

ENERGY EFFICIENCY POTENTIAL ASSESMENT OF ISTANBUL ULASIM RAILWAY SYSTEMS

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Energy is the primary subject of international agenda because of two main reasons: Global warming and energy supply security. The countries which depend on imported energy have to take energy efficiency measures and focus on domestic energy sources. Sustainable development can be depict protecting of energy sources and environment in order to later generations can meet their own energy requirements. To succeed on a sustainable energy future the most cost effective way is energy efficiency.

Transportation and energy politics have a direct dominant effect on human life. Transportation is the most important factor of urban life. The ratio of using public transportation modes is conceded as an indicator of civilization level. Railway systems are five times more cost effective than other transports modes.

The urban rail operator of Istanbul has nine urban rail lines: LRT, metro, funicular, tram and teleferics. Istanbul Ulasim carries on average 868 000 passengers per day. Rail based transport represents only 8.6 % of the daily trips in Istanbul. The Railway system covers 71 km, mainly in the European side of the city. Traffic congestion and environmental concerns have led the municipal government to invest heavily on public transport. New urban lines are being built, with a further 141 km planned until 2020.

Istanbul Ulasim is the 5th largest consumer of the electrical distribution company in Istanbul. Primary electrical energy consumption of Istanbul Ulasim is totally 82 million kWh for 2008. New energy efficiency applications and energy saving measures are implemented in LRT and Metro lines. In this study, a general overview of DC traction systems, Load flow and comparisons of efficiency characteristics between lines in Istanbul and urban lines will be given. The energy consumptions of Istanbul Ulasim lines will be studied and energy efficiency potential will be evaluated. Regenerative energy saving potential and analysis of electrical energy consumption and power required for traction and auxiliary functions on LRT and metro lines will be assessed. The problems in energy saving that IUAS is facing will be evaluated and solutions will be introduced.