



Deliverable D6.4

Investigating the public acceptance of wastewater reuse at the Vendée greenfield demonstration site



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Abstract	This document presents the exploration and elements of comprehension about social acceptability in the greenfield Vendée case study. Some semi-structured interviews, linked with sociologic literature underline 4 acceptance theme and 10 social acceptability factors that need to be taking into account in the implementation dynamic of Reuse in Vendée. These 10 factors underpin the strategic and operational recommendations that are proposed for the Vendée stakeholders.

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Executive Summary

The EU-funded DEMOWARE research project aims at identifying constraints on the development of wastewater reuse in Europe as a basis for the identification of solutions to address these constraints. A specific Work Package (WP) of the DEMOWARE project focuses on the development and implementation of a wastewater reuse pilot for the Vendée Greenfield, addressing the technical and regulatory challenges faced by wastewater reuse development for this site, along with its social acceptability challenges that are investigated under its Task 6.5.

Social acceptability dynamics, and the factors that influence social acceptability in the Vendée site, have been investigated via stakeholders' semi-structured interviews. Social acceptability is investigated using a wide perspective linked to the question of complexity: the contexts that have produced social acceptability factors are identified in relation to stakeholders' views, with social acceptability factors seen as complementary and closely interconnected. The contexts and the information collated for understanding social acceptability are presented at two different (macro-social and meso-social) scales. At the macro-social scale, our relation to risk and precaution/prevention, as well as the progressive development of controversies (in particular in relation to large scale projects) are two key issues presented and investigated. This is particularly the case for projects based on technological innovation in which the terms of debate are strongly influenced by biased arguments and juridical expertise. At the meso-scale, social acceptability factors are closely connected to the specificities of the Vendée territory.

Four main themes of social acceptability have been identified and investigated, covering ten individual operational factors of social acceptability. These include:

- **Theme 1: Co-building a common story** and the issue of the consensus on water resource management in Vendée. This first theme investigates the social acceptability question from a "content" perspective, addressing the questions of the relevance and opportunity to develop the wastewater reuse project in Vendée. It builds on the diversity of stakeholders' views and positions that leads to a lack of common understanding and to a "fragmented story". This theme addresses the social collective building of the problem and of its solutions, in the context of the structural and conjunctural situation of water resources and of drinking water in the Vendée territory.
- **Theme 2: Building trust** in the pilot project development process and the monitoring of the wastewater reuse project. This second theme addresses the issues linked to the process put in place for developing and then implementing a wastewater reuse pilot in Vendée. Trust relates to each individual step of the process (from the testing phase to the monitoring of projects in their full operation phase) and is linked in particular to the confidence one can have in the technologies applied and in the control of health impacts.
- **Theme 3: Ensuring the quality of the information** disseminated to stakeholders. This theme is connected to the communication strategies put in place for disseminating information on wastewater reuse and on the pilot project. It focuses on the intrinsic qualities of the information disseminated, and not on the role of disseminators and on the biases brought by the media in disseminating this information. The fundamental qualities of information include the transparency in the process that has produced information, and the completeness of the information disseminated.

- **Theme 4: Mobilizing stakeholders** for developing and implementing the wastewater reuse project. This issue, strongly related to environmental issues and practices, is seen by the stakeholders interviewed as an essential theme of social acceptability. It addresses the level of mobilization, as well as its spatial and temporal scales. The factors identified in this theme are thus related to the collective process that can be established to support the development and implementation of the wastewater reuse project.

On the basis of the analysis of the different social acceptability factors of these four axes, specific global and factor-specific recommendations, expected to enhance social acceptability for the Vendée wastewater reuse experimentation, are developed. At the global scale, the recommendations stress: the need for a collective development of the justification and general interest character of wastewater reuse at the scale of the Vendée territory; and, the need for joined ownership by all stakeholders of the proposed pilot project. This will require a shift in the paradigm of stakeholder mobilization. At a more operational level, the recommendations address the ten factors separately, stressing however the need to work on the different factors simultaneously.

Résumé

Le projet DEMOWARE vise à comprendre, pour mieux les dépasser, les contraintes pesant sur le développement de la réutilisation des eaux usées traitées en Europe. Le WP6 s'intéresse plus particulièrement au site test de Vendée. En complément aux travaux concernant les aspects réglementaires et techniques, la tâche 6.4 porte la focale sur les dynamiques d'acceptabilité sociale liées au projet d'expérimentation de réutilisation des eaux usées (REUT) indirecte porté par Vendée Eau.

Les dynamiques d'acceptabilité sociale, et les facteurs qui les influencent, ont été analysés à l'aide d'entretiens semi-directifs réalisés auprès d'acteurs du territoire. L'acceptabilité sociale est envisagée dans sa perspective large et par une approche liée à la complexité : les contextes de production sociale des facteurs d'acceptabilité sont identifiés en lien avec les dires d'acteurs ; les facteurs d'acceptabilité sont pris dans leur globalité et comme ne pouvant être séparés les uns des autres, au risque d'en avoir une approche instrumentale et finalement non opérationnelle.

Les éléments de contexte et de compréhension des facteurs d'acceptabilité sociale, que l'on retrouve dans les dires d'acteurs, sont présentés à deux échelles : une échelle macro-sociale et une échelle méso-sociale. A l'échelle macro-sociale les deux éléments contextuels majeurs semblent être, dans nos sociétés les relations au risque et à la précaution/prévention, ainsi que « la montée des controverses » dans laquelle tout projet de développement s'inscrit. On observe effectivement le développement des contestations envers les projets basés sur de l'innovation technologiques, dans la majorité des cas étayées sur des arguties et expertises juridiques. Par ailleurs, à l'échelle méso-sociale, les facteurs d'acceptabilité sociale identifiées sont associés aux spécificités du territoire vendéen.

Quatre grands axes d'acceptabilité sont ainsi identifiés et décrits, recouvrant dix facteurs concrets d'acceptabilité. Ces quatre axes d'acceptabilité recouvrent les éléments identifiés dans la littérature, notamment par le biais du WP5. Pour autant ils sont ici repris et détaillés dans le contexte français.

- Le premier thème est centré sur les éléments permettant de construire, sur le territoire vendéen, un « récit commun » partagé. Si cet axe n'est pas suffisant pour construire l'acceptabilité du projet de REUT, il est pour le moins indispensable à prendre en compte dans le partage d'un diagnostic initial de la ressource, permettant ainsi de mieux comprendre les raisons du développement d'une expérimentation de REUT.
- Le deuxième thème porte la focale sur les questions de confiance, à partir du travail réalisé dans le WP5. Si cette question de confiance envers les technologies est fondamentale et liée pour beaucoup à la capacité à mettre en œuvre une phase de « démonstrateur » ainsi qu'un dispositif de suivi collectif des process engagé, il convient de garder à l'esprit à la fois l'aspect indirect de la REUT en Vendée, de même que des perceptions anthropologiques solides associées à la pureté de l'eau.
- Le troisième thème d'acceptabilité sociale détaille les questions de qualité de l'information diffusée sur l'expérimentation de la REUT. Malheureusement souvent entrevue dans des schémas simples d'émetteur-récepteur, l'information est pourtant un des aspects les plus complexes de l'acceptabilité sociale en ce qu'elle met en jeu de multiples dimensions : construction des messages, biais de communication, appropriation-compréhension par les acteurs, utilisations et impacts en lien avec les comportements. L'enjeu sur le site vendéen est fort puisqu'il s'agit de communiquer sur une phase de démonstration, envers les acteurs, et dans un contexte de surinformation général.

- Le quatrième thème est celui détaillant les questions de participation et d'implication des acteurs. Les facteurs identifiés invitent, tout comme les travaux du WP5 à différencier les échelles de participation en fonction des typologies d'acteurs intéressés, de même qu'à construire des dispositifs collectifs, associant la diversité des points de vue, en vue du suivi des process engagés.

A l'issue de la description et de l'analyse de ces quatre grands thèmes d'acceptabilité, recouvrant dix facteurs opérationnels, des recommandations visant à renforcer l'acceptabilité sociale future de l'expérimentation en Vendée sont proposées, ces recommandations étant présentées à deux échelles : au niveau global, elles insistent sur la construction collective des argumentaires en faveur de la REUT sur le territoire vendéen ainsi que sur l'appropriation du projet par la diversité des acteurs en présence. Cela implique un changement de paradigme en termes de dynamique participative de développement. A un niveau plus spécifique, les recommandations reviennent sur l'ensemble des facteurs identifiés et invitent à travailler simultanément sur l'ensemble des dix facteurs mis en avant.

1 Introduction

The Vendée territory (or *département de Vendée*) is facing serious problems in the delivery of drinking water at the end of, and following, the summer period. Its hydro-morphologic conditions and climate, combined with a socio-economic development based on mass coastal tourism and intensive agriculture are key factors explaining this situation. These challenges are particularly critical in a context of important demographic development along the coast, with consumption and delivery issues at stake.

In the 1950s, the water management model could be sustained thanks to the development of storage dams that would ensure security in the supply of drinking water for human consumption. However, it faced an increasing number of crises, that we could be defined as tension over fresh water resources, since 1976, in particular since the end of the 1990s and the beginning of the 2000s. To respond to this situation, and as the building of additional storage capacity on the Auzance river had to be abandoned for non respect due to the European Water Framework Directive, different strategies for mobilizing alternative water resources have been proposed by the Vendée Eau water supplier to secure the water supply of the Vendée territory. The different options considered included both conventional and non-conventional water resources, including the testing of water reuse. This water reuse pilot testing, currently under development, is based on the reuse of wastewater from the Olonne wastewater treatment plan with: (a) additional treatment at the wastewater treatment site; and (b) the building of an about 20 km long pipe towards the Jaunay storage on the North; and (c) the discharge of the treated effluents upstream of the Jaunay storage.

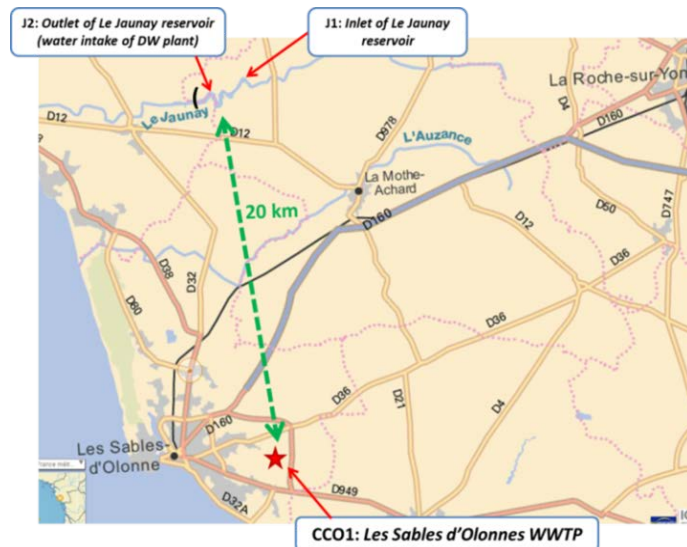


Figure 1 A planned indirect reuse scheme (Les Sables d'Olonne WWTP to Le Jaunay reservoir)

Building on this proposed pilot testing, Vendée Eau decided to participate in the EU-funded research project DEMOWARE with three main issues being investigated: (1) the technical feasibility of the project; (2) its integration into the current French regulatory framework related to both environment and health aspects; and (3) the social acceptability of the project – which is the focus of the present report.

More specifically, the pilot testing of a wastewater reuse project, addressing a key resource (water) and complex technological innovations that relate to many stakeholders of the territory, involves many social phenomena and interactions which need to be given due consideration. Earlier work carried out under Demoware on different sites has in particular stressed the importance of a careful assessment of social

processes and acceptability. Particularly developed in countries with an Anglo-Saxon culture, investigations on social acceptability processes have been developed progressively in France building in particular on the increasing number of controversies faced by development projects and the spreading of innovative technologies (Gendron, 2014). It is interesting to note that what and how to investigate these processes is still debated in the scientific community (Boissonade, Barbier R., Bauler T., Fortin M.J., Fournis Y., Lemarchand F., et Raufflet E., 2015).

In light of results of, and issues raised in, the available literature, identifying the main factors that influence social acceptability for the Vendée water reuse pilot site has built on a encompassing approach, accounting for the integration of the pilot testing project into its wider global and territorial context as key components of the social matrices that compose acceptability. This initial work, consolidated with stakeholders' views and perceptions, has then contributed to the identification of the main factors of social acceptability.

2 Methodology

The methodology applied for investigating the social acceptability of the water reuse pilot project is presented below, stressing in particular how social acceptability has been considered, the options considered for collating stakeholders' views, along with the steps followed for identifying the key components of social acceptability that are relevant to the Vendée territory in relation to the water reuse pilot project. And, as a key issue of the DEMOWARE project, this analysis of acceptability factors allows the identification of some recommendations for Vendée Eau.

2.1 The proposed approach to social acceptability and the specificities of the Vendée territory

Two approaches have been considered in the context of the Vendée greenfield (These two approaches were presented to Vendée eau in a short concept note in April 2015):

- The first approach builds on the investigation of social acceptability from a process dynamic perspective (Caron-Malenfant and Conraud, 2009). It mobilizes in particular a first series of interviews of key stakeholders of the territory, combined with the establishment of a “test monitoring group” on social acceptability. This group has met three times, with specific attention being given to the changes in the perception and acceptability of members of this group that cover a wide range of views.
- The second approach is more static, considering social acceptability as “level of acceptance” along the population. It builds mainly on (bilateral) interviews with key stakeholders, followed by a focus group that helps explore the different dimensions and current state of social acceptability.

Following discussions within the Demoware project team and in particular with Vendée Eau, it is the second approach that has been chosen and applied to the Vendée Greenfield within the context of the Demoware project. The main reasons that explain this choice include:

- 1) The fact that the water reuse pilot is at a very preliminary stage, requiring particular attention to how it could be discussed with stakeholders avoiding any “negative” reaction and opposition to a pilot that was still in its development phase. Indeed, applying a dynamic approach to social acceptability required specific information and communication about the project to a wide range of stakeholders – something that was clearly seen by Vendée Eau as very critical and challenging;
- 2) The importance of targeting key stakeholders connected to the project and to Vendée Eau in the first place, prior to conducting a survey of the general population.

It is important to stress that the approach implemented has helped understanding social acceptability at a given time, the definition and the design of the water reuse pilot being made in parallel based on Vendée Eau internal processes and discussions, interactions with stakeholders and research carried out in the context of the Demoware project.

2.2 Data collection

2.2.1 Semi-structured interviews and focus group

The methodology combined two complementary exploratory aspects:

- The aspect built on semi-structured interviews (Beaud et Weber, 1997), that helped to investigate the social representations of stakeholders with three main components considered, which helped put stakeholders' views on water reuse into their local context (see annex 1):
 - Perceptions of the overall context of water resources and water management in the Vendée territory;
 - Perceptions of water reuse in general (in terms of technical feasibility, risk and confidence associated);
 - Perceptions of the water reuse initiative/pilot as proposed by Vendée Eau.

The semi-structured interviews, following well-defined and tested interviews guidance by the internal work group in ACTeon, gave sufficient freedom for interviewees to express their views on a series of issues, facilitating the expression of their opinions, beliefs, attitudes and norms – key aspects influencing social acceptability that would form the basis for follow-up assessments.

- The second aspect included the establishment of two focus groups, the first one mobilizing stakeholders of the « core group » connected to the pilot testing, and the second one mobilizing more peripheral actors. The main objective of these two focus groups was to share and consolidate the data collected through semi-structured interviews and presented along the four components of social acceptability listed above. Technical and organizational difficulties (problems with digital invitation and stakeholders availability) however, prevented the organization of these focus groups within the scope of Demoware. They remain still an option for supporting future steps of the pilot project development. As replacement to the two focus groups, it was decided to carry out a short survey targeting actors who were supposed to participate in the two focus groups, with the objective to consolidate their views on the four components of social acceptability and on the different factors affecting social acceptability identified during the semi-structured interviews. Unfortunately, despite many efforts, two responses only (out of 26) could be collected. And these answers could not be used for strengthening the assessments.

2.2.2 Sample for semi-structured interviews

Sampling in qualitative assessments is not based on statistic representativeness, but on ensuring a wide diversity of views are captured (Poupart, Deslauriers, Groux, Laperrière, Mayer, Pires 1997) in the different interviews so the different logics of stakeholders in relation to our issue (in our case, pilot testing of wastewater reuse) are explored. It was initially proposed to interview:

- Stakeholders that are « core » to wastewater reuse, i.e. close to, and influential, to the decision to implement (and how) the pilot project (e.g. Vendée Eau or the health authorities), or that are geographically closely located (e.g. close to the wastewater treatment plant of Olonnes, the Jaunay storage or the location where re-injection of treated effluent might take place);
- Peripheral stakeholders, that are not directly impacted by, or connected to, the pilot project, but which have a thematic or technical expertise relevant to the pilot testing (e.g. linked to direct and indirect impacts on the environment, health or consumers);

And, in a transversal approach, combining stakeholders with different roles and status, technical experts, elected representatives and representatives of the civil society.

In practice, twenty seven stakeholders were interviewed, with representatives from: health issues (4 local and regional stakeholders); water issues (6 technical experts and 5 elected representatives, balancing water services and water resource management competencies); territorial development (3 actors from

agriculture and industry associations); environment (three environmental NGO representatives); consumers (four consumer NGO representatives); and local authorities (two elected municipal representatives).

In addition, five stakeholders were met and interviewed – but not included, following their request, in the sample to be analysed. These include experts from the health authorities and the independent agency ANSES, as well as a scientific expert specialized in social acceptability in relation to wastewater reuse. These experts and stakeholders argue that they are directly related to the wastewater reuse pilot project carried out by Vendée Eau, and that the lead of the research WP is similar to the lead of the REUSE project in Vendée, that can not be considered as “neutral”, but in position of influence and judge and jury. However, their views still helped consolidated the understanding of the national and local context vis-à-vis wastewater reuse, as well as the social acceptability dynamics linked to wastewater reuse in France and in Vendée.

Note that fifteen stakeholders from the stakeholder families presented above that were contacted did not answer to the request for interviews.

Overall, the sample that could be mobilized is considered as sufficient in terms of diversity of views covered and the possibility to analyse the social logics and dynamics in place in the Vendée territory vis-à-vis the wastewater reuse pilot project. It provided enough material for clearly identifying the different dimensions of social acceptability.

The interviews last half an hour at maximum and were recorded for the analysed, and, in the analysis process, encoded for the respect of anonymity and ethic. We have to underline that interviews were not fully transcribed, but analysed with a thematic approach, and not with a specific speech analysis.

2.3 Identifying the factors influencing social acceptability

The analysis of interview results was performed first in a linear manner, interview by interview. In a second step, the interview results were combined issue by issue, linking the interview results to the outcome of the literature review carried out under WP5, and complemented by a review of the French literature, mostly with sociologic publication. This issue-based assessment, combined with the knowledge on social acceptability factors relevant to wastewater reuse available in the literature, helped identifying the main social acceptability factors:

- Linked to the context, helping to understand the influence of the social context on acceptability in the Vendée territory, in relation in particular to the technical options initially considered for the testing/pilot project. Note that the context was considered at two scales: the global context (France/region) and the local Vendée context in particular in terms of integrated water management;
- Linked to an experimental/pilot project on wastewater reuse in the Vendée territory.

To facilitate their analysis and understanding, the 10 factors identified were grouped into four components of social acceptability (as presented in Section 4). It is important to stress that the factors identified relate to: (a) the stakeholders of the territory; (b) a wastewater reuse test/pilot project still in its development phase; and (c) the current social dynamics of the Vendée territory.

3 Putting the social acceptability of a water reuse pilot in Vendée in its context

In general, understanding the social dynamics influencing acceptability processes within a given territory requires some understanding of the context within which the wastewater reuse project is embedded. Thus, factors driving social acceptability identified through stakeholder interviews are analysed in light of the context in which the pilot project takes place, this context bringing its full meaning to the interview results. The context described here has been “built” on the basis of the knowledge collated during the stakeholder interviews, combined with knowledge from the literature – the objective being to provide the salient features of the context and not to develop an exhaustive analysis of this context.

This context could be understood as a “social matrix” of social acceptability factors production. These can’t be isolated with the social context where they are constructed. Highlighting these contextual elements help us to understand:

- That social acceptability factors have to be considered as a social construction;
- That social acceptability factors are closely linked to the social context and especially dynamics around innovation, risk perception;
- That social acceptability factors are “located”: it means that they are taken in a Vendée singular territory history.

Thus, contextual elements draw a backdrop that allow us to emphasise social acceptability factors.

The description of the context can combine two different scales that facilitate its understanding (Desjeux, 2004): a macro-social scale, bringing a global perspective to the issue investigated; and, a meso-social scale, highlighting the specificities of the Vendée territory in which the idea of the wastewater reuse pilot testing has emerged. Both scales are clearly interconnected, providing different (complementary) readings of the same reality. The context also helped identifying the social specificities of the Vendée Greenfield site as compared to other sites investigated under DEMOWARE, complementing the work carried out under Task 6.2 that primarily investigated its technical and regulatory dimensions.

3.1 Contextual elements at the macro-social level – Global scale

Three key elements of the context at the global scale, connected to our investigation and referred to by different stakeholders interviewed, are worth stressing.

The first element relates to the link between technical innovation and risk aversion (or risk culture - Peretti-Watel, 2003). This link, very complex and sometime contradictory, has significant influence on stakeholder perception in the field. Indeed, we are living in a modern society (Beck, 2000 et Giddens, 1991) within which social relationships can be linked to risk quantification, perception, acceptability and control (via specialized engineering). However, the assessment of the level of risk associated with innovation (in particular connected to industry) is always connected to the issue of uncertainty and risk management, as illustrated by the reference to the willingness to control rationally and technically uncertainty that plays a central role in our media, political and scientific spheres. It means uncertainty is, in a cultural perspective, considered to be removed. As a result, there is tension between technological development (such as, for example, the supplementary treatments that are required for effluents prior to their use), the probabilistic notion of risk, the wish to control risk, and the way stakeholders are impacted by, or to the contrary carry, the development and the dissemination of the technological development at stake. It is within this context that the questions of trust emerge, be it in relation to wastewater reuse technologies, the information that is shared and disseminated or the mechanisms put in place to collectively manage, or take into account,

risk and uncertainty – and to make “risk more acceptable”. This aspect of the context is important. Especially since in information and communication on risk, be it technical or in more general medias, does not distinguish between chosen risks and imposed risks – a difference that is essential in technological innovation projects as stressed by the acceptability factors identified (see below).

The second element, related to the connections between innovation and risk management, relates to the application of the precautionary principle, a principle promoted by the environmental stakeholders and NGOs, and registered in French constitution. The application of this principle, as highlighted by interviews in particular with water stakeholders, is seen as constraining innovation. Whereas the principle *stricto sensu*, promotes a more transparent and democratic risk management (Lascoumes, 1996). And there is confusion, largely fuelled by the media, between a precautionary principle addressing uncertainty, and the prevention principle (*principe de prevention*) that is based on risk management, with the goal to remove all risk (Peretti-Watel 2003). Clearly, based on literature, precaution cannot be assimilated to zero risk. The interviews with stakeholders stress this confusion which clearly influences trust in the technology and in the relationships between the stakeholders carrying out the water reuse pilot and health authorities. Without questioning the issue of health legislation related to wastewater reuse, stakeholder perceptions of these different principles help understanding the social acceptability of the wastewater reuse project by the Vendée stakeholders.

The third element is related to the “increase of controversies” (“*la montée des controverses*” as defined by Gendron, 2014), explaining how social acceptability develops and evolves over time. This increase of controversies exists for “large projects” and for all procedures addressing the public interest such as the public consultations (*enquêtes d’utilité publique* in France). Discussions during the first field visit with Vendée Eau in Mai 2015 referred to this issue, making reference to the new airport of Notre Dame des Landes that faces large and argued technical, political and public controversies¹. And many interviews also referred to that. Highly discussed in the media, this increase of controversies reduces trust in such projects from local stakeholders. In addition, it freezes the different (conflicting) positions of stakeholders in particular on technical questions (in our case, in relation to the efficiency and relevance of wastewater reuse as the solution to the water management crisis in the Vendée territory). This element of the global context is directly related to the first component of social acceptability identified, and in particular to its factors 1, 2 and 3 (see below).

3.2 Contextual elements at the meso-social – local scale

Three key issues are relevant to the local scale and help understanding the social acceptability factors identified by underlining singular factors linked to specific aspect of Vendée and the history of water governance in this territory.

First, in terms of socio-political context, we have to take account of the Vendée territory own culture that has, in part, its origin in a historical detachment between The State (Suaud, 1997). This statement has been expressed during interviews, being translated for example by local representative by a strong wish to test its “own” water reuse pilot and to address health issues in a specific manner. It is necessary then to complement the investigation of technical and regulatory issues with investigation of the political dimensions of the pilot (including the mechanisms and processes put in place for proposing and developing a pilot project related to a public good (water) and its associated governance). Interviewed stakeholders, especially NGO and authorities, also discussed this issue, questioning the reasoning justifying the

¹ Two other recent examples in France that have received special attention in the media include de Sivens dam (Adour-Garonne river basin) and the aquatic park of Roybon (Rhône-Méditerranée & Corse river basin).

wastewater pilot. This is detailed in the first component of social acceptability related to the building of a “common story”, or when stakeholders question their implication into the project (an issue also linked to the fourth component of social acceptability, and in particular its factors 9 & 10 that relate to stakeholder mobilization).

Second, every innovative project is built within the specificities of the history of the territory where the project will be implemented. In the case of the Vendée territory, its salient historical features include the reliance on dams for storing surface water combined with a specific approach to socio-economic development that has its roots in the 1950s. More specifically, the social acceptability of the wastewater reuse pilot is influenced by the Auzance dam project that did not materialize. Supported by the department de Vendée and by Vendée Eau, this project was not authorized by the public authorities because it did not comply with the obligations and objectives of the European Water Framework Directive. Many stakeholders do briefly mention the Auzance dam issue, apart from environmental NGOs, and this failed project has influenced the relationships between the state/public authorities, stakeholders and the civil society/NGOs, and in turn the dynamics surrounding innovation in the field of water. Indeed, the wastewater reuse pilot was initiated following the decision of the public authorities not to authorize the dam on the basis of the existing environmental legislation. Accounting for historical developments, which have influenced the relationships between stakeholders as well as collective memories, is directly linked to the social acceptability component addressing the co-building of a collective story.

Thirdly, the phasing of the wastewater reuse pilot also has implications on social acceptability. This phasing, challenging from a methodological point of view (see above), influences the perceptions, representations and positions of the stakeholders interviewed. In particular, as the pilot is in its pre-feasibility phase and considered within a larger set of possible options aimed at securing drinking water supply, its (future) characteristics are only discussed informally with the majority of stakeholders. Stakeholders’ understanding and views are not based on a detailed and clear description of the project and of its implications: they are based on the general idea of testing wastewater reuse in Vendée, thus strongly influenced by issues of wastewater reuse in general (even if put in the local context of water management in Vendée). It is assumed that this situation influences the key factors of social acceptability, in particular in relation to uncertainty and the trust one might have with regards to this (innovative) technology.

In the perspective of the implementation of the wastewater reuse pilot, a more robust assessment of the context could have been performed. However, the six (macro and meso elements identified above are considered as key to the understanding of the social acceptability of the future wastewater reuse project.

4 The social acceptability factors identified in the Vendée greenfield

The social acceptability factors are presented in two steps, with a general presentation of the acceptability factors first, followed by a more detailed description of each factor taken individually.

4.1 General presentation of the social acceptability factors

Several points of attention need to be stressed for understanding the main social acceptability factors identified in our research in relation to the Vendée Greenfield.

- The factors presented for the Vendée context have been developed on the basis of the knowledge collected during the stakeholder interviews. Thus, these factors have been identified by stakeholders themselves. They have then been challenged and strengthened by the available literature on social acceptability and wastewater reuse and the deliverables of the Demoware project. The main purpose was to highlight, on the basis of local stakeholders' views, the conditions that would enhance the social acceptability of a possible wastewater reuse project in Vendée.
- The different factors identified are coherent with the theoretical work available in the literature (building on the review of literature carried out under WP5) and with the deliverables of the Demoware project.
- The 10 factors identified have been grouped into four more general components to facilitate the sharing of results and their understanding.

The four themes of social acceptability are presented below:

Theme 1: Co-building a common story and the issue of the consensus on water resource management in Vendée. This first theme investigates the social acceptability question from a “content” perspective, addressing the questions of the relevance and opportunity to develop the wastewater reuse project in Vendée. It builds on the diversity of stakeholders' views and positions that leads to lack of common understanding and a “dispersed story” (or *récit éclaté* in French). This theme addresses the social collective building of the problem and of its solutions, in the context of the structural and conjectural situation of water resources and of drinking water in the Vendée territory. This theme includes the social acceptability factors 1,2 and 3.

Theme 2: Building trust in the pilot project development process and the monitoring of the wastewater reuse project. This second theme, coherent with the dynamics of acceptability analysed in the literature (see Deliverable 5.2 of Demoware), addresses the issues linked to the process put in place for developing and then implementing a wastewater reuse pilot in Vendée. Trust relates to each individual step of the process (from the testing phase to the monitoring of projects in their full operation phase) and is linked in particular to the confidence one can have in the technologies applied and in the control of health impacts. *This theme includes the social acceptability factors 4, 5 and 6.*

Theme 3: Ensuring the quality of the information disseminated to stakeholders. Also clearly identified as an issue in the literature (see Deliverable 5.2 of DEMOWARE), this theme is often connected to the communication strategies put in place for disseminating information on wastewater reuse and on the pilot project. It focuses on the intrinsic qualities of the information disseminated, and not on the role of disseminators and on the biases brought by the media in disseminating this information – two issues investigated in the

field of communication, social psychology and sociology (Mucchielli, 2005). The fundamental qualities of information include the transparency in the process that has produced information, and the completeness of the information disseminated. *This theme includes the social acceptability factors 7 and 8.*

Theme 4: Mobilising stakeholders for developing and implementing the wastewater reuse project. This issue, strongly related to environmental issues and practices (Barbier, Larue 2011), is seen by the stakeholders interviewed as an essential theme of social acceptability. It addresses the level of mobilisation, as well as its spatial and temporal scales. The factors identified in this theme are thus related to the collective process that can be established to support the development and implementation of the wastewater reuse project. *This theme includes factors 9 and 10.*

Table 1 Presentation of the acceptability themes and factors identified in Vendée

Social acceptability axes	Social acceptability factors identified
Theme 1: Co-building a common story and the issue of the consensus on water resource management in Vendée	Factor n°1 : A shared diagnosis on water resource and water resource management at the scale of the Vendée territory
	Factor n°2 : Sharing of experiences of all actors in relation to crisis situations for drinking water supply
	Factor n°3 : A shared (public) general interest combining drinking water supply, health and environmental issues and objectives
Theme 2 : Building trust in the pilot project development process and the monitoring of the wastewater reuse project	Factor n°4 : A testing phase building on a demonstrator/pilot well monitored with sharing of results
	Factor n°5 : A trust by all actors in the technology and its capacity to comply with sanitary/health norms
	Factor n°6 : A process monitored and controlled by a neutral third-party (that could be the state/public authorities)
Theme 3 : Ensuring the quality of the information disseminated to stakeholders	Factor n°7 : Transparent information on the project and on sanitary/health norms
	Factor n°8 : Complete and robust information disseminated to stakeholders of the Vendée territory
Theme 4 : Mobilising stakeholders for developing and implementing the wastewater reuse project	Factor n°9 : Mobilising stakeholders at all levels upstream of the implementation of the wastewater reuse project in Vendée
	Factor n°10 : Establishing a stakeholder advisory (or steering) group for monitoring the wastewater reuse development process in Vendée

The different social acceptability factors identified and listed above will be presented in more details in the following sections. This presentation will be linear (one factor after the other) to facilitate their

understanding. However, as a result of the many interrelationships between individual factors, it is recognized that only a complex (Morin, 1990) and systemic (Von Bertalanfy 1968) approach could help develop an understanding of social acceptability in the collective vision of stakeholders (translated into attitude, be it positive or negative – see Giust-Desprairies, 2003) in the Vendée context. In particular:

- 1) It is difficult, in light of this complex and systemic perspective, to isolate one social acceptability factor as each factor needs to be systematically considered within the wider group of factors relevant to the Vendée territory. Although some of these factors can be (and are in practice) prioritized by stakeholders, they need to be considered as a whole and not as disconnected variables;
- 2) The relationships between individual factors are clearly not simple linear causal or influence relationships. And it is likely that many feedback loops exist between social acceptability factors. As illustration: the information transparency influences trust in the technology which in itself can impact on trust in the information provided;
- 3) The global dimension of social acceptability is present in each factor, coherently with the famous Pascal's sentence "le tout est dans la partie qui est dans le tout". This is coherent with the general principle relevant to trust that emerged from Deliverable 5.2 of the Demoware project. The different social acceptability factors could be included into trust. And it could be the same with others principles that are embedded into each other.

Two factors are not explicitly presented in the diagram above, although these are referred to in the literature (see deliverable 5.2 and 5.3 of Demoware) and during interviews.

- The first factor is the so-called "yuck factor". It is mentioned in interviews through representations of the "grey water" or of "unknown and touristic" populations whose water is released in the Jaunay reservoir. This is, however, not a major factor of social acceptability in the context of the Vendée territory for three principle reasons. Firstly, the survey focused on actors' perceptions and acceptability rather than on the wider public (as it is mostly the case in studies addressing the yuck factor). Secondly, the Vendée Greenfield experimentation is an indirect wastewater reuse experimentation that does not have the same reality for stakeholders. And, thirdly, this factor has not been classified as a priority in interviews.
- The second factor is the cost of the wastewater reuse experimentation or of any wastewater reuse project in Vendée. Cost is mentioned marginally during interviews, mostly in relation to the impact wastewater reuse might have on consumers' water tariffs. As water tariff issues were not part of the focus of the study, it was decided not to further investigate this factor, even if it is recognized that this factor may need further attention when the project moves ahead.

All the axes and factors identified were analyzed in a similar way:

- A global description of each theme of acceptability was developed, which helped put factors into their wider context, identifying in particular the main characteristics of the Vendée Greenfield territory that are relevant to the understanding of social acceptability in this greenfield ;
- A more specific description of each individual factor was analyzed in the context of Vendée.

4.2 Detailed presentation of social acceptability axes and factors

Theme 1 of social acceptability:
Co-building a common story or
the question of shared culture in the territory around the issue of water resources.

Global understanding:

« A common story » about drinking water resources needs to combine three key elements to structure the way water resources, their management and dynamics, are understood. This helps explain the way we mobilize ourselves around the “means to manage this resource”. These 3 elements are: (1) A common and shared diagnosis; (2) feedbacks on operational experiences in addressing water quantity crises; and (3) an agreement on the general interest motivating new water projects or solutions.

Social acceptability of a wastewater reuse project implementation cannot consider only technical aspects, uses, future impacts or administrative issues. This would correspond to an instrumental approach focused on “*methodological rationality*” (Paturet, 2002) rather than an approach looking at outcomes and the search of meaning for living together based on the general interest.

One of the factors of acceptability seems to rely on the definition of a common story (“*meta-narrative*”). It consists in the development of a well-structured storytelling that gives its legitimacy (Lyotard, 1988), linking in particular the wastewater reuse initiative to the global Vendée water crisis. This notion is close to the concept of “project”. Anthropological analysis shows the importance of a structure based on the outcomes expected collectively and presented as “common speeches” (Boutinet, 1990). The importance of this well-structured storytelling is higher in a context where a given project is mainly defined and presented on the basis of full rationality, a project that all stakeholders should accept easily. Since discoveries on physical sciences, complemented by follow-up studies in social sciences, it is known that all projects keep “interacting with those observing and stakeholders that are interested in it” (Paturet, 2002). All projects seem therefore to rely on a specific purpose that can be seen as «*a shared understanding in a specific moment in the present that always needs to be redefined, since the project can only find significance in its ability to contribute to a shared story* (Paturet 2002). All projects should be part of a collective production of “*operating speeches*” (Merleau Ponty, 1945), combining experiences lived into a collective story developed and imagined by local stakeholders.

The common story relies on the notion of “common” (public or general) interest (Lascoumes, Le Bourhis 1998). Stakeholders interviews in Vendée stressed that this “common story” on water resources in Vendée:

- Is still to be constructed, especially in relation to the potential role a wastewater reuse project could play in contributing to the delivery of drinking water.
- Could be developed based on three strong elements: a shared diagnosis on the current status of water resources in Vendée; shared information on the “main” stakeholders’ experiences in addressing water crisis in Vendée; and, the definition of the purpose of the project as being clearly in line with the general interest.

Factor n°1: A shared diagnosis around the water resources in the territory of Vendée

This shared diagnosis is seen as an essential factor of the social acceptability of wastewater reuse. Indeed, stakeholders' perceptions of water resources and more specifically on water resources used as Drinking Water for Human Consumption (DWHC) differs depending on the way actors perceive the state of the art of water resource management, and on the way evidence is structured and combined to justify the project. Globally linked to social acceptability of a wastewater reuse project to guarantee resource in DWHC, it is important to stress the consensus – and not unanimity – on water resource issues in Vendée. As mentioned by one stakeholder, *“it is a topic that gathers a lot of stakeholders [...] around a heritage that generates much work”*. The consensus focuses on general aspects of water resource management, described as *“fragile”* or *“vulnerable”* with links made in stakeholders' responses to the availability of DWHC. The consensus exists on the current pressure on water resources, and on the imbalance between availability and needs, in particular with regards to the summer consumption. Water is highlighted as *“fundamental for the economic development of the Vendée territory”*.

However, it is necessary to go further than only the global view and apparent consensus on water resources which focuses only on *“an obvious lack of water in Vendée”* and on *“problems related to consumption summer peaks”*. The shared culture around water resources needs to be strengthened in Vendée². In short, collective memory and transmission of experience is replaced by diffusion of technical and factual information as communication. Yet, as is often the case for studies on the integrated management of water, the integration of the historical and collective memory dimension with socio-technical dimensions is essential for constructing a shared culture (Onema, 2010).

Above the consensus itself, three aspects have a clear impact on the diversity of points of views stakeholders might have – three issues upon which work on social acceptability could be further developed in the future in the Vendée Greenfield case. The first difference of opinions between stakeholders relates to quantitative water management issues. The general consensus mentioned above can be considered as a basis for social acceptance. However, despite this consensus, and in accordance with the diversity of roles and functions of stakeholders interviewed, stakeholders' views on the quantitative management of water resources are highly diverse. Indeed, stakeholders provide different answers to the first series of questions related to the water management issues faced by the territory, in particular in relation to:

- The scale at which stakeholders operate: regional actors (regional and “department” scales) and local elected representatives have clearly different views. Regional actors analyse the quantitative issue in the wider context of the challenges and dynamics of water resources in Vendée, with a perception of geographic differences between water resources, provisioning and production (taking place mainly in the eastern continental part of the region) and summer consumers located along the coast. Local elected representatives mention only local aspects of water resource management and use in relation to DWHC, as one of them mentioned *“our issues are local. My job is to be sure that my citizens can have water without any doubt”*.

² Cultural aspects linked to water resource (defined as a shared basic resource at the scale of the territory) was discussed already during the first field visit undertaken by ACTeon with Vendée Eau (internal document, Mai 2015), mentioning contents of this “culture of water” and ways to transmit it.

- The level of knowledge that is very heterogeneous: stakeholders' responses differ in terms of the level of technical knowledge on issues related to water resources in general, even if all actors interviewed are involved in local water policies (in particular through the local water commission³ steering the water management planning process⁴). More precisely, technical actors involved closely in water management focus their attention on technical and balanced quantitative aspects, whereas actors having a wider perspective on water focus on the links between water quantities and water uses. Hence, there is a clear knowledge gap between stakeholders, as illustrated by differences in perception such as *"the quantitative management is complex in its global perspective"* on one side, and *"available water quantities are a quite simple issue to understand if you need to look at its uses"*, on the other side.

The second difference of opinion between stakeholders relates to water quality issues. Here, perception gaps relate to three main issues:

- Actors from the health sector, the environmental and consumer NGOs and actors geographically located close to the Jaunay reservoir stress that water quality is the first and essential issue for the Vendée territory. Stakeholders close to the wastewater reuse pilot project do not mention water quality as an issue, or as a secondary issue. Among economic actors, industrial representatives perceive the issue of water quality as important even if *"not much perceived by firms since it has no impact on their own activities"* whereas the representative of the agriculture sector who was interviewed did not make reference to it.
- The issue of water quality linked to issues of DWHC covers different perspectives. The NGO sector stresses that the challenge of water quality in relation to DWHC is a priority one. Other actors (except the Water Agency of Loire-Bretagne) do not make an explicit reference to a direct link. Despite the reference to integrated water management, water quantity and water quality issues are mentioned separately in stakeholders' responses, even if these two aspects are intrinsically linked as mentioned by an actor: *"both issues are linked: not taking care of water quality implies no resource, even if we manage to treat a lot of things, but still..."*.
- Finally, discussions on water quality do not relate this issue to the potential wastewater reuse project (that aims at spreading treated effluent to land). However, the state of the Jaunay reservoir seems already critical, in particular in regards to eutrophication.

The third difference of opinion between stakeholders relates to the level of information that is made accessible and known regarding the issue of water availability for drinking water production. This imbalance between drinking water between needs and water resources is unanimously associated by actors to the hydro-geomorphologic structure of the Vendée territory. The territory depends almost exclusively on surface water resources, resources that are described by Vendée Eau as *"sparsely productive"*⁵. Actors with technical expertise, as well as actors "close" to questions of drinking water provision, mention tourism development and its links to water abstraction as the main (seasonal) water management issue, withdrawals for irrigation being mentioned more marginally.

³ Commission Locale de l'Eau (or CLE)

⁴ Schéma d'Aménagement et de Gestion de l'Eau (or SAGE)

⁵ Internal Vendée Eau document presenting the REUSE project, 2016

We are here talking about the notion of “point of view”, that is, simultaneously knowledge, information level, but also the perspective from which things are observed, in connection with social representations.

Factor n°2: Sharing of experiences of all actors in relation to crisis situations for drinking water supply

Looking for alternative solutions for addressing drinking water supply crises – severely low level of discharge, as known in 1989, 1995, 2003, 2005 and 2011- is a major argument used for justifying the wastewater reuse project in Vendée⁶. Even if there is a consensus on the existence of these crises among actors with a common history from 1976 onwards, the way people experienced these crises has not been explicitly and widely shared among stakeholders, except for a technical group of actors linked with a crisis emergency committee launched in 2003 by the willingness of state authority.

Yet, the crisis experience appears to be very sensitive to those who experienced it: for the water manager (*“believe me, when every morning, all the day and night long, you wonder how, collectively, you will manage to provide people with tap water”*), for the health authorities: (*“I experienced crises several times and this was always challenging”*), as well as for all interviewed actors (e.g. *“I lived crises, it trained me, I even almost died because I could not practice my job anymore, which almost pushed me to do stupid things”*).

The analysis of stakeholders’ responses highlighted once more the importance of different points of view with regards to the crisis experiences, influenced in particular by:

- The responsibility of the manager and of public authorities (mainly local ones) in relation to the delivery of drinking water supply to all subscribers and uses ranked as priority uses, combined with the issue of the “social image” as stressed by one local representative;
- The health impacts linked to priority water use, human consumption and social inequalities and health, but also the performance of the networks following a temporary stop in network use/delivery of the service;
- The relative importance of (daily) drinking water use, and its potential socio-economic impact for connected economic activities.

It is important to stress that (drinking water delivery) crises are not to be taken in isolation. As highlighted by a representative from the health sector, *“in period of tensions all conflicts of uses emerge again”*. Thus, the drinking water crises revealed additional disagreements among actors with regards to global resource management, the crises affecting a group of actors much wider than the sole technical managers. Overall, crises could be seen as the basis for looking for solutions, while working on the building of a shared culture on water. Finally, it is interesting to stress the high level of trust of interviewed actors regarding crisis management, connected directly to the recognition of the efficiency and responsiveness of Vendée Eau.

Sharing stakeholders’ views on how they lived water crises, in relation to their responsibility, water use and social roles, appears to be a critical factor of the social acceptability of a wastewater a reuse project in Vendée that aims at structurally reducing water crises.

⁶ See Deliverable 6.1 of DEMOWARE and Vendée Eau internal document, dated August 2016

Factor n°3: A shared (public) general interest combining drinking water supply, health and environmental issues and objectives

Interviews highlighted the different dimensions of the water resource status in Vendée, namely drinking water supply, health and environmental issues. A local representative stressed that « *while general interest can have economic and financial dimensions, it needs to rely on the development of the territory as a whole* ». An adequate balance between these three dimensions is potentially an important factor enhancing social acceptability, with the economic dimension being transversal across all three dimensions.

Literature on wastewater reuse social acceptability and, more specifically, Deliverable 6.2 of the DEMOWARE project, show how important health issues are for defining a wastewater reuse project. Interviews with actors, as well as the Vendée Eau internal document presenting the wastewater reuse scheme, stress the importance of securing the delivery of drinking water. Interviews, however, with environmental and consumers' associations in particular, highlighted the importance of the environmental dimensions of the project. Differences in the importance given to individual dimensions by stakeholders need to be accounted for in the construction of a shared story and water culture for the territory. More specifically:

- Justifications in favour of the wastewater reuse project are mainly – but not only – technical (internal document Vendée Eau, August 2016) because of the challenges and technical complexity to adjust the technical system to legal requirements (Deliverable 6.2 DEMOWARE);
- Issues stressed in interviews are mainly related to pressures on water resources;
- Environmental issues, exclusively mentioned by environmental stakeholders, are focused on water quality and more particularly of the quality of the Bultière and Jaunay reservoirs.

Therefore, stakeholders' responses to interviews stress the frictions between three dimensions: provisioning (ensure the delivery of water to all drinking water consumers), health (ensure health risk related to the wastewater reuse scheme is well managed) and environmental (ensure the quality of water ecosystems and habitats and the integration of water quality degradation).

The balance (to be collectively developed) among these three dimensions, that will shape the shared general interest, appears to be a strong factor of social acceptability in relation to the wastewater reuse pilot of Vendée. This factor might gain in importance because of the absence of a managed process that aims at developing a shared common interest, the absence of this process being a source of mistrust and potential conflict.

**Theme 2 of social acceptability: Building trust in the pilot project development process
and the monitoring of the wastewater reuse project**

General understanding:

The social acceptability of a wastewater reuse project depends heavily on the trust actors might have regarding the ways the project is implemented, the technologies used for complementary water treatments, and the mechanisms put in place to monitor the project once it is operating. These three dimensions are seen as central to stakeholders' trust towards the wastewater reuse pilot in Vendée.

As described in Deliverable 5.2 of the DEMOWARE project, and further investigated in the available literature, trust is an essential factor of social acceptability, in particular when the issues at stake are closely linked to the sanitary quality of water and health (Deliverable 5.2 DEMOWARE).

In many situations, the absence of definition of what trust is an issue in itself: undefined trust appears then as an « empty concept » that is never defined properly as “what it is” but always as “what makes trust possible or not”. Furthermore, the notion of trust is then always connected to its opposite, i.e. mistrust. Yet, to understand stakeholders' views on wastewater in Vendée, it is necessary to provide some (rather open) definition of the concept. Based on the social science literature, trust is referred to as (Gagné, 2011):

- A relation, and not as a permanent state, that is multidimensional and not stable but continuously discussed on the basis of a system of proof;
- Organisational issues (Thudoroz et al. 1999), even if, generally and more specifically in the Vendée context, interpersonal relations can have a major role in trust relations between actors;
- A wide range of variables impacting trust identified in the social psychology literature that can be grouped into 4 categories (Gagné 2011):

Table 2 The different dimensions of trust (Gagné 2011)

Attitude	Open-mindedness; justice ; availability; honesty; kindness; equity; skills; perceived expertise
Relation	Communication, transparency
Organisation	Norms, values, technical capacity, credibility, legitimacy
Strategic	Respect of commitment ; coherence between speech and actions

In addition, according to Gagné, Trust can be understood in relation to: a feeling of safety; faith in benevolence; and the acceptance of the risk dependence which is produced in a trust relationship.

These three points above supporting trust are seen as particularly relevant to the definition of trust linked with the development of the wastewater reuse pilot in Vendée, combining technical innovation, strong health issues, institutional and organizational relationships amplified by current regulatory gaps, and water quality issues.

In line with the evidence presented in the contextual assessment, the importance of the concept of trust and its origins in an advanced modern society (Luhmann, 2006) is specifically linked to the importance of uncertainty, and of the notion of risk and its management, two issues particularly present in today's public policy. Safety is then a dimension that has a particular importance in the context of the Vendée wastewater reuse pilot.

Finally, and specifically in relation to wastewater reuse, trust is linked to (see DEMOWARE Deliverable 5.2):

- Trust in the wastewater treatment procedures;
- Trust in the final product, i.e. treated effluent. In the Vendée case, the final product itself can have a double meaning: the treated water that will be discharged to the Jaunay site, or the drinking water that will be produced.

In light of the interviews, three key factors of acceptability have been identified in relation to trust, these being further described and discussed below.

Factor n°4: A testing phase building on a demonstrator/pilot well monitored with sharing of results

Health issues are critical in the implementation of a water reuse project. And all stakeholders recognize the importance of these health issues, with a consensus about the level of confidence in the pilot project. As stressed by the literature, the introduction of a pilot or the implementation of an experimental phase providing opportunities for feedback and experiential learning is a factor that positively impacts trust in the effective consideration of health issues (Deliverable 5.2 DEMOWARE).

The regional and departmental health authorities, and the Loire-Bretagne water agency, are the only stakeholders who clearly referred to the establishment of an experimental phase and pilot as key to acceptability (or to feasibility). Other interviewed stakeholders did not position themselves clearly on this issue (except for two water stakeholders who referred to some of the technical tests made for the Herbiers and Bultière sectors that were perceived already as components of an experimental phase).

Building on the interviews, several points can be raised regarding the links between the implementation of a pilot phase and acceptability:

- The implementation of a pilot is linked to the precautionary principle and to the importance of "having health guarantees regarding the water quality in the wastewater treatment plant effluent as well as in the discharge upstream of the Jaunay reservoir." The precautionary principle, as expressed in the French context (cf. the contextual assessment), is related in the Vendée case to:
 - The specific knowledge on, and full control of, the health risk – as mentioned by some stakeholders, or an overall monitoring and control "*to be with an acceptable risk*" – as mentioned by other stakeholders. These different views are linked to a desire for total security control on one side, and a desire to measure risk in a way that is acceptable to the health authorities, on the other side. This illustrates how the precautionary principle and the concept of health risk are perceived and lived today, between desire for control and risk management procedures (Peretti-Watel, 2003);
 - The control of the risk associated with the technical process in place and not limited to "the final product". The control of the process itself is inspired by industrial risk-management models, identifying for each technology critical points and formal protocols, owned and tested by employees in charge of risk management;

- The adequacy between available and sustainable human resources to implement and monitor risk management devices *"in a global context of decreasing human resources to monitor in favour of technology"*, an issue that was particularly stressed by stakeholders of the health sector.

The acceptability of the water reuse project *vis-à-vis* the health authorities will therefore be at the intersection of risk assessment models and industrial risk management processes, developed in connection with not only the financial, but above all the human resources deployed in risk and hazard management devices.

- This pilot project should be based on a technical and collective monitoring associating *"all the political and technical stakeholders"* with *"the same data to all at the same time"* for monitoring and for learning/developing feedbacks. In this context, the clarification of roles and competencies is seen as essential, in particular *"between the State, the operator, the département de Vendée and the DDTM"*.
- The decision to launch the pilot *"must not pre-empt the final decision to expand the device"*. It should fully play its role as a test and (potential) validation of what a wastewater reuse model could be in the context of Vendée.

This soundness of developing a pilot and learning from its application is also mentioned by the Loire-Bretagne water agency which refers to the model of industrial technology development where validation of all the processes and of results is a key step before any decision to produce and distribute a product.

In this context, trust is therefore built around the sense of safety that the pilot would raise in relation to risk management and compliance with current health standards. It will also build on the processes put in place for developing the pilot (even though the components of the pilot and the framework for its assessment are still to be built collectively) and on its organizational and strategic components.

Factor n°5: A trust by all actors in the technology and its capacity to comply with sanitary/health norms

Trust towards the technology associated with the implementation of wastewater reuse calls among the interviewed stakeholders for factors intimately linked to: social representations (norms, values, attitudes and beliefs) linked to the overall context of the water reuse project; perceptions on the singular context of the DWHC management in Vendée; and representations and knowledge associated with health risks related to water. This explains how this reliance on technologies, their implementation and monitoring in their ability to ensure health standards can appear contradictory in a climate of doubt and uncertainty. For example of some contradiction, some stakeholders can be receptive and optimistic to the reuse technologic option and success, but still with worries about health. Taking into account in this project a large scale of social representations (on water, on singular context in Vendée, on health risk) implies to observe some contradictions. These cannot be reduced as irrationality.

At this stage Two elements can be highlighted:

- There is an overall consensus among interviewed stakeholders regarding the possibility of establishing a wastewater reuse system ensuring health standards through additional processing technologies of the outputs of the wastewater treatment plant. However, an elected representative noted that *"a dirty water is still a dirty water"*, highlighting a real and persistent anthropological

factor in stakeholder discourses, regardless of the dynamics of confidence and rationalisation towards technologies (Bachelard, 1942; Deliverable 5.2 DEMOWARE). That confidence is reinforced by two points:

- 1) The sense of skill: *"we have enough experience now in water treatment, compared to everything that is pesticides, etc. So it should not be a problem, since it is things that already exist, you can rely on the experiences of other countries that have already made this kind of equipment"*
 - 2) Confidence in the project leader, Vendée Eau, and, more generally, in cautious and protective regulations: *"I trust them. We are in France. I went to foreign countries, including China, where I would not say the same, but in France I have no fear"*. Thus the frequency of controls, the transparency of processes and compliance with technical procedures are mentioned.
- The organisational trust is reinforced by the feeling that indirect wastewater reuse is already taking place in Vendée without leading to health issues as a result of the routines already in place, making the issue of risk taking more relative: *"we already do it taking water from the wastewater treatment plant and discharging it back into the natural environment, it's just that we don't even think about it anymore"*. This response of a local elected representative is taken many times as an argument in favour of the wastewater reuse experimental project in Vendée: *"We already do it every day. All treatment plants that are currently in the countryside flow into small streams that do not have water in summer. So most of the summer water flow is already treated wastewater "*.

Both elements relate to making the risk perception more relative. Provided, and despite the granted confidence, many questions remain among stakeholders concerning:

- The technological capacities to consider *"micro pollutants"*, *" hormone residues"* or *" endocrine disrupters"*. These questions, widely shared by interviewed stakeholders, are related to the scientific and technological capacity to investigate these substances that can impair human health. The discourse here is not built around the singular case of the Vendée, linked for example with the demographic development of Vendée or with a clear analysis of data on these substances. It is rather a perception of risk implicit in the social representations of stakeholders. This doubt about the technical capacity to monitor and treat these pollutants overlaps with the anthropological factors mentioned above;
- The ability to develop the technologies for complementary treatments in wastewater treatment plant discharges depending on the evolution of the risk characterization over time, with for example the scientific progress or the norms evolution. This concerns the adaptability of the proposed wastewater reuse system regards to the quality standard;
- The temporal dimension of risk perception and its consequences over time: the confidence in the technology differs from the risk taken over a medium term time scale, as illustrated by the responses from an economic development stakeholder: *"I'm not sure [...] that scientific studies prove there is no impact, and we will not end up with more cases of cancer after 15 years"*. As highlighted also by an elected representative, *"There is the problem today of contaminated blood, or of asbestos, where science has its current capabilities and limitations in its investigation: is scientific research today extensive and reliable enough to say that it will not have an impact on our children?"*

We perceive here the limit of the trust model towards technology offset both by the issue of uncertainty and potential consequences of an imposed (rather than chosen) risk taking.

We clearly understand at this point of the study the paradoxical, and seemingly irrational based on the crossing of individual and collective social representations logics, which involves all of the known biases (Abric, 2005), between:

- On one side: global confidence in technology, supported by confidence in the leader of the project as well as in risk relativization strategies;
- On the other side: questions related to uncertainties and potential (imposed) risk-taking, as well as information on health scandals and trials in France, linked to both query mechanisms and a general system of distrust expressed on a number of industrial projects (Gendron, 2014).

It means that trust in technology is particularly sensible to technologic evolution, and media exposition of health problem related to innovation.

Finally, based on analysed interviews that it must be emphasized that trust, mainly organizational given to technologies, is stronger if the technology is inserted into a system of indirect wastewater reuse, with re-infiltration of water discharged into the natural environment. This known system, pre-existing and giving to nature a key role in the control of water quality, seems to enhance the confidence of stakeholders in the Vendée case study.

Factor n°6: A process monitored and controlled by a neutral third-party (that could be the state/public authorities)

This social acceptability factor of the water reuse experimental project in Vendée is built in the context of:

- Confidence in the experimentation leader, namely Vendée Eau;
- The existing paradox, stressed in interviews and outlined above, between a health safety requirement that have to be assumed by state and a clear distrust *vis-à-vis* the State and the application of the precautionary principle as a prescribed form, experienced very negatively (even more so after the repeal in 2014 of the Ministerial Decree of 2010 – see deliverable 6.2 DEMOWARE);
- The central role of health authorities in the administrative implementation processes of wastewater reuse, clearly identified by local stakeholders.

Despite the negative experience of what is considered as "*administrative constraints to no end and that prevent innovation*" as referred to by this elected representative and water stakeholder, health authorities are positioned in the heart of the wastewater reuse system by all stakeholders. Even if regulatory modalities of action brought by the State are understood as "*everyone gets out his umbrella and protects his back*" according to an elected representative's shared opinion, the fact remains that state control is transversely mentioned by all stakeholders as a key component of safety and trust.

In light of the socio-historical culture of Vendée (Suaud, 1997), the role of the State as responsible for the process and results of wastewater reuse, is paradoxically positioned primarily on the authorizations to experiment, on project monitoring and on water quality information in the output of the wastewater treatment plant and from the pipe upstream of the Jaunay reservoir.

Shared and ambivalent, the involvement of State services as "*neutral third parties*" as expressed by a water stakeholder, is logically more emphasised by health authorities and by NGOs associative stakeholders than by stakeholders close to the wastewater reuse pilot.

Theme 3 of social acceptability: Ensuring the quality of the information disseminated to stakeholders
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General explanation

The information provided to stakeholders appears as a factor of social acceptability of a wastewater reuse project. This factor includes two sub-elements, namely the transparency (traceability) of information and the reliability of this information

Information is at the heart of social acceptability questions on wastewater reuse in relation to: (1) social representations of stakeholders and populations in the territory linked to the wastewater reuse project; and, (2) the project governance and management concepts (Boutinet, 1990) and, by extension, the fundamental question of environmental democracy (Barbier, 2011).

Social acceptability can sometimes be seen in its functionalist and normative dimensions (Beaudry, Fortin, Fournis, 2014). Indeed, it can be understood essentially as a communication and conviction strategy of the citizen or "unenlightened" and "irrational" stakeholder in order to seek adhesion to the project, increasing the level of acceptance by all the stakeholders concerned (Deliverable 5.2, DEMOWARE). In this perspective, information is a tool in the instrumental and technocratic management of our societies (Deneault, 2013).

However, a careful assessment of the role of information in social acceptability processes is essential, in that it can be an important lever and is transversal to all acceptability factors identified and discussed in this paper. When addressing information issues, four points can be highlighted to enhance the understanding of stakeholders' positions linked with the generic title of "quality of information to stakeholders":

- The distinction between "information", understood as the content of the message, and "communication" that is the strategy by which messages are disseminated. Work on the quality of information cannot be reduced to work on the presentation of the information and its dissemination to "target audiences";
- Literature shows how much the information received by all stakeholders is diverse and contradictory, and with various biases (knowledge network, paper media, digital media, images, etc.). It also stresses how much information is interpreted in relation to social representations (Muchielli, 2009), and the difficulty to document links between the level of information and behaviours (Schultz, 2002);
- Following the same logic, communication and information sciences data show the complex links between senders and receivers of information (Mattelart, 2004);
- Classic information models (characterised in particular with a sender and a receiver), in particular related to uncertainty contexts and the concept of risk, can be ambivalent and fail in addressing the demand for certainty (Joffe, Orfali, 2005). Innovative approaches to the demand for information are required in risk-related communication strategies.

The two social acceptability factors identified in interviews must be understood in light of the elements above. Overall, all the stakeholders interviewed on this project emphasised the importance of information as an essential factor of social acceptability. As mentioned by a stakeholder close to the wastewater reuse

pilot, "*Social acceptability is basically an information problem for me*". Beyond the causal link between information and social acceptability, it is important to address separately the issue of the informational content and the issue of information reliability.

Factor n° 7: Transparent information on the project and on sanitary/health norms

This factor is very sensitive in the case of the Vendée context, as evidenced by the repeated caution from the wastewater reuse project leader throughout the DEMOWARE process to avoid: (1) a too broad dissemination of information on a project still at its developmental stage; and, (2) any manipulation of information disseminated. The controversies around "major projects", the so-called "*failure*" of the proposed Auzance dam, and the potential mobilisation of environmental sector and consumer NGOs are very important contextual elements that need to be accounted for in the Vendée pilot project. In light of the tension between the progress of the project and an operational research project to be held on the same site, it remains a strong testimony of the importance of the issue of information and dissemination for this wastewater reuse experiment in the Vendée area.

The demand from interviewed stakeholders for information transparency related to the wastewater reuse pilot concerns the following:

- The justification for the wastewater reuse project (cf. theme 1 on acceptability and factors 1, 2 and 3) and the reasons that led to the identification of wastewater reuse as THE option rather than other solutions that had been proposed in the solution toolbox. Desalination and the Clouzeaux careers are two alternatives that are particularly referred to;
- The identified technical solutions, including the choice of the wastewater treatment plant: "*it would be quite normal that we are informed on why we seek the Sands, and what criteria have prevailed in selecting this option*", stresses a water stakeholder involved in the SAGE encompassing the Jaunay reservoir territory;
- The quality of the water in both wastewater treatment plant discharge and at the re-infiltration upstream of the Jaunay reservoir. This information is seen as complementary to the information published by the ARS on the quality of the drinking water distributed.

Furthermore, the demand for information refers to three different time periods:

- Prior to the start of the project and in the early stages of the project development, elected representatives want to play the role of information relay to their territory stakeholders and population. As underlined by an elected representative, "*there is a prior work, before starting anything, of awareness raising, explaining to the population why this project, why we do it. If you bring people with a fait accompli, that will not do. And allow time to accept, one, two, three years. This is a natural process*".
- Once the experimentation and the pilot project are set up, a regular dissemination of information focused on the process and on water quality;
- "*Clear and transparent*" information in the words of health authorities if crisis situations arise.

It is possible to combine the qualities of the information identified by the stakeholders as a social acceptability factor, with four basic characteristics of information and communication being identified:

- Transparency in the sense that *"we do not try to hide things [...] In fact, the main difficulty when implementing a major project is to ensure information flows (...) otherwise, there are necessarily blockages"*;
- Coherence, especially between the project leader and the health authorities. This coherence is at the heart of the information issue, as is the health component of the wastewater reuse project: *"The communication of the ARS on the subject should not go against the Vendée Eau communication. This does not require a single harmonized communication, but an institutional communication does not short-circuit Vendée Eau. There is a point of vigilance to have here"*. If this quality is mentioned in strategic and political terms, it is also a key and legitimate factor in contributing to territorial cohesion;
- Information must be weighed, i.e. to *"allow people to form an opinion"*. Beyond its sole content, information needs to be considered in the context of the pilot project to be meaningful. Therefore, informing is not about providing quantitative data or factual information, but putting these data into their context so as to give it some meaning;
- "At the right time": in the light of the specificities of the Vendée pilot project, information provided should be in line with the scheduling of the project, provided, as recalled by the project leader, that *"saying everything, all the time, to everyone has never been our policy"*. The information content is to develop in relation to the project's progress.

Finally, different publics that could be targeted by information and communication were identified:

- General water stakeholders, through for example communication at the CLE;
- Elected representatives, that are relays to local populations and stakeholders;
- The general public.

Addressing this diversity of publics in information and communication efforts, regardless of the variety of communication means that could be mobilized, is also part of the "transparent information" acceptability factor.

Factor n° 8: Complete and robust information disseminated to stakeholders of the Vendée territory

Linked to the previous factor, the reliability of information as a factor of acceptability is understood here as "the accuracy" of the information provided to the stakeholders of the Vendée territory.

In relation to the controversies on "large projects" and the general information overload our societies are facing, in particular linked to the influence of social networks and media, the reliability can be structured along four issues:

- The reliability attached to the actor or person providing the information, which is linked to the credibility of the project manager Vendée Eau in the eyes of stakeholders;
- The reliance on "convincing" and "indisputable data" related in particular to sanitary concerns, concerns over water quality, as well as the overall environmental impacts on the status of the Jaunay reservoir;
- The transparency with regards to information sources;

- The overall transparency already discussed above, which is understood here as the completeness of the information provided, *“in a way that there is neither a doubt left, nor a dark or grey area where people can imagine things”*.

It is worth mentioning that reliability is at the centre of the challenges of trust-mistrust on this Vendée wastewater reuse project, in particular between the health authorities under the jurisdiction of the state, the local elected representatives which are relays to the population, and environmental and consumer protection organizations.

Moreover, the interviews have shown the importance, in the collective mentalities, of the Auzance dam project case. This project is considered today as *“a blind point”*, in particular in relation to the justification explaining its refusal by the state authorities (*préfecture*) on the basis of lack of compliance with the EU WFD. The lack of information and sound arguments brought forward by the stakeholders of the former Auzance project reinforces the importance of the reliability of information as a factor of acceptability for the wastewater reuse project in Vendée.

**Theme 4 of social acceptability: Mobilising stakeholders for developing
and implementing the wastewater reuse project**

General explanation:

The participation of the stakeholders within the wastewater reuse pilot project can be understood under two aspects, which are: (1) the involvement of the stakeholders prior to the implementation of the project (experimentation and finalised project); and also (2) the involvement of a diverse and large group of stakeholders in the monitoring of the implementation process and of the performance of wastewater reuse.

Participation which is envisaged here – based on the focus of the study – is mainly seen under the angle of the involvement of stakeholders, i.e. those which have interests, elected representatives and technical experts, but not for all citizens concerned. This perspective influences the elements which are presented below in particular in terms of the two acceptability factors relating to participation that are identified.

The Deliverables 5.2 and 5.3 of the DEMOWARE project emphasize the importance of participation and of stakeholder involvement, as key factors of the social acceptability of wastewater reuse projects. Indeed, participation is mentioned as: (1) a mechanism for strengthening the effectiveness, efficiency and the coherence of the governance of the projects; (2) a process that proposes spaces and times of confrontation of opinions and viewpoints that aim at building something “common”; and (3) a mechanism for ensuring the representativeness of all stakeholders involved (OECD, 2015).

If participation has become an “old song” of public action as well as of territorial projects (Donzelot, Epstein 2006), there are three main justifications for participation (see R. Barbier, C. Larue, 2011, following the works of D. Fiorino):

- Instrumental: It is an operational justification linked to strengthening the effectiveness and the efficiency of projects through the involvement of stakeholders, in particular by strengthening trust among stakeholders. This issue is further analysed in the DEMOWARE Deliverables 5.2 and 5.3.;
- Substantial: Participation strengthens the quality of the process, and thus of the project, by aggregating a diversity of knowledge and expertise;
- Normative: participation is coherent with the notion and principles of environmental democracy.

In addition, social sciences have been particularly interested in participatory mechanisms within the same operational system (Crozier, 1977) or linked to the socio-technical systems (Calon, Latour 2006). Here literature stresses the importance of considering the diversity of viewpoints when identifying problems and in proposing collective ways to resolve them. This is essential for innovative projects to be successful. Finally, the work of Arnstein (Arnstein, 1968), and of H. Touzard (cited *in* Barbier, Larue, 2011), invite to clarify in an operational manner the levels of participation and involvement of the stakeholders, going from information only to participation in decision making. It is through the prisms offered by these different levels, in close relation to the operational dimensions of innovative projects, that the factors of acceptability should be examined.

Furthermore, this theme of social acceptability invites thinking about the aims of participation, its procedural aspects as well as its practical outcomes (Barbier, Larue, 2011). It is within this framework that the statements of stakeholders concerned by this issue have been analysed, in relation to the specificities of the wastewater reuse experimentation project in the Vendée.

Finally, it is important to keep in mind that measures that aim at involvement and participation, which are far from being *ad hoc* tools, fall within the culture of the territory and the type of project considered. It is necessary to position the debate on participation regarding the wastewater reuse pilot in Vendée to the participation and deliberative culture of the territory which has not been emphasised by stakeholders during interviews. This participation culture of the Vendée territory has to be seen in relation to the more global context of the territory (see part 2 of the report) as well as with the national context, stressing complex links between participative democracy – governance of proximity – and collective mobilization (Garon, Cantelli and Schiffrino 2013). The limited feedbacks and lessons from participatory experiences at local level must be noted here, as well as the lack of analyses on the reality of participation in local governance mechanisms such as the local water commissions or *CLE* (Barbier, Larue, 2011).

With this background, two factors have been distinguished in the framework of stakeholder participation and involvement, addressing participation at different spatial and time scales during the elaboration or implementation phase of the project:

- The involvement of stakeholders prior to the project development, and the level of participation effectively put in place;
- The establishment of a collaborative monitoring group for the wastewater reuse pilot project and process in Vendée.

Factor n°9: Mobilising stakeholders at all levels upstream of the implementation of the wastewater reuse project in Vendée

According to the analysis of interviews, the social acceptability of a potential wastewater reuse project in Vendée is based on the involvement of stakeholders at different levels, with the need to specify both the purposes of this involvement as well as the procedures put in place to ensure involvement.

From a general point of view, participation has been mentioned by all stakeholders interviewed, mainly from the angle of its purposes: “*to be informed*”, “*to be involved*”, “*to be kept up to date*”, “*to be in the loop*”, “*to be associated*”, “*to be consulted*” or “*to construct a consensus and to share the decision*” are statements made by the persons interviewed, stressing the strong demand from stakeholders in this social acceptability factor.

Furthermore, although the focus of these statements is on stakeholder mobilization, many stakeholders also refer to the potential participation of the “general public” and of “citizens”, but with the same ambivalence that the one already described above regarding information (see factors 6, 7 and 8). The purpose of this targeted participation is then only envisaged under the angle of information sharing.

Two points should be highlighted:

- The diversity of designations of the public: “users” on the one hand - making reference to the link with the provider of drinking water; “general public”, which makes reference to the whole population and which is often used to differentiate from the expertise of the professionals; and “citizen”, meaning the status of individuals in their relationship with the rights and duties in a common living environment;
- The ambivalence of participatory strategies, from a large participation ensuring information is widely shared about the project, to a restricted participation involving elected people and technical professionals connected to the project.

In a synthetic manner and linked to the elements of the literature presented in the general explanation of this acceptability theme, this demand for involvement can be sketched at different levels in reference to the statements made by interviewed stakeholders:

Sherry Arstein ladder of participation (1969)	Aggregate level of Participation	Relation between Vendée Eau and citizens and stakeholder
Citizen control	Active involvement	
Delegated power		Relevant stakeholder in Vendée
Partnership Placation		Health and Environmental authorities
Consultation	Consultation	Water stakeholders close to the reservoir Jaunay
Information	Information supply	Other stakeholders and population
Therapy Manipulation		

Table 3 Level of stakeholders' implication: From Arstein scale to Vendée

Furthermore, the demand for involvement, as formulated by stakeholders interviewed, is:

- Above all instrumental, focused on strengthening the effectiveness of the project and the trust among stakeholders;
- Marginally substantial, stressing the benefits of aggregating different viewpoints and know-how for the collective construction of a project. This demand for involvement is mainly formulated by stakeholders coming from community NGOs from the environmental or consumer protection fields, as well as from local elected persons, highlighting *“the expertise of the sector of voluntary associations which have a lot to bring to these projects, even if you do not agree with them”*.

Finally, if the involvement of stakeholders at different levels before the project seems to be a social acceptability factor for a future wastewater reuse project, the procedural aspects, as well as the concrete outcomes of participation, are actually not addressed by the interviews. Indeed, only four types of outcomes are mentioned:

- A communication strategy which aims at informing the stakeholders;
- The establishment of a steering committee, whose membership, role, governance and decision making process are not further specified, partly because the pilot project is currently under development. Exchanges today remain mainly *“informal”* or *“ad-hoc”*, as mentioned by some stakeholders;
- The establishment of links with the existing governance mechanisms, such as the local water commission (CLE) of the SAGE Jaunay and Vie, or all CLE of the SAGEs of the Vendée territory.

- “Regular follow-up information” about the advancement of the project is mentioned by most of the persons surveyed, without being more precise.

Factor n° 10: Establishing a stakeholder advisory (or steering) group for monitoring the wastewater reuse development process in Vendée

This social acceptability factor is based on the following issues:

- The interviews carried out with local stakeholders, in particular on the subject of participation as developed under the acceptability Factor n°9;
- The major health challenges identified within task 6.2 (DEMOWARE Deliverable 6.2) and which have been confirmed by ANSES in January (ANSES, 2016);
- The positioning of the project as part of a demonstration phase;
- Literature around the opportunity given by demonstration for the involvement of stakeholders (Gibson and Apostolidis, 2001), more specifically around the importance of stakeholder systems in innovation projects that allow for a dynamic collective elaboration and translation (Akrich, Calon, Latour, 1988).

An acceptability factor which brings together all the knowledge about these four points is the establishment of a Stakeholder Advisory Group for wastewater reuse testing in the Vendée territory. Members of such a Stakeholder Advisory Group could come from a large panel of stakeholders representing a diversity of viewpoints, combining experiential, technical, political, financial and scientific expertise. As a key economic stakeholder mentioned, “*all point of view could be gathered in a formal group, which could follow the implementation.*” It would play a different role than a more formal steering committee. The role of this group would be to produce a consensus on wastewater reuse in Vendée wider than the one established on basis of the dual relationship between Vendée Eau and the health authorities. “*For the moment, the discussions are done with discretion. and mostly in a face to face between Vendée eau and Health authorities. But why not having a group that could be a place of debate, exchange and dispute?*” say a consumer representative. In extension, this group could, similar to what is done around the socio-technical systems put in place in the long run (Chatzis, 1993), could have the ambition to: (1) construct collectively a consensus about the diagnosis (see factors 1, 2, 3); (2) strengthen the mutual trust among the diversity of stakeholders involved, complementing the trust on the technical project itself (see factors 4, 5, 6); (3) construct and elaborate the dynamics of information-communication (see factors 7, 8); and (4) address the challenges of participation (see factor 9). It would strengthen the substantial dimension of participation.

In terms of social acceptability, two questions would need to be clarified ahead of the creation of the Stakeholder Advisory Group: first, the link between this group and other governance (formal) mechanisms already in place, including in relation to the current contractual delegation of power towards Vendée Eau, as underlined by a local representative: “*if a group exist to follow this innovation, that imply to clarified the linked with Vendée Eau. Who will lead?*”; second, the legitimacy and the credibility of the facilitation of this group, which would be best performed by an “external third party” combining the scientific expertise with

expertise in the facilitation of stakeholder processes. This space, mechanisms and outcomes of this Stakeholder Advisory Group would enhance social acceptability of the wastewater reuse experimentation project in Vendée.

5 Recommendations

The recommendations presented here are based on the contextual elements presented in Chapter 2 of the report, as well as on the social acceptability factors of wastewater reuse identified for the wastewater reuse pilot project Vendée and presented in Chapter 3. For a better comprehension of recommendations, they are presented into two levels:

- A first global level linked to the development of a global strategy to enhance the social acceptability of wastewater reuse of the Vendée Greenfield;
- A second operational level addressing more specifically the different social acceptability factors identified and discussed in this report.

5.1 Global level of recommendations

At this global level, four strategic themes of recommendations for enhancing social acceptability of wastewater reuse of the Vendée greenfield are proposed and described below.

- 1) **Theme 1 – Refining (widening) the arguments and justification of the wastewater reuse pilot**, combining bilateral contacts with the health/sanitary and environmental authorities with a collaborative work with other stakeholders. This list of arguments and the justification could be based on: general concerns about water resource in Vendée; social concerns about the different factors linked to social acceptability; technical concerns in relation to wastewater reuse systems; procedural concerns linked to the monitoring of the pilot project and experimentation process, as well as to decision making and information disseminated to stakeholders.
- 2) **Theme 2 - Establishing a Stakeholder Advisory Group for monitoring the experimentation project.** This group could be formed with « core » stakeholders close to the decision concerning the wastewater reuse project or geographically close to the parts of the territory most likely affected by the pilot project (the wastewater treatment plant Sables d’Olonnes and the reservoir of Jaunay), complemented by stakeholders representing environmental and consumer associations [factor n°10]. The first task of this advisory group would be to discuss and consolidate the list of arguments justifying the wastewater reuse pilot project and system. This advisory group should in particular clarify: its mandate; its functioning and principles guiding exchanges between members – including the process for internal discussions and decisions; and its work programme.
- 3) **Theme 3 - understanding of the pilot project** based on a common interest collectively developed (on the basis of the work of the Stakeholder Advisory Group) and shared. The objectives of this workshop could include: (1) to share the work, outcome and feedbacks of the DEMOWARE project; and, (2) to work collectively and in small groups on the social acceptability factors identified in the DEMOWARE project, and on solutions for enhancing social acceptability for the Vendée Greenfield project.
- 4) **Theme 4 – developing an operational strategy for enhancing social acceptability of wastewater reuse in Vendée territory**, taking into consideration of all the social acceptability factors identified building on the outcome of the Stakeholder Advisory Group and of the workshops proposed above. This

strategy could include: objectives targeting each of the factors identified; practical tools and actions proposed for addressing each individual factor; and an operational work plan with clear deadlines for all proposed tools and actions. In its implementation, this strategy could build on, and mobilise, all existing governance mechanisms established in the territory in particular the existing local water commissions (CLE) of the Vendée SAGE. Links to other planning processes not dedicated to water management, such as land use planning (SCoT) or urban planning (PLU/PLUi) could also be proposed for implementing this strategy.

5.2 Operational recommendations

Recommendations presented in this section are operational addressing each social acceptability factor identified and described above, without any priority made between the recommendations identified.

Table 4 Presentation of the acceptability axes and factors identified in the greenfield of Vendée

Social acceptability factor	Proposed recommendations
Factor n°1 : A shared diagnosis on water resource and water resource management at the scale of the Vendée territory	Share the elements of the diagnosis during a collaborative workshop with all local stakeholders. This workshop could be an important step in building an argumentary for REUSE implementation
Factor n°2 : Sharing of experiences of all actors in relation to crisis situations for drinking water supply	Organize dedicated working sessions/meetings with core stakeholders – or with the Stakeholder Advisory Group if established – for sharing experiences on crisis situations, providing knowledge for benchmarking of experiences faced by different stakeholders, and feedbacks on crisis management in relation to drinking water supply in the Vendée. These working meetings could build on decision support and crisis management tools and issues, such as causality trees, protocols for crisis management, mental maps on stakeholder perceptions, etc.
Factor n°3 : A shared (public) general interest combining drinking water supply, health and environmental issues and objectives	Discussing and establishing the content of the “shared (and balanced) general interest”, for example during the collaborative workshop with all local stakeholders
Factor n°4 : A testing phase building on a demonstrator/pilot well monitored with sharing of results	Developing a pilot phase widely supported by the Stakeholder Advisory Group. Establishing regular, structured and transparent feedback (including written notes summarizing feedbacks). In parallel, working with the Stakeholder Advisory Group on decision criteria to be used to assess the feasibility of the pilot for a routine phase, and to take a decision on the follow-up to the pilot project (note: the definition of these criteria is required prior the launching of the pilot phase).
Factor n°5 : A trust by all actors in the technology and its capacity to comply with sanitary/health norms	Successive working meetings with: (a) the sanitary/health authorities; (b) the Stakeholder Advisory Group; then (c) all (local) stakeholders during collaborative workshops – for discussing the criteria of trust and transparency linked to the sanitary norms taking into account risk and uncertainty in the short to medium terms. At the same time, favouring exchanges with, and

Social acceptability factor	Proposed recommendations
	between stakeholders, about the issue of trust and sanitary challenges so their views can be mobilised.
Factor n°6 : A process monitored and controlled by a neutral third-party (that could be the state/public authorities)	Working with sanitary/health authorities on the establishment of a specific and strategic communication targeting stakeholders and focused on the controls of the sanitary components of the wastewater reuse. This communication could be developed in cooperation between the health authority and Vendée Eau.
Factor n°7 : Transparent information on the project and on sanitary/health norms	From the start of the experimentation phase, establishing a specific communication towards wastewater reuse stakeholders, with a sound pedagogy on the development of the information released. This communication effort could also address the questions of uncertainty and the governance/process put in place for the experimentation.
Factor n°8 : Complete and robust information disseminated to stakeholders of the Vendée territory	Detailing in all communication supports the source of information, their level of certainty, the justification of the information presented, and the objective of the communication support.
Factor n°9 : Mobilising stakeholders at all levels upstream of the implementation of the wastewater reuse project in Vendée	Within the strategy to strengthen social acceptability, developing an approach building on different levels of involvement combined with different levels of political and technical communication. Furthermore, building on the existing (water and territorial) governance mechanisms to favour exchanges on all aspects of wastewater reuse.
Factor n°10 : Establishing a stakeholder advisory (or steering) group for monitoring the wastewater reuse development process in Vendée	Establishing a Stakeholder Advisory Group gathering all stakeholders from the start of the experimentation, with a clear mandate for advice and/or opinion to the formal steering committee of the project.

6 Conclusions

Still in the state of pre-development, the pilot project that aims at supporting indirect wastewater reuse in Vendée falls within complex social and political dynamics going beyond the technical, economic and regulatory dimensions. This complexity supports the strategic importance of investigation on social acceptability, on factors which support or and constrain social acceptability, and on options that would enhance social acceptability of the pilot project.

The project's acceptability is influenced by the credibility and the legitimacy of the pilot project manager who is fully recognised by all stakeholders. It is influenced by the demand by the same stakeholders to be involved in the wastewater reuse experimentation process, as well as by the global trust concerning the technological effectiveness of the complementary treatments linked to the sanitary challenges.

In addition to the regulatory constraints detailed in Deliverable 6.2, the identified acceptability factors represent essential working areas for the effective implementation and acceptance of the pilot project building on a wider consensus. Of particular importance are: the role given to the collective construction and development of the pilot project, and of the wider wastewater reuse experimentation in Vendée; the co-development and sharing of the general interest character of the pilot project, and of wastewater reuse in general ; the need to strengthen trust despite risks, taking into account the relation to the sanitary and health uncertainty in the future; and, the establishment of collective governance processes to accompany wastewater reuse experimentation.

The study performed has addressed social acceptability issues linked to the current situation (with the pilot project still in its development phase). Social acceptability, however, is a dynamic issue in particular in the context of processes that have a strong innovative character (our case). Thus, efforts will be required to continuously understand social acceptability, and to propose solutions for new social acceptability factors that might have emerged during the experimentation process. As the global context of the social relationship with innovation, risk and uncertainty evolves, it will be important to confront us to the collective dynamics and to possible paradigm shift in set collaborative processes (Latour, 2005).

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Annex I: Semi structured interview guide

Semi-structured interviews guide – DEMOWARE

The French territory is participating to an experiment on REUSE through Vendée Eau.

This experimental project is supported by the European research project DEMOWARE, which objective is to observe, understand what allows or constraints the implementation of REUSE in Europe (technical, economic and legislation dimensions).

The research & consultancy company ACTeon is involved in the economic and social sections of DEMOWARE. This interview with you is part of the social section of the project. We are interested in knowing your opinion and perception of REUSE.

Our study investigates social acceptability of REUSE in Vendée. We conduct interviews of numerous stakeholders on the territory of Vendée.

The interview will be conducted in a semi-structured way, which means that I will introduce some themes to you – themes that we will discuss together.

The objective of the interview is to hear your perception on the context of water resource in Vendée, on REUSE in general and finally on potential REUSE in Vendée.

The interview will last an hour thirty. I will direct the discussion when necessary to make sure we discuss the different themes.

Your point of view will be analysed in an anonymous way. Do you mind if I record the interview for helping us to work on the interview? All numeric memory will be deleted after this work.

Knowledge and perceptions on the water situation in Vendée

○ (Perceptions of events of water scarcity)

➔ How do you perceive the situation of the water resource in Vendée?

- Characterization (adjectives): type of issues, level of severity ;
- How do you explain it? (perceived-known-analysed causes of these events)
- Why? how did you get to know this event? (knowledge channel: personal-expertise-peers-medias, personal-professional experience these past years. Closeness levels with these events)

○ (Level of trust towards the management of these events and more globally towards water providers)

➔ Have you lived events of lack of water?

- Have you been informed of these events, by who? (perception of the communication on these events of lack of water)
- Was this information sufficient and satisfactory to you? For what reasons? (level of trust towards this communication (completely trustworthy/ trustworthy/ Not trustworthy at all) explanations)
- Have these events been managed efficiently according to you? (perceived efficiency in the managements of these events)
- Globally, did you feel confident in the management of these events? (no, not at all/ Yes partly/yes/ Yes totally)

○ (Global perception of the quality of drinking water in Vendée)

- **→ How do you perceive globally the water quality in Vendée?**
 - General appreciation of water quality in Vendée (drinking- water reservoir)
 - Why? Could you explain your point of view? (unpleasant or worrying sanitary experience of water uses ; personal sanitary experience linked to water)

Knowledge and perception of REUSE

○ Global perception of REUSE

- According to you, what is REUSE? To what 5 words would you link it? Which ones are for you positive, which ones are negative?**
- According to you, is it possible to reuse treated wastewater coming out of treatment plants?**
 - How feasible is it? under what conditions? (perception of technical, political, etc. feasibility)
 - Level of trust in the technical/political feasibility (tool scale of Lickert)
- According to you, for what would REUSE be useful?**
 - Could give examples of possible use for REUSE? What would be for you the most appropriated use? (Prioritise the uses) Why ? (relaunch: give examples of uses)
 - What do you mean by “appropriate”?
 - In what context would it be relevant to use it according to you?

REUSE experiment in Vendée and acceptability criteria

An experimental REUSE project is under reflexion in Vendée.

The experiment would consist in reusing part of the water rejected by the treatment plant of the municipality of the Sables d’Olonnes to transfer it, after complementary treatments through a pipe upstream of the reservoir of Jaunay.

○ Knowledge of this experimentation

- Do you know this project?**
 - Have you heard of it? From who? (Level of information regarding this experiment)
 - What do you think? What arguments can you think of? (Global appreciation linked to this experiment)
 - How did you get to this point of view? (knowledge channel about this experiment)
 - Do you think that this experiment is feasible? (Perceived feasibility of this experiment)

○ Global acceptability of this REUSE experiment in Vendée)

- **→ What could make this experiment acceptable to you?**
 - What would make this experiment acceptable according to you? Do you think this your point of view only or is shared by other people? (Acceptability criteria perceived personally and by others)

- What would be according to you the main conditions for the experiment to be acceptable? Can you prioritise these conditions (Criteria prioritisation)
 - How do you perceive the question of social acceptability in the French context today? (links Innovation-precaution/prevention-acceptability process)
 - What would make this experiment unacceptable or unfeasible according to you? (Identification of criteria of unacceptability and unfeasibility)
- ➔ **More specifically, what would give you trust in the realization of this experiment?**
- Criteria for trusting the experiment
 - Priorisation of trust criteria
 - Attitudes towards operators linked to this experiment
 - Expectations towards operators to trust the experiment?

What is your current professional situation? (job)

What is your education background?

(gender)

Could you tell how old you are? (age)