JECO

The Jewish Ecological Coalition

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This month features another article by Jonathan Keren-Black about the most efficient way to heat and cool buildings. If you would like to contribute an article of your own, please email: flitman@optusnet.com.au
Evelyn Flitman
JECO President

Heating and Cooling your Home or Office

When we arrived in Melbourne in the very hot summer of 2003, looking for houses with air conditioning, the agent told us that people were generally more concerned that the house had good heating!

We were amazed at the gaps around windows and doors, and the general reflex to turn up the heating or turn on the cooling before putting on a jumper or removing some layers of clothing. This is in part due to the plentiful and cheap to extract brown coal of the Latrobe Valley in Victoria. Energy has been far too cheap here for so long that, unaware of the damage it does, it has become the easiest response. If Australia has the highest emissions per

capita around the world, then Melbourne's occupants takes the dubious title of the dirtiest emitters on the globe!

Still, we want to be warm, and cool, and changes of clothing and even better-insulated buildings are not always sufficient. So what is the best way to do it? For a new house there is one simple answer. Heat pumps. What on earth are heat pumps, you may be asking? They are better known as reverse cycle air conditioning – units than can cool, or heat, your rooms. That last word, rooms, is important. You should only heat the room or rooms you are using.

Luckily, by far the most efficient heat pumps are single room spilt system units. They are called split systems because they have two parts which work together – one inside the room and one outside. I'll come back to that in a moment. Let me first explain more about a heat pump.
What do you think is the most reliable piece of domestic equipment? The fridge. Reliable because it's simple. Now a fridge is a heat pump! Surprising as it may seem, a fridge does not make cold. And, though you may be aware that it has a radiator at the back or around the sides that is warm, it does not make heat either. What is does is MOVE (pump) heat from one area to another. In the case of the fridge it takes the heat from the air inside the fridge and dispenses it to the room through its radiator.

Your air conditioning unit does the same. Your room is like a big fridge. Heat is removed from the air in the room, and dispensed to the outside air through a radiator and fan.

This process can be reversible (in a reverse cycle unit). If you want to warm up the air in the room, the system takes warmth from the outside air and adds it to the air in the room. It's important to note that the actual temperatures aren't that important. In rough terms, if the air inside is 16 degrees and you want to raise it to 18, then two degrees of heat is required. So if the temperature outside is 10 degrees, (and if the outside was only the same size as your room), it would need to drop by two degrees to 8 degrees. Of course in reality the outside atmosphere is huge, so you wouldn't be able to measure an overall change, but the air coming out of the outside unit will be a bit cooler than that going in to it, as some heat is removed from it.

It's between 2 and 8 times more efficient to 'pump' heat in this way than to produce it from any other sort of electric heater. But between 2 and 8 is a very wide range. Smaller, single room units are more efficient than the best larger or multi-room units. Whole house units are the worst (and least controllable). Single room split systems themselves vary substantially, and their efficiency is indicated by a star system. Look for the maximum number of stars you can afford. (Window or hole in the wall units are completely hopeless and should never be installed.)

What about if you already have a house and it has a heating system (or a heating/cooling system)? New, split system units are much more efficient than whole house systems and even than older split systems. And it's much better to use electricity to power a heat pump than to use gas heating. But in replacing units which are still working, you have to be aware of what is called 'embodied energy' – basically 'how much energy was used simply to mine and make the materials and to build and transport this piece of equipment to my home?'. It will be hard or impossible to get a definitive answer, but you can assume it will only be 10% of the energy used in its expected lifetime. If a reasonable expected lifetime is 10 years, then this

means a new piece of equipment will save all the energy used in its manufacture in the first year. After that, it's helping save the world (and your money) every month and year!

However, don't forget to turn off the unit when you leave the room – and train your family to do the same! Although these units often have timers, they are rarely used, and because they are so quiet, they are commonly left on – not a way to save energy or electricity bills! Some units can turn off when the room is unoccupied – a feature worth looking for and using if possible!

One final point. If you are not already on 100% renewable electricity, you should be. This is the simplest, cheapest and most cost-effective step you can take to look after the environment. When you then use your heat pump to warm or cool your house, you can do so content in the knowledge that whilst you and your family keep comfortable, you are making no contribution to climate-changing emissions, and that such steps are active and effective Tikkun Olam - healing the world – as opposed to heating the world!

Jonathan Keren-Black is Rabbi at the Leo Baeck Centre for Progressive Judaism in East Kew, a founder member of JECO, the Jewish Ecological Coalition, and Board member of ARRCC, the Australian Religious Response to Climate Change. Jonathan is currently completing a Diploma in Social Change and Sustainability.

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The JECO Committee welcomes input to and comments about JECO eNews.

JECO works to deepen the Jewish community's commitment to caring for the earth. We believe there is a religious as well as a moral obligation to protect the environment. To this end we work with Jewish, secular and multi-faith groups in supporting activities that promote sustainability.