Residual Value Deep Dive

Understanding and Implementing Residual Value Guarantees (RVGs) for Zero-Emission Trucks (ZETs)

Monday 2nd June

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Agenda

- **Aims of the session (minutes 0-5)**
- Introduction
- Why care about residual value risk?
- Solutions to mitigate residual value risk
- Discussion: How is residual value risk currently being dealt with?
- What is a Residual Value Guarantee?
- Q&A
- Designing an RVG: discussion of key considerations
- Final reflections
- Recap & Next steps

Session Aims & Outcomes

Aims

- Provide examples of different approaches for mitigating residual value (RV) risk for zero emission (ZE) medium and heavy-duty vehicles (MHDVs), and when RVGs can be helpful
- Support policymakers and companies to understand how residual value guarantees (RVGs) work, and why they are a compelling solution
- Prepare participants for implementation through participatory implementation strategizing (learn and own by doing)

Outcomes

- Equip policymakers and companies with knowledge, resources and step-by-step plans needed to advance RVGs in their countries
- Identify opportunities for GFI and CALSTART to offer tailored assistance for RVG implementation

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Green Finance Institute

An independent advisor to governments, trusted by financial institutions and led by mission-driven finance experts, the Green Finance Institute (GFI) provides a neutral platform to co-design, test and scale new financial solutions and opportunities that channel global capital into net-zero and nature positive outcomes.

Our work

The GFI is at the forefront of shaping how finance can be used to facilitate real economy transition, globally. We create the enabling environments and financial solutions needed to accelerate the transition to a net-zero and nature positive economy.

We test, demonstrate, and scale financial solutions across sectors and geographies, with a tenacious focus on practical outcomes. Often, this involves operationalising pioneering concepts and breaking down barriers to action to enable capital to move between two counterparties.

Our Strategic Advantage

Since our inception in 2019, our pragmatic approach to channelling capital to facilitate real economy change has shaped the discourse around green finance. As an independent company with a proven track record, our credibility, capability and cross-sector engagement enable us to respond to market barriers and develop solutions where others can't.



Our Vision

We believe in a greener future made possible by finance.

Our Mission

We are accelerating the transition to a clean, resilient and environmentally sustainable economy by channelling private capital at pace and scale towards real-economy outcomes, creating jobs and increased prosperity for all.

Proven approach for sectoral transition

By testing, demonstrating and scaling new financial products and solutions, the GFI has formulated a proven methodology for creating new asset classes and channeling global capital towards local solutions.

1. Identify financing needs by sector

New approach to sectoral transition with technical analytics to identify investment gaps and opportunities

2. Design solutions

Innovation by GFI's finance and market experts creates new solutions, market enablers and policy frameworks

3. Market development

Test, demonstrate and scale new solutions and frameworks via strategic partnerships

4. Deliver impactful outcomes

Mobilise capital towards net-zero and resilient outcomes by embedding and scaling solutions

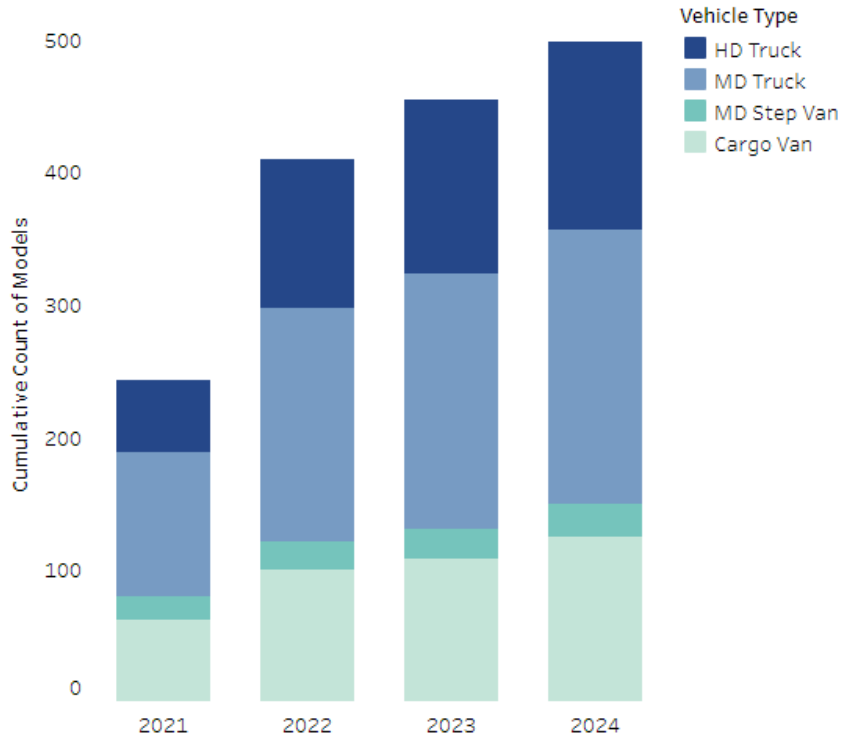
5. Replicate and Scale

Expand our work on pillars 1 - 4 into adjacent sectors and regions

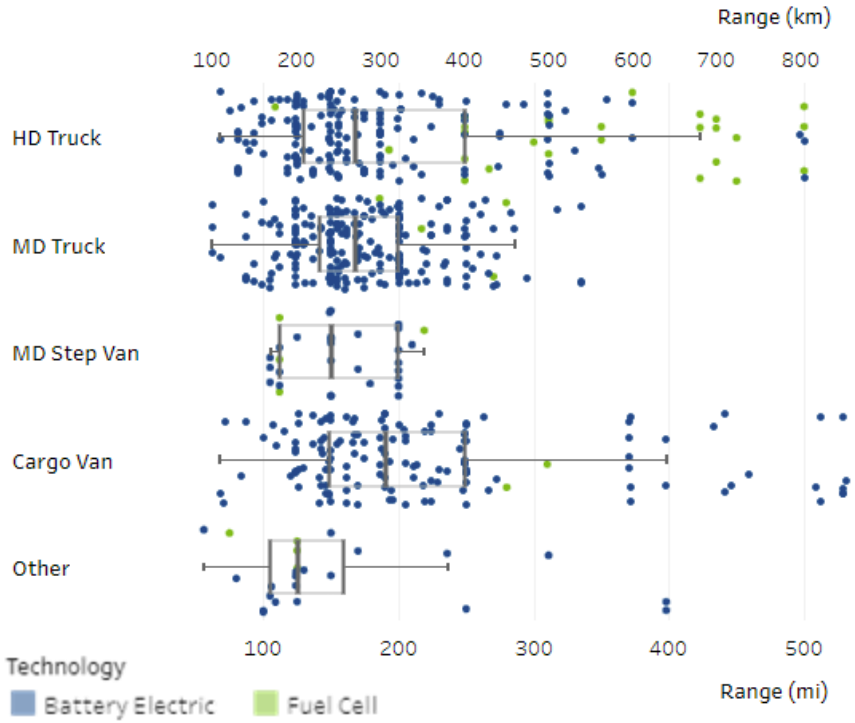


ZE-MHDV are commercially available and able to cover the vast majority of duty cycles; deployment expected to increase drastically driven by regulatory requirements

500+ ZE-MHDVs on the market

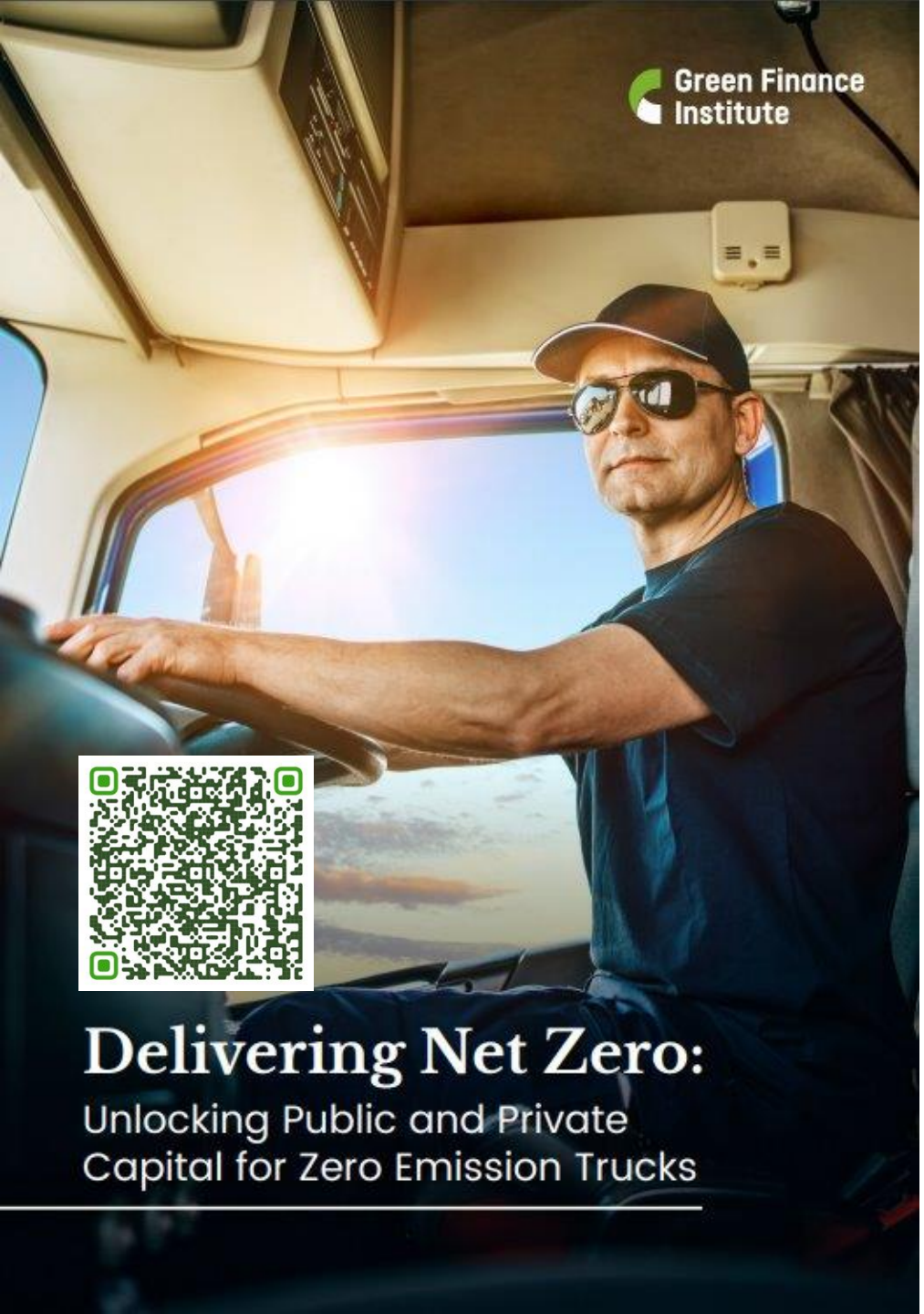


Average 200-400km range



Source: CALSTART (2024). ZETI Data Explorer

With 40 Global MOU signatory nations (as of May 2025), ZE-MHDV sales requirements will ramp up sales in major markets, to reach 80-100% of new sales by 2036-2040 in the US (California +10) and the EU.



Significant additional private investment will be needed to transition diesel MHDV fleets

- In 2024, ZEVs represented more than 1% of the European Market
- GFI report identified **a £50 to £100 billion investment gap** to transition the remaining UK HGV fleet to zero emission.

	Additional Investment
Replace entire UK HGV fleet with ZETs	£41 - £75 billion
Install depot infrastructure	£11 - £24 billion
Install public infrastructure	£1 - £2 billion
Total Additional Cost to Transition	**£50 - £100 billion**

Source:: GFI (2024). Delivering Net Zero

- In the EU, T&E estimated that the cost of decarbonising the heavy vehicle fleet by 2050 will require an investment of **€783 billion.**

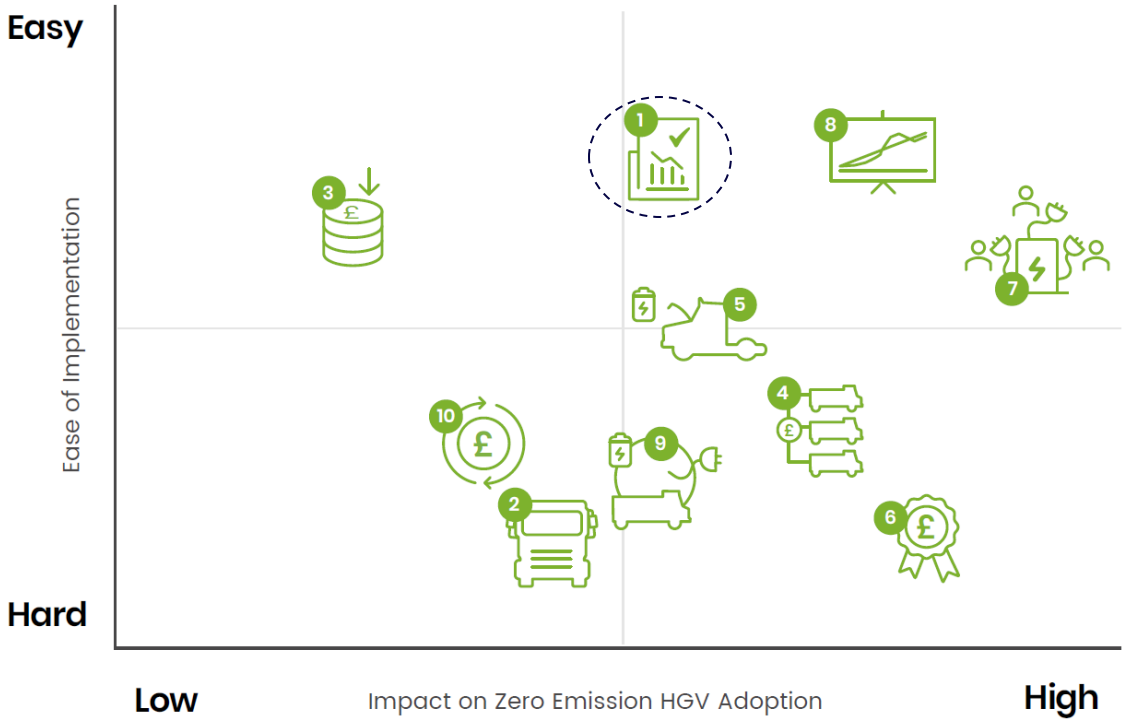
Heavy duty vehicles	2025-2030	2031-2035	2036-2040
Total needs (€bn)	142.7	301.1	339.9
Yearly needs (€bn)	23.8	60.2	68.0
Direct Cap-Ex (€bn)	15.7	33.1	37.4
Total public investment (€bn)	35.0		
Share of public investment	25%		

Source: Transport & Environment (2024). Financing transport decarbonisation

- **79%** of European transport operators own < 10 trucks (T&E, 2024), many do not have access to external capital or financing.

Together with experts we identified 10 innovative financing solutions that could help unlock the investment needed to transition the HGV fleet to zero emission

Further stakeholder engagement confirmed that **RVGs** would be particularly impactful in unlocking barriers to ZET adoption



Solutions for Trucks

1. Residual Value Guarantee
2. Shared HGV Risk Agreement
3. Concessional Loan
4. Demand Aggregation
5. Component Leasing
6. Small Operator Loan Default Guarantee

Solutions for Infrastructure

7. Shared Charging Infrastructure Agreement
8. Utilisation Linked Financing
9. Integrated End to End Financing
10. Revolving Fund

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- **Why care about residual value risk? (minutes 5-10)**
- Solutions to mitigate residual value risk
- Discussion: How is residual value risk currently being dealt with?
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Why care about RV risk? (1)

Definition: RV is the estimated worth of a vehicle at the end of a finance or lease contract. RV risk refers to the risk that the actual market value of the vehicle at the end of the contract will be lower than the estimated residual value, which on sale of the asset, could result in the owner incurring a financial loss.

Why is it a problem for zero-emission MHDVs?

- RV risk is perceived to be much higher for ZE-MHDVs than diesel due to a lack of resale pricing data, and greater uncertainty about technology obsolescence and battery health.
- RV is often the most significant factor in determining the quantum of loan or lease payments, since borrowers or lessees will pay for depreciation.
- Higher RV risk leads to lessors assigning very low RVs, increasing the rate of depreciation and the value of loan and lease payments.
- Perception of risk is making ZET loans and leases more expensive, and financing harder to access since lower perceived collateral value results in fewer successful applications for asset-backed finance.

RV risk is increasing the cost of ZETs for operators and **reducing adoption**.

Why care about RV risk? (2)

- Upfront cost is one of the key barriers to adoption of ZETs, typically 2-3x the price of a diesel equivalent.
- With strong RVs, RV-based financing can often offer the most cost-effective way for fleet operators to access a vehicle.
- Leasing and financing solutions supporting over 90% of BET deployments (CALSTART, 2024c), widespread expansion of attractive financial offerings is critical.

Getting BET RVs on par with diesel RVs is critical to unlock a hundred-billion plus market opportunity in time to meet international targets:

- Carbon Tracker has estimated that the global heavy duty vehicle sales market could reach $100 billion as soon as 2026, and $320 billion by 2035 (Carbon Tracker, 2025).

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- Aims of the session
- Introduction
- Why care about residual value risk?
- **Solutions to mitigate residual value risk (minutes 10-15)**
- Discussion: How is residual value risk currently being dealt with?
- What is a Residual Value Guarantee?
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Solutions to mitigate residual value risk

Long term ownership: some operators are planning to keep ZETs longer than they typically keep ICE vehicles to ensure sufficient return on investment.

Buy-back clause: some OEMs and dealers are offering customers the ability to sell their vehicle back to them for a guaranteed price.

Battery re-deployment: companies such as Zenobe are demonstrating how a ZET battery can be re-deployed to other use cases such a stationary storage units, providing dealers and vehicle / fleet owners with an additional source of revenue.

Residual value guarantee: an RVG could help mitigate losses from lower-than-expected RVs, protecting financiers or lessors for ZET lending/leasing at a lower cost than direct subsidies.

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- Aims of the session
- Introduction
- Why care about residual value risk?
- Solutions to mitigate residual value risk
- **Discussion: How is residual value risk currently being dealt with? (minutes 15 – 25)**
- What is a Residual Value Guarantee?
- Q&A
- Designing an RVG: discussion of key considerations
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Discussion (minutes 15-25)

How are participants dealing with residual value risk?

We now invite participants to share their experiences with residual values, how this compares to experiences with diesel, and any successful methods they have seen for companies in addressing RV risk for ZETs.

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- Aims of the session
- Introduction
- Why care about residual value risk?
- Solutions to mitigate residual value risk
- Discussion: How is residual value risk currently being dealt with?
- **What is a Residual Value Guarantee? (minutes 25 – 40)**
- Q&A
- Designing an RVG: discussion of key considerations
- Final reflections
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What is a residual value guarantee?

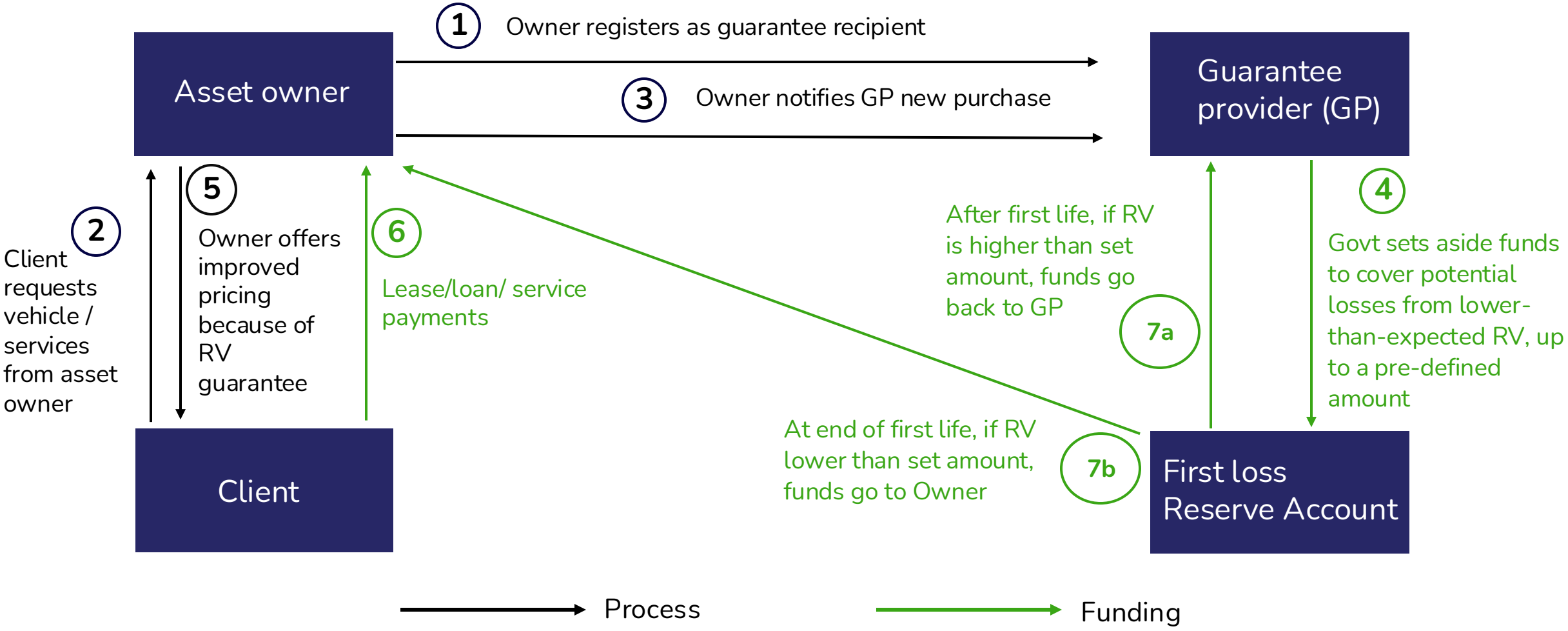
Function:

- Typically provided by a government, an RVG is a financial mechanism which provides financial support for lenders and lessors of ZETs. An RVG can also be provided by a third party, such as an insurance provider.
- For approved lenders/ lessors, an RV can mitigate the risk associated with ZET leasing and ownership by covering a portion of potential losses between a vehicle's actual resale value and a predefined benchmark.
- It also offers governments a way to recoup funds if ZET values outperform expectations, by requiring repayment in the case that resale values are higher than the benchmark.

Benefits:

- It can reduce the cost of lease payments, making electric trucks more affordable and cheaper than upfront subsidies. It can also increase the number of successful loan applications for ZETs.
- RVGs are a promising tool for governments to reduce costs of ZE-MHDV adoption while minimizing public spending: RVG only pays out if the market does not behave as expected.
- By stimulating early demand, the RVG accelerates market maturity until it can eventually be phased out and replaced by private sector solutions.
- Offers potential to generate income and even share in upside.

How an RVG would work



Economic Benefits

Example:

- A $10 million reserve for residual value guarantees could mobilize close to $250 million in BET investments.
- The program would set a reasonable BET RV of 20% of its retail price after five years, by setting aside 20% of its expected RV to act as first or second loss.
- Considering an urban medium-duty truck with a retail price of ~$171,000, this would bring up its residual value from the current near zero to $27,000 NPV, which would bring down the cost of the fleet's periodic finance payments.
- A $10 million budget would allow the program to support 1,455 urban medium-duty trucks, resulting in over $32 million in savings for fleets, and helping mobilize close to $250 million in total investments into BETs.
- The $10 million reserve would only be spent if the conservative RV ends up being lower than the actual resale price, which would be unexpected.

Achieving a similar cost reduction through upfront cost subsidies alone would require 2.5 times more public spending, without the upside of potentially not having to spend the money or even sharing in the upside.

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- Introduction
- Why care about residual value risk?
- Solutions to mitigate residual value risk
- Discussion: How is residual value risk currently being dealt with?
- What is a Residual Value Guarantee?
- **Q&A (minutes 40 – 50)**
- Designing an RVG: discussion of key considerations
- Final reflections
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Q&A (minutes 40 - 50)

We invite participants to ask questions or share thoughts related to the concept of what a RVG is, how it might work & the economic rationale.

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- Q&A
- **Designing an RVG: discussion of key considerations (minutes 50 – 105)**
- Final reflections
- Recap & next steps

Designing an RVG: discussion of key considerations

*Using excerpts from the **RVG Blueprint** developed by GFI & CALSTART, we will provide suggestions to consider when setting up a RVG to provoke thoughts and discussion around how an RVG can respond to local market conditions.*

These suggestions are offered based on industry feedback, mostly from companies in the United States and the United Kingdom and may not be applicable to all cases.

A thorough, tailored assessment including local financiers, fleets, suppliers, and other key stakeholders is strongly recommended.

1. Who and what does the guarantee cover?

A. The guarantee should aim to provide coverage for as many vehicles as possible, regardless of their preferred ownership model.

- *Early adoption sees a mix of ownership models, with some fleets preferring to own, others to lease, and others to use hire purchase or other types of asset-backed financing.*
- *The guarantee would be expected to see higher early traction if it can provide coverage to **whichever party takes on the residual value risk**.*
- *The guarantee program can do so by allowing any leasing provider, financier or asset owner to register for the program and request coverage for specific vehicles on which they have exposure to residual value risk.*
- *Ability to claim under the guarantee should be transferrable to investors that provide capital to financiers.*

1. Who and what does the guarantee cover?

B. Limited funding should prioritize vehicle segments with higher mileage and pollution levels, where commercially available models can meet most user needs

- *Prioritizing heavier vehicles offers more societal benefits: heavier vehicles are used more and pollute more. Compared to a passenger car, a class 8 (+33,001 lbs) truck covers six times the number of annual miles (AFCD, 2024), and emits around four times more CO2, 30-50 times more PM, and 30-100 times more NOx (EPA, 2024).*
- *At the same time, the more a vehicle is used, the more it will reap the operational savings offered by battery electric technology.*
- *As the market matures and some vehicle segments begin to see higher consumer demand and more substantial resale data, the guarantee's scope can be gradually scaled back and focused on the segments where support is needed the most.*

1. Who and what does the guarantee cover?

A. *The guarantee should aim to provide coverage for as many vehicles as possible, regardless of their preferred ownership model.*

B. *Limited funding should prioritize vehicle segments with higher mileage and pollution levels, where commercially available models can meet most user needs*

Discussion (50 - 65 minutes)

1. **How do the above rationale apply in your respective jurisdiction?**
2. **Are there any specific segments you think the guarantee should focus on first (in its trial phase), taking national or subnational policy into account?**

2. Identify the organization(s) best suited to act as guarantee provider, capital provider, and lead implementer

A. Identifying the operational lead and capital provider

Depending on the roles and responsibilities agencies have in different jurisdictions, the ***operational lead/ guarantee provider*** *could be:*

- *A government agency (such as the California Pollution Control Financing Authority in California),*
- *A development bank (such as the British Business Bank in the UK, or Nacional Financiera in Mexico),*
- *A green bank (such as the New York Green Bank), or another kind of public-backed financial institution.*

The guarantee provider would operationalize the resources provided by the ***capital provider*** *(another government agency, international cooperation, or philanthropy).*

2. Identify the organization(s) best suited to act as guarantee provider, capital provider, and lead implementer

B. Funded vs unfunded

Funded programs

- *Funded programmes require a budget for each guarantee issued being set aside in a reserve account, and being kept there until the guarantee has expired.*
- *Increased assurance, particularly where the credit rating of the entity providing the guarantee is low or there is a history of default.*
- *Preferred by industry, often due to quicker payment times.*

Unfunded programs

- *Depending on government accounting methods, may not necessarily require budget to be set aside to cover all guarantees issued which can make them easier and quicker to set up.*
- *Financiers have indicated that not knowing that the funds are reserved and to be claimed if needed reduces the confidence they can put on the guarantee program itself.*
- *Reduced uplift in credit rating, reducing ability to mobilise institutional capital.*

2. Identify the organization(s) best suited to act as guarantee provider, capital provider, and lead implementer

C. Sources of Funding

- *The guarantee can be designed to blend multiple funding sources with different return requirements.*
- *Sources of capital can include government funds, donor or philanthropic funds, concessional debt, and/or industry participation fees.*
- *Since RVGs are not being offered by the market organically, grant-equivalent funding is likely required. This may come from government's budgets, private philanthropies, overseas development assistance programs, carbon credit auctions, or other sources of funding which may be willing to accept below-market returns.*
- *These may be complemented by industry participation fees, which are charged to financiers interested in participating in the program, making the program work as an insurance product, albeit offering more robust protection than what would typically be offered on the private market for that amount.*

2. Identify the organization(s) best suited to act as guarantee provider, capital provider, and lead implementer

A. *Identifying a guarantee-provider (operational lead), capital provider & lead implementor*

B. *Funded vs unfunded*

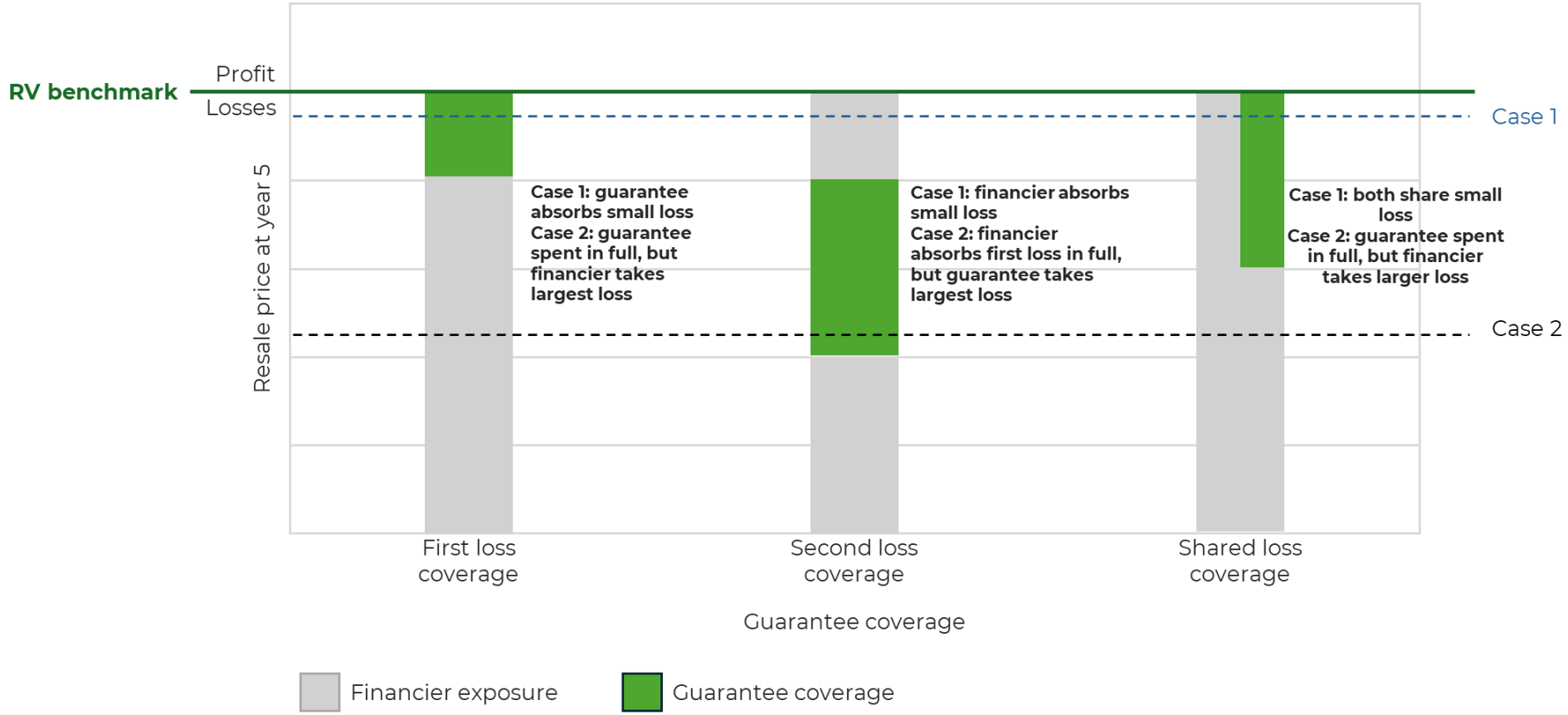
C. *Sources of funding*

Discussion (minutes 65 - 85)

1. **Which organisations are most suited to act as operational lead and capital provider in your jurisdiction?**
2. **Would a funded or unfunded guarantee be more suitable in your jurisdiction?**
3. **Can you share any experiences of schemes or initiatives that could raise capital for an RVG, for example carbon credit schemes or road toll charges?**

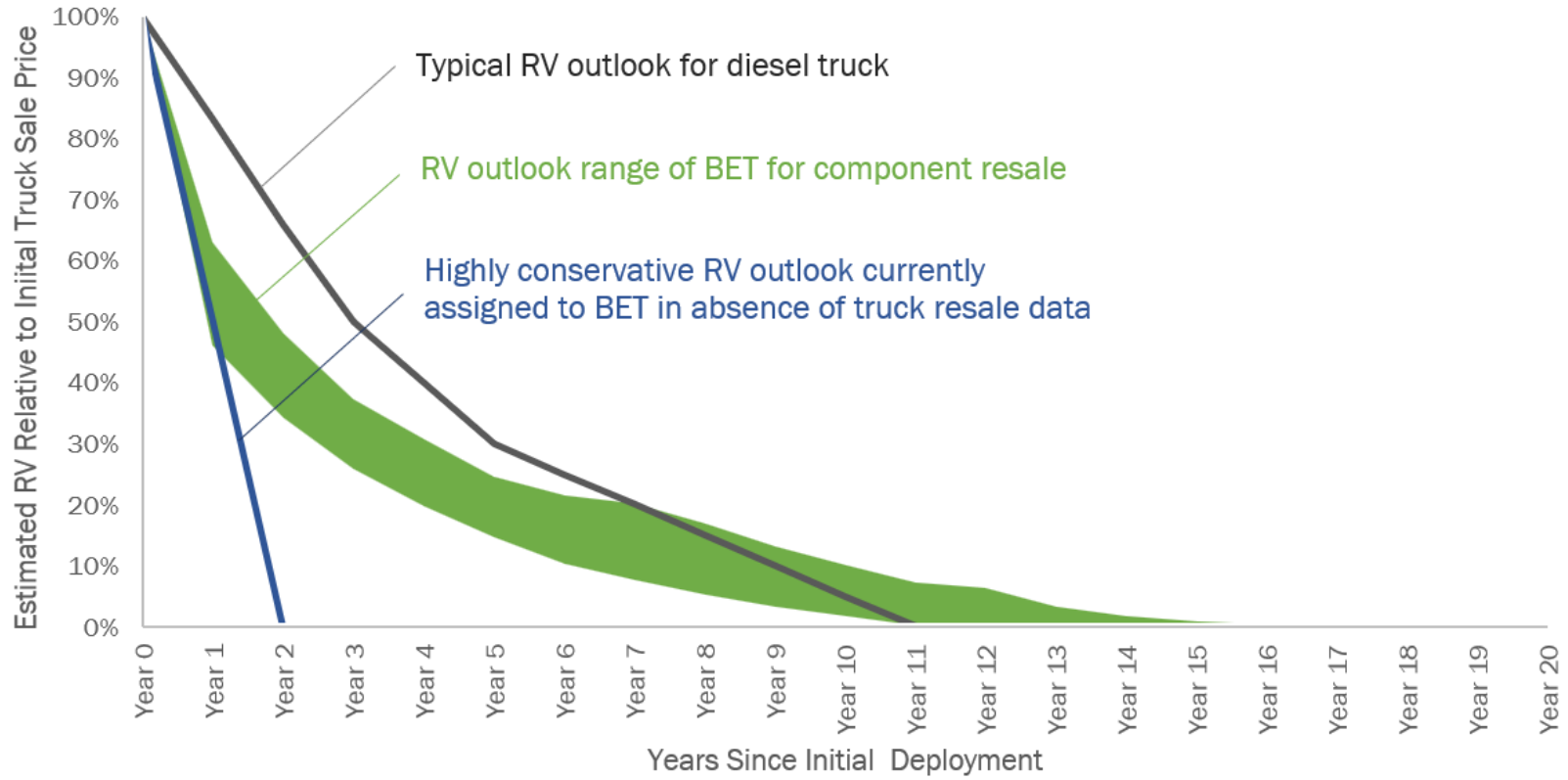
3. Developing an initial proposal with input from lessors, lenders, fleets, insurers, manufacturers, government agencies and donors

A. Identifying the best financial structure that could help increase RV setting in your particular market



3. Developing an initial proposal with input from lessors, lenders, fleets, insurers, manufacturers, government agencies and donors

B. Identifying reasonable benchmarks



ZET RV is much higher than zero even if sold by its components

3. Developing an initial proposal with input from lessors, lenders, fleets, insurers, manufacturers, government agencies and donors

C. Identifying and convening the right parties to develop the proposal

- *Finance providers, fleets, manufacturers, and other government agencies should be engaged early on to inform whether the RVG would be effective at addressing their concerns and encouraging wider access to better financing options.*
- *Stakeholders should be engaged at different stages throughout the development.*
- *One way to do this is by creating an industry taskforce early on in the process, who are committed to providing feedback throughout. The taskforce should be accompanied by a widespread public consultation ensuring all relevant parties can submit their comments.*
- *The taskforce could be managed by the lead implementer, which could be done either by the guarantee provider or a third party (such as a non-profit or financial consulting firm).*

3. Developing an initial proposal with input from lessors, lenders, fleets, insurers, manufacturers, government agencies and donors

A. *Identifying the best financial structure that could help increase RV setting in your particular market*

B. *Identifying reasonable benchmarks for support*

C. *Identifying and convening the right parties to develop the proposal*

Discussion (minutes 85 - 105)

1. **Have you any experience engaging with the financial sector in your jurisdiction? What is their current appetite?**
2. **Are you aware of any resale data design of the guarantee could use?**
3. **Are there any organisations already in your jurisdiction that could mobilise action?**

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- **Final reflections (minutes 105 – 115)**
- Recap & next steps

Final Reflections (10 minutes)

We invite participants to share any final reflections or thoughts from today's discussion.

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- **Recap & next steps (minutes 115 – 120)**

Recap

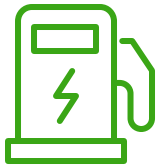
In today's discussion we covered:

- Why residual value is a problem
- When a RVG is helpful and when it is not
- Why RVGs make economic sense
- How to set up a RVG program

We are inviting stakeholders to **join this project** to support ZET adoption internationally and help to **develop ZET as a viable asset class** for investors



Be part of a project to design one of the world's first residual value guarantees for zero emission HGVs



Collaborate to support implementation of first-of-a-kind shared infrastructure projects



Shape the future of decarbonised trucking by stimulating investment in green hubs and freight corridors

Call to action: The GFI and CALSTART intend to co-design and deliver best in class guarantee schemes to support ZE-MHDV adoption in globally

Green Finance Institute

Unique position as an independent body with strong UK connections to both the public and private sector

CALSTART | GLOBAL COMMERCIAL VEHICLE DRIVE TO ZERO™ A CAMPAIGN OF THE CLEAN ENERGY MINISTERIAL

Experience designing and delivering schemes to support HGV decarbonisation

1. Industry engagement

Partner with **industry stakeholders** to design blueprints for RV and credit risk guarantees

2. Implementation

Work with Governments & NDBs to design real-life guarantee schemes across multiple jurisdictions