

# GREEN-MY-TECH TIPS 5

Sheets 1 to 4 in this series have looked at how, with awareness and co-operation, we can reduce the impact of computers and other communication gadgets on the environment and our health. However, there are also promising ways we can:

- Reduce greenhouse gas emissions and pollution through the specialised use of electronics (“ICT-assisted *mitigation*”), for example by “smart grids” and “smart buildings” and other efficiency gains. These applications could stop about five times more emissions than the 2% of emissions that information and communications technologies (ICTs) currently cause;
- Reduce the negative impacts of climate change on communities, environments and livelihoods, such as drought, flooding and other extreme weather events (“ICT-assisted *adaptation*”, reduced climate vulnerability or improved “e-resilience”);
- *Monitor* climate change and its effects using electronic devices; and
- Develop and co-ordinate strategic responses, globally and locally, to ecological threats.

Of course, some actions could fall into more than one category. Action to preserve forest ecosystems or maintain soil quality under climate pressures not only protects dependent communities, but also prevents further methane and CO<sub>2</sub> being released.

## USING IT AND ELECTRONICS TO BENEFIT THE ENVIRONMENT

### Can you give me an example of how I, as a consumer, can reduce green house gases using technology?

It's less fun, but you can try to travel less. Ask yourself: are all those conferences and workshops worth it? Or can they be done in another way? One of the IT-enabled mitigation measures is “telepresence”, which is evolving from video-conferencing and voice over IP (VOIP, like Skype or Jabber/Jitsi), and allows face-to-face interaction regardless of location. Assuming a 30% reduction in business travel, and a very large increase in working at home, this totals a modest 0.34 GtCO<sub>2</sub>e of savings (less than 1% of total emissions). Information technology may help us to “think globally”, raising awareness and communicating around the world, but we should also remember its potential to help us “act locally” at a level of connecting villages, districts and cities. For instance websites, email lists and social media can be used to campaign or to share resources. Car-sharing and journey-planning websites can also reduce transport costs. Unwanted goods do not need to be recycled if they can be distributed using auction sites, or donated for free through initiatives like Freecycle (or Freegle in the UK). We can't prescribe how the technology will be used, but you can be creative!

### What's so “smart” about smart technologies?

Large-scale engineering efficiencies using ICTs have been studied. The Global e-Sustainability Initiative (GeSI) has produced a report, *Smart 2020*, looking at potential efficiency gains through engineering, and also developed “Evaluating the carbon-reducing impacts of ICT: An assessment methodology” to quantify potential and achieved carbon reductions compared to business-as-usual. Most of the gains involve using sensors to monitor energy demands and so meet them in an optimal way. These include “smart motors”, “smart meters”, “smart grids”, “smart logistics” including urban transport systems and “smart buildings”. Accurate computer models of resource usage can also be employed in both design and operation stages, for example modelling use of natural sunlight, heat and air in a building. Optimising thermostats and timers for heating rooms is one of the biggest potential energy savings in cold climates, but ideally requires advance data on when the rooms will be inhabited. There are also many applications where people can use text messaging, for example, to know what the daily or long-term demand is for their products, whether fish catches or timber, and so prevent waste. One thing that is clear is that in the developed world, efficiency solutions need to be “retro-fitted” onto nineteenth- and twentieth-century cities and life-

styles, whereas in developing countries there can be more scope for building a modern and low-carbon infrastructure including “cleantech” and “smart” technologies, and so “leap-frogging” Northern economies. Cities can be sustainable, provided proper spatial planning allows a comfortable density of residential areas to be close to workplaces and green spaces and services, and so avoids informal housing.

### Okay, but is this something new?

Smart technologies are, but actually, one of the ecologically beneficial uses of ICTs has been obvious for some time. Through television, radio, and the internet, people can begin to understand the wonders of ecosystems on other continents, or in the deep ocean, and experience something of human societies, whether sustainable or not, far away on the other side of the world. This means that people can “connect the dots” between their role in a globalised economy and the effects they have on other people and their environment, and so understand what is needed to act more responsibly. Some have suggested that internet communication will enable a “global mind” that can learn how humanity can live equitably within planetary limits.

### And what about adaptation?

Using ICTs for adaptation occurs in many ways. A simple use is for better communication and information sharing. Radio and mobile phones are effective ways of distributing information about more sustainable practices in developing countries. For example, in Eastern Zambia these have been used to inform local people about the problems caused by deforestation and charcoal burning. Successful projects of this kind over wide areas almost always involve affected communities from the outset, have clear goals and processes, use or subsidise cheap and easily available appropriate technology that may already be present, share real practical stories, and communicate through relationships with trained local intermediaries, “infomediaries” or “champions”. Some projects require continued funding while other soon become financially self-sustaining.

### So, what should we consider first when it comes to using technology for adaptation?

This will depend on the specific location. But agriculture is one of the sectors most vulnerable to climate change. Just as in the Zambia example, cheap technology can be used to disseminate information about things like better working practices for example; which drought-resistant seeds to plant; which appropriate government schemes can help; what the market conditions are;

and build reinforcing links between people in general. ICTs can clearly play a role in enhancing literacy among all groups, and also help technology transfer from developed countries to developing countries and enable local research. Mobile phones can be used by groups of people over a large area to map effects like the retreat of glaciers or forest degradation. This information can be "crowd-sourced", for example using a web application like Ushahidi to give an overall picture of needs and potential problems and conflicts. Websites projects can be initiated by citizens to monitor ecological threats, for example suspected illegal logging by Spasigorata.net in Bulgaria. More formal Geographical Information Systems (GIS) can gather data from a wide network of automated remote sensors, which can need to be co-ordinated with early-warning systems in vulnerable areas. One interesting application of computers for individuals may be distributed computation. If you have a powerful computer that is mostly turned on anyway, you can download a program called BOINC and take part in massive simulations of climate prediction or of malaria control measures, or the World Community Grid. Computers can be used in simple ways to help individual environmental decision-making, for example with energy calculators like WattzOn and carbon calculators provided by Clean India, the World Wildlife Fund, Resurgence or offset companies like CarbonFootprint.com.

### **And this all contributes to sustainable development?**

2012 was a year for rethinking "sustainable development". The "Montreal Declaration" in May 2012 called on global leaders and technologists to prioritise renewable energy, support co-operative research and development of environmental uses of ICTs, invest in climate change monitoring, integrate ICTs in areas like agriculture, health and disaster management, take action on e-waste, and promote methodologies like those mentioned in these fact sheets. The

Rio+20 outcomes included calls for incentives for energy efficiency and for improved access to ICTs to engage civil society, "promote knowledge exchange" and to empower farmers and other primary producers. The British Royal Society's report *People and the Planet* concluded: "Technology has been vital for aiding human development of ecosystem services, and will continue to help avoid some of the impacts of a depleted natural environment." However, in developed and emerging economies "unsustainable consumption must be urgently reduced ... through dramatic improvements in resource use efficiency" and "combined effects of market forces and new technologies are not able to overcome planetary boundaries on the scale necessary to avoid unsustainable pressure on the planet and much human suffering."

### **And where do people fit in?**

Well, the British Royal Society also said we must "develop socio-economic systems and institutions that are not dependent on continued material consumption growth" because "barriers will not be overcome solely by technology, but in combination with changes in usage and governance". There are still many unknowns in the relationship between technology and sustainable living, and huge scope for innovation in all sectors. The great ideas come from individuals, but must be supported by action at organisational, national and international levels.

### **Does all this really make a difference?**

Yes! We all make a difference together. It may be an effort to do the work and convince other people now, but it pays off in the long run. Consider how you can make small changes in your life and encourage friends, colleagues or decision-makers to do the same, perhaps using the information in these sheets. Remember, don't break the biosphere -- someone else might want it!