Researchers develop a new system that can lower room temperature in buildings

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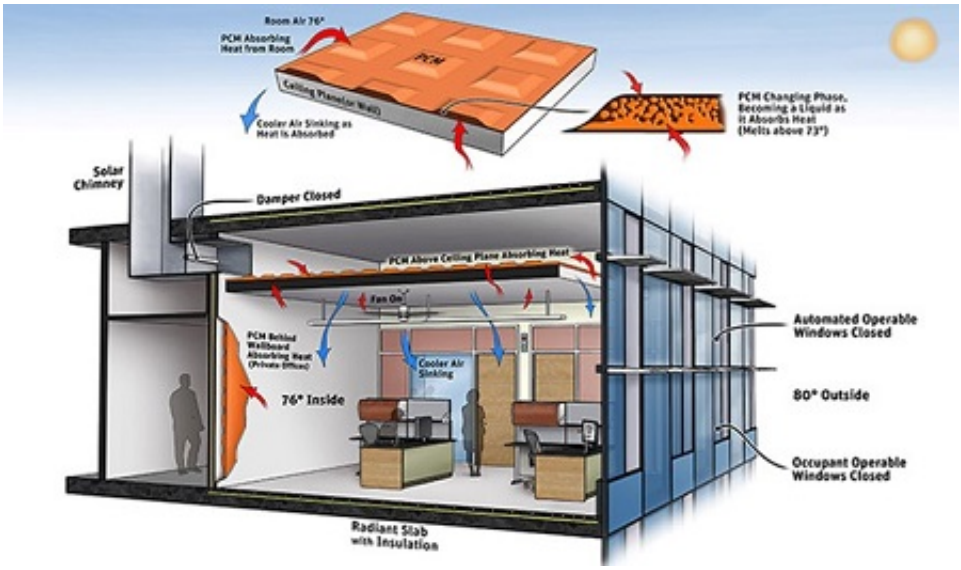

Credit: Saleh Haron

A team of researchers from Institut Teknologi Maju (ITMA), Universiti Putra Malaysia (UPM) has succeeded in inventing a new system, known as Nanotechnology for Encapsulation of Phase Change Material (NPCM) that can bring down room temperature in buildings, thus minimising the use of air-conditioning or heating systems, and saving electricity bill.

Head of research team, Prof. Dr. Mohd Zobir Hussein said the encapsulation technology could change material at nano-sized regime

which is good for use as thermal energy storage media.

"This NPCM method is the first of its kind in Malaysia that can absorb, store and release thermal heat when the surrounding temperature where the material is located is above or below melting temperature.

"These properties allow the phase change material to store the thermal energy when it melts and releases the energy when it solidifies," he said.

"If it is used as passive or active building component, it can help in controlling the internal building temperature fluctuations which will result in thermal-comfort buildings.

"This will reduce dependency of building occupants to air conditioning or heating systems and electricity consumption, indirectly reducing carbon dioxide emission.

"NPCM can be incorporated into cement or paint as active insulation materials and apply to the ceilings or walls of the buildings," he told a Press Conference during 2016 ITMA Innovation Day.

He also said if it is incorporated into building components, it will not give any adverse effect to the structure integrity of the buildings.

Elaborating, he said a study showed that the surrounding temperature in Malaysia is getting increasingly hot, torrid and humid with heavy usage of air-conditioning system among the people and this, indirectly had contributed to the increase in electricity consumption.

"In addition, most modern buildings are developed using light weight building material technology with low thermal inertia or low thermal mass.

"This causes the internal building to face large temperature fluctuations due to external heating or cooling load.

"The increasing demand for air-conditioning units will lead to further increase not only in electricity consumption but also cost of living," he said.

NPCM research which took about two years to be completed last year was carried out by four researchers, led by Prof. Dr Mohd Zobir. The other three researchers are Dr Tumirah Khadiran, Prof. Dr. Zulkarnain Zainal and Dr Rafeadah Rusli. The encapsulation technology is ready to be commercialized.

Provided by Universiti Putra Malaysia (UPM)