

## Financial analysis for 'Talimarjan Clean Energy Generation Project'

Version 4.8 dated 24/03/2015

### Data for alternative baseline scenarios

Item	Unit	A	B	Source
Total rated capacity	MW	820	820	Letter from Uzbekenergo #5145 from 15 December 2011, and Letter from Uzbekenergo #5144 from 15 December 2011  At the moment of decision making final technical solution for the project was not clear. Therefore, in order to be conservative for the purpose of the project calculations moderate 820 MW estimation (medium between 740 MW and 900 MW, 740 MW + 900 MW)/2) was assumed regardless of the fact that project always tend to have 900 MW of total capacity.
Plant Load Factor	%	85	85	Letter from Uzbekenergo #5144 from 15 December 2011 ADB, 'Financial analysis (Talimarjan power project)', page 1
Internal electricity consumption	%	3,45	2,73	Letter from Uzbekenergo #5144 from 15 December 2011 Feasibility study report
Efficiency of the plant	%	57,4	34,0	
Investment Cost	Million US\$/MW	0,995	0,62	
Fuel cost	US\$/kg or m3	0,053	0,053	
Water costs	Million US\$	6,9	1,05	
Maintenance and management costs	Million US\$	0,95	0,95	
Insurance	%	0,25	0,25	
Capital repair	Million US\$	34,3	15,5	

The data were cross-checked with EPC contract (dated 7 March 2013) and final FSR (approved at November 07, 2013). Please note that at the moment of decision making (March 2012) these documents were not available. As it was also stated in PDD at the moment of decision making final technical solution for the project was not clear. Nevertheless at the stage of Validation these documents were used for cross-checking to demonstrate consistency of the data.

### Additionally the following information common for all scenarios were applied

Item	Unit	Value	Source
Technical losses	%	13%	ADB, 'Financial analysis (Talimarjan power project)', page 1
Commercial losses	%	7%	ADB, 'Financial analysis (Talimarjan power project)', page 1

Please also see Excel page 'Info' for additional information regarding exchange rates, taxation rates applied in the calculations

### Summary results

<b>A</b>	0,0292
<b>B</b>	0,0284

	A	B	Baseline	Min
Basic assumptions	0,0292	0,0284	B	0,0284
-10% project costs	0,0274	0,0273	B	0,0273
+10% project costs	0,0309	0,0295	B	0,0295
-10% load factor	0,0313	0,0296	B	0,0296
+10% load factor	0,0274	0,0273	B	0,0273
-10% fuel costs	0,0282	0,0267	B	0,0267
+10% fuel costs	0,0302	0,0300	B	0,0300

### Formula of the levelized cost of electricity Production (LCOE)

$$LCOE = \frac{\sum_t [(I_t + M_t + F_t)(1+r)^{-t}]}{\sum_t [E_t (1+r)^{-t}]}$$

Where,

$I_t$	Capital expenditures in year t
$M_t$	Operation and maintenance expenditures in year t
$F_t$	Fuel expenditures in year y
$E_t$	Electricity generation in year y
$r$	Discount rate
$\sum_t$	The summary over the period including construction, operation during the economic lifetime and decommissioning of the plant as applicable

### Financial calculation for Scenario "The project activity not implemented as a CDM project"

No	Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total investment costs, mln. \$																			
	Annual investments in the project	12,2	259,0	285,6	259,0														
	Own capital	12,2	64,8	71,4	64,8														
	Lending	0,0	194,3	214,2	194,3														
	Interest on lending	6%																	
	Payback period (years)	15,0																	
	Balance on lending	0,0	194,3	408,5	602,7	562,6	522,4	482,2	442,0	401,8	361,6	321,5	281,3	241,1	200,9	160,7	120,5	80,4	40,2
	Return of the loan					40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18
Technical indicators																			
	Capacity, MW			410	820	820	820	820	820	820	820	820	820	820	820	820	820	820	820
	Generation efficiency			57,4%	57,4%	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574
	Capacity load			85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
	Volume of electricity generation, GWh/yr			1 526	4 579	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106
	Internal electricity consumption, %			3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%
	Technical losses, %			13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%
	Commercial losses, %			7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%
	Electricity provided to consumers, GWh/yr			1 168	3 505	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674
	Expected average electricity price, USD/kWh			0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037
	Fuel consumption, mln. m3			288	864	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152
	NCV, MJ/m3			33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24
	Gas price, USD/m3			0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053
Expected Cash Flows, mln. \$																			
	Annual revenue (net)			43,2	129,7	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9
	Fuel costs			15,1	45,4	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6
	Water costs			1,73	5,18	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90
	Maintenance and management costs			0,24	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95
	Interests on the lending		5,8	18,1	30,3	35,0	32,5	30,1	27,7	25,3	22,9	20,5	18,1	15,7	13,3	10,8	8,4	6,0	3,6
	Insurance			0,32	1,28	1,17	1,06	0,95	0,84	0,72	0,61	0,50	0,39	0,28	0,17	0,06	0,00	0,00	0,00
	Property tax			0,00	26,27	23,99	21,70	19,42	17,13	14,85	12,56	10,28	8,00	5,71	3,43	1,14	0,00	0,00	0,00
	Other taxes			1,98	5,94	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92
	Income tax			0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,5	1,0	1,4	1,9	8,8	9,1	9,3
	Capital repair			0,0	0,0	0,0	0,0	0,0	0,0	0,0	34,3	0,0	0,0	0,0	0,0	0,0	0,0	34,3	0,0
Reference information																			
	Depreciation			32,6	65,27	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3			
	Profit eligible for taxation		-5,8	-26,9	-51,0	-28,8	-24,0	-19,2	-14,4	-9,6	-4,8	0,0	4,8	9,6	14,4	19,3	88,1	90,5	93,0
Payback ratios calculation																			
	Net cash flow	-12,2	-70,6	-65,7	-50,5	-3,7	1,1	5,9	10,7	15,5	-14,0	25,1	29,4	33,8	38,1	42,4	39,1	7,0	43,5
	Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Discount rate (equity)	13,25%																	
	Discount ratio (equity)	0,883002	0,779693	0,688471	0,607921	0,536796	0,473992	0,418536	0,369568	0,326329	0,28815	0,254437	0,224668	0,198382	0,175172	0,154677	0,13658	0,120601	0,106491
	Discounted cash flows	-10,8066	-55,039	-45,1987	-30,6755	-2,00093	0,511593	2,463586	3,951819	5,058089	-4,03213	6,389216	6,613648	6,698106	6,67227	6,560792	5,345324	0,845014	4,629857
	Residual value																		326,4

Discounted residual value																		34,8
Net cash flow + Residual value	-12,2	-70,6	-65,7	-50,5	-3,7	1,1	5,9	10,7	15,5	-14,0	25,1	29,4	33,8	38,1	42,4	39,1	7,0	369,8

NPV	-57,3	mln. \$
LCOE	0,0292	US\$/kWh
IRR	8,73%	If input value as discount rate, NPV will be equal to 0.

Sensibility analysis - LCOE	-10%	0%	+10%
Investments	0,0274	0,0292	0,0309
Power Output	0,0313	0,0292	0,0274
Fuel costs	0,0282	0,0292	0,0302

Sensibility analysis - IRR	-10%	0%	+10%	
Investments	12,18%	8,73%	6,00%	1,00
Power Output	5,29%	8,73%	12,28%	1,00
Fuel costs	10,74%	8,73%	6,75%	1,00

Volume of investments					0,995
Investments, mln. \$	12,2	259,0	285,6	259,0	815,9
Own capital	12,2	64,8	71,4	64,8	213,2
Loans		194,3	214,2	194,3	602,7

Financial calculation for Scenario "The project activity implemented as a CDM project"

No	Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Total investment costs, mln. \$</b>																			
	Annual investments in the project	12,2	259,0	285,6	259,0														
	Own capital	12,2	64,8	71,4	64,8														
	Lending	0,0	194,3	214,2	194,3														
	Interest on lending	6%																	
	Payback period (years)	15,0																	
	Balance on lending	0,0	194,3	408,5	602,7	562,6	522,4	482,2	442,0	401,8	361,6	321,5	281,3	241,1	200,9	160,7	120,5	80,4	40,2
	Return of the loan					40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18	40,18
<b>Technical indicators</b>																			
	Capacity, MW			410	820	820	820	820	820	820	820	820	820	820	820	820	820	820	820
	Generation efficiency			57,4%	57,4%	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574	0,574
	Capacity load			85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
	Volume of electricity generation, GWh/yr			1 526	4 579	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106
	Internal electricity consumption, %			3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%	3,45%
	Technical losses, %			13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%
	Commercial losses, %			7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%
	Electricity provided to consumers, GWh/yr			1 168	3 505	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674	4 674
	Expected average electricity price, USD/kWh			0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037
	Fuel consumption, mln. m3			288	864	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152	1 152
	NCV, MJ/m3			33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24
	Gas price, USD/m3			0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053
<b>CER calculation</b>																			
	Baseline emissions, 000 tCO2e			905	2 716	3 621	3 621	3 621	3 621	3 621	3 621	3 621	3 621	1 810					
	Project emissions, 000 tCO2e			537	1 611	2 148	2 148	2 148	2 148	2 148	2 148	2 148	2 148	1 074					
	ER, 000 tCO2e			368	1 104	1 472	1 472	1 472	1 472	1 472	1 472	1 472	1 472	736					
	CER price, USD (2016)			12,35	12,35	12,35	12,35	12,35	12,35	12,35	12,35	12,35	12,35	12,35					
<b>Expected Cash Flows, mln. \$</b>																			
	CER revenues				11,37	15,91	18,18	18,18	18,18	18,18	18,18	18,18	18,18	13,64	4,55				
	Annual revenue (net)			43,2	129,7	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9	172,9
	Fuel costs			15,1	45,4	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6	60,6
	Water costs			1,73	5,18	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90	6,90
	Maintenance and management costs			0,24	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95
	Interests on the lending		5,8	18,1	30,3	35,0	32,5	30,1	27,7	25,3	22,9	20,5	18,1	15,7	13,3	10,8	8,4	6,0	3,6
	Insurance			0,32	1,28	1,17	1,06	0,95	0,84	0,72	0,61	0,50	0,39	0,28	0,17	0,06	0,00	0,00	0,00
	Property tax			0,00	26,27	23,99	21,70	19,42	17,13	14,85	12,56	10,28	8,00	5,71	3,43	1,14	0,00	0,00	0,00
	Other taxes			1,98	5,94	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92
	Income tax			0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,5	1,0	1,4	1,9	8,8	5,6	9,3
	Capital repair			0,0	0,0	0,0	0,0	0,0	0,0	0,0	34,3	0,0	0,0	0,0	0,0	0,0	0,0	34,3	0,0
<b>Reference information</b>																			
	Depreciation			32,6	65,27	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3	65,3			
	Profit eligible for taxation		-5,8	-26,9	-51,0	-28,8	-24,0	-19,2	-14,4	-9,6	-39,1	0,0	4,8	9,6	14,4	19,3	88,1	56,2	93,0
<b>Payback ratios calculation</b>																			
	Net cash flow	-12,2	-70,6	-65,7	-39,1	12,2	19,3	24,1	28,9	33,7	4,2	43,3	47,6	47,4	42,6	42,4	39,1	10,4	43,5

[illegible]

**Financial calculation for Scenario B "Construction of an Open Cycle Gas Turbine (OCGT) power plant"**

No	Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Total investment costs, mln. \$																		
	Annual investments in the project	7,63	161,42	177,94	161,42														
	Technical indicators																		
	Capacity, MW			410	820	820	820	820	820	820	820	820	820	820	820	820	820	820	820
	Generation efficiency			34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%
	Capacity load			85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
	Expected hours of operation per year			1 862	5 585	7 446	7 446	7 446	7 446	7 446	7 446	7 446	7 446	7 446	7 446	7 446	7 446	7 446	7 446
	Volume of electricity generation, GWh/yr			763	4 579	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106	6 106
	Internal electricity consumption, %			2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%	2,73%
	Technical losses, %			13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%	13,0%
	Commercial losses, %			7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%
	Electricity provided to consumers, GWh/yr			590	3 538	4 718	4 718	4 718	4 718	4 718	4 718	4 718	4 718	4 718	4 718	4 718	4 718	4 718	4 718
	Expected average electricity price, USD/kWh			0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037
	Fuel consumption, mln. m3			243	1 459	1 945	1 945	1 945	1 945	1 945	1 945	1 945	1 945	1 945	1 945	1 945	1 945	1 945	1 945
	NCV, MJ/m3			33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24	33,24
	Gas price, USD/m3			0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053	0,053
	Expected Cash Flows, mln. \$																		
	Annual revenue (net)			21,8	130,9	174,6	174,6	174,6	174,6	174,6	174,6	174,6	174,6	174,6	174,6	174,6	174,6	174,6	174,6
	Fuel costs			12,8	76,7	102,3	102,3	102,3	102,3	102,3	102,3	102,3	102,3	102,3	102,3	102,3	102,3	102,3	102,3
	Water costs			0,26	0,79	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06
	Maintenance and management costs			0,24	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95
	Insurance			0,20	0,80	0,73	0,66	0,59	0,52	0,45	0,38	0,31	0,24	0,17	0,10	0,03	0,00	0,00	0,00
	Property tax			0,00	16,37	14,95	13,52	12,10	10,68	9,25	7,83	6,41	4,98	3,56	2,14	0,71	0,00	0,00	0,00
	Other taxes			1,23	5,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98	7,98
	Income tax			0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	Capital repair			0,0	0,0	0,0	0,0	0,0	0,0	0,0	15,5	0,0	0,0	0,0	0,0	0,0	0,0	15,5	0,0
	Reference information																		
	Depreciation			20,3	40,67	40,7	40,7	40,7	40,7	40,7	40,7	40,7	40,7	40,7	40,7	40,7			
	Profit eligible for taxation		0,0	-56,9	-273,2	-343,2	-341,7	-340,2	-338,7	-337,2	-335,7	-334,2	-332,7	-331,2	-329,8	-328,3	-286,8	-286,8	-286,8
	Payback ratios calculation																		
	Net cash flow	-7,6	-161,4	-170,8	-132,1	46,6	48,1	49,6	51,1	52,6	38,6	55,6	57,1	58,5	60,0	61,5	62,3	46,8	62,3
	Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Discount rate (project)	9,63%																	
	Discount ratio (project)	0,9122	0,83211	0,75905	0,692407	0,631614	0,576159	0,525573	0,479428	0,437334	0,398937	0,36391	0,331959	0,302813	0,276227	0,251974	0,229851	0,20967	0,191261
	Discounted cash flows	-6,95644	-134,317	-129,675	-91,4749	29,4374	27,71298	26,06443	24,49174	22,99429	15,38746	20,22035	18,94061	17,72971	16,58544	15,50542	14,31563	9,808841	11,91218
	Residual value																		203,4
	Discounted residual value																		38,4

Discounted capital, fuel, operational and maintenance expenditures	6,95644	134,3167	145,304	166,6493	66,34056	60,47592	55,1297	50,25608	45,81328	47,94674	38,07119	34,70553	31,63739	28,84048	26,29082	23,97453	25,11947	19,94945
Discounted electricity generation	0	0	579	3 171	3 856	3 518	3 209	2 927	2 670	2 436	2 222	2 027	1 849	1 687	1 538	1 403	1 280	1 168

NPV -52,4 mln. \$  
LCOE 0,0284 US\$/kWh

Sensibility analysis - LCOE	-10%	0%	+10%	
Investments	0,0273	0,0284	0,0295	1,00
Power Output	0,0296	0,0284	0,0273	1,00
Fuel costs	0,0267	0,0284	0,0300	1,00

Volume of investments					0,62
Investments, mln. \$	7,6	161,4	177,9	161,4	508,4

Exchange rate, prices and taxes			Source
Data	20.03.2012		
Exchange rate	1 839,40 UZS/USD		National bank of Uzbekistan
<b>Electricity</b>			
Electricity tariff	0,037 USD/kWh	VAT free	ADB - financial analysis report
<b>Natural Gas</b>			
Gas price	116 100 UZS/000 m3	including VAT	Uztransgas site
Gas price	63,12 USD/000 m3	including VAT	
Gas price	52,60 USD/000 m3	VAT free	
<b>Water use tax</b>			
	8 UZS/m3		Presidential Degree - Republic
	0,0043 USD/m3		Uzbekistan # PP-1024 from
Water consumption	57 600 m3/hour		29.12.2008
Total payments	1,87 mln. \$		
<b>Profit tax</b>			
	10%		Presidential Degree - Republic
<b>Property tax</b>			
	3,50%		Uzbekistan # PP-1024 from
<b>Payroll taxes</b>			
	25%	% labour cost	29.12.2008
<b>Payments to the Fund on reconstruction, capital repair and equipment of educational establishment</b>			
	0,50%	% revenue	Presidential Degree - Republic
			Uzbekistan # PP-1024 from
			29.12.2008
<b>Mandatory payment to republic road fund</b>			
	1,40%	% revenue	
<b>Payments to the pension fund</b>			
	1,60%	% revenue	
<b>Depriciation rate for power</b>			
	8%		Tax code of Uzbekistan
<b>Depriciation period</b>			
	12,5 years		