



**UN CLIMATE CHANGE  
HIGH-LEVEL CHAMPIONS**



# Climate Champions' Extended Compendium of Climate-Related Initiatives

Regional Project List for UNECE Region

NOVEMBER 2022

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  - Categorization
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  - Project view

# Table of Contents

Overview of Projects

Categorization



**Aggregated view**

Project view

# We have categorized our projects using two dimensions

## Projects are categorized across ten different themes...



**Agriculture-** green and resilient agriculture production methods and input systems



**Blue Economy-** sustainable use of ocean resources for economic growth and livelihood



**Carbon Credits-** restoration of nature using carbon credits financing



**Cities-** adaptation and resilience of human settlements



**Digital-** digital infrastructure and systems enabling climate transition



**Energy-** energy production (e.g. wind, solar, hydro) and transmission (cable, hydrogen)



**Industry-** transition towards a net zero industry



**Land-** restoration of degraded land



**Transport-** sustainable transportation infrastructure and vehicles (e.g. electric motorbikes)



**Water-** security of water supply and protection against floods

## ... and across five different impact types



**Greenfield infra-** newly built infrastructure asset



**Brownfield infra-** existing infrastructure assets



**Enterprise-** enterprise (often start-up or scale-up) with a climate solution



**Program-** program ran by an organization to obtain a certain objective



**Fund-** Fund run by an investor that bundles capital and invests into specific type of solutions

# Table of Contents

Overview of Projects

Categorization



**Aggregated view**

Project view

# UNECE | 30 projects included in this document

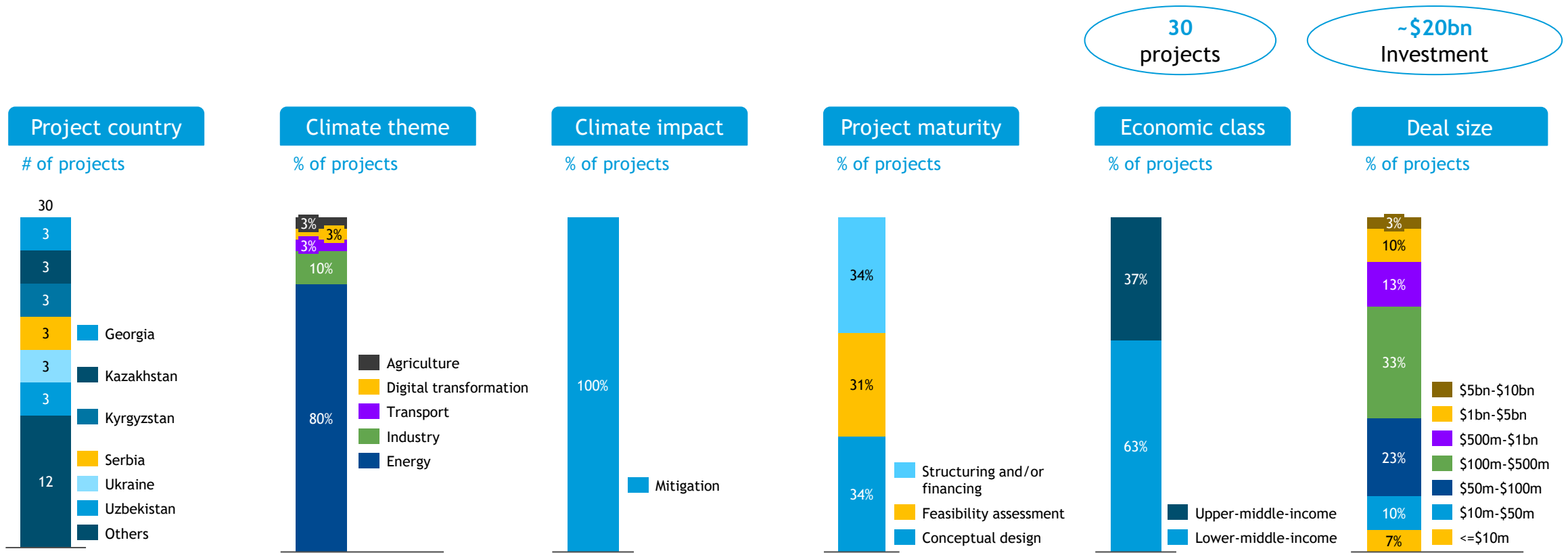
| Theme                          | Project   | Country    | Cost(m\$) |
|--------------------------------|---|------------|-----------|
| <b>Agriculture</b>             | Green Ammonia Production                            | Multi      | 2000      |
| <b>Digital transformations</b> | Global Climate-Neutral Resource Management Platform | Multi      | 17        |
|                                | Biofuels Production in Ukraine                      | Ukraine    | 1200      |
|                                | Bistrica Hydropower Plant                           | Serbia     | 674       |
|                                | Electric Heating of Small- and Medium-Sized Cities  | Ukraine    | 4         |
|                                | ElevenEs Battery Plant                              | Serbia     | 1200      |
|                                | Erseka Solar Park                                   | Albania    | 17        |
|                                | Meghri and Shnokh Hydro Power Plants                | Armenia    | 473       |
| <b>Energy</b>                  | Garadagh Solar Power Plant                          | Azerbaijan | 225       |
|                                | Geothermal Exploratory Drilling Project             | Armenia    | 11        |
|                                | Geothermal Power Plant                              | Georgia    | 55        |
|                                | Guzar Solar Photovoltaic Park                       | Uzbekistan | 345       |
|                                | Hatay Erzin Solar Power Plant                       | Türkiye    | 126       |
|                                | Khizi-Absheron Wind Power Plant                     | Azerbaijan | 300       |
|                                | Issyk-Kul High-Rise Solar Power Plant               | Kyrgyzstan | 785       |

| Theme            | Project   | Country         | Cost(m\$) |
|------------------|---|-----------------|-----------|
|                  | Kambar-Ata 2 Hydropower Plant                             | Kyrgyzstan      | 518       |
|                  | Kazakhstan Waste Programme                                | Kazakhstan      | 50        |
|                  | Kazchrome Donskoy GOK Wind Power Plant                    | Kazakhstan      | 230       |
|                  | Nigoza Wind Power Plant                                   | Georgia         | 70        |
|                  | Nurata Solar Power Plant                                  | Uzbekistan      | 179       |
| <b>Energy</b>    | Samgori Solar Panel Project                               | Georgia         | 87        |
|                  | Srednje Kostlacko Ostrvo Solar Photovoltaic Park          | Serbia          | 92        |
|                  | Sustainable Energy Financing Mechanism in Forest Villages | Türkiye         | 56        |
|                  | Svevind Green Hydrogen Project - Hyrasia One              | Kazakhstan      | 10000     |
|                  | Virovi Wind Farm  | North Macedonia | 578       |
|                  | Voltalia Solar Photovoltaic Plant                         | Albania         | 210       |
|                  | Management of Critical Raw Materials                      | Tajikistan      | 8         |
| <b>Industry</b>  | Resource Management Strategy & Atlas                      | Ukraine         | 110       |
|                  | Silicon Monocrystalline Plates                            | Kyrgyzstan      | 56        |
| <b>Transport</b> | Samarkand E-Bus Project                                   | Uzbekistan      | 109       |

Project source: UNECE

To be put in touch with the relevant project owner(s), please reach out to the High-Level Champions Finance Team at [hlcfinanceprojects@climatechampions.team](mailto:hlcfinanceprojects@climatechampions.team) and UNECE at [reserves.energy@un.org](mailto:reserves.energy@un.org)

# UNECE | 30 projects included in this document



Projects distributed across >8 countries

Deals heavily skewed towards energy

All projects are mitigation efforts

- Deals are fairly distributed along project cycle

Projects are targeted towards upper-middle income countries

59% of projects are above \$100m

Note: Not all data is currently available for all projects, e.g., latest milestone data missing for a few projects; Project countries classified as "others" have frequency <3 and include Albania, Armenia, Azerbaijan, North Macedonia, Tajikistan, Türkiye, Eastern Europe, Central Asia, MENA region; Source: UN Economic Commission for Europe (UNECE). To be put in touch with the relevant project owner(s), please reach out to the High-Level Champions Finance Team at [hlcfinanceprojects@climatechampions.team](mailto:hlcfinanceprojects@climatechampions.team) and UNECE at [reserves.energy@un.org](mailto:reserves.energy@un.org).



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**Project view**

## 30 projects included from UNECE

| Theme                          | Project   | Country    | Cost(m\$) |
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## Key info



Climate Smart  
Agriculture



Infra asset  
(greenfield)

## Project overview

The projects aims to lead to the transition of the nitrogen fertilizer industry to net zero CO<sub>2</sub> emissions by 2050. Ammonia is the critical ingredient in all mineral nitrogen fertilizers. Using green hydrogen as fuel, itself produced by electrolysis powered by solar energy with integrated battery storage system, makes a major contribution to reducing CO<sub>2</sub> emissions from fertilizer manufacture while significantly reducing energy intensity.

## Timelines

**Project stage:** Conceptual Design

**Project timeline:** Staged Implementation  
5-7 years

## Location

**Country:** Eastern Europe, Central Asia (Uzbekistan) and MENA Region (including Egypt)

## Impact



Mitigation  
(avoidance)

Green ammonia production would enhance food security and have uses in diverse energy vectors for global shipping, aviation and other high CO<sub>2</sub> emitting energy users.

**1.8% of global**  
CO<sub>2</sub>e elimination

## Project structure

**Project sponsor:** N/A; **Stakeholders:** EBRD, International Fertilizer Association (IFA), etc.

**Policy Support:** International Energy Agency (IEA)

## Financing



Project cost

Initial investment of \$150 million in integrating a green hydrogen electrolysis production unit powered by zero carbon solar energy with integrated battery storage (IFA member company Fertiberia)



## Key info



Digital Solutions



Infra asset (greenfield)

## Project overview

The project is part of The concept of Low-Carbon Development by 2060 using best technologies, which would require significant investments to modernize the industry. In 2021, Kazakhstan notified a reformative environmental legislation, according to which the licensing system will be based on the best available technologies. A pilot digital platform will be developed that allows storing a database of processes and technologies and calculating the economic effect of measures to reduce the carbon footprint.

## Timelines

**Project stage:** Conceptual design

**Project timeline:** 10 years

**Phase I:** Kazakhstan -2 years

**Phase II:** Central Asia -3 years

**Phase III:** Global coverage -5 years

## Location

**Country:** Regional initiative including Kazakhstan & other Central Asian countries initially

## Project structure

**Project sponsor:** Eurasian Engineering Association and International Technology and Investment Project Center, Kazakhstan

## Impact



Mitigation (avoidance)

Digital information support for the avoidance of approximately 100 million tons of CO<sub>2</sub>e in Central Asia by 2030

100m tons CO<sub>2</sub>e  
carbon sequestration by 2030

## Financing



Project cost



## Key info



Energy  
(Biomass)



Infra asset  
(brownfield)

## Project overview

The project involves liquid biofuels (advanced bioethanol & corn ethanol, advanced biodiesel & vegetable oil biodiesel), biogas and biochemicals and recycled chemicals like biomethanol and recycled methanol from mixed waste. Feedstock include waste oils & fats, straw, mixed municipal waste, kitchen wastes, vegetable oils & corn. European biofuels produced from domestic raw materials in a strictly sustainable manner achieve emission savings between 70%-90% compared to fossil fuels. Recycled biochemicals prevent use of virgin fossil raw materials (oil).

## Timelines

**Project stage:** Conceptual Design

## Location

**Country:** Ukraine

## Project structure

**Project sponsor:** Envien Group

## Impact



Mitigation  
(avoidance)

Additional project benefits:

- Spur circular economy
- Make Ukraine self-sufficient and improve energy trade balance
- Diversify energy sources
- Increase food security
- Decarbonize transportation
- Divert waste from landfill

**1.2 million**  
tons CO<sub>2</sub>e/year  
carbon sequestration

**4,680**  
GWh/year  
renewable energy

## Financing

**€1.2bn+**

Project cost

Total capex includes:

- €400m Waste to chemical facility
- €330m Biorefinery facility
- €300m Advanced bioethanol facility



## Key info



Energy  
(Hydro)



Infra asset  
(greenfield)

## Project overview

The Bistrica hydroelectric power plant is a reversible hydropower plant (“RHE”) with total capacity of 680MW. The plant will be built on the Uvac/Lim River, with an estimated hydro reservoir capacity of 80 million meter<sup>3</sup>, equipped with the additional facility for energy storage. It will be Serbia’s second pump-storage HPP. The project is essential for balancing out the oscillations in the output of wind and solar power plants and contributing to Serbia target of becoming a net exporter by 2028.

## Timelines

**Project stage:** Feasibility Assessment

**Project timeline:** Preliminary design and feasibility study ongoing<sup>1</sup>. The construction contract to be signed in 2022. The plant construction is planned to start by 2025

## Location

**Country:** Serbia

**Regions benefitting:** Sumadija and Western Serbia

## Project structure

**Project sponsor:** Elektroprivreda Srbije (EPS) and consortium that include Energoprojekt Hidroinženjering (\*)

## Impact



Mitigation  
(avoidance)

**1,100 GWh/year**  
renewable energy

## Financing



Project cost



## Key info



Energy- Electric Modular Boiler



Infra asset (brownfield)

## Project overview

This Ukrainian-based 300 kW auxiliary electricity project constructs small electric modular boiler houses with the laying of new and modern heating lines directly near the consumer using private funding. The project involves the installation and connection to the power grid of 8 storage units with a total capacity of 8 MW. Also, the pilot project consists of the production, construction and installation of 13 modular e/boilers. Thus, leading to the complete substitution of natural gas for heating.

## Timelines

**Current project stage:** Pilot phase

## Location

**Country:** Ukraine - Novomoskovsk & Dnepropetrovsk regions

## Project structure

### Developer

Remko sp. Zoo

### Contractual structure

Ukraine Energy

### Contractors

- NJSC Naftogaz Ukryny
- Remko sp. Zoo

## Impact



Adaptation & resilience

The Pilot Project is envisaged in Novomoskovsk, Dnepropetrovsk region, for:

- 22 apartment buildings (9 and 11 floors), approximately 5,000 inhabitants
- 3 municipal facilities (hospital, gymnasium, building /office of labour and social protection department of Novomoskovsk).
- The project will make it possible to virtually eliminate heat losses in heating mains (in the current, outdated and worn-out state of the heating mains, 30 to 40% of heat carrier losses occur).

## Financing



Total project cost

The project has a commercial payback of 5-6 years.



## Key info



Energy  
(CRM)



Infra asset  
(greenfield)

## Project overview

Serbian battery developer, ElevenEs, has developed technology to produce lithium iron phosphate (LFP) batteries for electrical vehicles (EV) and energy storage applications. ElevenEs along with investor EIT InnoEnergy will build the first LFP battery gigafactory in Europe that will produce 300MWh per year. After two years, production will expand to 8GWh, and to 16GWh after 2028. The factory will be based close to Serbia's Jadar valley, home to one of Europe's largest deposits of lithium.

## Timelines

**Project stage:** Structuring & Execution

**Project timeline:** The first phase of production, with a capacity of 300 MWh, should start by 2023.

## Location

**Country:** Serbia

## Project structure

**Project sponsor:** ElevenEs

## Impact



Mitigation  
(avoidance)

- LFP cells last more than twice as long as competing chemistries, they can be recharged up to 6,000 times, charge faster, can be repeatedly charged to 100% state-of-charge and cause practically no fires in EVs.
- Project will later be expanded to a capacity of 16 GWh-enough to equip more than 300,000 electric vehicles (BEVs) with batteries each year.
- The factory will use 100% renewable energy

**300 MWh/year**  
renewable energy

## Financing





**\$1.2bn**

Project cost

**Project Finance:** ElevenEs has signed agreements with EIT InnoEnergy. The project will also be backed by EU funds.





|   |   |   |
|---|---|---|
| <p><b>Key info</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Energy<br/>(Solar)</p> </div> <div style="text-align: center;">  <p>Infra asset<br/>(greenfield)</p> </div> </div>  | <p><b>Project overview</b></p> <p>Located in southeastern Albania, the 47 MWp Erseka Solar Park would offer 87 GWh of clean energy while developing a liberalised energy market in the country and uplifting the local rural economy. It would be one of the first projects in Albania to forego feed-in tariffs and instead sell its produced energy through a long-term offtake agreement with an energy trading company. Necessary key permits have been acquired and the project is expected to commence energy production in 2023.</p> | <p><b>Timelines</b></p> <p><b>Project stage:</b> Structuring/Financial Close</p> <p><b>Permitting &amp; Development:</b> 2021-2022</p> <p><b>Estimated COD:</b> end of 2023</p> |
| <p><b>Location</b></p> <p><b>Country:</b> Albania</p>   | <p><b>Project structure</b></p> <p><b>Project sponsor:</b> M&amp;K Energy Trading Co.<br/> <b>Contractual structure:</b> Design, Build, Operate</p>   |   |
| <p><b>Impact</b></p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;">  <p>Mitigation<br/>(avoidance)</p> </div> <div> <ul style="list-style-type: none"> <li>• <b>During Construction:</b> <ul style="list-style-type: none"> <li>- <b>Air Pollution:</b> within standards; Minimize impact actions</li> <li>- <b>Land:</b> Waste and inerts which cannot be reused in site will be moved to waste designated area</li> </ul> </li> <li>• <b>During Operation:</b> <ul style="list-style-type: none"> <li>- <b>Landscape:</b> Small impact in light reflection of mirrors</li> <li>- <b>Adaptation:</b> No residuals, Simple actions to return land to initial state</li> </ul> </li> </ul> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid #0070C0; border-radius: 10px; padding: 5px; text-align: center;"> <p><b>30,450 tons</b><br/>CO<sub>2</sub>e/year<br/>carbon sequestration</p> </div> <div style="border: 1px solid #0070C0; border-radius: 10px; padding: 5px; text-align: center;"> <p><b>87 GWh/year</b><br/>renewable energy</p> </div> </div> |   |   |
| <p><b>Financing</b></p> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  <p>Project cost</p> </div> <div style="text-align: right;"> <p><b>Project finance:</b> €13.5m</p> <p><b>Investment secured:</b> €4.5m</p> </div> </div>  |   |   |

# Meghri and Shnokh Hydro Power Plants



## Key info



Energy  
(Hydro)



Infra asset  
(greenfield)

## Project overview

Meghri Hydro Power Plants (HPP), with an installed capacity of about 100MW and an annual electricity generation of up to 800 million kWh will be constructed on the Araks River.

Located in the Lori region, the Shnokh HPP will have an installed electric capacity of 75 MW and annual electricity generation of 300 million kWh. It will be able to cover ~5% of domestic energy consumption in Armenia.

## Timelines

**Project stage:** Construction

**Project duration:** Construction period for the Shnokh HPP is 4 years. Meghri HPP construction commences in 2023 and enters into commercial operation in 2026.

## Location

**Country:** Armenia

## Project structure

**Project sponsor:** Shnokh HPP: Debed Hydro LLC, subsidiary of Energy Invest Holding CJSC and the Robbins Company

**Meghri HPP:** Farab

## Impact



Mitigation  
(avoidance)

>1,100 m  
KWh/year  
renewable energy

## Financing



Project cost

**Project finance:** \$450.5m

**Investment secured:** \$22.5m from the Investors club of Armenia



## Key info



Energy  
(Solar)



Infra asset  
(greenfield)

## Project overview

The project represents the country's first foreign investment-based independent solar power project, with a capacity of 230MW. The project is co-financed by Abu Dhabi Fund for Development, the Asian Development Bank, the European Bank for Reconstruction and Development, and Japan International Co-operation Agency.

## Timelines

**Project stage:** Structuring & Execution

**Project timeline:** The project is expected to start operations in 2023.

## Location

**Country:** Azerbaijan

## Project structure

**Project sponsor:** Masdar Azerbaijan Energy Limited Liability Company (SPV)

## Impact



Mitigation  
(avoidance)

The project will help to generate enough electricity to meet the needs of more than 110,000 homes, while also creating valuable jobs

**200,000 tons**  
**CO<sub>2</sub>e/year**  
carbon sequestration

**500 GWh/year**  
renewable energy

## Financing

**\$225m**

Project cost

**Project finance:** \$203.6m

**Investment secured:** The Asian Development Bank and Masdar Azerbaijan Energy Limited Liability Company signed a \$21.4m loan agreement.



## Key info



Energy  
(Geothermal)



Infra asset  
(greenfield)

## Project overview

The project will undertake exploratory drilling to confirm whether the geothermal resource at the Karkar field is suitable for power generation and, if confirmed, build the first geothermal station in Armenia with a capacity of 25MW. Currently, work is underway to implement package solutions for Geothermal projects in the country by attracting investors to the Jermahbyur and Karkar areas.

## Timelines

**Project stage:** Conceptual Design

## Location

**Country:** Armenia

## Project structure

**Project sponsor:** Government of Armenia

## Impact



Mitigation  
(avoidance)

Compensation eligibility for individuals who maybe relocated due to the project will be limited by a cut-off date.

## Financing

**\$10.69m**

Project cost

### Investment secured:

- 8.55m from Grant by Scaling-up Renewable Energy Program (SREP)
- \$ 2.14m is co-financed by the Government
- IBRD and the government are jointly-financing the project



## Key info



Energy  
(Geothermal)



Infra asset  
(greenfield)

## Project overview

A 10MW Geothermal Binary Power Plant has been planned by the Georgian Government that would disseminate the know-how and technology and encourage the private and public sector to develop similar projects. Preliminary analysis showed that Georgia has potential to launch 9 similar projects. Presently, Georgia's geothermal sector is under-developed. Realization of its complete potential will allow savings up to 500,000 tons of conventional fuel per year and reduce CO<sub>2</sub>e emission by 1.22 million tons.

## Timelines

**Project stage:** Feasibility Assessment

**Project timeline:** 84 months development and construction

## Location

**Country:** Georgia

## Project structure

**Project sponsor:** Georgia Geothermal Company LLC

## Impact



Mitigation  
(avoidance)

The project would generate 1,700 TJ heat per year and 140,000 tons of CO<sub>2</sub> equivalent to be reduced or avoided per year

**4.2m tons**

carbon sequestration  
through the operation  
period

**75 GWh/year**

renewable energy

## Financing



Project cost



## Key info



Solar  
PV Park



Infra asset  
(greenfield)

## Project overview

This is a solar photovoltaic (“PV”) independent power producer project with a capacity of 300MW in Kashkadarya region. The project also involves building a 220kV high-voltage dual circuit transmission line of 1.5 km in length to supply power from the new PV project to the nearest substation. The project is part of the Government 1 GW solar in partnership with the Asian Development Bank.

## Timelines

**Project stage:** Structuring & Execution

**Project timeline:** Bid received in March 2022. Project construction to commence in 2024, and expected to enter commercial operation in 2026

## Location

**Country:** Uzbekistan

**Regions benefitting:** Guzar district, Kashkadarya region

## Project structure

**Project sponsor:** National Electric Grid of Uzbekistan JSC (49%)

## Impact



Mitigation  
(avoidance)

Uzbekistan aims to deploy 8 GW of solar by 2030<sup>1</sup>

This solar program will help the country achieve its overall goals of lowering the cost of its energy sources for the benefit of the population, decreasing its dependence on fossil fuels, and reducing overall CO<sub>2</sub> emissions in energy production

## Financing



Project cost

1. According to the latest statistics from the International Renewable Energy Agency, Uzbekistan had only installed 4 MW of solar by the end of 2020

Source: UNECE

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## Key info



Energy  
(Solar)



Infra asset  
(greenfield)

## Project overview

Hatay Erzin Solar power plant has 100 Mwe of license capacity and 140 MW installed capacity with an estimated annual production of 256 GWh per year. The project is under the national Yeka (Yenilenebilir Enerji Kaynak Alanları) renewable energy program. 6 years of the Project's power generation is equivalent to absorbing around 1 million tons of carbon, which is equivalent to the amount of carbon that 45 million trees reduce in a year, or the annual average carbon emission of 220,000 vehicles.

## Timelines

**Project stage:** Structuring & Execution

**Project timeline:** Structuring/financing period:  
Aug 2022-Dec 2024  
Construction/development period: 2023-2024  
Operating period: 30 Years Generation  
Licence Period

## Location

**Country:** Türkiye

## Project structure

**Developer:** Limak Yenilenebilir Enerji A.Ş.

**Sponsor:** Limak Yatırım Enerji Üretim Hizmetleri ve İnşaat A.Ş.

**Off-taker:** EPIAŞ (Up to 2,300 GWh)

**Contractual Structure:** Generation Licence

## Impact



Mitigation  
(avoidance)

- The first 6 years of Erzin-1 power generation is equivalent to absorbing about 1 million tons of carbon
- Annual reduction of 165,000 tons of CO<sub>2</sub> emissions
- One person's yearly carbon emission is equal to 7 tons in Türkiye. The Project's annual production corresponds to the carbon footprint of ~24,000 inhabitants.

**4.8 m tons CO<sub>2</sub>e**  
carbon sequestration  
(2024-2053)

**256 GWh/year**  
renewable energy

## Financing



Project cost



## Key info



Energy  
(Wind)



Infra asset  
(greenfield)

## Project overview

The 240 MW Khizi-Absheron project is the first industrial renewable energy project implemented in Azerbaijan being developed through foreign investment. It will become the largest wind farm in the country. Azerbaijan set out to reduce carbon dioxide emissions by 40% by 2050. To achieve this, it is necessary to commission new energy capacities in the amount of 1,500MW. The project will contribute to the energy security of Azerbaijan and to the diversification of its energy sources.

## Timelines

**Project stage:** Feasibility Assessment

**Project timeline:** The project is expected to be launched in 2023.

## Location

**Country:** Azerbaijan

## Project structure

**Project sponsor:** ACWA Power

## Impact



Mitigation  
(avoidance)

- The project will save 220 million cubic metres of natural gas per year
- 300,000 homes will be provided with electricity.

**400,000 tons  
CO2e/year**  
carbon sequestration

**1 bn KWh/year**  
renewable energy

## Financing



Project cost





## Key info



Energy  
(Solar)



Infra asset  
(greenfield)

## Project overview

This is a high-rise Solar Power Plant (SPP) with a capacity of 300MW on 62 hectares in the Toru-Aigyrl Aiyl Okmotu village, in the Issyk-Kul region. It will generate 600 million kWh per year, equivalent to using over 140 million meter<sup>3</sup> of gas. It is planned to increase the capacity up to 1GW in the future. High-rise SPPs significantly save space (more than 2 times) and may be constructed in any climate and in any location.

## Timelines

**Project stage:** Feasibility Assessment

### Project timeline:

- Investment agreement signed on April 8<sup>th</sup> 2022
- Construction starts at the beginning of 2023 upon the required Documents signed by Sponsor and Government
- Scheduled Operation starts in 2024 (operation period 30 years)

## Location

**Country:** Kyrgyzstan

**Regions benefitting:** Ton District, Issyk-Kul region

## Project structure

**Project sponsor:** CPID<sup>1</sup>, CR20<sup>2</sup>

**Financial Institution:** Exim Bank, AIIB, EBRD, Bank of China, ICBC, Sinosure, etc.

## Impact



Mitigation  
(avoidance)

- Kyrgyzstan receives an annual average of 2.21 billion kWh of radiant solar energy.
- Over 1000 jobs direct and indirect are expected to be created
- Strategic significance of promoting efficient and clean renewable energy.

## Financing



Project cost

**Capex:** includes costs related to 80Km 500V Transmission Line according to Feasibility Study Report submitted by CPID & CR 20

1.6m  
tons CO<sub>2</sub>e/year  
carbon sequestration

2.21 Gwh/year  
renewable energy

1. China Power International Development Ltd & 2. China Railway 20 Bureau Group Corporation

Source: UNECE

To be put in touch with the relevant project owner(s), please reach out to the High-Level Champions Finance Team at [hlcfinanceprojects@climatechampions.team](mailto:hlcfinanceprojects@climatechampions.team) and UNECE at [reserves.energy@un.org](mailto:reserves.energy@un.org)



## Key info



Energy  
(Hydro)



Infra asset  
(greenfield)

## Project overview

Construction of the Kambatirskoy Hydropower plant near the Toktogul Lake. Total capacity 1,860MW for an annual production up to 5.6 GWh. The project has been identified as a project of national interest and the realisation phase is planned to take place in two stages:

- Stage 1: ancillary civil works and high voltage transmission lines (\$18.9m)
- Stage 2: construction of the dam and the power plant (~\$498.9m)

## Timelines

**Project stage:** Feasibility Assessment

**Project timeline:** N/A

## Location

**Country:** Kyrgyzstan

## Project structure

**Project sponsor:** OAO Power Plant

**Technical partners:** Lavalin (Canada) and Enex (Russia).

## Impact



Mitigation  
(avoidance)

**5.6 GWh/year**  
renewable energy

## Financing

**\$517.8m**





Project cost

### Financing:

Stage 1 will be financed in two phases:

- Phase 1: worth \$18.9m corresponds to technical studies and feasibility analysis; and
- Phase 2: valued at \$498.9m, for realisation of the civil works
- Debt will be raised from a combination of DFIs & commercial banks.



|  |   |  |
|--|---|--|
| <p><b>Key info</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <br/>             Energy (waste)         </div> <div style="text-align: center;"> <br/>             Infra asset (greenfield)         </div> </div>   | <p><b>Project overview</b></p> <p><b>Project A:</b> Waste Processing Industrial Complex that will process and sell products retrieved from the waste in the domestic market. Target customers include construction organizations, tyre manufacturers and restoration enterprises, etc. The key products developed will be carbon black and foam glass. <b>Project B:</b> Karaganda Solid Waste Management: The project involves procurement and setting up of composting units and biogas plant which would generate 5MW of electricity from the organic waste.</p> | <p><b>Timelines</b></p> <p><b>Project stage:</b> Conceptual Design for both projects</p> <p><b>Project timeline:</b> The commissioning of the production is planned for the 4th quarter of 2023, and the output to the design capacity in 2025</p>   |
| <p><b>Location</b></p> <p><b>Country:</b> Kazakhstan<br/> <b>A)</b> Near the city of Nur-Sultan <b>B)</b> Karaganda and Karaganda Oblast</p>   |   | <p><b>Project structure</b></p> <p><b>Project sponsor:</b></p> <ul style="list-style-type: none"> <li>• SIO Consulting LLP</li> <li>• GorKomTrans Goroda Karagandy LLP</li> </ul>  |
| <p><b>Impact</b></p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  <p>Mitigation (avoidance)</p> </div> <div> <p><b>A) Products creation annual capacity:</b></p> <ul style="list-style-type: none"> <li>• 3,500 tons of carbon black;</li> <li>• 30,000 cubic metres of foam glass granulate;</li> <li>• 4,400 tons of greenhouse tomatoes and cucumbers.</li> <li>• The project has potential of \$0.5m import substitution of carbon black.</li> </ul> <p><b>B) Range:</b></p> <p>The project will service 265,000 people per year, by reduction of solid household waste, and diversification of energy sources for Kazakhstan, which at present has negligible installed capacity of energy coming from biomass and waste.</p> </div> </div> <div style="border: 1px solid blue; border-radius: 10px; padding: 10px; margin-top: 20px; display: inline-block;"> <p><b>&gt;5 MW/year</b><br/>renewable energy</p> </div> |   | <p><b>Financing</b></p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;"> <br/>             Project cost         </div> <div> <p><b>Financing required</b></p> <p><b>Project A:</b> \$34m (30% Equity, 70% Debt)</p> <p><b>Project B:</b> \$16.7m</p> </div> </div> |



## Key info



Energy  
(Wind)



Infra asset  
(greenfield)

## Project overview

The Kazchrome Donskoy Wind Turbine Park has a capacity of 155 MW. It will feature the IEC S-class turbines, which can generate electricity in different weather conditions and at wind speeds of 3 to 25 m/s. The wind power generated will be used to supply and power the plant. This will be Eurasian Resources Group (ERG) first proprietary wind farm project, and forms part of the Group ambitious ESG Strategy and decarbonization program.

## Timelines

**Project stage:** Construction

**Project timeline:** The project is to be commissioned in 2024.

## Location

**Country:** Kazakhstan

## Project structure

**Project sponsor:** Kazakhstan Government & Eurasian Resources Group (ERG)

## Impact



Mitigation  
(avoidance)

- Around 300 jobs will be created during the construction phase, and the facility will provide 30 permanent jobs once it is commissioned
- The wind farm will supply energy to neighboring industrial facilities and the Aktobe region more widely, reducing Kazakhstan's usage of coal

**520,000 tons**  
**CO<sub>2</sub>e / year**  
carbon sequestration

## Financing

**\$230m**

Project cost



## Key info



Energy  
(Wind)



Infra asset  
(greenfield)

## Project overview

The Nigoza wind power plant with 50MW installed capacity is being implemented in cooperation with the Georgian Energy Development Fund (GEDF). It will generate up to 200 GWh in its first year and up to 5,000 GWh over a 25-year period. Full feasibility study (including 4 years wind measurement), ESIA, grid connection survey and all other necessary studies for the project have been conducted. The Government and the project company are currently negotiating to sign the Implementation Agreement.

## Timelines

**Project stage:** Feasibility Assessment

**Project timeline:** Start of construction is Q4 2023

## Location

**Country:** Georgia

## Project structure

**Project sponsor:** JSC Calik Georgia Wind<sup>1</sup>

**Contractual structure:** Build Own Operate

## Impact



Mitigation  
(avoidance)

100,000-  
190,000 tons  
CO<sub>2</sub>e/year  
carbon sequestration

258.75  
GWh/year  
renewable energy

## Financing



Project cost

**Project Finance target structure:** Equity 30%  
& Debt 70%

1. Shareholders: GEDF 15%, Calik Enerji Sanayi Ticaret A.S 85%

Source: UNECE

To be put in touch with the relevant project owner(s), please reach out to the High-Level Champions Finance Team at [hlcfinanceprojects@climatechampions.team](mailto:hlcfinanceprojects@climatechampions.team) and UNECE at [reserves.energy@un.org](mailto:reserves.energy@un.org)



## Key info



Energy  
(Solar)



Infra asset  
(greenfield)

## Project overview

Uzbekistan is planning to deploy 5 GW of solar PV by 2030 out of which only 4 MW had been installed by the end of 2020. To pursue the goal, a 200 MW solar power plant is being planned in Nurata. The plant will be the country's first solar park developed outside of the two tender schemes the government is running with the support of the Asian Development Bank and the International Finance Corporation.

## Timelines

**Project stage:** Conceptual design

**Project timeline:** No timeframe provided for its construction and completion.

## Location

**Country:** Uzbekistan

## Project structure

**Project sponsor:** Quyosh-Energy; Phanes Energy

## Impact



Mitigation  
(avoidance)

## Financing

\$179m

Project cost



## Key info



Energy  
(Solar)



Infra asset  
(greenfield)

## Project overview

Samgori is a solar photovoltaic power project, with a capacity of 96 MW. It is jointly developed with GEDF<sup>1</sup> and will be Georgia's largest and first utility scale solar power plant. Its annual generation will be 70 million kW/h.

## Timelines

**Project stage:** Feasibility Assessment

**Project timeline:** Finalization of Feasibility study: end of 2022  
Start of Operation: 2024

## Location

**Country:** Georgia

**Regions benefitting:** Village of Aakhali Samgori, Garbdani Municipality

## Project structure

**Project sponsor:** SPV (90% owned by Masdar and 10% by GEDF<sup>1</sup>)

**Contractual structure:** Build Own Operate

## Impact



Mitigation  
(avoidance)

The solar power plant's expected renewable energy generation is 196.7 GWh In the first year.

**90,000-180,000**  
tons CO<sub>2</sub>e/year  
carbon sequestration

**5,583GWh**  
renewable energy  
(over 25 years)

## Financing



Project cost

1. Georgian Energy Development Fund

Source: UNECE

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## Key info



Energy  
(Solar)



Infra asset  
(greenfield)

## Project overview

The ground-mounted 97.2 MW solar photovoltaic project is planned over 270 hectares. The 115 GWh of electricity generated will greatly contribute to Serbia's target of 8.3GW of solar energy by 2024. The plant is being installed on an active landfill of ash and slag dumps from coal power plants in the Kostolac mining basin. EPS, the project sponsor, is planning to install 17,100 PV panels of 650W each, with an efficiency rate of 20.9%.

## Timelines

**Project stage:** Feasibility Assessment

**Project timeline:** Permits in place. The layout report and final design report completed in 2022 and construction will commence soon after. Commercial operation expected by 2024.

## Location

**Country:** Serbia

**Regions benefitting:** Southern and Eastern Serbia

## Project structure

**Project sponsor:** Elektroprivreda Srbije (EPS)

## Impact



Mitigation  
(avoidance)

**115 GWh/year**  
renewable energy

## Financing

**\$91.56m**

Project cost

Note: Exchange rate used, EUR1 = USD0.96

Source: UNECE

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# Sustainable Energy Financing Mechanism in Forest Villages

## Key info



Energy  
(solar)



Infra asset  
(greenfield)

## Project overview

The project objective is to support the successful launch of a sustainable energy financing mechanism within the ORKOY credit mechanism, targeting a minimum of 30 MW of installed capacity of grid-connected, cooperative solar PV in forest villages. The public support and involvement in the initiative are led by ORKOY, working together with other key actors in the solar PV value chain, including private sector solar PV installers, Turkish utilities, and domestic and international banks.

## Timelines

**Project stage:** Structuring & Execution

**Project timeline:** Under development. At the end of 2021, it reached a total installed capacity of 1.5 MW of electricity production. By March 2022, rooftops of 806 houses in 36 different provinces had PV panels installed.

## Location

**Country:** Türkiye

## Project structure

**Project sponsor:** Department of Forest Village Relations Department (ORKOY), Ministry of Agriculture and Forestry

## Impact



Mitigation  
(avoidance)

**28,750 tons  
CO<sub>2</sub>e**

Emission avoidance  
compared to the  
project baseline

- 450 jobs to be created for forest villagers
- Approximately 2.5% or 175,000 people living in forest villages will have their electricity needs met by solar PV by the end of the project

**47.52 GWh/year**  
renewable energy

## Financing

**\$56.28m**

Project cost

Seed funding of \$3.8m was provided by the Global Environment Facility, \$100k through UNDP, with remaining coming from ORKOY and other investors.

Source: UNECE

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## Key info



Energy  
(wind and solar power)



Infra asset  
(greenfield)

## Project overview

The Svevind Green Hydrogen project would install ~40 GW of onshore wind power and solar PV to feed 20 GW of electrolyzers that will produce green hydrogen. The green hydrogen complex will convert yielded renewable electricity to produce 2 million tons of hydrogen and/or up to 11 million tons of ammonia per year. The exact ratio of green hydrogen and ammonia production will be adjusted based on the offtake structures. The output is set to be exported to markets in Eurasia.

## Timelines

**Project stage:** Conceptual design (finalization stage) On-site surveys and environmental impact assessment are underway.

**Project timeline:** The facility will be commissioned in 5 phases. Planning and execution is scheduled for a 10+ year period.

## Location

**Country:** Kazakhstan

## Project structure

**Project sponsor:** Svevind Energy Group

## Impact



Mitigation  
(avoidance)

- Two-thirds of the solar and wind output would be used to power electrolyzers that would create about 3 million tons of hydrogen per year from water
- The resulting green hydrogen, in either liquid or gas form, is produced without any GHG emissions
- The advantage of hydrogen, beyond being clean, is that it is easy to transport or sell abroad.

## Financing



Project cost



## Key info



Energy  
(wind power)



Infra asset  
(greenfield)

## Project overview

The Virovi wind park, with a capacity of 415MW, is a strategic project for North Macedonia. 69 new wind turbines will be installed between the towns of Kumanovo and Kriva Palanka. It will be developed at three different locations across the country. Once completed, Virovi would be the biggest renewable power plant in North Macedonia.

## Timelines

**Project stage:** Conceptual design

**Project timeline:** The construction is likely to begin in 2024 and expected to be completed in six years. The aim is to commission in three stages in 2025, 2026 and 2027, respectively

## Location

**Country:** North Macedonia

## Project structure

**Project sponsor:** German renewable energy company, WPD

## Impact



Mitigation  
(avoidance)

The wind farm will supply electricity to 290,000 households once completed.

310,000 tons  
CO<sub>2</sub>e/year  
carbon sequestration

1.3 GWh/year  
renewable energy

## Financing



Project cost



## Key info



Energy  
(Solar)



Infra asset  
(greenfield)

## Project overview

Voltalia is developing two projects over a combined surface of 317 hectares of non-productive salty lands:

- The Karavasta 140MW photovoltaic plant (PV), that will be the largest PV in the Western Balkans. The plant will be interconnected to the national grid through a 20 km long overhead line.
- 100 MW ground-mounted Spitalla Solar PV Park, off the Adriatic Coast, in the port city of Durres.

## Timelines

**Project stage:** a) Under construction since July 2022; b) Structuring & Execution

**Project timeline:** a) Construction: 2021; Commercial Operation Date: 2023; b) Construction: 2023; Commercial Operation Date: S224

## Location

**Country:** Albania

## Impact



Mitigation  
(avoidance)

- Karavasta will supply energy to over 220.000 Albanian families
- The project will avoid the emissions of 96,500+ tons of CO<sub>2</sub>, the equivalent of 9.5% of the emissions from the industrial sector in Albania.
- Spitalla will supply energy to over 154,000 households.

**163,548 tons**  
CO<sub>2</sub>e/year  
carbon sequestration

**>265 GWh/year**  
renewable energy

## Project structure

**Project sponsor:** French company, Voltalia

**Contractual structure:** Build, Own, Operate and Transfer; 30-year concession; 15-year sales contract with the Albanian public operator (50% and 70% of electricity output for Karavasta, and Spitalla respectively).

**Stakeholders:** EBRD

## Financing







Project cost

### Investment:

A combination of equity, Project Finance debt and grant

- a) €125m
- b) €83m







|  |   |   |
|--|---|---|
| <b>Key info</b><br><br>Energy (CRM), Industry<br><br>Program | <b>Project overview</b><br>Tajikistan has developed various programs to manage Critical Raw Materials (CRMs): <ul style="list-style-type: none"><li>• International Standard for the Assessment of Reserves of CRMs.</li><li>• Survey for deposits of rare earth elements in the Pamirs: The project allows assessing the prospecting potential of lithium, beryllium, and other critical minerals as well as discovering new deposits of rare earth elements in the Pamirs based on regional geochemical data, satellite remote sensing interpretation, and geological fieldworks.</li></ul> | <b>Timelines</b><br><b>Project stage:</b> Conceptual design<br><br><b>Project timeline:</b> Implementation period January 2023 to December 2025 |
| <b>Location</b><br><b>Country:</b> Tajikistan  | <b>Project structure</b><br><b>Project sponsor:</b> <ul style="list-style-type: none"><li>• State Commission of the Republic of Tajikistan for Mineral Reserves</li><li>• Department of Geology under the Government of the Republic of Tajikistan</li></ul>  |   |
| <b>Impact</b><br> Mitigation (avoidance)  | <b>Financing</b><br><br>Project cost<br>a) \$3m<br>b) \$5m  |   |

Source: UNECE

Note: The project will entail (a) organization of training and courses on the international standards and new software; (b) implementing programs in mining and geological industry; (c) drafting legal documents and adapting them to international standards; and (d) organization of consultations and seminars on convergence of approaches. To be put in touch with the relevant project owner(s), please reach out to the High-Level Champions Finance Team at [hlcfinanceprojects@climatechampions.team](mailto:hlcfinanceprojects@climatechampions.team) and UNECE at [reserves.energy@un.org](mailto:reserves.energy@un.org)



|   |   |  |
|---|---|--|
| <h3>Key info</h3>  <p>Energy (Solar), Industry</p>  <p>Program</p>  | <h3>Project overview</h3> <p>Two projects to help Ukraine reducing its dependence mineral imports:</p> <ul style="list-style-type: none"><li>• Formulation of a single national multi-level resource management strategy for energy, mineral, renewable and water resources</li><li>• Mineral &amp; Raw material Atlas: development of regulatory conditions for domestic production of mineral raw materials, preparation of new deposits, geological exploration works, and reassessment of drinking groundwater resources.</li></ul> | <h3>Timelines</h3> <p><b>Project timeline:</b><br/>Phase A: 12 months<br/>Phase B: 24 months</p> |
| <h3>Location</h3> <p><b>Country:</b> Ukraine</p>  | <h3>Project structure</h3> <p><b>Project sponsor:</b> State Commission of Ukraine on Mineral Resources (SCMR)</p>   |  |
| <h3>Impact</h3>  <p>Mitigation (avoidance)</p> <p>Strategies and mechanisms for the post-war recovery of resource-intensive sectors of Ukraine's economy will be developed with the objective to achieve climate neutrality, resource use efficiency, mineral base development and integrated water resource management.</p> | <h3>Financing</h3>  <p>Project cost</p> <p><b>Overall cost:</b><br/>Phase A: \$25m<br/>Phase B: \$85m estimated need per year (budget of the Government of Ukraine is currently at \$5-7m per year)</p>   |  |

Source: UNECE

Note: Implementation of the United Nations Resource Management System (UNRMS) will allow Ukraine to achieve sustainable development standards.

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## Key info



Energy  
(CRM), Industry



Infra asset  
(greenfield)

## Project overview

Establishment of a production facility for Silicon Monocrystalline Plates for solar panels by utilizing the Tiantong SIF-140 furnace technology. The project is being implemented in two phases:

- Phase 1: up to 119MW of production capacity (capex \$12.8m), and
- Phase 2 up to 409MW capacity (capex \$42.9m)

## Timelines

**Project stage:** Structuring & Execution

**Project timeline:** Construction time 18 months

## Location

**Country:** Kyrgyzstan

## Project structure

**Project sponsor:** Astra Ltd

## Impact



Mitigation  
(avoidance)

## Financing



Project cost

**Financing:** Amounts already invested include:

- \$7.3m in infrastructure and equipment, and
- \$3m in R&D

EBRD and Kyrgyz-Russian Fund for Project Investment are involved.



## Key info



Transport



Program

## Project overview

The project involves acquisition of a fleet of 180 electric buses and associated infrastructure, including charging stations and depots, for the city of Samarkand which will address the deficit of 300 buses, establish a reliable public transportation service and ensure its sustainable operations. The project is part of the Green Cities 2 framework (GrCF2 W2 E2) of EBRD.

## Timelines

**Project stage:** Structuring & execution

**Project timeline:** First purchases scheduled in 2022

## Location

**Country:** Uzbekistan

**Regions benefitting:** Samarkand

## Project structure

**Project sponsor:** Government of Uzbekistan

## Impact



Mitigation  
(avoidance)

- Through the project, Samarkand City will commit to developing a Green City Action Plan.
- A shift to electric mobility will significantly reduce greenhouse gas emissions and eliminate tail pipe air pollutant emissions.
- Uzbekistan emits 102,965 million metric tonnes of CO<sub>2</sub>.

## Financing



Project cost

**Investment secured:** Final review pending by EBRD to provide a sovereign loan of up to \$95m to the Republic of Uzbekistan





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