

Energy Efficiency for Development

*Providing **more** development service - with **less** energy*

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Energy efficiency: A definition

“Energy efficiency improvements refer to a reduction in the energy used for a given service (heating, lighting, etc.) or level of activity.”

Definition by the World Energy Council (WEC)

Energy efficiency in development: Why is it important?

- 1.6 billion people in the world with no access to electricity
- Another 2.5 billion people use wood, dung and agricultural residues for heating and cooking needs
- Access to energy and its efficient use: keys to poverty alleviation and reaching the Millennium Development Goals

Source: A Review of Energy in National MDG Reports, UNDP, January 2007

How can having access to energy help development and poverty alleviation?

- Let there be light – access to knowledge (lighting for studying, OLPC)
- Electrical tools become usable: motors, fridges
- Access to market information: radio, television, internet and mobile phones
gathering firewood takes time

IF YOU SAVE ENERGY, YOU ALSO SAVE TIME

Energy access and DSM: A contradiction in terms?

- Rural electrification and Demand Side Management Programme in Senegal
 - Senegalese Rural Electrification Agency «ASER»
 - Provides access to electricity to 365K households (3.8 million people – 50% of population)
 - Goal: 8% (2000)
16% (2006)
50% (2012)

Source: Presentation by Ousmane Fall SARR, ASER, Maputo 11 June 2009

Rural electrification & DSM Programme in Senegal (1)



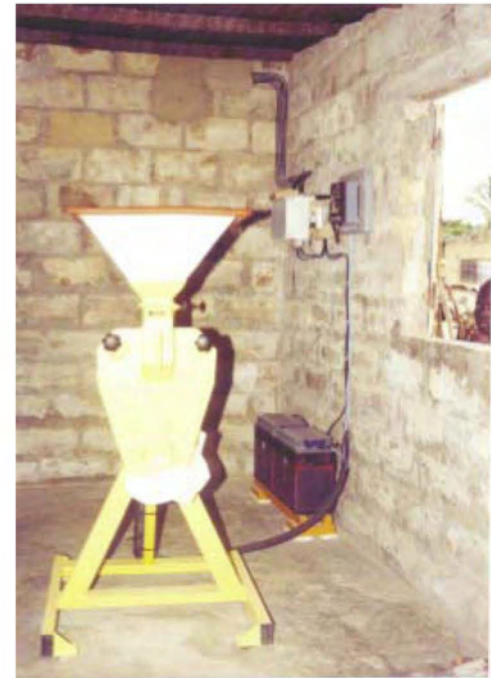
- Rural Energy Efficient Lighting Programme – 1.5 million compact fluorescent lights in newly electrified buildings (via Programmatic CDM)
 - Devices used to limit power demand:
no replacement by incandescent light bulbs possible
 - Used CFLs are collected and recycled

Rural electrification & DSM Programme in Senegal (2)

- Internal combustion motors replaced by other efficient electric motors



Source: ASER



Rural electrification & DSM Programme in Senegal (3)

- Between 2008 and the end of 2013, use of CFLs in Senegal rural areas alone will reduce demand by 45 GWh per year



Source: ASER

Energy efficiency: improving health and saving time for education

- The Pro-Tortilla programme: energy efficient stove for household tortilla business in Nicaragua
 - 30 million tortillas are sold every month in Managua, Leon & Granada in 2001
 - 4,000 small household businesses making and selling tortillas: single mother / father unemployed
 - Unemployment rate in Nicaragua: 50%

Source: Ashden Award for Sustainable Energy 2003

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The Pro-Tortilla Programme (1)

- 95% of businesses use traditional open fired stoves, without chimney
- Smoke causes respiratory illness
- Ecostove: 50% less wood, 35% less CO₂ emitted
- Dramatically reduces smoke and indoor air pollution

The Pro-Tortilla programme (2)



Source: Ashden Award for Sustainable Energy 2003

More tortillas to be made at less cost
(less time to collect firewood and more time for homework!)

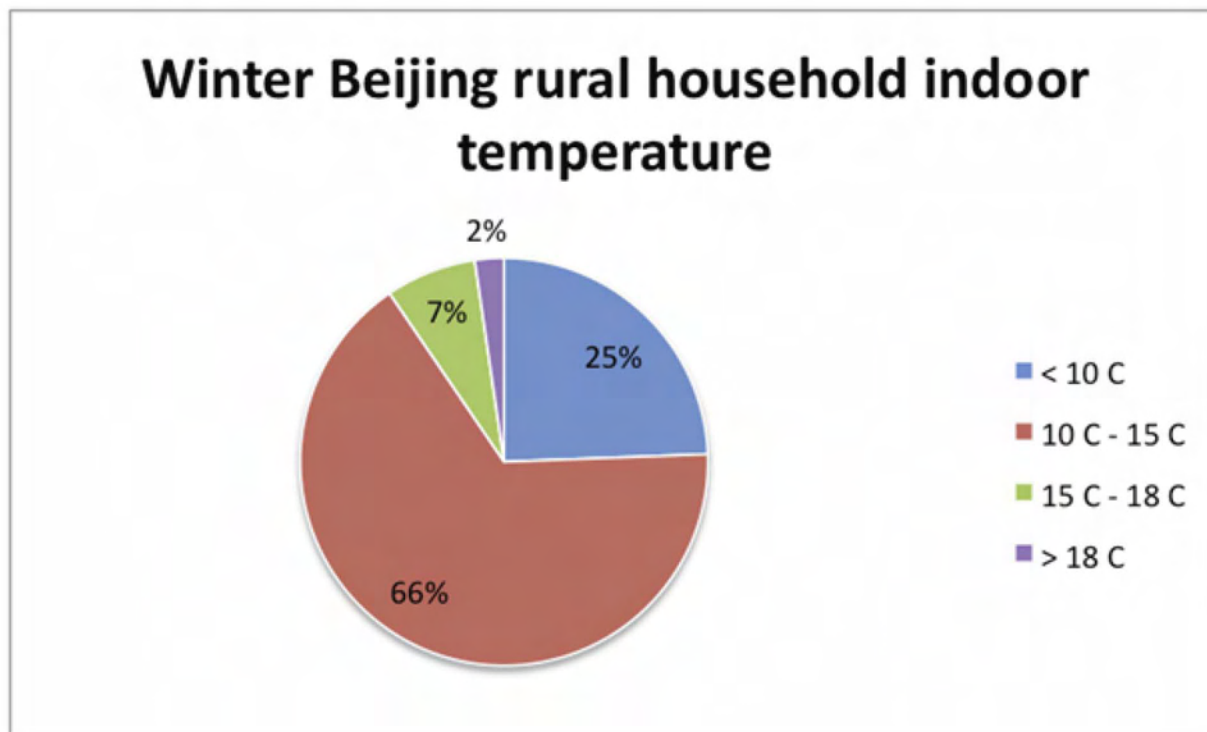
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Energy efficiency complements renewable energy investment

- Pinggu Solar Heated Housing for Rural Tourism Development in China
 - Strategy for economic development: rural tourism for residents from Beijing
 - City dwellers expect higher degree of comfort: need hot water and heating
 - Traditional heating methods cause pollution, affect local air quality and are expensive

Pinggu Solar Heated Housing (1)

- Local houses: poorly insulated, low indoor temperature, no hot water in the winter and very hot in the summer



Source: Z. L. Zheng, Y. H. Li, X. D. Yang Building Science Journal, Rural Building Energy Conservation Research of Beijing Municipality, 2008, 24 (4): 9-14

Pinggu Solar Heated Housing (2)

- Solar heated houses in Pinggu District: 1,508
 - Winter indoor temperature $> 18^{\circ}$ C
 - Summer indoor temperature $< 26^{\circ}$ C in the summer
- Insulation included at construction, with solar heating and hot water
- Local government subsidies: 40% grant, 43% interest free loan repayable over 8 years

Pinggu Solar Heated Housing (3)

- Present Value of subsidies: ~ € 19 million
- Present Value of net income from rural tourism alone: ~ € 87 million in 15 years (~ €114 million in 25 years)
- CO2 reduced over 25 years:
 - ~ 740,000 tons
 - ~ cost of 26 € / ton

Source: Beijing Building Energy Technology Development Co. Ltd

Gua Jia Yue (Pinggu District) Solar Heated Housing (4)

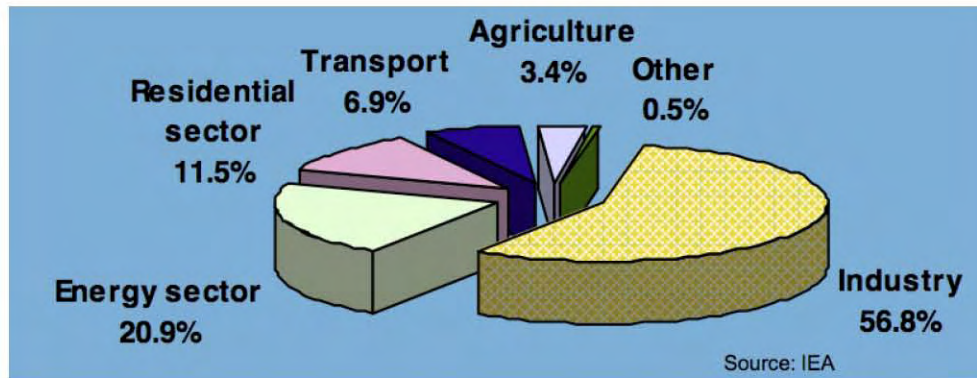


Source: Beijing Building Energy Technology Development Co. Ltd

Energy efficiency can significantly improve economic return from investment in rural economic development

Energy efficiency enhances energy security

- The EBRD Ukraine Energy Efficiency Programme (UKEEP)
 - High energy intensity: 0.5 (EU - 0.18, World - 0.21)
 - Electricity price: +110% (2005 -2008), increase of 20% / yr
 - Gas price: +280% (2005 – 2008), increase of 40% /yr
 - Potential energy savings of 223 Mtoe \approx 400 X 1,000 MW power plant (IEA)



Source: European Bank of Reconstruction and Development

Energy Efficiency in Ukraine



Energy efficiency can enhance energy security
and reduce reliance on energy import

Energy Efficiency for Development

Key messages

- Access to energy is essential in development: new users could use energy more efficiently than old ones
- Energy efficiency contributes to health and education in developing countries, benefiting particularly women and children
- Energy efficiency can significantly improve return on rural economic investments
- Energy efficiency contributes to energy security and supports continuous economic growth

The Message.....

The demand for energy services will grow. It will grow to reduce poverty and drive development.

Energy use will also continue to grow.

But this growth can be tapered by Energy Efficiency measures with multiple benefits.

THANK YOU!

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