

# WASTE TO ENERGY FOR WESTERN BALKANS CEMENT INDUSTRY

FEASIBILITY STUDY STUDY FOR THE PRODUCTION OF ALTERNATIVE FUEL AT BUSHATI LANDFILL, ALBANIA



waste 2 energy

CO-PLAN INSTITUTE FOR HABITAT DEVELOPMENT



**WASTE TO ENERGY FOR WESTERN BALKANS CEMENT INDUSTRY**

# **FEASIBILITY STUDY**

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**for the production of Alternative Fuel at Bushati Landfill, Albania**

Co-PLAN  
Institute for Habitat Development

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## Abbreviations and Acronyms

<b>ATR:</b>	Administrative-Territorial Reform
<b>Ad. Unit:</b>	Administrative Unit
<b>AF:</b>	Alternative Fuel
<b>AU:</b>	Administrative Unit
<b>BT:</b>	Biological Treatment
<b>C &amp; I:</b>	Commercial and Industrial
<b>DCM:</b>	Decision of the Council of Ministers
<b>EC:</b>	European Commission
<b>EU:</b>	European Union
<b>EWC:</b>	European Waste Codes
<b>EURITS:</b>	European Union for Responsible Incineration and Treatment of Special Waste
<b>GHG:</b>	Greenhouse Gas emissions
<b>ISWMP:</b>	Integrated Solid Waste Management Plan
<b>LSGU:</b>	Local-self Government Units
<b>LIMSWMP:</b>	Local Integrated Municipal Solid Waste Management Plan.
<b>MBT:</b>	Mechanical Biological Treatment
<b>MFE:</b>	Ministry of Finance and Economy
<b>MSW:</b>	Municipal Solid Waste
<b>MU:</b>	Municipal Unit
<b>NGO:</b>	Non-Governmental Organization
<b>NEA:</b>	National Environment Agency
<b>NSRF:</b>	National Strategic Reference Framework
<b>OP:</b>	Operational Programme
<b>PPP:</b>	Public Private Partnership
<b>RDF:</b>	Refuse Derived Fuel
<b>RES:</b>	Renewable Energy Sources
<b>RGJC:</b>	Civil Registry
<b>RU:</b>	Regional Unit
<b>SKMM:</b>	National Strategy of Waste Management
<b>SME</b>	Small and medium-sized enterprises
<b>SRD:</b>	Sustainable Rural Development
<b>SRF:</b>	Solid Recovered Fuel
<b>SWM:</b>	Solid Waste Management
<b>PCE:</b>	Public Communal Enterprises
<b>TT:</b>	Thermal Treatment
<b>WMP:</b>	Waste Management Plan
<b>WMZ:</b>	Waste Management Zone
<b>WtE:</b>	Waste to Energy
<b>WTS:</b>	Waste Transfer Station
<b>WTT:</b>	Waste Treatment Technology

# 1. EXECUTIVE SUMMARY

Co-processing of certain waste fractions as Alternative Fuel (AF) in the form of Refused Derived Fuel (RDF) as well as Solid Recovered Fuel (SRF) has proven to be of a great importance for the cement kilns across Europe and States. Such process is nowadays contributing in parallel towards meeting the industry decarbonization objectives as well as providing a significant step towards circularity through utilization of waste recovery practice.

This feasibility study provides an actual roadmap on the production of AF in Albania whereas it foresees a specific design for the installation of the required technology near Bushati Landfill. Furthermore, it develops based on the findings from Market Research, Screening of National Waste Framework, Needs Assessment Analysis and a series of more than 20 rounds of consultations with national and local stakeholders. This document is designed under the project “Waste to Energy for Western Balkans Cement Industry” funded by the Federal Ministry of Economic Cooperation and Development of Germany (BMZ) and the companies Titan Antea Cement (Albania), Titan Cementarnica Usje (North Macedonia) and Titan Cementara Kosjeric (Serbia), within the develoPPP.de program.

It is imperative that waste management in Albania has earned a much more prominent place both on political and Civil Society Organizations agenda. Recent updates on legal and institutional framework for waste management sector, point out the basic need to increase resource efficiency, improve public health, mitigate green-house emissions as well as avoid littering across rural and remote areas. Such positive developments are in line with overall objectives that Albania and all Western Balkans countries took recently under the Sofia Declaration and EU Green Deal.

Waste to Energy (W2E) is a regional project implemented simultaneously in Albania, Serbia and North Macedonia aiming to determine the preconditions for the use of municipal and industrial waste (as mono-fractions) and waste tires for the production of alternative fuel from waste (RDF / SRF) for the cement industry, in order to achieve opportunities for economic utilization of various waste streams, through utilization of the potential of the existing infrastructure and network for collection, preparation and processing of municipal and other priority waste for production of RDF / SRF.

Given that most of the Municipal Waste for the northern region of Albania have few treatments options due to lack of final treatments capacities, vis a vi the incinerators and landfills already in operation for the central and southern regions.

Among other things, it encouraged cooperation with the public and private sector for knowledge exchange and overcoming challenges, with the ultimate goal of:

- Providing a sustainable solution for reducing the amount of municipal waste being deposited in deposit sites, landfills and/or uncontrolled in the environment;
- Reducing the use of fossil fuels in the cement industry through alternative fuel co-processing;
- Quantify and advocate for environmental and financial benefits through alternative fuel production and usage at local level.

Due to rising cost of energy and fossils fuels Cement production Industries have expressed their interest in becoming part of the project in order to explore possibilities to use AF in their process. In this line, TITAN Antea Cement has shown its availability to purchase AF produced from the recovery processes of waste generated in Albania. At the current stage, TITAN requires up to 40,000 tons/year of AF in the form of RDF/SRF, this amount will allow them to reduce their fossil fuel consumption by 20% until 2025 and potentially increase their demand by double until 2030.

Types of waste considered for this research are: *Letter, Cardboard, Plastic, Used tires, Waste from leather, Waste from Textile Industry, Residues from the carpentry process, Waste from biomass and urban greenery, wood, leaf's, dry sludge after wastewater treatment*, practically fractions that have a high calorific embodied energy.

W2E project comprised the following Municipalities in its studies; Shkodër, Kukës, Lezhë, Mat, Kurbin, Krujë and recently Durres. Total amount of MSW that can be used for the production of alternative fuel in the form of RDF/SRF in the actual conditions (data from previous years 2017-2019) is 33,177 tons. Nevertheless, taking into consideration scarcities and increasing rate of recycling the overall output foreseen by the RDF Facility would be at **27,314 tons/year** from 2024 until 2035.

Hypothetically, if volumes from Durres are included to the overall calculation, the amount of MSW that can be used for the production of alternative fuel in the form of RDF/SRF could reach 53,270 tons/year. Nevertheless, for this feasibility, Durres is not taken into consideration due to the fact that not in any scenario it would be logical to send waste from Durres to Bushati Landfill for further production of Alternative Fuel. It is suggested that Durres integrates processing of Alternative Fuel within the projected MBT facility.

Alternative Fuel (AF) facility production would require **an overall 4000m<sup>2</sup>** space within the layout of Bushati Landfill, whereas the extension as-build project allows for this new installment to be accommodated in parallel to the existing segregation and recycling unit.

We are proposing hereby that Bushati Landfill and further Durres MBT as well as Kukës Landfill to include processing of refused urban waste fractions into Alternative Fuels that can further be marketed and co-processed by Cement Industry in Albania.

The overall investments required for the AF facility is estimated at **3,022,265 \$** and operative costs estimated at 57,797\$. This whole process is evaluated to generate around **1 million \$/year** through direct sales of AF at Cement Factory resulting with an estimated **Internal Rate of Return at 63%**

An additional benefit from the RDF facility consists on its contribution to extend the lifespan of Bushati landfill with **at least 4-5 years** given the reduced yearly amount of waste for final disposal.

Further if Alternative Fuel is co-processed in Cement Kilns in a temperature above 1450°C it could cut considerably emissions of green-house gasses (GHG), more specifically introduction of AF in the cement kiln could lead to an overall **reduction by 9,726 ton CO<sub>2</sub>/year**.

Production of Alternative Fuel within Bushati Landfill could incentive an **overall reduction of the gate-fee with 35% of the existing tariff**.

On the other hand, to facilitate the production of AF and its usage in Cement Industries preconditions should be meet:

- a. Apply the waste hierarchy;
- b. Implement extended producer possibility and polluters pay principle;
- c. Ministry of Tourism and Environment as well as Ministry of Infrastructure and Energy should Develop Best Available Techniques for the production of Alternative Fuels in Albania. The BAT design will standardize the product and determine its composition, calorific value and pollution potential, whether it burns with other substances or as a single substance;
- d. Draw up Local Waste Management Plans, in which RDF/SRF is accepted as a form of recovery.
- e. Fully transposition of Directive 2010/75/EU on Industrial Emission and include in DCM no. 908, dated 21.12.2016 should include the following definition: 'fuel' means any solid, liquid or gaseous combustible material as in the Directive;
- f. DCM 'On waste incineration' should be revised/updated as the Directive the DCM transposes is no longer in force;
- g. Construct waste transfer stations as foreseen in the sectoral plan, in which can be explored the possibility of installing waste recovery techniques;
- h. Air quality measurement should be carried out regularly, especially in those areas that tend to exceed pollution levels.

One of the most prevailing preconditions from communities with regard to usage of alternative fuel by cement factory is related to the emissions. Given the lack of independent and state monitoring practices there is a growing concern among public upon whom will control emissions than needs to be addressed by National Environmental Agency.

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