

Potential for energy efficiency improvements and investment in Ukrainian end-use sectors

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What is the Alliance?



- **Mission:** To advance energy efficiency world-wide through policy, education, research, technology deployment, market transformation and communication initiatives.
 - Headquartered in Washington, D.C. with operations in Eastern Europe, South Africa, Mexico, India and several states in the U.S.
 - **Chairs:** ✓ Senator Mark Pryor (D-AR)
✓ James James Rogers (CEO, Duke Energy)
- ...with strong bi-partisan congressional, corporate & public interest leadership.



Alliance ASSOCIATES



- Forging Alliances with Business, Govt. & Public Interests
- Alliance enjoys sponsorship by **>145 businesses and organizations** across a broad spectrum of economic sectors.
- **Complete list at:**
www.ase.org/section/_audience/associates



General Issues in Municipal Sector in Ukraine and the Region

- ❖ **Climate:** harsh winters for most.
- ❖ **Inefficient buildings & heating** → residential sector a major energy consumer
~ DSM can save 30% of residential energy use!

HEATING:

- ❖ **District Heating** dominates *but many systems in disrepair following collapse of Soviet Union.*

RESIDENTIAL BUILDINGS:

- ❖ Most built inefficiently half a century ago and neglected since.
- ❖ Many apt. bldgs. of pre-fab concrete panels.



A Host Of Barriers To Improvements

Energy Prices (Tariffs):

- Tariffs do not recover costs (*lowering incentives to EE and raising payback periods*)
- Non-payment tolerated
- Subsidies intended for the poor not well targeted



Consumer Challenges:

- Insufficient metering
- Lack of control over energy use
- Low willingness to pay for poor service, even when able.

Ownership Issues:

- Often unclear who owns the building
 - No clear responsibility outside the individual apartments
- → lack of FINANCING also a major barrier

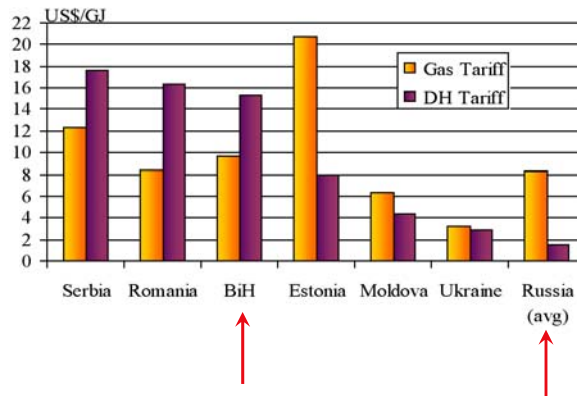
What Can Be Done to Improve Residential EE: The Policy Realm

❖ Metering - so billing is based on consumption

- Example: mandatory building-level metering in Moldova saved 20% - 50%

❖ Pricing

- Prices gradually rising towards market levels
- Subsidies being replaced with targeted aid
- Tariffs adjusted to minimize distortions like cross-subsidies



The Policy Realm, continued

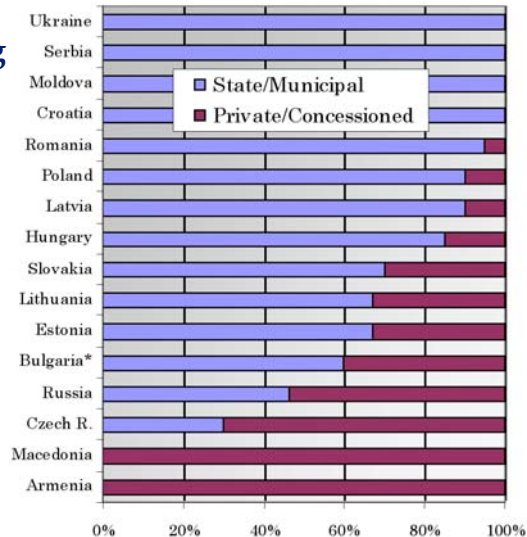
❖ Privatization of Heating

Reforms are increasing private participation:

- ✓ more effective management,
- ✓ transparent accounting,
- ✓ improved service & QC,
- ✓ lower costs.

More likely to embrace EE:

- ✓ well capitalized
- ✓ not subsidized by municipal budgets



Approach proved successful in Central and Eastern Europe

- ❖ Promoting policy reform: tariff reform, energy efficiency legislation
- ❖ Designing and establishing Innovative financing mechanisms: revolving funds, ESCO financing, etc.
- ❖ Training leaders: national and municipal energy planning, management and conservation
- ❖ Raising public awareness
- ❖ Building networks of EE experts and cities
- ❖ Designing energy efficiency (EE) projects: for buildings, heating systems, water supply networks

Innovative Policy Design and Reform - Alliance Experiences

- ❖ Promoted and Advised on Legal reform:
- ❖ Ukraine: Municipal Budget Code,
- ❖ Lithuania: district heating law
- ❖ Albania: new building code
- ❖ Bulgaria: National Policy Reform, ESCO Development
- ❖ Moldova: Housing and Condominium legislation

Innovative financing

- ❖ Grants: should only be used to trigger the market forces and gradually phased out to allow for market acceleration
- ❖ Performance contracting and third party financing - energy service companies (ESCOs)
- ❖ Housing renovation/modernization loans
- ❖ Municipal funds (linked to the awareness of municipal officials on benefits of such investments)
- ❖ Energy efficiency revolving funds

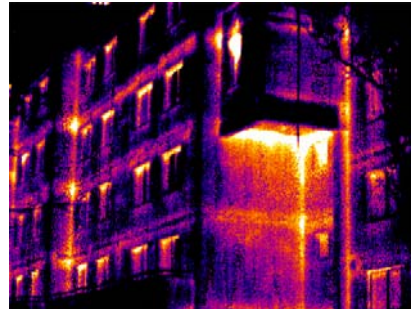
Innovative financing - continued

- ❖ Leasing
- ❖ Vendor credits
- ❖ Social/subsidy funds for low-income EE financing
- ❖ State Housing Development, Repair and Maintenance funds
- ❖ Credits from commercial banks,
- ❖ Credit guarantees
- ❖ Carbon finance, etc.

Typical EE Measures in Multi-Family Buildings in the Region

❖ Building Envelope

- windows & entrance doors
weather-stripped or replaced
- thermal insulation
(e.g., polystyrene boards on outside walls; attic and underground spaces)
- reduced thermal bridges
between balconies & façade



❖ Building Systems and DH Substations

- improved interior heat distribution systems *(e.g., pipe insulation)*
- waste heat recovery from air ventilation;
- DH substation retrofits



Typical EE Measures in Multi-Family Buildings in the Region, continued

❖ Inside Apartments

- Thermostatic Radiator Valves (to *control* heat from radiators)
- Heat cost allocators
(to *measure* radiator heat at apartment level so heat bills for entire building can be more accurately divided among apartments)
- Apartment-level **meters** for water and heat
- Heat **reflectors** behind radiators
- CFLs
- Low-flow shower fixtures
- Window repair/ replacement
- Enclosing and weatherproofing balconies



Designing municipal EE projects

❖ Buildings -municipal and residential:

demand-side energy efficiency, with metering, control, weatherization, and with billing for actual consumption - Lviv (Ukraine), Vanadzor (Armenia)

❖ Heating systems:

modernize district heating (DH) systems, achieve optimal centralization, switch fuels, introduce demand-side management (DSM), rehabilitating the DH networks and substations, including upgrades for increased CHP production

Designing municipal EE projects, continued

❖ Water supply networks: Watergy

Institutional:

Set up energy management staff and infrastructure within the City government and/or municipal water company.

Technical:

Energy Audit; metering, leak detection and repair, piping improvements, motor/drive replacements and other low-cost options

Ukraine municipal sector: Successes

- ❖ Ukraine: Information clearinghouse, replication of success stories, Association of Ukrainian Cities (AUC) partnership
- ❖ Municipal energy management and accounting (Lviv)
- ❖ Bill collection software (Kiev)
- ❖ Municipal and residential building EE: planning, heat metering, weatherization, regulation (Lviv)
- ❖ Carbon finance for school heating (Ivano-Frankivsk)
- ❖ Vendor credits (Kovel)

Municipal sector: Recommendations

- ❖ Increase technical capacity of municipalities for creating energy accounting database and establishing energy management system
- ❖ Develop revolving funding mechanisms for municipalities and incentives for energy efficiency investments
- ❖ Spur EE retrofit models for municipal and residential end-users

Municipal sector : Recommendations, continued

- ❖ Provide legal enabling environment for implementation of innovative financing schemes, Public-Private Partnerships, energy service companies, etc
- ❖ Launch a nation-wide energy efficiency project for schools
- ❖ Tariff reform eliminating subsidies combined with structured social safety programs

Ukraine Industrial EE Initiative: Overview

- ❖ UIEEI: July 2006 – March 2008 (USAID)
- ❖ Purpose:
 - Significantly reduce natural gas consumption by developing 10 EE projects at selected large consuming industries - large industrial users of natural gas (more than 10 million cubic meters (MM3) / year).

 - Develop, demonstrate and disseminate a sustainable process that can be widely replicated in Ukraine by other industries and large users

Ukraine Industrial EE Initiative: Implementation

Involved local ESCOs:

- ❖ ESCO OptimEnergo
- ❖ UkrESCO
- ❖ RENCO-Rassvet
- ❖ ESCO EcoSys
- ❖ Arena-ECO
- ❖ EnergoService – Sodruzhestvo

Ukraine Industrial EE Initiative: Implementation, continued

Investment grade audits:

- ❖ Sumykhimprom:
- ❖ UNIPLIT building material plant:
- ❖ Chernihiv Chemical Fiber plant (multiple projects)
- ❖ AvtoZAZ
- ❖ AvtoKRAZ
- ❖ Kozlov Distillery

Ukraine Industrial EE Initiative: Recommendations

Examples:

- ❖ Energy Management Systems
- ❖ Integration of thermal processes
- ❖ Heating network maintenance
- ❖ Heat recovery
- ❖ Replacement of old equipment by EE equipment
- ❖ Cogeneration plants
- ❖ Compressors
- ❖ Gas-steam Turbines
- ❖ Furnace retrofit
- ❖ Fuel switch

Reduction of NG ranges from 1 to 10 Million m³ per year per project

Ukraine Industrial EE Initiative: Results

Design and implement industrial EE projects:

- completed 10 investment grade energy audits
- engaged 6 Ukrainian ESCOs
- **over \$70 Million investment identified**
- assisted in finding project financing (UkrExIm Bank, EBRD, US ExIm Bank)

Strengthening the capacity of Ukrainian ESCOs:

- engaged in the audits and project development
- partnerships with western ESCOs (3 new JV)

Assisting in developing EE legislation:

- incentives for implementing energy efficiency

Contact Us!

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