

UN  **HABITAT**
FOR A BETTER URBAN FUTURE



Energy sector in Lao PDR

UN-HABITAT Environmental Technology Expert Group
Meeting II

*“Technical Cooperation for Sustainable Environmental
Development in the Asia-Pacific Region”*

30 September, Fukuoka, Japan

Lao PDR – country profile



Population (2009 estimate)	6.1 million
Per Capita GDI (2008)	US\$740
GDP growth rate (2009)	6.5%
GDP compilation (2008)	Services 38%, Agriculture 35%, Industry 27%
Urban population (1998/2008)	20%/31%
Population living in poverty (2008)	33%

Data sources: ADB / World Bank

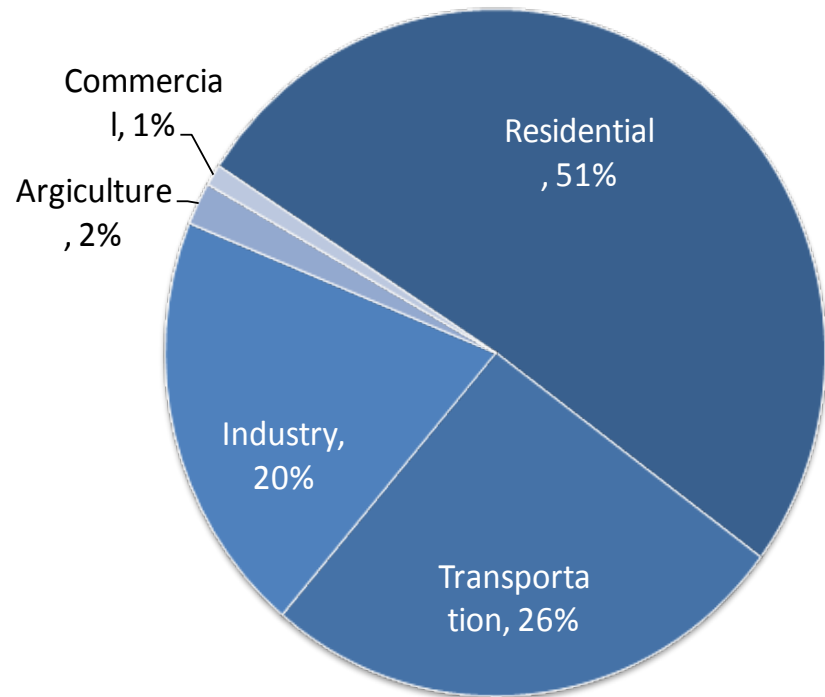
Energy consumption in Lao PDR

- Low conventional energy consumption
- Demand for energy expected to grow at over 5% per year until 2030
- Currently approx 60% of households electrified – target is 90% by 2020



Source: MEM 2010

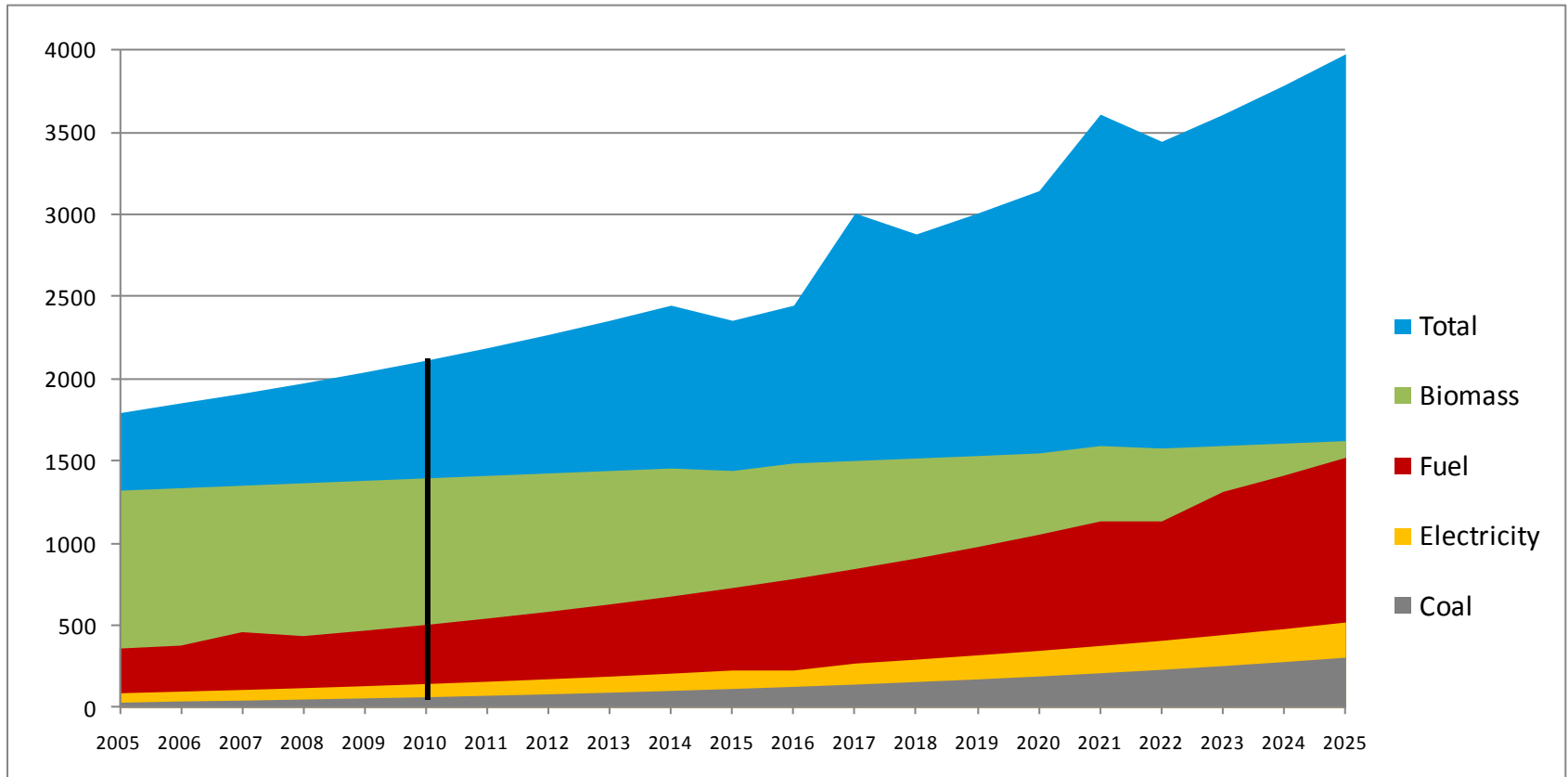
Energy use by sector



Energy demand expected to double by 2025

MTOE (Million
Tons of Oil
Equivalent)

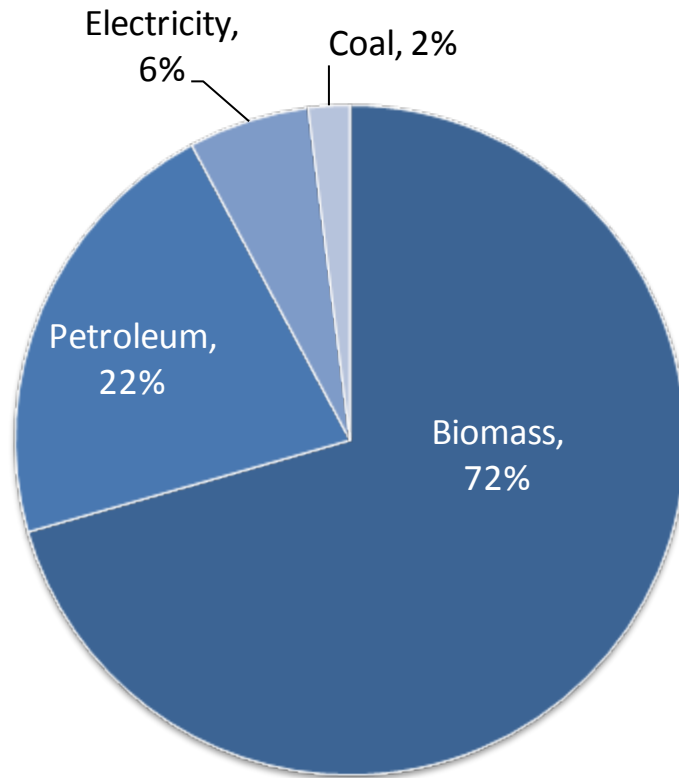
Energy demand estimation 2005-2025



Source: Renewable Energy Development Strategy in Lao PDR document - DRAFT June 2010

Energy sources at present

TFEC (Total Final Energy Consumption)
= 1949.6 KTOE



- Biomass accounts for approx. 72% total energy consumption, followed by petroleum products
- Majority of the biomass is made of fuel wood, which is widely used in rural areas
- Oil and gas are all imported and used mainly in the industrial sector

Source: MEM 2010

Hydropower

- 99.8% of electricity produced by hydropower
- Total of 11 hydropower plants with capacity ranging from 1MW to 1080MW
- TOTAL installed capacity 1750MW (2010)
- Total exploitable potential 23000-26,500MW (along Mekong river)
- 80-90% of all electricity produced is exported (mainly to Thailand) – one of the main sources of revenue for the country



Source: NAST Photo: NTPC

Petroleum / Coal

- Lao PDR imports all oil and gas it consumes
- The country has no petrol refinery plants
- Traditionally low use of fuel (0.935 Tons PP), however demand of fuel is rapidly increasing due to the increasing number of personal vehicles.



- Laos' coal industry is still young, not widely used for energy generation
- Substantial amount of coal resources – estimated at 900 million tons
- Exported to Thailand
- Mostly lignite
- Plans to construct a thermal power plant in Hongsa with a capacity of 1880MW

Photo: NTPC

Renewable energy

Currently accounts for approx 0.2% of all electricity produced

Small Hydro (<10MW)

- Already a popular source of renewable energy, has a lot of potential
- Current total capacity 34MW (either in use of under construction)
- 38 mini and micro plants
- Another 100MW under consideration
- Over 60,000 pico hydro plants (<1kw) installed nationwide



Solar energy

- Lao PDR has about 300 days of sunshine each year – good potential
- Currently about 20,000 households have been connected
- Installations carried out publicly and privately



Bioenergy

- Agricultural production and livestock waste create vast resources and potential for bioenergy
- However current use of biomass energy is low

Biofuel

- At experimental stage
- Plantations of Jatropha on a trial basis
- Potential to utilise sugar factories (for ethane production)



Windpower

- Unexplored resource
- Laos has wind power potential of about 39MW

Geothermal

- Unexplored resource
- A number of hot springs exist in the country

Source: NAST / ADB Photos: NAST

Biogas digesters project with UN-HABITAT and NAST

- Part of WAC programme in Houn district, Oudomxay province
- 5 biogas digesters of 6 m³ were installed under this project (2009)
- The objective was to develop pilot demonstration biogas digesters in one of the 12 secondary towns in which UN-HABITAT is currently working
- A community-based biogas energy source; inspiration for other sustainable energy projects
- Important in linking environmental sanitation to renewable energy sources and allowing communities to become aware of the possibilities of using waste as an energy source

Biogas digester construction

1



2



3



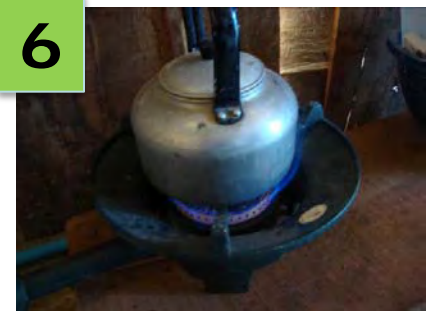
4



5



6



Photos: NAST

Future directions (government policy)

- Increase household electrification ration to 90% by 2020
- Reduce the use of imported fuel for electricity generation and other uses for through increased use of indigenous energy resources- mainly hydropower, solar, coal and biomass energy

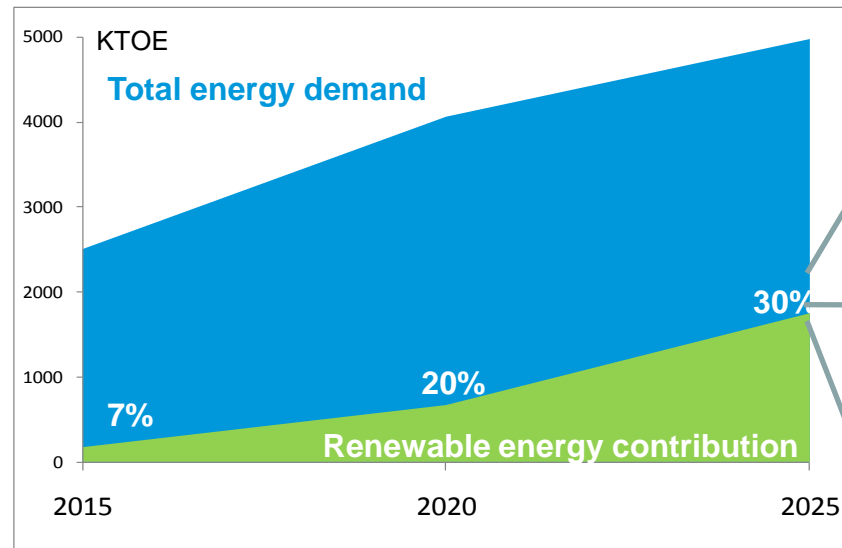
Direction	Targets
<ul style="list-style-type: none">• <i>Develop hydropower sources and renewable energy in order to supply energy to the production sectors and the society, and become the battery of ASEAN.</i>• <i>Extractive industries should take into consideration the conservation of the resource and protection of the environment (including water).</i>• <i>Develop systems for transmitting electricity to target areas (to raise production), and to reduce poverty, especially in remote areas, and expand power in other areas that have the potential to produce exportable goods.</i>	<ul style="list-style-type: none">• <i>Build 10 more large dams, to produce 5,015 Mega watt power</i>• <i>Ensure that the number of households who access electricity increases to 80% by 2015</i>• <i>Complete transmission lines (115 KV lines) in the north, central and south regions, to meet the power demand.</i>

Source: **The Seventh National Socio-Economic Development Plan (2011-2015) DRAFT**



Future directions on renewable energy

**Government target: by 2025
Renewable energy should be 30% of
the total energy produced**

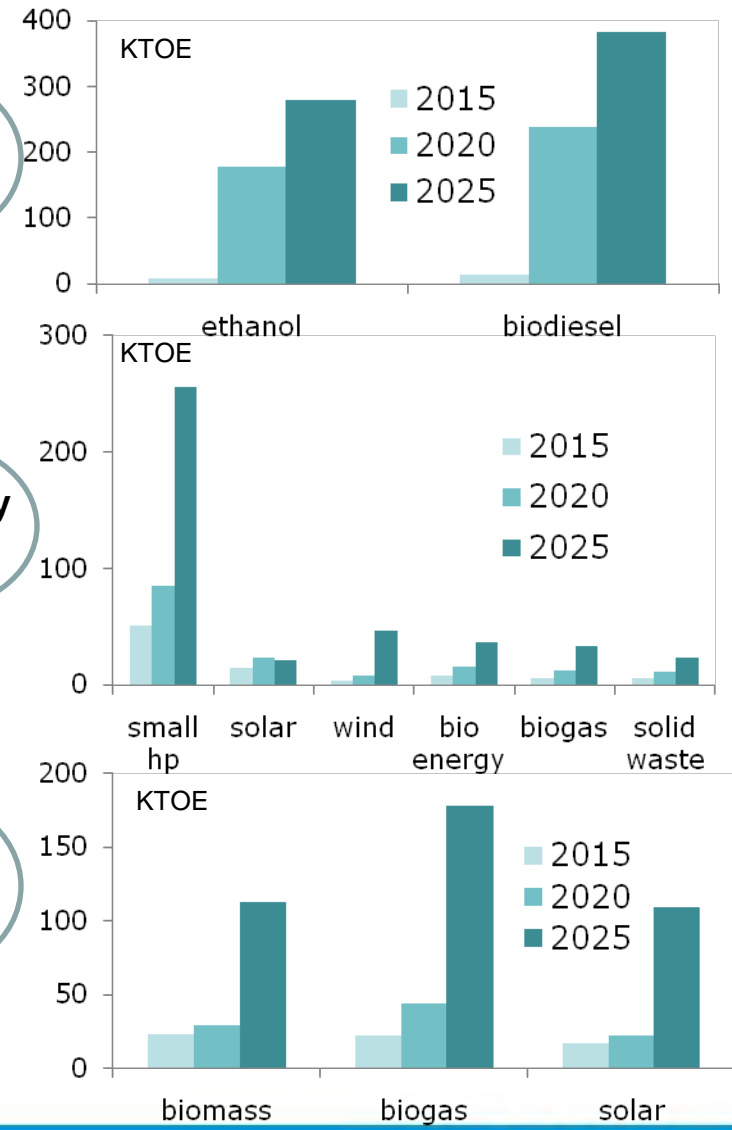


- Some of the challenges...**
- General lack of understanding, knowledge and experience of renewable energy
 - Limited access to equipment
 - Lack of funding
 - Lack of national strategy up to now
 - Lack of coordination between stakeholders
 - Lack of regulations and laws
 - Unclear which government department should take a lead on this sector

**Bio-fuel
45%**

**Electricity
28%**

**Geo-thermal
27%**



UN  **HABITAT**
FOR A BETTER URBAN FUTURE