LIFE DeNTreat

Decentralized innovative treatment of ammonium-rich urban wastewater

PROJECT PRESENTATION

LIFE DeNTreat INFO DAY

March 7th, 2019

SCR - Stamperia di Cassina Rizzardi

Life DeNTreat
LIFE16 ENV/IT/000345

The project stems from the need to develop sustainable solutions to deal with the problem of increasing nitrogen concentrations in industrial discharges of digital textile printing.

- Phase 1 preliminary study (10.2014 – 06.2015)
- Phase 2 continuous laboratory pilot plant (07. 2015 – 04.2016)
- Phase 3 Life project - demonstration plant (07. 2017 – 06.2020)

For the presentation of the proposal, the project had the support of Unindustria Como, Confindustria Lombardia, Sistema Moda Italia, Comodepur, Consorzio Alto Seveso and Livescia

UNINDUSTRIA COMO

COMO DEPUR

Life DeNTreat OVERVIEW

Project Number:	LIFE16 ENV/IT/000345
Title:	Decentralized innovative treatment of ammonium-rich urban wastewater
Acronym :	LIFE DeNTreat
Partners:	Lariana Depur SpA (IT, Coordinating Beneficiary) Politecnico di Milano (IT, Partner), Stamperia di Cassina Rizzardi SpA (IT, Partner) CITEVE - Centro Tecnológico Industrias Têxtil Vestuário Portugal (P, Partner) EURATEX - European Apparel and Textile Confederation (BE, Partner)
Duration:	36 months
Starting date:	1st July 2017
Conclusion date:	30th June 2020
Total project budget:	€ 1,391,893
Project website:	www.life-dentreat.eu

Project Coordinator

LARIANA DEPUR S.p.A.

Project Partners

EURATEX THE EUROPEAN APPAREL AND TEXTILE CONFEDERATION

SCR STAMPERIA DI CASSINA RIZZARDI

citeve TEXTILE TECHNOLOGY

POLITECNICO MILANO 1863

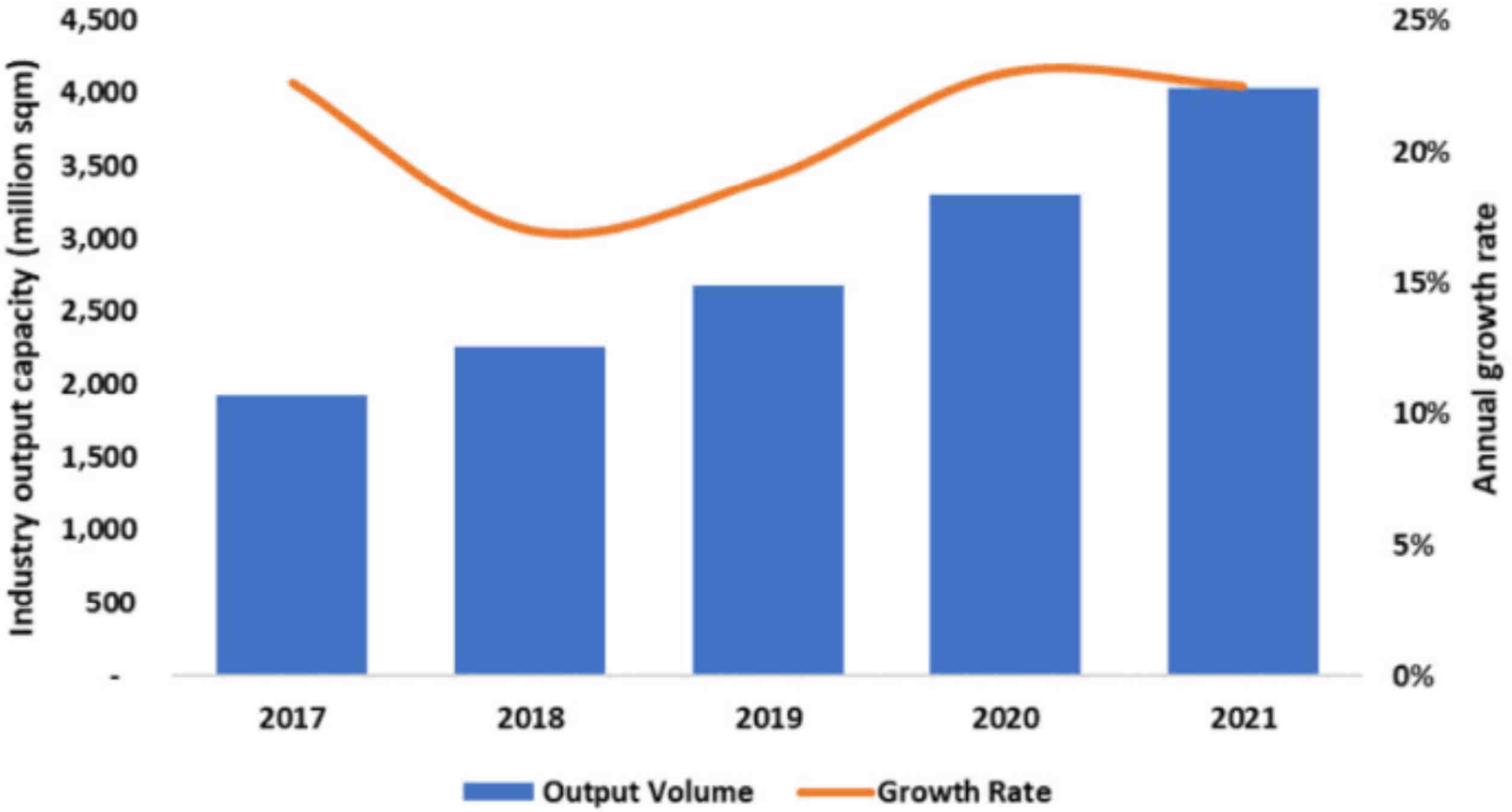
BUDGET

Coordinating Beneficiary's contribution				
Country code	Beneficiary short name	Total costs of the actions in € (including overheads)	Beneficiary's own contribution in €	Amount of EU contribution requested in €
IT	LARIANA	625,056	250,023	375,033

Associated Beneficiaries' contribution				
Country code	Beneficiary short name	Total costs of the actions in € (including overheads)	Associated beneficiary's own contribution in €	Amount of EU contribution requested in €
PT	CITEVE	100,371	40,149	60,222
BE	EURATEX	114,639	45,856	68,783
IT	POLIMI	363,729	145,492	218,237
IT	SCR	188,098	75,240	112,858
TOTAL Associated Beneficiaries		**766,837**	**306,737**	**460,100**

TOTAL All Beneficiaries	**1,391,893**	**556,760**	**835,133**

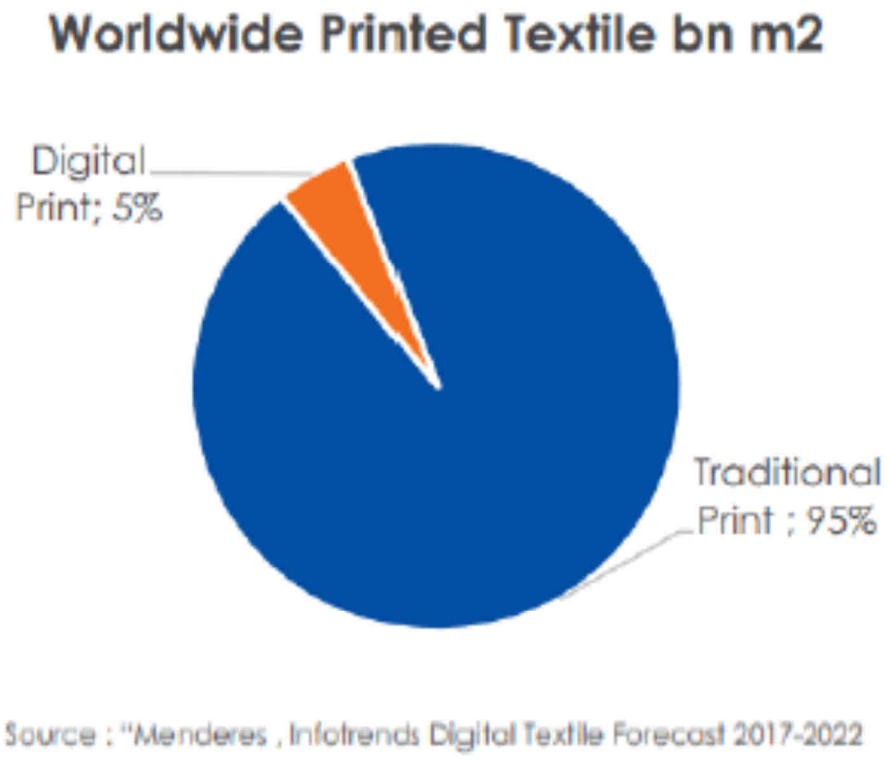
BACKGROUND
Global growth of Digital Textile Printing



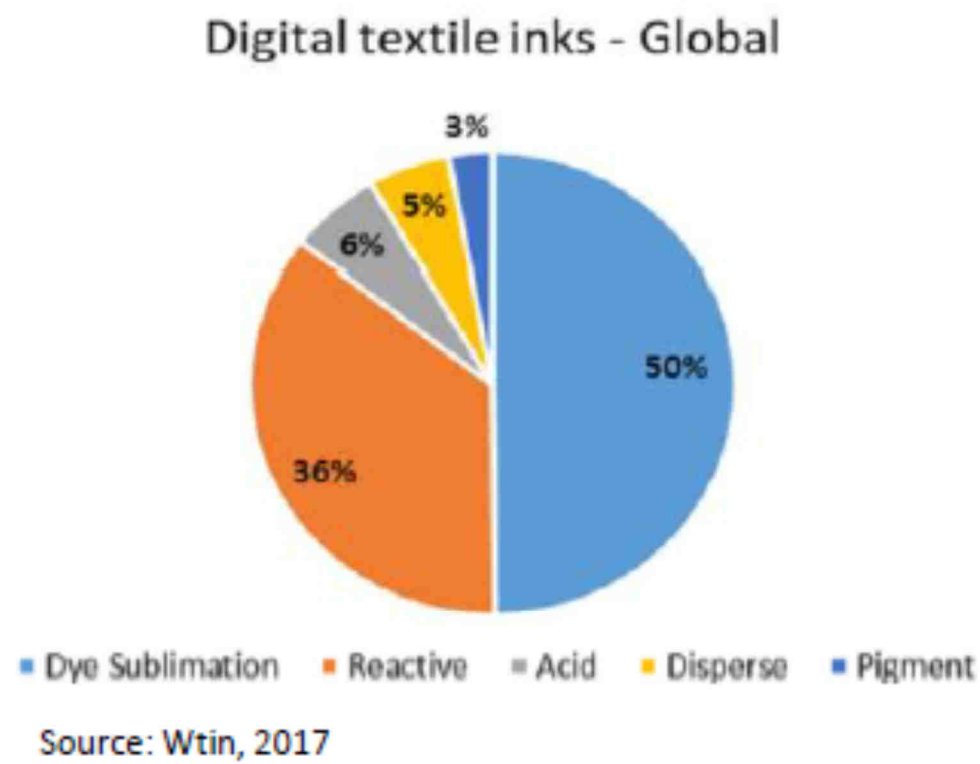
Source: Wtin, 2017

- In **2017** ,over **1.9 billion sqm** of fabric were digitally printed .
- The **annual growth rate** of digital textile textile printing is projected to **20 %** by volume through the period 2017 -2021.

BACKGROUND
Global growth of Digital Textile Printing



Source : "Menderes , Infotrends Digital Textile Forecast 2017-2022



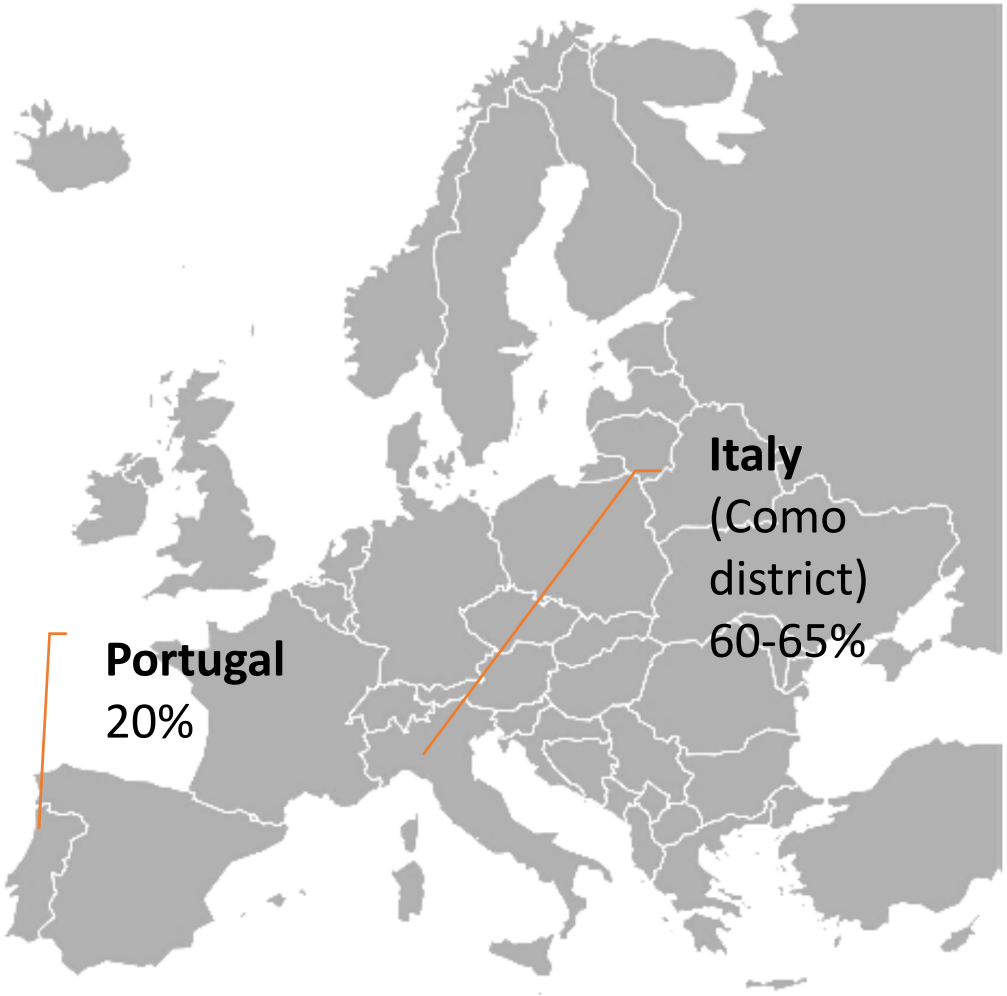
Source: Wtin, 2017

- Worldwide, digital textile printing has a **market share** of about **4-5%.**
- **Dye-sublimation ink** is the most consumed ink type, with a **50 % share** .
- **Reactive ink** follows with a **36 % share**.

BACKGROUND
Global growth of Digital Textile Printing

Digital textile printing growth in the last 15 years:

Average in Europe:
25%



BACKGROUND
Nitrogen: a new problem

Ink-jet printing requires a specific pre-treatment, where the reactive dye fixing agent carrier (urea) is applied

The specific pre-treatment with urea is applied to 100% all over of the textile material

Urea is then completely washed out after printing and fixation

Wastewater produced by DTP processes presents higher N concentration (in the forms of urea and ammonium)

Approximately 150 – 600 mg N/L

This increase correspond to an increase in nitrogen concentration in wastewaters of about 200%

THE PREVIOUS TARIFF

$$T_2 = F_2 + \{f_2 + dv + K_2 [\frac{O_i}{O_f} (db + Mdb + df + 1/3\ df + Mdf)] + da + daN \}\ V$$

daN = cost coefficient of charges for the nitrogen treatment (0,03369 €/m^3)

+

Fee per limit derogation (over 100 mgN/l) = 0,75 €/kgN

Wastewater with 200 mgN/l, 1.000 mg COD/l, 100 mgSST/l

Total tariff for ww treatment = 1,5809 + 0,075 = 1,6559 €/m^3

Fee for N = 0,03369 + 0,075 = 0,10869 €/m^3

Fee for N = 0,5435 €/kgN

THE NEW TARIFF

AEEGSI - DELIBERAZIONE 28 SETTEMBRE 2017 665/2017/R/IDR APPROVAZIONE DEL TESTO INTEGRATO CORRISPETTIVI SERVIZI IDRICI (TICSI), RECANTE I CRITERI DI ARTICOLAZIONE TARIFFARIA APPLICATA AGLI UTENTI

$$T_p^{ATO} = QF_p^{ATO} + QC_p^{ATO} + QV_p^{ATO} \cdot V_p$$

$$QV_p^{ATO} = Tf_{ind}^{ATO} + \max\left\{1; \left[\begin{array}{l} \%_{COD} \cdot \frac{COD_p}{COD_{rif}} + \%_{SST} \cdot \frac{SST_p}{SST_{rif}} + \%_N \cdot \frac{N_p}{N_{rif}} + \\ + \%_P \cdot \frac{P_p}{P_{rif}} + \sum_j \%_{X,j} \cdot \frac{X_{j,p}}{X_{j,rif}} \end{array}\right]\right\} \cdot Td_{ind}^{ATO}$$

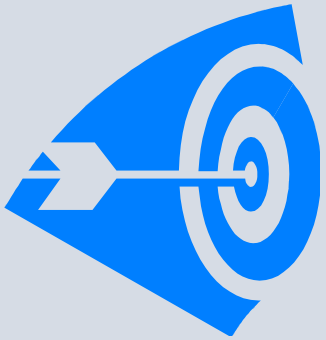
Nrif = 10 mg/l
%N = 15

Wastewater with 200 mgN/l, 1.000 mg COD/l, 100 mgSST/l

Total tariff for ww treatment = 2,1166 €/m^3 (+28%)

Fee for N = 0,9270 €/m^3 (8,5 times the previous tarif)
Fee for N = 4.635 €/kgN (8,5 times the previous tarif)

PROJECT AIM

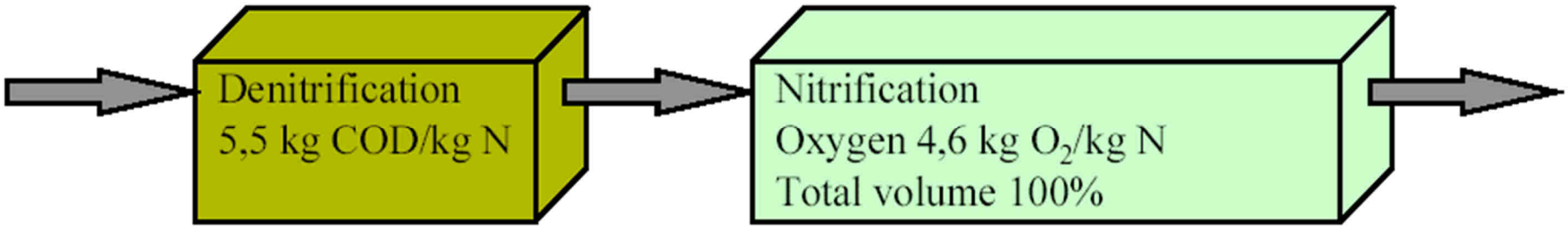


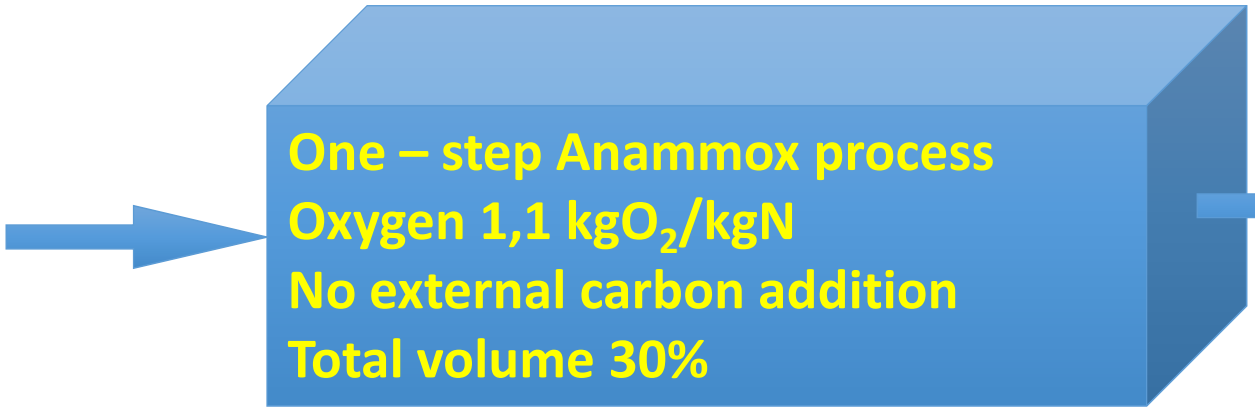
Life DeNTreat aims at demonstrating an **on site wastewater treatment module using Anammox** (Anaerobic AMMonium OXidation) technology to reduce nitrogen contents of wastewaters resulting from the **DTP process** and of overall urban ww

The Life DeNTreat tecnologies will allow to:

- obtain a residual N content below 100 mg/l in the wastewater released in the collection system
- easily accomplish Directive 91/271/EEC art.5 requirements asking to ensure that the mini mum percentage of reduction of the overall load entering all urban WWTP in a given area is at least 75% for total nitrogen produced
- assure the respect of residual nitrogen concentration in WWTP discharges, to be maintained below 10 mg/l enabling
- an actual saving of up to 40% in investment and operational costs
- a reduction of the N_2O emissions during biological wastewater treat ment to less than 20% of the currently adopted technologies
- an abatement of the sludge produced as a result of the nitrogen abatement process to less than 25% of the currently adopted technologies.

PROBLEM:
cheap removal of N from N-rich wastewater





Max conversion efficiency = 88,8%

Reduced volume

Opex reduction due to:

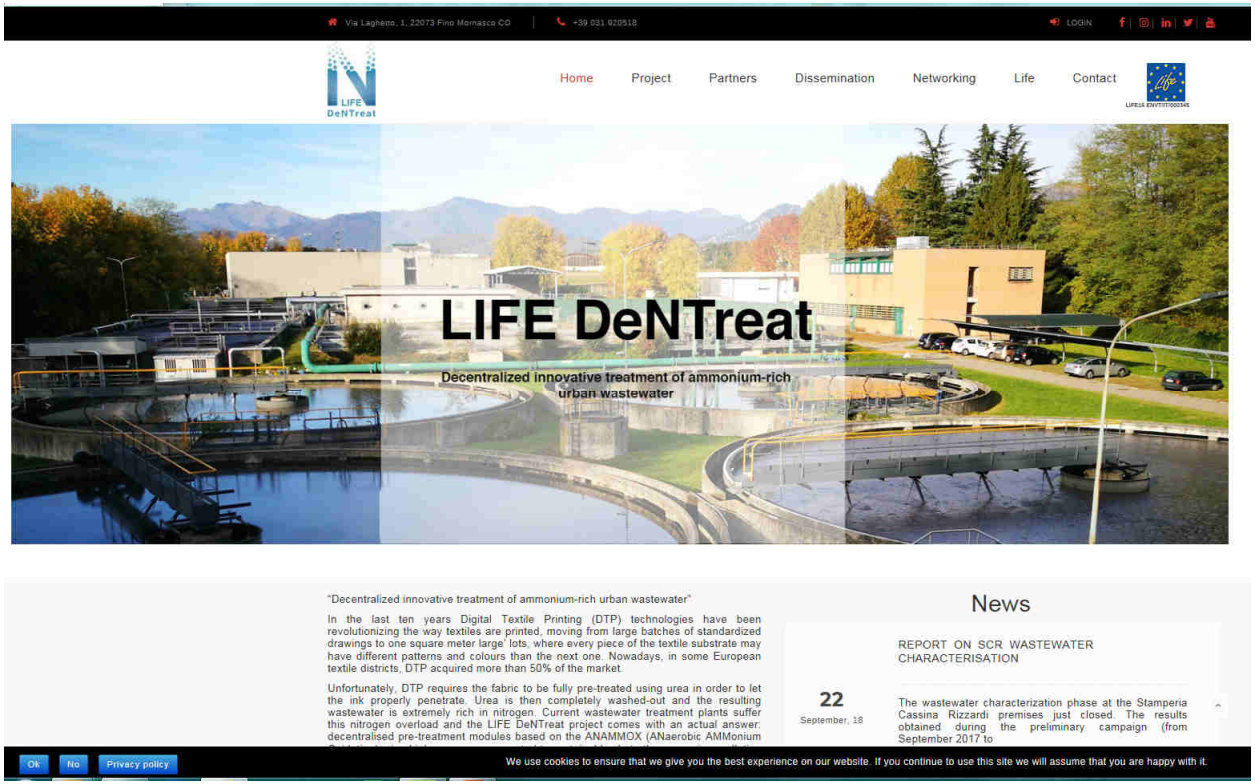
- ✓ Low O_2 consumption
- ✓ COD dosing absent
- ✓ Lower sludge production

MAIN ACTIVITIES AND TASKS

A	**PREPARATORY ACTIONS**
A.1	Characterization of the addressed wastewater and requirements collection
B	**IMPLEMENTATION ACTIONS**
B.1	Demonstration plant design and construction
B.2	Water treatment demonstration plant operation
B.3	Laboratory tests on digital textile printing company wastewater
B.4	Sustainability, transferability and replication of project results
C	**MONITORING OF THE IMPACT OF THE PROJECT ACTIONS**
C.1	Environmental, social and economic impacts analysis
D	**PUBLIC AWARENESS AND DISSEMINATIONOF RESULTS**
D.1	Dissemination of project results
E	**PROJECT MANAGEMENT**
E.1	Management and reporting to the EC
E.2	After Life N-free

PUBLIC AWARENESS AND DISSEMINATION OF RESULTS

Website homepage
http://www.life-dentreat.eu



SocialNetworking&SocialMedia

Instagram: https://www.instagram.com/lifedentreat/
Youtube: https://www.youtube.com/channel/UCCxC2kkDoe3slGRd6eIfmHQ?disable_polymer=true
Linkedin: https://www.linkedin.com/company/lifedentreat/
Twitter: https://twitter.com/LIFEDentreat
Facebook: https://www.facebook.com/LIFEDentreat/

PUBLIC AWARENESS AND DISSEMINATION OF RESULTS

Newsletter

Sign Up Newsletter at the website

Thank you

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