DC12: Life cycle assessment (LCA) methodology to address the environmental sustainability of new materials developed and used to treat waste water, at laboratory and pilot scale

Host institution	UNIBO – University of Bologna
Location	Bologna - Italy
Research field	Environmental Chemistry
Project Title	Life cycle assessment (LCA) methodology to address the environmental sustainability of new materials developed and used to treat waste water, at laboratory and pilot scale
Objectives and project description	The PhD project focuses on the life cycle assessment (LCA) methodology to address the environmental sustainability of new materials developed and used to treat wastewater, at laboratory and pilot scale. The DC will learn and apply LCA to estimate the environmental impacts related to the synthesis of CQDs (MIR), HS or HLS from residues and the potential benefits connected to their usage (at laboratory scale) in wastewater treatment processes. The DC will also compare such results with those of benchmark alternatives. The inventory phase will be carried out in close contact with DC9, DC7 and MIRTEC to obtain primary data that will feed the models analyzed by LCA software, representing the novel technologies. The DC will also use LCA for supporting scale-up of the technology proposed in cooperation with CIEMAT. Different options will be assessed in detail, to identify the most important contributing stages to the overall environmental impacts, so as to point out the main hot spots for improvements. The most important nexus between water and other resources (energy in particular) will be analyzed. The potential integration of LCA with other methodological tools (design of experiment, data analysis, pattern recognition, analytical hierarchy process) will be also explored, to obtain more overarching information from the experimental activity.
Foreseen secondments	(i) MIRTEC, Volos, **Greece**, tutor V. Stathopoulos (3 months) (ii) UPV, Valencia, **Spain**, tutor A. Arques (6 months) (iii) CIEMAT, Almeria, **Spain**, tutor I. Lopez (3 months)
Enrolment in Doctoral degree(s)	Ph.D. awarded by the University of Bologna (UNIBO, Bologna, Italy) and co-awarded by the Universitat Politecnica de Valencia (UPV, Valencia, Spain).

Requirements	EDUCATIONAL Chemistry: Master Degree or equivalent Industrial Chemistry: Master Degree or equivalent Chemical Engineering: Master Degree or equivalent LANGUAGES English: Excellent
Other specific requirements	Skills/Qualifications Candidates are expected to be fluid in English (both oral and written), good academic writing and presentation skills. Skills in multivariate data analysis and experimental design techniques are highly appreciated, together with previous experience in the use of LCA software and in the applications of this methodology to processes/products. Specific Requirements We are looking for one highly motivated PhD candidate with strong interest in environmental chemistry research, in particular in Life Cycle Assessment and in environmental assessment studies. The PhD candidate is required to have a master degree in Chemistry/Industrial Chemistry or closely related fields. Candidates are expected to be fluid in English (both oral and written), good academic writing and presentation skills. The position is open to applicants from around the world, with the limitation that at the time of recruitment by UNIBO, researchers must not have resided or carried out their main activity (work and/or studies) in Italy for more than 12 months in the 3 years immediately prior to the reference date. The candidates must demonstrate a high level of accomplishment and excellence in her/his previous academic experience.
Supervisors and contact person	Prof. Fabrizio Passarini mailto: fabrizio.passarini@unibo.it