PROGRESS REPORT

Consultations with stakeholders and validation of the Projects' ideas (Deliverable 2)

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Table of Content

List of Acronyms

AF	Adaptation Fund
CIF	Climate Investment Funds
GBP	Green Bond Principles
GCF	Green Climate Fund
GEF	Global Environmental Facility
GHG	Green House Gas
EE	Energy Efficiency
MDB	Multi-lateral Development Bank
Mtoe	Million tons of oil equivalent
NDA	National Designated Authority
NDC	Nationally Determined Contributions
R2E2	Armenia Renewable Resources and Energy Efficiency Fund
RE	Renewable Energy
TES	Total Energy Supply
TFC	Total Final Consumption

I. Scope of the Engagement

1.1 Project background

The Armenia Renewable Resources and Energy Efficiency Fund (R2E2) is a professional and experienced entity in the field of energy efficiency and renewable energy in the Republic of Armenia, which was established in 2006. R2E2 is implementing a wide range of activities aimed at promoting investments in energy efficiency and renewable energy sectors, fostering market development in the sphere of Armenia's energy efficiency and renewable resources, enhancing reduction of technological influence on environment and human health, developing mechanisms aimed at increasing the level of reliability of energy security and energy system.

One of the key objectives of Fund's operations is to promote "green energy" practices in the deprived regions of the country and make it affordable to the mostly vulnerable population, thus addressing "energy poverty" issues for the population. In doing so, R2E2 has partnered with number of international organizations and donor agencies to implement innovative and targeted support to the beneficiaries. Recognizing the outstanding achievements of R2E2, Armenia's National Designated Authority (NDA) for the Green Climate Fund (GCF), has nominated R2E2 as a Direct Access Entity (DAE) of the GCF. The "Environmental Project Implementation Unit" under the Ministry of Environment was already accredited in February 2019 under the project management modality with a project volume cap of to USD 10 mln (Micro). Along with R2E2, two commercial banks were issued with the NDA nomination letter and they are also currently pursuing the accreditation process.

This assignment will support the Armenia Renewable Resources and Energy Efficiency Fund (R2E2) in its efforts to strengthen its capacity in attracting climate finance and pursue accreditation as a Direct Access Entity (DAE) to the Green Climate Fund (GCF). It is part of the GCF-supported Readiness and Preparatory support programme titled "Readiness Support for accreditation gap assessment, capacity building and pipeline development for potential accredited entity", which goal is to implement comprehensive assessment of Fiduciary Standards for potential accreditation with GCF, elaboration of respective guidelines and methodologies, capacity building and pipeline development.

This assignment under the Readiness Programme aims to design project portfolio for R2E2 Fund as a potential accredited entity to the GCF (targeting accreditation under the "small" category – from 10 mln to 50 mln USD), following review of the national long-term policies in the domain of energy efficiency and renewable energy and in close consultations with stakeholders (relevant ministries and agencies, municipalities, private sector representatives and international development partners). The final deliverable of this assignment is two developed Concept Notes for the selected projects structured in accordance with respective procedural manuals and templates.

1.2 Objective of the Report and methodologies

The objective of this Report is to identify immediate intervention areas for channeling concessional financial instruments and proposing innovative frameworks for financing renewable and energy efficiency scale-up oriented projects in Armenia.

The methodology for doing so comprised of the following key pillars:

- Desk research aimed at identification of the market constraints (gaps and barriers), available financial instruments and frameworks, as well as initial mapping of potential intervention areas;
- Designing long-list of potential projects and further validation exercise with the engagement of the Armenia Renewable Resources and Energy Efficiency Fund's leadership and key stakeholders;
- Defining 2 priority projects, designing intervention framework and consultation with the sectorial experts on their feasibility and key conditions;
- Proposition of the financing framework for projects' implementation and design of Concept Notes in accordance with GCF standards.

II. Options for financing renewable energy and energy efficiency

2.1 Overview of the key sources of the climate finance

Among the potential sources of funding, the following should be considered:

- Climate funds and MDBs,
- Placement of sovereign and corporate green bonds;
- Closed-end investment funds;
- Equity crowdfunding platforms;
- Business angel networks;

2.1.1 International and multilateral financing frameworks

The Government of Armenia is extensively looking for international best practices in the field of innovative financial instruments to fuel its ambitions agenda of ensuring environmental resilience and climate change adaptation and mitigation. Ministry of Environment, designated national authority responsible for the policy formulation has necessary knowledge and professional capabilities that are used for implementation of consultations through different TA projects, environmental Foras and other consultative frameworks to figure out and adopt such innovative financial instruments.

Two sub-sections below, briefly summarize rationale of initiatives currently being considered by the Ministry. Channeling of respective expertise in this domain will provide with critical boost to the aspirations aimed at adoption of innovative instruments.

Debt 4 Environment Initiative

In 2018, the Ministry has come up with proposal to launch and pilot "Debt 4 Environment" initiative aimed at partial offsetting of developing countries' foreign debts to developed countries and other donors against implementation of climate related

commitments taken within the Paris Agreement. With support from World Bank (WB) initial round of consultations commenced aimed at better understanding various options of innovative financing solutions, with a focus on contributing to the environmental and climate agenda. As such, the World Bank supported the GoA by developing a Technical Roadmap, together with the relevant Communications Strategy, which outlines pros and cons of various environmental financing options, while stressing the importance of underlying institutional, technical and governance arrangements that would be needed regardless. Complementary to these efforts, the Bank has also supported GoA to develop a pilot project pipeline in key environmental sectors by designing Concept Notes for the following 3 projects:

- **Increasing forest coverage in the Republic of Armenia** (*$ 220 mln project throughout 2050*) – targeting: 1) mapping and clarification of forest boundaries and establishment of forest cadastre, 2) A/reforestation activities through direct planting of forests and preventive measures, and 3) establishment of nurseries for cultivation of endemic species.
- **Mining sites cleanup and land reclamation** (*$ 90 mln project throughout 2040*) aimed at: 1) assessment and development of Strategic Plan that includes mapping of abandoned mines, establishment of environmental monitoring of soil, water and air pollution in abandoned mining sites and affected areas, identification of environmental "hot spots", 2) cleanup and reclamation of two abandoned mining sites and affected areas, and 3) scale-up of cleanup and reclamation of other abandoned mining sites.
- **Lake Sevan integrated environment improvement** (*$ 50 mln project throughout 2023*) foreseeing: 1) lake and river restoration and improvement of wastewater wanagement through collection and treatment of wastewater, collection and safe disposal of solid waste from targeted rivers systems and restoration measures to improve Lake Sevan coastal ecosystems, and 2) improvement of watershed management aiming at reduction of environmental stresses from the Lake basin through the implementation of nonpoint source pollution mitigation and prevention measures.

Development of project pipeline has been carried out with the overall objective to help strengthen Armenia's case when approaching and negotiating with its bilateral creditors and other donors and showcase the most suitable projects based on Armenia's environmental and climate resilience objectives, attracting interest in the operation, and maximizing its positive outcomes.

Green Bonds

Green bonds are designated bonds intended to encourage sustainability and to support climate-related or other types of special environmental projects. More specifically, green bonds finance projects aimed at energy efficiency, pollution prevention, sustainable agriculture, fishery and forestry, the protection of aquatic and terrestrial ecosystems, clean transportation, clean water, and sustainable water management. They also finance the cultivation of environmentally friendly technologies and the mitigation of climate change.

Green bonds come with tax incentives such as tax exemption and tax credits, making them a more attractive investment compared to a comparable taxable bond. These tax advantages provide a monetary incentive to tackle prominent social issues such as climate change and a movement to renewable sources of energy. To qualify for green bond status, they are often verified by a third party such as the Climate Bond Standard Board, which certifies that the bond will fund projects that include benefits to the environment.

Currently, most green bond issuers are sovereign and development banks, but the number of companies is increasing. And if there are no questions about the targeted use of funds raised by sovereigns or development banks, the use of funds by companies has certain risks. To this end, the International Capital Market Association (ICMA) has developed the Green Bond Principles. The principles of green bonds help establish the integrity and uniformity of the green bond market by setting standards for transparency, disclosure and reporting. The Green Bonds Principles also contain a list of eligible investment projects, but the Principles remain voluntary

2.1.2 Climate Funds

Green Climate Fund (GCF)

Armenia has established partnership with the Green Climate Fund since 2016, with the Ministry of Environment serving as Designated National Authority. The access to GCF funding is available through:

- **Readiness and Preparatory Support Grant Programmes** (with annual cap at 1 mln USD) aimed at capacity enhancement of DNA and other national stakeholders. For applying to these grants, nomination letter from the Minister of Environment is required.
- **International/regional accredited entities**, typically multilateral development banks and international organizations (13 of which has their offices in Armenia). For nominating projects by these entities for GCF funding consideration non-objection letter from the Minister of Environment is required;
- **Direct access (national) entities**. As of May 2020 "Environmental Project Implementation Unit" State Non-Commercial Organization (EPIU) has accredited with GCF (since 28 February 2019) with cap for each individual project (grants only) established as 10 mln USD. Here as well non-objection letter from the Minister of Environment is required;

  Armenia Renewable Resources and Energy Efficiency Fund is in the process of accreditation and two commercial banks ("AmeriaBank" CJSC and "ArmSwissBank" CJSC) received nomination letters from NDA during the first quarter of 2020. All three organizations are targeting to be accredited within the range from 10 to 50 mln USD for each project.

The Green Climate Fund provides its financial support (*grants, concessional loans, equity and risk guarantees*) to the projects that:

- **Identified through "GCF – Armenia Country Cooperation Programme"** – multi-year document defining key priority sectors, projects and consultation framework.
- **Nominated by the NDA** – non-objection letter is required prior to commencement of negotiations;
- **Corresponds to the GCF 8 Impact Areas and investment criteria** – with Additionality concept as the most important one (leveraging ratio of funds requested).

"GCF – Armenia Country Cooperation Programme" has been designed within the framework of Readiness and Preparatory Support Programme implemented by EPIU and contains the comprehensive list of priority sector and list of 6 priority projects with total budget around 200 mln USD. However, preparatory works to design the second Country Programme for the 2nd replenishment round (2024-207) are under way.

Currently there are no projects implemented by national accredited entity. 3 projects are being implemented by international accredited entities: "De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits" (UNDP), "Green Cities Facility" & "GCF-EBRD CEFF Co-financing Programme" (EBRD, multi-country), "High Impact Programme for the Corporate Sector" (EBRD, multi-country) and "Forest resilience of Armenia, Enhancing Adaptation and Rural Green Growth via Mitigation" (FAO).

Adaptation Fund (AF)

Armenia is accredited with the Adaptation Fund since 4 November 2016, with "Environmental Project Implementation Unit" serving as 25th National Implementing Body (first country in Eastern Europe with National Implementing Body having been granted "direct access" to the Fund's resources). The "entity accreditation cap" is equivalent to 4 mln USD which is fully utilized at the moment with 2 big projects in the pipeline: "Artik city closed stone pit waste and flood management pilot project" (1.44 mln USD) and "Strengthening land based adaptation capacity in communities adjacent to protected areas in Armenia" (2.51 mln USD).

The Adaptation Fund provides its grant support to the projects that:

- **Assist developing-country** that are particularly vulnerable to the adverse effects of climate change in meeting the costs of concrete adaptation projects and programmes in order to implement climate-resilient measures.
- **Represent the following priority sectors**: agriculture, disaster risk reduction, food security, forests, rural and urban development, water management.
- **Corresponds to the Strategic Policies and Impact Areas**.

Armenia could potentially benefit from increasing the country cap to 10 mln USD during re-accreditation round (finalized during the first quarter of 2022 2021).

Climate Investment Funds (CIF)

The CIF has approved a USD 40 million investment plan for Armenia within the framework of the Scaling up Renewable Energy Program (SREP) comprised of around

USD 14 million of grants and USD 26 million of concessional loans. The USD 40 million of SREP funding is expected to catalyze roughly 4.5 times as much investment, most of which from the private sector (as equity or debt), and the commercial lending windows of multilateral development banks, including IFC, ADB, EBRD. Implementation of renewable technologies, geothermal (discontinued in 2019 per request from the Government) and solar PV pilot projects in Armenia will help reduce investment and implementation risks, develop local markets and expertise, provide incentives and opportunities for conducting government reforms, in particular setting appropriate tariffs. Along with enhanced expertise, it is expected that project development costs will decrease, and some technologies may be possible to produce locally.

Consideration of Government's strategic objectives and the clear recognition that SREP funding should be used to have a transformative impact on the renewable energy sub-sector resulted in consideration of the following five criteria:

- **Potential for scale-up of the technology.** The amount of developable resource potential relative to the other technologies, as measured by production potential (GWh). Resources with higher production potential were given higher priority.
- **Market maturity/immaturity.** The extent to which the technology is used or the resource is already exploited in Armenia, or there is financing already available from other donor programs. Resources or technologies which are already well-known and well-developed in Armenia (such as small hydropower generation), were given lower priority because they already had sufficient support or private sector interest. Resources or technologies which already have financing available through other donor programs (such as geothermal heat pumps, solar thermal heating and rooftop solar PV) were also given lower priority because there is already financing available through other MDB programs (such as financing available through local banks from EBRD and IFC).
- **Cost-effectiveness.** The cost of the electricity or heat generated by the technology, as measured by the levelized energy cost.
- **Potential for job-creation**. The extent to which use of a technology or exploitation of a resource creates jobs.
- **Effect on power grid stability.** The extent to which certain technologies had a negative or positive impact on system operation and dispatch. Technologies with no impact, or a positive impact on grid stability were prioritized over those with a negative impact.

Three following investment priorities emerged from the analyses and discussions with stakeholders:

1) geothermal power,
2) utility-scale PV, and
3) geothermal heat pumps and solar heating.

Global Environmental Facility (GEF)

The Global Environment Facility (GEF) serves as an independent financial mechanism aimed at helping tackle the most pressing environmental issues globally, while also contributing to fulfillment of commitments made by countries under signed and ratified Conventions. Since 2018, the Minister of Environment has been assigned as the GEF Operational Focal Point in Armenia.

During its operations, GEF has provided around USD 43 million grant resources to Armenia to implement 35 national environmental programs, of which 15 (approximately USD 19 million grant resources) have been allocated to support climate change issues in the country. Armenia has also received grant support from GEF in the context of financing 14 regional environmental projects (the total grant budget for regional projects amounts USD 179 million), 5 of which have also been channeled to address regional climate change issues (total grant budget - USD 139 million).

Under the Small Grants Programme, the GEF has also provided a USD 1.5 million grant resources to fund climate change mitigation projects, which press has been implemented by NGOs/ community-based organizations.

With the health of the global environment worsening, the GEF has received strong support for its new four-year investment cycle, (known as GEF-8), to help safeguard the world's forests, land, water, climate, and oceans, build green cities, protect threatened wildlife, and tackle new environmental threats like marine plastic pollution. The GEF-8 Programming Directions provides the strategic framework for the next cycle of the GEF investments.

GEF funding criteria

- **Eligible country**: Countries may be eligible for GEF funding in one of two ways: a) if the country has ratified at least one from the 8 conventions the GEF serves and conforms with the eligibility criteria decided by the Conference of the Parties of each convention; or b) if the country is eligible to receive World Bank (IBRD and/or IDA) financing or if it is an eligible recipient of UNDP technical assistance through its target for resource assignments from the core (specifically TRAC-1 and/or TRAC-2).
- **National priority**: The project must be driven by the country and be consistent with national priorities that support sustainable development.
- **GEF priorities:** to achieve the objectives of multilateral environmental agreements, it is required that the GEF support country priorities that are ultimately aimed at tackling the drivers of environmental degradation in an integrated fashion. For this reason, the focal areas (Biodiversity, Climate Change Mitigation, Land Degradation, International Waters and Chemicals and Waste), which remain the central organizing feature in the GEF-8 Programming Directions, provide countries with the opportunity to participate in selected "Impact Programs".
- **Financing**: The project must seek GEF financing only for the agreed incremental costs on measures to achieve global environmental benefits.

- **Participation**: The project must involve the public in project design and implementation, following the Policy on Public Involvement in GEF-Financed Projects and the respective guidelines.

2.1.3 Financing Instruments through MDBs

"Green Cities Facility" (co-funded by EBRD and GCF)

This is multi-country project with a budget equivalent to 285.4 mln USD (GCF financing 33.6%). Armenia's indicative budget comprises 60.7 mln USD, with the following distribution of financing among partners: EBRD (40.3 mln USD loan) and GCF (5.16 mln USD grant and 15.24 mln USD concessional loan).

The Facility is based on a country-driven and evidence-based approach that systematically prioritizes and then finances transformational municipal climate-related infrastructure investments. The Facility addresses multiple barriers to climate action through four components that:

1) deliver policy and strategy support to cities to assist them to prioritize actions;
2) facilitate green city infrastructure investments;
3) build capacity of key stakeholders; and
4) facilitate and provide a pathway for cities to access green finance and capital markets.

This systematic approach is based on a well-developed and tested methodology to develop a Green City Action Plan (GCAP). Municipalities use the GCAP to steer their own green urban planning initiatives and investments and to guide monitoring, reporting and further planning.

The Facility will make available concessional financial instruments. These instruments will be calibrated to address the incremental costs of low-carbon and climate-resilient infrastructure, which include higher upfront capital costs compared to baseline market-entry barriers arising from climate technologies' underrepresentation in local municipal sectors and climate externalities. Overall, the GCF funding will allow the Facility to take on more ambitious investments, more effectively target innovative solutions in new market segments, and further incentivize market participants by reducing financing costs and risks. The Facility's investments will focus on urban infrastructure in six sectors:

(1) low-carbon and climate resilient buildings,
(2) water and wastewater,
(3) solid waste,
(4) urban transport,
(5) municipal energy systems (district heating / cooling) and
(6) street lighting.

To ensure a paradigm shift is realized, cities' access to capital beyond public finance will be critical. The Facility will therefore work with a range of stakeholders, from cities to national agencies, to develop the tools and skills that cities need to attract private sector finance for green investments, particularly in local capital markets.

"Sustainable Energy Financing Facilities" (co-funded by EBRD and GCF)

This is multi-country project with budget equivalent to 1.4 bln USD (GCF financing 27.3%). Armenia's indicative budget comprises 74.7 mln USD, with the following distribution of financing among partners: EBRD (54.3 mln USD loan through EIB) and GCF (2.02 mln USD grant and 18.38 mln USD concessional loan).

The Project is aimed at promoting financing for private sector investments through local financial institutions. The program funded by EIB loan, E5P grant and co-funded by Yerevan municipality is aimed at energy effective reconstruction of about 60 kindergartens. The UNDP-GCF project provides technical assistance to the program. The global environmental goal is to reduce GHG emissions in the public sector by eliminating obstacles to investing in energy efficiency sector.

The Programme will contribute to achieving a paradigm shift by creating new and significantly scaling up existing markets for commercial sustainable energy, energy efficiency and climate resilience financing. By doing so it will contribute to the aim as stated in the Paris Agreement to "make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development", through an innovative combination of financial support, capacity building and technology transfer and supported by a deep level of country ownership.

The Programme will deliver scale over the next three years by financing, via local PFIs, scalable and replicable renewable energy, energy efficiency, and climate resilience projects across the industrial, commercial, residential, transport, and agricultural. It will address multiple market barriers along the technology supply chains and unlock the potential of private sector finance by:

- Building the capacity of all actors along the climate technology supply chain, in particular by encouraging local PFIs to establish and grow climate financing solutions for RE, EE and CR that currently either do not exist at all, or are underserved;
- Stimulating demand for best-available climate technologies by providing much-needed long-term finance that more closely matches the financial characteristics of RE, EE and CR projects; and
- Facilitating the creation of new markets by demonstrating the profitability and enhanced competitiveness of climate technologies and ultimately de-risking climate investments to leverage a growing level of funding from the private sector over time.

2.1.4 Green Bonds

Sovereign Green Bonds

The green bond market has deepened and expanded in recent years, with diversified investors such as various corporate entities and local governments. Increased investor demand includes large sovereign wealth funds and pension funds committed to responsible investment and to the integration of Environmental, Social and Governance (ESG) factors.

Nineteen sovereigns have now issued green bonds to finance green projects in governments' budgets, exceeding USD 130 billion[1]. Amid the COVID-19 pandemic, sovereign green-bond issuers have kept the issuance momentum in 2020 with 40% of all the outstanding sovereign green bonds in 2020 consisting of first time issuances by countries including Germany, Hungary and Thailand. In 2020 emerging market economies issued sovereign green bonds accounted for USD 10 billion. This growth continues into 2021 where the issuances in only the first 3 months of the year already account for over 20% of all outstanding sovereign green bonds.

Despite its rapid growth, the size of the sovereign green bond market is quite small compared to traditional bonds. For example, in the OECD area, sovereign green bonds account for around 0.2% of all government debt securities.

Although still nascent, this momentum is expected to continue throughout 2021 with prospective issuers including Brazil, Canada, Colombia, Mexico, Slovenia, Spain and the United Kingdom. The sovereign green bond market is also expected to keep growing over the longer horizon, as an increasing number of governments assess green bond issuance as a valuable tool to display moral leadership on climate change and sustainability, and to fund commitments under the Paris Agreement.

Global guidance on "green bonds" comes from the International Capital Markets Association which produced the Green Bond Principles[2], a set of voluntary process guidelines intended for broad market use, developed by a range of investment and multilateral banks, including the World Bank and IFC. The Green Bond Principles set the foundations for the elements to be incorporated within a Green Bond Policy Framework - a critical document to give credibility to a green bond.

The Green Bond Principles (GBP), together with the Social Bond Principles (SBP), the Sustainability Bond Guidelines (SBG) and the Sustainability-Linked Bond Principles (SLBP) outline best practices when issuing bonds serving social and/or environmental purposes through global guidelines and recommendations that promote transparency and disclosure, thereby underpinning the integrity of the market[3]. The principles also raise awareness of the importance of environmental and social impact among financial market participants, which ultimately aims to attract more capital to support sustainable development.

[1] OECD (2022), *OECD Sovereign Borrowing Outlook 2022*, OECD Publishing, Paris, available at https://doi.org/10.1787/b2d85ea7-en.

[2] https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/

[3] Green Bond Principles – Voluntary Process Guidelines for Issuing Green Bonds, June 2021, available at https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf

The GBP seek to support issuers in financing environmentally sound and sustainable projects that foster a net-zero emissions economy and protect the environment. GBP aligned issuance should provide transparent green credentials alongside an investment opportunity. By recommending that issuers report on the use of Green Bond proceeds, the GBP promote a step change in transparency that facilitates the tracking of funds to environmental projects, while simultaneously aiming to improve insight into their estimated impact.

The GBP provide high level categories for eligible Green Projects in recognition of the diversity of current views and of the ongoing development in the understanding of environmental issues and consequences, while referring when needed to other parties that provide complementary definitions, standards and taxonomies for determining the environmental sustainability of projects. The GBP encourage all participants in the market to use this foundation to develop their own robust practices, referencing a broad set of complementary criteria as relevant.

Green Bonds are any type of bond instrument where the proceeds or an equivalent amount will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible Green Projects and which are aligned with the four core components of the GBP.

It is understood that certain eligible Green Projects may have social co-benefits, and that the classification of a use of proceeds bond as a Green Bond should be determined by the issuer based on its primary objectives for the underlying projects. Bonds that intentionally mix eligible Green and Social Projects are referred to as Sustainability Bonds, and have specific guidance.

It is important to note that Green Bonds should not be considered fungible with bonds that are not aligned with the four core components of the GBP. Bonds issued under earlier Green Bond Guidance released prior to this version are deemed consistent with the GBP.

In April 2018, Fiji became the first emerging market sovereign to list a green bond on London's International Securities Market, raising capital that will support more than 80 domestic climate mitigation and adaptation projects[4].

Fiji has significant exposure to climate change; therefore, this represents a vital investment in the country's future, which will support renewable energy development, avoiding deforestation projects and upgrading infrastructure for climate resilience. Proceeds from the landmark green bond will be used to finance the sustainable management of natural resources, renewable energy, water and energy efficiency, as well as clean and resilient transport and waste-water management.

As a pioneer issuer, Fiji sought to set high standards for other nations to follow suit and was particularly supportive of the establishment of a robust and transparent process.

[4] London Stock Exchange Group, 2019. Navigating the Green Finance Landscape: Exploring the market drivers and financial instruments enabling the global transition to a sustainable, low carbon economy. A comprehensive guide. Available at https://docs.londonstockexchange.com/sites/default/files/documents/lseg_green_finance_issuer_guide.pdf

This transparency has provided future sovereign countries with a roadmap they can follow when issuing their own green bond.

The IFC and the World Bank supported Fiji's effort. The first tranche, which floated 40 million Fijian dollars (about $20 million), drew unprecedented demand from investors and was oversubscribed by more than double that amount[5]. The bond helped Fiji create a new way to mobilize finance for development—and a market for private sector capital seeking investment opportunities that support climate resilience and adaptation.

Fiji's sovereign green bond aims to raise a total of USD 50 million (a small fraction of the over $4 billion estimated to be necessary in the next ten years to reduce the country's vulnerability to climate change) to support climate change mitigation and adaption. Likely projects to be financed with proceeds from the green bond include investments in crop resilience, flood management in sugarcane fields, reforestation, and rebuilding schools to better withstand violent weather. They will all follow the internationally developed Green Bond Principles. Fiji will also use bond proceeds for projects supporting its commitment to achieve 100 percent renewable energy and reduce its carbon emissions in the energy sector by 30 percent by 2030.

Corporate Green Bonds

Green bonds, along with their close cousins, social and sustainability bonds, are one of the most visible market-based initiatives in green finance and their origins can be traced back to issues from the European Investment Bank (EIB) in 2007 and the World Bank in 2008. The 2007 Climate Awareness Bond was an innovative structured-note, linked to the equity performance of the FTSE4Good Environmental European Leaders Index and raised over half a billion euros from retail investors. Since that time the International Capital Markets Association (ICMA) has established and overseen the Green Bond Principles, and later the Social Bond Principles and Sustainability Bond Guidelines, which provide for their respective areas. Becoming an established asset class with institutional investors, these instruments have significant potential. Issuance increased by an average of 50 percent per year to 2017, exceeded USD 200 billion in 2018 and continues to grow[6].

A green, sustainability or social bond ensures the use of proceeds for specific activities, that in turn reflect an issuer's broader green, sustainability or social framework. More than 130 green, social and sustainability bonds have raised over USD 33 billion in 13 currencies from 49 issuers in 18 countries, since 2015 (data up to 2019)[7].

These financial instruments have the potential to attract project finance into private sector entities (other than banks issuing Green Bonds) in certain sectors/sub-sectors. For issuers, green, social and sustainability bonds are a way to tap into fixed income investors

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5 https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/cm-stories/fiji-green-bond-for-a-greener-future

6 London Stock Exchange roundtable https://www.lseg.com/sites/default/files/content/documents/LSEG%20Green%20Bond%20Roundtable%20April%202019.pdf

7 London Stock Exchange https://www.lseg.com/markets-products-and-services/our-markets/london-stock-exchange/equities-markets/raising-equity-finance/market-open-ceremony/welcome-stories/london-stock-exchange-welcomed-yorkshire-water-finance-plc's-first-sustainability-bond

that wish to achieve green financing impact through the bonds that they invest in. There is a pool of approximately US$100 trillion of patient private capital managed by global institutional fixed-income investors. And there is a desire by many to integrate climate and sustainable investment approaches into their portfolios.

> *While Armenia has no experience with sovereign green bonds, that is not the case for commercial green bonds. In 2020 Ameriabank issued a Green Bond in EUR for the equivalent of USD 50 million, marking a milestone in the local financial market as the first ever Green Bond project in Armenia. The Green Bond was structured in accordance with internationally recognized ICMA Green Bond Principles. In February 2022 Ameriabank also announced the public placement of nominal, coupon, book-entry bonds with the total volume of USD 8 million and AMD 3 billion during the period from February 14 to April 22, 2022. It represents the first ever placement of green bonds via public offering in Armenia. The bonds' maturity was 27 months, with the coupon rate of 3.5% for USD bonds, and - 9.5% for AMD bonds. The par value of the bonds is USD 100 and AMD 100,000. The coupon periodicity is 3 months.*

Overall, however, the entire corporate bonds market in Armenia is still small despite the favorable regulatory framework and several reforms in the field. The largest issuer of the corporate bond market is the financial sector who prefers to attract funds via bonds versus deposits due to more favorable tax and reservation policies. As a result, the secondary market of corporate bonds is characterized by low liquidity.

2.2 Overview of the green finance practices

Armenia is recognized as one of the most climate vulnerable countries in the region of Europe and Central Asia. Such vulnerability creates clear risks for the country's economic and social development. This is well reflected in the ambitious climate agenda and the Nationally Determined Contribution (NDC) of Armenia under its commitment to the United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement.

In this context, the Armenian government also considers a further enhancement of the NDC by defining a more ambitious set of targets and by making them more actionable. In particular, this aims at strengthening the existing institutional capacity, and more importantly, enhancing the financial mechanisms available in Armenia. The government of Armenia plans to significantly scale up the availability and volume of green finance instruments in Armenia and to secure a more pro-active participation of the private sector in implementing interventions in climate adaptation and mitigation domains.

The Armenian government has already been taking decisive steps towards the establishment of green finance infrastructure in the country with the assistance of international partners. For instance, in 2019 the European Union's new regional EU4Climate Initiative and the EBRD's Green Economy Financing Facility (GEFF) programme, developed and co-financed with the Green Climate Fund (GCF), were launched in Armenia.

Thanks to these initiatives and those of other DFIs, a number of financial institutions in Armenia have become beneficiaries of international green credit lines and have been providing green financial products to businesses and households, locally. Government promotion, increasing awareness and available green financing have enabled growing presence of green product vendors.

As a key element of the Armenian government's strategy to promote an enabling framework for introducing environment resilient practices, green finance has been gaining weight as a core element of an innovative and sustainable financing toolset to move Armenia onto a more sustainable development path. In recent years, in line with the international trends and the commitments undertaken for example in Paris in 2015, the Armenian government has increasingly focused on providing support for investment in clean and resource-efficient products.

Armenia has already developed a range of legal and policy frameworks on addressing issues concerning climate change and a wider set of sustainable development agenda (e.g. Strategic Development Programme of the Republic of Armenia for 2012-2025). During the period 2013-14, nearly USD 200 million per year of climate-related development finance was committed to support mitigation and adaptation actions in Armenia. The level of the committed amount was lower than the average among the countries of Eastern Europe, the Caucasus and Central Asia (EECCA) (i.e. USD 303 million per year). The allocation of funds between mitigation, adaptation and multifocal (i.e. both mitigation and adaptation) projects were relatively well balanced (29%, 38% and 33% respectively) during the period. The energy, agriculture and water-related sectors got the largest committed amounts of climate-related development finance in 2013 and 2014 (approximately USD 162 million per year, or 67.8%) in the country.

Both bilateral and multilateral providers committed significant amounts of climate-related development finance. The largest contributor was Germany, as well as the World Bank Group, the Asian Development Bank, and the European Bank for Reconstruction and Development. A diverse set of financial instruments are used to deliver climate-related development finance to Armenia, including grants, concessional and non-concessional loans and equity, while loans are an instrument most widely used in terms of the absolute amount. Loan financing dominates as an instrument to deliver climate-related finance both in bilateral and multilateral channels. The Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) provide non-concessional equity financing for mitigation projects (e.g. energy and financial sectors).

International organizations, donor agencies and multilateral development banks were also active in provision of "green financing" to Armenian private sector and households through specifically designed on-lending facilities. During last 5 years approximately 100 mln USD were channeled through Armenian commercial banks in the form of loans to the SMEs and households aimed at increasing energy efficiency and introducing of renewable energy solutions (key donors: EBRD, GGF, French Development Agency, WB and KfW). However, Armenia's banking sector significantly under-utilizes potential of green financing, primarily due to lack of expertise (e.g. E&S Safeguards) and respective methodologies, addressing of which is the over-arching goal of this proposal. In accordance with the "2019 Joint Report on Multilateral Development Banks' Climate

Finance" Armenia has received 107 mln USD in 2019, compared with 45 and 132 mln USD in 2018 and 2017 respectively.

2.3 Mobilization of private finance

The following regulatory gaps are to be addressed to accelerate flow of green finance into the energy sector:

- Defining Green Taxonomy based on the international best practices and introduction through executive orders;
- Adoption of strategy for incentivizing green (sustainable) investments through policy, regulatory and fiscal incentives;
- Advancing requirements for Green procurement system;
- Introduction of flexible and competitive tariff system for utilization of energy storage facilities (at household, MSME level and small scale producers), as well as special approach towards tariff structure for large-scale energy storage facility that could potentially have an impact on entire distribution system;

Mobilization of private finance is very much dependent on the enabling policy and regulatory framework created by the Government. One of the first bold steps of the Government of Armenia in assessing current status and utilization level of green finance instruments encouraging more pro-active participation of the financial and private sectors in designing and implementing investment projects in climate adaptation and mitigation domains was "Scaling up Green Finance Practices in the Republic of Armenia" Project. Funded by Green Climate Fund.

The intervention framework of the Project was designed in the manner to implement comprehensive assessment of the constraints for further expansion of "green finance" practices, mapping of available instruments and coming up with comprehensive set of methodological, awareness raising and capacity building interventions. Based on the comprehensive review of international best practices (country case studies and EU Green Taxonomy) the outline of the proposed Green Finance Taxonomy has been designed, discussed with the stakeholders and submitted to the consideration of the Central Bank of Armenia.

Review of submitted deliverables and consultations with key experts and stakeholders engaged reveals the following lessons learned that should be considered for advancing private finance:

1. **Institutional champions should be better positioned and empowered to deliver green finance advancement agenda.** This should be done at the levels of national policy making and advocacy, as well as donor engagement and coordination. NDA function for climate funds is currently carried out by the Ministry of Environment of Armenia and mainly limited to ensuring overall coordination framework of country engagement and communicating (rare) request. Naturally, state bodies and entities responsible for implementation of sectoral strategies should be more proactive in design and communicating (through NDA) capacity enhancement and investment

projects. More specifically, Central Bank of Armenia should pay more attention towards creating enabling policy framework and Ministry of Economy shall be more proactive in mobilization of the private sector participation and building of PPPs.

2. **More enabling policy environment should be established and streamlined through sectoral/sub-sectoral policies and strategies.** As a matter of fact, the prerequisites for the green finance taxonomy and initial stimulus has been delivered by MDBs within the framework of on-lending facilities implemented through partner local banks. While the country is lacking urgently needed Green Finance Taxonomy (based on the best international practices), conditions and eligibility requirements of the financing instruments mentioned above actually serve as outline for the potential national taxonomy. Based on the needs assessment carried out within the framework of the Readiness Project, followed by review of international bet practices and validation of initial assumptions it was recommended to design national Green Finance Taxonomy and propose administrative, regulatory and policy incentives to ensure accelerated development of the green finance practices in Armenia.
3. **Capacities of national actors/financiers should be further strengthened to ensure better and wider engagement.** Out of around 20 commercial banks and non-banking financial institutions (leasing companies and UCOs) surveyed, only very few reported that they have dedicated and well-trained lending and ESG personal that provides with targeting, appraisal and servicing of the green finance products. Most of them has also reported the need for capable staff members that should be responsible for negotiations and attracting green finance products from international markets. Last but not the least capacity constraint that was reported is absence of internal expertise for execution of initial ESG screening of the investment projects and provision of further guidance and servicing. It is worth to mention that capacity enhancement of national financiers regulated, led and encouraged by the regulator are among the most critical components necessary for advancement of green finance infrastructure in the Country.
4. **New innovative financial frameworks has significantly underutilized potential for crowding into the green finance scene.** Throughout review of international best practices, desk research and consultations with different stakeholders it has been noted that number of good preconditions are available for establishment, advancement and further encouragement of innovative financial models that could potentially be more flexible and aggressive in channeling green finance to the respective projects. More specifically, closed-end investment funds (with favorable tax regime and simplified reporting requirements), equity crowdfunding platforms and business angel network has tremendous appetite and, thus, potential for leveraging financial resources towards climate resilient projects in mitigation and adaptation domains.
5. **There is high appetite from private sector entities to structure, partner around and implement medium- and large-scale investment projects both in mitigation and adaptation domains.** Throughout surveys, focus group meetings and consultations with private sector representatives it has been discovered that number of entities are exploring opportunities for direct partnership with climate funds and MDBs. It has also been noted that there are high quality investment projects are available in the "informal" national pipeline. These efforts should further be reinvigorated through Government support in negotiations, engagement of qualified partners and provision of ad-hoc regulatory and fiscal incentives. In this regard, the

role of consulting companies and sectoral business associations has also been noted to be critical.

III. Financing for renewable energy and energy efficiency in Armenia

3.1 Armenia Renewable Resources and Energy Efficiency Fund

Armenia Renewable Resources and Energy Efficiency Fund is the most professional and experienced entity in the field of **energy efficiency and renewable energy** in the Republic of Armenia. It is mandated by the Government to promote investments in energy efficiency and renewable energy sectors, foster market development in the sphere of Armenia's energy efficiency and renewable resources, enhance reduction of technological influence on environment and human health, and develop mechanisms aimed at increasing the level of reliability of energy security and energy system. It implemented dozen of projects aimed at reducing administrative barriers in the sector and channeling financial instruments for financing generation renewable energy and energy efficiency.

Revolving Fund, operating under the aegis of R2E2 Fund aims to stimulate energy efficiency investments in large-scale energy consuming sectors in Armenia. Investment implementation goes directly from the Fund or with engagement of local commercial banks and non-banking financial institutions to develop and streamline procedures for appraising and financing energy efficiency projects. Fund provides loans with 4% interest rate and 8-year maturity to local commercial banks as an incentive to encourage the banks to lend to EE projects' owners/developers and ESCO companies at a maximum interest rate of 8% in local currency. The Government's dedicated credits line lowers the banks risks, which makes the energy savings and financial paybacks "tangible" to the commercial banks. This partnership has helped to unlock the EE financing bottleneck. The participating banks take the responsibility to manage and provide the loans and report to the R2E2 Fund, which provides technical assistance and develop/designs projects.

To date, through Revolving Fund more than **8,8 mln USD** has been channeled towards provision of turn-key services (energy audit, procurement, detailed design, financing, construction and monitoring) for EE upgrades of **56 eligible public facilities.**

Revolving scheme provides:

- Ensuring that all projects achieved real energy-saving, instead of simply equipment installation or replacement, as well as secure that amount of savings is higher than monthly repayments;
- Responsibility of stakeholders, as they have to pay back the investments (comparing with grant scheme), which means more quality of works and equipment;
- Reinvestment of returned money in other projects;
- Initiative of energy efficiency comes from decision makers of stakeholders and they are willing to support the project and provide appropriate control and exploitation;
- Monitoring the banks' performance to ensure they meet the targets in terms of lending and repayment.

Diligently designed approach that used innovative mechanisms called energy service agreements (ESAs) and net present value-based (NPV) procurement in the public sector generated high interest among potential beneficiaries.

3.2 Closed-end Investment Funds

Legal framework governing operations of non-public investment funds (up to 49 participants that came together to establish investment fund) is rather liberal in Armenia. Though under supervision of Central Bank of Armenia, that must approve the Rules of such funds, no license is foreseen for such entities and there are simplified reporting mechanisms in place. These entities are usually established by investors willing to finance the projects in certain sectors/sub-sectors of economy, thus, such organizational structures are suitable for mobilization of funds for investments into the renewable energy projects (e.g. yieldcos).

Favorable tax regime (0.01% on the Fund's Net Asset Value and 0% on the Fund's capital gain) along with other regulatory frameworks and opportunities (possibility to attract funds in different currencies, defining different types of investors and, thus, applying different ranges of services fees and conditions) makes this particular instrument as attractive framework for partnership of individual and institutional investors for financing projects in green energy domain.

There are currently 3-4 small (up to 10 mln USD) investment funds operating in Armenia (focused on high-tech sector) and one initiative group that is planning to establish first green economy-oriented equity capital fund. The letters could become potential beneficiary for the Fund of Funds project, along with key green banks and UCOs (3-4 as per needs assessment exercise carried out with the framework of "Scaling Up Green Finance Practices in Armenia" Project).

3.3 Missing infrastructure

As it is visualized throughout this report, one of the missing infrastructures that could potentially leverage investments in the energy efficient construction is institute of independent energy auditors.

Delegation of European Union of Armenia has launched tender (expected commencement date of the assignment is July 2022) to provide capacity building activities for R2E2, including establishment of energy auditors' certification scheme in partnership with European entities and in compliance with European best practices.

IV. Defining targeted sectors and stakeholder interview

4.1 Identifying targeted sectors

In order to identify priority for intervention sectors, comprehensive review and further compilation from the following sources has been carried out: 1) List of priorities identified through draft "GCF – Armenia Country Cooperation Programme", and 2) comprehensive review of the 200 projects approved for funding by GCF.

Strategic Pillar I - Energy - Mitigation	
Investment Area	**Potential Projects**
Energy transmission, network modernization and storage	➢ Modernization and technical upgrade of energy distribution network (to increase technical facilities for hooking up 250 MW of installed capacities of solar stations and reduce network loses from 8 to 6 %); ➢ Establishment of energy storage capacities with target value 100 MW/hours (both battery and pumped hydro-electrical types) (to enable further advancement of solar and wind stations);
Promotion of generation of energy from renewable resources	➢ Construction of 2 new big (with installed capacity more than 30 MW) hydro-power stations ➢ Constructions of industrial scale solar PV, wind power and biogas stations with the minimum 250 MW of installed capacities; ➢ Technical upgrades/rehabilitation of 30 technologically poor small (with installed capacity less than 30 MW) hydro-power stations; ➢ Facilitating utilization of solar potential by autonomous producers (households, SMEs) – minimum 50 MW of installed capacity;
Advancement energy efficiency	➢ Supporting activities aimed at increasing energy efficiency of private households, SMEs and big industrial companies – 50% upgrade for minimum 500 entities; ➢ Promotion of the energy-efficient construction of residential, public and commercial buildings – 10 new construction site development projects supported;

4.2 Consultation with stakeholders

To validate and get deeper insights on the findings from the intensive desk research, interviews with key stakeholders were conducted. Overall, more than 15 stakeholder interviews were implemented. In particular, interviews conducted with relevant representatives from the Government, civil society organizations, as well as international,

private organizations operating in Armenia and key experts. The detailed table of stakeholders targeted within the framework of the Assignment is presented in Annex 1.

4.3 Identifying projects

Key focus during consultations has been placed at receiving the feedback from stakeholders on the key criteria of the investment projects (defined below) and compliance with ESS Guidelines, bankability and preparedness for engagement.

Project Screening Template has been designed for identification of the potential projects and comparative assessment of key investment criteria:

1. **Information about the Project** – Result areas, impact potential, financing information (including amount and type of financing to be requested), ESS categorization and rationale/objectives;
2. **Project Context and Baseline** – climate vulnerabilities and impact, mitigation and adaptation needs, correspondence with country's priorities, problem root causes and barriers;
3. **Project Description** – activities to be carried out, scalability and transformation potential, costs and benefits, potential accredited entity to be targeted, risks and M&E framework;
4. **Performance against GCF investment criteria**:
    - Impact potential,
    - Paradigm shift,
    - Sustainable development,
    - Needs of recipients,
    - Country ownership,
    - Efficiency,
    - Effectiveness
5. **Justification of funding request** – why this particular project could not be financed from other sources and what is "incremental cost";

4.4 Proposed Projects' Longlist

The following criteria were used to define the long list of potential projects for consideration:

- Relevance to the country's national priorities;
- Existing barriers;
- Relevance of the intervention framework;
- Market size;
- Impact of the Projects;
- Financing conditions required

- Relevance to R2E2 mandate and capacities to handle the project management;

The following projects were identified in the result of initial screening:

- Scale-up of R2E2's funding program for EE and heating in the public sector, with a pilot in the university sector;
- Energy storage facility;
- Model clean energy solutions for agricultural sector;
- Concessional financing for clean energy in the private sector;
- Establishment of the network of EV charging stations;

The comprehensive consultation process with the engagement of the team and R2E2 leadership provided with the assessment of each project against key criteria and resulted in the selection of the 2 projects for further consideration.

Summary of the review results is presented in the table below:

N	Project	Relevance	Barriers	Intervention	Market	Impact	R2E2 engagement
1	Scale-up of R2E2's funding program for EE and heating in the public sector, with a pilot in the university sector	High (public building are among top priorities)	Access to finance and expertise	Energy efficiency, renewable energy, EVs, educational programmes	Moderate, but high demand	High (also demonstration effect)	Substantial expertise in provision of financing to public buildings
2	Energy storage facility	High (increasing share of solar demands balancing)	Absence of feasibility studies and very high cost of the project	Individual and system storage	Significant	High	None
3	Model clean energy solutions for agricultural sector	High (covering both sectors)	Awareness and absence of customized financial instruments	Agrivoltaic, energy efficient equipment, solar driers	Significant	High (also demonstration effect	Substantial expertise in solar installations and energy efficient equipment
4	Concessional financing for clean energy in the private sector	High	Lack of knowledge and ownership	Funding to green banks and equity funds	Significant	High (paradigm shift oriented)	Substantial expertise in potential financing sectors and good experience

							in partnership with financiers
5	Establishment of the network of EV charging stations	High (prioritized through several Policy documents)	Low level of the EV uptake	Funding to private sector entities willing to install EV charging stations	Significant	High (ecosystem building)	Limited

V. Project Options

5.1 Project Option 1. - Model clean energy solutions for agricultural sector

Objective

The **overall objective** of the proposed project is to design and introduce sustainable and scalable clean energy (RE & EE) models for small and medium-sized farms, greenhouses and agricultural processing companies based on the regional and crops' specificities and lessons learned from review of the successful financial instruments proven by international best practices.

Relevance to the Country's national priorities

In accordance with the "Strategy of the main directions ensuring economic development in agricultural sector of the Republic of Armenia for 2020-2030" the core of the agricultural policy will be the increase of agrarian efficiency, increase of the food security level, introduction of modern technologies, increase of exportation volumes, growth of profitability of all entities engaged in the entire value chain of agriculture - small households, farming cooperatives, processors, and exporters. More specifically, the Government has prioritized cooperation between education, scientific, research, and industrial sectors, supporting the introduction of new technologies and expanding non-agricultural activities in rural communities. Government Programme for 2021 – 2026, along with reconfirming these priorities commits to promote large-scale implementation of energy efficiency and energy saving measures in the agricultural sector, taking into consideration the requirements of the "Armenia European Union Comprehensive and Enhanced Partnership Agreement".

"Republic of Armenia Energy Sector Development Strategic Programme to 2040" concerning the Energy Balance for the year 2018 informs that agriculture sector (mainly comprised of 345,875 family farms with an average landholding of 1.4 ha per household) consumes 1.6% of total volume of energy, while industry sector (that includes around 1660 food processing enterprises with production volumes totaling to 1 bln USD and

contributing 22% to the total export volumes) consumes about 15.2% of energy. Households and transport sectors consume 33.21% and 33.81%, respectively.

According to the data from Electric Networks of Armenia, as of 01.01.2022 some 6,940 autonomous solar energy producers are connected to the grid with average installed capacity equivalent to 136 MW. Taking into account favorable regulatory regime (net-metering for installations up to 150 KW) and availability of attractive financing schemes it is expected that this figure will be doubled during the next 2-3 years.

According to the National Communication N4 to the UNFCCC the share of agricultural sector in national GHG emissions is equivalent to 22.3%, while the share of energy sector is 64.1% (data of 2016). This makes proposed by this project interventions critical effort in doubling the share of renewables in energy generation and contributing to reduction of GHG emissions to achieve NDC targets, including achievement of climate neutrality by the mid-century.

Despite the insignificant volume of energy consumption by the agricultural sector (and rather high input in GHG emissions due to cattle breeding), there is significant potential for accelerated utilization of clean energy solutions by the sector, currently lagging behind others.

Summary of the Project

Based on the comprehensive review of international best practices, consultations with representatives of Ministry of Economy (responsible for agricultural policy) and private sector, the financing of the following products is proposed to be considered within the framework of potential Programme:

- Up to 150 kW rooftop solar PV installation for micro and small agro-processing companies[8];
- Energy efficient upgrades for micro and small agro-processing companies targeting reduction of energy consumption equivalent to minimum 30%;
- up to 150 kW Agrivoltaic installations for farmers;
- Solar-powered fruit dryers;

Operating under the regime of net metering approach (applicable for solar PV installations for up to 150 KW) has significant advantages in substituting costly energy consumed by the entity (53.48 AMD per KWh) and the possibility of selling surplus electricity to the Electric Networks Armenia. The latter also serves as an accumulation facility, as the whole amount of energy produced by autonomous producer is channeled by it with a reverse metering approach. Annual calculations of the balance followed by payment of 26 AMD per each surplus KWh is important financial leverage securing guaranteed cash flow for framers and MSMEs. Further liberalization of electricity market (abolition of monopoly for electricity supply) creates new opportunity for households, family farms and MSMEs that could buy cheaper electricity from recently established new market players (6 licenses are issued to date).

[8] Around 1,600 enterprises operating in the agro-processing sector, among them: milk processing and diary production, fruits and vegetables processing, dried food production, meat processing.

Barriers

- Lack of well-structured evidence on applicability and impact of the clean energy technologies in the targeted sector;

  Traditionally, solar energy and energy efficiency solutions has penetrated to the households and corporate sector (as of 01.01.2022 around 6,940 autonomous solar energy producers are connected to the grid with average installed capacity equivalent to 136 MW). There is little evidence on the agricultural farming and processing sectors benefiting from the clean energy solutions that is assessed by the experts as minimal. One of the major obstacles for the interest towards clean energy solutions is pressing need to purchase outdated agricultural machinery and processing equipment to dramatically increase productivity.

- Limited awareness and lack of information among potential beneficiaries;

  Lack of evidence in its turn negatively affect the awareness issues. The sector representatives tend to benefit from financial products that are subsidized by the Government and, thus, awareness factor here is quite high. While preparedness of farmers to benefit from Agrivoltaic installations is close to the zero, due to absolute absence of evidence on what crops and in which regions successfully coexists with PV modules, as well as information about impact of additional revenues generated on the overall cashflow of farming households.

- Limited availability of tailor-made financial product/s in targeted regions;

  Government supported subsidy programmes target specific sub-sectors that are visualized through "Strategy of the main directions ensuring economic development in agricultural sector of the Republic of Armenia for 2020-2030" and Government Working Programme for 2021-2026. These are primarily loans/leasing products for procurement of agricultural machinery, equipment, installations of small greenhouses and intensive orchards.

- Reluctance to borrow under commercially available financing vehicles due to lavish subsidies by the Government within the framework of numerous programmes and projects;
  Here the problem is both with more pressing need to purchase agricultural machinery and replace the outdated equipment (for increasing productivity), as well as with absence of respective subsidies for installation of clean energy solutions.

Intervention Framework

The following inter-related set of activity clusters is proposed to achieve the Project's objective:

- **Proposing** model RE solutions (includes technical specifications, business models and cash flow projections) for targeted Agri-based SMEs and designing communication campaign/materials for raising awareness of proposed technologies (*AgriVoltaic mechanisms for farmers, model installations and EE equipment for small scale processing companies*);

- **Standard Product design** for banks and non-banking financial institutions and training of the responsible staff;
- **Engagement** with potential stakeholders (farmers' associations, agricultural cooperatives and private sector with financial market representatives) with the purpose of identification of viable SMEs, facilitating integration into regional supply chains and developing standard financing mechanisms;

Proposed instruments and market size

The market size reachable by R2E2 within the framework of the proposed Programme is summarized in the table below:

N	Products	Proposed instrument	Cost per installation (USD)	Reachable by R2E2 Market size *(USD in 3 years' perspective)*
1.	150 kW rooftop solar PV installation for micro and small agro-processing companies	Leasing	**90,000***	**9,000,000**
2.	Energy efficient upgrades for micro and small agro-processing companies targeting reduction of energy consumption equivalent to minimum 30%	Loan	**50,000 – 200,000**** (*depending on the size of MSME*)	**5,000,000**
3.	150 kW Agrivoltaic installations for farmers	Leasing	**110,000***	**5,000,000**
4.	Solar-powered fruit dryers	Leasing	**50,000*****	**1,000,000**
	TOTAL			**20,000,000**

** according to the blitz survey carried out within few biggest ESCOs the costs per one kW of solar rooftop installation is equivalent to 600 USD and per one kW of Agrivoltaic solar installations is around 730 USD.*

*** average data based on the analysis of information received from R2E2*

**** data received from producer*

Potential impact of the Programme

Potential impact of the Programme in terms of substituted green energy and reduced GHG emissions is presented in the table below:

N	Products	Number of beneficiaries	Green Energy substituted (GWh)	CO^2 avoided

1.	150 kW rooftop solar PV installation for micro and small agro-processing companies	100	**25**	**-**
2.	Energy efficient upgrades for micro and small agro-processing companies targeting reduction of energy consumption equivalent to minimum 30%	50	**10**	**-**
3.	150 kW Agrivoltaic installations for farmers	50	**25**	**-**
4.	Solar-powered fruit dryers	20	**-**	**-**
	TOTAL	**220**		**-**

Financing conditions

As it has already been mentioned, there is risk that potential beneficiaries will be reluctant to borrow under commercially available financing vehicles due to lavish subsidies by the Government within the framework of numerous programmes and projects (8-9% if not subsidized). There is a need either to negotiate and introduce the following regulatory and fiscal incentives or to channel concessional/grant funding to make products attractive for the beneficiary MSMEs:

- Interest rate subsidies (to make maximum effective interest rate equivalent to 2%);
- Cash backs (up to 20% of the loans);
- Others (to be identified and discussed);

Potential sources for financial incentives could be the following: 1) subsidies from the state budget within the framework of priority projects (to be negotiated with the Ministry of Economy), and 2) grants from climate funds and MDBs (similar solutions have been successfully utilized for SMEs targeting installation of rooftop solar stations within the framework of GCF-EBRD financed project).

Targeted results

The following results' framework (*indicative*) is to be achieved through Project implementation:

- **N of Mw per year** – energy capacities from installed solar PV modules;
- **N of farms SMEs –** benefited from the project;
- **N tCO_{2e} per year** – targeted emission reduction;
- **N%** increase in profitability/cost efficiency of Project beneficiaries due to reduction of energy component of the self-cost;

Implementation Framework

It is proposed to deposit project resources at the Revolving Fund operating under the auspices of the Armenia Renewable Resources and Energy Efficiency Fund. Through accredited commercial banks and non-banking financial institutions the funds will be channeled to beneficiaries (with the premium of 0.5% annually for technical services support and supervision by the R2E2).

R2E2, that has significant experience in implementing similar tasks executed within the framework of RE & EE programmes and projects financed/implemented will execute the role of the technical advisor and supervisor of the construction/installation works.

Key Risks

The key risk in implementing the proposed Project is linked to the low interest by potential beneficiaries to benefit from proposed financial instruments. This will be addressed through 1) structuring and proposing financial incentives (subsidized loans and/or cashbacks), and 2) raising awareness and visualizing the benefits.

5.2 Project Option 2. - Concessional Co-financing for Clean Energy in the Private Sector

Objective

The **overall objective** of the proposed project is to scale up green financing in Armenia through the establishment of the innovative instrument (Fund of Funds) that will provide selected beneficiaries[9] with long-term concessional funding aimed at financing construction of the energy efficient residential buildings and procurement (corporate and individual) of electric vehicles (EVs).

Relevance to the Country's national priorities

In accordance with the "Republic of Armenia Energy Sector Development Strategic Programme to 2040" the Armenian Government prioritizes the energy efficiency as a measure for the country's energy security, increasing economic competitiveness and reducing a negative impact on the environment as well as global climate warming. Average energy efficiency potential for current technologies amounts to 30% - 40% for buildings, which makes energy efficiency upgrades by means of effective thermal insulation (per KW) 2-3 time cheaper than for construction of adequate production capacities. Thus, the average cost per unit of energy conserved in buildings is 1 to 4 US cents per kWh meanwhile the average cost of energy generated by the Armenian power system is about 5 US cents. Along with the improving the energy efficiency through insulation, upgrade of heating and cooling systems, the consumer effective behavior in this sector will have greater saving potential -about 60%.

[9] Revolving Fund operating under the aegis of R2E2 Fund, Closed-end venture capital and equity funds, RA commercial banks and non-banking financial institutions.

Armenia's NDC for 2022-2030 defines energy efficiency among key priorities for the country's energy security and key drivers of low carbon development. Republic of Armenia 2014-2025 Strategic Program of Perspective Development outlines actions to maximize the use of domestic energy resources, focusing on renewable energy and promoting energy efficiency. Meantime, As per Government Programme 2021 – 2026, provisions of the EU-Armenia Comprehensive and Enhanced Partnership Agreement Roadmap defines 34 actions on energy efficiency, renewable energy, and energy security.

Promotion of electric mobility is among recently emerged priorities of the Armenia' Government that levied VAT on EVs and reached agreement withing Eurasian Economic Union to exempt them from custom duties (annual quotas for next to years are established at the level of 7,000 and 8,000 accordingly). With GEF financing, the Government also plans to implement demonstration project within the framework of which part of the fleet assigned to the Government and respective ministries will be replaced by EVs.

Summary of the Project

Based on the comprehensive review of available studies in the field of energy efficient construction of residential buildings and promotion of e-mobility in Armenia, as well as consultations with the representatives of the leading "green" banks in Armenia the financing of the following products is proposed to be considered within the framework of potential project:

- Construction of energy efficient residential buildings;
- Financing procurement of EVs for commercial and individual use purposes;

Barriers

- Absence of proposed financial infrastructure in the national ecosystem of green energy;

  There is well-established demand for the affordable instruments for financing the targeted projects, as well as appetite of the private sector financiers (commercial banks, UCOs and closed-end equity funds). However, available funding to not corresponds to the market demand and there is lack of mechanisms by MDBs to leverage financial resources. Experience form other sectors (e.g. high-tech) and from review of international best practices suggest that Fund of Funds is the missing element of financing infrastructure that could potentially leverage financing of the proposed projects in the clean energy domain.

- Limited engagement by MDBs and pension funds;

  Proposed to be established Fund of Funds, through financing highly demanded, visible and paradigm shift oriented projects will serve as a catalyzer for other MDBs and pension funds to provide financing for such projects (also through established Fund of Funds).

- Limited capacities of national stakeholders (businesses) to attracts funding from international markets (including green bonds);

During recent two years the national landscape for green financing has been significantly advanced. Along with availability of funding within the framework of on-lending facilities proposed by MDBs, Armenian banks and UCOs has also offered tailor-maid products. However, regulatory basis for further advancement is still under consideration by the Central Bank of Armenia. Among the most urgent steps to be carried out are defining of Green Taxonomy and introduction of the regulatory, policy and fiscal incentives for green economy projects. Meantime, market lacks sustainable models for implementation of PPP projects with the engagement of private sector entities.

Intervention Framework

The following inter-related set of activity clusters is proposed to achieve the Project's objective:

- **Mapping** bottlenecks of Armenia's green finance landscape and design financial instruments to address these gaps;
- **Implementation** of screening of potential beneficiaries (capacities, fiduciary standards, proposed intervention framework);
- **Establishment** of Fund of Funds and designing operational framework (defining Project-level taxonomy, modalities of funding, co-financing requirements, partnership requirements and exit strategy);
- **Funding** 5 beneficiaries for financing projects for construction of the energy-efficient residential buildings and procurement (corporate and individual) of the electric vehicles;
- **Introduction** of supervision/reporting standards and periodic compliance check of implemented/financed projects;

Proposed instruments and market size

The market size reachable by R2E2 within the framework of proposed Programme is summarized in the table below

N	Products	Proposed instrument	Cost per project (USD)	Reachable by R2E2 Market size *(USD in 3 years' perspective)*
1.	Financing of the construction of residential energy efficient buildings	Loan	**5,000,000***	**20,000,000**
2.	Financing procurement of the (commercial and individual) electric vehicles	Leasing	**40,000 – 60,000****	**20,000,000**
	TOTAL			**40,000,000**

** cost for financing of the one construction project in accordance with the results of the blitz survey carried out within few banks. Minimum 4-5 such projects are feasible to finance within the time-frame proposed.*

*** Average cost of EV demanded in the market. Consultations with the representatives of the commercial banks and leasing companies suggest that it is feasible to finance procurement of minimum 400 EVs during 2022 (for comparison the amount of EVs imported during the first quarter of 2022 is equivalent to 414).*

Potential impact of the Programme

Potential impact of the Programme in terms of substituted green energy and reduced GHG emissions is presented in the table below:

N	Products	Number of beneficiaries	Green Energy substituted (GWh)	CO^2 avoided
1.	Financing of the construction of residential energy efficient buildings	5/500	**-**	**-**
2.	Financing procurement of the (commercial and individual) electric vehicles	400	**-**	**-**
	TOTAL	**900**		**-**

Financing conditions

Operational framework of the Fund of Funds, based on the observations and consultations with the leading green banks, is proposed to structure in the following manner:

1. **For financing construction of residential energy efficient buildings** – entity (bank, UCO or equity capital fund) has to commit 2 mln USD against each 1 mln USD of funds requested. As the result, 3X volume of funds will be mobilized with the reduces to 7-8 % annual interest rate;
2. **For financing procurement of (commercial and individual) electric vehicles** - – entity (bank, UCO or equity capital fund) has to commit 2 mln USD against each 1 mln USD of funds requested. As the result, 3X volume of funds will be mobilized with the reduces to 6-7 % annual interest rate;

Potential sources for financial incentives could be the following: 1) subsidies from the state budget within the framework of priority projects (to be negotiated with the Ministry of Economy), and 2) grants from climate funds and MDBs.

Targeted results

The following results' framework (*indicative*) is to be achieved through Project implementation:

- **Fund of Funds** is established and operational;
- **N** of beneficiaries received funding;
- **N** of projects proposed for financing;
- **Sectorial benchmarks:**
    - **N of Kw/h per year** - saved consumption of non-green energy due to energy-efficient upgrades;
    - **N of Kw per year** – capacities of installed solar PV modules;
- **N tCO_{2e} per year** – targeted emission reduction;

Implementation Framework

It is proposed to deposit project resources at the Revolving Fund operating under the auspices of the Armenia Renewable Resources and Energy Efficiency Fund. Through accredited commercial banks and non-banking financial institutions the funds will be channeled to beneficiaries (with the premium of 0.5% annually for technical services support and supervision by the R2E2).

The role of R2E2 Fund in implementing proposed project could be two-fold:

- Provision of technical expertise on the Proposed projects;
- Channeling resources through its Revolving Fund for implementation of such projects.

Key Risks

There are two following potential risks for implementation of the project:

1. **Vague definition by national legislation of the energy efficient requirements to the energy efficient buildings** and possibility to "purchase" on the market respective audit report with doubted quality. To address this risk, R2E2 will engage its experts (including international ones to be deployed within the framework of expected EU funded project) to ensure quality control;
2. **Availability of low quality and damaged/used EVs** that could potentially become the subject of risky loans. R2E2 will define the list of verified suppliers (that are also able to provide servicing) and potential beneficiaries of the project will be obliged to purchase new EVs from those suppliers.

VI. Conclusions and Recommendations

Scenario 1. – Leveraging resources of climate funds

Along with design of potential project ideas, selection and consultations with the R2E2 Team the mapping of available climate finance sources has been carried out. Review of operational and financing modalities of the latter's (with particular focus on GCF) suggested the following project appraisal and implementation scenario:

1. **Potential partner MDB (accredited to GCF)** – bundles all 2 proposed Projects into 1 umbrella Programme (with 60 mln budget) and as accredited entity requests matching funding from the GCF (could be concessional loan along with grant component, or on-lending instrument can be financed by MDB and grant component by GCF);

   Also, using its own financial resources partner MDB will make sure that respective documents (Concept Note and Funding Proposal) are developed in the shortest period of time and of highest quality;

2. **Government of Armenia** – provides with non-objection letter and supports MDB as accredited entity in getting financing from the GCF;
3. **R2E2** – acts as implementing entity under the supervision of partner MDB team and Government of RA (through the Project Steering Committee).

Scenario 2. – Submission through R2E2 *(as potential accredited entity)*

In case if partner MDB is unwilling (also due to potentially long time to implement Scenario 1) to engage with GCF, the second option briefly described below is proposed:

1. **R2E2** – proposes one of the selected projects as potential accredited entity for the financing to GCF;
2. **Government of Armenia** – secures regulatory and fiscal incentives (subsidizing of interest rates, cash backs, etc);

Taking into consideration potentially long time (min 1 year) for R2E2 accreditation, combination of two proposed scenarios is suggested.

VII. Annexes

7.1 Annex I. – List of stakeholders interviewed

INSTITUTION	DEPARTMENT	POSITION
Public Authorities		
Ministry of Economy of the RA	Business and Investment Environment Improvement Department	Head of Department
Ministry of Environment of the RA	International Cooperation Department	Head of Department
Ministry of Environment of the RA	"Environmental Project Implementation Unit" SE	Director
Ministry of Territorial Administration	Head of the Energy Department	Head of Department
HSBC Bank Armenia CJSC	Banking Department	Sustainable Finance Champion
Armswissbank CJSC	Lending Department	Head of Project Financing Section/ GCF "Scaling up Green Finance Practices in Armenia" Project manager
Shtigen Ventures		Co-founder
BANA- Business Angel Network of Armenia		Director
Investors Club of Armenia		Director
International Organizations		
EBRD Yerevan RO		Energy TTL
World Bank Energy Team		Energy TTL
IFC Armenia		Senior Investment Officer
ADB Armenia RO		Climate PM