

Clean Development Mechanism

Sustainable Development co-Benefits Description Report¹

CDM project activity or programme of activities (PoA) information	
Title	San Clemente Hydroelectric Power Plant
Pre-registration reference no.	
Reference no.	4800
Type	Project Activity
Sectoral Scope	Energy industries (renewable - / non-renewable sources) (1)
Host Party	Chile

Report information	
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Name of third party verifier and/or comments	Most of the information used for the preparation of this report is contained in San Clemente's Project Design Document and Colbún's reports. Project Design Document was audited by AENOR. Since 2012 Colbún's reports are verified by a third party and are available at its website, www.colbun.cl .

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Overview of sustainable development co-Benefits

A. The extent of environmental co-Benefits:

		N/A	No	Slightly	Partly	Highly
Air	Reducing Sox					•
	Reducing Nox					•
	Reducing Fly ash				•	
	Reducing suspended particulate matter (SPM)					•
	Reducing Non Methane Volatile Organic Compounds (NMVOCs)	•				
	Reducing Noise Pollution	•				
	Reducing Odors	•				
	Reducing Dust				•	
	Other air quality improvements				•	
	Preventing end of life products/equipment (solid waste)				•	
Land	Producing/using compost	•				
	Producing/using manure, mineral fertilizer or other soil nutrients	•				
	Irrigation	•				
	Preventing soil erosion					•
	Minimum tillage	•				
	Other means to improve land quality	•				
	Improving management/control of wastewater	•				
Water	Saving/conserving of water					•
	Improving reliability/accessibility of water supply			•		
	Purification/cleaner water supply	•				
	Improving ecological state of water bodies	•				
	Other means to improve water	•				
	Protecting mineral resources	•				
Natural Resources	Protecting/enhancing plant life	•				
	Protecting/enhancing species diversity					•
	Protecting/enhancing forests					•
	Protecting/enhancing other depletable natural resources	•				

B. The extent of social co-Benefits:

		N/A	No	Slightly	Partly	Highly
Jobs	New long-term jobs				•	
	New short-term jobs	•				
	New sources of income generation	•				
	Other employment opportunities	•				
Health & Safety	Disease prevention	•				
	Reducing accidents	•				
	Reducing crime	•				
	Preserving food	•				

	Reducing health damaging indoor air pollution	•				
	Enhancing health services	•				
	Improving sanitation and waste management	•				
	Other health and safety improvement	•				
Education	Job-related training					•
	Enhanced educational services				•	
	Project-related knowledge dissemination					•
	Other educational benefits			•		
Welfare	Improving working conditions	•				
	Community or rural advancement	•				
	Poverty alleviation (more people above poverty level)	•				
	Improving wealth distribution/ generation of income and assets	•				
	Increased municipal revenues	•				
	Optimized women's empowerment	•				
	Reduced traffic congestion	•				
	Other welfare benefits					•

C. The extent of economic co-Benefits:

		N/A	No	Slightly	Partly	Highly
Growth	New investments	•				
	New industrial/commercial activities			•		
	New infrastructure	•				
	Enhancement of productivity	•				
	Reduction of production costs (services)	•				
	New business opportunities	•				
Energy	Other economic benefits	•				
	Improvement in supply of energy	•				
	Access to energy	•				
	Affordability and/or reliability of energy	•				
Technology	Other energy improvements	•				
	Introducing/developing/diffusing imported technology	•				
	Introducing/developing/diffusing local technology	•				
	Adaptation of new technologies to local circumstances	•				
	Know-how activities for a technology	•				
Balance of payments	Other technological benefits	•				
	Reduction of foreign dependency			•		
	Other macro-economic benefits	•				

D. Further information:

Information required

	Yes	No	N/A
			•

Detailed description

A. Environmental co-Benefits

	Indicator	Specification	Extent
	The CDM improves air quality by reducing air pollutants as follows:		
Air	SOx	<i>The Project activity generates clean renewable energy that is dispatched to the Chilean national grid (SEN, for its Spanish acronym) which, according to 2018 data, is mainly composed by fossil fuel power plants as they represent 57% of the generated electricity. Thus, the operation of San Clemente power plant displaces electricity that would otherwise be generated by fossil fuel power plants. According to an environmental guide for thermal power plants developed by the Chilean Superintendence of Environment, SO2 is a main emission of fossil fuel based power plants; therefore, San Clemente power plant avoids SOx emissions. Sources: Project Design Document, p. 7; "Guide to relevant environmental aspects for thermoelectric plants", developed by the Chilean Superintendence of Environment, p. 8, SEN Coordinator website: https://www.coordinador.cl/sistema-informacion-publica/portal-de-operaciones/operacion-real/generacion-real-de-las-centrales/</i>	Highly
	NOx	<i>As the project activity generates clean renewable energy that displaces electricity that would otherwise be generated by fossil fuel power plants, San Clemente power plant indirectly avoids NOx emissions. According to the environmental guide for thermal power plants developed by the Chilean Superintendence of Environment, NOx is a main emission of the fossil fuel based power plants. Sources: Project Design Document, p. 7; "Guide to relevant environmental aspects for thermoelectric plants", developed by the Chilean Superintendence of Environment, p. 8.</i>	Highly
	Fly ash emissions	<i>According to the environmental guide for thermal power plants developed by the Chilean Superintendence of Environment, fly ash from coal based power plants could be emitted into the atmosphere; therefore, San Clemente power plant also avoids fly ash emissions. Sources: Project Design Document, p. 7; "Guide to relevant environmental aspects for thermoelectric plants", developed by the Chilean Superintendence of Environment, p. 8.</i>	Partly
	SPM	<i>According to the environmental guide for thermal power plants developed by the Chilean Superintendence of Environment, SPM is a main emission of fossil fuel based power plants; therefore, San Clemente power plant also avoids SPM emissions. Sources: Project Design Document, p. 7; "Guide to relevant environmental aspects for thermoelectric plants", developed by the Chilean Superintendence of Environment, p. 8, 11.</i>	Highly
	NMVOCS		N/A

	Noise		N/A
	Odors		N/A
	Dust	<i>According to the environmental guide for thermal power plants developed by the Chilean Superintendence of Environment, depending on the accumulation and disposal conditions of the coal, dust could be emitted into the atmosphere; therefore, San Clemente power plant also avoids dust emissions. Sources: Project Design Document, p. 7; "Guide to relevant environmental aspects for thermoelectric plants", developed by the Chilean Superintendence of Environment, p. 8.</i>	Partly
	Other air quality improvements	<i>San Clemente power plant is part of the Colbún Complex from Colbún S.A., composed by six hydro power plants. Within this context, Colbún, in an alliance with the Municipality of Colbún developed a local agricultural program called "Program for the Management and Incorporation of agricultural residues 2018", focused on the promotion of best agricultural practices, where 80 local agricultors were trained and technically supported on field to implement the incorporation of agricultural residues to the land. The purpose of this program is to avoid the burning of agricultural residues, which generates local impacts to the air quality, and can cause possible forest fires. To date, 72 hectares have been intervened through the program. Source: Colbún's website: https://www.colbun.cl/programa-de-gestion-e-incorporacion-de-rastrojos-2018-presenta-positivos-resultados/</i>	Partly
Land	The CDM improves the soil quality and/or avoid soil pollution, waste disposal as follows:		
	Pollution prevention	<i>The project considered a plan for the disposal of the solid waste produced during the construction stage. These wastes are mainly packaging remains, electrical and metal components, concrete rubble and domestic trash. The plan prevented pollution by transporting waste to an authorized landfill. On the other hand, electric components were stored until they could be reused in another project or could be sold. There is not solid waste generation through the operation of the project. Source: San Clemente power plant Environment Impact Assessment, p. 35</i>	Partly
	Compost		N/A
	Manure, mineral fertilizer or other soil nutrients?		N/A
	Irrigation		N/A
	Soil erosion	<i>During the construction stage, a Soil Erosion Management Plan was developed, in agreement with the Agricultural and Livestock Service, in order to prevent erosion due to the construction works. Source: Colbún's Annual Report 2010, p. 81.</i>	Highly
	Tillage		N/A
	Other means to improve land quality		N/A
Water	The CDM improves the quality of water and access to water as follows:		
	Waste water		N/A

	Conservation of water	<i>San Clemente power plant is part of the Colbún Complex from Colbún S.A., composed by six hydro power plants. Within this context, in 2011, the project participant developed an agreement with the association of local farmers from Maule Sur sector, that created tools in order to encourage water savings and irrigation efficiency, considering a compensation to the farmers for their savings, resulting in benefits for both, agriculture and energy generation. Source: Colbún's Annual Integrated Report 2017, p 228, 350.</i>	Highly
	Distribution	<i>During 2009 and 2010, Colbún S.A. and the community of Sanatorio developed several activities and contributions, including improvements to the neighbour's drinking water network. Source: Colbún's Annual Report 2010, p. 81.</i>	Slightly
	Purification or a cleaner supply		N/A
	Water bodies		N/A
	Other means		N/A
Natural Resources	The CDM protects or enhance depletable natural resources as follows:		
	Mineral resources		N/A
	Plant life		N/A
	Species diversity	<i>Colbún S.A. has developed a Biodiversity Strategy that is applied in every project activity, which includes the following guidelines: To consider the project impacts on biodiversity in its early stages, to have environment management plans focused on biodiversity conservation to improve the knowledge on endemic species and conservation species located in the surrounding areas of the project, to promote in situ conservation of the biodiversity through the protection or rehabilitation of natural or interest areas, to promote knowledge and understanding of biodiversity of all the workers of the Company. Source: Colbún's Annual Integrated Report 2017, p. 248</i>	Highly
	Forests	<i>Colbún has reforested 10 hectares until 2013 with native species in the Maule river basin. Source: Colbún's Sustainability Report 2013, p. 71.</i>	Highly
	Other depletable natural resources		N/A

B. Social co-Benefits

	Indicator	Specification	Extent
Jobs	The CDM creates new job opportunities including income generation as follows:		
	New long term jobs	<i>The construction of the project required at least 120 people during the 16 months works, mostly local workers, as the selection was made in coordination with the San Clemente municipality. As the San Clemente commune has a high level of rural population, poverty and unemployment compared to the national average, the recruitment of local workers resulted in an enhancement of the economic activity during both the construction period and the lifetime of the project. Sources: San Clemente power plant Environment Impact Assessment, p. 24, Project Design Document, p. 2.</i>	Partly

		New long-term jobs > 1 year - 120	
	New short term jobs	New short-term jobs < 1 year -	N/A
	Income generation		N/A
	Other employment opportunities		N/A
Education	The CDM facilitates education, dissemination of information, research or increases awareness as follows:		
	Job related training	<i>The project participant, together with the Municipality of San Clemente and a Chilean professional institute, developed a Diploma in Nature Tourism, which seeks to promote skills and knowledge to the participants to enhance local tourism. During 2017, 25 people participated. Source: Colbún's Annual Integrated Report 2017, p. 350</i>	Highly
	Enhanced educational services	<i>San Clemente power plant is part of the Colbún Complex from Colbún S.A., composed by six hydro power plants. Within this context, Colbún, in association with Ecosfera consulting firm and teachers of the region, developed a teaching manual of education for sustainable development. This supporting manual is to be used by the students to learn more about their region and how to care about the environment. Source: Colbún's Sustainability Report 2012, p. 114</i>	Partly
	Project related knowledge dissemination	<i>San Clemente power plant is part of the Colbún Complex from Colbún S.A., composed by six hydro power plants. Within this context, Colbún developed an open interactive center called "The House of Energy" with the aim to generate trust and closeness between the company and the surrounding communities, spreading knowledge about the functioning of a hydro power plant. At this moment, the center has had more than 5,000 visits. Source: Colbún's Annual Report 2012, p. 108</i>	Highly
	Other educational benefits	<i>San Clemente power plant is part of the Colbún Complex from Colbún S.A., composed by six hydro power plants. Within this context, Colbún has developed a bulletin called "More energy", which is distributed to the community since 2011, to inform them about the company activities and local community news. Sources: Colbún's Annual Report 2012, p. 108; Colbún's website: https://www.colbun.cl/sostenibilidad/comunidad-y-sociedad/boletines/</i>	Slightly
Welfare	The CDM improves local living and working conditions as follows:		
	Improvement of working conditions		N/A
	Community or rural upliftment		N/A
	Poverty alleviation		N/A
	Changes in distribution and/or generation of income and assets		N/A
	Increased municipal revenues		N/A
	Empowerment of women		N/A
	Reduced traffic congestion		N/A
Other welfare benefits	<i>During 2009 and 2010, a community center with games for children was built, educational and recreational activities were carried out together with the workers of the San Clemente power plant, and the Sanatorio</i>	Highly	

		community's school, firemen, sports club and church. Additionally, provisional houses were built for neighbours whose houses were affected by the 2010 earthquake, most of them were working in the construction of the San Clemente power plant. In 2017, Colbún, in an alliance with a public charity institution and an organization of civil society oriented to provide decent housing, constructed about 34 houses for people affected by forest fires, in the surrounding area of the Colbún Complex, most of them for the families of the workers of the San Clemente power plant. Source: Colbún's Annual Report 2010, p. 81. Colbún's Annual Integrated Report 2017, p. 50.	
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C. Economic co-Benefits

	Indicator	Specification	Extent
Growth	The CDM supports economic development and/or stability as follows:		
	New investments		N/A
	New industrial/comercial activities	<i>The developement of the project activity led to improve the commercial activity in the surrounding area of the project, due to the increased the amount of people/ workers living in the area, which required more services like food, transport, and others. Source: Project Design Document, p. 2.</i>	Slightly
	New infrastructure		N/A
	Enhancement of productivity		N/A
	Reduction of production costs (services)		N/A
	New business opportunities		N/A
	Other economic benefits		N/A
Balance of payments	The CDM results in improving the country's balance of payments as follows:		
	Reduction of the dependency on foreign sources of energy	<i>The Project activity generates clean renewable electricity that is dispatched to the Chilean national grid (SEN, for its Spanish acronym) which, according to 2018 data, is mainly composed by fossil fuel power plants, as they represent 57% of the generated electricity. Thus, the operation of San Clemente power plant reduces fuel import requirements that would have been necessary for thermal power plants. Source: Project Design Document, p. 7; SEN Coordinator website: https://www.coordinador.cl/sistema-informacion-publica/portal-de-operaciones/operacion-real/generacion-real-de-las-centrales/..</i>	Slightly
	Other macroeconomic benefits		N/A