

Ministry of Energy, Communications and Multimedia Malaysia

<http://www.mecm-leo.gov.my>

MECM Low Energy Office building Putrajaya Malaysia

In the beginning of 2004, the Ministry of Energy, Communications & Multimedia MECM will move to its own 16,000 m² building in the new Federal Government Administrative Capital, Putrajaya, situated between Kuala Lumpur and the new Kuala Lumpur International Airport.

The Government of Malaysia wants their new Ministry of Energy building to be a showcase building for energy efficiency and low environmental impact, and design support from the Danish Agency for Development Assistance – DANIDA (formerly known as DANCED) program was requested and granted. The building shall demonstrate integration of the best energy efficiency measures, optimised towards achieving the overall best cost/effective solution.



Danish experts have since January 2001, in cooperation with Malaysian architects and engineers, optimised the overall design of the building and its energy systems for minimum energy consumption. A computerized design tool was introduced as a key instrument in the optimization of the building design and the design of the energy systems. In August 2002 the detailed design of the building has been finalised, and Putra Perdana Construction Sdn Bhd has started construction.

An ambitious goal was set for the energy efficiency of the building: Energy savings of more than 50% compared to traditional new office buildings in Malaysia should be achieved at an extra construction cost of less than 10%, giving a payback period of the extra investment of less than 10 years.

The cost target of maximum 10% extra costs for the energy efficiency measures have been confirmed through the recent Design and Built tender. The computer modelling using the Energy-10 computer software have predicted more than 50% energy savings. A subsequent energy monitoring follow up program is planned. The energy monitoring during use will add vital credibility to the predictions, that major energy savings and environmental benefits can be achieved in the building sector of Malaysia.

Design and Performance of the MECM LEO building

The new MECM LEO building demonstrates the feasibility of the energy efficiency measures according to the new Malaysian Standard MS 1525:2001 "*Code of Practice on Energy Efficiency and use of Renewable Energy for Non-residential Buildings*". Following this code, the LEO building must have an energy consumption less than 135 kWh/m²year. The predictions are, that the LEO building will have an energy index close to 100 kWh/m²year. This is a very good performance compared to typical new office buildings in Malaysia and the ASEAN region, having an Energy Index of 200 – 300 kWh/m²year.

The energy efficiency measures that are expected to contribute to achieving the goal of an Energy Index of 100 kWh/m²year are :

- Creation of a green environment around and on top of the building (illustration)
- Optimisation of building orientation, with preference to south and north facing windows, where solar heat is less than for other orientations.
- Energy efficient space planning (Illustration)
- A well insulated building facade and building roof
- Protection of windows from direct sunshine and protection of the roof by a double roof
- Energy efficient cooling system, where the air volume for each building zone is controlled individually according to demand
- Maximise use of diffuse daylight and use of high efficiency lighting, controlled according to daylight availability and occupancy (Illustration)
- Energy Efficient office equipment (less electricity use and less cooling demand)
- Implementation of an Energy Management System, where the performances of the climatic systems are continuously optimised to meet optimal comfort criteria at least energy costs