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# Towards a viable renewable energy sector

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18/10/2010

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## Overview

- Renewable Energies in Lao PDR
- Introducing LIRE
- Bottlenecks and energy context
- LIRE's activities
- LIRE's aspiration



# Renewable energy in the Lao PDR

- **Hydropower**
  - Large
    - Installed (2008): 660 MW, under construction 2280 MW
    - Lots of interest from foreign investors
    - Export oriented (10% for domestic market)
    - Environmental and social disruptions
  - Small to micro (pico)
    - Great potential
    - Limited number of sustainable implementations, especially small scale (<100 kW, 21 out of 30 failed)



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# Renewable energy in the Lao PDR

- **Biofuels**
  - Naturally occurring (e.g. Jatropha)
  - High interest in energy plantations
  - No biofuel production yet
- **Biomass gasification**
  - High biomass production, <40 ton dry mass/ha (Europe: <15 ton/ha)
  - Feasibility stage
- **Biogas**
  - SNV: domestic biogas (1000 installations; 2010), large scale implementation under planning)
- **Solar**
  - Subsidized SHS systems from WB: ~5000 (high fail rate)
  - Private rental systems SHS Sunlabob: ~1250
  - Some pilots using hybrid village grids



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# Grid and government policy

- **Grid:**
  - Electrification targets: 90% by 2020, 70% by 2010
  - Large donor support for grid expansion
  - Very low tariffs, cross subsidies
  - Expansion ≠ connection (high connection costs)
  - No feed-in structure
- **Off-grid electrification, target 10%**
  - Poor statistics on off-grid technologies
- **Currently no policies on renewable energy (ongoing)**
- **Renewable energy not in one Ministry**
  - Ministry of Energy and Mines,
  - Ministry of Agriculture and Forestry, and
  - Prime Minister's Office



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# General bottlenecks for renewable energy development in the Lao PDR

- **Lack of information**
  - Lack of consistent field data (e.g. household level electricity use)
  - Lack of sharing of information
- **Lack of local resources**
  - Limited funds for bottom-up market development
  - Limited renewable energy sector
- **Insufficient follow-up**
  - Many pilot sites, but few sustainable models
  - Lack of monitoring and evaluation
  - Technology-driven, rather than demand-driven
- **Limited focus on helping the poor**
  - Limited monetary income in rural areas
  - Inadequate understanding of rural energy situation



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# What is LIRE?

- Young institute for applied research
  - Lao non-profit association of members, set up in 2006
  - No base funding
  - Own programs and on-demand research (for NGOs, private sector, government)
  - Offers consultancy services
  - Fully authorized to work in the Lao PDR
- Lao and foreign experts
  - Permanent Lao staff: 9
  - Permanent foreign staff: 3
  - Lao and foreign experts: 4
  - Interns: 6



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# LIRE's Mission

**Objective: Contributing to the development of the renewable energy sector in the Lao PDR**

Through:

- Training and local capacity building
- Research and implementation
  - appropriate renewable energy technologies in the Lao context
  - sustainable implementation models
- Providing a local platform for all stakeholders involved
  - Knowledge exchange network
  - Technical advice
  - Feasibility studies
  - Monitoring and evaluation
- Policy support and development
- Consultancy and short-term assignments on renewable energy studies



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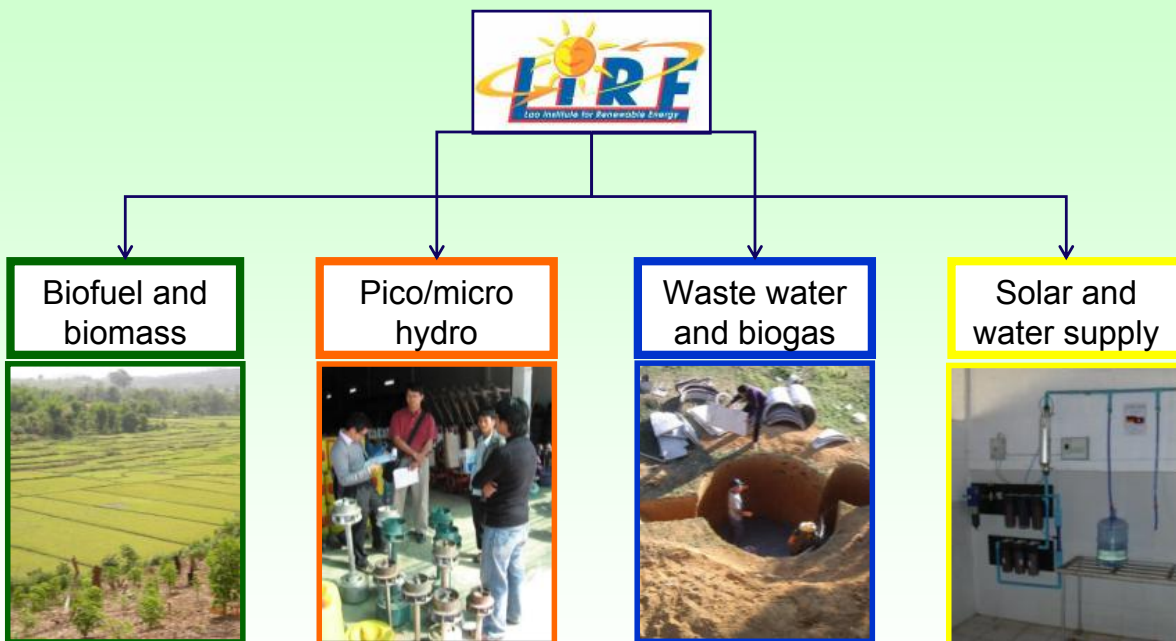
# LIRE team members



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# LIRE programmes



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# LIRE's activities: Hydropower

- Partners:
  - ETC Energy
  - BORDA
  - Faculty of Engineering
- Pico-hydropower program
  - Improving quality and safety of pico-hydro in Laos
  - Influencing the whole supply chain: traders, shopkeepers and end-users
- Micro-hydropower program
  - Feasibility studies for micro-hydropower (<10 kW)
  - Bringing stakeholders together (donors, implementors, communities)
- Capacity building
  - Student project with National University of Laos



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# LIRE's activities: Biofuels

- Partners:
  - Faculty of Agriculture
  - Lao State Fuel Company
  - LEAP
  - Jatrosolutions
- Jatropha propagation program
  - Test fields around Vientiane
  - Agricultural research
- Agricultural extension program: Designing and disseminating extension material on energy crops
- Feasibility study on biofuel production on village level
- Biofuel policy development
  - Biofuel assessment and policy and strategy study
- Capacity building



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# LIRE's activities: Biomass gasification

- Partners:
  - SME Cambodia,
  - World Bank ESMAP
- Pre-feasibility studies
  - General study for village and commercial sites
  - Detailed studies in Khammouane and Bolikamxay



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# LIRE's activities: Biogas

- Partners:
  - Biogas Pilot Program (BPP), Dep. of Livestock and Fisheries (under the MAF) supported by SNV
  - BORDA
  - SNV
- Technical support for the BPP
  - GIS mapping of potential target areas
  - Biogas user survey
- Starting activities in decentralized waste water treatment
  - Organizing technical expertise
  - Writing proposals for donors/investors
- Testing of next generation digesters
- Supporting biogas for rural electrification (medium-large scale)



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# LIRE's activities: Solar

- Partners:
  - Sunlabob Renewable Energy Systems,
  - Faculty of Engineering
  - BORDA
- Solar-powered water purification
  - Health impact assessments and water quality surveys
  - One pilot village
- Testing solar equipment
  - Battery lanterns
  - Amorphous vs. crystalline panels
  - Testing lighting
- Student project
  - Short course
  - Supervising 2 final year students



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# LIRE's activities: water supply

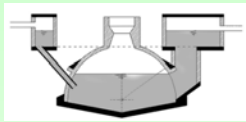
- Bottled drinking water for rural villages
  - Solar power for pumps, UV and Ozone disinfection, and local chlorine production
  - Operational model: owned by community, with village entrepreneur to run service, and collect income for maintenance costs
- Pilot project implementation
  - 5000 litre/day supply
  - Detailed monitoring to evaluate technical and operational models
- Programme improvement
  - Trials of open sand filters
  - Capacity building for HIA
  - Monitoring and evaluation of pilot
- Promotion and Marketing
  - Working with local implementation partners to supply to SME
  - Tendering for mining programmes



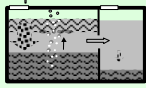
Weltwaerts mentor workshop 2009

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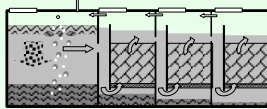
# LIRE's activities: DEWATS



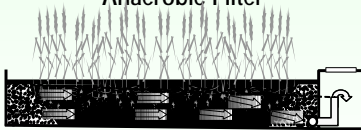
Biogas digester



Settler



Anaerobic Filter



Planted Gravel Filter

- Urban waste water is an emerging problem in Laos
- Decentralised approaches offer a cost-effective alternative to large central systems
- Customised systems for large individual users may also present energy opportunities

- BORDA Decentralized waste water treatment Systems (DEWATS) for
  - Community Based Sanitation (CBS)
  - Small & Medium Enterprises (SME)

- LIRE-BORDA partnership: Technology dissemination, advocacy, and capacity building of local institutions through pilot partnership programmes



## Solving Bottlenecks \ LIRE's Aspirations

- **Contribute to capacity building in the renewable energy sector**
  - Improve cooperation with the National University and with vocational schools
  - Assist and train relevant authorities and other stakeholders
  - Increase the number of Lao staff members
- **Improve coordination amongst stakeholders**
  - Play a leading role in national and regional forums
  - Promote Public-Private Partnerships in the sector
  - Provide means (knowledge, capacity, funding) to promote small-scale initiatives
  - Share information in one central place
  - Promote integrated renewable energy needs assessment
  - Improve monitoring and evaluation practices



# Solving Bottlenecks/LIRE's Aspirations

- **Contribute to renewable energy policy**
  - More focus on small scale and off-grid options
  - An integrated policy on sustainable biofuel development
  - Enabling environment for renewable energy companies/markets
  - Explore carbon trading options for Laos
- **Remove constraints for development of renewable energy market**
  - Focus on small-scale projects using local capacity
  - Promote market development at provincial and district level
  - Promote access to small and micro-credit

