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The aesthetics of more-than-human design: speculative energy briefs for the Chthulucene

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ABSTRACT

This paper is a theoretical contribution to HCI that considers the more-than-human (MTH) as an intrinsic part of human–computer interaction design. In particular, it focuses on MTH as central to responses to the climate crisis as manifested in energy-demand reduction and smart meters. This is explored by expanding on the notion of the 'design event', defined aesthetically as the patterns or conformation of unfolding and becoming of heterogenous human and non-human elements. It is with this version of the design event that the MTH can be more directly and effectively engaged. We do this with reference to environmental problems as signaled by Haraway's speculative future 'the Chthulucene' – a worlding for liveable futures. The paper views design briefs in HCI, and design more broadly, as problematics for exploring and determining aesthetic-possible pathways for invention, which necessarily involves MTH elements. Three interrelated design briefs are presented that propose how practitioners might go about addressing energy-demand reduction and metering and provide a set of guidelines on how to devise and write speculative more-than-human briefs. This, the paper argues, involves becoming sensitive to speculative MTH compositions where novel forms of 'sense making' orient alternative possibilistic – idiotic – relations to energy.

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1. Introduction

To be human is to be more-than-human. The human is constitutively more than itself, as so many authors – Alfred North Whitehead, Michel Serres, Bruno Latour, Donna J. Haraway to name some of the most immediately pertinent – have argued. In every human activity, from the most individual to the most collective, the nonhuman is present: even in the depths of our innermost dreams we are embroiled with physical surfaces, chemical compounds, and a multitude of microbes. It therefore comes as no surprise to note that HCI design practices, processes and outcomes are shot through with the more-than-human (MTH).[1] A panoply of bodies, technologies, natures, and environments all fold into, and play their part in, the heterogeneous emergence of a design. So far, so obvious.

However, this bald and basic account obscures a range of elements and moments that comprise the "design event". To deploy the term "event" in this context is to presuppose the heterogeneity of

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[1]See (Wilkie, 2010) for an ethnographic study of users as more-than-human assemblages routinely enacted as part of user-centered design practices in HCI.

the HCI design process, but also to signal other dimensions, not least the speculative and the aesthetic. As we shall argue, the process of making the more-than-human elements "cohere" entails "feelings" among those heterogeneous ingredients such that together they produce a "cogent" event.[2] This is an aesthetic process in which the diverse elements that comprise the event affect one another and combine or "synthesize" in a particular pattern or conformation. The cogency that emerges is not necessarily predictable, as the elements (including observers, practitioners, "users," etc.) that "synthesize" also change in the process. Put simply, we cannot portray these empirical moments as objectively representable: they are always already open, and we necessarily exercise a degree of speculation in accounting for them.

In this paper, we extend this broad model of the design event to explore how we can draw on a key element in the design event – the design brief – as a way of directly engaging with the MTH, the speculative and the aesthetic. Specifically, we wish to do this as a means of contributing to a potential future, one that evokes the hopeful possibilities of Haraway's (2016, p. 2) Chthulucene – "a timeplace for learning to stay with the trouble of living and dying in response-ability on a damaged earth," which strikes us as germane in the context of energy demand reduction.

In what follows, we begin with an elaborated outline of our perspective on the "design event," our understanding of generalized, or non-bifurcated, aesthetics and the place of the design brief in resourcing design practices. We then consider design research in the field of HCI especially approaches directed toward energy-demand reduction practices and energy communities. The paper then undertakes a more speculative exercise in which three briefs are devised and presented, each addressing a different aspect of possible MTH implications for, and involvement in, energy design practices as they are directed toward the prospects of energy use in the Chthulucene. Throughout, we address not only the MTH but also how this is entangled in the aesthetic (how relationalities between MTH elements are to be grasped and felt) and the speculative (how such "grasping" and "feeling" are open to potentialities).

On the basis of these reflections, we end by sketching a tentative set of guidelines on how to devise and write speculative more-than-human briefs oriented – always already awkwardly – toward the Chthulucene in order to resource more-than-human design and research practices in HCI as well as other design-related activities.

2. On the event of the more-than-human

The event can, and often is, understood as an occasion at which some sorts of difference take place, that is to say something changes as an upshot of the event (e.g., Deleuze, 1990; Stengers, 2000). For instance, novel technologies are developed and bring about new ways of doing things; food robots and microwave ovens supposedly make cooking easier and change gender relations in the home new desktop printing technologies occasion new shop floor typesetting practices and working relations and smart-phones continually transform how we communicate, consume information, track ourselves, whilst being tracked, and our data extracted.

These initial, albeit superficial, examples suggest a number of issues concerning the processes of eventuating difference. Firstly, the entities (or prehensions) that can take part in an event, or what

[2]The provenance of the term "more-than-human" lies in Sarah Whatmore's (2002, p. 162, 2006) materialist engagement, as a cultural geographer, with the ontologies of Baruch Spinoza, Whitehead and Deleuze as well as the field of science and technology studies where the notion of the nonhuman derives, in part, from actor-network theory and feminist approaches to the study of technoscience. Whatmore (2006, pp. 603–604) identifies four interrelated moves required to reanimate the study and making of worlds and societies irreducible to human agency, human needs and human interests, including 1) a focus on practice rather than discourse; 2) a shift of attention from meaning to agency and affect; 3) attention to "more-than-human modes of enquiry" where animals and technology, for instance, figure and have agency in socio-material change i.e. the "social," broadly put, is not a purely human achievement or interest; 4) from a preoccupation with identity politics to an engagement with knowledge politics involving the recognition of plural knowledge practices and communities and the distribution of expertise. Although broadly in agreement with Whatmore's position on the more-than-human, we view aesthetics, rather than affect, as the key register for feeling, experience and prehension from which affect (bodies with the capacity to feel and be felt) emerges.

Whitehead (1978) would also call an actual occasion, are profoundly heterogeneous both in type and scale: people, materials, technologies; sub-atomic particles, animal bodies and solar phenomena. The event is thus constitutively more-than-human. In coming together and combining (or concrescing), these prehensions affect one another: their qualities can change in the process and specificity of their concrescence, thus altering the very character of the event itself. For instance, a focus group or participatory design event can become an ironic game among participants as they interact or transform into a quasi-therapy session as the researcher is drawn into unforeseen topics raised by participants (Michael, 2021). According to Whitehead (1978) and Latour (1999), the event is becoming or emergent and as such needs to be understood to be propositional insofar as it "proposes" potential outcomes.

One upshot of this is that to observe or run a research or design event is also to be a part of an event, and thus to be open to change oneself. Indeed, to enact the event becomes a speculative act: one cannot grasp it in any straightforward way if one is oneself emergent from it. The key point here is that such more-than-human events are necessarily open and our relation to them is necessarily speculative. In this respect, when we attempt to grasp an event, we are proposing (a) particular version(s) of it.

A second dimension to the event concerns the inter-relations among the ingredients – the prehensions – that compose the event. Drawing on Serres' notion of a philosophy of prepositions (Serres & Latour, 1995), we can explore the sorts of relationalities through which prehensions co-habit, connect and combine. This suggests that in concert with the idea of propositions, we need a sense of prepositions: if the former implies an unfolding toward the not-as-yet, the latter highlights that this is shaped by the relationalities that comprise the unfolding event. Needless to say, given the discussion above, the notion of preposition also connotes the relationalities entailed in the embroilment of the researcher/designer in the event.

Related to this idea of prepositions as an attempt to capture the heterogeneous relations that connect ontologically disparate elements (Serres himself resorts to such figures as Hermes and angels), is Whitehead's term "experience." This signals the relationalities among prehensions without specifying with any precision the character of those relationalities (specification depends on the particularities of the event and its prehensions and in any case will be propositional, that is, speculative).

Baldly, then, prehensions experience one another and form relations in an event. However, this is also a process of inclusion and exclusion. Within an unfolding event, prehensions are felt for and experienced, while others are rejected as the event unfolds toward some sort of conformation (or attains what Whitehead calls satisfaction). This observation yields a third point: every event is at its core aesthetic where, as Steven Shaviro (2014) frames it (p. 61), "… aesthetics are universal structures, not specifically human ones" and beauty is "the internal conformation of the various items of experience with each other" (p. 78). Put differently, events are always aesthetic and felt before they are known. This is a point worth noting in the context of the fields of, user-centered, human-centered and human–computer interaction design where knowledge practices typically downplay or disregard such aesthetic processes, or else take on a version of aesthetics reduced to bifurcated human criteria of beauty, judgment and value. The more-than-human, therefore, necessitates a more-than-human aesthetics (Sehgal & Wilkie, forthcoming) to appreciate processes of experience and feeling immanent and fundamental to all ontological processes of becoming and individuation, generalized across all entities and phenomena. Thus, in stark contrast to "modern" aesthetics, variously predicated on the work of Alexander Gottlieb von Baumgarten and Immanuel Kant, we do not view aesthetics as a human or social concern, capacity or privilege, i.e., as a matter of human perception, judgment and criteria of beauty: for us, aesthetics is a matter of ontology, vice-versa.

Let us abstract the various features of this version of the event. It is always already more-than-human, entailing the combination or concrescence of heterogeneous elements or prehensions that (prepositionally) relate to and affect one another to propositionally yield an unfolding (aesthetic)

conformation that we can only address speculatively. No doubt this is quite an eyeful, but it allows us to propose a number of empirical engagements with the design research event (and more specifically, the design brief).

3. On the design research event

We take the "design research event" to be the process whereby a designed artifact, experience, interaction, setting, platform or service, etc., is developed and sociomaterialized (in the sense of bringing together into some conformation a more-than-human array of entities).[3] Design, as a discipline and a territory of disciplinary practice (e.g., the studio), is, we have argued elsewhere, a center of synthesis. Contrasted against the laboratory as a center of calculation (Latour, 1987), the design studio, in its many manifestations, both entails particularly heterogeneous ingredients and is set upon synthesizing them together in design practice, process and product (Wilkie & Michael, 2015).

With regard to this event of synthesizing practice, and drawing on the previous discussion of the event, we can point to the following issues in engaging with the design research event.

(1) To bring heterogeneous elements into the design process is not an innocent empirical process of introduction and integration. "Bringing into" is itself an event which can affect those elements, re-shaping some, excluding others. In other words, the "reality" that enters into the design research event is in its own right becoming even as it is recruited into the design research event (see Law, 2004). As such, what the designer believes enters the event is not necessarily what actually enters (even if we can only ever speculate on what it is). This means that we need to be hesitant and speculative about the elements that comprise the design research event (including the "character" of the human actors).
(2) The prehensions (including the designers themselves) that come together in the design research event co-become, re-doubling the sense of emergence. As the design research event unfolds, so it propositions particular possibilities that as with prehensions remain opaque. This means that it is important to be sensitive to the complexities and difficulties that pertain to what it is that the design research "propositions".
(3) Such propositions emerge out of the synthesis of the various elements (that might typically be recounted as, for example, circuits, code, visual and coding design software, user interfaces, data infrastructures, 3D printers, studio arrangements, funding and resources, "designerly" capacities and relations, and so on and so forth). This is an aesthetic process as this synthesis yields a conformation in which elements are included and excluded, central and marginal, more and less subject to change. This means that we need to think about what prepositions might be invented most usefully to address the relations among the heterogeneous elements of design research event and their synthesis.

Given the limited space, we have decided to consider these three concerns – the array of elements that enter, the prepositions that address relations among those elements, and the propositions that emerge in the synthesis of those in relations – in one particular ""phase" of design, namely the design brief. In the next section, we discuss the design brief in the context of design practices, before

[3]The notion of "event," inspired by Whitehead, Isabelle Stengers, and Mariam Fraser (2010), and elaborated on here to articulate more-than-human design as a pluralistic, heterogenous, speculative and immanent becoming has been variously employed in design in relation to: the analysis of situated design practices in user-centered design and HCI (i.e. ethnographic interviews, personas and prototyping: Wilkie, 2010, 2014); the analysis of engagement events in Speculative Design (Michael, 2012c); the development, design, deployment and analysis of inventive methods in HCI including social media robots (Wilkie et al., 2015) and probe workshops (Michael et al., 2018); designing with "nonhuman others" (Jönsson, 2015); and Research through Design (RtD) approaches to HCI (Gatehouse & Chatting, 2020). See Michael (2021) for the notion of "research event" in the context of social research.

illustrating how this might be understood in terms of our version of the design research event as this is applied in doing design research for energy demand reduction in the context of a speculative future, Haraway's Chthulucene.

4. Design briefs

Curiously, the design brief receives little attention in design literature, not least accounts of HCI practices, projects, and designed outcomes. This is despite its significance as a resource in commercial and industrial design practices as well as pedagogy and design research. Far be it for us to deliberate on why this might be the case, but suffice to say, and at base, the design brief is typically a written statement or instruction, devised at the formative stages of the design process that sets out the aims, objectives and scope of a design task; outlines the constraints and obligations of the design process and its deliverables; specifies the context of or setting for the outcome, its application, as well as indicating the various actors involved and implicated, including their interests in the design, such as patrons, clients, producers, technologies, putative users, and so on. In HCI discourse, the relative absence of references to briefs might in part be due to the use of the term "system requirements." This seems to be a more common term among HCI practitioners, and in this context, accounts of design practice more generally address the brief in terms of its heuristic role in educational settings or as part of commercial, industrial or research practices, and is typically associated with the role and nature of problems in design processes (e.g., Dorst, 2006; Hansen & Halskov, 2018; Kelley, 2020). Here, briefs might be understood, following Hatchuel (2001, p. 6), as heuristic scripts which cannot be overdetermined by, nor reduced to, problem solving, but rather as processes "designed to generate new concepts and problems," that, echoing Dorst (2006, p. 13), continually emerge in design processes.

Having said this, and in view of our discussion above on the design research event, a number of inter-related points can be drawn out in terms of the role of the brief in how designs are socio-materialized, and how briefs bring about and enhance existing, and novel, territories of practice. Here, we present a particular view of problems. Although the brief can be seen as an encoding of a design problem, we see briefs as the (often vague, but sometimes clear) inscription which initially sketches possible parameters, the potential elements to be composed and the prospective character of certain outcomes. The brief constitutes a "problematic," dramatizing a situation wherein propositions and prepositions are given their first airing (even if they subsequently change) and redefined in relation to one another, albeit tentatively. That is to say, briefs, as a certain kind of design problematic, structure a set of propositions and prepositions and offer pathways, or vectors, for the creative experimentation with and determination of problems and the creation of the new.[4] The primary imperative of the design brief is therefore ontological rather than epistemological as it demands the craft and cultivation required to bring the new into being. If the studio provides a locale for synthesizing heterogenous elements into designs, the design brief, as the encoding of a problematic, can be understood as a script, or score, that schematically and tentatively sets out the scope, identity and nature of such elements involved in design as well as the purpose for and nature of their composition, that is, the inter-relations of elements. As such, design briefs are "possibilistic" scripts that set out the problematic parameters for determinations into the aesthetic-possible that demand a transformative engagement with a particular situation.

Accordingly, design briefs operate not to overdetermine problems but rather to set the stage for what we might call, after Mariam Fraser, "inventive problem-making," where the problematic takes flight in certain routes through and with design practices that synthesize propositions. To paraphrase

[4]For a discussion of the notion of "problematic," its provenance in the work of Gaston Bachelard (1949) and its significance in twentieth-century French philosophy, notably Gilles Deleuze's affirmative revival of the problematic staging problem creation see (Maniglier, 2012). The recent Theory, Culture, Society special issue "Problematizing the Problematic" (Volume 38, Number 2, March, 2021) edited by Martin Savransky (2021) renews enquiries into the nature of problems and the problematic in relation to contemporary social, political and environmental concerns and knowledge practices.

Fraser (2010, p. 78), the "obligation here …" is to "… try to enable it [the design problem] to 'speak' or to pose it in terms that enable it to play itself out in productively creative ways." Thus, rather than ready-made negative obstacles to be overcome by "herculean" (Deleuze, 2001, p. 158) design efforts, design problems are fabricated and posed in the design process and, in part, activated by the problematic of the brief. If we are to take the more-than-human seriously, and not simply historicize it as a feature of contemporary technological "progress" (e.g., that interactive and computational technologies bring about other-than-human agency) then, as we outline above, all manner of living and non-living entities and phenomena count as the more-than-human and partake in the design event, *including* design briefs, problems, and ideas with their own peculiar manners of existence and becoming. After all, it is often the case that the brief itself gets re-written and recomposed as the design event plays out, bringing into being the prospect of new problems and new responses.

Furthermore, and contrary to Dorst (2006, p. 15), to say that (design) problems have their own mode of existence in the design research event suggests that they have an ontological status that cannot be reduced to or limited by human discourse, even if problems typically undergo narration and articulation in briefs or require spokespersons. One upshot of this is developed by Martin Tironi and Pablo Hermansen's (2018) account of interspecies prototyping between the Chimpáticos and the chimpanzees Judy and Gombe at the National Zoo in Santiago, Chile. Accordingly, non-human animals, as ethologists will appreciate, routinely encounter and entertain their own problems, such as living entirely in captivity, and such problems may or may not "concern thought or knowledge at all" (Savransky, 2021, p. 11) but are a basic feature of day-to-day existence. To say that animals have their own problems also opens the way for the acknowledgment that the non-sentient (such as trees and fungi, see Tsing, 2013) and the non-living also have and endure their problems which find expression and typically exist outside discourse and representation (see also: Despret, 2016). It also insists that problems are first experienced and felt, whether or not they come to be known. Witness climate scientists who have learned to become sensitive to the vulnerability and devastation of species and ecosystems by using sensing, measuring and visualization technologies. That is to say, problems are first and foremost sensible occasions and an intrinsic part of more-than-human experience, broadly speaking. For Isabelle Stengers, crafting and re-inventing new ways of more-than-human living together in the face of ongoing socio-environmental disaster pose one of the critical tests of our present: a situation of problematision unmistakably crying out "It matters!" (Stengers, 2021, p. 85) for designers to participate *in*, experiment *with*, and effect transformation.

5. A coda on the Chthulucene and energy

One obvious environmental concern is the reduction of energy use. Various suggestions and solutions have been put forward though often these presuppose certain social and infrastructural conditions. Increased energy efficiency mediated through HCI-designed smart homes presumes particular types of energy grids, patterns of consumption, socio-material and familial arrangements, as well as the identity and skills of what Strengers (2013) calls "resource man." However, beyond this array of assumptions lie wider imaginaries – those associated with the Anthropocene most obviously. For Haraway (2016) the Anthropocene, along with the Capitalocene, entail "too-big players and too-big stories of Capital and Anthropos" (p. 55). On the one hand, these point toward both particular solution(ism)s, and, on the other, they evoke a mixture of cynicism and defeatism. Instead, she proposes a speculative future, the Chthulucene. This is inherently more-than-human, a multi-species lateral connectivity or tentacularity in the process of becoming where "… human beings are with and of the earth, and the biotic and abiotic powers of this earth are the main story" (p. 55).

What the Chthulucene hopefully affords is "nonarrogant collaboration with all those in the muddle" (p. 56), a making of odd kin with others who are more than ancestral or genealogical, who might be neither individuals nor humans but are nevertheless persons (Haraway, 2015, p. 161). In composing these multilateral, heterogeneous connections, there is both a "join(ing of) forces to

reconstitute refuges, to make possible partial and robust biological-cultural-political-technological recuperation and recomposition, which must include mourning of irreversible losses" (p. 101).

Within the grand speculative scenario of the Chthulucene, how do we situate something as seemingly mundane as designing for energy reduction? In several ways, this is not such an enormous task, especially when we note that we share a Whiteheadian ethos with Haraway (see Haraway, 2000). Thus, designing for the Chthulucene means: being attuned to the more-than-human, being aware of the processes of emergence, the propositional nature of design research, and the centrality of speculation; resourcing ways of enacting prepositions that engage the complex, emerging that relationalities among design elements (one way in which Haraway refers to this is as a "muddle," e.g., Haraway, 2016, p. 55). But further, there is a hopeful dimension that Haraway adds to counterbalance the pessimisms of the Anthropocene: a willingness to conjure refuges that are a counterpoint to the seeming evidence of inevitable and irreversible loss. In light of this, for the designer it minimally means thinking about how to enable participants to proposition future refuges in which energy is consumed and to provide the resources to explore the prepositions that enact MTH relationalities in which energy use can be advantageously reconfigured.

6. Energy communities

One such domain in which the test of our socio-environmental present is surfacing is the problematic of energy-demand reduction in the UK, which comprises the backdrop of the present paper. More specifically, this has involved developing policy measures that could support local community level implementation of low carbon technologies to supplement macroeconomic (e.g., designing and regulating carbon markets) and individual consumer (e.g., enacting behavior change through domestic smart monitor rollout and use) interventions. In this context, and between 2011 and 2012, the UK Departments of Energy and Climate Change (DECC) Enterprise, Trade and Investment (DETI), the Welsh Government and the Department for Business, Innovation & Skills (BIS) distributed £10 million among 22 low carbon "test-bed" communities through the Low Carbon Communities Challenge (LCCC). The purpose of the funding was to support learning from the implementation of low carbon technologies, notably the investigation of sociological models of behavior change, or "nudge," among the communities. As the LCCC evaluation report outlines, 8,206 low carbon measures were delivered as part of the project, including biomass district heating, solar photovoltaic (PV) installations, air and ground source heat pumps, wind turbines as well as evaluation and infrastructure projects such as low emission car clubs.

To further support the ambitions of the LCCC to contribute to the 2009 UK government target of 39% carbon reduction and the renewable supply target of 15% by 2020, the Research Councils UK (RCUK, now UKRI) initiated a further program of research into energy communities, funding seven projects that aimed to evaluate and report on the communities who participated in the LCCC and explore further community developments. As part of this, and the focus of this paper, the "Sustainability, invention and energy demand reduction: Co-designing communities and practice" (ECDC) project, worked with a set of communities in England to explore and intervene in community energy demand reduction practices and raise issues about the nature of socio-technical environmental practices.

An evident problematic feature of energy demand reduction and the achievement of low carbon living in the UK, and likely elsewhere, have been the marked deficiencies of environmental market economics (see, for instance, Doganova & Laurent, 2019; Lederer, 2012) and the disputed efficacy of electricity feedback and monitoring technologies predicated on behavioral intervention, as well as its underlying assumptions (Dietz et al., 2009). Here, scholarship has provided substantive evidence of the problems wrought through attempts to provide sociotechnical solutions, where feedback technologies, for instance: give rise to the "boomerang effect" (Schultz et al., 2007) where apparent savings spur increases in energy use; remain oblivious to the sociotechnical settings of energy practices (Hargreaves et al., 2010; Shove, 2003), and drastically simplify the complexity and nuances

of persons figured as energy consumers (Strengers, 2013) through their translation as rational, reflexive and calculative users. Minimally, the more-than-human invites us to at least consider the complex nexus of sociotechnical and corporeal relations that provide a "thicker" account of energy users, communities and practices where carbon accounting technologies "co-articulate" the concurrent enactment of politics, economics, innovation and the environment (see, for instance, Marres, 2012). Merely *accounting* for carbon accounting technologies, however, underplays or skirts the situation at hand – climate and ecological disaster – that demands "response-ability to engage with unexpected others" (Haraway, 2015, p. 164) and the experimentation with the possibility of more-than-human transformations and the care for their (energy) practices, either existing or those practices to come.

Against this backdrop, the ECDC project set about engaging with a number of energy communities in England through participant observation, probe workshops (Michael et al., 2018), social media bots (Wilkie et al., 2015), rescripting workshops (Wilkie, 2019) as well as the design and three-month field deployment of 36 "Energy Babble" interactive devices (Gaver et al., 2015). In so doing, the project team, an interdisciplinary combination of designers and STS scholars, brought together a diverse set of interests and sensitivities, notably a "research through design" approach to HCI (Gaver, 2012) and the empirical study of "social" processes rooted in STS, and not indifferent to design practices themselves (e.g., Michael, 2012a; Wilkie, 2014). Equipped in this manner, the aim of the project, put briefly, was to investigate and explore the core assumptions across the energy landscape, so to speak, the actors (direct and implicated), entities and phenomena involved as well as the kinds of social, technological and environmental practices at play in energy communities. Thus, the specific problematic of the ECDC project concerned the more-than-human heterogeneity of "community" as enacted in and around specific issues (e.g., agricultural sustainability, inner-city deprivation and energy literacy, local awareness, etc.) and the (technological) practices afforded by such lived community experiments in energy demand reduction where, and to draw on Patrice Maniglier (2019, p. 12), "the ontology of a(n) …" energy problem is "a pragmatic ontology whereby to *be* does not mean to be *finished* but to be *in the making*."

To abstract from the foregoing, we provide the following summary "sequence" as the brief emerges and informs within the design research event:

(1) Our design briefs will need to substantively address the array of energy-reduction MTH ingredients that prospectively combine to comprise the design problematic. Thus, we might ask: what might be the inter-relations between these ingredients and how can they be enabled by thinking, feeling and acting prepositionally.
(2) The combination or concrescence of MTH ingredients unfolds toward a not-as-yet satisfaction. However, this simultaneously entails a number of "other" ingredients that are excluded, and also alternative prospects (satisfactions) toward which that concrescence is not oriented. Accordingly, we might ask how a design brief can propositionally enact these others in the sense of marking how they structure the MTH concrescence through their absence or exclusion. Specifically, what design and technical options for energy demand reduction (e.g., energy monitors) and versions of the future (e.g., Anthropocene) are being othered, excluded or absented.
(3) Pulling together the pre- and pro- positional elements of the design research event, we can positively enact the brief (or "system requirements") that lay out the relevant components and their concrescence as they unfold toward and begin to enact a particular speculative future (such as the Chthulucene). Here, we will need to be sensitive to the ways in which the brief remains emergent (as it encounters new MTH opportunities and possibilities as well as resistances and recalcitrances, not least as ingredients mutually shape one another). Specifically, we will need to be attuned to the sorts and patterns of prospective relations – or pre-propositions – that the brief implicates (say, between designers, energy communities, technologies and infrastructures, government policy, alternative energy futures).

Above sequence was placed in scare quotes. This is because we do not envisage these elements of our MTH version of the design brief as being temporally linear. Rather, they intersect and conflate in the "muddle" of the design research event. We disambiguate them for the purposes of exposition – in the concrete process of doing research, things are altogether more gloriously messy.

7. Idiot meter: three design briefs for the Chthulucene

Against the idea of "smart meters," and their troubled rollout and use, we counterpose the notion of *idiot meter* as the principal problematic orienting the following three design briefs. In keeping with the writings on the idiot in design theory and STS, the aim of the idiotic meter is to encourage explorations of how metering fails to "make sense" within the parameters of energy demand reduction, whilst making sense in other ways. Instead of purportedly offering instantaneous information on energy consumption and cost, thus expediting the figuring of the rational and calculative resource user, the idiotic meter has to do something other, something disorienting, ambiguous, playful (e.g., Michael, 2012b), thus slowing down the grasping achievement of rationality and implicating more-than-human users with likewise aesthetic capacities. As some studies suggest (e.g., Martin, 2020) sensorial or corporeal engagements with the environment, the home, technology and other humans can shape judgments about energy use, often to the sidelining of information from smart energy meters. Further, the senses and corporeal criteria of comfort (e.g., in relation to heating, lighting, or cleanliness, etc.) are themselves contextual (Shove, 2003). Shaped by infrastructural parameters and cultural norms, bodies and senses are affected in terms of what counts as "sufficiently warm or cool," as "properly illuminated" or as "appropriately cleansed". In relation to the Chthulucene, bodies and senses will need to be adapted to "refuges" in which energy is no longer plentiful, but also wherein new relations with MTH kin can emerge. In light of these points, the following briefs imply working toward an idiotic energy meter that playfully (mis)communicates sensorially while also challenging corporeal expectations and implicating emergent MTH relationalities. Here, we expect the meter to be variously interrogated and interpreted through engagements with the briefs and not reduced to a singular interactive electronic object for instance. Finally, the briefs have been written with research practitioners in HCI and design in mind, as well as students, as heuristic vehicles for engaging with more-than-human energy problems. Each of the briefs can be taken individually or engaged with as a sequence building toward a designed intervention.

7.1. *Locating the idiotic 'other' in energy settings*

Like smart meters, idiot meters are concretely located. This brief invites you to first situate your design investigation in a setting in which smart energy meters are currently used or propose an entirely new setting. Here, for instance, meters are typically installed in rented and private homes, workplaces, sites of leisure, organizations and institutions and so on, each of which implies a specific set of circumstances, users, communities and implicated actors. Likewise, meters that are imagined in unlikely or novel settings, such as a forest or a zoo, will carry different implications and articulate different communities. Second, and having chosen your setting, you are asked to empirically engage – ethnographic engagement, research probes, etc. – with the setting in order to explore what MTH entities and phenomena are included and/or excluded in your chosen setting. This is a twofold question of developing an inventory of more-than-human entities and phenomena implicated in energy demand in your chosen setting as well as sensitizing yourself to and detecting those that are absented or othered – there are always MTH elements that necessarily escape location, not least given their differential scale and temporalities. This is propositional task that relates to the "politics of aesthetics" as manifested in the process of synthesis in which the satisfaction of the design brief outcome can shape how the design ultimately impacts on energy demand reduction and energy communities. The aim of this brief is to produce a visualization of your idiot meter setting, a visual inventory of all the entities, phenomena and others that you detect in a fashion that renders the specificity of the situation, be it a diagram, collage, film, installation or map.

7.2. *Metering idiotic energy feeling*

For the Estonian naturalist and ethologist J. von Uexküll, parasitic ticks that feed off the blood of animals, can be defined, or metered, through three ways of feeling: the sense and sensing of light, smell and heat. Thus, like humans, the more-than-human involves sensing and feeling, and are capable of, if not defined by, aesthetic processes. In this brief, you are invited to explore the feelings and sensing of those more-than-human entities and others that you have identified in the first brief. In so doing, you may consider drawing out a number of energy-related examples from your visualization and, as with the tick, list the ways in which these actors feel – and perhaps feel with and for one another since feeling is a relational process. Thus, this prepositional brief concerns the forms and character that experience and the feelings that take place in relation to energy and in the face of energy-demand reduction. The aim of this brief is to produce a design workbook (Gaver, 2011) where you both document and detail the energy-related feelings of those MTH actors in your chosen setting as well as propose new ways in which these actors could feel in relation to energy-demand reduction.

7.3. *Prototyping idiotic energy feeling*

The third brief explicitly addresses the speculative question of the when, where and if of MTH energy communities and how the event of the brief elicits potential and emergence in those communities: how does the design brief both open itself and the energy communities up to, and simultaneously shape, the possibilities of the Chthulucene. To proceed with this pre-propositional exercise, you are asked to consider the inventory of MTH elements detected in brief 1 and the workbook of metered feelings produced as part of brief 2 and select a particular entity-feeling nexus with and through which to make a design intervention or to propose an entirely new entity-feeling that might enter into the setting you have chosen to work with. In direct contradistinction to human-centered design approaches, where persons are the focus of design efforts, here the putative user is decentered, completely displaced from your designs or an outcome, rather than given. In proposing your design intervention, you are invited to strengthen the speculative reality of your proposition by developing prototypes, mockups and/or visualizations, where appropriate deploying these designs in your selected setting, as well as a narrative, describing how your intervention occasions the emergence of new forms of energy feelings.

It will have been noticed that we have set up the three briefs as moving through, respectively, pro-, pre-, pre-pro positional "modes". This is in order to help cumulatively attune the designer to the "what" (inclusion and exclusion of heterogeneous elements), "how" (the complex inter-relations of elements) and "where/when" (the speculative not-as-yet that emerges from the design practice). Crucially, we have attempted to think the briefs as practical engagements that are multiple and complex and out of which the design in its openness sociomaterializes. This sense of emergence can be further reinforced through the following guidelines on how to devise a MTH brief for the Chthulucene:

(1) Site your design practice in a concrete milieu and engage with this empirically.
(2) Displace the human by detecting, prehending and representing MTH entities, phenomena and prehensions.
(3) Be agnostic and open to what enters into the design event and the prehensions this includes, for instance whether feelings are associated with a body, technologies or creatures.
(4) Learn to be affected (Despret, 2004) by your embodied (im)position in the setting you have chosen or the feelings you are investigating and exploring and gain an understanding of the effect of being affected. In other words, be reflexive as to your own becoming and feelings as a designer in the process – these matter.

(5) What new articulations of feeling are being made possible, how do these change the setting and what kinds of being-with does this involve, not least as a designer implicated in your design.
(6) Be mindful: the Chthulucene is a word designed to engender response-ability in troubled times, which for Haraway (2016, p. 1) is both a matter of peacekeeping and trouble-making – to care for what we inherit and to disturb by inventing new possibilities.

The point here is not to equip designers with a simple recipe for doing MTH design, but to trigger a sense of emergence in the designer as well as the design. In other words, these guidelines are heuristics whereby the designer "becomes" in the process of becoming entangled with the MTH, that is, of designing.

8. Concluding remark

In this paper, we have attempted to ground a more-than-human approach to HCI in the work of process-oriented scholars, and as such have emphasized a number of conceptual tools such as pre-proposition and aesthetics. We have tried to work these through HCI practice and illustrate how the development of design briefs might benefit from our particular version of engaging with MTH. Energy-demand reduction was chosen as the topic of the paper as it lies at the intersection of a number of concerns and efforts that link both HCI and approaches in science and technology studies sensitized to the more-than-human. To this end, we considered the development of briefs for an idiotic meter that orients toward the prospect of the Chthulucene.

The more-than-human not only presents a challenge to HCI, by way of user and human-centered design, it is also an opportunity. Insofar as MTH – as imagined here – invites practitioners to take seriously the agency of (computational) technologies in its creative and knowledge practices, it presents the radical imperative to revise the very images of thought and models of sociality that subtend design practices. However, and this point is crucial, we do not intend to render design and HCI practice epistemologically, ontologically or practically subordinate to the high theorizing of MTH by the likes of Whitehead and company (present authors included). Rather, we see design practice as introducing its own prehensions – MTH elements – into the event of MTH-oriented HCI design theorizing as conceptualized and articulated above. That is to say, design practice can open up – pre-proposition – the MTH-oriented HCI design theorizing in ways yet to be imagined.

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