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*'The role of government in voluntary
environmental programs: a fuzzy set qualitative
comparative analysis (fsQCA)'*

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‘The role of government in voluntary environmental programs: a fuzzy set qualitative comparative analysis (fsQCA)’

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Abstract

Voluntary Environmental Programs (VEPs) have become increasingly popular in addressing environmental risks that are too complex to solve through traditional direct regulatory interventions. Whilst VEPs have attracted much scholarly attention, little is known about how they cause their outcomes. This article seeks to better understand whether and how the roles of governments in VEPs affect their outcomes in terms of (i) attracting participants, and (ii) their contribution to a desired collective end. Using fuzzy set qualitative comparative analysis (fsQCA) this article addresses a series of 31 VEPs in the building sectors of Australia, the Netherlands, and the United States. It is particularly interested to better understand what configurations of five specific governmental roles in VEPs are sufficient to attract participants and contribute to a desired collective end. It uncovers three ideal type roles for governments in VEPs that are positively related to the two outcomes under scrutiny.

Keywords

Governance, voluntary environmental programs, governance performance, urban sustainability, fuzzy set qualitative comparative analysis (fsQCA)

1 Introduction

Voluntary Environmental Programs (VEPs) are often developed and implemented seeking to tackle environmental risks that are too complex to address through traditional state-led direct regulatory interventions ([Borck & Coglianese, 2009](#); [Potoski & Prakash, 2013](#)). VEPs are illustrative of a broader trend in contemporary governance. They fit the oft-discussed shift away from sole state-authority in governing (environmental) problems towards the involvement of non-state stakeholders in the development and implementation of governance arrangements (e.g., [Ansell & Gash, 2008](#); [Trubek & Trubek, 2007](#)). They also fit the related shift away from traditional prescriptive ‘command-and-control’ type (environmental) regulation towards governance arrangements that encourage self-organisation, market solutions or both ([Gunningham, Kagan, & Thornton, 2003](#); [Wurzel, Zito, & Jordan, 2013](#)). Since the 1980s a large variety of VEPs has been developed and implemented by governments, businesses, citizens, and combinations of these actors, in areas such as forestry ([Cashore, Auld, & Newsom, 2004](#)), organic food production ([Thøgersen, 2010](#)), and the building sector (Van der Heijden, 2014). VEPs have been studied to great length, and good reviews of the literature are available (see e.g., [Borck & Coglianese, 2009](#); [Darnall & Sides, 2008](#); [Koehler, 2007](#); [Lyon & Maxwell, 2007](#); [Van der Heijden, 2012](#)).

Of particular interest to VEPs is that they seek to influence environmental behaviour *without* the traditional force of law. This makes the strategy underlying VEPs different from traditional government approaches. Yet, in terms of their architecture VEPs often show considerable similarity to traditional government approaches. VEPs can best be understood as rule regimes that give exclusive rewards to their participants, such as the branding of their goods and services, or showcasing industry leadership. Individuals and organisations participating in these programs pledge to change their behaviour in such a way as to create desired societal outcomes beyond what is required by governmental regulation ([Potoski & Prakash, 2009](#)). It is considered that the rewards that come to VEP participants incentivise them to voluntarily commit to meeting the rules that underlie a VEP.

This article is particularly interested in the roles of governmental actors in VEPs. The current literature on VEPs highlights that governments are often actively involved in the development and implementation of VEPs. Among the motivations discussed in the literature are that governmental actors may seek to implement VEPs when they anticipate that future legislation is costly to implement and enforce, when they want to investigate or promote innovative policy ideas, when political resistance exists for implementing more stringent legislation, or when they want to support VEP initiatives by businesses or citizens ([for a review of the literature, see Van der Heijden, 2012](#)). The focus of the current article is however not on *why* governmental actors are involved in VEPs, but *how* they are involved and how their involvement affects the outcomes of VEPs.

The current article seeks to add empirical knowledge on five specific roles of governmental actors in VEPs that the current literature considers related to positive VEP outcomes (these roles are introduced in Section 2), and aims to better understand how different (configurations of) roles of governments affect the outcomes of VEPs. The article builds on a medium-sized sample of 31 VEPs in the building sectors in Australia, the Netherlands, and the United States; all countries in which governments have been active in VEPs (Hoffmann, 2011; Van der Heijden, 2014). The main sources of data for studying these arrangements are a series of over 100 elite interviews and existing documentation on these 31 VEPs. These data are studied using fuzzy set qualitative comparative analysis (fsQCA) logic and techniques.

The article unfolds as follows. Section 2 presents the theoretical background of the current study, and introduces the VEP outcomes and roles of governmental actors in VEPs that have focal attention. In

section 3 the research design of the study is introduced. Section 4 presents the analysis with a focus on governmental roles (or configurations of these) that may be necessary or sufficient for positive VEP outcomes. Section 5 presents three ideal type configuration of roles for governmental actors that are related to the VEP outcomes of interest, and illustrates these ideal types with insights from the interviews. Section 6, finally, concludes and discusses the impact of the research.

2 Theoretical background: VEP outcomes and roles of governmental actors in VEPs

2.1 VEP outcomes

Before introducing the five roles of governmental actors that have focal attention in this article, it is of importance to pay some attention to what is considered a VEP outcome in this study. The current study follows the work of Potoski and Prakash (2009), who consider two dominant criteria to assess the performance of VEPs (also, Borck & Coglianese, 2009):

- *Number of participants* (O1): The number of participants that join a VEP gives some insight into the VEP's attractiveness as a means to address a particular environmental problem, and the willingness of individuals and firms to voluntarily change their environmental behaviour. Yet, the value of a sole focus on this outcome is questioned. After all, participants may join a VEP but decide not to act to its goals. This is an oft-identified form of free riding (Potoski & Prakash, 2013).
- *Number of goods and services provided* (O2): A focus on the number of services and goods provided through a VEP gives a better understanding as to how willing VEP participants are to acting to the VEP's goals, and how well the VEP contributes to a desired collective end (in this article: improved environmental and resource sustainability of the built environment). Yet, one may wonder whether the goods and services provided can be fully contributed to the VEP in place, and whether the quality of these goods and services indeed contributes to that desired societal end in a meaningful way (Potoski & Prakash, 2013).

In short, whilst both criteria give some insight into the performance of VEPs, they do not provide an exhaustive insight. For the purpose of the current article, however, these two outcomes are sufficient to gain a better understanding of the various roles of governmental actors in VEPs.

2.2 Roles of governmental actors in VEPs

The extant literature on VEPs (see e.g., Borck & Coglianese, 2009; Darnall & Sides, 2008; Koehler, 2007; Lyon & Maxwell, 2007; Van der Heijden, 2012) considers at least five roles for governmental actors that may affect the above-mentioned VEP outcomes. These five roles will have central focus in the analysis in this article (section 4). They are:

- *Administrative support* (R1): As administrators, governmental actors may provide legitimacy for a VEP in the eyes of the larger public, which may be an incentive for prospective participants to choose this VEP over another. They may further ease participation for participants through administrative support. In administrative roles governmental actors may also be considered neutral actors by non-state participants, leading the latter to be more willing to become involved. Whilst the strength of the relation between this role and the outcomes remains an issue of some debate (as it is for all roles identified), the current literature has identified a positive relation between this role and the VEP outcomes under scrutiny (cf., Lobel, 2004; Solomon, 2008) – please note, for the latter analysis (section 4) it is of relevance to identify the direction of the relation between role and outcomes.

- *Financial support* (R2): Governmental actors may provide financial support to VEPs as an incentive for attracting participants. This may take away the financial risks of participants for joining a VEP, or simply reduce their cost in achieving the goals of a VEP. Again the current literature considers a positive relation between this role and the VEP outcomes under scrutiny (cf., [Héritier & Eckert, 2008](#); [Irvine, Lazarevski, & Dolnicar, 2012](#)).
- *Monitoring and enforcement* (R3): Without meaningful monitoring and enforcement VEPs are not expected to achieve their intended outcomes. Governmental actors are considered to be well suited to providing forms of enforcement capacity that are meant to ensure that VEP participants fulfil their obligations. Strict enforcement may uncover behaviour that is not in line with VEPs' participation criteria. Though, strict enforcement of VEPs' participation criteria may be unattractive to (potential) participants as well because it requires that they have to act seriously to the goals of the VEP. Thus, whilst governmental involvement in the monitoring and enforcement is expected to affect VEP outcomes, the relationship between this role and the VEP outcomes under scrutiny is unclear (cf., [Lyon, 2009](#); [Potoski & Prakash, 2009](#)).
- *Marketing* (R4): Governmental actors may be well suited to the collecting and disseminating of findings of VEPs, the standardising of best practices, and the replicating of success stories beyond the participant base of these VEPs. They are further well positioned to attract media attention for the VEPs, which on its turn may attract (new) participants. They are also well positioned to reward the leaders in a VEP with exposure on government websites and other publications, which may incentivise participants to perform in line with the goals of the VEP. The current literature considers a positive relation between this role and the VEP outcomes under scrutiny (cf., [Borck & Coglianese, 2009](#); [Lobel, 2004](#)).
- *Customer* (R5): As customer governments may require that the goods and services they buy meet particular sustainability requirements, which may fit their larger sustainable procurement policies, or they even require that the goods and services they buy meet particular VEP standards. Because of government demand suppliers may decide to join a VEP and supply goods and services that meet the requirements of this VEP. Again the current literature considers a positive relation between this role and the VEP outcomes under scrutiny ([Hofman & De Bruijn, 2010](#); [van der Horst & Vergragt, 2006](#)).

Interestingly, not only does the current literature indicate that these five roles are related to positive VEP outcomes, the current literature further indicates that governmental actors may and often do take up more than one of these roles in a VEP. This literature points out that different configurations of roles of governmental actors in VEPs may yield similar VEP outcomes (i.e., a situation of conjunctural causation and equifinality; cf., [Bailey, 2007](#); [Gunningham, 2009](#)).

3 Research design: case selection, data collection, and data analysis

3.1 Case selection

To gain insight in how (configurations of) the roles of governmental actors as identified in section 2 affect these above-mentioned VEP outcomes, a series of 31 VEPs is studied in Australia, the Netherlands, and the United States. All cases seek to improve the environmental and resource sustainability of the built environment in these countries. In all three countries the retrofitting of existing buildings may be considered the 'low-hanging fruit' in terms of reduced carbon emissions and energy savings, whilst in all countries studied the existing building stock will be considerably affected by a changing climate ([IPCC, 2014](#)). This all motivates the development of VEPs in these countries, and has stimulated governmental actors to take up roles in these (Hoffmann, 2011; Van der Heijden, 2014).

Furthermore, these countries show considerable similarity on a number of contextual conditions that the current VEP literature considers related to VEP outcomes (e.g., [Van der Heijden, 2012](#)) – i.e., by 'keeping' the contextual conditions of VEPs relatively constant it is assumed that differences in VEP outcomes are not caused by differences in VEP contexts. These countries show considerable

similarity in their statutory building code regimes ([Liu, Meyer, & Hogan, 2010](#)), and particularly their focus on resource sustainability and energy consumption of their built environments ([IEA, 2013](#)). The countries rank fairly comparably in terms of economic development and citizens' standards of living ([UNDP, 2013](#)), and in terms of environmental awareness of citizens and businesses ([OECD, 2013](#)). Please note, none of the country contexts clusters together in any of the solution formulae of the fsQCA analyses (see section 4). This suggests that the country contexts are appropriately constant for the current study.

Whilst space limitations do not allow for a full introduction of all 31 cases individually, the following three examples (all are cases studied in this article) give some insight of the type and content of the cases in this study¹:

- *1200 Buildings*, Melbourne, Australia. A VEP that allows the City of Melbourne to borrow money from financial institutions and to use this money to financially support buildings owners that cannot find funding for building retrofits. It allows the City of Melbourne to levy a new form of statutory charge that participants in the 1200 Buildings program voluntarily agree to. Building owners further need to commit to a 38% reduction in energy consumption when participating in the VEP ([City of Melbourne, 2010](#)).
- *LEED* (or Leadership in Energy and Environmental Design), United States. LEED is representative for a current trend of VEPs in the building sector to assess the environmental performance of buildings and to certify this performance in a particular class. In this way buildings can be compared according to their relative score – i.e., for a building developer, property owner, or tenant it is easy to understand that a 'platinum' rated building is somehow better than a 'bronze' rated one ([Yudelson & Meyer, 2013](#)). VEPs such as LEED are widely implemented around the globe and normally seek to push the performance of buildings beyond national construction codes ([Cole & Valdebenito, 2013](#)).
- *Green Deals*, the Netherlands. This VEP can be understood as a series of covenants between the National Government of the Netherlands and individuals, businesses or a sector as a whole. *Green Deals* seek to overcome regulatory and market barriers that stand in the way for, among others, improved environmental and resource sustainability of buildings. A typical example is a Green Deal between the government and a number of housing associations. Under this Green Deal the housing associations commit to upgrading the energy performance of their existing building stock well beyond statutory regulation, and the government provides them with monetary and administrative support for doing so ([Ministry of Economic Affairs, 2013](#)).

The 31 cases studied were identified based on an extensive Internet search using key words such as 'sustainable development AND [country]', 'sustainable building AND [country]', 'green building AND [country]', 'sustainable construction AND [country]' and 'green construction AND [country]'. Cases were selected (12 cases for Australia, 8 for the Netherlands, and 11 for the United States) when they met a number of criteria (i.e., a stratified sample).

First, they explicitly focus on increasing the environmental and resource sustainability of buildings through technical solutions or through changed use of buildings. Second, they all set requirements that ask property developers, property owners and building users to make changes to their buildings (or in the way they use these buildings) beyond requirements as laid down in building legislation and regulation. Third, only cases were selected that have matured to at least two years of actual implementation – i.e., it was expected that some time is needed for the cases to achieve outcomes. Fourth, cases with significant government involvement in all roles identified were selected, as well as cases with limited to no government involvement in these roles—this to gain adequate empirical data on the presence and absence of government involvement in the various roles. Fifth and final, cases were selected to include a variety of approaches to goal achievement of VEPs. These are: (a)

¹ Please note, this article reports on a larger study of VEPs in more countries than the ones reported on (including India, Malaysia and Singapore). The full study addressed more than the 31 cases reported on here. This explains why case numbers in table 2 exceed the number 31. A full overview of cases studied is available from www.EnviroVoluntarism.info

Collaborative networks such as the Green Deals in the Netherlands that aim to learn how urban sustainability can be improved without the use of statutory regulation (7 cases); (b) Best-of-class certification programs such as LEED (4 cases); (c) Innovative forms of financing that help owners of existing buildings acquire funding for retrofits such as 1200 Buildings (10 cases); and (d) Programs that target a particular regulatory barrier (e.g., regulation that hampers the instalment of solar panels on strata buildings; 10 cases). It was expected that including different approaches to goal achievement in the set of VEPs under analysis reduces the impact of a particular VEP design on the outcomes of the study, and strengthens the external validity of findings. The approaches are spread fairly well across the countries; and none of the approaches (or countries) indicate dominant positive or negative outcomes (see also table A in the online appendix).

3.2 *Data collection*

Most data relevant for the fsQCA analysis presented in this article could be obtained from the VEPs' websites, existing reports and other sources. Novel data on the cases was obtained through a series of in-depth face-to-face interviews carried out in 2012 and 2013. These interviews aimed to fill in gaps in the data from other sources, to resolve conflicts in data from other sources, and to gain additional insight in the cases under scrutiny. Interviewees were traced through internet searches and through social-network websites, particularly LinkedIn. This resulted in a pool of 101 interviewees (55 Australian, 27 Netherlands, 18 United States) from various backgrounds; table 1 gives an overview.

TABLE 1 ABOUT HERE

The interviews were based on a semi-structured questionnaire that provided a structure of checks and balances to assess the validity of the findings. The interviews were recorded, and based on the recording and notes taken during the interviews a summary report was drafted that was sent back to the interviewees for validation. The interviewees were often aware of and involved in more than one case. It is expected that this (partly) helped to overcome a sampling bias of administrators (and participants) who were overly enthusiastic about their 'own' case ([Sanderson, 2002](#)).

3.3 *Data analysis*

The data were processed by means of a systematic coding scheme and qualitative data analysis software (Atlas.ti). By using this approach the data were systematically explored and insights were gained into the 'repetitiveness' and 'rarity' of experiences shared by the interviewees, and those reported in the existing information studied. The data were further analysed using fuzzy set qualitative comparative analysis (fsQCA) logic, techniques and FS/QCA software ([version 2.5; freeware available from \[www.compassss.org\]\(http://www.compassss.org\); Ragin & Davey, 2014](#)). QCA was chosen because it helps to trace patterns of association between the roles of governments in VEPs and the outcomes of interest.

QCA differs from other data analysis methods in its focus. 'The key issue [for QCA] is not which variable is the strongest (i.e., has the biggest net effect) but how different conditions [i.e., roles for government] combine and whether there is only one combination or several different combinations of conditions (causal recipes) of generating the same outcome' ([Ragin, 2008, 114](#)). QCA is grounded in set theory, a branch of mathematical logic that allows studying in detail how causal conditions, here the roles for government in VEPs, contribute to a particular outcome. The fundamentals and background of QCA are well explained and documented in a series of strong textbooks ([Goertz & Mahony, 2012](#); [Ragin, 2008](#); [Rihoux & Ragin, 2009](#); [Schneider & Wagemann, 2012](#)).

In this article fsQCA is applied as it allows for giving a rather precise insight in the qualitative difference in my empirical data – i.e., the degree of presence or absence of a condition or the outcome in the cases under analysis. It should be kept in mind that whilst fsQCA uses numerical symbols, it is a qualitative method. The numerical information provided throughout this article should be understood as descriptions of data patterns that underlie the dataset, but not as a simplistic reduction of the qualitative data obtained. For instance, a 'consistency score' helps the researcher to understand how well a finding reflects the empirical data, whilst a 'coverage score' helps the researcher to understand how much of the empirical data are explained by the causal recipes uncovered. In QCA, associations between conditions and outcomes are expressed in terms of necessity and sufficiency. Necessity refers to the situation that the outcome (here: compliance) cannot be produced without a condition (here: a compliance motivation) – thus, if the outcome is present the condition will be present, and vice versa. Sufficiency refers to the situation that a condition itself can produce the outcome without the help of other conditions. For example, humans need oxygen to sustain life (oxygen is a necessary condition for human life), but oxygen in itself is not sufficient to live (food and water, for instance, are other necessary conditions).

The online appendix provides the coded data for this study as well as an explanation of the approach to coding.²

4 Data analysis

4.1 Necessary conditions

Following established fsQCA practice the data are first analysed for necessary conditions before exposing it to more complex analysis to identify (configurations of) sufficient conditions ([Rihoux & Ragin, 2009, Chapter 5, box 8.1](#); [Schneider & Wagemann, 2012, Chapter 11](#)). Table 2 presents the results of this analysis for necessity.

TABLE 2 ABOUT HERE

Conditions should only be considered as necessary if their consistency scores are very high (consistency indicates how strongly the condition relates to the outcome); a cut-off point of 0.90 is advised ([Rihoux & Ragin, 2009, 45](#)). As can be seen from Table 2, none of the conditions meets the consistency score of 0.90 or above. This indicates that strong involvement of governmental actors in any of the five distinctive roles in VEPs is not necessary for either attracting a high number of participants to VEPs, or for ensuring that these VEPs meet their goals in achieving a desired collective end (here measured as the number of goods and services produced by VEP participants).

To conclude, the data does not point to any distinct (relevant) necessary role that governmental actors may want to take up to ensure that VEPs achieve positive outcomes.

4.2 Sufficient conditions for attracting participants

To gain insight in whether conditions combine causing outcome O1, the data are analysed aiming to logically reduce the empirically observed configurations ([Rihoux & Ragin, 2009, Chapter 5, box 8.1](#); [Schneider & Wagemann, 2012, Chapter 11](#)). A first step of this analysis is to create a truth table, which is represented in Table 3.

² INCLUDE LINK TO ONLINE APPENDIX ABOUT HERE

TABLE 3 ABOUT HERE

The truth table represents all configurations of conditions that are logically possible. Thus, with the five conditions here the number of logically possible configurations is 32 (i.e., 2^5). The empirical observations are included in this table. As the truth table indicates, out of 32 logically possible configurations 15 were empirically observed (rows 1 to 15). Note that a score of “1” reflects the full or partial presence of a condition or outcome (the data observations identified with 0.67 and 1.00 scores in table 2), whilst a score of “0” reflects the full or partial absence of a condition or outcome (the data observations identified with 0.33 and 0.00 scores in table 2).

Because some observations of configurations of conditions were observed in different cases, some rows in the truth table refer to a few whilst other rows refer to only one case. It is normal that the truth table also contains rows of possible combinations, but without empirical observations (i.e., logical remainders, rows 16-32).

It should be noted that the truth table based on the data presented in table 2 one row turned out to be a ‘contradictory row’ (indicated as ‘C’). That is, whilst cases 13, 14, 17 and 54 are characterised by a similar configuration of conditions they show different outcomes – cases 13, 17 and 54 are at least more in than out (i.e., have a membership score >0.5), whilst case 14 is more out than in (i.e., has a membership score <0.5 ; see further table 2). This particular contradiction turns out to be related to the impact of the subprime mortgage crisis in the United States on case 14 (cf., [Sichtermann, 2011](#)). This has impacted on secondary funds available to specific participants in case 14, and therefore the outcomes of case 14.

The truth table is used for a logical minimization of data. First, a threshold for logical remainders was set. Following Ragin ([2008](#)) only configurations with at least one observation are considered in the analysis – which de facto implies that all the empirical data collected was studied. Second, a threshold was chosen to distinguish configurations that are subsets of the outcome from those that are not. One normally looks at the ‘raw consistency’ score in the truth table to set this threshold, which gives an indication of how well the configurations of conditions fit the outcome (i.e., the higher the score, the better the fit). It is sometimes advised to use the more accurate PRI consistency score (Proportional Reduction in Inconsistency) for setting this threshold ([Erkens & Van der Stede, 2013](#)). PRI consistency corrects for inconsistencies in the data by giving minor penalties to small inconsistencies and substantial penalties for large inconsistencies ([Ragin et al., 2006](#); [Schneider & Wagemann, 2012](#)). Ragin ([2008](#)) advises a consistency score of at least 0.75. In addition to this rule of thumb, researchers are advised to check the truth table on major gaps in consistency scores and use these to set the consistency threshold ([Schneider & Wagemann, 2012](#)). Following this advice the PRI consistency score was used, and the consistency threshold was set relatively high at 0.90 because of the large jump in PRI consistency scores under 0.90. 12 configurations met this requirement, capturing 25 cases.

From here on a standard analysis was carried out in FS/QCA 2.5. Table 4 represents the solution that results from this analysis.

TABLE 4 ABOUT HERE

Table 4 adopts a notation and presentation of causal configurations that are sufficient for causing the outcome of interest (‘solutions’) introduced by Ragin ([2008, 205](#)) and applied by others ([Erkens & Van](#)

[der Stede, 2013](#); [Fiss, 2011](#)). Full circles (●) indicate conditions that must be present to cause the outcome; crossed out circles (∅) indicate conditions that must be absent.

Table 4 indicates that six solutions (i.e., six configurations of conditions: 1a, 1b, 2, 3a, 3b, and 3c) are related to the outcome 'having attracted a substantial number or the expected number of participants'. The *solution consistency* (0.95) may be considered as high ([Ragin, 2008](#)), and indicates that the solution strongly relates to the outcome observed ([see further Schneider & Wagemann, 2012, section 5.3](#)). The *solution coverage* (0.84) can be considered as high as well, and indicates that the solution is of high empirical importance in reaching the outcome.

These six solutions can be understood as six causal recipes that are (individually) sufficient for causing the outcome. The six solutions can be read as three types of governmental actor involvement in VEPs that are related to attracting a substantial number or the expected number of participants:

- *Type 1* (solutions 1a and 1b): Governmental actors financially and administratively support a VEP. They further are (a) not involved in monitoring and enforcement of the VEP's rules and do not require their suppliers to participate in a VEP, or are (b) actively marketing the VEP.
- *Type 2* (solution 2): Governmental actors administratively support a VEP, monitor and enforce the VEP's rules, and actively market the VEP.
- *Type 3* (solution 3a, 3b and 3c): Governmental actors do not financially support a VEP, and do not monitor and enforce the VEP's rules. They further (a) do not administratively support a VEP and do not require their suppliers to participate in a VEP, (b) are actively marketing the VEP and do not require their suppliers to participate in a VEP, or (c) do not actively market the VEP and do require their suppliers to participate in a VEP.

4.3 *Sufficient conditions for achieving a desired collective end*

To gain insight in the solutions that may lead to the outcome O2 the data are studied again following the approach discussed in section 4.2 (note: the focus is on the goods and services produced by the participants in the VEPs, see section 2). The threshold for consistency was set at 0.80 for raw consistency (cf., [Ragin, 2008](#)). For this analysis the PRI consistency was not used because of the low scores. Table 5 presents the truth table for this analysis, and Table 6 presents the intermediate solution for this analysis.

TABLE 5 ABOUT HERE

TABLE 6 ABOUT HERE

Table 6 indicates that six solutions lead to the outcome 'having substantially contributed to achieving or having achieved a desired collective end' (i.e., six configurations of conditions: 4a, 4b, 5a, 5b, 6a, and 6b). Again the solution consistency (0.91) and the solution coverage (0.89) may be considered high – i.e., the solution strongly relates to the outcome, and the solution is of high empirical importance in reaching the outcome.

The six solutions can be read as, again, three types of governmental actor involvement in VEPs that substantially contribute to achieving or having achieved a desired collective end:

- *Type 4* (solutions 4a and 4b): Governmental actors financially and administratively support a VEP and do not require their suppliers to participate in a VEP. They further are (a) not involved in monitoring and enforcement of the VEP's rules, or are (b) actively marketing the VEP.
- *Type 5* (solutions 5a and 5b): Governmental actors administratively support a VEP, and monitor and enforce the VEP's rules. They further (a) actively market the VEP and do not require their suppliers to participate in a VEP, or (b) do not financially support the VEP.
- *Type 6* (solutions 6a and 6b): Governmental actors do not monitor and enforce the VEP's rules. They further (a) do not financially support a VEP and are actively marketing the VEP, or (b) do not administratively support the VEP and do require their suppliers to participate in a VEP.

5 Attracting participants *and* achieving a desired collective end

From the results presented in Section 4.2 and 4.3 it becomes clear that the solutions that relate to outcome O1 and outcome O2 are not fully similar. For instance, solution 1a related to outcome O1 is the same configuration of conditions as solution 4a related to outcome O2, but solution 1b is a more inclusive configuration than solution 4b. After all, solution 4b indicates that to achieve outcome O2 all conditions of solution 1b work together, but with an extra causal condition: the absence of governmental actors in the role of customer of a VEP. This indicates that, for the cases studied, a VEP with a design resembling solution 4b results in both outcome O1 and O2, whilst a VEP with a design resembling solution 1b results in outcome O1 but does not necessarily also result in outcome O2 (after all, within a design resembling solution 1b governmental actors can take up the role of customer, or stay out of this role).

This allows to, for the cases studied, simplify the two sets of solutions further to those that are related to achieving *both* outcome O1 and outcome O2. Table 7 gives an overview of this simplification.

TABLE 7 ABOUT HERE

By combining the two sets of solutions related to the outcomes O1 and O2 three ideal types ([cf., Fiss, 2011](#)) of roles come to the fore that are related to achieving both outcomes within the set of cases studied. These are:

- *Type I, Serve VEP participants, and do not ask too much of them*: In this role governmental actors take up the administration of a VEP, financially support participants, and ensure that insights on the VEP are marketed outside the participant base of the VEP. Governmental actors steer away from (strictly) monitoring and enforcing participants' compliance with VEP requirements, and steer away from requiring their suppliers to (in one way or the other) participate in a VEP.
- *Type II, Serve participants, but protect the VEP*: In this role governmental actors take up the administration of a VEP, they (strictly) monitor participants' compliance with its requirements, and ensure that insights on the VEP are marketed outside the participant base of the VEP. Governmental actors steer away from financially supporting a VEP's participants, or from requiring their own suppliers to (in one way or the other) participate in a VEP.
- *Type III, Only give a targeted push, but stay out of the VEP otherwise*: In this role governmental actors steer away from administrating a VEP or administratively supporting its participants, from financially supporting the VEP and its participants, and from (strictly)

monitoring and enforcing participants' compliance with VEP requirements. Their involvement in a VEP, if any, is highly targeted: they either ensure that insights on the VEP are marketed outside the participant base of the VEP, or they require their own suppliers to (in one way or the other) participate in a VEP.

In what follows a snapshot is taken from the 31 cases studied for each of these three ideal types; this to give some more insight in how they operate in real world settings. Snapshots are taken from cases that most closely resemble a particular type (see table A in the online appendix).

5.1. A snapshot of ideal type I: Serve VEP participants, and do not ask too much of them

In the stratified sample of cases studied, case 16 comes most closely to ideal type I. This case was a government-driven VEP, but was terminated recently after a change of government. It built on voluntary audits of homes, providing households information on how they can make significant reductions in their energy and water consumption. Households were further given a number of energy efficient light bulbs and a water-saving showerhead. The costs for the audit was about a tenth of the value households received.

One of the previous administrators of the VEP reflected: 'Basically it was advice over a cup of coffee.... We tried to make households commit to do three things differently. And it may not be the thing that makes the big difference, but it is about engaging people in that [reduced energy and water consumption]. It is an initial behaviour change. And if they start to see themselves as energy consumers and conservers ... that can lead to bigger and more successful changes'.³

Whilst this particular VEP attracted many participating households and high levels of self-reported activity in terms of reduced energy and water consumption by these households (via a website), interviewees questioned the lasting impact of this particular VEP.

5.2 A snapshot of ideal type II: Serve participants, but protect the VEP

Cases 9, 18, 51 and 52 closest resemble ideal type 2. Case 9, for example, is a collaborative network between the 13 largest property owners in a major Australian city and the City Council. By participating in the VEP the property owners commit to support the city in achieving its ambitious goals for reduced carbon emissions by 2030. In return the city involves these property owners in the development of urban policy and infrastructure investments.

The city fully administers and monitors the VEP. Its most senior administrator said: 'Through the [VEP] the city aims to improve the momentum of what it is these property owners are doing [in terms of environmental and resource sustainability]. But there is only so much they can do with their portfolio and their own buildings. The next jump [can only be achieved] by actually working together'.

In sharing lessons and in being supported by the city, the 13 property owners have achieved a greenhouse gas emission reduction of 31% (exceeding the anticipated reductions of 24%) and have saved over A\$25 million in avoided electricity costs. Based on their experiences the VEP administrators and its participants are now developing guidelines and checklists that other (smaller) property owners can follow.

³ In line with the custom of qualitative social science research, interviewees provided me with their insights in confidence. As such I cannot provide the identities of my interviewees.

5.3 A snapshot of ideal type III: Only give a targeted push, but stay out of the VEP otherwise

Cases 1, 27, 47 and 55 closest resemble ideal type 3. Cases 1, 27 and 55 are all examples of best-of-class certification programs, and governmental actors require their landlords or their contractors to ensure that their buildings are certified under these programs.

Case 47 is an office-to-office competition in a major city. In it office users compete with each other, aiming to achieve the largest reduction in energy consumption, or other resource consumption (i.e., water, paper). Whilst the VEP is not administered by the city, and whilst the city does not financially support the VEP's participants, it does support the VEP as a whole. The city's mayor is involved in a yearly awarding ceremony, and it gives much attention to the participants' efforts on their websites and in their media releases. Particularly this targeted involvement of the city was appreciated by one of the VEP's administrators: 'The concept was really good. It had the backing and support of the city. This is extremely important for some of the businesses that participate' (int. 186). She continued to explain that without this targeted support from governmental actors it was highly likely that a large number of participants would not wish to be involved in the VEP.

The participants of this VEP, together, reduce up to 8% of their energy and water consumption. For the year 2011, for example, this reduced their costs of operation with US\$18 million in 98 participating buildings.

6 Conclusion

This article aimed to gain empirical insight in whether and how particular (configurations of) roles of governmental actors in VEPs are (necessary or sufficient) to achieve two types of outcomes: attracting participants (O1), and contributing to a desired collective end (O2). The article has provided a number of novel insights.

First, it found that none of the five distinct roles for governmental actors that are currently identified as related to these outcomes in the literature are *necessary* for causing either of the two outcomes. This is of course not a really surprising finding. After all, VEPs are complex configurations of conditions and it is unlikely that any of these will individually cause the outcomes under scrutiny in this article. More interestingly, however, is the finding that governmental actors were *not* involved in particular roles in some solutions that were found to be related to either of the outcomes under scrutiny. For instance, for the outcome O1 all three solutions in type 3 indicate that governmental actors were absent in most of various roles studied (section 4.2). This indicates that the relation between the involvement of governmental actors in VEPs and the outcomes of these VEPs is more complicated than is currently expressed in the literature. To gain a better understanding of how VEPs cause their results, future research may therefore aim to not only focus on the presence of governments in VEPs, but also on the (deliberate) absence of governments in particular roles in VEPs.

Second, it is further of interest that outcome O2 is almost a perfect subset of outcome O1. In other words, except for case 9, all cases with a high O2 score also have a high O1 score. This indicates that, at least for the cases analysed, there appears to be a relation between achieving anticipated numbers of goods and services and anticipated numbers of participants (but not the other way around). It seems to go without saying that in order to achieve their anticipated O2 outcome VEPs need to attract their anticipated number of participants (O1). Yet, case 9, with a high O2 score and a lower O1 score, goes against this logic. Future research may wish to further explore the relation between these two VEP outcomes (i.e., does a high O2 score normally guarantee a high O1 score?), as well as the issue of 'beyond compliance' behaviour of participants within VEPs, which appears to characterise case 9.

Third and final, building on the 31 cases studied, the article has presented a clear and hands-on, evidenced-based typology of ideal type roles that governmental actors may want to take up in VEPs, if they seek to achieve the two outcomes under scrutiny in this article (cf., Fiss, 2011). This typology indicates that not just any configuration of roles may be expected to result in positive outcomes. More

importantly, this typology indicates that governmental actors need to think carefully in choosing the roles in which they wish to be involved. A potential positive impact by being involved in one role may be made redundant by not being involved in another role. The typology further adds to our understanding of VEPs: various conditions interact in causing VEP outcomes (i.e., conjunctural causation), and different VEP designs may result in similar VEP outcomes (i.e., equifinality).

However, regarding this typology some concerns need be expressed. First, the ideal types build on a study of VEPs that seek improvement of environmental and resource sustainability of the built environment in Australia, the Netherlands, and the United States. The current article does not claim that these ideal types hold for all contexts and settings. Future research may be interested to assess the reach of these ideal types, for instance by distilling ideal type VEPs from studies that address different sectors and different countries. Second and related, many other conditions than government involvement are likely related to the outcomes of VEPs, such as the rewards provided to participants and the requirements they are expected to meet ([Borck & Coglianese, 2009](#); [Potoski & Prakash, 2009](#); [Van der Heijden, 2012](#)). In sectors and countries other than the ones studied here these conditions may have a strong impact on the performance of VEPs, which could change the impact governmental actors have on VEPs. Finally, and of a slightly different order, the ideal types only consider the achievement of outcomes (i.e., participants attracted, buildings built, energy consumption reduced), but do not consider the relative societal value of such outcomes. For instance, one may wonder whether the 8% energy and water consumption reduction of the final example presented (case 47, section 5) is meaningful in addressing the environmental and resource challenges caused by the built environment.

The ideal types here should therefore not be understood as blueprints for the design of VEPs that are guaranteed to result in positive VEP outcomes, or designs for VEPs that provide a meaningful contribution to improved environmental and resource sustainability. Further studies may wish to apply an fsQCA approach to better understand how the roles of other actors, of contextual conditions and of design conditions affect the outcomes of VEPs; and future studies may wish to apply an fsQCA approach to compare VEPs with other governance and regulatory approaches to addressing environmental problems.

Tables

Table 1 – Overview of interviewees and their backgrounds

Interviewee background	Government	Non-government
<i>Policy maker</i>	9 (4A/4N/1U)*	
<i>Administrator</i>	29 (22A/4N/3U)	17 (12A/3N/12U)
<i>Architect, engineer, advisor</i>		13 (7A/6N)
<i>Contractor, developer</i>		7 (3A/4N)
<i>Property owner</i>		11 (4A/3N)
<i>Other</i>		8 (3A/3N/2U)
<i>Total</i>	39 (26A/8N/4U)	62 (29A/19N/14U)

*Abbreviations: A=Australia; N=Netherlands; U=United States

Table 2 – Analysis of necessary conditions (strong government involvement in VEPs)

Condition	O1 Consistency	Coverage	O2 Consistency	Coverage
<i>R1</i>	0.70	0.76	0.77	0.60
<i>R2</i>	0.46	0.81	0.53	0.66
<i>R3</i>	0.40	0.79	0.51	0.71
<i>R4</i>	0.66	0.90	0.72	0.69
<i>R5</i>	0.39	0.96	0.45	0.78

Table 3 – Truth table for the analysis of sufficient conditions for the outcome ‘having attracted a substantial number or the expected number of participants’

Row	Condition					No.	Outcome	Consistency		Case(s)
	<i>R1</i>	<i>R2</i>	<i>R3</i>	<i>R4</i>	<i>R5</i>			<i>Raw</i>	<i>PRI</i>	
1	1	0	1	1	0	4	1	1.00	1.00	9,18,51,52
2	1	0	0	1	0	3	1	1.00	1.00	15, 20, 49
3	0	0	0	0	1	3	1	1.00	1.00	1,27,55
4	1	0	0	0	1	2	1	1.00	1.00	2, 19
5	1	1	1	1	1	1	1	1.00	1.00	3
6	1	1	0	1	1	1	1	1.00	1.00	6
7	1	1	0	1	0	1	1	1.00	1.00	16
8	1	1	0	0	0	1	1	1.00	1.00	46
9	1	0	1	1	1	1	1	1.00	1.00	25
10	0	0	0	1	0	1	1	1.00	1.00	47
11	0	0	0	0	0	4	1	0.95	0.91	4, 22, 23, 26
12	1	1	1	1	0	4	C	0.95	0.86	13,14, 17, 54
13	1	0	1	0	0	1	0	0.89	0.65	33
14	1	1	1	0	0	2	0	0.83	0.49	24, 42
15	0	1	0	0	0	2	0	0.83	0.66	21, 50
16-32	Logical remainders						?			

Table 4 – Solution for the outcome ‘having attracted a substantial number or the expected number of participants’

Causal Condition	Solution		2	3	b	c
	1 a	b		A		
R1 (administrating a VEP)	•	•	•	∅		
R2 (financially supporting a VEP)	•	•		∅	∅	∅
R3 (monitoring and enforcing a VEP)	∅		•	∅	∅	∅
R4 (marketing a VEP)		•	•		•	∅
R5 (acting as a launching customer for a VEP)	∅			∅	∅	•
Cases	17, 46	3, 6, 13, 14, 16, 17, 54	3, 9, 13, 14, 17, 18, 25, 51, 52, 54	4, 22,23, 26, 47	15, 20, 47, 49	1, 2, 19, 27, 55
Consistency	1.00	0.96	0.93	0.95	1.00	1.00
Raw coverage	0.30	0.39	0.40	0.31	0.34	0.25
Unique coverage	0.02	0.02	0.09	0.09	0.05	0.08
Solution consistency: 0.95						
Solution coverage: 0.84						

Note: This table presents the results of a set-theoretic analysis for the outcome ‘having attracted a substantial number or the expected number of participants’.

Symbols: • = causal condition (present); ∅ = causal condition (absent).

Table 5 – Truth table for the analysis of sufficient conditions for the outcome ‘having substantially contributed to achieving or having achieving a desired collective end’

Row	Condition					No.	Outcome	Consistency		Case(s)
	<i>R1</i>	<i>R2</i>	<i>R3</i>	<i>R4</i>	<i>R5</i>			<i>Raw</i>	<i>PRI</i>	
1	1	0	1	1	0	4	1	0.89	0.72	9, 18, 51, 52
2	0	0	0	0	1	3	1	0.86	0.72	1, 27, 55
3	1	1	0	0	0	1	1	0.86	0.34	46
4	1	0	0	0	1	2	1	0.85	0.60	2, 19
5	1	1	1	1	0	4	C	0.84	0.58	13, 14, 17, 54
6	1	1	0	1	0	1	1	0.83	0.40	16
7	0	0	0	1	0	1	1	0.83	0.50	47
8	1	0	1	1	1	1	1	0.82	0.50	25
9	1	0	1	0	0	1	0	0.80	0.00	33
10	1	1	1	0	0	2	0	0.74	0.00	24, 42
11	1	1	1	1	1	1	0	0.73	0.25	3
12	1	0	0	1	0	3	0	0.70	0.14	15, 20, 49
13	1	1	0	1	1	1	0	0.66	0.20	6
14	0	1	0	0	0	2	0	0.66	0.00	21, 50
15	0	0	0	0	0	4	0	0.65	0.22	4, 22, 23, 26
16-32	<i>Logical remainders</i>					?				

Table 6 – Solution for the outcome ‘having substantially contributed to achieving or having achieving a desired collective end’

Causal Condition	Solution 4		Solution 5		Solution 6	
	a	b	a	b	a	b
R1 (administrating a VEP)	•	•	•	•	∅	
R2 (financially supporting a VEP)	•	•		∅		∅
R3 (monitoring and enforcing a VEP)	∅		•	•	∅	∅
R4 (marketing a VEP)		•	•		•	
R5 (acting as a launching customer for a VEP)	∅	∅	∅			•
Cases	16, 46	13, 14, 16, 17, 54	9, 13, 14, 17, 18, 50, 51, 52	9, 18, 25, 51, 52	47	1, 2, 19, 27, 55
Consistency	0.84	0.86	0.91	0.82	0.83	0.85
Raw coverage	0.35	0.41	0.46	0.39	0.23	0.37
Unique coverage	0.04	0.00	0.00	0.02	0.04	0.15
Solution consistency: 0.91						
Solution coverage: 0.89						

Note: This table presents the results of a set-theoretic analysis for the outcome ‘having attracted a substantial number or the expected number of participants’.

Symbols: • = causal condition (present); ∅ = causal condition (absent).

Table 7 – Solution for the outcomes ‘having attracted a substantial number or the expected number of participants’ and ‘having substantially contributed to achieving or having achieving a desired collective end’

Causal Condition <i>Original solutions</i>	Solution					
	I 1a, 4a	1b, 4b	II 2, 5a	5b	III 3a, 3b, 6a	3c, 6b
R1 (administrating a VEP)	•	•	•	•	∅	
R2 (financially supporting a VEP)	•	•		∅	∅	∅
R3 (monitoring and enforcing a VEP)	∅		•	•	∅	∅
R4 (marketing a VEP)		•	•		•	∅
R5 (acting as a launching customer for a VEP)	∅	∅	∅		∅	•
Cases	16, 46	13, 16, 17, 54	9, 13, 17, 18, 50, 51, 52	9, 18, 25, 51, 52	47	1, 2, 19, 27, 55

Symbols: • = causal condition (present); ∅ = causal condition (absent).

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Online appendix – Coding and coded data

Calibration of data (coding)

For the various outcomes and conditions the extremes and crossover points in the data are set as follows:

1. Observed outcomes:

- O1: *Number of participants*. Full membership (a score of “1.00” in table 2) represents that stated ambitions in terms of attracting participants are met; full non-membership (a score of “0.00”) represents that no participants, or only a marginal number of anticipated participants have joined the VEP. The crossover point is set as not meeting half the number of participants stated (in documentation or by interviewees; see further the above discussion).
- O2: *Number of goods and services*. Full membership represents that stated ambitions are met; full non-membership is not having achieved any goods or services at all, or only a marginal number of anticipated goods or services; and the crossover point is set at not meeting half the stated ambitions in terms of products or services (in documentation or by interviewees).

2. Conditions:

- R1: *Administrative support*. Full membership represents significant support; for instance, full administrative support solely carried out by governmental actors. More in than out (a score of “0.67” in table 2) represents medium support; for instance dominant roles of government in the administration of the VEP, but in collaboration with non-governmental actors. More out than in membership (a score of “0.33”) represents weak support; for instance, non-dominant government activity in this role. Full non-membership represents no government support. The crossover point is set at dominant government involvement.
- R2: *Financial support*. Full membership represents significant to full financial support (e.g., direct subsidies, rebates and tax incentives) for the activities undertaken by a VEP’s participants (where data allows, this implies 75-100% of these costs). More in than out represents some financial support for these activities (where data allows, this implies 30-75% of these costs). More out than in represents token financial support for these activities (where data allows, this implies 5-30% of these costs). Full non-membership represents no financial support for these activities. The crossover point is set relatively low at token support.
- R3: *Monitoring and enforcement*. Full membership represents strict enforcement; for instance enforcement is carried out by governmental actors, the enforcement process is documented, and certificate other form of compliance evidence is issued at the end of the process. More in than out represents medium enforcement; for instance, enforcement is carried out by governmental actors, but that there is no clear documented trail of such enforcement actions. More out than in represents weak enforcement; for instance, the relying on self-enforcement by participants. Full non-membership represents no enforcement. The crossover point is set at the reliance of enforcement documentation supplied by participants (i.e., enforced self-regulation).
- R4: *Marketing*. Full membership represents high government involvement; for instance the active dissemination of VEPs’ results and marketing of good practice of its participants solely by governmental actors. More in than out represents medium activity, for instance dominant roles of government in the marketing of a VEP, but in collaboration with non-governmental actors. More out than in represents low activity, for instance non-dominant roles of governments in this role. Full non-membership represents no government support. The crossover point is set at dominant government involvement.
- R5: *Customer*. Full membership represents high activity; for instance, procurement criteria by governments that mandate their suppliers to meet a particular VEP. More in than out represents medium activity; for instance, procurement criteria by governments that mandate their suppliers to meet a particular VEP or an equivalent of this VEP. More out than in

represents low activity; for instance, procurement criteria that prefer their suppliers to meet a particular VEP or an equivalent of this VEP. Full non-membership represents no government role. The crossover point is set at a stated preference for their suppliers to meet a particular VEP.

Coded data

Table A presents the data observations for this study. The data observations are calibrated on a four-point scale to indicate the comparative (qualitative) differences in observations, following the above approach to coding. Each number represents a qualitative category for a data observation. For example, for the outcome O1 (number of participants) a score of 1.00 represents that a VEP has met its stated ambitions in terms of attracting participants, whilst a score of 0.00 represents that a VEP has attracted no participants, or only a marginal number of anticipated participants. A score of 0.67 indicates that a VEP has attracted a number of participants smaller than what was anticipated, but relatively close to expected numbers; a score of 0.33 represents that a VEP has attracted a relatively small number of participants as compared to stated ambitions, but still more than none or only a few participants (which is the qualitative category represented by 0.00).

Table A – Data indicating qualitative differences in observations

No	Country	Approach	Conditions					Outcomes	
			R1	R2	R3	R4	R5	O1	O2
1	AU	BM/CL	0.33	0.00	0.00	0.00	0.67	1.00	1.00
2	AU	BM/CL	0.67	0.00	0.00	0.33	0.67	0.67	0.67
3	AU	COLL	1.00	0.67	1.00	1.00	0.67	0.67	0.33
4	AU	BARE	0.33	0.33	0.00	0.00	0.00	0.67	0.33
6	AU	INFI	1.00	0.67	0.33	1.00	0.67	0.67	0.00
9	AU	COLL	1.00	0.33	0.67	1.00	0.33	0.67	1.00
13	AU	INFI	1.00	1.00	0.67	0.67	0.00	0.67	0.67
14	USA	INFI	0.67	0.67	0.67	0.67	0.33	0.33	0.33
15	AU	COLL	0.67	0.00	0.00	0.67	0.33	1.00	0.33
16	AU	BARE	1.00	0.67	0.00	1.00	0.00	1.00	0.67
17	AU	INFI	1.00	0.67	0.67	0.67	0.00	1.00	0.67
18	AU	COLL	1.00	0.33	0.67	0.67	0.00	0.67	0.67
19	NL	INFI	1.00	0.33	0.33	0.33	1.00	0.67	0.67
20	NL	BARE	0.67	0.33	0.33	0.67	0.33	0.67	0.33
21	NL	BARE	0.33	0.67	0.00	0.33	0.33	0.33	0.00
22	USA	INFI	0.00	0.00	0.00	0.00	0.00	0.67	0.33
23	NL	BARE	0.00	0.33	0.00	0.00	0.00	1.00	0.33
24	NL	INFI	1.00	1.00	0.67	0.33	0.33	0.33	0.33
25	NL	COLL	1.00	0.33	0.67	1.00	0.67	1.00	0.67
26	NL	COLL	0.33	0.33	0.00	0.33	0.33	1.00	0.33
27	NL	BM/CL	0.33	0.00	0.00	0.00	0.67	0.67	0.67
33	AU	BARE	1.00	0.00	1.00	0.33	0.00	0.33	0.33

42	USA	INFI	0.67	0.67	0.67	0.33	0.33	0.33	0.00
46	USA	INFI	0.67	1.00	0.00	0.33	0.00	1.00	0.67
47	USA	COLL	0.33	0.00	0.33	0.67	0.33	1.00	0.67
49	USA	BARE	1.00	0.33	0.33	0.67	0.00	0.67	0.33
50	USA	INFI	0.00	0.67	0.00	0.33	0.00	0.33	0.33
51	USA	BARE	1.00	0.33	1.00	0.67	0.00	0.67	0.67
52	USA	BARE	1.00	0.33	0.67	1.00	0.00	0.67	0.67
54	USA	BARE	0.67	0.67	0.67	0.67	0.33	1.00	0.67
55	USA	BM/CL	0.00	0.00	0.00	0.33	0.67	1.00	1.00

Note: Cases are given numbers to maintain anonymity as requested by some interviewees.

Abbreviations: Country: AU = Australia; NL = Netherlands; USA = United States. Approach: BARE = regulatory barrier relief; BM/CL = best-of-class certification program; COLL = collaborative network; INFI = innovative form of financing. **Conditions** and **Outcomes:** as per Section 2.

Symbols: 1.00 = qualitative maximum score (e.g., the arrangement has attracted at least the expected number of participants); 0.67 = qualitative score closer to “1.00” than to “0.00” (e.g., the arrangement has attracted a substantial number of participants, but not the expected number); 0.33 = qualitative score closer to “0.00” than to “1.00” (e.g., the arrangement has attracted a moderate number of participants, but this number far from meeting the expected number); 0.00 = qualitative minimum score (e.g., the arrangement has not attracted any or only a few participants).