

# Usability in a sustainable future

Why usability is integral to achieving sustainability

prepared for



- My belief is usability and user experience design is integral to the success of sustainability initiatives and to create sustainable products
- My focus today is on environmental sustainability
- Sustainability is broader than this – includes social and financial
- Examples focus on physical products
- Increasingly integrated with software and networks, but also the web plays an important role in connecting people, information etc.

"Usability is about human behavior. It recognizes that humans are lazy, get emotional, are not interested in putting a lot of effort into, say, getting a credit card and generally prefer things that are easy to do vs. those that are hard to do."

*David McQuillen*  
in "Taking Usability Offline"  
Darwin Magazine, June 2003



- This quote on usability from David McQuillen appears on the UPA website
- We could easily re-word this...

"Sustainability is about human behavior. It recognizes that humans are lazy, get emotional, are not interested in putting a lot of effort into, say, recycling their waste and generally prefer things that are easy to do vs. those that are hard to do."



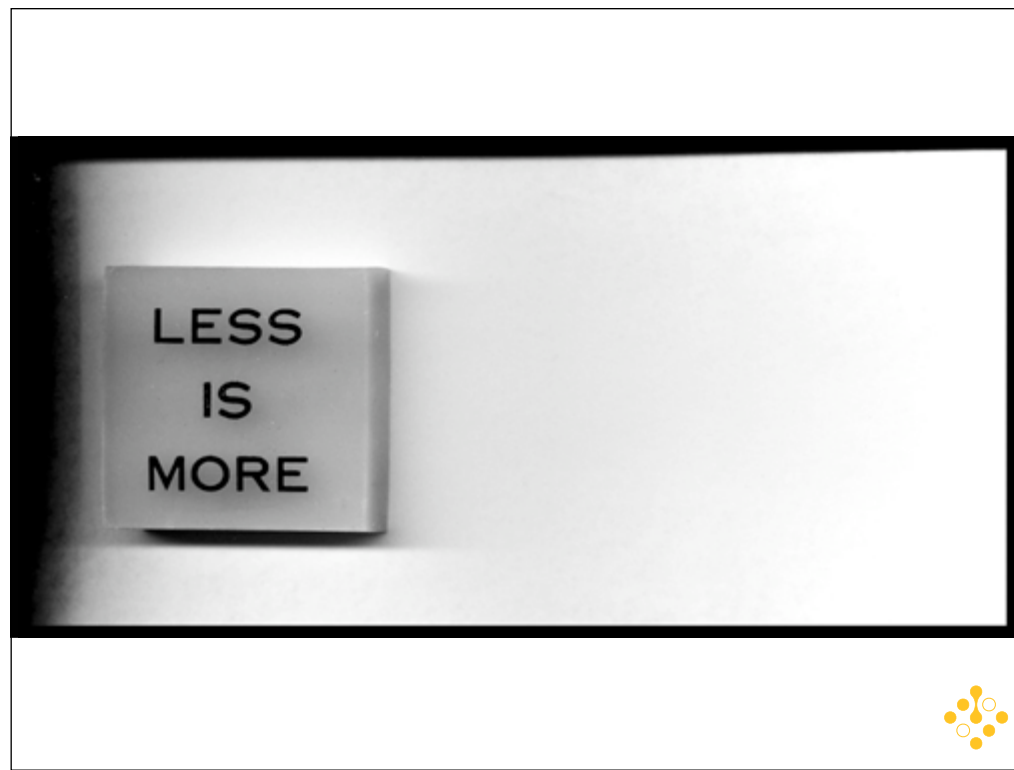
- Sustainability is at its core about changing behaviours
- This includes behaviours of product, systems, service designers
- People aren't willing to sacrifice performance or convenience
- Only willing to pay 5–10% more for “green”
- Usability's strengths critical for adoption of sustainability:
  - Understanding the people we wish to serve with products we're designing
  - Create valuable products that increase adoption
  - Bringing people into the design process will bring sustainability into the mix
- Perhaps we can extend “usability” to include...



## Pre-use-ability

- The process by which things are designed, made, packaged and transported

Image: gabi\_menashe at Flickr – [http://www.flickr.com/photos/gabi\\_menashe/218574269/](http://www.flickr.com/photos/gabi_menashe/218574269/)



- As in design, Less is definitely more when considering sustainability
- First ask: “do we need it”? Make less “stuff”
- A real challenge in design – our job is often to “sell more stuff”
- Ask ourselves: Can we use online instead of paper materials? etc.
- Secondly ask: “look at the system in which this is used – are there efficiencies to be gained by changing the system”?
- For example, cloud-computing and software as a service (SAAS) has potential to reduce carbon emissions and resource usage when compared to desktop applications – this is a small systemic shift that could increase sustainability

Image: hooverine at flickr – <http://www.flickr.com/photos/hooverine/2802881741/>



- Then we can consider materials etc.
- The Samsung Reclaim phone is “constructed from eco-friendly bio-plastic materials. Made from 80% recyclable materials”
- Reduce chemical usage and be vigilant in choices – many legal chemicals remain dangerous: Perkins+Will architects created blacklist of common chemicals used in construction. Cradle to Cradle lists other examples.

Further reading:

- Perkins+Will launches first chemical blacklist for building designers – <http://www.greenbiz.com/news/2009/11/10/perkinswill-creates-chemical-precautionary-list-building-designers>
- BBC: Plastic chemicals “feminise boys” – <http://news.bbc.co.uk/2/hi/health/8361863.stm>
- Cradle to Cradle (book): [http://www.mcdonough.com/cradle\\_to\\_cradle.htm](http://www.mcdonough.com/cradle_to_cradle.htm)

Images and further info: <http://www.letsgodigital.org/en/22829/samsung-reclaim/>



- Rethink our use of plastic especially
- 360 paper bottle from Brand Image
- Containers that outlast their contents by 100s if not 1000s of years – perhaps we need to rethink what “fit for purpose” means?

Image & further info: <http://www.mymodernmet.com/profiles/blogs/10-modern-packaging-concepts>

### Transportation

Five percent of Apple's greenhouse gas emissions are a result of transporting our products from assembly locations to distribution hubs in regions where our products are sold.

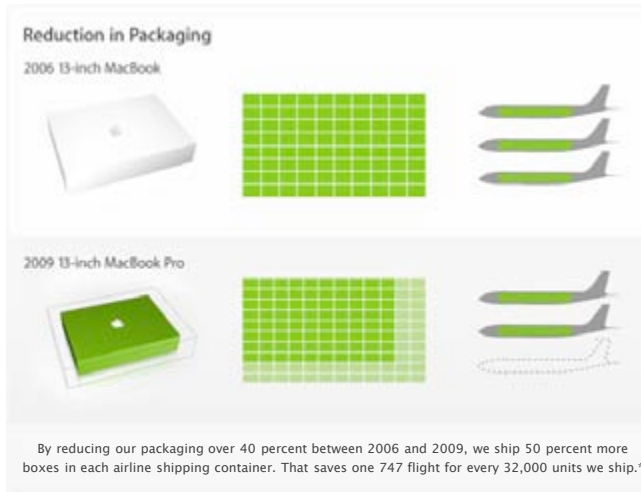
 5%

547,000 metric tons of greenhouse gas emissions

### Smaller packaging.

Efficient packaging design helps reduce the emissions produced during transportation. The packaging for the 13-inch MacBook Pro, for example, is 41 percent smaller than the previous-generation MacBook.

That means 50 percent more boxes fit on each shipping pallet, more pallets fit on each boat and plane, and fewer boats and planes are used — resulting in fewer CO<sub>2</sub> emissions.

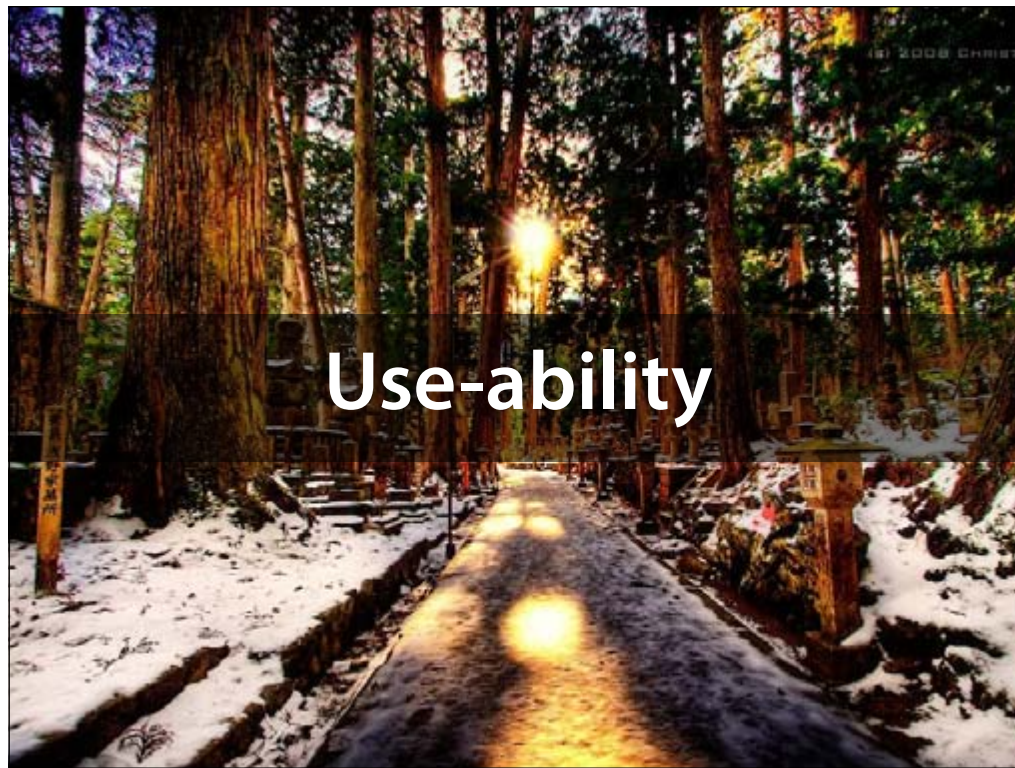


\*Calculated using U.S. configurations.

[Back to Top](#)

- Many companies reducing packaging
- Rethinking packaging can provide other usability benefits to users
- Reduces cost and emissions of transport
- Reduces materials required
- Reduces wastes
- Bottom-line benefits as well as environmental

Image and further info: <http://apple.com/environment/complete-lifecycle/>



- Many factors to consider in use

Image: Christopher Chan at flickr <http://www.flickr.com/photos/chanc/2385594832/>



- Herman Miller furniture – Mirra Chair
- 12 year warranty
- Designed to last – effective use of resources



- The “contortionist” bike (prototype)
- More aesthetically pleasing & usable version of the “folding bike”
- Packs into space of wheels
- Drag behind on own wheels (like a rolling bag)

Image 1 & 2 + further info: [http://www.treehugger.com/files/2009/08/contortionist-folding-bike-video-dominic-hargreaves-royal-college-of-art-student.php?dcitc=weekly\\_nl](http://www.treehugger.com/files/2009/08/contortionist-folding-bike-video-dominic-hargreaves-royal-college-of-art-student.php?dcitc=weekly_nl)

Image 3 + further info: <http://news.sky.com/skynews/Home/UK-News/Student-Invents-Bicycle-Which-Folds-Into-26-Inch-Wheel-Circumference-For-James-Dyson-Prize/Article/200908115353249?>

[lpos=UK\\_News\\_First\\_Home\\_Page\\_Feature\\_Teaser\\_Region\\_0&lid=ARTICLE\\_15353249\\_Student\\_Invents\\_Bicycle\\_Which\\_Folds\\_Into\\_26-Inch\\_Wheel\\_Cir](http://news.sky.com/skynews/Home/UK-News/Student-Invents-Bicycle-Which-Folds-Into-26-Inch-Wheel-Circumference-For-James-Dyson-Prize/Article/200908115353249?lpos=UK_News_First_Home_Page_Feature_Teaser_Region_0&lid=ARTICLE_15353249_Student_Invents_Bicycle_Which_Folds_Into_26-Inch_Wheel_Cir)



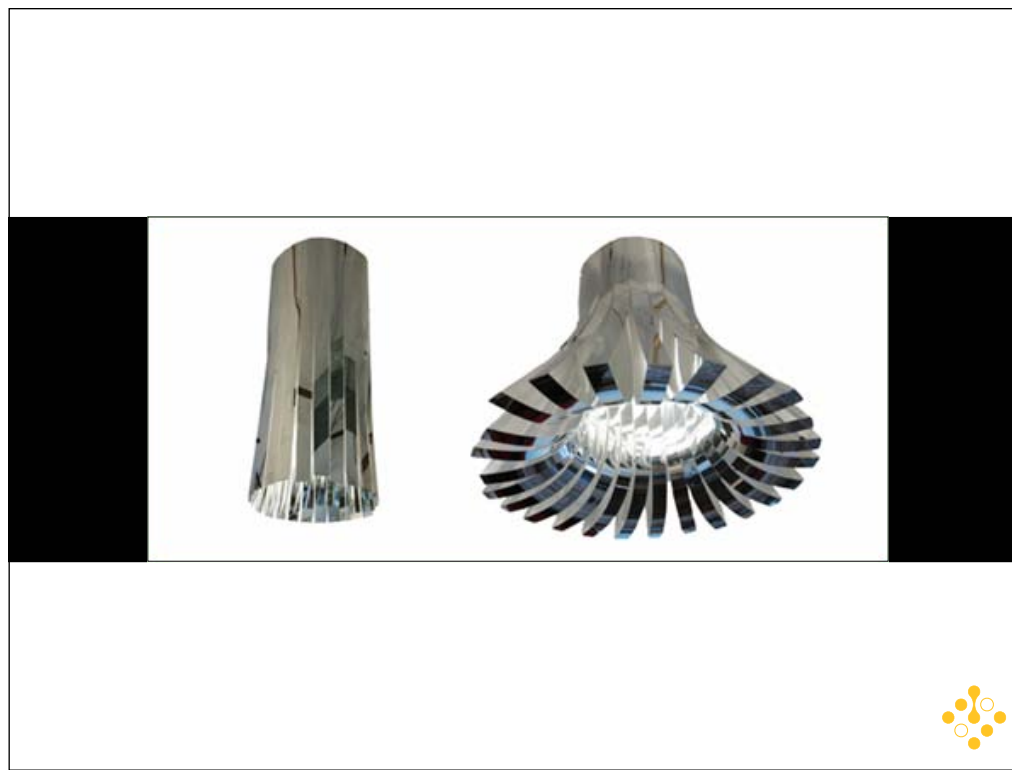
- Intelligent plugs – “equipped with componentry to make it a controllable node on a network, including an RFID chip, microprocessor, and wireless networking.”
- “identify exactly how much electricity an individual appliance or electronic is using, but they can also be used to control electronics (i.e. program TVs to turn on and off at different times).”
- Smart meters make the “invisible visible” – ambient awareness
- Just by showing data in useful, contextual ways reduces use

Plug image: Jake Mates on <http://www.flickr.com/photos/jakematesdesign/3165600114/>  
 Velopulse image + further info: [http://news.cnet.com/8301-11128\\_3-10391736-54.html?tag=mncol;title](http://news.cnet.com/8301-11128_3-10391736-54.html?tag=mncol;title)  
 iGoogle image: <http://www.google.com/support/powermeter/bin/answer.py?hl=en&answer=162868>



- Saverclip – shows electricity usage and recharges based on electromagnetic field
- More usable than meters that plug in directly to the outlet

Image & further info: <http://www.yankodesign.com/2008/01/14/saver-clip-shames-your-electricity-usage/>



- Flower lamp by STATIC! – “blooms” when not used much
- Look for opportunities of “ambient” feedback around efficiency and action

Image & further info: <http://flowingdata.com/2008/04/03/21-ecovisualizations-for-energy-consumption-awareness/>



- Example of a very small and simple opportunity that changes behaviour
- “About 50 percent of the energy consumption occurs after the jeans are purchased” – hot water and drying
- Also prompts people to consider extending life by donating

Label image + further info: <http://greeninc.blogs.nytimes.com/2009/10/27/with-new-consumer-care-tags-levi-strauss-aims-to-reduce-its-carbon-footprint/>

Jeans image: <http://www.levi.com.au/>



- Example of good product design that considers systems
- Version 2 had improved design to reduce transport costs (and emissions)

Image + further info: <http://www.hippowater.org/>



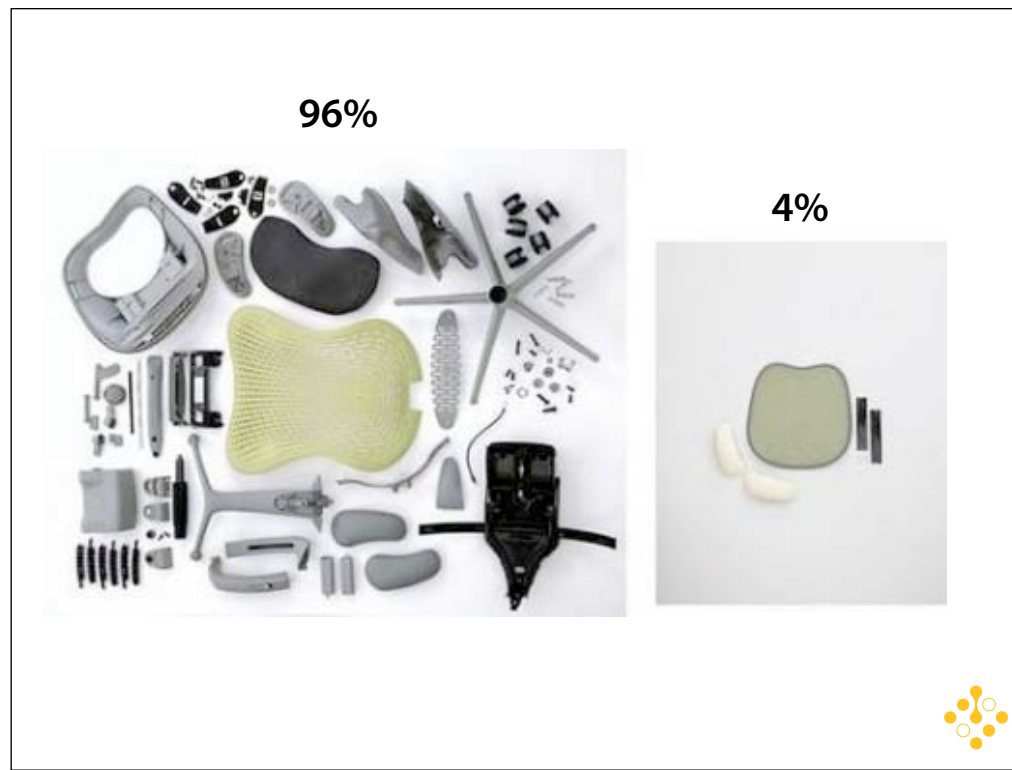
End of use-ability

Image: CP @ <http://flickr.com/photos/techbirmingham/345897594/>

- And “re-usability”



- Design for disassembly, re-use/recycling



- Homogenous components – don't mix natural and technical components (Cradle to Cradle)
- 96% recyclable
- 4% non-recyclable
- “Cradle to cradle” – design for “up-cycling” – technical and organic streams – in nature there is no waste

Image + further info: [http://www.treehugger.com/files/2007/08/herman\\_millers\\_1.php](http://www.treehugger.com/files/2007/08/herman_millers_1.php)



- Give packaging a “second life” before recycling

Image + further info: [http://www.treehugger.com/files/2007/05/twist\\_sponges\\_i.php](http://www.treehugger.com/files/2007/05/twist_sponges_i.php)



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- Susan Sun of Kansas State University
- Bio-adhesives enable edible barrel for cattle feed
- Further info: <http://cleantechnica.com/2009/11/10/new-bio-based-glue-lets-cows-have-their-cake-and-eat-it-too/>
- “The edible barrels replace oil drums, which cost approximately \$6 per barrel to clean for re-use as feed containers in addition to the cost of the barrel. Sun’s elegant waste reduction solution relieves farmers of this expense while practically eliminating the risk of oil-contaminated feed from poorly cleaned barrels. It also eliminates waste or water pollution associated with the cleaning process, and it eliminates the cost (and carbon footprint) of returning used barrels for re-use.”

Image: publicenergy @ flickr – <http://www.flickr.com/photos/publicenergy/1846375599/>



- Considerations for sharing
- Reverse Garbage + Bower Bird center Marrickville

The Sharehood

About Join Letterboxing More Info Get Involved Contact Home

### Welcome

The Sharehood is all about sharing resources within your neighbourhood and helps you to meet and make friends with people in your local area. All sorts of things can be shared, such as sewing machines, vegetables, wheelbarrows, tools, cars, books, washing machines and computers. Skills can be shared too: gardening help, bike fixing, accountancy, language skills, childminding, how to use a sewing machine or a computer, how to make wine or dance the tango.

When you [join the Sharehood](#) you get to see what all other people within 400 metres of your home are willing to share. You might well be the first person in your neighbourhood to join the Sharehood, so the best way to get others to join is to grab a friend and go doorknocking or deliver a welcoming letter to nearby letterboxes explaining how the Sharehood works (we've [drafted a letter](#) for you to modify).

When you've found a number of interested neighbours you could organise a social event – such as a picnic at a local park – to get to know each other and get the ball rolling.

Through the website you can arrange local events, participate in online forums and contribute to a photo gallery.

If you're interested in organising a similar community in your local area, please read up about [letterboxing](#) and [create yourself an account](#). If you have any questions, please [send us an email](#).

If you want to check out the internal working of the website before you join, try logging in as 'pingu', with password 'pingu' as well. You won't be able to make any changes to anything, but will be able to get into our hood in the south pole!

### Neighbour Login

Username: \*

Password: \*

Log in

[Create new account](#)

[Request new password](#)

### Information

- [Terms of Agreement](#)
- [Trading System](#)
- [Demurrage](#)

### Stay in Touch

Enter your email address to receive the Sharehood's quarterly newsletter

Subscribe

### Sharehood Information Evening - Starting a Sharing Community in Your Neighbourhood

<http://thesharehood.org>

This workshop will explain the process of starting a sharing community, how to set up a website, how to organise social events, as well as generally sharing the experience of building community. We'll also cover privacy issues, the local currency, people without the internet, and will have plenty of time for questions and discussion.

Following the info night discussion, we are having a meeting of the Sharehood Collective. Everyone is invited. We'll be discussing the philosophy behind the Sharehood, and would like to get as wide an input to this process as possible. Primarily we'd like to brainstorm our values, vision and mission. Take a look at our [Statement of Purposes](#) to get an idea

- Local sharing communities – The Sharehood is a Melbourne-based community sharing initiative
- Swap parties
- “Crowd sourcing” real-world goods

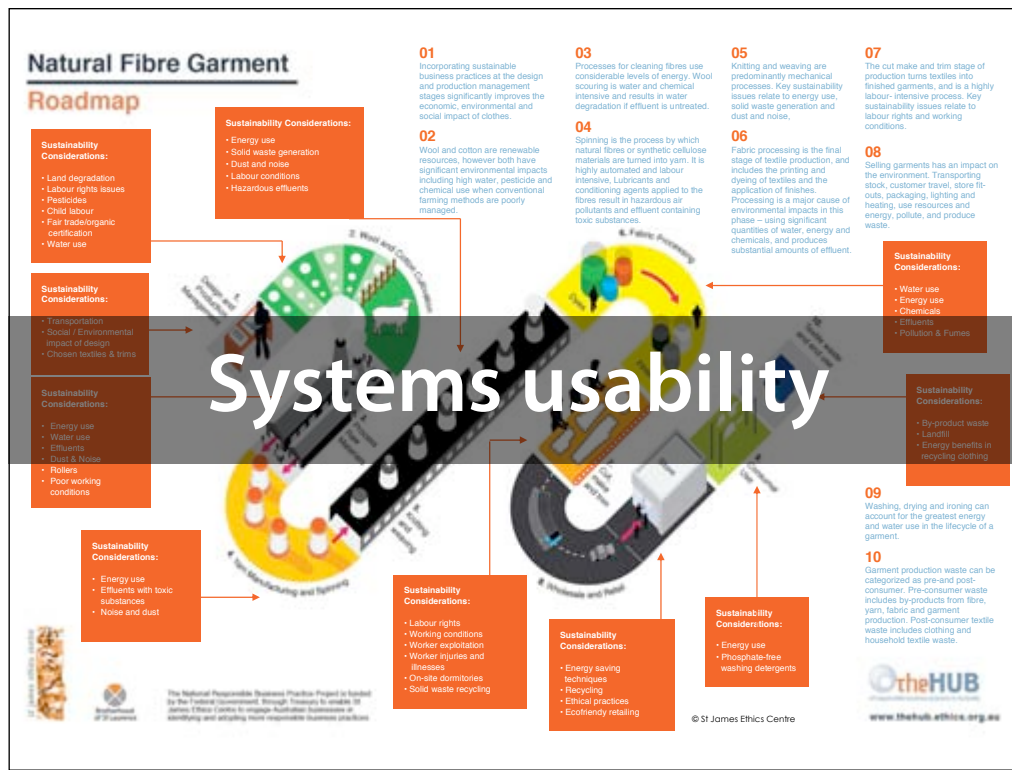
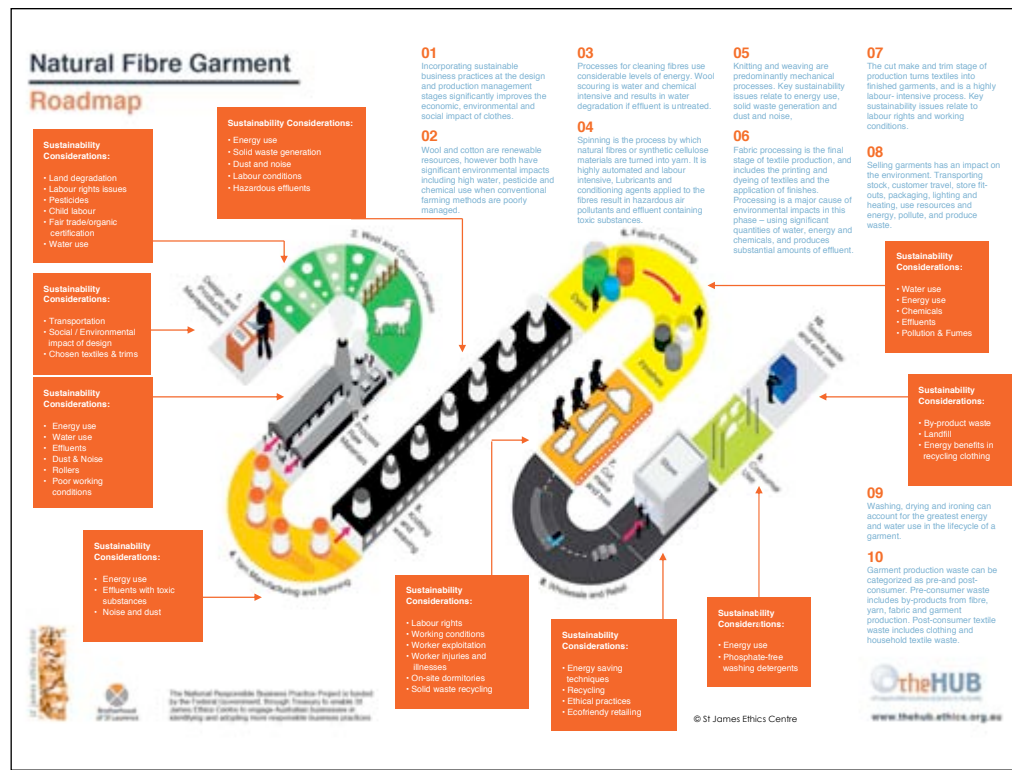


Image + further info: [http://thehub.ethics.org.au/sme/product\\_roadmaps](http://thehub.ethics.org.au/sme/product_roadmaps)




- This diagram highlights that “use” of a product is only one (sometimes small) part of the equation
- Consider the system in which items are used


Image: [http://thehub.ethics.org.au/sme/product\\_roadmaps](http://thehub.ethics.org.au/sme/product_roadmaps)

Further info:

- “If this product could talk” – [http://thehub.ethics.org.au/sme/product\\_roadmaps](http://thehub.ethics.org.au/sme/product_roadmaps)

**better place** 


**cars**



Electric vehicles offer a superior driving experience, delivering instant torque and smooth acceleration in an ultra-quiet environment.

[more >>](#)


**batteries**



EVs now take advantage of the most advanced lithium-ion battery technologies which are recyclable, environmentally friendly, and safe.

[more >>](#)


**charging**



Better Place provides energy when and where you need it with a flexible network of charge spots and battery switch stations.

[more >>](#)


**in-car services**



The vision of a "connected car" is fulfilled.

[more >>](#)


**energy**



Increasingly over time, the use of renewable energy based on wind, solar and other clean technologies to charge electric vehicles will minimize our impact on the environment and lessen our dependence on oil.


[more >>](#)

**standards**

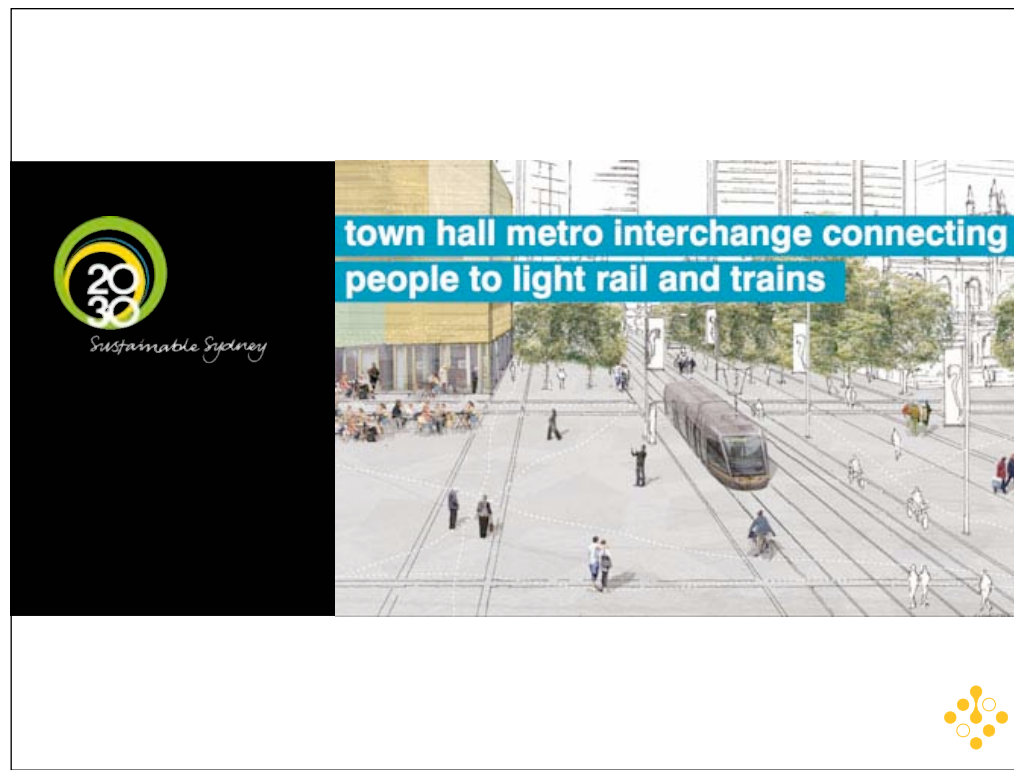


Developing an open network capable of serving all EV drivers is central to Better Place's mission to accelerate the transition to EVs.

[more >>](#)

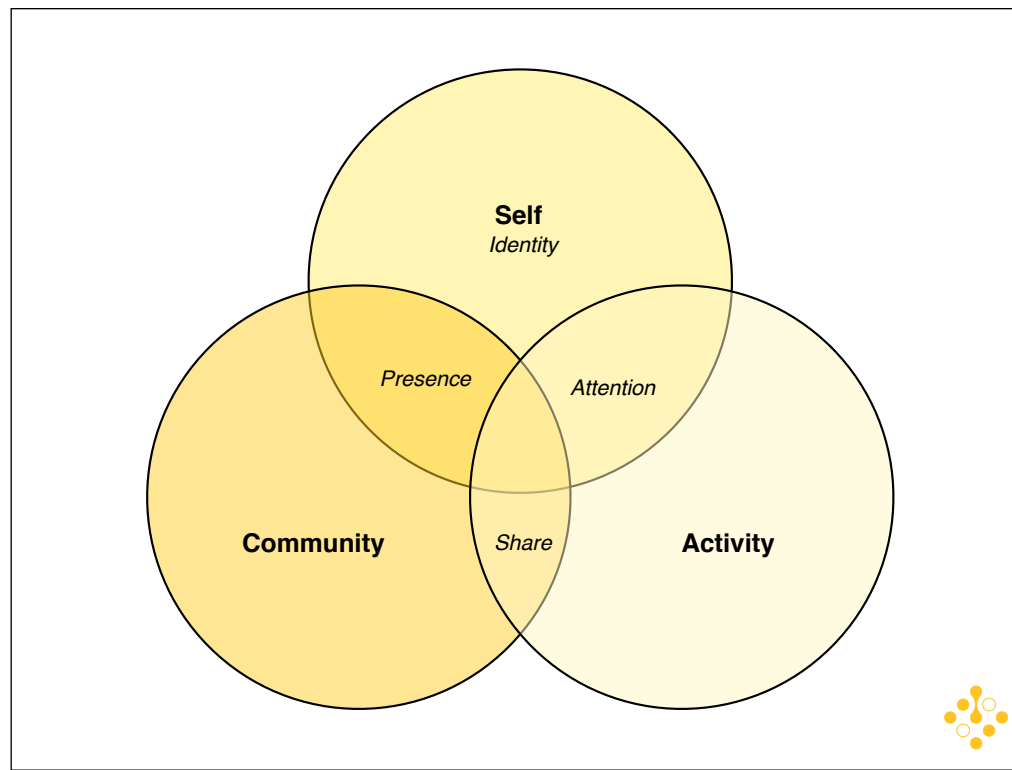


- A Better Place is not only a “product” – it’s a system
- Re-thinking “recharging” in the context of our existing experience of “refueling”
- Considering usability throughout their process



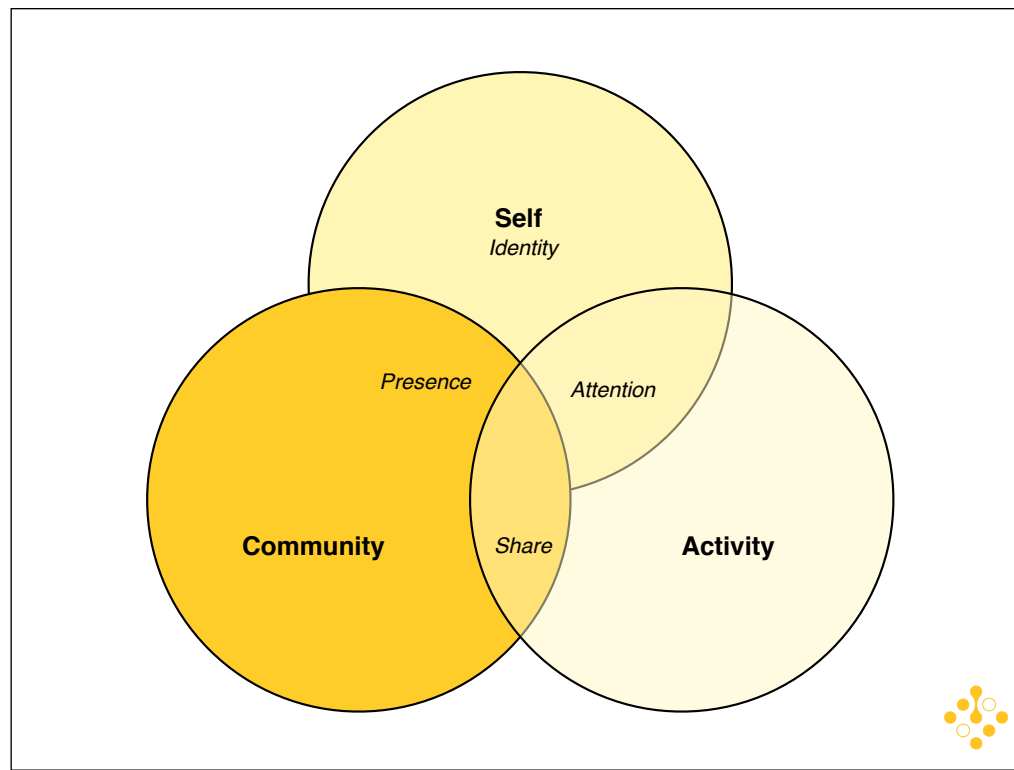
- Sydney City Council seems to be giving systems serious consideration
- Cycleways connecting key hubs
- Consideration of reducing traffic in CBD and planning based on pedestrian + public transport. etc.
- Electric buses with stops that are charging stations, but also that utilise GPS to provide information about the next bus etc. – human + technical factors

Image: <http://www.cityofsydney.nsw.gov.au/2030/thedirections/projects/IntegTransProj.asp>

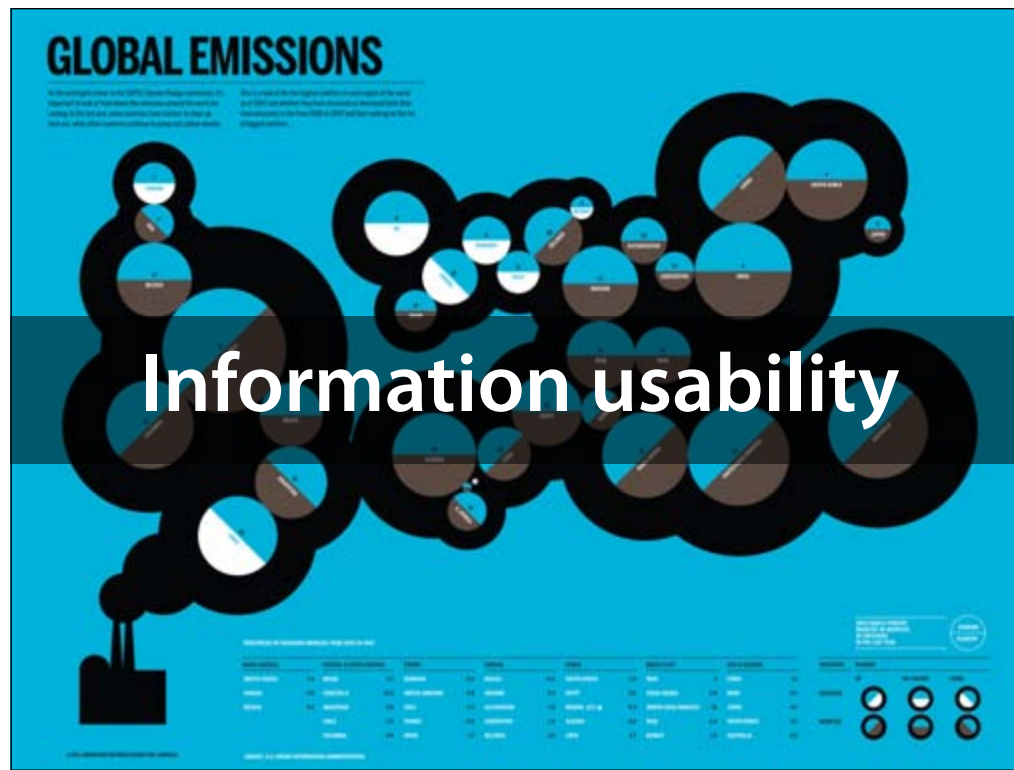


In the usability field we're mostly used to working in the "Self" and "Activity" areas...

Note: I'm not sure of the origin of this diagram – I noted this down during Christian Crumlish's "Social Design Patterns" Web Directions South workshop but have been unable to identify the source. Any pointers much appreciated...



..."Community" is something we need to pay more attention to when considering systems.



Information usability

Image: GOOD and Lamosca – <http://www.lamosca.com/> via Information is Beautiful – <http://www.informationisbeautiful.net/2009/four-infographic-morsels-2/>



- Al Gore most well known demonstration of how a good infographic and story can change people's perception

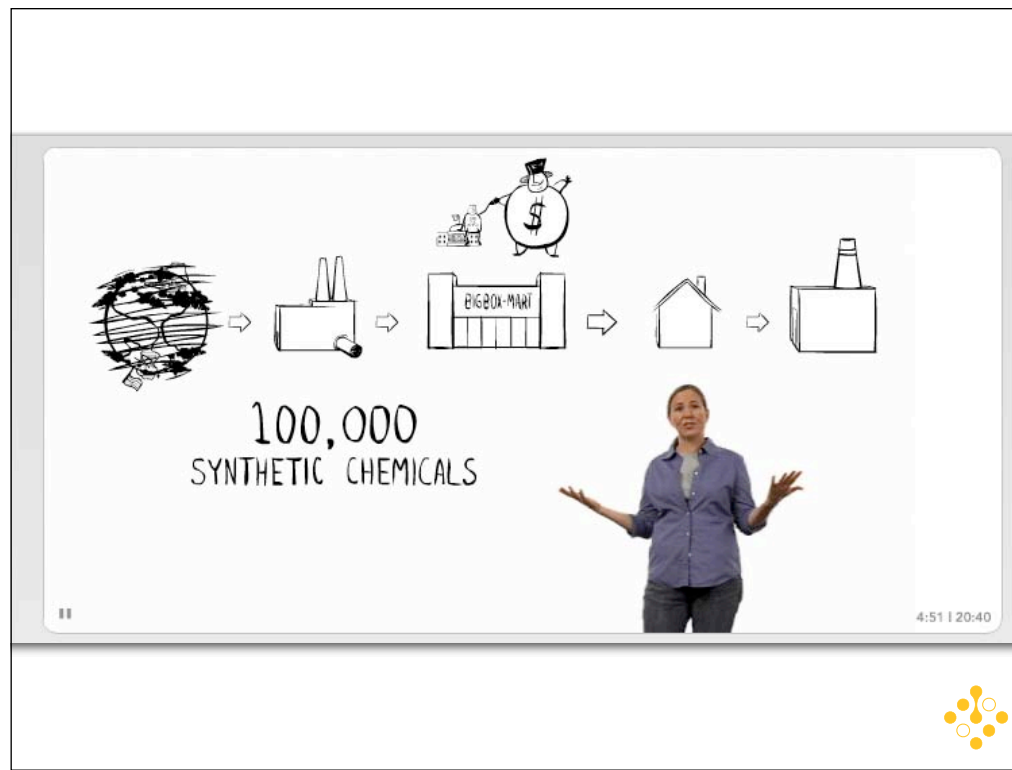


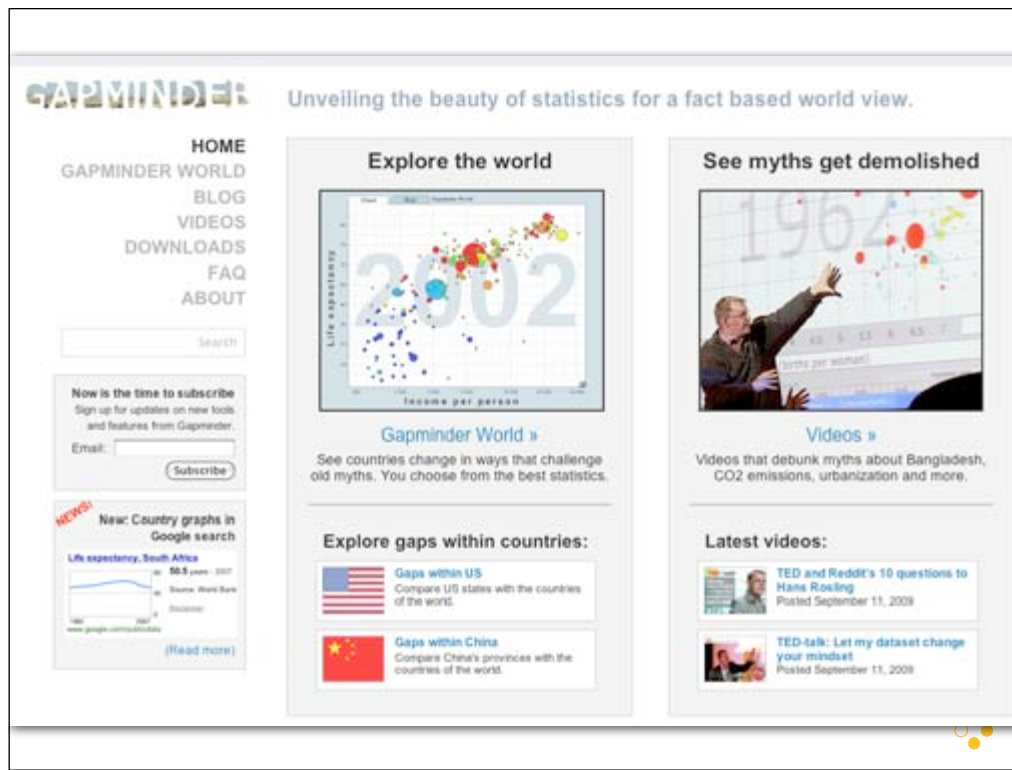
Image + further info: <http://storyofstuff.com/>

- The “Story of Stuff” another great example of information design



- Applicable to sustainability and corporate responsibility reports
- Apple have done a great job at expressing their environmental initiatives (after a public prodding by Greenpeace's Green My Apple campaign)

Image + further info: <http://apple.com/environment/complete-lifecycle/>



- GapMinder is just one great example of data visualisation in aid of social sustainability

# Interfaces everywhere



- Interfaces are appearing in more and more places
- Image shows one example: the Tesla S interior – the entire center console is an interactive display
- By demonstrating energy consumption at time of use we can influence driver behaviour to be drive more economically
- When focused on sustainability goals – greater usability = better experience = higher likelihood of adoption
- Augmented reality applications another potential example

Image + further info: <http://www.automotiveaddicts.com/3378/tesla-model-s-its-alive-official-images#more-3378>

# Telecommuting

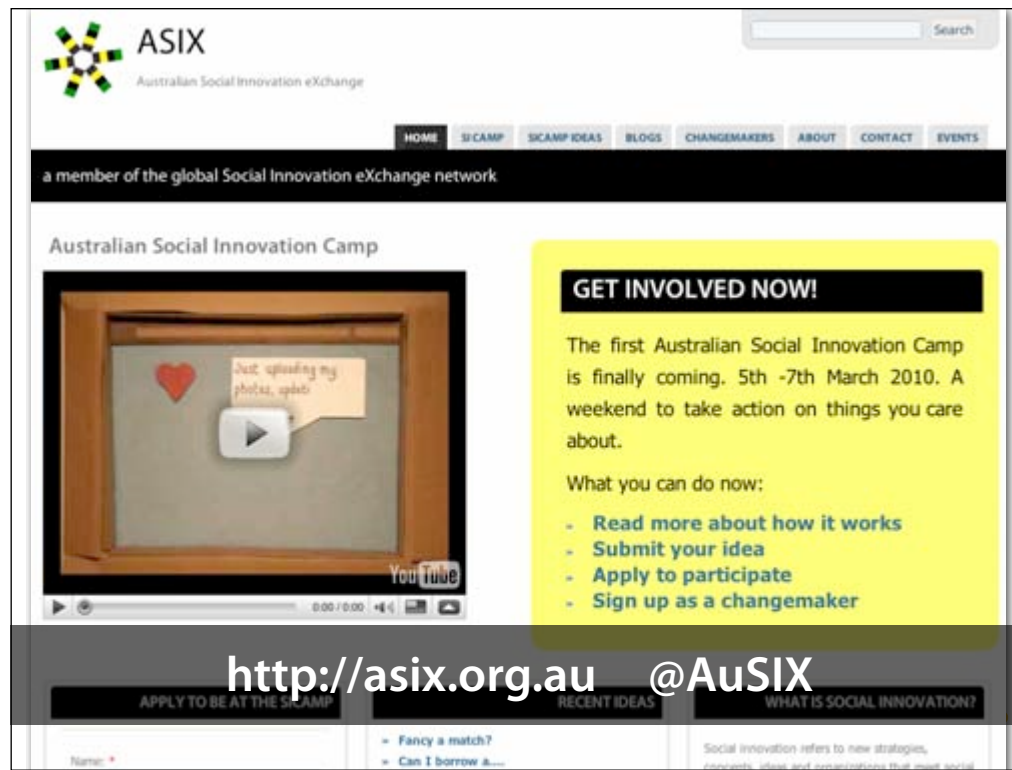


- Increase usability of remote collaboration systems, results in:
- Reduced transport emissions
- Increased productivity + quality of life

Telstra: <http://careers.telstra.com/getdoc/e3de4091-1b38-407c-9377-8757f4e3394f/GENERAL-517569-Telstra-Telework-Summary.aspx>

“telecommunications networks and digital products can enable business enterprises, households and governments to reduce carbon emissions, ... commute time and ease congestion in [CBDs], potentially delivering carbon emissions savings [in] Australia of up to 3.1 million tonnes per annum.”

Image: dolanh on flickr – <http://www.flickr.com/photos/reneeanddolan/655721842/> (Cisco 3000 telepresence suite)



- More “traditional” usability practice applied to building communities and supporting organisations working towards sustainability outcomes
- Improve the usability and experience of these sites increases engagement and support for these organisations

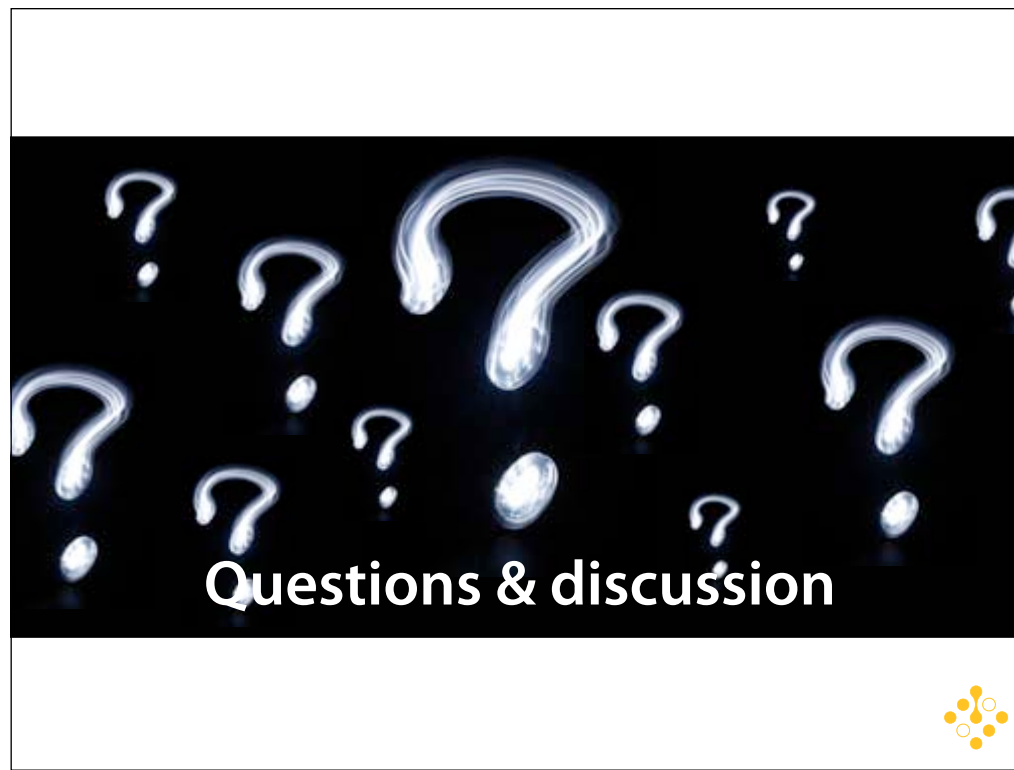


Image: Charles Chan @ [http://flickr.com/photos/charles\\_chan/544022867/](http://flickr.com/photos/charles_chan/544022867/)



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