

Session DP UP 2.1: Adapting to urban heat island effects

Date and Time of Session: Thursday, 30 September 2010, 13.00-14.45

Short description of the session topic and the objective of the session

Topic: During the day city's collect solar, which makes them get warmer then their surroundings. In the night the surroundings cool down, but the city's glow in the darkness.

Objective: To show possibilities for cities to adapt to the Urban Heat Island effect.

Session Agenda and Main Speakers

Session chair: Ronald Albers, TNO, the Netherlands.

Main speakers:

- Baldiri Salcedo, Delft University of Technology, the Netherlands/Spain (UHI: insights and challenges).
- Alex Nickson, City of London, United Kingdom (Urban heat in London).
- Heleen Mees, University of Utrecht, the Netherlands (Green infrastructure and heat stress in Toronto).
- Lissy Nijhuis, City of Rotterdam, the Netherlands (UHI, heat stress and measures in Rotterdam).

Most exciting insight, moment or outcome

The size of the problem London needs to cope with.

Main conclusions, themes, insights or messages

The Urban Heat Island effect:

During the day city's collect solar, which makes them get warmer then their surroundings. In the night the surroundings cool down, but the city's glow in the darkness. This difference in temperature can get a maximum of 10°C.

The most citizens of city's just enjoy this rise of temperature, although some complain.

But the problem caused by this increasing temperature is that people do not adapt to the heat. Which means that they don't recover during the nighttimes and that makes them more vulnerable.

The huge fires which threatened Russia made clear that nature also struggles whit the heat.

Another effect is that the electricity is hard to control, there are even cases that the electricity network got overloaded by cooling down the city instead of warming up.

The 4th effect is that the heating of the city makes it more comfortable for bacteria, which might lead to disease.

Above all the greatest risk is yet to come, when the temperature reaches the critical point of 24°C. At this point people will start to buy air-conditioning and the system will start air-conditioning it's own air-conditioning.

Alex Nickson: "30% of the heat in Hong Kong is generated by their own air-conditioning".

To cope with these effects there are 4 main roads of measures:

Absorption

At first the roofs of building makes a huge difference so colouring it white or change it to a green roof will make it absorb less heat. It's also a good way to create a good airflow through the building so the heat can move out while necessary.

Efficient cooling

As named in the absorption part a good airflow is a very efficient cooling system. Another way to improve the efficiency of cooling is to move the cooling machines from the roof, where they get heated by the sunlight, to under the ground.

City options

In the city structure the options are limited but worthy on more than just the heat aspect. Cause increasing the amount of trees and green zones in the city will reduce the temperature up to even 5°C. If the pavement will be changed as well the temperature can be decreased by 2,5°C. Another aspect that influences the temperature is the amount of water in the town, this may lead to a decrease of 2,5°C, as a Japanese ritual proved. In the Netherlands there is also a new design called "waterpleinen" which are places to store rainwater on the surface and can be multifunctional. For example it can be used as a footballfield on normal times and as water storage on top of the footballfield in times of heavy rainfall. Finally the city structure can influence the airflow and the amount of shade/sun, which is an important part of the heat.

Public

Last but not least the public part. According to the struggles in Toronto 2 hours of cool off makes the survival change increase pretty much. As well informing the public of possible heat danger by the government or partners will make a difference.

Heleen Mees: "Help your pet beat the heat".

Finally the city of Rotterdam introduced a recreation beach inside the town so the citizens no longer need to heat up the city by using their cars to move to the beach.

Key phrases or quotes

- Alex Nickson: "30% of the heat in Hong Kong is generated by their own air-conditioning".
- Heleen Mees: "Help your pet beat the heat".