

REPORT AND PROTOCOLS No. 1 AND No. 2 UNDER THE CONTRACT OF 05.02.2006

KT-4SU tram: electricity consumption fell two months in a row

Municipal Enterprise "I. A. Pyatetsky Tram Authority", Yevpatoria · head of the authority V. V. Glushko · work performed by PPCE "Rigonda", director A. B. Boyko

Yevpatoria, Ukraine · observation 02.03–30.06.2006 · protocols 31.05.2006 and 30.06.2006

PRODUCT

XADO technology
the document describes the
work as "application of XADO
technology"

OBJECT

KT-4SU tram car
inventory No. 36 · city route,
two-shift operation

DOCUMENT TYPE

Report and protocols No. 1
and No. 2
signed and stamped by
both parties

OBJECT AND PERIOD**OPERATING TIME****WHAT WAS MEASURED**

KT-4SU tram, inv. No. 36 —
baseline, 1–11.03.2006

155.69 h on the line, **2017 km**

Electricity consumption per shift

Same car — May 2006, after
treatment

380.74 h over 24 days, **4670 km**

Electricity consumption per day

Same car — June 2006

5525 km for the month

Electricity consumption by meter for
the month

The car ran on a city route in two shifts — 14–16 hours on the line per day; metering was done with the car's standard onboard electricity meter.

Key results

↓ **8.6–21.6 %**

electricity consumption per 1 km of run, 2.34 →
2.138–1.835 kWh/km

↓ **13.5 %**

electricity consumption per 1 hour of operation, 30.32 →
26.23 kWh/h

Electricity consumption per 1 km of run

PARAMETER	BEFORE TREATMENT · MARCH	MAY 2006	JUNE 2006
Run for the period	2017 km	4670 km	5525 km
Electricity consumption	4720 kWh	9987 kWh	10 140 kWh
Specific consumption per 1 km	2.34 kWh	2.138 kWh	1.835 kWh
Change vs. March baseline	—	−8.6 %	−21.6 %

Consumption was read from the car's standard meter; the change vs. the March baseline follows the conclusions of protocols No. 1 and No. 2.

Electricity consumption per hour of operation on the line

PARAMETER	BEFORE TREATMENT · MARCH	MAY 2006
Time in service on the line	155.69 h	380.74 h
Electricity consumption	4720 kWh	9987 kWh
Specific consumption per 1 hour of operation	30.32 kWh	26.23 kWh
Change vs. March baseline	—	−13.5 %
Saving for the month at the actual operating time	—	1557 kWh

The saving is the difference between the actual May consumption and what the car would have drawn at the pre-treatment rate over the same operating time.

Conclusions of protocols No. 1 and No. 2

Protocol No. 1 of 31.05.2006, signed by the Municipal Enterprise "I. A. Pyatetsky Tram Authority" and PPCE "Rigonda", records for KT-4SU tram car inv. No. 36: the electricity saving for May amounted to **13.5 %**; electricity consumption per 1 hour of operation on the line decreased by **13.5 %**; electricity consumption per 1 km of run decreased by **8.6 %**. Protocol No. 2 of 30.06.2006, covering the following month: electricity consumption per 1 km of run decreased by **21.6 %**. Both protocols were taken from one and the same car in ordinary service — in two shifts, **4670 km** in May and **5525 km** in June. By the second month the effect did not fade but grew: in absolute terms May gave a saving of **1557 kWh**, June — **2788.5 kWh** for a single car.



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The results relate to KT-4SU tram car inv. No. 36 of the Municipal Enterprise "I. A. Pyatetsky Tram Authority" on a city route in Yevpatoria; under other operating conditions the figures may differ. The saving was calculated by PPCE "Rigonda", which carried out the treatment. The originals of the report and of protocols No. 1 and No. 2, with signatures and stamps, are published in full and available for download.