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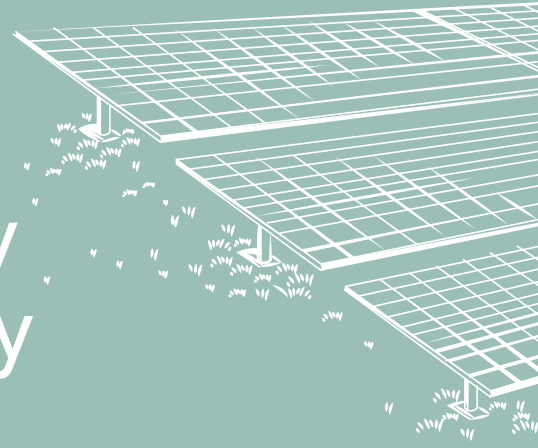


Going Green

The business case for switching
to solar energy in Timor-Leste

Market Development Facility

Timor-Leste offers a compelling opportunity to invest in solar energy



Timor-Leste has rapidly expanded electricity access to more than 83 per cent of the population but the country has yet to achieve energy security.¹ Consumer costs, even with government subsidy, remain high and outages are common. In addition, most of Timor-Leste's electricity is generated through costly and polluting diesel generators.

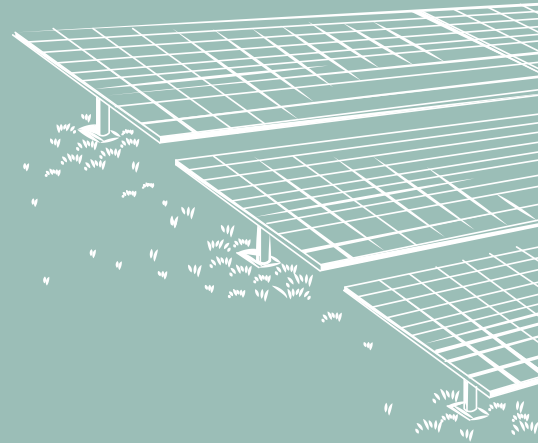
Australia's Market Development Facility (MDF) and ITP Renewables conducted an assessment of the potential market for roof-top solar energy systems in Timor-Leste. This involved detailed consultations with a variety of organisations, particularly with businesses to understand their awareness of solar energy and their intentions to shift to solar energy.

The results from this market assessment indicate that solar energy could be an excellent substitute or complement to Timor-Leste's electrical grid. High electricity costs and readily available solar radiation mean that the average payback period for a rooftop photovoltaic (PV) solar energy system in Timor-Leste is only 1.5 to 3 years instead of the global average of 6-10 years. Transitioning to solar can also help the country meet environmental commitments.

Globally, businesses are switching to solar energy to reduce expenses and respond to changing market and regulatory requirements. The return on investment for solar is improving because conventional energy costs are rising, and solar energy costs are falling – by 89 per cent between 2010 and 2020.

¹ Energy security is “uninterrupted availability of energy sources at an affordable price”; International Energy Agency.

Benefits of switching to solar energy



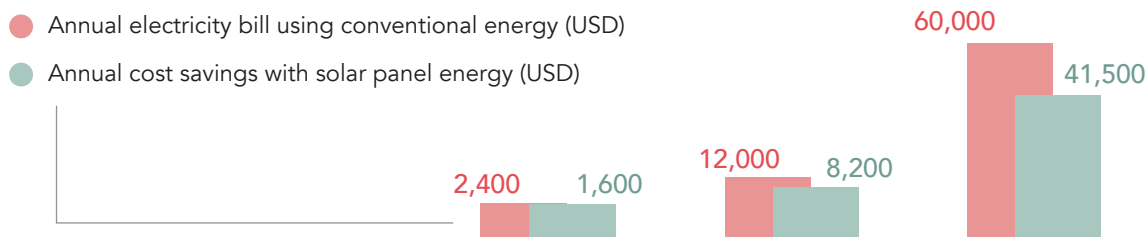
Cost saving

The average payback period for a rooftop PV solar energy system in Timor-Leste is 2.5 years. This is much lower than the global average of 6 to 10 years, due to solar resource and electricity costs:

- Timor-Leste has a high-quality solar resource. The global horizontal irradiance in Dili is higher than on the east coast of Australia, where the solar market is mature and installation costs are higher.
- The cost of electricity in Timor-Leste for commercial and industrial consumers is high compared to ASEAN countries. For instance, in Indonesia industrial electricity tariffs are 0.11 USD/kWh, compared to 0.24 USD/kWh in Timor-Leste.
- Adding solar to their energy mix can help businesses reduce the cost of electricity and save between USD 8,200 and USD 120,000 annually, depending on the size and energy requirements of the business.

Source: Timor-Leste Solar Market Assessment by ITP Renewables and MDF.²

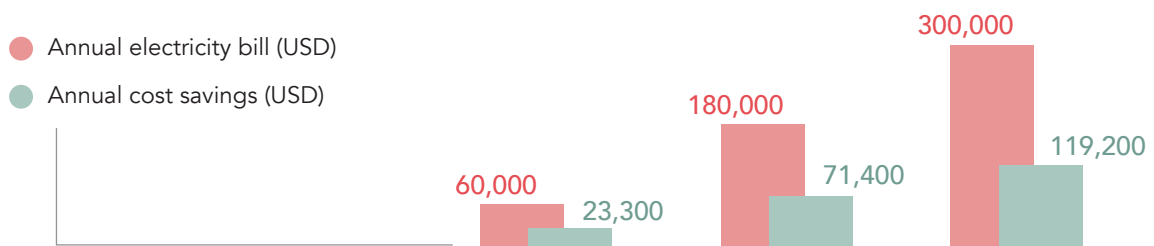
Cost saving with PV solar (commercial or public buildings)



Note: Commercial and public buildings use majority of their energy during the day.

² The financial analysis is indicative. Each organisation has unique usage patterns, that influence system size, cost and potential returns.

Cost saving with PV solar (industrial buildings)



Note: Industrial buildings are more likely to have energy usage during both daytime and nighttime.



Reliable supply

Research shows that nearly all businesses in Timor-Leste experience electricity outages, in some cases multiple times a week. Outages affect businesses in different ways:

- For tourism businesses, it impacts customer experience (internet, device charging, air conditioning and fans, food quality, and inability to refuel diving tanks).
 - For livestock and grocery businesses, it impacts quality and shelf life of produce stored in refrigerators. Frequent outages can also damage electronic equipment.
 - Unreliable grid supply means that businesses and essential service providers require a diesel generator, which has high upfront and running costs and contributes to GHG emissions. Solar provides an environmentally-friendly alternative that can provide uninterrupted supply during the day without battery back-up.
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There is a general understanding of the benefits of solar energy systems among businesses in Timor-Leste. Most businesses interviewed mentioned they would consider installing rooftop PV solar due to power outages and high electricity costs.³



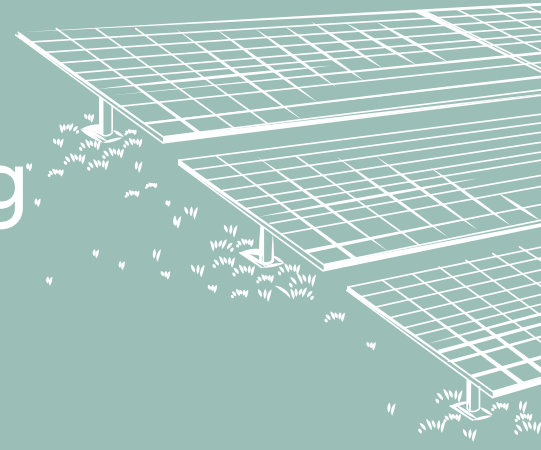
Market and regulatory requirements

One of the benefits for businesses to switch to solar is to meet increasingly stringent environmental requirements from customers and regulators. Businesses that procure renewable energy and have a sustainability plan can attract increasingly environmentally conscious customers and employees. A survey by McKinsey found that 66 per cent of respondents considered sustainability when they make a purchase and 72 per cent report that they buy more environmentally-friendly products than they did five years ago.

For businesses targeting international clients, switching to solar can provide them with a competitive advantage to penetrate niche markets and target environmentally-savvy consumers. The international coffee market, for instance, is increasingly favouring produce with sustainable characteristics.

³ MDF survey on understanding demand for solar in Dili, Timor-Leste.

Challenges of switching to solar energy



Maintenance and spare parts

Timor-Leste's rooftop PV solar industry is new and undeveloped. Limited availability of maintenance and spare parts inhibits some businesses from switching to solar. Maintenance tends to be limited to repairing malfunctioning system components, instead of preventative care or servicing, which can reduce the effectiveness of solar energy systems and increase costs.



Skills

Technicians in Timor-Leste have experience in small-scale, off-grid solar energy systems. Commercial or industrial scale installations are more complex and appropriate technical capacity is scarce.



Finance

Some businesses prefer to pay for systems and installation upfront, but for many businesses the availability of more manageable financing options can increase uptake. MDF research found that lenders in Timor-Leste are unwilling to lend to small and medium sized enterprises due to levels of default, perceived risks, and the difficulty of securing collateral.



Before shifting to a solar energy system, consider the following:



Cost analysis

Evaluate the upfront costs of installing solar panels versus long-term savings. Consider financing options to determine overall economic viability.



Energy needs

Assess your energy consumption, including time of consumption, to determine the appropriate size of solar installation. Understanding your energy needs helps in designing a system that meets your requirements.



Roof suitability

Ensure your roof is structurally sound and has sufficient space and proper orientation for solar panels. Factors like shade and the condition of the roof should also be considered.



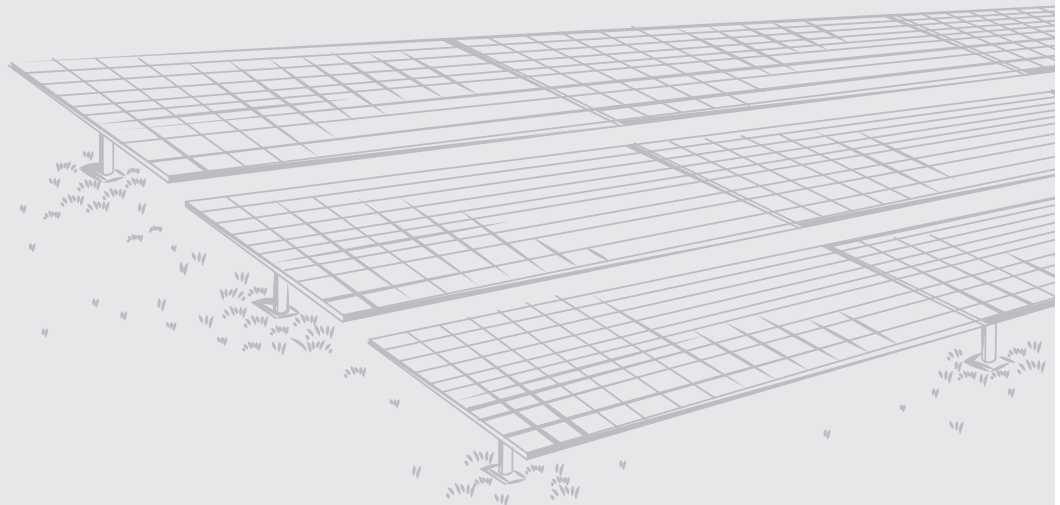
Lifespan and maintenance

Understand the expected operating life span, warranties and maintenance costs of solar panels. Factor these maintenance costs into your overall return-on-investment calculations.



Consult with solar energy system specialists

Seek expert advice on system size, equipment options and projected energy savings. Request detailed quotes, including installation costs and expected payback periods, to make an informed decision.



Annexure

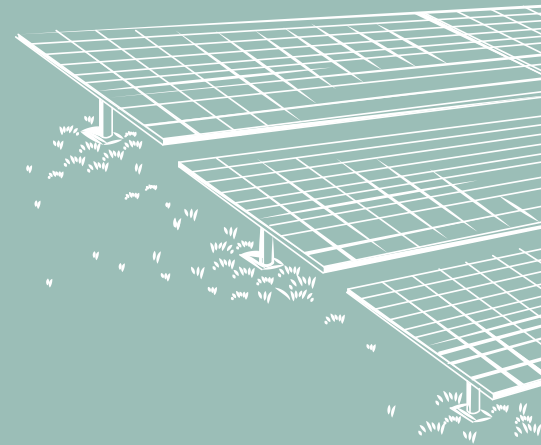


Table 1: Financial summary for commercial or public buildings⁴













 Monthly bill (USD)	 Solar system capacity (kilowatt-kW)	 Electricity needs fulfilled by solar	 Average payback period (years)	 Annual cost savings (USD)	 Capital investment cost (USD)
5,000	170	81%	2.4	41,500	98,000
1,000	32	80%	2.4	8,200	20,000
200	6.4	80%	2.5	1,600	4,000

Table 2: Financial summary for industrial buildings

 Monthly bill (USD)	 Solar system capacity (kilowatt-kW)	 Electricity needs fulfilled by solar	 Average payback period (years)	 Annual cost savings (USD)	 Capital investment cost (USD)
25,000	535	57%	2.3	119,200	270,000
15,000	320	57%	2.4	71,400	170,000
5,000	95	54%	2.5	23,300	58,000

Source: Timor-Leste Solar Market Assessment by ITP Renewables (ITP) and MDF.⁵

⁴ Commercial and public buildings use the majority of their energy during the day while industrial buildings are more likely to have energy usage during daytime and nighttime.

⁵ The financial analysis is indicative. Each organisation has unique usage patterns, that have an impact on the system sizing, cost, and potential returns.






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