CLIMATE CHALLENGES AND POTENTIAL PROJECT SEEDS IN UZBEKISTAN

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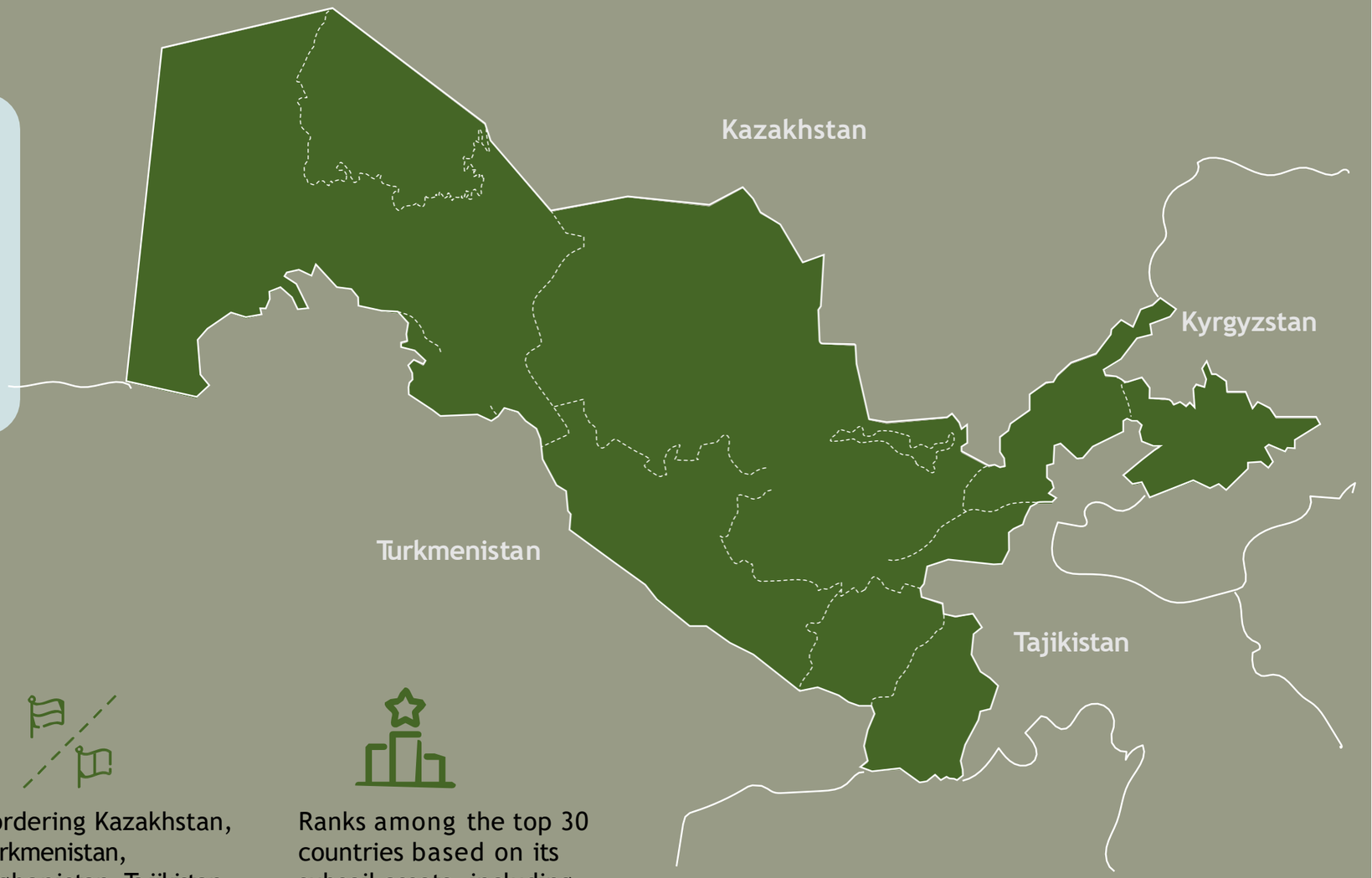
GREEN GROWTH

Shavkat Mirziyoyev

Prezident of the Rebublic
of Uzbekistan



Population of 36 million in 2022

Double landlocked country with a total land area of 448,978 square kilometers

Bordering Kazakhstan, Turkmenistan, Afghanistan, Tajikistan, and Kyrgyzstan

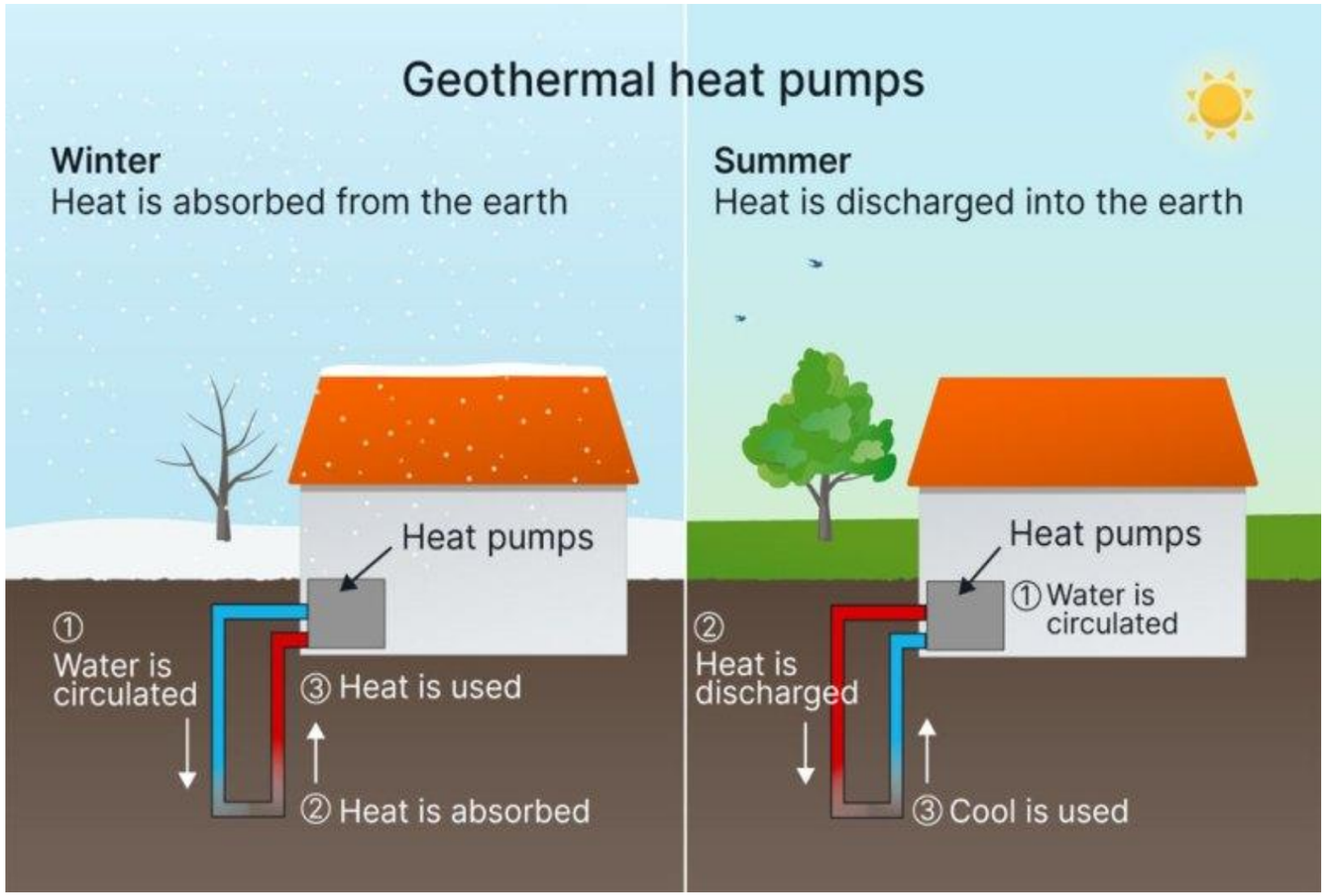
Ranks among the top 30 countries based on its subsoil assets, including natural gas, gold, copper, uranium, and coal

Karakalpakstan is located in northwestern Uzbekistan. It borders Kazakhstan to the north and west and Turkmenistan to the south. The region lies in the lower reaches of the Amu Darya River basin and once surrounded the shores of the Aral Sea.
Population: ~2.0–2.1 million
Capital city: Nukus (about 300,000 residents)

Karakalpakstan's air quality is mainly affected by environmental degradation and energy use. The primary source is toxic dust from the dried Aral Sea, producing high levels of **PM_{10} and $PM_{2.5}$**. Winter **residential heating** adds **$PM_{2.5}$, NO_2, and CO**, while **land degradation** and **older vehicles** contribute additional dust and NO_2. The key pollutants are **$PM_{2.5}$, PM_{10}, NO_2, and CO**.

Major sources: toxic dust storms from the dried **Aral Sea (Aralkum Desert)**, **residential heating** (especially in winter), **land degradation/agriculture**, and **older vehicles**.

Project Seed 1: Sustainable Heating Systems for Schools/Technikums in Kograt,Karakalpakistan



Main problem:

- In 2023, **241.5 thousand tons of coal** were supplied to public secondary schools across the republic, and the coal was delivered to schools **by 1 September**. In **Qo‘ng‘irot District**, there are **more than 50 general secondary schools and 3 techikums**, and in this area school buildings are **mainly heated using coal**. (2320 tons annually)

Place:
Kongrat Region and Amudrya degion in Karaalpakistan(schools and Technikum

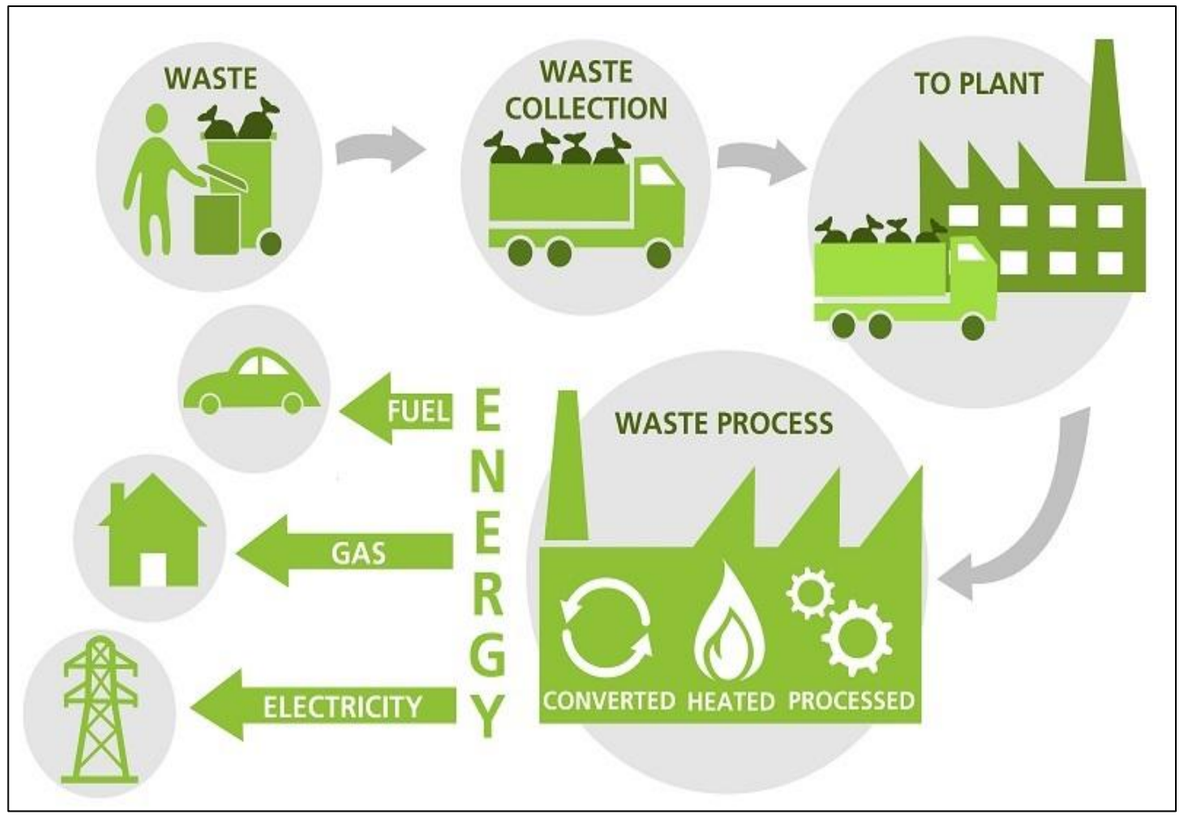
Stake holders: Municipality , Ministry of Environment, Agency for Vocational education, Ministry of Investment, Ministry of Finance
Potential partners: Bell Energy, NCI,CAA

Expected air quality and climate co-benefits:

- **Reduced air pollution: Significant decrease in $PM_{2.5}$, PM_{10}, CO, and NO_2 emissions up to 5000 tons from replacing coal-based heating in Kongirat district, leading to cleaner indoor and outdoor air .**
- **Health benefits: Lower risk of respiratory and cardiovascular diseases for students, teachers, and nearby communities.**
- **Climate mitigation: Reduced 4000 tons of CO_2 emissions through lower fossil fuel use and improved energy efficiency.**

What is/are the main problem(s) this project aims to address?	• High dependence on coal-fired heating systems • High carbon emissions from the energy sector
Where will the project be implemented and who are the key stakeholders?	• Kungrad District, Republic of Karakalpakstan • Deputy Mayor, Municipality of Kungrad District • Relevant City or district departments • Schools/Teknikum • CAA,NCI
How will the project be implemented?	• Geothermal heating technologies or heat pumps • Integration of renewable energy technologies with battery storage
What air quality and climate co-benefits are expected?	• Improved indoor air quality • Reduced greenhouse gas emissions • Public health protection

Project Seed 2: Low-Carbon Waste-to-Energy System for Kungrad City



Presidential Decree PF-56 (24 March 2025)
Waste Processing & Circular Economy Reform – Uzbekistan

• Goal: Cut landfilling and scale up recycling & waste-to-energy (WTE) under a "Zero Waste" model by 2030
– Reduce landfills by ≥50%
– Prioritize recycling & thermal treatment
– Establish Eco-Industrial Zones (EIZs) nationwide

MAIN PROBLEMS:

In 2025, 23,406 tons of solid household waste were collected and sent to a landfill. (This is approximately 10% of the total waste in the Karakalpakstan region.)
Limited waste management infrastructure

Stake Holders:
Municipality , Ministry of Environment, Agency for Vocational education, Ministry of Investment, Ministry of Finance
Potential partners: Bell Energy, NCI,CAA

THE PROCESS:

- Assessment of landfill capacities, baseline emissions, and waste composition
- Waste-to-energy facilities (e.g., waste incineration plants, anaerobic treatment systems, filtration systems)

TASHKENT CITY AND REGION INDUSTRIAL HAZARDOUS WASTE MANAGEMENT

PROJECT LIFE CYCLE

PROJECT COST AND DURATION

Total period of development: **18** months

Indicative cost of the project: **$10** mln

ACTIVITY	DURATION IN MONTHS	COST MLN USD
LAND, DEVELOPMENT AND OTHER INFRASTRUCTURE	4	3,5
PLANT AND MACHINERY	9	5
HEAVY MACHINERY	4	0,45
TRANSPORTATION EQUIPMENT	3	0,55
CONTINGENCIES	-	0,5
Total	18	10

KEY FINANCIAL INDICATORS

PARTICULARS	Amount mln USD
Installed Capacity (TPA)	
LAT	1,000
Incineration	2,000
Waste Pricing – USD/ MT	
LAT	1,230
Incineration	
Y1- Y3	1,230
Y4 onwards	1,475
Selected Financial Indicators (Over 25 Years)	
Average Revenue (USD MN)	5,50
Average EBIDTA	35%
Projects IRR	16%

KEY STAKEHOLDERS

PUBLIC PARTNER

MINISTRY OF ECOLOGY, ENVIRONMENTAL PROTECTION AND CLIMATE CHANGE OF THE REPUBLIC OF UZBEKISTAN

PRIVATE PARTNER (BUILD OWN OPERATE) [BOO]

Bell Energy

Sustainability

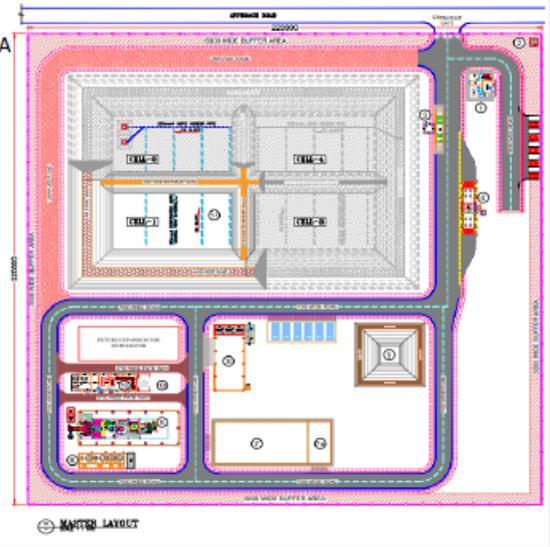
New Jobs Created **32**

Direct Investment **3,5** mln. USD

Foreign Loans Under Government Guarantee **6,5** mln. USD

TYPICAL PLANT LAYOUT

- Design Capacity : 3,000 MTPA
- RK Incinerator : 500 Kgs./ hr
- Stabilization Plant
- Storage Facility
- Laboratory and R&D Centre
- Class I Landfill
- Weighbridge
- Other infrastructure
- Land required – 5 Hectar

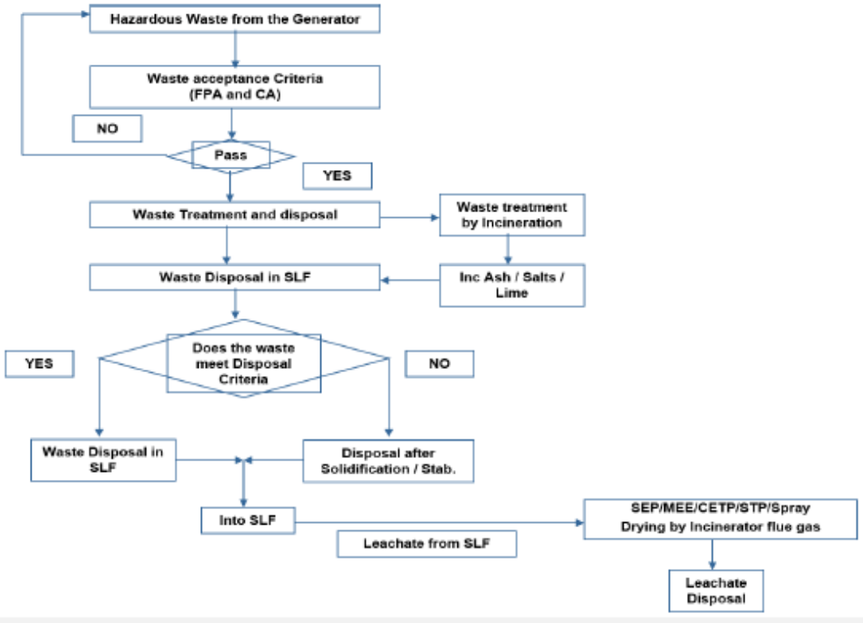


WASTE MANAGEMENT

TYPES OF WASTE

- ETP Sludge
- Spent catalysts and resins
- Discarded/ Off-specification products
- Salts and soluble substances
- Contaminated glass wool, Wiping cotton
- APCS residues and dusts
- Incineration ash
- Iron sludge
- Gypsum wastes
- Still bottom and High vacuum distillation residues
- Spent solvents
- Wash water from Mining Industry
- Tarry and oily wastes
- Waste oils
- Chemical Powdery waste
- Spent carbon
- Oily Sludge/ Oil & Grease
- Paint Waste
- Used oil filter

HZW TREATMENT PROCESS



OBJECTIVES

- Achieve the Uzbekistan Governments waste strategy ambitions
- Deliver quantifiable service improvement & cost savings
- Develop a circular waste management system

Waste-to-Energy Plant Launched in Karakalpakstan (Nukus District)

• Construction has started on an $80 million Waste-to-Energy (WTE) power plant in Nukus District, Karakalpakstan.

• The facility will process 274,000 tons of municipal solid waste per year.

• It will generate around 80 million kWh of electricity annually.

• The project is expected to create about 100 permanent jobs.

• The plant is being developed under an agreement between Uzbekistan’s Waste Management & Circular Economy

https://daryo.uz/en/search/hashtags?q=Waste+Management

Waste-to-Energy Power Plant Launched in Kogon District, Bukhara Region

• Construction has officially started on a municipal solid waste (MSW)–to–energy power plant in the *Navro‘z Mahalla* area of Kogon District, Bukhara Region.
• The project is being implemented under the Presidential Decree of 24 March 2025 on investment projects for electricity generation from MSW incineration.
• Total investment value: USD 165 million.
• Processing capacity: 1,500 tons/day or 547,500 tons/year of MSW.
• Power generation capacity: 400 million kWh/year.
• Construction period: 2 years.
• Employment impact: 120 permanent local jobs once operational

https://gov.uz/oz/buxoro/news/view/126930

Support needed to advance the project seeds

1. Financial Support

2. Technical Support

3. Experts

Cross-cutting opportunities for air quality improvement

-The Vocational Education Agency seeks technical and financial support to establish practical laboratories in technicums and to engage expert teachers in the field to train students in hands-on green technical skills, including the maintenance and repair of air quality and ventilation equipment, as well as clean energy and energy-efficient heating systems, directly contributing to improved air quality.

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