

Media communiqué

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Using Empa life cycle analyses to identify the low emission meeting

Being there is not everything where environmental issues are concerned

It is easy to forget that everyday office life with its business travel, conferences and meetings has a massive effect on the environment. Environmentally aware entrepreneurs will sooner or later ask themselves if they really need to be physically present at such gatherings, since nowadays modern information and communication technologies make virtual participation perfectly possible. And, if they do so, will in fact less climate-changing gases be released into the atmosphere? After all, computers, communication networks and similar infrastructure all consume their share of power too. These questions were addressed at the "Informatics Day at the Technopark Zurich held on August 29th, where at the Microsoft stand visitors were able to test how much CO₂ they would save, if any, if they replaced a "real" meeting with a videoconference. Using life cycle analysis methods and the «ecoinvent» database, Empa researchers produced comparative data showing what environmental effects were created, and where.

The management of an international company is planning to hold a one-hour board meeting in Zurich, to take part in which one director must travel from London. The management would like to know which option is more environmentally friendly – a teleconference over the internet or traveling by car, train or aircraft to be physically present at the meeting. Is the difference really significant, or is it negligible? This is the basic hypothetical scenario on which Empa scientist Roland Hirschier, of the institution's Technology and Society Laboratory, has analyzed using data from the «ecoinvent» database. «ecoinvent» is a globally unique scientific collection of basic life cycle data which was put together by Empa staff (in cooperation with other researchers) and which is also managed by Empa. Microsoft provided Hirschier with a list of all the equipment which would be necessary to arrange the videoconference, such as laptop computers, video cameras, projectors, servers, routers and so on – together with details of their power consumption and other technical data such as transmission rate and necessary cooling capacity. Using this information alongside the «ecoinvent» data relating to the electronics equipment, power production, and the various travel options available, the Empa expert was able to calculate the resulting emissions of greenhouse gases, measured in CO₂ equivalents.

The longer the journey, the more advantageous the virtual meeting in environmental terms

The results painted a clear picture. The most important factor in a real journey is the energy consumed by the means of transport, i.e. the train, car or plane. This is responsible for more than 99.8 per cent of the environmental impact, regardless of how one travels. However, a video conference over the internet also consumes large amounts of electricity, for servers, routers, laptop computers and projectors all need to be powered up and some devices need to be cooled too. Together, they are responsible for about 95 per cent of the greenhouse gas emissions associated with this option.

Nevertheless, the two different scenarios considered differ decisively in the quantity of greenhouse gas emissions generated. The virtual meeting emerged with the best marks by far, producing a mere 20 kilograms of CO₂ equivalent. This is almost entirely due to the fact that the data is transmitted over the internet. The most favorable travel option, by rail (in this case taking a high speed train via Paris) causes 108 kilograms, about a five-fold increase. Travel by air or road increases equivalent CO₂ emissions to 315 and 373 kilograms respectively, a 16 to 18-fold increase over the virtual meeting.

The train is by far the most environmentally friendly means of transport

Hirschier also calculated how the distance traveled affects the result. In other words, over what distance is a “real” meeting still acceptable or even better than a virtual meeting in terms of environmental impact? The results were surprising; for distances of less than 200 kilometers he found that it is environmentally less damaging when a single participant travels to the meeting by train than organizing a videoconference. “This is only true, however, when a single person has to travel this distance,” says Hirschier. If two persons need to travel to the meeting then the distance is halved, to 100 kilometers. And, of course, if ten or more participants were to travel to a meeting, as is frequently the case with conferences and seminars, then a virtual meeting is many times more environmentally friendly than a real one.

This is the same result as that arrived at by an older investigation, in which Hirschier, together with Lorenz Hilty, the head of Empa’s Technology and Society Laboratory, calculated the environmental impact of the «International Environmental Informatics Symposium» in Zurich, which they themselves organized. The study demonstrated that transporting the over 300 conference participants to and from the event was responsible for more than 96 per cent of the environmental effects. Particularly striking was the fact that nearly two thirds of the environmental impact was caused just 6 per cent of the travelers – those who journeyed more than 8000 kilometers. In comparison, a completely virtual conference would have caused about 45 times less impact, according to calculations based on the Empa scientist’s model.

The R’09 as an interim solution: a conference held simultaneously at several locations

Because personal contact is an important factor at meetings and conferences, and because it is the delegates’ intercontinental flights which cause the greatest environmental impact, Hirschier and Hilty evaluated the effect of a third option, a conference held in various different locations in parallel, in this case Zurich, Dallas und Tokyo. This approach caused the impact to be almost halved. Hilty plans to employ this “trick” next year during the organization of the «R’09 Twin World Congress on Resource Management and Technology for Material and Energy Efficiency». This event will once again be arranged by Empa and the

Swiss Academy of Engineering Sciences (SATW) to take place in Davos, Switzerland, and also simultaneously in Nagoya, Japan, with, of course, live video transmissions between the two venues. “As a little project on the side, we also plan to investigate how easy the participants find using the new technology, and how much CO₂ we save with the new arrangement,” says Hilty.

Further information

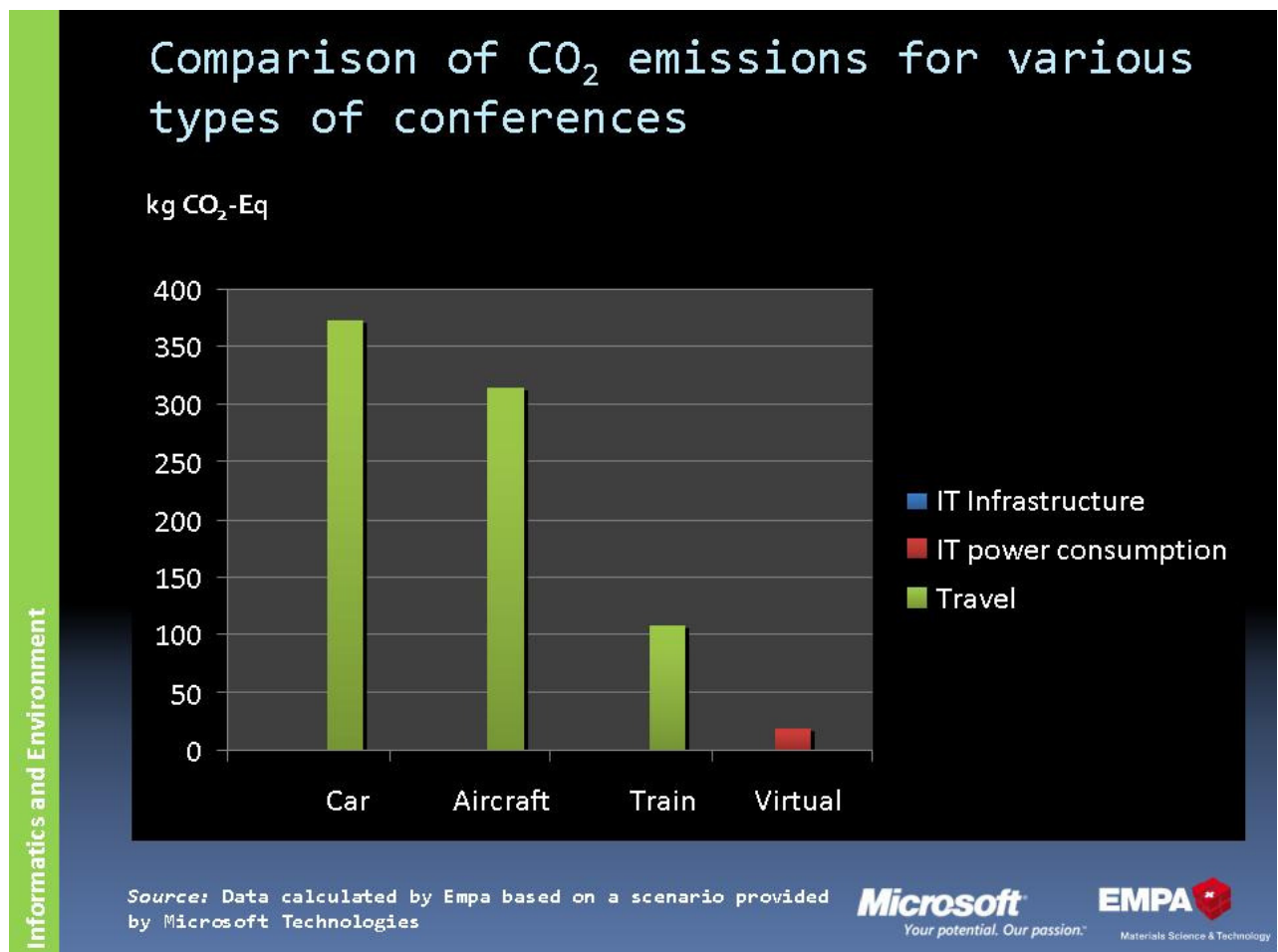
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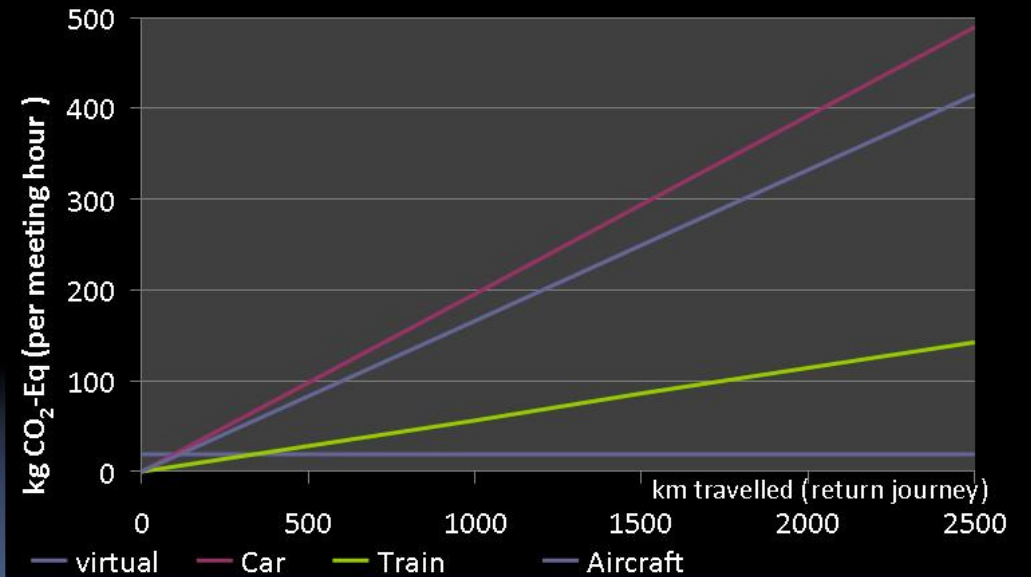
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CO₂ emissions with distance travelled to conference

Informatics and Environment



Source: Data calculated by Empa based on a scenario provided by Microsoft Technologies

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