



**POLITECNICO**  
MILANO 1863

**Final Conference of the project “SLUDGEtreat”**  
Politecnico di Milano, Room “Rogers”  
8<sup>th</sup> February 2019

# The SLUDGEtreat Project Overview and aims

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**SLUDGEtreat** 

# The project

Project no. 611593 - Marie Curie Actions IAPP -  
"Sludgetreat"

eco-friendly and energy efficient sewage SLUDGE deWaTeRing  
through novEl nanomAterials and electRo-osmotic process



SLUDGEtreat 

<https://sludgetreat.eu/>



# The team



POLITECNICO MILANO 1863

**Coordinator**



**XELLENCE IN WATER TREATMENT**

SME - manufacture of wastewater and sludge treatment machines



ASOCIACION DE LA INDUSTRIA NAVARRA – advanced **surface engineering technologies** and technology transfer to industry



A **high-tech spin-off company** from University Ramón Llull (Barcelona), specialized in PVD and CVD coatings



# Electrodewatering 1.0 – existing machines



- **CINETIK** (Ovivo, USA):  
<https://www.ovivowater.com/cinetik/>

- **ELODE** (ACE Korea Incorporation, South Korea):  
[https://cms.esi.info/Media/documents/Aquat\\_ELODE\\_ML.pdf](https://cms.esi.info/Media/documents/Aquat_ELODE_ML.pdf)

All adopt static electrodes



SELO - Single ELODE  
For Sludge Cake Dewatering

SELO, Single ELODE is a compact second stage equipment uses Electro-Osmosis method to further dewater the treated sludge cake from conventional dewaterers, to a higher dewater and significant reduction in sludge weight. It can be easily integrated into any of the existing conventional dewaterer such as belt press, decanter, gravity dewaterer etc. The sludge shall be treated to or below 60% by conventional dewaterers before it can be treated by SELO.



BELO - Belt Press Built-in ELODE  
For Sludge Cake

BELO, a highly efficient dewaterer that combined 1st stage of mechanical dewatering by belt press and second stage by Electro-Osmosis method. The one and whole becomes a cost-effective equipment that brings the sludge cake to much higher dryness. It significantly reduces the final sludge cake dryness to or below 65% (at the dewatering rate of 40%). It also reduces volume of the sludge to or less than 10% of final liquid sludge or at least 50% compared to conventional dewaterers.

- **Electrokinetic EKG**  
 (Electrokinetic, UK):  
[http://www.electrokinetic.co.uk/sewage\\_sludge.htm](http://www.electrokinetic.co.uk/sewage_sludge.htm)

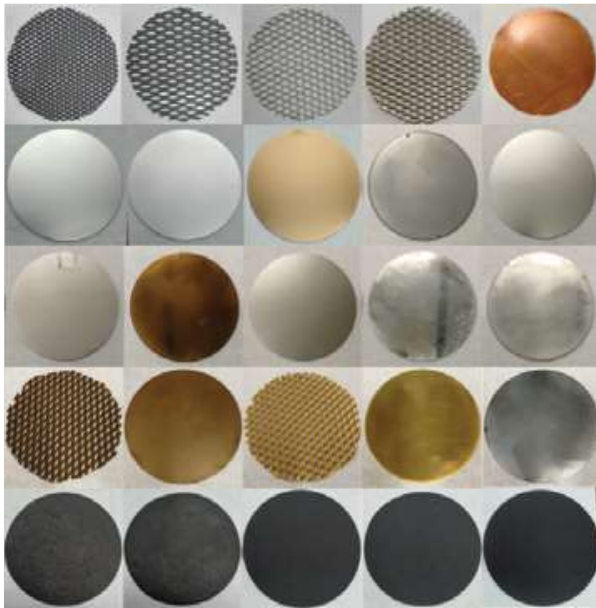
- **Choquenot – filtres-presses** (F)  
<https://www.pollutec.com/fr/Exposants/4697729/CHOQUENET-SAS/Produits/1417638/Traitement-des-boues-par-electro-deshydratation>

- **Dehydris™ Osmo**  
 (Degremont, F)  
<http://www.degremont.fr/pl/know-how/technologies/sludge-treatment/treatment-stages/>



# Main aims of the project

- **Develop** a novel electrically-assisted sludge dewatering machine



- **Identify** the best materials resistant to anodic corrosion

# Objectives



Assess the **applicability of EDW** for sewage sludge dewatering

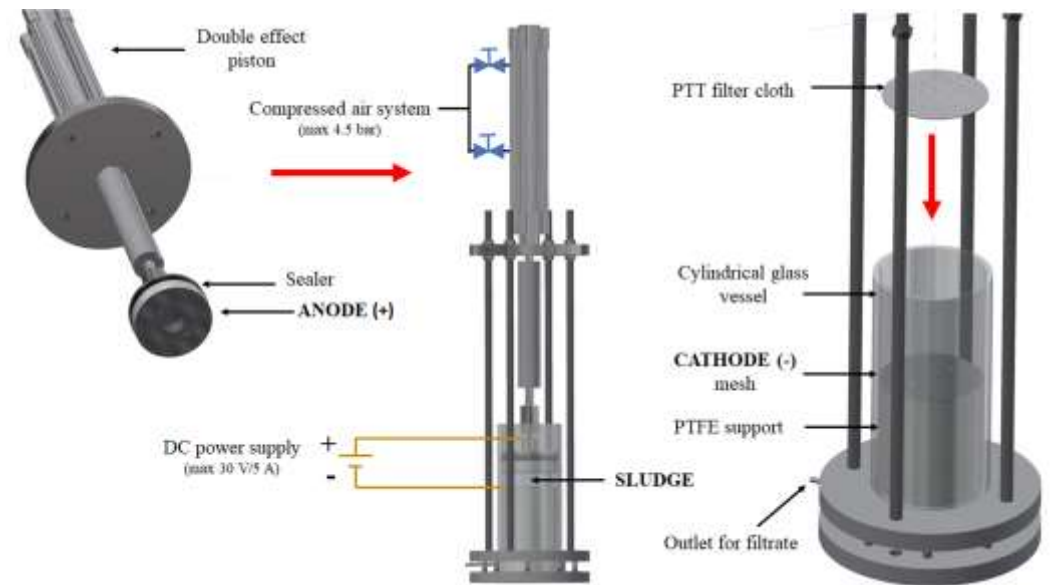


Study the influence of various **operating parameters** for process optimization



Evaluate EDW **economic and environmental** sustainability

# The experimental setup



# Electrodewatering 2.0 - something to be considered

## MECHANICAL DEWATERING

## + ELECTRO-DEWATERING

- *Filter press*
- *Belt press*
- *Centrifuge*

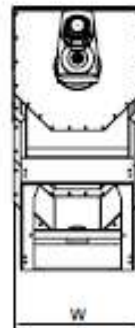
16 to 30%  
Dry solids  
(DS)



**DS increase  
up to 45%**

## Innovative

electrically-assisted  
screw-press





# From concept to industrial application



Technical  
feasibility



Economic  
profitability



Environmental  
impacts

After the coffee break....

The Sludgetreat  
Project:

**from concept**

to

**industrial  
application**

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Lab scale tests  
(*S. Visigalli, DICA POLIMI*)

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Materials for the anodes  
(*C. Diaz, AIN; M. Cruz, FLUBETECH*)

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The EDW prototype  
(*G. Di Florio, X2 Solutions*)

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LCA and economic assessment  
(*A. Turolla, DICA POLIMI*)

