

# E2SOL Solar-Powered Utility Median Barriers on Dubai Highways

DUBAI'S SOLAR POWER HIGHWAY  
MICROGRID POTENTIAL

PROVIDENCE, RI, UNITED STATES, April 3, 2025 /EINPresswire.com/ -- [E2SOL](#) Solar-Powered Utility Median Barriers on [Dubai](#) Highways

Rendering of an E2SOL Integrated [Highway](#) Median PV Microgrid System to Power Dubai

Image: E2SOL / By James Reid, Environmental Science Analyst



E2SOL Solar Median Micro-Grid

As climate change accelerates and energy demands rise, innovative solutions for sustainable power generation are crucial in reducing greenhouse gas emissions and promoting healthier ecosystems. Dubai's commitment to renewable energy is exemplified through initiatives such as the Dubai Clean Energy Strategy, which aims for 75% of its energy to come from clean sources by 2050. Dubai's Roads and Transport Authority (RTA) has successfully tested wireless charging for electric vehicles and buses using Shaped Magnetic Field

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POWER UP FROM YOUR  
LOCAL HIGHWAY”

*Anthony Baro*

in Resonance (SMFIR) technology. Additionally, the Dubai Electricity and Water Authority (DEWA) provides over 400 'Green Chargers' with 730 charging points across the Emirate, supporting the expansion of electric vehicle (EV) infrastructure.

Inspired by Dubai's sustainable development goals, our team explored the feasibility of integrating solar modules with micro energy storage on existing concrete median barriers along highways in Dubai. Dubai's extensive road network presents an opportunity to generate renewable energy without occupying additional land, aligning with urban planning regulations. This initiative could support localized renewable energy generation and distribution, powering electric mass transit via road-installed SMFIR technology or designated charging stations.

Background

Highways significantly contribute to carbon emissions from vehicular traffic. Installing solar modules on existing concrete barriers offers a dual benefit: harnessing renewable energy while mitigating greenhouse gas emissions. Similar concepts have been attempted worldwide, such as France's Wattway and Switzerland's solar highway noise barriers. However, challenges such as wear, and tear and hazardous glare have limited their effectiveness. E2SOL's Smart Solar Highway Project is designed to prevent these issues by ensuring that solar modules do not interfere with drivers' sightlines or road safety.



Dubai Suitable Highway Median Concrete Barriers

E2SOL's Smart Solar Highway integrates advanced technology with existing infrastructure to enhance grid resilience and renewable energy production. With Dubai's highways spanning approximately 793 kilometers (492.6 miles), substantial potential exists for solar module installations. Implementing high-wattage solar panels (e.g., 635 watts) with integrated storage could yield a total system capacity of approximately 192.49 MW, doubling to 384.99 MW with micro-battery storage.



If all available median barriers are utilized, the system could generate approximately 612,337 MWh annually, with 306,168 MWh stored for off-peak and adverse weather conditions. This output could power approximately 64,445 Dubai households annually. E2SOL modular design ensures resilience, enabling continuous operation of critical services like EV charging stations, highway lighting, and traffic management systems.

Dubai's commitment to clean energy makes the E2SOL Smart Solar Highway an innovative opportunity to lower costs, enhance sustainability, and align with long-term environmental goals. The estimated annual energy generation of 612,337.35 MWh could significantly strengthen Dubai's renewable energy capacity. Dubai's energy demand increased by 5.4% in 2024, reaching 59,594 GWh. DEWA has expanded transmission and distribution networks to support this growth while aligning with the Dubai Clean Energy Strategy 2050.

Currently, clean energy accounts for 20% of DEWA's 17.179 GW installed capacity. E2SOL Smart Solar Highway could enhance Dubai's renewable energy portfolio, supporting its Net Zero Carbon Emissions Strategy 2050. The project could offset approximately 322,242 metric tons of CO<sub>2</sub> emissions annually equivalent to:

- 71,319 gasoline-powered passenger vehicles driven for a year
- 778,619,737 miles driven by an average gasoline vehicle
- 34,404,590 gallons of gasoline consumed
- 339,635,647 pounds of coal burned
- 64,445 homes' annual electricity use

By integrating with the Shams Dubai net metering framework, surplus energy could be fed back into DEWA's grid, further enhancing sustainability and cost efficiency.

E2SOL Smart Solar Highway reduces reliance on external energy supplies and improves resilience during peak demands and grid disruptions. Key infrastructure, such as EV charging stations and highway lighting, can operate independently from the grid, enhancing reliability.

Additionally, this initiative strengthens Dubai's reputation as a leader in sustainable transportation and clean energy innovation. It meets government and public expectations for climate action and serves as a replicable model for other regions.

Communities near highways often experience higher pollution and may have limited access to clean transportation. E2SOL Smart Solar Highway ensures these communities benefit from renewable energy infrastructure, improving overall quality of life.

Transportation inequities persist due to high EV costs and insufficient charging infrastructure in lower-income areas. Dubai's highway barriers are near various communities, positioning the project as a step toward environmental justice by expanding clean energy access.

The E2SOL Dubai Smart Solar Highway project is more than a technological advancement—it is a visionary step toward sustainability. By leveraging existing infrastructure, this initiative provides a scalable solution to combat climate change, reduce carbon emissions, and generate renewable energy. Beyond environmental benefits, it fosters social equity, enhances energy resilience, and positions Dubai as a global leader in clean energy and sustainable transportation. Its success could inspire other regions, demonstrating that transformative change is possible when innovation meets purpose. Together, we can pave the way for a cleaner, more sustainable future.

E2SOL will be exhibiting at Middle East Energy Dubai 2025 on stand Z2.F32.

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