

# SUN

# EXCHANGE

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PROJECT INFORMATION NOTE:  
AUDIT REPORT



PREPARED BY: BRETT COHEN, INDEPENDENT CLIMATE CONSULTANT

[BRETT@THINKA.CO.ZA](mailto:BRETT@THINKA.CO.ZA), TEL: +27(0)72 434 2208

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## **1 INTRODUCTION AND OBJECTIVES**

Sun Exchange is a South African-based company that works to develop small-scale solar projects across Southern Africa. The business draws on finance from international investors to support the upfront cost of installation of rooftop solar PV projects for smaller organisations. The investment is then recovered from the off-takers of the electricity generated by the installations, through their diverting a portion of their electricity spend to Sun Exchange. The remaining portion of the off-takers electricity not supplied by the PV infrastructure is purchased either from Eskom or the municipal electricity supplier.

Sun Exchange has approached Credible Carbon to register the project on Credible Carbon's carbon registry, for the purposes of selling greenhouse gas emission reduction credits generated by their PV installations. These greenhouse gas emissions reductions are achieved through displacing the use of grid electricity which has a higher emissions footprint, with one installation to date replacing diesel generators. Through selling credits, additional revenue will be generated that the company hopes to use to achieve financial sustainability and fund additional projects, as well as generate additional societal benefits.

This document provides an audit of the Project Information Note (PIN) submitted to Credible Carbon to support the registration of the project and sale of credits for an initial period of 2020 to the end of 2022. The audit determines if the projects covered by the PIN meet the Credible Carbon registry requirements as to whether:

- The project is real.
- The project's described technology is in place and functioning according to its design specifications.
- The estimates of greenhouse gas emission reductions are reasonable in terms of accepted international standards and unbiased towards buyer or seller.
- The project has a discernible impact on poverty.

The auditor declares upfront that he has no conflict of interest or potential for material gain from conducting the audit.

## **2 AUDIT APPROACH**

This audit was prepared based on the PIN developed on behalf of Sun Exchange, with a thorough interrogation of assumptions and checking of calculations. Information on the projects contained in the PIN was cross correlated with that presented on the company website and public media, where information was available.

The auditor also held a meeting with key Sun Exchange employees to obtain further insights into the data gathering and analysis procedures. Furthermore, two installation site visits (to Rondebosch Boys High School and Tamboerskloof Primary School, both in Cape Town) were conducted as part of this audit to inspect whether the equipment was in place and operating. During the site visits, further information was gathered to understand the site implementation and data processes.

### 3 FINDINGS

The findings are structured to align with the four Credible Carbon registry requirements as identified above.

#### 3.1 IS THE PROJECT REAL?

All the PV installations listed on the PIN are identified on the Sun Exchange website as being “completed” projects<sup>1</sup>. Furthermore, the existence of most of the installations was confirmed through a web search, where news articles and organisation websites confirmed that the projects were in operation. Two site inspections were conducted, where Sun Exchange staff were questioned on other installations. On this basis, the project is confirmed to be real.

Only one inconsistency was noted in the data presented. Table 3 presented in the PIN suggests the Brackenfell installation to have a capacity of 56 kWp, although the website only suggests a figure of 50.4 kWp. This was checked with Sun Exchange, and it was confirmed that the PIN was correct. Sun Exchange was asked to update their website accordingly.

#### 3.2 IS THE PROJECT TECHNOLOGY IN PLACE AND FUNCTIONING ACCORDING TO DESIGN SPECIFICATIONS?

As indicated, the audit of the PIN did not include primary data collection, apart from the site visits. However, the auditor’s analysis of the data, along with the understandings obtained during meetings, suggests that the individual installations are operating within the range expected of rooftop solar panels, offering capacity factors within the range of approximately 15% to 18%. The electricity production figures from a selection of the projects do indicate lower annual capacity factors, but from inspection of the company’s website, this is largely attributed to the projects not operating for the full calendar year. In the first full calendar year of operation, these capacity factors are expected to be higher.

#### 3.3 ARE ESTIMATES OF GREENHOUSE GAS EMISSION REDUCTIONS REASONABLE IN TERMS OF ACCEPTED INTERNATIONAL STANDARDS AND UNBIASED TOWARDS BUYER OR SELLER?

Three potential standardised methodologies were assessed in the PIN for the calculation of greenhouse gas emissions savings from the installation of the PV panels by the project proponents, to determine their suitability for application. Based on this high-level assessment of methodologies, a standardised methodology produced by the Clean Development Mechanism, “AMS-I.F – 1 : Renewable electricity generation for captive use and mini-grid” was selected. The auditor considers this to be a suitable choice.

In brief, in line with the methodology, greenhouse gas emissions savings associated with the PV installations are calculated by determining the electricity output in kWh from the panels over the period of assessment and assumes that this electricity displaces grid-purchased electricity – in other words, grid electricity represents the baseline. For one of the sites,

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<sup>1</sup> Several other installations appear on the website. As mentioned in the PIN, these are not included in the emissions estimates, either because they began operating more recently than the period covered by the PIN, and others because of arrangements other carbon intermediaries and so Sun Exchange does not own the carbon

Karoo Fresh, the Sun Exchange installation wholly replaces a diesel generator rather than grid electricity, which is also covered by the methodology.

A grid electricity emissions factor is used to calculate the baseline emissions. The PIN states “Emission factors for the South African Grid vary but we use a figure of 1 070 gCO<sub>2</sub>/kWh published by the UNFCCC in December 2021.” Although not stated explicitly in the PIN, this figure represents an operating margin grid factor (rather than an average grid factor), which is appropriate and aligned with the CDM methodologies. For the Karoo Fresh installation, an emissions factor of 0.8 kgCO<sub>2</sub>/kWh was used for the baseline calculation. This is (appropriately) noted in the PIN to be a conservative factor.

The grid factor (and in the case of Karoo Fresh, the diesel emissions factor) is the only parameter used in the calculation of emissions savings, given that actual generation is based on historical data, and noting an adjustment for percentage ownership of credits by Sun Exchange for two of the projects.

The grid emissions factor and diesel emissions factor are the only parameters which introduce any uncertainty into the calculations. For the grid emissions factor there is no single agreed figure on this value, and the UNFCCC source used for this number only commits to preparing an update every two years. As such, future calculations will need to use updated grid factors, as is noted in the PIN. The emissions factor for a diesel generator depends on a range of factors, including efficiency, size, operation etc. Using the most conservative value in the standard is considered appropriate in the absence of further information. This choice could be revised if more accurate information is sourced for specific installations.

The PIN covers three years, being 2020, 2021 and 2022. In 2020, only two projects were considered, growing to 15 in 2021 and 27 in 2022. At the time of this audit, several other proposed future projects were identified on the company’s website, suggesting that savings could grow in future.

All emissions savings calculations were checked and shown to be correct, with the final electricity generation and emissions savings for the three reporting years being replicated in the table below for reference.

	<b>2020</b>	<b>2021</b>	<b>2022 Actual</b>	<b>Total</b>
<b>PV generated energy per year (kWh/year)</b>	95 755	2 095 359	3 308 036	5 499 150
<b>Grid Emission Factor (kgCO<sub>2</sub>e/kWh)</b>	1.07 (with a diesel factor of 0.8 for Karoo Fresh)	1.07 (with a diesel factor of 0.8 for Karoo Fresh)	1.07 (with a diesel factor of 0.8 for Karoo Fresh)	
<b>Avoided CO<sub>2</sub> emissions (tCO<sub>2</sub>/yr)</b>	102	2 242	3 526	5 871

### 3.4 DOES THE PROJECT HAVE A DISCERNIBLE IMPACT ON POVERTY?

The PIN includes a short generic note about the role of renewable energy and the potential impacts on employment and education, reports on the employment creation of the company itself (creating 35 jobs), and describes the links to the Sustainable Development Goals (SDGs). Furthermore, for some of the projects, a description of the positive impacts of their installation is presented on the Sun Exchange website. This does suggest a some contribution to poverty alleviation.

In the PIN, it is also noted that: “In terms of the direct impact on poverty alleviation, the executive team have proposed the formation of a fund to support social impact projects through Sun Exchange. Half the carbon revenue generated from the sale of carbon credits will be used to subsidise tariffs at poorer schools and other social impact projects. Further details about the formation and design of the fund will be reported to Auditors at the first Audit.” However, the PIN then goes on to note that “The fund will not be formally constituted at this stage but rather managed an allocation within the company’s accounting records.” The allocation of funds should be tracked in future audits.

## 4 CONCLUSION

This audit indicates that, based on the information contained in the PIN and that available in the public domain, the Sun Exchange offering meets the requirements of Credible Carbon for inclusion in the registry. Furthermore, the calculations to convert electricity savings into emissions savings were found to be correct and the project is thus considered suited for generating carbon credits for sale.

Future audits should include site visits to ensure sites are still operating, and a spot audit could potentially be considered of the actual data recorded by Sun Exchange’s data systems sale. The monitoring plan proposed in the PIN suggests a procedure for doing so, although it only recommends two site visits – the auditor recommends that this number be increased to four or five in the beginning, and then more thereafter, especially as the number of projects in the portfolio grows.

Furthermore, the poverty benefits achieved through allocation of funds to social impact should be tracked.