UN ECE - Committee on Sustainable Energy

Energy Efficiency 21 Project, Steering Committee

AHGE on Energy Efficiency Investment for Climate Change Mitigation
Geneva, 21-22 February 2008

Financial Engineering for Energy Efficiency Projects in Bosnia and Herzegovina

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- Energy situation in BiH
- Main barriers
- Financing possibilities
- EE Pilot projects
- Urgent steps
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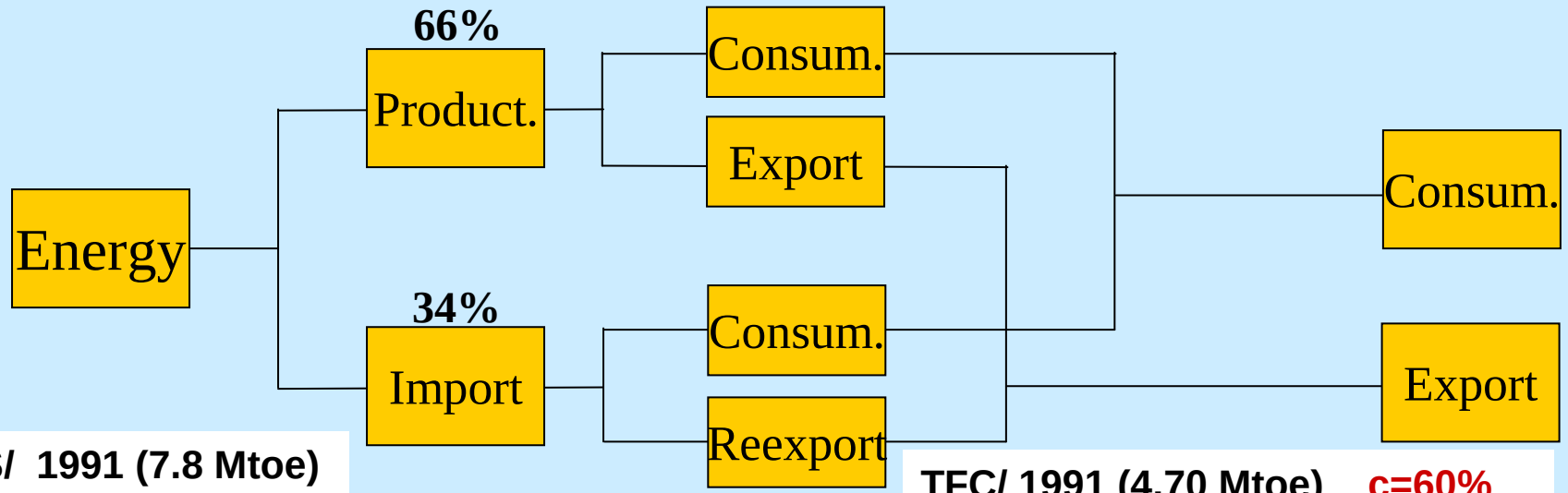
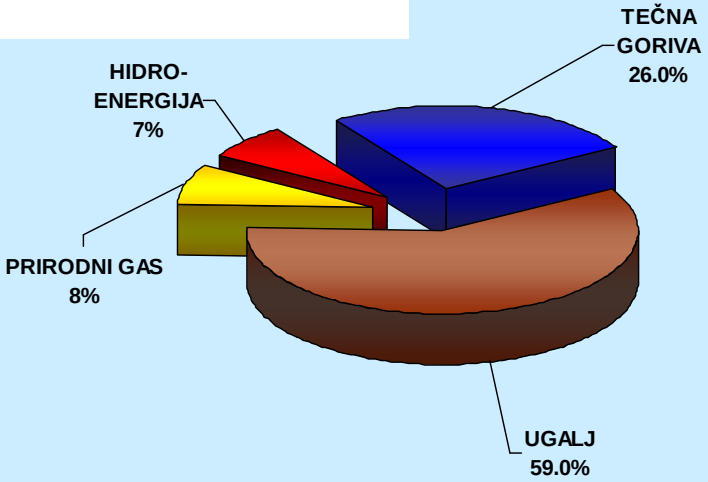
- Comments

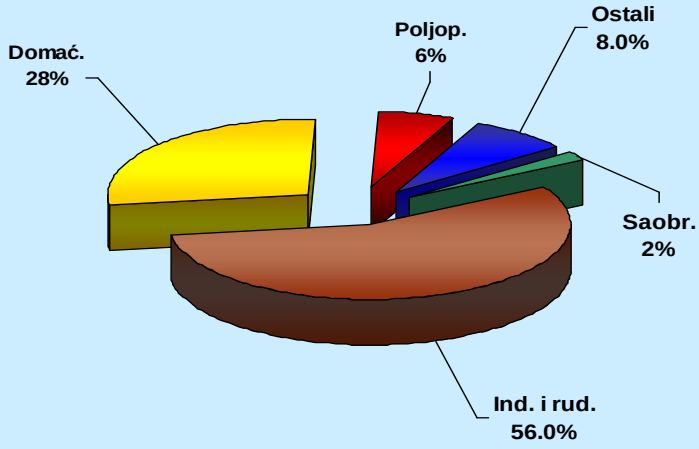
0) *Energy in BiH 1991, 2006*



TPES/ 1991 (7.8 Mtoe)
2006 (~5.6 Mtoe)

TFC/ 1991 (4.70 Mtoe) c=60%
2006 (3,3 Mtoe) c=59%





0) Key Indicators in BiH (2005-2006.)

(1)

	2005	2006
➔ Population (mio)	3.83	3.844
➔ BDP-GDP (bio EUR)	~ 8.00	~ 9.00
➔ GDP/cap. (USD)	2923 $(4122 KM);	3284 $(4631 KM)
$2000	1864 $	2049 $
(World; 2004,2005) $2000	(5514 $)	(5652 $)
(OECD, 2004, 2005) $2000	(23795 $)	(24390 $)
➔ Energy market value(bio KM)	~ 4.23	~4.95
➔ Energy costs /GDP	~ 27 %	~29%
(Developed countries)	(~ 6÷7%)	(~ 6÷7%)

Source: Energy balances of BiH (FBiH, RS), Agency for statistics of BiH; Key energy indicators IEA-OECD 2006,

0) Key Indicators in BiH (2005-2006)

(2)

	2005	2006
➔ Energy Intensity(toe/000 USD) (World; OECD)	~ 0.57 (~0.3; ~ 0.18)	~ 0.51 (~0.3; ~ 0.18)
➔ TPES/popul. (toe/cap) (World; OECD, 2004)	1.31 (1.77; 4.73)	1.38 (1.77; 4.73)
➔ Electricity consumption (kWh/st.) (World; OECD, 2004)	2969 (2516; 8203)	3123 (2545, 8432)
➔ Buidings heating (kWh/m2a) (Europe-selected countries)	120÷200 (30÷50)	120÷200 (30÷50)

Source: Energy balances of BiH (FBiH, RS), Agency for statistics of BiH; Key Energy indicators IEA-OECD 2006,

0) Key Indicators in BiH (2005-2006)

(altern.)

	2005	2006
➔ Energy market value (bio EUR)	~ 2.3	~2.5
➔ GDP-BDP (bioEUR)	~ 8.00	~ 9.00
➔ Energy costs /GDP (Developed countries)	~ 27 % (~ 6÷7%)	~29% (~ 6÷7%)
➔ Energy Intensity(toe/000 USD) (World; OECD)	~ 0.57 (~0.3; ~ 0.18)	~ 0.51 (~0.3; ~ 0.18)
➔ Buildings heating (kWh/m2a) (Europe –selected countries)	120÷200 (30÷50)	120÷200 (30÷50)

Source: Energy balances of BiH (FBiH, RS), Agency for statistics of BiH; Key energy indicators IEA-OECD 2006,

0) *Energy sector in BiH*

Origin resources:

- **Coal- reserve: balance- 4.0; geol.- 9.0; exploat.-2.8 (bio tons)**

- **Hydro potential:**
  - **Technical potential(HPPs &SHPPs)- ca 6800 MW and ca 24000 GWh/y (of which ca 700 MW and 2600 GWh/y SHPPs**
  - **Economically-ca 90% of technic. • Usable ca 80% of econ.**
  - **Potential used (1991): ca 9.000 GWh (38%) and ca 2400 MW (35%) – lowest in Europe**

  (SHPPs – used 4,4% of available power and and 5,7% of available energy.

- **Wind energy – Potential estimated ca 1000 MW;**
- **RES in BiH hydro and fuel wood) in energy mix- ca 15%**

Main barriers

- Insufficient institutional and human component
- No Strategy and Legislation in the field of EE
- Inadequate financing investment in EE
- Poor practical experience
- Costs for energy consumption are low
- EE field is not yet in focus of decion makers interest;

State/Entity/Municipalities and Financial Institutions capital Investments are non-related to EE

Progress

a) Energy Sector Study in BiH- prepared 2008, in the phase of experts and public disscusion;

b) Energy Sector Strategy in BiH, started but now waiting for results and adoptation of ES Study;

c) Electricity Law of FBiH –2008, updating, which includes EU Direc and regulatory issues;

d) Strategic Plan and Program of ES, 2008 Development;

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Projects in EE and RES

A/ Project proposals – 12 PPs identified – in the phase of Financing EE Investment analysis; municipalities- DHS, water supply,street ligh bldgs, CHP (0.3 to 6 MEUR, totally ca 35 MEUR)

B/ RES: WE – ca 200 MW, FS, finished, design in preparation; small HPPs – ca 200 pcs; biomass;

C/ New Power Generation: 4HPP + 4TPP; 1971 MW installed capacity, New Clean coal technology and equipment + Enveronment protection; Investment ca 3,5 bio EUR; Next programme ca 2500 MW

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Projects in EE and RES

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B/ RES: WE – ca 200 MW, FS, finished, design in preparation;
small HPPs – ca 200 pcs;

-

Financial barriers in municipalities

- Low budgets and limitations
- Priorities in investment are not in EE
- Creditworthiness of municipalities to access private sector municipal credit market is low yet
- Modest co-financing funds and high interest rates
- Poor ability to prepare project documents, feasibility studies and business plans
- Lack of energy policy and demand planning tools

EE Pilot Projects

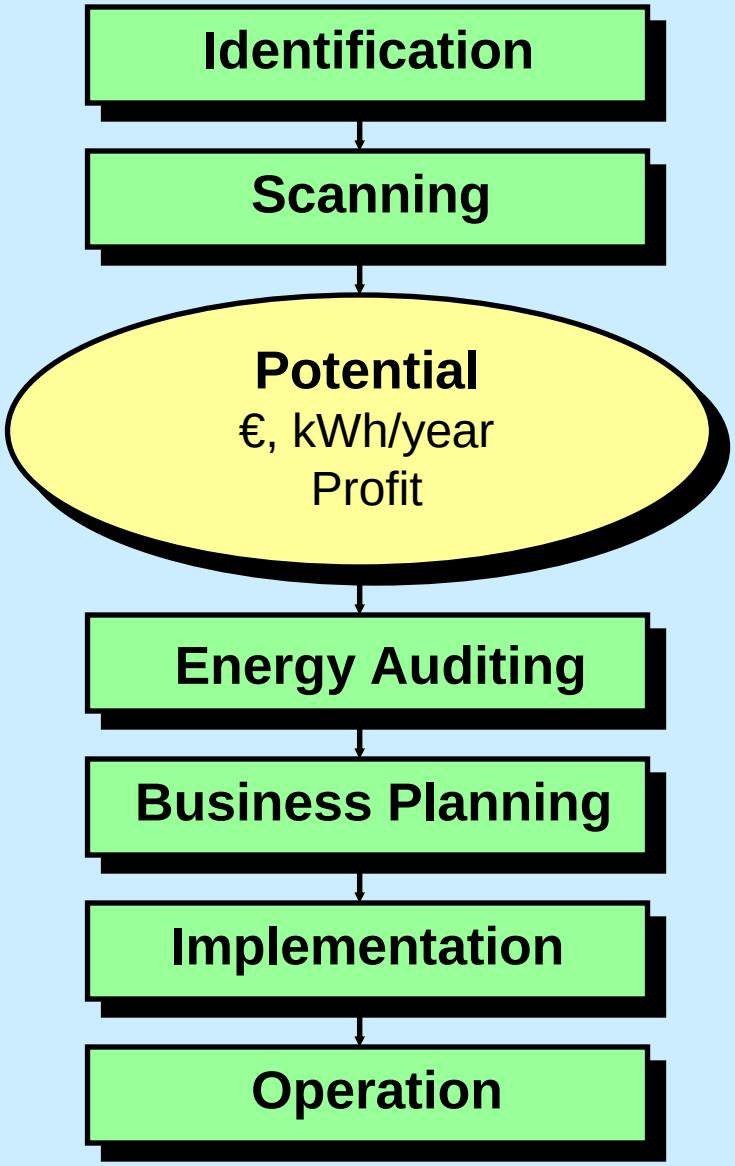
Positive example – Project ‘’**Financial Engineering for Energy Efficiency Projects in Bosnia and Herzegovina'' in implementation with ENSI, Norway and CENER 21, BiH**

Combined capacity building and project development programme

The primary target is to build capacities and skills enabling companies and organisations in Bosnia and Herzegovina to develop, arrange financing for, implement and maintain energy efficiency projects and hence contribute to sustainable development.

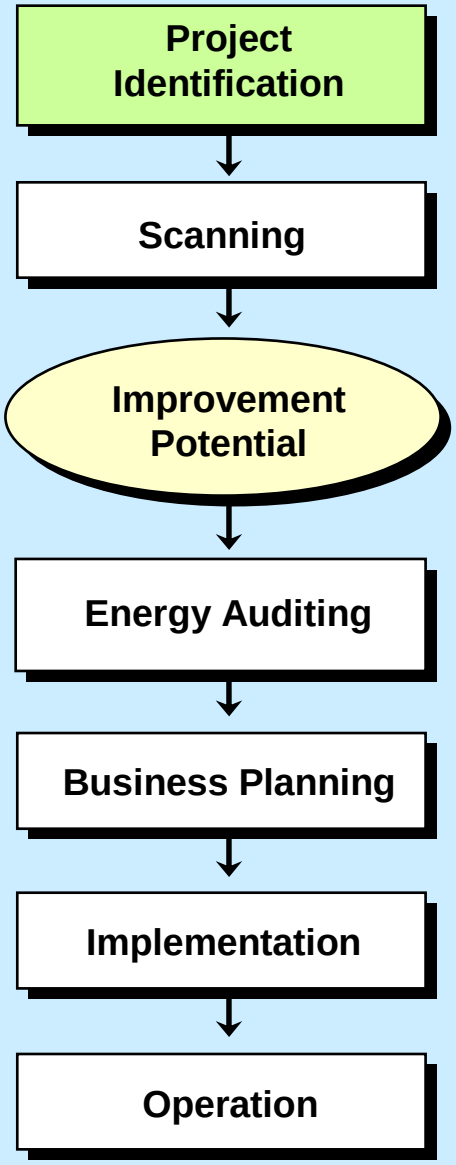
The outcome of the programme is business plans for real, concrete projects defined by the partners in Bosnia and Herzegovina.

Project Development Process



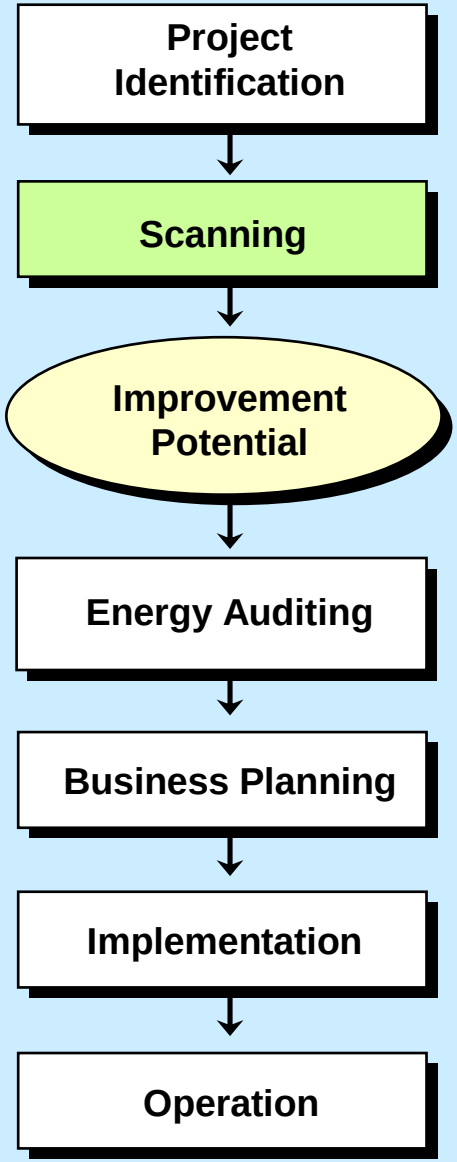
Identification

- ✓ **Dialogue with the project owner**
- ✓ **Collection of main information (technical, financial, available resources, etc.)**
- ✓ **Collection of relevant energy statistics from previous years**
- ✓ **Brief evaluation of the potential for energy/economic savings**
- ✓ **Evaluation of the owner's interest and possibilities in accomplishing a total project implementation**
- ✓ **Evaluation of the owner's financial possibilities**



Scanning

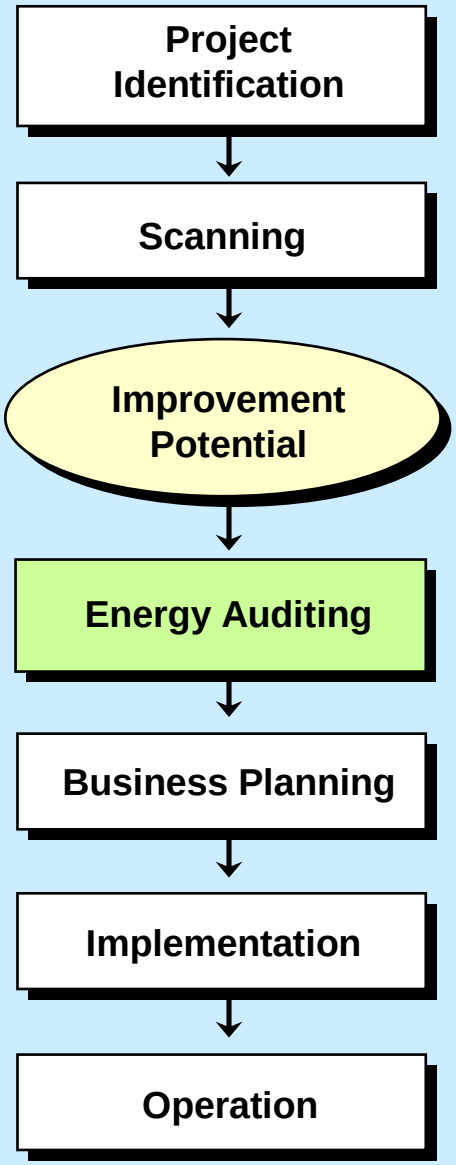
- ✓ **Preparations**
- ✓ **Inspection for description of the present situation**
- ✓ **Technical and economic calculations**
- ✓ **Development of a Scanning Report**
- ✓ **Presentation and discussion with decision-maker**



Energy Auditing

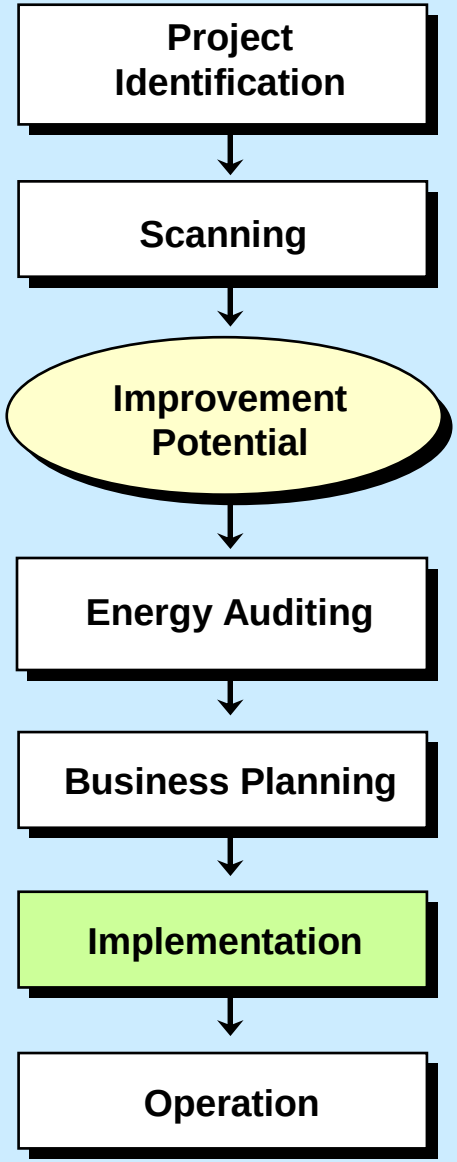
- ✓ **Preparations**
- ✓ **Inspection for description of the present situation**
- ✓ **Technical and economic calculations**
- ✓ **Development of a Energy Audit Report**
- ✓ **Presentation and discussion with decision-maker**

Audit = Scanning ?



Implementation

- ✓ Project Management
- ✓ Design/planning
- ✓ Contracting
- ✓ Installation
- ✓ Control and testing
- ✓ Commissioning
- ✓ As-built documentation
- ✓ Training of personnel



Urgent steps

1) Building state and local capacity and raise awareness for sustainable and efficient energy management on:

- state and entity levels
- municipalities
- industry and communal service enterprises

To establish Center or Agency for Energy and EE

Urgent steps cont'd

2) Developing and implementing the Energy policies

leading to energy efficiency improving and energy saving (sustainable development, tariff and subsidy reforms etc.)

3) Developing the projects

- Help cities to meet the banks and understand lending criteria

- Develop innovative financing instruments-leasing, vendor-credit, micro credit and municipal bonds
- Assist in project design, feasibility studies, etc.

Urgent steps cont'd

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- Develop local - international loan guarantee instruments

- Hold workshops between banks/leasing companies and cities to better understand each other,

-Develop projects for possible ESCO financing.

4) Demonstrate benefits

of Energy efficiency investments – pilot projects and programs

COMMENTS

- **Urgent steps in Energy Efficiency Field in BiH, all levels**:

- **Institutional structure - state, municipal level (Agency, Center)**
- **Development of human capacity in E&EE field**
- **Coherent energy strategy according to EC –Energy Charter Tr.**
- **Legislation on energy efficiency and energy saving**
- **Removing of financial barriers (budget for EE..)**

Urgent steps

cont'd

''Center for Energy, Environment and Resources in BiH''- CENER 21

was established recently to help to overbridge above mentioned gaps.

One of the goals is to move the market by helping the state, regions and municipalities in BiH energy sector to learn how to use contemporary financial tools to upgrade their infrastructure.

Energy Efficiency must be on the short list of state, entities and municipal priorities