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THEY MAKE THE CHANGE: ROLES OF ACTORS IN TRANSITIONS

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Introduction

Transitions to sustainability necessarily involve systems change. Whether it concerns a transition to affordable and human-centred health care or decarbonised energy supply, the change implied is changed systems. It is therefore no surprise that the eponymous research field studying them—sustainability transitions—has put much conceptual emphasis on systems. The stereotypical description of a transition is as some kind of systemic fight, where an incumbent monolith of a system, usually referred to as the regime, is considered to be under pressure, for example from resource constraints. In response to such pressures, one or more new systems emerge—typically around innovations and referred to as niches—which eventually replace or transform the incumbent one. This caricature serves to show that the explanatory core, the golden thread of the narratives, is framed in terms of systems. It is not that we think there is anything wrong with this systemic fight picture, in fact we think there is a lot right about it. But what we also think is that systemic change, as all societal change, is the consequence of human actions, and that transitions therefore should be explained as such. In this paper we present a theoretical framework with a central role for those who actually make the change, the actors in transitions, the agents of transformative change.

We are by no means the first to point out that actors, agency and power are under-conceptualised, and that a bias towards innovation, technologies and systems remains, see eg Fischer and Newig (2016), who systematically surveyed the literature on actors in transitions. Certainly, theorists in the field have also not been idle in addressing this challenge, as testified by for example Geels' (2014) ongoing sophistication of the Multi-Level Perspective (MLP) with respect to matters of agency and power and other issues (Geels 2011), and Avelino's pioneering work on power in transitions (Avelino and Rotmans 2009; Avelino and Wittmayer 2015). Actor typologies of various kinds have been introduced, such as the recent user-focussed one by Schot et al. (2016). We do contend however, that actors themselves have remained poorly represented, literally. Whom we perceive as the protagonists of transformative change are still typically discussed in aggregated or abstracted forms, or being simplified as either regime or niche players.

In addition to a lack of concepts to represent actors, and despite the ongoing sophistications of frameworks like the MLP, the fact remains that explanation in transitions studies does not *rely* on actors or agency. It is possible, and in fact straightforward, to provide an account of a transition that is devoid of actors, as illustrated by the systemic fight caricature earlier. Agency can be added to taste, and in principle be drawn from any suitable theory.¹ This means either that the explanations of the transitions frameworks simply do not depend on agency, or that agency does not play an important role in transitions at all. We believe the latter is not the case, therefore conclude the former and arrive at the situation we would like to change.

Besides such theoretical motivations—which we will elaborate later—there are empirical and societal reasons to want to understand the role of actors in transitions. Amongst the empirical reasons are the growing possibilities for individuals to be agents of transformative change. Online platforms have enabled new business models and partnerships, manifesting themselves in digital and sharing economies and crowd initiatives. In parallel, some consumers are moving away from being passive end users to become active prosumers, often making use of decentralised technologies and forming citizen cooperatives. These examples illustrate that the advent of new technologies and social possibilities online has conferred power to individuals. With these new means, individuals can organise themselves and cooperate effectively to achieve shared goals in ways that used to be the privilege of governments, large corporations or significant social movements. The societal reason seems obvious, understanding how actors influence transformative change could inform the further development of transitions governance, empowering societies to be less at the whim of complexity and contingency. Or, more positively formulated, as the resolution of societies' most pressing problems lie at the other

end of transitions; understanding the roles people can have in them is crucial.

In the theoretical framework we are about to present,² systems change is the consequence of strategic actions of actors. As the preceding paragraphs perhaps already revealed, we understand actors to be individuals. Obviously, systems change can typically not be achieved by a single individual and collective actors as some would call them, such as organisations, NGOs, networks, movements and so on, play a vital role in transitions and thus also in our theoretical treatment. Therefore, an important aim of our framework is to explain how actors work together and form such *alliances* to achieve their transformative goals. We will argue that transformative actors are value driven and that shared value sets are the basis of their alliances. As these are values related to societal issues, rather than individual affairs, we will introduce the concept of *streams* to denote a specific kind of societal value sets. Thus, the interplay between *actors*, *systems* and *streams*, jointly referred to as the *field*, determines the dynamics of transformative change. If the circumstances of the actors, systems and streams are such that transformative change may actually result, we speak of a *transformative field*. In summary:

- Streams are value sets enabled by the state of knowledge (science, technology or otherwise) and the available organising principles (eg economical, infrastructural) with which that knowledge could be harnessed to meet societal needs. When actors connect to streams, the stream can be thought to direct their strategic actions.
- Actors are strategic and interpretive individuals, working on their own or together as part of alliances. Their strategic actions are aimed at making certain solutions available to society, or at phasing certain solutions out. These actions, if successful, would change systems. Actors connect to streams and affiliate with solutions, possibly several of either.
- Systems are institutionalised sets of solutions with which societies meet societal needs. To this end, solutions may involve the employment of technologies, practices, organisations and arrangements. The solution set of a system is institutionally coherent and organised to meet specific needs, eg public transport and car-based mobility would typically represent distinct systems.

In the following, we will first explicate what we mean by transformative change and the systems it happens to. This will lead into a discussion of how actors and streams are involved which completes a condensed overview of the theoretical framework, the transformative field - actors, streams and systems (Section 2). We will then present a typology of actor roles, the kind of affiliations they form and relate this to the systemic changes associated with their actions. We will also illustrate the framework with two hypothetical cases (Section 3).

Transformative change and the transformative field

Before we present a framework to explain the role of actors in transition dynamics, it may be useful to first explain what we mean by transformative change and how we distinguish it from other forms of change. The change we are interested in is the change that happens to societal systems, by which we mean sets of institutionalised solutions to meet human needs—such as health, energy, transport—on societal scales. What solutions are and what we mean by institutionalisation precisely will be discussed shortly. In a way, change is happening to these systems constantly and much of this change is in fact directed at keeping things the same. This leads to a gradualist development of societal systems along more or less predictable lines - path dependence. Change that deviates from such paths is transformative change and we argue that it takes intentional, even strategic, actions to achieve this and break the path dependence.

From the above it is clear that transformative change, despite its tautological name, is a special kind of change. It is the kind that transforms the systems of resource and service provision that meet societal needs, the kind of change transitions are made of. Transitions are made by people however, and so are the systems that are transformed by them. So in order to understand the roles of actors in transitions it is important to understand what systems are and the different ways in which people interact with them.

The field—systems

We said societal systems are systems meeting human needs on a societal scale, which means that they are, in a sense, economic systems, or rather, sub systems. How these systems are organised, how services and resources are mobilised to meet societal needs and how this may change as different needs are expressed by the societies they serve is of central interest to the transition analyst. It is in a way the dependent variable, one of the main objects of analysis, and for that reason it is useful to have a clear conception of what these systems consist of. We said that systems consisted of institutionalised solutions, so let us explicate more precisely what we mean by solutions and institutions.

Needs can be met by providing services or resources. Perhaps not all needs, but at least for the needs that can be met on societal scales, this seems to be the case. The means to provide such services or resources we call solutions. Providing services or resources usually involves the following two things, either separate or in combination:

- Tools - technological means like infrastructure or other purposively designed and built artefacts, or some pre-existing, natural structure appropriated for the cause.
- Processes - routines or procedures believed to produce outcomes contributing to the cause. Any such tool, process or combination thereof that can be conceived to function in isolation, as a system in itself, is what we call a solution.

To make solutions work, people need to make them work, and since it is usually desirable that this responsibility does not lie with one particular individual, the required knowledge and skills have to somehow be social—shared or distributed—or at any rate allow this possibility. Thus, adopting a solution in a societal context involves the development of institutions around it and its use. By institutions here, we mean the shared³ knowledge, norms and rules, broadly interpreted, that enable solutions to function as such in societies, a conception of institutions building on that of Scott (1995). In addition, we point out that even the implementation of a certain solution—as a social agreement⁴ to provide services or resources by certain means—constitutes an institution.

Clearly, some tools and processes work better together than others. Moreover, some only work in the presence of others while yet others impede the work of some. As solutions are adopted to meet needs, and those needs change over time, the most straightforward adaptation seems to either augment the existing solution set (ie more of the same) or to implement new solutions that work well with, or are similar to, the existing ones (ie incremental change). Such an approach to adaptation is certainly justified, be it from an engineering complexity, financial, transaction cost or other optimisation rationale. Except of course, when the change required is not anywhere in sight on the path ahead.

The field—actors

Actors are of central importance to the structure and functioning of societal systems. This notwithstanding, we do not consider actors to be *parts* of societal systems—if only to avoid confusion—it is quite common for an individual to play a role in different systems at the same time. Instead we prefer to say that an actor has an affiliation with a system, or possibly several affiliations with several

systems.

We pointed out earlier that institutions enabled solutions, and consequently systems, to function in society. Given that institutions were the knowledge, norms and rules, in a broad sense, related to solutions, we could also say they encode the functioning of a system. But we also pointed out that this functioning is always the consequence of human actions, and from this we can infer that a functioning societal system presupposes roles for actors in line with the relevant institutions. Sometimes such roles are explicitly part of the institutions in question, for example, when delivering a certain service directly corresponds to a job description, or in the case of a role associated with maintaining the infrastructure. Other roles would be less obviously so, but nevertheless part of the institutional apparatus that keeps the system functioning. We will refer to actors in such roles as *institutional actors*. The notion of an institutional actor does not preclude change or even innovation, but their direction and aim would be towards maintaining or improving the status quo.

Then there are actors who, for reasons we will discuss, take it upon themselves to change that status quo. They believe that different solutions should be adopted to better meet society's needs and the solutions they advocate do not readily fit the institutional structure nor do they necessarily work well with the existing solutions. Their notion of *better* is clearly not the same as that of an institutional actor, who would define *good* or *better* in terms of performance, efficiency or price. These are *transformative actors*. To make their proposed solutions available to society, there appear to be two routes: changing the institutions of the incumbent system to fit the alternative solution, or establishing a new system with new institutions. Where institutional actors affiliate with institutions, transformative actors affiliate with solutions.

That a transformative actor's notion of *better* would differ from an institutional actor's, already suggests that their main motivations may lie outside of the realm of the functioning of systems per se. Another reason to suspect this, is that regardless of whether they pursue their transformative goals by the first or the second route, the initial pay offs are likely to be negative, either because of competitive disadvantages or simply because of the effort absorbed in building up or breaking down institutional structures. Yet transformative change does happen, suggesting that the actors involved have some motivation to pursue it. This leads us to believe that transformative actors are value driven, that is, they affiliate themselves with a certain solution because they think it is the right solution. In this respect, transformative actors are transitional agents in more than one sense, as once their goal is achieved a new solution is functioning, either in an existing or a new system, and institutional actors would then be taking care of a new status quo.

The field—streams

We mentioned earlier that actors working together and forming alliances would be crucial in achieving transformative change. But we have just argued that transformative actors are driven by their values, and values are personal; so on what basis can actors form alliances to achieve their shared goals? The answer is of course their shared values, but this would not be enough, since values alone, even if shared, do not provide what we would call an action perspective, the suggestion of a mode of organisation. This leads us to the concept of *streams*.

Streams are societal value sets,⁵ but more than just that, they are values that could be *enabled* given the available knowledge and state of technology. For instance, in the late 19th and early 20th centuries, egalitarian values came—in certain respects—within reach because of the growing engineering prowess and increased organisation of the public sphere. This provided an action perspective, a notion that uniform and universal access to basic services, such as sanitation or health care, could be provided with available means. In a similar way, we see individualist values coming within reach

at the present time because of new modes of organisation made possible by the Internet, providing platforms for collaboration and sharing. The action perspective associated assumes tailor made and on demand service provision is possible and lucrative.

As the above examples suggest, streams are not bound to any particular system or jurisdiction. Streams live in actors' minds—if perhaps unarticulated or implicit⁶—and can therefore be informed by the knowledge available to these actors and shared in various ways.

When an actor's values are in line with the values of the stream, we say the actor *connects* to the stream. Actors aligned to the same stream have a shared value set on the basis of which they may form alliances. Whether some streams are intrinsically a better basis for alliances than others is an interesting question. At any given time, a society may have several distinct and possibly conflicting streams present. In such a situation, different actors and alliances would pursue transformative change in line with the stream they connect with. Moreover, new streams may appear as knowledge and technological possibilities progress, just as streams may lose relevance. We refer to this as streams *rising* and *drying* up respectively.

Because streams are essentially value sets, they do not presuppose particular solutions, though some solutions would obviously enable certain values and others not, and yet others may or may not enable them under the right or wrong circumstances. Rather than pointing an actor towards a particular solution, streams provide them with a more abstract sense of what needs to be done, a direction of change as it were. It is for this reason that streams facilitate actors to cooperate and form alliances. Different actors may still, for personal or technical reasons, put forward their preferred solution, but the stream allows them to join forces with other actors with possibly different solutions that they nevertheless perceive as contributing towards the same goal.

Transformative dynamics

This section will outline how transformative change is explained within our framework. As per our own decree, the actions of transformative change agents—actors—will be at the core of these explanations. Nevertheless, as also mentioned before, the entire field, comprised of actors, streams and systems is involved in transformative change. Moreover, it is through alliances that actors compound and increase their transformative potential. In the following, therefore, we will elaborate on the value-driven dynamics of actors and streams, on the alliances that actors can form and on the systemic manifestations of their actions. Before we do this, we will present a small number of fundamental roles of transformative change agents. We think it is important to note that these are roles and not stereotypes of persons. In other words, when we describe these roles we are not trying to sketch a psychological profile or list the ideal character traits of transformative people. Rather, these are the roles we deem essential in transformative dynamics; roles can be enacted by different people at different times and an individual can enact multiple roles.

Typology of transformative actor roles

Frontrunners - are already known from the Transition Management literature (Loorbach and Rotmans 2006). The frontrunner role is geared towards making alternative solutions known and available early on, they are solution driven. Frontrunners act upon their own personal values and do not necessarily align with any stream, as far as they are concerned. Becoming part of an alliance may however explicitly connect and align them and their endeavours to a stream.

The alternatives presented by frontrunners provide systems with diversity.

Connectors - connect in two respects: (1) they connect solutions to systems—be they emerging or

incumbent—by embedding or anchoring them in an institutional context. They institutionalise solutions, making them established options to society; (2) by connecting actors with other actors on the basis of their shared value sets, aligning them with a stream. The connector role is therefore crucial in the formation of alliances.

Connectors provide connectivity amongst actors and between solutions and systems.

Topplers - are mobilising and system-oriented in their actions (as opposed to the solution-driven frontrunners). Actors in a toppler role introduce, change and phase out institutions to make way for alternative solutions. Topplers may affiliate across different systems, for example, emerging and incumbent, in order to achieve their transformative goals. Topplers are able to articulate the values that connect their alliances to a rising stream and make them explicit. By externalising values they are able to attract supporters.

Topplers provide coherence to the alliances and nascent or changed systems.

Supporters - are not themselves to be considered transformative, though their support is an important factor in the institutionalisation process of transformative change. Their adoption and endorsement provides the legitimisation, and expresses the societal need for the new solutions and changed systems.

As the title of this subsection suggests, these are actor roles involved in transformative change only. A more complete treatment would also include several types of institutional actors. In particular actors whose role it is to counter or slow down change. Treatment of such actors is however outside the scope of this article.

Actor dynamics and the formation of alliances

The actors in the roles we just presented all aim—in one way or another—to effect transformative change. In order to do this, they can either directly try to implement an alternative solution themselves or they can work together with other actors on the basis of a shared aim and values. Either way a measure of success would be the support received. Consequently even the most straightforward strategy to achieve transformative change will involve some alliance between one or more transformative actors and one or more supporters. We will now discuss the kinds of alliances we consider crucial, the actor dynamics behind their emergence and some of their potential systemic consequences.

Initiatives

The most straightforward type of actor dynamics is that of one or several actors form an initiative. Initiatives, staying close to the intuitive ring of the word, are the organised endeavours of actors with the aim of making alternative solutions known or available. As can be expected, initiatives are typically the work of frontrunners, though connectors or topplers may also be involved and of course initiatives may have supporters.

Initiatives often have an entrepreneurial character—in the broadest interpretation of the word—and may take the form of startups, businesses, NGOs, coops or similar forms of organisation. This however, may give the impression that initiatives are necessarily small or at least grow from the bottom up, which need not be the case at all. Initiatives may also be large, or even mega projects such as infrastructure roll outs or thorough-going legislative reform in a particular sector. Just as not every startup is an initiative in the transformative sense in which we use the word, not every large-scale infrastructure project should be considered one. What sets initiatives apart from other organised endeavours is that they aim to provide new or alternative solutions to what is offered by the incumbent systems.

Two more things need to be said about initiatives; about how they relate to streams and about their systemic manifestations. In regards to the former, we indicated that initiatives are typically instigated by frontrunners. As a consequence, initiatives at first usually only accidentally align with a particular stream until they grow as alliances, incorporating other transformative actors. The involvement of connectors can lead to further institutionalisation of the initiative's proposed solutions. Regarding the latter, amongst the systemic consequences of a successful initiative is the establishment of what we shall call a single-solution system. Another systemic consequence would be the connection of the initiative and its proposed solutions to an incumbent system. In either way, a measure of success would be that the initiative attracts supporters.

Networks

In a similar way as initiatives are related to frontrunners, networks are related to connectors. Networks form under influence of connectors who bring together several actors on the basis of shared values. Networks may, but do not necessarily include initiatives. Where it was possible for a front-runner and consequentially an initiative to be only accidentally aligned with a stream, becoming part of a network makes such alignment an explicit necessity. It is part of the role of connectors to bring this alignment about.

Networks may be loose affiliations amongst like-minded transformative agents but they may just as well be formalised organisations with restrictive policies about membership. Knowledge networks and unions are typical examples, as are user communities (be they virtual or in *real* life), advocacy groups, trade associations and so on. As with initiatives, it is their transformative agenda that sets networks—in our sense of the word—apart from the other networks around.

Amongst the systemic consequences of networks are the alignment of potentially several single-solution systems. For example, connectors align actors in the network along the same stream which in turn leads the single-solution systems of these actors to acquire some institutional alignment also, through interactions, knowledge exchange and agreements. Connectors, as in the case of initiatives, further institutionalise the single-solution systems related to the network, either amongst each other—forming, as it were, a networked system of single solutions—or to become part of incumbent systems, or combinations of these options. Successful networks align various initiatives and connect actors with shared value sets.

Movements

Movements are closely related to, and typically the consequence of, the actions of topplers. It is a key characteristic of the toppler role to articulate and advocate the value sets that would connect actors to a rising stream. It is by virtue of this externalising of a shared value set that a transformative movement can emerge and amass supporters. Movements need not consist of topplers and supporters exclusively; frontrunners, connectors and, consequentially, initiatives and networks often also form part of movements. What sets movements apart from networks is that most supporters do not have, or need, a direct connection to the transformative actors in the alliance, but rather more abstractly connect to value sets embodied by the movement.

Movements typically rally to some theme or goal from which they often derive their names; think for instance of the Open Source, Socialism and Transition movements. Such a theme or goal is indicative of the specific value set that unites the movement and connects them to a stream. Within a movement, a portfolio of solutions may be considered the appropriate instrumentarium to put the value set in practice. Indeed, when some of those solutions have already reached a level of institutionalisation, such as in a single-solution system, they may become identified with the cause of the movement. Think in this respect for example about the role of communist parties in 19th and 20th century Socialism, or the Transition Town model for the present day transition movement.

The systemic consequences of the dynamics of movements are the taking shape of alternative systems. This can be in the form of single-solution systems growing and further institutionalising, several small systems merging to form a larger system or such aligned new solutions becoming institutionalised parts of incumbent systems. When we said topplers provide coherence, it was in this system-shaping sense as much as in the sense of articulating and advocating shared values amongst actors.

Actor dynamics and systemic change

The above treatment of actors, their alliances and potential systemic consequences may give rise to three misunderstandings: that alliance formation is somehow necessarily sequential, that transformative change is always about building up, and that we have forgotten about actors who aim at maintaining the status quo and impede change. The first would be a simple misunderstanding and it can easily be clarified: A movement may emerge in the absence of prior networks or initiatives and, moreover, movements may give rise to new initiatives and networks within them.⁷ In other words, though there is the apparent suggestion of a natural progression from initiative to network to movement, such a progression is not necessary for, and perhaps not even common in transformative change. Regarding the third, we would like to emphasise that we have not so much forgotten others as chosen to focus on transformative actors. We have of course identified institutional actors as the ones who maintain the structures of systems (which is close to tautological) but we have not at all attempted to typologise them or their potential strategies, if any. This is surely a shortcoming and we are aware of this. The second potential misunderstanding is a more subtle matter to clarify and it is central to understanding how the threads of actor dynamics described thus far can come to form a transitions tapestry.

Transformation is as much about breaking down as it is about building up. However, arguably, most transformative actors consider their goals to be positive ends, they would consider their actions constructive rather than destructive. The issue is that transformative change is about changing systems, sometimes by adding something new to the existing offerings but typically by providing alternatives, and these will either compete with or replace incumbent solutions. From this the picture emerges that transformative dynamics produced by the actions of actors, in the sense of their various endeavours to institutionalise alternative solutions, can have constructive or destructive consequences depending on the degree of institutionalisation of the systems in question. Roughly speaking, the initiative of a frontrunner can be constructive if leading to the emergence of a single-solution system and destructive if the initiative is to implement the alternative in an incumbent system, where the institutional setting will need to be adjusted and where it competes with other solutions.⁸ We will elaborate this a little bit more.

We said that frontrunners, through their alternatives, provided systems with diversity. Connectors were considered to provide connectivity, for obvious reasons. And, topplers, through their system shaping, articulation and advocacy of shared values, provided coherence. Each of these can have disruptive outcomes as much as reinforcing, depending on the system in question. Diversity of non-aligned alternatives may be an important breeding ground to grow from, but in established systems it may be at odds with stability and efficiency. Similarly for connectivity, where connecting alternatives into an existing system may be disruptive, but connecting several alternatives into a network or nascent system may be reinforcing. Finally, coherence was related to the system shaping work of topplers, which entails establishing alternative sets of solutions as much as it can mean phasing out of incumbent solutions.

In an ongoing transition, the transformative actions of actors relate to incumbent and emerging systems alike. Not all actors are affiliated to both, but many necessarily have to be. In order to

start an initiative, for example, a frontrunner may need access to funding or at least permission to do whatever the initiative is about, and this may very well come from the systems the frontrunner provides an alternative for. Networks, in a likewise manner, may be initiated by connectors affiliated to an incumbent system whereas their actions may lead to the development of an emerging system in direct competition with the incumbent, or to the displacement of certain solutions within the incumbent system. Toppler action would almost always rely on simultaneous affiliations to incumbent and emerging systems either because the transformative potential of movements requires supporters in institutional roles or because their system-shaping activities involve negotiations and establishing agreements across systems.

From the above one sees again the virtue in framing actors' relationships with systems in terms of affiliations, rather than viewing actors as part of, or exclusively belonging to, specific systems.⁹ Actor dynamics lives in an *actor space*, where actors interact and form alliances on the basis of shared values that connect them to streams living in their own *stream space* as it were. The consequences of the (inter)actions of actors and alliances are felt in the *system space* and the transformative dynamics at large requires taking into account the actors, streams and systems, that is, the entire transformative *field*.

Illustrations and hypothetical cases

At the risk of stereotyping we can now construct two pictures of transition dynamics based on actors, streams and systems. At the core is the actor dynamics, where actors affiliate with alternative solutions and existing systems as they deem opportune. They connect to a rising stream, and initiatives, networks and movements form with increasing numbers of supporters. In the systems space there can of course be several outcomes but we will for now consider only two complementary scenarios of successful¹⁰ transformative change.

Figure 1 depicts the simple decline of the incumbent system at the expense of the success of the emerging system. Paired with this is the drying up of the stream representing the values embodied in the incumbent system and the rise of the stream of the emerging one. During the course of this transition the two systems exist as almost mutually exclusive ways to meet the same societal needs. Figure 2 depicts a transition where the emerging system grows in co-evolution with the declining incumbent. Doubly affiliated actors facilitate constant exchange and mutual adoption of solutions and institutions. Midway through the depicted time line the two systems are at the verge of merging while both have changed significantly and their streams have come together; that is, both their value sets have adapted to each other.

Presenting these two highly stylised scenarios as illustrations again invites the misunderstanding that our framework presupposes some kind of necessarily sequential, almost unavoidable unfolding of transition dynamics. We argue however, that the contrary is the case. The building blocks of these scenarios—the dynamic assumptions of our framework—are capable of representing transitions of arbitrary complexity and are not at all limited to these two, admittedly simplistic, examples.

Figure 1. Transformative field dynamics of an incumbent system being replaced by an emerging system. Actors, streams and systems as well as connections, affiliations and alliances are shown.

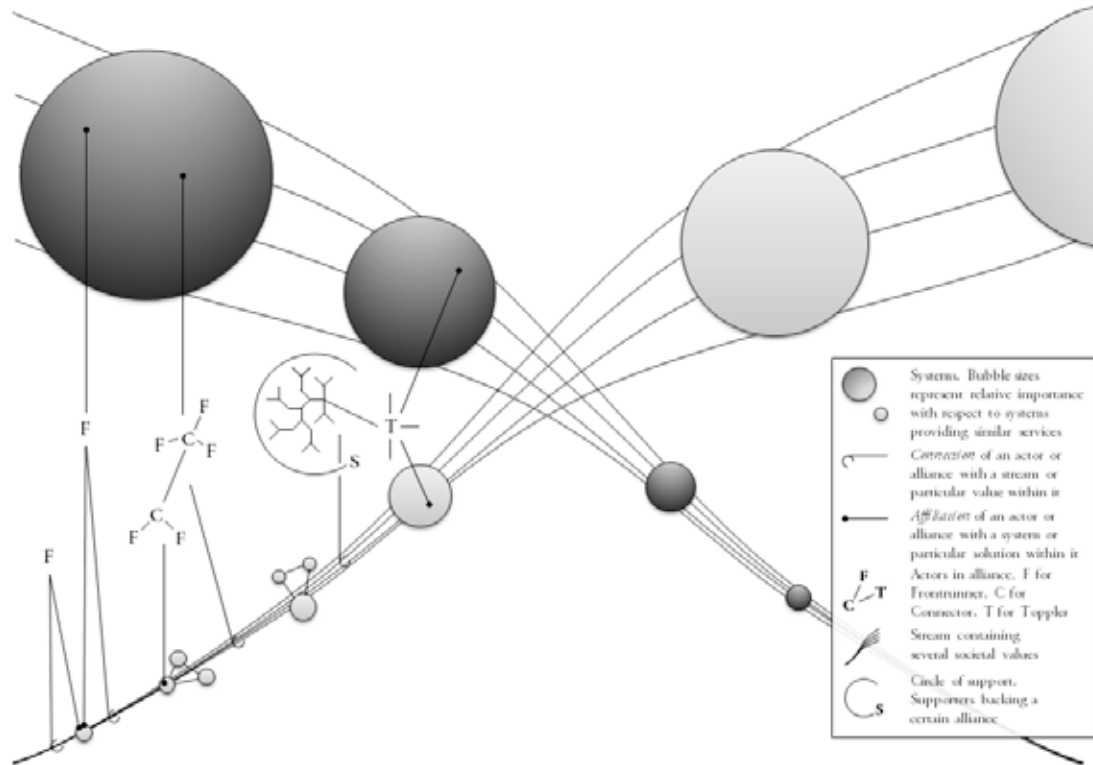
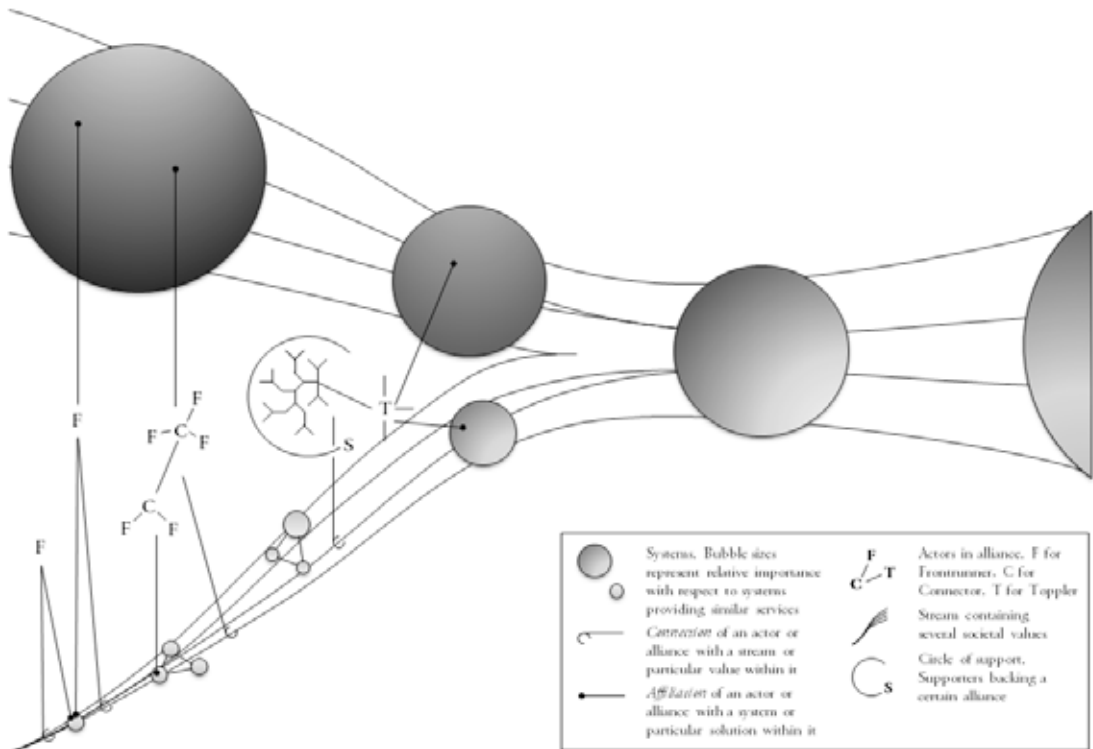


Figure 2. Transformative field dynamics of an incumbent system merging with an emerging system. Actors, streams and systems as well as connections, affiliations and alliances are shown.



To make these depictions in abstracto come alive somewhat, we can fill them in with particulars from two hypothetical case studies. Although these cases are hypothetical, they are meant to be plausible and representative for actual cases in OECD-like countries such as the Netherlands and Australia, on which many of the stylised facts are based. Hypothetical Case 1 is intended to illustrate the dynamics depicted in Figure 1 and Hypothetical Case 2 those of Figure 2.

Hypothetical case 1: Electricity provision

The first case concerns an electricity provision system, based on central generation and grid distribution. The system depends heavily on fossil fuels and it embodies a stream with such values as universal access and affordability. Though this system is powerful, a new stream is rising with values like self-sufficiency and sustainability. A variety of transformative actors and alliances connect to this new stream and see smaller-scale distributed electricity technologies, such as wind turbines and solar photo voltaics as the right solutions for energy provision. The alliances of these actors implement these solutions in several ways that differ from the central generation model, including cooperatives and producer-consumers.

The implementation of such solutions and the initiatives around them are typically the work of frontrunners. Connectors play an important role in the institutionalisation of the novel approaches pioneered by the frontrunners, think for example of the creation of subsidy schemes, legal or tax exemptions that facilitate uptake etc. Note that such connectors would often have, or also have, a role as an institutional actor in the incumbent, grid-based system. The ongoing proliferation of distributed solutions, may lead to the gradual institutionalisation of a new system alongside the incumbent system.

Though the emergence of this new, distributed system in itself already reduces the dominance of the incumbent one, it does not necessarily imply its demise. Strategic action of topplers may lead to further systems-level changes. For example through being a figurehead of a movement drawing many supporters away from the incumbent solutions to the emerging ones. Another example would be a toppler directly pursuing institutional change curbing the functioning of the incumbent system and empowering the emergent one. This was what the toppler of Dutch NGO Urgenda did by means of a lawsuit against the Dutch government, arguing their harmful negligence in relation to the effects of carbon emissions, pointing to their duty of care. Contrary to expectations of many people, the court ruled in favour of Urgenda, effectively ordering the Government to cut emissions by at least 25% within five years.¹¹

Hypothetical case 2: Health care

The second case concerns a modern health care system with high levels of specialisation, run by academically trained professionals. As the system is costly, insurance is mandatory and arranged by insurance companies rather than the state. This system embodies a stream with values like universal access, efficiency and efficacy of treatment. Consequentially the system is accessible, efficient and effective. It is also bureaucratised, very complex and focussed on medical procedures rather than patients' wellbeing. A new stream with more individualist values such as personalised care, is rising.

Actors connecting to this new stream started initiatives that have emerged in the area of home care that offer solutions with a different approach. These initiatives are again typically the work of frontrunners. Just as in the first hypothetical case, connectors play an important role in the institutionalisation of the novel solutions, and here also this may amount to subsidies and legal and tax exemptions. In this case however, the efforts of connectors are directed towards making the new solutions an accepted part of the incumbent system, for example by means of accreditation and certification. Toppler action in this case can consist in strategically

outcompeting the solutions of the incumbent system, like in the case of the Dutch home care organisation Buurtzorg¹² (Neighbourhood Care) who have become a firmly established and appreciated alternative and whose success has led to uptake of the Buurtzorg model in several other countries including the US.¹³ See the book by Rotmans et al. (2014) for more on Buurtzorg and their toppler (in Dutch).

Systemic change and institutionalisation

We can now briefly revisit the idea that the constructive or destructive consequences of transformative change depend on the degree of institutionalisation of the system in question.¹⁴ Assuming it carries some truth, and with the framework as it now stands, we can draw some conclusions. Firstly, if we consider a transition starting with a well-established incumbent system then all transformative change is initially going to contribute to its decline, however small these effects may be at the outset. Conversely, transformative change, for nascent systems, is more likely to have a constructive effect, until of course, the emerging system reaches a degree of institutionalisation at which transformative change will become detrimental to it. Thus we arrive at the conclusion that if the degree of institutionalisation determines the constructive or destructive systemic manifestations of transformative actions, then there is a degree of institutionalisation at which it is unclear whether the effects of transformative change will be constructive or destructive.

It is tempting to assume this would occur in the middle stages of Figures 1 and 2 or the acceleration phase—the steep part of the S-shaped curve—of the Multi-Phase picture of transitions (Rotmans et al. 2001), when a period of pre-developmental transformative change has brought down the degree of institutionalisation of some, and increased that of other systems. One could conjecture that since in such a period more directions of systems change are possible, the strategic actions of relatively few actors may be highly effective, which is an important observation to make if one is interested in steering or managing transitions. Surely, these are the periods of disequilibrium that Rotmans and Loorbach (2009) view as opportunities to direct systems in desirable directions.

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- ¹ Geels also points this out in the context of the MLP in his 2011 article and presents a number of examples from the literature where this has been done.
 - ² A more in depth treatment of the concepts described here can be found in the following articles: (de Haan and Rotmans, 2011)—societal systems, (de Haan et al. 2014)—societal needs, (de Haan and Rogers 2014)—needs, solutions and institutions. The integration of these concepts and its further development, including the explication of transformative change, institutional and transformative actors, streams and the field, was first presented in (de Haan and Rotmans 2015).
 - ³ The extent of this sharing can of course vary and we certainly do not imply, for example, that all relevant knowledge is universally shared—or even accessible—in a given society.
 - ⁴ Here also, it is not necessarily the case that such an agreement is social, in the sense that all of society would have agreed.
 - ⁵ Our understanding of values should be non-controversial, roughly corresponding to Schwartz's (2012) conception. However, for the purposes of our framework and its applications the actual values one encounters will typically be more specific than Schwartz's list of basic personal values.
 - ⁶ To be explicit about our metaphysical commitments, we are not claiming any reality for the concept of streams beyond the analytic possibility of providing a useful label in explanations of related phenomena.
 - ⁷ Or think for example of how a global movement, possibly grown out of a local initiative, may inspire local initiatives and networks in a different region or context.
 - ⁸ Nota bene, we do not mean that it depends on one's viewpoint whether these consequences are constructive or destructive. The constructive consequences of transformative change (building up of an alternative) and the destructive consequences (phasing out of obsolete solutions) are both real.
 - ⁹ Moreover, the idea that actors can have multiple affiliations (with different systems) and several roles (acting as a frontrunner, connector or toppler, say) enables the treatment of boundary spanning actors within our framework. See eg (Brodnik and Brown, 2014; Smink et al., 2015) for discussions of boundary spanning in transitions.
 - ¹⁰ Successful, also not intended in any relative sense, but simply to mean that transformative change has indeed occurred - whether in a desired direction or not.
 - ¹¹ See <http://www.urgenda.nl>. For a brief overview of the legal aspects, see: <http://blog.oup.com/2015/07/urgenda-netherlands-climate-change/>
 - ¹² See http://en.wikipedia.org/wiki/Buurtzorg_Nederland
 - ¹³ See <http://www.buurtzorgusa.org/>
 - ¹⁴ The idea of 'degree of institutionalisation' is admittedly not very well defined at all, but it can be thought of as a kind of systemic maturity. It is in that sense similar to the notion of 'structuration of activities in local practices' as employed in some incarnations of the MLP (MLP, eg Geels and Schot 2007) to distinguish between niches and regimes—the former obviously having less structuration than the latter. See (Coenen et al. 2012) for an interpretation of the MLP levels as a measure of systemic maturity ('[. . .] they are conceptually related to the maturity of the socio-technological system').

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