


ENERGY EFFICIENCY COORDINATION GROUP


WORLD BANK ENGAGEMENT




June 23, 2021

WB Support Priority areas for WB engagement in energy efficiency

- 1 Public Sector Energy Efficiency** 

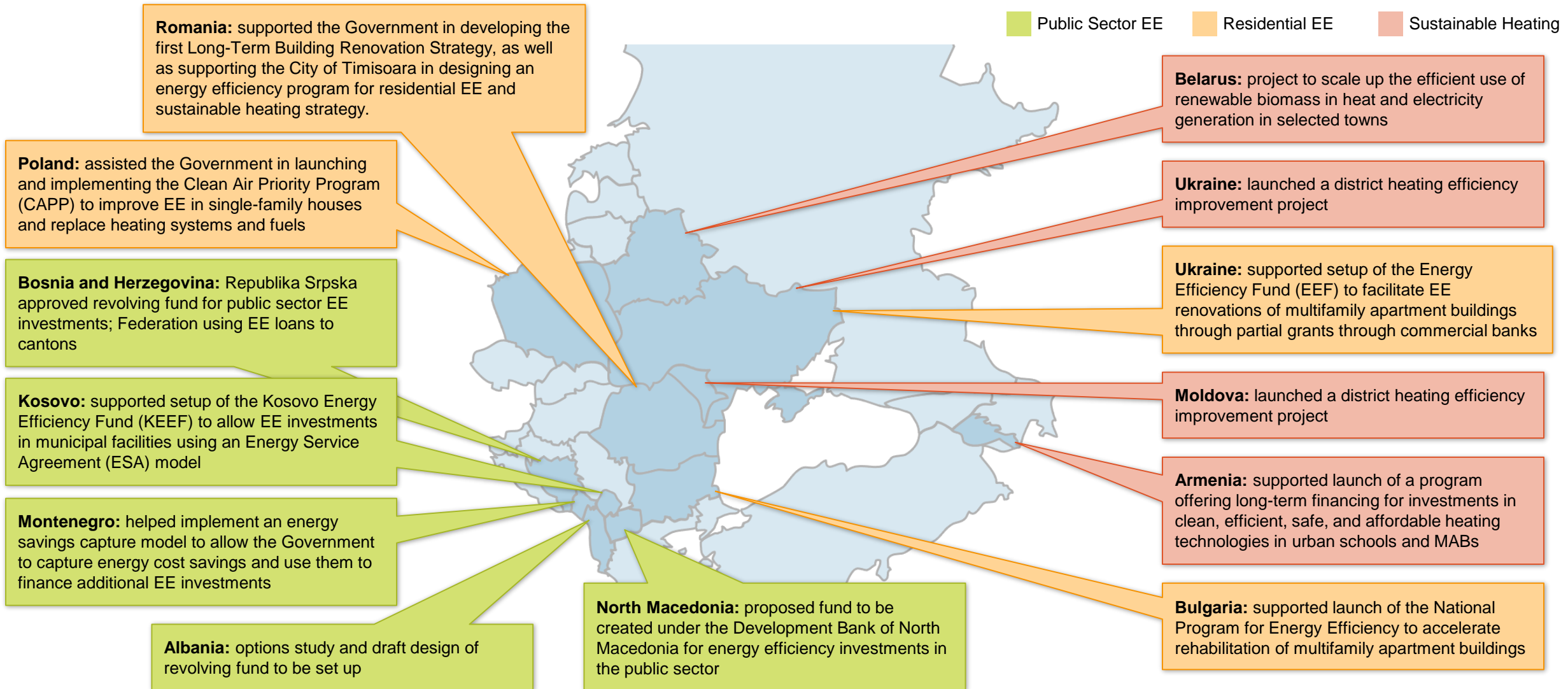
Support to the design and setup of **revolving schemes for energy efficiency in public sector buildings**, with the goal to achieve long-term sustainability
- 2 Residential Buildings Energy Efficiency** 

Design of renovation programs in the residential sector (for both multifamily apartment buildings and single-family houses), including **financing schemes and implementation**
- 3 Sustainable Heating** 

Development of **national sustainable heating strategies** and **design of sustainable heating components** in national energy efficiency programs

New area of engagement

WB Support World Bank's key active and past engagements in ECA



1 Public Sector EE Revolving EE schemes offer a number of benefits

Revolving EE schemes combine easier access to financing, economies of scale, streamlined processes, and sustainability

Why use a revolving EE schemes mechanism?

Fills the **gap of financing** and assures **predictable flow of funds** to plan and implement EE in additional facilities

Predictable flow of funds



Easier access to financing



Allows for financing when **commercial banks are unable or unwilling** to provide loans
Can offer financing at **preferential terms**, reduces **public debt**

Economies of scale



Enables **pooling of funds** from government, IFIs, and commercial financing
Allows **bundling of projects** and **lowers transaction costs**

Targets **centralized implementation arrangements** to support scale-up

Streamlined processes



Support to market development



Sets the stage for eventually bringing in **commercial financing**, **ESCOs**, and other **private sector actors**

Allows **standardization of documents and procedures**

Provide the basis for long-term sustainability, thanks to the **capture of energy savings through budget reflows and revolving scheme features**

Long-term sustainability

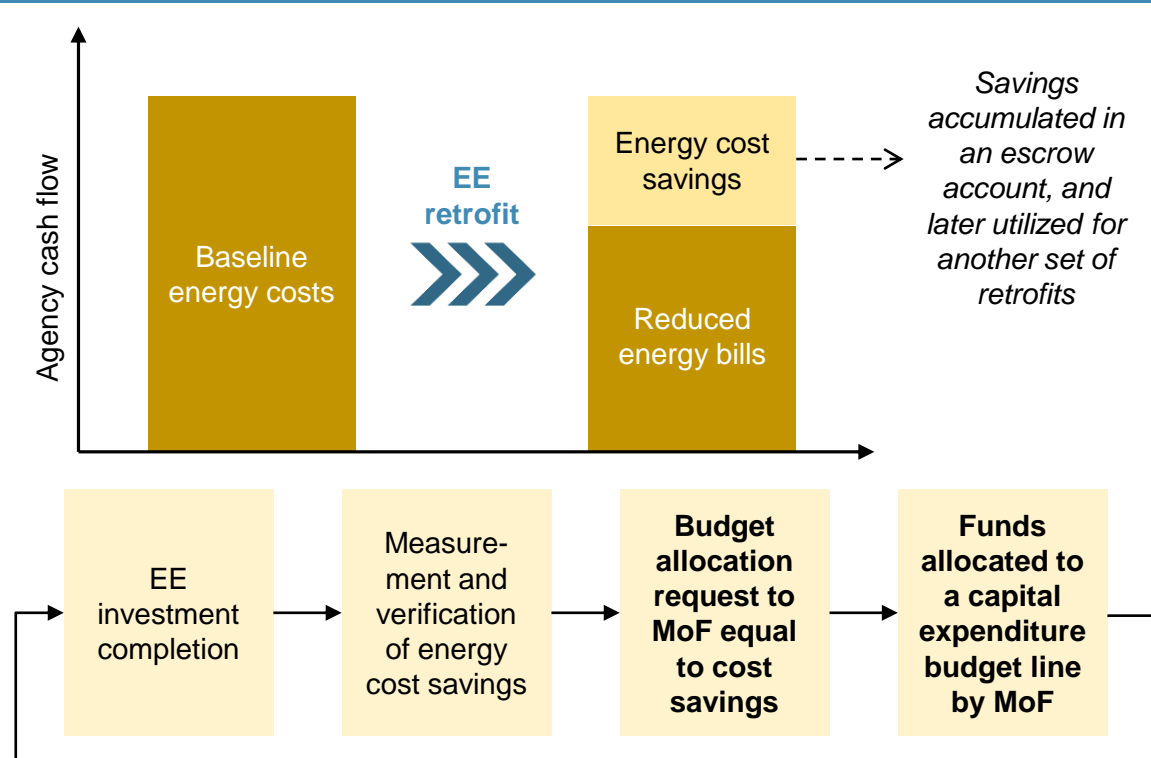


- Governments should **move towards revolving EE schemes** and, to the extent possible, **sustainable financing mechanisms** for public sector EE
- The schemes can be established **within an existing institution**, or as a **new independent entity** with fiduciary accreditation
- Revolving EE schemes **differ across countries** to reflect the various local **political, legal and regulatory environment** as well as the different **government priorities**

1 Public Sector EE Several options are available for setting up revolving EE schemes

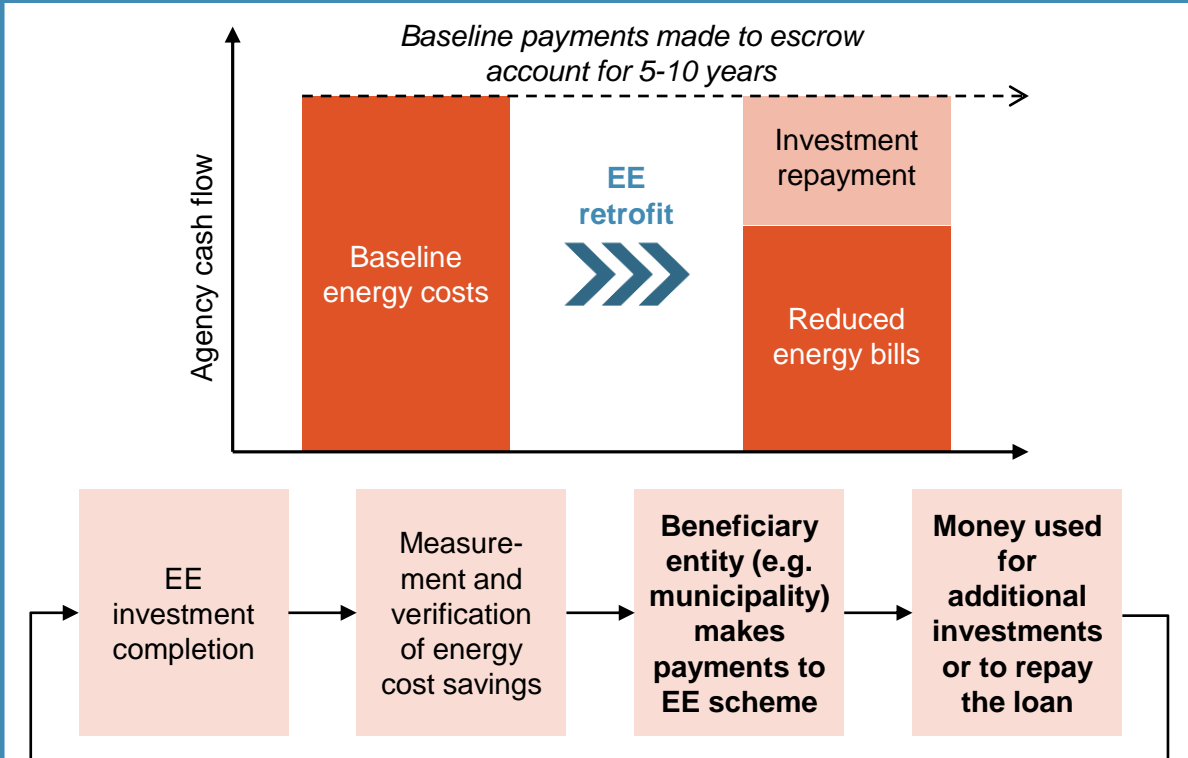
The two main alternatives are the energy savings capture model and the energy service agreement model

Energy Savings Capture Model



- Typically used where the EE scheme is **institutionally housed within a national Government ministry**
- Operates within the **public budget** and **public procurement law**

Energy Service Agreement (ESA) Model



- Typically used where the EE scheme is an **independent legal entity operating outside a line ministry** (the entity could be owned by the Gov't)
- Operates **outside the public budget system** and public procurement system, i.e., under **commercial law**

Both models could allow for some portion of investment to be used for structural improvements and improving indoor comfort levels

1 Public Sector EE The WB has extensive experience setting up revolving EE schemes in different countries

Bosnia and Herzegovina

Energy Efficiency Project



Key Project Information

- Implementation period: **2014-2020 (original project); 2020-2023 (additional finance)**
- Total envelope: **US\$32 million + US\$32 million**
- WB financing: **US\$64 million** (credit + loan)

Project Activities

- The project involves both the **Federation of Bosnia and Herzegovina (FBiH)** and **Republika Srpska (RS)** and supports energy efficiency investments in **schools, hospitals, clinic centers, and administrative buildings**
- The project also supports the **development of sustainable energy efficiency financing mechanisms** in the public sector, strengthens implementation capacity and helps increase public awareness on energy efficiency
- Under the second phase, revolving financing mechanisms (financial reflows) have been set up in both entities; in addition, in FBiH and RS, innovative procurement approaches (notably performance-based contracting) is being piloted.

Results Achieved/Expected

- The original BEEP project closed after achieving all expected results:
 - **100 percent of credit** disbursed
 - EE improvements completed in **nearly 90 public buildings**
 - **Total lifetime savings of 683 GWh** and a reduction in lifetime GHG emissions by almost **200,000 tCO₂eq**
 - Directly improved conditions for more than **800,000** children, students, patients, teachers, doctors and nurses.
- The newly set up revolving fund mechanisms are designed to remain operational after project closure and continue EE retrofits on the basis of reflows.

Kosovo

Energy Efficiency and Renewable Energy Project (two phases)



Key Project Information

- Implementation period: **2014-2020 and 2020-2022**
- Total envelope: **US\$32.5 million + EUR 10 million (IPA)**
- WB financing: **US\$31 million** (loan)

Project Activities

- **Kosovo Energy Efficiency Fund (KEEF)** was set up as an **independent extrabudgetary entity**
- The Fund is **investing in municipal facilities** using the **Energy Service Agreement (ESA)** model, which is implemented in the following steps: (i) fund issues a **call for proposals**, and municipalities respond with renovation projects; (ii) once selected, **municipality signs ESA** with the fund; (iii) **fund conducts audits** to establish the baseline energy consumption; (iv) fund **implements EE investments**; (v) after renovation, an **independent entity** verifies energy cost savings; (vi) **municipality pays a fixed amount** to the fund that is not necessarily equal to the savings estimated originally

Results Achieved/Expected

- The original project has renovated **57 central government buildings, 44 are under construction** (29 to be completed by end July)
- **Total lifetime savings of 511 GWh** and a reduction in lifetime GHG emissions by almost **398,000 tCO₂eq**
- First call for proposals under the ESA for **municipal buildings** model was launched in April 2020 and **about 100 applications were received** from various municipalities
- KEEF signed **80 Project Initiation Agreements** for **building and street lighting projects** with the municipalities; renovations to be initiated in the Fall 2021

1 Public Sector EE Key Lessons Learned

There is a **significant risk of limited continuation** of building renovation programs once concessional finance runs out

Government **project management units (PIUs)** suffer from a **loss of technical capacity** or are **dismantled** once individual projects/programs are completed

Revolving schemes can ensure the **sustainability of EE programs, EPCs and M&V** become more important

Energy audits need to consider **structural soundness, seismic resilience, underheating, safety**, etc. to avoid unsustainable renovations and ensure investments can payback

New institutions may require **legislative changes, good governance and budget provisions** for operating costs

Plans for **future business planning, recapitalization**, staffing, etc. to be done before project closure

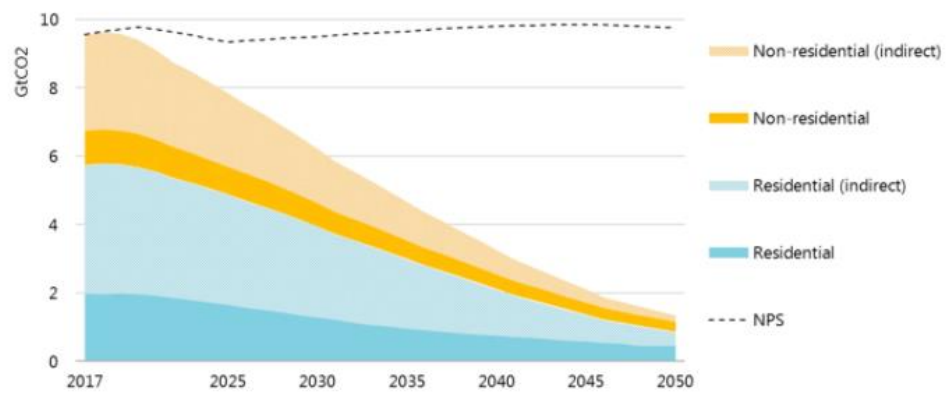
2 Residential EE The buildings sector needs to scale up its contribution to economy decarbonization

In order for this to happen, public intervention has to focus on addressing the key types of barriers to residential EE financing

The buildings sector will need to scale up its contribution to GHG emission reduction by 2050

- **Direct emissions** from fossil fuel use in buildings will have to **drop by 75% by 2050** in the IEA's Faster Transition Scenario, a steeper percentage reduction than most other sectors
- **Energy efficiency and demand-side flexibility** will be **equally essential** to relieve pressure on the power sector, given the significant share of electricity demand in buildings

Buildings-related CO₂ emissions in IEA's Faster Transition Scenario, 2017-2050



Notes: NPS = New Policies Scenario; Indirect CO₂ emissions result from upstream generation of electricity and heat used in buildings. IEA 2019. All rights reserved.

Source: IEA 2019

This will require that governments act to address the key types of barriers to residential EE financing

Key types of barriers	Possible public interventions (selected)
i Legal and regulatory barriers	<ul style="list-style-type: none"> • Legal/regulatory reforms to strengthen HOAs, enable institutions to finance residential EE investments
ii Implementation capacity limitations and lack of awareness	<ul style="list-style-type: none"> • Technical support to homeowner associations (HOAs), households, maintenance companies, utilities, and municipalities • Awareness campaigns to inform consumers about the potential and benefits of EE investments
iii Investment profitability (net present value)	<ul style="list-style-type: none"> • Credit lines to partnering financial institutions • Funds offering low-interest loans/ repayable grants, potentially leveraging financial intermediaries¹ • Investment grant support to HOAs/households¹
iv Investment risk profile and risk perception	<ul style="list-style-type: none"> • Loan guarantee schemes for banks • Energy savings guarantees built into contracts

Programs that are **successful in scaling up residential EE financing** address these **types of barriers**, with a range of possible **support mechanisms**

¹ Several ways are available to capitalize such funds and raise resources for grants (e.g., some form of energy/environmental tax)

2 Residential EE The design of effective financing mechanisms requires extensive preparatory work

The diagnostic should assess the EE potential, identify financial sector gaps, and analyze consumer behavior

i Market assessment



- Gather data on **building stock** and **energy consumption baseline**
- Evaluate **technical, financial, and economic potential** for energy efficiency improvements

ii Gap analysis



- Identify key barriers that **restrict access to financing for EE investments** in the residential sector

iii Behavioral analysis



- Assess **potential for the adoption of behavioral approaches** that can help improve policy outcomes by ‘nudging’ households to take better decisions

- The results of the diagnostic can **inform the design of effective financing mechanisms**
- The World Bank has **extensive experience** supporting governments in **designing these diagnostics** and **structuring residential EE programs (MABs and SFBs)**

2 Residential EE The WB can help governments to structure effective residential EE programs

Poland

Clean Air Priority Program



Key Project Information

- Implementation period: **2021-2026**
- Total envelope: **US\$6,273 million**
- WB financing: **€250 million** (Program-for-Results financing)

Project Activities

- In 2018, the GoP launched the **Clean Air Priority Program (CAPP)**, a US\$28 billion, 10-year initiative to improve EE in SFBs and replace heating systems
- CAPP is managed by the **National Fund for Environmental Protection and Water Management (NFOŚiGW)** through 16 regional funds, and uses **partial subsidies** (30-75%) and **tax reliefs**
- **Commercial banks** are planned to participate in CAPP with a loan product to **provide complementary financing**

Results Achieved/Expected

- As of April 16, 2021, CAPP had received more than **233,500 applications** for US\$1.03 billion in grants
- CAPP will **mobilize commercial financing** and **spur the private sector**, thanks to:
 - The involvement of commercial banks, which is expected to make the process smoother for all actors involved
 - A range of private actors that will be involved in all aspects of implementations (e.g., equipment supply, installation, monitoring)

Ukraine

Energy Efficiency Fund (EEF)



- Implementation period: **2019-today**
- Total envelope: **US\$200 million**
- WB financing: **n.a.**

- Ukraine's Energy Efficiency Fund (EEF) facilitates **energy-efficient renovations of residential buildings** by providing grants that leverage investments by the homeowners
- The WB helped design the fund and develop the **Operations Manual**
- The **grants** and the **oversight** are **supported by IFC** and jointly financed by a **Trust Fund of the EU and Germany** and from the **Government of Ukraine**
- IFC also works with banks to **tailor products and services** to help homeowners' associations carry out energy-efficiency upgrades

- The **state-owned Ukrgasbank joined the EEF program** to assist homeowners in making their buildings more energy efficient; in June 2020, **KredoBank** became the **first private bank** in Ukraine to join the EEF program
- To build awareness, **IFC appointed 24 regional advisers** who help homeowners' associations apply for the EEF grants; these advisers have delivered over **450 training and awareness events**, jointly and with partners
- By mid-June 2020, the EEF had already received **110 applications**, program adjustments took effect August 2020 to streamline procedures and provide for TA grants

2 Residential EE Key Lessons Learned

Basic building blocks need to be in place—**cost reflective energy pricing, regulations to establish HOAs**, common practice for homeowners to pay monthly dues (MABs), reasonable level of heating

Partial subsidies are recommended (typically 20-30%) to address issues of **high payback periods, structural soundness, seismic resilience, underheating, safety, low-income owners**, etc.

Access to financing should be simple, ideally with access to full project financing (loans, grants) under a single application window; financing can be public (e.g., reimbursable grants) until banks are willing to lend

Institutional structures need to be developed and funded to support **program implementation** (organization of program actors, provisions for training and outreach, technical assistance, help desk) and allow for **program adjustments, scale-up, development of future phases**

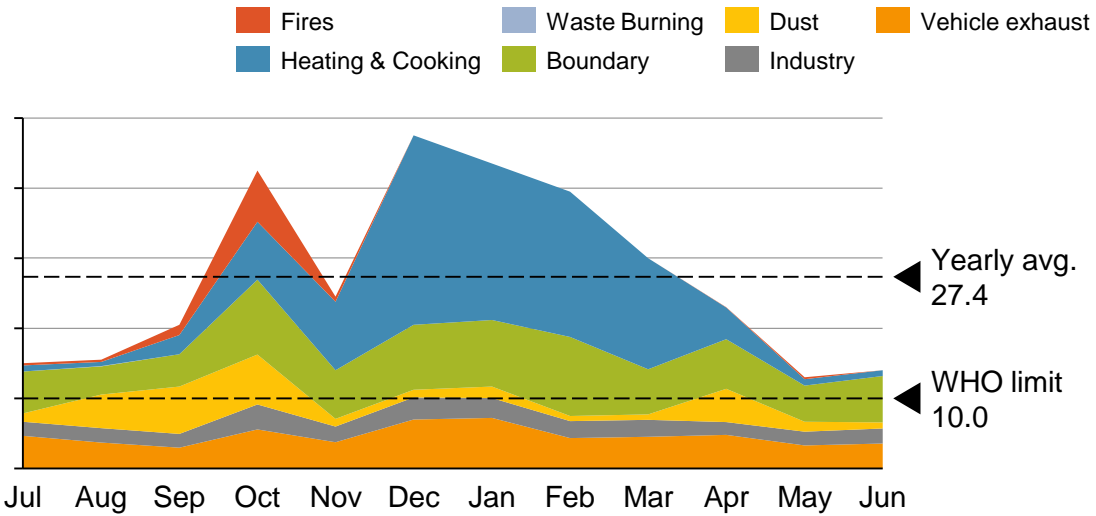
Lower **transaction costs** through **streamlining of processes, standard documents and templates, websites with prequalified contractors, case studies**, etc.

3 Sustainable Heating Governments in the EnC should have an increased focus on sustainable heating Residential heating is a major source of air pollution and EnC countries are lagging behind other regions

Residential heating is a major source of air pollution

- **Heating** is typically the **main source of air pollution** in the EnC countries, especially in **winter months**
- The main source of heating-related PM_{2.5} emissions is typically **individual firewood, oil, and coal boilers** and district heating plants powered by **heavy fuel oil**
- According to the World Health Organization, exposure to PM_{2.5} accounts for **thousands of premature deaths per year**

Monthly PM_{2.5} concentrations in Belgrade, µg/m³

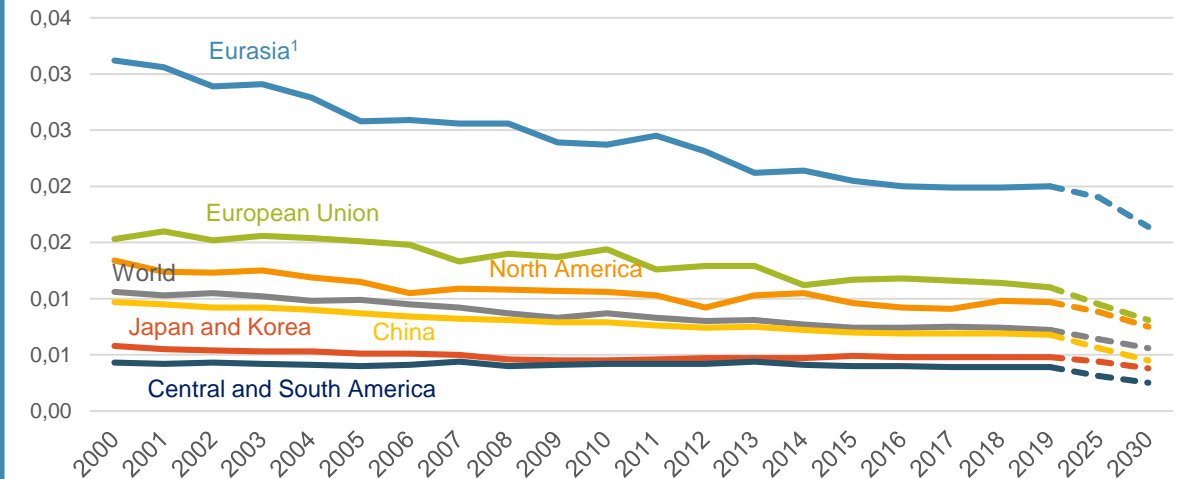


SOURCE: Modeling by UrbanEmissions.info for World Bank, March 2021

Heating is lagging behind other sectors in the clean energy transition

- Globally, ECA's heating sector has the **highest energy intensity**
- Many countries in the ECA region are characterized by: (i) **cold climates** with high heating needs and long heating seasons; (ii) prevalence of **low-cost traditional and fossil fuel-based heating**; (iii) widespread **energy poverty**; (iv) **low energy efficiency**; (v) historically **low uptake of policies** to promote heating energy transition

Energy performance of space heating and water heating in the Sustainable Development Scenario, total final energy by m² in toe, 2000-2030



SOURCE: IEA

1 ECA excluding EU countries and South Eastern Europe

3 Sustainable Heating

Scaling up the heating transition requires addressing the key challenges
The WB provide countries with full package from upstream analytics to investment financing

WB Support on Sustainable Heating



Policy and regulatory frameworks

- Support for the preparation of **integrated national heating strategies and plans** (including for district heating), also through the deployment of new **geospatial modeling tools**
- **Policy advisory** to support regulatory frameworks, **benchmarking of providers, technologies, programs, just coal transition**



Analytics and decision-making capacity

- Design of programs based on **market assessments, an understanding of the financial sector, and behavioral analytics**, potentially in coordination with residential EE programs
- **Capacity building programs**, to empower national and local governments to share best practices and transfer knowledge



Financing

- **Financing support** and removal of distortions through:
 - **Scaling up WB concessional lending** to expand financing into areas that have received less attention
 - Leveraging **public and commercial financing**
 - Mobilizing **grants** to support affordability

3 Sustainable Heating The WB has supported the launch of several sustainable heating programs

Belarus

Biomass District Heating Project



Key Project Information

- Implementation period: **2014-2019**
- Total envelope: **US\$90 million**
- WB financing: **US\$90 million** (loan)

Project Activities

- The project objective was to **improve the energy efficiency of district heating** and **increase the use of local wood biomass** by:
 - Installing **individual building-level heat substations** with temperature controls and (re)constructing **district heating networks**
 - Investing in **biomass boilers and CHP plants**, as well as wood chipping equipment
 - Supporting the improvement of **existing social accountability mechanisms** and the shift to **energy-content-based biomass pricing**

Results Achieved/Expected

- By **December 2020**, the project had produced the following results:
 - Projected lifetime energy savings of **1,404 GWh**
 - 116 MW of **renewable generation capacity** constructed
 - **Direct project beneficiaries**: 114 thousand

Armenia

Urban Heating Program for Multi-Apartment Buildings (MABs) and Schools



Key Project Information

- Implementation period: **2005-2009**
- Total envelope: **US\$22 million**
- WB financing: **US\$15 million** (loan)

Project Activities

- The project objective was to increase the use of **clean, efficient, safe, and affordable heating technologies** in **urban schools and MABs** by:
 - Creating market conditions for the **commercial provision of heating services**
 - Providing **long-term financing** to service providers and consumers
 - **Building the capacity** of local financial institutions
 - Promoting **efficient and safe equipment**
 - Stimulating creation and functioning of **self-regulating community organizations**

Results Achieved/Expected

- Supported by the project, participating financial institutions provided **7,225 sub-loans** for the **purchase of heaters and boilers**
- **112 schools** were provided with **modern, gas-fired heating systems** enabling winter classroom temperatures above 15 degrees Celsius
- Share of individual households in MABs with safe gas or gas-fired, hot water-based heating rose **from 11% in 2004 to 70% in 2011**, exceeding the target of 50%
- The project supported **training for 400+ people in 15 cities** to enable them to install heaters and boilers in a safe and efficient manner



Thank You!

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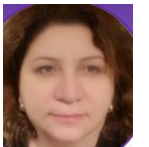
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