Climate Change and ICTs: some ICT perspectives from the UK

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GreenNet was set up in 1986 to connect environmental NGOs, both internationally and with each other, initially through email and newsgroups (electronic conferences). Nowadays GreenNet is unfunded and concentrates mostly on website development and hosting for paying projects, including among many others Community-Led Total Sanitation (CLTS), Freshwater Action, FERN.org and Datum International.

GreenNet also has a history of work on internet rights, supporting privacy, freedom of expression and equal access online. GreenNet is a non-hierarchical non-profit, and proud to be a founder member of Association for Progressive Communications (APC), with which it has also worked on projects like Fibre for Africa.

Cedric Knight has been a technical worker for GreenNet since 2003, specialising in email, and also contributes policy work. He is a technology-hating geek, which is awkward for everyone. This is his first visit to Africa, and he's here to learn.

Mitigating the climate impact of ICTs?

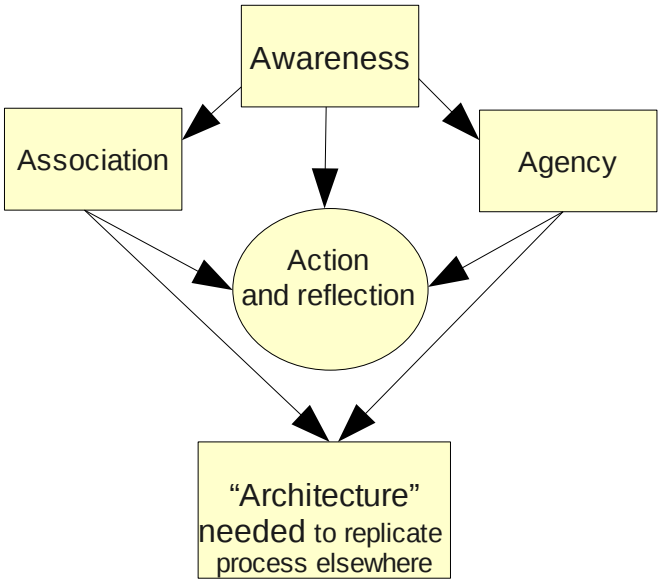
While specific technologies may help climate change mitigation in various ways, from videoconferencing to smart grids, in Europe there has been more consciousness of negative environmental aspects of ICTs, including power usage, coltan and e-waste. In 2007, IT analysts Gartner claimed that the life cycles of PCs, servers and cooling, telephony and printers were globally responsible for 2% of CO_2 emissions, equivalent to emissions from aviation[1], and further that 23% of ICT power usage is from data centres housing servers, and 40% from PCs and monitors.

This awareness has led to many claims from private companies in the UK for "greener IT", some of which buy carbon credits or RECs. My attempt to find reliable independent information for the GISWatch (Global Information Society Watch) 2010 report on "Greening IT" ran into difficulties. While there are some useful metrics (eg the PUE [Power Usage Effectiveness] of data centres), and best practice (eg EU Code of Conduct), and the 2010 Carbon Reduction Commitment

Background figures on mitigation: Greenhouse gas emissions are most commonly measured in metric tonnes of CO_2 equivalent (tCO_2e), equating other GHGs like methane using global warming potential (GWP) over 100 years. 1 tCO_2e equates under US assumptions to about 1400kWh of electricity. Total global GHG emissions in 2004 were 49 $GtCO_2e$, of which 56.6% was CO_2 from fossil fuel use (IPCC, 2007), or 16.1 tCO_2e per capita in the developed Annex I countries. To limit global warming to 2K above pre-industrial levels, emissions need to peak before 2020, and per-capita emissions must be less than 1 tCO_2e a year by 2050, an 80-90% reduction for the developed world. (Allison et al, 2009) **UK response:** The UK, backed by popular support, was the first country to pass climate change legislation in 2008, requiring 80% emission cuts by 2050 while the EU aims for 20% cuts (below 1990 levels) by 2020. The 2006 review by economist Nicholas Stern recommended investing 2% of GDP to combat climate change, although this s based on higher final atmospheric CO_2 (up to 550ppm) than most experts think is acceptable.

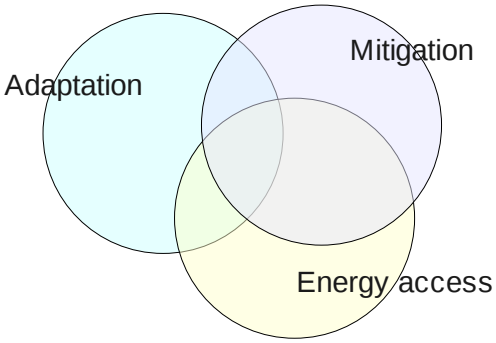
1 Gartner. 2007. Press release: "Gartner Estimates ICT Industry Accounts for 2 Percent of Global CO_2 Emissions", 26 April 2007, http://www.gartner.com/it/page.jsp?id=503867 The aviation comparison is debatable, as the "total warming effect of aircraft emissions is 2.7 times as great as the effect of the carbon dioxide alone" (Monbiot, 2006) IPCC. 2007. *Climate Change 2007: Synthesis Report*, AR4, section 2.1 http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains2-1.html Allison, I et al. 2009. *The Copenhagen Diagnosis*, University of New South Wales Climate Change Research Centre. http://www.copenhagendiagnosis.com/executive_summary.html

forces better energy reporting, there is an inherent problem in defining or legislating “efficiency” in ICTs since the work done is not quantifiable. Also, claims that 80% of ICT energy use is in manufacture (Williams, 2004), typically 1780 kWh in production of a desktop PC and CRT monitor and 220 kWh in one year's use, are contradicted by other sources claiming only 20%.



The “5 As” model of the necessary and reinforcing conditions for change. After Ballard S, Ballard D, “Clearing the Pathways to Transformation” in *Surviving Climate Change*, 2007. http://bit.ly/xEXg3t

In 2011, GreenNet worked with APC member Colnodo to produce an inventory of sustainable ICT tools and practices for both ICT4D practitioners and for ISPs (internet service providers), with a view to providing information for policy and advocacy groups, and practical guides. The inventory focused mostly on mitigation, through hardware and software power management; hardware refurbishing; IT tools on transport and carbon calculators; telepresence; and small-scale renewables.



Projects may simultaneously have benefits for multiple aspects of sustainability, for example soil stabilisation may address both climate change mitigation and adaptation. Many mitigation measures may overlap with adapting to energy scarcity, or even with conflict prevention.

We did not identify any practices or technological tools that were *specific* to sustainability of ICTs in the ICT4D community. Although there are technologies associated with ICT4D, including Ushahidi, FrontlineSMS and ChildCount+, my guess is the ICT tools used for climate change measures in agriculture and health in the South will tend towards cheap mass-produced technology and possibly existing free software on economic grounds (with the added benefit that local initiatives may customise it to needs). A common grassroots ICT mitigation application in the UK and US that may be replicable elsewhere is reuse using Freecycle email lists.

Possible follow-ups include “5 As processes” (opposite) in various areas: software design (not the efficiency of kit, but how you “drive” it), hardware design and ICT infrastructure policy.

GreenNet does little direct ICT4D work, although it provides ICT services to development organisations, and there are small-scale plans to raise funds from UK consumers for mobile broadband access to schools in Kenya using rugged 8W “Aleutia” PCs.

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