Social capital and public good provision in community-based energy initiatives: an empirical study

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Abstract

The objective of this paper is to shed more light on the role of social capital in stimulating voluntary contributions in community-based renewable energy projects. Based on quantitative data from an original survey conducted with one renewable energy cooperative in Flanders, it analyzes the relationships between different measures of social capital and members' financial contributions to the cooperative, i.e. the number of cooperative shares purchased. The results show that the different types of social capital social considered do not play the same role: social identification to the cooperative and a dense social network structure have a non-negligible positive effect on financial contributions in the cooperative. By contrast, generalized trust does not have a major influence on members' contributions. Additionally, monetary incentives appear to play a major role. Furthermore, the democratic nature of cooperative governance and active participation to decision-making are positively associated with financial contributions. Significant differences among cooperative members are also highlighted. The findings suggest that policy makers should rely on the social capital contained in communities and consider enabling and incentivizing cooperative membership across societies to help trigger citizen investments.

1. Introduction

Climate change associated with the emission of greenhouse gases (GHGs) is among the most crucial challenges of the twenty-first century. Averting massive climate change is a global public good, because everyone benefits from reduced GHG emissions even if they do not contribute any effort themselves, and therefore requires collective action (Sandler 2004). To tackle this issue, many analysts call for an institutional solution at the global level, because global threats such as climate change are believed to require 'global solutions' negotiated internationally (Nordhaus

1994, Stavins 1997, Stern 2007, Wiener 2007). However, a binding and enforced agreement including all principal emitters and targeting an ambitious decrease in global GHG emissions will take long to develop (Ostrom 2010), despite promising commitments at the 21st Conference of the Parties held in Paris in Dec. 2015. Most governments' reluctance to engage in coordinated international policies bears out the conventional theory of collective action according to which rational agents pursuing their own interest will not participate in collective efforts because they have incentives to free-ride on the constructive behavior of others (Olson 1965, Hardin 1968).

The transition toward low-carbon energy sources can be described in similar terms. Historical energy transitions (e.g., from traditional biomass to coal and from coal to oil) have been driven by a large minority of consumers who were willing to pay considerably more for privately accruing services associated with new energy sources or technologies (Fouquet 2010). In contrast, the environmental benefits of the current low-carbon transition are shared by all individuals and thus clearly present public good characteristics. It is likely that too few consumers will be willing to pay more for the environmental improvements, although this number is growing (Longo et al. 2008). For instance, the collective-action problem has indeed been identified as one of the major barriers to the diffusion of renewable (RE) technologies. While attitudinal surveys demonstrate high levels of public support for green power products (Batley et al. 2001, Nomura and Akai 2004), the green marketing literature consistently reports a large gap between the number of residential customers willing to pay a premium for them and actual participation rates in green pricing programs (Byrnes et al. 1999, Wiser 1998, Litvine and Wüstenhagen 2011).

More recently, various authors, spearheaded by Nobel Prize co-winner Elinor Ostrom, have challenged this 'zero contribution thesis' (Ostrom 2000a). They show that, under certain conditions, agents involved in a collective-action problem have self-organizational capabilities and are able to implement institutional arrangements in order to solve it in the absence of external interventions (Ostrom 1990). In particular, collective-action problems faced by large groups, such as climate change mitigation, are often decomposable into dilemmas at a smaller scale, some of which are typically surmountable given the existence of social capital (Marshall 2007). Although the exact definition of social capital is subject to debate, most scholars describe it in terms of norms of trust, cooperation and civic-minded behavior (Coleman 1990, Putnam 1993, Fukuyama 1995). Social capital has been proposed as an explanation for why some groups are able to resolve collective-action problems, while others are unable to bring people together for common purposes. Evidence suggests that this relationship between social capital and collective outcomes is mediated by its positive effect on voluntary public-goods provision

(Putnam 2000). For instance, Anderson et al. (2004) show that the most frequently employed measures of social capital are significant determinants of contribution levels in a canonical public-goods experiment.

Given the potential contribution of social capital in resolving global public good dilemmas in general and the fight against climate change in particular, an increasing number of scholars have proposed that a global policy is not the only strategy needed but that actions are required at multiple, smaller scales to start the process of climate change mitigation (Bulkeley and Betsill 2005, Bulkeley and Kern 2006, Ostrom 2012). Accordingly, several studies have argued that community-based renewable energy (CRE) projects facilitate collective action for a transition toward low-carbon energy systems and climate change mitigation (Walker and Devine-Wright 2008, Seyfang and Haxeltine 2012, Bauwens et al. 2016). By enabling citizens to collectively own and manage RE projects at the local level, CRE initiatives may increase levels of societal acceptability of renewables and contribute to finance the transformation of energy systems (Yildiz 2014). In the same perspective, the roles of social norms have gained increasing attention in the literature on green energy products. For instance, several studies analyze the roles of social interactions and peer effect processes in the decisions and intentions to adopt photovoltaic systems (e.g. Bollinger and Gillingham 2012, Noll et al. 2014). However, little is known yet about the actual role of social capital in stimulating active participation in CRE projects. In particular, an alternative hypothesis may be that members of CRE initiatives are primarily driven by monetary incentives, given the importance of private monetary benefits that are often attached to community-based energy participation, while social capital plays a negligible role.

Hence, the objective of this paper is to shed more light on the relative role of social capital in stimulating voluntary contributions in community-based renewable energy projects. The dependent variable consists in members' financial contributions to the cooperative, i.e. the number of cooperative shares purchased. This is novel, since very few studies to our knowledge have explored the relationship between social capital and environmental public good contributions in this empirical setting. The paper uses quantitative data from an original survey conducted among the members of Ecopower, a renewable energy cooperative located in Flanders (the Northern part of Belgium). Ecopower produces and supplies renewable electricity. RE cooperatives, as a specific form of CRE schemes, enable citizens to collectively own and manage RE projects at the local level. Through this model, citizens produce, invest in and, in some cases, consume RE. The following cooperative principles, adopted by the International Co-operative Alliance ((ICA) 1995), are common to all types of cooperatives around the world: a voluntary and

open membership, democratic member control (e.g. a 'one person-one vote' rule), economic participation by members, autonomy and independence, education, training and information, cooperation among cooperatives, and concern for the community. In addition, only a limited remuneration of the capital subscribed is permitted in cooperatives, which suggests that profit maximization is not the main objective.

Our study is further distinguished from the existing literature on social capital and public good provision by its survey-based methodology and by the forms of social capital considered. Most existing studies are of an experimental nature and focus on one specific type of social capital. Instead, our survey-based data takes into account three meaningful variants of social capital: generalized interpersonal trust, social identification to the cooperative and social network structure. Hence, it allows grasping a more complex reality and simultaneously assesses the role of different types of social capital in non-student samples who participate in real-world environmental public good contribution decisions. By taking into account monetary incentives, the paper also sheds some light on the role of economic institutions in triggering private contributions to environmental public goods.

The results show that the different types of social capital social considered do not play the same role: social identification to the cooperative and a dense social network structure have a non-negligible positive effect on financial contributions in the cooperative. By contrast, generalized trust does not have a major influence on members' contributions. Additionally, monetary incentives appear to play a major role: the return on investments is a strong incentive to trigger contributions to the cooperative, while members whose decision to join the cooperative was primarily motivated by incentives linked to electricity supply (e.g. a cheap electricity price) tend to contribute smaller amounts of money. Furthermore, the democratic nature of cooperative governance and active participation to decision-making are positively associated with financial contributions.

2. Theoretical framework

2.1. Social capital and collective action

From an economic perspective, joining and engaging with CRE initiatives exemplifies an individual's voluntary effort to provide an environmental impure public good (Kotchen 2005, Kotchen and Moore 2007). It is impure, because participating in a CRE initiative generates private and public benefits as a joint product (Cornes and Sandler 1984, 1994). Private benefits include, as we will see below, returns on investment under the form of dividends and green

electricity at lower price. Public benefits are, for instance, expanded generation capacity of green electricity and reduced greenhouse-gas emissions of conventional power generation, contribution to job creation in the renewable energy industry and reduction of resource import dependence. Hence, the objective here is not to challenge the idea that members of CRE initiatives may partially act based on self-regarding calculations.

Our data will cover three interrelated, yet distinct components of social capital: generalized trust, social identification to the group and social network structure. First, generalized interpersonal trust refers to the 'values and attitudes that influence how people relate to each other and that predispose them to cooperate, trust, understand and empathize with each other' (Brunie 2009). It is a somewhat abstract and pervasive concept as it is not limited to known individuals, and in this sense, differs from the thick trust or strong reciprocity (Gintis 2000) associated with dense and repeated interactions within a well-defined group. It is not a group that builds trust, but rather its members who acquire particular values and attitudes (Brehm and Rahn 1997). In addition, these values and attitudes apply to the population at large and translate into a general propensity to trust and cooperate with others beyond specific settings and purposes. Generalized trust is associated with a variety of positive macro-level outcomes. Using a dataset of 29 European countries over the period 1990–2007, Carattini et al. (2015) highlight a negative relationship between generalized trust and countries' greenhouse gas emissions. Beyond the environmental field, generalized trust appears to be associated with such measures of collective well-being as economic development (Knack and Keefer 1997), democracy and governance (Brehm and Rahn 1997, Rothstein and Eek 2009), and health (Kawachi et al. 1997).

In contrast to the abstraction of generalized trust, social identification, i.e. the perception of belonging to some human aggregate, is associated with membership of a specific and well-defined group as well as with the emotional and affective significance attached to that membership (Tajfel 1978). The socio-psychological literature on collective action has shown that a strong perception of a shared collective identity fosters cooperative behaviors toward the group (Tyler and Blader 2001). This result is supported by extensive evidence from experimental settings and the field (Brown-Kruse and Hummels 1993, Dawes et al. 1988, Goette et al. 2006, Kramer and Brewer 1984, Brewer and Kramer 1986). For instance, Stürmer and Kampmeier (2003) highlight the importance of group identification as a determinant of community volunteerism and local participation, relying on experimental and field data.

Finally, in order to build social capital, trust-based transaction relationships have to be embedded in a specific network structure (Coleman 1988). Building on Granovetter (1973)'s work, two main

types of network structures can be distinguished as far as network density is concerned: 'tight-knit', dense social networks, in which members have a high number of linkages or 'strong' ties with each other, are referred to as having a closed network structure, while more diverse social networks in which members have fewer interconnections or 'weak' ties are said to have an open network structure. Network structure has been found to play a role in various empirical settings such as in the spread of information , criminal activity and delinquency (Glaeser et al. 1996, Haynie 2001), risk-sharing among individuals [27], technology adoption [6], and altruistic behavior in laboratory experiments [14,33,42].

2.2. The institutional characteristics of communities

The extent to which social capital is created and enforced is mediated by the specific institutional settings in which social interactions take place. Generally defined, institutions refer to the formal and informal rules shaping and structuring the interactions between people within collective settings – families, local communities, markets, business organizations, etc. (Ostrom 2005). They constrain the actions and strategies adopted by individuals, the information they obtain, the outcomes they receive or are excluded from and how they reason about the situation.

Aside from being economic firms operating on a market, community-based renewable energy initiatives are also typically embedded in communities (of place or interest). From an institutional perspective, a 'community' is a social institution characterized by high entry and exit costs and non-anonymous interactions among members (Bowles and Gintis 1998, 2002). In addition, interactions among community members are more frequent and extensive than interactions with 'outsiders'. These structural characteristics of interactions contrast with those of other institutions, such as markets, at least in their idealized forms. Market interactions are characterized by ephemerality of contact, anonymity among interacting agents and ease of entry and exit. In contrast to markets, by facilitating direct personal interactions, communities effectively encourage the formation of norms, such as interpersonal trust, group identification, solidarity, reciprocity, reputation, personal pride, vengeance, etc.

Given these institutional characteristics, Bowles and Gintis (1998) identify three mechanisms by which communities raise the net benefits to individual pro-social or pro-environmental behaviors, which are briefly reviewed hereafter: reputation, retaliation, and segmentation. As for the reputation effect, repeated interaction among community members lowers the cost of acquiring information and raises the benefits of discovering the characteristics of those with whom they interact. In other words, individuals can assess more easily whether they trust others sufficiently to engage in mutually productive social exchanges, even though they are dilemmas.

Thus, individuals have an incentive to act in ways that establish their reputation for being trustworthy and keeping promises. This is also why communication on a face-to-face basis significantly increases the level of cooperation (Ostrom et al. 1991). With a chance to see and talk with others repeatedly, individuals can increase (or decrease) their trust in the reliability of others (Ostrom 2003). Communication also contributes to group identification and reduces social distances between individuals. Regarding the retaliation effect, there is an incentive to act in a socially beneficial way today to avoid future repercussions, because there is a high probability that members who interact today will interact in the future (Axelrod 1984, Axelrod and Hamilton 1981). As for the segmentation effect, members of the communities making up the larger population interact more frequently with insiders than with outsiders, due to the high entry and exit costs that characterize communities. As a consequence, the population is segmented. 'A result is that pro-social behaviors are more likely to be rewarded, those with pro-social norms being more likely to interact with other pro-social agents, and conversely for anti-social behaviors' (Bowles and Gintis, 1998: 9). In addition, Bowles and Gintis (1998) identify the 'parochialism' effect, which does not induce pro-social behaviors directly, but enhances reputation, retaliation, and segmentation effects under the appropriate conditions.

In conclusion, the different types of social capital may be expected to have a positive influence on the financial contributions made by members of CRE initiatives. Accordingly, the empirical analysis in this article assesses the following research question: how does social capital influence cooperation in community-based energy projects? The methodology followed is presented below.

3. Methodology

3.1. Field setting

The research question of this article is addressed through case study research on one renewable energy cooperative based in Flanders (the northern part of Belgium), Ecopower. There are currently 6 RE cooperatives in Flanders. However, many of them have been created recently and do not have many members yet. In contrast, Ecopower is relatively well-established, as it is the oldest initiative. In 2013, Ecopower represented 83% of members of RE cooperatives in Flanders. This figure ensures that the case of Ecopower represent a large majority of members of such organizations in this region.

Table 1. General characteristics of cooperatives.

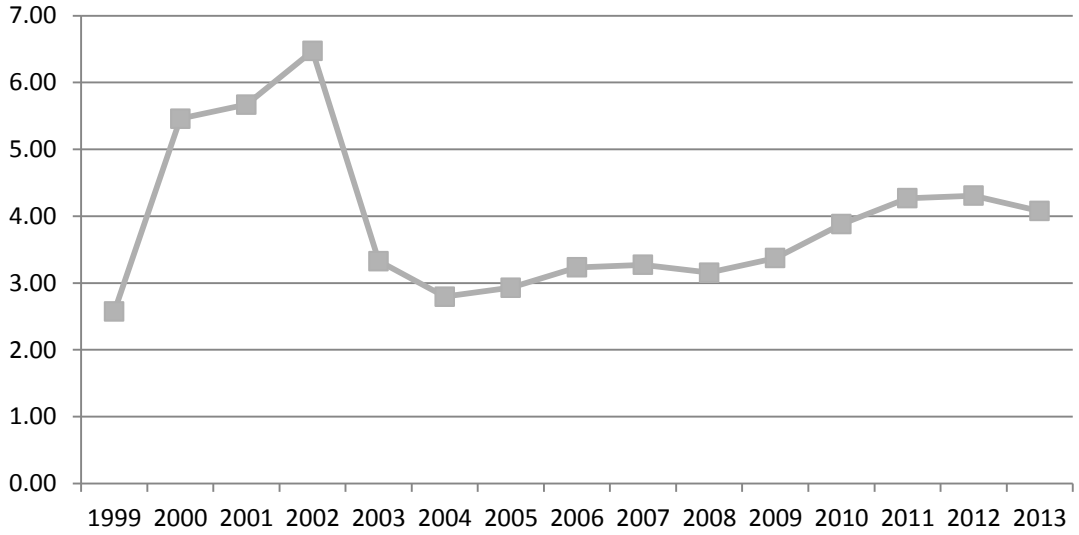
Year of creation	1991
Number of full-time equivalent workers	22
Number of members	47,419
Price of one cooperative (in euro)	250
Total cooperative capital (in euro)	48,328,750

Source: created by author based on 2013 data provided by the cooperative.

For studying the evolution of the institutional context in which members' contributions have taken place, it is meaningful to identify the main stages of its organizational development. Ecopower has gone through three main phases. The original goal of the cooperative was to gather small amounts of money from motivated individuals to finance the refurbishment of small hydropower installations. As such, during the first phase, from the year of its creation in 1991-1999, the cooperative itself was not involved in any energy production activities. The second phase corresponds to the period 2000-2002. It started with the installation of three wind turbines in the city of Eeklo, which were financed by a recruitment campaign launched in 2000. The third phase is identified with the start of electricity supply in 2003 and extends to the present. Parallel to its supply activities, Ecopower continues to invest in RE projects.

It is interesting to relate these different phases with the evolution of the average number of shares/member from the start of the organization onwards (Figure 1). The average number of shares/member was relatively low in 1999, i.e. at the end of the first phase, amounting to less than 2.6 shares per member. It rose at the beginning of the second phase to 5.46 shares in 2000 and reached a maximum of 6.47 shares in 2002. Then, when the third phase started in 2003, the average number of shares/member declined steadily to 3.3 in 2003 and to 2.80 in 2004. This suggests the arrival of a large cohort of new members who bought a very limited number of shares and reflects the start of electricity supply in 2003. Since then, it has slightly increased over the years and has stabilized today around 4 shares/member. Hence, this graph suggests that the average level of financial contributions to the cooperative varies depending on the organizational phase: in the first and third phases, the average number of share/member was relatively low compared to the second phase.

Figure 1. Evolution of the average number of shares/member.



Source: constructed by author based on annual reports of the cooperative.

3.2. Data collection

We collected household data on cooperative members through an online questionnaire-based survey conducted between May and June 2014. The design of the questionnaire was based on a qualitative exploratory data collected through several non-structured interviews with managers, workers and members of the cooperative, with the purpose of understanding better the issues at play and discovering important underlying factors that might be missed. The cooperatives provided members' email addresses. 36,642 emails were sent to Ecopower members. In addition, a paper version of the questionnaire was handed out during both organizations' General Assembly to the purpose of reaching a profile of people who would not have been by the online questionnaire. Indeed, General Assembly participants are typically an older public with a presumably lower usage of the Internet. 195 printed copies of the questionnaire were handed out in Ecopower's General Assembly. All in all, out of the 37,729 copies distributed in total, 4061 respondents participated in the survey. While this 10.8% response rate averages that obtained in similar surveys (e.g. Litvine and Wüstenhagen 2011), drawing firm conclusions about the generality of members calls for caution.

3.3. Variables

3.3.1. Dependent variable: financial contributions in the cooperative

As for the number of shares purchased, it appeared from the qualitative exploratory phase that the exact amount of shares purchased was a piece of information many members did not know precisely. Thus respondents were asked to indicate on a six-point scale how many shares they had purchased (1 = '1 to 9 ', 2 = '10 to 19', 3 = '20 to 29', 4= '30 to 39', 5 = '40 to 49', 6 = 'more

than 50') so as to maximize the response rate to this question. The cooperative also provided data about the exact number of shares purchased for the entire population of members. Unfortunately, our survey data could not be linked to the data provided by the cooperative for anonymity reasons. Nevertheless, the distribution of this variable in the sample could then be compared to the population distribution (Table 3).

Table 3. Distribution of the dependent variable in the sample and the whole population.

	Whole population (%)	**Sample (%)**
1 to 9 shares	84.88	84.24
10 to 19 shares	10.63	10.20
20 to 29 shares	1.49	2.13
30 to 39 shares	0.42	0.47
40 to 49 shares	0.54	0.38
More than 50 shares	2.04	2.57

Source: survey (2014) and information provided by the cooperative.

As shown in the table, the two distributions are very similar. This provides confidence that the dependent variable is a valid proxy for the number of cooperative shares purchased.

3.3.2. Measures of social capital

The different dimensions of social capital were measured according to the existing literature. Generalized interpersonal trust (TRUST) was measured using three items selected from the World Value Survey (WVS): 'Would you say that most people can be trusted, or that you can't be too careful in dealing with people?', 'Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?' and 'Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?'. They were answered through a 7-point Likert scale, from 1 = 'completely disagree' to 7 = 'completely agree'. These three items were then aggregated into a single summative scale (Cronbach's alpha = 0.82). As generalized trust is not directly observable, it can only be approximated from individual perceptions in surveys. One drawback of survey measures related to generalized trust is that they are not necessarily good predictors of actual cooperative behaviors. For instance, the WVS trust question which asks whether people in general can be trusted has not been a good predictor of trusting behavior in experimental trust games (Glaeser et al. 2000). Moreover, it seems that measures from the General Social Survey, another large-scale survey similar to the WVS but administered only to the United States population, do not lead to good forecasts of individual

cooperation in the laboratory (Ostrom and Ahn 2003). However, other studies reviewed by Ostrom and Ahn (2003) provide a more optimistic picture, showing that although general survey questions may struggle to depict the trust pattern (e.g. if a participant trusts the other participants when playing first), they are generally successful in predicting trustworthiness (e.g. the amount of money given back by trustees if players in the first round decide to trust).

Social identification was measured by five items adapted from existing studies (Tyler and Blader, 2001; Stürmer and Kampmeier, 2003). Social identification entails a cognitive component (a cognitive sense of belongingness to a group), an affective component (the emotional and affective significance attached to group membership) and an evaluative component (a positive or negative value attached to membership) (Ellemers et al. 1999). Accordingly, we sought to collect indicators of these different aspects. The cognitive component, self-categorization, was measured by three items: 'I have a lot in common with the other members of the cooperative', 'Being a member of the cooperative is an important part of who I am', and 'I feel attached to the other cooperative members'. One item was used to measure group-based self-esteem: 'I am proud to be part of the cooperative', and another one to measure affective commitment: 'I like talking about the cooperative in the presence of others'. Together, the five items formed an internally consistent scale (Cronbach's alpha = 0.86).

Finally, In order to assess members' linkages with other cooperative members, respondents were asked whether or not they had other members within their direct social network (relatives, friends, and neighbors). Hence, this variable captures the density of the network of cooperative members.

3.3.3. Control variable

Individuals' pro-environmental orientation was captured through two dimensions: pro-environmental self-identity and daily behaviors. In order to measure the degree of pro-environmental self-identity, six items from existing questionnaires were selected and adapted (Castro et al. 2009, Fielding et al. 2008, Whitmarsh and O'Neill 2010). These items measure on a five-point scale the extent to which the respondent perceives himself as a person concerned with environmental issues. To measure respondents' pro-environmental engagement in terms of daily behaviors, pro-environmental behaviors were selected from existing studies (Delacolette et al. 2011), such as 'travel short distances on foot or by bike', 'avoid plastic bags in shops' or 'turn off the tap while brushing my teeth'. Respondents were asked to indicate on a five-point scale the frequency at which they executed each of the five actions over the last fortnight. The items were then aggregated into a single summative scale. Table 4 reports the specific statements along with

statistics to test for internal consistency (item-total correlations and Cronbach's alpha). The Cronbach's alpha indicates good internal consistency (alpha = 0.84).[1]

Table 4. Item-total correlation and Cronbach's alpha for the different scales.

		Item-total correlation and Cronbach's alpha
1.	I feel concerned about climate change.	0.63
2.	I think that human activities are one of the main causes of climate change.	0.45
3.	I am the type of person who cares about ecology.	0.65
4.	I think of myself as an eco-responsible consumer.	0.68
5.	I want to feel that I personally contribute to the protection of the environment.	0.68
6.	I like that my family or my friends see me as someone concerned by the environment	0.57
7.	Make short distances on foot or by bike	0.44
8.	Avoid plastic bags in shops	0.45
9.	Reuse old plastic bags	0.48
10.	Buy fruit and vegetables grown locally rather than imported	0.40
11.	Turn off the tap while brushing my teeth	0.40
Cronbach's alpha		0.84

Source: created by author.

In addition, members were asked about their motivations to join the cooperative. Indicators of motivations consist of a series of ordinal variables which have been constructed by asking respondents to indicate on a five-point scale (from 1 = 'not at all' to 5 = 'completely') the extent to which a specific motivation had played a role in their decision to join the cooperative. More specifically, questions were included to assess the importance of material incentives, which correspond to self-regarding motivations, including return on investment, low electricity price, the absence of charges for connection and the transparency of pricing. Furthermore, in order to assess the importance of norm-driven motivations, members were asked to what extent they valued the production of renewable energy and the influence of other people's advice in their decision to join the cooperative.

Additionally, members were asked the year when they joined their cooperative, so that their period of membership (in years) could be computed. Data about the frequency of attendance to

[1] The dimensionality of each series of items has also been tested by conducting exploratory factor analyses. In each case, the results highlight that the items reflect a unique dimension and thus confirm the relevance of aggregating them into one single summated score

general assemblies and about the number of cooperative shares purchased was also collected. Respondents had to indicate on a four-point scale the frequency at which they attended general assemblies (1='never', 2='sometimes', 3='often', 4='always').

For simplicity of the analysis, socio-psychological characteristics were transformed into binary variables taking the value 1 if the respondent's score is above the median and 0 otherwise. Table 5 reports the description and summary statistics of all the dependent and explanatory variables used in the analysis. Table A1 (Appendix) presents the correlation coefficients between all the dependent and explanatory variables used in the analysis.

Table 5. Descriptive overview of the variables.

Variable	Description	N	Mean	SD
Dependent variable				
NUMBERSHARES	Indicates the number of shares purchased (1-6)	3603	1.29	0.91
Measures of social capital				
TRUST	= 1 if interpersonal trust > median	3839	0.46	0.50
SOCIDENT	= 1 if social identification > median	3839	0.48	0.50
NETWORK	= 1 if member has other coop members in social networks (cooperative members only)	3720	0.57	0.49
Control variables				
DISTRIBUTIVE	= 1 if pro-environmental orientation > median	3839	0.44	0.50
PROCEDURAL	= 1 if pro-environmental orientation > median	3839	0.48	0.50
ENVORIENT	= 1 if pro-environmental orientation > median	3839	0.44	0.50
PRICE	= 1 if importance of electricity price = 4 or 5	3839	0.55	0.50
TRANSPARENT	= 1 if importance of transparency of pricing = 4 or 5	3839	0.64	0.48
NOFIXEDCHARGE	= 1 if importance of absence of connexion charges = 4 or 5	3839	0.63	0.48
DEMOCRATIC	= 1 if importance of democratic control of organizations = 4 or 5	3839	0.46	0.50
GREEN	= 1 if importance of generation of green energy = 4 or 5	3839	0.69	0.46
ADVICE	= 1 if importance of other members' advice = 4 or 5	3839	0.18	0.38
ROI	= 1 if importance of ROI = 4 or 5	3839	0.25	0.43
AGM	= 1 if frequency of participation = "often" or "always"	3839	0.02	0.14
PERIOD	Period of membership in years	3714	2.58	0.71
EDUCATION	Ordinal variable taking the value 1 if secondary education, 2 if superior non-university education and 3 if university education	3682	2.05	0.77
AGE	Age in years	3825	49.12	11.95
GENDER	= 1 if individual is a man	3816	0.82	0.39
TURBINE	= 1 if household close to a wind turbine (< 2 km)	3800	0.13	0.33
INCOME	Ordinal variable taking the value 1 if household income<2000 €/month, 2 if 2000< household income <€ 4000/month and 3 if household income >€4000/month	3302	2.04	0.67
PVPANELS	= 1 if household has PV panels	3721	0.50	0.50
RURAL	= 1 if household located in a rural area	3817	0.46	0.50

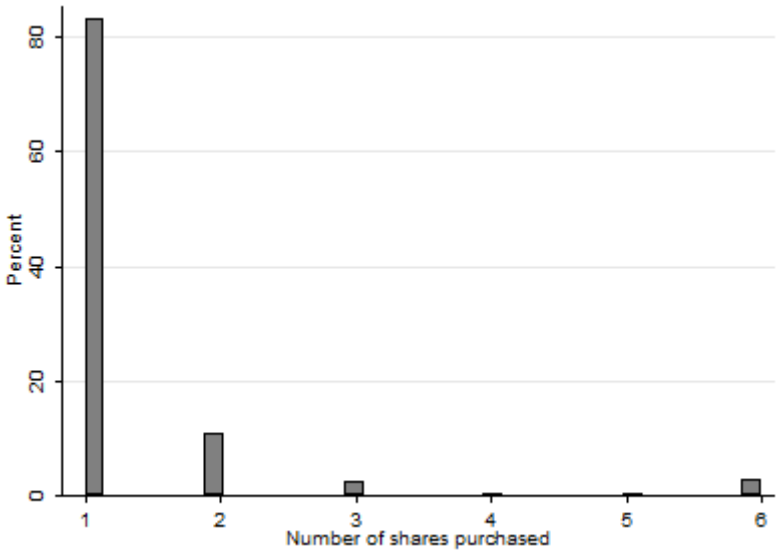
SEMIRURAL	= 1 if household located in a semi-rural area	3817	0.29	0.45
URBAN	= 1 if household located in a urban area	3817	1.83	0.85
OWNER	= 1 if household is owner of the home	3825	0.94	0.24
TENANT	= 1 if household rents the home	3825	0.06	0.24
APARTMENT	= 1 if household lives in an apartment	3771	0.08	0.28
HOUSE	= 1 if household lives in a house	3771	0.92	0.28
ANTWERP	= 1 if hous. lives in prov. of Antwerp	3783	0.22	0.42
EAST	= 1 if hous. lives in prov. of Eastern Flanders	3783	0.25	0.43
BRABANT	= 1 if hous. lives in prov. of Flemish Brabant	3783	0.18	0.38
WEST	= 1 if individual lives in Western Flanders	3783	0.20	0.40
OTHERPROVINCE	= 1 if individual lives elsewhere	3839	0.00	0.04
PROFESSIONAL	= 1 if individual is a professional	3654	0.03	0.17
SELFEMPLOYED	= 1 if individual is self-employed	3654	0.04	0.20
WORKER	= 1 if individual is a worker	3654	0.07	0.25
EMPLOYEE	= 1 if individual is an employee	3654	0.39	0.49
EXECUTIVE	= 1 if individual is an executive	3654	0.17	0.38
OTHERSTATUS	= 1 if individual has another employment status	3654	0.05	0.22
INACTIVE	= 1 if individual is inactive (student, retired, etc.)	3654	0.25	0.43

Source: survey (2014).

3.4. Data analysis

Determining the proper modeling procedure for the analyses of the data requires examining the distribution of the dependent variable (Figure 2).

Figure 2. Distribution of the dependent variable.



Source: survey (2014).

The variable is of a count type, i.e. it only takes non-negative integer values. Moreover, the distribution is far from normal. A large majority of members purchase one to nine shares, while a minority purchases a large number of shares. Additionally, as there are no zero counts in the data because cooperative members must purchase at least one share, the data is truncated at zero. Due

to large positive skew in the distribution, the normality assumption of OLS cannot be approximated with a mathematical transformation. Therefore, zero-truncated count models, designed to handle count dependent variables with distributions incorporating large positive skews and excluding the value zero, are appropriate (Cameron and Trivedi 2013). Two types of models can be used: zero-truncated Poisson (ZTP) regression or zero-truncated negative binomial (ZTNB).[2] The latter is used when the assumption of equidispersion underlying the former is violated (Gardner et al. 1995). According to this assumption, the conditional variance of the outcome is equal to the conditional mean. The presence of overdispersion, which occurs when the variance is greater than the mean, can be tested by comparing the log likelihoods of the ZTP and ZTNB models. Our strategy was to first estimate the models with the ZTNB model, which yields an estimate of overdispersion. If there was significant evidence of overdispersion, we relied on ZTP estimates; if it was significant (always the case below), we reported the ZTNB results.

The unconditional mean function in the ZTP and ZTNB models has the exponential form[3]:

$$E[N_i|x_i] = exp(x_i'\beta)$$

Where N_i is the proxy for the number of shares purchased, β measures the effect of the covariate in vector x_i and η_c is a cohort fixed-effect for cooperative members belonging to cohort c. A one-unit increase in x_i multiplies the proxy for the expected number of shares purchased by a factor of $\exp(\beta_i)$. The coefficients for explanatory variables have been converted to easily interpretable percentage change figures ([$\exp(\beta)$ - 1] 100). Standard errors are reported for the original negative binomial coefficients which can be recovered by applying the inverse of the conversion formula.

4. Results

Table 11 presents the results. Different specifications were estimated and control variables were added gradually. Model 1 contains control variables only and serves as a baseline by which to evaluate the introduction of the measures of social capital.

[2] The ZTNB model differs from ZTP regression by the addition of a residual variance parameter that captures overdispersion in the dependent variable.
[3] Unconditional mean

Table 6. Determinants of the level of contributions: zero-truncated negative binomial regressions with cluster robust standard errors in parentheses.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Measures of social capital						
TRUST		-3.48			-5.35	-5.75
		(0.13)			(0.13)	(0.09)
SOCIDENT			36.19**		30.78*	29.39***
			(0.14)		(0.14)	(0.03)
NETWORK				34.61**	31.54**	36.92***
				(0.13)	(0.13)	(0.06)
Control variables						
EDUCATION	21.24**	21.22**	21.06**	19.41**	19.30**	22.44***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.07)
AGE	5.68***	5.70***	5.66***	5.79***	5.78***	6.18***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
GENDER	24.30	24.19	23.55	25.34	24.54	26.57*
	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.12)
INCOME	9.75	9.91	8.46	10.59	9.55	11.53
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.13)
PVPANELS	31.04**	31.19**	29.14*	28.25*	27.18*	15.43
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.09)
TURBINE	-5.23	-5.35	-3.91	-4.42	-3.40	-10.03***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.16)	(0.04)
RURAL	29.21	29.13	29.26	27.23	27.12	29.11***
	(0.18)	(0.18)	(0.17)	(0.18)	(0.17)	(0.02)
SEMIRURAL	11.03	10.85	13.29	11.50	13.07	13.93**
	(0.17)	(0.18)	(0.17)	(0.17)	(0.17)	(0.05)
OWNER	136.95***	136.89***	132.40***	138.68***	134.67***	217.49***
	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)	(0.18)
HOUSE	-29.30	-29.07	-26.94	-28.60	-26.10	-40.66***
	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.07)
DISTRIB	-13.30	-13.48	-11.12	-14.14	-12.60	-16.50***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.02)
PROCED	-13.16	-12.63	-14.85	-13.11	-13.71	-14.62**
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.07)
PROENVORIENT	-4.41	-4.04	-10.41	-7.76	-12.14	-5.53
	(0.13)	(0.13)	(0.14)	(0.13)	(0.14)	(0.16)
PRICE	-49.40***	-49.46***	-50.48***	-48.79***	-49.84***	-46.91***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.14)	(0.11)
LINEAR	4.77	4.89	3.89	7.86	7.19	3.24
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.12)
NOFIXED	-19.71	-20.02	-19.21	-23.44	-23.41	-22.51***
	(0.17)	(0.17)	(0.13)	(0.17)	(0.17)	(0.06)
DEMOCRATIC	44.08***	44.29***	36.03**	44.12***	37.25**	33.15***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.04)
GREEN	-12.02**	-12.08	-16.01	-13.42	-16.91	-15.15
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.13)
ADVICE	-37.10**	-36.86**	-38.05**	-39.81***	-40.07***	-39.78***
	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)	(0.07)
ROI	498.72***	497.73***	507.55***	483.52***	490.03***	472.02***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.06)
AGM	260.09***	258.89***	249.57***	240.29***	231.19***	340.13***
	(0.29)	(0.30)	(0.31)	(0.29)	(0.30)	(0.23)
PERIOD	51.64***	51.73***	51.14***	48.97***	48.83***	
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	
ECOPOWER 1						-23.50***
						(0.08)
ECOPOWER 2						56.75***
						(0.11)
Dummies for provinces	YES	YES	YES	YES	YES	YES

Dummies for prof. status	YES	YES	YES	YES	YES	YES
Constant	-24.40***	-23.74***	-24.56***	-25.34***	-25.64***	-25.53***
	(0.73)	(0.76)	(0.69)	(0.70)	(0.73)	(0.58)
N	2,906	2,906	2,906	2,877	2,877	2,877
McFadden's Pseudo- R^2	0.144	0.144	0.146	0.146	0.146	0.158
Overdispersion parameter	$7.24e^{7}$***	$4.56e^{7}$***	$1.04e^{8}$***	$4.97e^{7}$***	$5.07e^{7}$***	$5.61e^{7}$***
Log-likelihood	-1682.17	-1682.12	-1678.86	-1663.30	-1660.77	-1656.44

Source: survey (2014). P-value:*p<.10; **p<.05; ***p<.01.

The slopes are interpretable as percentage change coefficients. For example, the positive effect of education in model 1 is consistent with much of the empirical research on pro-environmental behavior (e.g. Scott and Willits 1994), and the 21.24 coefficient indicates that education increases financial investment in the cooperative by about 21 percent, holding all other variables constant. Among socio-demographic variables, the most powerful and consistently significant effect occurs for house-ownership (positive). That is, owning one's home increases the level of investment in the cooperative. Pro-environmental orientation and distributive and procedural feelings of justice do not appear to have major influence on the level of financial contributions in the cooperative. Regarding members' motivations to join the cooperatives, the largest effect is for the return on investment, which positively influences the number of shares purchased. This suggests that financial involvement in the cooperative is largely driven by monetary incentives. The electricity price has a significantly negative effect. This indicates that members who joined cooperatives mainly for incentives related to electricity supply tend to invest less in the cooperative. The democratic control of organizations is significantly positive, which suggests that people strongly motivated by the democratic nature of cooperative governance tend to purchase more shares. This is in line with experimental findings, which show that democratic institutions, such as those present in cooperatives, affect the level of cooperation of parties involved in an economic exchange. Given a decision or policy, the level of cooperation is higher when decisions are made democratically by involved parties; the same decision or policy imposed undemocratically through another mechanism does not induce similar levels of cooperation (Dal Bó et al. 2010). The importance of other members' advice is significantly negatively associated with the amount of money invested in the cooperative. This result can be explained in terms of opinion leadership and diffusion networks of innovation (Rogers 1995), an interpretation which will be returned to in Section 5. The effect of the frequency of participation in annual general meetings is significantly positively associated with the number of shares purchased. This suggests that participation in the governance of organizations is positively related with financial involvement and is consistent with the former finding that the democratic control of organizations plays a positive role. We note the inherent endogeneity between these two variables. A higher level of financial involvement could result from a more active participation in decision-making.

Conversely, the fact of having invested a higher amount of money in the cooperative can make members feel more concerned with the financial situation of the organization and the way it is run and, therefore, more willing to have their say in general meetings. In addition, the membership period is positively related with the level of financial contributions in the cooperative, which indicates that members who joined the cooperative earlier tend, on average, to invest larger amounts.

Models 2 through 4 introduce the effects of generalized trust, social identification to the cooperative and density of social networks, respectively. Generalized trust appears to have no significant effect on the amount of financial contributions to the cooperative, but social identification to the cooperative has a significantly positive effect on the number of shares purchased (model 3). That is, the more cooperative members identify to their organization, the larger their financial contribution to it. Similarly, there is a positive social network effect (model 4). Having other cooperative members in one's close social network increases the financial contribution to the cooperative by about 34.6 percent, net of other factors. Model 5 presents the effects of all controls and all social capital variables estimated simultaneously. Again, social identification to the cooperative and the presence of other members in one's social network are shown to play a significant role in stimulating financial contributions to the cooperative.

Model 6 introduces several adjustments to deal with the patterns related with the different organizational phases identified in Section 3.1. To do so, the cohorts of cooperative members who joined the cooperative during the three phases are distinguished. Since cooperative members are clustered in the three cohorts, model 6 includes fixed effects η_c for the first two cohorts. Hence, these coefficients need to be interpreted with reference to the third cohort of Ecopower members, i.e. those who joined after the cooperative became an electricity supplier. We thus control for unobserved heterogeneity at the level of the different cohorts. A further adjustment is made on the covariance matrix of the estimates. Since we can assume correlation is present between the residuals of members within the same cohort, we use cluster robust standard errors.

$$E[N_i|x_i] = exp(x_i'\beta + \eta_c)$$

The dummy for the first cohort of members has a significantly negative sign, while the sign of the dummy for the second cohort is significantly positive. This indicates that members belonging to the second cohort tend to purchase significantly more shares than members belonging to the third cohort. On the other hand, early Ecopower members invest a smaller amount of money in the cooperative, on average.

As a robustness analysis, we compare popular alternative models for our preferred specification. We compare the zero-truncated negative binomial model with a standard Poisson and its zero-truncated counterpart. The standard Poisson model ignores the issue of zero-truncation and that of overdispersion, while zero-truncated Poisson ignores overdispersion only. Additionally, we estimate a standard negative binomial model. Table A2 (Appendix) shows that our estimates are robust and that the qualitative interpretation is the same. Yet, ignoring the zero truncation of our data has an appreciable influence on the estimated coefficients, which are systematically smaller as compared to zero-truncated models. On the other hand, ignoring the overdispersion does not have a large influence on our findings, as the zero-truncated Poisson model shows.

5. Discussion

Our findings have important implications for several major bodies of research. First, as regards the effect of social capital, the results suggest that distinct components of social capital have different effects on the voluntary provision of environmental public goods. On the one hand, abstract notions of social capital, such as generalized interpersonal trust, do not seem to have a significant impact on environmental public good provision, in line with Glaeser et al. (2000) who find that generalized trust is not a good predictor of trusting behavior. On the other hand, the sense of belongingness to a well-defined, specific group significantly increases members' contributions. Similarly, the presence of other cooperative members in one's direct social network has a positive effect on contributions to the cooperative, highlighting the positive effect of a dense network structure on contributions to environmental public goods.

Second, the signs and magnitude of the coefficients for members' motivations to join the cooperative provide interesting insights about how shaping incentives affect the population of types of individuals who are most likely to come to prominence in a particular setting. The return on investment appears to be a very powerful incentive to stimulate financial contributions to the cooperative. On the other hand, incentives related to electricity supply and, in particular, a cheap electricity price, are negatively associated with contribution rates. This means that members who primarily joined for being supplied with electricity make fewer contributions, on average, to the cooperative. From an institutional perspective, this may be explained by the fact that electricity supply establishes a market transaction between the organization and its members. By attaching market incentives in the form of electricity supply to cooperative membership, Ecopower modified the incentive structure faced by existing and potential members. It started attracting members who were quite distinct from early members and who developed more of a customers'

attitude in wanting to benefit from the advantages of electricity supply without investing large amounts of money in the cooperative. Moreover, Bauwens (2016) showed that individuals who joined Ecopower before it became an electricity supplier in 2003 have higher pro-environmental orientation and identify more strongly with their organization than Ecopower members who joined later on. This is in line with the hypothesis that market institutions may undermine the formation of social norms (Bowles 1998). The findings also highlight the trade-off that is likely to arise for community-based initiatives between the creation and maintenance of a high level of social capital and the scaling up of activities.

Members for whom other members' advice was an important motivation to join the cooperative tend to invest smaller amounts of money in the cooperative, on average. This result can be interpreted in terms of Rogers (1995)'s analysis of opinion leadership and diffusion networks of innovations. Opinion leaders are individuals who lead in influencing others' opinions about innovations. In this perspective, if the cooperative management of RE projects is thought as an institutional innovation, members for whom other members' advice was an important motivation to join the cooperative are best described as opinion followers, who tend to seek information and advice from existing cooperative members. This finding suggests that opinion followers tend to make smaller financial contributions in the cooperative than opinion leaders.

Regarding the analysis of the different cohorts of Ecopower members, members who joined during the second development phase invest more money in the cooperative on average than members of the third phase. By contrast, members who joined during the first phase tend to purchase fewer shares. To interpret these findings, it is worth recalling that the second phase corresponds to the installation of the first wind turbines. The results thus suggest that the concrete realization of the first wind energy project and the expectation of tangible economic benefits coming with it attracted many members willing to invest larger amounts of money in the cooperative. On the other hand, the first phase was characterized by relatively higher risk and was not associated with any clear material benefits for members. This may explain why members who joined during the first phase made smaller contributions to the organization.

As in any research project, the choices made in this study reveal some limitations in our findings, which suggest various avenues for future research. The empirical investigation presented in this paper focused on the influence of social capital on pro-environmental behaviors at the local level. It remains to be seen whether and how these sustainable behaviors adopted at the local level affect the global system in which they occur or, in other words, whether and how local sustainability adds up to global sustainability. Even if voluntary pro-environmental behaviors

generate real impacts at the individual level, fundamental properties of feedback systems suggest that there can be no guarantee that effective pro-environmental behavior, however well intentioned, will contribute to system-level sustainability (Anderies et al. 2013). The choices made in terms of geographical scope and in our sample frame also imply some caution when generalizing our results. Further research could include the analysis of social capital in other geographical contexts and of other types of community-based energy projects.

6. Conclusion

The objective of this paper was to examine the role of social capital in influencing the voluntary provision of environmental public goods in community-based renewable energy projects. Overall, the findings show that social capital is an important factor in explaining members' voluntary contributions to the cooperative. Yet, differences between several types of social capital are observed. Generalized trust does not appear to be a significant predictor of financial contributions made by cooperative members, in contrast with social identification and density social network structure, which have a positive effect on financial contributions.

As regards policy and managerial implications, the findings suggest that in addition to traditional economic incentives, policy makers and CRE managers should rely on the social capital contained in communities and consider enabling and incentivizing cooperative membership across societies to help trigger citizen investments. CRE managers could, for instance, increase referrals from word of mouth by encouraging and rewarding existing members (not necessarily with monetary incentives) to recommend cooperative membership. To deal with the trade-off between the level of social capital and scaling up, CRE managers could favor growth paths other than an increase of members and an accumulation of assets in a single organization, e.g. through the replication and franchising of a successful business model or through the free and open flow of knowledge and the sharing of relevant experiences. As for policy makers, they should bear in mind that supportive institutions will crowd in social capital by enforcing individuals' feeling of autonomy and self-esteem (Ostrom 2000b). Given the magnitude of RE investments required to achieve a successful low-carbon transition, the support of households and civil society is essential. It allows governments to achieve RE targets with less publicly financed resources. In this perspective, policy makers could facilitate the formation of CRE initiatives by creating an environment conducive to their development, including financial and institutional support. That being said, monetary incentives and social capital should be combined with care, as they are likely to interact with each other. Indeed, the introduction of monetary incentives, such as financial

rewards or sanctions, may sometimes 'crowd out' behaviors that are based on social preferences. For instance, (Frey and Oberholzer-Gee 1997) found that proposing financial compensation reduced Swiss citizens' willingness to host a nuclear waste facility.

7. Appendix

Table A1. Correlation matrix.

		1	2	3	4	5	6	7	8	9	10
NUMBERSHARE	1	1									
TRUST	2	-0.01	1.00								
SOCIDENT	3	0.04	0.10	1.00							
NETWORK	4	0.06	0.06	0.11	1.00						
EDUCATION	5	0.02	0.14	0.02	0.03	1.00					
AGE	6	0.17	-0.01	0.05	-0.04	-0.27	1.00				
GENDER	7	0.06	-0.03	0.00	-0.02	-0.10	0.09	1.00			
INCOME	8	0.00	0.09	-0.03	0.01	0.31	-0.22	0.14	1.00		
PVPANELS	9	0.04	-0.04	-0.04	0.06	-0.07	-0.01	0.14	0.19	1.00	
TURBINE	10	0.02	-0.04	0.01	0.03	-0.08	0.00	0.04	-0.02	0.06	1.00
RURAL	11	0.03	-0.05	-0.04	0.00	-0.12	0.09	0.07	0.04	0.21	-0.02
SEMIRURAL	12	-0.01	-0.01	0.00	0.02	0.01	0.03	0.01	0.03	0.02	0.06
OWNER	13	0.04	0.00	-0.02	0.01	0.01	0.03	0.08	0.19	0.23	0.02
HOUSE	14	-0.01	0.03	-0.02	0.04	-0.01	-0.02	0.05	0.19	0.27	0.00
DISTRIB	15	0.01	-0.10	-0.11	-0.03	-0.09	0.03	0.15	0.08	0.16	0.03
PROCED	16	-0.01	0.25	0.10	0.02	0.16	-0.08	-0.02	0.12	-0.05	-0.03

PROENVORIENT	17	0.00	0.17	0.31	0.10	0.13	-0.01	-0.15	-0.08	-0.13	-0.01
PRICE	18	-0.06	-0.06	-0.03	-0.03	-0.06	0.00	0.03	-0.05	-0.09	0.00
LINEAR	19	-0.04	-0.05	0.02	0.01	-0.07	-0.04	0.03	-0.01	0.11	0.05
NOFIXED	20	-0.03	-0.11	-0.03	0.02	-0.10	-0.02	0.09	0.01	0.25	0.04
DEMOCRATIC	21	0.05	0.03	0.31	0.06	-0.06	0.11	0.02	-0.10	-0.07	0.02
GREEN	22	-0.01	0.07	0.21	0.02	0.14	-0.10	-0.10	0.02	-0.10	-0.03
ADVICE	23	-0.02	0.00	0.14	0.11	-0.08	0.04	-0.04	-0.10	-0.02	0.02
ROI	24	0.23	-0.09	0.00	0.04	-0.04	0.06	0.08	-0.03	0.08	0.04
AGM	25	0.13	-0.01	0.11	0.04	-0.01	0.09	0.00	-0.06	-0.02	0.01
PERIOD	26	0.13	0.08	0.12	0.07	0.06	0.16	0.02	0.01	-0.06	0.01
ANTWERP	27	-0.01	0.04	0.02	-0.02	-0.02	-0.03	-0.02	-0.03	-0.06	-0.10
EAST	28	0.00	0.01	0.02	0.00	0.07	-0.08	-0.06	0.00	-0.06	0.01
BRABANT	29	0.00	0.03	0.01	-0.03	0.11	-0.03	-0.03	0.09	0.01	-0.13
WEST	30	-0.01	-0.07	-0.01	0.01	-0.08	0.07	0.05	-0.06	-0.01	0.11
PROFESSIONAL	31	0.03	0.01	-0.01	0.02	0.08	-0.03	0.01	0.08	-0.01	-0.02
SELFEMPLOYED	32	-0.03	0.01	-0.02	-0.01	0.03	-0.07	0.01	-0.01	0.00	0.00
WORKER	33	-0.02	-0.06	-0.02	0.02	-0.27	-0.06	0.10	-0.09	0.05	0.04
EMPLOYEE	34	-0.08	0.02	0.01	0.01	0.06	-0.37	-0.13	0.07	0.01	-0.02

EXECUTIVE	35	0.01	0.05	-0.02	0.01	0.25	-0.13	0.09	0.33	0.07	-0.02
OTHERSTATUS	36	-0.03	0.02	-0.03	0.00	0.06	-0.08	-0.01	0.05	0.00	0.01

		11	12	13	14	15	16	17	18	19	20
RURAL	11	1									
SEMIRURAL	12	-0.59	1.00								
OWNER	13	0.13	-0.01	1.00							
HOUSE	14	0.24	0.01	0.38	1.00						
DISTRIB	15	0.11	0.01	0.09	0.01	1.00					
PROCED	16	-0.08	0.02	-0.02	-0.01	0.00	1.00				
PROENVORIENT	17	-0.13	0.00	-0.06	-0.05	-0.21	0.11	1.00			
PRICE	18	-0.02	0.04	-0.02	-0.03	0.06	-0.01	-0.12	1.00		
LINEAR	19	0.05	0.02	0.04	0.01	0.04	-0.07	-0.09	0.38	1.00	
NOFIXED	20	0.09	0.02	0.08	0.05	0.13	-0.11	-0.16	0.28	0.59	1.00
DEMOCRATIC	21	-0.03	0.01	-0.03	-0.02	-0.15	-0.03	0.16	0.02	0.12	0.11
GREEN	22	-0.10	-0.03	-0.04	-0.06	-0.21	0.03	0.25	-0.06	-0.01	-0.08
ADVICE	23	-0.01	0.00	-0.04	-0.04	-0.05	-0.02	0.07	0.10	0.11	0.12
ROI	24	0.05	-0.01	0.02	-0.02	0.13	-0.02	-0.10	0.16	0.11	0.17
AGM	25	-0.02	0.00	-0.03	-0.06	-0.02	0.00	0.05	-0.03	0.01	0.00

PERIOD	26	-0.04	0.02	0.01	-0.02	-0.08	0.06	0.12	-0.04	-0.06	-0.10
ANTWERP	27	-0.09	-0.02	0.01	-0.09	-0.02	0.01	0.09	-0.10	-0.07	-0.09
EAST	28	-0.09	0.01	-0.05	0.00	-0.05	0.02	0.03	0.03	-0.01	-0.03
BRABANT	29	0.11	-0.02	0.02	0.04	0.00	0.03	0.02	-0.01	-0.01	-0.02
WEST	30	-0.11	0.11	0.01	0.02	0.05	-0.01	-0.09	0.11	0.09	0.09
PROFESSIONAL	31	-0.02	0.02	0.03	0.02	0.03	-0.01	0.01	-0.05	-0.03	-0.04
SELFEMPLOYED	32	0.02	-0.03	-0.01	0.01	0.03	-0.02	0.00	-0.03	-0.04	-0.04
WORKER	33	0.06	-0.02	0.01	0.04	-0.01	-0.05	-0.04	0.00	0.04	0.06
EMPLOYEE	34	-0.04	-0.02	0.00	0.02	-0.08	0.07	0.05	-0.01	0.04	0.01
EXECUTIVE	35	-0.02	0.03	0.05	0.05	0.06	0.05	-0.05	-0.02	-0.03	0.00
OTHERSTATUS	36	0.00	-0.03	0.01	0.01	-0.01	0.03	0.02	0.02	0.01	-0.01

		21	22	23	24	25	26	27	28	29	30
DEMOCRATIC	21	1									
GREEN	22	0.23	1.00								
ADVICE	23	0.28	0.08	1.00							
ROI	24	0.05	-0.02	0.10	1.00						
AGM	25	0.10	0.04	0.05	0.01	1.00					
PERIOD	26	0.06	0.10	-0.04	0.01	0.07	1.00				

ANTWERP	27	0.02	0.09	-0.03	-0.04	0.05	0.07	1.00			
EAST	28	0.02	0.05	0.02	-0.02	0.00	0.00	-0.33	1.00		
BRABANT	29	-0.01	0.02	-0.03	-0.02	-0.02	0.00	-0.28	-0.27	1.00	
WEST	30	0.00	-0.10	0.04	0.05	-0.02	-0.05	-0.26	-0.26	-0.22	1.00
PROFESSIONAL	31	-0.01	0.04	-0.03	-0.06	-0.03	0.00	-0.01	0.00	0.02	0.00
SELFEMPLOYED	32	0.00	0.05	-0.01	-0.04	-0.03	0.00	0.02	-0.02	0.02	-0.03
WORKER	33	-0.01	-0.06	0.06	-0.01	-0.01	-0.08	0.00	-0.01	-0.09	0.05
EMPLOYEE	34	-0.02	0.07	0.00	-0.02	-0.03	-0.03	0.01	0.04	0.04	-0.06
EXECUTIVE	35	-0.05	0.00	-0.07	0.01	-0.03	0.01	-0.01	0.01	0.06	-0.01
OTHERSTATUS	36	0.00	0.01	-0.01	0.00	-0.01	0.02	-0.01	0.01	0.00	0.00

		31	32	33	34	35	
PROFESSIONAL	31	1					
SELFEMPLOYED	32	-0.04	1.00				
WORKER	33	-0.04	-0.05	1.00			
EMPLOYEE	34	-0.14	-0.17	-0.20	1.00		
EXECUTIVE	35	-0.08	-0.10	-0.12	-0.36	1.00	
OTHERSTATUS	36	-0.04	-0.05	-0.06	-0.19	-0.11	1

Source: survey (2014).

Table A2. Robustness checks

	Zero-truncated Poisson	*Standard Poisson*	*Standard negative binomial*
Measures of social capital			
TRUST	-6.11 (0.07)	-0.93 (0.02)	-0.93 (0.02)
SOCIDENT	9.54* (0.05)	2.46*** (0.01)	2.46*** (0.01)
NETWORK	33.90*** (0.05)	7.64*** (0.01)	7.64*** (0.01)
Control variables			
EDUCATION	17.64*** (0.06)	4.33* (0.02)	4.33* (0.02)
AGE	4.52*** (0.01)	1.04*** (0.00)	1.04*** (0.00)
GENDER	16.23* (0.09)	3.34 (0.02)	3.34 (0.02)
INCOME	10.76(0.10)	2.20 (0.02)	2.20 (0.02)
PVPANELS	7.29 (0.04)	0.93 (0.01)	0.93 (0.01)
TURBINE	-0.88 (0.04)	2.24*** (0.01)	2.24*** (0.01)
RURAL	18.60*** (0.02)	2.88*** (0.00)	2.88*** (0.00)
SEMIRURAL	-0.75 (0.12)	-0.46 (0.03)	-0.46 (0.03)
OWNER	115.11*** (0.16)	15.57*** (0.03)	15.57*** (0.03)
HOUSE	-30.17*** (0.13)	-7.42** (0.04)	-7.42** (0.04)
DISTRIB	-12.68*** (0.04)	-3.73*** (0.01)	-3.73*** (0.01)
PROCED	-11.78* (0.06)	-3.32** (0.02)	-3.32** (0.02)
ENVORIENT	-2.54 (0.11)	-0.84 (0.02)	-0.84 (0.02)
PRICE	-30.89*** (0.12)	-8.72*** (0.03)	-8.72*** (0.03)
LINEAR	-1.36*** (0.09)	0.36 (0.01)	0.36 (0.01)
NOFIXED	-23.07 (0.05)	-6.42*** (0.01)	-6.42*** (0.01)
DEMOCRATIC	23.50*** (0.07)	4.72*** (0.01)	4.72*** (0.01)
GREEN	-15.56*** (0.12)	-4.51* (0.03)	-4.51* (0.03)
ADVICE	-35.18 (0.04)	-9.90*** (0.02)	-9.90*** (0.02)
ROI	234.43*** (0.04)	41.94*** (0.01)	41.94*** (0.01)
AGM	144.85*** (0.14)	50.00*** (0.09)	50.00*** (0.09)
ECOPOWER 1	-16.37*** (0.01)	-3.35*** (0.00)	-3.35*** (0.00)
ECOPOWER 2	54.56*** (0.02)	19.59*** (0.02)	19.59*** (0.02)
Dummies for provinces	YES	YES	YES
Dummies for prof. status	YES	YES	YES
Constant	-4.44*** (0.70)	0.60*** (0.11)	0.60*** (0.11)
N	2907	2907	2907
McFadden's Pseudo- R^2			
Log-likelihood	-1882.68	-3589.96	-3589.96

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