

KOSRAE UTILITIES AUTHORITY ENERGY EFFICIENT LED STREET LIGHTING UPGRADE PROPOSAL

Executive Summary

Our comparative energy consumption modelling has calculated a 46.4% energy saving using 40w LED Street lights, delivering an **overall 43% saving** when combined with reduced maintenance costs. Further energy savings are achievable through programmable street lights.

However, we would recommend the Authority secure the immediate 43% energy consumption and maintenance savings from our standard 40w LED street light, and phase in lighting control management systems at a late stage.

Based on a 100 street light sample size, the project will achieve the following metrics from the existing lighting system, which indicates the value of this upgrade. In addition this project will deliver 9.57 tonnes of CO2 savings per 100 luminaires replaced with 40w LEDs.

Refer **attached** Financial Analysis

DESCRIPTION	12 HOURS / 7 DAYS Per 100 STREET LIGHTS
Energy Consumption Saving	46.4% 15,943 kWh p.a.
Energy Cost Saving	\$6,377 p.a.
Total Annual Savings Including Maintenance	43% \$9,044
Net Present Value (NPV)	\$100,333
Internal Rate of Return (IRR)	74%
Payback Period	4 Years
CO2 Savings	9.57 Tonnes p.a.

Financial Analysis

The **attached** financial model incorporates the following key factors which are as follows;

1. The electricity Tariff is USD\$0.40 kWh. The model assumes a 5% per annum increase in the price of electricity and a 3% CPI general increase annually.
2. The street light operating hours are based on 12 hours per day, 365 days per annum.

3. Installation and maintenance costs are based on a standard \$200 per light.

4. **TNL0729-40 Prices**

4.1 The “FOB” price for the standard model with a daylight sensor installed is **NZD\$365** per unit.

4.2 The “CIF” NZD\$426.15 (**USD\$340.92**)

The CIF price is based on a DHL FCL 20ft container freight price to Kosrae, Micronesia of NZ\$6,115.63. Typically 200 LED street lights can be transported in a 20 ft container. The unit freight cost for 100 units is \$6,115.63/100 = NZD\$61.15 per light.

	NZD\$
FOB Price	\$365.00
Shipping	<u>\$ 61.15</u>
CIF Price	\$426.15

4.3 Foreign Exchange Rate USD\$1.00 = NZD\$1.25

4.4 The prices quoted will remain fixed for a period of 60days from the date of this proposal.

Technical Selection of the TNL0729-40 Street Light

TransNet has calculated an Isolux plot comparison analysis of the ECOLight TNL0729-40 watt with a generic 70w High Pressure Sodium (HPS) street light.

Please refer the **attached** Isolux plot comparison chart highlights the TNL0729-40 model compares favourably against a 70w HPS.

Technical Specifications

- ECOLight street lights comply with **AS/NZS 1158.6:2010** and **IEC 60598** standards.
- The LED module is rated for a 50,000 hour life span, typically 10 – 12 years.
- The TNL0729 series have a **daylight sensor as an optional extra** at no additional cost.
- The TNL0729-40 supplied to the Council will have a standalone **programmable** capability.

Please refer the **attached** technical specification sheet –**TNL0729-40**

Technical Support

TransNet employ specialist lighting and electrical engineers who are able to assist with design and technical advice for all our ecolight products. In addition the company is developing a range of network technologies to control and dim our street lights.

Supply Lead Times

The TNL0729-40 is a stock item in the ECOLight range, however, please allow 10 - 12 weeks from receipt of order for larger quantities.

ECOLight Street Light Customers

TransNet has been successfully supplying ECOLight Street lights since 2009, with over 3 million hours of operation delivering up to 60% energy savings.

To achieve this, the company was successful in securing an Asia Development Bank (ADB) project in Tonga to supply energy efficient LED street lights.

The project provided ECOLight with the unique opportunity to durance test their products in the challenging Pacific climatic environment.

The company has since expanded its supply of ECOLights to New Zealand Councils, including trials at Hutt City, Counties Power and Dunedin City.

Our Pacific market includes Cook Islands, Niue, PNG and Samoa with a trial due to commence in Port Vila, Vanuatu.

Summary of LEDs' Advantages

- **Efficiency:** producing more effective light per watt than sodium.
- **Colour:** LED can produce "white" light which is safer than the orange light of sodium lights.
- **Slow failure:** LEDs fail over a long period of time rather than an abrupt failure.
- **Lifetime:** LED lights are rated for 50,000 hours plus.
- **Shock resistant:** LEDs being solid state are difficult to damage while fluorescent and incandescent bulbs are fragile.
- **Directional:** LEDs produce direct (linear) light at around 99% efficiency and delivers all of its light toward desired direction with virtually no waste.
- **Toxicity:** LEDs do not contain mercury or hazardous substances.

Attachments:

1. Financial Analysis – LED Street Light Energy Savings Project
2. Isolux plot comparison chart
3. Technical datasheet