Towards a sustainable future:
Lessons for local collaborative governance

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Content

Executive summary

In 2013, over 40 Dutch organizations, including the VNG, signed an Energy Covenant. It was agreed that in 2023 the amount of renewable energy should be increased by 16% and that energy consumption should go down by 1,5% each year. Already, there are many initiatives that contribute to a more sustainable future. However, it is yet unknown what makes some initiatives successful and others less successful. This research report advises municipal authorities via the VNG on what they should pay special attention to and what endeavor should be made or avoided in order to increase the chances of producing collaborative innovations in the domain of sustainability. The research question that is answered in this study reads as follows:

What are drivers and barriers of collaborative public innovation initiatives that contribute to the energy transition on a local level?

In the theoretical section, this study largely adopts Chris Ansell and Alison Gash's definition of collaborative governance and their model of collaborative governance. That is, collaborative governance is conceptualized as a circular process whereby municipalities and stakeholders work together to produce innovative solutions. However, given that Ansell and Gash's model falls short on the conceptual development of what successful outcomes of collaborative governance are, the model is complemented with six assessment criteria for successful collaborative governance drawn from Jacob Torfing. Concretely, the model that is used in this study focuses on starting conditions, institutional design, facilitative leadership, collaborative process and effectiveness.

The findings are based on a study of studies. Peer-reviewed studies were retrieved from online scientific databases. In total, seventeen collaborative sustainability initiatives in Belgium, Denmark, the Netherlands, Germany and the United Kingdom are analyzed qualitatively to distill best practices. The analysis of the cases consisted of two steps. First, the cases were scored with an assessment tool that measures collaboration, innovation and effectiveness. This resulted in four groups of cases: positives extremes, comparison cases, deviant cases, and negative extremes. Secondly, the theoretical model was applied on the seventeen cases. Drivers were found in the cases with high scores whereas barriers were found in the cases with low scores. In total, thirteen critical drivers and barriers were identified.

The study finds that some best practices can be drawn from scientific case studies. The main finding of the research is that what may actually be considered as best practices is dependent on the type of collaboration. Municipal authorities should therefore consider what kind of collaboration they are in. Concretely, three types of collaboration are distinguished: citizens' initiatives (bottom-up), governing by authority (top-down) and partnerships with other state or non-state stakeholders (horizontal).

Whereas some drivers are given, others can be manipulated. Drivers that can be influenced by a municipality are labeled as best practices. The best practices include the following:

- Having a facilitative leader to bring stakeholders to the table or support the collaboration;
- Co-creating a vision that serves as symbolic guidance;
- Governing by enabling, rather than by authority, when dealing with citizens' initiatives;
- Including a broad range of stakeholders either for gaining legitimacy, facilitating implementation or stimulating exchange of assets;
- Avoiding the exclusion of relevant stakeholders and potential adverse effects of resistance from those stakeholders;
- Designing initiatives that combine not only sustainable but also economic values, especially when taking a more top-down approach;
- Attracting change agents in the process;
- Fostering the creation of policy niches or urban laboratories for generating protected environments for innovation;
- Building capacity in local communities and beyond.

The best practices extracted from the case studies do not offer a concrete how-to guide or remedial actions to individual cases, but are merely reflection points for local authorities that are working towards the energy transition. Three reflection points can be distilled from this research. A first point for reflection is that for successful collaborative innovation past cooperation cannot be ignored. Local authorities play a pivotal role in preserving and providing continuity to past cooperation. A second point of reflection concerns the implementation of collaborative governance. The implementation of a collaborative innovation should not only be considered as a phase for the fulfillment of targets, but also as an opportunity for capacity building. A third point of reflection concerns the disposition of municipalities toward trial and error. Local authorities should take more courageous efforts and allow for more experimentation in order to be innovative. Besides the three reflection points, there is a methodological recommendation. This study stresses that adaptation to new circumstances is highly valuable but it is not feasible without enough capacity or sufficient feedback. A good practice would be to steer more on knowledge creation that enables opportunities for adapting practices on an evidence base.

In addition to this report, an applied guideline is attached, which provides practical recommendations for municipalities.

1. Introduction

1.1. Mitigating climate change

Climate change is one of the most wicked problems in contemporary Dutch society. The need for a more sustainable future is widely acknowledged, but not much progress has been made yet. For example, in 2015, the share of renewable energy of all Dutch energy consumption was only 5,8%[1]. Of all EU countries, the Netherlands is only performing slightly better than Malta and Luxembourg (both only 5% of renewable energy), while performing much worse than the best performing country (Iceland, 70,2%). In order to increase the amount of sustainable energy production, reduce carbon dioxide emissions and lower energy consumption, over forty Dutch organizations signed an Energy Covenant. A wide range of public and private organizations signed this agreement, including environmental organizations, the national government, labor unions and employers' associations. In this covenant, ambitious goals are set to improve sustainability in the Netherlands. For example, it is agreed that 14% of all energy production should be renewable by 2020 and 16% by 2023.

The Dutch Association for Municipalities (VNG) is committed to the Energy Covenant. Municipalities are thus also responsible for the attainment of the objectives that are laid down in the agreement. Moreover, the local level plays a very important role in the transition towards a sustainable future. For instance, decentralized energy production and sustainability initiatives such as smart grids are getting more popular and contribute significantly to mitigating climate change. These initiatives heavily depend on municipalities[2]. Therefore, municipalities are much involved in realizing what is called the energy transition, that is, the change towards sustainable ways of producing energy and living in general. This fits within a larger trend. As Barber[3] argues, nation states have failed to tackle global, wicked problems like climate change.

In the last decades, a rapid stream of technological improvements has enabled many possibilities for the efficient and effective production of renewable energy and other sustainable ways of living. However, technological innovation alone is not sufficient for facilitating future sustainable systems. Appropriate ways of governing are equally important[4]. Without the necessary involvement of public actors, such as municipalities, technological improvements will not resort any change. Municipalities thus have an important role to play when it comes to the realization of the energy transition and the attainment of the objectives in the Energy Covenant.

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[1] Eurostat (2017)
[2] Lammers and Diestelmeier (2017)
[3] Barber (2013)
[4] Lammers and Diestelmeier (2017)

One of the strategies to make effective and efficient sustainability initiatives prosper is through collaboration. Climate change is one of many 'wicked problems'[5] that are faced by municipalities. Similar to other public organizations, municipalities experience a growing demand for innovative solutions to this type of problems[6]. Municipalities are thus confronted with problems that cannot be solved with the existing problem-solving repertoire. Therefore, new ways of governing are needed. An important way to innovate is through collaboration with other stakeholders, such as private and public organizations and citizens[7]. This is called collaborative governance[8]. The concept of collaborative governance has become very popular in recent years[9] and many municipalities are engaged in all types of collaborations and networks that contribute to the realization of the energy transition. Yet, it is unknown which factors are important for the success or failure of collaborative initiatives in the sustainability domain[10]. Hence, this research aims to provide guidelines for municipalities on what constitutes successful, collaborative, innovative, public initiatives on a local level that contribute to the realization of the energy transition. The research question that this study will answer, reads as follows:

What are drivers and barriers of collaborative public innovation initiatives that contribute to the energy transition on a local level?

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[5] Hartley, Sørensen and Torfing (2013)

[6] Hartley, Sørensen and Torfing (2013)

[7] Torfing (Unpublished)

[8] Torfing (Unpublished)

[9] Torfing, Guy Peters, Pierre, Sorensen (2012)

[10] Sustainability is broader than just the energy transition. For example, water management is important for a sustainable future, but does not necessarily involve energy. Because the concept of energy transition is fairly new and not clearly demarcated, we will look at sustainability initiatives in general. Although these initiatives do not always (directly) contribute to the realization of the energy transition, they can still be meaningful and relevant for the realization of it. Thus, the most important criterion for inclusion is in this study is not whether an initiative is linked to the energy transition but whether the initiative involves a technical solution and is perceived as located within the domain of sustainability.

2. Theory

2.1. Introduction

In various Western countries, participative decision-making processes have been initiated, and their emergence has become known as the shift from *government* to *governance*[11]. This shift is also a shift from vertical decision-making towards horizontal decision-making, where both citizens and societal organizations are more involved at different stages of the policy process[12]. Although such processes are not inherently effective nor ineffective[13], it is believed that they produce more favorable outcomes, as they ensure support from relevant societal actors, improve the quality of decision making, and enhance legitimacy of decision-making[14]. Before discussing the assessment criteria for collaborative governance, a proper definition of collaborative governance will be provided.

2.2 Defining collaborative governance

Although the concept of governance is in many ways under-specified and inadequately understood, it has become a dominant concept which is commonly used[15]. One of its uses is to describe collaborations between public actors and non-state, semi-state or other state stakeholder. This is called collaborative governance. To clarify the concept of collaborative governance, the definition of the concept will be discussed first. In this study, we build upon an existing definition of Chris Ansell and Alison Gash[16] and define collaborative governance as follows:

A process where one or more public agencies directly engage non-state, semi-state or other state stakeholders in collective decision-making that is formal, consensus-oriented, and deliberative and that aims to make or implement new public policy or manage public programs or assets differently.

This definition can be broken up into four components: (1) at least one public agency engages with a non-state, semi-state or other state stakeholders; (2) participating parties directly engage in a collective decision-making process; (3) the collaboration is consensus-oriented, even if consensus is not reached eventually; and (4) the aim is to make or implement new public policy or manage public programs or assets differently.

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[11] Edelenbos (2005)
[12] Michels & De Graaf (2010)
[13] Torfing, Guy Peters, Pierre, Sorensen (2012)
[14] Edelenbos (2005)
[15] Torfing, Guy Peters, Pierre, Sorensen (2012)
[16] Ansell and Gash (2007), p. 544

(1)   The initiator of collaborative governance is typically a public agency: a governmental body at the local, regional or national level[17]. In our study, however, we focus only on the local level, as this is where municipalities operate. Moreover, Ansell and Gash[18] classified in their initial definition only collaboration with non-state stakeholders as collaborative governance[19]. Non-state stakeholder are private organizations, non-profit organizations, interest groups and citizens. Interagency coordination and collaborations between different public actors are thus not classified as collaborative governance by Ansell and Gash[20]. However, state/non-state collaborations do not hold a monopoly on producing innovative solutions for mitigating climate change. Inter-agency collaborations, both horizontal and vertical, and inter-departmental collaborations can also be innovative. Other scholars have searched for a definition that encompasses a broader range of possible stakeholders; for example, Emerson, Nabatchi and Balogh use the phrase: "*(...) that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic sphere (...)*"[21]. Our definition attempts to integrate this perspective with Ansell and Gash's definition, resulting in the formulation *non-state, semi-state or other state stakeholders*. Our definition is thus broader and classifies inter-agency and inter-departmental collaborations as collaborative governance too.

(2)   The second component of the definition concerns the process of collaboration, which should be a formal collective process. This implies a two-way communication between stakeholders, who should all have a real influence on the decision-making process (therefore, a collective process). Collaboration is distinctive from consulting or advising, where stakeholders are not directly engaged in the process and do not bear real responsibilities. Moreover, this aspect of the definition distinguishes between formal and informal interaction, where only the former can be part of collaborative governance.

(3)   Thirdly, the aim of the collaboration is to make decisions through consensus, despite the fact that the initiator of the collaborative process often has more authoritative power than the other stakeholders. Even if consensus is not reached in the end (which is often the case), participants should strive towards some level of agreement.

(4)   Finally, collaborative governance is restricted to the management of public policies, assets and programs. Purely private matters are thus not included in this definition.

Because we define the concept of collaborative governance quite broadly we will use the term 'governance networks' to refer to any group of stakeholders that meet the definition described above.

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[17] Ansell & Gash (2007), p. 544
[18] Ansell & Gash (2007)
[19] Ansell & Gash (2007), p. 546
[20] Ansell & Gash (2007)
[21] Emerson, Nabatchi & Balogh (2012), p. 2
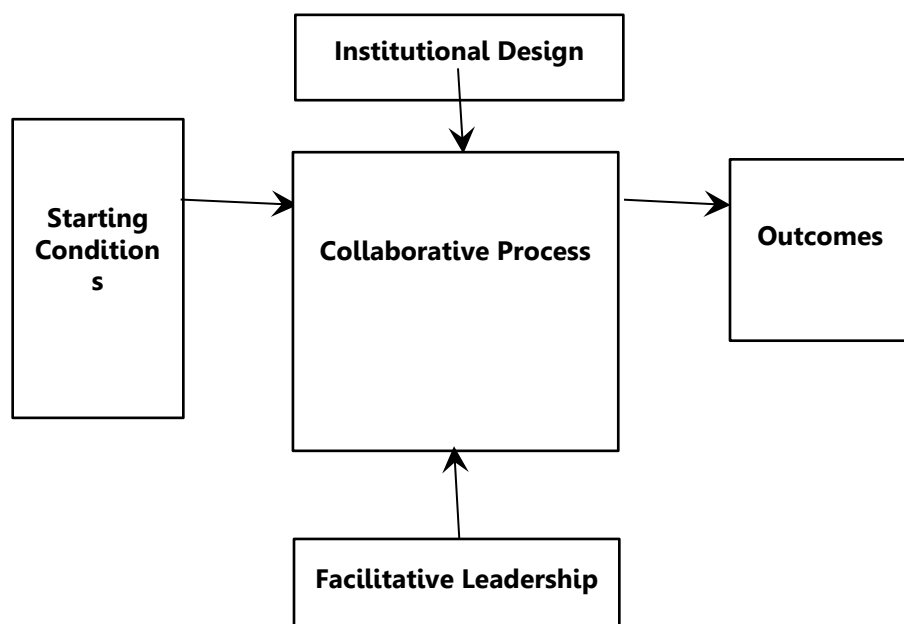
2.3. A model of collaborative governance

Figure 1. A model of collaborative governance (a simplified version)[22]

Figure 1 shows the process of collaborative governance. Ansell and Gash[23] design this model on the basis of a meta-analysis wherein they review 137 case studies on collaborative governance. Their aim is to identify critical variables that influence the likeliness of a collaboration to be successful. That is, successful in the sense that stakeholders are satisfied with the process, not necessarily successful in goal achievement.

The core of this model is the *collaborative process*, in which the decision-making and policy implementation are situated. Because of its consensus-oriented character, the collaboration partners should develop a shared understanding of the policy problem, identify mutual gains, and negotiate over possible solutions. This collaborative process is often described by scholars as a staged process. These scholars distinguish for instance a problem-setting phase, direction-setting phase, and implementation phase[24] or preparation phase, policy development phase, and decision-making phase[25]. However, Ansell and Gash[26] argue that collaboration is actually cyclical, rather than linear. The collaborative process should therefore be conceptualized as *'a virtuous cycle between communication, trust, commitment, understanding, and outcomes*[27]. Collaboration is rather an iterative process, going back and forth between problem definitions and solutions, while adjusting to changing contexts than a straight path.

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[22] Ansell & Gash (2007), p. 550

[23] Ansell & Gash (2007)

[24] Gray (1989)

[25] Edelenbos (2005)

[26] Ansell & Gash (2007)

[27] Ansell & Gash (2007), p. 558

In addition to this core collaborative process, there are three main variables that make a critical contribution to the success or failure of a collaboration. These are starting conditions, facilitative leadership and institutional design[28]. Firstly, starting conditions are present before the collaboration starts. An example of a starting condition is the shared history of participating stakeholders. If the participating stakeholders share a history of good cooperation this will have a positive impact on the initial level of trust. Contrary, a shared history of conflict between participants will have a positive effect on the level of distrust. Moreover, another important starting condition is whether power is equally or unequally distributed among the participants. Differences in knowledge, resources and authority affect the collaborative process. Secondly, the institutional design sets the ground rules for collaboration and determines who has access to the collaborative process in the first place. The inclusion or exclusion of relevant stakeholder has a strong impact on the collaborative process. For example, when relevant stakeholders are not participating, this has a negative impact on the legitimacy of the process. Thirdly, facilitative leadership is often needed to bring stakeholders together, build trust, and guard the process. The task of a facilitative leader is to guide the process. Especially when things get rough, the facilitative leader should step in and mediate between participant to ensure a smooth process.

2.4. The effectivity of collaborative governance

Ansell and Gash do not provide a detailed discussion on the nature of outcomes of the collaborative process. Torfing and his colleagues[29], however, do provide a very in-depth discussion about outcomes. The outcomes of collaborative governance are not just about producing a certain output with the most efficient use of (scarce) resources. The effectivity of interactive governance cannot be assessed unidimensional, because of the complexity and distinctiveness of it. Torfing and colleagues[30] describe six separate dimensions for the assessment of effectiveness of collaborative governance: (1) understanding policy problems and opportunities; (2) generating innovative, proactive and yet feasible policy options; (3) reaching joint policy decisions; (4) ensuring smooth policy implementation; (5) providing flexible adjustment to policy solutions; (6) creating favorable conditions for future cooperation. The first three assessment criteria are about policy formulation. The remaining criteria relate to policy implementation, policy adjustment and future cooperation. Moreover, it should be noted that collaborative governance initiatives do not necessarily meet all or none dimensions. A particular initiative can succeed in ensuring a smooth policy implementation, while failing to provide flexible adjustments to the policy solution.

The first assessment criterion relates to whether governance networks clarify the problems and opportunities at hand. The criterion reads as follows: a governance network should ***"produce a clear and well-informed understanding of the policy problems and policy opportunities***"[31]. The assumption is that governance networks face scattered and perplexing

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[28] Ansell & Gash (2007)
[29] Torfing, Peters, Pierre and Sørensen (2012)
[30] Torfing, Peters, Pierre and Sørensen (2012)
[31] Torfing, Peters, Pierre and Sørensen (2012), p. 174

problems. Problems can be elucidated in different ways. For instance, specialized knowledge from a wide range of actors can be a source of understanding. In addition, the stakeholders may start with a broad and vague formulation. This is not inherently wrong. Progressively, stakeholders can make a more precise policy agenda.

The second assessment criterion refers to the formulation of policy options. More specifically, it is about whether governance networks *"generate innovative, proactive and yet feasible policy options"* [32]. There are different possible means to achieve this: trust building through sustained interaction; scenario building or proactive policymaking; and a joint assessment of feasibility of policy options.

The third assessment criterion is whether governance networks reach joint decisions through dialogue-based coordination and willingness to contribute to the costs of policy option. The criterion reads as follows: governance networks should *"reach joint decisions that go beyond the lowest common denominator while avoiding excessive costs and unwarranted cost shifting"* [33]. It might be the case that stakeholders merely come to an agreement because they prefer to settle an uncontroversial solution, without this involving open-minded deliberation and bargaining. This is likely to be the lowest common denominator, whereas governance network should aim for more ambitious solutions.

The fourth assessment criterion is about ensuring a smooth policy implementation. That is, avoiding obstacles, avoiding blunders, and mitigating or resolving conflicts and implementation resistance. The criterion reads as follows: governance networks should *"ensure a smooth implementation of policy decisions so that problems are solved, opportunities are exploited, and goals are achieved"* [34]. Governance networks allow for a smooth implementation through continuous coordination, good timing, avoiding duplication of efforts, negotiations to facilitate conflict resolution and higher feelings of ownership to the policy output.

The fifth assessment criterion is about adjustment of policy decisions. The criterion reads as follows: governance networks should *"provide a flexible adjustment of public policies and services in the face of positive and negative policy feedback and changing conditions, demands, and preferences"* [35]. In this regard, governance networks differ greatly from top-down government initiatives which are *"slow to adjust policies to critical feedback voiced by experts and user groups and to new circumstances experienced by street-level bureaucrats"* [36].

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[32] Torfing, Peters, Pierre and Sørensen (2012), p. 175
[33] Torfing, Peters, Pierre and Sørensen (2012), p. 176
[34] Torfing, Peters, Pierre and Sørensen (2012), p. 177
[35] Torfing, Peters, Pierre and Sørensen (2012), p. 178
[36] Torfing, Peters, Pierre and Sørensen (2012), p. 178

Finally, the sixth assessment criterion refers to creating favorable conditions for future cooperation. The criterion reads as follows: governance networks should ***"create favorable conditions for future cooperation through cognitive, strategic, and institutional learning among the network actors"***[37] . These favorable conditions are created through the development of a common vocabulary, a frame of reference, a mutual dependence, rules, norms or procedures.

2.5. Conclusion

In this study, we adopt the model of collaborative governance that has been developed by Ansell and Gash[38]. One of the advantages of this model is its emphasis on perceiving collaborative governance as a process. However, this model does not provide clear criteria for how to assess the outcomes of collaborative governance processes. The model is therefore supplemented by the assessment criteria for effective collaborative governance, as developed by Torfing and colleagues[39]. Hence, the model in this study is both descriptive (process) and prescriptive (outcomes). A detailed explanation of the research design and procedures will be discussed in next chapter.

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[37] Torfing, Peters, Pierre and Sørensen (2012), p. 179
[38] Ansell & Gash (2007)
[39] Torfing, Peters, Pierre and Sørensen (2012)

3. Methodology

3.1. Country selection

This study addresses cases within Belgium, Denmark, Germany, the Netherlands, and the United Kingdom. Two major reasons of inclusion support restricting the focus to these five European countries. Specifically, these cases are most-similar cases on two respects.

First, municipalities play an important role in the energy transition in the five selected countries, either because they have laws with devolution agendas or because decentralization of services has been traditionally implemented. For example, in the UK, a devolution agenda is pushed through the Strong and Prosperous Communities White Paper[40]. In Germany, the municipalities (Stadt) are responsible for the provision of gas, transport, sewage, water and waste and this thus shows that cities have a big role to play. The system is even more decentralized in Denmark where the municipalities (Kommuner) realize the national goals without guidance from the central government. In Belgium, renewable energy sectors are mainly represented by small and medium-sized enterprises and are pushed by a combination of citizen movements, private companies and municipalities. Energy cooperatives are increasing, and stand for the acceptability and development of renewable energy production. The support of the municipality plays an important part in developing local plans of renewable energy in Belgium[41]. Therefore, the Belgian municipalities, as well as the Dutch municipalities, have a long history in designing and implementing their climate change policies, and are at the center of energy transition[42].

Second, the energy transition has important relevance in the selected countries. In the UK, the national government published the Energy White Paper on Low Carbon Economy in 2003 setting a clear carbon reduction target: carbon emissions should be reduced by 60% of 1990 levels by 2050[43]. In Germany, the energy transition (Energiewende) is a priority since the Renewable Energy Act from 2000 (Erneuerbare Energien Gesetz). These Act has been reformed subsequently to phase out gradually nuclear power and fossil energy sources. In 2015, Belgium signed the United Nations 2030 Sustainable Development Goals (SDGs) which aims at achieving 18% of renewable energy and reducing energy intensity from 3.58 MJ/€ in 2013 to 1.95 MJ/€ by 2030[44]. Both the Netherlands and Denmark have set the ambitious target of having 100% of their energy supply covered by renewables by 2050.

In addition to the two reasons stated above, language skills of the research team are also an important reason for focusing on the cases in Belgium, Denmark, Germany, the Netherlands and the UK in the current study.

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[40] DCLG (2006)
[41] ICET (2016)
[42] VROM (2010)
[43] DTI (2003)
[44] FPB (2016)

3.2. Case selection

This study employed the following case selection strategy. To start with, the team employed the Thomson Reuters Web of Science search engine to search case studies about collaborative public innovation initiatives in the domain of sustainability. We focused on studies that were published in English between 2007 and 2017. The team used a standard search query that included different terms related to the energy transition, municipalities, public innovation and case studies. The search query was adjusted to the countries of interest (BE, DE, DK, NL, UK). An initiative is included in the 'case pool' if it fulfills the following conditions: there is at least one initiative or maximum two initiatives described through case study research; at least one municipality is involved in the initiative; the article is a case study about a city-level intervention; and there is wide information about the initiative described.

With the case search strategy stated above, in total 24 cases were identified. Relevance of the cases was checked by two researchers separately. By closely examining the 24 cases stated above, 4 irrelevant cases were removed (See appendix I for the final list of cases).

Figure 2. Map of case studies

3.3. Operationalization

3.3.1 Adjusting Torfing's original assessment tool

All selected cases were scored by using an adjusted assessment tool that was originally developed by Jacob Torfing[45]. The original assessment tool is a criteria-based instrument that enables Danish local municipalities to measure the outcome of local crime prevention projects and determine the conditions for their success. Torfing used his assessment tool in a study on Danish local youth crime prevention programs. The key empirical finding of that study is that collaboration is influential to public innovation, which in turn has a strong impact on the ability of local projects to help prevent juvenile delinquency[46].

The original assessment tool contains twelve indicators which constitute three dimensions. These three dimensions are: collaboration, innovation and effectiveness. Each dimension is measured with four indicators, which are all scored on a 5-point Likert scale. The answer category of each indicator constitutes of a qualitative description which is coupled to a number (1 through 5). A score of 1 represents very bad performance of that particular item, whereas a score of 5 represents a very good performance. Thus, a higher score means a better performance. Note, all cases were scored on the basis of the match between the text in the article and the *qualitative* description of the answer category. Later on, in the process, the *quantitative* scores were entered into the dataset. See for more information on this process in *session 3.3.2*.

Torfing's original assessment tool was adjusted for the purpose of this study. The adjustments include the removal of indicators which are irrelevant to the context of this study (two indicators of effectiveness). Additionally, the wording of some answer categories was modified to create a better fit with the research context. In the end, the final assessment tool consists of four indicators for collaboration, four indicators for innovation and two indicators for effectiveness (See Appendix II for assessment tool as used in this study).

3.3.2. From text to scores

In order to get experience with the assessment tool, one article was read and scored by all authors. The scores were then compared and discussed. No big discrepancies surfaced, however, the wording of the assessment tool was slightly adjusted to improve validity. After assessing the first case collectively, the remaining articles were divided. In order to improve reliability, all articles were read attentively by two team members. The scheme was set up in a way that every possible set of scorers read and scored roughly an equal amount of articles. The main reason for this was to reduce any potential personal bias[47].

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[45] Torfing (Unpublished)
[46] Torfing (Unpublished)
[47] The process of scoring can be divided into two steps. In the first step, each case was scored individually by two scorers separately. Scores were noted in a digital or printed version of the

3.3.3. Missing data

Based on the information within the articles, it was often not possible to assess all indicators. In the case of lack or insufficient information, no score was noted for the corresponding indicator. To minimize missing data, the corresponding authors of all case studies with missing data were contacted by email. In this email, we briefly explained our research. After explaining our research, we kindly asked for their cooperation[48]. From the 17 cases that are discussed in this study, only one was scored completely on the basis of the information provided in the article. For the 16 remaining articles, their corresponding authors were contacted. Seven authors in total provided information of 23 indicators. One author did not reply with scores, but with additional literature which contained more information on the effectiveness of the project. That information was then used to score the two indicators of effectiveness. Moreover, it should be noted that there was a lot of variance in how much information was retrieved from the authors. The minimum amount of provided indicators from a single author was 1, whereas the maximum of provided indicators from a single author were as much as 11. In total, 13,5% of the dataset was based on the assessments of authors.

Besides contacting authors of the articles, another strategy to reduce the percentage of missing data was also pursued. For two indicators, online information was looked up. These indicators are about the reputation of the innovation and goal attainment. It was decided to look only for information on these two indicators because of two reasons. First, information on these indicators was most frequently absent in the articles. Therefore, these indicators boosted the percentage of missing data significantly. Secondly, it was likely that relevant information was to be found online. For example, information on goal achievement can be found in an evaluation study. Similarly, information on the external recognition can derived from the website of the initiative or news articles. In total, online information was applied in 4 cases, taking up 2,35% of the dataset.

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assessment tool. Moreover, the text that was used to assess a certain indicator was marked and the number of that indicator was placed in the margin. Sentences or paragraphs that indicate a particular score were written up. In the second step, the scores were added into a digital file and which were then compared by the scorers. In the case of a discrepancy, scorers agreed on a 'agreed score' through informed arguing in order to reach agreement. If a dialogue did not solve the disagreement, the other two scorers were kindly asked to assist in the disagreement. Only when consensus was reached, a 'agreed score' was entered into the dataset. Otherwise, the indicator was left blank.

[48] To be specific, the corresponding author was asked to score the indicator(s) that we were not able to score by ourselves. In each email, we attached a form which contained only the indicators that with missing data for that particular initiative. Some selected articles involved a multiple case study. In such cases, it was clearly noted whether we were interested in all cases or only in a subset. Moreover, in order to prevent confusion, it was clearly stated which indicator(s) belonged to which initiative.

The proportion of missing data were computed for each case. To maximize the quality of the assessment, cases with high percentage of missing data were removed. More specifically, for a case study to be included in the final sample, it had to have information on at least 50% of the indicators (5 out of 10). The tolerated level of missing data was thus 50% (also 5 out of 10). All cases that had over 50% of missing data were excluded from the data set. In the final data set, the percentage of missing data is 14,2%.

3.3.4. From scores to dimensions

As discussed above, the assessment tool contained four indicators regarding collaboration, four indicators regarding innovation and two indicators regarding effectiveness. Scores were aggregated by taking the mean of indicator scores that belong to the same dimension. Normally, one would only compute mean scores for dimensions that have full information on each of its indicators. However, due to the relatively large number of missing data in this study and the small number of cases, it was decided to compute mean score for all dimensions that contain at least fifty percent of the scores. More specifically, for collaboration and innovation, mean scores were computed when there was information on two or more indicators. For effectiveness, the mean score was computed when there was at least information on one of the two indicators[49]. Only in two cases these quality criteria were not met. For both these cases, the innovation dimension was not computed. This means that 3,92% of the dimensions was missing in the final dataset.

3.3.5. From dimensions to classification

After the computation of the mean scores, different cut-off points to distinguish between good performance and bad performance were discussed. Two main ways to set a cut-off point were used: a relative approach and an absolute approach. An absolute approach implies that a static value can be regarded as a criterion. For example, the midpoint of a scale can function as the absolute value. All scores above the midpoint are then regarded as good performance, whereas all scores below the midpoint are regarded as bad performance. On the contrary, a relative approach implies that performance is not good or bad in an absolute sense, but relative to the performance of the others. What counts is the ranked position compared to the other cases. Different relative cut-off points such as the mean and median were discussed.

After a thorough discussion among team members, the median was selected as the cut-off point. The main reason of selecting median as cut-off point was that every absolute cut-off point would be every ambiguous. Taking the midpoint, for example, would result in a huge amount of good performing cases, which makes it hard to give meaning to the results. Moreover, the sampling of the articles is far from random. Only initiatives that are described in scientific literature are included in this study. Researchers often write about extreme cases[50], which are by definition not representative of all existing initiatives. Therefore, the initiatives

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[49] Note: technically speaking it is impossible to compute a mean with one score. In the case of only one scored indicator for effectiveness, this score was imputed as the mean score.
[50] Flyvbjerg (2001)

under study are inherently biased. By taking a relative cut-off point this problem can be overcome.

The median is the middle number in a sorted sequence of number. The median of each dimension was computed. The median for collaboration is 3,75, the median for innovation is 4 and the median for effectiveness is 3. If the value of a case was as large as or larger than the median of that particular dimension, it would be considered as a high value. Scores lower than the median on a particular dimension were scored as low. This led to a binary distribution for each of the three dimensions. In Figure 3, the distribution of low and high scores is displayed.
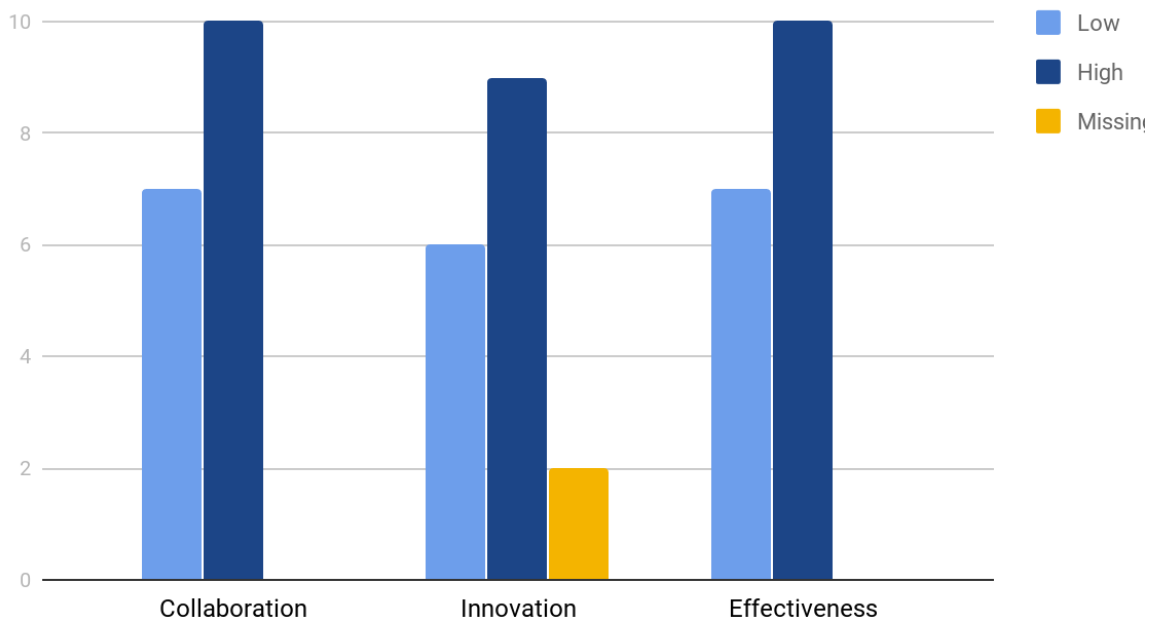

Distribution of cases per dimension

Figure 3. Distribution of cases per dimension, by low, high or missing data

3.3.6. From classification to graphical representation

The results of the assessment are presented in Figure 4. This diagram is a Venn diagram. There are three circles, one for each dimension scored (collaboration, innovation and effectiveness). The Venn diagram shows whether a case has a high score on collaboration, innovation and/or effectiveness. That is, only cases with a high score on a particular dimension are included in the corresponding circle. Because cases can have a high or low scores on each of the variable, there are also overlapping groups. Case number 5, for example, scored high on innovation and effectiveness, but not on collaboration. Cases number 7, 8 and 10 scored high on collaboration and innovation but not on effectiveness.

Numbers refer to cases IDs that were assigned to the cases. The case IDs, however, are not random. The cases were ranked according to their overall mean score. This mean score was computed by taking the average of all indicator scores. Thus, when full information is available, 40% of the mean score consists of indicators concerning collaboration, 40% of the mean score consists of indicators concerning innovation and 20% of the mean score consists of indicators concerning effectiveness. The mean score provides additional information that is relevant for the interpretation of the Venn diagram. First, it provides a rough measure of reliability. Because effectiveness is only measured with two indicators, the results are less reliable. This is reflected in the mean score, because the magnitude of effectiveness is proportional. Secondly, operational effectiveness is only one goal of collaborative governance. Being collaborative and innovative may also be regarded as successful outcomes. The mean score provides a more holistic view on which cases are successful.

Based on the Venn diagram, four case categories were identified: positive extremes, comparison cases, deviant cases and negative extremes. Positive extremes have a high score on all dimensions. These cases are in the middle of the Venn diagram. Comparison cases are located in the intersection of two circles. These cases will be compared with to positive extremes. This will provide valuable information on which factor(s) make(s) the difference between, for example, being only collaborative and innovative and being collaborative, innovative and effective. Deviant cases are only performing high on one dimension. These cases can still be interesting, especially for identifying barriers. Negative extremes are cases that do not have a high score on any of the dimensions. These cases are placed outside the diagram. The analysis started from the positive extremes. As much as possible best practices were derived from the positive extremes. Then, the comparison cases were compared to the positive extremes. This provided further evidence for the already identified best practices. Besides, by comparing positive extremes and comparison cases, barriers were identified. Subsequently, the deviant cases were analyzed. These cases were only analyzed for validation of the already identified drivers and barriers.
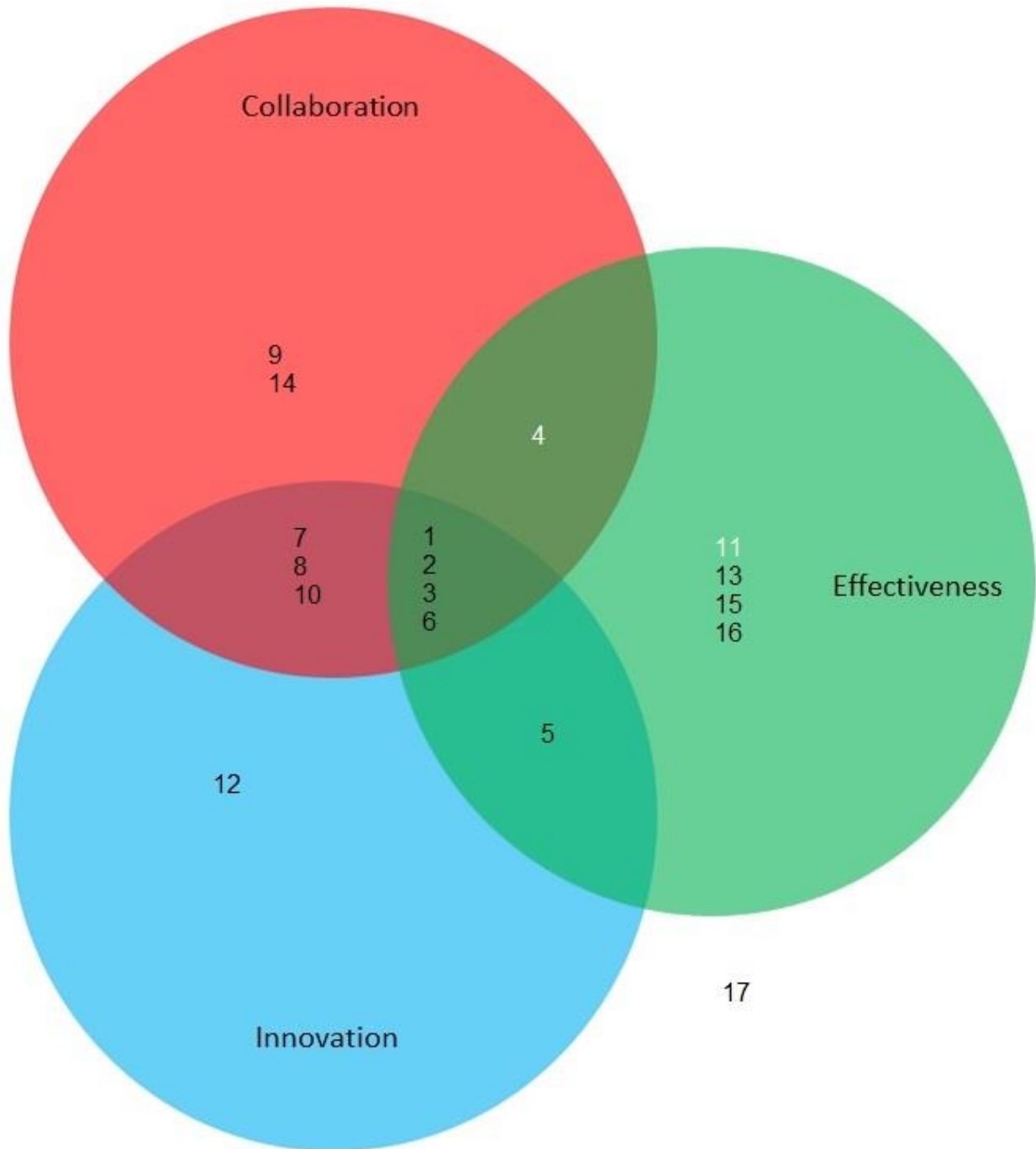
Figure 4. Venn diagram with cases IDs
Note: Case numbers in white have no value for the dimension of innovation.

4. Results

4.1. Drivers and barriers

An inductive qualitative study was conducted for each case. Elements which facilitate or hinder the initiative to become successful were noted. Case notes were compared within-group as well as between-group. Subsequently, commonalities among these notes were grouped into 13 drivers and barriers. These drivers and barriers can be grouped according to Ansell and Gash's collaboration model, distinguishing starting conditions and leadership affecting the whole collaborative process. Within this process, four additional components emerged from the results: collaboration, innovation, implementation, and feedback loop. These elements can be deemed as sequential phases in an iterative process, where collaboration and innovation are usually prior to implementation. The implementation provides feedback, which can be used to improve the whole process. However, it is also worth noting that these components are highly interwoven in practice, making them difficult to be separated. Below, Table 1 lists all drivers and barriers, organized in the above-mentioned six components.

Starting conditions	Collaboration	Implementation
+ History of satisfactory cooperation	+ Inclusiveness of a broad range of stakeholders	+ Building capacity
- Antagonistic history	+ Integral incentive design based on mutual gains	- Fragmented implementation
- Power imbalances		
Leadership	**Innovation**	**Feedback loop**
+ Facilitative leadership	+ Change agents	+ Symbolic recognition
+ Co-created vision as symbolic guidance	+ Creating a policy niche or urban lab	+ Recursive learning

Table 1 List of drivers (+) and barriers (-)

4.1.1. Starting conditions

According to Ansell and Gash[51], starting conditions set the basic level of trust, conflict, and social capital that become resources or liabilities during collaboration. From the cases of interest, three factors are identified as influential elements in the starting phase, namely, satisfactory or antagonistic history of cooperation between stakeholders and power imbalance.

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[51] Ansell & Gash (2007)

History of satisfactory cooperation between stakeholders. An advantageous starting condition for collaboration is a history of satisfying past cooperation, which is likely to produce higher levels of trust and commitment between stakeholders.[52] Many successful initiatives indeed benefitted from a working environment of mutual trust, originating from past cooperations (cases 4, 7, and 8). Moreover, informal relationships that had been fostered during a past cooperation are very useful. In Bottrop and Rotterdam (cases 4 and 7), collaboration was enhanced thanks to long-term informal relationships between departments of the local administration.

Antagonistic history. Whereas a previous satisfactory cooperation between stakeholders has a positive influence on success, it is the opposite for stakeholders who share an antagonistic history. In such a situation, there is a high level of distrust between stakeholders. This type of "we versus them" dynamic impedes successful collaboration.[53] This is apparent in case 8, where the close collaboration between the municipality and university worsened the support of adjacent low-income communities, who had an antagonistic relationship with the university.

Notwithstanding the fact that antagonism is a hindrance to the success of collaborative governance, this barrier can be surpassed through active communication and engagement. A policy deadlock can actually create a strong impetus for collaborative governance. It can function as an advantageous alternative from continuing exhausting and frustrating ongoing political battle, especially in natural resource contexts[54]. Case 5, for example, shows that in the 1990s in Manchester, an incineration plant for waste management was proposed, yet environmental groups rejected it. Later on, the waste management authority had to engage in an active campaign to secure the support of these groups. In the end, this collaboration proved to be more satisfactory and successful.

Power imbalances. Power imbalances are an often noted obstruction for successful collaboration[55]. In case of power imbalances, the collaborative governance process is prone to manipulation from the stronger stakeholder(s). Case 16 provides a clear example. In this initiative, grass-root organizations worked together with the regional authorities in a transition process towards sustainability. Whereas the regional authorities mainly focused on top-down physical interventions, the grass-root organizations initiated bottom-up people-oriented initiatives. However, grass-root organizations felt that there was an unequal relationship between them, as the following quote shows: *"some grass-root organizations have repeatedly criticized the predominant role of public administrations. These activists argue that massive investments in the physical environment lead to the gentrification of working-class neighborhoods and that bottom-up projects are often instrumentalized to legitimize these investments in the eyes of the local population"* (case 16, p. 88).

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[52] Ansell & Gash (2007), p. 553
[53] Ansell & Gash (2007), p. 554
[54] Ansell & Gash (2007)
[55] Ansell & Gash (2007), pp. 551-522

Case 8 in Manchester provides another example. The main power imbalance existed between the university and municipality on the one side and low-income communities on the other hand. The collaborating university and the municipality did not include inhabitants from the adjacent low-income communities in the collaborative governance process. In other words, access (and thus influence) was unequally distributed among the relevant stakeholders, thereby neglecting the social values involved. "*As such, the partnership and the laboratory tend to reinforce the divide between the knowledge community and the surrounding neighborhoods rather than integrate these in a new way*" (case 8, p. 482).

Lastly, legal power is as important as organizational power. Case 12 provides an interesting discussion on legal powers of participants. In many initiatives, there was some kind of non-state actor involved in the collaboration, such as natural persons, NGOs and private firms, whereby the distinction between the public and private sector became blurred. This has implications for the power relationship between the collaborating actors. For example, in Copenhagen, the municipality was not allowed to initiate a follow-up initiative after a successful pilot as under Danish law this had to be done by a private enterprise (case 14).

4.1.2. Leadership

Leadership, according to Ansell and Gash, can provide essential mediation and facilitation for the collaborative process[56]. In cases being studied, leadership, be it clear leadership or symbolic leadership, exerts considerable influences on increasing membership, unitizing stakeholders, or guiding different actors toward a shared end goal.

Facilitative leadership. The common understanding of the meaning of leadership is an authoritative actor that shapes the process and has the final say in decision-making. Although this might be effective in top-down bureaucracies, collaborative governance networks require a different, more facilitative leadership style from key actors. Collaborative networks can use either a single leader or a steering group that takes a leading role, and this role can be both formally and informally fulfilled. The aim of the facilitative leader is to bring a broad range of stakeholders to the table and to support the collaboration in a way that benefits all participants. Leadership is needed to involve and empower stakeholders, especially when incentives to participate are weak or power is unevenly distributed among stakeholders. Having a neutral third party at the table can provide sceptical actors that feel overpowered with trust that the collaboration will also serve their interests[57]. This shows in the studied cases where citizens were involved as participants and (an actor within) the local government successfully took up a supporting leadership role to open up their agency to society (cases 1, 3, 6). In Saerbeck and Lochem, leadership was exercised by a single high-level public officer. In Saerbeck the key figure was the Mayor, who invited individuals and residents in activities for the purpose of establishing a carbon neutral town and specifically wanted to include the interests of residents. In Lochem, the Alderman in the municipal board started the project by personally engaging with the community, identified the problems and invited citizens to bring forward solutions. In Leeds,

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[56] Ansell & Gash (2007), pp. 550
[57] Ansell & Gash (2007), pp. 554-555

which was a grassroots, community-led initiative, the local government had a role in its success by bringing together multiple informal networks of individuals, groups and organizations who could support the project with political power, resources, or knowledge. Another important aspect of leadership is to safeguard the process when it has started and to maintain the collaborative spirit among all stakeholders. In the end, participants should reach a consensus that is accepted by everyone and solves the problems at hand. A leader's role here is to act as mediator during negotiations and to explore possible mutual gains[58]. For example, in Bottrop (case 4), a steering group was created to act as mediator between city departments, companies and science institutions and helped "*to build bridges between different competence areas; it acts as a kind of "transmitter" between diverging organizational cultures and rationales of action, most importantly the industrial and the administration worlds. It also acts as "catalyser" when bottlenecks, for instance legal ones, hinder collaboration between the project partners*" (Case 4, pp. 260-261.)

Co-created vision as symbolic guidance. While clear leadership is a critical ingredient for collaborations where participants have conflicting interests and trust is low, this can be different for more horizontal partnerships such as interagency collaborations or between different state actors. Rather than empowering stakeholders or safeguarding negotiations, guidance is needed to bring different actors towards a shared end goal. This can be a more symbolic guidance in the form of a visionary document, in which all stakeholders formulated a shared vision for the project. This vision can then later serve to commit stakeholders to the goal they had agreed on earlier in the process. Most projects start with the formulation of a vision, but it is an important step to capture this in a (written) product that can be retrieved in later phases of the project. In successful horizontal partnerships in this study (cases 7, 8, 10, 11), a clear distinction was made between several sequential phases: the creation of a vision, coming up with strategies to realize this vision, and implementing specific projects that fit these strategies. For example, in two projects in Rotterdam (cases 7 and 10), all relevant stakeholders were involved from the beginning of the process to develop a shared understanding of the problem and a perspective for a sustainable future. This was laid down in a shared vision and sustainability agenda, which served as a basis for all future projects. In both cases, it was successful in committing all partners to the implementation of the agenda, even when implementation was transferred to a broader political arena: "*the vision acted as a flagship inspiring and committing the different actors to its implementation*" (case 10, p. 415).

4.1.3. Collaboration

Results of the current study identifies that, in the stage of collaboration, including a broad range of stakeholders and designing incentives for different stakeholders to participate and stay in the collaboration are of great importance. Two factors identified from the cases of interest seem influential: the range of stakeholders, and incentives for non-state stakeholders to participate.

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[58] Ansell & Gash (2007), pp. 554-555

Inclusiveness of a broad range of stakeholders. In all cases that are deemed innovative, collaborative and effective, multiple stakeholders participate in the collaboration, including the local government/municipality and other societal actors, including the target group. The benefits derive from the inclusiveness of a broad range of stakeholders include conferring legitimacy, facilitating implementation and stimulating exchange of complementary assets between differing stakeholders. The case of Hamburg (Case 2) shows that the coalition-building processes created an authorizing environment and conferred legitimacy to informal networks to take action. A coalition, 'Our Hamburg – Our Network' (OHON), was formed, including grassroots and larger organizations. OHON success in a referendum for the municipalization of the energy grids allowed informal networks to create a supervision platform, *Energie Roundtable*, with the authority of monitoring the implementation of the referendum.

Broad inclusiveness facilitates that members develop a sense of ownership, which secures low resistance during the implementation. Collaborations that start with a rather small core group of partners need to seek for additional support when it comes to implementation, especially when key actors in the field were not included in the policy making. To ensure a smooth implementation, policy actors should feel responsibility for the program to reduce the risk of resistance later in the process.[59] This is best done as early in the process as possible, so stakeholders feel involved and take ownership over the initiative. In Rotterdam (case 7), the project was initially executed outside the official policy arena and the administration departments. The team members actively seeked executive support by inviting the directors to their workplace while the designing was still unfinished: "*where the floor was filled with coffee cups and the wall was covered with unfinished drawings. The directors thought they still had influence […] they felt ownership.*" (Case 7, p. 1286) Another way to create ownership is to involve the target group in the implementation phase itself, as was done in Manchester (case 8). Here, residents received training to be able to be involved in the installation and maintenance of a sensor network. Even without having had influence in the decision making, residents felt some ownership for the sensors.

Furthermore, inclusiveness stimulates exchange of complementary assets. In Lochem (case 1), having multiple stakeholders involved -- the University, grid operators, energy company, the municipality and households --allowed the field experiment about smart grids to gain from the complementary assets of its stakeholders.

Excluding relevant stakeholders can have adverse consequences. For example, in Copenhagen's Citylogistik-kbh initiative (case 14), the potential stakeholders, such as transport companies and retailers, showed some interest but either did not see the problem of truck running in the city and were therefore resistant to the idea of city logistics, or they did not trust the intentions of the municipality going into this activity. The fact that the Copenhagen municipality was at the end not allowed to participate in the project according to Danish regulations aggravates the distrust problem. In the case of Manchester Oxford Corridor (case 8), the adjacent low-income communities were not involved as participants in the process, although they were among the

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[59] Torfing, Peters, Pierre & Sørensen (2012), p. 177

targeted beneficiaries. This reinforced the divide that exists between the knowledge producers (universities) and the knowledge users (communities), and generated opposition to the project by the communities.

Integral incentive design based on mutual gains. A powerful incentive for non-state stakeholders to participate is the promise of opportunities to pursue their goals within the collaboration.[60] The studied cases point out the importance of designing incentives that combine economic and sustainable targets, that is, coupling direct short-term gains and long-term indirect (sustainable) goals. To attract a broad range of stakeholders, local governments should focus on additional values besides sustainability, such as economic values. In Leeds (case 3), the zero-carbon eco-housing project needed to attract households. To do this, emphasis was made not only on the goal of carbon reduction, but also on an economic model of cohousing that was affordable to household members. In Manchester (case 8), the partnership's mission statement stated as its core objective 'to maximize the economic potential of the area' (Case 8, p. 418), although the municipality used this partnership to reduce carbon footprints. Also in Rotterdam (case 7), economic and sustainability values were combined in the sustainability vision, which attracted some public-private partnerships: "*growth is still seen as the underlying focus; however sustainability is seen as the paradigm that can stimulate innovative and robust future developmen*t" (p. 414). These mutual gains between businesses, societal partners, communities, and sometimes researchers enhance their respective incentives to participate.

4.1.4. Innovation

In the phase of innovation, from the cases being studied, having change agent(s) and creating a policy niche or laboratory demonstrate influential effects on the depth of innovations.

Change agents. Transition processes partly rely on institutional conditions and decisions that are made, but can also heavily rely on personal influence of the participants. Change agents are needed to set a radical transition in motion or to commit other stakeholders to the collaboration at the start. They are open for exploring new options, exchange of each other's stakes and developing innovative solutions. For example, in one of the Rotterdam cases (case 10) the transition process had been delayed for a few years by conflicts among stakeholders and needed an impulse of over 100 change agents (representatives of all stakeholders involved, including public departments, industries and NGO's) to form a 'transition arena network' to formulate pathways for action. The reason they succeeded, where the others before them had failed, was that these change agents formulated a shared vision over a long time horizon, allowing for real innovative solutions, and exchanged perspectives on the problem. Change agents can also radically reorganize an organization from the inside and thereby allowing for new innovative ways of working (as was present in cases 1, 5, 6). An example of such a reorganization can be found in the Lochem case (case 6), where the municipality had to adopt a novel approach to support citizens' initiatives: "*this required an organizational transition within the municipal organization. In this process the alderman was supported by change-oriented,*

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[60] Ansell & Gash (2007), p. 552

daring, and supportive civil servants (...)" (p. 1915). Change agents were needed here to overcome resistance within the organization and to persuade other civil servants who feared change of their traditional ways of doing or to lose their jobs.

Creating a policy niche or urban lab. Two types of experimental governance are present in the cases to allow for a secure and protected environment that is sheltered from wider political and economic pressures: a policy niche and an urban laboratory. A policy niche is a small and protected space within an department or organization where experiments can take place that radically break with traditional perspectives and ways of doing. Innovation is not an iterative process here, but rather expanding from innovative niches towards the bigger regime by translating innovative solutions found in niches into policies. In Rotterdam (case 7), a policy niche was created by forming a multidisciplinary team from the departments of water management and urban development to participate in a design event. Failure of this project would have no political consequences, which allowed its members to create a transformative and innovative vision for the future. The team members were able to formulate a revolutionary vision for Rotterdam by linking water management and urban development: two policy fields that had always been separated before. The vision that was created in this niche was later successfully translated into policy and implemented through different projects. Other examples of policy niches are local energy initiatives (cases 1 & 6) and the cohousing initiative in Leeds (case 3).

In an urban laboratory, it is possible to experiment in the field to create knowledge and directly implement this knowledge into policy. This is often in the form of a partnership between the municipality and universities, as was the case in Manchester (case 8). Linking institutions that create knowledge and those that use knowledge is a good practice to come up with innovative yet feasible solutions. Both types of experimental governance are good environments for experimenting with new ideas and solutions to see what works in this specific environment. Risk-aversive behavior of stakeholders can be reduced, because of the lack of formal consequences, leading to the opportunity to radically break with the status quo, instead of optimizing the current situation.[61]

However, promising these initiatives can be, it might be hard to translate innovative solutions from a niche to regime. There is no magic bullet to scaling up projects that are even considered to be successful. This is especially hard when the target group is opposed to the solutions or incentives are low for other stakeholders to contribute. This was for example the case in Manchester (case 8), where residents did not feel involved in the experiments and offered resistance in the implementation phase. In the community-led cohousing project (case 3), the authors stressed that there were some concerns as to whether the niche could be replicated. To replicate a niche, however, the literature suggested that intermediate institutions were needed to provide similar funding support (case 3).

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[61] Torfing, Peters, Pierre and Sørensen (2012), p.174-154

4.1.5. Implementation

From the cases of interest, two important factors were identified as influential elements in implementation phase: the scale of the implementation and building capacity.

Fragmented implementation. In some of the cases, multiple smaller initiatives are carried out within the context of a bigger framework (case 10 and 16). Besides the upside of tailor-made solutions, this type of institutional design bears also some disadvantages. In case 16, it turned out to be very hard to establish a good coordination of visions among the different actors. The following quote from the research on NCs shows this perfectly: "*The interventions are split into physical and people-oriented elements that are subsequently implemented by different actors that only rarely cooperate with each other*" (Case 16, p. 88). In case 10, the different partnerships grew apart after establishing a shared vision. This lowered their ability to learn from each other.

Building capacity. Most effective cases exerted to build capacity in local communities, which is indispensable to keep the initiative sustainably developing in the long run. For example, in case 7, local government protected and emphasized the role of citizen-co-invested companies by avoiding involvement of large scale market companies in local energy projects. Besides, education and knowledge sharing activities was offered to town residents and tourists, both young and old, on energy and on reasons to avoid climate change. In Lochem (case 6), the local government 'give[s] citizens confidence' to let the public manage things on its own, but in urgent cases the local government was there to support. In case 3, the project ensured lives in the project to be debated, modified, and constantly improved by adopting a cohousing approach from the outset as a way to increase community self-governance and promote individual and collective behaviour change. In Hamburg (case 2), households gained the chance of becoming members of the energy cooperative. Case 16 also demonstrates this pattern.

4.1.6. Feedback loop

Another insight of this study is that results of the initiatives may, in return, influence the initiatives. Two factors are identified as important factors in this feedback stage.

Symbolic recognition of the program. Symbolic recognition, in this study, stands for the reputation and perception of the program. Winning awards help the project get more attention from media and therefore getting more subsidies. Awards are not only material incentives, but also about symbolic recognitions. In case 1, the municipality won a competition among 60 participating municipalities, received 1.1 million Euros and also the symbolic title of Klimakommune. Reputation of the municipality attracts not only energy tourists, but also companies. In case 7, the initiative of Rotterdam Water City 2035 won the first prize of Biennale Infrastructure and Construction Award, which strengthen the political support. This pattern also shared by the case 3 and 5 , where the programs attracted more stakeholders or received more fund when they were perceived as successful.

Recursive learning. The learning process emphasized here refers to the process of learning from experimentation, which aims at gaining knowledge about innovative solutions and occurs predominantly in partnerships with universities or other knowledge institutions. Examples of this can be seen in the experimental governance cases (5, 8, 10, 12); knowledge sharing between different projects is needed to learn from experiments and to achieve overall goals. This is for example present in the Manchester Urban Lab (case 8) where there was an emphasis on a three-stage feedback loop for recursive learning. "*The kind of carbon governance found in the Oxford Road corridor constitutes a three-stage feedback loop, whereby (1) the laboratory is established and experiments conducted, which (2) generate data and results that (3) are fed into policy development. The process then begins anew with the conducting of further experiments. This is, in theory, what differentiates the urban laboratory from existing forms of governance: its explicit and formalized emphasis on recursive learning.*" (Case 8, p. 425).

On the contrary, a low level of recursive learning can have adverse consequences. For instance, a lack of evaluation and monitoring of pilot projects can be a reason why innovative projects are not effective in reaching their targets. In the City Ports case in Rotterdam (Case 10), there was a lack of monitoring and evaluation and reflexive activities. This limited the potential of the project to adapt to the circumstances and to adjust in line with lessons learned. This pattern also can be seen in case 7.

4.2. Modes of governance

Generally speaking, the found drivers and barriers are applicable to different collaborative modes of governance. This study finds that collaborative innovations can be either bottom-up, top-down or partnerships. Bottom-up collaborative innovations can start, for instance, with a citizens' initiative whose members request some form of assistance to the local government. The municipality can support the citizen's request and a shift in the municipality might occur that adjust better the municipality's way of governing to the needs of the citizens' initiatives and that therefore makes the municipality more citizen-centered. Cases 1 and 6 are examples of bottom-up collaborative innovations.

There are cases with a more top-down approach where empowerment is not the result of a response action from the municipality in support of a citizens' initiative, but the means for achieving predefined goals, performance criteria, or technical requirements. The necessary means are provided to participants for the attainment of a certain sustainable goal predetermined by the municipality itself. In three out of four cases that are only effective, the goal was set from the start instead of originating in response to citizens' initiatives (Cases 11, 13, 15). Participants mainly had to be persuaded with economic incentives about the benefits of the targets set. In one case of a Danish municipality, homeowners were given advice about how to improve their energy-consumption (Case 15). The advice was based on government-approved calculations and institutionalized knowledge. Specialized firms then helped these homeowners to implement the energy-saving measures. Empowerment was based upon a clear rational and economic viewpoint as the following quotes show: "*The idea is to 'to get the market to drive the process on lucrative conditions'*" (Case 15, p. 519) and "*It [demonstration projects and*

experiments, red.] shouldn't be used for things that are mature for the market. The market has to cope with that" (Case 13, p. 327).

Finally, there are partnerships (Cases 7, 8, 10, 11, 14). We need to mention only the case of Manchester (Case 8), which examined a public-private partnership between universities, a municipality and property owners, and the cases of Rotterdam that involved public-private partnerships (case 7) or multiple kind of partnerships (case 10). In public-private partnerships, at least three cumulative characteristics converge: firstly, the aim is the realization of public policy; secondly, there is an active involvement of a private actor; and thirdly, a contract or a legal structure mediates between the parties (Case 12).

5. Discussion points

Two general points for discussion can be made. A first point is about the process of evaluation and estimation of case studies in accordance with the assessment procedure followed. A second point refers to the meaning of the results.

Firstly, the process of assessing collaborative innovations on the basis of a study of studies calls for a discussion about the grounds and applicability of the evaluation criteria, and the possible sources of over- or underestimation. The discussion about the grounds of the evaluation criteria is far beyond the scope of this study, yet it is possible to open the discussion about the applicability of the evaluation criteria and the possible sources of over- or underestimation.

The definition of the effectiveness of a collaborative innovation in our evaluation was narrowed down to operational effectiveness, which requires from the evaluator a minimal information about targets and goal attainment. However, this definition overlooks effectiveness of the processes focusing only on the assessment of results. This might have two drawbacks. On the one hand, collaborative innovations that do not transit the whole cycle of collaborative governance from ideation to intermediate outcomes will be penalized by operational effectiveness, although they might be effective in the processes. On the other hand, the authors that document the collaborative innovations might present information relevant to another meaning of operational effectiveness. This overlooks relevant information on effectiveness and results in a higher level of missing data. In fact, the study finds among the cases considered a noticeable deficit in that very few provide information about the operational effectiveness of the initiative. It was therefore extremely difficult, if not impossible, despite a careful reading of the cases, to determine the targets of the initiative, or the degree of goal attainment, without having to resort to alternative information resources for filling the missing data.

It is possible to note that it is sometimes possible that our scores overestimate the success in processes and outcomes of collaboration, innovation and operational effectiveness of governance networks, given two intermingled conditions:

(1) The information basis for the assessment is comprised of case studies in articles published in international journals, and

(2) Editors are more likely to accept positive results and that therefore there is a publication bias.

Secondly, another important point for discussion is the use of the expression 'best practice' and its implications for interpreting the results. In this report, a best practice does not entail a practice that will lead unambiguously and linearly to a specific positive result, but it merely indicates to local authorities that there are some precedents suggesting that a practice was successful and that they might do well in taking it into account. A modest meaning of a 'best practice' is chosen, as its predicting value is limited because of other contextual conditions

influencing the success of initiatives, the relatively small number of cases in this study, and the limited comparability of cases.

The term best practices is not intended to imply that they are exclusive or rule out the possibility that other factors for success exist. The drivers and barriers presented in this study are factors that can be manipulated by municipalities to a large extent, but often several contextual conditions can also have a large influence on the likelihood of success, that are independent of actions by municipalities. Sometimes a collaboration can only start or succeed because initiators see a window of opportunity: a combination of several favorable conditions existing within the same time frame.

Furthermore, it is safe to assume that other drivers and barriers may exist for collaborative sustainability initiatives that are not included in this study, due to its restricted number of included countries. Only selecting countries that are similar to the Netherlands contains the risk of missing some best practices. A different approach could have been to include front-running countries in the sustainability domain (for example Iceland and the Scandinavian countries) that could serve as benchmark for countries that are lagging behind in the energy transition. However, the current approach allows better for comparing cases and distilling best practices that are present in multiple initiatives and in different contexts.

Finally, this study does not aim to provide municipalities with best practices that are context-independent and work for all collaborative, innovative, public initiatives. Despite the fact that the included cases are relatively comparable, still important differences exist in characteristics of the cases. In particular the design of the collaboration proved to be a distinctive feature, defining to what extent drivers and barriers are applicable for improving an initiative. Therefore, it should be kept in mind that the presented drivers and barriers do not apply in all cases, and should be examined in light of the context of concrete initiatives.

6. Conclusion

This study aims at providing municipalities with guidelines for collaborative and innovative initiatives to realize the energy transition. Over the last decade, many local initiatives have been implemented, of which a substantial part has been studied closely by academic scholars. This stream of scientific literature of case studies provides a lot of cues about what factors contribute to the respective successes and – to a limited extent – failures of these initiatives. However, what is lacking is an overview of these case studies which shows what factors are the most critical for success. This study acknowledges this shortcoming and provides a comparative overview of seventeen case studies in the domain of sustainability, resulting in the identification of thirteen drivers and barriers for collaborative governance.

In this study the model of collaborative governance developed by Ansell and Gash[62] is used to to give meaning to collaborative innovations and regard them as an iterative process, in which phases repeatedly alternate and follow each other in a loop. We recognize some factors from the Ansell and Gash model in the studied cases – starting conditions, institutional design and facilitative leadership – that influence the collaborative process. Additionally, four phases of collaborative initiatives are identified in the process itself: collaboration, innovation, implementation and a feedback loop. These phases can be seen as sequential in an iterative process, where it starts with collaboration, which is followed by innovation. Thereafter, the implementation follows. At end of the process there is feedback, which serves as input to improve all previous phases. It should be noted that these phases are highly interwoven in practice, making it impossible to clearly separate them. Moreover, every phase of the process is also important in all following phase. For example, collaboration is also important for the innovation, implementation and feedback phase. We do not argue that every phase is or should be separated. However, what we do argue is that collaboration is relatively most important in the beginning of the process. Later on in the process, innovation is more important, followed by a phase where implementation is more important. Then there is a phase where feedback is relatively most important. Moreover, the distinction of the four phases helps to locate the barriers and drivers in the process. The identified drivers and barriers are more relevant in some phases than others. Figure 5 shows an adjusted model of collaborative initiatives, illustrating the aforementioned phases and its corresponding drivers and barriers.
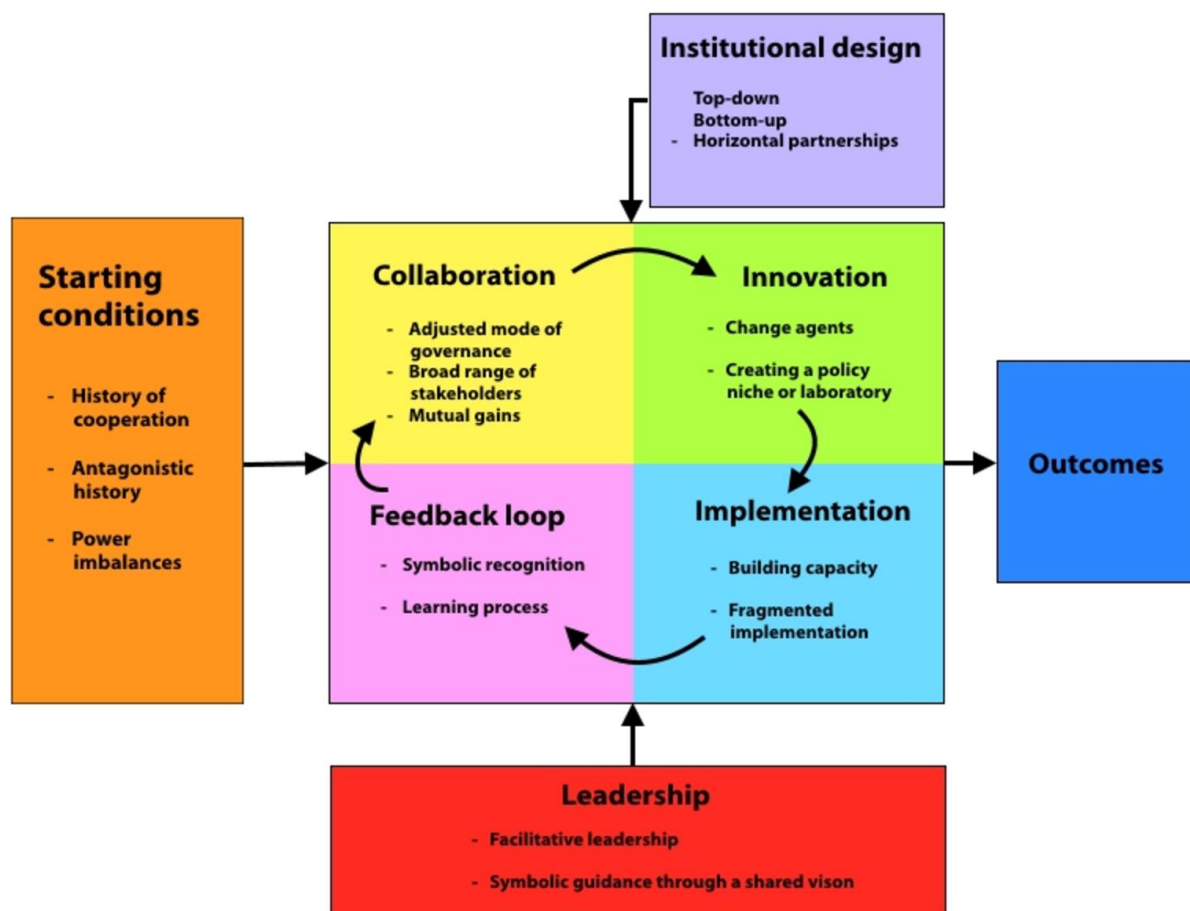
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[62] Ansell & Gash (2007)

Figure 5. Adjusted model of collaborative governance

Comparison of the different case studies shows an additional feature: some cases are grouped together often and share drivers and barriers that are maybe less applicable to other cases in this study. Further analysis of these groups of cases reveals that their institutional design is an important factor that influences what drivers and barriers are relevant for success. Three main types of institutional designs can be distinguished from the included cases: top-down designs, bottom-up designs, and horizontal partnerships.

There does not exist something like context-independent best practices that will make any initiative succeed. However, a general lesson that can be learned from this observation is that municipalities should reflect upon the institutional design, as the applicability of drivers and barriers varies depending on the institutional design of the initiative at hand. Furthermore, the results show that all institutional designs can be successful – although perhaps in different ways. Local governments should give room to this institutional diversity and have no established preference for one design over others. Each design calls for a different approach, and each design allows for different opportunities. This lesson especially concerns municipalities that tend

to favor top-down designs and give little room to citizens' initiatives; this study shows that bottom-up initiatives can be very effective, collaborative and innovative.

The best practices extracted from the case studies do not offer a concrete how-to guide or remedial actions to individual cases, but are merely reflection points for local authorities that are working towards the energy transition. Three reflection points can be distilled from this research. A first point for reflection is that for successful collaborative innovation past cooperation cannot be ignored. This study shows that local authorities play a pivotal role in preserving and providing continuity to past cooperation. A second point of reflection concerns the implementation of collaborative governance. This study suggests that the implementation of a collaborative innovation should not only be considered as a phase for the fulfillment of targets, but also as an opportunity for capacity building. A third point of reflection concerns the disposition of municipalities toward trial and error. This study suggests that local authorities should take more courageous efforts than devising a clever strategic plan. Some cases show that an epistemological turn is needed from municipalities: a deductive logic seems to be less innovative than a more experimental, inductive logic. Municipalities should face the challenge, and at the same time the opportunity, of creating more favorable environments for innovation. This is particularly the case for niches and urban laboratories.

Besides the three reflection points stated above, we would like to pinpoint another recommendation that follows from this study. We call upon local governments to start with systematic evaluations of collaborative governance initiatives and place greater emphasis on the matter of learning from evidence. This study stresses not only the importance of adaptation to changing circumstances, but also notices that adaptation is not feasible without the capacity and sufficient feedback to adapt. A good practice would be to steer more on knowledge creation that enables opportunities to adapting practices on an evidence base.

In addition to this report, an applied guideline is attached, which provides practical recommendations for municipalities.

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Appendix I. Full case list

ID	Country (local authority)	Author	Year	Title
1	Germany (Saerbeck)	Hoppe, Graf, Warbroek, Lammers & Lepping	2015	Local Governments Supporting Local Energy Initiatives: Lessons from the Best Practices of Saerbeck (Germany) and Lochem (The Netherlands)
2	Germany (Hamburg	Becker, Naumann & Moss	2016	Between coproduction and commons: understanding initiatives to reclaim urban energy provision in Berlin and Hamburg
3	UK (Leeds)	Chatterton	2013	Towards an Agenda for Post-carbon Cities: Lessons from Lilac, the UK's First Ecological, Affordable Cohousing Community
4	Germany (Bottrop)	Mattes, Huber & Koehrsen	2014	Energy transitions in small-scale regions - What we can learn from a regional innovation systems perspective
5	UK (Greater Manchester)	Uyarra & Gee	2013	Transforming urban waste into sustainable material and energy usage: the case of Greater Manchester (UK)
6	The Netherlands (Lochem)	Hoppe, Graf, Warbroek, Lammers & Lepping	2015	Local Governments Supporting Local Energy Initiatives: Lessons from the Best Practices of Saerbeck (Germany) and Lochem (The Netherlands)
7	The Netherlands (Rotterdam)	De Graaf & Van der Brugge	2010	Transforming water infrastructure by linking water management and urban renewal in Rotterdam
8	UK (Manchester)	Evans & Karvonen	2014	'Give Me a Laboratory and I Will Lower Your Carbon Footprint!' —Urban Laboratories and the Governance of Low-Carbon Futures
8	Belgium (Flanders)	Van Assche, Block & Reynaert	2010	Unravelling urban sustainability. How the Flemish City Monitor acknowledges complexities
10	The Netherlands (Rotterdam)	Frantzeskaki Wittmayer & Loorbach	2014	The role of partnerships in "realising" urban sustainability in Rotterdam's City Ports Area, The Netherlands

11	The Netherlands (Rotterdam)	Larondelle, Frantzeskaki & Haase	2016	Mapping transition potential with stakeholder- and policy-driven scenarios in Rotterdam City
12	The Netherlands (North East Frysland)	Heldeweg, Sanders & Harmsen	2015	Public-private or private-private energy partnerships? Toward good energy governance in regional and local green gas projects
13	Denmark(Stenløse)	Smedby & Quitzau	2015	Municipal Governance and Sustainability: The Role of Local Governments in Promoting Transitions
14	Denmark (Copenhagen)	Gammelgaard	2015	The emergence of city logistics: the case of Copenhagen's citylogistik-kbh
15	Denmark (Middelfart)	Vlasova & Gram-Hanssen	2014	Incorporating inhabitants' everyday practices into domestic retrofits
16	Belgium (Brussels)	Kampelmann, Van Hollebeke & Vandergert	2016	Stuck in the middle with you: The role of bridging organisations in urban regeneration
17	Germany (Emden)	Koehrsen	2015	Does religion promote environmental sustainability? - Exploring the role of religion in local energy transitions

Appendix II. Adjusted Torfing's assessment tool

Score Table 1: Breadth of collaboration

Points	Description / criteria
5	The collaboration involves a range of public and private actors, as well as citizens from the target group (or a representative who can convey their points of view, wishes and needs)
4	The collaboration involves one or more public actors, and one or more private for-profit or non-profit organizations
3	There is collaboration between various public organizations (state, region, municipality, etc.), departments (social, leisure, culture, etc.) and professional groups (social workers, administrators, etc.), which have different perspectives on the problems, challenges and solutions
2	There is collaboration across different professional groups within the same public organization or administration
1	The collaboration involves relevant actors within a given public organization or administration, who share the same professional background

Score Table 2: Scope of collaboration

Points	Description / criteria
5	Collaboration between two or more actors has impacted all aspects of the development and implementation process, including the definition of problems and targets during the initial phase
4	The collaboration covers both development and design of the project's form and content, as well as its subsequent testing, implementation and operation, but not the definition of problems and targets during the initial phase

Points	Description / criteria
3	The collaboration covers the fine-tuning of the project during the testing and decision-making phase, and also the final implementation and operations phases
2	The collaboration covers the implementation and operations phase, which requires negotiation, knowledge sharing and coordination
1	The collaboration only covers the operations phase, which requires ongoing coordination among several actors

Score Table 3: The character, closeness and depth of collaboration

Points	Description / criteria
5	The actors involved in the collaboration all play a relatively active role in the joint creative process, and are in close dialogue with one another over an extended period in which they design and implement the project together
4	Relevant and affected actors participate regularly in joint discussions about the project, although the latter is developed and implemented by a small core group of actors working closely together
3	During the collaboration, relevant actors have been involved in discussions about one or more parts of the project, with a view to its further development and adaptation
2	During the collaboration, various actors have had the opportunity to put forward good ideas and relevant information, based on robust knowledge, that can contribute to developing the project
1	The collaboration is characterized by the fact that various actors have been informed about a project that others have designed, and have had the opportunity to object to its implementation

Score Table 4: Management of the collaboration

Points	Description / criteria
5	The collaboration is characterized by clear and effective management throughout the project, and its leadership is anchored in a board or steering committee in which several of the partners reflect on the collaboration and on how to improve it and generate better results
4	There is a clear and visible management that seeks to create good arenas for collaboration and constructive relationships, and at the same time stimulates new ways of thinking and ensures that the risks associated with doing things in new ways are addressed
3	There is a permanent and persistent management which strives to promote collaboration between the involved actors by creating suitable forums for dialogue and by building mutual trust and understanding between participants
2	When problems arise from time to time during the collaboration, someone usually takes on a leadership role, but there is no systematic, long-term leadership
1	Apart from convening meetings, there isn't really anybody who takes responsibility for ensuring collaboration among all the involved actors

Score Table 5: The depth of innovation at the ideational level

Points	Description / criteria
5	The innovation builds on a completely new and different program or change theory that does not merely propose new targets and the means to achieve them, but also changes the underlying understanding of the problems and challenges faced
4	The innovation builds on a modified program or change theory that both proposes new targets and the means to achieve them

3	The innovation introduces new ideas and forms of knowledge which enable existing targets to be achieved using completely new means
2	The innovation builds on new ideas that originate either internally or externally, and which change the form and content of existing solutions
1	The innovation builds mainly on old ideas that are combined with new and different means which create new results and effects

Score Table 6: The depth of innovation at the level of practice

Points	Description / criteria
5	The innovation affects policy broadly in the area in question, as well as the organizations and processes through which the service or public good is delivered, and its form and content
4	The innovation affects the content of the public service or public good, the way in which it is produced and delivered, and the respective roles of the public and private actors operating in the area, including the role of the target group, if relevant
3	The innovation affects the content of the service or public good and the way in which it is produced and delivered to the target group
2	The innovation primarily affects the content of the service offered to the target group or public good
1	The innovation solely offers a new means to produce and deliver an existing service or public good.

Score Table 7: The character of the innovation

Points	Description / criteria
5	The innovation constitutes a radical break with established practice in the area in question, as well as with underlying assumptions and actors' role perceptions; and it requires an extensive and complex change process
4	The innovation builds on new ideas and significantly changes established practices and assumptions in the field
3	The innovation challenges some established practices and assumptions in the field while leaving others unaffected
2	The innovation constitutes a clear break with existing ways of doing things, but builds mainly on existing elements
1	The innovation is small-scale and only differs to a minor extent from ongoing everyday improvements aimed at improving the area in question

Score Table 8: The reputation of the innovation

Points	Description/ criteria
5	The external environment, e.g. other municipalities and private associations and organizations, recognizes the project as innovative and it has, for instance, won prizes or spawned related projects
4	The project is regarded as innovative both by the participants, various partners and a large segment of the project's target group
3	Besides the project's initiators and participants, its closest partners also consider it to be innovative in the local context

2	The majority of the actors involved in the project's development and implementation regard it as innovative in the local context, as do its initiators
1	The project's initiators regard it as innovative inasmuch as it brings something new to the local context

Score Table 11: Safe and robust knowledge

Points	Description / criteria
5	The project builds essentially on evidence-based methods tested by other projects, and also provides documentation for its own effects through quantitative measurement
4	The project's activities are based on elements of well-documented knowledge about the effects of specific initiatives, as well as systematic measurement to test whether these actually produce the desired effects
3	The project's activities are not based on externally generated knowledge about the effects of specific initiatives (possibly because such knowledge does not exist), but the project can demonstrate, both qualitatively and quantitatively, that it produces the desired effects
2	The project's activities are based on externally generated knowledge about the effects of some of its initiatives (e.g. through evaluation of a pilot project), but can only document to a limited extent that these produce the desired effect
1	The project's activities are based solely on assumptions about their possible effects, but it is not yet possible to document that the desired effects are being produced, either because the project has just started or because its documentation procedures are inadequate

Score Table 12: The achievement of stated goals in terms of results and effects

Points	Description / criteria
5	The project has attained almost all its goals for activity-related results and specific effects and there is therefore good reason to raise expectations in the future
4	Most of the result and effect targets have been met but there is still room for improvement
3	The project's specific effect targets have been satisfactorily met, but most of the result targets have not been met
2	The project's result targets have been adequately met, but the same cannot be said for the specific effect targets
1	The project's result and effect targets have only been partially met, or not at all

Municipalities heading for a sustainable collaboration

An applied guide of drivers and barriers for collaborative sustainability initiatives

Legenda

The presented drivers and barriers for a collaborative, innovative, public initiative are best practices for differing types of governance:
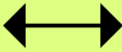
Driver

Barrier

Bottom-up collaborative mode of governance: the municipality supports a citizens' initiative in response to a request

Top-down collaborative mode of governance: the municipality predetermines goals, performance criteria or technical requirements, and persuades the target group of meeting the predetermined goals

The driver or barrier is applicable to <u>all</u> modes of governance

Horizontal partnerships: the municipality collaborates with other parties in a horizontal relationship

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Starting conditions

History of satisfactory cooperation

Your municipality brings long-term relationships from the past, that have produced mutual trust and commitment. Maintaining this relationships will enhance opportunities for new cooperations.

Antagonistic history

Some stakeholders distrust your municipality and oppose you fiercely, hindering collaboration. Opening channels for communication and inviting them to an open dialogue might change the hostile dynamic.

Power imbalances

Your dominant role is repeatedly criticized. Securing a more equal playing field for all stakeholders and empowering them will give them a sense of ownership of the ongoing process

You are amid a partnership where stakeholders feel neglected. Granting access, and giving them capacity to influence will give them voice and will reduce opposition to the implementation of the initiative.

Leadership

Facilitative leadership

Facilitative leaders within your municipality invite members of citizens' initiatives, listen to them, identify their needs and facilitate needed resources.

In partnerships, facilitative leaders mediate and steer toward consensus as much as possible.

Co-created vision as symbolic guidance

Your municipality is in a partnership with multiple stakeholders, and you are in need of finding a commitment to shared goals. By co-creating a vision with your partners, and documenting the results, you secure a future referent and a guidance in the implementation phase.

Collaboration

## Inclusiveness of a broad range of stakeholders

If you expect risk of resistance in the implementation of your initiative, seek to collaborate with the target group.

If you need to build or enhance political legitimacy of the initiative, form coalitions outside the political arena.

Integral incentive design based on mutual gains

To attract non-state partners, you should focus on their respective values aside from your long-term sustainability goals .
Formulate an overarching goal or incentive to integrate various interests
(e.g. economic gains or opportunities for knowledge creation).
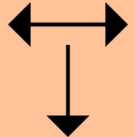
Innovation

Change agents

Traditional assumptions, perspectives and practices embedded in your organisation prevent you from thinking
and practicing innovative solutions. Be open to citizen's groups and individuals within your organisation or partnership
who dare to create path-breaking visions or have radical ideas.

Create a policy niche or lab

In a highly politicized arena, small-scale experiments secured from political pressures allow for trial and error,
which might help to create useful knowledge and counter the *status quo*.
Promote the creation of policy niches and urban labs which are suitable for experimenting.

Implementation

Building capacity

To secure the endurance of the initiative in the long run, you need capacity within the local community.
This can be done through involving the target group (e.g. co-investment, knowledge sharing or membership).

Fragmented implementation

Separate parts of your project are being implemented by different actors, yet there is a lack of cooperation
between them or an inability to learn from each other. Coordinating visions might produce alignment.

Feedback loop

Symbolic recognition

Prizes, national fundings or symbolic recognitions bring (non)material rewards, political support and additional partners
to the initiative which favor opportunities for growth. Your municipality should strengthen
the reputation of its initiatives by making them more visible (e.g. joining contests, applying for national funding).

Recursive learning

Your initiatives should be monitored and evaluated regularly in order to adapt to changing circumstances.
Especially if they are experimental in nature, you should take advantage of constant learning and implementing
to make incremental improvements.

Outcomes