ADG AFRICA WASTE TO WEALTH PROGRAM

Zero emissions & zero waste

WASTE PROCESSING COMPLEXES

of 180 - 2700 t/day capacity

in urban Africa

May 2023

AFRICA DEVELOPMENT GROUP:

- Investment & Project Management Company (Dubai, UAE)

- Management company for several Investment Funds, focused on sustainable development projects in Africa

- Innovative project financing solutions customized for Africa conditions

- Owns rights for zero emission waste processing technology with options to produce synthetic gas, power, methanol and meprin (high protein animal feed component)

- Strategic partnership with technological partners, equipment manufacturers and EPC contractors

- Readiness to implement projects in partnership with local project developers/local governments (municipalities)

- Provides detailed guidelines for project development and terms of partnership

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DEMAND FOR MSW PROCESSING IN AFRICA

Estimate of demand for MSW processing facilities in Africa

		2020	2030	2040	2050
Population of Africa	mln people	1200	1560	2028	2636
Population growth rate	% per year	3%	3%	3%	3%
Rate of urbanization	%	30%	35%	40%	45%
Urban population in Africa	mln people	360	546	811	1186
MSW generation by urban population in Africa	tons per day*	252 000	382 200	567 840	830 466
	mln tons per year	90 720	137 592	204 422	298 968
% of MSW collection in cities	%	40%	55%	70%	80%
MSW collection	mln tons per year	36 288	75 676	143 096	239 174
Number of 180 tons per day (50 000 tons per year) units*	units	726	1514	2862	4783

*

Does not take into account industrial and agricultural waste, which also can be processed and generates additional demand for waste processing facilities

PROGRAM RATIONAL

- Environmental risks of waste accumulation in landfills
- Limited access to technologies and investments in waste processing by local municipalities & governments in Africa
- High current demand and dramatic demand growth for environment friendly waste processing in Africa
- Demand for modular complexes will increase 6 times in 30 years (from 730 in 2020 to 4800 in 2050)
- PROGRAM is based on universal technological solution customized for African conditions
- Planned complex capacity of 180-2700 t/day can satisfy needs of cities with population from 300 000 people up to 4 mln people. For large cities with population above 4 mln people we will build several complexes, in order to minimize waste delivery routes and costs
- Project elements can also include waste collection component as well as landfill accumulated waste processing component

ADG target for next 5 years –

200-modular complexes in 10-15 countries of Africa

ZERO EMISSION WASTE PROCESSING PLANT

WASTE PROCESSING PLANT

ADVANTAGES

- All type of waste, including MSW, industrial, agricultural, medical and other hazardous waste as well as sludge are processed without sorting
- No need for external power (generates power for own needs
- ZERO GAS EMISSIONS
- ZERO WASTE WATER
- Includes water treatment component, all water used in technology processes in recirculated. In case of sludge processing with high liquid content treated water can be sold as the final product

PLANT CHARACTERISTICS

- Capacity from 180 to 2700 tons per day (50 000 - 750 000 tons per year)
- Unit capacity 180 t/day
- Modular plants, capacity can be increased following increase in volume of generated and collected waste
- Option to process any type of waste including MSW, medical waste, transformer oil, industrial hazardous waste of 1-3 class, processing of railways sleepers, agriculture waste

PRODUCTION STAGES

Stage 1: Production of purified synthetic gas

Stage 2: Production of product with high demand in the local market:

- Electric power
- Metanol
- Meprin (feed protein)

OPTIONS FOR WASTE PROCESSING PLANTS

Single modular complex of 180 tons per day (50 000 tons per year)

	TECHNOLOGICAL UNITS	FINAL PRODUCT	PRODUCT YIED	MODULAR COMPLEX INVESTMENT COST
1	• Gasifier pyrolisys + plasma • Power generators	Electric power	4-5 MW (depending on waste composition)	**15 mln$**
2	• Gasifier pyrolisys + plasma • Synthetic gas to methanol unit	Methanol	40 000 tons per year	**20 mln $**
3	• Gasifier pyrolisys + plasma • Synthetic gas to methanol unit • Power generators • Methanol to meprin unit	Meprin + electric power	6 000 tons per year + 3 MW	**22 mln $**
4	• Gasifier pyrolisys + plasma • Syntetic gas to methanol unit • Methanol to meprin unit	Meprin	12 000 tons per year	**23 mln $**

ADVANTAGES OF
ADG WASTE PROCESSING TECHNOLOGY

ADG
Africa
Development
Group

- Universal complexes (does not require MSW sorting , can be supplied to phyrolisys rector in compressed form, which allow reduce waste delivery logistics cost
- Medical waste is packed when delivered to processing plant
- Hazardous waste of 1-2 class is processed in a separate special unit
- Special equipment for supply of liquid waste
- Absolutely all waste is transformed into purified synthetic gas
- All gas flows are circulated in cycle (contour) which guarantees zero gas emission into the atmosphere
- Complex application of technologies allows independent supply of power and water for own needs of the plant (for technology processes)
- All products made from waste have demand in local markets in Africa

TERMS OF PARTNERSHIP WITH LOCAL DEVELOPER

Local partner **- municipality or private local developer, or JV of municipality and private developer**	• Guaranteed access to waste (waste collection concession, landfill management concession) for min 30 years; • Land rights (min 10 ha land plot in close proximity to landfill, in case of lease minimum term 30 years); • All necessary permits, licenses, approvals (including EIA, construction permit, operating license, etc); • Investment incentives (usually tax holidays for 10 years or until full return to investment, zero import duty for equipment, others applicable based on country legislation); • Offtake agreements for products of waste processing: ○ Power purchase agreement for min 20 years (in case of power production); ○ Methanol or meprin offtake agreement for min 10-years.
ADG (investment and technological partners)	• Rights to zero CO2 emissions waste processing technology • Technical feasibility study • Technical and financial management of projects both in the development phase and in the operating phase • Full project financing

HOW TO START THE PROJECT IN YOUR CITY

- **GET ADDITIONAL INFORMATION ABOUT THE PROGRAM ON www.investfundafrica.com or on www.w2w4a.com**

- **MAKE AN INITIAL ASSESSMENT OF PROJECT POTENTIAL**

  - Get information about waste generation, collection and management in your city

  - Contact the city's council and agree terms for long-term waste collection and landfill management rights (concession). If interested, invite the municipality as a partner

  - Secure rights for 10 ha of land in close proximity to landfill

- - Investigate demand for power, methanol and meprin in your local market

  - Discuss terms (duration and tariff) of long-term offtake options for power with related stakeholders, for example power utility or commercial customers for long term power purchase agreement

- **FILL PROJECT APPLICATION FORM AND SUBMIT TO ADG**
- **AFTER INITIAL ACCEPTANCE BY ADG, SIGN MOU FOR JOINT PROJECT IMPLEMENTATION**
- **REGISTER SPECIAL PROJECT COMPANY, GET NECESSARY AGREEMENTS**

START JOINT PROJECT IMPLEMENTATION WITH ADG