

## Where finance and green technologies meet

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### Key results as of 30 September 2021

- GEFF in Armenia has financed 249 projects worth EUR 21.1 million through Partner Financial Institutions (PFIs), thus reducing primary energy usage by 98,560 MWh/year, saving 24,250 tonnes of CO<sub>2</sub> annually and enabling 5,227 m<sup>3</sup>/year in water savings.
- 33.5 MW installed capacity of renewable energy projects make it possible to avoid 20,700 tonnes of CO<sub>2</sub> annually.
- 1,450 EE and RE technologies provided by 169 vendors through 21 sites around Armenia are made accessible through the [Green Technology Selector](#).

## New PFIs joining the expansion of green financing resources and opportunities in Armenia

ACBA Leasing and ArmSwissBank join the GEFF's second phase in Armenia, marking the strong commitment of the EBRD, the donors (GCF and CIF), and the financial institutions themselves to further support the country's transition to a green economy. ACBA Leasing and ArmSwissBank, after successfully disbursing green funds through GEFF's first phase with loans amounting to

US\$ 2 million and 2.5 million, respectively, have joined with new tranches of US\$ 5 million and 4 million.

The new phase of financing covers **Climate Adaptation** investments in addition to the previously financed high-performance technology investments in EE and RE.

## Green finance and ESCOs

With rising **energy prices** and growing awareness of energy conservation, many **organisations** around the world are taking steps to reduce energy use. Energy service companies (ESCOs) play a key role in these developments, since they are committed to identifying the potential for EE or RE investments in the client's facility, then implementing the most cost-efficient Energy Efficiency Measures

(EEMs). These services may also include providing or arranging financing from financial institutions. Based on the signed Performance Contract, the client and the ESCO share the savings generated through the implementation of EEMs. Thus, the income of the ESCO is strongly connected with the proper design, implementation, and maintenance of EEMs.



Usually, the ESCOs are engineering and consulting firms, equipment manufacturers (**Siemens**, **Johnson Controls**, etc), vendors, or utility companies. Such companies know that in order to stay competitive they need to offer integrated solutions combining their technical expertise with financial support for comprehensive energy services. Although there is no regulation of ESCO activities in Armenia, many projects have been successfully implemented. For **example**, over the past few years several local ESCOs have installed solar PV stations at client premises. The advantage for the clients is an immediate reduction in electricity costs due to

the generation of electricity, even though the clients do not have to make any financial investment. Rather, the ESCOs obtain and repay the bank loans required for construction. After a few years, once the stations have paid for themselves, they will become the property of the client.

Overall, the highly specific nature of such cooperation indicates that both financial institutions and ESCOs understand the profitability of such projects, and because potential is very high nationwide it is possible to develop sustainable financing through commercial banks.

## Green construction – achievements and opportunities for growth



In 2016, Armenia adopted a new building insulation code which introduced the classification of buildings based on EE classes (A++ to E) and prohibited the design and construction of new projects with an EE class lower than C. Although this was generally a challenge for the entire housing construction sector, in recent years residential buildings have already been built above the minimum requirements in Armenia, for [example](#) with EE class B+. The energy consumption for heating in such buildings is more than 40% lower than in most existing ones. Developers of such EE buildings admit that, whereas initially the idea was to use high EE class as a marketing ploy, now this brings a significant financial advantage thanks to better technologies ranging from high-performance building envelopes to energy-efficient construction machinery.

Instead of traditional thick stone walls, developers began to use thinner and lighter concrete blocks, or ventilated facade systems. So, even though the construction price of an EE building was 10-15% higher compared to a conventional one, developers still benefitted from the high demand for apartments, the additional usable area available

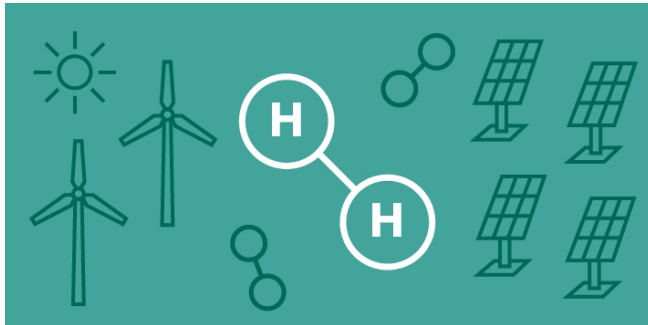
when using thinner and lighter walls, and reduced construction time.

High demand in the housing market is supported by government [incentive](#) (article 160) policies. Most apartments are purchased using an income tax refund mechanism. There is also a programme to subsidise the interest rate on mortgage loans for young families. There are various support measures for EE housing from [donors](#), for both end-buyers and developers. When purchasing an EE apartment, buyers can receive a loan at a preferential interest rate; also, demand for such apartments remains high and their value is maintained on the secondary market. In turn, developers can receive free technical support in EE building project design and the energy passport process.

Despite the economic challenges, housing construction shows stable growth from year to year. The building sector has tremendous potential for reducing greenhouse gas emissions, not only in the capital but also in other regions of the country with largely untapped potential for EE housing construction.



## The potential of green hydrogen development in Armenia



The hydrogen economy is focused on producing clean green hydrogen energy as an alternative energy source with near-zero greenhouse gas emissions. In a coordinated and collective effort to reduce reliance on fossil fuels, the use of renewable and near-zero-carbon energy sources to produce clean hydrogen is supported by governments and industry worldwide in a coordinated and collective effort to reduce reliance on fossil fuels. Highly specialised companies in the developed world focus on hydrogen research, engineering, technology and infrastructure solutions in order to accelerate the commercial maturity of clean hydrogen production, storage and distribution of gaseous and liquid hydrogen.

Hydrogen energy production technologies have been a topic of interest in Armenia since the early 2000s, when Armenian-American research in fuel cells was established to leverage the local scientific potential of the country. A well-known local company developed pilot-scale production and sought investors to bring the manufacturing process to a larger scale. The company even received a U.S. government scientific grant of US\$ 500,000 to produce forward-looking technology to transform hydrogen and oxygen into electricity. However, because of the involved costs and the availability of low-cost oil and natural gas at that time, the desired environmentally friendly technology was still far from being commercially viable and the hunt for venture capital was unsuccessful.

Change came once Western multinationals became interested in the subject, mindful of the

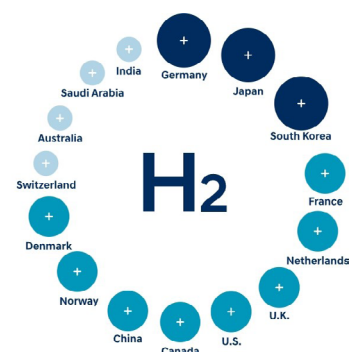
eventual depletion of the Earth's hydrocarbon reserves. This applied in particular to U.S., European and Japanese carmakers, who began to show more commitment to fuel-cell development programmes.

In terms of regional advancement, a major step was taken by the Georgian government in 2020 towards tapping into the country's potential to generate green hydrogen, which could then be blended and transported to end-users through existing gas pipelines – an opportunity that has been deeply explored by EBRD.

Armenia is a country with scarce natural resources and limited access to the global hydrogen supply chains. Nonetheless, using its local scientific background and experience in hydrogen research, and also leveraging diaspora-linked networks and lessons learned in EBRD regions, the country could tap into the development and testing areas in green hydrogen advancement, particularly considering the substantially lower costs in Armenia as a crucial advantage over potential competitors in the West.

Entry into these fields could be gained by developing relationships with the research and development hubs of the 15 high-ranking countries in green hydrogen market development presented in a Bloomberg [Index](#).

### H<sub>2</sub> Leadership by Country



To learn more about how EBRD approaches the development of green hydrogen in its regions, please click [here](#).

*\* Interesting fact: In support of a carbon-free future for the planet, the flame at the 2020 Summer Olympics in Tokyo's National Stadium was powered for the first time by hydrogen throughout the games.*

## How climate change affects the Armenian businesses and how Armenian MSME business leaders feel about it

In its efforts to contribute to an inclusive economy overall, to support PFIs in developing their green portfolios and to empower MSMEs to seek greener and more inclusive development paths, the EBRD's GEFF Gender component conducted a multi-faceted study on gender, climate change, and green finance in Armenia.

The survey of businesses led by both women and men in key MSME sectors vulnerable to climate change exhibited that:

- Armenian women and men nationwide acknowledge that climate change threatens their businesses and lives,
- awareness is somewhat higher among women than men (70% vs 59%, respectively),
- climate change mitigation is more present than climate change adaptation,
- among the strongest impediments to the adoption of green technologies are the:
  - relatively short maturity of loans,
  - lack of alternative or in-kind sources of funding (grants, technical assistance, etc.),
  - absence of collateral (a major requirement when applying for financing), particularly among women

The survey also shed some light on what female and male business leaders would potentially invest in, if they had dedicated financial resources:

### BUSINESS, WOMEN:

Production and processing equipment  
Energy-saving printing devices  
Energy-saving ventilation systems

### BUSINESS, MEN:

Energy-saving vehicles  
Solar PV power generators  
Production and processing equipment  
Refrigeration systems

On 30 September 2021, GEFF in Armenia held an online event, "An Inclusive Green Economy for Armenia: Strengthening Women and Men-led MSMEs for a Sustainable Future". In addition to presenting the [key findings](#) of the research, the event provided a forum for representatives from the financial, business and policy-making sectors to discuss ways to strengthen the position of women MSME-owners to secure a sustainable future for Armenia by joining private and public initiatives using both online and offline communication channels.

## Featured GTS technology: VRF system

One type of heat pump, known as a VRF (Variable Refrigerant Flow) system, is a high-tech development in multi-split air conditioning systems. The VRF system has one outdoor unit and many indoor units. Such systems are used for heating and cooling in residential and commercial buildings. The high level of energy efficiency in such systems is due to the use of compressors and fans with variable capacity and DC motors, which allows significant energy savings at partial loads. In addition, the Heat Recovery VRF system allows simultaneously cooling and heating in different rooms, while using a minimum amount of energy.

Browse through our [Green Technology Selector](#) to view more heat pump technologies.



## Success Stories

**Tiga Shin LLC** – specialises in the construction of multi-storey buildings, as well as the rental and sale of formwork. Until recently, the company had rented an obsolete tower crane manufactured in the USSR. For the construction of two residential multi-storey buildings, the company purchased a new tower crane with a 60% decrease in energy resource use.



Investor	Tiga Shin LLC
Location	Yerevan, Armenia
Investment	Tower crane
Investment size	US\$ 138,500
Energy savings	147 MWh per year
Payback	10 years
CO <sub>2</sub> savings	36 tonnes per year
Impact	High quality of service, low operational costs
Donor	GCF, CIF

**Evrika Group LLC**, which owns a chain of supermarkets and has bakeries in some of its stores, replaced old bakery equipment with new units in two locations. With the new Italian dough mixers and also ovens of French and Italian origin, the company can decrease energy use by 35% and further contribute to overall operational efficiency.



Investor	Evrika Group LLC
Location	Yerevan, Armenia
Investment	Bakery equipment
Investment size	US\$ 84,828
Energy savings	161 MWh per year
Financial results	Payback in 6 years
CO <sub>2</sub> savings	35 tonnes per year
Impact	High quality production, increased cost-efficiency
Donor	GCF, CIF

Browse our website to view more [Success Stories](#).

**GEFF** | Green Economy Financing Facility  
armenia@ebrdgeff.com  
+374 10 542721  
[www.ebrdgeff.com/armenia](http://www.ebrdgeff.com/armenia)

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