

PROJECT IDEA NOTE (PIN)

A. Description of the project, type of the project, area/location and schedule of the project realization.

Title of the project: Use of the industrial CO₂ emissions for soda ash production.

A brief description of the project

<p>Project objective</p>	<ul style="list-style-type: none"> - Utilization of industrial adverse CO₂ emissions and their use for soda ash production; - Providing domestic and industrial needs of the Republic in soda ash; - Improvement of ecological condition through industrial CO₂ emissions reduction; - Set-up of new work places.
<p>Project description and measures/activities planned, including technical project description</p>	<p>Significant role in environment pollution of Tajikistan is played by industrial enterprises wastes. Further atmosphere condition worsening may lead to for the human negative consequences. Therefore, the key objective on environment protection and treatment of the pollution wastes with new products receipt becomes priority problem of the modern science.</p> <p>Every year 200 thous. tons of soda ash are imported on expensive costs into the republic (since there is no workshops for the soda ash production) for providing domestic and industrial needs. Hundreds of tons of this product are used for entrapment of outgoing fluoride gases in workshops on gas-cleaning of the Tajik Aluminum Plant. There are large enterprises that emit a great volume of CO₂ as a result of technological processes (“Tajikkhimprom” - 100Gg/year/CO₂, “TajikAzot” - 70Gg/year/CO₂ Tajik Aluminum Plant – 20 thous. tons/month/CO₂ and thous. tons/month/CO). Therefore, CO₂ entrapment and treatment for the new production receipt will allow ceasing importing expensive transfer of soda ash from abroad and improve ecological condition in the region. Enterprises like “Tajikkhimprom” and “TajikAzot” are considered to be largest ones in the Central Asia. “Tajikkhimprom” is specializing in disinfectant chlorine-containing substances, including fluoride and burned lime production. Lime production capacity is 85 thous. tons per year. For the time being CO₂ formed when lime producing is emitted into the atmosphere completely and is 100 Gg per year.</p> <p>“TajikAzot” is specializing in mineral fertilizing – carbamide and ammonia. CO₂ emissions from ammonia production at this plant are 70 Gg per year.</p> <p>At the Yavan’s Heat Power Station CO₂ huge emissions from fuel combustion, natural gas in particular, are not utilized yet.</p> <p>The project supposed includes CO₂ froth-over from “TajikAzot” into “Tajikkhimprom” by means of pipelines and tanks via railways. We have already conducted a number of preliminary researches on utilizing outgoing greenhouse gas aimed at soda ash receipt at “Tajikkhimprom”.</p> <p>Generally, soda ash is produced from sodium chloride through</p>

	<p>ammonia method. Refined calcium chloride is treated by ammonia, then, the brine is carbonized by CO₂ containing gas. At the same time sodium bicarbonate crystal suspension in the ammonia chloride is formed. Then, the technology of soda ash receipt is undergoing:</p> $2\text{NaCl} + 2\text{CO}_2 + 2\text{NH}_3 + 2\text{H}_2\text{O} = 2\text{NaCO}_3 + \text{NH}_4\text{Cl}.$ <p>At the Yavan's plant when technology processes are conducted a huge number of electroslag wastes that can be used for soda ash production are remained.</p> <p>Outgoing electroslags are connected with carbon dioxide utilized with soda ash receipt:</p> $2\text{NaOH} + \text{CO}_2 = \text{Na}_2\text{CO}_3 + \text{H}_2\text{O}$ <p>When integrating industrial method of soda ash receipt it's possible to utilize up to 61% of summary CO₂ emissions both from technology process and energy process (gas combustion in stoves) – 1 ton of soda ash absorbs 668 kg of CO₂. The number of CO₂ in 421kg that wasn't reacted is directed back to carbonized technology process, i.e. we can affirm that 1021 kg of CO₂ is utilized per 1 ton of soda ash. When organizing soda ash production arrangement 100 thous. tons of soda ash per year 102 Gg of CO₂ will be utilized (including 67,15 Gg from lime burning). Depending on the volume of soda ash production CO₂ emissions may be used from Yavan Heat Power Station (via pipelines) and "TajikAzot" (via railway).</p> <p>Tajikistan's need in soda ash use is about 200 thous. tons per year, therefore, the project realization considered to be beneficial economically.</p> <p>When the soda ash production by-products are occurred (1 ton of soda ash received – 1 ton of calcium chloride and 0,5 ton of sodium chloride). Calcium chloride is critical and will be market claimed. Second waste is carbonate materials remnants that can be used for cement and other material production.</p> <p>There are technological developments of this kind of production that can be applied practically in limited edition and volume.</p> <p>Advantages of industrial wastes utilization:</p> <ul style="list-style-type: none"> - Ecological safety at all production phases; - Considerable and totally complete reduction of CO₂ emissions into the atmosphere; - Effective utilization of formed by-products at soda ash production in other industry branches.
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Technology to be used	Technology with the ammonia or alkaline solution addition will be used for soda ash production.
Project author	Scientific research institute of industry of the Ministry of industry of the Republic of Tajikistan.
Name of the author project	B. Mirzoev, Ph.D, SRI of industry
Other functions of the project author	Author control
A brief description of the project author experience in relevant	SRI of industry was founded in 1998 at the Ministry of industry of the Republic of Tajikistan. Since 2001 technology issues in regard to local materials and industrial wastes treatment for new product receipt that

area	will meet and satisfy economic needs of the republic.
Address	Agency on hydrometeorology
Contact person	Climate change center
Project sponsors	Scientific research unitary enterprise “Padida”
Name of the first project sponsor	Scientific research unitary enterprise “Padida”
Organization category	State and public
Address	Neftyanik rural area, Dushanbe city
Contact person	B. Mirzoev
Tel./fax	(993 372)27-61-81
E-mail	
Key activity types	Research and treatment of local material for environment condition improvement in the region and new product receipt. “Padida” enterprise was founded in 1991 and aims at intellectual capacity integration for finding solutions in local material and industrial wastes treatment.
A brief description of fund indicators	
Project stakeholder	Climate Change Centre of the Agency on Hydrometeorology of the State Committee for environmental protection and forestry of the Republic of Tajikistan
Address	47 Shevchenko Str., Dushanbe 734025, TAJIKISTAN
Contact person	ILHOM RAJABOV
Tel.:	(992 372) 27 61 81
II. Expected sponsors	CDM – Clean Development Mechanism. Asian Development Bank. ODA Programme. World Bank carbon market prototype. “Padida” enterprise. Global Environment Facility (GEF).
Project type	
Activity type	CO ₂ utilization for soda ash production Activity type is aimed at greenhouse gas industrial emissions reduction and improvement of ecologic condition in the region
Activity area	Activity area measures include soda ash providing for the population, hospitals and other enterprises concerned including Tajik Aluminum plant – outgoing fluoride gases utilization.
Location of the project implementation	
Region	Khatlon Region
Country	Republic of Tajikistan
Towns	Yavan, Sarband
A brief description of the project area implementation	Yavan town is located 60 km from Dushanbe city Sarband town is located 110 km from Dushanbe city and 10 km from Kurgan-tyube city. Distance between “TajikAzot” and “Tajikkhimprom” plants is 60 km.
Expected ecological and social benefits	Approximate emission reduction: 1 year – by 50 Gg CO ₂ 2 year – by 70 Gg CO ₂ 3 year – by 100 Gg CO ₂
Key scenario	CO ₂ emissions reduction through industrial wastes utilization at the region’s enterprises
Exact benefits for the environment at global and local scales	The project aims at environment pollution reduction of the region and ecological cleanness preservation both at global and local scales
Social and economic	

aspects Both social and economic effects can be attached to the current project and wouldn't be implemented without the support of the CDM project	1. Environment pollution reduction in regions indicated (Vakhsh and Yavan regions) 2. Soda ash production for meeting economic needs of Tajikistan. 3. Set-up of new work places.
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Funding				
	Total cost of investments of the project is 1 200 000 USD			
		In national currency (000\$)	In hard currency (000\$)	TOTAL (000\$)
	- ADB		0.853	0.853
	-WB, state credit		0.232	0.232
	Sales return from CER			
	Income re- funding		69	69
	IDF grand (Great Britain)		46	46
	TOTAL		1.200	1.200
General project budget of expenditures	Total funding needs (including circulation capital needs and funding for percentage payment on credit during the construction process period) is 1 200 000 USD.			
Aggregative project budget of expenditures in national currency. As of March 1, 2006 - somoni				
Cost of the equipment			1 155 200,0	
Summary capital contribution for equipment including mounting, acquisition of subsidiary materials and unaccounted expenditures			1 824 000,0	
Cost of total construction expenditures			837 760,0	
Author control (0.6%)			23 040	
Summary capital contribution			3 840 000,0	
Circulating capital and percentages on credit during the construction process				
Total funding needs				
Aggregative project budget of expenditures in US dollars. As of March 1, 2006 - US \$				
Cost of the equipment			361 000,0	
Summary capital contribution for equipment including mounting, acquisition of subsidiary materials and unaccounted expenditures			261 800,0	
Cost of total construction expenditures			261 800,0	
Author control (0.6%)			7 200,0	
Summary capital contribution			1 200 000,0	