

# Designing for emotional attachment to energy

James Pierce, Eric Paulos

*Human-Computer Interaction Institute, Carnegie Mellon University  
Pittsburgh, PA, USA, {jppierce,paulos}@cs.cmu.edu*

**Abstract:** Drawing on a diverse body of literature from philosophy, design theory and other areas we have been developing a perspective on *energy-as-materiality* and employing a designerly approach of *materializing energy* [1]. Building on a framework for approaching energy as materiality, we discuss several design explorations around emotional attachment to energy and frame issues for future work related to energy, emotion and sustainable interaction design.

**Key words:** *Sustainability, energy, design theory, interaction design, everyday practice*

## 1. Introduction

Drawing on diverse literature from the fields of philosophy, material culture studies, anthropology and design theory, among other areas, we have been developing a perspective on *energy-as-materiality* and employing a designerly approach of *materializing energy* [1]. Our work integrates critical inquiry and material design exploration in order to reframe individual and societal relationships with and understandings of energy by extending our relationship with energy beyond existing producer-consumer models toward ones that are more engaging, meaningful, and emotional. Our research contributes to a growing set of discourses around sustainability and design. However, our work importantly challenges existing assumptions in design, such as that energy is centrally produced and distributed via large-scale power plants and electrical networks, and that energy is homogenous and undifferentiated from the perspective of everyday practice. Rather than assuming, for example, that “using less energy” implies “being sustainable”, our research aims to propose alternative ways of being sustainable and sustaining our being through design. In this paper we focus on one key aspect of our ongoing work related to energy and materiality: designing for emotional attachment to energy.

## 2. Approaching energy as materiality

In prior work [1] we proposed a simple framework for designing interactions with energy-as-materiality: (i) **collecting energy** (generating/producing), (ii) **keeping energy** (storing/maintaining), (iii) **sharing energy** (transmitting/distributing), and (iv) **activating energy** (using/consuming). A primary intention of the proposed framework is to expand on the ways in which we design interactions with and around energy. Designers typically design almost exclusively for consumption (activation) of energy. In large part, this is because the design of centralized energy systems does not require individuals to be concerned firsthand with the production, storage, and distribution of their energy. However, in this paper we choose to explicitly explore alternative design territories such as those that explicitly foreground more personal and emotional ways of engaging individuals with collecting, keeping and sharing energy in everyday life. The emergence of microgeneration from small-scale wind, solar and geothermal offers one of many compelling scenarios in which to design for collecting, keeping and sharing as well as activating energy-as-materiality:

It is likely that decentralized generation from homes and buildings, along with local power plant such as small-scale wind farms or district heating systems with CHP plant, will represent very different contexts for energy behaviour in the future. Deployment of micro-generation and smart-metering technologies will transform buildings into power stations and offer unprecedented opportunities for ‘in sight and mind’ energy systems. These devices not only challenge accepted ways of imagining or talking about energy generation and supply, such as the utility of the concept of ‘power station’ in a decentralized energy future...but are also likely to substantially raise the salience of energy issues in everyday life, making people more aware of how heat and power is generated, supplied and consumed, and closing the current awareness gap between personal energy consumption and the consequences of such consumption for environmental problems such as climate change. ([2, p. 72], originally cited in [1])

Such a scenario of microgeneration and energy decentralization offers many opportunities for designers to redesign our everyday interactions and practices with and around energy-as-materiality in terms of collecting, keeping sharing and activity. The terms collecting, keeping, sharing and activating are further intended to offer some conceptual distance from their more technically-oriented respective terms of generating/producing, storing/maintaining, transmitting/distributing, and using/consuming. We argue that designers can and should shape both emerging and commonplace technologies in order to re-shape our everyday practices and circumstances as experientially pleasurable, meaningful and sustainable.

### **3. Designing for emotional attachment to energy**

Previous work from outside of design, in particular work from the field of material culture studies, has investigated people’s relationships with and attachments to physical objects (e.g., [3,4]). Within design research focused on the areas of product design, interaction design and design theory a number of authors have investigated relationships among design, emotion, and attachment to everyday objects, some with an emphasis on promoting durable and sustainable interactive products (e.g., [5,6]. However, notwithstanding Backlund *et al.*’s work exploring energy as a material in design [7], designers and researchers have yet to engage significantly with people’s interactions and relationships with energy in terms of emotion and attachment. Our work adopts and develops a perspective on energy as *material culture*, with a focus on designing unique and particular energies and interactions with energies [1]. Approaching energy as materiality, specifically energy as material culture, allows us to propose and investigate novel design research question around energy: How might we design for individuals to treat and relate to energy differently based on various ways of collecting, keeping, sharing and activating energy-as-materiality? How might individuals develop emotional attachments to particular energies through everyday practices involving collecting, keeping, sharing and activating energy-as-materiality? In what ways might individuals use energy more efficiently and effectively as a result of new practices with and attachments to energy? In order to begin to explore such questions conceptually and materially we present discussion around two scenarios for emotional energy in everyday life: (i) everyday energy collection and (ii) Energy Mementos. We briefly discuss each scenario in turn.

#### **3.1. Everyday energy collection: Everyday practice as a source of emotionally significant energy**

Our early thinking related to emotional attachment or connection to energy centered on the idea of collecting energy from everyday interactions and practices with which people are already engaged. However, rather than adopt a typical “energy harvesting” perspective dominated by concerns of efficient engineering and practical applications, our concern was primarily with how people might be emotionally connected to the particular sources and processes of energy collection and with the particular energies collected. This led us to create a

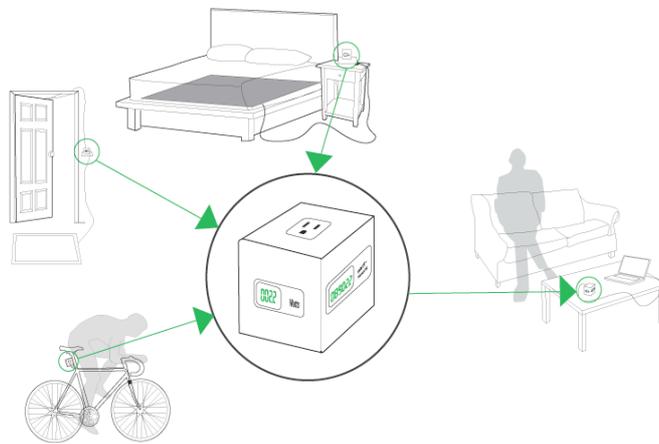


Figure 1. *Everyday energy collection*. How might people want to keep, share and activate different energies collected from everyday routine practices: Restless-sleep energy? Kids-jumping-on-the-bed energy? Making-love-in-bed energy? Entering-and-leaving-home energy? Cycling-to-work energy?

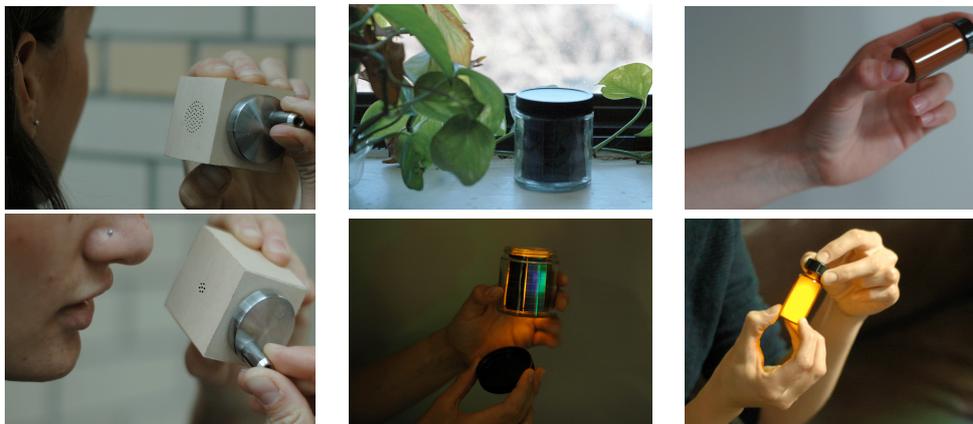


Figure 2. *Energy Mementos*. (Left to right) *Crank-Sound Box*. Turning the crank towards the microphone on one face of the box records sound using the energy collected from cranking; turning the crank the opposite direction collects energy that is immediately used to replay the recorded sounds through the speaker on the opposing face. *Light Jar*. The jar collects solar or other light energy; opening the jar activates the energy as a glowing light. *Shake-Light Bottle*. Shaking the bottle collects energy; removing the cap activates the light energy. (See [1] for further discussion of the Energy Mementos.)

number of different scenarios for collecting energy from everyday, routine activities—for example, linear motion from opening and closing a door (push/pull), rotary motion from riding a bicycle (pedal), and mechanical strain from stepping on a door mat or tossing in bed (press, bounce) (Figure 1). While the idea of collecting or “harvesting” energy in such ways is hardly a novel concept, little attention has been paid to the potential for designing new experiences with and around energy as a result of new ways of collecting energy. Our focus is not on the efficiency of the harvesting technology but rather on the emotional qualities created with and imparted to that energy as a result of its personal and intimate production. Modern energy such as electricity has overwhelmingly been designed and interacted with as totally *undifferentiated*; the energy used for lighting, heating, and charging a mobile phone are, from the perspective of use, essentially the same [1]. In contrast, designers might think about how people may treat certain energies and interactions differently based on the particular way in which that energy was collected. For example, an individual may use their commuting-to-work energy to charge their mobile phone, their entering-and-leaving-home energy to watch a movie once a month, and their making-love-in-bed energy simply to cherish as a keepsake. In the next section, we build on this last scenario to more deeply explore emotional attachment to particular energies.

## **2.2. Energy Mementos: Attachment to singular energies**

In previous work we introduced Energy Mementos as a way of discussing the “undifferentiatedness of energy” and the potential for designers to carefully craft the material-symbolic value of particular energies [1]. The Energy Mementos are small objects that allow individuals to collect small amounts of energy “within” the objects, for example, shaking a bottle or placing a jar in a sunny windowsill (see Figure 2). Rather than using the collected energy for some common utilitarian function, the Energy Mementos are designed with the symbolic function of activating the energy specifically in order to reflect on the energy itself and other memories related to the particular energy being activated. For example, one might give the energy that was collected by repeatedly shaking the Shake-Light Bottle to a friend or lover; the receiver may then activate the giver’s energy as a glowing light by removing the cap on the bottle. The Energy Mementos offer a radically different way of interacting with energy characterized by potentially deep, emotional connections with and attachments to particular “bits” of materialized energy.

## **4. Energy, emotion, and interaction design issues**

Our work related to designing for emotional attachment to energy and more generally our approach of materializing energy opens up a rich design space for re-designing not only how we use and conserve energy but also we interact with and relate to energy as thing. In closing we frame several issues for future work related to energy, emotion and interaction design.

**4.1. Designing aesthetic interactions with energy.** An obvious area for interaction designers to focus on in terms of designing for emotional attachment to energy is the aesthetic interactions involved in collecting, keeping, sharing, and activating energy-as-materiality. For example, to date many consumer microgeneration applications ranging from hand-crank flashlights and electronic devices to domestic solar and wind technologies are focused almost exclusively on efficiency and usefulness. However, it is also important that such applications are aesthetically engaging and pleasurable to interact with; otherwise, microgeneration will continue to be viewed as a paradigm appropriate only for emergency applications or novelty items rather than a normal and routine aspect of everyday life. Designers might explore, for example, various general and particular ways of collecting energy-as-materiality through bodily interactions: pushing, spinning, twisting, pressing, squeezing, etc.

**4.2. Transforming our relationships with energy.** One of the primary aims of our research is to promote sustainable everyday practices. This includes common acts of energy conservation, such as turning off lights and other devices when they are not being used. However, to a greater extent our concern is with creatively imagining and designing scenarios for transforming everyday practices for sustainability. Emerging wind and solar technologies, for example, are not simply ways of obtaining “clean” energy but also may potentially transform how we think about and relate to energy. Designing for individuals to be emotionally connected to their energy could promote new forms of care and maintenance over the technologies and energies required to sustain one’s self and community. Designing for emotional relationships with energy further may encourage “energy literacy” among the general public and help draw non-experts into debates about energy consumption and energy ethics.

**4.3. Reifying energy.** Explicitly designing for emotional attachment to energy also raises questions about how we should relate (and not relate) to energy. While increasing people's attachment to energy could, on the one hand, lead to increased care and conservation of energy it might also lead to increased consumption and fetishization of energy. (See [1] for additional discussion around the potential "reification of energy"; also see Tony Fry for a discussion of "symbolic devaluation and the destruction of sign value" as a strategy for sustainable design [8].) Thus, while we argue that designing for emotional attachment to energy is a novel and important area for interaction designers to consider, we also argue that the ideas introduced here should be engaged with cautiously. We tend to view the notion of emotional attachment to energy as a useful counterpoint to the design of current interactions with energy, one that may serve as a conceptual lens for re-thinking how to design our relationships and interactions with and through energy in everyday life. Our work is not intended to replace our entire existing energy infrastructure, but rather to challenge this single, homogeneous energy landscape and to augment the range of experiences and interactions with energy. It is almost certainly inappropriate, for example, to design interactions with larger-scale domestic solar collection systems in the same way that we envisioned people might interact with the Energy Mementos. However, by considering emotional attachment to energy in the design of technologies such as domestic solar microgeneration systems, designers may encourage individuals to think about and use their "homeade energy" differently, potentially leading to more sustainable interactions and relationships with their energy and technology.

## 5. Conclusions

Building on a framework for approaching energy as materiality, we have discussed several design explorations around the theme of emotional attachment to energy. We have framed some emerging issues related to energy, emotion and interaction design by proposing a design strategy aimed at rendering energy more tangible and meaningful. Such a strategy goes beyond "energy awareness" toward promoting more involved and meaningful material engagement *with* energy. In future work we intend to further engage with design issues related to energy and materiality with the aim of redirecting everyday interactions and practices toward sustainability.

## 6. References

- [1] Pierce, J. & Paulos, E. (2010, In press). Materializing energy. In *Proc. Of the 8th ACM conference on Designing interactive systems*.
- [2] Devine-Wright, P. (2006). Energy citizenship: psychological aspects of evolution in sustainable energy technologies. In J. Murphy (Ed.) *Governance of Sustainable Tech*.
- [3] Belk, R. (1991). "Possessions and the Sense of Past." In Russell W. Belk (ed.) *Highways and Buyways: Naturalistic Research from the Consumer Behavior Odyssey*.
- [4] McCracken, G. (1988). *Culture and consumption*. Indiana University Press.
- [5] Mugge, R., Schifferstein, H. N. J., & Schoormans, J. P. L. (2004). Personalizing Product Appearance: The Effect on Product Attachment. In Kurtgözü, A. (Ed.) In *Proc. of 2004 International Conference on Design and Emotion*.
- [6] Verbeek, P-P. (2005). *What Things Do – Philosophical Reflections on Technology, Agency, and Design*. Penn State Press.
- [7] Backlund, S., Gustafsson, A., Gyllenswärd, M., Ilstedt-Hjelm, A. S., Mazé, R., & Redström, J. (2006). Static! The aesthetics of energy in everyday things. In *Proc. of Design Research Society Wonderground International Conference*.
- [8] Fry, T. (2009). *Design futuring*. Berg.