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## **PricewaterhouseCoopers LLP**

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Nanyang Technological University  
50 Nanyang Avenue  
Singapore 639798

Attention: The Board of Trustees

12 October 2021

Our Ref: ASR FEL/LBY(13)  
(When Replying Please Quote Our Reference)

**REPORT ON FACTUAL FINDINGS IN CONNECTION WITH THE SUSTAINABILITY-LINKED BOND FRAMEWORK (OCTOBER 2021) OF NANYANG TECHNOLOGICAL UNIVERSITY (“NTU” OR THE “COMPANY”)**

Dear Sirs

We have performed the procedures agreed with you in our Contract dated 6 October 2021 and enumerated in Appendix I with respect to management’s processes for selection of Key Performance Indicator (“KPI”) and calibration of Sustainability Performance Target (“SPT”) in connection with NTU’s Sustainability-Linked Bond Framework (October 2021) (the “Framework”). Our engagement was undertaken in accordance with the Singapore Standard on Related Services SSRS 4400 Engagements to Perform Agreed-Upon Procedures Regarding Financial Information.

The procedures were performed solely to assist you in assessing management’s processes for selection of KPI and calibration of SPT in the Framework (the “Purpose”).

We report our findings in Appendix I and we found no exceptions from performing the procedures.

Because the procedures do not constitute either an audit or a review made in accordance with Singapore Standards on Auditing or Singapore Standards on Review Engagements or an assurance engagement made in accordance with Singapore Standards on Assurance Engagements, we do not express any assurance on management’s processes for selection of KPI and calibration of SPT.

Had we performed additional procedures or had we performed an audit or review of the financial statements in accordance with Singapore Standards on Auditing or Singapore Standards on Review Engagements or had we performed assurance procedures in accordance with Singapore Standards on Assurance Engagements, other matters might have come to our attention that would have been reported to you.

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Yours faithfully

*PricewaterhouseCoopers LLP*  
PricewaterhouseCoopers LLP  
Public Accountants and Chartered Accountants

Singapore



**Agreed-Upon Procedures in connection with NTU’s Sustainability-Linked Bond Framework (October 2021)**

No.	Agreed-Upon Procedures	Factual Findings
1.0	<b>General</b>	
1.1	<p>Inquire with Ong Eng Hock (Chief Financial Officer) on the basis for the establishment of the Framework, the rationale for sustainability-linked bond (“SLB”) issuance, and whether the Framework and rationale for SLB issuance are consistent with the Company’s overall sustainability and business strategy.</p> <p>Agree the NTU 2025 Core Pillars, Enablers and NTU Smart Campus initiatives set out in the Framework to the NTU 2025 strategic plan.</p>	<p>Inquired with Ong Eng Hock (Chief Financial Officer) who advised that:</p> <ul style="list-style-type: none"> <li>• the establishment of the Framework is based on the NTU 2025 strategic plan set out in Section 1.1 of the Framework;</li> <li>• the rationale for SLB issuance is set out in Section 2 of the Framework; and</li> <li>• the Framework and rationale for SLB issuance are consistent with the Company’s overall sustainability and business strategy.</li> </ul> <p>Agreed the NTU 2025 Core Pillars, Enablers and NTU Smart Campus initiatives set out in Section 1.1 of the Framework to the NTU 2025 strategic plan. Noted that the NTU 2025 Core Pillars, Enablers and NTU Smart Campus initiatives set out in Section 1.1 of the Framework are as follows:</p> <p><b>Core Pillars</b></p> <ol style="list-style-type: none"> <li>1. <b>Education:</b> To nurture leaders with character, competence and cognitive agility</li> <li>2. <b>Research:</b> To strengthen deep disciplinary discoveries and high-impact interdisciplinary research</li> <li>3. <b>Innovation:</b> To translate knowledge into enterprise that benefits industry and society through partnerships</li> <li>4. <b>Community:</b> To foster a diverse, inclusive and cohesive community</li> </ol>



No.	Agreed-Upon Procedures	Factual Findings
		<p><b>Enablers</b></p> <ol style="list-style-type: none"> <li>1. <b>Talent:</b> A mission-led and high-performing organisation</li> <li>2. <b>Financials:</b> Diversified revenue streams and efficiency across the University</li> <li>3. <b>Technology:</b> Enabling technologies to power innovation and growth</li> </ol> <p><b>NTU Smart Campus initiatives</b></p> <ol style="list-style-type: none"> <li>1. Support efforts for on-campus test-bedding projects in areas including innovative green energy, lower carbon footprint and waste management technologies</li> <li>2. Undertake clean energy and autonomous vehicle development and pilot projects both on and off campus</li> <li>3. Set an ambitious target of halving our net energy utilisation, water usage, and waste generation each by March 2026, compared to the levels of 2011</li> <li>4. Encourage the use of digital technologies to improve working, learning, and living experiences on campus</li> </ol> <p>No exception noted from procedures performed.</p>
1.2	<p>Inspect the Framework for inclusion of the following core components of the Sustainability-Linked Bonds Principles (“SLBP”) dated June 2020, published by the International Capital Market Association (“ICMA”):</p> <ol style="list-style-type: none"> <li>1. Selection of KPI</li> <li>2. Calibration of SPT</li> <li>3. Bond characteristics</li> <li>4. Reporting</li> <li>5. Verification</li> </ol>	<p>Inspected Section 2 of the Framework and noted the inclusion of the following core components of the SLBP dated June 2020, published by the ICMA:</p> <ol style="list-style-type: none"> <li>1. Selection of KPI</li> <li>2. Calibration of SPT</li> <li>3. Bond characteristics</li> <li>4. Reporting</li> <li>5. Verification</li> </ol> <p>No exception noted from procedures performed.</p>



No.	Agreed-Upon Procedures	Factual Findings
1.3	<p>Inquire with:</p> <ul style="list-style-type: none"> <li>• Ong Eng Hock (Chief Financial Officer);</li> <li>• Siew Hoong Kit (Principal Civil Engineer &amp; Director - Projects, Office of Development &amp; Facilities Management); and</li> <li>• Tong Kok Kwang (Principal Mechanical Engineer &amp; Director - Projects, Office of Development &amp; Facilities Management)</li> </ul> <p>on whether the Framework complies with the requirements of the SLBP dated June 2020, published by the ICMA.</p>	<p>Inquired with:</p> <ul style="list-style-type: none"> <li>• Ong Eng Hock (Chief Financial Officer);</li> <li>• Siew Hoong Kit (Principal Civil Engineer &amp; Director - Projects, Office of Development &amp; Facilities Management); and</li> <li>• Tong Kok Kwang (Principal Mechanical Engineer &amp; Director - Projects, Office of Development &amp; Facilities Management)</li> </ul> <p>on whether the Framework complies with the requirements of the SLBP dated June 2020, published by the ICMA, and they confirmed that the Framework was prepared in accordance with the aforementioned SLBP.</p>
1.4	<p>Inspect evidence of approval of the Framework by the required delegated/authorised personnel.</p>	<p>Inspected email approval dated 10 October 2021 from Professor Subra Suresh (President, NTU) for the approval of the Framework.</p> <p>No exception noted from procedures performed.</p>



No.	Agreed-Upon Procedures	Factual Findings
<b>2.0</b>	<b>Selection of KPI (used to measure the Company's sustainability performance)</b>	
2.1	Inspect the Framework for inclusion of: <ul style="list-style-type: none"> <li>• the description and definition of the selected KPI; and</li> <li>• the rationale behind the selection of KPI.</li> </ul>	Inspected Section 2 of the Framework and noted the inclusion of: <ul style="list-style-type: none"> <li>• the description and definition of the selected KPI, as follows: <i>NTU's Scope 2 gross carbon emissions intensity (kgCO<sub>2</sub>e/m<sup>2</sup>) from the NTU Yunnan Campus (i.e. Scope 2 gross carbon emissions from NTU's total electricity consumption divided by the gross floor area of the NTU Yunnan Campus); and</i></li> <li>• the rationale behind the selection of KPI, as follows: <i>NTU is focusing on Scope 2 gross carbon emissions intensity for the purpose of its SLB Framework as they represent the key environmental footprint within NTU's core operations which NTU has reasonable control over. Scope 1 emissions, for example, fuel used for backup generators for buildings on campus have been excluded as they are deemed immaterial. From 2011 to 2019, Scope 1 emissions amounted to between 0.95% to 1.31% of NTU's total Scope 1 and 2 gross carbon emissions. With regard to Scope 3 carbon emissions, a large proportion of it is not within NTU's direct control and hence have been currently excluded from the scope of the KPI.</i></li> </ul> <p>No exception noted from procedures performed.</p>



No.	Agreed-Upon Procedures	Factual Findings
2.2	<p>Inquire with Ong Eng Hock (Chief Financial Officer) on the basis for the selected KPI (i.e. NTU's Scope 2 gross carbon emissions intensity (kgCO<sub>2</sub>e/m<sup>2</sup>) from the NTU Yunnan Campus) and:</p> <ul style="list-style-type: none"> <li>• whether it is material to the Company's core sustainability and business strategy;</li> <li>• whether it addresses relevant environmental, social and/or governance challenges of the industry sector; and</li> <li>• whether it is under management's control.</li> </ul>	<p>Inquired with Ong Eng Hock (Chief Financial Officer) who advised that the selected KPI (i.e. NTU's Scope 2 gross carbon emissions intensity (kgCO<sub>2</sub>e/m<sup>2</sup>) from the NTU Yunnan Campus) is based on the NTU 2025 strategic plan set out in Section 1.1 of the Framework and:</p> <ul style="list-style-type: none"> <li>• it is material to the Company's core sustainability and business strategy;</li> <li>• it addresses relevant environmental challenges of the education industry; and</li> <li>• it is under management's control.</li> </ul>





No.	Agreed-Upon Procedures	Factual Findings
<b>3.0</b>	<b>Calibration of SPT</b>	
3.1	Inspect the Framework for inclusion of: <ul style="list-style-type: none"> <li>• the definition of baseline i.e. a fixed point of reference that is used for comparison to determine the measurement of the performance of the SPT;</li> <li>• the rationale for that baseline to be used; and</li> <li>• the Company’s own performance over 10 years on the selected KPI (i.e. track record).</li> </ul>	Inspected Section 2 of the Framework and noted the inclusion of: <ul style="list-style-type: none"> <li>• the definition of baseline i.e. a fixed point of reference that is used for comparison to determine the measurement of the performance of the SPT, as follows:               <p><i>Gross carbon emissions intensity of 56.0 kilograms of carbon dioxide equivalent / square meter in 2019;</i></p> </li> <li>• the rationale for that baseline to be used, as follows:               <p><i>2019 was selected as the baseline as 2020 was an unusual year due to the COVID-19 pandemic; and</i></p> </li> <li>• the Company’s own performance over 10 years (from 2011 to 2020) on the selected KPI (i.e. track record).</li> </ul> <p>No exception noted from procedures performed.</p>
3.2	For the Company’s 2019 Scope 2 gross carbon emissions disclosed in the Framework: <ul style="list-style-type: none"> <li>(a) Obtain the monthly tax invoices issued by the electricity retailer for the 2019 calendar year (i.e. 12 months).</li> <li>(b) Agree the energy consumed per the tax invoices in (a) to the Company’s detailed workings – “2019 Electricity Consumption”.</li> </ul>	For the Company’s 2019 Scope 2 gross carbon emissions disclosed in the Framework: <ul style="list-style-type: none"> <li>(a) Obtained the monthly tax invoices issued by the electricity retailer for the 2019 calendar year (i.e. 12 months) from Alfred Cheng (Project Director, Office of Development &amp; Facilities Management).</li> <li>(b) Agreed the energy consumed per the tax invoices in (a) to the Company’s detailed workings – “2019 Electricity Consumption”.</li> </ul>



No.	Agreed-Upon Procedures	Factual Findings
	<p>(c) Obtain the 2019 Grid Emission Factor (“GEF”) published by the Singapore Energy Market Authority (“EMA”).</p> <p>(d) Recompute the 2019 Scope 2 gross carbon emissions by applying the following formula:</p> <p style="padding-left: 40px;">Gross carbon emissions = Energy consumed * 2019 GEF</p> <p>(e) Agree the 2019 Scope 2 gross carbon emissions computed in (d) to the Framework.</p>	<p>(c) Obtained the 2019 Grid Emission Factor (“GEF”) published by the Singapore Energy Market Authority (“EMA”).</p> <p>(d) Recomputed the 2019 Scope 2 gross carbon emissions by applying the following formula:</p> <p style="padding-left: 40px;">Gross carbon emissions = Energy consumed * 2019 GEF</p> <p>(e) Agreed the 2019 Scope 2 gross carbon emissions computed in (d) to the Framework. The Company’s 2019 Scope 2 gross carbon emissions amounted to 78,607,586 kgCO<sub>2</sub>e.</p> <p>No exception noted from procedures performed.</p>
3.3	<p>For the Company’s 2019 gross floor area of the NTU Yunnan Campus disclosed in the Framework:</p> <p>(a) Obtain a detailed listing of NTU’s gross floor area in 2019, broken down by building names.</p> <p>(b) For one sample building, obtain the Grant of Written Permission (“GWP”) submitted to the Singapore Urban Redevelopment Authority (“URA”) and agree the gross floor area declared in the GWP to the detailed listing in (a).</p> <p>(c) Sum the gross floor areas for all buildings in the NTU Yunnan Campus listed in the detailed listing in (a).</p>	<p>For the Company’s 2019 gross floor area of the NTU Yunnan Campus disclosed in the Framework:</p> <p>(a) Obtained a detailed listing of NTU’s gross floor area in 2019, broken down by building names from Siew Hoong Kit (Principal Civil Engineer &amp; Director - Projects, Office of Development &amp; Facilities Management).</p> <p>(b) For one sample building, obtained the Grant of Written Permission (“GWP”) submitted to the Singapore Urban Redevelopment Authority (“URA”) and agreed the gross floor area declared in the GWP to the detailed listing in (a).</p> <p>(c) Summed the gross floor areas for all buildings in the NTU Yunnan Campus listed in the detailed listing in (a).</p>



No.	Agreed-Upon Procedures	Factual Findings
	<p>(d) Agree the 2019 gross floor area of the NTU Yunnan Campus computed in (c) to the Framework.</p>	<p>(d) Agreed the 2019 gross floor area of the NTU Yunnan Campus computed in (c) to the Framework. The Company's 2019 gross floor area of the NTU Yunnan Campus amounted to 1,404,030 m<sup>2</sup>.</p> <p>No exception noted from procedures performed.</p>
3.4	<p>For the Company's 2019 Scope 2 gross carbon emissions intensity disclosed in the Framework:</p> <p>(a) Recompute the Company's 2019 Scope 2 gross carbon emissions intensity by applying the following formula:</p> <p style="padding-left: 40px;">Gross carbon emissions intensity = Gross carbon emissions (per Procedure 3.2) ÷ Gross floor area of the NTU Yunnan Campus (per Procedure 3.3)</p> <p>(b) Agree the 2019 Scope 2 gross carbon emissions intensity computed in (a) to the Framework.</p>	<p>For the Company's 2019 Scope 2 gross carbon emissions intensity disclosed in the Framework:</p> <p>(a) Recomputed the Company's 2019 Scope 2 gross carbon emissions intensity by applying the following formula:</p> <p style="padding-left: 40px;">Gross carbon emissions intensity = Gross carbon emissions (per Procedure 3.2) ÷ Gross floor area of the NTU Yunnan Campus (per Procedure 3.3)</p> <p>(b) Agreed the 2019 Scope 2 gross carbon emissions intensity computed in (a) to the Framework. The Company's 2019 Scope 2 gross carbon emissions intensity amounted to 56.0 kgCO<sub>2</sub>e/m<sup>2</sup>.</p> <p>No exception noted from procedures performed.</p>



No.	Agreed-Upon Procedures	Factual Findings
3.5	<p>Inspect the Framework for inclusion of:</p> <ul style="list-style-type: none"> <li>• the description and definition of the SPT;</li> <li>• the motivation for the outlined SPT;</li> <li>• the timeline for the target achievement; and</li> <li>• the means for achieving the SPT.</li> </ul>	<p>Inspected Section 2 of the Framework and noted the inclusion of:</p> <ul style="list-style-type: none"> <li>• the description and definition of the SPT, as follows: <p><i>Achieve carbon neutrality for the NTU Yunnan Campus by 2035, while aiming to reduce gross carbon emissions intensity by at least 50% from the 2019 baseline;</i></p> </li> <li>• the motivation for the outlined SPT, as follows: <p><i>From 2011 to 2019, NTU had managed to significantly reduce its gross carbon emissions intensity by 42%. Moving forward, NTU intends to reduce its gross carbon emissions intensity even further by targeting to reduce gross carbon emissions intensity by at least 50% from the 2019 baseline, and to offset the remaining Scope 2 gross carbon emissions to achieve carbon neutrality by 2035. The University believes that the target is an ambitious one and reflects NTU's commitment to decarbonisation and sustainable development.</i></p> <p><i>NTU, with its strong leadership in research and development, owns and operates many laboratories, both wet laboratories (with fume exhaust) and dry laboratories (without fume exhaust). In general, energy consumption from laboratories, especially from wet laboratories, are much higher than non-laboratories spaces such as offices and common areas due to energy-intensive equipment installed in these laboratories. As part of its profile as a University focused on research and innovation, NTU will continue to build laboratories required for future research and innovation efforts. This demand for more laboratories</i></p> </li> </ul>



No.	Agreed-Upon Procedures	Factual Findings
		<p><i>will increase its energy consumption further, making it more challenging to achieve the SPT;</i></p> <ul style="list-style-type: none"> <li>• the timeline for the target achievement, as follows: <i>By 2035; and</i></li> <li>• the means for achieving the SPT, as follows: <i>NTU seeks to mobilise all resources available to achieve the SPT, and there are mainly three levers to achieve it – 1) Reducing energy consumption for the NTU Yunnan Campus, 2) Sourcing renewable energy and 3) Carbon offsets. In addition to gross emissions reduction from campus infrastructure, NTU will also drive organisational and individual behavioural changes and practices to reduce emissions from business travel, work models, education and pedagogical innovations, and greater deployment of innovative green technologies.</i></li> </ul> <p><i>1) <u>Reducing energy consumption for the NTU Yunnan Campus</u></i></p> <p><i>As part of the NTU 2025 strategy, NTU has planned a series of sustainability initiatives. NTU will support efforts for on-campus test-bedding projects in areas including innovative green energy and carbon footprint lowering technologies. NTU also plans to undertake clean energy vehicle development and pilot projects, both on and off campus. NTU will also encourage the use of digital technologies to improve working, learning and living experiences on campus. Some of the initiatives NTU has planned to embark</i></p>



No.	Agreed-Upon Procedures	Factual Findings
		<p><i>on to drive down NTU's energy consumption include:</i></p> <ul style="list-style-type: none"> <li>• <i>Investments in smart technology to regulate temperature on a real-time basis;</i></li> <li>• <i>Adopting state-of-the-art materials to improve energy efficiency in its infrastructural buildings; and</i></li> <li>• <i>Continuing research in the area of sustainability to bring about reductions in its carbon footprint.</i></li> </ul> <p><i>Although the University has identified future projects to reduce its energy consumption, NTU will still require considerable efforts and investments to achieve the SPT, including exploring new technologies and innovative solutions to enable further savings.</i></p> <p><i>2) <u>Sourcing renewable energy</u></i></p> <p><i>NTU will explore sourcing its electricity from renewable sources together with its utility providers.</i></p> <p><i>3) <u>Carbon offsets</u></i></p> <p><i>While NTU is fully committed to reducing its gross carbon emissions intensity as much as possible through (1) and (2), in the event that there are residual gross carbon emissions, NTU will purchase high quality carbon offsets meeting global verification standards, to achieve carbon neutrality by 2035.</i></p> <p>No exception noted from procedures performed.</p>



No.	Agreed-Upon Procedures	Factual Findings
3.6	Inquire with Ong Eng Hock (Chief Financial Officer) on the factors considered by management in evaluating whether the SPT is ambitious.	<p>Inquired with Ong Eng Hock (Chief Financial Officer) and were advised that the following were the factors considered by management in evaluating whether the SPT is ambitious:</p> <ul style="list-style-type: none"> <li>• whether the SPT represents a material improvement in the KPI (i.e. NTU’s Scope 2 gross carbon emissions intensity (kgCO<sub>2</sub>e/m<sup>2</sup>) from the NTU Yunnan Campus) and be beyond a “Business as Usual” trajectory;</li> <li>• whether the SPT can be compared to a benchmark or an external reference;</li> <li>• whether the SPT is consistent with the Company’s overall strategic sustainability strategy; and</li> <li>• whether the SPT can be determined on a predefined timeline, set before (or concurrently with) the issuance of the bond.</li> </ul>