Solar Trams Initiative: Q&A

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What is the Solar Trams Initiative?

The Solar Trams Initiative matches 100 per cent of the electricity used by Melbourne's tram fleet with renewable energy generation.

The Initiative is a Victorian Government TAKE2 climate change pledge on behalf of the Victorian transport sector.

What is a TAKE2 climate change pledge?

TAKE2 is a Victorian Government program run by Sustainability Victoria. Under the program, governments, businesses, schools, community organisations, schools and individuals can pledge to reduce their carbon footprint.

How does the Solar Trams Initiative work?

The Solar Trams Initiative works by the Victorian Government purchasing Large-scale Generation Certificates (LGCs) from two Victorian solar farms, which are then voluntarily surrendered.

The Victorian Government purchases and surrenders approximately 82,000 certificates annually – equivalent to 82,000 megawatt-hours (MWh) of renewable energy generation, which matches the electricity consumption of Melbourne's tram network.

What is a Large-scale Generation Certificate (LGC)?

An LGC is a certificate created under the Federal Renewable Energy Target (RET). They are issued to certified renewable energy generators and each certificate is equivalent to 1 MWh of renewable energy generation.

When did the Solar Trams Initiative commence?

The Solar Trams Initiative was announced by the Minister for Energy, Environment and Climate Change the Hon. Lily D'Ambrosio on 19 January 2017.

The Initiative commenced on 1 November 2018, with the first LGC surrender taking place on 12 February 2019, matching the electricity used by the tram network during November and December 2018.

Which Victorian solar farms provide the certificates for the Solar Trams Initiative?

Approximately 35 megawatts (MW) of generation from the following two solar farms are linked to the Solar Trams scheme:

1. Bannerton Solar Park by Foresight Group: a 110 MW DC/88 MW AC project located 12 kilometres south of Robinvale in the Sunraysia district.
2. Numurkah Solar Farm by Neoen: a 128 MW DC / 100 MW AC project located 23 kilometres north of Shepparton.

How are emissions avoided through the initiative?

The Solar Trams Initiative reduces emissions in several ways:

1. The additional Solar Farm capacity procured under the Solar Trams scheme decreases the average emissions intensity of Victoria's state grid.
2. The tram network is linked to renewable energy which replaces the electricity produced from our traditional grid - this is equal to about 82,000 MWh or ~80,000 tonnes of CO_2 equivalent (tCO_2-e).
3. Surrendering LGCs from circulation lowers the supply of certificates required to meet the annual RET targets. These certificates can only be replaced by clean energy, meaning the Initiative is encouraging additional renewable energy generation.

How are the avoided emissions estimated?

Emissions are avoided through the certificate surrender, which replaces the electricity load from the grid for the entire Melbourne tram network with certified renewable energy.

The Solar Trams-linked LGCs created via the renewable energy generated at the Bannerton and Numurkah Solar Farms avoid approximately 80,000 tCO_2-e that would have been emitted if the electricity had not been replaced by an equivalent amount of certified renewable energy.

The avoided emissions are estimated by multiplying the electricity usage of the entire Melbourne tram network by the state's indirect (scope 2) emission factor for consumption-purchased electricity.

Why is there a difference in emissions intensity for solar generation and the average Victorian electricity generator?

Solar generation uses energy from the sun to convert to electricity and this does not result in any carbon emissions.

The average Victorian electricity generator includes a mixture of generation types (e.g. brown coal power, gas power, hydro-electric power, solar energy, wind energy). The average emissions intensity of all these generators combined is currently close to 1 tCO_2-e per MWh of electricity produced.

Are the trams powered by solar panels?

The trams are not directly powered by solar panels. The trams' power usage is linked to the electricity generated by the solar farms through the voluntary surrender of a corresponding amount of LGCs. The tram network continues to operate as normal, connected to the Victorian electricity network. From a technical perspective, there is currently not enough surface area on the trams to be able to place enough solar panels for delivering the power required to run the trams.

What are the key outcomes of the Solar Trams Initiative?

- Melbourne's tram network is linked to new renewable energy projects in Victoria.
- The electricity used in Melbourne's tram network is offset by renewable energy certificates. This is expected to avoid approximately 80,000 tonnes of carbon dioxide equivalents (t CO_2-e) annually.
- The Solar Trams Initiative is part of the government's TAKE2 climate change pledge to be net zero emissions by 2050 and keep the global temperature rise to under 2 degrees.

Where can I find out more about the Solar Trams Initiative?

- The Department of Environment, Land, Water and Planning (DELWP) website: https://www.energy.vic.gov.au/renewable-energy/victorias-renewable-energy-roadmap/government-renewable-energy-purchasing
- DELWP's TAKE2 climate change pledge – Acting now on climate change: https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0030/89832/DELWP_Take2-Acting-Now-on-Climate-Change.pdf
- DELWP's media releases: https://www.delwp.vic.gov.au/media-centre/media-releases/on-board-with-solar-trams
- DELWP's YouTube page: https://www.youtube.com/watch?v=XrU_j9OVxeM