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Matters of concerns and user stories: ontological and methodological considerations for collaborative design processes

ABSTRACT

In this article, we lever on *matters of concern* (MoC) as a way to reflect on the articulation of collaborative design processes. We do this by focusing on an international project for the development of an ICT platform for energy management at the household and housing cooperative levels. We analyse retrospectively how the project development process captured and accompanied several MoC in two piloting areas, where all authors were directly involved. Our work contributes to the body of knowledge that builds on Science and Technology Studies (STS) scholarship to enrich the understanding of complex design processes. In particular, the paper goes beyond a descriptive take on MoC and provides ontological and methodological considerations on the use of user stories. Ultimately, the paper argues that scaffolding tools, such as user stories, can capture and convey MoC, and they can facilitate a transparent process of actor-networks alignment and emergence.

Keywords: Matters of concern; STS; ontology; methodology; drawing things together; user stories

1- Designing collaboratively in the era of energy transition

In recent years, the field of collaborative and participatory design witnessed an enlargement of the practice towards a more encompassing, public, and open orientation (Bødker 2015; Dittrich, Eriksén, and Hansson 2002). Researchers and practitioners embraced a conception of design as a complex, open ended and farther reaching process, where collectives of 'humans and non-humans' aggregate and come into play in the attempt to 'draw things together' (Ehn 2008; Storni et al. 2015). They engage with the most diverse issues ranging from social innovation (Hillgren, Seravalli, and Emilson 2011) to the formation of publics (DiSalvo 2009; Le Dantec 2012), from commoning practices to infrastructuring ones (Marttila, Botero, and Saad-Sulonen

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2014; Karasti and Baker 2008; Macchia, Poderi, and D'Andrea 2015; Bogdan and Mayer 2009), only to name a few.

In this context, designing collaboratively for delivering meaningful and empowering interventions calls for practitioners to explore renewed frames and concepts. These shall support them in the processes of meaning making and alignment of interests, which frequently happen at different levels of scale (*i.e.* local/global) and intervention politics (*i.e.* public, private, and hybrid). The contribution of this paper is placed at the emerging intersection of Science and Technology Studies (STS) and collaborative design practices (Storni 2015). Indeed, the twofold aim of this paper is to reflect on how the construct of *matters of concern* (MoC) can support the articulation of collaborative design processes in large projects, with multiple levels of administration, power and localizations, and how user stories come into play in such articulation. We do this by focusing on an international project for the development of an ICT platform for energy management at household and housing cooperative levels. We analyse retrospectively how the project development process captured and accompanied MoC in two piloting areas, where all authors were directly involved. In particular, as we argue in the next section, we go beyond a descriptive take on the construct of MoC by engaging with the following research question: how can matters of concern be enrolled in co-design processes to support a transparent work of actor-networks alignment and consolidation?

The paper is structured as follows. In the next section, we address MoC conceptually. We provide an overview of how its use is emerging in design literature and how different interpretations, beyond the descriptive one, might be used. Afterwards, we clarify the context for the case and the overall methodology that characterized the collaborative design work in two piloting areas. The details of each matter of concern

are presented in connection to the user stories that 'revealed' them, in Section 4. Finally, in the Discussion and Conclusion sections, we further elaborate on how the design method "user stories" can capture and convey MoC and support collaborative design at the ontological and methodological levels.

2- Matters of concern and (co)design

In 2004, STS scholar Bruno Latour elaborated on the distinction between *matters of fact* and *matters of concern* as means to provide ground for the critical appreciation of contemporary controversies (Latour 2004). The former hints at well-defined, identifiable and stable states of affairs, which are portrayed and perceived as objective. Basically, it reduces the world to concrete entities and it implies an ontology where things are knowable and manageable. The latter highlights 'things' which society is preoccupied with. These are characterized by "highly complex, historically situated, richly diverse" gatherings (Latour 2004, 237) whose objects of interest are uncertain and disputed (Latour 2005).

Recently, different ways to interpret and use the construct of MoC emerged in collaborative and participatory design literature. First, *as a self-reflexive tool,* MoC can help problematizing specific methodological or theoretical principles so to make them visible. For instance, the very notion of *participation* in the tradition of Participatory Design (PD) shows quite different insights and traits depending on whether it is approached as matter of fact or as matter of concern (Andersen et al. 2015). In the former case, efforts, processes and challenges of realizing participation in design interventions are largely unnoticed. In the second case, they are recognized and made evident. Thus, participation becomes central to a distributed, heterogeneous, and relational process that: deals with complex network configurations; extends its reach

beyond the collaborative design events; and calls for a constant articulation of challenges and inquiry of alternative configurations. Second, given that also objects have their politics and agency in society (Marres 2012), MoC can be conceived *as embedded in* or *expressed through design*. Indeed, objects or technology design can facilitate the articulation of problematic issues in ways that can be experienced individually and collectively, as well as convey the connections between the characteristics of the given issue and their broader implications or consequences. For instance, in their work DiSalvo *et al.* (2014) showed that it is possible to go beyond the limitations of the official and 'scientific' assessment of air pollution by enabling citizens themselves to monitor air pollution, to share their measurements and verify 'official' measurements. Third, *as a guiding orientation for design(ing)*, MoC emerged as a valuable construct for identifying problematic topic areas and contested societal issues. These can be located around the most diverse domains and issues: from the conflicting relationships between student life and public transports (Teli et al. 2015) to the contested appropriation of public spaces (Marttila and Botero 2016) or the complexity of dealing and coping with dyslexia (Menéndez Blanco and De Angeli 2016). All these cases showed how much the problematization of an issue, or the identification of an existing controversial issue, can be considered as channels for rich discussions and active participation throughout the design process, rather than hindrances.

We come back to the contemporary turn of collaborative and participatory design as a complex, open ended and farther-reaching process; and we highlight the consolidation of the link between design and STS: in particular, the appropriation of latourian

language and actor-network theory (ANT)[1]. Storni (2015) recently suggested three different perspectives to value this bond and to go beyond the descriptive nature that essentially characterizes latourian scholarship, MoC included. Briefly, the three perspectives are (1) *ontological*: the 'objects' of design are the actor-networks - relatively stable alignments of actors (human and non-human) that come into play and consolidate in connection to design processes; (2) *methodological*: the means to facilitate such actor-networks shall become public, transparent and visible. Thus designers are urged to repossess and to make visible the mapping of interests and controversies; and (3) *epistemological*: designers become agnostic facilitators and make of co-habitation their core standpoint instead of pursuing a 'better state of things' that is determined a priori. Referring back to our initial research question, we claim our interest to lie at the junction between the first two perspectives - ontological and methodological.

In the next section, we clarify the context of the R&D project, which is the basis for our case; and we outline its main actors and the methodological approach used to accompany the design process in two specific piloting areas.

3- Methodology and case overview

The energy domain is following a long-term process of transformation towards a decentralized, distributed and green paradigm (Rifkin 2011; Sovacool 2016). Several factors contribute to this process: (*i*) the awareness of the inherent complexities that exist among energy systems, societies and the environment (Bulkeley, Broto, and Edwards 2012; Umbach 2010); (*ii*) the widespread diffusion of new technologies and

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1 See, for instance, *CoDesign* special issue: "Designing things together: intersections of co-design and actor-network theory", vol.11, 2015.

their hybridization with contemporary ICTs (Putrus et al. 2013; Schick and Winthereik 2013); (*iii*) the pursuit of national and supranational energy policies around energy efficiency, sustainability and low carbon emissions (da Graça Carvalho 2012); and (*iv*) the emergence of new actors in the energy value chain, such as energy cooperatives and energy communities (Viardot, Wierenga, and Friedrich 2013), or the transformation of old ones, such as housing cooperatives and amateur energy managers (Hasselqvist, Bogdan, and Kis 2016).

The case discussed here pertained EU's interest to tackle the so called societal challenge of efficient energy and, in particular, to exploit ICTs for promoting new relationships among distributors, producers, intermediaries, and households towards a more sustainable use of energy in the domestic sector. This took the form of a three-year R&D project for the design, prototyping and real-life testing of "*ICT solutions able to reduce energy use and carbon emissions by levering on the potential of social networks and communities"*. As it often happens for these projects, the preoccupation of moving 'beyond the state of the art' was a concern that the EU, as funding agency, and project partners elaborated upon. Since the project originated in the entrepreneurial and innovation oriented environment of European Institute of Innovation and Technology[2] (EIT), social innovation and business dimensions became central. They were declared in a pre-defined set of three use cases, which we call *proto-stories* (PS). Each PS interpreted the concern of going 'beyond state of the art' in a specific way, and they all envisioned a combination of social media and energy data: (*PS1*) social energy comparison; (*PS2*) peer-to-peer energy sharing and new business models; and (*PS3*)

[2] https://eit.europa.eu/

collective or community drivers for energy optimizations.

From a practical point of view, we adopted user stories (Kankainen et al. 2012) as a tool to support collaborative design throughout the process; and they were used to facilitate alignment and discussions vis-a-vis with local stakeholders in the piloting areas and among project partners. Each user story identified a realistic scenario, the scope of the intervention, the supporting ICT tools, and the social dynamics underpinning the intervention. In this article, we reflect on seven user stories (see Table 1) that emerged at different points in time from a continuous work of drafting, deletion, refinement, and merging that took place during the three-year project[3]. Consequently, the initial and underlying proto-stories were considerably modified. The user stories tried to facilitate alignment among the involved actors (project and piloting areas' ones), they supported an understanding of intervention feasibilities and mapped progresses of work. Ultimately, they materialized in the prototyping of an ICT platform (Huang et al. 2019) deployed for testing in two piloting areas, one in the Trentino Alto-Adige region in Italy and the other in Stockholm, Sweden. A thorough analysis of the interactions that shaped collaborative design work during the various phases of the project are described in (Poderi et al. 2018).

Two electric cooperatives, producing and selling 100% renewable energy to their associate members acted as key stakeholders in Trentino Alto-Adige a region in northern Italy. The regional distribution system operator (DSO), representatives of two municipalities, two cultural local associations and the directors of two primary schools

[3] CIVIS Deliverables 1.1-1.3 include the most updated versions of the user stories at the end of each project year, and they can be found here: http://www.civisproject.eu/project.html

also participated as stakeholders in various phases of the project, by providing knowledge and support for technical aspects related to energy and households' engagement. At a practical level, stakeholders convened quarterly (six meetings) to work on the general purpose and technical design of the platform. Members of recruited households were involved in six focus groups, six co-design workshops, and three public presentation events. The user stories were used as basis for discussion or contextual frames for the activities. Ultimately, in this piloting area the platform materialized into a web-app designed to support household members in shifting their consumption loads towards timeslots characterized by high local production. Households' efforts were subsidized by the availability of an 'energy budget' to be managed and allocated collectively at the end of the trial period. In Stockholm, the project intervention took place in a central residential neighbourhood with mainly apartment buildings owned by housing cooperatives. Initial key stakeholders that were involved in the user story creation were housing cooperative board members, households from the cooperatives and a local energy initiative. Later, a more extensive analysis of interesting stakeholders for future engagement was conducted, which is described in (Hasselqvist and Eriksson 2018). The first part of the design process included participation in meetings with the local energy initiative and meetings with four housing cooperative representatives to discuss the initial user stories. Based on the user story work, we created a design proposal for an energy app, which was discussed in a focus group session with three amateur energy managers from the cooperatives. The proposal developed into a functioning energy app, and we held app sign-up and feedback meetings with representatives and members from six housing cooperatives when a first version of the app was launched. The energy app we provided aimed at

facilitating both building and household-level energy reduction actions.

4- User stories and matters of concern around ICT for community energy management

In both pilot areas, the engagement and collaborative activities, which were pursued to align local stakeholders' expectations and project intervention objectives, touched upon a multitude of aspects at different levels: general visioning; technical feasibility; social, economic, and energy impacts; and practical implementation. However, certain issues catalysed everyone's attention and efforts more than others did. We briefly present them here as MoC, because in line with our previous definition: they touched upon issues, which stakeholders seemed quite attached or sensitive to, and they were characterized by actors' specific stances on the issues and their understandings thereof.

We introduce each MoC in connection to the user story that revealed or triggered it, as summarized in Table 1. As the table shows MoC do not necessarily map one-to-one on

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user stories. They can also emerge out of different user stories.

Table 1 Overview of user stories, their connections with the original proto-stories and the MoC. "TN" and "ST" identify the stories for Trentino in Italy and Stockholm in Sweden, respectively.

ID (link to proto-story)	**Short description of user story**	**MoC**
TN1 (PS1)	To trigger knowledge sharing and peer pressure about energy practices and 'good behaviours' by enabling enhanced energy data visualization (own individual data and comparison data) through project platform.	*Qualities of Energy Data*
TN2 (PS2, PS3)	To investigate households attitudes toward social use of energy savings (or surplus), through the simulation of a gamified scenario where households with PV panels could decide how to share their own energy production.	*Mechanisms of Energy Sharing*
TN3 (PS2)	To explore the feasibility and usefulness of a system for automated appliances management, which supported shifting of electricity demand to meet households' defined energy targets and allowing PV panel owners to share energy.	
TN4 (PS2, PS3)	To support demand side management (DSM) with a Time-of-Use signal and a participatory energy budgeting process with the goal of matching households consumption peaks with cooperatives' production ones and collectively manage the associated savings (an 'energy budget' to be used as a solidarity fund).	*Value of Energy Saving*
ST1 (PS1, PS3)	To provide households in apartment buildings with energy saving technologies (*e.g.* smart plugs, automated taps and energy efficient shower handles) and influence energy use by providing detailed energy use feedback linked to social media.	*Moving beyond State of Art*
ST2 (PS2)	To create a sense of community and shared goals among households through an online energy reduction challenge, as a way of exploring incentives for sharing energy.	*Incentives for Sharing Energy*
ST3 (PS3)	To support housing cooperative members, particularly those managing the cooperative, in understanding building-level energy use and possibilities to reduce the energy use of their cooperative, through a system for sharing energy use data and experiences of energy reduction actions. Sharing takes places within and between housing cooperatives.	*Sharing Energy Experiences*

Since energy practices, legislations, and citizen associations for energy use vary between the two countries involved, we will present each matter of concern separately, and we will subsequently discuss them together.

4.1- MoC in design infrastructures - Trentino

In Trentino, four user stories were produced and used to identify and implement the project intervention for this pilot area. Three MoC characterized the debate around one or more user stories. These MoC all concerned specific and relatively technical aspects of the infrastructure supporting the ICT platform design. We labelled them *qualities of*

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energy data; *mechanisms of energy sharing*; and *value of energy*.

"Qualities of Energy Data" refers to one of the earliest matter of concern that emerged. The intervention proposed in user story TN1 focused on enabling enhanced energy data visualizations to support awareness and improvements of energy behaviours. The availability of energy data was a paramount prerequisite for realizing this. However, project stakeholders had diverging ideas about energy data on different levels: their time granularity (daily, hourly or fifteen minutes intervals), their level (household and/or appliance levels), their measurement type (current, power or energy), and their availability. These diverging ideas accompanied the project activities for several months. Electric cooperatives were apt to provide access to their aggregate data and to try re-negotiating their metering data plans with third parties, in order to obtain higher granularity. The two main technical project partners vouched for additional monitoring devices as means to obtain, in a practical and timely manner, the proper data they envisioned for the platform infrastructure. At the same time, project reviewers questioned the accuracy and reliability of the data that the monitoring devices would produce for the purpose of impact assessments. Finally, a few participants from recruited households in the pilot raised their scepticisms about their data being appropriated by commercial third parties and their desire to preserve anonymity in connection to the processing of such data. After several consultations, even if it did not address all critiques, the compromise solution we settled upon was to adopt additional monitoring devices and to use their data in combination with the official, aggregate ones of the cooperatives.

Two user stories (TN2 and TN3) - very similar in the aim of the proposed interventions, but different in the way to implement them - revealed "Mechanisms of Energy Sharing"

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as another matter of concern. Both stories wanted to enable a peer-to-peer like energy sharing intervention. Here, prosumers (households with own PV panels) could share their electricity production directly with their neighbours. TN2 proposed to deliver a simulated experience through a simple game-like environment while TN3 proposed to rely on machine intelligence to automate energy sharing among households. As much as energy sharing was considered an innovative intervention to pursue, stakeholders brought their perspectives on the matter in the discussion. According to the local grid operator, energy sharing could have introduced grid stability and network management issues. For the electric cooperatives, the mandatory accounting of all micro-interactions of energy sharing would have scaled up to an unbearable administrative overload. At the same time, for household members it turned out impossible to agree on aspects such as who and how could benefit from the sharing of their own energy; or what kind of incentives would there be for PV panel owners, compared to non-owners. Furthermore, a great gap emerged between project stakeholders and local energy ones. The former addressed and conceived energy sharing as a technological and social issue. The latter emphasized it often as a legislative and regulatory issue. Therefore, despite the overall positive reception and preliminary activities, the two stories were ultimately replaced by a relatively simpler one (TN4) that proposed an intervention centred on the donation of energy. This would be made possible by a collectively managed energy budget collected through households' energy performances and supported by the cooperatives.

We labelled "Value of Energy Savings" a matter of concern linked with TN4. A time-of-use (ToU) tariff was envisioned in this user story as the main tool to subsidize virtuous consumption behaviours. We collaboratively worked out a tariff whose prices would be economically favourable for consumptions made during the optimal time of the day (from the point of view of electric cooperatives' local production) and, at the

same time, would hoard a tiny percentage of the price into an energy budget, for every kWh consumed in these optimal times. The electric cooperatives together with the project technical partners worked for a realistic tariff design in light of a possible future adoption. However, on the one hand, electric cooperatives wanted to estimate price bands and their values while making estimates for adoption and impacts as sound as possible. On the other hand, the technical partners wanted to model this tariff design and its estimates based on new, beyond state of the art, approaches that had no comparable outlooks. After several technical meetings, the only estimates found for a two price-band tariff had a very tiny difference between the two. Regardless, one cooperative considered this tariff design realistic enough to be developed further for the testing, while the other cooperative considered the price difference too marginal to serve the purpose of a subsidy. Similarly, from our perspective, the insignificant percentage that would be allocated for hoarding into the energy budget was problematic for supporting collective dynamics. Ultimately, the challenge of converging on the details of the tariff pushed us to opt for an alternative approach. We chose to use a ToU signal (*i.e.* red and green), rather than a ToU tariff, which allowed us to postpone the assessment of the energy savings' value until after the testing period.

4.2- MoC as design orientation - Stockholm

In Stockholm, three user stories and three MoC emerged. Here, the MoC were primarily connected to the general design goal of the ICT platform, and we labelled them *moving beyond State of Art*; *incentives for sharing energy*; and *sharing energy experiences*.

The first matter of concern that emerged in the context of Stockholm was "Moving beyond State of Art*"*. This is a concern among researchers in the society, and the ways in which this concern affected the other project deliverables and processes are

interesting to reflect upon. With many stakeholders involved in a project it is natural that the interests of different stakeholders are not always aligned, and state of art means different things to different research disciplines and stakeholders. The first Stockholm user story (ST1) is a good example of how this research project concern clashed with the needs and desires of households as intended users of the new technologies. The story, initiated by energy researchers, paints the picture of apartments equipped with lots of state-of-art sensor and actuator devices, such as smart plugs controlling electric appliances, automated taps and energy efficient shower handles. These are coupled with modern time-of-use ways of billing energy and an energy feedback app with possibilities of sharing energy reduction successes and experiences of the new gadgets on social media. While the participant households and housing cooperatives expressed some interests in the technologies described in the user story, they were not sure what value that would bring for the households, particularly since the residents' influence on energy is rather limited in apartment buildings and any savings would be small. This is in line with previous research on design of energy feedback technologies - *e.g.* Strengers (2014) - which raise issues regarding clashes between households' everyday practices and efforts to reduce energy use.

Another central MoC in Stockholm was "Incentives for Sharing Energy*"*. This concern originated in the project proposal's proto-stories, emphasizing social drivers to reduce energy use, and it was pictured in the form of donations of energy savings to others in a community. Taking a community perspective was also aiming to address the lack of direct benefits from energy reductions for the individual households and to provide a different type of incentive than reducing costs. This remained a central concern throughout the project, although it had to be adapted to the realities of energy regulations and practicalities in the local contexts. For Stockholm, this was initially

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explored in user story ST2 by relating individual households' energy reductions to a shared goal: to "save" enough energy needed to power a local school. Participants from the housing cooperatives liked the idea of households donating money saved by reductions in energy use to a local good cause and gave examples of specific community concerns that could benefit from donations. The donations from each family would be small, since the direct energy costs for apartment households are low and usually only based on electricity use, but adding up the savings from many apartments could make a significant contribution. However, as pointed out by researchers and housing cooperative stakeholders, since the aim was to significantly decrease the carbon emissions related to energy use it seemed contradictory to focus on apartment level electricity reductions when the bulk part of the energy use was managed by the housing cooperative. In Sweden, apartment owners are members of a cooperative that collectively, through an annually elected board, manages the cooperative's finances and building(s). This includes decisions that affect the buildings' energy use, mainly in terms of electricity for the shared facilities and energy for heating and hot water.

"Incentives for Sharing Energy" gradually evolved into another MoC: "Sharing Energy Experience*"*. Rather than sharing savings of energy reductions in monetary form, the focus moved gradually to sharing opportunities for energy reductions in the form of knowledge exchange. This is captured in user story ST3, which focused on sharing data about energy use in housing cooperatives and possibilities to collectively manage energy and reduce energy use by learning from neighbouring cooperatives. From the meetings and the stakeholder discussions of the user stories it became evident that managing energy on a housing cooperative level was essential for representatives of housing cooperatives, and it had close links to other energy-related needs and desires voiced by the residents. Although reducing energy use is desired, housing cooperative

board members often lack energy management knowledge and may not know *how* to influence the cooperative's energy use. Therefore, the story centres on an energy app for sharing energy experiences related to energy reduction actions already taken in other cooperatives, and sharing the energy impact of these actions. This app was also developed as a prototype and tested by the housing cooperatives. However, comparing energy use between housing cooperatives and understanding the impact of energy reduction actions is far from straightforward since many factors affect the energy use of a building. The housing cooperative representatives stressed the importance of "fair" comparisons that would enable them to understand if their cooperative was doing better or worse than other cooperatives and to identify relevant cooperatives to learn from. While completely fair comparisons were impossible to make, transparency in which factors affect the energy use of a particular building (*e.g.* number of apartments and type of ventilation system) became an important aspect of the app development.

5- Discussion

Dealing with issues that are difficult to resolve and that link with the multiple interests of heterogeneous stakeholders is common to many projects; and it can become particularly challenging in large-scale projects with different levels of intervention and politics (*e.g.* international/local or public/private). To work accordingly to the approaches and practices of collaborative design often means to be comfortable being amidst such challenges. Preserving or stimulating controversies may even be a relevant goal of, or a method for, designing collaboratively (DiSalvo 2012; Björgvinsson, Ehn, and Hillgren 2012). At least in part, socio-technical gatherings 'whose objects of interest are uncertain and disputed' and which bring about matters of concerns, can be regarded in both of our pilot areas as *clashes among the research ambitions, the 'real world' actors and their situated contexts* such as utilities, tenants, cooperatives of

various kinds. This is not to say that the researchers are naïve, but it rather indicates certain expectations (realistic or not) that the research funders and the researchers themselves have about future possibilities of technology such as the social implications of ICT in the energy domain. In the attempt to bridge those clashes, several boundary objects came into play. In this paper, we focused on the role of user stories, their developments and their relations with proto-stories and energy app prototypes. Furthermore, we regard the evolutions of such boundary objects, user stories in particular, as tightly connected with the matters of concerns which we identified.

Differently from recent literature where an overarching matter of concern is either adopted as a reflexive tool, expressed through design, or used as guiding orientation, we showed that multiple and different types of MoC can emerge, evolve, resolve, or diversify within the same, yet complex, project. For instance, the desire to bring about an energy intervention that would be beyond the state of the art moved from the project partners' network to the local network of Stockholm. However, for the local network in Trentino, this issue did not consolidate as a relevant concern. Furthermore, the concern around energy sharing emerged as relevant for all stakeholders' networks involved, but took its own specific shapes in each of them. Among project partners and in the project proposal this concern was envisioned as a peer-to-peer energy-sharing model. In Trentino it consolidated as a concern around the actual mechanics of the sharing, while in Stockholm the incentives for the sharing garnered more attention. An interesting evolution in Stockholm was also the transition towards a new, different kind of sharing, which continued to stimulate the debate: from sharing energy per se to sharing knowledge, experiences and best practices about energy. We stress the importance for co-designers and researchers to be alert about the possibility for MoC to emerge at different levels in the design processes and to provide scaffolding tools (user stories in

our case) accompanying the MoC, rather than hiding or neglecting them.

Menéndez and De Angeli (2016) highlighted public awareness, technological instruments, emotional load, and certification processes as some examples of MoC that attend to interventions in the case of supporting technologies for people affected by dyslexia. In a similar manner, we can indicate issues such as quality of energy data, mechanisms and incentives for sharing, value of energy, and sharing energy knowledge as MoC. These might be regarded as relevant for those interventions that target reduction and shift of energy consumptions, which have energy sharing as the driving design objectives and involve cooperative or collective forms of energy governance.

As contribution to a view of MoC as a guiding orientation for design, we add the following methodological consideration: the coming together of actor-networks around complex issues, which consolidate as MoC, can be expected in collaborative design processes. In our specific case, employing user stories was a valuable scaffolding tool for the articulation of collaborative work among different groups of actors, including researchers from various fields, and at different points in time. Furthermore, since all stakeholders engaged with the same categories of user stories (in the pilot sites and in the plenary venues of the project) the process and the debates on the technical issues of the intervention became transparent for all. Here, a parallel can be drawn with the idea that MoC can be conveyed or expressed through design and design artefacts. We believe that, similarly to design outcomes, the artefacts generated in the process (*i.e.* user stories) can capture MoC implicitly - *e.g.* "Qualities of Energy Data" in TN1 - or can convey them explicitly - *e.g.* "Sharing Energy Experience" in ST3.

In short, we argue that MoC can support collaborative design - ontologically - in its endeavour of nurturing socio-technical gatherings that are busy in 'drawing things

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together' and - methodologically - by turning design artefacts (*i.e.* user stories) into a scaffolding tool for the transparent alignment of such socio-technical gatherings.

6- Conclusions

Co-design literature has recently approached the STS construct of matters of concern in different ways (*e.g.* as a self-reflexive tool or a guiding orientation for the practice). In this paper, we argued that MoC can bridge co-designers' efforts to facilitate the transparent emergence of actor-networks - by means of traceable and shared mappings of interests and controversies (Storni 2015). We followed the emergence of concerns as they unfolded in connection to the prototyping and testing of an ICT platform for energy management at household and housing cooperative levels. At the ontological level, we showed that MoC accompany the emergent collectives of 'humans and non-humans' as they attempt to draw things together. Methodologically, we showed that user stories are a relevant scaffolding tool for the transparent and public alignment of such socio-technical gatherings.

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