



## Biogas generation from wastewater, Thailand

Captured methane from starch plant waste waters is being used as fuel in existing heat generating devices and is furthermore replacing the use of heavy fuel oil.

### Location



The project is located in central Thailand, about 180 km southwest of Bangkok in the province of Ratchaburi. The region surrounding mountainous region is typified by agriculture and has numerous cassava (tapioca) plantations supplying the regional starch industry.

### Project



Thailand is one of the world's most important starch exporters, with its production based on tapioca, a plant that grows well in dry and low-nutrient soil conditions. Until recently, the country's many starch factories were struggling with their high demand of water for washing the cassava, with pungent odour emissions and high fossil fuel cost for drying the starch. Today, funded by carbon revenues and private investment, a one-in-all solution successfully tackles the above problems and at the same time saves greenhouse gas emission from entering the atmosphere – on a large scale.



Prior to the project activity, the plant's wastewater was treated in seven cascading open anaerobic lagoons, with a retention time of more than one year. This resulted in heavy emissions of methane, one of the strongest greenhouse gases, from the organic content of the wastewater. Now, the project activity replaces the old treatment with a modern *Upflow Anaerobic Sludge Blanket (UASB)* reactor system. The captured biogas is used for energy production instead of being released to the atmosphere, and replaces fossil fuels in the starch drying process which saves even more greenhouse gases from heating up the climate. In the end, the recycled water can be re-used in the plant for cleaning the cassava, which saves many tons of freshwater per day.

Apart from the positive climate effects, the project also benefits the local community by actively supporting agricultural education, a kindergarden and a Buddhist temple. Last but not least, the strong odour nuisance has dropped.

## Project achievements



### Socio-economic impact:

- New jobs have been created during construction and in the operation phase.
- Workers receive special training on modern technology to improve their skills.
- The project owner provides financial support to a local Buddhist temple and to a foundation for the disabled.
- Scholarships are given to local students from low-income families to support higher education and sustainable development.
- The local kindergarden received fundings from the project owner.
- Neighbouring communities are regularly supported through project staff's team building events, e.g. by cutting grass, clearing roads and pathways, and cleaning clogged canals and waterways.
- 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 (compared to pre-project status).

### Environmental impact:

- 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 fresh water are now saved since the new biogas reactor system allows the starch factory to reuse the treated effluent in the production process.

## Checklist Project 300 141



✓ Additionality and permanence:	according to the rules of the VCS
✓ 3 <sup>rd</sup> party verified::	by TÜV Nord
✓ Transparency:	provided by Markit Environmental Registry
✓ Annual CO <sub>2</sub> -reduction:	17,000 tCO <sub>2</sub> e
✓ Social and environmental benefits:	as documented in our database

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