

CHANGE, IMPACT, SUSTAINABLE DEVELOPMENT

HOW THE ISLAMIC DEVELOPMENT
BANK GROUP IS IMPROVING
PEOPLE'S LIVES

WASTE TO ENERGY

AVERTING ENVIRONMENTAL
DAMAGE IN AZERBAIJAN



2020

INTRODUCTION

For decades, all of the capital city Baku's waste was taken to a huge landfill in the Balakhani settlement. President of the Republic of Azerbaijan, Ilham Aliyev, said: "The smoke of the garbage burned there poisoned the sky over the city." The Chairman of Azerbaijan's Clean City initiative, Zakir Ibrahimov, identified it as "a gross violation of environmental norms and standards." It was a hazard to human health and the environment. This project constructed the country's first waste-to-energy plant to support economic development by improving the ecological and health conditions in the Greater Baku area.

THE CHALLENGE

Azerbaijan's capital Baku, the 'City of Winds', is the largest city on the Caspian Sea and in the Caucasus region. Baku's built-up urban area, including city and suburbs, covers around 1,127 square kilometers and is home to an estimated 2.7 million people, about a quarter of Azerbaijan's population. Since 1963, the municipal waste generated by the area had been taken to open landfill at the Balakhani dumpsite. Originally 10 kilometers from the city, the dumpsite was gradually engulfed by the spreading city's growing residential areas. The health of the people in both the suburbs and the city center suffered from the effects of pollutant emissions and the extensive smoke caused by inadequately controlled fires. The low air quality and deteriorating environmental conditions affected most of the capital, and the people working at the Balakhani dumpsite itself were particularly affected.



THE PROJECT

The overall objective of the three-year Baku waste-to-energy project was to support economic development and improve the environmental and health conditions for the 3.5 million population of Azerbaijan's Greater Baku area by constructing the country's first waste-to-energy plant.

Using 4.8 million work-hours of labor, the project built a waste-to-energy plant with capacity to treat over 500,000 tons of municipal solid waste and generate 230 GWh of electricity annually from incineration, supplying the equivalent to the power needs of more than 50,000 households.

Between December 2012 and January 2020, the plant thermally treated 3,281,343 tons of household waste, and exported 1,015,800 MWh of electricity to the national grid system. Today, 80% of Baku's household waste is thermally treated and sorted in accordance with European Union (EU) environmental directives, surpassing the project's goal of reducing dumping of household waste by 75%.

The plant consists of two incineration units, each with a capacity of 33 tons per hour, with high-quality emission control systems. It currently treats around 400,000 tons of household waste per year.

Fly ash generated during incineration is caught by special filters to prevent it polluting the environment. Bottom ash, which is heavier and less harmful, is used as road construction material, and metal residues are recycled. The plant is ISO 14001 certified and meets the strictest EU and Azerbaijan standards relating to industrial pollutant emissions. Odors are neutralized during combustion and no aqueous waste enters the environment. As the wetness of the waste changes from season to season, reducing its calorific value for electricity generation, the plant sometimes uses natural gas to generate electricity.

RESULTS

This flagship project covering 10 hectares is one of the largest waste-to-energy facilities in Europe. Its impact on the health of people and the planet is clear. It has resulted in cleaner air and improved health for residents of the Greater Baku area. Regarding greenhouse gases, while incinerating waste does generate carbon dioxide, the methane generated from the old dumpsite had a greenhouse effect 21 times greater than burning the waste. Emissions of methane and smoke from the old Balakhani dumpsite have now been reduced to below the limits of EU Directive 2000/76/EC. The electricity generated by the plant saves the country from burning 100,000 tons of oil per year. By diverting 80% of municipal waste to the new plant, the equivalent of 500,000 tons of carbon dioxide emissions are avoided each year. The new management of municipal waste has also encouraged the fledgling recycling industry in the country.

80%
OF BAKU'S MUNICIPAL WASTE IS THERMALLY
TREATED, AMOUNTING TO ABOUT

400,000
TONS PER YEAR

THIS GENERATES
230GWH
OF ELECTRICITY, ENOUGH TO SUPPLY MORE THAN

50,000
HOUSEHOLDS





LESSONS LEARNED

The efficiency of the plant could be improved with the construction of a fly ash treatment facility to fully utilize the end products, and a waste transfer facility to dry wet waste. To address this, with Government support, a semi-automatic sorting facility has been in operation since 2012, and Tamiz Shahar (the company that operates the plant) has plans for additional waste transfer stations and a sorting facility with 100,000 tons of annual capacity for the Garadag and Khazar regions of Baku city. The sorting of waste prior to reaching the plant will improve plant operation. Close liaison with other international actors when planning such projects, in this case with the World Bank landfill project at Balakhani, should enhance opportunities and synergies. Gala settlement and the Narimanov region of Baku city are piloting asking households to segregate waste into organic and non-organic waste, including using public awareness campaigns.

THE NEW PLANT AVOIDS

500,000

TONS OF POLLUTANT EMISSIONS EACH YEAR,
INCLUDING GREENHOUSE GASES

ISDB MEMBERSHIP COVERS

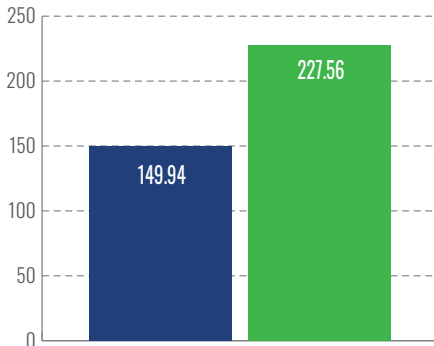
57

COUNTRIES SPREAD
OVER 4 CONTINENTS



TOTAL PROJECT COST

EUR 377.50M



CONTRIBUTIONS

- ISLAMIC DEVELOPMENT BANK
EUR 149.94M
- GOVERNMENT OF AZERBAIJAN
EUR 227.56M

DISCLAIMER THE MAP IS FOR ILLUSTRATIVE PURPOSES ONLY

"Before the operation of Baku waste plant, all household waste was dumped in the old landfill. But today 80% of Baku household waste is thermally treated and sorted in accordance with EU environmental directives. So, we have achieved our goal and minimized dumping of household waste."

Sabit Zeyniyev, Deputy Chairman of the Executive Board,
Tamiz Shahar (Azerbaijan's Clean City initiative).



INCINERATING WASTE (TO GENERATE ELECTRICITY) WAS KEY TO CLEANING THE AIR OF THE GREATER BAKU AREA

ELECTRICITY GENERATED BY THE NEW PLANT SAVES

100,000
TONS OF OIL ANNUALLY

CO₂ EMISSIONS IN AZERBAIJAN DECREASED FROM

73.3MT
TO 34.7MT
BETWEEN 1990 AND 2018

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