



Renewable Energy in Europe and CIS: *Results and Lessons Learnt from UNDP portfolio*

**Presented by Marina Olshanskaya
Regional Technical Advisor, Climate Change**

**Astana, Kazakhstan
May 2011**

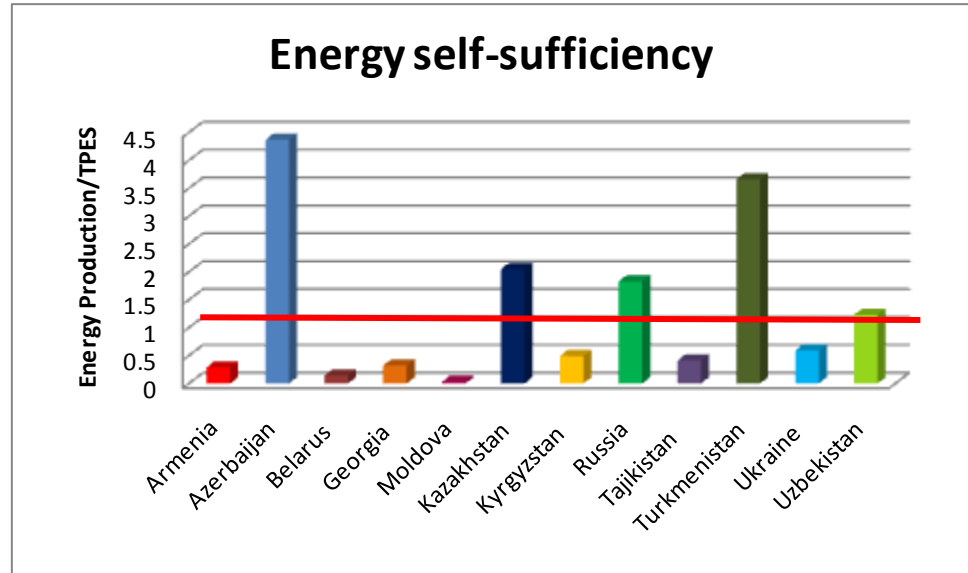
Outline

- **Rationale: why renewable energy**
- **Overview of UNDP portfolio**
- **Project Examples**
- **Lessons learnt**



Why renewable energy?

Politics & economics :
 improve energy security &
 save cash on energy
 imports/increase hard
 currency revenues from
 energy exports



GHG Intensity of GDP

| World Rank | Country | tCO2e/Mill. Intl \$ |
|------------|---------------------------|---------------------|
| 1 | Zimbabwe | 4,204.2 |
| 2 | Korea (North) | 3,247.0 |
| 3 | Uzbekistan | 2,663.2 |
| 4 | Turkmenistan | 2,524.9 |
| 5 | Mongolia | 1,615.4 |
| 6 | Ukraine | 1,462.0 |
| 7 | Kazakhstan | 1,348.1 |
| 8 | Iraq | 1,278.6 |
| 9 | Azerbaijan | 1,086.7 |
| 10 | Russian Federation | 1,047.7 |
| 11 | Moldova | 1,012.8 |

Environment: reduce
 pollution and greenhouse
 gas emissions

Why renewable energy & UNDP?

- **Globally: 1.5 billion people do not have access** to electricity and an additional 1 billion have limited access to power grid
- **CIS:**
 - Reliability of energy supply is an emerging development issue: e.g. in Tajikistan rural (73%) population consumes 8.6% of total electricity with no/limited power supply in November - March
 - Provision of social services (schooling and health-care) is affected
 - Land degradation due to unsustainable cutting of fuel-wood



Up to 6-8 hrs/day spent to collect fuel wood by women/kids



Poor insulation resulting in high heat losses



Dysfunctional water supply and sanitation systems



Deforestation (up to 90% forest loss) and soil erosion



Inefficient cooking stoves - indoor pollution and health risk

UNDP's work in Renewable Energy in Eastern Europe and CIS

Small hydro: Montenegro, Georgia, Kyrgyzstan, Tajikistan

Wind power: Kazakhstan

Solar Water Heating: Albania, Armenia, Uzbekistan

Biomass: Slovakia, Belarus, Poland, Slovenia, Latvia

Biogas: Georgia, Kyrgyzstan

Landfill Gas: Ukraine

Solar PV: Uzbekistan, Georgia



Funding sources & strategies

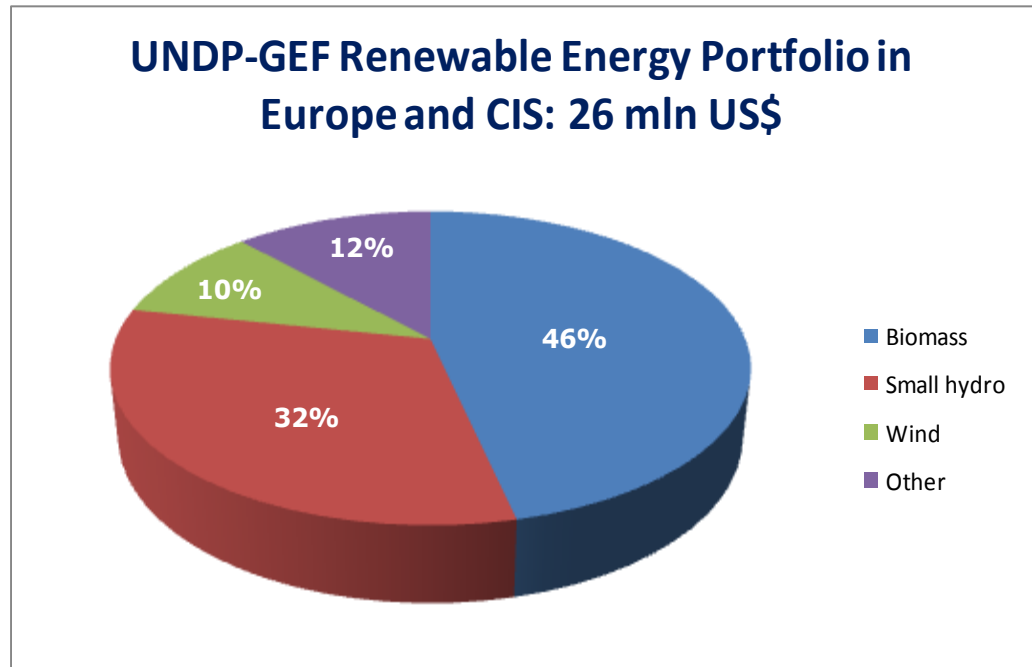
Strategy 1: Supporting market transformation for RES

➤ Focus on policies/enabling environment to level playing field for commercial investments in RE

➤ Funding source: GEF

➤ Key technologies:

- Biomass,
- Wind
- Small-medium hydro (1-10 MW)



Funding sources & strategies

Strategy 2: Provision of Access to Affordable, Locally Available and Acceptable Energy

- **Demonstrating small-scale RE applications and community-based delivery models, including provision of capital subsidies to cover hardware costs**
- **Funding sources: UNDP's own, bilateral donors, GEF Small Grant Program**
- **Technologies: mini-hydro (up to 1 MW), solar PV, solar water heating, biogas,**

Biomass for heat and power supply: Belarus

Energy security

- Energy imports account for 86% of Belarus' total primary energy consumption

Demonstrating an alternative

- Five investment projects implemented: biomass boilers installed across country (30MW)

Policies & Financing

- National Plan for Ensuring Sustainable Development and Efficient Use of Wood Fuel for Energy Supply (Heat and Electricity Production) in the Republic of Belarus
- The Plan is supported by committed funding of over USD 80 million from the state budget and innovation funds



Vileyka biomass cogeneration plant



Chips unload at fuel storehouse



Installation of superheated steam boiler 15 MW

Solar energy for rural health-care: Uzbekistan

Context:

- WB provided 2,200 rural clinics with modern medical equipment

Securing energy supply

- Installation of solar water heating and PV systems to secure heat and power supply in rural health-care facilities and provide comfort conditions for patients and doctors, avoid service interruption and ensure quality of medical supplies

Reducing natural resources use

- Natural gas consumption reduced by 36% or by cca 27,000 m³/year (i.e. cca 8,000 US\$/year at current gas export prices)



Solar Water Heating system in rural clinic:
4 m², 250l, \$2300



Solar PV system

Small hydro for local development: Georgia

Leveraging financing

- UNDP-GEF the German Development Bank (KfW) has launched a 5 million euro **Georgia Renewable Energy Fund** for the development of small hydro power plants
- Two Georgian banks, TBC and VTB, will receive a low-interest rate, preferential loans from the Renewable Energy Fund



Construction of Khadori-2 hydropower plant

First projects approved

- Rehabilitation of the **Khadori-2** hydropower plant in Pankisi Gorge, one of the poorest regions in Georgia, to triple its design capacity **from 1.6 MW to 5.4 MW**
- Rehabilitation of the Ritseula small hydro power plant in the mountainous region of Racha, in western Georgia



Georgia has 26,000 rivers and a potential for 15,000 megawatts of hydroelectricity

Sustainable energy to support MDGs: Tajikistan

Helping the poor

- 100 poor households provided with 1kW per household meeting their basic energy needs (lighting)

Improving social services

- Energy consumption optimized and secured in local hospital, school and kindergarten via wall and roof insulation, installing PV and solar thermal systems

Strengthening local governance

- Community-based public utility organization set-up to provide for collective management of local energy and water supply systems

Improving economic viability of small hydro power (SHP)

- SHP plant connected to national grid to sell power in summer at attractive tariffs

Developing Renewable Energy Law and by-laws:

- Technical regulations for connection to the grid of SHP
- Methodology for calculating costs for power from SHP
- Contracting modalities for buying back electricity from SHP



Two small hydro power units (2 x 500 kW)



Energy efficient retrofit of hospital, school and kindergarten



PV system on the roof of hospital

Lessons learnt: market transformation

- **Policies are most important:**
 - attractive price (fixed feed-in tariff)
 - equitable access to energy grid for IPPs
 - clear governmental mandate

- **Technologies are available:**
 - domestic supply chain for design, installation and maintenance

- **Resources availability can be tricky:**
 - in general – plentiful (hydro, solar, wind, biomass)
 - but each case requires careful assessment

- **Financing is secondary to RE policies and investment climate:**
 - private sector is keen to finance RE projects, but need to be able to manage risks (technology, resources, policies)
 - climate finance (CDM, JI, NAMA) is an emerging opportunity

Lessons learnt: access to energy

- **Access to affordable, reliable and environmentally benign energy is an emerging human development issue in CIS for rural and poor urban populations/countries**
- **Vicious circle: poverty – lack of access to energy – pure social services – absence of productive opportunities – more poverty**
- **Number of demo-projects proved successful => the way forward is to SCALE UP**
- **Scaling up requires:**
 - **Dedicated policies**
 - **Dedicated financing from the government**
 - **Technology transfer and capacity development for O&M&M (operation, maintenance and management)**



Thank you

**Presented by Marina Olshanskaya
Regional Technical Advisor, Climate Change**

**Astana, Kazakhstan
May 2011**