



Nature-Powered Armenia: Circular Climate Solutions

A 4-year initiative to reduce emissions and build rural resilience through circular economy approaches, transforming agricultural waste into valuable energy resources while addressing energy poverty and environmental degradation in Armenia's vulnerable rural communities.

Project Overview

\$5M

Funding Requested

Grant financing with \$800,000 in-kind co-financing

210K

tCO₂eq Reduction

Estimated mitigation impact over 20-year lifespan

4 yrs

Project Duration

Implementation period with long-term sustainability plan

Led by the Environmental Project Implementation Unit (EPIU) under Armenia's Ministry of Environment, this project will deploy decentralized bioenergy systems, enhance energy efficiency, and build institutional capacity.

The Challenge

Armenia's rural communities face increasing vulnerability to climate change and energy insecurity, particularly in mountainous and semi-arid regions. During harsh winters, energy demand spikes while supply systems remain insufficient and inflexible.

Households and public institutions primarily depend on:

- **Coal and imported fossil fuels**
- **Unsustainably harvested firewood**
- **Traditional biomass with inefficient combustion**

These practices contribute to deforestation, soil degradation, biodiversity loss, greenhouse gas emissions, and serious health problems from indoor air pollution, particularly affecting women and children.



Untapped Opportunity

Agricultural Waste Problem

Armenia generates substantial quantities of agricultural residues including wheat straw, orchard prunings, vineyard clippings, and livestock manure.

Current disposal methods rely on open-field burning or unmanaged decomposition, releasing methane (28× more potent than CO₂) and black carbon.

Circular Solution Potential

These residues represent a significant untapped resource for renewable energy and soil enrichment if processed through appropriate technologies.

Transforming waste into bioenergy and compost aligns with circular economy principles, promoting resource efficiency.



Barriers to Implementation

Limited Access to Technology

Rural communities lack access to bioenergy technologies like biomass briquetting and anaerobic digesters

Policy Environment

Regulatory frameworks haven't fully recognized or incentivized agro-waste valorization



Financial Constraints

Insufficient financial resources for upfront investments in clean energy infrastructure

Technical Knowledge Gaps

Limited technical skills and institutional support to adopt circular solutions

Project Components

Component 1:

Decentralized Bioenergy Systems

- Install ~10 biomass briquetting units and/or biogas digesters
- Form community energy cooperatives
- Provide technical training on equipment operation
- Develop business models for economic viability

Component 2:

Energy Efficiency Improvements

- Retrofit 20+ public buildings with modern bioenergy heating systems
- Distribute efficient cookstoves to ~1,500 vulnerable households
- Prioritize women-headed families and remote communities

Component 3:

Capacity Building & Policy

- Train local technicians, youth, and farmers
- Develop local value chains for bio-briquettes and compost
- Engage authorities to develop enabling frameworks
- Establish monitoring and evaluation systems



Implementation Structure

Executing Entity: Environmental Project Implementation Unit

- Government agency under Ministry of Environment
- Accredited Direct Access Entity to Green Climate Fund and Adaptation Fund
- Strong cooperation with the World Bank, UNDP, FAO, UNEP, etc.
- Experience managing multiple climate fund projects

Implementation Arrangements

- Collaboration with local governments and communities
- Technical partners providing specialized training
- Steering committee with representatives from ministries, municipalities, and beneficiaries
- Transparent oversight and adaptive management

Why Grant Financing is Necessary



Public Sector Limitations

Armenia's government faces competing budgetary demands with limited fiscal space for rural bioenergy infrastructure



Private Sector Barriers

Long payback periods and market risks deter private investment in unproven rural energy models



Beneficiary Constraints

Rural communities lack upfront capital, financial literacy, and collateral to access commercial loans

Grant financing addresses these barriers by covering upfront costs, building capacity, and de-risking investments, making clean energy accessible without increasing financial burden on vulnerable communities.

Sustainability & Replicability

Institutional Sustainability

EPIU's continued role as accredited entity with strong partnerships across government and international agencies

Financial Sustainability

Community business models generating revenue from biomass-based energy with linkages to national green finance schemes

Technical Sustainability

Local capacity for operation and maintenance of technologies with integration into national monitoring systems

Policy Sustainability

Alignment with Armenia's NDCs and Rural Development Strategy, informing development of incentives for agro-waste reuse

The exit strategy involves full transfer of responsibilities to community-level actors and national institutions, with EPIU continuing oversight through regular programming.

Expected Impact

210K

tCO₂eq Reduced
Through avoided open
burning and fossil fuel
substitution

1,500+

Households
Benefiting from
improved energy
access and reduced
indoor pollution

20+

Public Buildings
Retrofitted with clean
bioenergy heating
systems

This project will serve as a scalable model for rural resilience and climate mitigation in Armenia and beyond, demonstrating how agricultural waste can become a valuable resource in the transition to a low-carbon future.





Thank you!

Ministry of Environment

Republic of Armenia

www.env.am