



CLIMATE FRIENDLY CLIMATE RESEARCH POLICY BRIEF “EXISTING SOLUTIONS”

June 10th 2014

This policy brief reviews existing approaches to reduce the carbon footprint of research and research programming. On the basis of results from the policy brief, “problem analysis” and in the course of compiling existing solutions of “Climate Friendly Research” three main issues were identified:

Meetings and Events in general play an important role in the research and research programming context. It is obvious that climate friendly organized events - so called green meetings – can reduce the environmental impact.

Synchronous online communication has become a valid option for co-operation of distant project teams as well as conferences and workshops. The use of such technologies can reduce the carbon footprint in many ways.

Research infrastructure - research takes place within infrastructure: Buildings, facilities, technical devices, equipment, mobility, and more which is important for the overall carbon or ecological footprint of research.

The material presented here is based in particular on the JPI CLIMATE – Climate Friendly Climate Research project, coordinated by the Austrian Alliance of Sustainable Universities.



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Overview/background

Climate change research and research programming, especially in terms of publicly funded research programs, aim to support society in tackling the grand societal challenge of climate change and to underpin the necessity of reducing the carbon footprint of its activities. Ironically, the carbon emissions of universities and research organizations – and therefore also research programming – are high and in some regions on the rise.¹ This is due to the considerably carbon-intensive working style that researchers and their institutions have developed, fuelled by growing expectations of international cooperation, low air fares and an increasing use of resource-intensive infrastructures. However, crucial to scientific communication is also credibility, which can be severely undermined by such activities, which are often inconsistent with the message that climate scientists in particular advocate.

Introduction

This policy brief reviews and systematizes existing approaches to reduce the carbon footprint of research and research programming.

In seeking to identify ways to reduce the carbon footprint of research, it is hoped that additional positive side-effects can also be achieved, e.g. in terms of better use of time and financial resources, the broader impact of resource use and work-life balance.

This brief also assesses the potential of such solutions to contribute to the mitigation of the carbon footprint of (climate) research and research programming.

Methods

The main goal of this brief was the compilation of the state of the art on green solutions for research and research programming by means of a literature review and stakeholder interviews.

Analysis

Recommendations emerging from this brief are tailored to different stakeholder groups and organization units, defined in the first CFCR policy brief “Problem Analysis”. Likewise, the state of the art has been broken down into stakeholder groups and key elements of research that can be considered in isolation. These different stakeholder groups and research units are the following:

¹ See CFCR policy brief “Problem Analysis”.

- Universities and research institutes
- Individual researchers
- Research programming and funding
- Individual research projects
- Scientific conferences

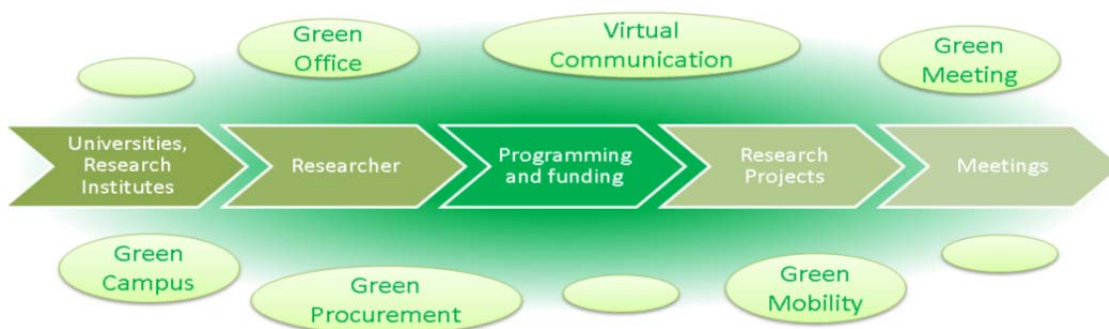


Figure 1: Bridging Sustainability and Research through Programming and Funding (own representation)

In the course of compiling existing solutions of “Climate Friendly Research” in the context of Research programming and funding, we focused on three main issues:

- **Meetings and Events**

Events in general play an important role in the research and research programming context. It is obvious that climate friendly organized events - so called green meetings – can reduce the environmental impact.

- **Virtual communication technologies**

Synchronous online communication has become a valid option for co-operation of distant project teams as well as conferences and workshops. The use of such technologies can reduce the carbon footprint in many ways.

- **Research infrastructure**

Research takes place within infrastructure: Buildings, facilities, technical devices, equipment, mobility, and more which is important for the overall carbon or ecological footprint of research.

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Greening Meetings and Events

Introduction and Overview

Events in general play an important role in the research and research programming context. It is obvious that climate friendly organized workshops or scientific conferences - so called green meetings – can reduce the environmental impact.

Green meetings or green events are organized in ways, which minimize the environmental impact of such activities. Event planners apply increasingly environmentally preferred practices to travel and local transportation, resource and energy use, venue selection, food provision and disposal, accommodation, and waste management for conducting more sustainable gatherings.

Environmental Impact

By following Green Meeting guidelines and suggestions, organizations such as universities and research institutes can significantly reduce their environmental impact. Green meetings minimize waste, save energy, conserve water, and reduce greenhouse gas emissions. Depending on the type, size, and international scope of the meeting, the impact of these efforts may vary but all of them help contribute to more sustainable activities.

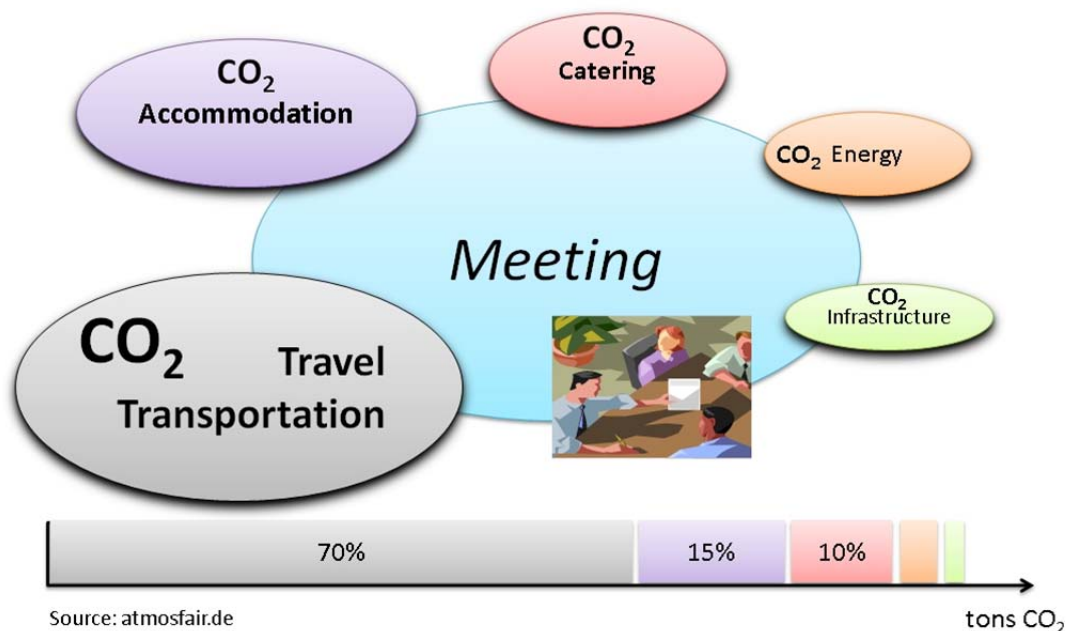


Figure 2: Environmental impact of international meetings

Key Impact Factors

The following activities associated with meetings and conferences are major sources of pollution and waste.²

Travel — Greenhouse gases and other pollutants released via planes, trains, buses, and automobiles.

Local Transportation — Greenhouse gas emissions and other pollutants released from taxis or rental cars.

Accommodation — Water usage associated with laundering; indoor air quality issues associated with building materials and cleaning products; energy, paper, plastic, and material waste associated with single-use toiletries.

Catering — Waste from disposable coffee cups, plates, napkins, and plastic-ware; disposal of extra food; non-sustainable farming practices.

Organization of Event and Registration — Paper waste associated with direct mailings among organizers, speakers, attendees, and venues. Waste from excess information materials, giveaways, and energy.

Conclusion: Travel trumps all others

Attendee travel to and from any given event is particularly impactful, accounting for as much as 70% or more of the overall footprint if a majority of attendees are flying. Even with no air travel, ground transportation and accommodation use alone can account for 65-70%³ of the event's carbon footprint. Encouraging your attendees to use low-carbon forms of transportation, or offset their travel can be more valuable than your own efforts.

Green Meeting – Guiding Principles:

EPA⁴, Atmosfair.de⁵ and others developed several guiding principles to provide a framework, which stakeholders can use to make environmentally sound decisions. The principles are:

Avoidance: Think about the need of a real meeting! Is a virtual meeting an alternative? Synchronous online communication has become a valid option for co-operation of distant project teams as well as conferences and workshops.

² See also: Environmental Protection Agency: <http://www.epa.gov/oppt/epp/pubs/meet/greenmeetings.htm>

³ See Climatepath.org: <http://www.climatepath.org/forbusiness/greenevents>

⁴ EPA – <http://www.epa.gov>

⁵ <http://www.atmosfair.de>

Reduction: In case of a physical meeting, the first step to reducing emissions is comprehensive planning. One important step is encouraging guests to switch to more environmentally friendly means of transportation by providing relevant information.

Decision-support tools – showing the accessibility of various locations in relation to the meeting location – can help choosing a location which is accessible via rail travel for the highest number of participants:

Table 1: Accessibility criteria for day-time and night train travel

		1 “convenient”	2 “acceptable”	3 “committed”	4 “voluntary”
Daytime train travel:	Duration	≤ 8h	≤ 12h	≤15h	≥15h
	Earliest departure time	07:00	06.00	-	-
	Latest arrival time	20:00	22.00	-	-
	Maximum number of changes	1	2	3	-
Night-train travel:	Duration	≤ 12h	≤ 15h	≤18h	≥18h
	Maximum number of changes	0	1	3	-
	Time without departure/changes/arrival	0:30 – 05:30	0:30 – 05:30	01:00 – 05:00	-
	Maximum number of changes	0	1	3	-
	Earliest departure time	17:00	-	-	-
	Latest arrival time	10:00	-	-	-

Source: University of Natural Resources and Life Sciences, Vienna⁶

Environmental accounting: The second step is to calculate the amount of CO2 emissions that cannot be avoided. This calculation is based on both the unchangeable realities of the event’s location as well as on the factors of the particular event that can be manipulated.

Compensation: The third step in holding a green meeting is compensating the unavoidable emissions through specialized organizations like:

DE: Atmosfair.de – www.atmosfair.de

CH : MyClimate – www.myclimate.org

NL: GroenBalans – www.groenbalans.nl/calculator/rai/calculator_rai_en.html

UK: Carbon Consultancy – www.carbonconsultancycompany.co.uk

⁶ <http://www.boku.ac.at/klimafreundlichemobilitaet.html?&L=1> (Accessed: 12.06.2013)

US: Climate Path – www.climatepath.org

Best practice solutions and Recommendations for any meeting to make it more environmentally responsible:

1. **Think about transportation needs.** How will attendees get to your event? Reduce distances travelled by speakers and delegates. If you can, select a location that is central, convenient, and accessible via public transportation. Aside from providing information on public transportation options, choose a venue and hotels that are close to train and bus stations and the airport and within walking distance of each other.
2. **Use paperless technology.** Use new media and electronic technology to cut down your paper use. Create a conference web site; offer electronic registration and confirmation; and advertise using the web and/or email.
3. **Food and other sourcing:** Providing local, seasonal, organic and vegetarian food options is always appreciated. Less meat means a lower footprint. Ask food vendors what they do to green their products and services and arrange to donate extra un-served food. Ask for organic, fair trade coffee, tea, milk, beverages, etc.
4. **Waste Management:** Set a waste goal and arrange for recycling. Ask your hotel and/or meeting venue to provide visible and accessible reduction, reuse and recycling services for paper, metal, plastic and glass.
5. **Save energy:** Energy generation causes greenhouse gas emissions. Coordinate with the meeting venue to ensure that energy lights and air conditioning will be turned off when rooms are not in use.
6. **Select eco-friendly accommodation:** Point attendees to eco-friendly certified hotels.
7. **Spread the word:** Tell delegates, speakers and the media about your efforts, and ask for their cooperation. You'll be surprised by the enthusiasm. You can make a difference, and attendees appreciate the effort!

Guidelines and References

UNEP Green Meeting Guide (2009): Whether you are a host, planner or supplier, this is where you'll find the tips, tools and resources to make environmentally responsible choices for your meetings.

www.unglobalcompact.org/docs/issues_doc/Environment/Green_Meeting_Guide_WEB.pdf

Umweltbundesamt, Deutschland (2010): Leitfaden für die nachhaltige Organisation von Veranstaltungen: www.umweltdaten.de/publikationen/fpdf-l/4059.pdf (German only)

Lebensministerium, Österreich: Umweltzeichen – Green Meetings & Green Events: UZ62
www.greenmeetings.umweltzeichen.at (German only)

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Universität Salzburg: Green Meeting Guide (2011):

www.uni-salzburg.at/greenmeeting (German only)

US Environmental Protection Agency – EPA: The EPA website provides information to incorporate environmentally friendly practices for event planning, accommodation, catering, and event location. Links to current environmental initiatives and tools are available. www.epa.gov/opptintr/greenmeetings

Meetingsnet: Green Meetingsnet resources related to environmentally conscious meeting planning and trends. meetingsnet.com

Green Meetings Industry Council: The GMIC is a non-profit, membership-based organization for improving meeting management by supporting collaboration and the development and dissemination of resources and opportunities that improve the environmental performance of meetings and events. www.gmicglobal.org

Benefits of Green Meetings

- The Economic Bottom Line: Planning and executing environmentally sustainable events isn't just about being environmentally responsible, they can have economic benefits for the event organizer (e.g. paperless technology, waste reduction, energy saving).⁷
- The Environmental Bottom Line: Using recycled materials, recycling materials used, reusing items and reducing materials used can significantly lessen the environmental impact an event has.

Greening Communication: Virtual communication technologies

Introduction and Overview

Synchronous online communication has become a valid option for co-operation of distant project teams as well as conferences and workshops. Due to the continuous technical improvement of web conference systems, client computers and Internet connections it developed into a viable solution. However, use is still limited. There are objections concerning technical reliability as well as social implications. This section will give an overview on the state-of-the-art of synchronous online communication and will outline innovations available in the near future.

⁷ HULTGREN, K. (2009): Affordable and Green. How planners can save Money and still help the environment. Meetings and Conventions. October 2009. http://www.meetings-conventions.com/article_ektid29114.aspx

Video Conferencing and Video Telephony

- Skype

A simple to use tool is Skype⁸. Introduced in 2003, Skype soon became the number one tool for video conversations, due to its user-friendly design, its availability on most of the common platforms (such as Windows, Mac OS X, Linux and various mobile operating systems) and of course because it's basic use - video chatting - is free of charge. By the end of 2012, Skype had about 700 million users. The paid version of Skype currently enables users to set up video conferences for up to ten participants. In order to use Skype one has to install a client programme or in case of a mobile device an app.

The chat Skype offers has proved to be very useful for team collaboration to send URLs, email addresses, pictures, files and so forth during a conference call. The additional text channel is also valuable to check the availability of your counterpart before calling.

The paid version of Skype allows including participants with landline telephones in a conference call as well. To combine Skype with other synchronous tools like Google Drive (see below) is usually an advantage. Google Drive offers collaborative text editing and can be used to jointly write minutes of a meeting. As an alternative to Skype there is a standardised protocol for VOIP communication called SIP⁹ offering similar options for voice and video calls over the Internet.

Web Video Conferencing

Web conferences erase the barriers of geography and make it easy for anyone to join a virtual meeting from anywhere. The main requirements are a stable connection to the internet and a fast computer. No special hardware is needed besides a headset and a webcam. Most systems are either based on Adobe Flash¹⁰ or Java¹¹. They offer far more flexibility and options than Skype or SIP clients. But they require some effort adjusting microphones, webcams and to familiarise oneself with the system. The market for web conference systems is evolving at fast pace. It is difficult to compare features and prices. Subsequently three of the most popular ones are outlined.

- Adobe Connect

Adobe Connect is a Flash-based cloud hosted web video conference system. It is very flexible and customisable and one of the market leaders. An advantage is that it does not need additional software to be installed. A browser and the latest version of Flash are

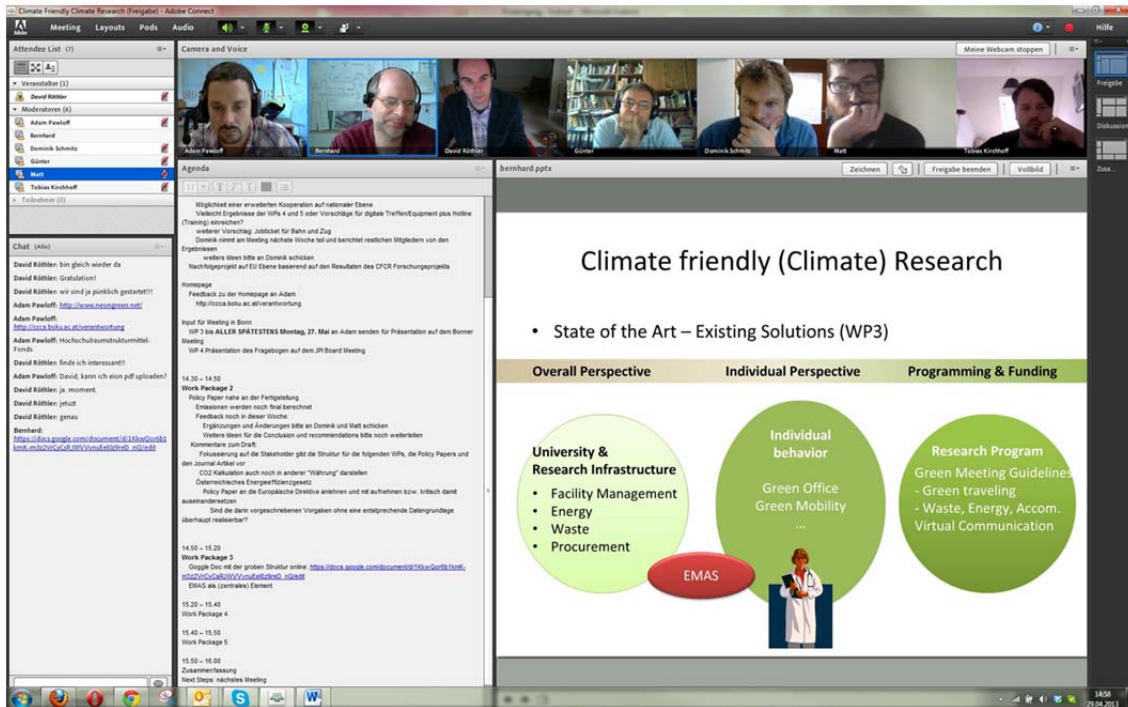
⁸ <http://www.skype.com>

⁹ http://en.wikipedia.org/wiki/Session_Initiation_Protocol

¹⁰ http://en.wikipedia.org/wiki/Adobe_Flash

¹¹ [http://en.wikipedia.org/wiki/Java_\(software_platform\)](http://en.wikipedia.org/wiki/Java_(software_platform))

sufficient. Nevertheless a small piece of software called “add-in” enhances audio and video quality and allows screen sharing. It offers mobile support for Android and iOS. Adobe Connect offers features like chat, polls, whiteboards, sharing of PowerPoint, PDF, recording sessions.



Source: David R thler

- Cisco WebEx

One of the competitors of Adobe Connect is WebEx¹². It offers similar features and pricing. WebEx offers carbon footprint calculator at

<http://www.webex.co.uk/why-webex/environment.html>

- Citrix GoToMeeting¹³¹⁴

A further alternative is GotoMeeting. HD video conferencing is possible as well.

¹² <http://www.webex.co.uk>

¹³ <http://www.pcmag.com/article2/0,2817,2387935,00.asp>

¹⁴ <http://www.gotomeeting.co.uk>

Open Source and Free Web Conferencing

Non-proprietary systems have been developed more recently. They are improving but still lack stability and features. Apache OpenMeetings¹⁵ and BigBlueButton¹⁶ are two prominent examples. They have to be installed and administrated by the institution using them whereas the commercial systems are cloud services maintained by the companies offering them.

- Google Hangouts

A stand-alone category is Google Hangouts. They are part of Google’s social network Google+, which offers a built-in web conferencing tool. A browser and a Google+ account are the basic requirements to take part in a hangout, but for voice and video functionality it’s necessary to install a plugin, since HTML5 does not offer native support for those features. Once installed, it enables up to ten Google+ users to easily set up a web conference with additional features. Google benefits from its enormous range of different tools and expertise in various areas, allowing it to include other tools like Google Drive/Docs.¹⁷

Telepresence



Telepresence systems usually require additional hardware. Market leaders in this field are Polycom¹⁸, LifeSize¹⁹ and Cisco Telepresence²⁰. They offer more immersive picture and sound quality. The price range of solutions is very broad. Most systems offer as well webbased and mobile clients. The systems tend to be more and more interoperable²¹ e.g. LiveSize can community with Microsoft Lync.

Source: <http://arblog.inglobetechnologies.com/?p=1031>

¹⁵ <http://openmeetings.apache.org>

¹⁶ <http://www.bigbluebutton.org>

¹⁷ With the live-broadcast feature to Youtube, called “Hangout On Air”, Google created a contemporary form of television. Starting in 2013 the German chancellor Angela Merkel uses Hangouts to broadcast live, allowing her to reach younger generations. Google Hangouts on Air can support PR and are a useful tool for science communication. There is a mobile app available for Android and Apple’s iOS devices.

¹⁸ www.polycom.com/content/www/en/company/features/video-collaboration-20121008-player.html

¹⁹ www.lifesize.com

²⁰ www.cisco.com/web/telepresence

²¹ www.wainhouse.com/files/papers/wr-vc-in-cloud.pdf

An interesting approach in this regard is the VideoMeet²² by Deutsche Telekom. It connects Polycom, Cisco, Lifesize with desktop based solutions like Skype, MS Lync and even Google Talk.

Second Life

The 3D world Second Life is – despite the end of the hype a couple of years ago – a category of its own and a fascinating way to communicate. The participants are represented by avatars who can move in the three dimensional environment. Speech transmission is of high quality and the stereo effect supports the 3D perception. Second Life can be highly immersive. Interaction between participants can be more personal as the position of the actors play an important role often overlooked in 2D systems.



Source: David Röhler

Second Life requires a strong Computer and a client. A good alternative to the standard client is the Firestorm Viewer²³. Second Life is more difficult to use than other systems. But the Second Life experience can be worth the additional effort. Especially for virtual social events Second Life can be an option.

²² videomeet.telekom.de

²³ www.firestormviewer.org

Comparison

	Skype	Google Hangouts	Web Conferencing	Telepresence	Second Life
For Beginners	++	+	+	+	-
For Advanced Users	+	++	++	+	+
Small Meetings	++	++	+	-	+
Large Meetings	-	-	++	+	+
Costs	++	++	-	--	++

Further Synchronous Web Tools

An important aspect of workshops and conferences is live interaction and collaboration of participants. These can be enhanced through the use of additional tools.

- Google Drive

Google Drive²⁴, formerly known as Google Docs is very useful to work collaboratively and synchronously on documents (text, spreadsheets, presentation etc.) Furthermore it serves as an archive for e.g. project related documents.

- Padlet

Padlet²⁵ is an easy to use brainstorming tool and can serve as a virtual pinboard for text, hyperlinks and images. It even does not require registration.

²⁴ <https://drive.google.com>

²⁵ <http://padlet.com/>

Interactive Broadcast of Meetings

It is a frequent issue that not everybody of a work group can participate at a meeting or conference. The solution is to include remote participants e.g. via web conference systems. The hardware requirements exceed those of simple web meetings as better microphones, speakers and multiple cameras should be used to give on-site and remote attendees a high quality experience. The utmost attention should be paid to a simple and reliable solution as the meeting or conference should not be disturbed by technical problems.

Hardware suggestions for small meetings (up to 10 people on-site):

Speakerphones	Moveable webcam
Jabra 500 ²⁶	Microsoft LifeCam Studio ²⁷
Yamaha PJP50 USB ²⁸	

Hardware suggestions for large meetings or conferences:

- Videomixer Roland VR-3²⁹
- 3-4 video cameras on tripods
- Wireless microphones
- Speakers according to size of the venue

Additional hardware going beyond standard technology would comprise robots, micro drones or remotely controlled Segway³⁰ like tools.



Source: <https://www.anybots.com/>

²⁶ <http://www.jabra.com/products/pc-headsets/jabra-speak-510-series/jabra-speak-510>

²⁷ <http://www.microsoft.com/hardware/de-de/p/lifecam-studio>

²⁸ <http://www.yamaha.com/products/en/communication/usb-conference-speakerphones/pjp-50usb/>

²⁹ <http://www.rolandsystemsgroup.com/products/100096>

³⁰ <http://www.anybots.com/> or <http://www.doublerobotics.com/>

The Future of Web Conferencing

The internet is a constantly evolving stratosphere. New technologies, innovations, gadgets, are being released frequently. Hardly a day goes by with some new technological marvel being revealed. In this milieu, the landscape of web conferencing might undergo a complete overhaul. The way people interact over the internet changes.

- Google Glass

Google Glass³¹ seems to be the next hype. Even before its release people discuss the technological and especially societal implications. What many people aren't aware of is the fact that it can be used for web conferencing as well. The wearable headset can be used to make calls to multiple people at once and conduct a conference on the go. It is expected to be the first of the devices listed here to hit the markets.

- Oakley's "Glass"

There is no official prototype or design for what Oakley is claiming to be its answer to Google Glass³². The company has a number of patents, which are similar in design to the Google Glass and have been working on them for the past 15 years. However, they are yet to come up with a design, which can be used to make a commercial product. Little is known about it but if it were similar to Google Glass, the device could be used for web conferencing.

- Microsoft Holodesk

The Holodesk³³ is probably the most innovative of all the tools Microsoft has come up with yet. The see-through screen of the device enables you to juggle objects, which aren't there. Hence, when you place video conference calls on it, it will appear as if the person you called is floating in the air in front of you.

- Oculus Rift

Almost on the market is Oculus Rift³⁴, a virtual reality device for video games. One can expect that similar devices will be used for immersive video conferencing in the near future.

³¹ www.google.com/glass/start/

³² Pre-product by Oakley technabob.com/blog/2012/10/31/oakley-airwave-ski-goggles/

³³ www.digitaltrends.com/cool-tech/video-microsoft-developing-a-holodesk/

³⁴ www.oculusvr.com

Further Resources:

Adobe Connect white papers: www.connectusers.com/learning_center/papers/

Comparison of web conferencing software:

en.wikipedia.org/wiki/Comparison_of_web_conferencing_software

www.pcmag.com/article2/0,2817,2388678,00.asp

Greening Research Infrastructure

Introduction and Overview

Research takes place within infrastructure: Buildings, facilities, technical devices, equipment, infrastructure for mobility, and more which is important for the overall carbon or ecological footprint of research. This infrastructure – especially built infrastructure – cannot easily be changed within the short term. One has to be aware of “windows of opportunity”, e.g. the renovation of buildings, or the integration of the university campus into the public transport network. On the other hand, awareness plays a key role: Developing environmentally sound behaviour of scientists at their workplace has a big impact on the ecological footprint of research projects. To estimate the environmental impact of infrastructure, electricity use and mobility see CFCR policy brief “Problem Analysis”!

Review

The best developed and most accepted measure to improve the ecological performance of companies and other organisations is EMAS – the EU Eco-Management and Audit Scheme³⁵. Introduced 1993, EMAS is an EU-wide instrument, aimed at step-by-step and long-term improvement of defined key environmental indicators. Process orientation, regular reporting and evaluation are primary features of EMAS:

- As a starting point an initial environmental review has to be performed to identify the organisation’s environmental aspects
- An EMAS registered organisation must approve compliance with environmental legislation.

³⁵ <http://ec.europa.eu/environment/emas>

- The environmental performance and its continuous improvement are evaluated by an environmental verifier.
- An EMAS registered organization has to be committed to employee involvement and to an open dialogue with representatives of the public, as local authorities, suppliers and other stakeholders.
- A verified public statement on the environmental performance lays down the results achieved against the environmental objectives and the future steps to be undertaken in order to improve the organization's environmental performance.

There are several and very diverse guidelines or tool kits for procurement, for parts of the infrastructure or for "good behaviour" existing at some European universities, or more general guidelines for public entities. To mention first some on a more general level:

Sustainable Procurement

Almost all member states of the EU have issued action plans on sustainable public procurement, part of which tool kits – also useful for universities or research organisations – are, e. g.:

Austria: www.nachhaltigebeschaffung.at/

Germany: www.umweltbundesamt.de/produkte-e/beschaffung/

EU: ec.europa.eu/environment/gpp/gpp_criteria_en.htm

UK: sd.defra.gov.uk/advice/public/buying/background/green-public-procurement/

In this regard, also national or international eco labels are helpful for purchasers, e. g.

- EU eco label: ec.europa.eu/environment/ecolabel/
- Nordic eco label (Nordic countries): www.nordic-ecolabel.org
- Blauer Engel (Germany): www.blauer-engel.de
- TCO (electronic devices): tcodevelopment.com
- Energy Star (electronic devices): www.eu-energystar.org/en/

Green Building

The Energy Performance Certificate is an EU-driven tool to make the energy consumption of buildings transparent, now part of national law in almost all EU countries³⁶:

³⁶ [DIRECTIVE 2002/91/EC](#) OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2002 on the energy performance of buildings

- The TQB (Total Quality Building)-Tool of the ASCB-Austrian Sustainable Building Council (www.oegnb.net/de/zertifikat.htm) is a sustainability check for existing buildings as well as a tool to support the planning process of a building in order to optimize its ecological indicators.
- LEED (www.usgbc.org/leed) is a US green building tool, developed by the US Green Building Council, which provides third party verification.

Selection of some guidelines of universities:

Sustainable Procurement

Leitfaden nachhaltige Beschaffung der Karl-Franzens-Universität Graz (2012; Guideline Sustainable Procurement, University of Graz)

Green Office

Green Office Zertifizierung der Universität Salzburg (2013, Green Office Certification, University of Salzburg): www.uni-salzburg.at/PLUSGreenCampus

Green Mobility

Several universities have implemented measures to:

- enhance the use of bicycles (“university-bikes”)
- make the use of public transport more attractive (jobtickets)
- promote carpooling
- give disincentives to use a car (e. g. via management of parking)

Green Campus Initiatives

Leuphana Universität Lüneburg:
www.leuphana.de/nachhaltigkeitsportal/nachhaltigkeitsbericht.html

University of Technology Graz:

www.tugraz.at

University of Life Sciences and Natural Resources, Vienna:
www.boku.ac.at/nachhaltigkeit.html

University of Salzburg: PLUSGreenCampus:

www.uni-salzburg.at/PLUSGreenCampus

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A different approach are – holistic – Carbon Management Plans of universities in UK, which include measures and projects like the above mentioned; e. g. University of Durham: www.dur.ac.uk/resources/environment/carbon/DurhamUniversityCMPV222.pdf

There are very good examples of Green Campus initiatives and concepts in Scandinavia, e.g. University of Oslo: www.uio.no/english/about/strategy/environment/

Policy Options, Recommendations, and Conclusions

Universities and research institutes:

- Introduction of EMAS
- Issuance of guidelines for mobility (incentives for the use of bicycles and public transport as job tickets, disincentives for the use of cars and planes) and the management of parking areas, energy efficiency/sustainability standards for buildings, procurement and “sustainable behaviour” at the workplace – preferably after a participatory process – and coming into effect via transparency, steady communication, reports and competitions.
- Motivation/obligation for canteens, cafeterias and restaurants to shift to regional, seasonal organic and “low-meat” food/products
- Evaluation of options for web conferencing. Note: Desktop solutions are considerably simpler and easy to implement than complicated conference room infrastructure. The ease to host an online meeting from the comfort of the workplace is of great value. Reserving a specific room for online communication increases the effort and decreases the frequency of online meetings.
- Provision of web conference infrastructure and the necessary technical support.
- Provision of free webinars explaining the respective systems. Introduction of incentives (financial, social) for web meetings, if these are preferred over traveling.
- Support and provision of such supportive infrastructure by umbrella organisations of research institutes or universities e.g. Climate Change Centre Austria – CCCA.

Individual researchers:

For individual researchers there are two main fields to contribute to a “green campus”:

- Mobility: Preference of environmentally sound modes of mobility, whenever possible: going by foot, biking, and using public transport for journeys to and from the workplace or to attend meetings!
- Workplace: The attentive use of facilities und resources (electronic devices, light, heat) e.g. can reduce about 25% of energy consumption at an average workplace. This

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positive impact can be increased by awareness regarding the use of (less and environmentally sound) paper and stationary!

- Virtual communication: Use of simple and free online communication tools like Skype and Google Hangouts for simple, free everyday communication.
- A headset and webcam are required to achieve good sound quality.
- Use of web based conference systems for project meetings and online workshops. A second screen is an advantage if the screen content is shared with other participants. This allows having the meeting window shown on one screen and the shared content on the other screen avoiding frequent switching of programme windows.
- Provision of budgetary resources to cover expenses for license fees, if the infrastructure for web-based conferences is not provided by the host.

Research programming and funding:

- Introduction of “EMAS certified” as an advantage (later: precondition) for applicants.
- Issuance of guidelines regarding the use of public transport and web conferencing tools by applicants, including mandatory reports.
- Introduction of green meetings as a criterion in funding programmes. Stipulation for project consortiums to propose ways how to avoid (air) travel without compromising the quality of collaboration. Carbon footprint to be taken into account similar to e.g. gender or European dimension.
- Linking of the aspect of online collaboration with innovative aspects like open access, open science, and innovative science communication as online collaboration usually lowers the barrier for the implementation of such schemes. Thus, sustainability is improved not only in an environmental sense but as well in the sense of the longevity and accessibility of results.
- Additionally, these approaches open up the research system and are likely to build a basis for concepts like citizen science or crowd-sourcing.

Individual research projects:

- Mobility: Use of rail travel where possible; no car use or flights for distances under 700 km. If car use is unavoidable: consider carpooling.
- Use of web conferencing tools to avoid travel whenever possible.
- Web conferences can contribute to the objectives of open science, a recent trend to make all results and the research process transparent. Web conferences can be opened for attendance of the public or recorded and then archived publicly. Open science is also an effective means of science communication.

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Scientific conferences and workshops:

- Communication of the preference of public transport, including “how to get there by public transport”- information.
- Provision of free public transport tickets for the participants
- Preference of regional, seasonal organic and “low-meat” food/beverages for catering.
- Consideration of the use of web conferencing tools.
- Live and if feasible, interactive broadcasting of all scientific conferences. This is not only a matter of transparency but of accessibility and will give absent researchers the opportunity to participate if they cannot join due to time constraints or distance. It is even possible to invite speakers online from anywhere in the world. Furthermore, the recorded live stream of the conference will serve as documentation. The recording can be distributed online.

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Amiando, (2013): Green Events Report 2013. Wie grün ist die Eventindustrie?

http://documents.amiando.com/pdf/Green_Events_Report_Deutsch/index.html

<http://info.amiando.com/LP=394>

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About JPI CLIMATE

The Joint Programming Initiative on Connecting Climate Knowledge for Europe (JPI CLIMATE) acts as a strategic platform for aligning national research priorities in the area of climate research and also for launching joint funding activities. It has fourteen member countries (Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Norway, Spain, Sweden, the Netherlands, and the United Kingdom).

JPI CLIMATE contributes to coordinated knowledge development and connecting that knowledge to decision-making on climate change adaptation and mitigation. By connecting science and decision making processes JPI CLIMATE aims to provide the knowledge necessary to meet the challenge of making Europe both climate-friendly and climate-proof, and reach the target of becoming a energy-efficient, low carbon society.

In consideration of the grand societal challenge of climate change being central to research efforts that are initiated by the JPI, it seeks to contribute to mitigating the carbon footprint of its work and activities. In doing so, JPI CLIMATE is committed to increasing the credibility of climate impact research and function as a role model for other groups of society in terms of responsible, climate-friendly science and research.

About the Alliance of Sustainable Universities in Austria

The Alliance of Sustainable Universities in Austria was founded in 2012 as an informal network of universities that aims at promoting sustainability issues in Austrian universities and thus to contribute to a more sustainable society. Currently nine Austrian universities are members of the network. Through its common appearance, the Alliance strengthens sustainability issues generally and also provides added motivation to its members to integrate sustainability at their institutions and adds support to these efforts. The main objectives of the alliance are to exchange good and best practice-experiences and to start joint activities in the fields of research, education, operations, society/knowledge transfer and identity, which are conducted in the framework of working groups. Within the Alliance the participating universities have committed to developing a sustainability strategy as part of the performance agreements for 2013-2015 that each university negotiates with the Austrian ministry for Science, Research and Economy.

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Authors

Zagel, Bernhard*; Getzinger, Günter**; Röthler, David***; Helgenberger, Sebastian****;
Kirchhoff, Tobias*****; Pawloff, Adam*****; Schmitz, Dominik*****;

* University of Salzburg

** Alpen-Adria University, Klagenfurt, Vienna, Graz

*** PROJEKTkompetenz.eu

**** University of Natural Resources and Life Sciences, Vienna

***** Austria Vienna University of Economics and Business

Contact

Adam Pawloff, MA (project lead)

Centre for Global Change and Sustainability

University of Natural Resources and Life Sciences, Vienna

Borkowskigasse 4

1190 Vienna

Austria

Tel: ++43 1 47654 7703

Email: adam.pawloff@boku.ac.at

Further CFR Policy Briefs and Recommendations

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