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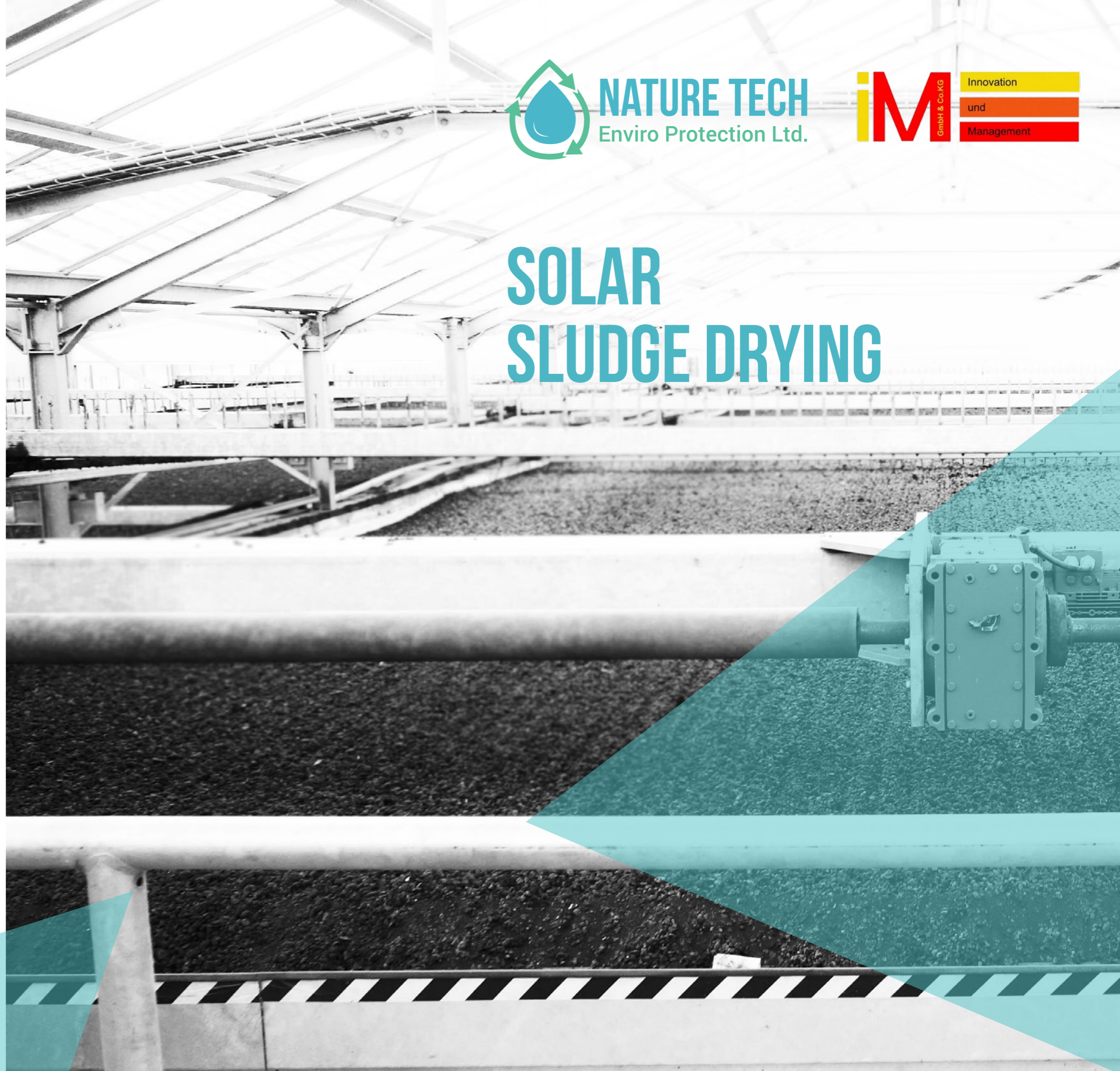
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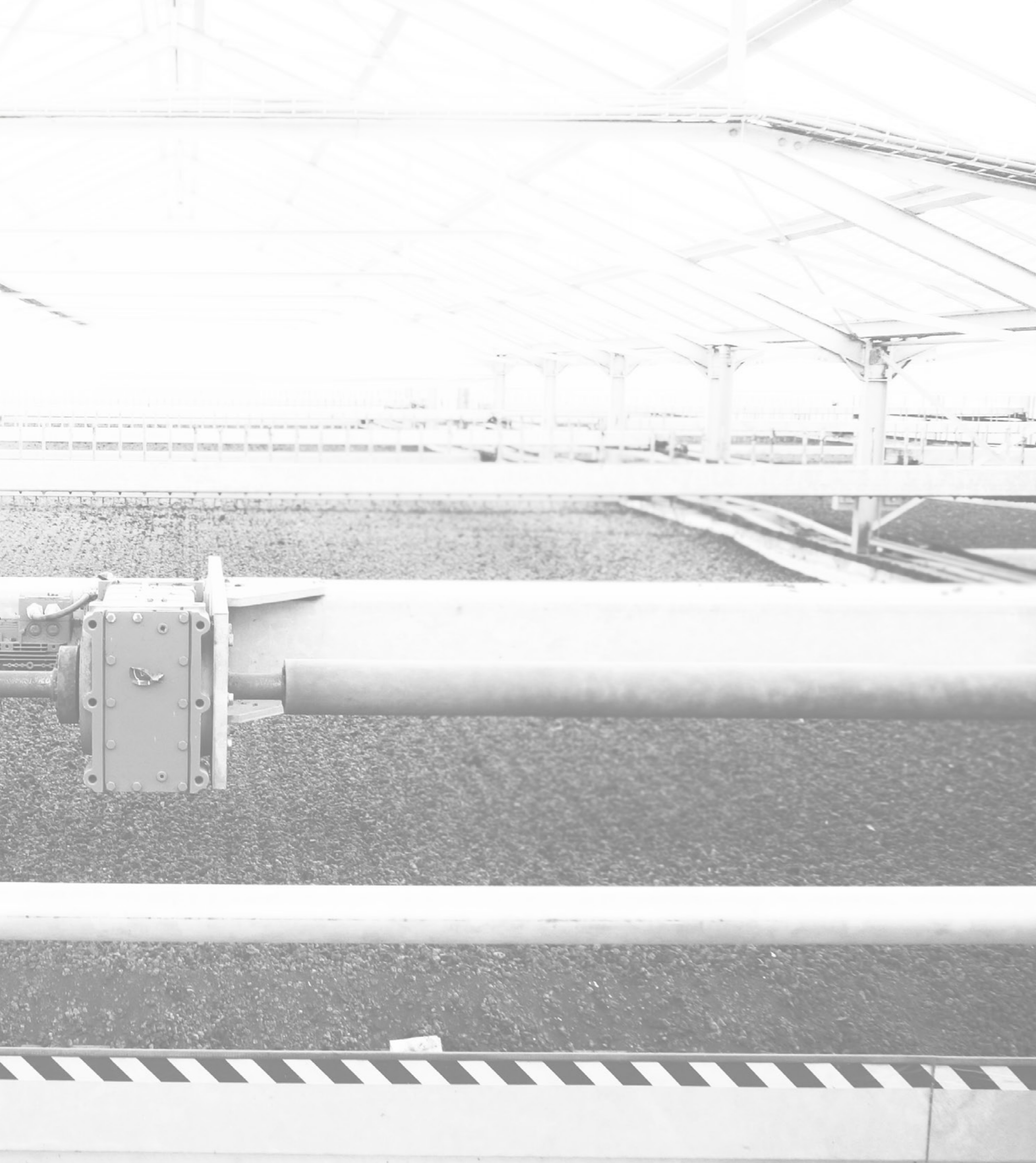


**NATURE TECH**  
Enviro Protection Ltd.



# SOLAR SLUDGE DRYING





# CONTENTS

An Overview

1

Why Sludge Drying

3

Why Solar Sludge Drying

5

General Information

7

Plant and Process

9



Win the fight  
**AGAINST POLLUTION.**

## AN OVERVIEW

Naturetech aims to improve the state of water in the world by bringing innovation to the forefront of the fight against pollution.

With vast experience and knowledge base, we along with our partners strive to bring you an economical and robust solution for optimal results. We operate on a custom design and delivery approach to ensure complete customer satisfaction while delivering organic results.

With our focus on Wastewater, we encourage all the stakeholders in the cycle (Govt, Private Enterprise and Households) to join us take the next step towards water recycling.

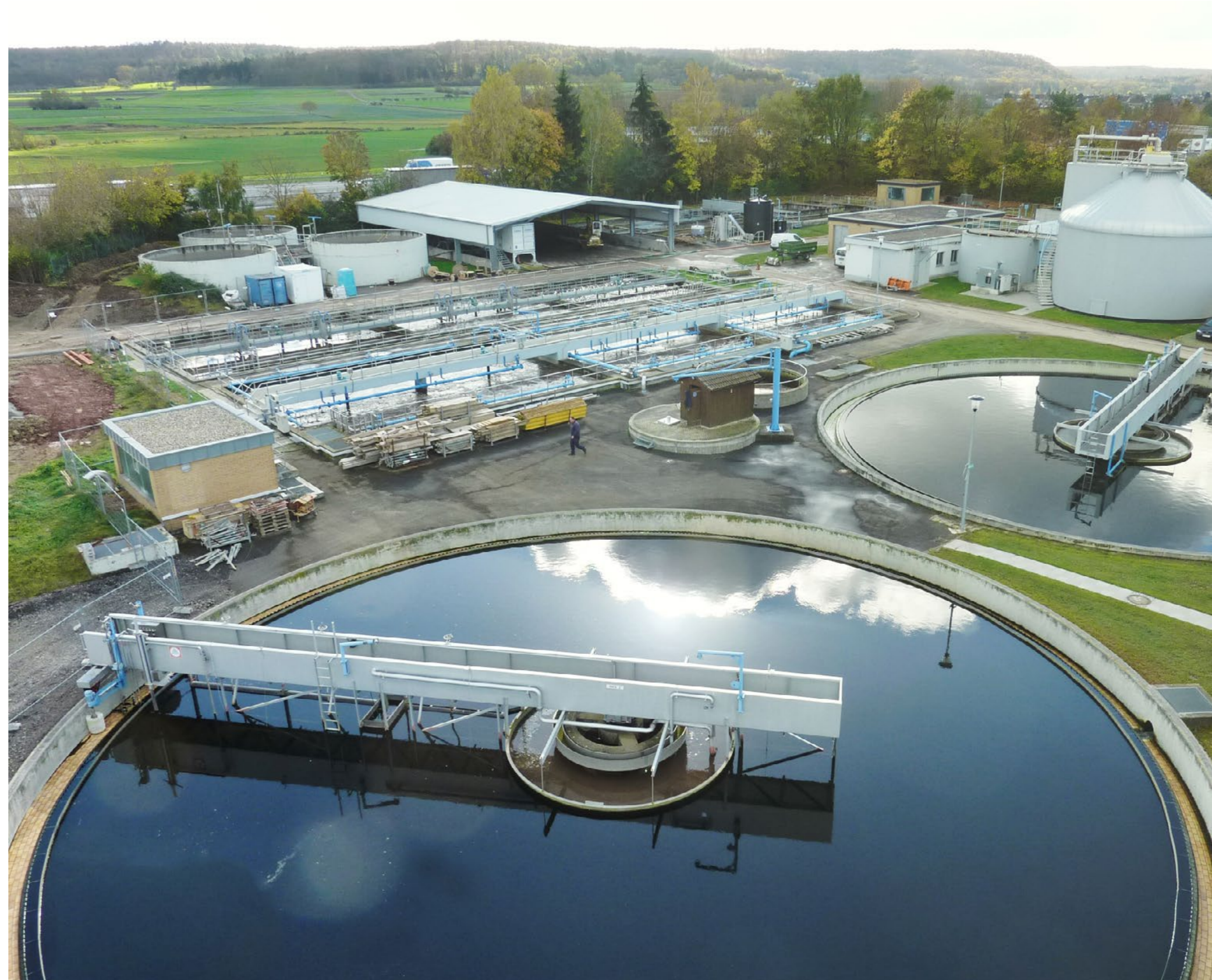
- Strong team of Professionals
- Experts from diversified field
- In house technical-commercial resources
- Tie up with financial institutions
- Close ties with Government and Public-Private organizations
- International Channel Partners for various technologies

# WHY SLUDGE DRYING ?

The main goals of solar drying of sludge are:

- 01 To eliminate water from sludge and diminish volume of sludge up to a quarter in order to make the transportation cost lower and the sludge storage easier.
- 02 To increase sludge calorific value, so that sludge could be easily incinerated as RDF.
- 03 To stabilize sludge (easy transport and storing by drying up to 90% of DS).
- 04 To improve sludge structure before spreading by the agricultural equipment.
- 05 To make sludge a fertilizer or a soil conditioner of high market value.

*Note: Fertilizer for vegetables and animal food needs to be hygienized. However, with solar sludge drying may not be able to achieve the parameters alone.*



# WHY SOLAR SLUDGE DRYING?

The tests show that organic soil conditioners which came into being during solar drying processes have following advantages:



Dry, granular and safe to handle product with over 90 % solids content

Moderate drying temperature -  
no odour nuisance



Little dust generation - safe operation

Use of solar energy and low-  
temperature (waste) heat



Independent of season and climate

Small footprint



Low operation and maintenance costs

# GENERAL INFORMATION

Sewage sludge disposal is a hot topic of discussion topic since years. Common ways of disposal are agricultural spreading as fertilizer, land re-cultivation, landfill and co-combustion of dewatered sludge. **Especially because of heavy metals, antibiotics and other harmful things, agricultural land and landfill became more and more critical.** In times of increasing prices regarding fossil fuels dried sewage sludge can be member of the **new green energy** sources: CO2 neutral and locally available.

The Naturetech and i+M solution offers the unique possibility to dry in combination with the solar power of global radiation and free heat sources. After dewatering the system is able to dry sludge up to 90% dry solid to reach energy values between 9 and 12 MJ/ kg according to organic content and digestion. Thus dry sludge replaces fossil fuels in cement factories or other heavy industries.

Material	Calorific Value (MJ/kg)	Heating Value (kWH/kg)
Green Wood	6, 8	1,9
Air Dried Wood	14, 4-15, 8	4-4, 4
Household Waste (mixed)	9-11	2, 5-3
Dried Sewage Sludge (90% DS)	9-12	2, 5-3, 3
Wood Briquette / Pellets	17, 5-18	4, 8-5, 0
Raw Brown Coal	8	2, 2
Brown Coal Briquette	19, 6	5, 6
Hard Coal, Var.	27-32, 7	7, 5-9



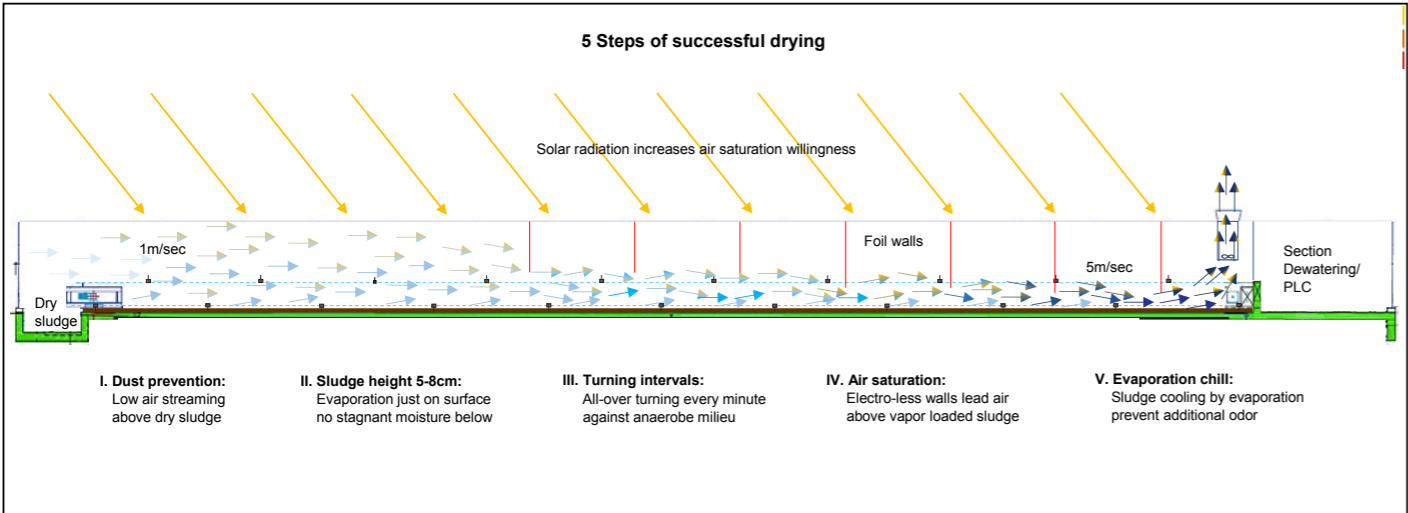
# PLANT AND PROCESS

## BASIC DRYING PROCESS



With options for automatic conveying and manual input, the Naturetech and i+M system offers flexibility right from the start. With the help of a thin sludge layer in combination with fast turning intervals and optimum air supply the Naturetech and i+M technology prevents anaerobic layers and charges fresh air with evaporated water in a continuous process.

Evaporation energy is covered by either solar or in combination of solar and free thermal energy until ca. 85°C is reached, which is used for an (optional) floor heating system under the sludge. Physical characteristics of water vapour is used efficiently by the Naturetech and i+M technology.



Warm floor heating surface causes vapor generating inside the sludge core and its exit at the sludge shell. By continuously turning and conveying the sludge is able to get in contact with fresh non-saturated air that carries out the vapor. Maximum efficiency and least hassles are reached by reliable mechanical engineering, unique air streaming control and precision sensors' data all processed inside a Siemens PLC system. If necessary air scrubber can be equipped easily due to the flexible design of the Naturetech and i+M system.

Drying sludge up to any required dry solid content is influenced by named parameters, weather conditions, available energy and sludge quality.

# ENHANCEMENT OPTIONS

Naturetech can provide a number of enhancements to the drying system to provide improved performance and versatility of the system.

- Automated Sludge handling systems for both feeding and output, which will be custom designed based on individual system requirements. It will minimize labor requirements and provide higher efficiency with the help of conveyors, pumping systems and storage bins.
- Repurposing external waste heat sources to provide additional heat within the greenhouse to raise the internal temperature, hence increasing performance.



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