# Experience Improving Residential Energy Efficiency in Eastern Europe

**RESNET 2008** • San Diego, CA

Brian T. Castelli Executive VP and COO Alliance to Save Energy





## **Presentation Outline**

- > A little about the **Alliance**
- Geographic focus
- Issues in the region with residential EE
- Overview of typical
  approaches used in the region to promote EE
- Some specific examples



# 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 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 >130 businesses and organizations across a broad spectrum of economic sectors.
- •Complete list at:

www.ase.org/section/\_audience/associates



## **Area of Focus: the Transition Economies**

- From Eastern Europe eastward to the Former Soviet Union
- Economies that transitioned (or are still transitioning) from centrally planned to market-based

Factorn	Control	Poltic	Commonwealth of		
Europe	Balkans	States	Western	South	Central
			CIS	Caucasus	Asia
Czech Rep.	Bosnia & Herzegovina	Estonia	Russia	Armenia	Kazakhstan
Hungary	Serbia & Montenegro	Latvia	Ukraine	Georgia	Uzbekistan
Bulgaria	Croatia	Lithuania	Moldova	Azerbaijan	Turkmenistan
Poland	Macedonia		Belarus		Tajikistan
Romania	Albania				Kyrgizstan

Central and Eastern Europe and (on next slide) the Commonwealth of Independent States...







## **GENERAL ISSUES in 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.
- Biomass, coal, nat'l gas, electricity burned directly for heat where DH not dominant.

#### **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
- $\rightarrow$   $\rightarrow$  lack of **FINANCING** also a major barrier



### Measures Underway to Promote Residential EE in Eastern Europe: 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



## **Promoting Residential EE Through HOME-OWNER ASSOCIATIONS**

- Home-Owner Associations (HOAs or "Condos")
  - Common now that apt ownership transferred to residents
  - High potential for HOAs to improve EE of their bldgs

### Slovakia Example

- National laws on management of every multi-family building:
  - ✓ A manager responsible for operation and rehab as decided by owners.



- ✓ Homeowners make monthly payments that generate a Maintenance Fund.
- ✓ HOAs officially registered → owners make loans and legal decisions
- A **national association** that distributes educational materials on EE and organizes trainings for HOAs.

## The Policy Realm, continued

### Privatization of Heating

*Reforms are increasing private participation:* 

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

### More likely to embrace EE:

- ✓ well capitalized
- ✓ not subsidized by municipal budgets



# **Building Energy Passports**

- In August 1994, Moscow has had a mandatory municipal energy code for new and retrofitted residential and commercial buildings. By mid-2006 53 Russian Regional Governments adopted the energy codes.
- To encourage compliance, the code's developers came up with the Energy Passport<sup>/1</sup> program, an innovative energy rating and certification program
- The passport is required to list efficiency features, predicted energy consumption, and, after two years, metered energy use
- Buildings that exceed target efficiency levels will soon be able to use their Energy Passports to receive lower heat tariffs, and favorable taxation and loans.

# **Building Energy Passports**

• The Passport Concept moves to the European Union

- The EU's 2006 Directive tries to bring energy efficiency aspects of houses towards the market with the new building "passports"
- Like in Russia, the buildings' actual operational ratings to be used for the directive rather than the asset-based ratings available at the time of construction or planning.
- The EU recognizes that data proving the effectiveness of the design are usually absent once the building has been constructed.



## **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



## Residential EE Retrofits: Sofia, Bulgaria

### Retrofits:

- new roof
- some windows and doors replaced
- insulation of entire building envelope
- weather-stripping
- piping networks for heating and water (hot & cold) replaced as needed
- **♦ Savings** in Heating: **60**%
- **\*** Financing:
  - Subsidized loan to HOA
  - Each owner makes monthly payments





## **Residential EE Retrofits:** Czech Rep.

### Rumburk

- New windows
- 7 cm polystyrene boards on outside walls
- 5 cm polystyrene in underground space
- 15 cm polystyrene in new roof
- brush strips on doors
- Brno-Novy Liskovec
  - New windows and doors
  - 15 cm polystyrene on walls
  - reduced thermal bridges between balconies & façade
  - waste heat recovery from air ventilation
  - improved interior water & heat distribution systems
- ✤ Savings: both ~50% (heating)
- Financing: subsidized loans & grants from gov't





## Residential EE Retrofits: Gabrovo, Bulgaria

### Building:

- Panel construction, 1986
- 108 flats

### Retrofits

- TRVs
- radiator reflector screens
- windows weather-stripped
- new entrance doors
- CFLs
- low flow shower fixtures
- substation retrofits
- ✤ Savings: 30%
- Financing: demo funded by UNDP





## Residential EE Retrofits: 5 Bldgs in Slovakia

- **Retrofits:** comprehensive rehabilitation
- Savings:
  - 41% in heating
  - 28% in hot water
  - 34% in cold water



Financing: mostly low-interest gov't loans,
 + some grants and commerial loans



# **Contact Us!**

Brian T. Castelli Executive VP and COO <u>bcastelli@ase.org</u>

## 202-530-2209

### www.ase.org



ALLIANCE TO SAVE ENERGY

Creating an Energy-Efficient World