REPAiR

REsource Management in Peri-urban AReas: Going Beyond Urban Metabolism

D7.1 Theoretical model of knowledge transfer

Version 2.1
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Acronyms and Abbreviations

AMA	Amsterdam Metropolitan Area
CE	Circular Economy
EU	European Union
EIS	Eco-innovative Solution
GA	Grant Agreement
GDP	Gross Domestic Product
GDSE	Geodesign Decision Support Environment
KT	Knowledge Transfer
LL	Living Laboratory
MS	Milestone
NIMBY	Not in my back yard
PULL	Peri-Urban Living Labs
RDF	Refuse Derived Fuel
REPAiR	Resource Management in Peri-urban Areas. Going Beyond Urban Metabolism
SRF	Solid Recovered Fuels
WP	Work Package
WRO	Wet Ruimtelijke Ordening

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Publishable Summary

The report outlines a theoretical framework for knowledge transfer within the REPAiR project. Drawing on a critical review of the literature on knowledge transfer and related concepts (from policy transfer to policy mobility) and an initial empirical investigation, this report addresses the key objective of REPAiR's WP7: to elaborate a methodology for knowledge transfer that reveals the most effective and appropriate channels, tools and processes for transferring knowledge on eco-innovative solutions for improved resource management - designed in the network of Peri-Urban Living Labs - across the projects' differentiated case study regions. The premise of the model is to avoid the typical pitfalls of knowledge transfer related to copying of 'best practice' from elsewhere without (i) consideration of how the practice emerged, (ii) how it builds on the place-specific tacit knowledge and sociospatial features, (iii) how transferrable it is, and (iv) what needs to be done to adapt to the recipient context. The theoretical model presented in the report, thus, offers guidance on the agency ('who'), process ('how') and content ('what') of knowledge transfer.

1. Introduction

One of the cornerstones of the REPAiR project is the organisation of Peri-Urban Living Labs (PULLs) in the six case study areas across Europe. In the context of these laboratories,   eco-innovative solutions (EIS) for better resource management and strategies for promoting circular economy will be developed with active engagement of the regional stakeholders and using the geodesign 'six-question framework' approach. In an increasingly globalised and interconnected world, seeking solutions to local problems abroad and learning from foreign experiences by local, regional or national government to improve domestic policies has become the norm, even if such processes are riddled with uncertainty about the fit of a foreign solution in the recipient context and some risks are always behind the corner (Dolowitz and Marsh, 2000; Rose, 1991). However, in the process of devising solutions to complex problems affecting a particular territory, foreign experience can provide a useful source of inspiration, cautionary tales, ideas, understandings or concrete measures, which can enrich the spectrum of possibilities and knowledge pool available to decision-makers. Accordingly, the exchange and transfer of the knowledge generated within PULLs to other case study areas, where it would be incorporated into the process of designing solutions and strategies for these areas, has been given a high priority in the project's structure and put at the heart of Work Package 7 (WP7). This deliverable outlines the theoretical framework for knowledge transfer activities as part of REPAiR.

1.1 Why transfer knowledge?

There are at least three reasons behind this emphasis on knowledge transfer in REPAiR. First, the aim is to broaden the scope for devising eco-innovative solutions (EIS) for resource management in the six case study areas through exchange and knowledge co-creation among the stakeholders from different peri-urban regions. While for each of the case study areas, dedicated and place-specific solutions and strategies will be elaborated in their respective PULLs to address their particular challenges in terms of material flows, decision-making and governance or knowledge generation needs, learning from the results of PULLs in the remaining cases will be an important aspect of this process. Going beyond mere 'learning from abroad', knowledge transfer in REPAiR has the ambition to generate new solutions not only in relation to a particular space, but rather promote the emergence of knowledge through collaborative relations of stakeholders and researchers from the six case study areas. This means echoing the concern for 'policy mobility' not as a simple transposition of a practice developed in 'place A' to 'place B' (Mccann and Ward, 2012; Temenos and Mccann, 2013), but rather as an outcome of co-creation of knowledge in stakeholder networks that would be based on shared understandings and thus more readily transferable and applicable to various contexts. In a nutshell, the purpose of knowledge transfer is to deliver better eco-innovative solutions and circular economy strategies in the case study areas.

The second reason for the emphasis on knowledge transfer in REPAiR is connected with the project's ambition to deliver broad and significant impacts, in line with the Horizon 2020 programme requirements and the commitments made in the Grant Agreement (GA). The purpose of knowledge transfer is thus to ensure that the impacts of the eco-innovative solutions and strategies for improved resource management developed in PULLs in a case study are not limited to that particular area only, but also provide learning and lesson-drawing opportunities for actors operating in the remaining case study areas.

Third, knowledge transfer activities will help to ensure broad impact of the research beyond the six REPAiR case study areas. In particular, this will entail defining a methodology and elaborating a handbook for strategic and collaborative knowledge transfer between different regional contexts. These will be widely applicable in the domain of circular economy and possibly other aspects of (urban) sustainability that call for place based eco-innovative solutions. This methodology and handbook will thus facilitate the dissemination of the circular economy solutions and strategies designed in the REPAiR's living labs to other peri-urban areas in Europe. In turn, this will promote learning for circular economy, innovation and broadening the evidence base for circular economy policies. Moreover, this will also provide a more generally applicable toolkit for knowledge transfer to be used beyond the REPAiR project and its core theme.

2. A critical review of the main approaches to study the transfer of knowledge across space

2.1. What knowledge to transfer? The explicit and tacit knowledge

A first necessity is to establish the relationships pertaining between the key terms (data, information and knowledge), as well as to define more precisely what the differences between them might be. Machlup (1979) stated that information equates to analysed data that are in a position to make the taking of concrete decisions easier; whereas knowledge relates to the simultaneous absorption, assimilation, understanding and appraisal of the said information (Chapman and Slaymaker, 2002). In turn, in the popular definition proposed by Davenport and Prusak (1998, p. 5), knowledge is "a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers."

Information and knowledge are treated as a good that meets people's basic needs. However, unlike other goods they are a somewhat 'transitory' resource, in the sense that they can be forgotten, deformed or go out of date. Equally, they possess certain specific and valuable attributes, such as: a) knowledge is not used up in the production process and is indeed capable of being multiplied; b) a person handing on knowledge is not deprived of it, but remains in possession of it; c) knowledge can be gained rather readily (should the level of motivation and other conditions prove suitable), and then be the subject of exclusivity of use (Drucker, 1994; Nonaka and Takeuchi, 1995).

The propagation of critical approaches as linked with a weakened legitimisation for science as the dominant form of knowledge and an attendant return of some people to more local forms (Giddens and Sutton, 2017) has encouraged distinction-drawing with respect to the different types of knowledge. Nonaka and Takeuchi (1995) drew the distinction between *explicit* knowledge (i.e. that which is documented, public, structured, disseminated and awareness-raising) and *tacit* knowledge (i.e. that which goes unarticulated, is fuzzy and secret, subjective, personalised, personal and quiet). All of these adjectives do much to offer effective augmentation of the thesis from Polanyi (1966), that the existence of tacit knowledge is perceived in the way we know more than we can tell.

Expanding this two-fold division, one can distinguish four types of knowledge, of which the first two fall within the characterisation of formal knowledge (accessible with the aid of such traditional forms as education, libraries, the media and so on); while the last two come under the heading of informal knowledge (in that they are accessed *via* individual experience as well as social relationships). The four types are as follows:

a)   descriptive and information-related knowledge (know-what) – as relating to facts and linking up closely with what one considers as information,
b)   explanatory and prognostic knowledge (know-why) – which is concerned with principles and laws,
c)   practical and technological knowledge (know-how) – as relating to skills,
d)   person-related knowledge (know-who) – encompassing information on what is

known by whom and how to do things (Lundvall, 1996; OECD, 2000; Chojnicki, 2001).

From the time that the division of knowledge into codified and uncodified began to grow in popularity, scholars began to pay attention to the significance, not just of one or the other of these, but the complementarity between them. The spiral of knowledge acquisition has its beginning in the base knowledge most likely gained at school. Without that, there is no possibility of tacit knowledge being created, or formal knowledge taken advantage of (Drucker, 1994). In the course of the subsequent stages of knowledge acquisition, it is important that a balance between its explicit and tacit forms is maintained (Guile, 2001); even if one may argue that tacit knowledge has higher status and priority conferred upon it (Howells, 2002; Gertler, 2003).

The two types of knowledge referred to may be looked at from the point of view of their means of acquisition (and hence in respect of sources of knowledge). Codified knowledge is rather readily capable of being passed on. For example, it may be obtained from such sources as books, the press, education and the media. Tacit knowledge in turn exists in the minds of people, and especially in their intuition, behaviour and perception. It also develops in the course of shared experience, problem-solving and interaction, but is thus dependent on a certain development of interpersonal skills. Florida (2004) and Törnqvist (2004) recognise this as an essential element of the institutional environment. For its part, uncodified knowledge links up closely with place, arises out of context and the specific features of an area, and derives from various sources, including the science and learning, tradition, culture and economy present in a given region (Bathelt et al., 2004; Storper and Venables, 2004; Hilpert, 2006). Tacit knowledge is perceived to be of key importance in the processes by which new knowledge is created, with its transfer taking place via a process of socialisation, hence the importance of proximity or closeness in this context. Tacit knowledge may be passed on where there is a jointly occurring social context, for example involving shared values, language or culture (Gertler, 2003), with this clearly relating to the specifics of the passing-on (or coding/decoding) of that information. Usually, a common context is possible specifically because there is physical closeness, a dense social network, mobility of human capital, culture and organisational efficiency (Boschma and Lambooy, 1999).

2.2 Knowledge transfer: from organisational studies to REPAiR

Knowledge transfer is a term which originated in organisation studies, where it was used to study how knowledge 'travels' between firms and contributes to innovation processes (Argote and Ingram, 2000; Argote, Ingram, Levine, and Moreland, 2000; Inkpen and Tsang, 2005; Simonin, 1999). According to Argote and Ingram (2000, p. 151), "knowledge transfer in organizations is the process through which one unit (e.g., group, department, or division) is affected by the experience of another." The emphasis here is on how knowledge would be spread across organisational boundaries within a firm and its various branches or departments (for an overview see Van Wijk, Jansen, and Lyles, 2008). Inkpen and Tsang, for instance, argued that knowledge transfer, whether it is intra- or inter-organisational, is conditioned by network structural features like the strength of the ties between the actors (weak ties promote access to more and more distant information, while strong ones facilitate in-depth understanding of complex information – see Hansen, 1999; Argote and Fahrenkopf, 2016) and their stability, but also cognitive characteristics like shared goals or trust between them (2005). Others have argued that collaboration, open communication, and trust between the actors involved are crucial factors supporting effective knowledge transfer, pointing to partnering between organisations as a means to achieve this (Bellini et al., 2016).

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The term is also used to refer to how tacit knowledge travels between firms, for instance within the space of hi-tech industrial clusters or regional innovation systems (Bathelt, Malmberg, and Maskell, 2004; Doloreux and Parto, 2005; Inkpen and Tsang, 2005). Knowledge transfer in such contexts is highly dependent on the structure, qualities of the networks or the intangible 'relational assets' of a particular city or region that facilitate flows of knowledge (Cooke and Morgan, 1998; Florida, 1995; Storper, 1997).

The literature on knowledge transfer has some gaps. One of them is the limited understanding of how organisations identify what is relevant and suitable to transfer into their own practice (Argote and Fahrenkopf, 2016). Literature shows how 'absorptive capacity' of organisations determines their ability to identify relevant external knowledge, assimilate and apply it in practice (Cohen and Levinthal, 1990) and underscored how social networks can facilitate search for relevant knowledge outside an organisation (Hansen, 1999). However, there is still a shortage of research that would explore this process in practice on the micro-level (Argote and Fahrenkopf, 2016). In particular, one promising avenue for research into this phenomenon entails studying how organisations use analogical reasoning to spot the kinds of relevant knowledge that could be imported across boundaries (Argote and Fahrenkopf, 2016). Another under-researched issue is the relationship between knowledge, understood as the cognitive content, and the context to which it is applied, i.e. the material, social and political setting of the recipient organisation or space. There seems to be a consensus about the importance of social capital, trust and collaborative relations in networks (e.g. Inkpen and Tsang, 2005) as well as the institutional, absorptive capacity (Cohen and Levinthal, 1990) and the knowledge landscape of the recipient context (Matthiesen, 2005). However, research to date has paid much less attention to the role of informal relations between the organisations for knowledge transfer that may be more important than formal interaction channels, communications and structures, particularly in situations where there are significant cultural differences between the actors (Ado, Su, and Wanjiru, 2017).

While the significance of contextual factors, formal or not, is widely recognised, there is no consensus on what the concept 'context' actually means (does it concern an organisation or the wider institutional, legal, cultural environment in which it operates?) and how it affects knowledge transfer (Yakhlef, 2007, p. 44). For Yakhlef, the fact that knowledge content and context are intrinsically related does not mean that the latter is fixed. In fact, "the transfer of knowledge from one context to another implies the transformation of both the target context and knowledge content […] through processes of translations, negotiation and bargaining among actors" (Yakhlef, 2007, p. 44). Thus, in the process of knowledge transfer, knowledge is not only adapted to fit the target context but it does have a transformational impact on this very context.

The term 'knowledge transfer' was chosen in REPAiR because it captures well the notion of transferring and learning innovative solutions through a network of organisations. This is notably more complex than a mere transfer of a solution from A to B (Stone, 2012), which can be compared to usual information, and hence more suitable to the living labs network approach used in the project (see REPAiR deliverable 5.1). In the REPAiR project, however, this notion is applied mainly to conceptualise and implement the generation and flow of knowledge (designs, technical solutions, governance arrangements, stakeholder engagement techniques and tactics, policies) related specifically to eco-innovative solutions and elements of strategies for development of circular economy, between the six peri-urban case study regions and beyond. Before outlining the key characteristics of the REPAiR's approach to knowledge transfer, it is worthwhile to critically review the related concepts in the literature on the broadly

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understood flows of knowledge. In fact, an understanding of their uses, assets and drawbacks, allows for positioning the REPAiR approach against the wider scholarly literature on this topic and highlighting the ways in which it addresses some of its conceptual and practical shortcomings.

2.3. Policy convergence and diffusion: understanding the adoption pattern

'Policy convergence' and 'policy diffusion' are concepts used mainly in political science literature, but also in planning (Healey and Upton, 2010), to study how policy practices, programmes, ideas or paradigms spread internationally leading to a varying degree of convergence of policies across the world. The first approach, prominent in political science, seeks to understand why policies across the world tend to converge towards a similar direction in terms of goals, instruments, outcomes, or policy styles, and explains this by stressing not as much the role of actors pushing for convergence but rather the structural forces such as industrialisation, globalisation or regionalisation which promote certain patterns of increasing similarity of policies and institutional configurations put in place to implement them (Bennett, 1991; Börzel, 1999; Busch and Jörgens, 2005; Knill, 2005; Stone, 2012). Convergence can result from emulation of foreign practices, but also international policy elites networking or harmonisation, for instance, through the obligation of membership in international organisations, like the EU, or other coercive international pressures (Bennett, 1991).

Policy diffusion is a closely related notion to that of convergence, however, here the emphasis is on a process of policy adoption by 'osmosis' or 'contagion', as opposed to a conscious process of voluntary (or not) adoption of foreign policy features. This happens through networks of communication between state officials, geographical proximity, or adoption of best practices from the 'pioneer' states by the 'laggard' states (Berry and Berry, 1999; Stone, 2012).

As Stone remarked (2012), one of the key limitations of these approaches is that the focus is on adoption pattern and little attention is dedicated to the understanding of how practices and norms are changed and adapted to the local context during the adoption process. A related shortcoming is that the political interests and agendas of actors engaged in transfer of policies remains unknown. Finally, the focus is on the international or external conditions for transfer rather than the content of transfer and the internal factors related to the power dynamics or socio-cultural features of the 'recipient' context, which are important determinants for what and how is actually adopted (Stone, 2012, p. 485).

2.4 Policy transfer and lesson-drawing: exploring the process and agency

While policy diffusion or convergence literature focuses on the adoption pattern of certain policy notions or practices, the 'policy transfer' (Dolowitz and Marsh, 1996, 2000; Evans, 2004) and 'lesson-drawing' (Rose, 1991, 1993, 2004) concepts put an emphasis on the process of transfer itself and on its content.

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These notions have become hugely influential and spurred an explosion of studies on policy transfer in political science since the mid-1990s. Dolowitz and Marsh defined policy transfer as 'knowledge about how policies, administrative arrangements, institutions and ideas in one political setting (past or present) are used in the development of policies, administrative arrangements, institutions and ideas in another political setting' (Dolowitz and Marsh, 2000, p. 5). The policy transfer literature considers the movement of policies from one context to another as either voluntary or coercive, but always proactive process, taking place mainly among politicians and state bureaucrats, but also policy entrepreneurs including think-tanks; knowledge institutions; experts; pressure groups; global financial or corporate players; or international or supranational organisations (Stone, 2000). Thus, the emphasis is also on the agency and not only on who is involved but also on why it is involved.

However, Dolowitz and Marsh's seminar work (2000) also stresses the motivations for transfer that the different actors may have, from more or less rational lesson-drawing to more or less coercive transfer or obligation to adopt certain foreign practices (not only who is involved but also why). It also explores the direction of transfer (from where to where) and what is actually the object of transfer (from more abstract ideas to concrete programmes). It attempts to classify its outcomes, from loose inspiration to actual wholesale copying of solutions from one context to another.

Finally, Dolowitz and Marsh's policy transfer framework also considers the conditions in which policy transfer may result in policy failure in the recipient country. The latter may happen in cases where transfer is uniform ('one size fits all', without adaptation to local context), incomplete (only parts of a policy are transferred) or inappropriate (not suitable for the recipient context due to the lack of structural conditions, knowledge or resources, for instance).

In a similar vein, Evans (2009) was also interested in what could make policy transfer unsuccessful and conceptualised the potential obstacles for this process. First, he distinguished 'cognitive' obstacles in the decision-making phase that could stem from limited search for foreign solutions, cultural assimilation through commensurable problem recognition and definition limiting the options for learning from abroad, or the sheer complexity involved in the process of transfer. Second, he identified 'environmental' obstacles which affect the process of transfer itself. Here, the possible obstacles include ineffective cognitive and elite mobilisation strategies by the agents of transfer; the lack of robust transfer network; structural constraints related with the recipient context (socio-economic, political or institutional); or, finally, more prosaic technical implementation problems stemming from lack of resources or technical capacity. Third, Evans also stressed 'public opinion' as another potential obstacle for policy transfer. Here opposition to transfer of foreign policies may come from elite opinion (economic, political, bureaucratic), the media or the constituency groups (voters).

That being said, what policy success or failure actually is in itself is rather unclear. Marsh and Sharman (2009) stressed the importance of robust evaluation success

and failure of policies, to be able to evaluate the policy transfer process. However, they do admit that such evaluation is problematic too, as it is inherently politicised, subjective and inevitably brings the question: 'successful, but for whom?'

Another key term in the policy transfer literature is 'lesson-drawing' as popularised by Rose (Rose, 1991, 1993), who was also concerned with the process of transfer of policies but put an emphasis on the role of the bureaucrats and the programme being transferred for policy learning from the past or from other organisations. One of Rose's main contributions was his reflection learning from abroad as a factor in policy change and on the conditions under which policies can work in another context, putting an emphasis on the circumstances in which lessons are being drawn from abroad, the extent to which they are adopted and how they affect the recipient policy environment. His critics argued, however, that the lesson-drawing approach fails to explain why policy transfer takes place in the first place and that it pays limited attention to the ways in which learning from abroad is determined by exogenous forces; but, most importantly perhaps, that it does not engage with practice and gives few recommendations to successfully adopt foreign programmes (Evans, 2009).

In his later work, Rose (2004) partly addressed at least the last of those critiques and attempted to make his approach more relevant for practice. He provided a set of pragmatic guidelines for policy practitioners wishing to address a domestic policy problem by looking for lessons from the other's experience. At the early stage of the process, Rose prescribes, for instance, scanning alternatives to identify the right source of lessons and learning through study visits abroad (this point is also stressed in the policy mobilities literature discussed below). Then he suggests to seek to extract from the observed programme a generalised model of how it works, which then can be turned into a lesson that can fit the domestic context. Before doing that, as Rose argues, one needs to decide whether the lesson should be adopted at all and whether it actually can be applied domestically and, if needed, simplify it to increase the chances of success. Finally, he points to the need to learn from lesson-drawing, that is to evaluate the outcome of the lesson and if it is adopted to assess how it evolves over time.

To reiterate, while being extremely influential, the policy transfer concept has numerous drawbacks and has been the object of a vivid critique. On a more practical level, policy transfer literature has been criticised for focusing more on 'how' transfer takes place, but not dedicating much interest to the 'what' is actually transferred and 'why'. As Howlett and Rayner argued, "'what' is being diffused is sometimes lost in the concern for 'how' diffusion takes place" (Howlett and Rayner, 2008, p. 386). Even if these issues have to some extent been addressed by Dolowitz and Marsh (2000) and Rose (2004), one still knows relatively little about how the practitioners involved in policy transfer selected the actual elements of foreign policies to adopt and how this information is processes and utilised domestically (Benson and Jordan, 2011). This research gap seems to chime with that identified in the knowledge transfer literature, where there is insufficient research into how organisations identify relevant and applicable knowledge to transfer (Argote and Fahrenkopf, 2016).

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What is known, however, is that learning from glossy 'best practice' examples is nowadays commonplace and does bring some risks. While Rose himself recognises that drawing lessons from abroad is riddled with uncertainty about suitability of the foreign solutions and conflicts about their desirability (Rose, 1991), there is much less recognition of the problems associated with the circulation of best practice and much less research on poor and failed transfer, with the focus being mainly on 'success stories'(Stone, 2012). In fact, lack of knowledge on how such best practice emerged, what were the other options that were pondered, what was the process that lead to this and what were the possible failures or u-turns in it, creates a risk of misinformed transfer and ultimately failure of the adopted solutions (Stead, 2012). The uncritical approach to learning from best practice can entail 'copying mistakes when over-committed policymakers have responded to complexity and crisis by unreflectively cutting and pasting from foreign models' (Sharman, 2010, pp. 623–625). Others soberly remarked that some policies are so deeply embedded in the peculiar national legal, political, educational or social systems that they cannot be transferred elsewhere (Stone, 2012).

Finally, policy transfer has also been critiqued for the neglect of agency and the interplay of power that may hide behind it. In particular, the transfer literature dedicates little attention to the role of sub-national, non-state actors and the networks of practitioners which can play instrument for the process of transfer and adaptation of foreign policy to fit the domestic context (Stone, 2012). Moreover, as geographers dealing with this topic tend to assert, policy transfer literature tells us little about the interests and politics that lie behind exporting or importing best practices (McCann and Ward, 2012; Temenos and McCann, 2013).

2.5 Exploring the dimensions of policy translation, agency and space

As a result of the criticism towards policy transfer, other schools of thought on this topic emerged, stressing the notion of learning and local translation of foreign practice, the role of transfer agents and networks in this process, and its spatial dimension.

This led inter alia to a growing interest in 'policy translation' (see Stone, 2012), as opposed to transfer as a simple copy-paste process. Policy translation is about a 'move away from thinking of knowledge transfer as a form of technology transfer or dissemination, rejecting if only by implication its mechanistic assumptions and its model of linear messaging from A to B' (Freeman, 2009, p. 429). In the process of translation of a foreign practice to the local 'language' hybridization and learning processes take place, which in turn can lead to emergence of new policy meanings and a significant departure from the 'original' imported policy. This can have the merit of resulting in 'a more coherent transfer of ideas, policies and practices' (Stone, 2012, p. 488). What is more, such a learning perspective can also be useful as it allows for learning from failure: 'policy learning is not synonymous with policy adoption; decision-makers can learn "negative lessons" where learning from the ideas that are diffused help crystallize what ideas and policy paths they do not wish to follow' (Dunlop, 2009, p. 307).

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For Evans policy transfer is essentially a process of organisational and policy-oriented learning that involves "collaborative decision structures comprised of state and non-state actors that are set up with the deliberate intention of engineering policy change" (Evans, 2009, p. 260). He argues that policy transfer networks comprising a variety of policy stakeholders are important because they determine the policy outcomes of the process of learning from abroad and, interestingly, they also breed further networks that lead to further transfer of knowledge over time. Thus, "policy transfer activity can have a momentum of its own through a process of functional spillover" (Evans, 2009, p. 260), whereby cooperation and exchange continues between the actors that engaged in transfer networks in the first place.

Policy transfer networks comprising a large variety of actors, as opposed to closed bureaucratic networks, also have the ability to facilitate both 'soft' and 'hard' aspects of transfer (Evans and Davies, 1999; Stone, 2000, 2004). Soft forms of transfer entail spreading of norms and ideas, concepts and attitudes, which play an important role in shaping the behaviour of actors and the trajectory of policy change. They complement hard transfer, which relates to the transfer of policy instruments, structures, legislation, and concrete practices.

Research in the realm of Geography has pushed the debate on policy transfer onto new territories. For them 'policy mobility' is about linking global circuits of policy knowledge to local policy practice, politics, and actors (McCann, 2011; McCann and Ward, 2012; Temenos and McCann, 2013). This approach stemmed from an observation that policy transfer research has a "tendency to fall into a literalist trap of assuming that little happens to policies *along the way* or *in the telling* as they are moved from place to place" (McCann, 2011, p. 111). The emphasis here is on the role of the 'global relational mobilities' occurring in networks through which policies emerge and travel, but with a recognition of the importance of spatial nodes in which these networks are anchored. In fact, these 'sociospatial nodes within global circuits of policy knowledge' (McCann, 2011, p. 111) are fluid and shifting. It is where policy knowledge is produced, modified and reinterpreted as it travels across space. These spaces are often cities, but also the less tangible spaces of policy travel, co-presence and learning, such the spaces of fact-finding trips and study visits or conferences and seminars where policy actors meet and exchange (McCann, 2011, p. 118).

Table 1 below summarises the key strands of theory on knowledge transfer and related concepts, while Table 2 summarises the key 'takeaway messages' from these bodies of literature. The following section outlines how REPAiR's approach to knowledge transfer builds on these concepts.

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Concept	Discipline	Authors	Interest	Focus
Knowledge transfer	Organisation studies / regional studies	Argote et al. 2000; Argote and Ingram, 2000; van Wijk et al. 2008, Inkpen and Tsang, 2005, Cooke and Morgan 1998, etc.	How knowledge is transferred across organisational boundaries within or between firms; translation of ideas rather than copying	Process
Policy diffusion / convergence	Political science, planning	Bennet, 1991; Knill, 2005; Healey and Upton, 2010, etc.	How policies spread by osmosis or contagion	Adoption pattern
Policy transfer	Political science	Dolowitz and Marsh, 2000; Evans, 2009, etc.	How is transfer of policy taking place pro-actively (voluntary or coercive), what is being transferred, and when it can lead to policy failure	Content, process, agency
Lesson-drawing	Political science	Rose, 1991, 1993, 2004	Under what circumstances and to what extent can a programme that is effective in one place transfer to another	Content, process
Policy learning and translation	Political science	Dunlop, 2009, Stone 2012, etc.	How do policy actors learn from abroad; who facilitates this; how the foreign practice is translated to fit the domestic context; how policy transfer networks facilitate learning	Process, epistemic communities and networks, translation and learning dynamics
Policy mobility	Geography	Ward and McCann, 2011; McCann, 2011, etc.	Linking global circuits of policy knowledge to local policy practice, politics, and actors	Process, agency, context, spaces

Table 1. Knowledge transfer and the related concepts
Source: Own contribution

Developing an in-depth understanding of both 'sender' and 'recipient' contexts;

Paying attention to what aspect of a solution is being transferred and how to 'translate' it locally;

Operationalising transfer activities in an iterative network setting, with opportunities for interaction and first-hand experience of the 'sender' context;

Providing practical guidelines on effective knowledge transfer:

The 'how' question: identifying general barriers; critical contextual differences; and channels to ensure transferability of eco-innovative solutions;

The 'what' question: understanding of a solution in its context and identifying which aspects of it are universal and which place-specific;

The 'who' question: engaging research and practice stakeholders from both 'sender' and 'recipient' contexts in iterative workshops to facilitate an understanding of how solutions emerge, enact knowledge co-creation and promote strategic translation in the process of transfer.

Table 2. Key lessons from the literature for knowledge transfer in REPAiR
Source: Own contribution

After identifying the major gaps in the literature on knowledge transfer and the theoretical and practical limitations of transferring policies and practices across space, one should ask how to overcome those. REPAiR endeavours to conceptualise and operationalise knowledge transfer by using the living lab approach, as outlined in the next section.

2.6 Living Labs as method for knowledge transfer

A network of six Peri-Urban Living Labs (PULLs) will provide a platform for knowledge transfer across the project's case study regions. Living Labs, as organised in REPAiR, offer a fertile soil for such an endeavour as they "have been recognised as successful instruments for speeding up the innovation process, co-

creating and improving innovative ideas, investigating and creating business opportunities for different case study areas" (REPAiR 2017c, p.10).

Based on the open innovation paradigm, the use of external as well as internal resources increase firms ability to innovate (Chesbrough, 2006). The involvement of end-users (as external resource/actor) in the innovation process is ensuring useful and useable products and services that was further elaborated in the lately emerging paradigm called Living Lab (Bergvall-Kåreborn et al. 2009).

Living Lab is widely used for - user-centric (van Geenhuizen, 2018) innovative planning process started to emerge around Europe in 2000 (Lepik et al., 2010; REPAiR, 2017c). The concept has grown, spread out in Europe and in the world creating networks (cf. REPAiR, 2017c) and providing a platform/methodology for knowledge/innovation co-creation (open innovation), validation and test (Lepik et al., 2010). Living lab brings the users/consumers/citizens into the system of innovation, thereby leveraging on a larger mass of ideas, knowledge and experiences etc. and substantially boosting the innovation capability' (Eriksson et al., 2006, p.1.).

Science, policy and society are often far to understand each other. The different knowledge, language and institutional framework in use, the different perception of a challenge hamper a barrier to understand each other (for instance see Driessen et al., 2010, for an overview on science-policy interaction). However, 'joint knowledge production' (or knowledge and innovation co-creation) - which is the key aspect of Living Lab - can bridge the gap between science, policy and the (local) society, allowing exchanges, co-evolution and joint construction of knowledge with the aim of enriching decision-making (van den Hove, 2007, Hegger et al., 2012).

Besides the transfer of an EIS/knowledge co-created (or joint knowledge production - cf. Hegger et al., 2012) in one (PU)LL to a foreign (PU)LL, Lepik and colleagues (2010) underline the importance of transfer of LL as a method (in their case from Helsinki to Tallinn). Lepik et al. (2010) see living labs as an innovation to be transferred where technology, ideology, knowledge, institutional cooperation experience, and ways of thinking and acting needs to be transferred and taken into consideration (Lepik et al., 2010, p. 1093).

3. From knowledge transfer to interregional knowledge co-creation: the REPAiR approach

3.1 REPAiR knowledge transfer goals

The goal of knowledge transfer in REPAiR, as envisaged in the grant agreement, is to ensure that eco-innovative solutions and strategies are compared across the six REPAiR case study areas and beyond. More specifically, the aim is to facilitate the generation of knowledge to be transferred through deliberation and collaboration between stakeholders from different regional contexts within the network of REPAiR's PULLs (see D5.1). Moreover, a methodology for choosing the most effective and appropriate knowledge transfer channels, tools and processes across peri-urban areas with differentiated characteristics is elaborated, with the underpinning aim to avoid transfer failure and provide a knowledge transfer 'toolkit' to be used beyond the REPAiR project. At the same time, however, the unique setting for knowledge transfer in REPAiR, based on a network of six urban living labs, allows for experimenting with and rethinking this process by putting forward the notion of co-creation of knowledge by stakeholders from the various regions involved in this network. Hence, knowledge transfer in REPAiR can be conceptualised not merely as a process of shifting solutions from one region to another, but rather as an iterative and co-creative process of knowledge co-generation.

3.2 REPAiR knowledge transfer approach: bridging the gaps

This approach draws on a combination of insights from the critical review of knowledge transfer literature, that on policy transfer and from knowledge on policy mobility.

First and foremost, knowledge transfer activities in REPAiR will put a strong emphasis on unpacking the context, both the recipient and the host, thus responding to the calls for more careful consideration of the context in studying knowledge transfer. In order to ensure a deeper understanding of the context, REPAiR draws on Matthiesen's work (2005), who considers knowledge as a practice that is determined by a structure, processes and environments that unfold in specific contexts and advocates a focus on 'KnowledgeScapes' to analyse case-specific hybrid mixes of different knowledge forms.

On this basis, and considering a urban metabolism perspective, an in-depth analysis of the context(s) for knowledge transfer in REPAiR will be ensured through the prism of four 'scapes', referring to different aspects of knowledge which manifest themselves in the case study areas:

- Governance scape: referring to the characteristics of the national and sub-national institutional systems in which the stakeholders operate. The analysis of this 'scape' will draw on the insights from WP6 in which decision-making landscapes in case study areas are analysed.
- Socio-cultural scape: referring to the social and cultural characteristics that affect the behaviour of actors vis-à-vis waste, drawing predominantly on the inputs from WP3, investigating socio-cultural characteristics of the case study areas, but also on those from WP2 where Geodesign exercises will take place and WP5 where PULLs will be organised.
- Technological and eco-innovative scape: referring to the characteristics determining the capacity to generate new technologies and eco-innovations, drawing mainly on the insights from the operation of the PULLs in WP5.
- Metabolic scape: referring specifically to the spatial characteristics that shape metabolic flows in the area. The analysis of this scape will rely on the inputs from spatial analysis, material flow analysis and modelling carried out in WP3 and WP4.

It is worth to note here that REPAiR will seek to find a middle ground between an approach in which knowledge from one place is adapted to fit in recipient context and the opposite one, in which knowledge transfer seeks rather the adaptation of the recipient context to the knowledge, which is done through standardised practice (Yakhlef, 2007). In our approach the in-depth analysis of both the 'sender' and the 'recipient' contexts will allow for selecting the most suitable solutions, or theirs aspects, for drawing lessons from. At the same time, however, REPAiR will seek to standardise the procedure for knowledge transfer by providing a robust methodology for it, explained in an accessible online handbook (D7.2).

Moreover, the method for generating eco-innovative solutions and implementation strategies through PULLs and transferring them across the six case study areas has created a scope for overcoming several of the barriers and shortcomings associated with learning from abroad, as highlighted in the policy transfer and policy mobility literature. The PULLs have[1] entailed knowledge transfer events (workshops) bringing together the relevant stakeholders as part of the living labs in six case study areas as well as representatives of stakeholders from other REPAiR case study areas. These workshops played a triple role. First of all, through participatory observation of the operation of the living labs one can identify the main peculiarities of knowledge transfer, analysing the dialogue and exchange of knowledge between stakeholders with different territorial, disciplinary and socio-cultural background. This allowed for empirically testing some of the assumptions made in the literature on transfer networks and policy mobility, while at the same time informing the practice of transfer in REPAiR (cf. methodology and outcomes in Dąbrowski et al. 2009). Second, workshops have enabled a discussion on the knowledge transfer itself, i.e. how to operationalise in a way to maximise the scope for meaningful learning from other cases. This has informed the creation of a knowledge transfer methodology and the related handbook (of D7.2). Third, the workshops have provided a forum or a 'relational

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[1] Recently (24.02.2020 - version 2.1), PULLs' so called knowledge transfer events were organised successfully.

space' (Peck, 2011) for interaction and knowledge co-creation between stakeholders from various case study areas, thus not only facilitating knowledge transfer from one region to another, but also generation of new knowledge in this networked setting. Knowledge transfer events have not only promoted an exchange of knowledge across cases but also co-created new ideas and solutions through joint discussion (see the outcomes in D 5.2, D5.3, D5.5, D5.6, D5.7, D5.8 - EIS catalogues of the six case study areas) on the techniques and solutions to solve resource management problems, and their possible spatial implementation and fitness for wider regional circular economy strategies. This has been complemented by knowledge transfer-focused workshops (KT events) taking place at REPAiR consortium meetings, where representatives of stakeholders involved in the project are expected to participate and take part in generation of new knowledge and insights while discussing ways to transfer solutions between case study areas

PULLs as a method for knowledge transfer tick many boxes with respect to the shortcomings of policy/knowledge transfer identified in the literature. To begin with, by focusing on the regional scale in PULLs and facilitating the interaction of stakeholders from various regions, the REPAiR's approach to knowledge transfer avoids 'methodological nationalism' (Stone 2004, p. 549), whereby the focus is on the states as agents of transfer rather than on the transfer networks that may operate as part of state institutions but also beyond them. In the case of REPAiR, the focus is firmly on co-creation of knowledge through interregional interaction in the living labs.

Moreover, by analysing the 'sender' and 'recipient' contexts and engaging stakeholders from various sectors and from different case study areas, REPAiR responds well to the calls for more culturally and socially-constructed perspectives on learning across national boundaries (Dolowitz and Marsh, 2012; McCann and Ward, 2012). Furthermore, echoing the concerns expressed in the policy mobility literature (McCann, 2011; McCann and Ward, 2012), REPAiR spatialises knowledge transfer by emphasising the six peri-urban focus areas where PULLs and the transfer events will take place. Thus, knowledge transfer in REPAiR operates in a network of stakeholders that is 'moored' to specific spatial nodes, in our case, the six peri-urban regions. It is in those nodes that solutions and implementation strategies will be generated and transferred to other cases, with translation into another context taking place in the PULLs, thus responding to the suggestion made by Stone to consider the policy translation process rather than just shift from A to B (2012).

Responding to the need to go beyond copy-pasting of international 'best practice', REPAiR will seek to extract the transferable elements of policy knowledge and translate them into local contexts, while discarding what is not transferable (see Rose, 2004; Stone, 2004). By doing so, REPAiR will respond to the criticism of policy transfer for its insufficient consideration of what is actually transferred and why.

What is more, because PULLs will generate the knowledge (eco-innovative solutions) to be transferred through collaborative processes, they will allow for

gaining a very good insight into how the practices emerged, what was the process that led towards them, what were the potential difficulties and u-turns – in other words, the knowledge on the solution to be transferred will be more complete (see Stead, 2012). By drawing on the insights from knowledge transfer in PULLs, REPAiR will also be able to add to the literature by drawing conclusions from the observation of how a given solution 'travels' and how it is 'translated' locally. This in turn will allow for a better understanding of what makes a transfer successful or even possible and what are the barriers for this process.

REPAiR will also echo the concerns of the policy mobilities scholars for exploring how knowledge is produced, modified and interpreted in networks of policy actors which are 'moored' in spatial nodes (our case study areas), which will be operationalised and experimented with in PULLs. The latter will thus provide a platform for 'knowledge brokering' between the stakeholders from the different case study areas. This thinking about transfer as a process taking place in a network with spatial nodes will be developed and turned into a practical tool not only for transfer of knowledge but also for its co-creation. This in turn will equip the participants with tools to tackle the complex realm of circular economy and its spatial implications. By operationalising knowledge transfer in PULLs, where knowledge will be (co-)created and exported through an iterative process of exchange between the various stakeholders, one will also be able to respond to the critique of the policy transfer literature (see McCann and Ward, 2012) for its limited attention paid to the agency, to the interests and agendas of the actors involved in transfer networks. It will also explore the potential for stimulating interregional knowledge co-creation in a set of place-specific, yet interconnected, living labs.

4. Theoretical model of knowledge transfer

4.1 Possible channels and barriers - Lessons drawn from initial REPAiR WP7 investigations

As extensively described in the second chapter, there is a sprawling literature from a wide range of disciplines on (policy) learning, lesson drawing and the transfer of new ideas. The significance of contextual factors in transformation is discussed and focus is on what 'context' means and how it is understood in the REPAiR project. In order to select what is proper for REPAiR's goal (chapter 3), some preliminary empirical investigations were conducted. Based on their findings, section 4.1 briefly presents the most relevant elements needed to elaborate the theoretical model (section 4.2) and the theoretical expectations (section 4.2.4) for knowledge transfer of eco-innovative solutions for boosting circular economy.

Based on the first empirical investigations, participatory observations, interviews and surveys (see also Dąbrowski et al., 2019, pp 54-56), REPAiR attempts to revisit and validate the theoretical approaches to knowledge transfer and amend them. These amendments are based on preliminary findings at an early stage of the PULL process, thus they have to be revisited in a later stage of the REPAiR project, in the light of the insights from the knowledge transfer events. Shedding more light on the circumstances in which EIS transfer (between case study areas) takes place will thus require additional empirical investigation. In section 4.1, firstly an attempt is made to describe the potential channel for learning and transferring eco-innovative solutions, while the sub-section afterwards describes the main factors that can hamper or facilitate the travel of EIS from one case study to another.

4.1.1 Preferred channels for learning EIS

Several research works are investigating transfer channels, mostly focusing on firms or on university-industry interactions, and as it was pointed out above, the origination of the notion of knowledge transfer is also related to the firm (Argote and Ingram, 2000). In these relations, publications, conferences, informal information exchange and consulting are very important (e.g. Cohen et al., 2002), especially in R&D intensive industrial activities. However, various channels of knowledge transfer are not related to a sector as such (Bekkers and Bodas Freitas, 2008). In the literature university-industry interaction is discussed from the point of view of preferred transfer channel (including the emphasis on open innovation (cf. e.g. Perkmann and Walsh, 2007). Another interesting argument (from the point of view of this deliverable) is the communication (and knowledge co-creation) between public sector and science. As it was mentioned above (section 2.6.) a living lab can be a potential channel for that (see again Driessen et al. 2010,

van den Hove, 2007, Hegger et al., 2012). More specifically, it can bridge the gap between the different knowledge types hold by scientists, policy makers and public actors (see section 2.5).

The first investigations in REPAiR project suggested that best practice copy-pasting is not a 'winning strategy,' which is also in line with the insights from the literature (Stead, 2012). Instead, the stakeholders emphasised the importance of adapting a solution from abroad to the local context. Furthermore, as Marino and colleagues argued, 'working in close physical and psychological proximity with colleagues can affect the rate of knowledge accumulation of an individual due to his or her exposure to the pool of skills, attitudes to decision making and problem solving and, more generally, the cognitive ability and experience of others. In this context, co-workers represent potential sources of knowledge and information at the individual's disposal that differ from the (usually task-specific) knowledge acquired directly through on-the-job-training and learning-by-doing practices' (2016, p.169). Building on this argument, a living lab also allows for going deep into the 'know-how' and 'know-who' questions, revealing up the elements of tacit knowledge.

A more important gap to bridge in the REPAiR project, however, is the transfer of this tacit knowledge from region A to region B (where region A and region B have very different social contexts, culture, language, legislation, etc.). A solution for that can be the 'cross-over' participation of the stakeholders from the different regions involved in the activities of the six PULLs. The hypothesis that has been tested during the PULLs and their knowledge transfer events is that there is a moderate potential to transfer the informal, uncodified knowledge with cross-over participation in PULL activities. The network of PULLs have provided a platform for knowledge transfer and learning in eco-innovation while knowledge is being co-created among stakeholders, providing a degree of insight into the tacit aspects of that knowledge. The 'cross-over' participation of stakeholders in this co-creation process has created scope for socialisation processes among the participants and for emergence of shared understandings, which are considered to be the mechanisms through which tacit knowledge is normally produced (see section 2.1).

In the above cited works (e.g. Rose, 2004; McCann, 2011), an attempt is made to identify the right source of 'lessons-drawing' (or policy mobility), that is learning through 'fact-finding trips' or study visits abroad. In line with that, several stakeholders in our CE-related investigations (see D7.2) pointed out the importance of field trip/study visits as a significant channel for learning eco-innovation. Although, field trip/study visit is known as 'fact-finding' learning (the explicit knowledge), from the point of view of REPAiR project (based on the first empirical findings), the focus would be on the learning on the 'milieu', namely the visited region's social context (see Gertler, 2003). In other words, this is a possibility to gain insight into the situational/tacit knowledge present in another region.

Having outlined the potential channels for knowledge transfer, it is worth to consider the potential barriers face during the transfer process. These are

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outlined below, drawing, partly based on the first empirical investigations, complemented by insights from the literature on explicit and tacit knowledge.

4.1.2 Language

One could say that language is a 'dummy' barrier in learning and knowledge transfer, especially when the knowledge is travelling between different language cultures. However, in the REPAiR case, there are some differences regarding language barriers. For instance, while in Amsterdam REPAiR could organise a PULL event with stakeholders in the English language, in other cases one faced difficulties with the English skills of some of the stakeholders. Thus, in the Eastern and Southern European cases, namely Naples, Pecs and Łódź, it may be more challenging to organise proceedings at PULL workshops in English due to less wide-spread knowledge of English.

4.1.3 Disciplinary background

Interpersonal exchanges between co-workers can arise in a knowledge pool of a firm (Battu et al., 2003; Marino et al., 2016). In this sense, PULL events can be likened to a firm where co-workers exchange their knowledge. As mentioned above, heterogeneity of the actors involved in knowledge transmission and sharing is highly important (Marino et al., 2016). Lazear (1999) in his theoretical prediction argues that (labour) diversity in terms of educational background is productivity enhancing. Consistently with it, Marino et al. (2016) based on empirical investigations emphasis that diversity in education is significantly and positively associated with (firm) productivity. Our first investigations in PULL events underpin the above findings in our situation, and it seems that PULL workshops can work as firms in this sense: EIS in REPAiR's understanding (see details in REPAiR, 2017c) can be a product but also a process, hence multidisciplinary stakeholder involvement in PULL events is necessary. It means that diversity of *education in disciplinary sense is a facilitator of knowledge transfer* (and co-creation) in our case, even if working across disciplinary boundaries can be a challenge as such.

4.1.4 Geography (of metabolic flows)

Geographical peculiarity, or in other words, the difference between geographical locations and their geographical circumstances/situations matters (cf. geographers approach on policy mobility above). One of the major criticism of research on sustainability transitions[2] is its lack of geographical dimension. On

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[2] As argued by Johnstone and Newell, 'sustainability transitions is an emerging field of research that has produced both conceptual understandings of the drivers of technological transitions, as well as more prescriptive and policy-engaged analyses of how shifts from unsustainable to sustainable forms of production and consumption can be achieved' (2018, 72). In other words, 'sustainability transition is a 'long term, multi-dimensional, and fundamental transformation towards more sustainable modes of production and consumption' (Markard et al., 2012, 955 in Yu and Gibbs, 2018, 70).

the other hand, the majority of its literature focuses on the national level, while the role of cities and regions is relatively neglected (Yu and Gibbs, 2018). A first investigation indicates that wastescapes are very much place-specific and it is hard to find anything to transfer, beyond the more general idea behind the solution, such as the future function of the reused wastescape. For example, reuse of wastescapes for water management, discussed for the Amsterdam Metropolitan Area (AMA) relies on the very Dutch-specific water system management that does not exist elsewhere. On the other hand, redevelopment solutions of abandoned greenhouses in Amsterdam are not relevant in Naples due to the climate differences.

4.1.5 Socio-cultural differences

In the case of REPAiR, several reasons are laying upon the different agents' understandings and behaviours related to ecological sustainability and more specific natural environmental aspects that are deeply embedded into certain, collectively accepted, respected and followed social values, norms, rules, conventions, customs and attitudes. Accordingly, these social patterns influence the agents' way of thinking (perceptions and interpretations, i.e. concepts) and way of doing things (i.e. praxes) about environmental challenges. It is important to note that 'agent' in this research refers to both involved stakeholders (decision-makers, experts, experience-holders, etc.) and any member of the general population. Therefore, the aforementioned hypothesis is assumed to be true regarding to expert and lay knowledge-holders as well (REPAiR, 2017b). From the viewpoint of knowledge transfer, it means that one should take into consideration waste sensitivity[3] of a given agent while transferring the EIS. Waste sensitivity or environmental awareness might filter the mode of transfer. An agent with high environmental awareness can accept an EIS easily; on the other hand, an agent with low waste sensitivity can hamper the introduction of an EIS as he/she cannot see the environmental benefits of it. In this case, adaptation might include a marketing activity that emphasises the environmental (and maybe the economic) benefits for an easier adaption.

Schumacher (2015) draws our attention to another role of culture and says that environmental culture is endogenously determined. Using the tools of environmental economics, he argues that "For low wealth levels, society is unable to free resources for environmental culture. In this case, society will only invest in environmental maintenance if environmental quality is sufficiently low. Once society has reached a certain level of economic development, then it may optimally invest a part of its wealth in developing an environmental culture. When environmental quality and wealth are both sufficiently large, then society may find it optimal to temporarily over-invest (vis-à-vis its steady state level) in environmental culture. This is optimal until environmental quality is decreased to a level from which onwards it is important for society to also invest in maintenance. In other words, if there is no urgent need for society to improve

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[3] Waste sensitivity (a type of environmental awareness) refers to waste-conscious behaviour (See more details in REPAiR D3.2.).

environmental quality, then society will either invest in environmental culture if it can afford to do so, or not invest in case it is too poor.

4.1.6 'Other' socio-political phenomena

There are other social phenomena that can influence the transfer/adaption of an EIS. 'Not in my backyard' phenomenon (NIMBY) is one example. However, this phenomenon is not place-dependent in our sense, as it does not relate to any of the case study areas or culture, or country. NIMBY can be seen as a general barrier of EIS transfer/knowledge transfer and can emerge in any place.

However, there is a similar phenomenon to NIMBY that can be place-specific in our understanding. Evans (2009) – as it is described above - stressed 'public opinion' as an obstacle where opposition to transfer of *foreign* policies may come from elite opinion and the media. This might be a real danger for hampering EIS transfer in the recent Hungarian situation (see the details about the recent continuously changing and unpredictable institutional and governance situation in Hungary in D6.2 Governance and Decision-Making Processes in Pécs, REPAiR, 2017d).

4.1.7 Legal aspects

Discrepancy in legislation between two different places/countries seems to be an obvious barrier for EIS transfer (e.g. barriers in legislation on building and land development in the recipient study area while the transferring EIS is relating to (re)-building). However, knowing the legislation, it is easy to modify the given EIS and to adapt it in another place. What is problematic and can create more barriers is the unpredictable and continuously changing legislation. This situation - namely the continuously changing responsibility of the treaty of waste type/resource (like plastic) - in Hungary recently can cause defects in waste management (see in details in D6.2, REPAiR, 2017d), and therefore can cause unpredictability in 'receiving EIS', new ideas and new knowledge.

Furthermore, delay in adoption of a legislation (e.g. adoption of an EU directive) can hamper a prompt adaption of a particular EIS. On the other hand, the different understanding of adoption of an EU directive can also have a (negative) effect on the transferability of an EIS (cf. Varjú, 2014).

Ockwell et al. (2010) pointed out the Intellectual Property Right as another crucial legal aspect of (technology) transfer that is a key barrier of technology transfer and deployment (in developing countries).

Theoretically, one has to face another legal barrier. In the case of the early stages of development (of a technology or an EIS), the legal status and legislative circumstances might not be elaborated (cf. a popular example is the case of Uber and recipient country legislation, where Uber started to provide the service, however, the legislation just follows the peculiarities of service - (i.e. follow-up legislation). This can constitute an obstacle to the transfer.

4.1.8 Governance and decision-making

Having regarded governance (mainly focusing on environmental governance[4], but not solely), based on our first empirical insights, different modes of governance can influence the transferability. Concerning Matthiesen (2005) in environmental decision making - as a common knowledge constellation - a gap can be find between expert knowledge, scientific knowledge and technical knowledge (cf. Matthiesen 2005) on the one side and local or everyday knowledge on the other. This gap may be closed by decentralized and participatory procedures. Frank Fischer calls this procedure of creating and accessing local knowledge "participatory inquiry" (Fischer, 2000, Ch. 11 in Heinelt et al., 2006, p. 7). Both PULL and knowledge co-creation process have to face this. Moreover, based on our first insights, institutional knowledge is also unavoidable to bear, especially in the Hungarian case where the institutional system is in continuously changing.

Heinelt et al. (2006) argues that 'governance arrangements' are made of bundles of rule systems[5] which each has a distinct influence on the combination, application and the *trading/transferring of knowledge* (Heinelt et al., 2006, p.7). Heinelt et al. (2006) propose a broad and extended concept and typology of governance forms 'to include public and private, hierarchical, competitive and network forms of action coordination' (Heinelt et al., 2006, p. 26). They distinguish 1) Hierarchical; 2) Non-hierarchical networks by bargaining; 3) Non-hierarchical networks by arguing; and 4) Market (governed by the 'hidden hand') types of governance forms (Heinelt et al., 2006). One could argue that these types of governance forms formulate not only the reflexive knowledge (co-creation of knowledge) but play important roles in knowledge transfer. Our hypothesis is that for a successful knowledge (EIS) transfer, a similar set/mix of governance arrangements should take place in place A and B. This means that an EIS (rather if it is a procedure) elaborated in a hierarchical governance arrangement can be easily adaptable in a country/region with a similar hierarchical governance arrangement rather than one with a bargaining-based network governance. In this sense, before transferring an EIS, one should face the structure – actually the concrete mixture - of the governance arrangement of the 'sender' and 'recipient' cases.

Another important issue (partly – but not solely - derived from the typology of governance arrangements) is the level(s) where decisions are made in the related field. (The level of decision-making can touch the elaboration of the EIS). For instance, in the AMA case a crucial aspect with regards to the governance of waste management is spatial law and policy. In the Netherlands, the Spatial Planning Act (Dutch: Wet Ruimtelijke Ordening, WRO, introduced in 2008, De Minister van Justitie, 2016) sets down how the spatial plans of the state, the provinces and municipalities are to be prepared and implemented (Government of the

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[4] The concept of environmental governance is closely related to 'the processes of collective decision-making that are deployed to protect the environment and resolve conflicts over natural resources' (Tacconi, 2011; Paavola, 2007; Driessen et al., 2012, Van der Molen et al. 2016, p. 436)

[5] Based on IAD-Approach of Ostrom (1999)

Netherlands, 2017). The WRO marks a change towards more decentralisation and deregulation of planning powers in a number of fields, most notably infrastructure and the environment. Spatial planning decisions are made at the national, regional and local levels and are accompanied by more flexible spatial visions and policy changes that have replaced planning decisions (national government), regional plans (province), and structure plans (municipalities) (REPAiR, 2017a). In order to use an EIS co-created within these governance structures in another region, the transfer process requires a careful attention of whether there is a suitable governance arrangement in place in the 'recipient' region and what is needed to adapt the solution to the local governance context. For instance, when there is a need for a decision at a waste management company while the decision-making level is at central governmental level, modification of the EIS in this respect may be needed.

The differentiation in decision-making levels can raise other important questions: *who are the main actors*? *Are their categorisation similar*? For instance, due to a new Hungarian legislation, ownership of the waste management companies must belong to at least 51% to a public actor (state or local governmental). It means that the decision-making level (whether to adapt an EIS within the waste management company) can be transferred to the local government or to the state government. It suggests to us that an EIS created in a (mainly) for-profit waste management company not necessarily can be copy-pasted for a Hungarian waste management company due to the different decision structure, and vice versa.

Actors' role in decision-making is crucial. Especially, if their roles are changing due to a perturbation. As a result of the global financial crisis, the majority of Dutch municipalities have become more conscious about the financial risks involved with active land development policies and have readjusted their land policies in favour of a more facilitating role (Heurkens and Hobma, 2014; Van der Krabben and Heurkens, 2015). This has allowed for more private sector-led urban development (Heurkens, 2012), in which private and civic initiatives play a more significant role in spatial planning (REPAiR, 2017a).

4.1.9 Technological aspects

Ockwell et al. (2008; 2010) pointed out the importance of (horizontal[6]) technology transfer[7] between developed and developing countries (with the case of low-carbon technology). The main aim of low-carbon technology transfer is to cut down the 'peak' of the Environmental Kuznets Curve[8] since one does not need to wait for achieving a higher GDP level in order to achieve lower emissions. However, 'the different stages of development of low carbon technologies, from research and development (R&D) through to commercial diffusion, introduce new and unique barriers, opportunities and policy challenges which are not yet properly understood' (Ockwell et al., 2008, 2012, p. 729). Technology (as an EIS) transfer cannot be an evident solution of learning (with economic or other benefits). Technology can be transferred in case of similar 'environmental culture'. In our case, it means that – for instance – a Dutch solution of disposal of residual waste with a major incineration (and the incinerator technology transfer) towards Hungary is not unambiguous, as in the Hungarian 'environmental culture' incineration is not a preferred technology. RDF/SRF[9] section separation for burning (especially in cement factories) is common, but incinerating residual household waste is facing major opposition, both from the household and from the environmental expert sector.

Ockwell et al. (2008) draw our attention to another insight – levels of integration[10] in the transfer process - relating to technology transfer, that might be interesting in our case as well. They say, that "less integrated technology transfer arrangements [...] are more likely to involve knowledge exchange and diffusion through recipient country economies. The lower the level of integration, therefore, the greater the chance that technology transfer will contribute to developing technological capacity within recipient countries. In the long term, knowledge related to more integrated technology transfer activities may eventually diffuse through recipient country firms, but this may not be commensurate with the urgency of the need to encourage the uptake of low carbon technologies[11] in developing countries" (Ockwell et al., 2008, p. 4113).

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[6] The transfer from one geographical location to another

[7] '…a process by which expertise or knowledge related to some aspect of technology is passed from one user to another…' (Schnepp et al. 1990, p.3)

[8] 'The main idea behind the EKC is that the relationship between income and pollution is inversely u-shaped. This means that poorer countries increase their wealth by living off the environment, while when they get richer their economic growth may decouple from pollution' (Schumacher 2015, 214).

[9] Refuse Derived Fuel/Solid Recovered Fuels

[10] The level of integration refers to the extent to which technology suppliers integrate the different flows involved in the transfer process (flows A–C in Fig. 1). For example, the transfer of technology might be highly integrated (e.g. involving some form of turnkey project), or highly disaggregated (e.g. via the acquisition of different items of plant from a wide range of host country equipment manufacturers) (Ockwell et al. 2008, p. 4110).

[11] Ockwell et al. (2008) focus on low carbon technology in this paper.

4.2 Towards a theoretical model of knowledge transfer

The aim of the knowledge transfer theoretical model for REPAiR is to conceptualise the actors of transfer and their roles ('who' should transfer), the process of transfer through interactions between those actors ('how' to transfer), and its content ('what' should be transferred). The model will underpin the knowledge transfer methodology and guide its implementation. Critically, it also allows for formulating expectations on (1) the relations between transferability of solutions and the degree to which they are rooted in the context from which they emerge; (2) the scope for transfer of the different elements of solutions in relation to the proximity between 'sender' and 'recipient' contexts; and (3) the role of knowledge co-creation through engagement in the network of PULLs as part of REPAiR for the process of transfer, learning across the stakeholders involved and the translation of solutions across contexts.

4.2.1 'Who:' knowledge transfer within the 'relational space' of the PULLs

To reiterate, in the REPAiR project, knowledge transfer goes beyond the mechanistic copying of a practice from one place and pasting it in to another. The focus is on 'what happens in between,' i.e.:

- on co-creation of knowledge through interaction between stakeholders from different areas;
- and on processes of learning and translation of solutions to ensure that they remain suitable for the 'recipient' context.

Thus, our approach is close to that advocated by policy mobility literature in the field of geography, which considers transfer not as a 'sequential diffusion'- whereby a solution emerges in a given place and then later is picked up and imported by actors elsewhere - but rather as a 'relational connection' through which actors from different places interact with and learn from each other, leading to a 'mutation' of the original solution as it 'travels' across space (Peck, 2011; also see Figure 1 below).
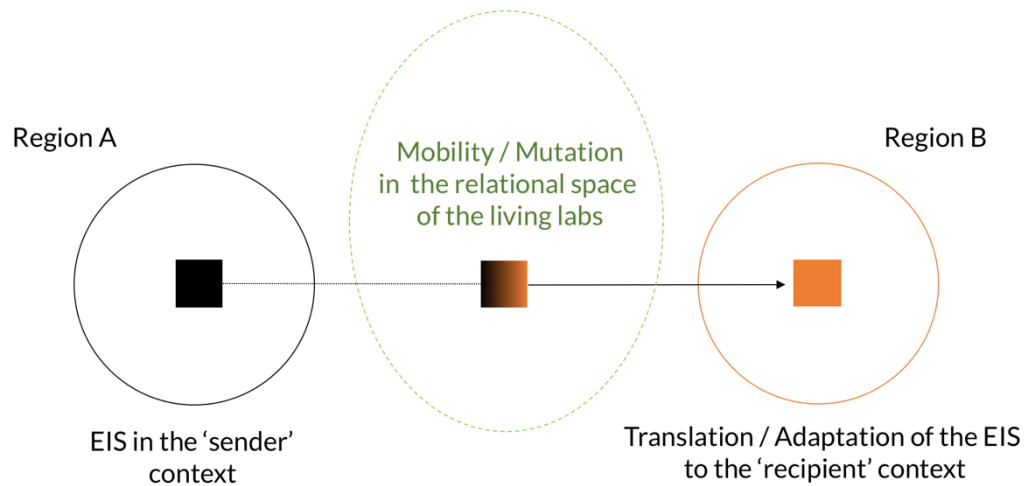
Fig. 1 Knowledge transfer in REPAiR putting emphasis on mutation of solutions in the 'relational space' between case study areas and their translation to fit the local context
Source: Authors, elaborated from Peck (2011)

In the 'relational space' between the 'sender' and the 'recipient' and other locations, in which stakeholders from different places interact, network and learn from each other, solutions are modified, adapted or even co-created. In REPAiR, this theoretical model of mobility of solutions across space is operationalised and tested in the network of the six PULLs (see Figure 2 below), providing such a 'relational space' for knowledge transfer. It is important to note, that it refers not only to the physical meetings between stakeholders at PULL workshops, but also to the wider interactions between the stakeholders throughout the PULL process during which partnership- and trust-based relations between them are expected to develop.
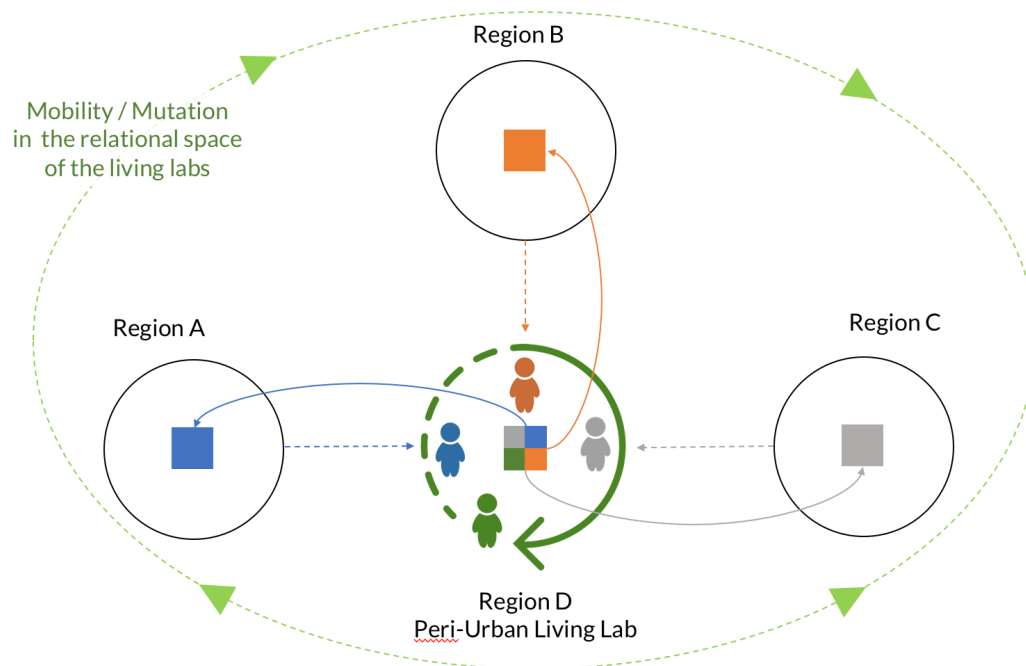
Fig. 2 Co-creation and mobility of Eco-Innovative Solutions in a network of living labs (Authors)

The methodology for this learning and knowledge co-creation activity identifies the channels for transfer (interactive activities and knowledge transfer events in PULL workshops, field trips) and methods for stimulating exchange, learning and interregional knowledge co-creation as part of those (participation of stakeholders from different regions in PULL workshops, discussions on transferability of solutions to feed into the process of elaboration of EIS, using EIS cards and posters, knowledge transfer events).

The participants of the knowledge transfer involved stakeholders from the REPAiR's six case study regions involved in the network of PULLs. It is important to note here, that in the process of transfer, the boundary between 'sender' and 'recipient' stakeholders is somewhat blurred. Thus, the process of transfer is structured around PULL workshops during which 'guest' participants from other regions also take part. In the context of such a workshop, the main participants are 'local' stakeholders, representing the local / regional / national governments, key actors for the relevant material flows from the public and private sector (e.g. waste management, construction, food production or processing), representatives of the civil society organisations from a given region, and experts in the relevant fields (academic or not). There are also, however, participants hailing from the other PULLs (mainly representing the different REPAiR partners) whose role is double: (1) to 'bring in' solutions or inspiration from their own regions, feeding into the process of co-design of EIS; and (2) to 'take solutions home' to their own PULLs, to feed into the EIS co-design process in them. Thus, both kinds of participants play the roles of 'donors' and 'recipients' of knowledge. Those roles are blurred in the process of interregional learning and knowledge co-creation taking place during the exchanges in PULL workshops.

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In addition to the stakeholders from the different regions, the important actors of the transfer are the facilitators of knowledge transfer, organising and animating the exchange and learning processes in the 'relational space' of the PULLs. In the REPAiR project, these actors are researchers representing the REPAiR's WP5 and WP7 teams, in charge of, respectively, the organisation of the PULL process and of the knowledge transfer activities within them.[12]

4.2.2 'How:' conceptualising the barriers for knowledge transfer

The channels for transfer and the process of interaction among the stakeholders from the different regions in the network of PULLs is structured by the abovementioned knowledge transfer methodology, however; to shed more light on the 'how' question, it is also important to outline the potential barriers for knowledge transfer. This in turn allows for reflecting on the means to mitigate them and taking informed decisions on transferring a given solution (or in some cases avoiding transfer altogether). The table below summarises those barriers along two categories – contextual barriers specific to the 'sender' and/or 'recipient' regions and process barriers related to the transfer activity itself. The typology of barriers is based on the abovementioned literature and our observations of the early stages of the PULL process.

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[12] It has to be acknowledged here, on the basis of the first experience with the 'cross-over' participation of stakeholders from other regions in the PULL workshops in Amsterdam and Naples, that integrating 'guest' from other regions in to discussion on the challenges of the 'host' region and the possible solutions to them cannot be taken for granted. It requires a degree of preparation (previous knowledge of the 'host' region context and its stakeholders) and clarification of the role of the local and 'guest' stakeholders in the proceedings.

	Barriers	Examples
Contextual	Legal	Solution based on specific national laws and regulations
	Governance and decision-making	Solution based on place-specific governance arrangement or planning practice
	Socio-cultural	Solution requiring high degree of engagement of citizens in reduction of waste or is incompatible with the 'environmental culture' of a place shaping preferences towards certain solutions
	Political	Reluctance towards 'foreign' solutions, NIMBY is with respect to waste processing facilities
	Technological	Solution based on advanced technological infrastructure or processes
	Geography of metabolic flows	Solutions addressing a material flow problem that is specific to a given territory (e.g. wastescapes related to noise around airport)
Process-related	Disciplinary background	Difficulty in finding a shared understanding between stakeholders with different background, e.g. waste management engineers and urban designers
	Language barrier	Difficulty in organising a knowledge transfer event in English at a PULL workshop
	Insufficient insight into process leading to EIS	Lack of awareness of the discussions on other options preceding the choice of a solution
	Insufficient insight into the 'source' context	Lack of awareness of the legal or spatial characteristics of the 'sender' context limits the understanding of the pre-conditions and enabling factors for a solution to work
	Stuffiest insight into the details of a solution to be transferred	The format through which a solution is explained is to concise to cover the vital details or focuses mainly on 'selling' the successful solution

Table 3. Typology of barriers for transferring EIS in PULLs
Source: Own contribution

These barriers require careful consideration when (a) choosing solutions to transfer into one's region, (b) choosing what to transfer from a given solution (see section 4.2.3), and (c) when modifying the solution to ensure suitability for the 'recipient' context.

There is an important caveat to mention here concerning determinism about the presence of the above mentioned barriers and transferability of solutions. In fact, these barriers may be mitigated to a certain degree or be more or less restrictive in terms of transfer. For instance, in situations where there are barriers for transfer between two regions that stem from the differentiated advancement on the pathway towards circular economy. Such gap between the 'sender' and the 'recipient' contexts may be technological, with the lack of specific infrastructures or machinery in place to introduce new ways to (re)use or repurpose waste flows in the potential 'recipient' context. It can also be socio-technical or even political, with different levels of ecological awareness, acceptance of the necessity of

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efforts to reduce waste among citizens and political decision-makers or presence of know-how and skills-base for implementing circular economy innovations.

While those barriers considerably reduce the scope for effective knowledge transfer, their presence does not preclude transfer. In fact, knowledge transfer leapfrogging, understood as "(1) skipping over generations of technologies; [or] 2) not only skipping over generations, but also leaping further ahead to become the technological leader" (Gallagher, 2004, p. 384), is possible under certain circumstances. One major example of such leapfrogging is the development of circular economy in China (Geng and Doberstein, 2008) or of solar photovoltaic energy sector in India and China (Fu and Zhang, 2011). There is, however, scepticism among academics about technological leapfrogging in less developed contexts (Perkins, 2003), and that is for good reasons. The literature suggests that to make leapfrogging work there is a set of often omitted pre-conditions to be in place. What is key to enable leapfrogging is putting in place and enabling policy and regulatory environments in the 'recipient' context, and building technological and/or institutional capacity to develop the skills and know-how needed to mainstream the innovative technologies (Perkins, 2003; Gallagher, 2004; Fu and Zhang, 2011). While there is a consensus that multinational corporations investing in manufacturing or research and development plants in less-developed contexts may be important drivers for a leapfrogging technology transfer, government intervention matters too (Perkins, 2003). In particular, incentives for change of business models need to be put in place (e.g. removing subsidies for environmentally damaging industries; taxing for waste generation; introducing new regulations on emissions or waste processing). That said, such policy changes need to be supported by efforts to build technological capability for the new technology, in particular the know-how and skills, which need to be developed over time and with institutional support (universities, educational institutions, research institutes, etc.).

Research on leapfrogging in terms of mitigation of carbon emissions in the car industry in China, for instance, highlighted the importance of aggressive regulatory policies introducing ambitious environmental standards and tax incentives to incentivise companies to embrace 'cleaner' technologies, but also investment in education and skills to support such change (Gallagher, 2004). Perkins proposes a set of measures to make leapfrogging a realistic prospect (2003). First, one needs to set specific targets of leapfrogging to plan and focus efforts on those. Second, one needs to set priority sectors for investment, again to focus the attention of stakeholders. Third, one needs to support the development of leapfrogging capabilities with adequate regulations and policies (tax, regulations, education and know-how, institutional setting). Finally, considering the importance of interactions between stakeholders for the development of know-how, one should promote collaborative partnerships around the key sectors and targets chosen. In sum, "because history suggests that accumulating the capabilities needed to support these activities is a lengthy process, leapfrogging must be seen as a long-term process, requiring ongoing policy support and guidance […] need political will if they are to challenge entrenched domestic and foreign interests whose preferences lie, to a greater or lesser extent, along a business-as-usual path" (Perkins, 2003, p. 185).

In the context of REPAiR and transfer of EIS, these considerations are also valid, particularly in light of the barriers to knowledge transfer identified, for instance between the more advanced, in circular economy terms, Western and North-Western regions (Hamburg, Amsterdam, Ghent) and the catching-up Naples, Pécs and Łódź. Transferring of EIS in the context of such differences may indeed require a reflection on putting in place the enabling conditions – in terms of regulations, incentives, and capacity-building efforts - for making leapfrogging knowledge transfer a viable option. That being said, the organisation knowledge transfer activities within a network of PULLs, involving repeater interactions and knowledge co-creation among stakeholders from the various regions involved, offers a sound basis for facilitating the transfer of know-how needed for introducing more advanced solutions in territories that lag behind on the path towards circular economy and the use of waste as a resource.

4.2.3 'What:' maximising transferability

In order to ensure successful and strategic transfer of EIS co-created in PULLs across the regions studied in the project, it is necessary to conceptualise transferability. The concept remains fuzzy. In the policy transfer literature, the more complex the object of transfer, the less transferable it may be (Dolowitz and Marsh, 1996). More specifically, Rose (1993) argued that the easiest elements to transfer are (policy) programmes that have single goals, tackle a simple problem, link directly the problem and the solution, have few side-effects, are well known to transfer agents, have predictable outcomes. While being potentially helpful in considering the transferability of EIS solutions (the less complex, the more easy to 'import'), there is a need to consider place-specificity of solutions to guide knowledge transfer in the context of REPAiR. Given that the project puts an emphasis on EIS embedded in specific regional territories and being part of strategies to promote circular economy in those territories, one has to consider the degree to which these solutions are embedded in the characteristics of the place.

Building on the above claims about complexity by Dolowitz and Marsh, or Rose, one may hypothesise that the more place-specific a solution is, the less transferable it is. This relationship is represented on Fig. 3 below. For instance, a governance solution that relies on pre-existing networks of actors, structured around established institutional arrangements and the features of local political or planning culture, is likely to be hardly transferable to a different regional context, with different governance and planning systems, unless substantially modified.
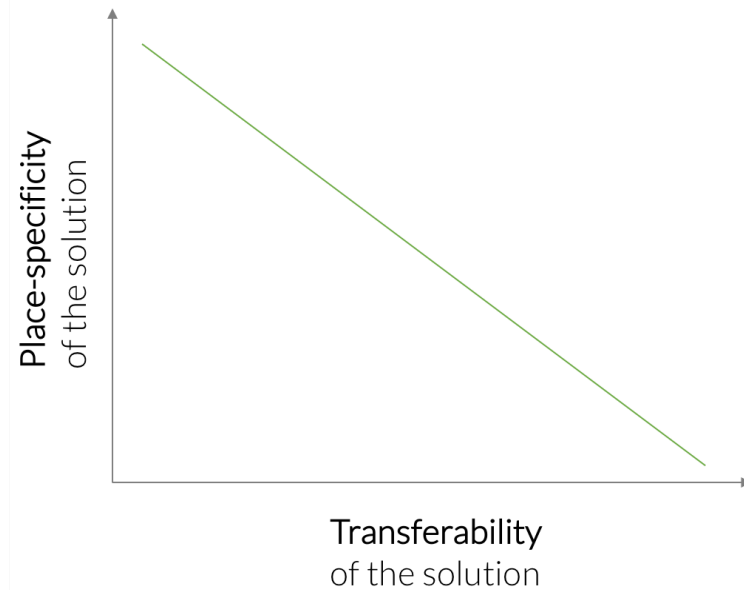
Fig. 3 Place-specificity and transferability of eco-innovative solutions
Source: Own contribution

Moreover, one may advance a hypothesis that the more place-specific a given solution is, the greater the degree of abstraction of the context of the transfer should be, and the greater the need for adaptation to the 'recipient' context is. This is represented in Figure 4 below. Hence, in a situation where place-specificity of a solution is relative, that is a solution does not rely on any particular institutional, socio-cultural, technological legal, or spatial features of the region of its region of origin (e.g. a recyclable or reusable recipient for food waste or a brick made out of food waste), one may attempt to transfer the solution in its entirety (goals, actors, specifics, methods, etc.) and without much need for adaptation to the 'recipient' context. If there is a certain level of place-specificity of a solution for regeneration of wastescapes, for instance, due to the spatial features of the region (e.g. proximity of the airport), a solution cannot be fully transferred, however, its elements can be considered as a source of inspiration for another region, with the necessary adaptation to the spatial features of the recipient region. Finally, if a solution is highly place-specific (e.g. connects wastescapes regeneration to the unique physical and governance features of the regions' water system), its transferability is limited and only the reasoning or general ideas behind can serve as a source of inspiration, requiring a substantial effort of tailoring to the characteristics of the 'recipient' context, if not providing a degree of inspiration for designing a mostly endogenous solution.
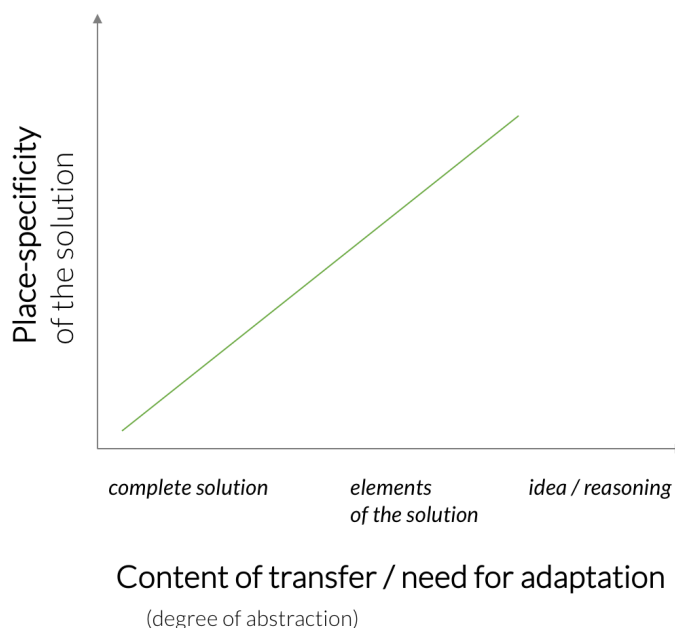
Fig. 4 Place-specificity and the possible content of transfer
Source: Own contribution

4.2.4 Theoretical expectations on knowledge transfer in PULLs

On the basis of the above conceptualisation of knowledge transfer, one may advance a set of expectations about how this process is likely to work in the context of REPAiR. These expectations will be verified through the implementation of the six PULLs, and more specifically, through the knowledge transfer activities within them.

The actors of transfer and their roles are prescribed in the knowledge transfer methodology outlined in the online handbook of knowledge transfer (D7.2) and the PULL Handbook (D5.4).
There are thus no specific theoretical expectations concerning the agency beyond that the active participation of 'guest' stakeholders from different regions in the process of elaboration of EIS in a PULL will facilitate learning and the transfer of solutions or their elements to the region hosting the PULL and, vice-versa will facilitate learning and 'export' of EIS to the remaining PULLs.

On the 'how' question, there are several expectations deriving from our model. First, one can expect that the barriers for transfer will be more pronounced between the more developed Western and North-Western regions (Amsterdam, Ghent and Hamburg) and the more economically lagging and less advanced in terms of circular economy Eastern and Southern regions (Łódź, Pécs, Naples). Second, consequently, one expects that the flows of knowledge will concentrate within those two groups of regions, facing more similar challenges and being more close to each other on the transition towards circular economy. In other words,

one can expect transfer to be more pronounced in cases where the 'sender' and 'recipient' regions are similar.

On the practical level, one can anticipate organisational challenges in the process of transfer. These are likely to be mainly due to language barriers, the complexity of logistics required to ensure participation of stakeholders in PULL workshops across the six case study regions, time constraints (limited scope for commitment of stakeholders to extensive workshops), and the limitations of the media chosen to present the EIS across different PULLs in terms of extensiveness of the description of the background process and context of the solutions.

Moreover, several theoretical expectations also derive from the conceptualisation of transferability of EIS. First, one can expect that, in line with the model, more context-specific solutions, particularly those concerning behavioural, legal and spatial aspects will be less transferred. One can expect the transfer stakeholders seeking for solutions in other PULLs to stay away from the deeply contextual solutions. By contrast, one can expect more transfer activity with respect to solutions that are 'technical', process-focused and not embedded in the local context. Second it is expected that in most cases, there will be a substantial degree of 'mutation' of solutions as they will be sourced from one region and implemented in another.

Finally, one can expect that the network of PULLs will indeed trigger learning and knowledge co-creation processes among the stakeholders from the six regions involved. While these learning processes remain hardly measurable, they are expected to contribute to cross-pollination of ideas, possibly inspiring and informing the process of designing largely home-grown solutions, and to generation of new ideas through deliberation and exchange taking place in the KT events in the living labs.

Taking into consideration the above described frames a theoretical model/method for transferring the EISs co-created in the PULL is sketched. The first step in this is to get familiar with the context of the other regions (milieux). This learning/knowledge transfer is supported by the study visits in the consortium meetings and the reading of the process-models of the case study areas (for the KT events a summary can be created for the PULL stakeholders). The second step is the pre-selection of EIS co-created in region A within the 'relation space' (see Fig. 5 and 6). The pre-selection process made in WP5 and PULL leaders and responsible from region A and region B. The third step is the filtering process and evaluation (Fig. 7) during the KT Event in the framework of a PULL workshop at co-production phase. After the evaluation, KT participants (both from region A and region B) can decide which and what (entire EIS or its element) to transfer to region B. Thus, this decision will contribute to drafting of the EIS list for further discussion and for further phase of the PULL process.
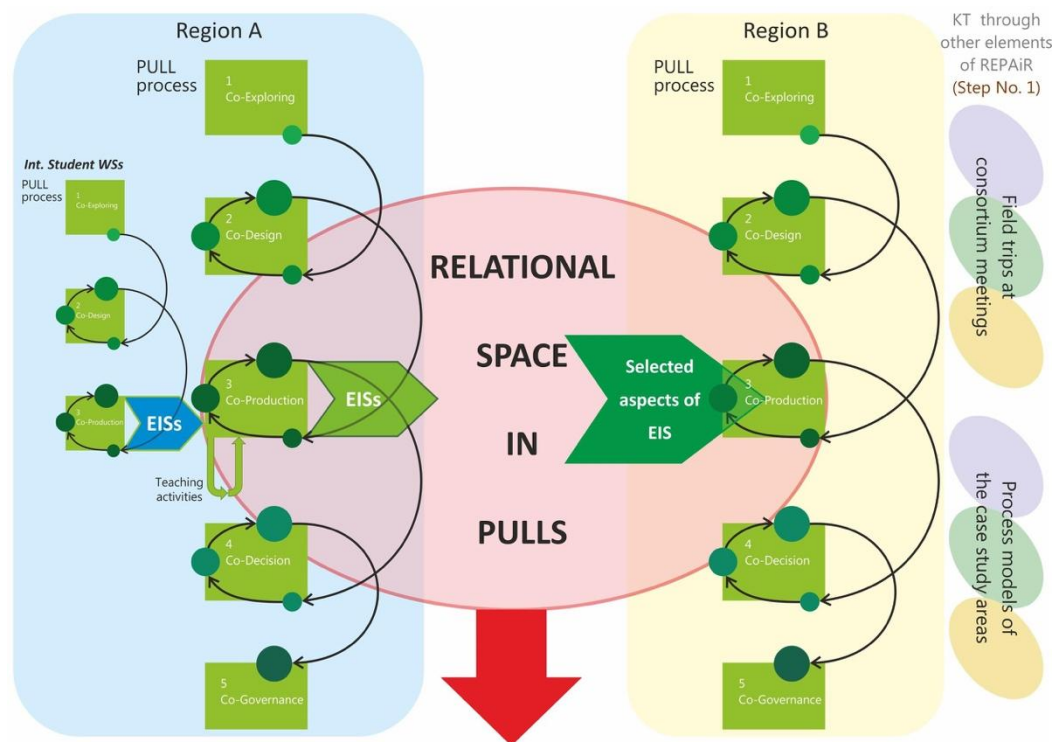
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Fig. 5 The theoretical model of knowledge transfer in the REPAiR project
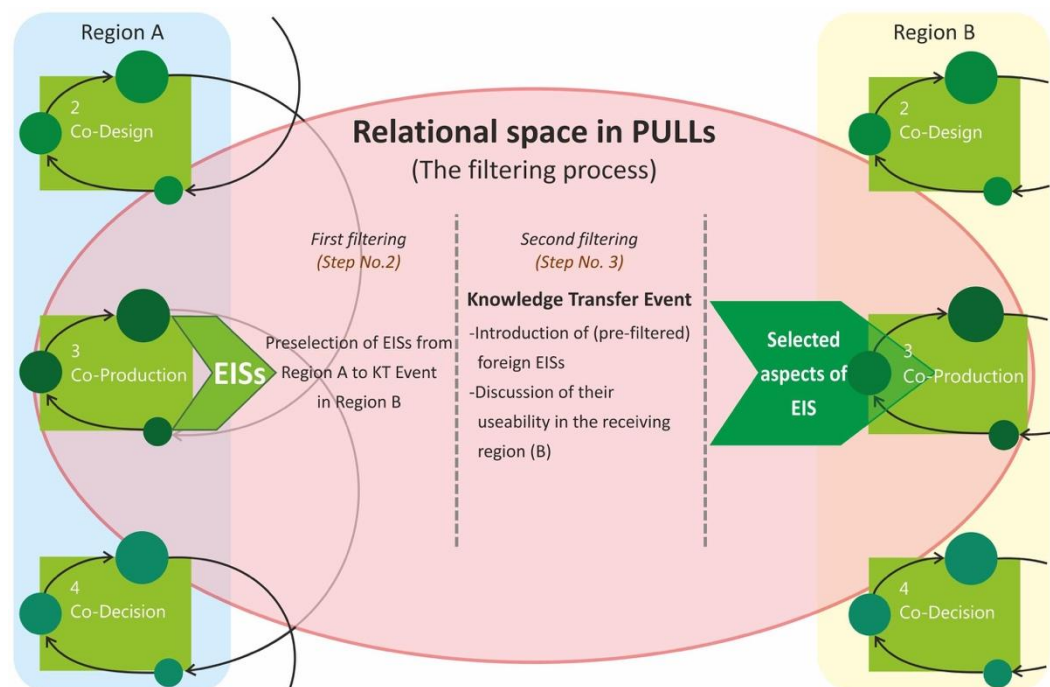*Source: Own contribution*

Fig. 6 The relation space in the REPAiR project
Source: Own contribution

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Beyond this, one should mention three other aspects relating to knowledge transfer. The first aspect), the international student workshop can also contribute to the EIS co-creation and to the knowledge exchange between region A and region B. These workshops can be a parallel co-production process that feed the main PULL process. The second aspect are the study trips that can help stakeholders involved to get an impression of the other region's context (milieu). The third aspect of learning is a teaching activity where members of the project consortium can disseminate their results and can receive feedback from students via their work (entailing proposals for EISs developed during the course). These results of the students' work can also be an input into the PULL co-creative phase.

5. Conclusions

The objective of the deliverable was to set up a theoretical frame for knowledge transfer within the REPAiR project, based on an in depth literature review and an initial empirical investigation. This deliverable, therefore, adds to the pursuit of the key objective of WP7 which is to elaborate a methodology for knowledge transfer that reveals the most effective and appropriate knowledge transfer channels, tools and processes across peri-urban areas with differentiated knowledge, technological, socio-cultural and governance characteristics of the case study regions.

Drawing on a critical review of the literature on knowledge transfer and the related concepts, the deliverable provides a theoretical base for transferring eco-innovative solutions (EIS) across the case study regions. The REPAiR theoretical model for knowledge transfer builds in particular on the insights from policy mobility literature and relating those to the living labs approach. The former stresses the importance of transfer networks and emergence of knowledge through interaction of actors from different locations, while the later entails a method of knowledge co-creation, co-design and co-decision in a collaborative setting. The premise of the model is to avoid the typical pitfalls of knowledge transfer stemming from copy-pasting of 'best practice' from elsewhere without (i) consideration of how the practice emerged, (ii) how it builds on the place-specific tacit knowledge and sociospatial features, (iii) how transferrable it is, and (iv) what needs to be done to adapt to the recipient context.

The theoretical model presented here offers guidance on the agency, process and content of knowledge transfer from one place to another. The deliverable pointed to the role of the network of stakeholders involved in the REPAiR's Peri-Urban Living Labs (PULLs) as the agents of knowledge transfer ('who'). Then it set out the channels for and conditions in which transfer should take place ('how') and offered guidance for the process of selecting what should actually be transferred across the case study regions ('what').

Two knowledge transfer channels are outlined as particularly important for the REPAiR project: field visits and the network of PULLs. The latter, in particular, relates to the core methodology of the project and will provide the main arena for knowledge transfer. In REPAiR's understanding a network of living labs connected in the frame of the project is a method for co-creation of new knowledge (EIS) and also a key tool for exchanging and transferring explicit knowledge between (i) actors from academia, policy and public sectors and (ii) the regions involved in the project. The transfer between regions is achieved through 'cross-over' participation of the consortium members in the activities of the six PULLs of REPAiR. Moreover, such engagement of partners from the different regions in elaboration of EIS in the operation of living labs (as well as in the field

trips) can lead to the emergence of shared understandings and help to decode elements of the tacit knowledge.

Concerning the 'how' question, the deliverable also identified a set of obstacles that are likely to hinder knowledge transfer in REPAiR. These obstacles include (i) language barriers, (ii) divergence in disciplinary background of the participants, and (iii) geography, socio-cultural, socio-political, legal, governmental and technological barriers. Beyond this, one has to also acknowledge that there are limits to the transfer of tacit, context-specific aspects of knowledge. Some aspects of EIS co-designed in PULLs thus are bound to remain tacit and impenetrable to the outside actors. It is thus likely that elements of the EIS co-designed in region A may remain obscure for the stakeholders from region B and, hence, hardly transferable. One needs to consider this limitation and consciously select elements of an EIS and then adapt and tailor them to the recipient region's context.

Further addressing the 'what' question, the model proposed here posits that increase of sociospatial difference between two regions rises the possibility of a relatively easy transfer of a concrete solution. Parallel, the more place-specific an EIS is, the less transferrable it is, and hence the more modifications and adaptation are needed to make it suitable for the recipient context. At the same time, the more place-specific an EIS is, the more abstract should the content of the transfer be, on the spectrum from the complete, entire solution, its elements, to the more abstract idea behind it. The magnitude of the sociospatial differences between two regions also determines the degree of transferability of EIS between them, on a spectrum from 'copy-paste readiness' to impossibility of transfer. The greater the differences, the less possible transfer is.

In sum, the model indicates that 'who', 'how' and 'what' in knowledge transfer are quite interconnected and interrelated. The precise nature of those linkages remains a matter for further empirical investigation in REPAiR and in future research.

The theoretical model outlined above has been applied and tested in the six PULLs via further empirical investigation and the Knowledge Transfer events organised in the framework of the PULL workshops. This application of the model led to its refinements in confrontation with the practical challenges encountered in the KT events and then provided a theoretical basis for elaborating the online knowledge transfer handbook (D7.2). The latter provides REPAiR stakeholders and practitioners willing to engage in inter-regional knowledge co-creation through networks of living labs with guidelines on how to learn from abroad, how to approach and operationalise transfer knowledge on circular economy solutions and strategies from one region to another, and critically, how to stimulate the emergence of new knowledge through collaboration of peers from different places. The handbook based on this this theoretical model can serve a basis for knowledge transfer also beyond the REPAiR project, as the guidelines in the handbook are provided in widely accessible manner, that is neither place-specific nor related only to circular economy and waste management, allowing for

applying these outputs of REPAiR's WP7 in the framework of other collaborative projects.

After the application of this theoretical model in the REPAiR's PULLs, the empirical experience gathered will allow for refinement of the model and elaboration of further academic outputs. This, in turn, will be a unique opportunity to make a major contribution to understanding of knowledge transfer across space and to draw practical lessons for such transfer, both for the specific field of circular economy and beyond. In particular, the co-creative experience of generation of knowledge through interactions between peers from various regions in the PULLs invites us to rethink and challenge the linear notion of knowledge transfer and to propose a more iterative and collaborative understanding of how knowledge emerges and travels through cooperative inter-regional or inter-urban networks.

6. References:

Ado, A., Su, Z., and Wanjiru, R. (2017). Journal of International Management Learning and Knowledge Transfer in Africa-China JVs : Interplay between Informalities, Culture, and Social Capital. *Journal of International Management*, 23(2), 166–179.

Argote, L., and Fahrenkopf, E. (2016). Organizational Behavior and Human Decision Processes Knowledge transfer in organizations : The roles of members, tasks, tools, and networks. *Organizational Behavior and Human Decision Processes*, 136, 146–159.

Argote, L., and Ingram, P. (2000). Knowledge Transfer: A Basis for Competitive Advantage in Firms. *Organizational Behavior and Human Decision Processes*, 82(1), 150–169.

Argote, L., Ingram, P., Levine, J. M., and Moreland, R. L. (2000). Knowledge Transfer in Organizations: Learning from the Experience of Others. *Organizational Behavior and Human Decision Processes*, 82(1), 1–8.

Bathelt, H., Malmberg, A., and Maskell, P. (2004). Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, 28(1), 31–56.

Bathelt, H., Malmberg, A., Maskell, P. (2004). Clusters and knowledge: Local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, 28, 31–56.

Battu, H., Belfield, C.R., Sloane, P.J. (2003).Human capital spillovers within the workplace: evidence for Great Britain**.** *Oxford Bulletin of Economics and Statistics*, 65(5), 575-594.

Bellini, A., Aarseth, W., and Hosseini, A. (2016). Effective Knowledge Transfer in Successful Partnering Projects. *Energy Procedia*, 96(1876), 218–228.

Bennett, C. J. (1991). What is policy convergence and what causes it? *British Journal of Political Science*, 21(2), 215–233.

Benson, D., and Jordan, A. (2011). What have we learned from policy transfer research? Dolowitz and Marsh revisited. *Political Studies Review*, 9(3), 366–378.

Bergvall-Kåreborn, B., Eriksson, C.I. Ståhlbröst, A., Svensson, J. (2009) A Milieu for Innovation – Defining Living Labs. In K.R.E. Huizingh; S. Conn; M. Torkkeli; I. Bitran (eds.), *Proceedings of the 2nd ISPIM innovation symposium: Simulating recovery - the Role of innovation management*, New York City, 6-9 December 2009.

Berry, F. S., and Berry, W. D. (1999). Innovation and diffusion models in policy research, in: P. A. Sabatier (Ed.), *Theories of the Policy Process*, pp. 169–200. Boulder, CO.: Westview Press.

Börzel, T. A. (1999). Towards convergence in Europe? Institutional adaptation to Europeanization in Germany and Spain. *JCMS: Journal of Common Market Studies*, 37(4), 573–596.

Boschma, R., Lambooy, J.G. (1999). Evolutionary economics and economic geography. *Journal of Evolutionary Economics* 9, 411–429.

Busch, P., and Jörgens, H. (2005). The international sources of policy convergence: explaining the spread of environmental policy innovations. *Journal of European Public Policy*, 12(5), 860–884.

Chapman, R., Slaymaker, T., (2002). *ICTs and Rural Development: Review of the Literature, Current Interventions and Opportunities for Action*. Working Paper 192, London: Overseas Development Institute.

Chesbrough, H. (2006). Open Innovation: A New Paradigm for Understanding Industrial Innovation, in H. Chesbrough, W. Vanhaverbeke and J. West (eds.) *Open Innovation: Researching a New Paradigm*. Oxford: Oxford University Press.

Chojnicki, Z. (2001). Wiedza dla gospodarki w perspektywie OECD. In A. Kukliński (Ed.) *Gospodarka oparta na wiedzy. Wyzwanie dla Polski XXI wieku*. Warszawa: KBN.

Cohen, W. M., and Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1), 128–152.

Cohen, W.M., Nelson, R.R., Walsh, J.P. (2002). Links and impacts: the influence of Public research on industrial RandD. *Management Science*, 48(1), 1-23.

Cooke, P., and Morgan, K. (1998). *The Associational Economy: Firms, Regions, and Innovation*. Oxford: Oxford University Press.

Dąbrowski, M., Varjú, V., Amenta, L. (2019). Transferring Circular Economy Solutions across Differentiated Territories: Understanding and Overcoming the Barriers for Knowledge Transfer. *Urban Planning*, 4(3). www.cogitatiopress.com/urbanplanning/article/view/2162

Davenport, T.H., Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston, MA: Harvard Business School Press.

Doloreux, D., and Parto, S. (2005). Regional innovation systems: Current discourse and unresolved issues. *Technology in Society*, 27(2), 133–153.

Dolowitz, D. P., and Marsh, D. (2000). Learning from Abroad: The Role of Policy Transfer in Contemporary Policy-Making. *Governance*, 13(1), 5–23.

Dolowitz, D. P., and Marsh, D. (2012). The future of policy transfer research. *Political Studies Review*, 10(3), 339–345.

Dolowitz, D., and Marsh, D. (1996). Who Learns What from Whom: a Review of the Policy Transfer Literature. *Political Studies*, 44(2), 343–357.

Driessen, P.P.J., Dieperink, C., Van Laerhoven, F., Runhaar, H.A.C. and Vermeulen, W.J.V. (2012). Towards a conceptual model for the study of shifts in modes of environmental governance – experiences from The Netherlands, *Environmental Policy and Governance*, 22, 143–160.

Driessen, P.P.J., Leroy, P., Van Vierssen, W., (2010). *From Climate Change to Social Change – Perspectives on Science–Policy Interactions*. Utrecht: International Books.

Drucker, P.F. (1994). *Post-Capitalist Society*, London: Routledge.

Dunlop, C. (2009). Policy transfer as learning: capturing variation in what decision-makers learn from epistemic communities. *Policy Studies*, 30(3), 289–311.

Eriksson, M., Niitamo, V., Kulkki, S. and Hribernik, K. A. (2006). "Living labs as a multi-contextual RandD methodology," *2006 IEEE International Technology Management Conference (ICE)*, Milan, 2006, 1-8. doi: 10.1109/ICE.2006.7477082

Evans, M. (2004). *Policy transfer in global perspective*. London: Routledge.

Evans, M. (2009). Policy transfer in critical perspective. *Policy Studies*, 30(3), 243–268.

Evans, M., and Davies, J. (1999). Understanding policy transfer: A Multi-level, multi-disciplinary perspective. Public administration, 77(2), pp. 361–385.

Fischer, F. (2000). *Citizens, Experts, and the Environment. The Politics of Local Knowledge.* Durham and London: Duke University Press.

Florida, R. (1995). Toward the learning region. *Futures*, 27(5), 527–536.

Florida, R. (2004). *The Rise of the creative class. And how it's transforming work, leisure, community and everyday life.* New York City: Basic Books.

Freeman, R. (2009). What is' translation'? *Evidence and Policy: a Journal of Research, Debate and Practice*, 5(4), 429–447.

Fu, X., and Zhang, J. (2011). Technology transfer, indigenous innovation and leapfrogging in green technology: the solar-PV industry in China and India. *Journal of Chinese Economic and Business Studies*, 9(4), 329-347.

Geng, Y., and Doberstein, B. (2008). Developing the circular economy in China: Challenges and opportunities for achieving 'leapfrog development'. *The International Journal of Sustainable Development and World Ecology*, 15(3), 231-239.

Gertler, M.S. (2003). Tacit knowledge and the economic geography of context, or the undefinable tacitness of being (there). *Journal of Economic Geography*, 3, 75–99.

Giddens, A., Sutton, P., W., 2017. *Sociology*. Oxford: Wiley.

Guile, D. (2001). Education and the economy: Rethinking the question of learning for the 'knowledge' era. *Futures*, 33, 469–482.

Hansen, M. T. (1999). The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge across Organization Subunits. *Administrative Science Quarterly*, 44(1), 82–111.

Healey, P., and Upton, R. (2010). C*rossing borders: international exchange and planning practices.* London: Routledge.

Hegger, D. Lamers, M., van Zeijl-Rozema, A., Dieperink, C. (2012) Conceptualising joint knowledge production in regional climate change adaptation projects: success conditions and levers for action. *Environmental Science and Policy*, 18, 52-65.

Heinelt, H., Held, G., Kopp-Malke, T., Matthiesen, U., Reisinger, E., Zimmermann, K. (2006): *Governance for Sustainability. Conceptual Frame.* Working Paper of G-FORS (FP6) project, Darmstadt/Erkner.

Heurkens, E.W.T.M. (2012). *Private Sector-led Urban Development Projects: Management, Partnerships and Effects in the Netherlands and the UK*. Delft: Delft University of Technology.

Heurkens, E.W.T.M. and Hobma, F.A.M. (2014). Private sector-led urban development projects: Comparative insights from planning practices in the Netherlands and the UK. *Planning Practice and Research*, 29(4), 350-369.

Hilpert, U. (2006). Knowledge in the region: Development based on tradition, culture and change. *European Planning Studies*, 14 (5), 581–599.

Howells, J.R. (2002). Tacit knowledge, innovation and economic geography. *Urban Studies*, 39, 871–884.

Howlett, M., and Rayner, J. (2008). Third Generation Policy Diffusion Studies and the Analysis of Policy Mixes: Two Steps Forward and One Step Back? *Journal of Comparative Policy Analysis: Research and Practice*, 10(4), 385–402.

Inkpen, A. C., and Tsang, E. W. K. (2005). Social Capital, Networks, and Knowledge Transfer. *Academy of Management Review*, 30(1), 146–165.

Johnstone, P. and Newell, P. (2018). Sustainability transition and the state. *Environmental innovation and Societal Transition*, 27, 72-82.

Knill, C. (2005). Introduction: Cross-national policy convergence: concepts, approaches and explanatory factors. Journal of European public policy, 12(5), pp. 764–774.

Lema, R., and Lema, A. (2012). Technology transfer? The rise of China and India in green technology sectors. *Innovation and Development*, *2*(1), 23-44.

Lepik, K-L., Krigul, M., Terk, E. (2010) Introducing Living Lab's Method as Knowledge Transfer from one Socio-Institutional Context to another: Evidence from Helsinki-Tallinn Cross-Border Region. *Journal of Universal Computer Science*, 16(8), 1089-1101.

Lundvall, B. A. (1996). The Social Dimension of the Learning Economy. *DRUID Working Pape*r, 96 (1), Aalborg: Aalborg University.

Machlup, F. (1979). Stocks and flows of knowledge. *KYKLOS International Review of Social Sciences*, 32 (1/2), 400–411.

Marino, M., Parotta, P., Pozzoli, D. (2016). Educational diversity and knowledge transfers via interfirm labor mobility. *Journal of Economic Behaviour and Organization*, 123, 168-183.

Markard, J., Raven, R., Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy*, 37(4), 596-615.

Marsh, D., and Sharman, J. C. (2009). Policy diffusion and policy transfer. Policy studies, 30(3), 269–288.

Matthiesen, U. (2005). KnowledgeScapes. Pleading for a knowledge turn in socio-spatial research. Erkner: nowledgeScapes. Pleading for a knowledge turn in socio-spatial research.

McCann, E. (2011). Urban policy mobilities and global circuits of knowledge: Toward a research agenda. *Annals of the Association of American Geographers*, 101(1), 107–130.

McCann, E., and Ward, K. (2012). Policy Assemblages, Mobilities and Mutations: Toward a Multidisciplinary Conversation. *Political Studies Review*, 10(3), 325–332.

Meyer-Krahmer, F., Schmoch, U. (1998). Science-based technologies: university–industry interactions in four fields. *Research Policy*, 27, 835-851.

Nonaka, I., Takeuchi, H. (1995). *The knowledge creation company: how Japanese companies create the dynamics of innovation*. Oxford: Oxford University Press.
OECD (2000). *Knowledge Management in the Learning Society*. Paris: OECD Publishing.
Polanyi, M. (1966). *The Tacit Dimension*. London: Routledge.

Ockwell, D. G., Haum, R., Mallett, A., Watson, J. (2012), Intellectual property rights and low carbon technology transfer: Conflicting discourses of diffusion and development. *Global Environmental Change*, 20(4), 729-738.

Ockwell, D. G., Watson, J., MacKerron, G., Pal, P., Yamin, F. (2008). Key policy considerations for facilitating low carbon technology transfer to developing countries. *Energy Policy*, 36, 4104-4115.

Ostrom, E. (1999). Institutional Rational Choice: An Assessment of the Institutional Analysis and Development Framework. In: Sabatier, P. A. (ed.): *Theories of the Policy Process*. pp. 35-71. Boulder: Westview Press.

Paavola, J. (2007). Institutions and environmental governance: a reconceptualization, *Ecological Economics*, 63, 93–103. doi: 10.1016/j.ecolecon.2006.09.026

Perkins, R. (2003), Environmental leapfrogging in developing countries: A critical assessment and reconstruction. Natural Resources Forum, 27, 177-188.

Perkmann, M. and Walsh, K. (2007). University-industry relationship and open innovation: Towards a research agenda. *International Journal of Management Reviews*. 9(4), pp. 259-280.

Petts, J. (2001). Evaluating the Effectiveness of Deliberative Processes: Waste Management Case-studies. *Journal of Environmental Planning and Management*, 44(2), 207-226.

REPAiR (2017a) *Governance and Decision-Making Processes in Pilot Cases*. Delft University of Technology. doi:10.4233/uuid:30c806a9-9b80-45a9-89a0-5bf2db1ea7c0

REPAiR (2017b) *REPAiR: REsource Management in Peri-urban AReas: Going Beyond Urban Metabolism: D3.2 Socio-cultural/socio-economic and company-related investigations for pilot cases.* Delft University of Technology. doi:10.4233/uuid:29901a4b-e4e6-4bfc-b5fa-6aa56a522b1d

REPAiR (2017c). *REPAiR: REsource Management in Peri-urban AReas: Going Beyond Urban Metabolism: D5.1: PULLs Handbook.* Delft University of Technology. doi:10.4233/uuid:321f152a-0fe7-4125-bb98-c8c253e5b39f

REPAiR (2017d) *REPAiR: REsource Management in Peri-urban AReas: Going Beyond Urban Metabolism:* D6.2 Governance and Decision-Making Processes in Follow-up Cases. Delft University of Technology.

REPAiR (2019) *REPAiR: REsource Management in Peri-urban AReas: Going Beyond Urban Metabolism:* D7.2 Online knowledge transfer handbook. Delft University of Technology. http://h2020repair.eu/project-results/knowledge-transfer-handbook/

Rose, R. (1991). What is Lesson-Drawing? *Journal of Public Policy*, 11(1), 3–30.

Rose, R. (1993). Lesson Drawing in Public Policy: A Guide to Learning across Time and Space. Chatham: Chatham House.

Rose, R. (1993). *Lesson-drawing in public policy: A guide to learning across time and space.* Chatham: Chatham House Publishers.

Rose, R. (2004). *Learning from comparative public policy: A practical guide.* London: Routledge.

Schnepp, O., von Glinow, M.A., et al., (1990*). United States–China Technology*

Schumacher, I. (2015). The endogenous formation of an environmental culture. *European Economic Review*, 76, 200-221.

Sharman, J. C. (2010). Dysfunctional policy transfer in national tax blacklists. *Governance*, 23(4), pp. 623–639.

Simonin, B. L. (1999). Ambiguity and the process of knowledge transfer in strategic alliances. Strategic management journal, pp. 595–623.

Stead, D. (2012). Best Practices and Policy Transfer in Spatial Planning. *Planning Practice and Research*, 27(1), pp. 103–116.

51

Stone, D. (2000). Non-governmental policy transfer: the strategies of independent policy institutes. *Governance*, 13(1), pp. 45–70.

Stone, D. (2004). Transfer agents and global networks in the "transnationalization"of policy. J*ournal of European Public Policy*, 11(3), 545–566.

Stone, D. (2012). Transfer and translation of policy. *Policy Studies*, 33(6), 483–499.

Storper, M. (1997). The regional world: territorial development in a global economy. New York: Guilford.

Storper, M., Venables, A., J. (2004). Buzz: Face-to-face contact and the urban economy. *Journal of Economic Geography*, 4, 351–370.

Tacconi, L. (2011). Developing environmental governance research: the example of forest cover change studies. *Environmental Conservation* 38, 234–246. doi: 10.1017/S0376892911000233

Temenos, C., and McCann, E. (2013). Geographies of Policy Mobilities. *Geography Compass*, 7(5), 344–357.

Törnqvist, G. (2004). Creativity in time and space. *Geografiska Annaler, Series B: Human Geography*, 86, 227–244.
van den Hove, S., 2007. A rationale for science–policy interfaces. *Futures* 39 (7), 807–826.

van der Krabben, E. and Heurkens, E.W.T.M. (2015). Netherlands: a search for alternative public-private development strategies from neighbouring countries'. In Squires, G. and Heurkens, E.W.T.M. (eds.) *International Approaches to Real Estate Development*, pp. 66-81. London: Routledge.

van der Molen, F., Van der Windt, H. J. and Swart, J. A. A. (2016). The interplay between knowledge and governance: Insights from the governance of recreational boating in the Dutch Wadden Sea area, 1981–2014, *Environmental Science and Policy*, 55, 436-448.

van Wijk, R., Jansen, J. J. P., and Lyles, M. A. (2008). Inter-and intra-organizational knowledge transfer: a meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies*, 45(4), 830–853.

Varjú V. (2014). The need for an effective and integrated environmental policy: lessons from Hungary. *EUROPA XXI*, 27, 33-46. http://dx.doi.org/10.7163/Eu21.2014.27.3

Yakhlef, A. (2007). Knowledge transfer as the transformation of context. Journal of High Technology Management Research, 18, 43–57.

Yu, Z. and Gibbs, D. (2018). Sustainability transitions and leapfrogging in latecomer cities: the development of solar thermal energy in Dezhou, China. *Regional Studies*, 52, 68-79.