

# Energy audits of operational sites

## RATP (Paris)

### CONCEPT

An energy audit is the analysis of the energy performance of existing buildings. Energy audits assist companies in understanding how they use energy and help to identify the areas where waste occurs and where opportunities for improvement exist. These audits seek to prioritise actions to improve energy efficiency, according to the greatest to least cost-effective opportunities for energy savings.

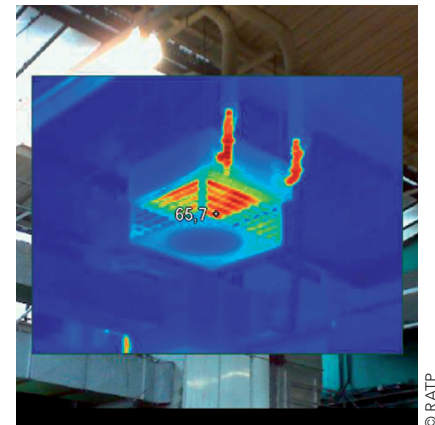
### OBJECTIVES

- Improve the knowledge on the energy consumption of existing assets;
- Identify short- and long-term actions to reduce the energy consumption;
- Monitor the results of energy-efficient actions.

### INVESTMENT DESCRIPTION

Under the "Grenelle de l'environnement", French public policy defining key actions for tackling sustainable development issues, it was decided that most energy-consuming public-owned buildings would be subject to an energy audit by 2010. The aim is to reduce energy consumption by 40% and GHG emissions by 50% by 2020. As a public company, RATP had to meet this new regulation and organised energy audits for all its tertiary and industrial buildings.

The audit is achieved by recording the characteristics of the building structure including the walls, ceilings, floors, windows, etc. For each component, the resistance to heat flow is measured and the leakage rate or infiltration of air is analysed. This can be strongly affected by the window construction and the quality of door seals. The audit will also assess the efficiency, correct installation and programming of mechanical systems such as the lighting, heating, ventilation, air conditioning equipment and energy management systems (thermostats, sensors,...). Professional and independent auditors will be helpful for delivering energy audits as they require the use of specific equipment: blower door, infrared cameras,... They may also include interviews of the staff to understand its patterns of use over time. It is concluded by the submission of a technical report containing recommendations for improving energy efficiency with cost-benefit analysis and an action plan to reduce energy consumption. It is therefore a very useful tool for energy managers to plan future investments.





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## COST AND FUNDING

The Ticket to Kyoto project allowed RATP to finance the last seven energy audits of its operational sites: €80,000 for the study of 7 sites.

## RESULTS

This broad investigation gave RATP a clear view of the energy performance of its sites and enabled useful comparisons between similar sites. The average energy bill for a RATP building amounted to €320,000 per year with an average cost of €150/m<sup>2</sup>/year. Based on these audits, specific actions have been taken to improve the energy efficiency of the buildings: heating and cooling regulation, enhanced ventilation procedures, temperature and motion sensors, relighting, etc.

## LESSONS LEARNED

Most public transport estates such as workshops or depots were inherited from the past and are not efficiently insulated from heat and cold. As a result, it is useful to achieve energy audits to identify the energy losses and what actions are the most effective to undertake in order to reduce the energy consumption. Energy audits are a great tool for monitoring the achievements made in old buildings. In a previous phase, RATP energy audits focused mostly on expensive actions that were not relevant for the short term, as they would require additional studies and budgets. So a new analysis framework was established to highlight what measures could be taken in a shorter term. This has led to short-term actions for heating, cooling and ventilation systems.

## CONTACT

### RATP

Sophie Klein  
+33 1 58 78 33 94  
Ticket2Kyoto@ratp.fr



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