Sustainable action for a better tomorrow

SBC & MoT

Renewable Freight Certificate Assessment

Final

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Contents

Executive Summary

This report outlines the findings of a study investigating the feasibility of a Renewable Freight Certificate system. Such a system would allow certificates to be generated by low carbon freight assets, which can then be sold to freight users. The two key outcomes of this are:

- Money generated through the sale of the certificates will be used to help fund additional low carbon freight assets for freight providers.
- Certificate purchasers can reduce their Scope 3 freight carbon emissions.

The key findings of this study are:

- The RFC is feasible, and there are overseas frameworks which have recently been published demonstrating exact methodologies of how such a system could operate.
- An RFC system in NZ should align with these frameworks, specifically those produced by the Smart Freight Network.
- A similar (although simpler) system is operating in NZ already – the Renewable Electricity Certificate system has been operating for a number of years and illustrates that a significant portion of the country is willing to pay a cost premium in order to utilise certificates that reduce the carbon footprint of their organisation.
- The key next steps include undertaking a detailed demand assessment and forming a working group to confirm system details, including:
    - System naming
    - Inclusions (eg fuels, modes)
    - Pricing levels and structure
    - Entry requirements (such as adherence to WBCSD principles)
    - Ringfencing of funds
    - Calculation methodologies
- The likely timeframe until a system could be operational is 18-24 months.
- The likely overall setup cost covering the detailed demand assessment and working group facilitation and advice is ~$500,000+.

There has been significant interest in an RFC system from a range of companies in NZ, both in terms of generating RFCs and purchasing RFCs. Further, a number of organisations have indicated their desire support and help setup a system as they have identified it as a credible way to enable and speed-up the decarbonisation of heavy transport freight in the country. A collaborative approach across private companies and government entities is required in order to create a cohesive and well supported framework.

Next steps are summarised on the table below.

	Item	Timeline	Led by
A	Establish ongoing partnerships for participation and funding	2 months	SBC
B	Survey for potential demand		SBC/NZ Post
C	Establish detailed requirements for the Framework Creation group		DETA/SBC
D	Framework design and confirmation of system attributes (group task)	6 months	DETA/SBC
E	Construct certification system	6 months	NZECS
F	Framework marketing and rollout	6 months	Group

Glossary

EV – Electric Vehicle
BEV – Battery Electric Vehicle
FCEV – Fuel Cell Electric Vehicle (typically hydrogen fuelled)
REC – Renewable Electricity Certificates
SAF – Sustainable Aviation Fuel
PPA – Power Purchase Agreement
GLEC – Global Logistics Emissions Council
Tkm – Tonne kilometre. A metric of freight movements.
WBCSD – World Business Council for Sustainable Development
SBTi – Science Based Targets initiative.
Scope/Cat 1 emissions – Carbon emissions from sources that an organisation owns or controls directly.
Scope/Cat 2 emissions – Carbon emissions the organisation makes indirectly – specifically when the electricity (or energy) it purchases is being produced on its behalf.
Scope/Cat 3 emissions – Carbon emissions that are not produced by the organisation and are not the result of activities from assets owned or controlled by them, but by those that it's indirectly responsible for up and down its value chain.

1. Introduction

1.1 What is an RFC?

During previous SBC Heavy Transport work, and subsequent discussions with organisations, a common desire from a range of freight enablers was to be able to offer a "low carbon freight" solution to customers. This would see the customer being able to select to have their product delivered via a low carbon method, while paying a premium for the privilege. However, providers don't have a low carbon method on all possible routes, so want a way to transfer the attributes of a low carbon activity in one route to another.

Likewise, many commercial and industrial organisations are undertaking carbon reduction programmes and are searching for ways to reduce their Category 3 freight emissions - we envisage selecting the "low carbon freight" option would enable reductions in the Category 3 emissions to be realised through a carbon reporting framework.

For ease of description, we are referring to this system as the Renewable Freight Certificate (RFC) system. In general, these systems are based on "book and claim" methodology, which sees activity (or it's attributes) in one space transferred to another, via a certification system. The key feature of this approach is that it allows a customer to purchase the attributes of the original service (ie low carbon emissions), decoupled from the physical serviced that they ultimately receive.

It is important to note that an RFC system is not "offsetting", i.e. purchasing carbon credits. The RFC system enables reductions in carbon emissions to be decoupled from the actual activity and be transferred to another. This enables an organisation which is willing to pay for the carbon reductions to do so, potentially without actually having those reductions occur on their specific use.

One of the driving tenets of a system such as this is accurate and comprehensive certification. This ensures double counting does not occur, primarily that the users of the initial activity do not receive any carbon reduction benefit from it, unless they pay for the certificate.

1.2 Project Purpose

While there are some similar systems currently in place in NZ (such as the REC framework) and around the world (primarily for SAF trading), a range of complexities with freight transport mean an assessment of feasibility is required before attempting to launch such a system.

As such, this project has been undertaken to assess the feasibility of implementing an RFC system, answering a number of key questions and providing information around:

- The viability of implementing a system.
- Foreseeable challenges and opportunities for implementation.
- Next steps, including timeframes, required partners and costs.
- Entity to oversee the certification system.

- Analysis of estimated freight emissions reduction the system could enable.
- International examples and best practice.

1.3 Project Process and Participants

In order to fully gauge the feasibility of creating an RFC system, discussions, research and workshops have been undertaken with a wide range of stakeholders. Specific actions include:

- Two workshops with key technical organisations. Participants include SBC, MoT, Toitu and DETA.
- Information and discussion sessions with potential users of a RFC system, including Kiwirail, CHEP, ANZCO, HWR and NZ Post
- Information and discussion sessions with other technical experts, including EECA, NZECS and Waka Kotahi.
- Research into frameworks, protocols and similar overseas systems.

The findings from the above are summarised in this report.

2. Outline of RFC System

2.1 Operational Description

Operationally, an RFC system would have two parts:

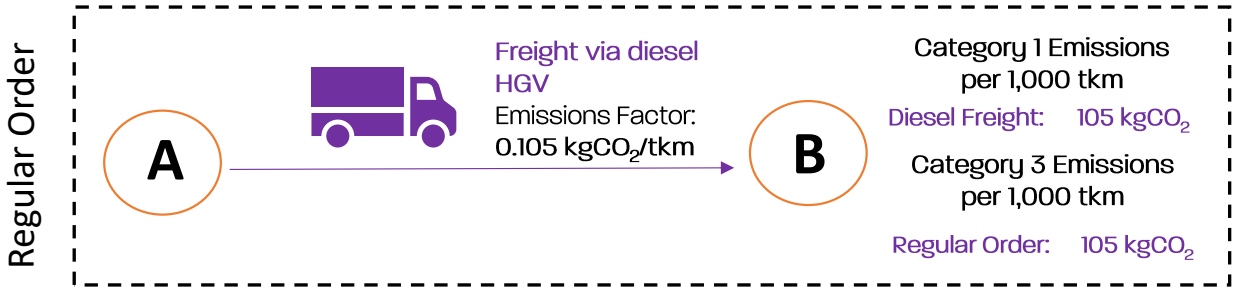
- **RFC generation.** A freight provider would purchase and operate a low carbon vehicle (typically EV, FCEV, renewable liquid fuel or similar). The energy use (and therefore carbon emissions of the vehicle) is recorded, along with the tonnage and distance the freight is moved. This would generate RFCs for xxx tkm at yyy $kgCO_2$/tkm.
- **RFC use.** A freight receiver can choose to purchase an RFC for freight which is delivered to them. This route may or may not have a low carbon delivery option available, but in purchasing the RFC (with a price premium beyond the normal costs for the freight journey) the receiver is entitled to reduce their Scope/Catergory 3 emissions by the appropriate amount. The RFC is then retired from the registry. The amount of RFC required would be assessed by the tkm travelled by the freight.

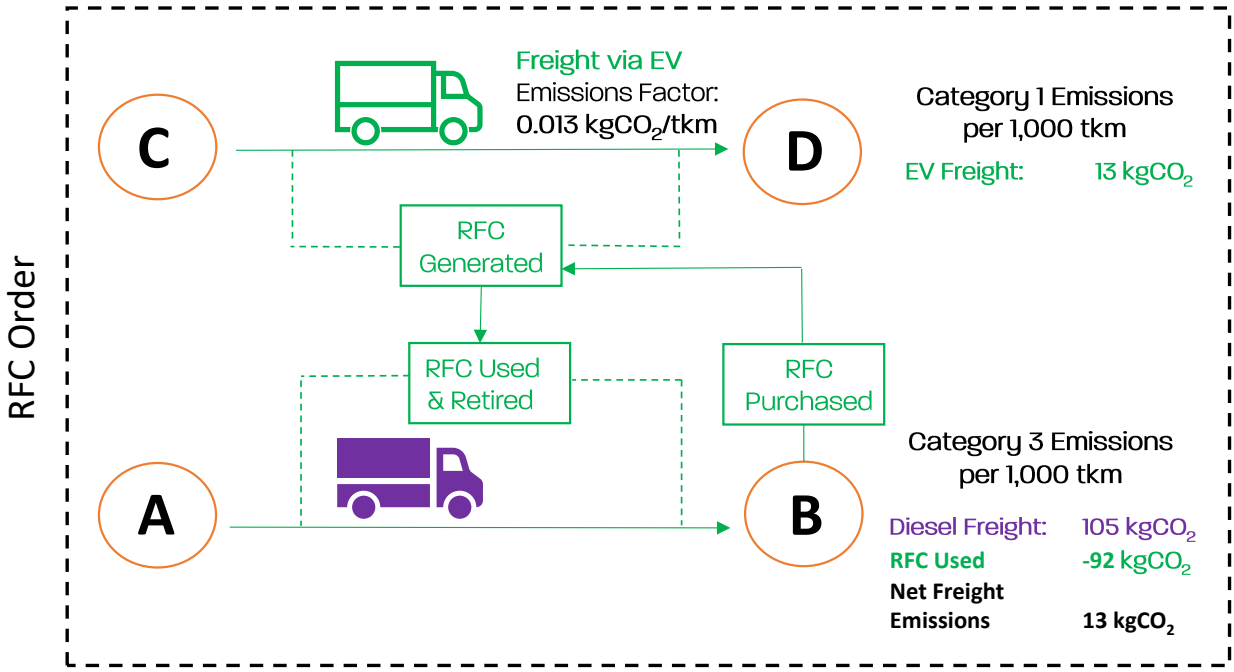
The above enables the freight provider to reduce their Scope/Category 1 emissions and receive funding for additional low carbon vehicles, while the freight receiver reduces their Scope/Category 3 emissions.

It should be noted that through our conversations with relevant stakeholders, it appears that systems are already being rolled out to provide more detailed information, that could be easily rolled into an RFC system. Examples include more detailed vehicle monitoring information from Eroad and parcel delivery carbon calculators from NZ Post.

2.2 Infographic

The infographic below outlines how such a system would operate. Note that it assumes a grid average electricity emissions factor of 0.07 $kgCO_2e$/kWh.





2.3 Worked Example

The below example, and in general the proposed operation of the RFC system, is in alignment with international practice and based on frameworks endorsed by the Smart Freight Network, as outlined in Section 3.1.

RFC Generation

A 20T EV truck is purchased and provides freight services between Auckland and Tauranga daily (260 days per year), with an annual logged distance of 104,000 km and freight moved of 10,400 T. Electricity use of the truck was measured as 376,000 kWh for the year and the EV is recharged with grid electricity (emissions factor of 0.07 $kgCO_2e/kWh$) for a total of 27,900 $kgCO_2e$.

This operation generates RFCs covering 2,080,000 tkm @ 0.013 $kgCO_2e/tkm$.

Because the RFCs have been generated, no Scope/Category 3 emissions reductions have occurred for the freight receivers in Tauranga.

RFC Use

A facility in Invercargill purchases bulk cement form the Port of Timaru, two 20T loads per week. The distance travelled is 400 km, providing total annual freight of 832,000 tkm. The facility wants to reduce their Scope/Category 3 transport emissions so purchases the equivalent amount of RFCs to cover this. At a rate of \$100 /tCO_2e, this correlates to \$7,600. The Scope/Category 3 change includes:

- Base Scenario - emissions of 832,000 tkm x 0.105 $kgCO_2e/tkm$ = 87 tCO_2e
- RFC Scenario - emissions of 832,000 tkm x 0.013 $kgCO_2e/tkm$ = 11 tCO_2e
- RFCs have resulted in a reduction of 76 tCO_2e

A department store in Gisborne has ordered delivery of 3 tonnes of goods from Tauranga each day. The goods are freighted on a truck with a range of goods for other users. The distance travelled is of 275 km, providing total annual freight of 300,300 tkm. The store wants to reduce their Scope/Category 3 transport emissions so purchases the equivalent amount of RFCs to cover this. At a rate of $100 /t$CO_2$e, this correlates to $2,800. The Scope/Category 3 change includes:

- Base Scenario - emissions of 300,300 tkm x 0.105 kgCO_2e/tkm = 32 tCO_2e
- RFC Scenario - emissions of 300,300 tkm x 0.013 kgCO_2e/tkm = 4 tCO_2e
- RFCs have resulted in a reduction of 28 tCO_2e

Following these two RFC purchases (and retirement), RFCs of 947,700 tkm (@ 0.013 kgCO_2e/tkm) are still available for use for the EV truck owner, and they have received $10,400 to aid in the purchase of additional low carbon transport equipment.

2.4 Specific inclusions

Through the assessment undertaken there have been a number of specific points raised which would need to be included/considered in such a system:

- Rather than zero carbon, a low carbon instrument is needed as there are very few circumstances in which a fuel is truly zero carbon. The residual carbon generated by the low carbon vehicles would need to be measured and assessed as part of the RFC generation. In order to achieve this, the origin of the fuel, along with specific emissions in the production and transport would need to be understood. This will require detailed information on each fuel source:
    - Electricity – charging location of EV trucks may be required in order to accurately reflect the carbon emissions. However, as a default, assuming the worst-case scenario of grid average emissions intensity could be an option.
    - Hydrogen – refilling location and certification of emissions of the hydrogen would be required. For example, hydrogen generated with electricity purchased by PPA with a wind farm would have zero emissions, compared to hydrogen generated with grid average electricity.
    - Renewable Liquid Fuels – certification of feedstock type, emissions during processing and transport would be required from the supplier in order to get an accurate emissions factor for liquid fuels.
- The certificates could cover a range of fuel and technology types, including EV, FCEV, renewable fuels, in both full and part offsets.
- Because a freight certificate is measured in tkm, the trading of certificates could happen within a single company, across companies who operate the same freight modes (e.g. trucks) or potentially across modes. Cross modal trading would need further consideration.
- Standard mode shift (e.g. the savings realised from moving from road to rail) cannot be included in this system, but still has significant benefits to the user in terms of lower carbon emissions, and the country as a whole through reduced emissions, congestion etc.
- A key attribute to ensure transparency is the requirement that money generated through the sale of RFCs are ringfenced for additional purchases of low carbon freight vehicles or

associated equipment (such as chargers). This ensures that all money paid directly helps to reduce future emissions in the country.

- There will need to be requirements for detailed operational measurements on vehicles which wish to partake in generating RFCs. This is likely to be an Eroad (or similar) monitoring system, which can measure distance travelled, as a minimum.

3. Considerations

3.1 International Protocols

There are a range of international protocols and organisations which endorse programmes similar to the proposed RFC system, primarily in the book and claim space. However, there are some key points to note:

- Organisations such as SBTi do not currently have a framework in place to include "book and claim" trading in their carbon assessments and reduction framework.
- There is interest in book and claim, primarily in the Sustainable Aviation Fuels market. This allows SAF to be used in a relatively small area, but the benefits felt and paid for by a much wider range of stakeholders without the need to create a whole distribution network.
- The Smart Freight Centre has been instrumental in setting up methodologies around how book and claim systems work, and how carbon emissions from logistics organisations should be measured[1]. These methodologies are built on the GHG protocol, and given the international interest in these systems, we believe it is likely that they will be incorporated into the SBTi frameworks in the coming years. However, this cannot be guaranteed.
- The Smart Freight Centre has recently released a document[2] which outlines a framework for freight providers to effectively partner with each other to deploy low emission transportation services. This framework builds on the standard book and claim methodologies and the GLEC framework and creates a system which directly relates to the proposed RFC system.
- The WBCSD has a document which provides guidance for organisations undertaking carbon reduction initiatives[3]. This provides a range of recommendations to help ensure a robust and transparent system. There are three key pillars recommended for organisations/systems:
    - A company should have an externally reported carbon reduction target, carbon footprint and reduction plan across Scopes 1, 2 and 3.
    - The solution has mitigation potential according to the latest climate science and recognised sources.
    - The solution has direct and significant decarbonisation impact.

Given the above, while an RFC system is not currently endorsed by SBTi, there are various frameworks which outline a common approach and international organisations who are actively supporting their application. Aligning the RFC system to these will provide system creditability and aid in recognition by SBTi and is crucial to ensure a well-functioning system.

[1] https://www.smartfreightcentre.org/en/our-programs/global-logistics-emissions-council/calculate-report-glec-framework/

[2] https://smartfreightcentre.org/en/about-sfc/news/new-accounting-framework-to-address-barriers-to-transport-decarbonization/?utm_source=flexmail&utm_medium=e-mail&utm_campaign=sfcpublicationsandwebinars264smartfreightnewsjune20230627t153634175z&utm_content=here

[3] https://www.wbcsd.org/Imperatives/Climate-Action/Resources/Guidance-on-Avoided-Emissions

3.2 Certification

Certification of a system is a requirement to ensure that it operates as designed, there is no double counting and in general to provide assurance to users that it is effective and robust. Through discussions with the NZ Energy Certificate Scheme (NZECS), it appears that their certification system would be suitable for the RFC system. This system was set up to allow trading and operation of Renewable Electricity Certificates (REC) and is based on similar principles to the RFC system.

3.3 Demand

Through our discussions with various parties, it has been clear that some organisations are very keen to partake in the generation and use of freight certificates. However, the interest varies widely from organisation to organisation and there are some key drivers which enhance interest:

- **Value of product moved** – the trader of a high value product is more likely to be interested in an RFC. The additional cost of an RFC can be more easily incorporated onto a high value product, whereas lower value products may struggle to pay the additional premium.
- **Area of operation** – some organisations have more stringent requirements regarding carbon reduction targets, such as exporters and government departments. These organisations are more likely to pay a premium for RFCs.
- **Emissions profile** – an organisation with a large proportion of Category 3 emissions is more likely to engage with the system in order to meet targets. Where an organisations emissions are predominately Category 1, we believe their primary focus will be in reducing these.
- **Sales requirements** – an increasing number of products are requiring to be sold with various zero/low carbon freighting solutions, such as exporting of food products into Europe. RFCs may be required by organisations with this exporting in order to maintain their markets.

As a comparison, we have had discussions with NZECS (the certifying organisation for Renewable Electricity Certificates in NZ) and they outlined that currently almost 4% of electricity purchased in NZ is contracted under a REC contract – this sees a premium paid in order to eliminate Catergory 2 emissions.

Further, growth in REC purchasing has been steadily increasing between 50% and 100% each year since inception.

During more detailed discussions with NZ Post, they believe there is a market for the product and would be more likely to offer this to their large, premium customers to help generate overall demand. A rollout to smaller, individual users could follow this, once the systems have become established.

3.4 Price

As with indications of demand, there have been significantly different opinions around the level of price an organisation is willing to pay for an RFC, ranging from nothing, up to an additional 10%

in freight cost. We believe further work is required to gauge actual demand, which could be undertaken via a survey of SBC members, or a similar process.

While the market will likely set the price of a RFC, we believe:

- The price will be higher than that of a REC. A REC is equivalent to $40/tCO$_2$e, and at this level it would only increase the fuel cost of a truck by ~6% per year. We don't believe this would be sufficient to drive incentives to create RFCs.
- The price will be higher than that of the ETS. At the current ETS cost of $50/tCO$_2$e, the fuel cost of a truck would increase by ~8%. An RFC would have significant reporting advantages when compared to ETS offsetting, and a premium is therefore justified. Further, the majority of decarbonisation projects in NZ are currently costing well above the ETS rate. This indicates that organisations are willing to approve these projects based on factors other than ETS savings alone.
- It is possible that the price of an RFC would be equivalent to ~$100/tCO$_2$e ie above the level of the ETS – this premium is justified as an RFC system would enable gross emissions of the organisation to be reduced, rather than a reduction in net emissions seen with the purchase of ETS offsets. At this level, the cost of fuel for the truck would increase by ~18%, and once other charges are included (such as labour, maintenance, depreciation etc) the overall premium is likely to reduce below 10% of total freight cost.

The current emissions from road transport are approximately 3,500,000 tCO$_2$e. Assuming only 1% is moved under an RFC arrangement at a price of $100/tCO$_2$e, the annual payment figure would be $3,500,000 and would help to generate 35,000 tCO$_2$e of carbon reductions.

As a comparison, REC purchases (at 4% of total NZ demand) correlates to a premium paid by organisations of $4,600,000 per year.

3.5 Naming

To date the system has been based on a Renewable Freight Certificate (RFC). Through this investigation it has become clear that a certificate will be required, but that an overall name change is recommended to better reflect the nature of the proposed system. Examples include:

- Reduced Emissions Road Freight Certificate
- Low Carbon Road Freight Certificate

Alternatives would include removing the word Road, to make a more generic system that could be streamlined over different modes, or creating additional certificates covering the Rail and Coastal Shipping modes also:

- Low Carbon Freight Certificate
- Low Carbon Rail Freight Certificate

3.6 Public Perception

While such a system will help drive a transition to a lower carbon freight sector, care will need to be taken to ensure that users understand how the system operates. This is particularly crucial

as a client may be disappointed when they select a low carbon delivery option and their freight arrives in a standard diesel truck. Sufficient information and support will need to be provided to overcome this.

We believe this is more likely to be an issue in the consumer market. In the corporate market the primary driver will be Category 3 emissions so is likely to be less of an issue.

3.7 Self sufficiency

We anticipate that once a significant portion of freight is moved via a low carbon source, an RFC system may no longer be required. At this time, the system could either be closed, or a more natural process of decline undertaken.

Because the market will set the price, as the value to the perceived individual users reduce, the price of RFCs will also need to reduce to ensure that they are still purchased. If at a point in time the price of an RFC is so low that it is no longer worthwhile to partake, the system will likely close out naturally.

4. Next Steps

4.1 Survey of potential demand

During the investigations it became clear that there will be some organisations who are keen to participate in an RFC system, and some who are not. In order to create a more comprehensive list of potential organisations, NZ Post and DETA discussed information sessions for a number of premium NZ Post clients (such as Office Max, The Warehouse), outlining the system, benefits, costs and overall operation.

Further, a survey of other potential users (such as SBC and ERoad members) would be beneficial in order to gauge overall interest.

As such, we recommend undertaking further demand assessment, as per the two items above, to provide greater certainty regarding system use.

4.2 Modify Certification System

While the underlying certification system is largely in place due to NZECS setting up the REC system, there would need to be modifications and additions to account for different fuel types and the particular requirements of the RFC system. Speaking with NZECS, this is likely to take less than a year.

4.3 Creation of RFC Framework

The major work required is to fully scope the system and effectively create a marketable framework that the members want. This would stipulate items such as:

- Naming
- Inclusions (eg fuels, modes)
- Pricing levels and structure
- Entry requirements (such as adherence to applicable WBCSD principles)
- Ringfencing of funds
- Calculation methodologies

While this report has tentatively outlined a number of these already, it is crucial that buy in is received from initial users to ensure the system is fit for purpose and provides the incentives required.

These items should be decided by a core group of interested parties, nominally SBC, DETA, Toitu, plus foundation members who wish to pioneer and use the system, such as NZ Post, CHEP, and HWR. Technical support would be required from associated parties (such as NZECS, MoT, Waka Kotahi, EECA, ERoad) on an as required basis, and the system would be setup to ensure participation by a range of parties not in the initial group.

The key output of this group is a marketable system that would drive the low carbon transition of heavy freight. This system would operate over top of the NZECS certification system.

4.4 Timeframes

We believe that a realistic timeframe for both the RFC framework creation and updating the certification system is 18-24 months, and that these could operate alongside the demand survey.

4.5 Costs

The costs of setting up this system will be substantial, and are estimated as:

- **Demand Survey Support - $20,000** (based on 70 hours of work).
- **RFC Creation Framework – Estimated at $500,000+.** These costs would likely be spread across key parties as required, including:
    - Consultancy fees for DETA, Toitu and NZECS = ~$200,000.
    - Marketing and communication costs = ~$100,000.
    - Certification framework upgrade costs = ~$100,000.
    - Other required fees = ~$ 50,000.
    - Misc project costs = ~$ 50,000.
- **Ongoing costs.** We anticipate that the ongoing costs of the RFC system would be funded through fees paid by users, including a setup fee per asset, a small base annual fee and a portion of the RFC cost going towards NZECS for the ongoing operation and maintenance of the certification system, as is done in the existing REC system.

Note that these costs are estimates only and would need confirmation.

4.6 Action Summary

The items above cover the next steps in general, and the table below outlines these in a summary, with additional details around timing and responsibility:

	Item	Timeline	Led by
A	Establish ongoing partnerships for participation and funding	2 months	SBC
B	Survey for potential demand		SBC/NZ Post
C	Establish detailed requirements for the Framework Creation group		DETA/SBC
D	Framework design and confirmation of system attributes (group task)	6 months	DETA/SBC
E	Construct certification system	6 months	NZECS
F	Framework marketing and rollout	6 months	Group

We anticipate that there will be some overlap in tasks, in particular items D and E

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