CICERO
Center for International Climate Research

BASQUE CENTRE FOR CLIMATE CHANGE
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‘Second Opinion’ on ADIF-ALTA VELOCIDAD’s Green Bond Framework

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Summary

Overall, ADIF-Alta Velocidad's Green Bond Framework (GBF) provides a clear and sound framework for climate-friendly investments. The GBF lists eligible projects that are supportive of the objective of promoting a transition to a low-carbon and climate-resilient growth and is supported by a strong governance structure. Eligible green projects include investments into new rail lines and extensions, and investments related to maintenance, upgrades and energy efficiency improvements.

Transportation is among the fastest growing sectors globally in terms of CO2 emissions. This highlights the importance of reducing emissions in this sector if we are to successfully transition into a low carbon future. One way to do so is to increase investment into public transportation as well as vehicles that do not rely on fossil-fuels. In this regard, investments into ADIF-Alta Velocidad's electrified high speed rail network help achieve both of these goals.

It is worth noting, however, that electric transportation such as high speed rail is only as clean as the methods by which the electricity it uses is produced. Currently only about a third of Spain's electricity generation is renewable, while the rest is fossil fuel based or nuclear. Consequently, we should be aware of the indirect GHG emissions stemming from the production of electricity to power rail and strive to keep increasing their efficiency. However, it is reasonable to expect that in the future Spain's energy mix will continue to become less carbon intensive which reinforces the potential benefits of investing in rail transport.

Finally, we consider that ADIF-Alta Velocidad's reporting and transparency guarantees are quite strong, as they have committed to annually publish on their website publicly a series of relevant impact metrics related to the Eligible Green Projects. Moreover, they will also publish on their website an annual report from auditors that will verify the internal tracking method and the allocation of funds from the Green Bond proceeds to the Eligible Green Projects. We do however think that the selection process for green projects would benefit from giving a veto power to the Environmental Management Department.

Based on the overall assessment of the projects that will be financed by the green bond, and governance and transparency considerations, ADIF-Alta Velocidad's green bond framework gets a Dark Green shading, representing the highest level of potential with regards to the extent to which it can contribute to building a low-carbon and climate resilient society. Dark green is awarded for projects and solutions that are realizations today of the long-term vision of a low carbon and climate resilient future. Typically this entails zero emission solutions and governance structures that integrate environmental concerns into all activities.

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Dark Green

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1 Introduction and background

As an independent, not-for-profit, research institute, CICERO (Center for International Climate and Environmental Research - Oslo) 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 institutions themselves (the client) and information gathered during meetings, teleconferences and e-mail correspondence with the client. This Second Opinion has been jointly produced by CICERO and BC3.

CICERO has established the global Expert Network on Second Opinions (ENSO), a network of independent non-profit research institutions on climate change and other environmental issues, 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 currently 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. A more detailed description of CICERO and BC3 can be found at the end of this report.

ENSO is 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. 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 does not validate or certify the climate effects of single projects, and thus, has no conflict of interest in regard to single projects. ENSO is 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 ADIF-Alta Velocidad Green Bonds Framework and policies for considering the environmental impacts of their projects. The aim is to assess the ADIF-Alta Velocidad Green Bonds Framework as to its ability to support ADIF-Alta Velocidad's stated objective of promoting the transition to low-carbon and climate resilient growth.

This Second Opinion is based on the green bond framework presented to ENSO by the issuer. Any amendments or updates to the framework require that ENSO 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. ENSO strives 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'

CICERO 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 of ADIF-Alta Velocidad:

- 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 are 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 ADIF-ALTA VELOCIDAD's Green Bond Framework and rules and procedures for climate-related activities

ADIF-Alta Velocidad is a state-owned public corporate entity[1] with legal personality, management autonomy and its own resources, operating under the supervision of the Ministry of Public Works of the Spanish Government. It was created in 2013 after the split of ADIF (Administrador de Infraestructuras Ferroviarias) into two separate entities: ADIF and ADIF-Alta Velocidad. ADIF-Alta Velocidad is responsible for the construction and management of Spain's high speed rail network, as well as other activities such as management of the high-speed stations and the supply of energy. ADIF-Alta Velocidad has 2,534 km of high speed lines in operation.

ADIF-Alta Velocidad has a concrete sustainability goal, contained in their Master Plan for Energy Savings and Efficiency 2014-2020, of reducing their energy consumption by 106.81 GWh_{equiv} per year by 2020, relative to energy use in 2008. In their pursuit of an overarching goal to reduce as much as possible their environmental impacts, the company aims to: use more efficient technology, implement mechanisms to control and reduce energy consumption, make the most of bioclimatic solutions and principles to obtain energy and provide lighting and heating, increasing their use of renewable energy, and greater stakeholder involvement among others.

Definition: An amount equal to the net proceeds will be allocated for investments in one or more of the "Eligible Green Projects". Eligible Green Projects include ongoing projects that are at most two years old or new projects that are started within two years of the issuance of the bonds.

"Eligible Green Projects" include:

- Investments related to new rail lines and rail lines extensions[2]
- Investments related to maintenance, upgrades and energy efficiency of the rail system.

Selection: The Treasury and Accounting Department, in coordination with the Financial Planning and Budget Department and the Environmental Management Department, will review the allocation of the projects annually[3]. Projects included in the two categories above may be considered eligible for green bond proceeds allocation.

Management of proceeds: Until the total allocation of an amount equal to the net proceeds from the sales of the Notes to Eligible Green Projects, ADIF-Alta Velocidad will temporarily invest an amount equal to the unallocated net proceeds from the sales of the Notes in monetary funds managed following a responsible investment approach, in bank deposits, cash, or equivalents.

[1] "Entidad pública empresarial" in Spanish.
[2] ADIF-Alta Velocidad has informed us that this includes the required stations, technical buildings and other installations. It does not include new trains.
[3] ADIF-Alta Velocidad delegates the activities of the Treasury and Accounting Department, and the Financial Planning and Budget Department to ADIF. A resolution dated 28 January 2014 was passed by the Secretary of State for Infrastructure, Transport and Housing, who authorised publication of the resolutions of ADIF-AV's Board of Directors dated 17 January 2014, which permit ADIF-AV to delegate these activities to ADIF.

Transparency and Accountability: Within one year of the issuance of ADIF-Alta Velocidad Green Bonds and until the maturity date of the Green Bonds issued, ADIF-Alta Velocidad will annually publish on its website (http://www.adifaltavelocidad.es) the information below:

1.- Annual updates on the amounts allocated to the Eligible Green Projects.
2.- Relevant expected impact metrics and where feasible actual impact metrics, related to the Eligible Green Projects. The metrics will cover the following two types of investments:

- Investments related to new lines and rail line extensions
- Investments related to maintenance, upgrades and energy efficiency of the ADIF-Alta Velocidad rail system.

3.- Annual report from auditors or any other third party appointed by ADIF-Alta Velocidad, that will verify the internal tracking method and the allocation of funds from the Green Bond proceeds to the Eligible Green Projects.

The table below lists the documents that formed the basis for this Second Opinion:

Document Number	Document Name	Description
1	Informe de auditoría de las cuentas anuales 2015	Auditors' report on the 2015 financial statements in Spanish
2	Informe de auditoría de las cuentas anuales 2016	Auditors' report on the 2016 financial statements in Spanish
3	Auditors' report on the 2015 financial statements	Auditors' report on the 2015 financial statements in English
4	Auditors' report on the 2015 financial statements	Auditors' report on the 2016 financial statements in English
5	Informe de Sostenibilidad y Gobierno Corporativo 2015	Corporate Social Responsibility (CSR) Report for 2015
6	Informe anual de Gobierno Corporativo 2015, presentado ante la CNMV	Corporate Governance Report for 2015
7	Memoria Medioambiental 2015	Environmental Report for 2015

8	Plan Director de Eficiencia Energética 2014-2020	Master Plan for Energy Savings and Efficiency 2014-2020
9	Código Ético y de Conducta	Code of ethics and conduct
10	Procedimiento de contratación para contratos	Procedures for hiring
11	Procedimiento de contratación para contratos de obras	Procedures for works

3 Assessment of ADIF-ALTA VELOCIDAD Green Bond framework and environmental policies

Overall, the ADIF-Alta Velocidad green bond framework provides a detailed and sound framework for climate-friendly investments.

The framework and procedures for ADIF-Alta Velocidad'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".

Category	Eligible project types	Green Shading and some concerns
Clean transportation / Energy Efficiency	New rail lines and rail lines extensions[4]	**Dark Green** • As electrified public transport, rail is among the most efficient modes of transportation. In so far as a better rail system is able to attract passengers that would otherwise have travelled by road or air we consider further developing the rail network as an important part of the low carbon future. • Be aware of rebound effects and landscape/biodiversity issues.
Clean transportation / Energy Efficiency	Maintenance, upgrades and energy efficiency of the rail system	**Dark Green** • Maintenance and upgrades are necessary to support the continued operation of the rail system • According to their Master Plan for Energy

[4] ADIF-Alta Velocidad has informed us that this includes the required stations, technical buildings and other installations. It does not include new trains.

	Savings and Efficiency 2014-2020 and CSR report these may include the installation of renewable energies including solar (thermal and PV), wind and geothermal • ADIF-Alta Velocidad has informed us that fossil fuel energy efficiency will not be eligible • Energy efficiency measures should continuously be adopted but should be wary of the potential for rebound effects

Table 2 Eligible project categories

Strengths

Transportation is among the most important sources of greenhouse gas (GHG) emissions worldwide (IPCC 2013), and it is among the fastest growing sectors globally in terms of CO2 emissions. 95% of this sectors energy comes from fossil fuels, largely gasoline and diesel. Consequently, fast rail transport, which is entirely electric, is amongst the most environmentally friendly means of transportation, especially when compared to alternatives such as air and road transport. ADIF-Alta Velocidad has published figures showing that in terms of energy consumption, travelling by rail required less than a fifth of the energy than travelling by road or air. This translates into an emission of about one fifteenth of the GHG that would have been emitted by road or air travel.

In this regard, further investment into the rail network of ADIF-Alta Velocidad will contribute to the climate change mitigation target set by the Spanish government (UNFCCC 2016). According to the IEA, $15.7 trillion in additional transport investment will be necessary over the course of the next couple decades if we are to stay under the 2ºC target. As such, further investment into rail transport is likely to encourage a shift from other means of transportation that currently contribute more to global warming.

It is worth noting, however, that electric transportation such as high speed rail is only as clean as the methods by which the electricity it uses is produced. According to IEA (2015) 36% of Spain's electricity generation is renewable (versus 43% from fossil fuels and 21% nuclear), which translates to a national energy consumption of about 16% renewable, although the national target is to continue increasing the share of renewable energy consumption to 20% by 2020 (EUROSTAT 2017). Consequently, while increasing the use of rail will help Spain reduce its fossil fuel consumption (as passengers reduce their use of road and air transport), we should nevertheless be aware of the indirect GHG emissions stemming from the production of electricity to power rail and strive to keep increasing their efficiency. Nevertheless, it is reasonable to expect that in the future Spain's energy mix will continue to become less carbon intensive which reinforces the potential benefits of investing in rail transport.

Additionally, we consider that ADIF-Alta Velocidad has demonstrated a commitment to work on increasing their sustainability in some cases by going beyond simply complying with the minimum standards set by national legislation and by integrating a strong emphasis on environmental aspects, including climate impacts, into their company's profile and activities. For example, ADIF-Alta Velocidad has certified their compliance with the voluntary ISO: 14001 standard which requires organizations to consider environmental issues relevant to their operations including air pollution, water and sewage management, climate change mitigation and adaptation, and

soil contamination, among others. They have also developed a specific energy efficiency six-year plan ("Master Plan for Energy Savings and Efficiency 2014-2020") that explicitly states a quantitative energy reduction target.

We consider their commitments to reporting and transparency to be quite strong. In their Framework, ADIF-Alta Velocidad commits to publishing on their website a series of relevant metrics related to the Eligible Green Projects including the GHG emissions avoided by their investments related to the rail network, the reduction in energy consumption stemming from their efficiency improvements, as well as the percentage of achievement of the objectives set out by the Master Plan for Energy Savings and Efficiency 2014-2020. This will be important to ensure that the projects perform as intended with respect to their environmental goals. In addition, on an annual basis they will publish an auditor report that will verify the internal tracking method and allocation of funds from the Green Bond proceeds to the Eligible Green Projects. ADIF-Alta Velocidad is also committed to including environmental and efficiency criteria throughout the different phases of their hiring and procurement processes, as well as submitting new projects to an environmental assessment. Finally, in the framework of their management system they have a dedicated channel to receive, document and respond to complaints/concerns with regards to the environmental impacts of the company's operations. Given the above, we believe that the green bond framework and strategy is aligned with the company's track record.

Weaknesses

We find no major weaknesses in ADIF-Alta Velocidad's Green Bonds Framework

Pitfalls

One potential pitfall we have identified is that among the departments that are in charge of choosing the Eligible Green Projects (7 Treasury and Accounting Department, Financial Planning and Budget Department, and Environmental Management Department) the Environmental Management Department does not have a veto power in the selection process. We believe the Green Bond Framework would benefit from giving greater decision power to this department.

We also consider that the category of "New rail lines and rail lines extensions" is quite broad. ADIF-Alta Velocidad has informed us that this includes the required stations, technical buildings and other installations required to support the expansion of the rail network, but does not include procuring new trains. Given that investments in this kind of infrastructure are long term it is important to be aware of potential lock in effects. However, given that the DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings will come into effect by 31 December 2018, requiring new buildings occupied and owned by public authorities to be "nearly zero-energy", we consider this risk to be small. However, we do recommend that when constructing new infrastructure ADIF-Alta Velocidad consider going beyond simple compliance with the relevant legislation and make additional efforts to keep increasing energy efficiency by following a holistic approach that enables them to further contribute towards a low carbon and climate resilient future.

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 of an activity is reduced there will be incentives to do more of the same activity. In the case of an improved rail network we highlight the possibility

that while the environmental cost per trip is reduced relative to alternative modes of transportation, there exists a risk that it may lead to an overall greater amount of GHG emissions if the number of additional trips is sufficiently large. ADIF-Alta Velocidad should be aware of such effects and possibly avoid Green Bond funding of projects where the risk of rebound effects is particularly high. However, the potential for rebound effects of this sort is more likely in developing countries due to the larger unmet demand for modern services, and thus we consider the risk for the case of ADIF-Alta Velocidad in Spain relatively small.

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Appendix:

About CICERO

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, 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.

cicero.oslo.no/greenbonds

About BC3

BC3 – Basque Centre for Climate Change is an excellence research centre that contributes to long term research on the causes and consequences of climate change in order to foster the creation of knowledge in this multidisciplinary science. The BC3 seeks to prepare a highly-qualified team of researchers with the primary objective of achieving excellence in research, training and dissemination. It was created in 2008 jointly by the Basque Government and the Basque University under the BERC programme (Basque Excellence Research Centres). BC3 was designed to focus on the socio-economic aspects of climate change, albeit within an interdisciplinary framework that includes the natural as well as social sciences. The BC3 is one of the few centres in Europe with this specialization, and it has already established a strong reputation in the field. BC3 is currently a world-class climate change research centre aimed at informing decision-making at the Basque, Spanish, and International level by integrating natural and social sciences to address the socio-economic implications of global climate change.

Under the leadership of Professor María José Sanz, BC3 seeks to contribute to solve this great challenge from the Basque Country, summing up efforts with other centres in the world, collaborating towards this ambitious goal. BC3 has four main research lines: Low Carbon, Climate and Natural Environment, Health and Climate, and Climate Policy.

As a result of its international research, BC3 was named in 2013 the Top European Climate Think Tank by the International Center for Climate Governance (ICCG). The ICCG Climate Think Tank Ranking assessed 260 of most prominent climate think tanks centres and research groups working on the field of climate change economics and policy. Despite of the substantial increase in competing institutions, in the last 5 years, BC3 has always been included in the top ten ranking. As of 2017 BC3 relies on a multidisciplinary team of 46 researchers and 5 management staff.

BC3 was awarded in March 2015 by the European Commission with the “HR Excellence in research”.

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http://bc3research.org/