Track 8: Transition paths and urban futures

The strategic dilemma of an open and closed approach of transitional change. Comparing three transition paths to sustainability in the Netherlands.

Ries van der Wouden

PBL Netherlands Environmental Assessment Agency, ries.vanderwouden@pbl.nl

Abstract: The paper aims to make two contributions to the literature on planning and transitions. First, it analyses transitional change as an open and closed process. The policy challenges are 'wicked problems' with unforeseen uncertainties, multiplicity of political values, and complex institutional systems. Dealing with these kind of challenges requires an open approach. Yet, in spite of the wickedness of the issues at stake, policymakers tend to treat transitional change as a closed process: as a large project with fixed goals, road-maps, time-tables, and strategies to reduce uncertainty. The paper argues that this is not a matter of ignorance but the result of institutional mechanisms that push policymakers towards a closed approach. Second, the paper analyses how a closed approach leads to the exclusion of crucial aspects of transitional change, in particular the matter of social justice. It argues that, whereas some transition processes exclude social justice issues, it is better to include them in order to design an open and viable transition strategy. These issues are demonstrated by a comparative analysis of three transition paths to sustainability in the Netherlands: climate and energy, agriculture and food, circular economy.

Keywords: Sustainability; long term planning; the Netherlands; comparative analysis

Introduction

The political debate on climate change has triggered a renewed interest in long term policy. The downfall of the Berlin Wall and the following two decades of 'less state, more market' had given long term policy and planning in general a bad reputation, albeit less so in continental Europe than in the USA and UK. But the urgency of a transition to a more sustainable society has changed this. Long term policy is back on the political agenda, but in a different way than during the 1960s and 1970s. The 'rationalistic', 'blue-print character' and the 'central-rule approach' of former long term policies have been effectively criticized by political scientists and economists (Simon 1957, Rittel and Webber 1973, Van Gunsteren 1976, Pressman and Wildavsky 1979, Rhodes 1996). The times of modernist, rationalistic planning are behind us. Long term policy nowadays has a more reflexive character:

rationality is bounded by principal uncertainties of long term processes, the long and complex road from plan to action is recognized, and the central government rule is replaced by the concept of governance. But this new, more reflexive context of long term policy produces its strategic dilemma's. One of them is the dilemma between an 'open' and a 'closed' approach: the recognition of uncertainties and multiplicity of political values, multi-actor processes, adaptive strategies and learning processes versus policy as a large project with fixed goals, road-maps, time-tables, and strategies to reduce uncertainty. This dilemma is at the heart of long term transition policies to a more sustainable society.

The transition to sustainability is not the first long term transition policy in the Netherlands. During the first decades after the Second World War, the transition to a modern economic system was a big issue in Dutch politics. The industrial sector was to be modernized, rationalization of the agricultural sector was thought to be necessary to rise food production and to keep prices low, and new relations between labor and capital should prevent economic conflicts in the future. Central government and its institutions played a big part in this transition. The result was a rise in economic production, not only in the industrial sector but also in agriculture (Luiten van Zanden 1997: 171). A number of new institutions came into being: knowledge institutes for the economy and agriculture; corporative structures for consultation between government, capital and labor; organizations to rationalize and coordinate different economic sectors. They formed a sound institutional base for the future Dutch welfare state.

During the 1960s and 1970s it became clear that economic growth caused a lot of environmental problems: pollution of water and soil, smog, reduction of biodiversity by the use of pesticides. Environmental policy gained importance, at the national as well as the local level. Environmental policy led to a reduction of some of these problems. It took some years before it was evident that long-term transitions were needed in order to create a sustainable economy for the future generations, and that some problems could only be tackled on a global level. In the Netherlands, the National Environmental Policy Document 4 (NMP 4, 2001), was an important starting point for transition policies. The document named three essential transitions: of the energy system, of the agricultural system, and towards sustainable use of raw materials. These transitions still are dominating Dutch long term policy, albeit with somewhat different names. Energy transition was related to climate policy, sustainable use of raw materials became circular economy, and agriculture now includes the food system.

The paper is structured as follows. The next section discusses the central theoretical concepts of this paper: open and closed approaches, the role of uncertainties and multiple values, institutions and transitional change. Next, three long term transition policies to sustainability in the Netherlands will be discussed: climate and energy, agriculture and food, and circular economy. In the last section of this paper the transitions will be compared, and some conclusions will be formulated.

Transitions, cognitive systems and institutions: open and closed strategies

Transitions to sustainability differ from day-to-day policies. Whereas the latter usually stay within the borders of the existing policy system, transition policy deliberately aims to change the policy system itself. The existing policy system has to be replaced by a new policy system, embedded within political values reflecting sustainability, with new goals and instruments. Therefore, transition policy is long term policy almost by definition, and involves reflection on political values and the knowledge structure of the policy system. Geels and Schot (2010: 11-12) defined the main characteristics of transitions, which can be summarized as follows.

Transitions are:

- Co-evolution processes that require multiple changes in socio-technical systems or their configurations, including technologies, markets, regulations, infrastructures, cultural symbols.
- Multi-actor processes, usually with interactions between groups from the private sector, public sector, and civil society.
- Radical shifts from one system or configuration to another. 'Radical' refers to the scope of change, not to its speed.
- Long term processes, very often 40-50 years.
- Macroscopic. The level of analysis is that of 'organizational fields'.

This definition refers to transitions as socio-technical systems. In this paper we will concentrate upon the policy systems, connected with those socio-technical systems. The distinction between socio-technical systems and policy systems is important, because policy systems are connected to other policy systems and the political system as a whole. Economic policy, social policy, environmental policy, spatial policy, agricultural policy, they all have developed their own core values, goals, instruments and institutions. They interfere on the level of political choice. Sometimes their core values conflict, leading to political debate and struggle. The last century showed a lot of conflicts between maximizing economic growth and social justice, asking for a more equal distribution of welfare. And during the last decades, conflicts between the values of economic growth and protection of the environment. These value conflicts lead to a shift from the daily routines within the policy systems to the field of political deliberation, political choice, and the search for compromises. It is a shift from a 'closed' to an 'open' policy context: from a context of policy making as a rather technical set of routines with well-defined risks and no debate on core values to a context with multiple values, unknown risks and shifting institutional structures. The balance between 'closed' and 'open' contexts within policy systems changes in the course of time, and so does the need for 'closed' and 'open' policy strategies.

This is also true for transitions to sustainability. Although they often start within the borders of an existing policy system, in the course of time they are confronted with the need to change the policy system and to challenge its core values. But they do so within different contexts, the context of different policy systems and their core values. A transition path to sustainability of the agricultural policy system may be different from the energy system or transport infrastructure. This makes a comparison between transitions to sustainability within different policy systems interesting. It learns us more about which factors matter and which not, and which policy strategies can be transferred to other policy systems and which not. Therefore, this paper compares three transition paths to sustainability in their policy systems: climate and energy, agricultural and food, and circular economy.

The policy systems and their transitions will be compared on following two aspects.

- The cognitive structure of the policy system/transition (knowledge, values)
- The institutional structure of the policy system/transition, including its political, economic and social contexts.

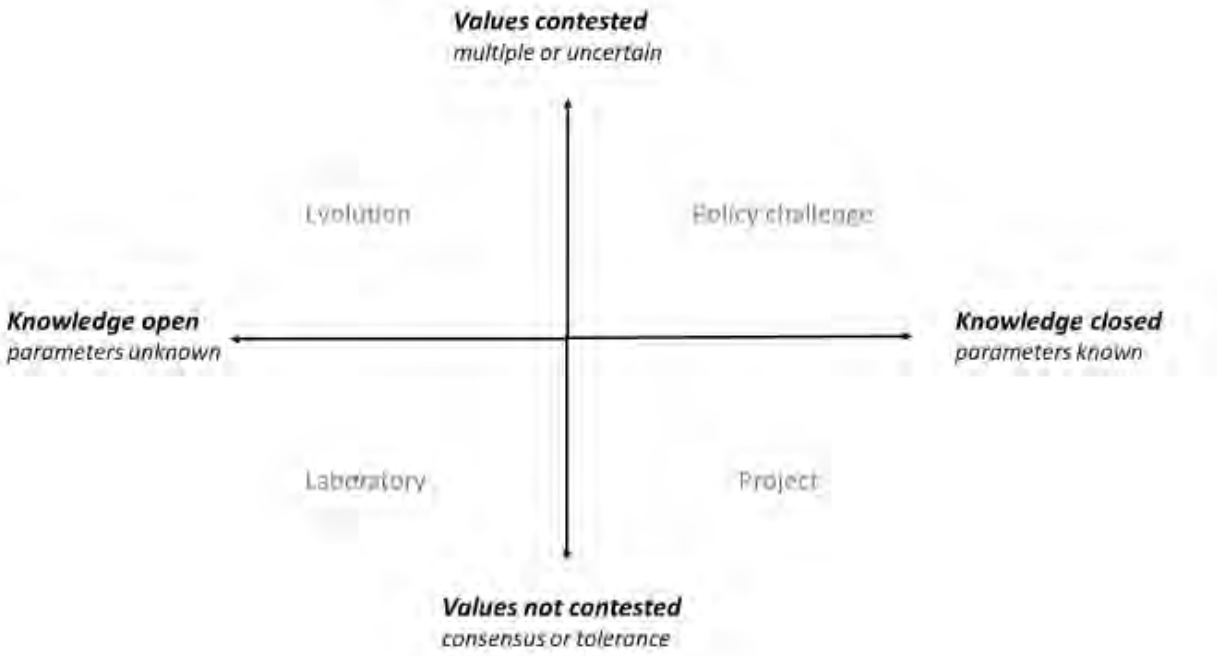
The cognitive structure of the policy system/transition

Policy systems are problem solving machines, among other things. Social, economic or environmental problems enter the policy system through interaction between (parts of) the society and public institutions (problem finding and defining), these problems are 'structured', translated into policies ('solutions'), and matched with the set of available policy instruments, thus leading to bureaucratic action. This is a brief description of the policy making process as a cognitive activity. It is slightly idealized, because very often the policy making process goes the other way around: the existing policies and instruments are matched with a set of policy problems. But either way, it is important to notice that this cognitive dimension of policy making involves both knowledge and values. Sometimes the values seem to be hidden, but they always are there, because policy problems define the gap between an existing situation and a more desirable situation, between 'is' and 'ought'. No 'ought' without values, not even in day-to-day policies. But the more 'fundamental' the policy problems, the higher the change that the underlying values are debated and contested.

There is a growing collection of scientific literature on the cognitive dimensions of the policy process, especially on the structure and structuring of policy problems. In 1973, Rittel and Webber published their seminal article on 'tamed' and 'wicked' problems, followed by the publications of many others (Rittel and Webber 1973, Levin et al 2012, Crowley and Head 2017). Others discern 'structured', 'moderately structured' and 'unstructured' problems, referring more or less to the same characteristics as Rittel and Webber did (Dunn 1981: 103-104, Hoppe 2010: 72-75). For 'tamed' or 'structured' problems, a solution can be found through careful analysis, for 'wicked' or 'unstructured' problems this strategy does not work. For wicked problems there is no definitive formulation, let alone a 'best' solution. Wicked problems are always connected with other problems and therefore lack a final and verifiable knowledge base (there are always 'unknown unknowns'), and are often situated in a multi-value environment. Environmental policy problems very often belong to the category of wicked problems (Crowley and Head 2017: 533-534), and this is even more true for the long term policies for transitions to sustainability, Levin et al. (2012) even labelled them 'super-wicked'.

How to connect this cognitive dimensions of transitions to sustainability with 'open' and 'closed' policy strategies? *Figure 1* shows a typology.

Figure 1. Structure of transitions



The horizontal axis shows the knowledge system, at left side the 'open' system (parameters unknown), at the right side the 'closed' system (parameters known). The vertical axis shows the value dimension, on top the 'open' value situation (values contested or uncertain), on the bottom the 'closed' value situation (consensus or tolerance of differences). This results in four quadrants with different policy strategies. The two extremes are Evolution and Project. Evolution means finding your way while constantly dealing with wicked and changing problems definitions and multiple values, with uncertain time-paths and instruments. Core values of policy systems (sustainability) sometimes conflict with others (social justice), often resulting in compromises but without final solutions. This is the most 'open' strategy. Projects deal with a tamed problem, consensus over values/goals, optimal instruments, and the possibility to make a fixed time-table. This is the most 'closed' strategy. Policy challenge and Laboratory are in between these extremes.

Transitions to sustainability seem to fit into the Evolution strategy. But as we stated before, the structures of policy problems are not 'fixed', problem structuring is a cognitive and political activity that sometimes results in a move to another category. An example is the transition of the energy system in the Netherlands. The 'cutting up' of the policy problem into several smaller problems resulted in a move from Evolution to Policy Challenge, at least temporally. This will be discussed in the next section. However, there is a constant pressure within policy systems to move from 'open' to more 'closed' strategies, not only because the necessity to operationalize of policies demands this, but also for reasons of political accountability ('what results can be expected and when?'). All forms of reflexive long term policies face the dilemma between an open and a more closed approach, according to Voss, Smith and Grin:

> ‘On the one hand, the requirement is not to suppress diversity, but to nurture bottom-up spontaneous developments that are open to ambivalence and contestation, and to retain adaptability towards the complex dynamics of change. On the other hand, there remains a requirement to achieve coordination, to take a synoptic view on broader developments, to close contingency, to fix long-term goals for orientation and mobilization.’ (Voss, Smith, Grin, 2009: 281).

The institutional structure of the policy system/transition

Policy systems do not only have a cognitive structure, the institutional structure is equally important. Most of the ‘mature’ policy systems have complex institutional structures. Usually, they consist of central and local governments, private organizations, pressure groups, knowledge institutes, etc. The institutional structures of those mature policy systems are multi-actor and multi-level, and they have uncertain border-areas with other policy systems. Whereas some of the policy outcomes are the result of the actions of one governmental organization, the more often are not. Other actors from the organizational field are ‘co-producers’ of the policy outcomes. This reflects the shift from ‘government’ to ‘governance’ (Rhodes 1996, 2017; Hajer 2009), from central-rule to network policies (Castells 1997).

Transition policies have to deal with this complex ‘organizational fields’. Sometimes, they cut through different policy systems, with different institutional structures. Complex institutional structures are not easy to change, they create their own path-dependence. The complexity of institutional structures is influenced by:

- The combination of public, private, and civil actors
- The number of government layers involved (international, national, regional, local)
- The number of policy systems involved

These policy systems and organizational fields function within the broader institutional contexts, both national and international. Political factors: the legitimacy of the national political system, the role of international organizations and agreements, the level of political consensus and conflict. Economic factors: the preferences of consumers, the role of the international markets, the consequences of the digitalization of the economy. Social factors: national and international pressure groups, the level of trust in a society, the role of civil society (see Geels *et al* 2016, comparing transitions of the electricity systems in Germany and the UK). This varied set of factors is hard to categorize, and their effects differ from policy system to policy system. For example, the globalization of food markets has strengthened the lock-ins in the agricultural sector, and has reduced the capacity of farmers to change their ways of farming. But on the other hand, the 2015 Paris Agreement on Climate Change has enhanced the national capacity for the energy transition. We will discuss the influence of the most relevant external factors in the next section.

Transition policies can move through this institutional and organizational fields with different strategies, again ranging from more ‘open’ to more ‘closed’. The governance-based strategies are more open (collaboration between actors, collective responsibility), the government-based strategies are more closed (public organization responsible). Here, the political pressure comes from both sides. There are pressures towards an open strategy, because of the necessity of a broader public support. But there are also pressures towards a closed strategy, because of political accountability and the need to develop clear ‘guidelines’ for transition policy.

Analyzing transitions to sustainability in the Netherlands

Climate change and energy

The energy system has gone through many transitions in history: from wood to coal, and to oil, gas and nuclear energy. Nowadays, the transition of the energy system is connected with the political discourse on climate change. In order to reduce global warming, there is a growing sense of urgency to switch from fossil energy to more sustainable sources of energy. The 2015 Paris Agreement on Climate change underlined this urgency, and its goals were adopted in the national climate and energy policy in the Netherlands. There is a national Climate Agreement in the making, and a new Climate Law has already passed the Second Chamber of Parliament. The energy transition is the most important, but not the only policy issue in climate policy. There are also policy programs to tackle the consequences of rising sea-level and changes in the river system because of climate change. Recently, political debate on climate policy has flamed up again, because of the rising prices of energy for households.

Its global character and its relation with other political issues has made climate change into a 'super-wicked' problem. These are the most important reasons: 1. despite the Paris Agreement, there is no central authority to coordinate and enforce policies; 2. those who are willing to solve the problem are also causing it; 3. time is important and running out, delay enhances the risk of passing a point of no return in global warming; 4. politics discounts the future irrationality (Levin *et al* 2012, 126-130). And we can add one more reason: 5. in the political arena the core value of climate policy (towards a sustainable world order) potentially conflicts with other political values. With these characteristics, climate policy seems to be firmly rooted in the Evolution quadrant of *Figure 1*. But the combination of the Paris Agreement and its translation in national goals with the energy system offered the opportunity to structure the climate change problem into policy programs for energy transition. Policy makers used the strategy of 'cutting up' the energy transition into different parts, in order to develop more viable policy programs (PBL 2017). Some of these programs are connected with innovations in the field of energy production. Whereas the energy transition as a whole cuts through a number of policy systems, the 'cutting up' in different policy programs connected each program more or less one-to-one to an existing policy system (industrial policy, agricultural policy, housing and built environment, production of electricity, mobility and transport). By this strategy, the energy transition moved from the Evolution quadrant of Figure 1 to the Policy Challenge quadrant.

The 'cutting up' strategy has its strengths and its weaknesses. It has made the implementation of the energy transition easier. Policy makers could concentrate themselves upon their own policy programs and projects. For example, the energy transition in housing and the built environment has been translated into many projects on the level of urban residential areas, very often in cooperation between public and private actors. The possibility to translate abstract goals into action is one of the strengths of this strategy. But it also made the energy transition more 'closed', in two ways. First, the different parts of the energy transition had to be 'fitted into' existing policy systems: housing, mobility and transport, agriculture, economic policy. Thus, these parts of the energy transition had to adapt themselves to the dominant rules and institutions in the policy system. Second, public and private actors concentrate upon their own part of the energy transition, and lose sight upon the broader context. And this broader context is the source of conflicting values, as became clear in the course of 2018 and 2019. The prices of energy for households did rise more than predicted, whereas the industrial companies with much CO2 pollution did not seem to pay their just part of the costs of the energy transition. Thus, the energy transition came into conflict with social justice as one of the core values of tax- and income policy. All of a sudden, the

energy transition seemed to be back in the Evolution quadrant. Both the core values and the knowledge base (uncertainty on the income effects and the feasibility of some programs) were contested again. But at the same time, most of the policy programs and projects continue. The energy transition may be situated in both the Evolution and the Policy Challenge quadrants at the same time. The outcome of this balancing act is uncertain, and partly depending on political forces. On hindsight, it would have been wiser to have kept the energy transition more 'open' in order to include social justice issues.

The institutional structure of the climate policy and energy transition ranges from international (Paris Agreement) to regional and local. On the national level, the development of a National Climate Agreement includes many actors, ranging from public to private and civil society, including NGO's. On the regional level, provinces, municipalities and water boards cooperate in the design of regional energy strategies. Here, the shift is made from a government to a governance system, from a closed to an open institutional system. But the balance between government and governance in climate and energy policies is still a dilemma that comes to the surface of the political debate from time to time. One the one hand, more government actions and choices can create more certainty for investments from the private sector and citizens (electric cars, sustainable houses), on the other hand an inclusive governance structure enhances the legitimacy of the climate policy and energy transition and makes room for innovative initiatives.

Agriculture and food

Agriculture has a long history of transitions and a strongly institutionalized policy sector. National agricultural policy started after the crisis in food prices at the end of the nineteenth century. Farmers formed cooperative organizations for the purchase of seeds and fertilizers as well as for the production of dairy products. The government started with information services for farmers, research institutes and an educational system, ranging from basic vocational training to the Wageningen agricultural university. After the Second World War the institutionalization of the agricultural policy sector became stronger. The Ministry of Agriculture was established, as well as a number of corporative structures and a new research institute, the Agricultural economic institute LEI (Keulen 2014: 24-71). This institutionalized cooperation between government and the agricultural sector became very effective in defending the interests of the agricultural sector, and was known as 'the green front' or even the 'iron triangle'. A modernization program started, including rationalization of production methods, a more efficient use of land, and the enlargement of farming companies. As a result of these actions, there was a strong growth of agricultural production and export of agricultural products. A successful transition to modernity (Grin 2010). There was broad consensus on the core values of agricultural policy: efficient production methods and land use, food security, and secure incomes for farmers. These values formed a rather closed policy system. The wicked problem of fluctuating food prices and food shortages seemed to be tamed. Agricultural policies were firmly situated in the quadrants of Policy challenges and Projects of *Figure 1*. Technological innovations were framed by the search for rationalization and efficiency of agricultural production.

But the economic success had its downside. During the 1960s and 1970s it resulted in the overproduction of dairy products, and the first environmental problems became visible. There were concerns on the effects of pesticides on human health, on the degradation of the landscapes by the agricultural companies, and on animal welfare. The spatial impact of the modernization of agricultural sector was huge: agricultural land use covered about two-third of the Netherlands, and changes were visible everywhere in the countryside. The societal image of the agricultural sector became more and

more negative: from successful economic sector to 'bio-industrial complex'. A strong environmental counter-discourse against modern agricultural production came into existence, and soon gained much social support. This critical current existed of two branches: a 'eco-fundamentalist' and a 'eco-efficient' branch. The first branch based itself upon counter-values against the dominant agricultural practice: small-scale and biological production methods, living in harmony with the earth, less or no meat consumption. It promoted an alternative agricultural and food system. The second branch tried to reconcile ecological values with economic values, promoting more efficiency in order to reduce the environmental effects of agricultural production while preserving the economic vitality of the sector. And more efficiency implies large scale rather than small scale farming. From the 1990s onward, the globalization of food markets and the decrease of national government subsidies led to a downward pressure on food prices, and the 'eco-efficient' branch became dominant, in production as well as in the policy system (Schuurman 2013). This resulted in a 'lock-in' of agricultural production. Farmers have to rise their production levels and to invest in new technologies (often with borrowed capital) in order to survive. Alternative ways of production become more and more difficult, if not impossible. And the changes in the institutional system have enhanced this. There is less government influence, but instead the farmers have become more and more dependent upon the big supermarket-companies, the most powerful actors in the food system. The 'lock-in' of agricultural production itself is related with this institutional 'lock-in'. Compared to the two other transitions discussed in this paper, the agricultural policy system does not have to deal with many other policy systems, but is by far the most institutionalized policy sector, thus creating its own path-dependencies. The complexity of the institutional arrangements was enlarged by the growing influence of EU-policies, not only in agricultural policy, but also in environmental and nature policy.

But at the same time, a number of crises (BSE, Q-fever, animal welfare issues, reduced biodiversity, and degradation of nature close to agricultural areas) shows that the eco-efficient approach has reached its limits. Some environmental goals have been absorbed into the rather closed approach of eco-efficiency, but a transition to a more sustainable agricultural and food system asks for more changes (PBL 2018b). A more 'open approach' is wanted, to combine the value of efficient food production with sustainability values. However, there is consensus that the negative environmental effects of agriculture should be reduced, but far less on the transition itself. What values must prevail: animal welfare, reducing the effects on biodiversity and climate change, protecting landscape and nature? And can these values be combined with protecting the economic vitality of the agricultural sector, with affordable food prices, or with feeding a growing world population? What to expect from technological innovations, and how to prevent more dependency of farmers from banks and supermarkets? How can the policy system influence agricultural production and consumption? These are the fundamental issues in the transition of the agricultural and food system in the Netherlands nowadays.

Answering these fundamental questions for a future transition policy asks for an open approach, including and confronting the different values in a public debate. And an open approach on the institutional level: including producers, governments, consumer organizations, supermarkets and NGO's. The need to take this essential step towards a transition to a more sustainable agriculture and food system is now recognized by the Dutch government (LNV 2018). In 2019 further steps in the debate and the design of a transition policy will be taken.

Circular economy

Compared to the two other transitions to sustainability discussed in this paper, the transition policy from a 'linear' to a 'circular' economy is quite recent. However, the transition policy was preceded by a policy program aiming at recycling waste, from the end of the 1980s onward. In the course of the years, the policy program also focused upon the reducing the use of raw materials, as a stepping stone towards attending the circular economy as a whole. Since 2016 the government of the Netherlands adopted a National Program Circular Economy, with an even stronger focus upon raw materials (I&M and EZ 2016). The program developed a policy goal: a reduction of 50% in 2030 in the use of raw abiotic materials (minerals, metals, fossil energy sources). In 2018, five priorities were formulated: biomass and food, synthetic materials, industrial production, building industry, and consumption goods. There is a strong link with the priorities in the EU-policy on promoting a circular economy.

The transition policy is based upon a ranking order of strategies, ranging from refuse, rethink, reduce, reuse, repair, to recycle and recover energy (PBL 2018c: 11). The ranking order starts with the most fundamental strategy. Refusal, rethinking and reducing the need for raw materials is more fundamental than recycling or using waste for energy purposes. But the most fundamental strategies also demand the most fundamental changes in the economic system, the innovation of products and the process of production. In the Netherlands, the majority of policy actions have been aiming at bringing more efficiency in the process of production, and the recycling of waste in the process of consumption. Here, the situation is comparable to the agriculture and food system: policies are directed at maximizing the eco-efficiency of the existing economic system, not at transforming the system itself. There is no operationalized transition strategy, the strategy is still in the phase of translating concepts into policies. In this respect, it lags behind the Climate change and energy transition program.

A more fundamental transition strategy also demands innovation, in products and in processes. In 2019, PBL published the results of a research project monitoring circular activities in Dutch society (PBL 2019). This study had two important conclusions. First, not all circular activities are new. The majority of activities is rooted in the traditional economy, such as the repair of bicycles and cars, and reselling used furniture. Second, only a minority of the activities have an innovative character, in the sense that they are aimed at the change of products and processes of production. Many of these innovative activities are 'recycling' initiatives, experimenting with new ways of reusing materials. This innovative initiatives situates the transition policy towards a circular economy in the Laboratory quadrant of *Figure 1*: trying to find out what works and what not. The PBL report advises the government to give more support to innovative initiatives outside the recycling category, in order to develop a more fundamental transition strategy. This strategy could bridge the gap between policy concepts and practice. It is also a strategy to postpone fundamental debates on the core values of the transition, and its potential conflicts with other political values. The approach is 'open' in its experimental search for new knowledge, but 'closed' towards the debate on core values, at least temporally.

The institutional context of the transition to a circular economy is potentially complex. It connects activities on many levels, from the global markets of raw materials to local activities. And it at aimed at changing the most fundamental social system, the economy as a whole. Therefore, it involves many policy systems, and many public and private actors. But in this phase of the transition, much of the institutional complexity is still hidden. There are some initiatives to coordinate activities towards a circular economy, such as the national Raw Material Agreement. But compared to the Climate and energy transition, this 'open' approach is still in its starting phase, and it misses the urgency of

internationally agreed goals like the ones in the Paris Agreement on climate change. But on the other hand, the transition policy toward a circular economy can learn from the successes and failures of the other transitions to sustainable development. And recently, the Minister of Agriculture adopted a circular approach to promote more fundamental change in the agriculture and food system. This could give a boost to the circular economy transition.

Comparison of transitions and conclusions

In the preceding section the three transitions are analyzed separately, in this section the transitions will be compared in relation to the cognitive and institutional aspects discussed in the previous section. The results are summarized in *Table 1*.

Table 1 Three transitions compared

Aspect	**Climate/energy**	**Agriculture/food**	**Circular economy**
Wicked/structured			
Knowledge	Structured by partial policy programs, innovation	Partly structured by research and knowledge	Not much structured, growing innovation
Values	Urgency, from consensus to re-politicization	Urgency but no consensus, Different core values	Medium consensus and urgency
Institutional structure			
Role private sector	Mixed: some policy issues low, others large	Large	Mixed: some policy issues low, others large
Policy systems involved	Many	One dominating policy system	Many
Layers of governance involved	Global (Paris Agreement) to regional/municipal	European and national dominating	European to municipal
Open and closed approaches	Closed on policy programs, opening on (conflicting) core values; governance mixed	Open on core values, tendency to more open governance under social pressure	Open towards innovation processes, fuzzy governance

Some conclusions can be drawn from this comparison:

- There are many similarities between the climate/energy transition and circular economy, especially in their institutional characteristics. Both transitions involve many policy systems, both have a mixed public-private structure. Their governance structure is a bit different, because

of the existence of the global agreement on climate chance. A similar agreement is absent in the transition to a circular economy. This is an explanation for differences in both the urgency and the development and implementation of policy programs. The process of transition for climate and energy seems some steps ahead of the transition to a circular economy. This implicates that some lessons can be drawn from the climate/energy transition process for the circular economy transition.

- At the same time, the climate/energy case clearly shows that this large transition is not a linear process. The process of structuration of the initially wicked problem through the creation of partial policy programs was confronted with a renewed political debate on the consequences of the transitions for the incomes of households in the Netherland. Thus, the core value of the transition, i.e. sustainability, came into conflict with the political value of social justice. The transition process was forced to 'open up' for this political debate. This did not mean that the process of structuration in the partial policy programs stopped, both processes have parallel lives. But it creates an uneasy balance, which can be disrupted by political shifts. On hindsight, it would have been wiser to have kept the energy transition more 'open' in order to include social justice issues.

- The situation of the agriculture and food transition is completely different from the other two, to begin with the institutional structure. Whereas the two other transitions have relatively new policy programs that 'cut through' various policy systems, agriculture has a longstanding policy tradition, resulting in a strongly institutionalized policy system. During the last century, the prime goal of this policy system has been the modernization of the agricultural sector, supported by the rationalization of the production of food. From the 1980s onward, there were two major changes. First, worries about the environmental effects of agriculture became an important policy issue. The 'eco-modernist' strategy tried to combine environmental goals with the modernization program. This strategy has reached its boundaries. Second, the agricultural system has moved from a 'policy ruled' to a 'market-ruled' system, with price-based competition. This creates lock-in situations for farmers, making it difficult to change their ways of production. Most of the actors involved agree that it is necessary to move towards a more sustainable system, but there is much debate about the core values, including the economic vitality of the agricultural sector. But apart from an already initiated open debate on these core values, it is clear that this transition cannot do without a strong program for institutional change.

- What about open and closed approaches? At the level of core values, it is clear that a more open approach is emerging in some transitions. It has the advantage of the possibility to identify potentially conflicting values in an early stage, especially social justice values. Energy prices and food prices are crucial for most households, and lower income households spend a relatively large part of the incomes to food and energy. Social justice values are strongly institutionalized in Dutch society, and therefore it is better to include them in the transition strategy by an open approach (Van der Wouden 2017). This is less clear at the operational and institutional levels. Sometimes are more closed approach can create an operational 'fast lane' for the development of policy programs with clear goals, a transition path with certainty for investors, and accountability towards politics and society. But this strategy comes with some risks. The 'cutting up' of both the energy transition and the transition towards a circular economy into different policy programs implied that these transitions had to adapt themselves to existing policy systems (for the energy transition: housing, mobility and transport,

agriculture, economic policy). At least, the closed approach may be combined with a more open approach at the project level: bottom-up, experiments and trying out innovation. And at the institutional level there is an essential tension between the more open governance strategy and the more closed government strategy. A governance strategy will facilitate economic and social support (and sometimes resistance) and also the use of the creativity of private co-producers of transition policy. But for some types of institutional change, especially when laws and rules are involved, a more closed approach is suitable. Decisions on these issues are the legitimate domain of government.

- The transitions to sustainability will have consequences for land use, especially at the regional and local level. Wind energy, solar panels, combining nature and agriculture, electric cars, water retention because of climate change, new ways of urbanization, they all imply changes in land use. This is where the urban and regional spatial planning comes in, because land-use planning is its core business. The default strategy at this level is an open approach, because the land-use claims of different transitions often have to be combined in the context of scarcity of available land. Involvement of different policy sectors and actors is crucial for success. On top of this, an open approach can facilitate creative innovation in the combination of functions in land-use.

References

Castells, M., 1997, *The rise of the Network Society*. (New York: Wiley).

Crowley, K., and Head, B.W., 2017, The enduring challenge of 'wicked problems': Revisiting Rittel and Webber. *Policy Sciences* 50, 539-547.

Dunn, W.N., 1981, *Public Policy Analysis*, (Englewood Cliffs: Prentice Hall)

Geels, F.W. and Schot J., 2010, The dynamics of transitions. In: Grin, J., Rotmans, J. and Schot, J., (eds.), *Transitions to Sustainable Development*, 11-101. (New York/London: Routledge).

Geels, F.W., *et al.*, 2016, The enactment of socio-technical transition pathways: A reformulated typology and a comparative multi-level analysis of the German and UK low-carbon electricity transitions (1990–2014). *Research Policy* 45, 896-913.

Grin, J., 2010, Understanding Transitions from a Governance Perspective. In: Grin, J., Rotmans, J. and Schot, J., (eds.), *Transitions to Sustainable Development*, 223-319. (New York/London: Routledge).

Gunsteren, H.R. van, 1976, *The Quest for Control*, (London: Wiley)

Hajer, M., 2009, *Authoritative Governance, Policy-making in the Age of Mediatization* (Oxford: Oxford University Press).

Hoppe, R., 2010,*The Governance of Problems*. Bristol: The Policy Press.

IenM and EZ, 2016, Nederland circulair in 2050. Rijksbreed programma Circulaire Economie. Den Haag: Ministeries van Infrastructuur en Milieu en Economische Zaken.

Keulen, S., 2014, Monumenten van beleid. (Hilversum: Uitgeverij Verloren).

Levin, K. *et al*., 2012, 'Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change'. *Policy Sciences* 45, 123-152.

LNV, 2018, Landbouwvisie, Nederland als koploper in kringlooplandbouw, Den Haag: Ministerie van Landbouw, natuur en voedselkwaliteit.

Luiten van Zanden, J., 1997, *Een klein land in de 20e eeuw. Economische geschiedenis van Nederland 1914-1995*. (Utrecht: Het Spectrum).

NMP4, 2001, Nationaal Milieubeleidsplan 4. Een wereld en een wil, werken aan duurzaamheid. Den Haag: Ministerie van VROM.

PBL, 2017, Methodiek voor de analyse van transitiebeleid. Den Haag: Planbureau voor de Leefomgeving.

PBL, 2018a, Nederland duurzaam vernieuwen. Balans van de leefomgeving 2018. Den Haag: Planbureau voor de Leefomgeving.

PBL, 2018b, Naar een wenkend perspectief voor de Nederlandse landbouw. Den Haag: Planbureau voor de Leefomgeving.

PBL, 2018c, Circulaire economie: wat willen we weten en wat kunnen we meten. Den Haag: Planbureau voor de Leefomgeving.

PBL, 2019, Circulaire economie in kaart. Den Haag: Planbureau voor de Leefomgeving.

Pressman, J., and Wildavsky A., 1979, *Implementation, How Great Expectations in Washington Dash in Oakland, California*, (Berkerley: University of California Press, 2nd edition)

Rhodes, R.A.W., 1996, The New Governance: Governing without Government, *Political Studies* 44, 652-667

Rittel, H.W.J. and Webber M.M., 1973, 'Dilemmas in a General Theory of Planning'. *Policy Sciences* 4(2), 155-169.

Schuurman, A., 2013, 'Agricultural policy and the Dutch agricultural institutional matrix during the transition from organized to disorganized capitalism'. In: Moser, P., and Varley, T. (eds.), *Integration through Subordination. The Politics of Agricultural Modernisation in Industrial Europe.* (Turnhout: Brepols), 65-84.

Simon, H.A., 1957, *Administrative Behavior, a Study of Decision-Making Processes in Administrative Organizations*, (NY: McMillan, 2nd edition).

Voss, J.P., Smith A., Grin J., 2009, Designing long-term policy: rethinking transition management. *Policy Sciences* 42: 275-302

Wouden, R. van der, 2017, Leefomgevingsbeleid op een tweesprong. De leefomgeving als maatschappelijke en als ruimtelijke opgave. Den Haag: Planbureau voor de Leefomgeving.