



Sustainability action · Project Renewable Energy and Energy Efficiency

Chol Charoen Wastewater treatment, Thailand

*New technology in Thailand turning wastewater into energy
- Biogas from wastewater is captured and burned to produce electricity and heat that powers the factory.*

Project

Thailand is an emerging economy depending heavily on the agricultural sector. It is the number one exporter of dried cassava, producing about 75% of world exports. Cassava is a root crop grown in tropical climates and is a major food staple across Africa, Asian and South America. The Chol Charoen factory produces tapioca starch from dried cassava that is grown locally. This process creates vast amounts of wastewater, around 2,400m³ per day, which is stored in a series of 13 lagoons. The large size of these lagoons and the warm temperature creates perfect conditions for the breakdown of organic compounds in the wastewater. This produces large amounts of methane, a powerful greenhouse gas. At Chol Charoen the existing process has been modified into a closed loop system that captures the methane emissions. This is done with

new locally developed technology – the result of joint research between King Mongkut's University of Technology Thonburi and the National Centre for Genetic Engineering and Biotechnology. The captured gas is used to create heat and electricity for the factory, in place of electricity from the fossil-fuel intensive grid and heavy fuel oil used in the boilers. Surplus electricity is also fed into the national grid.

The project not only reduces GHG emissions by avoiding the release of methane into the atmosphere, but also by reducing fossil fuel consumption. In this way it prevents approximately 29,000 tonnes of greenhouse gases being emitted each year. The treatment of wastewater from tapioca factories in open lagoons is the prevailing practice in Thailand as it is low-cost and low maintenance. The substantial cost of modifying existing factories and a lack of locally available skills and technology are significant barriers to the implementation of improved processes. The additional revenue from the sale of carbon credits provided the necessary incentive to justify this investment.

Checklist	Additionality and permanence	3 rd party verified	Transparency	Annual CO ₂ -reduction	Social and environmental benefits	Marketing material
Project 300 285	According to the rules of the VCS	By Germanischer Lloyd Certification	Provided by Markit Environmental Registry	29,000 tCO ₂ e	As documented in our database	Pictures available



Location

The Chol Charoen Wastewater Treatment Project is located at a tapioca starch processing plant in Cholburi Province in Thailand.

Project achievements

Socio-economic impact

- The project has created 30 new local jobs in the construction and operation phases.
- Agricultural programs and trainings help regional farmers increase their tapioca output, e.g. through integrated pest management. In addition, farmers are supplied with non-chemical, biological means such as natural enemies to manage harmful insects.
- Residents enjoy better living conditions thanks to avoided odour emissions.
- The success of this project will lead to the spread of this new technology to other factories throughout Thailand.
- The project helps to improve Thailand's energy security by providing a local source of clean, renewable energy, reducing dependence on fossil fuels.

Environmental impact

- The treatment process has improved wastewater quality, so that the water can now be reused in the factory for washing the cassava, saving precious local groundwater resources.
- The project activity improves water and air quality significantly, mainly due to the high efficiency of the biogas reactor and improved process control as compared to open lagoons.
- In addition, large amounts of water are now saved since the new biogas reactor system allows the starch factory to reuse the treated effluent in the production process.

