

# **Handbook for Financial and Development Professionals**

## Chapter 8

### **Social and Environmental Dimensions of Developing Country Energy Production and Use**

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#### **This chapter explores:**

- Why Energy Matters
- The Connection between Energy and Poverty, Health and Equity
- The Connection between Energy and Environment
- The Connection between Energy and Population
- Towards a Solution – the role of NGOs and other intermediaries

#### Why Energy Matters

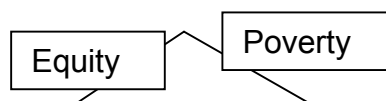


If this woman spends four hours every day hauling water her chances of escaping poverty are very low.

If this boy collects firewood instead of attending school his child will probably do the same thing.



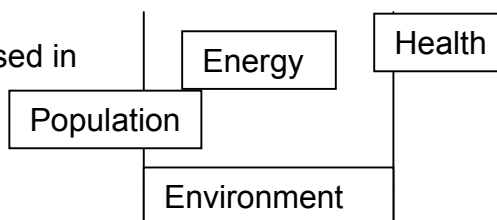
#### **Why energy matters I: the face**



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of energy is that of a woman or child.

How energy is produced and used in developing countries has enormous impact on poverty, health, environment population and equity.



**Why energy matters II:** conventional approaches to energy production and use – central station fossil fuel facilities and electricity grids – have severe limitations. Fossil-fueled energy production is a leading cause of local and global pollution, including climate changing greenhouse gas build-up.

Electricity grid extensions are prohibitively expensive in many rural energy applications. For lesser sums energy can be provided that is as efficient and clean.

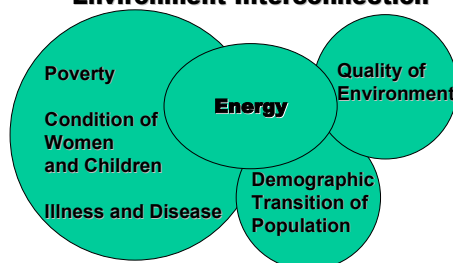
**Why energy matters III:** economic and social development require increases in energy. The history of humanity is essentially the history of the ever more productive application of energy resources. Without energy increases economic and social development is not possible.

**Why energy matters IV:** people are already spending large sums for inefficient energy carriers (dry cell batteries, kerosene). This expenditure represents a substantial business opportunity. Small and medium sized entrepreneurs are already capitalizing on this opportunity.

The activities of these entrepreneurs can have enormous impacts in three of the most pressing issues facing the world:

1. Poverty alleviation, health and the status of women and children.
2. Environmental quality and sustainability.
3. Demographic transition to more sustainable population growth.

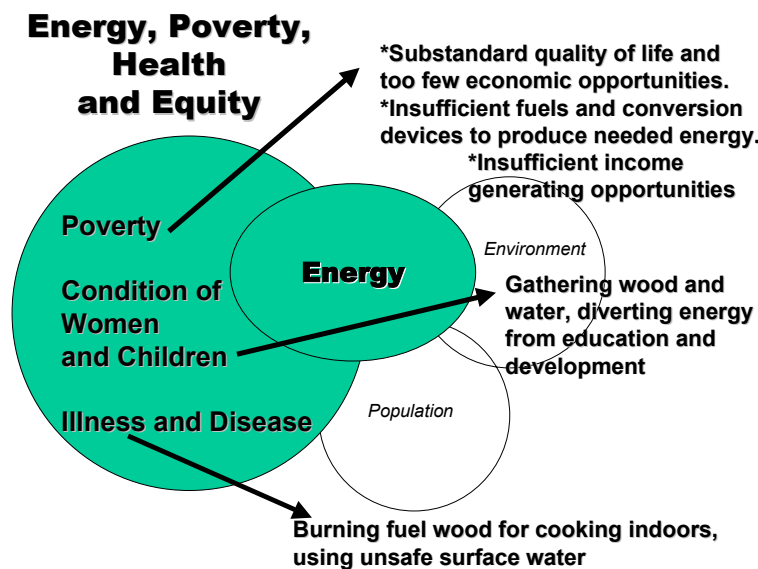
**The Energy-Development-Population-Environment Interconnection**



**Poverty alleviation, health and the status of women and children.**

If a woman or child spends extraordinary amounts of time gathering fuel wood and water then the opportunity for that woman or child to engage in income generation, education or other quality of life activities is severely limited. Energy improvements attack this problem from two sides: labor saving, which creates the opportunity for income generation; and, energy inputs with which to generate income.

## Issues



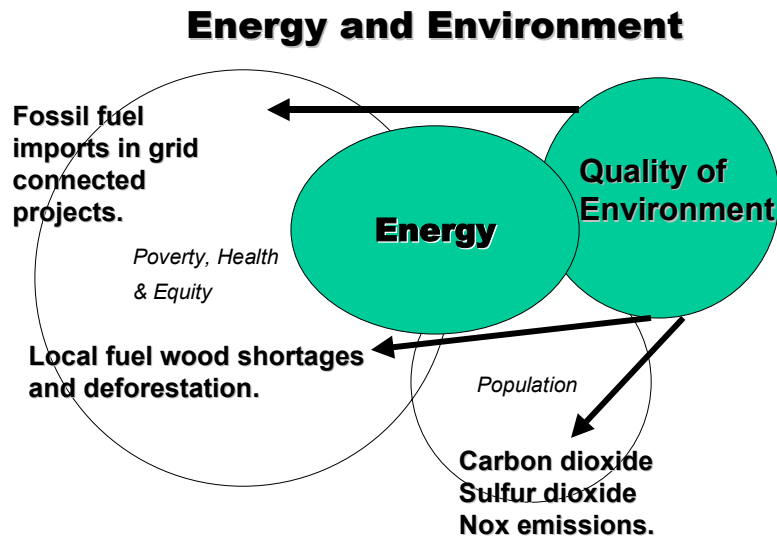
## Solutions

- ❑ Small and medium sized enterprises -- private sector, NGO or community based – using local resources (e.g. biomass, running water, wind and sunlight) as fuel.
- ❑ Decentralized and efficient energy conversion devices, including improved cook stoves.
- ❑ Water pumping or filtration systems.
- ❑ Productive use and income generation “kits” combined with training.
- ❑ Community lighting and power points for education.
- ❑ Local enterprises installing and servicing.

*An income generating “kit” consists of an energy supply system combined with the equipment needed to produce a product (building blocks, fencing, bread) or provide a service (sewing, chilling, hair cutting)*

## Environmental quality and sustainability.

Whether the issue is fossil fuel use in large energy projects or fuel wood, coal or charcoal being burned in households the environmental consequences are severe. These mostly pertain to air pollution and climate changing greenhouse gases, although there are consequences to local soil and wood conditions also.



## Solutions

- ❑ Energy production using water, wind, sunlight and biomass.
- ❑ Policies encouraging clean energy resources and eliminating subsidies for polluting technologies and fuels.
- ❑ Policies supporting independent energy production and capital market interest in renewable energy projects..
- ❑ Energy entrepreneurs developing clean energy resources and establishing commercially viable businesses.

### Energy, Health, Income

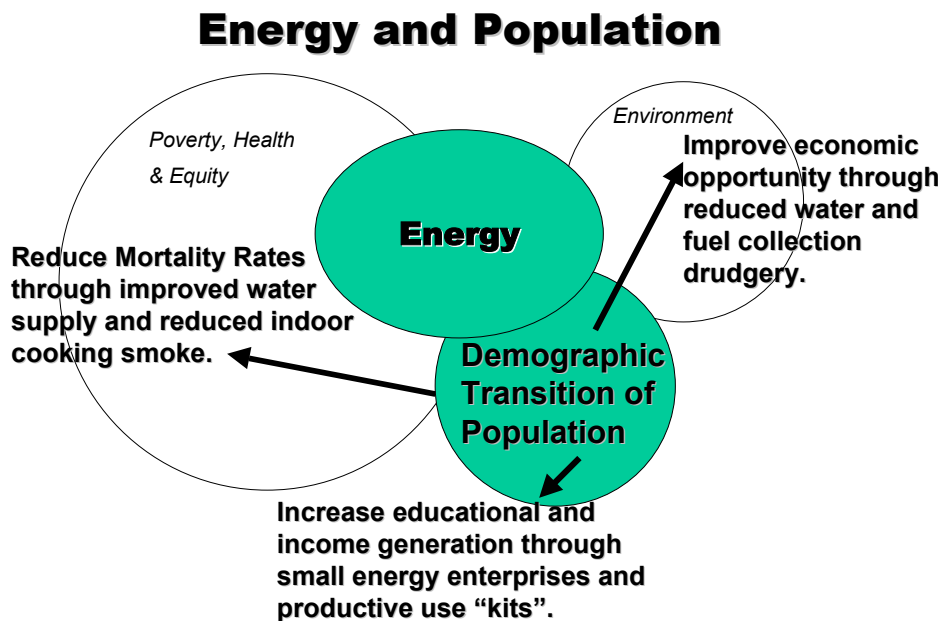
<i>Country and Income (purchasing power)</i>	<i>Energy Kg of oil equivalent</i>	<i>Under 5 Mortality Rate (per 1000)</i>	<i>Population w/ Safe Water</i>
<b>Ghana</b> \$1,581	313	107	52%
<b>Bolivia</b> \$2,881	766	96	32%
<b>Vietnam</b> \$1,641	570	43	42%
<b>Netherlands</b> \$21,104	4182	6	100%

## Demographic transition to more sustainable population growth.

### Issues

- ❑ Higher “under 5” mortality rates, significantly caused by unsafe water and indoor smoke from cooking with wood and coal.
- ❑ High demand for women and child labor in water and fuel wood tasks, eliminating opportunity for education and income production.
- ❑ Lack of energy, energy conversion devices and productive use equipment.

### Some of the Solutions



# TOWARD A SOLUTION – Role for NGOs and Other Intermediaries

- NGOs can support, with enterprise development services and seed capital, energy entrepreneurs developing clean energy grid connected projects or rural energy delivery companies.
- International organizations and donors can support NGOs and other intermediary organizations supplying enterprise development services and seed capital to energy entrepreneurs.
- Enterprises should include within their rural energy delivery product lines: productive use kits; water pumping and purification; and, efficient cook stoves and fuels.

