CICERO
Center for International Climate Research

‘Second Opinion’ on Advanced SolTech’s Green Bond Framework

20 April 2017

Environmental Finance Green Bond Awards 2017 Winner
Best external review provider

Green Bond Awards 2017
Climate Bonds

Summary

Overall, Advanced SolTech Sweden AB's (ASAB) Green Bond Framework provides a clear and sound framework for climate-friendly investments. The framework lists a single eligible category of projects (renewable energy) that supports the objective of promoting a transition to low-carbon growth.

Advanced SolTech Sweden AB (publ.) (ASAB) is the issuer of the green bonds and Advanced SolTech Renewable Energy Hangzhou Co. Ltd (ASRE) is the owner, installer and operator of Solar Power Stations. Any transfer of funds between the two entities are in the form of intra-group loans. ASAB is a Swedish subsidiary of SolTech Energy Sweden AB (SolTech).

The framework includes a clear governance structure, including a Green Bond Committee which approves the selection of eligible projects managed by ASRE. SolTech has policies, such as its Sustainability Policy, which guide operations of its subsidiaries. It is a strength that Soltech will ensure a good implementation of the ASAB Green Bond Framework through its majority representation on the Green Bond Commitee.

ASAB has strict criteria for project selection, including a requirement of substantial reduction of building greenhouse gas emissions through the switch to solar energy. ASAB also has in place a process for transparent management of proceeds and an external review process. There is also a plan for annual review and communication of green bonds activities and impacts to the investors and the public.

Based on the overall assessment of the project types that will be financed by the green bond and governance and transparency considerations, ASAB's Green Bond Framework gets a Dark Green shading.

Contents

Summary ____ **2**

1 Introduction and background ____ **4**

Expressing concerns with 'shades of green' ... 5

2 Brief Description of SolTech's Green Bond Framework and rules and procedures for climate-related activities ____ **6**

3 Assessment of Advanced SolTech's Green Bond framework and environmental policies ____ **7**

Eligible projects under the Green Bond Framework ... 8

Strengths

Weaknesses ... 10

Pitfalls

Impacts beyond the project boundary ... 10

Rebound effects ... 10

Appendix: About CICERO and SEI ____ **11**

1 Introduction and background

The global Expert Network on Second Opinions (ENSO), a network of independent non-profit research institutions on climate change and other environmental issues, was established by CICERO (Center for International Climate and Environmental Research – Oslo) to broaden the technical expertise and regional experience for second opinions. CICERO works confidentially with other members in the network to enhance the links to climate and environmental science, building upon the CICERO model for second opinions. In addition to CICERO, ENSO members include Basque Center for Climate Change (BC3), International Institute for Sustainable Development (IISD), Stockholm Environment Institute (SEI), and Tsinghua University's Institute of Energy, Environment and Economy.

This Second opinion was produced by SEI and CICERO on behalf of ENSO. SEI is an independent international research institute that has been engaged in environment and development issues at local, national, regional and global policy levels for more than 25 years. CICERO is an independent, not-for-profit, research institute, focused on providing reliable and comprehensive knowledge about all aspects of the climate change problem. A more detailed description of each of these institutions can be found at the end of this report. SEI and CICERO are both independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure.

The CICERO-led ENSO provides second opinions on institutions´ framework and guidance for assessing and selecting eligible projects for green bond investments, and assesses the framework´s robustness in meeting the institutions´ environmental objectives. The second opinion is based on documentation of rules and frameworks provided by the institution themselves (the client) and information gathered during meetings, teleconferences and email correspondence with the client. ENSO encourages the client to make this Second Opinion publically available. If any part of the Second Opinion is quoted, the full report must be made available.

ENSO's Second Opinions are normally restricted to an evaluation of the mechanisms or framework for selecting eligible projects at a general level. ENSO network members do not validate or certify the climate effects of single projects, and thus, has no conflict of interest in regard to single projects. Network members are neither responsible for how the framework or mechanisms are implemented and followed up by the institutions, nor the outcome of investments in eligible projects.

This note provides a Second Opinion of ASAB's Green Bond Framework and policies for considering the environmental impacts of their projects. The aim is to assess the ASAB Green Bond Framework as to its ability to support their stated objective of climate mitigation.

This Second Opinion is based on the green bond framework presented to CICERO by the issuer. Any amendments or updates to the framework require that CICERO undertake a new assessment.
ENSO takes a long-term view on activities that support a low-carbon climate resilient society. In some cases, activities or technologies that reduce near-term emissions result in net emissions or prolonged use of high-emitting infrastructure in the long-run. Network members strive to avoid locking-in of emissions through careful infrastructure investments, and moving towards low- or zero-emitting infrastructure in the long run. Proceeds from green bonds may be used for financing, including refinancing, new or existing green projects as defined

under the mechanisms or framework. ENSO assesses in this Second Opinion the likeliness that the issuer's categories of projects will meet expectations for a low carbon and climate resilient future.

Expressing concerns with 'shades of green'

ENSO Second Opinions are graded dark green, medium green or light green, reflecting the climate and environmental ambitions of the bonds and the robustness of the governance structure of the Green Bond Framework. The grading is based on a broad qualitative assessment of each project type, according to what extent it contributes to building a low-carbon and climate resilient society.

This Second Opinion will allocate a 'shade of green' to the Green Bond Framework (GBF) of ASAB:

- Dark green for projects and solutions that are realizations today of the long-term vision of a low carbon and climate resilient future. Typically this will entail zero emission solutions and governance structures that integrate environmental concerns into all activities.
- Medium green for projects and solutions that represent steps towards the long-term vision, but are not quite there yet.
- Light green for projects and solutions that are environmentally friendly but do not by themselves represent or is part of the long-term vision (e.g. energy efficiency in fossil based processes).
- Brown for projects that are irrelevant or in opposition to the long-term vision of a low carbon and climate resilient future.

  The project types that will be financed by the green bond primarily define the overall grading. However, governance and transparency considerations also factor in, as they can give an indication whether the institution that issues the green bond will be able to fulfil the climate and environmental ambitions of the investment framework.

2 Brief Description of SolTech's Green Bond Framework and rules and procedures for climate-related activities

Brief description of issuer: Advanced SolTech Sweden AB (publ.) (ASAB) is the issuer of the green bonds and Advanced SolTech Renewable Energy Hangzhou Co. Ltd (ASRE) is the owner, installer and operator of such Solar Power Stations. Any transfer of funds between the two entities are in the form of intra-group loans.

ASAB is a Swedish subsidiary of SolTech Energy Sweden AB (SolTech). SolTech is a Swedish public (limited liability) stock company. The company was formed in Sweden and registered with Bolagsverket (the Swedish Office for Company Registration) 2006-08-30. SolTech is traded on First North at NASDAQ Stockholm under the short name SOLT. SolTech is a provider of solar energy solutions, including glass tiles and thin film solar cells. Soltech is active globally and currently has installations in eight countries. SolTech is the majority shareholder in ASAB, which is a legal entity, and SolTech maintains the Chair position on the Board of Directors of all its subsidiaries.

In China, SolTech operates through a joint venture company, Advanced SolTech Renewable Energy (Hangzhou) Co. Ltd (ASRE), which is run in conjunction with China-based Advanced Solar Power, ASP, an experienced solar cell supplier in the Chinese market. In China, SolTech is prioritizing to meet increased market demands of solar production units in China, along with an intense work to make sure the internal sustainability work is top class. SolTech is the majority (51%) owner of ASRE, with ASP as a minority (49%) owner. In the business model ASRE is responsible for the installation, ownership, and periodic maintenance of solar energy installations mounted on the roofs of customer-owned facilities. The customer's commit to a 20-25 year contract to purchase all the electricity and/or thermal heat produced by the installed units. ASRE's goal is to have the capacity of approximately 230 MW in full operation, generating current annual sales of 400 MSEK (40.1 MEUR) by 2019.

Policies: The ASAB Green Bond Framework (GBF) and SolTech's Sustainability policy (which applies to all SolTech subsidiaries).

Definition: Eligible projects and assets are related to climate mitigation through the promotion of renewable energy, specifically solar power. They include new, under construction, or existing, Solar Power Stations owned and managed by ASRE in China, as well as the expansion or enhancement of existing Solar Power Stations owned and managed by ASRE in China. Eligible projects could include (but are not limited to): modern glass roofs and walls with thin film technology, glass tiles with underlying absorbers for generation of thermal heating, and solar panels for electricity generation. Fossil fuel or nuclear power projects are not eligible.

Selection: After conducting a customer and project evaluation process, ASRE proposes eligible projects to a Green Bond Committee (GBC) for a decision on green bond financing. The GBC votes on whether to approve it based on consensus vote for funding. The approval decisions are documented. The GBC consists of members from ASAB management and the Chinese local management including the Chairman of the Board of ASAB and two Board of Directors of ASAB. As owning company, SolTech Energy Sweden (publ.) maintains the Chair position and a majority in the GBC.

Management of proceeds: ASAB has a dedicated specific green bond account for an amount equivalent of the net proceeds of the green bonds to be kept at a financial institute. ASAB can perform intra-group loan transfers to ASRE, who disburses funding to eligible projects and assets. Positive balances on the ASAB and/or ASRE designated green bond related accounts can be temporarily deposited with banks (in any currency relevant), and/or temporarily invested in commercial papers and/or short dated bonds issued by banks and/or any green bonds. ASAB will monitor and document transfers to and from the accounts.

Reporting and Accountability: ASAB will annually report on its green bonds (until maturity is reached) through its website (www.soltechenergy.com) and through its annual newsletter. Reporting will cover allocation of the net proceeds, current portfolio data (including ratio of new projects to refinancing of such projects), as well as financial and climate impacts (CO^2-equivalent mitigated). It will also cover the details regarding management of proceeds and account balances, an independent party annual review of compliance with the GBF, as well as an external audit of the financial aspects. All projects receiving any financing/refinanced from net proceeds from the issuance of green bonds will be disclosed in the reporting in relation to the share financed/refinanced by green bonds.

Table 1: Documents Reviewed

Document Number	Document Name	Description
1	Advanced SolTech Green Bond Framework	Green Bond Framework description, 6th of April, 2017
2	Etablering av Greenbonds-program fas II 2016/2017 (Establishment of Green Bonds program phase II 2016/2017)	A longer document describing different aspects of SolTech's activities in general and green bond motivations
3	SolTech website http://www.soltechenergy.com/en/activities-in-china; http://www.soltechenergy.com/en/investors/corporate-governance/	SolTech corporate website pages including information on their activities in China and corporate governance.
4	SolTech Hållbarhetspolicy (Sustainability Policy) http://www.soltechenergy.com/en/investors/corporate-governance/sustainability-policy/	SolTech Sustainability policy, 16th of January, 2017

3 Assessment of Advanced SolTech's Green Bond framework and environmental policies

Overall, the ASAB Green Bond Framework (GBF) provides a succinct and sound framework for climate-friendly investments in the area of solar energy. The GBF and procedures surrounding ASAB's green bond investments are assessed and their strengths and weaknesses are discussed in this section. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon

projects, whereas the weaknesses are typically areas that are unclear or too general. Pitfalls are also raised in this section to note areas where issuers should be aware of potential macro-level impacts of investment projects.

Eligible projects under the Green Bond Framework

At the basic level, the selection of eligible project categories is the primary mechanism to ensure that projects deliver environmental benefits. Through selection of project categories with clear environmental benefits, green bonds aim to provide certainty to investors that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP) state that the "overall environmental profile" of a project should be assessed and that the selection process should be "well defined".

In table 2 below an investment category that includes projects and solutions that are realizations today of the long-term vision of a low carbon and climate resilient future is dark green. Typically this will entail zero emission solutions and governance structures that integrate environmental concerns into all activities. Medium green covers projects and solutions that represent steps towards the long-term vision, but are not quite there yet. Projects and solutions that are environmentally friendly but do not by themselves represent or is part of the long-term vision (e.g. energy efficiency in fossil based processes) are graded light green.

Category	Eligible project types	Green Shading and some concerns
Climate mitigation/ Renewable energy	Installation of new solar power stations, owned and managed by ASRE (SolTech's subsidiary in China) and/or enhancement or expansion of existing solar power stations owned and managed by ASRE	**Dark** ✓ consider impacts over the lifecycle of the solar cells (production and disposal phases).

Strengths

Established governance structure

SolTech is responsible for and guarantees the good administration in its subsidiary companies (e.g. ASAB) and has policies, such as its Sustainability Policy (01.2017), which also guide the projects of its subsidiaries. The Sustainability Policy defines the company's values and principles and details its commitment to the following goals: "(1) … reduction/elimination of fossil-based fuels; (2) … a reduction in the use of harmful chemicals and toxins; (3) … a reduction in the persistent, incremental destruction of the environment through deforestation, overfishing, etc., as well as; (4) … a manifest respect for the fundamental needs of humanity, which is to say, our fellowmen." The policy outlines their financial, environmental and social responsibilities and is published on their website. SolTech's Sustainability Policy is based on internationally accepted standards and guidelines, e.g. UN's Declaration of Human Rights, its convention on children's rights, relevant ILO conventions, and the UN's Global Compact.

SolTech has also closely been involved in the development of the ASAB GBF and continues to support its application and performance through a majority representation on the Green Bond Committee (GBC) which approves project eligibility for funding. The GBF includes a brief description of the project eligibility criteria, the project selection and approval process, management of proceeds, the governance and reporting structures, as

well as the external review. The framework also states that the GBF has the right to exclude any eligible projects or assets already funded by green bond net proceeds if it is sold or for other reasons loses eligibility. Such changes will be documented in the annual report.

Strict eligibility criteria
ASAB's criteria for green bond eligibility restrict ASRE solar energy projects to the application of solar power stations installed on existing buildings and in areas with high levels of greenhouse gas emissions. Projects shall also substantially lower CO^2 equivalent emissions through either substituting fossil fuel use with solar power or if the project is responding to increased energy needs, the project will serve to avoid fossil fuel related energy use. Eligibility will be determined by ex-ante evaluation performed as a part of the initial customer and project evaluation performed by ASRE. The evaluation includes the themes of energy consumption, energy mix and CO^2 impact, future energy needs, as well as the technical aspects like location, roof gradient and condition.

Although SolTech goes beyond what is necessary to obtain a dark green shade due to its focus on lowering emissions through solar energy installations in China, more clearly defining the eligibility criteria would further strengthen the selection process. Currently the GBF states that project sites must be located in areas of "high" GHG emission levels in order for them maximize the decrease of GHG emissions, as well as improve the poor air quality which results from utilizing fossil fuels. Similarly, the GBF states that projects need to also deliver "substantial reductions of GHG emissions". Clarity about what indicators and e.g. levels of GHG emissions and air quality are considered "high" would further strengthen the eligibility criteria. Defining a target level or percent of reduction of GHG emissions would further support selecting between eligible projects, if prioritization is needed.

Furthermore, in terms of calculations of environmental impacts, it is recommended that lifecycle approach be used to calculate the environmental and climate impacts of the project and also that calculations be performed both ex-ante and ex-post project completion. A lifecycle approach includes the calculation of impacts from production of solar power stations and components through to the recycling and/or disposal phase and provides a broader view of the impacts than pure consumer use-based impacts. Performing and comparing estimated theoretical (ex-ante) and actual calculations of energy use (ex-post) improves transparency, as well as provides valuable insight into future project development about realistic emissions reductions.

Capable Green Bond Committee (GBC)
Eligible projects have to be approved by a GBC, which includes members of the Board of Directors of ASAB. Committee members are expected to have both experience in business development in an international context, as well as expertise in renewables and sustainability. If further competence is seen as necessary, external consultants will be utilized. This ensures commitment and accountability from the highest levels of the company.

Reporting and External Review
ASAB has an external annual review and reporting process in place. The GBF details the specific information included in the reports, including current allocation of the green bonds, the climate impact, as well as financial information. Climate impacts are reported using a baseline calculation method, which identifies the energy saved, avoided energy use and fossil energy replaced. ASAB also reports on the reduction or avoidance of CO2-equivalent emissions, per project, in proportion to the eligible part financed or refinanced with net proceeds from green bonds. These impact calculations are based on the initial ex-ante assessment performed by ASRE for the determination of eligibility.

ASAB has in place an annual external review process which covers green bond program (eligible projects and assets) compliance with the GBF. Also externally reviewed are the separate accounts, intra-group loans to

ASRE's designated green purpose account and temporary holdings. The external review documents will be part of annual reporting and are considered an essential part of company communication with investors.

Weaknesses

We find no obvious weaknesses in the ASAB GBF.

Pitfalls

Impacts beyond the project boundary

Due to the complexity of how socio-economic activities impact the climate, a specific project is likely to have interactions with the broader community beyond the project borders. These interactions may or may not be climate-friendly, and thus need to be considered with regards to the net impact of climate-related investments.

Rebound effects

Efficiency improvements may lead to rebound effects. When the cost or impact of an activity is reduced there will be incentives to do more of the same activity. From the project category of renewable energy in Table 2 an example is the potential decrease in awareness of personal energy use due to the use of a renewable energy source. This, could in part lead to more energy use. ASAB should be aware of such effects and possibly avoid Green Bond funding of projects where the risk of rebound effects is particularly high.

References

IPCC (2013). Climate Change 2013: The Physical Science Basis, Fifth Assessment Report, Intergovernmental Panel on Climate Change

Appendix:
About CICERO and SEI

CICERO Center for International Climate Research is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international climate cooperation. We collaborate with top researchers from around the world and publish in recognized international journals, reports, books and periodicals. CICERO has garnered particular attention for its work on the effects of manmade emissions on the climate and the formulation of international agreements and has played an active role in the UN's IPCC since 1995.

CICERO is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO received a Green Bond Award from Climate Bonds Initiative for being the biggest second opinion provider in 2016 and from Environmental Finance for being the best external review provider (2017).

CICERO Second Opinions are graded dark green, medium green and light green to offer investors better insight in the environmental quality of green bonds. The shading, introduced in spring 2015, reflects the climate and environmental ambitions of the bonds in the light of the transition to a low-carbon society.

CICERO works with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions. Led by CICERO, ENSO is comprised of trusted research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute (SEI), the Institute of Energy, Environment and Economy at Tsinghua University and the International Institute for Sustainable Development (IISD). ENSO operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

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Stockholm Environment Institute (SEI) is an independent international research institute that undertakes policy oriented and applied research on environment and development issues. Our innovative, integrated systems research forms the basis for our work on policy advice, capacity development, decision support and implementation of policy and practice. Our mission is to support decision-making and induce change towards sustainable development around the world by providing integrative knowledge that bridges science and policy in the field of environment and development.

SEI actively works in the field of *green finance*, for instance collaborating with the Swedish Government and liaising with the G20 Green Finance Study Group in the lead-up to the G20 in China. It is an active member of the Global Commission on the Economy and Climate participating in the finance work-stream. Through ENSO, SEI contributes to the Second Opinion assessments of green bond frameworks.

Since 2008 SEI has contributed to public debate regarding climate finance, publishing research on the subject, and being engaged by UN agencies, the European Commission, national governments and

NGOs to evaluate existing policies and processes and recommend improvements. SEI's work includes studies tracking international finance, analysis of the governance of multilateral climate funds and potential corruption risks, and assessment of criteria and suitability of multilateral and bilateral channels for climate-related expenditure. One of SEI's new initiatives, the Climate Finance Initiative, examines key obstacles and challenges of the present climate finance regime, particularly from the perspective of the needs and priorities of developing countries.

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