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New financing mechanism for rainforest conservation

An assessment of the Tropical Forest Forever Facility (TFFF) and how Norway can contribute

Rainforest Foundation Norway

VISTA ANALYSE

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Authors	Andreas Hoel-Holt and Åsmund Sunde Valseth
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Project	Åsmund Sunde Valseth
Quality assurance	Haakon Vennemo
Client	Rainforest Foundation Norway
Responsible in Rainforest Foundation Norway	Julia Naime and Torbjørn Gjefsen
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Vista Analyse AS is a social science analysis company with a focus on economic analysis, evaluation, consulting and research. We carry out assignments with a high level of professional quality, independence and integrity. Our key areas of focus are climate, energy, transport, business development, urban development and welfare.

Our employees have high academic competence and broad experience in consulting. When necessary, we utilise a well-developed network of companies and resource persons nationally and internationally. The company is wholly owned by its employees.

About Rainforest Foundation Norway

Rainforest Foundation Norway is an international environmental and human rights organisation with its headquarters in Norway. We work to save the world's rainforests and secure the rights of indigenous peoples and other local communities who live in and from the forest. Together with around 60 local partner organisations

in the Amazon, Central Africa and Southeast Asia, we work closely with local communities to strengthen their rights and opportunities to live sustainable lives in the rainforest. Where local people have rights to the forest, it often remains standing.

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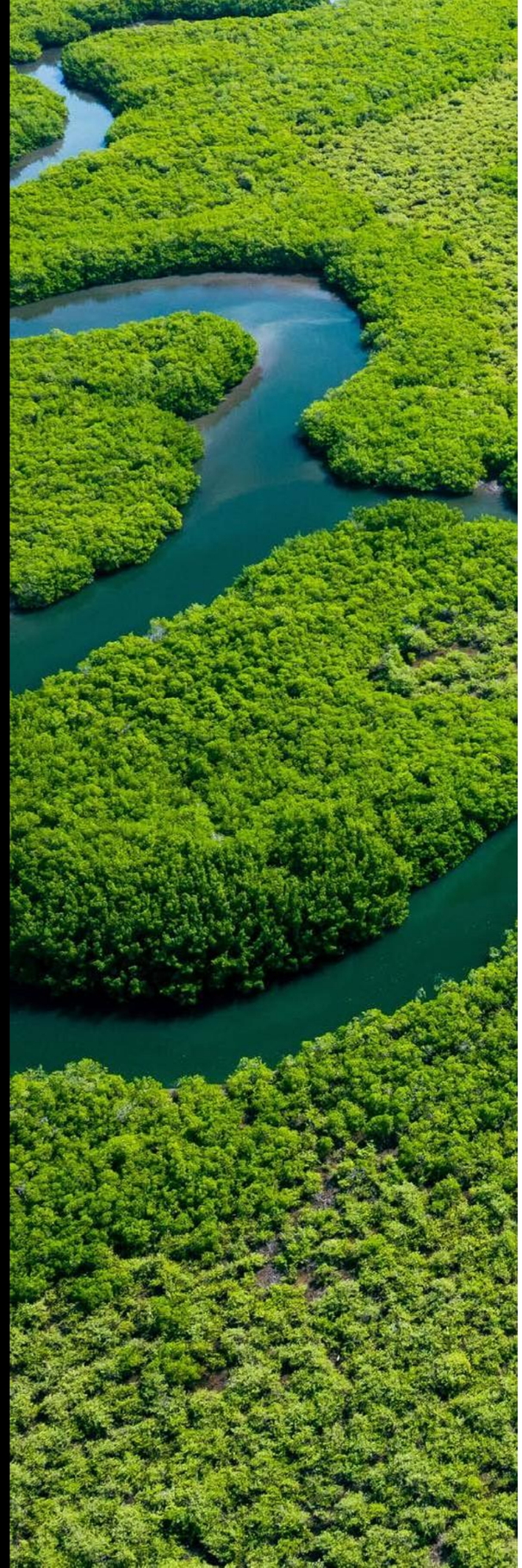
Foreword

At the request of Rainforest Foundation Norway, Vista Analyse has described and assessed the Tropical Forest Forever Facility (TFFF), a proposed new financing mechanism for rainforest conservation. We would like to thank our contacts Julia Naime and Torbjørn Gjefsen at Rainforest Foundation Norway for their excellent cooperation and valuable input during the course of our work. We would also like to thank key individuals involved in the work on the TFFF, including those from the Brazilian Ministry of Finance, for their useful input and clarifications.

Oslo, 4 August 2025

Åsmund Sunde Valseth
Partner
Vista Analyse AS

Photo: Curioso. Photography



Summary and conclusions

The Tropical Forest Forever Facility (TFFF) is a new financing mechanism for rainforest conservation that is expected to be launched at the climate summit in November 2025 (COP30). The initiative comes from Brazil, which is hosting COP30.

The TFFF differs from existing mechanisms in that rainforest countries will receive support based on the amount of standing forest, rather than reduced carbon emissions from deforestation, combined with a sharp reduction in support for each hectare that is either deforested or degraded.

The TFFF also stands out in that the support is to be paid out from the returns on a fund that will be built up with capital from (i) sponsors (countries and philanthropists) and (ii) market investors, and invested in a portfolio with an expected return of 7.6%. This model means that payments to forest countries do not depend on annual transfers from donors and that the mechanism can, in theory, last forever, providing rainforest countries with long-term stability and predictability. Sponsors and market investors will receive a return of 4.9%, while the rest will go to pay rainforest countries – expected to be between USD 3 and 4 billion per year. In the event of a fall in returns, support to rainforest countries will be reduced first, followed by returns to sponsors, with market investors being affected last. This will contribute to an AAA credit rating for market investors and low capital costs for TFFF.

At the request of Rainforest Foundation Norway, Vista Analyse has described and assessed (i) the support mechanism itself and (ii) the financing model.

By providing support based on all rainforests in a country, and not just those under direct deforestation pressure, TFFF complements existing mechanisms such as REDD+ and gives countries the incentives to preserve intact rainforest areas – areas that contribute to major global and local ecosystem services. Combined with a sharp reduction in support per hectare that is either deforested or degraded within a year, the TFFF also gives forest countries a clear cost for deforestation and degradation of rainforests. Consequently, TFFF could give countries a marginal cost of deforestation of USD 450–850 per hectare. This is higher than the income per hectare associated with some of the less profitable forms of land use in tropical forest countries, such as small-scale cattle farming and other livestock farming. The fact that the support is results-based means that countries themselves can assess which measures are most effective in halting deforestation and degradation. The TFFF also proposes an objective and verifiable system for measuring results, which strengthens the credibility of the results.

As the financing model is based on investments, where the countries' contributions have lower priority than market investors, a key issue is how much of Norway's contribution should be allocated from the ordinary budget, as a so-called ‘loss provision’. Based on an assessment of the credit risk for sponsors and a comparison with Norfund, Vista Analyse recommends that between 20 and 25% of Norway's contribution should be an ordinary budget appropriation.

Based on this, Rainforest Foundation Norway recommends that Norway contribute a loan of NOK 25 billion (approximately $2.5 bn) as sponsor capital to the TFFF spread over four budget years, with a loss provision of 20%. This should be part of a necessary increase in Norwegian climate finance and come in addition to existing Norwegian climate aid, including the Norwegian International Climate and Forest Initiative (NICFI).

Support for standing forests based on ecological criteria and satellite measurements gives countries responsibility for implementing effective measures

TFFF is a results-based model for financing rainforest conservation, where support is based on objective criteria and measurements. The target group is countries with tropical and subtropical rainforests that have a relatively low deforestation rate of less than 0.5%.

When payments are linked to results, it is up to the forest country itself to assess which measures are most effective in achieving the objectives. Unlike measure- or effort-based schemes, donors do not need detailed knowledge of the costs and effects of various instruments, which often vary from country to country. Forest countries get strong incentives to take measures that actually contribute to forest conservation. Some possible measures are reduced or changed agricultural subsidies, taxes, payments for ecosystem services, protection and strengthened monitoring and enforcement.

The use of ecological criteria and satellite-based measurement also limits the possibility of countries adjusting their classification and reporting in order to obtain increased support. Which areas and countries qualify for support is determined on the basis of so-called biomes, which are areas defined on the basis of ecological characteristics, and all forests within these biomes in a country are covered. Satellite-based measurement provides an objective and verifiable basis for assessing possible deforestation.

The TFFF imposes a clear cost on forest countries for deforestation and degradation of rainforests

Forest conservation can have a cost for forest countries, through lost income from, for example, agriculture, livestock farming, timber harvesting or other land use. The economic gains from deforestation are often concrete and measurable for the country's economy, while the global environmental values of intact rainforests are reflected to a lesser extent in the country's own revenues.

Without sufficient compensation, it will therefore often be rational for a country to deforest more than is desirable from a global climate and environmental perspective.

The TFFF provides economic incentives to conserve forests through two elements:

- *Flat support for standing forests:* Rainforest countries receive annual support per hectare of tropical rainforest. The support amount is estimated at USD 4 per hectare in the concept note.

- *Reduction in the event of deforestation:* For each hectare deforested from one year to the next, the total support will be reduced by 100 or 200 times the amount of support, i.e. USD 400 or USD 800. The degree of reduction depends on the extent of deforestation. If deforestation exceeds a certain level, the entire subsidy will be withdrawn.

For a country considering refraining from deforestation the economic incentive at the margin will not only consist of (the present value of) the loss of many years of support for standing forests, but also the "one-off penalty" through the reduction per hectare of deforested land.

According to our analyses, TFFF has a marginal cost for deforestation of between USD 450 and USD 850 per hectare. It is mainly the reduction per hectare of deforestation that contributes to the marginal cost, as the loss of future support only amounts to USD 50 in present value.

However, support for the entire standing forest is a prerequisite for having a penalty mechanism, because there must be some support in the first place from which the penalty can be deducted.

The economic incentives provided by the TFFF are not sufficient to compete with the most profitable forms of land use in tropical forest countries, such as large-scale soy and palm oil production. In other cases – particularly where small-scale cattle farming and other livestock farming dominate – the economic incentives from the TFFF are higher than the income per deforested hectare.

This is particularly true in the Brazilian Amazon, where cattle farming is the dominant cause of forest loss. In addition, much of the deforestation, especially in the Amazon, is already illegal. Here, payments from the TFFF can play an important role. If the funds paid out through the TFFF are channelled into increased resource use for monitoring and enforcement, this may increase the likelihood of illegal logging being detected and sanctioned.

This suggests that the TFFF has real potential to prevent deforestation, particularly in areas where deforestation is driven by low-profit activities or where a lack of public funding makes effective monitoring difficult.

TFFF interacts with existing schemes

The TFFF is designed to operate in parallel with existing schemes such as REDD+, carbon markets, bilateral and multilateral aid, philanthropic initiatives and others. The TFFF aims to fill a critical gap in existing schemes by providing incentives for long-term conservation of tropical forests, including large and intact forest areas that are not under immediate pressure from deforestation. These intact forests provide enormous ecosystem services and are often subject to gradual degradation and

deterioration of ecosystem services, biodiversity and carbon storage long before full deforestation occurs, but have nevertheless struggled to attract funding.

REDD+ is particularly suitable for countries with high deforestation rates, where measures can result in large emission reductions and thus provide a basis for results-based payments. However, REDD+ is less suitable for countries with stable forest cover or low/no deforestation, at least as long as results are measured against historical deforestation levels. Here, TFFF fills an important gap by providing countries that have received support through REDD+ with incentives to continue conserving forests after REDD+ payments are gradually reduced, or to prevent deforestation from increasing to a level that would bring them into REDD+ in the first place.

One advantage of TFFF is that it avoids the need for complex estimation of baseline deforestation trajectories. REDD+ allows for the establishment of baseline trajectories based on estimates of how high deforestation would hypothetically be without measures, and emission reductions are rewarded against this benchmark. Several studies indicate that nations then have an incentive to overestimate their expected future deforestation in order to secure higher compensation. Simply put, in the TFFF the reference level is the forest that stood there last year.

TFFF is financed through a fund with low credit risk for sponsors and market investors

Support for forest countries is financed by returns from a fund called TFIF (Tropical Forest Investment Fund). The fund is built up through contributions from (i) sponsors and (ii) investors who invest on market terms ("market investors"). The sponsors are expected to be states or philanthropists.

TFIF is invested in government bonds from developing countries. The concept note estimates the return at 7.6% and the credit risk at BB+. Both sponsors and market investors will receive a return similar to that on long-term government bonds with a high credit rating (AAA). The return on such bonds is estimated at 4.9%, which then constitutes TFIF's cost of capital.

The difference of 2.7% between the cost of capital and the return on TFIF's portfolio goes to support rainforest countries based on the criteria in TFFF. The TFFF proposes a fund of USD 125 billion, which means USD 3.4 billion in support to rainforest countries each year, not taking credit risk into account.

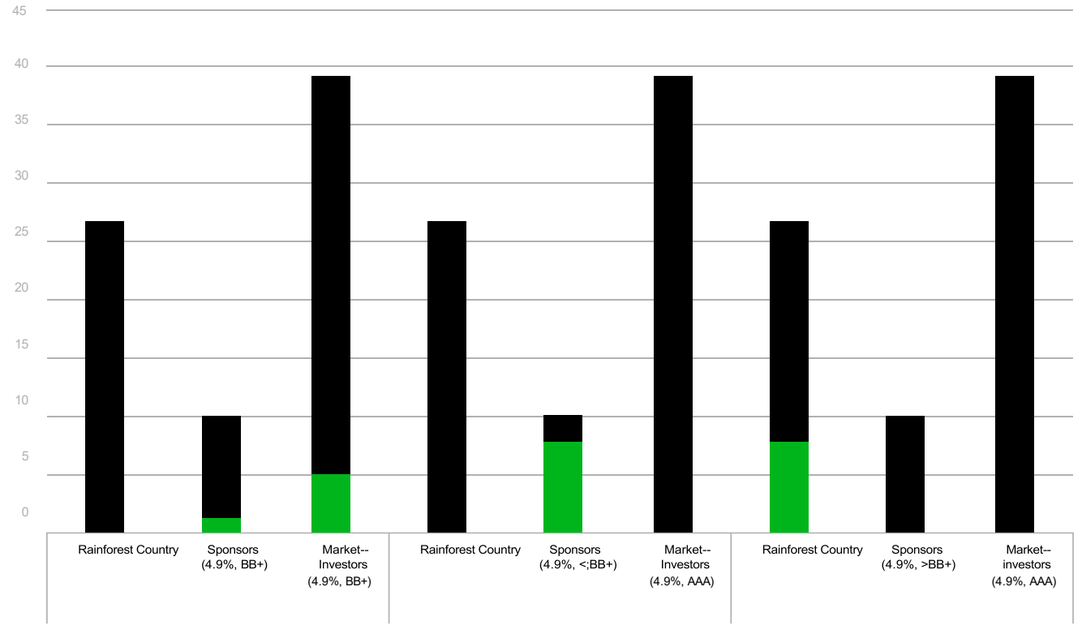
In the event of default, transfers to rainforest countries will be postponed or reduced first if necessary. If the reduction in transfers is not sufficient to cover the shortfall, the return to sponsors will initially be postponed and, if necessary, reduced – and/or TFIF will use guarantees. If this is not sufficient, the returns to market investors will be postponed or reduced. This structure contributes to very low credit risk for market investors.

Furthermore, the desired ratio between sponsors and market investors is set at 80-20. Together, this is calculated to be sufficient for TFFF to issue bonds with an AAA credit rating, according to TFFF's concept note. This means that an investment in TFIF for market investors corresponds to a US government bond or similar in terms of both return and credit risk.

Although the sponsors take on greater credit risk than the market investors, their credit risk is also relatively low and lower than that of the underlying TFIF portfolio, as it is the payments to the forest countries that are delayed or reduced first in the event of a fall in returns. This is illustrated in Figure S.1, which shows how a 10% reduction in returns is distributed among rainforest countries, sponsors and market investors, given a fund value of NOK 1,000 billion. Here, model C is the one proposed for TFIF, while models A and B are hypothetical models for comparison, to provide a better understanding of model C.

Figure S.1

Distribution of 10% reduction in annual return for different models, with a fund value of NOK 1,000 billion, NOK billion



Source: Vista Analyse

The figure clearly shows that sponsors take less risk in the TFIF model than if they took a proportionate share of the risk in the underlying portfolio (A). Only in the event of very large falls in returns do sponsors incur losses in excess of what they would have done under model A. We therefore assess the credit risk for sponsors to be somewhere between BB+ and AAA.

For rainforest countries, support from TFIF can be understood as a right to the return on a bond with a credit rating lower than BB+ and a return of 2.7%. They pay nothing for this right, but must preserve forests in order to receive payments.

Budgetary management should be assessed on the basis of expected shortfall in returns

The Norwegian Ministry of Finance makes a clear distinction between ordinary expenditure and loan transactions. Allocations in the ordinary budget are often referred to as allocations "above the line", while loan transactions are referred to as "below the line". Allocations below the line are not subject to prioritisation against other purposes.

Investments and loan transactions below the line should normally provide an expected return that corresponds to the risk associated with the investment, and if this and other conditions are not met, the main rule is that funds are allocated in the ordinary budget.

Nevertheless, according to the Ministry of Finance, it is established practice that "certain investments may be budgeted as ordinary expenditure", often referred to as a 'loss provision'. In its guidelines for government budget work, the Ministry states that the practice is to allocate 35% as ordinary expenditure in such cases. This practice is described in more detail in the Yellow Book 2023:

The difference between the expected return on the investment and the return that would correspond to the risk in the investment constitutes an expected shortfall in return compared with market investments. This expected shortfall in return is central to the assessment of correct budgetary management.

Norfund and Nysnø Klimainvesteringer AS are instruments that have received a significant portion of their capital "below the line", with loss provisions of 25 and 35 per cent, respectively.

Between 20 and 25 per cent of Norway's contribution to the TFFF should be allocated from the ordinary budget

We are assessing how much of Norway's contribution to the TFFF should be budgeted as an ordinary expense through a loss provision. We have developed a method for calculating how large the loss provision should be to compensate for the fact that the actual return from the TFIF is somewhat lower than the market return. In addition, we make a discretionary assessment based on a comparison with Norfund.

We use a return of 4.9% for sponsor countries such as Norway and 7.6% for the underlying TFIF portfolio as a starting point. We assess the credit risk for sponsor countries such as Norway to be between BB+ and AAA. We do not determine credit risk and return precisely, but assume that the relevant market return is in the range of 5.8 to 6.8%.

Our calculation shows that the loss provision should be between 20% and 30%. This is how much must be allocated above the line in order for the total return to correspond to what we would have had in market return on the investment below the line.

However, a comparison with Norfund's activities under its development mandate suggests that the loss provision for TFIF should be equal to or lower than Norfund's 25%. Based on an overall assessment, we therefore recommend a loss provision of between 20 and 25%.

TFFF itself considers the credit risk for sponsor investors to be very low. If, in line with TFFF's assessments, we assume a significantly lower market interest rate of 5.4%, our calculation model gives a loss provision of 9%.

As an illustration, we have calculated that if Norway is to contribute 10% of the sponsor capital in TFIF, NOK 1.7–2.1 billion must be allocated in the ordinary budget each year for three years for loss provisions of between 20% and 25%. The calculation is based on the concept note's desire for a fund of USD 125 billion, of which USD 25 billion is to come from sponsor investors.

By comparison, the allocation to the Climate and Forest Initiative is NOK 4.3 billion in 2025, in its entirety above the line, and the allocation has previously been around NOK 3.0 billion annually for several years.

In principle, it is not crucial whether the support is provided through capital or guarantees

In principle, it is not of importance to Norway whether the support to TFFF is provided through capital or guarantees, as long as the budgetary treatment is the same. The loss provision should be the same as long as the support provided is of equal value. In order for a guarantee to have value for TFIF and contribute to a credit rating that is high enough for the fund to attract market investors, the guarantee must be provided on subsidised terms.

We make a simple calculation of the key figures for a guarantee scheme, based on the assumption that Norway will contribute the same amount of support through the ordinary budget as through a loss provision of 25% of the capital. We find that with an annual probability of 1% that the (entire) guarantee will be used, the guarantee premium (loss provision) must be just over 30% of the guarantee framework at a guarantee period of 40 years. With an annual probability of 5% that the guarantee will be used, the guarantee premium must be just under 90%.

Photo: Alexis Huguet

Rainforest Foundation Norway's recommendation on Norway's contribution to the TFFF

The Tropical Forest Forever Facility (TFFF) represents a new and unique opportunity to support and incentivise rainforest countries' long-term conservation of rainforests. This will be in addition to existing mechanisms such as REDD+ and the Norwegian Climate and Forest Initiative.

The TFFF can trigger significant and necessary financial support for rainforest conservation, based on public loans and private investments, which is particularly important at a time when public budgets are under pressure.

Rainforest Foundation Norway recommends that Norway contribute loans to the TFFF. The loss provision on such a loan could be included in a new Norwegian climate financing target for 2035 and help to mobilise private investment in rainforest protection.

The Norwegian contribution to the TFFF should be part of a necessary increase in Norwegian climate finance. In line with the decision of the UN Climate Change Conference in Baku (COP29) in 2024, there is a need for a significant increase in Norwegian climate finance from the current target of NOK 14 billion by 2026. The loss provision should therefore be in addition to existing Norwegian climate finance, including the Norwegian Climate and Forest Initiative.

Rapid mobilisation of the necessary sponsor capital is crucial for the success of the TFFF. We therefore propose that Norway contribute at least 10% of the necessary sponsors capital (NOK 25 billion) spread over four budget years.

Based on Vista Analyse's assessment, we recommend a loss provision of 20%. For a loan of NOK 25 billion, this will amount to NOK 5 billion. Spread over four budget years, this implies a loss provision of NOK 1.25 billion per year in the state budget.

TFFF's own calculations indicate a lower risk for sponsorship capital than Vista Analyse's assessment and thus a lower loss provision. We recommend that the government take a closer look at TFFF's assessment of the risk for the sponsor capital and that the loss provision should be adjusted and returned to the aid budget if it turns out that it should be lower.

1 Introduction

The Tropical Forest Forever Facility (TFFF) is a new financing mechanism for rainforest conservation. The initiative comes from Brazil, which will host the COP30 climate summit in November 2025. The mechanism is described in detail in a concept paper prepared by the Federal Government of Brazil (Governo Federal Brasil, 2025).

The TFFF differs from other mechanisms for rainforest conservation in that the support provided (1) is calculated on the basis of the amount of standing forest rather than reduced CO_2emissions as a result of specific measures, and (2) is financed by returns from a fund rather than direct contributions.

At the request of Rainforest Foundation Norway, Vista Analyse has conducted an analysis of how Norway can contribute capital to the fund that will finance the TFFF. Two different options for contributions are being considered:

1. Loans repayable over 30-40 years, in line with the terms and conditions set out in the concept note.
2. Guarantee to TFFF, enabling TFFF to raise the corresponding amount in the capital market.

Based on the concept note, we are assessing the design of a contribution from Norway, including appropriate loss provisions or guarantee premiums premium, and clarify the consequences the contribution will have for the Norwegian state budget. The assessment is made in light of the framework and practice for state budget work.

We also assess the mechanism itself and what effect it can be expected to have on the conservation of tropical rainforests, in light of existing mechanisms such as REDD+, with particular emphasis on the degree of added value and incentive structure of the mechanism.

The report is structured as follows:

- In Chapter 2, we assess the TFFF's mechanism for the permanent conservation of rainforests. The purpose of this chapter is to provide a technical basis for assessing whether it is appropriate to contribute to the capitalisation of the TFIF. The analysis includes an assessment of the incentives for conservation that forest countries will face. Based on this, we assess whether the size of the financial incentives provided by the TFFF are sufficient to preserve forests to a significant degree. We also assess the criteria and methods used to qualify member countries and measure results, and whether these are appropriate and objective. Finally, we assess how the TFFF fits in with other financing arrangements, in particular REDD+.
- In Chapter 3, we assess how Norway can contribute to the TFFF. We begin by describing the principles and practices in Norway for budgeting investments that do not generate a market return. We then assess how much of Norway's contribution to the TFFF should be provided as ordinary appropriations through a loss provision, first through a calculation using a newly developed method and then through a comparison with Norfund. We then illustrate this through a numerical example based on Norway contributing 10% of the capital in the fund. Finally, we discuss how a contribution from Norway could alternatively be provided through a guarantee.

Photo: Shutterstock

2 TFFF's mechanism for sustainable rainforest conservation

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In this chapter, we assess the mechanism for rainforest conservation in the TFFF, with the aim of providing a technical basis for assessing whether it is appropriate to contribute to the capitalisation of the TFIF.

The analysis is based on theoretical perspectives, findings from research literature and professional assessments of possible practical implications. We base our description of the TFFF mechanism on version 2.0 of the concept note describing the scheme, as well as discussions with the TFFF secretariat.

In sub-chapter 2.1, we analyse the system used in TFFF to calculate payments to forest countries. This includes a socio-economic assessment of the reasons for the need for such payments. Based on the expected size of the fund, we calculate the implicit marginal cost of deforestation and degradation that forest countries will face, and how the interaction between a flat support per hectare and sharp reductions give forest countries economic incentives to preserve forests.

In section 2.2, we look to the research literature to examine what income forest countries lose by preserving their forests – such as agricultural production and livestock farming. Based on this, we assess the extent to which the economic incentives provided by TFFF are sufficient to preserve forests. We also discuss how the financial support provided can contribute to preserving forests in ways other than through marginal economic decisions, for example in relation to increased funding for monitoring illegal logging and other enforcement of existing regulations. Finally, in this sub-chapter, we discuss which measures the authorities in each forest country can introduce against actors on the ground. In sub-chapter 2.3, we assess the extent to which the results-based payment structure proposed in the TFFF provides sponsor countries and recipient countries, as well as the cost-effectiveness of such a structure versus effort- or action-based schemes. The effect of results-based schemes depends on the criteria and measurement methods used, and we therefore assess the extent to which the methods used in the TFFF appear to be objective and appropriate.

Finally, in sub-chapter 2.4, we assess how the TFFF fits in with other financing schemes, in particular REDD+. We also look at how the TFFF can build on existing frameworks and capacity developed through countries' participation in REDD+. REDD+ is most accessible to countries that have had relatively high historical deforestation, and in this context we discuss how TFFF can complement areas where REDD+ is less accessible. This is also related to the development of reference levels, which are avoided in TFFF, as we discuss in conclusion.

21 The TFFF imposes a clear cost on forest countries for deforestation and degradation of rainforests

Rainforest conservation can entail costs for forest countries in the form of lost income from, for example, agriculture, livestock farming, timber harvesting or other land use. The economic gains from deforestation are often concrete and measurable for the country's economy, while the global environmental values of intact rainforest are reflected to a lesser extent in the country's own revenues – with the exception of any revenues from other financing mechanisms, such as REDD+. Without adequate compensation, it will therefore often be rational for a country to deforest more than is desirable from a global climate and environmental perspective. TFFF helps to correct this imbalance by giving forest conservation a measurable and visible value.

Research warns that the rainforest, and especially the Amazon, is approaching a tipping point where it could collapse as an ecosystem (Flores et al., 2024; Nepstad et al., 2008; Staal et al, 2020). The combination of rising temperatures, more extreme droughts, increasing deforestation and degradation, and forest fires is in danger of triggering an irreversible feedback loop, whereby the rainforest will transition into a drier, tropical savannah forest. In addition to their intrinsic value, tropical rainforests contribute to climate regulation, biodiversity, water cycles, food security, flood protection, air and water purification, and livelihoods for indigenous peoples and local communities – as well as carbon storage (Fuss et al., 2021; Taye et al. 2021). The risk of irreversible damage to the rainforest – and all the global, regional and local ecosystem services provided by rainforests – makes it extremely important to put in place robust financing mechanisms that provide incentives to conserve forests.

The TFFF provides forest countries with payments for standing tropical and subtropical rainforests. The mechanism is designed to conserve forest by compensating forest countries financially for preserving the forest and its global environmental value. The purpose of the scheme is therefore not limited to contributing to carbon storage and emission reductions alone.

The TFFF uses a results-based model, in which the financial incentives to preserve forests are provided through two elements:

- **Flat support for standing forests:** Rainforest countries receive annual support per hectare of tropical forest. The concept note estimates the support amount at USD 4 per hectare.
- **Reduction in the event of deforestation:** In the event of deforestation, the support is reduced by 100 times the support amount per deforested hectare from one year to the next (for deforestation of up to 0.3%) or 200 times per hectare (for deforestation between 0.3% and 0.5%). For degraded forests, the support is reduced by 25 times the support amount. If deforestation is increasing or exceeds 0.5%, the entire support will be withdrawn. The deforestation rate is calculated as the average for the last three years.

As an example, let us assume that a forest country has 200 million hectares of tropical forest remaining in a given year.[1] At USD 4 per hectare, this gives a potential payment of USD 800 million for that year, before deductions for deforestation. If we assume that the country has had an average annual deforestation rate of 800,000 hectares over the last three years, this gives a deforestation rate of 0.4%. The reduction will therefore be 100* 600,000 times the support amount (for deforestation of the first 0.3%) plus 200 * 200,000 times

1 This example is also used in the concept note. By comparison, Brazil has over 300 million hectares of rainforest.

support amount (for deforestation between 0.3% and 0.5 %), totalling 100 million times the support amount. At a support amount of USD 4 per hectare, this results in a reduction of USD 400 million, so that the final support to the country this year will be USD 400 million in this example.

The flat payment structure means that all eligible hectares receive the same compensation, even though the actual opportunity costs of conservation vary considerably – for example, depending on soil quality, distance to roads and market prices for agricultural products. The flat payment may be higher than the opportunity cost of conservation in low-pressure areas, thereby leading to actors receiving support to conserve forests that would probably have remained standing anyway. This can be referred to as support for inframarginal hectares, i.e. areas where the decision to conserve is not influenced by the economic incentive provided by the TFFF. Because the TFFF provides a flat payment per hectare of standing forest, a high proportion of the payments will be to such inframarginal areas, which may indicate a low expected additional value of the scheme.

If the funds from the TFFF go to forests that would have remained standing anyway, the effect on the margin is limited, and the transfers from the TFFF can then take on the character of more ordinary aid earmarked for forest conservation measures (see section 2.2). Nevertheless, the TFFF can help to prevent pressure on forests before land use changes become profitable enough to trigger extensive intervention. It is often not one specific action that threatens the forest, but a gradual change in political priorities, subsidies, market conditions and other factors.
In addition, TFFF reduces incentives for forest degradation, which opens the forest to future deforestation, but which often occurs long before deforestation. Support from the TFFF can also be used by authorities in forest countries to protect the most critically endangered parts of the forest, even though the total support is largely based on existing inframarginal areas.

For countries with low GDP per capita and large areas of intact forest, the TFFF can offer a form of compensation for the global value that the forest represents – even when it is not immediately in danger of being destroyed. By offering stable and predictable transfers, the TFFF can legitimise political initiatives for long-term conservation, providing countries with incentives to maintain and further develop measures for sustainable land management before the areas are actually subjected to economic or political pressure.

However, the reduction factors in the TFFF mechanism are an important measure for increasing the added value of the scheme and contribute to a stronger conservation incentive for the state in forest countries. The reason is that they significantly increase the amount the country loses through deforestation. For a country considering refraining from deforestation, the economic incentive at the margin will not only consist of (the present value of) loss of many years of support for standing forests, but also the "one-off penalty" through the reduction per hectare deforested.

We calculate that the TFFF mechanism introduces a marginal cost for further deforestation in forest countries of between USD 450 and USD 850 per hectare, based on a payment per hectare of USD 4, which rises by 2% per year (cf. concept note[2]), a (nominal) discount rate of 10% (chosen arbitrarily) and an infinite time horizon.[3] The assumption of an infinite time horizon is not decisive for the result. For example, a planning horizon of 30 years would instead give a present value of USD 45 for the loss of support, which corresponds to a range for the total marginal cost of USD 445–845.

The marginal cost of deforestation is mainly linked to the reduction in support per hectare deforested. Based on the above assumptions, the reduction amounts to USD 400 and USD 800 per hectare when deforestation is less than 0.3% and between 0.3% and 0.5%, respectively. Meanwhile, the cost of losing future support for standing forest amounts to only USD 50. Support for the inframarginal forest is, however, a prerequisite for having a penalty mechanism, because there must be some support from which the penalty can be deducted.

Photo: Fábio Nascimento / ISA

2 The concept note assumes that payments per hectare will increase at a rate equal to the expected growth in the US consumer price index, at 2%. It is advantageous that payments are adjusted for inflation, but it is not certain that the chosen rate will maintain constant conservation incentives over time in forest countries. To achieve this, the growth rate should be set equal to the expected growth in net income per hectare for alternative use of the forest area.

3 Forest land participating in the TFFF will, through the loss of support, in practice face a marginal cost of deforestation expressed by the following formula:

$$\textit{Marginal cost per hectare of deforestation} = \sum_{t} \frac{s}{(1+r-g)^t} + \psi s$$

Here, s is the amount of support that would have been received per year if the forest had remained standing, r is the discount rate, g is the growth rate in (nominal) payments, while ψ is the multiplier, equal to 100 for deforestation lower than 0.3 per cent and equal to 200 for deforestation between 0.3 and 0.5 per cent.

22 Economic incentives to halt deforestation

The extent to which TFFF actually contributes to halting deforestation depends on how large the incentives through TFFF are compared to the income that alternative land use can provide. In the previous section, we found that the TFFF implies a marginal cost of deforestation of between USD 450 and USD 850 per hectare. Here, we compare this to income from deforestation-related activities in different contexts.

The literature we have reviewed shows that the level of such income – and thus the opportunity cost of conservation – varies considerably between countries, regions and types of production.[4]

Silva et al. (2019) estimate that preserving one hectare of rainforest on Brazil's "agricultural frontier" requires foregoing USD 979 in annual income from cattle ranching, logging and agriculture – on average. In a more disaggregated analysis, Franklin and Pindyck (2024) find that income per hectare can vary between USD 130 and USD 935 per year, depending on the type of agricultural activity and region of Brazil analysed. They find that cattle farming – which is a leading driver of deforestation in Brazil – is also consistently the least profitable. This is also supported by Garrett et al. (2017). One explanation is that cattle farming is very inefficient in terms of land use. Studies also show that large areas in Brazil and Indonesia are already fallow after previous deforestation and agriculture, making it possible to use already deforested areas instead of deforesting new ones (Nepstad et al., 2008).

In a study of a number of small-scale producers across six forest countries, Ickowitz et al. (2017) found an average annual net income of between USD 114 and USD 1,807 per hectare from various types of livestock farming and agriculture.

The lowest-income households in this study have an annual income from agriculture and livestock farming of USD 16 per hectare, which corresponds to a present value of USD 200 (using the same assumptions as in the previous sub-chapter).

Grieg-Gran (2008) reviews a number of studies of agricultural income measured in net present value per hectare over 30 years for several countries around the world. In Brazil, small-scale cattle farming, rice and banana (USD 4), dairy cows (USD 218) and medium-sized cattle farming (USD 525) have historically been very unprofitable. Soy production, on the other hand, is relatively profitable, with a present value of USD 4,160 per hectare. In Indonesia, palm oil is the most profitable, with a present value of between USD 1,219 and USD 4,242 per hectare. Small-scale rubber production (USD 91), rice (USD 36) and yuca (USD 24) have significantly lower profitability.

The economic conservation incentives provided through the TFFF are therefore not sufficient to compete with the most profitable forms of land use in tropical forest areas, such as large-scale soy and palm oil production. In other cases – particularly where small-scale cattle farming and other livestock farming dominate – the economic incentives for conservation provided by the TFFF may exceed the economic returns from deforestation. This suggests that the TFFF can provide direct economic incentives to halt deforestation, particularly in relation to less profitable industries such as cattle farming, which is the main driver of deforestation in the Brazilian Amazon.

4 We deflate the amounts from the articles in this section to 2020 USD.

Extensive illegal deforestation

Much of the deforestation, especially in the Amazon, is already illegal. Ferreira (2024) finds that the probability of deforestation in Brazil being penalised in a given year has been only 13% in the period 2011–2020, and that the proportion has been falling in recent years. The declining proportion has coincided with a 20% cut in real terms to the budget of the forest protection authority IBAMA and a cut in operational expenditure in the Amazon region that was twice as large. In addition, only 5% of the fines actually imposed are paid, which means that the effective penalty for deforestation is very low (Imazon, 2025).

Here, payments from the TFFF can play an important role, beyond the direct financial incentives relative to the opportunity cost discussed above: if the funds paid out via the TFFF are channelled into increased resources for monitoring and enforcement, this may increase the likelihood of illegal logging being detected and sanctioned.

Franklin and Pindyck (2024) have estimated that the historical public costs of such monitoring and law enforcement in Brazil amounted to USD 3.20 per hectare of standing forest in the period 2004–2015, which is equivalent to the level of payments expected from the TFFF. Although this amount has historically not been sufficient to stop deforestation, it nevertheless indicates that TFFF contributions could, in principle, make a significant contribution to covering such costs, particularly in countries with lower budgets.

The use of satellite-based monitoring in the TFFF may also have implications for capacity building (see section 2.3). In Brazil, such systems, such as the DETER programme, have been an important and effective part of the country's forest management (Assunção et al., 2023). If the TFFF contributes to establishing similar systems in other participating countries, this could reduce barriers to effective monitoring.

However, this presupposes that the countries themselves prioritise using the funds for this purpose, and that necessary institutional frameworks are in place. The effect will therefore depend on national priorities and implementation capacity.

Measures targeting actors on the ground

Because payments are made to the country's authorities, the incentives for conservation will be directed to the national level. In order for the scheme to have the desired effect on the ground, the authorities should implement instruments aimed at the actors who actually carry out the deforestation.

One possibility is for the authorities to establish economic mechanisms that continue the same incentives that the authorities get from TFFF. However, this is easier to achieve if the state itself owns the forest or private forest owners manage larger areas where both rewards and sanctions can be used in combination – as TFFF does with the authorities in forest countries. This means that in such cases, forest owners receive payment for standing forests, which is significantly reduced if there is deforestation – and that in this way they internalise the incentive that applies at the national level. In cases where forest owners only manage a small area, where deforestation is illegal or where property rights are unclear, it is more challenging for the national government to directly mirror such incentives. In such cases, the government can use other measures to try to achieve conservation. These may include support for local monitoring and enforcement as mentioned above, the introduction of fines and fees for deforestation, incentive schemes for sustainable land use, reduction of environmentally harmful subsidies, or reduction of incentives for land grabbing.

The fact that the scheme is results-based means that it is ultimately up to the countries themselves to determine which measures they expect to work best suited to their situation. However, the TFFF sets certain minimum requirements for participation and use of the funds. Among other things, countries must:

- Commit to transferring at least 20% of payments to Indigenous Peoples and Local Communities (IPs and LCs), who play a key role in the long-term conservation of rainforests (Dawson et al., 2021)
- Document which national programmes and policy measures are to be financed through TFFF funds
- Demonstrate that the funds are in addition to existing budgets.

This provides both scope and a need to introduce new national policies or strengthen existing policies and programmes, so that incentives and schemes

to halt deforestation and degradation are strengthened. The earmarking for Indigenous Peoples and Local Communities is intended to increase financial support to those who, according to the concept note, manage over 50% of the remaining intact rainforest, but who between 2010 and 2020 received less than 1% of global ODA funds for climate mitigation and adaptation (Rainforest Foundation Norway, 2021).

Photo: Alexis Huguet

23 Results-based payments for standing forests based on ecological criteria and satellite measurements

Support from the TFFF is results-based, and objective eligibility criteria and measurements are used to calculate payments. Here we describe (i) the advantages of results-based payments over measure- or effort-based schemes and (ii) how the use of ecological criteria and satellite measurements contribute to objectivity.

Payment for results

When payments are linked to results, it is, as mentioned, up to the forest country itself to assess which measures are most effective in achieving the goals. This is an advantage compared to measure- or effort-based schemes, where the sponsor country must have detailed knowledge of the costs and effects of individual measures – such as legislative changes, training measures or forest planting. This is particularly challenging in a global context, where local conditions vary considerably both between and within countries. Because TFFF's payments will be based directly on the results the sponsors want – that rainforests remain standing – there is no need to take a detour to reach the goal. In this way, results can be achieved more cost-effectively.

By doing so, both the reward and the risk are placed with the recipient of the funds – closer to those who can stop local deforestation. Recipients therefore have a stronger incentive to choose measures that actually work for forest conservation (Chiroleu-Assouline, 2018; Escalante and Orrego, 2021). Pure performance-based management, on the other hand, can create unfortunate incentives, where the incentives for action are reduced because the outcome risk is in practice retained by the donor (Stritzke, et al., 2021). Payments from the TFFF are channelled directly to the authorities of the participating countries, rather than to individual actors or projects. National authorities have the opportunity to address drivers of deforestation linked to political conditions, such as agricultural subsidies, weak land-use planning and lack of investment in monitoring and enforcement of laws. The TFFF mechanism provides countries with a financial incentive to address political and institutional weaknesses that undermine forest conservation, without having to specify in advance which measures will be most important.

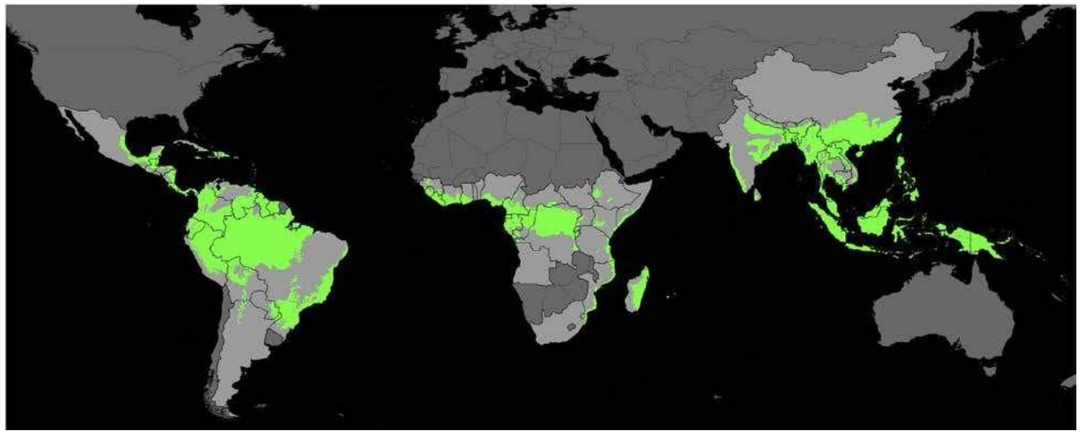
Use of objective criteria and measurements

When the scheme is results-based, it is important that the results can actually be measured in a precise, transparent and credible manner (Holzapfel and Janus, 2015). TFFF takes two main steps to try to achieve the greatest possible objectivity in both the qualification of the area eligible for support and in the measurement and verification of the results:

1. Ecologically defined criteria for which areas are eligible for support
2. Satellite-based measurement to monitor standing forest cover

The use of ecologically defined areas means that it is not national forest definitions that determine which areas are eligible for support. Instead, areas defined on the basis of ecological criteria, known as biomes, are used. This provides common rules across countries, which limits the use of national discretionary assessments of forest area boundaries. According to the concept note, this is also intended to ensure that the scheme targets regions with high carbon storage and intact forests, rather than fragmented areas with lower conservation value. Figure 2.1 shows the rainforest areas that qualify for support in green, and the countries in which these rainforests are located in light grey.

Figure 2.1 Areas of the world covered by tropical and subtropical rainforest



TFFF-eligible countries (light grey) and eligible biome areas within these countries (green), including tropical and sub-tropical moist broadleaf forest biome and adjacent mangrove areas. Analysis by Eligibility and Monitoring Task Force using data from ecoregions.appspot.com and Dinerstein et al (2017).

Source: Concept note (Governo Federal Brasil, 2025)

The actual measurement of results is based on satellite observations of forest cover. Mapping is to be carried out annually, and countries must either use an approved national system that meets specific technical requirements or an approved third-party system.

When the support criteria are based on external definitions, rather than national definitions or politically influenced indicators, this limits the possibility of countries changing their classification or reporting routines in order to increase their payment basis. Similarly, the satellite-based measurement method makes it easier to provide an objective basis to verify results that is not based on reference trajectories or business-as-usual scenarios. This reduces – but does not eliminate – the risk of interpretations and disagreements.

Participation criteria

The scheme is aimed at countries with a relatively low annual deforestation rate. To participate, a country must have an annual deforestation rate of less than 0.5% (measured as a rolling three-year average) and a declining trend in deforestation at the time of admission. After joining, the country must avoid an increase in its deforestation rate.[5]

A country that expects to join the TFFF but has not yet qualified may have greater economic gains from allowing deforestation or forest degradation before joining than after. The reason is that deforestation before becoming a member only reduces future support without additional penalties, while deforestation after joining includes the strict reduction for deforestation or degradation. This provides theoretical scope for strategic adaptation. However, the risk is significantly mitigated by the requirement for a three-year average decline in the deforestation rate, as well as limitations on how much the authorities can directly control and plan deforestation.

5 Except in predefined force majeure situations, such as earthquakes, hurricanes and other circumstances beyond human control. In such cases, an ad hoc increase in deforestation of 0.1% is proposed.

TFFF is designed to operate in parallel with – and complement – existing schemes such as REDD+, carbon markets, bilateral and multilateral aid, philanthropic initiatives and others. In other words, the TFFF is not intended to replace what already exists, but to add a new layer of incentives that are more focused on long-term conservation of tropical forests and conservation of standing forests that are not under immediate pressure from deforestation.

Builds on and expands existing frameworks

REDD+ and LEAF[6] – two of the best-known funding mechanisms targeting tropical forests – both contribute to building capacity, infrastructure and institutions. The REDD+ framework comprises three phases, with results-based payments being the final phase after countries have planned and implemented local measures to combat deforestation (Angelsen, 2017).

Investments in capacity building, instruments and measures from REDD+ and other schemes will contribute to lower deforestation, which qualifies for TFFF, which in turn rewards low deforestation over time. In addition, the instruments and measures implemented through REDD+ could provide a framework that can be used to channel funds from the TFFF. The same applies to existing monitoring mechanisms and tools for verification and measurement, which can be reused in cases where technical requirements are met.

Fills a gap in financing in countries with relatively low deforestation

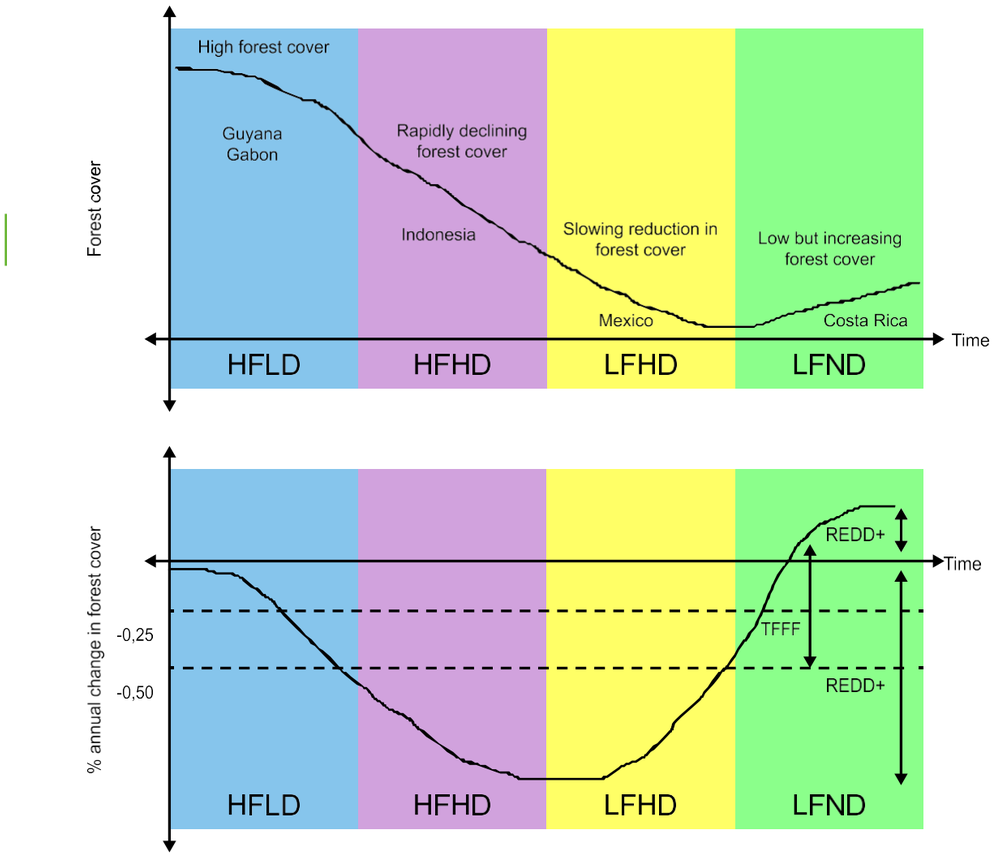
REDD+ and TFFF can play complementary roles, depending on which stage a country is at on the so-called forest transition curve, as illustrated in Figure 2.2. REDD+ is particularly suitable for countries with high deforestation rates (HFHD and LFHD), where measures can result in large emission reductions (compared to a historical reference levels) and thus provide a basis for results-based payments. On the other hand, such incentives are less relevant for countries with low or no deforestation (such as HFLD

and LFND), where methodological challenges and low potential for reduced emissions compared to historical emissions mean that REDD+ funds are in practice largely unavailable. This creates an opportunity for the TFFF, which by providing payments for standing forests can support countries such as Gabon – a country with extensive forest cover and low deforestation – and Costa Rica, which is at the other end of the transition curve with stable or increasing forest cover and now needs financial incentives other than REDD+ to maintain low deforestation rates. The TFFF can thus serve as a continuation and reinforcement of conservation efforts after REDD+ funds are phased out – or before they are phased in.

In theory, the TFFF's contribution to avoided deforestation could lower the counterfactual reference trajectories that form the basis for results-based REDD+ payments. In such cases, the TFFF could indirectly replace funding from REDD+, even if this is not the intention. This suggests that there is a potential risk of double payments or inflated emission reductions from REDD+ if the reference trajectories are not adjusted downwards.
However, reference trajectories based on historical deforestation figures will not be affected by this mechanism. In addition, concerns about possible double payments should be viewed in light of the current levels of forest conservation funding remain far below what is considered necessary to achieve global goals, according to the concept note and the analysis of opportunity costs in this report. In practice, the challenge is more a lack of funds than that schemes overlap in some cases.

At the same time, TFFF and REDD+ largely target different parts of the opportunity cost curve for land use and can therefore still play a complementary roles. Jurisdictional REDD+ (JREDD+) has a higher expected carbon price, around 15 USD per tonne of CO_2 (EDF, 2024), while the implicit carbon price for emissions from (marginal) deforestation in TFFF will be much lower. This makes REDD+ particularly suitable in areas with high deforestation pressure and high alternative income, where significant payments are needed to compete with economically profitable activities such as soy and palm oil. TFFF, on the other hand, can play a role in the preventive protection of intact forests, in low-income areas and where enforcement capacity is already in place, but financial support is lacking.

Figure 2.2 Opportunity areas for REDD+ and TFFF on the forest transition curve



Source: Concept note (Federal Government of Brazil, 2025)

6 https://www.leafcoalition.o r g /

Avoids complicated estimation of reference trajectories and reduces leakage problems

The preparation of counterfactual reference trajectories involves estimating how high deforestation would hypothetically have been without measures to combat deforestation. Emission reductions that are rewarded when measured against this have proven to be methodologically demanding and vulnerable to undesirable strategic influence. Several studies indicate that nations have an incentive to overestimate their expected future deforestation in order to secure higher compensation. This so-called "tropical hot air" problem entails a risk that support will be paid for unrealistic emission reductions (Angelsen, 2017; Chiroleu-Assouline, 2018).

If the measures are not implemented on a sufficiently large scale, there is also an increased risk of leakage – i.e. deforestation being shifted from one area to another (Kerr, 2012). This is part of the background for the design of JREDD. The scheme pays for results at the national level or larger areas at the subnational level, rather than individual actors (Nepstad, 2023). There is also a shift towards measuring results against historical deforestation rather than counterfactual projections.

The TFFF's reference baseline is the forest that stood there last year. This simplifies the system considerably and reduces the need for subjective assumptions.

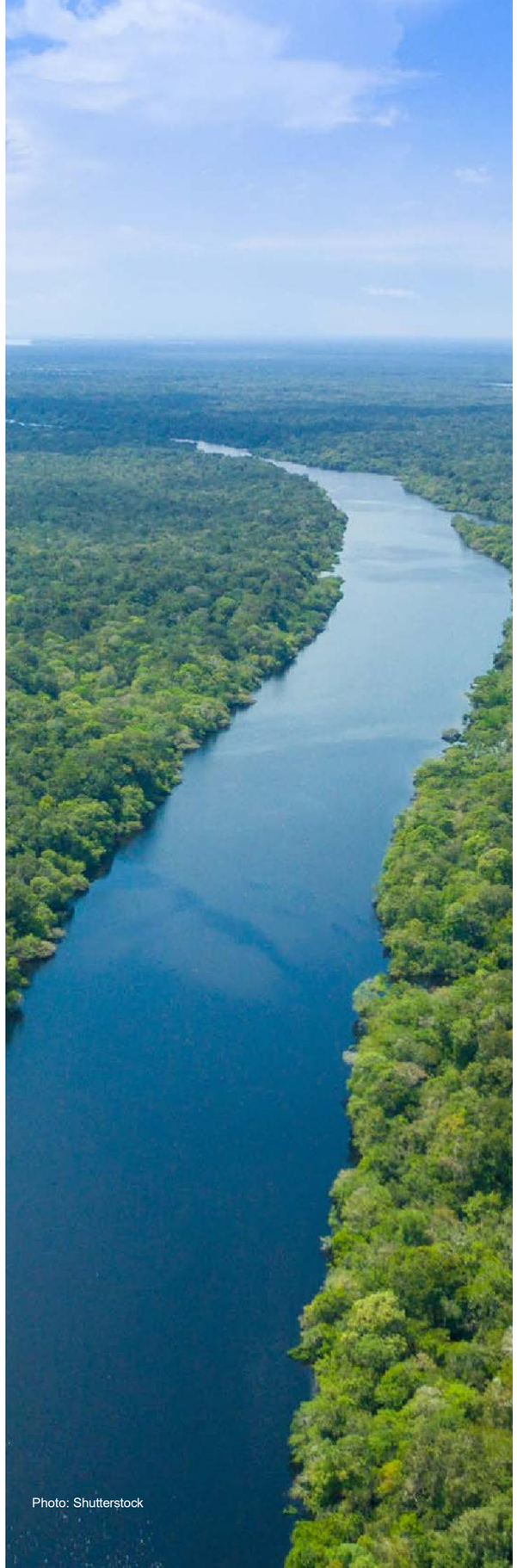


Photo: Shutterstock

3. How can Norway contribute to TFFF?

In this chapter, we assess how Norway can contribute to the TFFF, given the financing model involving the establishment of a fund. We begin in sub-chapter 3.1 by describing the financing model. Then, in sub-chapter 3.2, we explain the framework and practice in Norway for budgeting investments that do not generate a market return. Then, in sub-chapter 3.3, we consider how much of an investment in TFFF that should be appropriated in the ordinary budget, through a loss provision. Furthermore, in sub-chapter 3.4, we calculate how large the appropriation should be for different sizes of loss provisions. Finally, in sub-chapter 3.5, we assess whether the support could instead be provided through a guarantee, and illustrate this with a simple calculation. We have not assessed administration and management costs.

3.1 Return and credit risk for investments in TFIF

Support for forest countries through the TFFF is financed by returns from a fund called the TFIF (Tropical Forest Investment Fund). The fund is intended to amount to USD 125 billion and will be built up through contributions from (i) sponsors and (ii) investors who invest primarily on market terms (‘market investors’):

- Sponsors capital (loans, guarantees or grants). Capital is repaid with interest, but sponsors are subordinate to market investors (are junior). The extent to which sponsors receive market returns is discussed in more detail below. Sponsors are expected to be states or philanthropists.
- Market investors contribute through capital invested on market terms, but contributions to reducing greenhouse gas emissions may also count positively for some of these investors.

TFIF is invested in a portfolio of government bonds from developing countries. The concept note estimates the return at 7.6% and the credit risk at BB+, based on an index from JP Morgan.[7] Return here refers to yield, which is the annual coupon payment as a percentage of a bond's market price. Coupon is the regular payment from the country that has issued the bond to the bondholder.

Both sponsors and market investors shall receive a return equal to that on long-term government bonds with a high credit rating (AAA), such as US government bonds.[8] The return on such bonds is estimated in the concept note at 4.9 %, which then constitutes TFIF's cost of capital.

The difference between the cost of capital and the return on TFIF's portfolio goes to support rainforest countries based on the criteria in TFFF. With the above return figures, the difference is 2.7%.

7 JP Morgan Emerging Market Bond Index (EMBI) as of 7 January 2024.

8 However, in spring 2025, several rating agencies downgraded US government bonds somewhat.

Given the desired fund size of USD 125 billion, this gives USD 3.4 billion for payments to rainforest countries each year, before adjustment for credit risk.

In the event of default on bonds in which TFIF has invested, transfers to rainforest countries will be reduced first. If returns fall so much that these transfers are insufficient to cover the shortfall, returns to sponsors will initially be delayed and, if necessary, reduced – or TFIF will utilise guarantees. If this is also insufficient, the returns to market investors will be deferred or reduced.

This means that, in terms of default, TFIF has three classes of investors, from most senior to most junior:

1. Market investors
2. Sponsors
3. Tropical forest countries

This structure contributes to very low credit risk for market investors.

Furthermore, the desired ratio between sponsors and market investors set at 80-20. Together, this is calculated to be sufficient for TFFF to issue bonds with an AAA credit rating, according to TFFF's concept note. This means that an investment in TFIF for market investors is equivalent to a US government bond or similar in terms of both return and credit risk.

Although the sponsors take on greater credit risk than market investors, their credit risk is also relatively low and lower than that of the underlying TFIF portfolio, as it is the payments to the forest countries that are delayed/reduced first in the event of a fall in returns.

We illustrate this with a figure showing how a 10% reduction in returns in a given year is distributed among the various actors, in three different models:

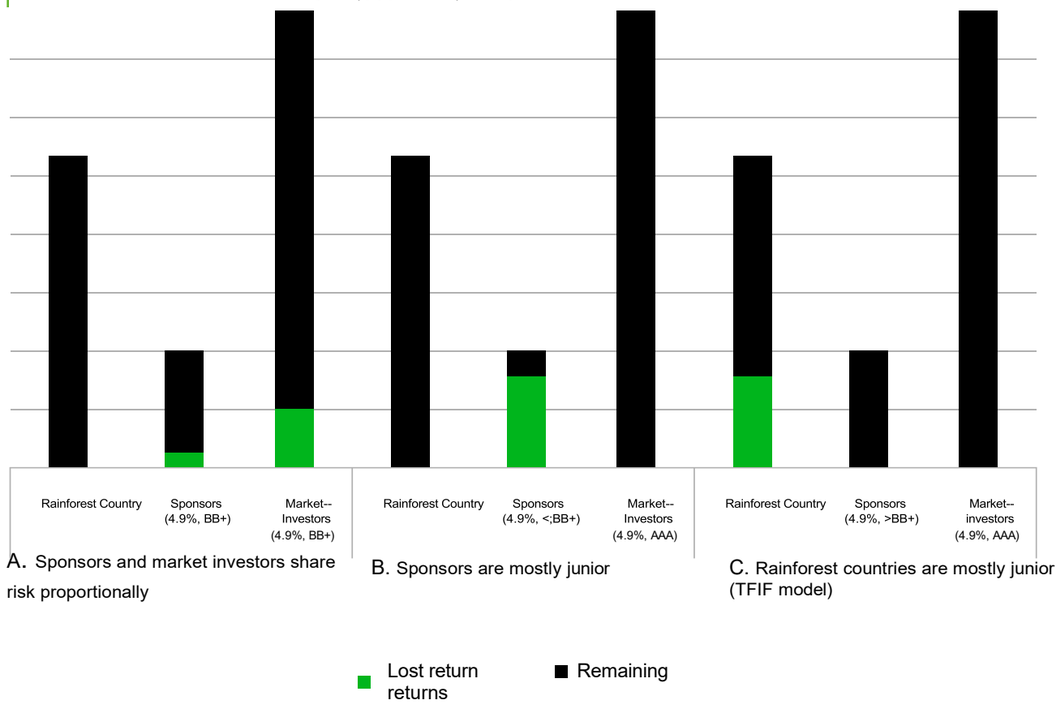
A. Market investors and sponsors assume all credit risk, proportionate to their ownership share
B. Sponsors take most of the credit risk (most junior)
C. TFIF model: Tropical forest countries assume most of the credit risk (most junior)

For simplicity's sake, the fund's value in the calculation behind the figure has been set at NOK 1,000 billion, which is slightly lower than the fund's proposed value of USD 125 billion.

Return is measured in per cent and distribution between sponsors and market investors is as stated above. The reduction in return may be due to default on bonds in the portfolio, whereby the issuer fails to pay the coupon. In the event of full default, the amount invested will also be lost, which is not taken into account in the figure.


Photo: Alexis Huguet

Figure 3.1 Distribution of 10% reduction in annual return for different models, with a fund value of NOK 1,000 billion, in NOK billion



Source Vista Analyse

The figure shows how the TFIF model (C) entails less risk for market investors and sponsors than model A, where the sponsors have the same credit risk as the underlying portfolio, BB+.

It would be incorrect to say that TFIF involves a transfer of risk from market investors to sponsors, as illustrated by model B. Based on a comparison between model A and the TFIF model (C), it is clear that it is primarily to the rainforest countries that the credit risk is transferred. Only in the event of a very large fall in returns will the sponsors incur losses in excess of what they would have done under model A.

Note that both models A and B are hypothetical, as market and sponsor investors are unlikely to contribute capital on these terms.

Table 3.1 Return and credit risk for the TFIF portfolio as a whole and the various players

Recipient	Credit risk	Return
TFIF portfolio	BB	7.6
Rainforest countries	Less than BB+	2.7
Sponsors	Between BB+ and AAA	4.9
Market investors	AAA	4.9

Source: *Vista Analysis based on concept note*

We therefore assess the credit risk for the sponsors to be somewhere between BB+ and AAA. Table 3.1 summarises the return and credit risk for the TFIF portfolio and for each of the recipients/investors. For the rainforest countries, support from TFIF can be understood as a right to the return from a bond with a credit rating lower than BB+ and a return of 2.7%.

The TFFF initiative itself considers the credit risk for sponsor investors to be very low. TFFF has shared the results of simulations which, according to TFFF, show that the probability of sponsor investors receiving less than a 4.9% return over the investment horizon is 4.46%. Furthermore, the calculations show that the average payout if the return were to be less than 4.9% is 97% of what it would otherwise have been.

We have not assessed TFFF's credit risk calculations in detail.

3.2 Principles and practices for budgeting investments that do not generate a market return

The Norwegian Ministry of Finance explains the principles and practices for budgeting loan transactions in its guide to government budgeting (Ministry of Finance, 2023):

The framework for fiscal policy draws a clear distinction between ordinary expenditure [...] and loan transactions [...]. Ordinary expenditure in the national budget is financed by tax or oil revenues and affects the scope for action in fiscal policy. Ordinary expenditure is weighed against each other in the budget process. Loan transactions are asset reallocations and, in principle, should be regarded as loans from the Treasury. Loan transactions are financed by the government taking loans.

[...]

Normally, the following two conditions must be met in order for something to be budgeted as a loan transaction and entered under item 90:

- *The measure must provide an expected return that corresponds to the risk associated with the investment.*
- *The return must be financial and derive from income in a market.*

If these conditions are not met, the main rule is that the entire amount must be recorded as an ordinary expense. However, it is established practice that certain investments can be budgeted with a portion as ordinary expenses. This applies, among other things, to investment portfolios where the return is expected to be positive, but nevertheless not correspond to the risk associated with the investment. If it can be demonstrated that a portion of an investment can be budgeted as a loan transaction, it is standard practice to use a standard distribution where 35% is budgeted as an ordinary expense and 65% is budgeted as a loan transaction.

In its guidelines, the Ministry refers to the discussion in the Yellow Book 2023 (Prop. 1 S (2022)). The discussion is largely similar, but explains more about what is central to the assessment of budgetary management:

The difference between the expected return on the investment and the return that would correspond to the risk in the investment constitutes an expected shortfall in return compared with market-based investments. This expected shortfall in return is central to the assessment of proper budgetary management.

The portion budgeted as an ordinary expense has often been referred to as a “loss provision”.
This term can be misleading, because it does not generally refer to a loss of the amount invested. However, because it still refers to a loss relative to what could have been gained from an investment on market terms, the term loss provision is not entirely incorrect.

Table 3.2 shows loss provisions for a number of different investments and schemes.
The scheme for investments in renewable energy is discussed in more detail in section 3.5. Allocations in the ordinary budget are often referred to as allocations "above the line", while loan transactions are referred to as "below the line".

Table 3.2 Loss provisions for various investments/schemes

Investment/scheme	Category	Loss provision
Norfund / Climate Investment Fund Nysnø	Investment	25
“Nysnø” Climate Investments AS	Investment	35
State guarantee scheme for investments in renewable energy	Guarantee	15

Source: *Vista Analysis based on the Ministry of Foreign Affairs' Prop. 1 S (2024–2025) and the Ministry of Trade, Industry and Fisheries' Prop. 1 S (2023–2024).*

3.3 How large should the loss provision for TFFF be?

We assess how large the loss provision should be based on the difference between the return to sponsor countries such as Norway and the market return on a similar investment. This assessment is in line with the Ministry of Finance's statement in the 2023 State Budget that the difference in return, the shortfall in return, is key to how budgeting should be handled.

We make this assessment in two different ways. First, we make a formal calculation of how large the loss provision should be based on the difference in return. We then assess the loss provision based on a comparison with Norfund, which we consider to be the most relevant basis for comparison.

We use the returns presented in the concept note as a starting point, which, as described in section 3.1, should be 4.9% for sponsor countries such as Norway and 7.6% for the underlying TFIF portfolio.

However, because the credit risk is different, these are not directly comparable. In order to assess the size of the loss provision, we need an estimate of the market return for an investment object with the same characteristics which the sponsors receive through TFIF. We assume that 7.6% and 4.9% are market returns for bonds with credit ratings of BB+ and AAA, respectively. Since we assess the credit risk for the sponsors to be between these two, the same must also apply to the return. We do not determine credit risk and return precisely, but assume that the relevant market return is in the range of 5.8% to 6.8%. The midpoint of this range, 6.3%, is the average of 7.6% and 4.9%. This means that the sponsors receive a return of 72-84% of the market return.

3.3.1 *Calculation of loss provisions based on underperformance*

We have developed a method for calculating how large the loss provision should be in order to compensate for the fact that the actual return from TFIF is somewhat lower than the market return.

What we calculate is how much must be allocated above the line in order for the total return to correspond to what we would have had in market return on the investment below the line.[9] Capital raised above the line is also recognised as income above the line upon repayment. The method is described in more detail in Text box 3.1 below.

The calculation gives a loss provision of between 16 and 28% if the return to the sponsors is 4.9% and the relevant market rate between 5.8 and 6.8%.

However, we are adjusting the calculated loss provision slightly upwards based on a discretionary assessment of the financing model as a whole, to between 20 and 30%. The financing model is relatively complex, which argues in favour of starting with a slightly higher loss provision and then adjusting it downwards as uncertainties are clarified, if the investment is spread over several budget years.

Return here refers to the annual coupon rates on which coupon payments are calculated. The calculations are summarised in Table 3.3.

Note that the loss provision is the same regardless of the investment horizon and repayment model. This is shown formally in Text Box 3.1.

However, the fact that the loss provision is the same does not mean that the investment horizon and repayment period are irrelevant. In the case of later repayment, it will take longer for the Norwegian state to recover the loss provision as income above the line. The socio-economic cost of granting the loss provision is therefore higher the longer the time horizon. This cost can be expressed as the difference between the loss provision and the present value of the loss provision at the time of repayment. As in other areas of society, it is the investment itself and not the loss or gain that is granted.

Table 3.3 Loss provision under different assumptions about market interest rates

Investment horizon	Low	Medium	High
Market interest rate	5.8	6.3	6.8
Sponsor return	4.9	4.9	4.9
Estimated loss provision	16	22	28
Adjusted loss provision	**20**	**25**	**30**

Source: *Vista Analyse*

9 Due to an error, the first printed version of the report stated that the total return is recognised below the line in this section, text box 3.1 and Appendix A. This is incorrect. The return is recognised above the line. This was corrected on 6 August 2025.

Text box 3.1 Calculation of loss provisions based on lower returns

Here we show how the loss provision is calculated based on the difference between the market return and the return on the subsidised investment (the loan). We first look at the case where the entire investment is repaid at once. We then explain how the loss provision becomes the same in the case where the investment is repaid in equal amounts each year over several years, which is the case for TFIF. We model the return using coupon rates, i.e. the return is paid annually.

We use the same discount rate to value future coupon rates, both for actual coupon rates and market coupon rates. Credit risk is taken into account in the assessment of what is a relevant market coupon rate. We further assume that the bonds are identical apart from the coupon rate, so that the systematic risk for the cash flows is also the same. As the calculation shows, we do not need to assess the level of the discount rate when it is the same.

Let capital below the line (loan transaction) be k_u and capital above the line (ordinary allocation) be k_o, market coupon rate be r_m and coupon rate on the subsidised investment be r_s. Let T be the time horizon. We will find out how much capital k_o must be allocated above the line so that the total return corresponds to the return we would have obtained if the capital below the line k_u had been invested on market terms. We begin with that the present value of the investment below the line, including interest on the amount invested above the line (left side), shall correspond to the present value of the investment below the line when investing on market terms (right side). This gives the following expression, which we solve for k_o:

$$\frac{1}{(1+r)^T}k_u + \sum_{t=1}^{T}\frac{1}{(1+r)^t}(k_u+k_o)r_s = \frac{1}{(1+r)^T}k_u + \sum_{t=1}^{T}\frac{1}{(1+r)^t}k_u r_m$$

$$\sum_{t=1}^{T}\frac{1}{(1+r)^t}(k_u+k_o)r_s = \sum_{t=1}^{T}\frac{1}{(1+r)^t}k_u r_m$$

$$(k_u+k_o)\sum_{t=1}^{T}\frac{1}{(1+r)^t} = k_u r_m \sum_{t=1}^{T}\frac{1}{(1+r)^t}$$

$$(k_u+k_o)r_s = k_u r_m$$

$$k_o = \frac{r_m - r_s}{r_s}k_u$$

The expression tells us that the allocation above the line must be $(r_m - r_s)/r_s$ greater than the allocation below the line. The intuition is that it must be increased by the relative lower return on the investment below the line, in order for the total return to correspond to the market return on the investment below the line. The total return is recognised as income above the line.

Finally, we find the allocation above the line as share of total investment, which constitutes loss provisions percentage:

$$\frac{k_o}{k_u+k_o} = \frac{r_m - r_s}{r_m}$$

The loss provision is independent of the investment horizon, as long as the calculation interest rate is the same. This is because there is no compound interest rate effect, unlike a situation where the

return was instead stated as zero coupon rates (yield to maturity).

Thus, the total loss provision is also the same when the investment (loan) is repaid over several years, as is the case for TFIF.

Note that even though the loss provision is the same, the cost of making the loss provision is still greater with a longer repayment period. The reason is that one has to wait longer before the investment is repaid and recorded as income above the line.

If the return were stated as zero coupon rates (yield to maturity), the investment horizon would have an impact on the loss provision due to compound interest. This is shown in Appendix A.

3.3.2 *Comparison with Norfund and the Climate Investment Fund*

For investments in Norfund and the Climate Investment Fund, 25% is taken from the ordinary (aid) budget through loss provisions.

Norfund's portfolio under the development mandate has had a total return since its inception in 1997 of 5.1%, measured in investment currency (Norfund, 2025). By comparison, the Norwegian “Oil Fund” (Government Pension Fund Global) has since 1 January 1999 achieved a return of 7.07 % on the equity portfolio, measured in investment currency (NBIM, 2025).

The return on Norfund's portfolio is approximately 72% of the return on the Oil Fund's equity portfolio. We have not adjusted for any differences in systematic risk between these portfolios. It may also be that unsystematic risk is less diversified in Norfund's portfolio, so that fortunate or unfortunate individual investments have a significant impact on the fund's overall return. Furthermore, the return figures are not necessarily directly comparable, because Norfund reports returns as the internal rate of return, while the Oil Fund uses annualised annual returns.

As described earlier in this section, it is uncertain what constitutes a relevant market return for Norway's return as a sponsor.
We have assumed 6.3% in our calculations and performed sensitivity analyses for returns 0.5 percentage points above and below this. This gives a return from TFIF as a share of market return of 78%, and 72% and 85% respectively for the sensitivities.

A comparison with Norfund's development mandate therefore suggests that the loss provision for TFFF should be equal to or lower than Norfund's 25%.

On the other hand, the Climate Investment Fund achieves very high returns on its investments in renewable energy. Since its inception in 2022, the return is 14.4% measured in investment currency (Norfund, 2025). In Vista Analyse (2025), we have pointed out possible reasons why the Climate Investment Fund can achieve market-based returns on its investments, even though the investments are intended to be catalytic and would not normally be carried out by others without the Climate Investment Fund's participation. There is much to suggest that the Climate Investment Fund should have had a lower loss provision. Based on this understanding, the comparison with Norfund's development mandate is most relevant.

3.3.3 *Overall assessment of necessary loss provision*

As described in section 3.3.1, our calculations indicate that the loss provision should be between 20 and 30%, while the comparison with Norfund in section 3.3.2 indicates that the loss provision should be 25% or lower.

Based on an overall assessment, we therefore recommend a loss provision of between 20 and 25 per cent.

If we instead based our assessment on TFFF's own assessment of credit risk for sponsor investors, as discussed in section 3.1, the loss provision would have been significantly lower. TFFF considers the credit risk for sponsors to be very low, which means that the relevant market interest rate in the comparison should be lower. We have not been told what market interest rate TFFF considers relevant, but have made a calculation for a market interest rate of 5.4% for illustrative purposes. The calculation gives a loss provision of 9%.

3.4 *Necessary appropriation for Norway to contribute 10 per cent*

As an illustration, we have calculated that if Norway are to contribute 10 per cent of the sponsor capital in TFIF, NOK 1.7–2.1 billion must be allocated in the ordinary budget each year for three years for loss provisions of between 20 per cent and 25 per cent. The calculation is based on the concept note's proposal of a fund of USD 125 billion, of which USD 25 billion is to come from sponsor investors. This corresponds to just under NOK 250 billion from sponsor investors. Table 3.4 contains all the results from the calculation.

By comparison, the allocation to the Climate and Forest Initiative is NOK 4.3 billion in 2025, in its entirety above the line, and the allocation has previously been around NOK 3.0 billion annually for several years.

Table 3.4 Required allocation for a 10% contribution from Norway, total and distributed over 3 years (billion NOK)

Loss provision	20 %	25%
Total contribution	25,00	25,00
Ordinary allocation	5,00	6,25
Per year for 3 years	8,33	8,33
Loan transaction	1,67	2,08

35 Support through guarantees as an alternative to capital

In principle, it is not of decisive importance for Norway whether the support to TFFF is provided through capital or guarantees, as long as the budgetary treatment is the same. The loss provision should be the same as long as the support provided is of equal value. In order for a guarantee to have value for TFIF and contribute to a credit rating that is high enough for the fund to attract market investors, the guarantee must be provided on subsidised terms.

We make a simple calculation of the key figures for a guarantee scheme. We assume that Norway will contribute the same amount of support from the ordinary budget as in the calculation example in the previous sub-chapter, where Norway was to contribute 10% of the capital to TFIF. We assume a contribution from the ordinary budget of NOK 6.25 billion, which, according to Table 3.4, corresponds to the loss provision in NOK when the support is provided as loan, given a 25% loss provision.

We assume that there is a certain probability that the guarantee will be used each year, and that it will then be used in its entirety and cannot be used more than once.

The calculation is made for different guarantee periods. For the sake of simplicity, we do not take into account that it costs less if the guarantee is used late in the period. The guarantee is provided by Norway without requiring any guarantee premium. This means that the guarantee premium is covered by Norway through an appropriation in the ordinary budget, which also constitutes the loss provision.

We set the guarantee premium equal to the guarantee limit multiplied by the probability that the guarantee will be used, for simplicity's sake without taking into account that guarantee payments at different times have different costs for Norway:

*Guarantee premium = Probability that the guarantee will be utilised * Guarantee limit*

We first perform the calculation for an annual probability of 1% that the guarantee will be used, which for a guarantee period of 40 years gives a guarantee limit of NOK 19 billion and a loss provision as a percentage of the guarantee limit of 33%. See Table 3.5 for more results from the calculation.

Table 3.5 Guarantee schemes with different periods, at a 1% annual probability of use

	10 years	20	30 years	40
Guarantee framework, NOK billion	65.36	34.32	24.01	18.88
Probability that the guarantee will be used	9.6	18.2	26.0	33.1
Guarantee premium, billion NOK	6.25	6.25	6.25	6.25
Loss provision	10	18	26	33

Source: *Vista Analyse*

We then calculate an annual probability of 5 per cent that the guarantee will be used, which for a guarantee period of 40 years gives a guarantee framework of NOK 7 billion and a loss provision as a percentage of the guarantee framework of 87 per cent. See Table 3.6 for further results from the calculation.

Table 3.6 Guarantee schemes with different periods, at a 5% annual probability of use

	10 year	20	30	40
Guarantee limit, NOK billion	15.58	9.74	7.96	7.17
Probability that the guarantee will be used	40.1	64.2	78.5	87.1
Guarantee premium, NOK billion	6.25	6.25	6.25	6.25
Loss provision	40	64	79	87

Source *Vista Analyse*

Norway has recently established a state guarantee scheme for investments in renewable energy, with a guarantee framework of NOK 5 billion. It is unclear the extent to which the scheme involves subsidies. The Ministry of Foreign Affairs states in Prop. 1 S (2024-2025) that the scheme is to be financed by guarantee premiums, but also states that guarantee premiums may be subsidised. A loss provision is to be made of 15%, i.e. NOK 750 million, allocated over two years (2025 and 2026).

With the limited information available on this scheme, it is difficult to use it as a basis for assessing the design of contributions to TFFF through a guarantee.

The fact that a loss provision has been allocated however, this indicates that guarantee schemes will be handled in much the same way as

allocations under the line that does not provide a market return.

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Appendix A

Loss provision at zero coupon rates

Here we show how the loss provision can be calculated based on the difference between the market return and the return on the subsidised investment (the loan), when both returns are stated over the investment horizon (zero coupon rates). We first look at (i) the case where the entire investment is repaid at once, then at (ii) a case where it is repaid in equal amounts each year over several years. In both cases, we assume that the return (interest) is paid upon repayment of (i) the entire loan or (ii) each instalment, rather than on an ongoing basis through a coupon rate.

Let the capital below the line (loan transaction) be k_u and the capital above the line (ordinary allocation) be k_o, the market return be r_m and the return on the subsidised investment be r_s. Let T be the time horizon. We will determine how much capital k_o must be allocated above the line so that the total return corresponds to the return we would have obtained if the capital below the line k_u had been invested on market terms. We begin with that the value of the investment below the line, including interest on the amount invested above the line (left-hand side), should correspond to the value of the investment below the line when investing on market terms (right-hand side). For simplicity's sake, we use the final values as our starting point, which means that in a present value calculation we would use the same discount rate as in the calculation for coupon rates in section 3.3.1. This gives the following expression, which we solve for k_o:

$$k_u + (k_u + k_o)\Big[(\mathbf{1} + r_s)^T - \mathbf{1}\Big] = k_u + k_u\Big[(\mathbf{1} + r_m)^T - \mathbf{1}\Big]$$

$$(k_u + k_o)\Big[(\mathbf{1} + r_s)^T - \mathbf{1}\Big] = k_u\Big[(\mathbf{1} + r_m)^T - \mathbf{1}\Big]$$

$$k_o = \frac{\Big[(\mathbf{1}+r_m)^T-\mathbf{1}\Big]-\Big[(1+r_s)^T-\mathbf{1}\Big]}{\Big[(1+r_s)^T-1\Big]}k_u$$

$$k_o = \frac{R_m-R_s}{R_s}k_u$$

Here is R_m and R_s accumulated percentage return over T years on a market investment and the subsidised investment, respectively. The expression tells us that the grant above the line must be greater than the grant below the line.

$$\frac{R_m-R_s}{R_s}$$

Finally, we find the allocation above the line as a percentage of total investment, which represents the loss of revenue measured as a percentage:

$$\frac{k_o}{k_u+k_o} = \frac{R_m-R_s}{R_s}$$

We will now look at the case where the investment (loan) is repaid linearly over several years, with the first repayment (instalment) in T_1 and the last in T_f Each repayment is equal and we find a total loss provision by calculating the loss provision for each of the instalments separately, and then taking the average of these. The total loss provision is thus given by:

$$\frac{1}{T_f-T_1+1}\sum_{T=T_1}^{T_f}\frac{\Big[(\mathbf{1}+r_m)^T-\mathbf{1}\Big]-\Big[(1+r_s)^T-\mathbf{1}\Big]}{\Big[(1+r_m)^T-1\Big]} = \frac{1}{T_f-T_1+1}\sum_{T=T_1}^{T_f}\frac{R_{m,T}-R_{s,T}}{R_{m,T}}$$

The total return, which will correspond to the market return on the investment below the line, is recorded as income above the line. When the investment is repaid, the amount allocated above the line is returned as income above the line.

Vista Analyse AS Meltzers
gate 4
0257 Oslo

post@vista-analyse.no
vista-analyse.no

Rainforest
Foundation
Norway Mariboes
gate 8
0183 Oslo

rainforest.no

Regnskogfondet

VISTA ANALYSE