



Sludge- The New Circular Economy

By - Naturetech Enviro Protection Ltd



Why are we not talking about Sludge ?

Challenge 1 Micro Level

- Requires large real estate/energy.
- Chemical properties render treatment difficult.

Challenge 2 Meso Level

- Lack of research and information on markets.
- Lack of access to market developments for operators.

Challenge 3 Macro Level

- Government bodies and open landfilling.
- Liberal legislation around sludge.





The Problem- An overview

Planning

Limited treatment.

Biological sludge disposal- 'Zero Cost'.

Hazardous- Via Landfill.

Lack of regulation.

Lack of knowledge regarding landfilling impacts.

Operation

Poor monitoring over sludge disposal.

High Volumes leads to high costs.

Sludge releases a lot of GHG's.

Landfilling is hazardous, making disposal problematic.

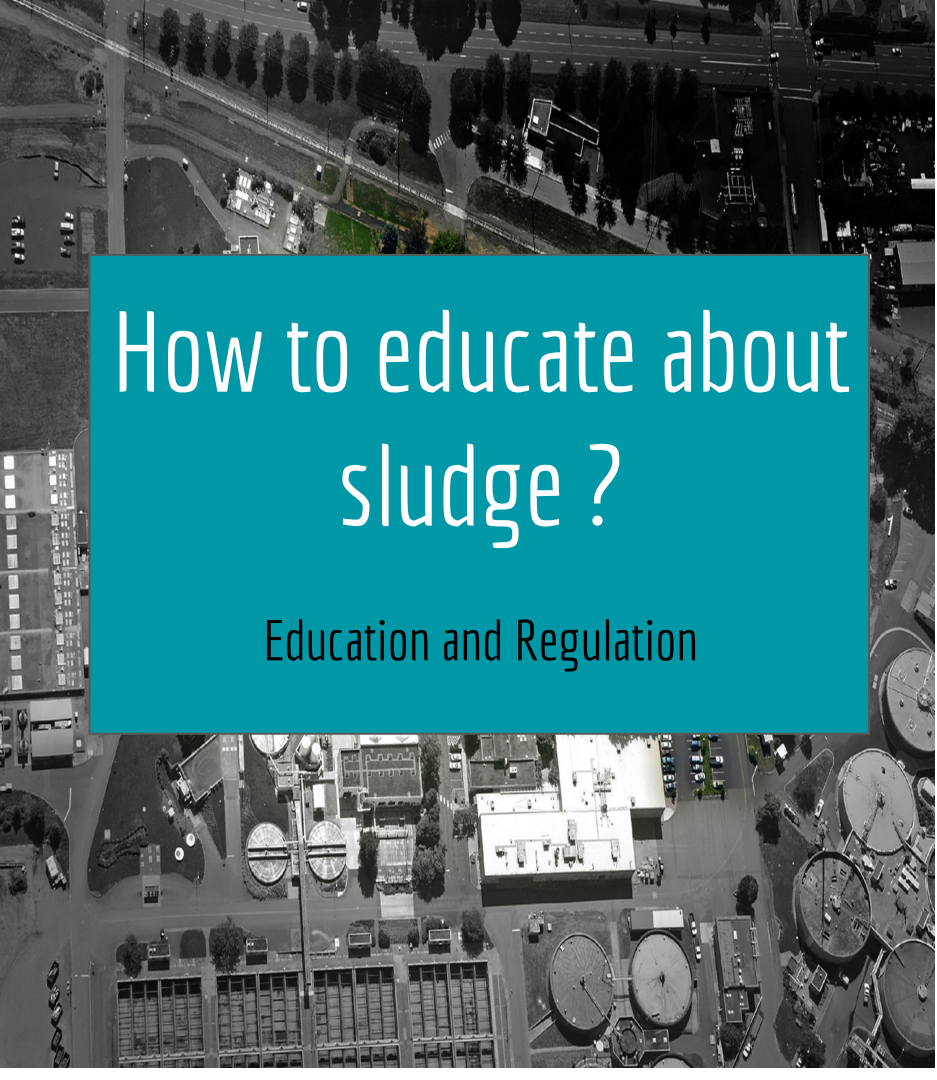
Communities

Health Risk- Sludge Landfilling.

Environmental risk by Landfilling.

Sanitation problem for the cities due to transportation of the sludge

Massive land consumption tendency.



How to educate about sludge ?

Education and Regulation



- Moving away from the lowest cost model.
- Educating operators and Educating end users like farmers, RDF manufacturers and cement plants about the value of sludge.
- New mandates around sludge management.
- New mandates pertaining to sludge as a performance criterion.
- Incentives and subsidies for sludge management.



Different avenues of disposal

Industrial applicability

- Sludge Incineration.
- Minergy Gas Aggregate.
 - Crystallisation.
 - Biofuel Production.
- Landscaping and Land spread
 - Fertilizers*
 - Element recovery.

*The sludge shall be free of toxic elements for agriculture use.

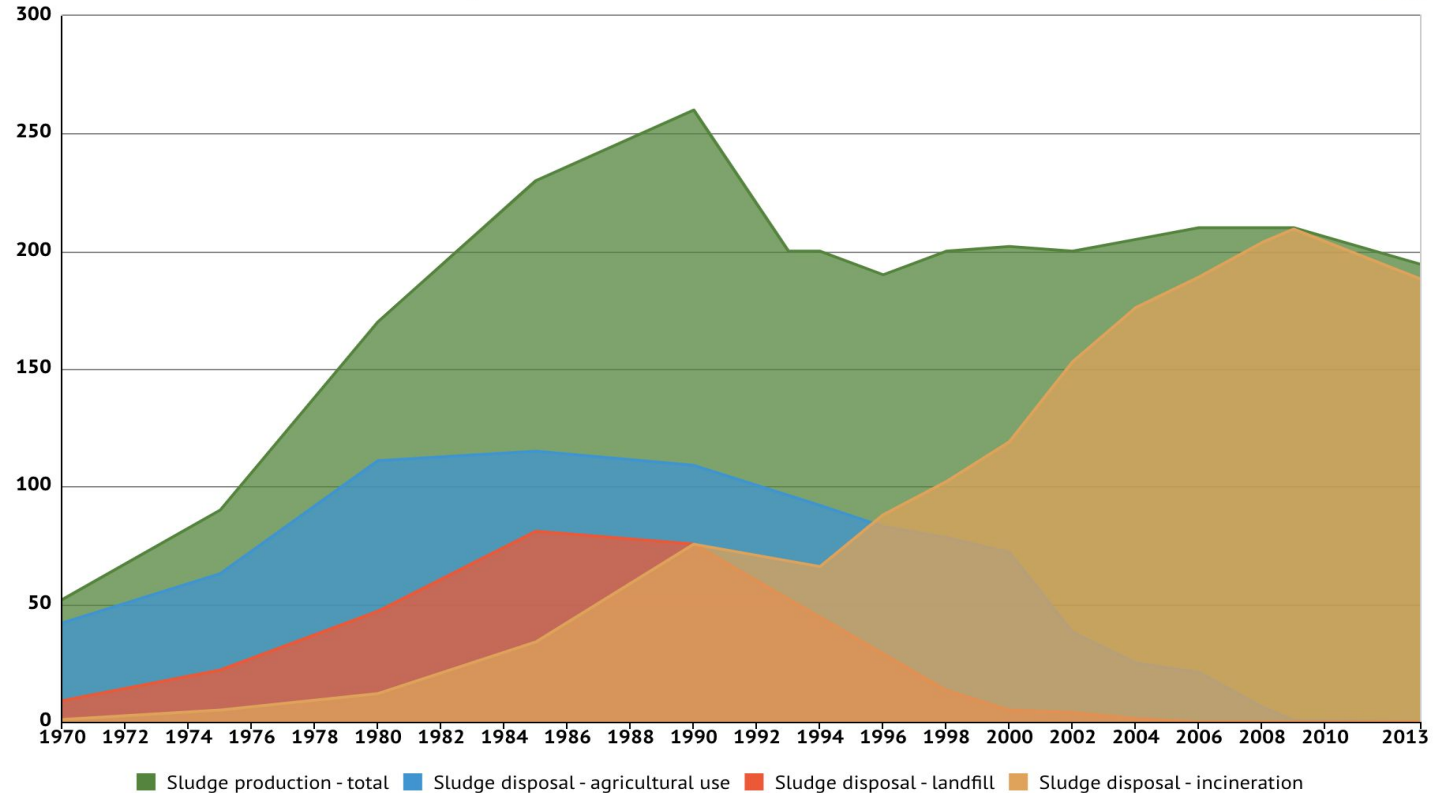
Case Study - Switzerland.



Switzerland- A sludge Incineration case.



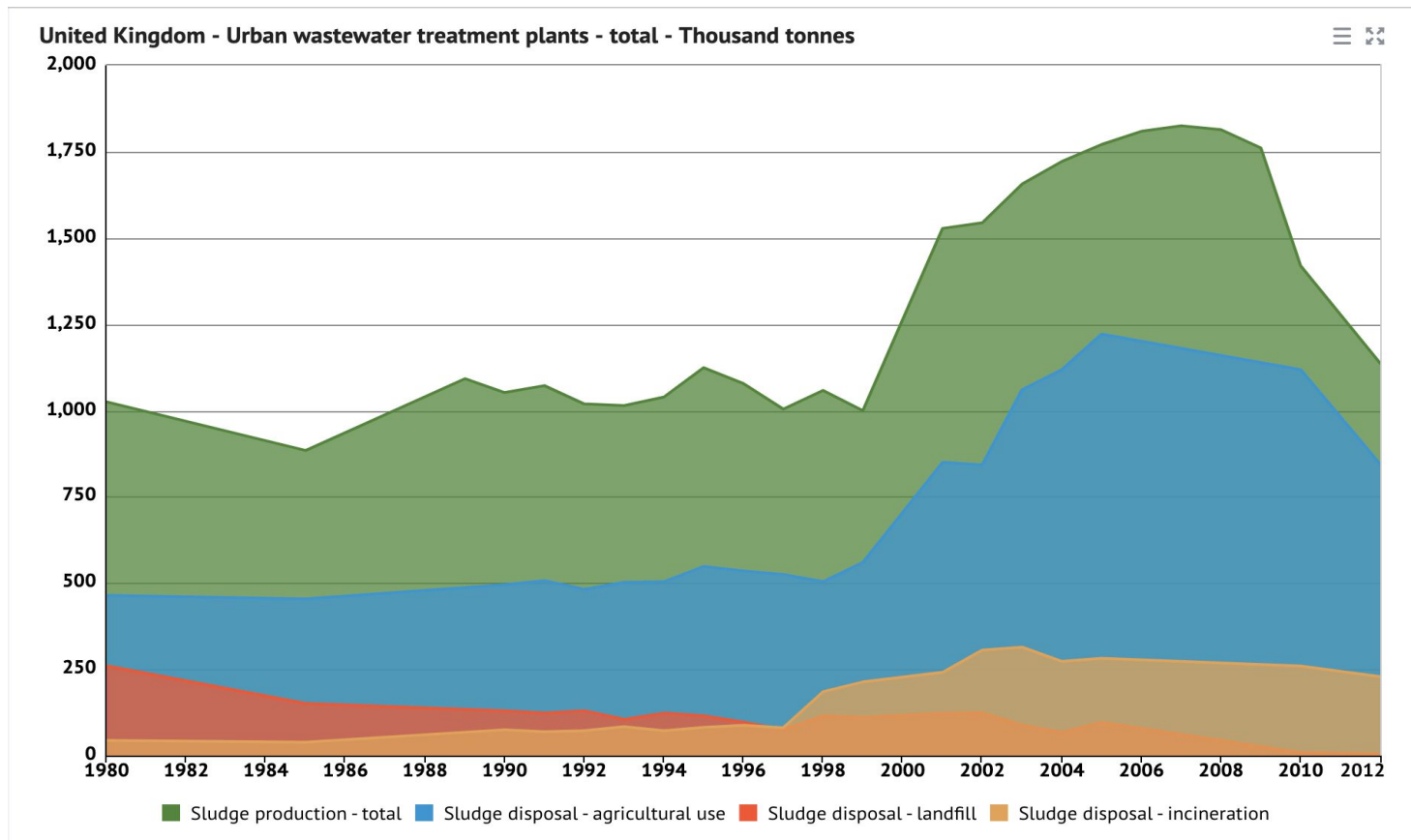
Switzerland - Urban wastewater treatment plants - total - Thousand tonnes



Case Study - United Kingdom



Agriculture and Sludge- A real time case study.



Case Study - MCGM, Mumbai.



Upcoming STP's in Greater Mumbai



Plant Name	Capacity (MLD)	Sludge Generation (Metric Tonnes/Day)
Bandra	360	-145
Versova	180	-75
Bhandup	215	-85
Ghatkopar	337	-135
Colaba	37	-15
Dharavi	250	-100
TOTAL SLUDGE (MT/Day)		-555

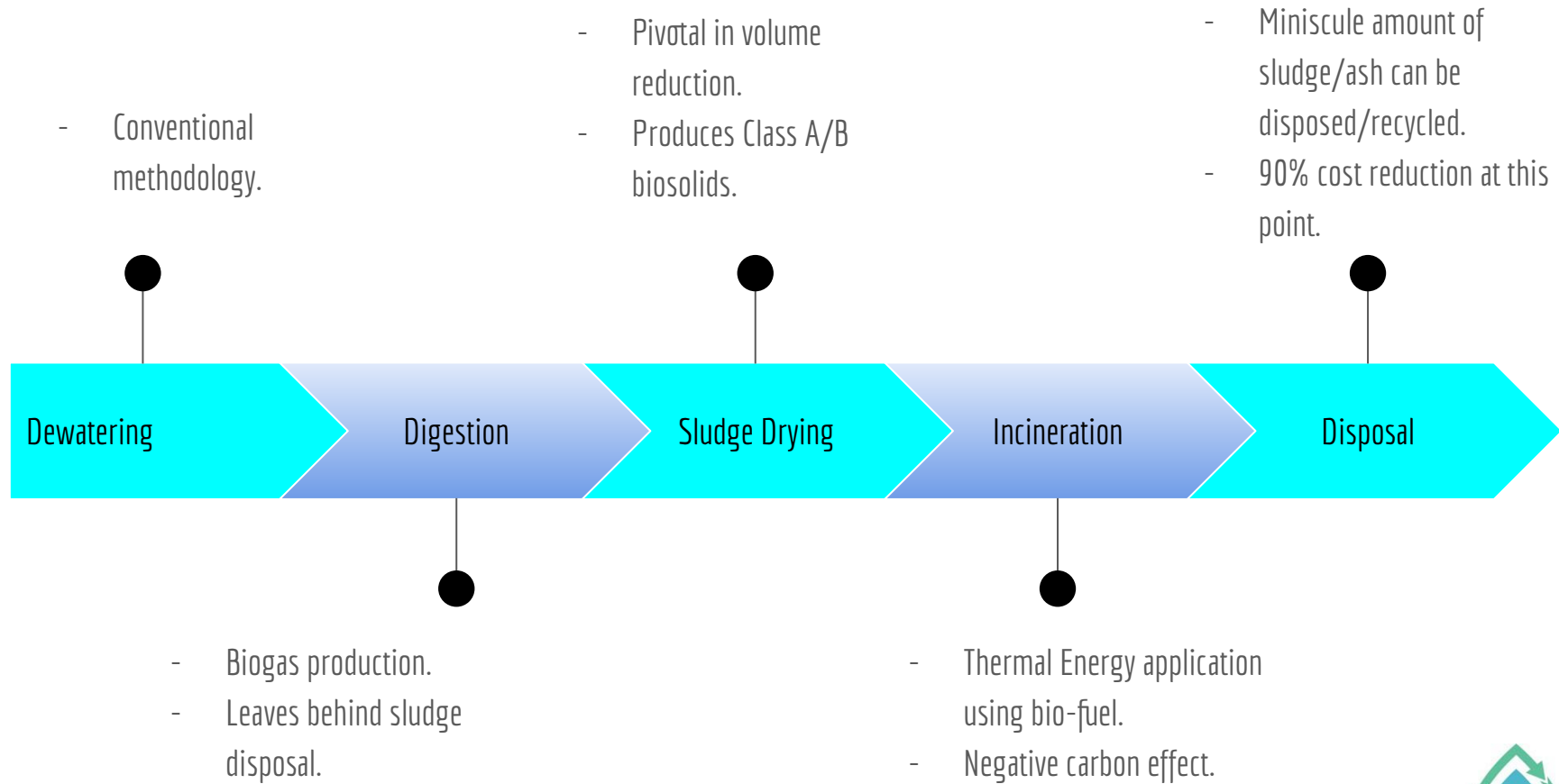
To tackle this enormous sewage sludge generation:

- Addenda mandate:: -90% DS content.
- Mathematically, this reduces the need to dispose around 450 MT of sludge per day, solely due to moisture reduction.

The Land footprint minimization, economic perks garnered by saving disposal costs whilst creating a valuable byproduct, and the mitigation of health/environmental risks is commendable...



SLUDGE TREATMENT METHODOLOGIES





Impact

Creative Destruction- Schumpeter (1942)

New market development opportunities

- (1) Refuse Derived Fuel (RDF) - Biofuel.
- (2) Organic fertilizers
- (3) Element recovery
- (4) Biosolids for Landscaping and Land reclamation



Research Avenues

Empirical Research Recommendations

Research avenues for sludge treatment efficacy:

- Construction and dry sludge.
- Alternate applications of sludge.
- Policy making around sludge treatment.



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