

PROMOTION OF ENERGY SCIENCE EDUCATION FOR SUSTAINABLE DEVELOPMENT IN CAMBODIA

Theme 7: Good Practices

Theme 7-3: Along Tamey Gasifier

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LAYOUT

- A glance on power plant
- Management
- Benefit of the project

HISTORY

○ Phase 1

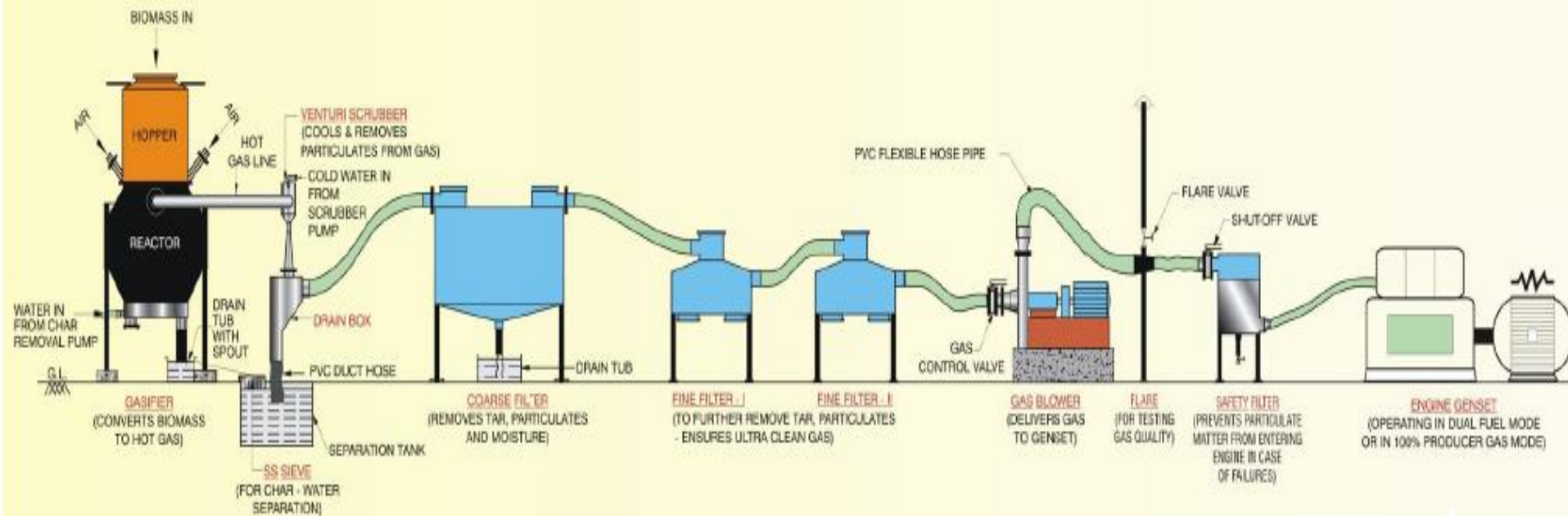
- Year of installation: January 2005
- Capacity: 7kWe (100% gas)
- Biomass source: Leucaena trees (farmed) and corn cob
- Purpose: village electrification
- Location: Anlong Tamey Village, Battambang province
- Funding source: the Canada Fund

○ Phase 2

- Year of installation: December 2006
- Capacity: 20kWe (100% gas)
- Biomass source: Leucaena trees (farmed) and corn cobs
- Purpose: village electrification (extension of original system)
- Location: Anlong Tamey Village, Battambang province
- Funding source: UNDP GEF/SGP + additional loan by E+Co

THE GASIFIER

- Gasification is a thermo-chemical process that converts biomass into a combustible gas called producer gas which contains about 80% of the energy originally present in the biomass. The producer gas is sent through a cooling and purifying unit before feeding into the engine to generate electricity. The system is commercially available as small as 4 kWe.



LEUCAENA LEUCOCEPHALA

- Source of biomass for the gasifier
- Multipurpose leguminous tree
- Native to Cambodia (Australian hybrid)
- Nitrogen fixing (improves the soil and can be used as a fertilizer)
- Leaves for animal feed, wood for firewood
- Seeds can be collected and sold



SOME PICTURES OF GASIFIER POWER PLANT



LAYOUT

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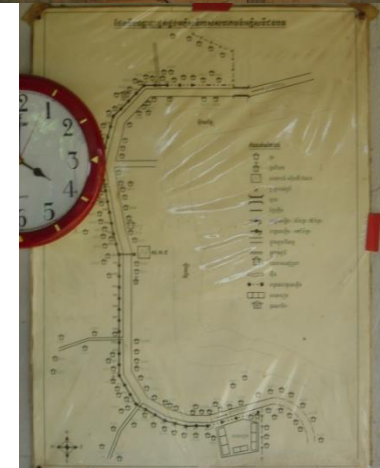
WHAT IS CEC?

- Community Electricity Cooperative (CEC): a member owned system
 - Founded in 2004
 - Consists of 5 committee members,
 - 5 workers and the 239 households connected to the grid
 - President of the committee, (elected for 3 years in 2005), and the other committee members are responsible of the gasifier plant and the grid system
 - Workers + the committee keep the plant running (daily: 9am-4pm and 5pm-11pm)



SOME COSTS

- Grid about 2km long
- 1500 Riel / kWh (\$ 0,375)
 - 1200riel / kWh → 2006 (2000 Riel occasionally)
- 1000 Riel / kWh for battery charging
- Fuel costs:
 - Leucaena: dry 1000kg / \$18
wet 1000kg / \$12
 - Corn cobs: 1000kg / \$10
 - Nutshells: 1000kg / \$10



MEMBERS OF CEC

- 239 members in 4 villages
 - 70 000 riel (\$17)
+ electric wire if further than 50m
- Krola Pas: 55
- Anlong Tamey: 116
- Choum Ka Svay: 52
- Phoum Tkou: 16
= 239



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SOME FIRST IMPRESSIONS

- How the electricity is used?
 - Lighting (2 lamps from CEC), TV (and other entertainment equipment) and fan
 - Electricity is quite cheap (1500riel/kWh)
 - Many still use batteries and kerosene lamps when the gasifier is not working, but electricity is cheaper and the light is better
 - People can afford to use electronic equipment (colour TVs)



SOME BENEFITS

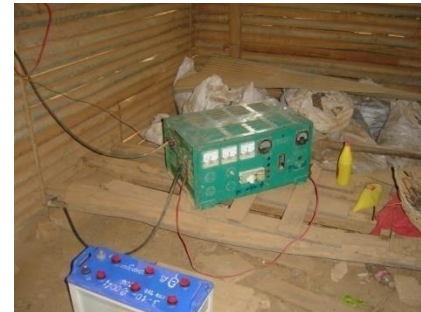
- The life continues after dark
- Possibility to cook in the evening
- Business hours continue after the dark
- Children can study in the evening
- People can relax with TV
- Rythm of life might be changing
- New information, ideas and understanding from TV programs
- Income from selling Leucaena (some cows are fatter)



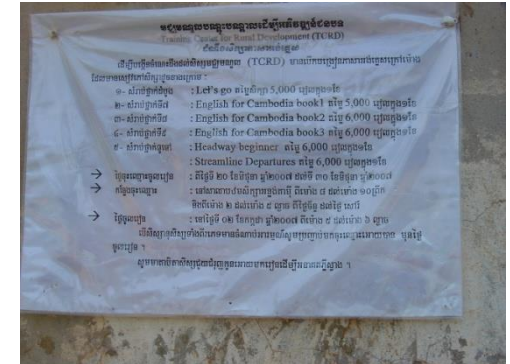
BUSINESS



BUSINESS



A photograph of a classroom in a rural school. Children are seated at wooden desks, looking towards the camera. The room has a high ceiling with exposed wooden beams and a window with a red curtain. Educational posters are visible on the wall.



”ANLONG TAMEY IS A HAPPY VILLAGE.”

- ...because we have now cheap electricity and lights in the evening and street lights as well. People come to spend their time along the road because of the lights and TVs and shops staying open.
- ...because lighting and tv are also good for relaxing. They are good for your menthal health. They are good for loneliness and good after a hard working day.
- There seems to be a sense of solidarity and sense of working for a common cause (e.g. members of the CEC committee are working for free) to develop the village; to make it a better place to live in



DEVELOPMENT IDEAS AND PLANS MENTIONED BY THE VILLAGERS

- Bigger gasifier, longer grid, electricity for the whole day
- Small sewing factory (garment factory) (work for the young people)
- Computers and teaching to use them
- Coffee shop open in the evenings (boxing from screen)
- A small restaurant
- Electricity for water pumping
- Fixing the streetlights
- Small market in Anlong Tamey
- Small sugar factory, small cassava factory
- More shops
- Planting experiments and soil improvement experiments
- Small health centre
- Help from organisations outside the village is needed



SOME DIFFICULTIES

- Demand is bigger than supply
- The grid is mostly installed along the road
- Electricity is not available for the whole day
- The filters have to be cleaned quite often (e.g. rice husk filter after every 3 days)
- Sometimes the gasifier doesn't work from 9am to 4pm
- Not enough Leucaena and people have only a little bit of land



CONCLUSIONS

- Anlong Tamey is an important case:
 - Pilot
 - Renewable energy
 - Poverty reduction, livelihood improvement and income generation
 - Member owned (villagers)
 - Implemented by NGO and funded by a donor and a loan company
 - Seems to be working
- It seems that there is a change happening, but it has just started.



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