

# Green Bond Impact Report

March 2024

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# Introduction

In March 2023, the university raised S\$340 million from its third green bond after a strong reception to its inaugural issuance in June 2020 and second issuance in June 2021. With a fixed coupon rate of 3.268 per cent, the 10-year notes were fully subscribed and will mature in 2033.

Leaning on the NUS Green Finance Framework, the proceeds will go towards financing further green projects and energy-related initiatives that are aligned to the following five focus areas:

- i. Green buildings or precincts;
- ii. Renewable energy and energy efficiency infrastructure and systems;
- iii. Sustainable water and wastewater management;
- iv. Pollution prevention and control; and
- v. Environmentally sustainable management of living natural resources and land use.



# Allocation of Proceeds

100% of the green bond proceeds raised in March 2023 were allocated to finance eligible projects as defined under section 3.1 - Use of Proceed, Eligibility Criteria for Green Projects, of the NUS Green Finance Framework.

The list of key buildings funded by the green bond proceeds are documented in subsequent pages 5 to 11 of this report. These buildings have been certified by the Building and Construction Authority with the Green Mark (GM) Platinum (Zero Energy), GM Platinum (Super Low Energy), or GM Platinum.

The green bond proceeds remain fully allocated as at the date of this report.



# Impact Reporting

# Campus Upgrading (Phase 2C)

## – MD1

Yong Loo Lin School of Medicine (Block MD1) promotes Professionalism and Excellence in Medical Education. Located at 10 Kent Ridge Crescent, National University campus, the 17-storey building was built in 2016 with a total GFA of 38,448 m<sup>2</sup>. It comprises of spaces such as dry and wet lab, offices, and lecture rooms.

The building incorporated sustainable features such as:

- Energy efficient LED and T5 light fittings that is 27% more efficient over BCA code compliant performance
- Motion sensors control for all toilets and staircases, select laboratories and corridors
- Use of passive heat pipe for dehumidification
- Energy efficient air distribution system for laboratory ventilation
- Use of Energy efficient heat recovery system for hot water
- Extensive use of certified sustainable products including low VOC paints and finishes



The building was awarded Green Mark Platinum under Green Mark Non-Residential Building NRB Ver 3.0 in 2012.

The development has achieved a total energy savings of 32% and water savings of 48% as compared to BCA code compliant building.

Annual utilities savings is estimated to be 7,657,878 kWh for electricity and 52,480 m<sup>3</sup> for water.

# Campus Upgrading (Phase 2C)

## – MD6

The Centre for Translational Medicine (MD6) houses both laboratory and teaching spaces to meet the needs of both the School of Medicine and the Centre of Nursing. Built in 2011, MD6 is a 15-storey building with a total GFA of 40,764m<sup>2</sup>. The building consists of two 300-seat capacity lecture theatres, medical library, research laboratories and a simulated hospital including mock wards and procedure rooms.

The building incorporated sustainable features such as:

- Energy efficient LED and T5 light fittings that is 4.74% more efficient than BCA code compliant performance
- Motion sensors control of lighting in all toilets and staircase to reduce wastage
- Use of WELS Excellent and Very Good rated water fittings
- Use of Energy efficient heat recovery system
- Extensive use of certified sustainable products



The building was awarded Green Mark Platinum under Green Mark Existing Non-Residential Building (ENRB) 2017 in 2021.

The development has achieved a total energy savings of 11% as compared to BCA code compliant building.

Annual utilities savings is estimated to be 3,289,575 kWh for electricity and 12,363 m<sup>3</sup> for water.

# Yale-NUS College (Land and Building)

Completed in 2015, Yale-NUS College is a new development located in NUS University Town at Dover Road with a total GFA of ~ 64,000 m<sup>2</sup>. It comprises of 3 Residential Colleges, 1 Block of 2-Storey Performance Arts Building, 1 Block of 4-Storey Sports Hall / Library / Administration and Science Teaching Building.

The building was awarded BCA Green Mark Platinum in 2013 under the Green Mark Non-Residential Building criteria Version 4.0.

The building incorporated sustainable features such as:

- Extensive courtyard, green roofs and sky gardens improves bioclimate by maximizing cross ventilation and shade thereby reduces urban heat gain effect
- Water sensitive urban design with ecopond and bioswales to reduce stormwater runoff
- Good natural ventilation in Student Apartments
- Naturally ventilated and daylit student corridors living rooms external corridors and lift lobbies
- Mixed mode ventilation and daylit for Sports Hall Dining Halls Student Bedrooms and classrooms to reduce cooling load
- Photo sensors in dining hall
- Occupancy sensors to control lighting and air-conditioning in faculty offices to reduce lighting consumption



The development has achieved total energy savings of 36% as compared to BCA code compliant building.

Annual utilities savings is estimated to be 2,809,629 kWh for electricity and 32,559 m<sup>3</sup> for water.



E8 (formerly known as EW2) is a 6-storey building with a GFA of 14,352 m<sup>2</sup>. Built in 1979, it was designated in 2018 to be a high-risk building, where all wet labs for Chemical Engineering related research will be consolidated here.

Major renovation works to upgrade the building to serve this function commenced in 2018 and was completed by end 2019.

Another objective of the renovation is to carry out energy improvement works which includes:

- Replacement of light fittings
- Provision of chilled water AHU to replace DX units
- Provision of Building Management System
- Replacement of existing glass façade

Toilets are also upgraded with more efficient water fittings.



The building was awarded Green Mark Platinum in 2019 under Green Mark Existing Non-Residential Building (ENRB) Version 3.0.

It has achieved energy savings of 35% for lighting system and 29% for air distribution system over BCA code compliant performance.

Annual utilities savings is estimated to be 764,442 kWh for electricity and 3,255 m<sup>3</sup> for water.

## 04

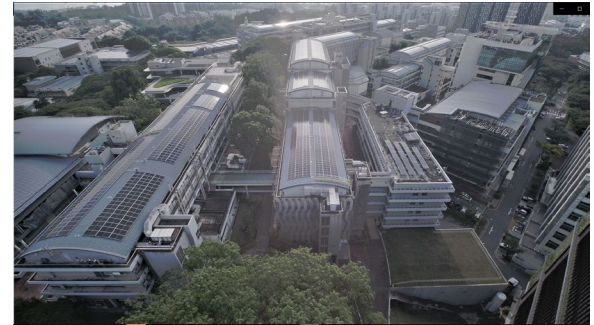
# Solar Photovoltaic (PV) Systems

As part of NUS sustainability efforts to decarbonize, NUS Campus Asset management has embarked on the project to install 9 MWp of Solar PV on the roof of about 55 buildings across Kent Ridge and Utown Campus.

Estimated Electricity generation of the PV systems is about 9,847,708 kWh (about 4% of the whole campus energy consumption). This translate to an annual savings of \$2.7 million based on electricity tariff rate of 27 cents / kWh.

With project cost estimated at about \$16 million, the expected ROI for the campus solar PV system is about 6 years.

Project is expected to commission in June 2024.



# 05 Student Residence at Site A

The Student Residence at Site A is new 19-storey student hostel development in NUS located along Kent Ridge Crescent, occupying a site area of about 3,738m<sup>2</sup>. Total GFA of the development is 16,592 m<sup>2</sup> and comprises of 600 student bedrooms as well as amenities such as seminar rooms, student lounges, student commons and fellow's apartments.

When completed, the Student Residence at Site A would provide some relief to the unmet demand for student hostel, allowing more students the opportunity to experience residential life within campus.

The design of Site A incorporates sustainable features such as

- a) Carefully positioned windows with shading elements that enhances ventilation and daylight while reducing glare
- b) Flexible cooling system for student bedroom (Mixed mode ventilation) and natural ventilated common are and corridor which reduces air-conditioning energy
- c) Sky Gardens from 3<sup>rd</sup> to 19<sup>th</sup> storey providing a breakout space for student residents to relax and mingle benefitting their health and well-being. The sky garden also helps to improve the micro-climate of the spaces
- d) Extensive use of sustainable building materials and products

Site A was awarded Green Mark Platinum under Green Mark Non-Residential Building (ENRB) Version 2015

It has achieved energy savings of 55% for lighting system and about 34% for air conditioning system over BCA code compliant performance. Total Energy Performance of Site A is estimated to be 32% better than a BCA code compliant building.

Total annual utilities savings is estimated to be 620,724 kWh (excluding PV) for electricity.





# Independent Assurance

NUS has engaged Ernst & Young LLP to provide independent limited assurance on our first anniversary reporting and management of proceeds in accordance with NUS Green Finance Framework.

The Independent Limited Assurance Report is appended in Annex 1.



# Annex 1

Ernst & Young Independent Limited Assurance Report



## Independent Limited Assurance Report to the Management of National University of Singapore (“NUS”)

### Assurance conclusion

Based on our limited assurance procedures, as described in this statement as of 25 March 2024, nothing has come to our attention that causes us to believe that the relevant post-issuance processes do not meet the requirements of NUS’ Green Finance Framework and the Green Bond Principles (June 2021), in all material aspects.

### Scope

We have performed a limited assurance engagement in relation to the post-issuance processes in relation to NUS’ green bond issuance of S\$340 million in March 2023 (“2023 Green Bond”), in order to provide a conclusion as to whether anything has come to our attention that causes us to believe that the subject matter detailed below (“Subject Matter”) does not meet, in all material respects, the criteria as presented below, as at 25 March 2024.

### Subject Matter and Criteria

The Subject Matter and associated Criteria for this limited assurance engagement are set out in the table below:

Subject Matter	Criteria
<p>Post-issuance process for NUS’ 2023 Green Bond of S\$340 million, as described in the NUS’ Green Finance Framework (the “Framework”) and NUS Green Bond Impact Report March 2024 (the “Report”), that sets out:</p> <ul style="list-style-type: none"> <li>▶ Use of Proceeds</li> <li>▶ Process for Project Evaluation and Selection</li> <li>▶ Management of Proceeds</li> <li>▶ Reporting on use of proceeds and project performance</li> </ul>	<ul style="list-style-type: none"> <li>▶ NUS’ Green Finance Framework dated 30 April 2020 and Addendum to the Framework dated 31 March 2022</li> <li>▶ The Green Bond Principles (June 2021, with June 2022 Appendix 1) (“GBP”) requirements on: <ul style="list-style-type: none"> <li>▶ Use of Proceeds</li> <li>▶ Process for Project Evaluation and Selection</li> <li>▶ Management of Proceeds</li> <li>▶ Reporting</li> </ul> </li> <li>▶ Respective GBP criteria found at below link: <ul style="list-style-type: none"> <li>▶ <a href="https://www.icmagroup.org/assets/documents/Sustainable-finance/2022-updates/Green-Bond-Principles-June-2022-060623.pdf">https://www.icmagroup.org/assets/documents/Sustainable-finance/2022-updates/Green-Bond-Principles-June-2022-060623.pdf</a></li> </ul> </li> </ul>

### **Management's Responsibilities**

Management is responsible for selecting Criteria, and for presenting the Subject Matter in accordance with that Criteria, in all material respects. This responsibility includes establishing and maintaining internal controls, maintaining adequate records, and making estimates that are relevant to the preparation of the Subject Matter Information, such that it is free from material misstatement, whether due to fraud or error.

### **Auditor's Responsibilities**

Our responsibility is to express a limited assurance conclusion on the Subject Matter based on the procedures we performed and evidence we obtained.

We conducted our engagement in accordance with the International Standards on Assurance Engagements (ISAE) 3000 (Revised) Assurance Engagements other than audits or reviews of historical financial information ("ISAE 3000 (Revised)"), and the terms of reference for this engagement as agreed with NUS on 21 August 2023. Those standards require that we plan and perform our engagement to obtain limited assurance about whether, in all material respects, the Subject Matter is presented in accordance with the Criteria, and to issue a report. The nature, timing, and extent of the procedures selected depend on our judgment, including an assessment of the risk of material misstatement, whether due to fraud or error.

We believe that the evidence obtained is sufficient and appropriate to provide a basis for our limited assurance conclusions.

### **Auditor's Independence and Quality Control**

We have maintained our independence and confirm that we have met the requirements of the Accounting and Corporate Regulatory Authority Code of Professional Conduct and Ethics for Public Accountants and Accounting Entities and Institute of Singapore Chartered Accountants Codes of Professional Conduct and Ethics. Our team has the required competencies and experience for this assurance engagement.

EY also applies International Standard on Quality Management 1, Quality Management for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

### **Description of procedures performed**

Procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Our procedures were designed to obtain a limited level of assurance on which to base our conclusion and do not provide all the evidence that would be required to provide a reasonable level of assurance.

Although we considered the effectiveness of management's internal controls when determining the nature and extent of our procedures, our assurance engagement was not designed to provide assurance on internal controls. Our procedures did not include testing controls or performing procedures relating to checking aggregation or calculation of data within IT systems.

A limited assurance engagement consists of making enquiries, primarily of persons responsible for preparing the Subject Matter and related information, and applying analytical and other appropriate procedures.



**Our procedures included:**

- Read NUS' Green Finance Framework to understand the policies, procedures and criteria
- Interviewed select management and team members to understand the key issues in relation to the Framework
- Read key policies and procedures for project evaluation and selection, management of proceeds, information disclosure and reporting for NUS' 2023 Green Bond issuance
- Read key documents supporting eligibility of the nominated projects
- Validated eligibility of nominated projects for inclusion in NUS' 2023 Green Bond against the GBP and NUS' Green Finance Framework criteria
- Obtained an understanding of relevant internal systems and process function
- Sought the relevant management representations from NUS

**Conclusion**

Based on our procedures and the evidence obtained, we are not aware of any material modifications that should be made to the Subject Matter as of 25 March 2024, in order for it to be in accordance with the Criteria.

**Restricted use**

This report is intended solely for the information and use of the Management of NUS and is not intended to be and should not be used by anyone other than those specified parties.

**Observations on particular aspects of our engagement**

We provide selected observations aligning to NUS' Green Finance Framework and the GBP core components, to enable the reader to gain an understanding on how the relevant post-issuance processes meet the Criteria.

These observations are not intended to detract from our conclusion provided above.

**Use of Proceeds:**

Proceeds from NUS' 2023 Green Bond were used for both financing and refinancing purposes of its eligible Green Buildings and financing of Solar Photovoltaic Systems.

The use of the 2023 Green Bond proceeds aligns with the NUS Green Finance Framework and the GBP's indicative list of project categories.

Specifically, the Green Buildings eligible for the 2023 Green Bond must attain a minimum of "Singapore Building and Construction Authority ("BCA") Green Mark: BCA Green Mark Gold<sup>Plus</sup> rating and/or an equivalent".

Proceeds were also channeled towards the installation of Solar Photovoltaic Systems on campus, which has been listed as one of the project types under Renewable Energy and Energy Efficiency Infrastructure and Systems.



**Process for Project Evaluation and Selection:**

NUS has implemented the necessary processes and procedures for project evaluation and selection as stated in the Green Finance Framework which outlines the environmental objective of the proposed Green Bond, eligibility criteria for determining green projects and the process for project selection and evaluation.

As part of NUS' annual review of the Green Project Register and the Report, it was presented to Chief Financial Officer and Vice President (Campus Infrastructure) as highlighted in the Addendum to NUS' Green Finance Framework dated 31 March 2022 on updates to Process for Project Evaluation and Selection.

**Management of Proceeds:**

NUS has implemented processes to manage proceeds received from the 2023 Green Bond and to monitor the ongoing use of such proceeds. These processes include:

- An ear-marking process through the Green Project Register and internal systems to designate the proceeds received
- A process for deploying any unallocated proceeds to temporary cash equivalent investments (not applicable for 2023 Green Bond as proceeds were fully allocated)
- A process for monitoring the on-going use of proceeds through the Green Project Register and internal systems

NUS has fully allocated the proceeds of the 2023 Green Bond in the Green Project Register to the eligible projects that qualify under the Framework's Eligibility Criteria.

**Reporting:**

NUS will publish the Report on the allocation and the expected environmental impacts of the 2023 Green Bond on NUS' website, based on the Report provided to EY on 25 March 2024.

This Report includes a list of key eligible projects to which proceeds of the 2023 Green Bond have been allocated to, the total amount of 2023 Green Bond allocated, and the expected environmental impacts attributed to the eligible assets.

NUS has sought independent limited assurance post-issuance of its 2023 annual Green Bond report.

Ernst & Young LLP



Signed for Ernst & Young LLP by  
Simon Yeo  
Partner, Climate Change and Sustainability Services  
Singapore  
25 March 2024



**THANK YOU**