

Discussion session 2

Chair:

It seems clear that for moderate climates (Belgium, the Netherlands, UK, Germany,...) active cooling becomes an important issue in summer. The challenge is more in the direction of how to deal with thermal comfort in summer than how to give good thermal comfort in winter. It is also important to mention we need an appropriate building design to minimize the need for cooling. What do people think about this issue? Should we bring the designer or architect closer to the process? Should we not put more emphasis on the issue of active cooling for dwelling applications? Is there any comment on this topic?

Public:

1. It is important to mention that the people who are living in the dwellings have to decide whether they want cooling or not.
2. I do see a need for cooling in houses in summer, but we might not forget problems such as security. You can't let your windows open, if you are not at home. For security reasons you need to keep your windows closed. This will have an impact on future houses. I do think plant cooling, mechanical ventilation or heat recovery cooling are ways forward.
3. The humidity in summer is a much bigger problem. We made a calculation for Essen (city in Germany) and there we have an outdoor temperature which is only 250 hours a year higher than 26 °C, but the humidity is more than 2300 hours a year higher than the comfort value. So, the main thing we need is a dehumidification and then you also have a good thermal comfort.
4. I think night cooling in summer can also be very effective. All what you need are openings in the facade that can be controlled.
5. I think this is correct in a sense, but after 2 or 3 weeks hot outside weather night cooling doesn't work any more. I believe there is one country in Europe where mechanical cooling is prohibited. I believe it is in Switzerland, but I'm not sure. Is there somebody from Switzerland who can tell something about this and who can explain how it works in practice.
6. In Switzerland you have to prove the need to install an air conditioning system. You have to prove that the inside temperature is over 28 °C within 30 hours a year. On the other hand outside temperatures over 30 °C are not put into the calculations, since these days are considered as hot days. So, it's difficult for us to get a permission to install an air conditioning system.
7. I would like to give a remark concerning 'night cooling'. You have to be careful. If you do it mechanically by a fan, you need more electricity for the fan per kWh cooling than with a normal refrigeration system. It is very important to clarify this. Furthermore, night cooling will never help you dehumidify the building. A decrease of the inside temperature by night cooling leads to a higher relative humidity and will never give you a better comfort.
8. I agree you cannot control the inside humidity by night cooling, but you will get an increased air speed within the room which gives you a better comfort. I was involved in a project in which we could keep the temperature during the hot summer of 1994 below 25 °C. People were very satisfied with this.
9. In Australia people felt that it wasn't quite right to spend the money just for a few months in summer. Then, the electricity authorities started to bring in a very strong marketing campaign on reverse cycle systems (a cooling system is used in summer, a heating system is used in winter). The sales have gone up enormously, but most importantly the energy consumption has come down dramatically in the winter. I would like to know what is happening about reverse cycle systems in Europe.

10. In a lot of European countries electricity is too expensive for heating in winter. Gas is much cheaper than electricity.
11. In New Zealand we have electricity that is relatively cheap compared to gas. So, in our country the number one on the list today is the electric heat pump. Without the heat pump we could not make the savings that we are making today in air conditioning.
12. Several years ago we made a study in Japan on domestic air conditioning systems and how people use them. The study revealed that a lot of people had an air conditioning system installed, but did not use it. The main reason was the money they didn't want to spend.
13. In Luxembourg we have problems to get a permission to install a heat pump because of the refrigerants. I would like to know from the people in Australia or New Zealand what refrigerants are used in those heat pumps.
14. Up to recently, most heat pumps operated on refrigerant R22. It looks from the information I've got that the heat pumps in future will be running on 134a.

Chair:

I would like to close the session here. I hope you will be very active in the discussions at the posters. Thank you.

Karl Janssens