane	0.08120
C5+	0.0190

Natural gas consumption for LNG production (medium pressure closed expander cycle with mixed cryoagent)

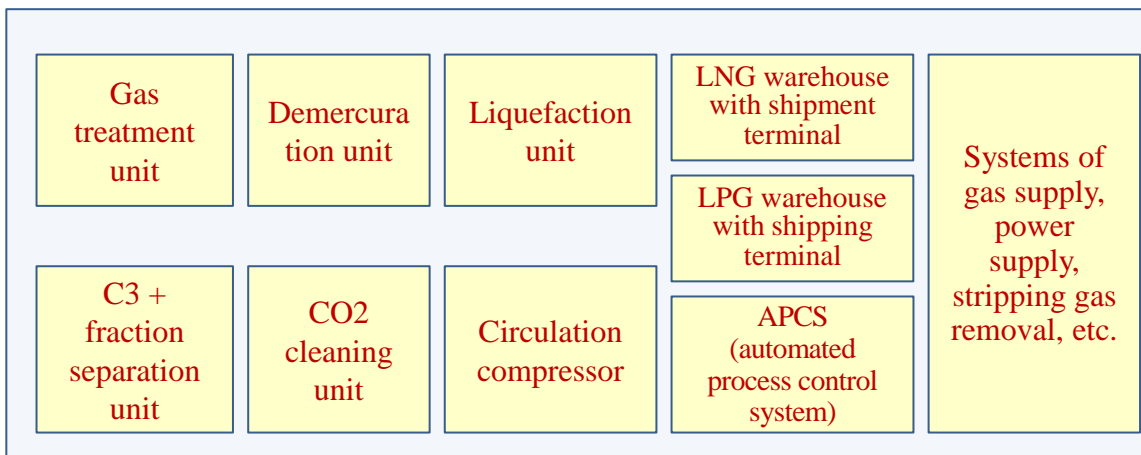
Project Stage (startup production), capacity, thousand tons per year	Consumption, billion m3 per year	
	with external power supply	with own power supply
First, - 300	0.43	0.50
Second, - 350	0.49	0.55
Third, - 350	0.49	0.55
TOTAL, - 1,000.	1.41	1.60

Design, Procurement and Construction of production complex

Scope of pre-project and LNG production design works

Feasibility study development			Preliminary permissions		Design stages	
Foreign terms		Russian terms	Land surveying documentation, including linear-type facilities		Foreign terms	Russian terms
Pre-Feasibility Study		Feasibility study, justification of investments	Findings (preliminary design and design stage)		Conceptual Design	Concept design
Feasibility Study	Technical, Operational, Legal, Time, Resource, Financial Feasibilities		Technical conditions for utility connection to infrastructure facilities		Pre-FEED	Pre-front-end engineering and design (preliminary design stage)
Market Research			Market research	Results of preliminary agreement on gas and power supply conditions.		FEED
			Special technical requirements for the designed facilities.		Examination	Examination
			Results of public hearings		DPD	Preparation of designs (detailed design stage)

Main process equipment of LNG production



Options for selecting

design organization, manufacturer, supplier of process equipment are presented in Appendices 1 and 3. Competitive selection is organized by the project operator with the participation of shareholders' representatives, the investor. Risks of erroneous decision making when choosing a technology, manufacturer of equipment and a designer are key risks of the Project. As a rule, decisions are made with the participation of an independent consultant.

Capital expenditures

Price targets: according to publications in the media on projects for 2005-2018

Production capacity	t/hour	0.5	1.0	1.5	3.0	5.0	10	20	30	40	50	90	125	200	300	600	800	1,000	1,400
	thousand tons/year	3.8	7.5	11.3	22.5	37.5	75	150	225	300	375	675	938	1,500	2,250	4,500	6,000	7,500	10,500
Capital expenditure, including VAT	specific, US\$ million for 1 t/hour	16.0	12.0	12.0	12.0	12.0	11.0	11.0	11.0	10.5	10.0	10.0	10.0	10.0	9.7	9.0	8.8	8.5	8.2
	full, US\$ million	8	12	18	36	60	110	220	330	420	500	900	1,250	2,000	2,900	5,400	7,000	8,500	11,500



LNG plant in Vysotsk with a marine terminal, commissioning in 2019, 660 thousand t/year (OOO Cryogas-Vysotsk, Gazprombank Group).

Project (all projects include a marine terminal)	Production capacity, million tons per year	Capital expenditures, US\$ bln
Sakhalin-2 (3 stage, construction)	4.8	5.4
Baltic LNG (FS)	10.5	12.5
Far East LNG (FS)	6.0	7.0
Vladivostok LNG (FS)	1.50	
Cryogas-Vysotsk (construction)	0.66	0.9
LNG plant on the basis of KS Priportovaya (construction)	1.50	2.0

Operating expenditures

Operating expenditures for LNG production, \$ million, excluding VAT, in prices of 2018

Production facilities, stage, performance	Staff wage fund	Service and repair work	Electri- city	Deprecia- tion	Taxes	Management expenditures	Security	Insurance	Reserves	Total	Unit expenditures, \$/ton
LNG production in the Republic of Sakha (Yakutia), stage 1, 300 thousand tons/year.	1.8	1.8	1.4	7.7	4.8	0.4	0.1	1.6	0.5	20.0	67
LNG production in the Republic of Sakha (Yakutia), stage 2, 650 thousand tons/year.	1.5	1.5	1.4	7.7	4.8	0.3	0.1	1.6	0.5	19.3	55
LNG production in the Republic of Sakha (Yakutia), stage 3, 1,000 thousand tons/year.	1.3	1.3	1.4	7.7	4.8	0.3	0.1	1.6	0.5	19.0	54
TOTAL:	4.5	4.5	4.3	23.0	14.4	0.9	0.3	4.8	1.5	58.3	58

LNG Pricing

**Price structure of the LNG sold to the basic consumer (exports to China, CIP Heihe),
\$ / ton, excluding VAT, in prices of 2018**

Price components	LNG production in the Republic of Sakha (Yakutia)		
	Stage 1 (300 thousand tons/year.)	Stage 2 (650 thousand tons/year).	Stage 3 (1000 thousand tons/year).
Raw material expenditures (natural gas)	82	81	80
CAPEX	88	69	64
Operating expenditures (OPEX)	67	61	58
Delivery basis	CIP Heihe		
Shipping expenditures (CIP Heihe)	105	105	105
Exporter commission (Gazprom Export LLC)	21	21	21
Total profit of manufacturer, carrier	20	20	20
TOTAL:	383	357	348

Investment efficiency

**Enlarged (preliminary) financial model, LNG production in the Republic of Sakha (Yakutia),
Stage 1, productivity 300 thousand tons/year. Without VAT.**

%, million, without VAT	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Inflation rate,%	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Price for raw materials (PG) (\$/thousand m3)	46,0	46,2	46,5	46,7	46,9	47,2	47,4	47,6	47,9	48,1	48,4	48,6	48,8	49,1	49,3	49,6
LNG price (domestic market, EXW)	290	291	293	294	296	297	299	300	302	303	305	306	308	309	311	313
LNG price (export, CIP Heihe), without commission of Gazprom Export, LLC	350	352	354	355	357	359	361	362	364	366	368	370	372	373	375	377
Design capacity, thousand tons per year				300	300	300	300	300	300	300	300	300	300	300	300	300
Realization (domestic market), thousand tons				30	36	42	48	54	60	67	72	78	84	84	84	84
Realization (export), thousand tons				270	264	258	252	246	240	233	228	222	216	216	216	216
Operational costs (production), \$/t				67	67	68	68	68	69	69	69	70	70	70	71	71
Unit cost of transportation, CIP Heihe, \$/ton				105	106	106	107	107	108	108	109	109	110	110	111	111
Plant capacity load,%	Building			100	100	100	100	100	100	100	100	100	100	100	100	100
Financial performance																
Revenue (witwout commission of Gazprom Export, LLC)				104,8	104,9	105,1	105,2	105,4	105,5	105,6	105,8	106,0	106,1	106,7	107,2	107,7
Total cost			8,3	50,4	50,5	50,5	50,6	50,6	50,7	50,7	50,8	50,9	50,9	51,2	51,4	51,7
EBITDA			-8,3	54,4	54,5	54,5	54,6	54,7	54,8	54,9	55,0	55,1	55,2	55,5	55,7	56,0
EBITDA margin %				51,9	51,9	51,9	51,9	51,9	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0
Depreciation			-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0	-20,0
EBIT			-28,3	34,4	34,5	34,5	34,6	34,7	34,8	34,9	35,0	35,1	35,2	35,5	35,7	36,0
EBIT margin %				32,8	32,8	32,9	32,9	33,0	33,0	33,0	33,1	33,1	33,2	33,3	33,4	33,4
Payment of bank interest			25,9	23,4	20,9	18,4	15,9	13,4	10,9	8,4	5,9	0,0	0,0	0,0	0,0	0,0
Profit before taxes			-54,2	11,0	13,6	16,2	18,8	21,4	24,0	26,5	29,1	35,1	35,2	35,5	35,7	36,0
Income tax, total			0,0	2,2	2,7	3,2	3,8	4,3	4,8	5,3	5,8	7,0	7,0	7,1	7,1	7,2
Net profit			-54,2	8,8	10,9	12,9	15,0	17,1	19,2	21,2	23,3	28,1	28,2	28,4	28,6	28,8
(+) Depreciation			20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0
(-) fixed asset		-50,0	-50,0	-50,0												
(-) investment in CAPEX	-12,0	-195,0	-20,0													
Cash flow	-12,0	-195,0	-54,2	-21,2	30,9	32,9	35,0	37,1	39,2	41,2	43,3	48,1	48,2	48,4	48,6	48,8
Accumulated cash flow	-12,0	-257,0	-361,2	-432,4	-401,5	-368,6	-333,6	-296,5	-257,3	-216,1	-172,8	-124,7	-76,6	-28,2	20,4	69,2
Internal rate of return for 2019-2040	10%															
Simple payback period, years, from the date of commissioning	8															

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Conclusions and offers

Project Capital Costs.

According to a preliminary estimation, the capital costs of the Project will amount to (with VAT 20%) \$ 1.24 billion, incl. stage 1 \$ 450 million, stage 2 \$ 396 million, stage 3 \$ 396 million.

These costs include the cost of creating a transport and logistics complex, total of \$ 30 million.

The data are subject to clarification based on the results of the feasibility study.

The works to increase the productivity of the Srednevilyisk gas condensate field and the modernization of the gas transmission system are not included in the Project boundary. It is assumed that the costs of these works and the reimbursement of attracted investments are taken into account in the cost of the supplied natural gas.

Main sources of financing:

- share capital, including additional capital in the form of loans and credits,
- project financing, incl. loans and credits,
- share participation of the Project partners in the creation of separate industries, companies,
- financial leasing,
- targeted loans for the purchase of equipment, export financing.

The total investment of the management company in the share capital of the Project is about \$ 150 million, incl. at stage 1 about \$ 60 million, at stage 1 \$ 45 million, at stage 1 \$ 45 million.

Investment efficiency.

IRR of the project is about 8%. **IRR of own equity investments is about 25%.**

The timing of the first phase of the project - 2020 - 2022. LNG supply starts in 2023.

The main direction of sales is deliveries to China.

Offers:

To consider the possibility and necessary conditions for participation in the Project, including development of pre-project documentation (as it relates).