

SIRA Consultation Form

Submission Date 18-07-2016 12:47:53

Are you responding to this questionnaire on behalf of/as: A single organisation

Please indicate your connection to the WssTP: Non-WssTP member

Organization name: Arctik

Name: Quentin

Surname: Galland

Telephone: +3226465881

Email quentin.galland@arctik.eu

Please indicate the type of organisation represented: Consultancy

Please enter your country of residence or where your organisation is based: Belgium

Questions:	Disagree	Slightly disagree	Neutral	Slightly agree	Agree
The conceptual model provides a clear and sensible understanding of the structure of the SIRA	-	-	-	-	✓
The conceptual model provides a logic representation of the synergies and interdependencies between the different key components	-	-	-	-	✓

These sub-challenges present the main challenges to be addressed to reach the vision objectives. Yes

For each sub-challenge several research and innovation actions are identified that are considered necessary to reach the set goals. Do you have any comments to the research and innovation priorities currently listed for each sub-challenge? Yes

Please provide your comments. If you feel that certain priorities should be added, please feel free to describe them here (if possible, please indicate the relevant sub-challenge)

KC1 – SC5 Energy harvesting as integrated valorisation strategy of water:

The EC funded project POWERSTEP (www.powerstep.eu) tries to achieve a real paradigm shift in wastewater treatment processes: the overarching goal is to convert sewage treatment plants (STEPS) in power production facilities (POWER) while still achieving a high effluent quality for the treated wastewater. This will be carried out by carbon extraction of primary sludge what will together with excess sludge lead to higher biogas yields. The biogas valorization can finally be carried out by different technologies like CHP, POWER-2-GAS or HEAT-TO-POWER concepts. From an environmental point of view, the high energy potential present in municipal wastewater should be better exploited in future WWTP schemes to save on limited fossil resources for electricity production and associated emissions of greenhouse gases, turning WWTPs into producers of renewable or “green” energy. This will be shown in the POWERSTEP project testing different technologies as well as concepts in large scale at 6 European WWTPs.

For each topic a Technology Readiness Level (TRL) is indicated, do you feel these TRL's are appropriate?

Yes

These sub-challenges present the main challenges to be addressed to reach the vision objectives.

No

For each sub-challenge several research and innovation actions are identified that are considered necessary to reach the set goals. Do you have any comments to the research and innovation priorities currently listed for each sub-challenge?

No

For each topic a Technology Readiness Level (TRL) is indicated, do you feel these TRL's are appropriate?

No

These sub-challenges present the main challenges to be addressed to reach the vision objectives.

Yes

For each sub-challenge several research and innovation actions are identified that are considered necessary to reach the set goals. Do you have any comments to the research and innovation priorities currently listed for each sub-challenge?

No

For each topic a Technology Readiness Level (TRL) is indicated, do you feel these TRL's are appropriate?	Yes
These sub-challenges present the main challenges to be addressed to reach the vision objectives.	Yes
For each sub-challenge several research and innovation actions are identified that are considered necessary to reach the set goals. Do you have any comments to the research and innovation priorities currently listed for each sub-challenge?	Yes
Please provide your comments. If you feel that certain priorities should be added, please feel free to describe them here (if possible, please indicate the relevant sub-challenge)	<p>In POWERSTEP (www.powerstep.eu) - a Horizon 2020 project - new solutions and existing technologies are tested in large scale conditions to demonstrate the concept of energy-positive wastewater treatment plants, without compromising the quality of the water treated. Such WWTPs would act as « local power plants of the future » and would showcase the participation of the sector to the overall objectives of the Energy Efficient Europe.</p> <p>The success and the market uptake of the technologies and solutions suggested in POWERSTEP rely very much on the development of an appropriate framework at both regulatory and economic levels. Cross-sectoral discussions involving stakeholders from the water, wastewater and energy sectors are essential to support the deployment of the right conditions that will support the concept of « energy-positive wastewater treatment plants ». We therefore call on enhancing the cooperation between all the actors concerned." by "Concretely, this means that from a legal point of view, energy produced from wastewater should not be discriminated from other renewable energies (as this is the case in many Member States today), and that it should at least benefit from the same tax and subsidy advantages</p>
For each topic a Technology Readiness Level (TRL) is indicated, do you feel these TRL's are appropriate?	Yes
For each Living Lab several characteristics are provided that define the main real-life experiments to be tested in real-life conditions. Do you have any comments to the characteristics currently listed for each Living Lab?	Yes

Please provide your comments. If you feel that certain characteristics or experiments should be added, please feel free to describe them here (if possible, please indicate the relevant Living Lab)

KC5 - LL3 Smart (Peri-)Urban Living Labs:

"Municipal wastewater treatment in Europe currently requires a significant amount of energy to eliminate organic matter and nutrients such as nitrogen and phosphorus from the sewage prior to its discharge to receiving waters. Under the assumption of an average electricity demand of 32 kWh per capita and year for large wastewater treatment plants (WWTP) as current benchmark, the municipal wastewater sector within the European Union (EU) consumes at least 16,000 Gigawatthours (GWh) per year for its service, which is equivalent to the annual power generation of two large (1,000 Megawatt) power plants.

On the other hand, the organic matter contained in municipal wastewater has an internal chemical energy content of 14.4 MJ or 4 kWh per kg of chemical oxygen demand (COD). Based on an organic matter load of 120 g COD per capita (PE) and year, the theoretical energy potential in municipal wastewater amounts to 175 kWh/(PE*a) or 87,500 GWh per year for the entire EU25+3, which is equivalent to the electricity produced by 12 large power plants. If this chemical energy potential is compared to the current benchmark of energy demand for wastewater treatment stated above, it is obvious that municipal wastewater contains significantly more energy in its organic matter than is required for its treatment. Thus, an energy-neutral or even substantially energy-positive wastewater treatment process is theoretically possible by converting this chemical energy into usable types of "renewable" energy.

Considering that wastewater treatment may account by up to 30% of the electricity bill of a city, energy efficient wastewater treatment plants may be a relevant position in strategies for climate neutral cities or regional energy politics

These sub-challenges present the main challenges to be addressed to reach the vision objectives.

Yes

For each sub-challenge several research and innovation actions are identified that are considered necessary to reach the set goals. Do you have any comments to the research and innovation priorities currently listed for each sub-challenge?

No

For each topic a Technology Readiness Level (TRL) is indicated, do you feel these TRL's are appropriate?

Yes

Any other comments or questions you would like to share on the strategic innovation and research agenda and/or the described research, development or innovation challenges?

Don't under-estimate the power of wastewater as a "renewable" energy source and please don't see wastewater as waste, it is a valuable resource, so let's call it "bio-water", (POWERSTEP Team)