H2020-MSCA-ITN-2018

ReTraCE

Realising the **Tra**nsition to the **C**ircular **E**conomy:
Models, Methods and Applications

D3.1

A framework for Engaging Stakeholders
in the Transition towards a Circular Economy

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Innovative Training Networks (H2020-MSCA-ITN-2018) scheme, grant agreement number 814247 (ReTraCE).

Project Information

Acronym: **ReTraCE**

Title: Realising the Transition towards the Circular Economy: Models, Methods and Applications

Coordinator: The University of Sheffield

Reference: 814247

Program: H2020-MSCA-ITN-2018

Start: 1st November 2018

Duration: 48 months

Website: www.retrace-itn.eu

Consortium:

The University of Sheffield (USFD)
Università degli Studi di Napoli Parthenope
University of Kassel (UniKassel)
South East European Research Centre (SEERC)
Academy of Business in Society (ABIS)
Högskolan Dalarna (HDA)
University of Kent (UniKent)
Tata Steel UK Limited (Tata)
Olympia Electronics SA (OE)
Erasmus University Rotterdam (EUR)

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Deliverable

Number: **D3.1**

Title: A framework for Engaging Stakeholders in the Transition towards a Circular Economy

Lead beneficiaries: ABIS, USFD

Work package: WP3

Dissemination level: Public (PU)

Nature: Report

Due date: 31.01.2020

Submission date: 30.01.2020

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Recommended citation:

Acquaye, A., Bozhinovska, E., Genovese, A., Malek, W., Pansera, M., Pinyol, J., Ramezankhani, M.J. A framework for Engaging Stakeholders in the Transition towards a Circular Economy. Report D3.1 for the ReTraCE project.

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Executive summary

In the last decade, 'Circular Economy' (CE) has surged as a prominent concept in the political and corporate discourse around the world. The notion, which, thanks to its immediacy, can be easily communicated and employed to coin slogans and mottos, is the most probable candidate to replace the outdated 'sustainable development' imaginary.

Although presented in a neutral, apolitical fashion, the CE agenda represents a highly contested political project. As such, in order to conduct research in this field, which can address timely challenges, the existence of alternative and competing CE narratives that are produced by the multitude of stakeholders involved in the CE arena in different sectors (academia, industry, NGOs, policy-makers), must be assessed.

To address this gap, this report provides a guide to explore and to acknowledge this plurality of stakeholder views and paradigms, which exist in the field. The engagement of such stakeholders, endowed with different interests and positions when it comes to CE implementation, represents a fundamental step for unveiling the tensions and barriers which might inhibit the transition towards a CE.

In the present deliverable, we briefly outline a rationale to include stakeholder/public engagement in research on CE, a field that is totally neglected by the extant literature on the topic. Then we present a few examples of engagement techniques that constitute a general framework that could be potentially adopted by scholars conducting research in the field.

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Acronyms

CE Circular economy

GM Genetic Modification

NCCPE National Coordinating Centre for Public Engagement

RI Responsible Innovation

RRI Responsible Research and Innovation

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1 Introduction

In the last decade, 'Circular Economy' (CE) has surged as a prominent concept in the political and corporate discourse around the world. The notion, which, thanks to its immediacy, can be easily communicated and employed to coin slogans and mottos, is the most probable candidate to replace the outdated 'sustainable development' imaginary that dominated the post-Brundtland era. Although its origin can be located in a specific academic tradition (i.e. the one linked to the Industrial Ecology field of study), CE has become an 'umbrella term' - i.e. an empty *buzzword* that can shelter different meanings (Rip & Voß, 2013) - whose flexibility and haziness is a potential battle ground for competing ideological agendas (Homrich et al., 2018; Korhonen et al., 2018). In the views of its promoters, CE represents a new paradigm that will push the frontiers of environmental sustainability by transforming the relationships between ecological systems and economic activities (Ghisellini et al. , 2016). The transition to a CE is supposed to happen through a shift in the design of socio-economic systems from a linear model based on the traditional *'take, make, use',* and an inevitable delay in *disposal'* model to a self-sustaining one which fosters zero landfill direction, and the notion of viewing waste as biological and technical resources in manufacturing and re-manufacturing (Genovese et al., 2017). CE proponents are not just concerned with the reduction of the use of the environment as a sink for residuals or with the delay of cradle-to-grave material flows (as a simplistic view of sustainable supply chain management strategies may suggest), but rather with a thorough rethinking of production methods, which also involves a reduction of resource use and the implementation of advanced planning approaches (Genovese et al., 2017). For their capacity to mobilise different and complementary imaginaries (i.e. the technical, the environmental and the commercial/economic), CE principles represent the new political frontier to the achievement of environmental sustainability (Winans et al., 2017).

As postulated by Korhonen et al. (2018a, 2018b), although presented in a neutral, apolitical fashion, the CE agenda represents a highly contested political project. As such, in order to conduct research in this field which can address timely challenges, the existence of alternative and competing CE narratives, which are produced by the multitude of stakeholders which is involved in the CE arena in different sectors (academia, industry, NGOs, policy-makers) must be assessed.

To address this gap, this report provides a guide to explore and to acknowledge the plurality of stakeholder views and paradigms, which exist in the field. The engagement of such stakeholders, endowed with different interests and positions when it comes to CE implementation, represents a fundamental step for unveiling the tensions and barriers which might inhibit the transition towards a Circular Economy. Stakeholder and public engagment have been proved to be useful in different fields[1] in order to:

- Augment 'expert knowledge' (e.g., from scientists and engineers) by opening the door to a plurality of epistemological approaches. This implies acknowledging that knowledge is not

[1] For more info see also: https://www.publicengagement.ac.uk/about-engagement/why-does-public-engagement-matter. Accessed January 2020

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only produced by scientists and experts but also by communities, private sector workers, social workers and even indigenous communities, just to mention a few examples.
- Increase the acceptability of specific technological solutions in society, also by creating mechanisms of co-production of knowledge and co-creation of technology among different actors.
- Strengthen civil society around common objectives, through participatory and democratic exercises.
- Re-politicise spaces of decision-making that had fallen under technocratic mechanisms, which alienate the public participation to the decisions about the governance of science and technology.

Furthermore, given the always uncertain implications of any type of technological transition (including the transition towards the CE), multiple stakeholder engagement is crucial to deliberate about what kind of world and society we want CE to bring us. In principle, an environmentally sustainable society might be potentially achieved under a variety of different socio-economic systems, from an eco-fascist oligarchy to a centrally planned socialist economy (Gorz, 1980). The negotiation process among different competing narratives that stakeholder mechanisms provide can help to achieve a more desirable output for all.

In the present deliverable, we briefly outline the case for including stakeholder/public engagement exercises in research on CE. It is important to remark that the need for similar exercises is totally neglected by the current literature on the topic (e.g. a Google Scholar search on public/stakeholder engagement for Circular Economy returns no results). Then, we present a few examples of engagement techniques that constitute a general framework, which could be potentially adopted by researchers in the field (including the ReTraCE community).

2 Stakeholder and Public Engagement: Rationale and Principles

"*Public engagement describes the myriad of ways in which the activity and benefits of higher education and research can be shared with the public. Engagement is by definition a two-way process, involving interaction and listening, with the goal of generating mutual benefit.*" (NCCPE)[2]

2.1 Framing engagement: Stakeholder Engagement vs Public Engagement

'Stakeholder Engagement' and 'Public Engagement' generally refer to a set of methods and techniques to involve people who might be affected by the decisions made by a public or private organisation. The principles underpinning these methods - those of inclusion and cooperation - are essentially very similar, but the origin of these two concepts is different. Stakeholder engagement originates within the 'organisation studies' field and is a key part of corporate social

[2] National Coordinating Centre for Public Engagement in the UK. More info at: https://www.publicengagement.ac.uk/about-engagement/what-public-engagement - Accessed January 2020

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responsibility (CSR) literature. This strand of literature analyses how a (generally for-profit) organisation can achieve social acceptance and legitimacy through engagement with influential stakeholders such as clients, governments or powerful NGOs, including trade unions (Noland & Phillips, 2010). The underlying idea is that, through engagement, organisations can achieve not only a return on investment, but also social and environmental benefits (the so-called triple bottom line). In this view, stakeholder engagement tends to focus on influential stakeholders, which are those actors, often organisation, that can influence a specific decision with their relative power.

The notion of public engagement [3] originates in the sphere of public interventions (e.g., development projects, but also public research and science projects). Public engagement initiatives aim at supporting and stimulating a scientifically literate society able to actively participate in and support democratic processes, and development of science and technology. This includes research and innovation policy agendas, in particular the nature of societal challenges. An emphasis on co-creation, mutual understanding and iterative, inclusive and participatory 'multi-actor dialogues'.

Public involvement implies a paradigm change from a top-down approach to the governance of technology to a more participatory approach that not only include researchers and practitioners, but also the wider public. It provides every actor involved in the process the chance to learn from one another (Keown et al., 2008). More specifically, public involvement improves research as non-academic actors are able to bring their feedback to the research process, ensure the utility of results for managers in industry, build trust among stakeholders, build acceptance of scientific results by both internal and external audiences, enhance public involvement, public understanding and scientific literacy (Powell & Vagias, 2010). Public engagement also helps to harness traditional knowledge, create epistemological plurality, identify relevant issues that are important for other stakeholders (such as democracy or social justice) (de Sousa Santos, 2015), and re-evaluate the impact of certain measures (Hughes, 1998).

In sum, stakeholder and public engagement literature have different origins but share fundamental principles. For the sake of simplicity, in the rest of this report we will use both notions with the idea in mind that "public engagement" incorporates "stakeholders' engagement"; as such, it provides a more general and participatory approach.

2.2 The importance of engagement and inclusion

Technological innovations have the capacity to generate societal disruption that sparks societal debates, conflicts, and public reactions among stakeholders, although public engagement has varied during history (Macnaghten & Chilvers, 2014; Owen et al. , 2012; Sutcliffe, 2011; Sykes & Macnaghten, 2013; Von Schomberg, 2013). This is also the case of the transition towards a Circular

[3] Public Engagement is often used in combination with (or replaced by) 'Community Engagement'. In this case, it refers to engagement initiates that address very specific and localised projects e.g. the construction project, the implementation of a nuclear plan etc.

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Economy, as this could represent a major revision of the current economic paradigm (MacArthur, 2013), and it is expected to provoke deep changes in the society as a whole.

Sykes & Macnaghten (2013) identify four main drivers that push for greater public engagement in the case of technological innovation. These drivers are:

- The emergence of a new political paradigm of public protests about certain technological projects, especially visible in the case of the anti-nuclear or environmental movements from the 1960s;
- The increasing demand by governmental agencies to have a solid knowledge of the impacts of new developments;
- A growing demand for citizen participation;
- The demands from the scientific community to improve scientific literacy among the general public to avoid tensions and conflicts stemming from public misunderstandings (Sutcliffe, 2011; Sykes & Macnaghten, 2013; Von Schomberg, 2013).

Engagement with the public presents many interesting benefits but also important challenges. Technological agendas (including CE) are often promoted by powerful industrial actors. Creating spaces of debate in which all the different voices, sometime with divergent or even incompatible points of view, can have the same legitimacy is often extremely difficult. More powerful stakeholders tend to dominate the debate and impose their interests. Achieving a 'two-way' process is often extremely challenging. Furthermore, engagement exercises may not always produce desirable outputs. In other words, engaging the public in the governance of technology does not guarantee an ethical and responsible result by itself. Moreover, many public institutions and private companies, although recognise the importance of stakeholder engagement, struggle to create an organisational and/or institutional culture that promotes and takes advantage of the benefits of participation for their institutions. The result is a *tokenistic* use of the engagement discourse that does not produce any relevant effect in the way decisions are made in organisations[4]. To be more explicit, stakeholders' engagement exercises often become a box-ticking activity in which *cherry picking* of stakeholders or the creation of "ad-hoc" stakeholders' groups are frequent (Larner & Mason, 2014). Finally, scientists and private companies are not always prone to engage with the public. Many times, these groups are sceptical and even hostile to engage with non-experts.

2.3 From Engagement to Responsible Research and Innovation

Because of these societal pressures, the governance of science has evolved over the last few decades to accommodate public concerns on the disruptive power of innovation in science and technology. Public values are increasingly incorporated into ethical and social considerations, and forms of anticipatory reflection and reflectivity are adopted through a new research attitude called

[4] For more info about the barriers to public engagement, see also the national reports of the RRI-practices H2020 funded project available at: https://www.rri-practice.eu/ - Accessed January 2020

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Responsible Research and Innovation (Macnaghten & Chilvers, 2014). Responsible Research and Innovation brings inclusivity into the innovation process by:

- Conducting a holistic and transdisciplinary reflection on the potential effects, risks, and consequences of certain technological developments (Stilgoe et al., 2013a; Sutcliffe, 2011; Von Schomberg, 2013);
- Opening up the debate on technologic or scientific development, its values and aims (Stilgoe et al., 2013a);
- Creating public scrutiny on how institutions and technologies are developed and implemented (Macnaghten & Chilvers, 2014; Sutcliffe, 2011).

Responsible Research and Innovation is thus, not a mere inclusion of non-academic stakeholders in the research process, but a whole new scientific governance paradigm, in which a broader ethical reflection is introduced in the scientific and innovation process by creating and integrating new spaces of public dialogue into the research process (Irwin, 2006; Macnaghten & Chilvers, 2014). Stilgoe et al., (2013a) propose a framework to operationalise Responsible Research and Innovation based on four categories: (1) anticipation, (2) reflexivity, (3) inclusion and (4) responsiveness.

These four categories are defined as follows:

- **Anticipation** is the attempt to improve foresight in issues of science and innovation. This process faces a tension between prediction, which aims to foresee previously unexplored impacts, applications and issues in the future, and participation, which seeks to discuss them from various angles (Stilgoe et al. 2013a).
- **Reflexivity** is described by Stilgoe et al., (2013a) as the capacity of *being self-aware of the limits of knowledge and being mindful that a particular framing of an issue may not be universally held*". This category involves scientists, research funders, regulators and the other institutions in the process of integrating moral responsibilities in the research process (Stilgoe et al., 2013a).
- **Inclusion** is defined by Stilgoe et al. (2013a) as the requisite to move beyond engagement with stakeholders to include members of the wider public. The public dialogue is expected to open up a discussion of what are the social, political and ethical implications that science and innovation projects would likely involve (Stilgoe et al., 2013b).
- Finally, Stilgoe et al. (2013a) propose **responsiveness**, or the "capacity to change shape or direction the research process in response to stakeholder and public values and changing circumstances". Under this category, the innovation process has to be flexible to respond to new epistemic approaches and accordingly adjust its course of research.

These four categories are designed in order to address the main issues that emerge in public debates on scientific and technological innovation. Based on these four categories, Stilgoe et al. (2013a) propose a list of engagement techniques, classified according to the category that they address (Table 1).

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2.4 Engagement and Inclusion Principles

Effective engagement with stakeholders is required to prevent negative repercussions of science and technology controversies. Sykes & Macnaghten (2013) highlight the example of Luddites in 1811-1816 who opposed new technology in the Industrial Revolution as they feared their jobs would be cut and that money and power would be consolidated by the already wealthy and already powerful, creating an even wider division in class. No engagement with the public led to the British government sending troops to protect technology from the Luddites. 17 Luddites were subsequently hung by military troops.

Conversely, the US government attempted to engage the public on the topic of Genetic Modification (GM) in 2002-2003 through open meetings at several venues, but many members of the public felt that key decisions around GM had already been made. Consequently, the open meetings were used as an opportunity for passionate people on both sides of the dispute to argue violently with each other. This bad example of public engagement led to negative media attention and a loss of good will, as elaborated further by Sykes & Macnaghten (2013). Clearly, no engagement or bad public engagement can be disastrous for projects and highlights its importance for ensuring a fair and just CE transition.

A defined set of principles to engage stakeholders is necessary to articulate how researchers and other stakeholders will engage in a way that is perceived as legitimate and fair for all parties involved. To define these principles, we took inspiration from the procedural fairness framework of Worsley (2017) in the context of participatory and collaborative governance. Stakeholders need to perceive the process where they are engaged as legitimate, fair, open, inclusive, and accountable, in order to accept the final decision or outcomes (Newig et al., 2018; Webler & Tuler, 2000). Engagement principles clarify the values and behaviours that any CE project should adopt. They outline how stakeholders should be engaged to ensure that engagement occurs effectively. Worsley (2017) outlines 6 key principles for stakeholder engagement, which are summarised in Table 2.

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Table 1 - Four Dimensions of responsible innovation. Source: Stilgoe et al., (2013a)

Dimension	Indicative techniques and approaches	Description
Anticipation	Foresight	Foresight methodologies are aimed at analysing the outcomes of the present actions which may form different futures and select the desirable future and facilitate its realisation (Grupp & Linstone, 1999). It will systematically look into the desirable future and identify what kind of strategic research will lead to the greatest economic and social benefits (Martin, 2010).
	Technology assessment	Technology assessment comprises a set of systematic methods used to scientifically anticipate and ameliorate the negative impacts of human intervention in research-based technologies which interact with social and environmental systems (Grunwald, 2009; Guston & Sarewitz, 2002). It is a tool for assessing and rating the new technology from its very first introduction to the time when it is accepted for application (Banta, 2009). It aims to assess the consequences of the application of new and emerging science and technology in advance and provide a platform to develop a technology which is most beneficial for its stakeholders (Swierstra et al., 2009).
	Horizon scanning	Horizon scanning is a systematic method to detect early signs of potentially important developments of novel and unexpected issues, as well as persistent problems or trends, by examining threats and opportunities (Könnölä et al., 2012). Its main goal is to analyse weak and usually conflicting signals of novel issues and determine emerging issues which are associated with highly uncertain fallouts (Sutherland et al., 2008). It is considered as a solution to being insufficiently prepared in the face of new issues and also helps strategy and policy makers to implement timely policy development (Sutherland & Woodroof, 2009).
	Scenarios	Scenarios are aimed at analysing the outcome of different one time-tested foresight methodology often filled with uncertainties to dissect explicit and implicit consequences to enable public and private organisations and groups gear up for the future more readily and intelligently (Selin, 2011).
	Vision assessment	Vision assessment intends to analyse the legitimacy and feasibility of the mental image of an attainable future shared by a collection of actors and the actions that are required to pave the way to make it happen (Uhl, 2012).

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	Socio-literary techniques	Socio-literary techniques offer a unique approach to deal with the long-term technology innovation. It is inspired by science fiction and could offer a helping hand in managing the new and emerging technologies to democratise thinking about the future (Miller & Bennett, 2008).
Reflexivity	Multidisciplinary collaboration and training	The multidisciplinary collaboration and training intend to combine disciplinary depth with the ability to share expertise. Experts from different backgrounds come together in an interactive way and engage with each other deeply to learn about the disciplines to contribute jointly and develop a new technological system and open up the laboratory to social deliberations and concerns (Gorman, 2002).
	Embedded social scientists and ethicists in laboratories	Embedding social scientists and ethicists in laboratories should result in forcing the designers/engineers in the labs to make ethical decisions and value trade-offs by explaining morally relevant features of research. For this, social scientists and ethicists must gain a working knowledge of the research in the technical environment (van Wynsberghe & Robbins, 2014).
	Ethical technology assessment	Ethical technology assessment serves as a tool to determine negative effects of new technologies at an early stage. It should be undertaken in dialogue with technology developers and have the form of a continuous dialogue rather than a single evaluation at a specific point in time (Palm & Hansson, 2006).
	Codes of conduct	Code of conduct is a set of rules that manifest ethics in people attitudes and behaviours. It has to be put together to bring broader ethical reflection to the scientific and innovation process and open up science and innovation (Stirling, 2007).
	Moratoriums	A moratorium is a precautionary action to delay or suspension of an activity. It is used to suspend of an activity to allow a legal, moral or technical challenge to be carried out (Rogers, 1975).
Inclusion	Consensus conferences	Consensus conferences involve a small group of non-scientific people who go through a learning process on a given technological issue, engage experts, and develop an assessment of the key issues they identify as critical with the intention to make the process more democratic (Einsiedel & Eastlick, 2000).
	Citizens' juries and panels	Citizens' juries and panels enables the non-professional public to discuss, evaluate, criticise and implement the upstream in the scientific and technology development (Chilvers et al., 2010).
	Focus groups	Small numbers of stakeholders engaged in a discussion focused around a particular topic or set of issues (Wilkinson & Silverman, 2004).

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	Science shops	Locations open to the general public to seek answers to scientific and technical questions, and for scientists and engineers to translate their knowledge, training, and skills to topics of social concern (Dickson, 1984).
	Deliberative mapping	Symmetrical process to engage together "specialists" and "citizens", within a consistent framing, mutual inter-linkages, and substantial opportunities for face-to-face discussion (Burgess et al., 2007).
	Deliberative polling	Expositions of random samples to balanced information, where stakeholders are encouraged to weigh opposing arguments in discussions with heterogeneous interlocutors, and then to harvest the more considered opinions (Fishkin & Luskin, 2005).
	Lay membership of expert bodies	Inclusion of outside stakeholders within expert advisory committees from outside formally recognised areas of expertise (Jones et al. , 2008).
	User-centred design	Design approach that aims to create elements that are applicable, appropriate, and accessible to as many users as possible (Wilkinson & De Angeli, 2014).
	Open innovation	Research paradigm that opens the innovation process outside of the traditional innovation experts by placing outside-made ideas at the same importance that inside-made ideas (Chesbrough et al., 2006).
Responsiveness	Niche management	Strategy to direct the evolution of research and develop them by following the preferences and desires of certain stakeholders (Schot & Geels, 2008).
	Value-sensitive design	Acknowledgement and monitoring of the possible unforeseen biases of the research (Friedman, 1996).
	Moratoriums	Partial temporal ban of a research or project to prevent potential negative externalities (Gibbs et al., 2015).
	Stage-gates	A set of periodic meetings to review a specific idea, project or innovation, in which those are being evaluated during its design process (Cooper et al., 2002).
	Alternative intellectual property regimes	A review on the intellectual rights of property regimes to redefine the freedom of design, and the access to new standards or outcomes of research and innovation (Drahos, 2005).

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Table 2 - Six principles of stakeholder engagement. Source: Worsley (2017).

Principle	Description
1	Stakeholders should have a say in decisions that affect them.
2	Stakeholder participation includes the promise that their contributions will influence decisions.
3	Stakeholder engagement seeks out those potentially affected by, or interested in, a decision.
4	Stakeholder engagement seeks input on how they may wish to participate.
5	Stakeholder engagement provides information, time, and space to allow stakeholders to participate in a meaningful way.
6	No matter how much one may disagree with another, politeness and respect must always be shown for others' position.

The first and third principles outline the need to consider opinions from a wide variety of stakeholders – not just those included within the CE projects, but also external stakeholders affected by the project, and stakeholders who are interested, but not affected by, the project. The second principle highlights the importance of maintaining flexibility and changing the direction of the project, if stakeholder feedback urges it.

The fourth principle continues the theme of flexibility but extends this to consider the different ways each stakeholder may wish to contribute to CE projects. Meanwhile, the fifth principle encourages sufficient resources to be allocated to stakeholder engagement such that it allows stakeholders to participate fully. The final principle highlights the importance of managing conflicts and maintaining a respectful environment, even in cases of fundamental disagreement.

3 The role of stakeholders in circular economy research

In the case of the CE, stakeholder involvement is a crucial element to deliver a responsible and socially just transition towards social and environmental sustainability. A transition towards the CE implies certainly a tremendous effort in developing new technologies with all the possible unexpected outcomes associated with it. The implementation of an oversimplified understanding of the CE may neglect serious aspects of its conceptualisation and implementation, or the lack of communication and trust between local stakeholders and scholars. Despite the importance of this topic, the issue of stakeholder involvement as well as the political economy of the transition towards a circular economy is an issue that has not received much attention (OECD, 2017; OECD, 2019).

This seems to suggest that a critical evaluation of the CE paradigm, of its economic, societal and policy implications, and of the outcomes of its implementation (i.e. which industrial sectors will

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benefit the most, which stakeholder groups can be classified as winners and which ones as losers) has not been conducted yet (Korhonen et al., 2018). This represents an urgent and major research gap that the ReTraCE project will attempt (at least partially) to address, which will therefore provide useful insights to policy-makers for evaluating the feasibility of the transition to the CE (Murray et al., 2017).

The transition towards a CE will impact many stakeholders and may lead to a re-allocation effect where some sectors will experience a decline, while others will experience growth (OECD, 2017). OECD (2017) elaborates that sectors likely to decline include natural resource extraction and elements of manufacturing, while sectors likely to expand include waste management and recycling, remanufacturing and repair, and services.

One of the few contributions that examine the potential stakeholder reaction towards the implementation of a Circular Economy is the one provided by Becque et al. (2016), that identifies the main groups of stakeholders in Europe and India, and scans their position towards the debate of the circular economy. For this reason, there is an increasing need to further research the position of the different stakeholders in order to create more understanding of: the existing viewpoints and worldviews of the transition towards a Circular Economy; the potential impact on stakeholders; the expected trade-offs derived from this implementation; the potential stakeholder groups that will support the transition towards a Circular Economy and the potential groups that will oppose it.

As a first approximation, we may expect important societal groups to be concerned on some of the effects of a transition towards a circular economy, or potential opponents, and another group to be enthusiastic on this idea, or potential supporters. Although this classification is an oversimplification of the complex reality and behaviours that diverse stakeholder groups may have, this first approximation serves as a tool to foresee the main potential societal reactions and anticipate any potential public opposition.

This framework will be structured as follows; first, a review of the importance stakeholder identification process will be provided; then, an example of a mapping process of CE stakeholders will be provided; finally, a possible stakeholder engagement framework will be described in detail.

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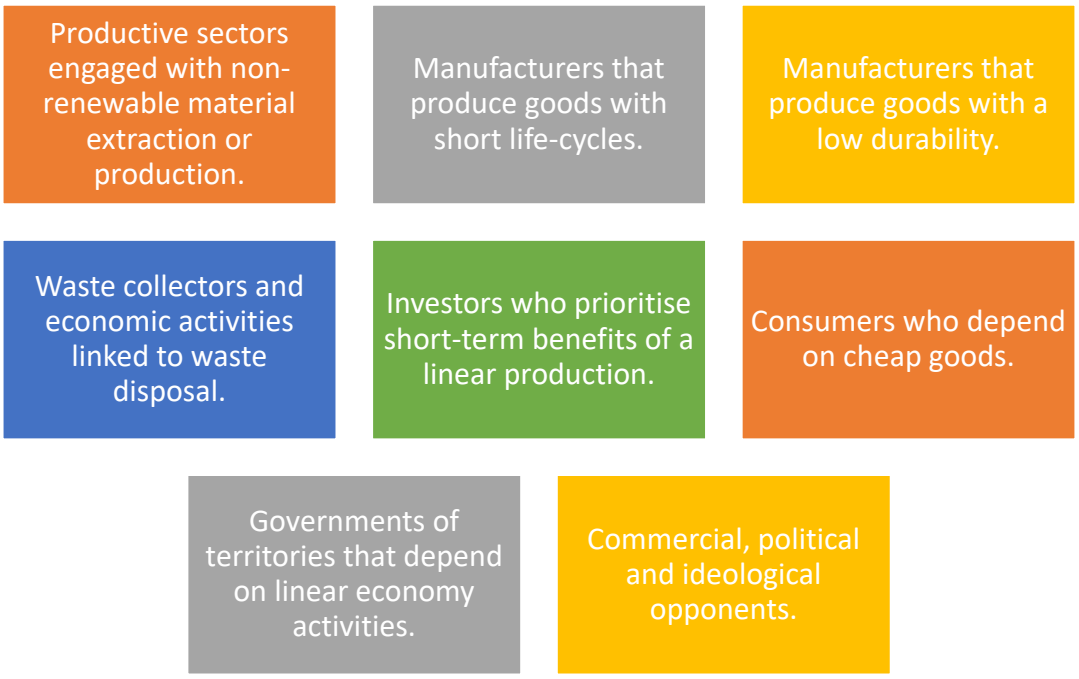

Figure 1 - Potential Opponents to the Circular Economy Transition

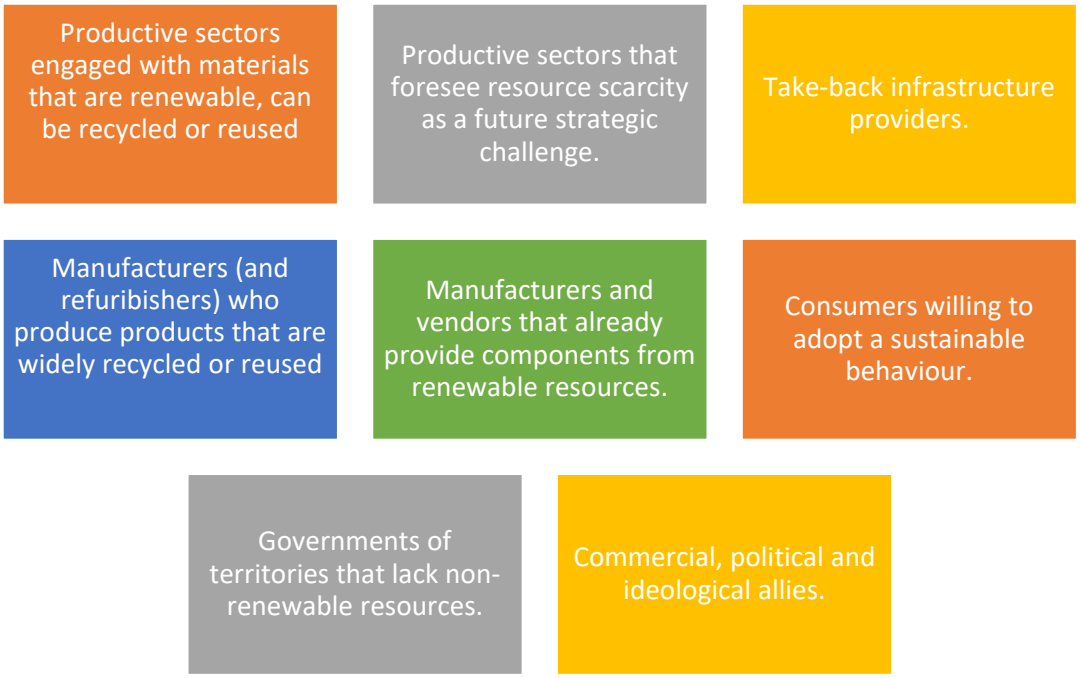

Figure 2 - Potential Supporters of the Circular Economy Transition

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Table 3 - Description of Potential Opponents

Potential Supporter	Description
Productive sectors engaged with non-renewable material extraction or production.	Loss of market share to sectors for renewable products
Manufacturers that produce goods with short life-cycles and low durability.	Loss of profit margins from reduced production and consumption
Waste collectors and economic activities linked to waste disposal.	Loss of resources (waste volumes) for waste collectors and closure of economic sectors linked to waste disposal
Investors who prioritise short-term benefits of a linear production.	Reduced opportunities for investments and quick growth of their profit
Consumers who depend on cheap goods.	Loss of access to some products due to financial or other constraints
Governments of territories that depend on linear economy activities.	Loss of competitive economic advantage, drain on government resources for supporting the transformation of linear to circular economic activities
Political and ideological opponents.	Loss of support from voter base dependent on linear economic livelihoods

Table 4 - Description of Potential Supporters

Potential Supporter	Description
Productive sectors engaged with materials that are renewable, can be recycled or reused.	Opportunities for improved profitability and efficiency.
Productive sectors that foresee resource scarcity as a future strategic challenge.	Mitigate impact of resource scarcity as a threat to survival.
Take-back infrastructure providers.	Opportunities for growth through increased demand for their services.
Manufacturers (and refurbishers) who produce products that are widely recycled or reused	Opportunities for growth through increased demand for their products and services.
Manufacturers and vendors that already provide components from renewable resources.	Opportunities for growth through increased demand for their products.
Consumers willing to adopt sustainable behaviour.	Consistency of CE with own outlook on sustainability.
Governments of territories that lack non-renewable resources.	Consistency with present practices that do not exploit non-renewable resources significantly.
Commercial, political and ideological allies.	Consistency of CE with own outlook on sustainability.

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3.1 Preliminary Circular Economy stakeholder mapping

We propose the following guide to select a group of stakeholders that could be potentially engaged in the research on CE initiatives. This selection is being performed following a set of steps to strategically involve a specific selection of stakeholders to enhance diversity of epistemic positions and perspectives to the involvement framework.

As a first step, we propose a set of criteria to draw a list of stakeholders based on their possible position towards the idea of a circular economy. In this sense, we firstly suggest a division between those stakeholders that are likely to be favourable to the transition towards a circular economy and those who may bear with its negative consequences and thus, are likely to oppose to it (see Figure 1 and Figure 2). Secondly, we propose to maintain an equilibrium between (1) geographical distribution, (2) gender and (3) age balance to ensure diversity in perspectives of the stakeholders participating in this research process. Thirdly, we encourage to select stakeholders that come from different fields of expertise and even have different degrees of expertise within their fields to maximise diversity within the engagement group.

Other criteria that will affect our selection will be the availability to participate in the engagement group, and the capacity to speak English. Although these two criteria do not contribute to better select a group of stakeholders, we acknowledge the implicit bias that these two attributes hold, since those will inevitably implicate a social bias among the stakeholders that will be participating in the engagement group. In this sense, an explicit recognition of this bias is necessary to create awareness on the final results of the involvement group.

Finally, we propose a selection among at least six groups of stakeholders: (1) academia, (2) governmental organisations, (3) industry (private companies but also coops), (4) investors, and (5) NGOs (including Trade Unions) (6) Communities. These stakeholders should be involved in the debate on the implementation of circular economy policies or initiatives, and from all the 28 EU countries. Based on these six categories, we conducted a scanning of all the stakeholders that: have any involvement with the transition towards a circular economy, belong to one of these six categories of stakeholders, and are located in the EU.

Academia refers to institutions that perform research, offer courses and programmes related to the CE, and are tasked with distributing knowledge of the field to students. Academia is thus, a category of stakeholders that are specialised in produce and disseminate scientific knowledge in diverse fields, as circular economy, environmental management, or climatology among many others. In addition, some academic institutions have established collaborations with private and public organisations to accelerate the transfer of knowledge into practice. Furthermore, some institutions may host research positions relevant to the CE and its externalities, and so contribute to expanding knowledge of the field.

Governmental organisations are public agencies responsible for developing CE policies and incentives, financing and investing into CE business models, foster international cooperation and stimulate creation of knowledge and innovation through education and research. Governmental organisations are aiming to see a transition to the CE over the next decade to an extent that partly

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helps to satisfy the 17 SDGs (Sustainable Development Goals) by 2030, as required by the United Nations 2030 Agenda. These organisations have diverse scales and scopes, as they can have a small department of a local government, or an international organisation that brings together many national governments, as the EU, or the world bank.

Industry refers to any organisation that produces goods or services. Industries can be owned publicly or privately by either a group of investors or a cooperative of workers, and range in size from sole traders to employing thousands of individuals. They can also be based in one location or be in areas spanning multiple continents. With regards to the CE, organisations may face pressure to adopt more sustainable practices from policy makers, its customers or even its own employees. While some organisations may voluntarily adopt the sustainable practices, others may be forced to do so via regulation or incentivised. A subset of organisations in the industry are consultancies, which offer knowledge and best practices.

Investors are financial enterprises that allocate financial resources or provide investment guidance, including states and public banks. Investors may need to make decisions to invest in CE projects, either voluntarily or due to external pressures.

Non-Governmental Organisations (NGOs) operate independently from the government and engage concerned members of civil society. NGOs can implement CE related projects, build multi-stakeholder platforms for promotion of CE concept, and represent certain groups of stakeholders. Moreover, NGOs can mobilise and structure public opinion, and advocate for a multitude of issues, such as social rights, environmental preservation, consumers rights, and many others. NGOs include also Trade Unions.

Communities refers to the group of people that can be potentially affected by CE projects. This generally indicates unorganised citizens but also informal organisations like neighbourhood activists, indigenous communities and a variety of civil society forms of activisms. A more extended definition of communities includes also plants, animals, entire territories or natural commons like the atmosphere, a river, a lake or the sea.

A list with examples of CE key stakeholders in the EU is reported in Annex A.

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Table 5 - Characterisation of Circular Economy Stakeholders

Stakeholder	Opposer or supporter?	Interests at stake	Reasons to include	Potential challenges
Academia	Environmental academics would support CE Academics funded by fossil-fuel industry may not	CE research has become popular and research grants for CE project are increasing	Scientific knowledge and expertise	Scientists tend to propose top-down technocratic solutions
Governmental organisations	Potential supporters, through the development of policies related to the CE.	Sustainability of the state Resource preservation Political legitimacy and consensus	Major funders	Tokenistic attitude towards CE
Industry	Opposers if their business models are disrupted by CE practices Supporters if they can make profits with CE	Creation of new markets Disruption of established markets	Commercialisation and diffusion of CE solutions	Tokenistic attitude towards CE Lack of financial incentives i.e. linear modes of production are more profitable than CE practices
NGOs	Generally, NGO are supporters of CE practices. Neo-Liberal Think Tanks and Trade Unions from traditional economic sectors might oppose CE	Legitimacy vis-à-vis society	Negotiation role between industry, government and the public Alternative sources of knowledge e.g. funding independent studies	Co-optation and political manipulation
Communities	Opposers if CE projects poses a threat to living standards Supporters if CE projects empower and enable autonomy of the local community	Livelihood; Secure jobs; Increase access to resources	Democracy Social justice Public acceptance and legitimacy and Trust Alternative sources of knowledge	Conflicts on resources Lack of trust and social rejection One directional communication i.e. the voices of community are not taken into account

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4 A Possible Engagement Framework

The term 'engagement' can include a wide array of activities from basic dissemination/disclosure of information, to consultation and participation – during all phases of the research or project. According to the international Stakeholder Engagement Standard (Accountability, 2015), successful engagement depends on mutual understanding on why the project plans to engage stakeholders (the purpose), what issues will be considered (the scope), and who needs to be involved in the engagement (ownership, mandate, stakeholders). This document envisages the stakeholder engagement process in two parts: stakeholder identification and analysis (section 3), and engagement framework (the present section) as a guide for actual integration of the identified stakeholders in the project activities.

The following engagement framework provides a structured strategy to interact with the different stakeholders to enable understanding and integration of the views and interests of different stakeholders on topics that are researched within the field of CE. The stakeholder engagement framework has been described as a vital element for promoting transparency and accountability, effective participation and inclusion (IUCN, 2019). Under the Responsible Research and Innovation paradigm described in the previous part of this document, a two-way public engagement for scientific knowledge coproduction has been argued to be needed to overturn the process of science (e.g. specific topics for research and how knowledge is produced) as internally governed by academics themselves. In such a way, society is given opportunity to actively interact, shape and influence the agendas, processes and outcomes of science (Hughes, 1998; Keown et al., 2008).

4.1 Levels of engagement

It is not practical to engage all stakeholder groups with the same level of intensity and by using the same approach. Table 3 presents five different level of engagement with the public that spans from merely informing stakeholder about a specific issue/project to involving certain stakeholder in the governance structure of a specific initiatives. The first level 'Inform', in CE initiatives can be addressed by dissemination activities such as open access research publications, events and a specially dedicated blog where research and opinions are openly presented to the public. The higher intensity stakeholder engagement processes of consultation and collaboration (see Table 3), could be implemented at the ESRs project levels and will depend on their specific projects and topics.

4.2 Engagement technique

For each level of engagement, specific methods and techniques can be used to include a variety of stakeholders. Table 3 presents the most common methods of engagement associated with each level.

The activities listed under level of **Consult** are designed to explore what external (to the project) stakeholders think about a specific issue/project. This includes various surveys and inquiries into

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public opinions. A particularly useful method for Public Engagement is the Focus Group extensively described by (Macnaghten, 2017). The consult level doesn't imply a pro-active role of stakeholders and it is limited to the level of exploration of public opinion about certain issues.

Table 6 - Levels and methods of engagement

	Levels of engagement				
Methods of engagement	Inform	Consult	Involve	Collaborate	Empower
	One-way communication	Limited two-way communication	Two-way communication, learning on both sides	Two-way communication, learning, negotiation and decision making on both sides	Decision-making in the hands of the stakeholders
	- Websites - Bulletins - Reports - Conferences - Presentations	- Survey - Focus groups - Public hearings - Online feedback	- Multi-stakeholder forums - Advisory panels - Consultative committees - Workshops	- Joint projects - Partnerships - Multi-stakeholder initiatives	- Integration of stakeholders into governance structure

Adapted from: Stakeholder Engagement Framework. Australian Government – Department of Health. (Australian Government, 2017).

The level **Involve**, require a deeper two-ways communication. This can be achieved through the establishment of multi-stakeholder forums[5], Advisory Panels[6], Consultative committees and workshops organised ad hoc to explore specific topics within the ESRs projects.

The level **Collaborate** implies the establishment of co-creation mechanisms among the promoters of the CE practices and the stakeholder involved. This can be achieved by direct collaboration in the projects of specific stakeholders or partnerships.

Finally, the level **Empower** requires the inclusion of stakeholder in the governance structure of the CE projects. This also implies an active participation of external stakeholders in the formulation of objectives, methods and strategy.

[5] Multi-Stakeholder forums are powerful mechanisms to engage with a variety of different stakeholder. There is a huge literature about this topic. For more info see also the guide published by the Open govt Partnership: https://www.opengovpartnership.org/multistakeholder-forums/ - accessed January 2020

[6] In the case of ReTraCE, this function can be covered by the project advisory board.

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4.3 Engagement stages

The five levels presented above can be enacted singularly or simultaneously depending on the level and nature of engagement that a specific initiative intends to achieve. Engagement strategies can generally follow three phases, (1) the pre-engagement, (2) the engagement, and (3) the post-engagement. These phases correspond to the different actions that can be performed during the stakeholder engagement, stakeholder involvement, feedback, and follow-up processes.

4.3.1 Pre-engagement

In this phase, the engaged stakeholders will be informed about the **engagement plan** (project overview, activities description, scope of study, engagement objectives, priority issues to be addressed, technique/s of engagement, roles and responsibilities, level of documentation and dissemination of the engagement process). The engagement plan should give the involved stakeholders all the guarantees of transparency, ethics and accountability to protect their role in the engagement activities (this also includes ethical clearances). There exist a number of standards and methods to develop an engagement plan. In this report it is suggested to follow the guidelines from international Stakeholder Engagement Standard[7].

4.3.2 Engagement

In this phase, according to the level of engagement that the specific project wants to achieve, a number of activities will be organised and conducted. These may take the form of multi-stakeholder forums, multidisciplinary workshops, consensus conferences, focus groups and other, according to the needed level of stakeholder engagement. The participation in the engagement process should be representative of identified stakeholders list, as well as gender-inclusive. The engagement process needs to be responsive to stakeholder needs, provide appropriate explanation to the stakeholders of the used information and realistic about what can be accomplished (Jeffery, 2009).

A good practice for developing a true partnership with external stakeholders is to co-develop a results chain which visually depicts the relationship between the project activities and its expected outcomes. This co-development can make all stakeholders to share a common understanding of the factors and assumptions involved in the engagement activity before the creation of the final output (Betley et al., 2018).

[7] The standard description is available at the following URL: https://www.accountability.org/wp-content/uploads/2016/10/AA1000SES_2015.pdf (Accessed January 2020)

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4.3.3 Post-engagement

The aim of this phase is to i) respond to the engagement exercise, this might mean to reshape the initial objectives of the projects, restructure internal processes and in some extreme cases, kill the projects[8]; ii) document the engagement process, as Kopse et al. (2015) suggest, to capture

- the purpose and aims of the engagement;
- the methods used;
- who participated and who did not;
- the time frame;
- a summary of stakeholder concerns, expectations and perceptions;
- a summary of key discussions and interventions; and
- outputs (e.g. queries, proposals, recommendations, agreed decisions and actions).

The documentation of the engagement process can take a form of a report, which should be distributed to all engaged stakeholders and open for feedback. Thomas et al. (2005) recommend reviewing the whole engagement process itself in order to identify possibilities for future improvements in subsequent stakeholder engagement cycles.

After finalising the conclusions of the study, as a result of the engagement and obtaining the key learning insights from the feedback process, these should be reported back to stakeholders in written or oral form, depending on stakeholder panel size and time constraints. Also, all stakeholders should be consulted again if they still agree with what has been concluded in the pre-engagement phase regarding the publication of the engagement outcomes.

4.4 Identification of potential engagement risks

As we briefly mentioned in section 1, public engagement is often challenging and not immune from risk. A good engagement plan should be always associated with a risk management plan. Risk management is a process through which risks can be timely identified, assessed and addressed, and better decision-making can be enabled. This process can be integrated into the stakeholder engagement plan, to anticipate potential negative outcomes and plan for contingency activities which can facilitate effective engagement (Kopse et al., 2015). A review of the most common risks related to stakeholder engagement is presented in Table 4, along with potential mitigation strategies.

[8] In some case Public Engagement can lead to the closure of scientific projects. See for example the case of Geo-engineering in the UK documented by Owen & Goldberg (2010).

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Table 7 - Potential risks and contingency plan for stakeholder engagement

Potential risk	Contingency plan
Unclear purpose	The purpose of the engagement needs to be clearly defined to enable relevant identification of stakeholders and a proper method selection. Stakeholders can be included in defining the purpose of the engagement to better manage stakeholder expectations.
Differing capacity of stakeholders	It must be ensured that stakeholders have sufficient levels of skills and experience to enable their full participation and provision of high-quality information. In some cases, capacity building activities need to be supplied to stakeholders to level the playing field.
Insufficient skills of organizers	It is important to identify the available in-house skills and skills that need to be outsources by external expertise.
Unwillingness to engage	To engage with unwilling stakeholders may require an adjustment of the scope, purpose, level and method of the engagement. Early on participation in the engagement planning processes is important to ensure transparency and build trust.

Adapted from Australian Government (2017) and Kopse et al. (2015)

5 Conclusions

In the last decade, 'Circular Economy' (CE) has surged as a prominent concept in the political and corporate discourse around the world. The notion, which, thanks to its immediacy, can be easily communicated and employed to coin slogans and mottos, is the most probable candidate to replace the outdated 'sustainable development' imaginary.

Although presented in a neutral, apolitical fashion, the CE agenda represents a highly contested political project. As such, in order to conduct research in this field which can address timely challenges, the existence of alternative and competing CE narratives that are produced by the multitude of stakeholders involved in the CE arena in different sectors (academia, industry, NGOs, policy-makers), must be assessed.

As such, this report has provided a guide to explore and to acknowledge this plurality of stakeholder views and paradigms, which exist in the field. The engagement of such stakeholders, endowed with different interests and positions when it comes to CE implementation, represents a fundamental step for unveiling the tensions and barriers which might inhibit the transition towards a Circular Economy.

In the present deliverable we have briefly outlined a rationale to include stakeholder/public engagement in research on CE. Such effort was needed, as stakeholder engagement in the transition towards a Circular Economy represents something which is totally neglected by the current literature on the topic. Examples of engagement techniques have been presented, with the aim of

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providing a general framework that could be potentially adopted by scholars conducting research in the field.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Innovative Training Networks (H2020-MSCA-ITN-2018) scheme, grant agreement number 814247 (ReTraCE).

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