

# **INNOQUA: Sustainable sanitation with nature-based solution**





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# A commitment



- Develop a decentralised sanitation system suitable for the Global North and the Global South
- Urban and rural areas
- A 4 years R&D project
- 20 partners from diverse horizons



# A commitment



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 689817.

# Specifications



- Market studies
- Social acceptance questionnaire
- Legal requirements
- End-user requirements
- Environmental and cost assessment
- Communication

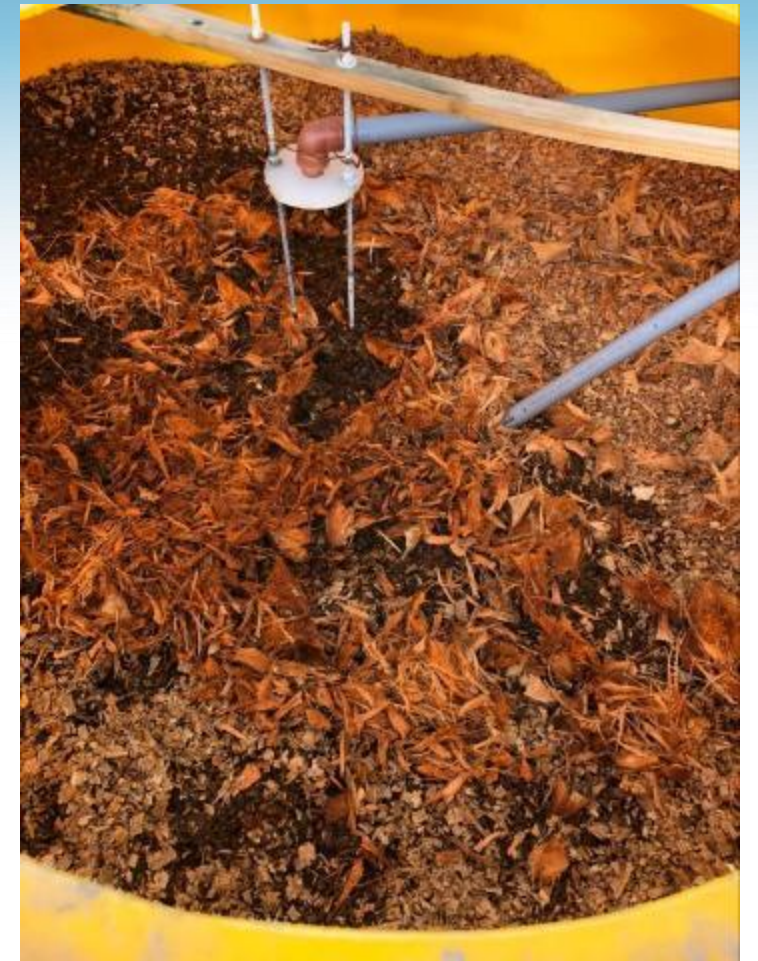


## 4 Technologies from the concept to the product

### THE INNOQUA SYSTEM



## 4 Technologies from the concept to the product



# The Daphniafilter



**Daphniae**



**Biofilm**

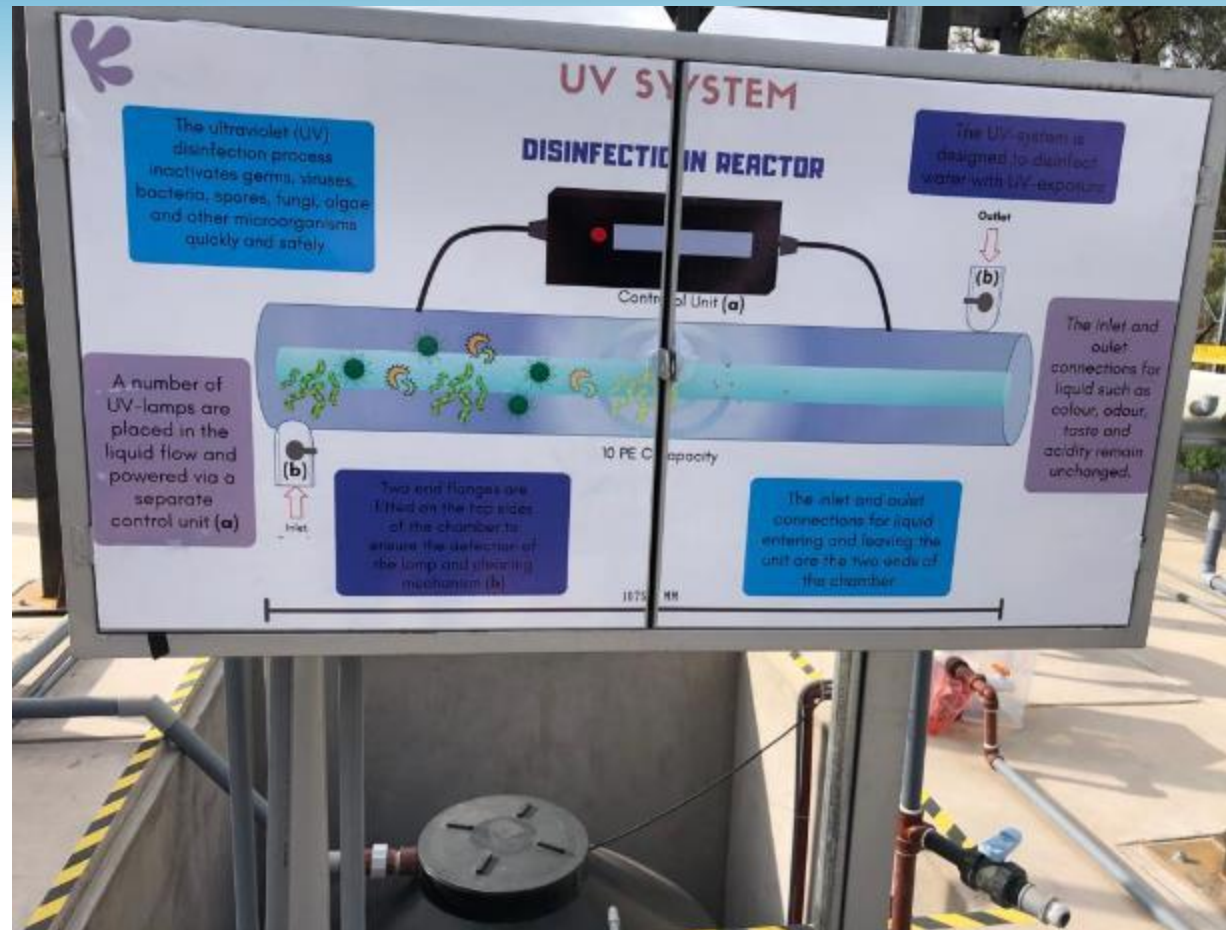


# The BioSolar Purification



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# The UV lamp



# LABORATORY SCALE LUMBRIFILTER TEST RIG AT NUI GALWAY



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# INNOQUA Site Scale 10 Pe Integrated Prototype System



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# Worldwide demonstration status

Prototype	Configuration
Ireland	LBF+DF+UV
Spain	LBF+DF+BSP
Demosite	Configuration
Ireland Ecuador	LBF
Italy	LBF+UV
France Romania Scotland	LBF + DF
Tanzania Turkey	LBF + DF + UV
India Peru	LBF + DF + UV LBF + BSP
France	Lumbricomposting



Demo-Site	Responsible	Location	Wastewater origin	Wastewater type
1	NUIG	Cattle Farm Craughwell, County Galway	Cattle farming (dairy wastewater)	Industrial
2	LBT	La Canourgue, France	Inland aquaculture	Industrial
3	DE5	Vasto, Italy	Western single family	Domestic
4	NBK	Anglet, France	Tertiary/ commercial building	Domestic
5	SW	Littlemill, Scotland	Collective housing	Domestic
6	EKO	Sinop, Turkey	Collective housing	Domestic
7	RMC	Suceava county, Romania	Touristic Building	Domestic
8	UCU/GYA	Quito, Ecuador	Residential building	Domestic
9	BORDA	Mlalakuwa, Tanzania	Collective housing	Domestic
10	BORDA	Bangalore, India	Collective housing	Domestic
11	UCSM	Arequipa, Peru	University (labs, toilets, general use)	Domestic

# The challenge



*Selected treated effluent limits, where discharged to surface water body (on a mg / L basis if not stated otherwise)*

Country	Volume (m <sup>3</sup> /day)	TSS	COD	BOD <sub>5</sub>	Ammonium
Ireland	0.2	5483	8148	-	57.6
France	0.6	609	1313	495	164
Italy	0.5	325	1016	380	161
UK	2.00	68	335	147	32
Turkey	1.50	595	772	261	53.8
Romania	2.40	324	857	395	36.7
Ecuador	2.00	164	506	298	62
Peru	2.5	134	872	511	180
Tanzania	1.40	95	511	-	78
India	1.2	2644	2036	1217	117



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# The challenge

*Selected treated effluent limits, where discharged to surface water body (on a mg / L basis if not stated otherwise)*

Country	pH	Temperature (°C)	Suspended Solids	COD	BOD <sub>5</sub>	Total nitrogen	Total phosphorus
Ireland	-	-	-	-	-	-	-
UK	8	20	35	125	25	25	-
Romania	7.5	35	60	125	25	15	2
Italy	8	-	25	100	20	15	2
France	-	-	25	-	35	-	-
Turkey	9	-	30	-	30	-	-
Ecuador	-	-	100	250	100	-	-
Peru	8.5	+3*	-	40	15	-	-
Tanzania	8	20-35	100	60	30	35	6
India	9.5	+5**	20	50	10	10	1

%removal efficiency in some countries varying between 70-85% for TSS/COD/N removal

# The demonstration sites



# The demonstration sites



# Lumbrifilter (Ireland & Ecuador)



Ireland – agricultural demo-site

Up to 0.2 m<sup>3</sup>/day



# Lumbrifilter +UV system (Italy)



## Italy demo-site



# Lumbrifilter + DF (France, Romania, Scotland )



French demo-site

SEPTIC TANK



LUMBRIFILTER

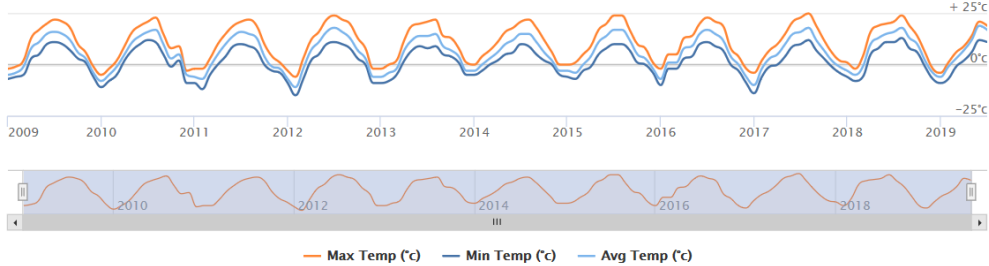


DAPHNIAFILTER

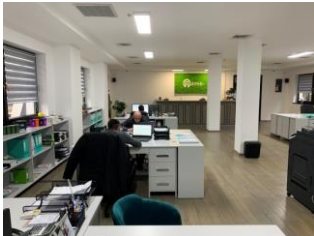


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# Romania demo-site



WorldWeatherOnline.com

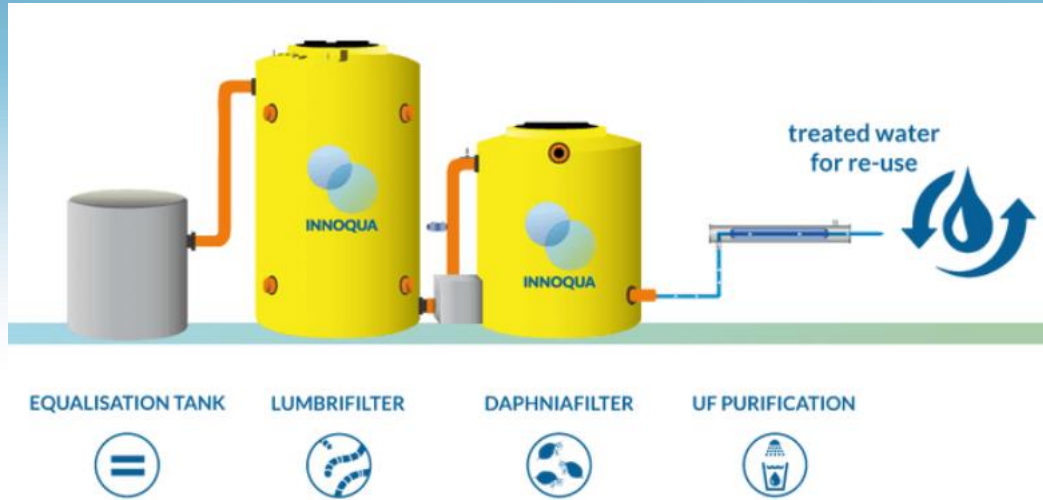


# Scotland demo-site



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# Lumbrifilter + DF + UV system (Turkey, Tanzania)



# Tanzania demo-site



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# Lumbrifilter + DF + UV system } (India & Peru) Lumbrifilter + BSP



## Demo-site INDIA



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# Lumbrifilter + DF + UV system } (India & Peru) Lumbrifilter + BSP



## Demo-site Peru



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**Thank you for taking part!**

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