

# Detailed Viability Study of Decentralised Small Scale Biodiesel Production in Lao PDR and First Pilot Implementation at District Level

## Project Objective

The overall objective is to meet 100% of the demand for biodiesel in Wapi district, with the assumption that the government adopts the B10 blend mandate for diesel sales.

LIRE intends to demonstrate the extent to which small-scale production can contribute to this target without negatively affecting other national development objectives. Furthermore, this project will provide the local government authorities with the tools for decision-making, that help to evaluate district biofuel potential, transfer processing plant technology and know-how, and lead to future sustainable biofuel investments, by proving the commercial and social viability of such plants.

## Description

The Biofuel sector in Laos is still poorly developed compared to neighbouring countries. Whereas countries like Thailand have existing plantations of crops suitable for conversion into Biodiesel/Bioethanol (such as oil palm or sugar cane), Laos has a less developed plantation system. Instead of converting an existing industry into making biofuels, for example by putting a biodiesel reactor at a palm oil mill, Laos needs to put in new crops and processing units specifically for Biofuels. The policy mandate of 10% Biofuels by 2025 is a hugely positive step and this has been well received by the biofuel industry, but investments in biofuels in Laos have had a poor record of success, perhaps because their business models failed to integrate well into existing farming systems and instead were proposing a completely new way of farming. This project is strenuously seeking to fit into existing farming and community structures, hence the focus on small scale systems.

## Project Highlights

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| <b>Project ID</b>                              | : 2-L-106  |
| <b>Country</b>                                 | : Lao PDR  |
| <b>Lead Partner</b>                            | : Lao Institute for Renewable Energy (LIRE)  |
| <b>Partners</b>                                | : Department of Electricity of the Ministry of Energy and Mines of Lao PDR, FACT Foundation, Netherlands |
| <b>Total Project Cost</b>                      | : € 344,000  |
| <b>EEP Financing (% to total project cost)</b> | : € 125,000 (36.34%)   |
| <b>Technical Focus</b>                         | : Bio-fuels  |
| <b>Activity</b>                                | : Pilot Project and Feasibility Study  |
| <b>Duration</b>                                | : 20 months  |

The project will grow various oil feedstock crops in the district, process them into high quality biodiesel, and sell the fuel produced within the district to locally meet the national target of 10% biofuel by 2025. The district benefits from the farmers earning money from growing the feedstock crops. The production facility employs local people to produce the fuel, and high quality biofuel suitable for blending with normal fuels is sold through the current supply chain in the district.

This approach fits strategically with the Lao farming system of small farmers and small plots. It is an alternative to large-scale energy plantations on estates where villagers can only benefit as dependent farm labourers. With a focus on distributed hedges and small plots for biofuel feedstock crops, the traditional conflict between energy crops and food crops will be minimised. Synergies between the two can help stabilise the production systems and contribute to agro-ecological diversity.

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Fortunately making good quality biodiesel, by the method of transesterification, is well proven and an established technology, with the equipment available within the region. The main unknowns are working up the viability of this approach and then operationally putting it all together, with a special emphasis on making the production safe and adapt safety protocols to the Lao context.

This project shall provide the first biofuels produced in a small plant at district level from stock grown by smallholder farmers in the district, whilst doing it in a safe and sustainable way. This is a project that will not compromise on safety, deliver on sustainability, and be fully in line with the national biofuels strategy communities. Other suitable technologies, such as low-cost micro-solar power for households and floating battery recharging stations will also be demonstrated.

## Relevance to Country's Energy and Environment Policies

The Lao Government has stated in a recent decree that by 2025, 10% of the fuel in Laos will be biofuel. Although investing solely in large scale plantations could provide the required feedstock, it would do little to reduce rural poverty levels or meet the other government objective to preserve biodiversity and the environment. One of the fair criticisms of biofuel production is that it can reduce the land available for food production, while contributing to increased energy security. Another issue with biofuel production is that large areas of forests could be replaced with biofuel monocultures only.



## Innovation and Knowledge Transfer

The participatory approach for the implementation of the pilot biofuel plant allows the respect of the socio-cultural context, targets the participation of the most vulnerable rural poor and ethnic populations by enhancing the gender equity in ensuring the involvement of the women in the project development, creating new jobs for the project operation, enhancing sustainable land use and land management and contributing to soil erosion control by planting suitable crops.

### For more information:

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