

Promoting Energy Awareness through Interventions in Public Space

'Free Energy' consists of a series of conceptual design examples exploring how to work with energy as a design material by making it more apparent in the use of things and by making choices more explicit to users in public space. The Energy Tap is first in the series of design examples to be completed and placed within local environments, in order to explore methods for participatory and public involvement as well as examine how such objects might stimulate reflection. As design examples, our 'tests' have been crafted as a participatory and reflective forum, as a means for people to try out and experience alternative choices in existing situations and for generating new ideas with possible users. In 'Free Energy' our objective is not to offer a solution to the problem of energy over-consumption, but to explore design as a means of promoting increased awareness and to provoke responses and discussion.

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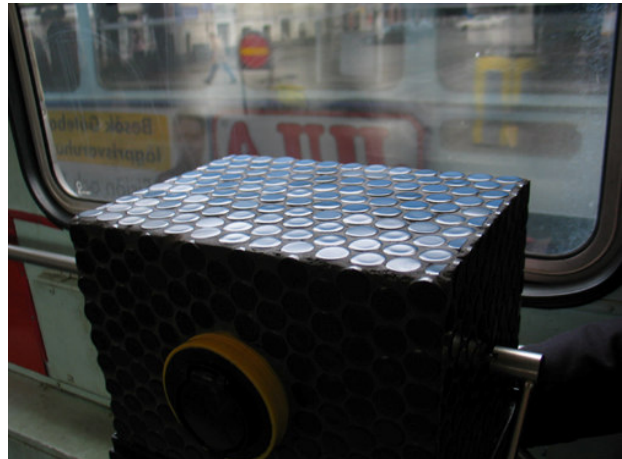


Figure 1: the Energy Tap on the tram

INTRODUCTION

For the last few decades, technology has played a central role in the design of artefacts. Initially its incorporation into designed goods was perhaps driven more by the technology itself creating a plethora of overproduced and underused technological gadgets. More recently, however, the very nature of technology's immateriality has raised questions about the artefacts that are being designed and how they are being designed including inquiries into their proposed use and value to society and the methods employed to design them [9]. As the material and conceptual possibilities continue to expand, it is evident that designers should continue to rethink processes and prototyping methods. Already designers have become more engaged with people at early stages in the design process employing new methods such as games or cultural probes to elicit participation and user feedback [3, 5, 8]. More and more focus is being placed not only on the form of artefacts and their implied use, but what occurs throughout the life-cycle of a designed object including what happens in the hands of the user; the use and misuse that occurs and the behaviours that emerge [4, 7].

Within Static!, a project platform at the Interactive Institute RE:FORM studio, we are investigating interaction design as a means of increasing our awareness of energy, an invisible and increasingly valuable resource [6]. Since technology and energy share this immaterial quality and in many cases are integrated with one another, similar questions are raised regarding how to design artefacts that incorporate either of the two. Static! plans to revisit the design of everyday things with a focus on issues related to energy use and begin to probe into how design can be used to stimulate changes in energy behaviour. However, we propose that the first step in changing people's behaviour with regards to this issue is to begin by increasing the level of awareness surrounding energy and energy use.

With 'Free Energy', a project within the Static! theme, we focus on the creation of design examples that are primarily used to stimulate increased awareness of energy use in local

communities, by looking at how energy is treated in design for public space and how it appears to users through design means.

Although in modern society, we are reliant upon energy sources to charge or power elements in our surroundings or in many of the artefacts we use, most people are unaware of the issues surrounding this energy use and more specifically the problems that are arising in the design of technological artefacts that rely on electricity and batteries. For example, mobility has been the driving force behind many developments in computing and all these mobile devices need some form of electrical power, but not much emphasis is placed upon the solutions that are emerging to resolve these energy-related issues [2].

Since our goal is to increase energy awareness and promote reflection, we propose using our design examples as a basis for communication and discussion amongst both users and designers for developing a more profound understanding of energy in design including design issues related to energy use early in the product development process. In order to stimulate continued reflection and awareness about personal energy use, we also intend to provide a space for new behaviours or habits to emerge, treating energy as an ongoing product experience, extending beyond the stage of product design into the choices and practices of people in their everyday lives.

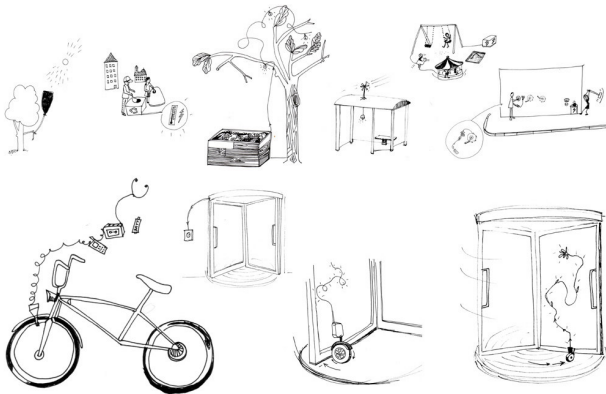


Figure 2: sketch documentation of energy stations from the design process

FREE ENERGY

The project 'Free Energy' aims to increase energy awareness in the public realm by making energy more visible, tangible and accessible in our everyday surroundings. By staging devices that are engaging and tangibly interactive, our secondary goal is to expose and change energy behaviours by using design as a vehicle.



Figure 3: STATIC probes



Figure 5-6: sampling of materials used and generated in participatory workshops for Underdogs & Superheroes

Design Approach

Our initial idea behind 'Free Energy' was to create a range of energy stations (see figure 2) that could be built onto or inserted within public structures and spaces reaching a wide spectrum of people throughout the course of their day. Energy could then be harnessed and accessed throughout the city at these stations with the intention of offering not only spaces for collecting energy, but for reflecting upon what energy is and how it is used. All of the stations would dispense energy that is driven by either forces of nature, for example solar or wind power, or human effort such as physical driven mechanical energy.

Our ideas were inspired by people's participation early in the design process with participatory workshops done in previous projects and through the use of cultural probes. For example, the workshops performed in the project Underdogs & Superheroes [8] included several techniques from mapping the public environment to other more game-based methodologies such as role-playing with props and resulted in concepts that were related to recharging or sharing power in local or social situations (see figures 5-6).

Additionally, we employed the 'cultural probe' method [5] during the early stages of the Static! project, by distributing packages containing disposable cameras and logbooks to people in order to gain insight into how they interacted with energy everyday (see figure 3). This method gave people the freedom to personally document their experiences in the form of pictures, diary reflections and sketches and served as inspiration materials throughout our design process. In particular, we noticed people's constant attention to certain forms of energy – especially in relation to mobile or portable



Figure 7-8: initial survey of existing sites of interaction, a social corner

devices. Energy use also continued throughout peoples' day and across several contexts – extending from the home or workspace and into more transitional and public spaces.

To explore this personal and widespread notion of energy within the Static! project, 'Free Energy' concepts evolved from the idea of energy stations to exploring alternative 'energy

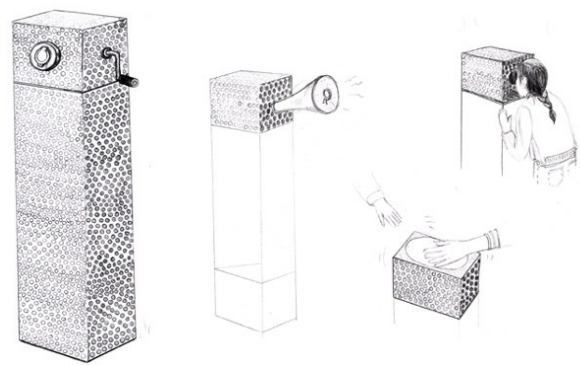


Figure 9: Energy Tap and modules

interventions' throughout the course of one's day. Essentially, we could examine the merit of the energy station by making initial 'tests' with regards to awareness first and foremost including input gained from conversations with and among users and secondly we could examine subsequent emergent behaviours including use or misuse all the while taking advantage of the larger audience reached in public contexts.

We opened the design space in order to understand different possibilities for implementing 'free energy' into public spaces and to further our relationship with people as 'co-designers', engaging them both experientially and personally. Design parameters we were particularly interested in that could contribute towards increasing energy awareness included the placement of energy (social corners versus quiet zones of reflection), deployment (re-design, parasiting off existing structures, or the intervention of new objects), and perceptions of energy (transparency, reward systems, and emerging behaviours). As a result, a series of concepts surrounding the notion of 'energy interventions' have been created as initial sketches for our energy stations. What follows is the process we engaged in during the creation and 'testing' of the Energy Tap, the first in the line of 'energy interventions'.

THE ENERGY TAP

How might personal effort free energy for use? The 'Energy Tap' is a self-sustaining energy outlet for open use. It may be inserted into any space, and can be cranked by anyone in order to generate energy or supply power for any electric or electronic appliance.

Placing Energy Taps as accessible electrical outlets in the public space challenges existing expectations of where energy might be retrieved. Generally electrical sockets are either privatized or inaccessible, situated indoors or connected to a private building. In most cases, the owner to the power is visible. The Energy Tap provides an alternative that is open for either public or personal use, in other words, anyone can generate or utilize energy for his or her own purpose.

Placing an outlet that is 'free' and available for anyone's use opens room for new possibilities and habits to form in the public space. Depending on where the Energy Tap is situated, people can make new choices such as picnicking in the park or having a dance on the street corner. Similar to Philips Design's 'Open Tools' or open product designs that act as 'service units' to larger systems, the Energy Tap builds on notions of open or adaptable systems, enabling users themselves to negotiate, locate, and pace their own interaction through the device [1].

Situation projections

Before determining the form of the Energy Tap or how it might be used, an initial study was done in order to gather information about possible situations and behaviours that such designs might support or provoke. First a survey was made of existing sites of interaction and animation where increased

attention and awareness might be achieved, such as meeting places, social corners and parks. Pictures were taken of a selection of different sites and we began imagining what would occur if electrical sockets were inserted into these spaces that do not generally support electrical access. This was followed by a series of fictional stories and scenarios, created as provocative images based on existing behaviours, but projecting visions of what everyday life could be with ‘free energy’ (see figures 7-8).

Prototype Description

The design of the Energy Tap began as a small box with a crank on its side but after several brainstorming sessions it was decided to create an object that could be staged to either draw the public’s attention or remain hidden in the surrounding environment. Currently, the Energy Tap consists of two parts: a stand and a module for generating and accessing energy. In order to test placement and identity of the objects, the module has been designed in a manner so that it can be placed either on or off the stand. On the stand, the module could, perhaps, draw more attention, while alone it becomes more portable and may blend less conspicuously into the surroundings, offering greater transparency. In this case, we can test scenarios where people serendipitously happen upon or have a more private interaction with the device. The Energy Tap is the first in a set of modular pieces highlighting different aspects of energy. Other modular pieces for possible development in the future include modules for hearing energy, seeing energy and feeling energy. It is the first module that is described in detail below.

The first module of the prototype consists of a crank on one side, solar panels on the top and a power outlet for local energy generation. Building upon the metaphor present in existing energy-efficient devices such as hand cranked emergency lanterns or radios, the module does not innovate technically. Instead, the first module explores this notion of tangibility in relation to energy within a public context.

Combining cranking action with power harnessed from the solar cells creates enough energy to use the outlet. The amount of time the outlet generates energy is proportional to how much solar energy is available or has been stored as well as how much the crank is turned. At this stage, however, the amount of



Figure 9: Patterns collected from the city as design inspirations



Figure 10: The first ‘test’ of the Energy Tap

energy retrieved from a combination of the crank and the solar panels is not substantially enough electricity to work alone for an extended period. As a result, in order to rapidly test our idea, we incorporated a hidden cord enabling us to borrow energy from other private sources.

Design Inspiration

Both the design of the module and the overall Energy Tap borrow their design language from electrical objects and other public structures located outdoors. We were inspired by brickwork and other repetitive patterns found in public spaces, as well as the structures housing wiring for buildings or routing electricity to different locations (see figure 9). Since there are no other products like the Energy Tap existing in the public space it was interesting and in some way important to not commercialize its design.

The two pieces are constructed utilizing simple and reserved forms and are covered with black mosaic tiles emanating patterns found in public space, which give it an almost hidden and seamless impression that is simultaneously discrete and decorative. The details of the tile-work are done in bright yellow drawing attention to interactive parts such as the crank and the outlet. This results in an object that though not immediately noticed, given a second glance, will draw attention and generate awareness.

Other inspirational sources include larger cities’ old and decorative elements that inspire experience and create an atmosphere of shared feeling. In addition, the design of the initial module is influenced by notions of vintage appliances with built in mechanical attributes such as meat grinders or antique telephones. Combining traditional textures and industrial details, the result is both strange and familiar.

The concept makes energy use or options clear through means of placement, visibility, or additional choice and by drawing upon the design language of existing artefacts or commonly understood situations. Using a simple prototype to convey how physical interaction and everyday activity can relate to more conscious or sustainable energy behaviours, it is our longer term goal to elicit hands-on and proactive participation after increasing energy consciousness in the public realm.

STAGING ENERGY INTERVENTIONS

Alongside building the prototype, we were mainly interested in what occurs as people interact with the Energy Tap, namely what behaviours emerge and overall whether the devices generate interest, discussion and are successful in increasing awareness. For example, the Free Energy project could increase the amount of energy used on a daily basis since it provides new possibilities, affecting habits and public

behaviour. If so, perhaps it would also increase the awareness of sustainable energy sources, creating a better system for energy usage overall.

An important question for us was not only are these ideas successful, but is the public arena an ideal site for increasing and making visible means for sharing, awareness, and communication about energy? In the spirit of Svanaes and Verplank we were looking for metaphors as well as emerging behaviours that could inform the design of future energy stations [9] and the context for the 'energy interventions' proved as important as the intervention, or the idea itself.

We decided to stage the 'energy interventions' by either parasiting off of local structures [6] or simply inserting them into personal surroundings in an effort to reveal hints about aspects of energy use that can be changed or insight into what is already available for use (see figure 10).

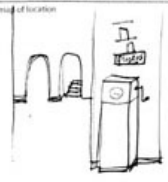
In energy tap date: 24/2-05 time: 12/15 author: erd video timecode:			
description of location: Student café by the entrance			
map of location 	description of person or people Group of four people	description of behaviour looking, testing the crank without any electrical device just cranking opening up the plug lifting the hat type	successful energy use
notes Talk about how to store energy involving at the gym → energy to your home a lamp that grows bright when you come home from gym.	A big discussion starts, 10 min/15 min talking about different and alternative energy sources and solutions how is it more sustainable (energy use) Criticism about the cranks resistance - Can it really give any power? - Isn't there any other better solutions? the power of weight etc. etc.		

Figure 11: documenting the second energy intervention

To this date, four energy interventions have been staged throughout the winter of 2005 in Gothenburg Sweden. Each energy intervention or 'test' was conducted in a similar fashion. We designed paper worksheets (see figure 11) to record information about each test location, as well as documenting our observations of peoples' experiences with the Energy Tap with drawings or in written form. We also brought both a still camera and a video camera to capture what took place. Locations were chosen before we began, based on the situation projections that were created earlier in the design process.

Each 'test' began by placing the Energy Tap in a location, watching and listening, simply to see what happened for a period of time generally from one to three hours depending on the weather and other external factors. This was followed by a series of short interviews of people who had participated in our energy intervention (unbeknownst to them).

Ultimately, the impetus for staging energy interventions was to engage in people's experience of the artefact. Experiences involve personal investment, reveal behaviours and they can also be designed in a way that reflects the evolution of the design objectives [2]. What we propose is to design the energy interventions as experiences to learn more about how to design the final energy stations. By offering people the opportunity to use and experiment with this simple prototype, we can understand the kind of meaning that can be created through the use and misuse of this new device.

Test 1 Chalmers Mechanical Engineering School

The first test was staged at an indoor meeting place and cafeteria in the Mechanical Engineering Department of the

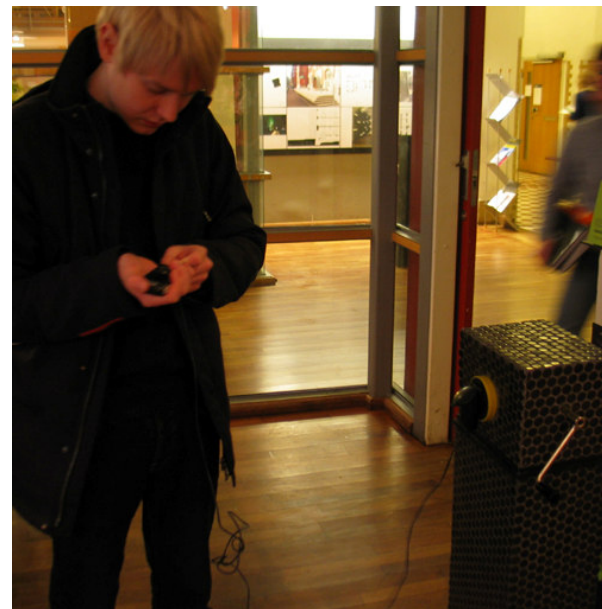


Figure 12: male student using the Energy Tap in the café

Technical University in Gothenburg. The test initiated at 11:00 am and continued until 12:00 pm. During this time the cafeteria was relatively empty. In addition while this location was located inside a large University there were actually electrical outlets available for use throughout the foyer and café. As a result few people interacted with the device.

We also had difficulties placing the Energy Tap. Initially we had placed the Energy Tap beside revolving doors in the foyer that led into the cafeteria. Here, no one paid any attention to it at all. Later, we moved the Energy Tap closer to the queue for getting lunch. This location was an improvement. Although there were few people in the cafeteria and queuing for lunch a couple people did take notice and tried to discover exactly what the Energy Tap was. This occurred on two different occasions. Each occasion resulted in a similar outcome. The participants approached the object, opened the flap that housed the electrical socket, turned the crank and walked away. There seemed to be no perception of a connection between the two.

Afterwards when asked about their experience, one of the participants noted that they had understood that there was a connection between the two but that they could not understand why this object was placed in this location.

'I pay for studying at Chalmers so I have access to the energy, I can borrow it.'

In the end, we agreed with this statement. As mentioned before this location already was equipped with energy outlets that were open to public use or at least use by students attending the school. Perhaps this location was not 'public' enough in the sense that although the premises appear relatively open there is an understood code of what is possible, this includes students assuming that while on campus, they will be able to access or borrow energy from the school. In addition a limited number of students were located in the cafeteria during the morning time so few people even came within the vicinity of the Energy Tap.

Test 2 Cafe

The second test was completed on the same day at a public café located downtown from around 12:30 pm to 2:00 in the afternoon. Although one could argue that this café was a private and not public institution there were no outlets available for customer use. In this, the Energy Tap was much better located inside this café than in the University cafeteria and as a result, this intervention proved much more successful.

The Energy Tap was placed near the entrance of the café, as a result people entering and exiting the space took notice of this new object and were curious about what it was.

Several people frequent this particular café and since the Energy Tap was situated on the premises during the lunch hour there was a relatively large group of people located in the space, roughly about 45-50 people in all.

Discussions usually started when one or two persons from the different smaller groups of people drinking coffee or eating approached the Energy Tap. Similar behaviour to that of the participants in the first test was noted. Generally people explored the interface, looking at the electrical socket and in many cases turned the crank and then returned to the rest of their group seated at the table.

Among one of the observed groups a big discussion started in a group consisting of three men and two women. This group was seated at a table nearby the Energy Tap. One of the members seating closest to the Energy Tap rose and went over to wind the crank, followed by opening the cap of the socket. She exclaimed to the others in her group what she thought it was before she took her seat again. She understood the principles right away but couldn't comprehend its purpose. The group seemed to forget about the actual object, but continued

~~to~~ girls and
Boys
in the age
22-30 years old

Short and quick
try out of the
crank looking
behind
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goes back
to their friends
talk and explains
have their own
theories.
how it will work

Figure 13: noting participation during the second test

speaking about different ways of generating energy. They discussed several different forces including air pressure and weight or force of gravity. All of the discussed ideas and solutions involved sustainable sources, and they appeared excited as they spoke about something that for them was perhaps an unexplored field.

After a while, the discussion led into a more playful conversation about how to utilize energy released during workouts at the gym. A young man in the group thinks that it would be 'cool' to have a lamp at home connected to the gym that would light up when you arrived home and glow more brightly depending on how hard you had exercised. The energy discussion continued for approximately fifteen minutes.

Another group of visitors consisted of students from a design school near by. They started discussing how it was even possible to generate electricity using the force of the crank. Their conversation continued offering ideas and solutions for how this energy could actually be obtained. As design students, their perceptions are perhaps more geared towards looking at and exploring objects in their surroundings.

One of the male students decided to test the device and proceeded to plug in his cell phone. He then cranked the Energy Tap. He immediately noticed that the crank did indeed supply energy to the phone and called the others over. After a couple attempts, he also noted that the amount of energy that he was receiving was connected to how much he cranked the Energy Tap (see figure 12). This was followed by another discussion about the form and placement of the Energy Tap. The students had different ideas about what the Energy Tap could look like including that it should be much smaller and be located outdoors (see figure 13).

At about 1:15 pm, a lonely young man sitting at a table had been watching and taking note of the Energy Tap from a distance. He had also noticed us while finishing his lunch. Once finished, he walked up to the energy tap and did what many of the other explorers had done before him. He opened the cap of the socket and began winding the crank. He then asked us how it worked and what it was, we explained in short terms. He thought it was exciting to actually receive a hint about what it might feel like to wind up electricity using one's own strength. He also believed the Energy Tap simply expresses how electricity works and found it similar to how children's programs on television shows explain how things work.

Test 3 Downtown Gothenburg Outdoors

Since the prototype runs on electricity and has a cord which is hidden. Ironically, we were dependent on electricity and outlets where we would place the model for the energy interventions. This made it also harder to place the energy tap in the areas where it was designed to fit in.

The third test was completed in the afternoon outdoors. Fortunately we made arrangements with a storeowner that agreed we could place the Energy Tap outside her tobacco shop and she would also lend us some electricity. Despite the cold and unfriendly weather we had the chance to observe and talk to a few interested people (see figure 14).

One of them was an older gentleman who liked the idea of Free Energy and started to think about ways of using the free energy in a broader perspective. He relayed his ideas to us.

‘I would use it to recharge my car or my future car’

His initial response was that it could be used as a recharge station for cars. He then thought that it could be used more frequently today for charging personal devices that need electricity. He imagined these stations could be located alongside kiosks as presented during this test.

Another participant a young woman, perhaps 30 years old, was completely inspired by the Energy Tap. After exploring what the Energy Tap might be, she became very animated. It was not long before she saw us and was able to draw the connection from ourselves to the object. She related to the idea of ‘free energy’ on several levels.

‘I love the idea of free energy that is all about releasing energy into the world... with free energy, people would be more connected ... maybe people would get out of their houses and throw parties in the street and get to know each other better.’

She decided to sit with us for the rest of the test to see what would occur. Several other passers-by were interested by the Energy Tap and as in the previous tests, they began by either winding the crank or looking at the socket and ending with the other task. Most people did not interact for very long with the object and as a result we interviewed few participants.

The test took place from about 2:00pm to four o’clock in the afternoon. As this was during the winter months in Sweden, the weather outside was extremely cold so perhaps some of the participants were simply too cold to stay outside long enough to understand what the Energy Tap actually was.

Test 4 Chalmers Student Center Entrance

Due to the cold weather we decided to stage another test indoors. We chose another location at Chalmers, the nearby technical university. This time we chose a location that was more frequented by students and had less access to free energy. This energy intervention took place from four o’clock to six o’clock in the afternoon.

The student house is a centre where students can study, arrange parties, hold meetings and sit with friends for a coffee or small lunch. By the entrance is a large hall that somewhat is connected to the rest of the main building.

The Energy Tap was placed beside a counter close to a coffee machine and a litterbin. This situated the Energy Tap in the center of other practical items. There were fewer people than we anticipated in circulation but those who sat in the surrounding began by giving both the tap and us curious looks.

Two men walked up to the tap, they were genuinely interested in what it was and how it worked. They checked all the details and began discussing the Energy Tap for a period of about ten minutes (see figure 15). One of the young men believed that the crank was used to make energy.



Figure 14: a passer-by interacts with the Energy Tap outside the tobacco shop

‘It was kind of isolated and around the contact so it looked like an outdoor outlet, I believed it was for making energy... I also thought it looked like it belonged outdoors.’

The second young man agreed.

‘My first thought was that it was something for the electric car because it looks like an outdoor piece of equipment.’

We later revealed to both of them what the Energy Tap was and what the project was about. When asked what they might use the Energy Tap for they had different ideas.

‘After a while I think more and more people would use it to charge their phones and CD players, or their cameras’

‘I think I could take my computer to the park and do work.’



Figure 15: two young men curious about the Energy Tap in the fourth test

‘It would be really nice to take out your guitar amplifiers and have outdoor concerts.’

Other visitors to the student center explored the same techniques that other participants had completed. Again people looked underneath the cover of the outlet and cranked the crank. A few spoke to one another about what they thought it might be, others made loud exclamations of surprise or inquiries into exactly what the object was.

One student was also deeply engaged with the Energy Tap. He noticed us and quickly proceeded to ask questions. We explained the project to him and we ended up having an extensive conversation surrounding the Energy Tap, its implied use and other uses that he thought about as well as its relationship to pirating software or wireless technologies.

In regards to the Energy Tap ‘there could be more events happening in public spaces, in the spaces we share. People would figure out things to do outside so public spaces would take a different direction. There would be different kinds of music in the streets, perhaps more electronic music.’

‘If it’s free, it’s sustainable, then it’s one of the best solutions ever. It would give people an alternative – they would not have to rely on certain markets, it would be more fair.’

He went on to comment upon how the thinking behind the Energy Tap could be applied to third world countries.

‘More people would be able to develop their businesses and lives. People in the third world would have a greater opportunity to develop their artistic or technological potential. It would give some kind of independence in the relationships of market and power and evolve the relationship between the first and third worlds.’

He began to speak about pirating energy and how in Columbia, where he is from, that it is not uncommon to parasite off of existing energy structures. Poor income families and even kiosks in the streets ‘steal’ energy from public systems. People also ‘pirate’ gas, another form of energy, from underground piping and tubes that lay beneath the surface. He equated it to people in the first world parasiting off of existing wireless networks that they don’t pay for. People can access wireless Internet connections in several locations, although the people who actually own it must pay for it. In some ways, he believed that this freedom regarding energy increases the awareness of people in the community, offering new solutions and revealing connections.

Overall we estimate that about 35 people interacted with the Energy Tap in some way over the course of these staged interventions. However less than half of these people made any real effort to understand what the Energy Tap was, much fewer used it to generate and receive energy.

REFLECTIONS & DISCUSSION

Although much of what we do throughout our day is dependent upon some form of energy, awareness of the availability of alternative energy sources and clean energy is not as present in our society as it could be. For instance, most people carry on throughout their days with little regard to the energy that they consume. How can we increase sensitivity and awareness of energy issues in society?

We believe that the ‘energy interventions’ are a good start. In order to reach a larger critical mass, our intention with the ‘energy interventions’ was to stage devices and installations that draw people’s attention, provide energy and or rewards for using less energy, in social or public spaces thereby increasing awareness.

Considering the problems that involving people in the design process can raise, in terms of budget, resources, or real participation the amount of responses we received from only two days of testing can already be considered a sort of success.

Although the Energy Tap did not spur unexpected use, it did spur several unexpected conversations and created a heightened sense of awareness. In this way, the level of attention given to the Energy Tap may have exceeded our initial ideas about the ‘energy interventions’. People were made more aware about energy, its use in society today and what free energy might do for society by not only interacting with the object, but also by interacting with one another. In this, the Energy Tap was a starting point, an icebreaker, a topic of conversation among friends and strangers alike.

With this in mind, the Energy Tap successfully gave interaction with energy a physical presence in the social space and offered a tangible interface for open use and local interpretation relating to systems of energy.

The common apprehension we found among the interviewed persons was that it is more acceptable to spend free energy from sustainable sources such as the Energy Tap on something fun and carefree. The ideas and visions of how to incorporate free energy into their lives raised hopes and dreams on more than one occasion about a more lively street life.

We also noted that people would find it much more convenient to be able to access free energy while they spend their day outdoors in for example the park or on the beach (far from more accessible yet private sockets to parasite energy from).

Another common response was the idea of the ‘recharging station’. Several participants concurred that the device was actually made for recharging electric cars and others believed that it could be used to recharge mobile devices. Perhaps this is

an issue pertinent to the state of our society and the increased amount of ubiquitous computing devices equipped with batteries. The notion of 'recharging' has become commonplace. For our personal technological objects to function, their batteries must be charged.

The ideas surrounding the third world and how free energy could be utilized to enhance the lives of people with lesser incomes spurred several thoughts about reinterpreting the Energy Tap. In addition it posed new questions that we could begin to ask regarding free energy and not just what it means to first world society but how it could change the energy infrastructure of the world affecting politics and public policies.

Something that maintained itself throughout the series of tests was the connection that people made from the crank on the side of the Energy Tap to the electrical socket located on its front. We were happy to see that the relationship between this tangible interface and the generation of energy was not hard to interpret. We were, however, disappointed that most of the participants did not use the energy that they had created. This may be due to the fact that many of these tests occurred during short time spans and extreme cold weather conditions, or as in the example of the first test, energy was not even a necessity in that precise location.

Overall we believe that the 'energy interventions' were successful in increasing awareness. We attribute this to several factors surrounding the approach, the placement within a public context and the design of the 'Energy Tap'. Staging 'energy interventions' was a successful approach to involving people in the design process and receiving feedback. Although the intention of the 'energy interventions' differs from that of other public space occupations such as advertising in that we were not trying to sell a product the level of attention that can be obtained by going public and capitalizing on the occupation of space is important to recognize. Placing the tap in public scenarios afforded a greater opportunity for reaching a larger audience and learning more about the types of people that would use the device. Since it is not possible to obtain energy in most public settings, the Energy Tap was an obvious way to draw attention and spur conversation. The 'Energy Tap' was also designed as a simple and straightforward example of how one might use his or her own powers to generate energy or use alternative sources in a manner that was both visible and tangible. This proved understandable to our audience and supported sharing, several of the discussions, and even promoted some subsequent use, pointing towards what behaviours might emerge in the future.

FUTURE DIRECTIONS

Deciding on how to use other peoples experience in a design project is a critical issue. From the beginning, our intention with the 'energy interventions' was to involve people, their experiences, and their observed behaviours in the process of designing for 'free energy'. Fortunately, the results from these initial tests have already offered a great deal of insight into how we shall take this project forward. Although we were able to observe little in terms of emergent behaviour, we were able to draw conclusions about people's perceptions of the Energy Tap and how both the artefact and the staging of the 'energy interventions' can be improved upon.

For example, we think it is important to keep in mind that Sweden's street life is dependent on the different seasons in the sense the outdoor activities change dramatically depending on what weather occurs or how warm it is. It is also more common to sit and spend time outdoors in parks or beaches instead of using the space of the street. In addition, in Sweden, the street has a tradition of being a relatively quiet space in many locations, especially where housing complexes are located.

In relation to this, we will stage more 'energy interventions' with the Energy Tap during the warmer months in Sweden and in more outdoor locations such as in a park or near a city bench.

The timing of the tests will also be extended to see if and what behaviours emerge over a longer timeframe. It may be that it takes the public longer than a couple of hours to truly appropriate a new artefact and reinterpret it for their own use.

Surrounding energy sources are often hidden and invisible in their 'naturalness.' After completing the first round of 'energy interventions', we still intend to explore if there is a way to add elements to collect energy from natural or sustainable sources to make them more visible. These elements would reveal the possible uses for the sources. Free energy could appear in many more ways, as rewards for using your own power, such as in the case of the Energy Tap, or perhaps 'Free Energy' could further explore reinterpreting the existing surroundings.

Informed by various experimental design methods probing into people's daily lives and perceptions of energy, we intend to continue to stage 'energy interventions' with the Energy Tap and other prototypes we create to engage in this conversation. Outcomes and examples will continue to be simple, sometimes hidden clues, about how one could act or how it could be with access to 'free energy'.

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