



Green Bond Second Opinion

Based on the *Green Bond Principles* for which the International Capital Market Association (ICMA) acts as secretariat.

February 2018

Prepared for: Star Energy Geothermal (Wayang Windu) Ltd



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Carbon Trust Second Party Opinion Statement

To: Star Energy Geothermal (Wayang Windu) Ltd ("**Wayang Windu**" or the "**Bond Issuer**")

Summary

The Bond Issuer's Green Bond Framework (the "**Framework**") provides a forward-looking framework for the allocation of bond proceeds to finance or refinance the development, construction and operation of the Wayang Windu geothermal energy generation facility in West Java, Indonesia (the "**Facility**"). The Bond Issuer has adopted a robust Framework for the financing and refinancing of the Facility that is aligned with the four components of *the Green Bond Principles* for which the International Capital Market Association (ICMA) acts as secretariat. The Framework defines eligible projects as geothermal energy generation facilities that support the objectives of the Indonesian government's sustainability strategy, which includes the commitment to decrease greenhouse gas emissions by 26%¹ by 2020. The Framework and supporting procedures have a strong governance structure that includes an annual reporting mechanism requiring verification by an independent assurer.

The Bond Issuer is proposing to issue senior secured notes on or about the date of this Opinion (the "**Bonds**"). The Bonds will be issued in accordance with the Framework. The portion of the net proceeds from the issue of the Bonds will be used to fund the Bond Issuer's debt service account. The remaining net proceeds will be used to repay all the Bond Issuer's existing senior indebtedness secured on the Facility and for general working capital purposes in line with the Framework.

Terms of Engagement

Carbon Trust Assurance Limited ("**we**" or "**Carbon Trust**") was commissioned to provide a second party opinion regarding the issuance by the Bond Issuer of the Bonds in accordance with the Framework and the Bonds' alignment with the GBP. Carbon Trust's role was to act as a 'Consultant Reviewer' as defined by the GBP and provide a second party opinion as contemplated by the GBP.

Wayang Windu is a wholly owned subsidiary of Star Energy Geothermal Pte Ltd ("**Star Energy**") and is the owner of the Wayang Windu geothermal energy generation facilities in West Java, Indonesia, approximately 40km south of Bandung. The Facility is managed under a joint operation contract with PT Pertamina Geothermal Energy ("**Pertamina**"). The generated electricity is sold to PT PLN (Persero) ("**PT PLN**"), a state-owned utility company, and supplies part of the electricity network's needs in West Java. An Energy Sales Agreement between Star Energy, Pertamina, and PT PLN gives Star Energy the right to develop up to 400 MW of further electricity generating capacity over a period of 42 years. The Facility at Wayang Windu was completed in 1999, and has been producing at full capacity (110 MW) since 2000. In 2009 a second turbine unit was installed at the Facility, with generation capacity from a single turbine/generator, of 117 MW.

¹ First Nationally Determined Contribution, Republic of Indonesia, November 2016

Therefore, total geothermal electricity generation capacity at the Facility is currently 227 MW and may increase over the next decade.

In order to understand the use of proceeds, management of proceeds and reporting aspects of the Bonds, as well as the sustainability strategy of the Bond Issuer as a whole, we reviewed relevant documents as described below and held conversations with the Bond Issuer's management. We also received certain information from the Joint Global Coordinators and Joint Bookrunners of the Bond (Deutsche Bank and Barclays, together the "**Banks**") regarding the Bond issuance process.

No opinion or assurance is provided regarding the financial performance of the Bonds or the value of any investments in the Bonds or any asset deriving value from the Bonds. The Carbon Trust's objective has been solely to provide an opinion on whether the Bonds meet the GBP criteria described in the basis of opinion set out below.

Basis of Opinion

The Bond Issuer has established the Framework to underpin the use of the Bond proceeds and meet the principles and criteria laid out in the GBP. The GBP are a set of voluntary process guidelines for issuing green bonds that "recommend transparency and disclosure and promote integrity in the development of the Green Bond market by clarifying the approach for issuance of a Green Bond"².

The GBP are comprised of four core components and the Carbon Trust reviewed the alignment of the proposed Bonds with them, namely:

Principle One: Use of Proceeds

The proceeds of green bonds should be used to finance or refinance Green Projects that should be appropriately described in the legal documentation of the security. All designated Green Project categories should provide clear environmental benefits, which will be assessed and, where feasible, quantified by the issuer. Examples of eligible Green Projects are described in the GBP.

Principle Two: Process for Project Evaluation and Selection

The issuer of green bonds should outline a process to determine how the projects fit within the eligible Green Project categories identified in the GBP and the process for determining eligibility and the criteria used. The process should consider the environmental sustainability objectives of the proposed bond.

Principle Three: Management of Proceeds

The net proceeds of green bonds should be credited to a sub-account, moved to a sub-portfolio or otherwise tracked by the issuer in an appropriate manner and attested to by a formal internal process linked to the issuer's lending and

² The Green Bond Principles (GBP), ICMA, 2 June 2017

investment operations for Green Projects. A declaration should be made as to how any unallocated bond proceeds are managed.

Principle Four: Reporting

Issuers should make, and keep, readily available up to date information on the use of proceeds to be renewed annually until full allocation, and as necessary thereafter in the event of new developments.

Relevant Documentation

The following information and documents have been reviewed in order to form the basis of the opinion.

- Wayang Windu's Green Bond Framework dated February 2018
- Wayang Windu's environmental certifications
- Wayang Windu's Sustainability Report 2016
- a draft of Wayang Windu's Bond Offering Circular as at the date of this opinion (the "**Offering Circular**")

Management Responsibility

The management of the Bond Issuer are responsible for the following (the "**Procedures**"):

- designing, implementing and maintaining internal controls relevant to the preparation and issuance of the Bonds that are free from material misstatement, whether due to fraud or error;
- selecting and/or developing a suitable green framework to underpin the issuance and management of the Bonds;
- reporting relevant information on the use of proceeds; and
- maintaining alignment with the GBP criteria.

Our Responsibilities

Our responsibility is to plan and perform our work to form an opinion on whether the Framework and Bonds comply with the principles of the GBP, as described in the Basis of Opinion and to report to the Bond Issuer in the form of a 'Second Opinion' based on the work undertaken and the evidence obtained.

We have not performed any work, and do not express any conclusion regarding the ongoing effectiveness of the application of the Procedures.

Assurance Standards

We performed our work in accordance with Carbon Trust's assurance methodology which is based on the International Standard on Assurance Engagements 3000 ("**ISAE 3000**"). However, this second opinion is not an assurance opinion in accordance with ISAE 3000.

Our Assurance Activities

Our objective was to assess whether the the Framework and the Bond are structured in accordance with the principles of the GBP. We planned and performed our work to obtain all the information and explanations that we believe were necessary to provide a basis for our opinion.

Our work included, but was not restricted to:

- Requested information and evidence from the Bond Issuer and key staff responsible for the arrangement of the Bonds to obtain an understanding of the organisation, its environmental objectives and intended use of proceeds of the Bonds;
- Reviewed the Bond Issuer's Framework, including processes, systems and controls in place for management of proceeds; and
- Conducted research in relation to the Facility and attended site visits to assess conformance with eligibility requirements specified in the GBP.

Carbon Trust Competence

We ensure the selection of appropriate individuals to carry out the work in order to give this opinion, based on their qualifications, training and experience. All opinions and conclusions are internally quality assured by senior management.

Our Opinion

Based on the work we have undertaken and the evidence provided by the Bond Issuer, we believe that the Framework and the Bond complies with the principles of the GBP. Set out below are our specific findings and statements in relation to each of the GBP as they relate to the Framework and Bonds issued in accordance with it.

Principle One: Use of Proceeds

The Bond Issuer will describe in the Use of Proceeds section of the Offering Circular, the allocation of the net proceeds from the issue of the Bonds, after deducting fees, commissions and other estimated offering expenses. A proportion of the net proceeds shall be used to fund the Bond Issuer's 'Debt Service Account' in an amount equal to the first semi-annual interest payment on the Bonds.

The Bond Issuer intends to use the remainder of the net proceeds to repay all outstanding indebtedness under the Bond Issuer's 'Existing Senior Debt Facilities' and pay associated repayment expenses. These facilities are secured on the Facility and related assets (including the shares in the Bond Issuer, insurances and bank accounts, including the 'Debt Service Account'). The Bonds will be secured by the Facility once released from the existing security. Finally, the remaining net proceeds of the Bonds will applied (if necessary) for general working capital purposes of in relation to the

Facility. The respective share of the Bond Proceeds allocated to each of the purposes will be described in the Offering Circular.

The Framework defines eligible projects as geothermal energy generation facilities that support the objectives of the Indonesian government's sustainability strategy, which includes the commitment to decrease greenhouse gas emissions by 26% by 2020. Proceeds of Bonds issued in accordance with the Framework will only be used in connection with assets with emissions of less than 100g CO₂ per kWh estimated carbon intensity. This compares favorably to the Indonesian national average emission factor for electricity of over 730g CO₂ per kWh and coal-fired generation at nearly 990g CO₂ per kWh³. In our opinion, these criteria satisfy the requirements of a Green Project under the GBP and based on information provide to us by the Bond Issuer and the Banks the Facility also meets these criteria. Further information on the Facility is set out below.

The main inputs to the Facility's geothermal power generation process are the geothermal steam and brine which come from the Wayang Windu geothermal reservoir. The generation units employ a single flash turbine driving a generator. Geothermal fluid, comprising steam and brine, flows under pressure from production wells through a system of gathering pipelines aboveground to a separator in each of the generation units near the power plant. The separators separate the steam from the brine. Brine from the separators flows by gravity to a common brine injector where it is returned to the underground reservoir. Steam from the separators is piped to steam scrubbers located in each generation unit where steam is cleaned of any remaining particles of sand or water before entering the turbine. Most of this steam is admitted to the turbine, with a small portion used for the jet ejectors, which is part of the non-condensable gas removal system. This flow of steam into the turbine causes the turbine's blades to turn. Since the turbine shaft is connected to the generator shaft, this also causes the generator rotor to turn. Inside the generator of each of generation unit, the rotor passes through a magnetic field and generates electricity. The output of the generator is connected to a transformer which connects to the PT PLN electricity grid.

Steam that has passed through the turbine loses pressure and is turned into water within a condenser in each of the generation units. Cooling water is sprayed onto the steam to assist this condensation. Non-condensable gases, including hydrogen sulphide and carbon dioxide that collect in the condenser are removed by the gas removal system and released to atmosphere. Surplus water is removed in a continuous stream and is re-injected into the reservoir through condensate injector wells.

The Facility has achieved numerous certifications for its environmental initiatives and management systems, Including:

- PROPER Gold Award from the Indonesian Ministry of Environment and Forestry;
- Energy Efficiency Award from the Indonesian Ministry of Energy and Mineral Resources;
- ISO 14001:2015 Environmental Management System (EMS) Certification from Lloyds Register Quality Assurance ("LRQA"); and
- Certification of Environmental Management System, Quality, and OSH ISO 14001:2015, OH SAS 18001:2007 and ISO 9001:2008 in 2006, 2007, and 2014 from LRQA.

In 2010 unit 2 of the Facility was registered by the United Nations Framework Convention on Climate Change ("UNFCCC") as a Clean Development Mechanism ("CDM") project. The CDM (which is provided for under the Kyoto Protocol, an international agreement linked to the UNFCCC which commits its parties by setting internationally binding emission reduction targets), encourages emission-reduction projects to be developed in developing countries. Such projects can earn saleable certified emission reduction credits, each equivalent to one tonne of CO₂, which can be

³ International Energy Agency, 2016.

counted towards meeting Kyoto Protocol targets. A CDM project must provide emission reductions that are additional to what would otherwise have occurred and must qualify through a public registration and issuance process. Approval of the project is given by the designated national authorities granted responsibility to authorise and approve participation in CDM projects. Emission reductions from CDM projects are monitored and the monitoring results are audited every six months.

Renewable energy (including production, transmission, appliances and products) comprise one of the valid Green Project categories recognised by the GBP as addressing key areas of environmental concern. Globally, the electricity and heat generation sector is the largest emitting sector and accounts for 25%⁴ of global greenhouse gas emissions. According to the International Energy Agency in 2016, global renewable electricity generation grew by an estimated 6% and represented around 24% of global power output⁵. New renewable electricity capacity grew at its fastest pace ever in 2015, supported by policies driven by energy security, local pollution concerns and climate benefits. Renewable power is forecast to grow by 36% over 2015-21, making it the fastest-growing source of electricity generation globally. Based on the Carbon Trust's opinion, the development of geothermal energy generation and associated infrastructure will contribute to reducing greenhouse gas emissions and help Indonesia to meet its climate and sustainability targets.

It should also be noted that assets that are involved in the following operations will be ineligible under the Framework: oil and gas power, clean coal or any other fossil fuel-related technologies, nuclear and nuclear related technologies, large-scale hydropower or infrastructure that facilitates the above forms of energy generation. New eligible asset categories may be added to the Framework in the future but only after prior approval by Wayang Windu's Environmental and Social Impact Committee. The Facility may also be used as security for further indebtedness incurred by the Bond Issuer in accordance with the covenants applicable to the Bonds, with any such indebtedness relating solely to the Facility. This opinion relates only to the Framework as at the date of this opinion and the Bond.

Principle Two: Process for Project Evaluation and Selection

The Bond Issuer's process for selecting eligible assets and projects is based on the policies described in its Framework. The Bond Issuer will identify eligible assets and selected assets and projects will be reviewed by its Environmental and Social Impact Committee (the "**Committee**"). The Committee is empowered to enforce the use of proceeds requirements and restrictions as described above and as defined in the Framework. After initial project evaluation and selection by the Bond Issuer, the Committee will validate the selection decision, or, by the use of its veto power, decline final selection where the selected asset or project does not comply with the requirements defined in the Framework. The Framework describes the sustainability objectives of related bond issuances and includes criteria excluding the selection of assets or projects associated with oil and gas power, clean coal or any other fossil fuel-related technologies and nuclear and nuclear related technologies.

In the Carbon Trust's opinion the Bond Issuer has a clear process under the Framework for project evaluation and selection that is in accordance with the GBP. Furthermore, as described above, in our opinion the Facility is an eligible Green Project under the GBP.

⁴ IPCC (2014)

⁵ International Energy Agency, Tracking Clean Energy Progress 2017

Principle Three: Management of Proceeds

Proceeds from the issuance of the Bonds will be allocated to refinance the existing geothermal Facility, fund the 'Debt Service Account' for the Bonds, provide for working capital at the Facility and pay for certain expenses associated with the Bond as described in more detail above. It is not expected that there will be any unallocated Bond proceeds at the time of issuance. The Framework states that if unallocated proceeds should arise they will be earmarked and kept as liquidity reserves until they are reinvested in green assets in line with the definitions of the Framework. The Bond Issuer will track and monitor the allocation of the Bond proceeds as part of the Facility on an annual basis through the use of a Green Bond register.

The Carbon Trust confirms that the proposed management of proceeds is transparent and aligns with the GBP.

Principle Four: Reporting

The Bond Issuer will publish a dedicated, annual Green Bond Report (the "**Report**") regarding the Bonds that contains information on the financial constitution of the Bonds, the associated installed geothermal energy production capacity (MW) of the Facility and an estimate of avoided carbon dioxide emissions. The Report will be verified by an independent assurer and made available to investors on the Bond Issuer's website.

The Carbon Trust confirms that the reporting process is transparent and aligns with the GBP.

This opinion shall be read in the context of the inherent limitations of the Procedures and this statement's intended use.

A handwritten signature in dark ink, appearing to be "James", with a long horizontal flourish extending to the right.

Carbon Trust Assurance Limited

26th February 2018



Carbon Trust Assurance Limited, London

Email: info@carbontrust.com

This second opinion statement ("Opinion") is given by Carbon Trust Assurance Limited ("CTA") and is addressed solely to the Bond Issuer in accordance with the terms of the engagement contract between us and the Bond Issuer. Those terms permit disclosure to other parties (whether by publication on the website of the International Capital Markets Association Green Bond Resource Centre (the "GBRC") or otherwise), solely for the purpose of enabling the Bond Issuer to show that it has obtained a second opinion as contemplated by the GBP in connection with the Bonds. We have not considered the interest of any other party in the Opinion. To the fullest extent permitted by law, we accept no responsibility and deny any liability to any other party for our work, for this statement or for the conclusions we have reached. CTA will not accept any form of liability for the substance of the Opinion and/or any liability for damage arising from the use of the Opinion and/or the information provided in it. As the Opinion is based on information made available by the Bond Issuer, CTA does not warrant that the information presented in this Opinion is complete, accurate or up to date. Nothing contained in this Opinion shall be construed as to make a representation or warranty, express or implied, regarding the advisability of investing in any securities or any asset whose value is derived from any securities. Any person other than the Bond Issuer who obtains access to the Opinion or a copy thereof and chooses to rely on it will do so at its own risk. Furthermore, this Opinion shall in no event be interpreted and construed as an assessment of the economic performance and credit worthiness of the Issuer or the Bond. The issuance and the performance of the Bond Issuer and the Bond is outside the scope of this engagement. We have consented to the inclusion of the Opinion on the GBRC or in such other manner as ICMA shall from time to time use for making second opinions rendered in respect of Green Bonds available to the public. We reserve the right to withdraw such consent at any time.

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