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S'ENGAGER POUR LA PLANÈTE EST UNE BELLE ENTREPRISE



Lessons learned and vision, from the perspective of an international private operator

ADB, MAY 2014

EXECUTIVE SUMMARY

- Context: Unprecedented transformation on the waste market
- Waste market is rapidly growing in emerging countries
- Solid waste management will be specific
- Energy is key
- Framework : leap frog to specific solutions
- Adapt waste hierarchy to local realities
- Avoid technology / complex infrastructures trap
- Solutions : focus on treatment vs sophisticated collection solutions
- Simple multipurpose platforms
- Adapted contractual models
- Examples of successful experiences



SPECIFICITIES OF WASTE IN EMERGING COUNTRIES

1. CONTEXT: WASTE MARKET And ISSUES IN EMERGING COUNTRIES

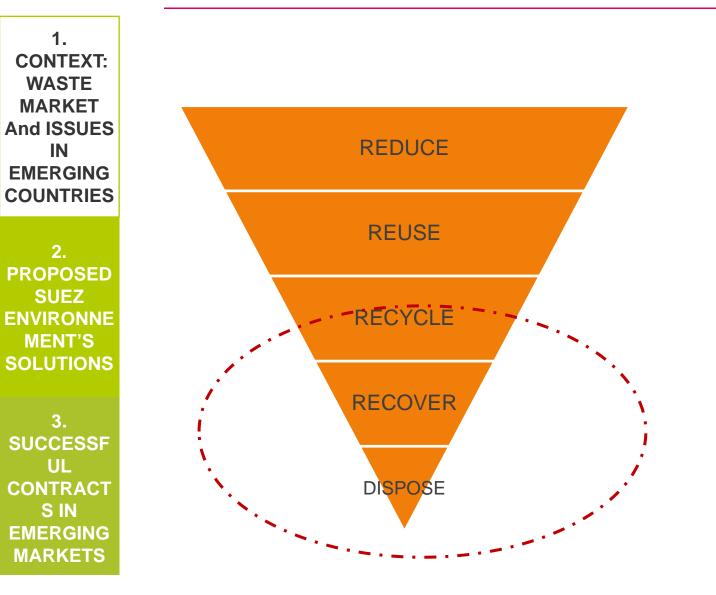
2. PROPOSED SUEZ ENVIRONNE MENT'S SOLUTIONS

3. SUCCESSF UL CONTRACT S IN EMERGING MARKETS



- Volume of waste grows faster than urbanization
- Composition of waste varies compared to high income countries, with a majority of organics
- Importance of informal sector
- Low income countries spend most of their Solid Waste Management (SWM) budget on waste collection rather than disposal

FOLLOW (but adapt) THE WASTE HIERARCHY

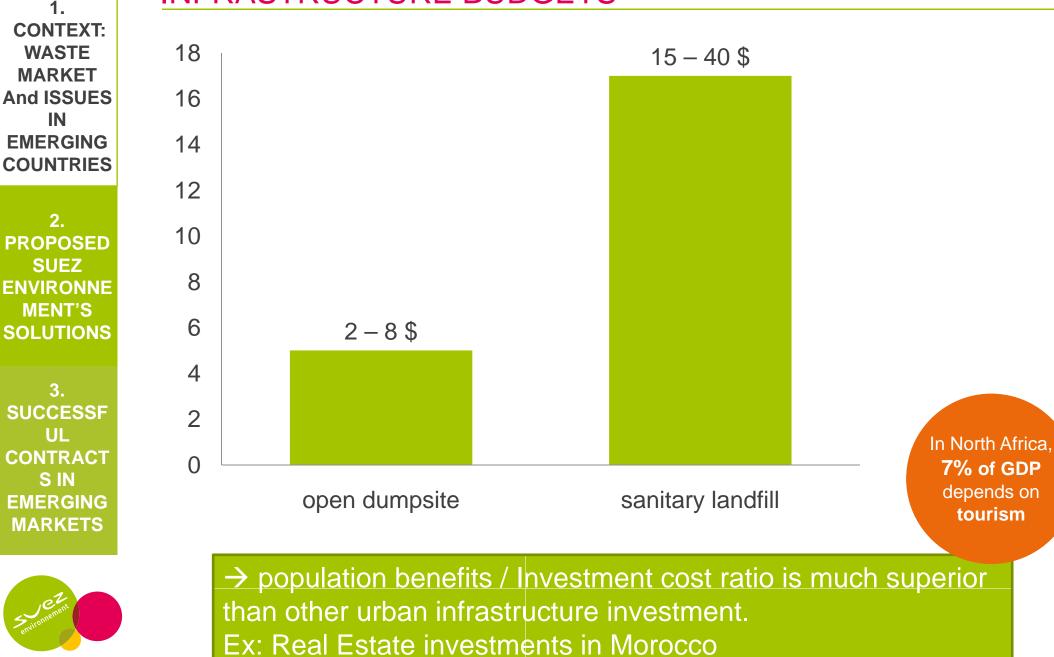




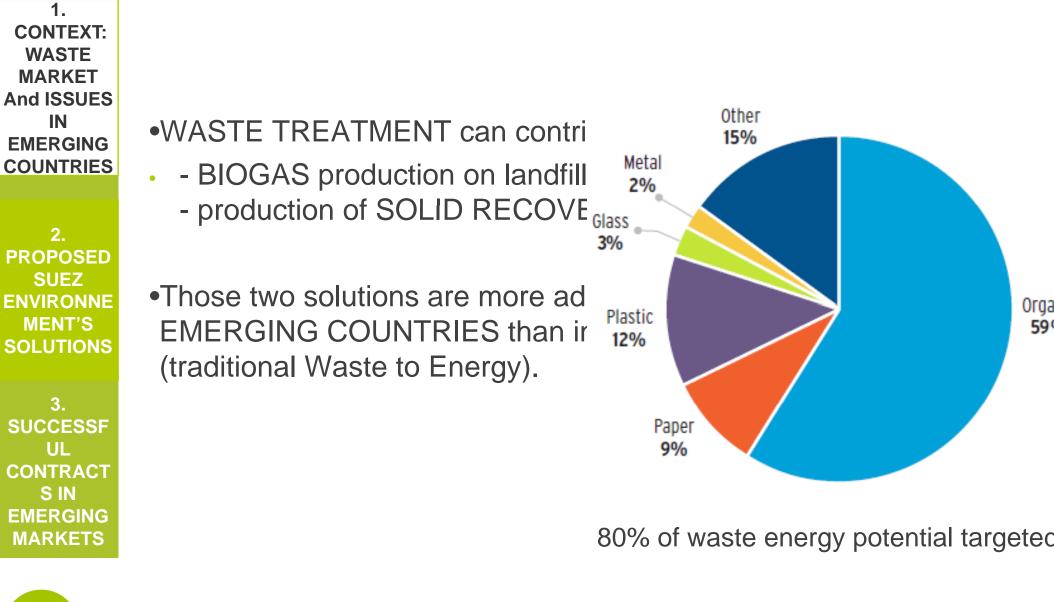
EFFORTS SHOULD FOCUS IN PRIORITY ON RECYCLE-RECOVER-DISPOSE

Municipal Solid Waste Management in developing countries

INCREMENTAL COST FOR ENVIRONMENTALLY SAFE TREATMENT IS MINIMAL COMPARED TO URBAN INFRASTRUCTURE BUDGETS



LANDFILL / ENERGY RECOVERY PLATFORM OPTIMAZISES ENERGY AND FINANCIAL YIELDS





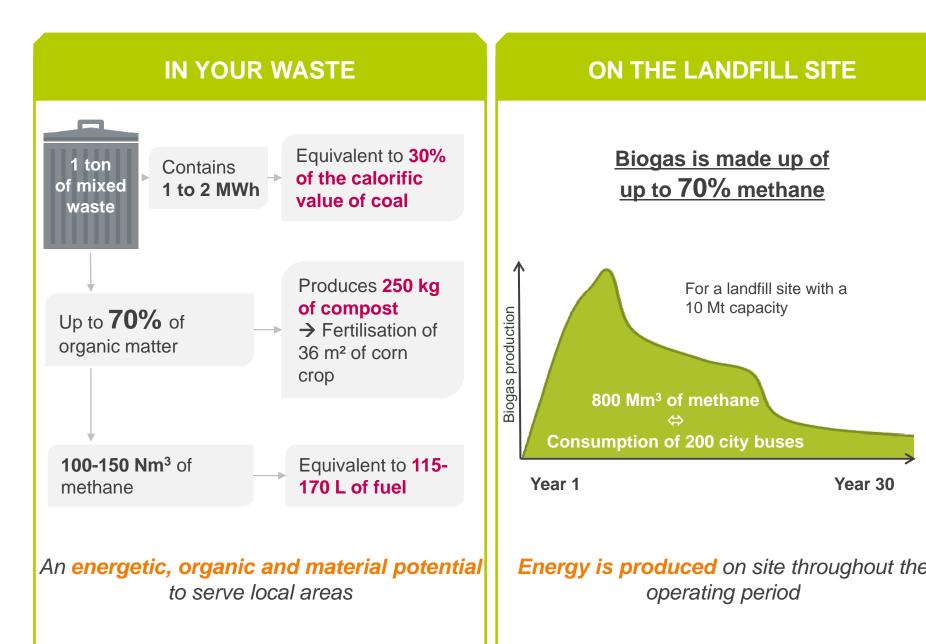
SOLUTIONS ALLOWING MATERIAL & ENERGY RECOVERY

1. CONTEXT: WASTE MARKET And ISSUES IN EMERGING COUNTRIES

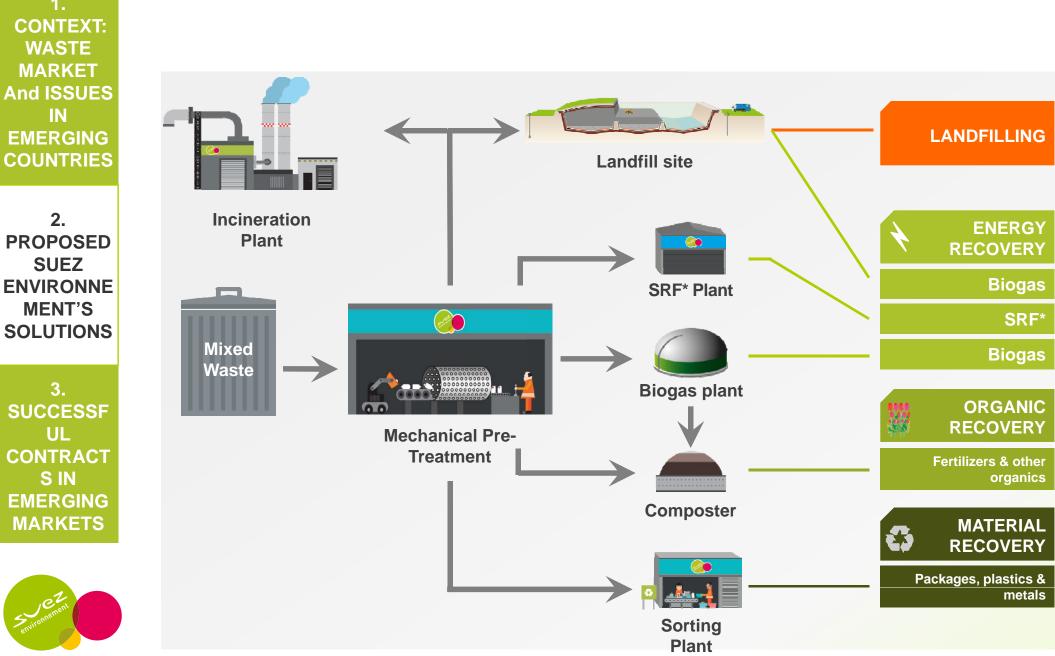
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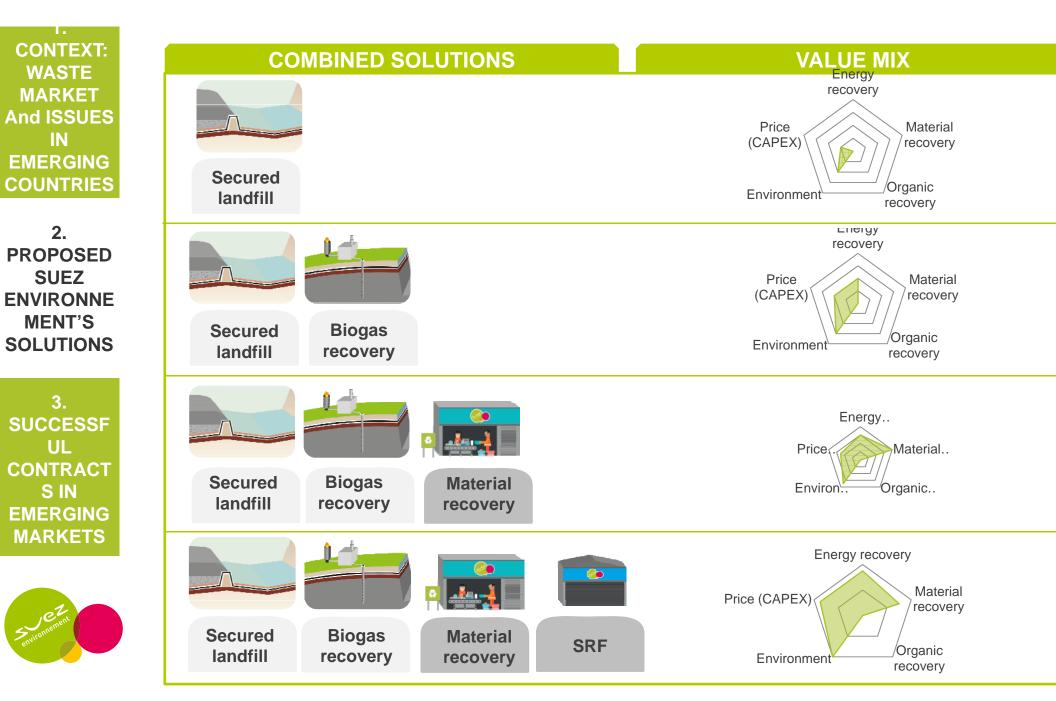


EUROPEAN ADVANCED SYSTEM SOLUTIONS ARE EFFICIENT BUT COMPLEX

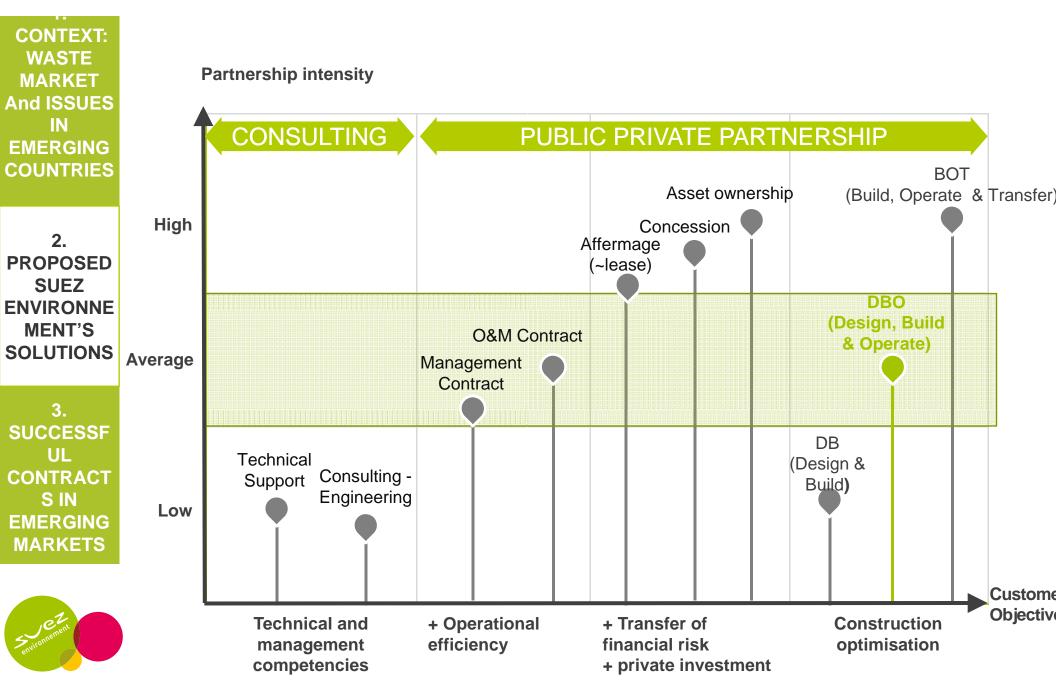


*SRF : Solid Recovered Fuel

SIMPLE AND EFFICIENT SOLUTIONS EXIST TO MEET EMERGING COUNTRIES CHALLENGES



EUROPEAN ADVANCED CONTRACTS ARE NUMEROUS BUT INADAPTED



DESIGN-BUILD-OPERATE IS EFFICIENT TO DELIVER WASTE SOLUTIONS

1. CONTEXT: WASTE MARKET And ISSUES IN EMERGING COUNTRIES

2. PROPOSED SUEZ ENVIRONNE MENT'S SOLUTIONS

3. SUCCESSF UL CONTRACT S IN EMERGING MARKETS



Local authorities face significant interface risk between Design, Construction and Operation.

DBO contract enables them to transfer this risk to one single point of contact that will allow project to be delivered in time and in budget.

DBO contract ensures :

- \rightarrow Quality of DB
- → Selecting the right technology
- → Optimisation of O&M costs
- → Asset value maintainance

A project contracted in DB bears the risk to result in an infrastructure that the authority does not have the expertise to manage properly, or which operating and maintenance cost is too high for the client to assume. Municipal Solid Waste Management in developing countries - 12 -

FOCUS: LONG-TERM MANAGEMENT MEKNES, MOROCCO

CONTEXT: WASTE MARKET And ISSUES IN EMERGING COUNTRIES

2. PROPOSED SUEZ ENVIRONNE MENT'S SOLUTIONS

3. SUCCESSF UL CONTRACT S IN EMERGING MARKETS





CONTEXT

Significant **tourist industry** Implementation **of a legal framework** related to waste management



SOLUTION

- Rehabilitation of existing landfill site (22 ha) and construction of :
 - a **new landfill** (30 ha)
 - a compost plant (3,000 m2)
- Preservation of existing jobs and creation of new jobs
- Inclusion of informal sector



OBJECTIVES

Customer support to an efficient and sustainable household waste management

Adoption of **best techniques** and **international norms**

RESULTS

- Operating period: commitment for 20 years
- 200K t/year of processed waste
- Installation of 7 tanks for leachate treatment with a total capacity of 48,000 m³
- Creation of ~50 direct jobs
- Structure the informal sector (autonomous but organized) and provide them with acceptable working conditions

Municipal Solid Waste Management in developing countries - 13 -

FOCUS: REHABILITATION OF A DUMP SITE SAÏDA, LEBANON

CONTEXT: WASTE MARKET And ISSUES IN EMERGING COUNTRIES

2. PROPOSED SUEZ ENVIRONNE MENT'S SOLUTIONS

3. SUCCESSF UL CONTRACT S IN EMERGING MARKETS







SOLUTION

Security

- Landfill cell design
- Lining of cells
- Use of secured plant equipment
- Site capping
 Leachates
- Leachate collection in lagoon
- Leachate transfer and treatment at an external treatment plant

Biogas

 Onsite collection and treatment of biogas

OBJECTIVES

Total site **security Mitigation** of sanitary and environmental risks

RESULTS

- 700,000 tons of waste landfilled in safe conditions
- 40m³/day of leachates collected and treated
- After-use as a landscaped public park
- 1-year aftercare service following closure

Municipal Solid Waste Management in developing countries - 14 -

FOCUS: BIOGAS RECOVERY NENT, HONG KONG

CONTEXT: WASTE MARKET And ISSUES IN **EMERGING COUNTRIES**

2. **PROPOSED** SUEZ **ENVIRONNE** MENT'S SOLUTIONS

3. SUCCESSF UL CONTRACT S IN **EMERGING** MARKETS





- Biogas collection
- Biogas recovery in 3 ways:

SOLUTION

- thermal leachate treatment
- landfill site electricity supply
- used as fuel in a thermal power plant
- On site collection and treatment of leachate



Biogas recovery to produce heat

Site total capacity:

RESULTS

Every day:

- 1000 m³ of leachate treated
- 1.9 MW production of electricity
- More than 25,000 m³ of biogas treated and transferred to a thermal power plant
- Generator capacity: 3 MW