

Service Quality of 120-foot Solar Container for Urban Lighting





Overview

Are solar-powered streetlights a sustainable solution for urban lighting?

The work explores forward-thinking solution for urban lighting by combining solar-powered LED streetlights with Visible Light Communication (VLC) technology, aimed at creating a sustainable and multifunctional lighting framework for smart cities.

How to design a solar street light?

1. Solar Street Lighting Demand Design Formula: $P_{LED} = E \times A / (\eta \times U \times K)$
Example: Road width 6m, distance between lights 25m, target illuminance 20 lx → $P_{LED} = 20 \times (6 \times 25) / (0.85 \times 0.5 \times 0.75) = 20 \times 150 / 0.32 \approx 94W$ → Choose a 100W LED module (Luminous flux 15,000 lm) 2. Solar Street Light Photovoltaic System Capacity Calculation Steps: 3.

How can solar power help a smart city?

By harnessing solar power for both lighting and communication, the system significantly reduces energy consumption and decreases reliance on the grid. This approach not only enhances its eco-friendliness but also ensures a sustainable, long-term solution for IoT-based smart city infrastructure.

Why is solar power a viable alternative to public infrastructure?

As cities work towards sustainability renewable energy solutions that lower the carbon footprint of public infrastructure are becoming crucial. Solar power stands out as an ideal alternative because it is renewable, readily available and particularly well-suited for outdoor lighting .



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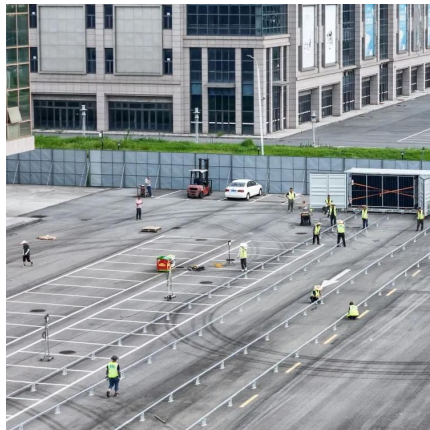
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