

Dynamic heating of the third rail – RATP (Paris)

CONCEPT

The RATP metro network has a top-contact third rail to supply energy to the metro trains. This situation leads to high energy use, because the third rail must be heated in winter to avoid the accumulation of snow and ice. RATP would like to implement an intelligent controller based on real-time measurements of weather parameters. The study was led during the T2K project, the experimentation could take place in 2014/2015.

Results

Investment costs (€)	€8,500
Energy savings (%)	9%
Annual energy savings (kWh)	25,200 kWh
Annual CO ₂ savings (TCO ₂)	2 TCO ₂
Payback time (years)	4 years

CONTACT

RATP

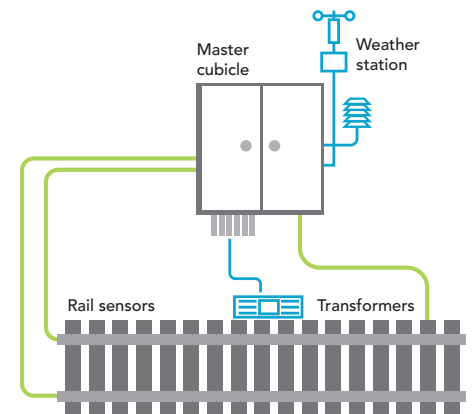
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OBJECTIVES

- Clarify the conditions under which it is necessary to heat the third rail on a metro line;
- Reduce the energy consumption of heating devices.

INVESTMENT DESCRIPTION

RATP evaluated the conditions under which it is necessary to heat the third rail and how the energy consumption of heaters could be reduced. It implemented an intelligent controller along test lines. The heating control is based on actual measurements of weather parameters via one or more weather stations measuring temperature, wind speed and rain or snow. So heating devices are activated only when required, thus reducing the energy consumption. As an example, three systems (weather stations + temperature sensors) are required for the metro line 6 (14 stations).



COST AND FUNDING

The cost for three systems for metro line 6 is €8,500.

RESULTS

The estimated results for metro line 6 show energy savings of around 9% with potential economic savings of some €2,000 per year with a payback time of 4 years. Extrapolated to all RATP metro lines, dynamic heating of the third rail could allow saving 82 MWh per annum.

LESSONS LEARNED

The main advantage of this investment is that it does not require any adaptation of the existing equipment.