## Republic of Kazakhstan

Batys Power LLP Investment project "Construction of the GTPP-500 URALSK gas turbine power plant. Phase II and Phase III."





## **Location Of Batys Power Plant**



GTES-200 is located 25 kilometers north-west of the city of Uralsk in the West Kazakhstan region, near the village of Beles, in close proximity

- to the 220 kV Stepnaya substation 220 kV belong to National Grid Operator Kegok
- 3km from Main Export Gas Pipeline belong to National Gas Operator, KazTransGas.









### West Kazakhstan Energy Zone

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## Kazakhstan and Russia integrated energy connection

Russia	Kazakhstan	Line				
Saratov Energy Russian Volga Region Operators	National Operator Kegok	220(500)	Stepnai Balakovo 503			
Saratov Energy Russian Volga Region Operators	National Operator Kegok	220	Stepnai Uznai 258			
Saratov Energy Russian Volga Region Operators	National Operator Kegok	220	Uralsk Kenel 252			
Саратовэнерго	Самара Орловская Томыловская БАЭС					
	Семиглавый Мар Сел Каменка	п. NA637 503 СТЕПНАЯ 152 Переметное Фрунре Б. Чаган Кушум Акжаик 727	ав Пойма Месторождение Алгабас Чарачаганах Кая Чалгабас Таганас Александровка			



### Technical characteristics of the main equipment.



### Gas turbine generator plant

The manufacturer is a affiliate company of General Electric, Nuovo Pignone;

as a component of:

### Gas turbine - Model: GE PG9161E

- Nominal power 116.9 MW;
- Efficiency, not less 31,8%;
- Fuel type natural gas;
- Start system electric motor;
- The total capacity of the generator terminals is 80.8-112.4 MW;
- Fuel consumption 30777-34455 n/m3 Generator -Model: TA30-80 GEC Alstom
- Output power 110 MVA;
- Voltage 11.5 kV;
- Rated current 5522A;
- Nominal speed 3000 rpm;
- Frequency current 50Hz.

#### The block-container of turbine, generator, auxiliary equipment protection and control systems

This installation is modular. To exclude the influence of climatic conditions and to reduce the noise impact, the installation is placed in sound enclosure of container type. Operation of the unit is fully automated

## GTPP-500 URALSK. The fist start-up complex BATYS POWER



## General parameters of URALSK GTPP. The first start-up complex.

### Gas turbine generator plant .

Installed capacitance of the Power Plant - 100 MW The output of the plant is 700 million kWh per year. Fuel gas consumption is 280 million cubic meters per year. Total number of employees - 58 employees





Modern equipment is from world leaders in the field of electric power industry, maintenance is carried out by Etos Energy - Germany.









# BATYS POWER

# GTPP-500 URALSK.The fist start-up complex with the capacity of 100 MW.

- Form of ownership private Batys Power LLP
- Batys Power LLP was established in 2012;
- The only participant of Batys Power LLP is Zhaik Holding LLP;
- Construction of GTPP-500 of Uralsk started in January 2014;
- Date of commissioning April 5, 2016;
- Main consumers are entities of the wholesale electricity market (KEGOC JSC, Batys Energoresursy LLP, Atyrau Refinery LLP, Zap.Kaz. REC JSC), Mangistau REC, etc.)



## **Technical characteristics of the main equipment.**



- Switchgear 6KV (SG-6KV)
- Switchgear 0,4KV (SG-0,4KV);
- Emergency Diesel-Generator.





## **Operation and maintenance of the power plant**





Maintenance of GTPP-500 Uralsk is carried out by the world leader in the field of maintenance and technical support of turbine equipment General Electric company Ethos Energy, the main participants of this company are 50/50 Wood Group / General Electric.





# **"Construction of the GTPP-500 URALSK gas turbine power plant. Phase II and Phase III" Project**



Implementation of the project involves 3 stages:

**Phase I** - construction of one 100 MW gas turbine, had been already implemented in 2013-2019:

**Phase II and III** - construction of the second and third gas turbines and heat recovery to bring the total capacity up to 500 MW. Timeframe for implementation: 2020-2024

#### The purpose of the Project:

-Production of electricity in the West Kazakhstan region of the Republic of Kazakhstan;

-Fully satisfying the needs of the West Kazakhstan Oblast in electric energy;

-Supply of electricity to the most energyintensive consumers of Atyrau and Mangistau oblasts;

-Participation in the integration processes of the energy markets of the Republic of Kazakhstan and the Russian Federation within EurAsEC.

### "Construction of the GTPP-500 URALSK gas turbine power plant Project. Allocation of start-up complexes»

## Phase II и III –heat recovery and increasing the total capacity to 500 MW

"GTPP-500 URALSK Project. Allocation of start-up complexes" assumes one start-up complex of 100 MW and two start-up complexes of 130 MW each, with the possibility of increasing plant capacity, the simple cycle of the power plant will be expanded by waste heat boilers of excess heat and steam turbine generator with the capacity of 140 MW. The construction cost of the gas turbine power plant Phase II and III and increasing the total capacity up to 500 MW is about 300 million U.S. dollars.

**Cogeneration** is a significant cost reduction, and the overall fuel utilization rate increases, significantly reducing the purchased fuel cost.

Currently, the most promising and economical way to use gas fuel is to organize the steam-gas cycle.

Applying of the CCGT cycle ensures low environmental load due to both low concentrations of emissions release from natural gas firing and reduction of the specific fuel consumption per 1 kWh. Efficiency of power supply in condensing mode of modern natural gas CCGT units is 49...58 % and depends on capacity, type and manufacturer of turbines, number of working body circuits in the cycle, type of equipment used. In our Project for determination of technical characteristics of CCGT units it is supposed that characteristics, scope of delivery and technical systems of CCGT GE MS 9001E of a new and already installed at GTPP Uralsk are similar. Thus, the equipment is selected as follows:

Unit 1 of CCGT - one gas turbine GE MS 9001E (already in operation at the Uralsk GTPP in the "open cycle"),

Unit No.2 and CCGT Unit No.3 - two gas turbines GE MS 9001E, two heat recovery steam generator(HRSG) of two pressures without supplementary firing, one steam condensing turbine.

Or:

Unit No.2 and Unit No. 3 – two gas turbines Siemens SGT5-200E, two heat recovery steam generators, one steam turbine STT-600



## Phase 2 & 3 Proposed GE Solution

Two Gasturbines, GE Frame 9E.03, 2 x 130,3MW Two HRSG, Manufacturer ZIO-Podolsk

One Steam Turbine, GE STF-D200, 150,6MW

Total new production output: 399,12MW Plant Net Effectivity: 52,1%

Plant Total Output ( existing + new ) : 500MW

### Phase 2 & 3

**Proposed GE Solution** 



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### Phase 2 & 3 Layout Proposed GE Solution



Эксплинация зданий и сооружений Buildings and Facilities List							
AND AND	Описание	Description	tor to	Ancarte Rompound	Лринечание		
1.2	Газован турбана 17 2	Gas furbine GT2	1	-	Condecul geographics		
2.2	Водяной ренулер ГТ 2	GT Water Recooler	1		noceative o N		
3.2	Выхолной ранный бантилятор окоапатния 17-2	IT GT Exhaust Frame Gooling Blower 2	2		Concerno Concerno		
4.2	Устройство для пронивни контресира 17-2	67 Compressor Wash Skid 2	1		Nepepturies Jonanalies		
5.2	Контейнер дах контроля IT и abusarte.ne	GT Control and MCC Container2	1	59,44			
6.2	Фильтр забора боздна ГТ 2	GT Air Intake Filter House 2	1				
7.2	Насосная станция скланденнов Боди /1 2	GT Cooling Water Pump Skid2	1		Constration Decisioners		
8.2	Станине вильтрации тапиийного ваза 11-2	GT Fuel Gas Filter Skid 2	1	35,00			
9.2	Контейнер СО2 /Т 2	GT CO2 Container 2	1	14,45			
10.2	Temepanop 17 2	GT Generator 2	1		Colorised Briefferen		
"	Енность для сбора конденсата	Fuel Condensate Tank	1		Rogannod panavalna		
110	Быхость для одоронто	Odorant Tank	1		(Commonly) permanente		
12.2	Абарийние клопони перекрытия топлибного ваза IT 2	Fiel Gar Bonopeny Stat Store (2023) Value (2023)	1		vo čina Svecine c XB		
13	Азотная установка	Miragen Station	1				
14.2	енесть своро конденсато — Дланция енестрации топланского ваза 172	Fuel Condensate Tank 2 - GT Filter Skill	1		represed yorkeretay		
20.2	опиратов распределательное успроботов 2-220 кВ	220 W Switchgear 2					
21	Контейнер зациями 220 мВ	220 KV Protection Container	1	29,55			
22.2	Автонопичесної сыклочатель генеротора 17-2	GT Generator Circuit Breaker 2	1		nocenative e l'		
23.2	Порезаниция трановорнотор П 2 11,3/220 ив	GT Step Up Transformer 2–11,5/220kv	1		escendra o f		
24.2	11,378,3 and meansportance	Step Down Tanafattur 2-11,5%,587	1		econativa o f		
25	устройство 6,5 иВ	6,5 kV Switchgear Container	1	29,55			
26.2	1600 KW HOTE 6,5/0,4 KB	& V&Ar OT Step down Transferrer 2			nocember e l'		
27.2	Понимальний проновидматер 800 Кия, напр. 6,5/0,4 кв	6.1924 V Dep down Theodorne 2			nocensilva e l'		
28	Контейнер распределительного устработва 0,4 кв	0,4W Station Seltchgear Container	1	29,55	блоно- контрінерног		
29	Контернер абаридного дительного генератора	Emergency Diesel Generator Container	1	29,55	SACAR-		
30	Контернер для диовльного топлива	Dissel Fuel Tank Container			Servic- completion		
32	Адарийная вняхоть для контейнера дияльного тольцая	Diesal Fuel Container Emergency Tank			(Commonly of the second		
40	Контейнер котельной со аларон автоналировани	Boller container with control cabilinet					
41	Контеднор узла ризьтрации, подовреба и учетка вода	Gos filtering, heating and metering container					
42	Контейнер узат редпробония каза	Gas Reducing container					
42A	Kowmedwep Szows IV4 "KHOTuA"	Instrument Container block N4					
43.2	Вилопная труба ГТ 2	GT Exhaust Stock 2			naceative c //		
60	Административное здание	Administration Building		288,00	5.00460 390460		
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63	Мастерская для такелово обсендобоные	Heavy Mechanical Markshop		500,00	ADDRESS ADDRESS		
64	Chang	Warehouse		180,00	annebana		
66	Понарное дело	Fire Guard House		324,00	Ларнасная храния		
680/6	Водозаборная снавення	Natar Well	2				
70	Насосное станале для понаротушения	Fire Water Pump Station	1	18.0	Angenauros Salinas		
71a/8	Понарный реперанар вык. 200м3	Fire Water Tank 200m3	2		\$\$\$35 m		
74	Насоснае с внигостани для питивой боди	Pump Water Tank	1		Anne-		
76a	Connue spounteg. 3w3/cym	Sewage Water Tank	1		(commonly)		
786	Connux spoundlog. 1.5w3/cym	Sewage Water Tank	1		(commod )chances		
77	Реперанар для сборя промишленных стаков и слива трабинного масла	Process Drain and Turbine Of Drain Tank	1				
78	Резербного для слива траноформаторново насла	<b>Gli Drain Tank Transformer</b>	1				
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## Phase 2 & 3 Proposed Siemens Solution

Two Gasturbines, Siemens SGT%-2000E, 2 x 187MW Two HRSG, Manufacturer ZIO-Podolsk

One Steam Turbine, Siemens SST-600, 179MW

Total new production output: 553MW Plant Net Effectivity: 53,4%

Plant Total Output ( existing + new ): 653MW

### Phase 2 & 3 Proposed GE Solution



Phase 2 & 3

### **Proposed Siemens Solution**



## **Capacity Market in Kazakhstan**

**BATYS POWER** 

The current tariff from 2020 is divided into 2 parts:

- investment part participation in the capacity market;
- and the rest, i.e. Cost Price participation in the electricity market





# **Finance of the project**

New Capacity	400 WM
Total Capacity	500 MW
Price for 1000 m3 Gas	11000 tenge
Price	0.03 per kWh
Project Cost	300 000 000 USD
Price per 1 MW of capacity paid by the market	1 200 000 Tenge 1MBт



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