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## **Monitoring and diagnosis of energy consumption in wastewater treatment plants. A state of the art and proposals for improvement**

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## Section 1. Overall pollution removal

According to this index, expressed in total pollutants mass removed (kg of pollution removed), is possible to calculate the overall pollution removal of a WWTP. This methodology aims to quantify in a single term the effluent pollution load of compounds that have a major influence on the quality of the receiving water body. Specifically, the calculation of the EQI is described in the equation:

$$EQI = \frac{1}{1000 (t_f - t_i)} * \int_{t_f}^{t_i} [C_1 * W_1(t) + C_2 * W_2(t) + C_n * W_n(t)] * Q_e(t) dt \quad (\text{Eq. 1})$$

Where,  $C_i$  is the removal of single pollutants (COD, BOD, TSS, TN, TP etc.),  $W_i$  is the weights for the different pollutants and  $Q_e$  is the effluent flow rate and  $t$  time.

**Table S.1. Weights for overall pollution removal calculation from different literature sources.**

	BOD	COD	TSS	NO <sub>x</sub>	TKN	TN	TP	Reference
Discharge pollution fee (DPF)	2	1	2	0	0	20	100	[1]
Oxygen consumption pollution (OCP)	1	0	0	4	18	0	100	[2]
Effluent quality index (EQI)	2	1	2	20	20	0	0	[3]
Effluent quality index (EQI)	2	1	2	20	20	0	10	[4]
Effluent quality index (EQI)	2	1	2	0	0	20	100	[5]
Effluent quality index (EQI)	2	1	2	10	30	0	50	[6]

## Section 2. WWTPs dataset

Table S.2 containing dataset used for the analysis is available as MS Excel spreadsheet attached to this supplementary material (Available at:

<https://www.dropbox.com/s/t3sp4uy4fdon4bc/SupplementaryMaterialDataset.xlsx?dl=0>).

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