

Jun 25th, 9:00 AM

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Cyril Tjahja

Hanze University of Applied Sciences, Groningen, The Netherlands

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Citation

Tjahja, C. (2022) Setting the stage: The value of contextual social research when designing with local sustainability initiatives, in Lockton, D., Lenzi, S., Hekkert, P., Oak, A., Sádaba, J., Lloyd, P. (eds.), *DRS2022: Bilbao*, 25 June - 3 July, Bilbao, Spain. <https://doi.org/10.21606/drs.2022.290>

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Setting the stage: The value of contextual social research when designing with energy transition initiatives

Cyril Tjahja

Research Centre NoorderRuimte, Hanze University of Applied Sciences, Groningen, The Netherlands

c.tjahja@pl.hanze.nl

doi.org/10.21606/drs.2022.290

Abstract: This paper presents an exploration of the (pre)conditions in which local energy transition initiatives operate in the city of Groningen, the Netherlands, and to what extent these conditions influence the co-design process. The findings show that participation in such schemes is not necessarily a given, as local initiatives and (design) practitioners can encounter several interrelated issues, which must be taken into account before even considering a co-design approach to the energy transition. Informed by insights from the social research studies conducted, the initial design-centred approach was altered to incorporate (co)design in a more flexible and iterative manner, inspiring new ways to collaborate.

Keywords: co-design, design and social innovation, citizen participation, energy transition

1. Introduction

Barely two decades into the 21st century, the environmental consequences of the Anthropocene have never been clearer, most notably in terms of the evident changes in global climate. A community approach to the energy transition from fossil fuels to renewable energy is seen as key to combatting climate change (Walker, 2011; Seyfang et al., 2013; Creutzig et al., 2014), which has spurred on a rise in energy transition initiatives, also known as local energy initiatives (Hasanov & Zuidema, 2018), community energy (Brummer, 2018), and energy communities (Mahzouni, 2019), among others. These initiatives are perceived as essential to both the generation and storage of renewable energy (Shelby et al., 2012), and their prevalence, particularly in Europe, reinforces the notion that civil society and bottom-up social movements play an important role in supporting sustainability transition (Arentsen & Bellekom, 2014).

The broad spectrum of energy transition initiatives, all of which have different motivations, scopes, and goals, is difficult to capture in a single definition. However, in an ideal scenario, they are fully owned and operated by local residents who work for the benefit of their local



community (Walker & Devine-Wright, 2008). This is by no means an easy task, as these initiatives often struggle to maintain themselves and are unable to tackle the larger, unsustainable structures that surround them (Hargreaves et al., 2013). Furthermore, in an uneven playing field, they have to position themselves against more powerful players, such as (local) governments (Blanchet, 2015).

The use of participatory or co-design approaches by energy transition initiatives could help bridge this gap, by bringing together various stakeholders to collectively design possible scenarios and solutions. Although in practice, (co)design tools and methods are used within this context, investigation and evaluation of the process has been discussed in relatively few studies, among which are Shelby et al. (2012), Capaccioli et al. (2016), and Ambole et al. (2019).

For the MAKING-CITY project, the Hanze University of Applied Sciences (HUAS), together with the TNO (the Netherlands Organisation for applied scientific research), were tasked with designing a new citizen engagement approach for the energy transition in the city of Groningen, the Netherlands. The original aim was to adopt a participatory design approach, with the intention of organising a variety of co-creation and co-design activities with local energy transition initiatives and neighbourhood residents. However, when the COVID-19 pandemic severely restricted physical encounters in the Netherlands, the study was necessarily changed from a design approach to a social research approach, as the latter would be more feasible to conduct remotely.

From a research perspective, this initially appeared to be a significant setback, since all of the planned design interventions and activities were put on hold indefinitely. However, in retrospect, the unexpected change turned out to be a blessing in disguise, as this enabled the social research component to be expanded significantly, from the initial three to six months to more than two years. This provided a unique opportunity to explore a variety of issues in great depth, which under normal circumstances would have been less thoroughly investigated, and which has led to new insights into how (co)design can be utilised in the energy transition.

This paper will accordingly discuss how the insights from social research inspired ad hoc ways of co-designing. It will argue that, whenever possible, design researchers and practitioners should endeavour to develop a deep understanding of the local context through social research, and do so before conducting design research in which the participation of local communities is required, as this could result in a significantly more targeted approach.

2. Literature review

Margolin and Margolin (2002) noted several decades ago a lack of research pinpointing exactly what designers can do to improve human well-being. Although this situation has since changed significantly, with much new ground being covered in participatory design,

social design, and design for social innovation research, many challenges remain when designing together with local communities.

For example, Wang et al. (2016) note that most (urban) social designers experience difficulties understanding and communicating with the (rural) communities with whom they work, due to their drastically contrasting modes of life. Similarly, a study by Erözçelik and Taşdizen (2017) demonstrates that standard co-design methods, which are often based on homogeneous communities, could not easily be transferred to communities that are heterogeneous.

In addition, Kiem (2011) highlights a "blind spot" that exists in design and social innovation in relation to the existing power/political structures, which is particularly relevant in the context of citizen participation in the energy transition, as its success also requires facilitation by and cooperation with (local) government and energy providers. In addition, studies on energy transition initiatives indicate various social barriers to success, such as scepticism (Brummer, 2018), NIMBY-ism (Woo et al., 2019), and political interference (Wahid et al., 2017).

In order to provide the necessary tools to analyse society as well as to develop (reflexive) methods frameworks to initiate change, Koskinen and Hush (2016) suggest grounding social design in sociological theory. This would, in addition, enable designers to share a common language with social scientists, who, according to the authors, are present in most government sectors, where they bear responsibility for directing public sector resources.

The present study has taken up the call by Koskinen and Hush to a certain extent, by connecting a (co)design approach with social theory. However, instead of going 'deep' by firmly rooting it in sociology, as the authors suggest, the social research in this study was conducted in a 'broad' way by approaching citizen engagement from a multi-disciplinary perspective, mainly using surveys and interviews. It is acknowledged that these methods can be subject to methodological issues, such as correct interpretation (Cicourel, 1982) or limited generalisation of the research data (Duda & Nobile, 2010). However, the aim of the paper is not necessarily to test a particular theory or generalise findings, but rather to highlight that employing social research methods before a co-design process can provide valuable information on the social context. This, in turn, could serve as a stable foundation which could significantly contribute to the success of proposed design interventions.

3. Background of the study

The research conducted for this study is part of MAKING-CITY, a Horizon 2020 project funded by the European Commission. The project aims to demonstrate the possibilities of *positive energy districts (PEDs)*, which are defined as districts with zero annual net energy imports as well as zero carbon emissions, with the goal of producing an annual local surplus of renewable energy, which can then be shared with other urban zones (MAKING-CITY, 2021).

The consortium consists of more than thirty European partners, among which are municipalities, universities, research institutes, energy providers, technical companies, and energy transition initiatives. Over a five-year period (2018–2023), two designated 'lighthouse' cities, Groningen in the Netherlands and Oulu in Finland, will be demonstrating the possibilities of the PED concept. The findings from these pilot cities will then be disseminated and replicated in six European 'follower cities': Bassano del Grappa (Italy), León (Spain), Trenčín (Slovakia), Kadiköy (Turkey), Lublin (Poland), and Vidin (Bulgaria).

In addition to activities and interventions that investigate technical, legal, and socio-economic aspects of positive energy districts, the MAKING-CITY project seeks to explore new ways of citizen engagement, involving the active participation of local residents in co-creation. At HUAS, the project was led by Research Centre NoorderRuimte (Dutch: *Kenniscentrum NoorderRuimte*), a multidisciplinary research centre conducting applied research on sustainability, liveability, health and well-being, and earthquake resistance.

Initially, the study aimed to investigate four main areas: the role of co-design and co-creation in the energy transition; the types and dimensions of social relations that influence co-design practices; the role of communication in local energy transition initiatives; and the role of the local context of Groningen in the co-design process. Prior to the COVID-19 pandemic, most of these topics would have been examined by organising co-design workshops, or design charrettes/ateliers, with local energy transition initiatives and residents. However, the circumstances made it necessary to adopt an alternative approach, which at first glance might appear simple and straightforward through the lens of design research, yet provided valuable insights into the conditions in which local initiatives operate.

The research centre's multidisciplinary character enabled a collaboration with (junior) researchers from a variety of disciplines, including communication and media design, energy studies, applied psychology, communication science, business, facility management, and real estate. In the period leading up to the research studies, the researchers endeavoured to establish a working relationship with local energy transition and sustainability initiatives, built on rapport and reciprocity, leading to the co-creation and co-formulation of a variety of different research directions and questions.

For example, how can homeowners or tenants be persuaded to take sustainable measures? How might communication be used to increase awareness of the energy transition? Which measures can be used to increase social cohesion and to increase residents' willingness to participate in the activities organised by the local initiative? How can certain 'difficult' groups, such as (international) students and social tenants, become actively involved using a transmedia storytelling approach?

This paper presents the aggregated findings from the individual research studies that were deemed relevant in the context of co-designing with local sustainability initiatives.

4. Methodology

Over a period of two years, four research studies were conducted in Groningen: one general exploratory study and three studies focusing on the neighbourhoods of Paddepoel, Noorderplantsoenbuurt, and Reitdiep respectively. In each of the neighbourhoods, the researchers collaborated with one of the local energy transition/sustainability initiatives. First contact was established either by approaching members during neighbourhood events organised by the initiatives, or by contacting members directly via email.

The initial meetings with the initiatives' representatives and (junior) researchers focused on getting to know one another and sharing (research) interests. Based on these discussions, the respective research plans and questions were formulated and presented to the initiatives' members, who had the opportunity to provide feedback and suggestions, after which the research proposals were finalised.

The data were mostly collected by the junior researchers, who came from different disciplines, with the coding and analysis supervised by the senior researchers, most of whom trained as designers or architects and some of whom have a background in psychology.

4.1 Data collection

For the general exploratory study, semi-structured interviews were conducted with (board) members of energy/sustainability initiatives, local residents, and (international) students residing in and around the city of Groningen. The interviews were aimed at identifying perceived barriers and incentives to energy transition and sustainability in general, but within the context of Groningen and the north of the Netherlands.

The three studies conducted in the neighbourhoods of Noorderplantsoenbuurt, Paddepoel, and Reitdiep comprised several smaller studies, which investigated issues specific to the respective neighbourhoods. In all three studies, a flyer with a QR code inviting residents to participate in an online survey was distributed door-to-door. In each of the three neighbourhoods, only one questionnaire was distributed, and these questionnaires had a similar format.

The first section contained demographic questions, such as age, gender, income, and occupation, as well as questions pertaining to interest in and awareness of issues with the energy transition. The second section was modified according to the research directions co-created by the researchers and the local initiatives, as well as the respective neighbourhood contexts. For example, the questionnaire for the Reitdiep neighbourhood contained additional questions on social cohesion, as this was reported by the local initiative to be an issue of interest.

For every twentieth residence, an additional flyer was included with an invitation to be interviewed. Residents who responded to the invitation were contacted on the email address they supplied and were invited to participate in a virtual meeting, where they were asked to elaborate on some of the issues in the questionnaire during a semi-structured

interview. In addition to local residents who responded to the flyers, potential interviewees were contacted through the researchers' networks. This included members of local sustainability initiatives, officials from the municipality, (international) students, and homeowners and tenants.

The survey and interview questions were based on several theoretical frameworks, depending on the researchers' respective academic disciplines and the corresponding research questions. These included activity theory (Engeström, 2000), the model of pro-environmental behaviour (Kollmuss & Agyeman, 2002), the social capital index (Van Beuningen & Schmeets, 2013), and social cohesion surveys (Hooghe et al., 2009; Eerland et al., 2020), as well as models based on features of successful public-private partnerships (Jacobson & Choi, 2008) and network efficiency (Provan & Milward, 2001).

4.2 Data analysis

The interview recordings were transcribed and coded using the qualitative data analysis software ATLAS.ti. The initial codes were derived from the theoretical frameworks, with new codes being added during the coding process. Using the thematic analysis framework, which enables the identification and analysis of patterns (Braun & Clarke, 2006), the codes were organised by broader themes. As thematic analysis is not necessarily tied to a pre-existing theoretical framework, it fits well with the multidisciplinary nature of the study. The survey findings were of less relevance for this paper, since they mostly pertained to demographics and attitudes to the energy transition and sustainability, as well as to questions specific to the smaller research studies. Nonetheless, a selection of these findings is presented in Table 1 in the next section.

4.3 Limitations

The restrictions and lockdowns imposed by the Dutch government during the COVID-19 pandemic meant that a majority of the research was conducted online, resulting in less interaction with the respondents, which might in turn have affected the quantity and richness of the interviews, and perhaps led to fewer respondents to the survey.

5. Findings

In total, 240 residents responded to the 4,500 surveys that were distributed in the three neighbourhoods, with an average response rate of 5% (see Table 1). In addition, there were 60 interviews conducted with a variety of stakeholders (see Table 2).

Table 1. Summary of survey findings

	Neighbourhoods			Total
	Noorderplantsoenbuurt	Paddepoel	Reitdiep	
Surveys distributed	2,000	1,500	1,000	4,500
Respondents	107	66	67	240
- Homeowners	74	39	65	178
- Tenants	33	26	2	61
- Other	0	1	0	1
Response rate	5%	4%	7%	5%

Table 2. Number of interviewees by type

Interviewee type	Number	Remarks
Members of energy or sustainability initiatives	16	Respondents from 8 different initiatives were interviewed
Homeowners	21	
Tenants	11	4 of the respondents were students
Private landlords	2	
Representatives of housing corporations	2	
Civil servants	4	3 municipality employees, 1 police officer
Others	4	1 neighbourhood centre employee, 1 neighbourhood committee member, 2 members of other types of initiatives
Total	60	

Through thematic analysis, six themes were identified, all of which are deemed relevant to the context of co-designing with local sustainability initiatives: (lack of) communication, different barriers to participating, research fatigue, expectation management, power relations, and dislike of top-down approaches. The following sections will elaborate on these themes.

5.1 (Lack of) communication

Issues related to communication were reported on several levels. At the top level, several respondents noted that there was insufficient communication and awareness of activities relating to energy transition in general, with misperceptions being common. Some respondents were reluctant to switch to renewable energy sources as they perceived the concept of energy transition as "too complicated". Students in particular had a low awareness of matters concerning energy transition. Furthermore, communication with the municipality was characterised as complicated due to bureaucracy, which makes it difficult for residents to sustain interest and participate in projects.

At the middle level, occupied by the neighbourhood initiatives, it appears that several groups of stakeholders who play an essential role in the (co-creation) process, such as (social housing) tenants, (international) students, and private landlords, are seldom addressed in energy-related activities and campaigns. Some practitioners attempt to engage with social housing corporations or private landlords, whereas others neglect tenants altogether. In particular, students are rarely approached, even though they comprise around 20% of the total population of Groningen. In addition, international students often encounter a language barrier, because most material concerning neighbourhood events or projects is communicated only in Dutch, automatically excluding those who do not speak the language. This is a missed opportunity, as the findings also show that even though awareness of energy transition initiatives is low, both international and domestic students are willing to participate in and contribute to neighbourhood activities when invited.

5.2 Different barriers to participating

An issue related to communication is that different stakeholders experience different barriers to participation. Homeowners of the younger (21–29) and older (50–69) age groups are those most interested in energy transition, though the former group often lacks the financial means to implement the measures.

In contrast, it has always been thought "difficult" to engage (social) tenants in the energy transition, as they appear not to derive much benefit from participating. Social tenants have also reported feeling embarrassed by their comparatively poor living conditions, which prevents them from asking for advice or allowing outsiders (such as energy coaches) to enter their residences. Even when motivated, tenants often struggle to bring about changes to their environment because they have no ownership of their residences, and this is even more challenging when their landlord has no interest in implementing the measures. In general, tenants and landlords are unaware of each other's stance on sustainability.

Young families are also reported to lack the time or ability to participate, instead preferring to give priority to their personal lives. Despite respondents indicating that there is a convivial atmosphere in the neighbourhood and that neighbourly interactions occur with some regularity, it cannot be concluded that social cohesion is high in Reitdiep. Two-thirds of the respondents said that they have little contact with other residents, and more than half agree

that the people in the neighbourhood hardly know one another. In addition, a majority of respondents report feeling disconnected to the neighbourhood. The interviews conducted with some of the residents support these findings, confirming the notion that Reitdiep's community is not particularly tight-knit, which makes it challenging for the local initiative to stimulate residents to engage in their activities.

Overall, several respondents, including tenants, students, and landlords, have indicated that they were not involved in neighbourhood activities organised by local sustainability initiatives as they feel that the events catered for a certain type of person (homeowners), and were therefore not applicable to their own situation. Instead, the respondents indicated that they would have been more likely to participate if these gatherings were more personalised, that is, more tailored to their personal circumstances, interests, and issues, rather than assuming that all residents have similar needs, wants, and priorities.

5.3 Research fatigue

Research fatigue, characterised as a reluctance of individuals or groups to engage with (further) research, often due to their previous or present experience with research (Clark, 2008), was not directly attested from the survey or the interview data, but was inferred from several experiences during the research process. One indicator is the survey response rate of 5%, which would be considered as low under normal circumstances. However, in the context of Groningen, such a response rate is not uncommon, and the prevalence of research fatigue among local residents is an issue well-known to local researchers.

Even though this phenomenon has not been officially studied, it is often attributed to the presence of the two large universities, the Hanze University of Applied Sciences (HUAS) and the University of Groningen (RuG), who both conduct research studies throughout the academic year. The number and frequency of these research efforts unfortunately result in local residents often expressing reluctance when asked to participate in (yet another) survey, focus group, or interview. The fact that Groningen is frequently considered the national focal point in matters of energy transition attracts even more researchers from other parts of the Netherlands, who are eager to hear the opinions of local energy transition initiatives and residents on sustainable energy.

This unwillingness was also attested in this study, since some energy transition initiatives declined an initial meeting, stating that there were too many requests from researchers asking for their cooperation and that they did not have time to accommodate all of them. Even some of the initiatives that did participate in the study were slightly apprehensive when first contacted, because their previous experiences were often characterised as being more in the interests of the researchers than those of the initiatives.

5.4 Expectation management

The interviews with members of energy transition initiatives showed that there is often much ambiguity in the roles and responsibilities of the different stakeholders in the process.

This is particularly relevant in terms of the level of participation that has been promised in the co-creation or co-design process and how this translates to actual practice, both in the relationship between the municipality and the initiatives and between the initiatives and local residents.

5.5 Power relations

The uneven playing field that exists between the initiatives and the municipality has been noted by some of the respondents. This manifests itself in, for example, the (in)ability of local initiatives to make decisions and determine their approach independently of the municipality. The (perceived) autonomy of the initiatives is also connected to their status and empowerment in a joint project. Another example in which power relations play a role is that some students have indicated their reluctance to raise issues concerning sustainability with their landlords, due to the fear of being perceived as troublesome, which comes with the risk of being evicted.

5.6 Dislike of top-down approaches

The failure of the Dutch government to confront the ongoing natural gas and earthquake issues in the province of Groningen has significantly eroded trust in government bodies in general. Besides, previous negative experiences with the municipality of Groningen have coloured local residents' perceptions of projects in which the municipality plays a role, MAKING-CITY included. Several respondents have indicated their distrust of local government, particularly concerning energy transition, which is another reason to organise themselves as a grassroots sustainability initiative. One respondent, who works at a professional organisation that assists local energy transition initiatives to realise their sustainability projects, asserted that a bottom-up approach would be able to improve an energy project's success rate from 10% to 50%, this opinion being informed by their experience of working with a large number of initiatives.

6. Discussion

The desire to involve citizens actively in the energy transition initiatives has led to the recognition that local sustainability and energy transition initiatives are key to this ambition (Radtke, 2014; Yildiz et al., 2015). The experiences shared by the respondents highlight some of the complexities that local sustainability initiatives and residents encounter when attempting to participate, which are particularly relevant when adopting a co-design approach.

Some of the themes were interrelated, such as (the lack of) communication and other barriers to participation. For example, by (un)consciously focusing communication efforts on homeowners, other stakeholders, such as students, tenants, and private landlords, will not feel involved, reinforcing the prevalent notion that these groups of residents are "difficult" and "are not interested anyway". However, respondents from these three groups

interviewed for this study indicated that they would be willing to participate in neighbourhood events or activities if: 1) they were aware of them; 2) the barriers to participation were dealt with; and 3) the activities or events were tailored to fit their personal situations.

These findings are congruent with the idea of pro-environmental behaviour (Kollmuss & Agyeman, 2002), which suggests that (the existence of) barriers and (the lack of) incentives, among other things, can influence sustainable (in)action. Therefore, local energy transition initiatives should adapt their communication strategies and activities to accommodate and engage with different types of residents. Private landlords, for example, have indicated that they would join neighbourhood meetings on sustainability if other landlords were present, as it would give them an opportunity to network and exchange ideas. Similarly, students would be willing to participate if the threshold was sufficiently low and they were rewarded in some way for their sustainable behaviour.

These insights have significantly changed the nature and implementation of co-design activities in the overall approach to citizen engagement. The initial plan was to organise design charrettes or design ateliers with all stakeholders at key decision points, but the involvement of students and landlords, for example, was far from assured.

Since a personal approach was preferred by respondents, a communication strategy that manages to differentiate between resident groups was required. For this purpose, transmedia storytelling¹ campaigns were conceptualised by students from the Communication, Media and Design department of the HUAS to raise awareness of the energy transition initiatives, and to encourage residents to collaborate with their local initiative in the design of their future neighbourhood. The campaigns each devised one overarching creative concept – or story – related to sustainability and communicated them to different groups of residents within one neighbourhood, such as tenants, students, families with children, and the elderly. For each group, the story was customised to appeal to their particular needs and interests, and communicated using the media that the respective groups tend to prefer. The results were presented to the collaborating local initiatives, who it is hoped will implement them, or some of their components, in their respective neighbourhoods. Although the campaigns were not co-designed with the initiatives, the potential for such collaborations remains.

The issue of research fatigue and initial scepticism when approaching local initiatives was acknowledged from the outset and tackled by actively building relationships based on mutual benefit and other reciprocation with those involved. Co-designing the research studies with the local initiatives increased trust as well as a sense of ownership of the eventual outcomes, and provided fertile ground for future collaborations. The importance of building trust and personal relationships when engaging in co-design activities has been

¹ Transmedia Storytelling is defined as a process by which the constituent parts of stories are disseminated through different media to form a cohesive experience, which makes use of each medium's strengths. Ideally, each part of the story makes a unique contribution to the overall narrative (Jenkins, 2006).

emphasised by several authors (Warwick, 2017; Petrella et al., 2020), and the experiences from this research study support these notions.

The themes of dislike for top-down approaches, expectation management, and power relations are also intertwined. The aversion to a top-down approach highlights that local historical and social conditions can significantly influence stakeholders' perceptions. If certain residents already have a negative attitude to the municipality, or in some cases the local sustainability or energy transition initiative, they are unlikely to participate in any kind of design activity in which any of these parties are involved. Expectation management also plays a role in this matter, because some respondents recalled that in certain cases they were not involved or consulted to the extent that they had initially hoped, making them doubt their further participation in similar projects. In some cases, this could be attributed to the uneven power relations between the municipality and the local initiatives (top to middle) and between the local initiatives and residents (middle to bottom).

The failure to recognise the extent to which power relations and politics influence the social innovation space, in which the energy transition is also situated, is a known weakness of design and designers (Kiem, 2011; Von Busch & Palmas, 2016). The disparity that exists between the different stakeholders, each having their own approach to energy transition, has prompted the development of the Unified Citizen Engagement Approach (UCEA). This approach, which is currently being developed within MAKING-CITY by project partners TNO and HUAS, brings together the three main players in energy transition – the individual, the cooperative/initiative, and the municipality – in one iterative and dynamic process, specifying who is (jointly) responsible for what action at which moment in time. It is hoped that the frequent interaction, collaboration, and co-creation activities involving all three actors will create mutual understanding, set realistic expectations, and mitigate the potentially negative effects brought about by uneven power relations.

Even though the co-design activities that were originally planned for the study were largely suspended or postponed, co-design did take place to a certain extent. For example, junior researchers with a real estate background were taught by the designers in the team how to facilitate co-design sessions, which they then utilised in their study of how students could be motivated to participate in the energy transition through the co-designing of a student challenge.

However, in this study, co-design also took different forms and on different levels than originally envisioned. The research questions in each of the respective neighbourhoods were created together with the energy transition initiatives and (junior) researchers, who formulated questions and explored directions not immediately evident to design researchers, which provided valuable insights into factors that can influence the co-design process. For example, the involvement of researchers who also had a background in psychology led to the investigation of social cohesion within neighbourhoods as regards participation. Similarly, junior researchers from the MA course Energy for Society explored

barriers and incentives to participation, as well as viable business cases for energy transition initiatives.

The multidisciplinary collaboration in this study shows that co-design practices do not necessarily need to be one-way, with non-designers having to be taught by designers how to practice (co)design. Conversely, design can also be informed by social sciences and other disciplines, who can provide insights that might not have been considered in a design approach but are nonetheless equally important and relevant to the research study.

7. Conclusion

This paper has explored the local context in which sustainability initiatives operate, by utilising social research to identify conditions that could influence co-design activities pertaining to the energy transition process in the city of Groningen, the Netherlands. Due to the COVID-19 pandemic, the original design-based approach had to be postponed. Instead, the duration of the social research studies was significantly extended, which allowed a broad investigation into various contextual factors in Groningen. Data were collected in four different studies, consisting of a general study and three studies aimed at specific neighbourhoods.

The analysis of the interviews using thematic analysis identified six themes relevant to local initiatives and practitioners who are interested in using a co-design approach to the energy transition. Issues surrounding communication were underlined by several respondents, particularly in relation to the lack of awareness and the exclusion of certain groups of stakeholders. Closely related were the barriers faced by the aforementioned groups, who are not motivated to participate due to the lack of a personal approach catering to their specific situations, interests, or priorities. A co-designed transmedia storytelling approach might be a promising way to both raise awareness and encourage participation in a manner that is appealing to each group of residents.

Research fatigue among both residents and initiatives is a well-known barrier to research in Groningen in general. The co-creation of the research questions contributed to the reciprocal nature of the study and strengthened the long-term relationships with the initiatives. Several concerns, these being a dislike of top-down approaches, expectation management, and power relations, are interrelated, as a lack of trust in (local) government can be exacerbated by poor expectation management and an imbalance in power relationships. The newly proposed Unified Citizen Engagement Approach, which is currently under development, aims to redress these issues by bringing the three main actors in the energy transition closer together, which offers hope of them better understanding each other's positions and interests, and of increasing the success of co-design methods and tools.

Remarkably, the switch to a social research-based approach has inspired, among other things, alternative ways of co-designing, from co-creating a transmedia storytelling

campaign to jointly formulating research directions. Perhaps this demonstrates that a (co-) design approach does not necessarily entail a formalised design process or an approach based on design methods: when its foundation is firmly rooted in the social context, design will find its way.

Acknowledgements: This research was funded by the European H2020 Research and Innovation programme under the Grant Agreement n°824418.

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About the Author

Cyril Tjahja is a postdoctoral researcher at the Research Centre NoorderRuimte, Hanze University of Applied Sciences. His research interests include design and social innovation, co-creation and co-design, pluriversal design, visual communication, Dutch design and material culture.