„Wood energy for cooking and heating“

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
SV Basic Energy Services HERA
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Content

- Sector Program Basic Energy Supply
- Value Chain Woodenergy
- ISO Process for cook stoves
- Warm Comfort
- Knowledge Transfer

Optional

- BEST Strategy
Sector Program Energy Access (HERA)

Objective
Collect, develop and provide innovative concepts, mechanisms and lessons learnt for improving the supply with basic energy to households, social facilities and small enterprises.

HERA is a sector program with a global scope that concentrates on:

- Facilitating access to electricity
- Facilitating access to improved cooking and heating energy
- Promoting productive uses of energy (PUE)

www.giz.de/HERA
“Poverty and energy are interrelated in many ways. Access to energy services is a precondition for satisfying human basic needs as well as the development of a modern economy.” (BMZ*, 2007)

Energy itself is not a basic need – however it is important in order to satisfy the human basic needs

- **Physiological Needs**
  - Water
  - Food
  - Shelter
  - Clothing

- **Further Needs**
  - Sanitation / Hygiene
  - Health Care
  - Education
  - Participation in Society

* Federal Ministry of Cooperation and Development
Our Target Group

„What is the best way to meet their need for energy?“
An improved energy supply must always be adapted to users’ **needs and capabilities** if it is to prove successful in the long term.

**Basic Energy Services**

- Cooking
- Heating / Drying
- Cooling
- Light
- Information
- Water

I.e.: An Integrated Approach to Basic Energy Services
Summery

Our Sectorprogram….

- aims to supply energy that help **poor and low income households, social institutions** and **small and medium businesses** to meet their needs
- utilises an integrated approach which looks at **energy source, application and user**
- works in the areas **thermal energy, access to electricity** and **productive use of energy**
- provides advice to our Ministry for Economic Cooperation and Development (BMZ)
- cooperates with international actors to establish sustainable **market structures** and help build up **financial services** for producers, sellers and consumers
- provides information and knowledge transfer as well as access to networkd
Basic Energy Services

- Heating (parts of) the living space
- Storage of food, drinks, medicine, etc.
- Preparation of food
- Sewing, processing of agricultural products for sale, irrigation, hair-cutting, etc.
- Light for education or other purposes
- Light
- Water
- Transport
- Communication
- Income Generation
- Cooling

- Mobile phones, radios, TVs, Computers to exchange and participate in society
- Drinking water (for humans and animals) or field irrigation
- Transport as a means to participate in society and access services (health, etc.)
- Preparation of food
- Sewing, processing of agricultural products for sale, irrigation, hair-cutting, etc.
- Light for education or other purposes
- Light

07.10.2015
More heat with less wood - GIZ D.Otremba
Thermal Energy for cooking and heating = Vital for survival

(Electric) Energy for Lighting, Cooling, Communication, Entertainment = Quality of Life and crucial for development
Systems and dependencies

Wood Energy

Cooking and Heating System

Kitchen/Housing

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Wood Energy

Problem

Isolated interventions (reforestation, sustainable forest management, dissemination of improved stoves) fail to adequately exploit possible synergies that would foster sustainability if combined.
Challenges of the Biomass Sectors

- Intersectoral nature
- Unclarity of roles and responsibilities
- Lack of proper regulation / enforcement
- Unclear / unfavourable, legal status
- Small profit margins
- Long gestation periods
- Low investment
- Low efficiencies
- Lack of statistics
- Informal nature
- Rural nature
- Bad image
- Lack of governmental priority
Value Chain – Improved leverage – Focus on Energy Efficiency

**Political Framework**
- Sustainable Forestry
- Long-term tenure to rural communities (e.g. Niger, Mali, Chad)
- Promoting of private plantations on marginal sites (e.g. Madagascar)
- Energy contracting by small and medium-sized commercial Consumers to private farmers (e.g. Brazil, Nicaragua)

**Energy Efficiency Gains**
- Improved technology (e.g. kilns)
- Introduction of alternative wood energy products (e.g. wood-chips, briquettes or pellets)

**Commercialisation & Wholesaling & Retrailing**
- Establishment of formalised local energy markets
- Introduction and enforcement of a proof of origin of sustainably produced wood-fuel
- Standardisation and improved product quality
- More equitable benefit sharing

**Consumption**
- Improved Stoves
- Research & development for cleaner and safer combustion
- Kitchen management
- Insulation
- Heating economical
- Correct Heating
- Correct Ventilation

**Wood Production**

**Processing**

**Transport & Communication**

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Wood Energy - Value Chain – Holistic Approach

Government

Wood Production
- Tax & Tariffs Regime
- Monitoring & Evaluation
- Issuing Licenses
- Stakeholder Consultations
- Policy & Strategy Formulation
- Laws and Legislation
- Measures against Corruption
- Revenue Collection & Investments

Charcoal Production
- Improved Klin Technologies
- Financial Services (PES)

Transport
- Improved Stove Marketing
- Monitoring & Evaluation

Wholesaling

Retailing
- Monitoring & Evaluation

Consumption

Service Provider

Wood Energy - Value Chain – Holistic Approach

Energy

Agriculture

Nature conservation

Transport

Land administration

Health

Finance

CBD

UNFCCC

UNCCD

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Taskforce Wood Energy (internal)

The taskforce was established 2013 and has members from different sectors who discuss the work of GIZ on wood energy in collaboration with SNRD* Africa working group wood energy.

**The Sectors:**

- Agriculture
- Energy
- Environment
- Forestry

*SNRD Sector Network Rural Development*
Taskforce Wood Energy – What are we doing

- Promote wood energy as a cross sectorial topic (forestry, energy, rural development, agriculture)
- Lobbying for political attention of the topic
- Promote exchange between projects and activities from different sectors and regions to create synergies
- Collaboration during international events
- Possibly collaboration in studies
- Collaboration in projects / Advisory services
- Knowledge Management
- Support multiplication of best case projects
Wood Energy

Advantages

- Wood fuel is widely and locally available – ensure a secure and steady supply of energy
- Wood is directly usable as fuel and can be used on demand
- Wood residue from saw mills, for example, can be used as fuel
- Wood energy can be converted to other usable forms of energy

Challenge

- Wood-based fuel is often considered as a “backward” and ecologically risky energy source; therefore - attempt to replace wood energy with fossil fuels as soon as possible

The question is: what underlies to this assumption
Wood energy

Solution
To adopt a holistic approach and a modernisation is necessary across the entire value chain

Action required
Target support for various stakeholder groups, acting as links in the entire value chain

Impact
- Increased value added on a regional scale
- Improved efficiency of the entire value chain
- Sustainable provision of wood energy
Key Messages

- Wood energy can be renewable, modern and profitable
- Wood energy is and will remain an important part of the energy mix => promotion of alternatives is essential, additionally the challenges of the wood energy sector need to be addressed
- Political, institutional and legal reforms need to accompany any value chain improvement -> governance situation (recent study on governance of wood energy by GIZ/ECO Consult in 4 SSA* countries)
- Political will needed for improvement in the sector (cross sectorial cooperation, inclusion of stakeholders with vested interests)
- International Debate on Forest Landscape Restoration; window of opportunity?

*Subsahara Africa

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Systems and dependencies

Wood Energy

Cooking and Heating System

Kitchen/ Housing

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Option: Decrease fuel needs with energysaving technologies

- Fuel-efficient & cleaner stoves (household, schools, etc.)

**Stove = Heat-Generator**

How to make most heat from the fuel

Factors to optimise complete combustion:
- Time, Temperature, Turbulence

Specific for size, shape, moisture content and state of carbonisation

**Heat-Transferstructure**

How to get most heat into the pot

Factors to optimise the heat transfer:
- Temperature, Area, Radiation, Proximity, Velocity

Form follow function:
- Depending on: fuel, cultural factors, meal type, type of cooking
- Pot-shape, material, size etc.

..and always have the user in mind ...
ISO TC 285 „Clean cookstoves and clean cooking solutions“

The issue of stove performance and international cooking standards was discussed for decades.

First Working Group Meeting was in 2014 and

Four working groups were established:

1. Conceptual Framework
2. Lab Testing Methods
3. Field Testing Methods
4. Social Impact

And the two Taskgroups Fuel and Communication

The German delegation is represented by GIZ – on behalf of DIN and FNH (Heating and Cooking Equipment Standards Committee) through HKI (Industrial Association of House, Heating and Kitchen Technology)
Timeline for ISO TC 285

4 WGs and 2 TG are developing working drafts until July 2015

- TC 285 Launch
- WG Establishment
- Working Drafts
- Committee Draft
- Cooking standard

2011
Lima Consensus

2012
IWA

2014, Feb
TC 285 Launch

2014, Oct
WG Establishment

2015
Working Drafts

2016
Committee Draft

2017
Cooking standard

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Committee Structure

TC285

- Develop scope for standards activities and establish working groups

**WG1 – Conceptual Framework**
Groups of nominated experts resolve open questions, respond to comments and develop drafts

**WG2 – Harmonized Lab Protocols**

**WG3 – Guidelines on Field Testing**

**WG4 – Guidelines on Social Impacts**

- Promotion of TC 285 activities

**Mirror Committee**
Participating countries form committees to develop national positions on committee activities; Vote on drafts; Nominate experts for WGs

**Mirror Committee**

**External Liaison Organization**
International organizations participate to share expertise and coordinate on parallel activities; Nominate experts for WGs

**External Liaison Organization**

Review of relevant existing fuel standards, including gap analysis

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GIZ and ISO cooking intervention countries

- Bolivia
- Guatemala
- Honduras
- Peru
- USA
- Benin
- Burkina Faso
- Cameroon
- Gambia
- Ghana
- Mauritania
- Nigeria
- Senegal
- Burundi
- Congo, DR
- Egypt
- Ethiopia
- Kenya
- Malawi
- Mozambique
- Rwanda
- South Africa
- Tanzania
- Uganda
- Australia
- Bangladesh
- Cambodia
- China
- India
- Indonesia
- Nepal
- Taiwan
- Vietnam

Legend:
- GIZ
- EnDev
- ISO
Systems and dependencies

- Cooking and Heating System
- Wood Energy
- Kitchen/Housing

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Warm Comfort: Microloans for Thermal Insulation

Situation

- Poorly insulated houses and inefficient stoves lead to:
  - high fuel consumption for heating and cooking
  - damages to one’s health, if the room temperature falls under 20°C/17°C
  - pressure on household budget and on natural resources

Fact

The effect of improved cooking-heating stoves on indoor air temperature will be small, in case the heated room is not insulated.

Conclusion

In cold mountain areas, thermal insulation of buildings takes priority over improving space heating stoves or cooking stoves to gain overall minimum room temperatures and firewood savings.
Warm Comfort: Microloans for Thermal Insulation

Approach*

1. The implementing partner, the microfinance organisation MADINA sends a technical consultant to the advice the interested households on different insulating possibilities

2. Credit worthiness will be checked

3. MADINA offers microcredit – no cash!

4. MADINA pays the insulation material; organizes the construction and installation process of thermal insulation measures

5. Using local market mechanism

6. Purchase material for the clients in large quantities – individual Clients also profit from discounts

7. Supervision of the technical consultant

*developed by MADINA (since 2008) supported by GIZ-Project Sustainable Management for Natura Resources and implemented by GIZ-Project „Support for microfinance services in rural areas„, Tajikistan in cooperation with local partners
Warm Comfort: Microloans for Thermal Insulation

Positive economic impact

- **for clients**: use on average 30% less fuel (living space is even warmer during winter time – improved health condition); save money and time; refund of investment in average two years
- **for manufactures**: empowerment for high quality products; increase the demand for craftmen and construction worker

Positive environmental impact

- Reduction of natural resources being used as fuel material; therefore good for soil and agriculture

Replication of the Warm Comfort Concept in Kirgisistan and in Peru
Summary

The multi-dimensional „system of cooking heating energy needs“

**User Behaviour**
Energy-efficient heating-cooking practices such as ventilation, heating frequenz

- **Heating-Cooking Stove**
Appropriate stoves for available fuel types, efficient combustion and heat transfer, chimney

- **Housing Conditions**
Thermal insulation of walls, ceiling, floor, window and doors

- **Heating-Cooking Fuel**
Dry moisture content, appropriate size of fuel

- **Heating-Cooking Environment**
Exposition of house, place of stove, altitude, energy services carried out in one room

- **Heating-Cooking Equipment**
Heat exchanger, cooking pots and lids, heat retention, water heating systems
Knowledge Transfer – Access to Information

 Unsere Publikationen

 WIKI - Energypedia
Thank you for your attention

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