



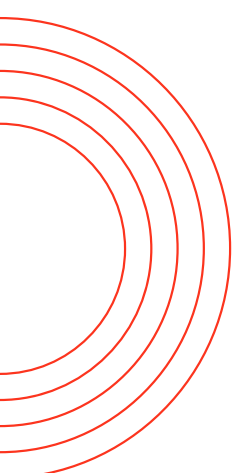
Secretariat
CLIMATE GROUP

Financing the decarbonisation of medium and heavy- duty vehicles: a subnational perspective

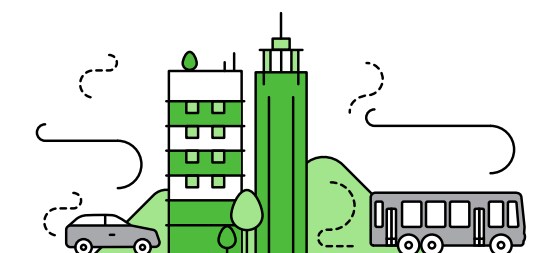
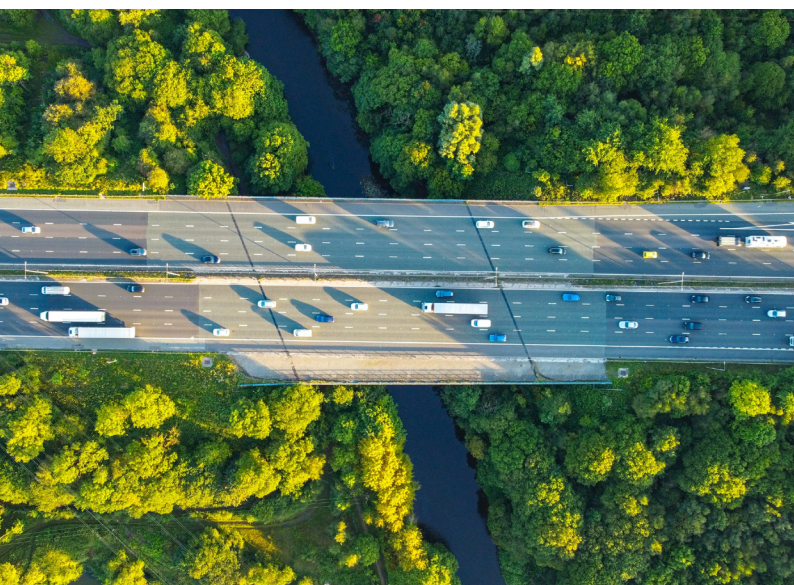
Policy Summary | ZEV Community

June 2024

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Summary

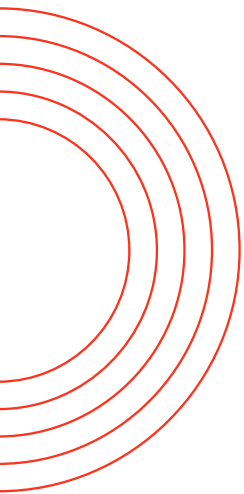
Medium and heavy-duty vehicles (MHDVs) are disproportionate contributors to the climate crisis. According to the International Council on Clean Transportation (ICCT) they represent less than one tenth of all vehicles, but roughly 40% of their carbon emissions.¹

Tailpipe CO² emissions from all MHDVs have been increasing rapidly since 2000 (IEA), with trucks accounting for the lion's share – more than 80% – of this growth². Overall, MHDVs are largely considered as a 'hard-to-abate' sector with competing technologies promising to slash emissions and local pollutants.

As one the most complex pieces of the sector decarbonisation puzzle, electrification of MHDVs requires our attention urgently, to put in place the right policy frameworks, investment, and commercial deployment. Following the rapid progress we've seen in passenger cars over recent years, it is now time to address heavier vehicles.

1 'White Paper (2017): Transitioning to zero-emission heavy-duty freight vehicles by the ICCT. Available at theicct.org/publication/transitioning-to-zero-emission-heavy-duty-freight-vehicles/

2 IEA (2023): Overview: Truck and Buses. Available at www.iea.org/energy-system/transport/trucks-and-buses



The important role of subnational governments:

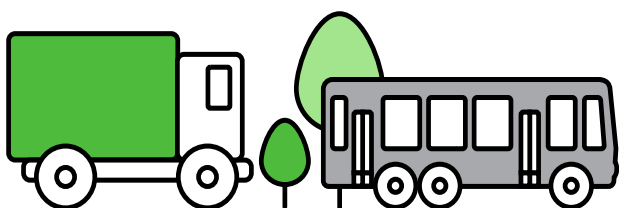
To achieve MHDV electrification, key actors (public and private) require finance. We also need to ensure that these resources are spent wisely and effectively, in close collaboration with local authorities and companies, providing certainty long-term to all stakeholders that such investments make economic sense and will yield high social returns.

Subnational governments are critical to unlocking financing for electric MHDV fleets, both public and private. They provide an essential layer of regulatory, legislative and budgetary autonomy (with a degree of variation from country to country) and control key policy levers that have a direct impact on transport and its infrastructure.

Subnational governments are critical to unlocking financing for electric MHDV fleets, both public and private.

Despite this potential, there has been relatively little analysis of subnational action for MHDV decarbonisation. This is surprising given that states and regions in many countries have ample legislative powers to act while also allowing for greater connection and alignment between different levels of government (national and city) on targets and pathways.

Developed by [Climate Group](#) on behalf of the [ZEV Community](#), with the support of the [Scottish Government](#) and [EV100+](#), this paper aims to identify current gaps and opportunities for action. Additionally, this policy summary also considers what support states and regions need to overcome current barriers to e-MHDV uptake.





Methodology

Our research findings are based on 14 survey responses and 8 structured interviews with representatives of states and regions in Europe, Africa, Latin and North America.

Survey and interviews took place in January and February 2024. In total, we had inputs from across 21 governments, which have a combined GDP of over \$10.6 trillion USD and a total population of nearly 186 million people.

All the states and regions that completed the survey are members of the [Under2 Coalition](#) or engaged with ZEV Community activities. The Netherlands is the only respondent operating at the national level of governance. For a visualisation of our findings please see Annex 2 at the end of this document.

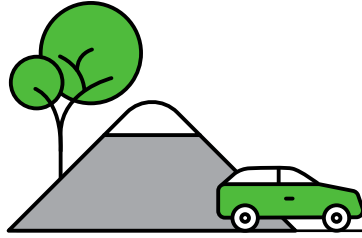
Interviews

- Baden-Württemberg, Germany
- California, USA
- Emilia-Romagna, Italy
- Maryland, USA
- New Jersey, USA
- North Rhine Westphalia, Germany
- Scotland, UK
- Wallonia, Belgium

Survey respondents

- British Columbia, Canada
- Cross River State, Nigeria
- Emilia-Romagna, Italy
- Gauteng, South Africa
- Jalisco, Mexico
- Lombardy, Italy
- Navarra, Spain
- Netherlands
- North Bank Region, The Gambia
- Quebec, Canada
- Queensland, Australia
- Queretaro, Mexico
- Victoria, Australia
- Washington, USA

01



Challenges to decarbonising the MHDV sector

1.1 Overview of main challenges for subnational governments

Fewer than half the governments surveyed have a target year to ensure public/government owned MHDV fleets are net zero emission. Some governments do have partial or incremental targets or overarching net zero targets in place.

Where governments do have target years in place, the majority of these are aligned with the current global benchmark of 2030 for buses and 2040 for MHDVs. Overall, government respondents in North America tended to be at a more advanced stage of the transition (and showing higher ambition) than governments in other geographies.

The top challenges cited by governments are:

- Lack of charging infrastructure;
- Lack of access to public finance;
- The need for underlying grid development;
- Investment

Governments also cited several issues that they were not directly asked about. The following were mentioned on multiple occasions: workforce and skills shortages; use and space availability; adapting government procurement practices to what is needed for this type of large-scale decarbonisation; and lack of infrastructure programmes.

For a complete overview of the challenges identified, please see Annex 2. Governments noted the interconnected nature of many of the issues they are facing and the complexity and uncertainty this creates. Of the challenges above, two stood out in terms of importance and relevance across geographies, which are assessed below.



1.2 Access to finance

➤ Access and availability of public financing:

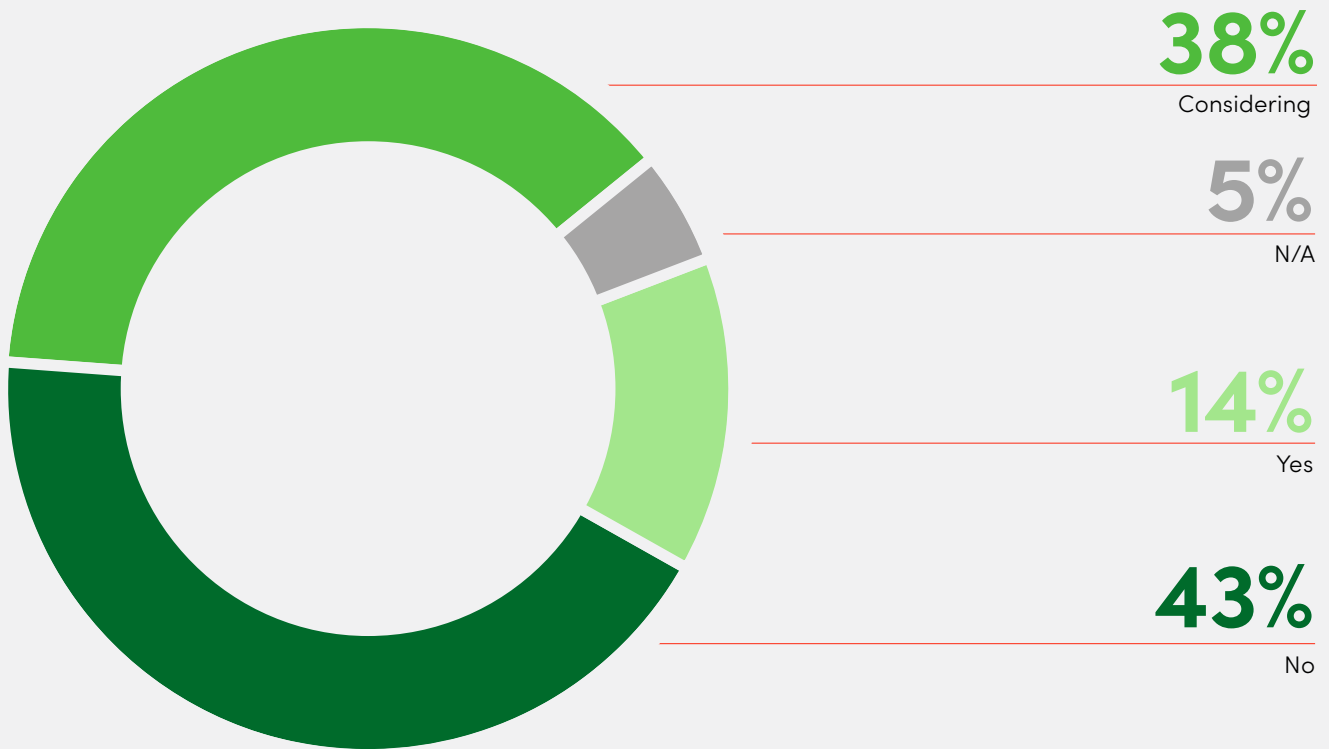
Though lack of public financing was one of the top challenges mentioned, financing in general is an issue. Governments referenced the sheer scale of funding required for the MHDV transition, including the cost of the vehicles themselves and the cost of the required grid upgrades that are essential to support the development of charging infrastructure.

At a time of increased economic uncertainty, where many governments are facing budget challenges, the MHDV transition is given a lower priority than other issues facing subnational administrations. Federal funds are available in some cases but can be hard to access.

➤ Shortage of private investment:

In addition to the shortage of public financing, there's also a shortage of private investment. Innovative financing solutions and alternative business models could potentially address this issue, but very few governments currently have such models in place, as seen in Figure 1 below. This is a topic under consideration for many governments, but some governments have not yet begun to explore it. There are good examples that other governments could draw from, and several governments are actively exploring different models and solutions.

Figure 1 Is your government encouraging uptake of alternative financing models, for example ‘as service models’ to support fleet decarbonisation?



A few of the governments surveyed are currently exploring ways to aggregate demand, both for vehicles and for infrastructure to enable investment. There is a high degree of uncertainty about what the most effective approaches might be due to the complexity of the issues involved. One government mentioned an inability to access funding because their projects are not of sufficient size and scale. Some governments reported challenges in their efforts to aggregate demand, particularly in terms of engaging with the private sector (for example small and medium-sized fleet owners who may be more risk-averse).

Uncertainty in terms of which technology to invest in was also cited as a top challenge for several governments, particularly on the role that hydrogen could play in future MHDV fuelling. Lack of confidence in technology, for example, because of the shortage of available data on vehicle performance, was also cited as a potential reason why some governments are facing challenges working with the private sector to aggregate demand.

➤ Barriers to accessing funding:

For the transition of public fleets, governments noted a number of barriers. The lack of long-term, sustainable financing options was a dominant theme as was budget uncertainty and the ability to commit budget to multi-year investment. Challenges with accurately forecasting the total cost of ownership and potential returns on investment were also cited as major barriers.

1.3 Challenges in expanding infrastructure

Several complex challenges related to charging infrastructure for MHDVs came through in the surveys and interviews.

Four of the main challenges noted were:

- Inadequacy of grid infrastructure to manage additional loads;
- Lack of understanding of projected charging needs;
- Joint planning with utilities to meet electricity demand;
- Lack of financing for necessary grid upgrades

These challenges cannot be addressed in isolation and will need tackling jointly.

Additionally, financing for grid upgrades is also an issue, in particular the lack of funding for grid updates and the lack of a predictable customer base (contributing to uncertainty of the uptake trajectory). Further challenges include how best to incentivize private sector investment and the too long return on investment.

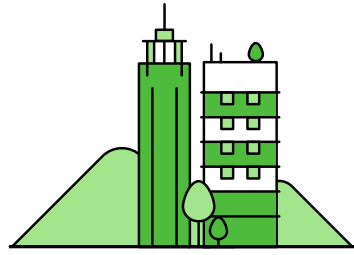
Many governments are working to address these challenges, largely in collaboration with the private sector. Some governments surveyed have put financial incentives in place to encourage private investment in charging infrastructure and some are actively seeking national funding for large scale infrastructure projects.

Many governments are working to address these challenges, largely in collaboration with the private sector.

Governments are actively encouraging shared fleet charging opportunities and simplifying chargepoint procurement for all public sector bodies. Most governments who are not actively encouraging this are considering doing so.



02



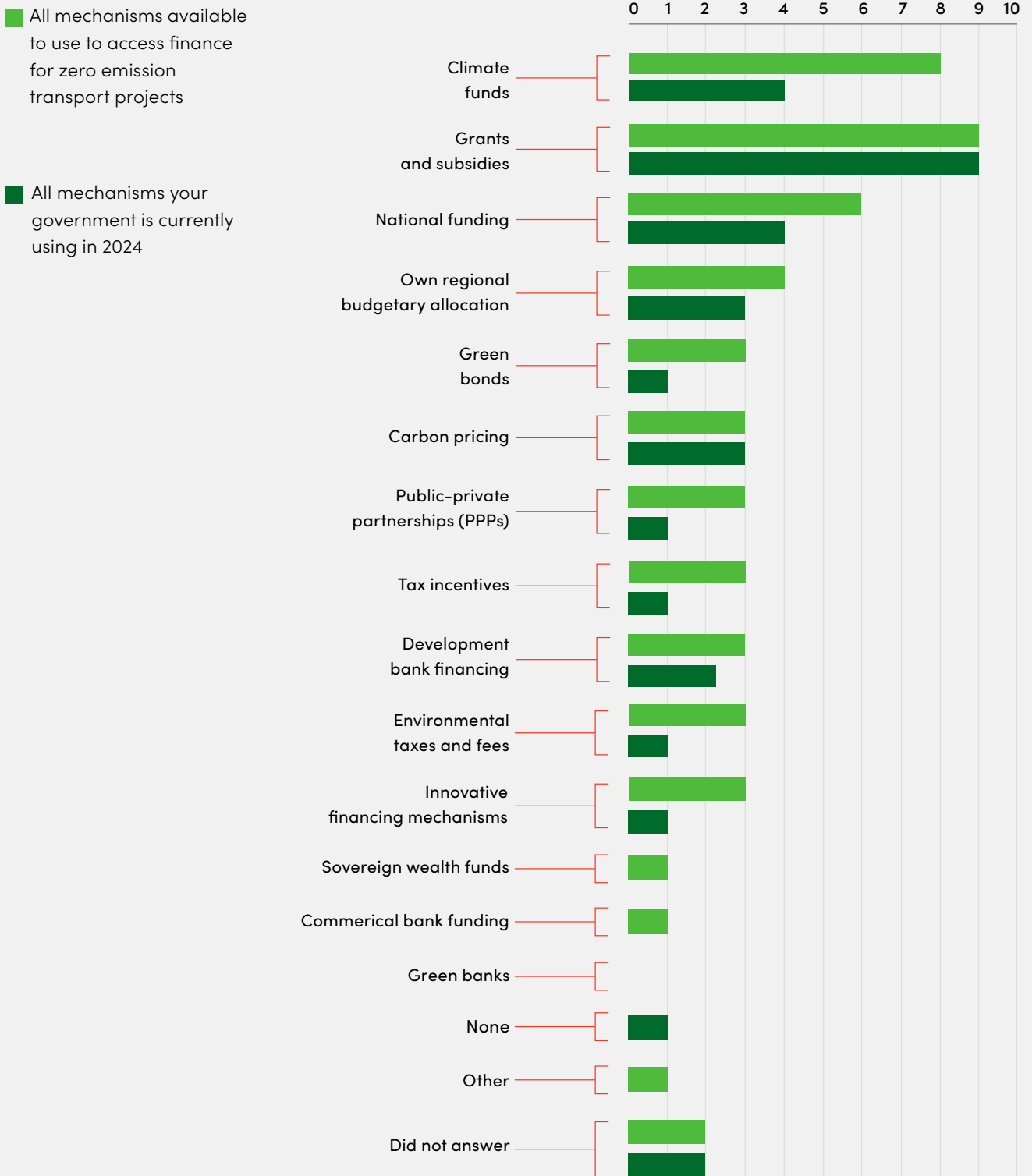
Subnational government levers for action

At a subnational level, some governments do have a limited range of mechanisms to access finance for their MHDV transition, but even so, uptake of such mechanisms tends to be limited.

But, as Figure 2 below illustrates, there is a wide array of potential funding mechanisms which states and regions can access in comparison to those currently in use for financing zero emission transport projects.



Figure 2 Funding mechanisms available for use in comparison to funding mechanisms currently in use in 2024





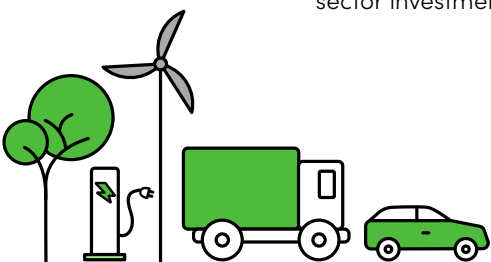
2.1 Subsidies

Our findings show that subsidies are the most used mechanism, with all governments who can utilise this tool doing so to varying degrees.

Governments are frequently providing subsidies to fleet operators for vehicle purchase but subsidizing fleet operators to invest in charging infrastructure is less common. National funding and climate funds were available to a higher proportion of governments but not all are actively using them. Based on feedback this may be due to issues of scale, with larger projects being prioritised, or on funds themselves being difficult to access.

When asked, few respondents were able to give examples of national or federal level programmes providing fiscal support for fleets in their region to transition to lower or zero emission. This included responses from governments where there are national schemes in place (for example in the US where active Federal schemes include EPA Clean Heavy-Duty Vehicles Program, US DOE Commercial Electric Vehicle and Fuel Cell Electric Vehicle Tax Credit).

Nearly half the governments we engaged with are also facilitating private sector investment in the transition, mainly through subsidies and tax incentives.





2.2 Engagement with the private sector

Over a third of governments are in active dialogue with the private sector and/or investors to explore innovative ways of overcoming investment barriers.

Some private sector connections have been facilitated through grant programmes and others through broader initiatives and networks (such as state agencies and regional partnerships). Stakeholders mentioned include vehicle dealers, manufacturers, trade associations and utilities.

While the question was focused on investment challenges, respondents also referenced how these connections were also being used to support other elements of the transition, including consultation on regulatory frameworks and in relation to logistics and infrastructure. There was a low response rate to this question which may suggest that whilst some governments are doing this very actively, others are less engaged in this area.

There are some good examples of governments engaging with private sector fleets owners, including through regular meetings, research projects and funding programmes. Many governments are actively engaging with these stakeholders on needs mapping and infrastructure planning (including exploring opportunities for shared fleet charging). Facilitating data sharing is also a key activity which is likely to be interconnected with needs mapping and infrastructure planning.



Conclusion

Our findings demonstrate that significant best practice and experience is available that can facilitate practical exchanges between subnational governments to increase awareness and inspire other states and regions to take action to support the decarbonisation of MHDV fleets.

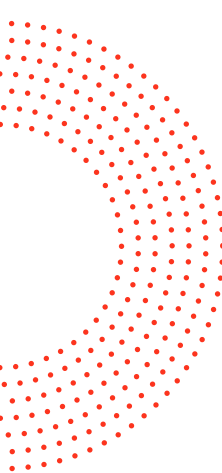
One important step is **setting a clear target date** for phasing out internal combustion engines trucks and buses. A target date of 2030 for a zero emission bus fleet and 2040 for trucks is the most widely recognised benchmark, and sets a clear target date give subnational governments more certainty to prioritise their transition to electric MHDVs. This could address some of the barriers illustrated in this policy summary on resource allocation, infrastructure development and vehicle procurement.

A target date can also create a sense of regulatory certainty which can support businesses to invest confidently in vehicles and infrastructure, helping to speed up the transition and unlock private finance while also providing manufacturers with certainty about demand. Studies³ suggest that target dates are likely to be more effective if they are accompanied by legally binding policies.

Given the cost of the MHDV transition (which is compounded by the high upfront costs and the degree of risk and uncertainty involved), innovative financing solutions can and should play a key role. Many governments are interested in or are actively exploring innovative finance models and examples are already in place. Improving information and insight-sharing across governments could increase and speed up the adoption of such mechanisms.

Aggregating demand for e-MHDVs and infrastructure can help with access to financing and encourages manufacturers to make this technology more of a priority. Governments would benefit from greater awareness and understanding of how to aggregate e-MHDV demand across their jurisdictions as well as a deeper understanding of the infrastructure requirements for MHDVs.

³ ICCT (2021): Global overview of government targets for phasing out internal combustion engine. Available at theicct.org/global-overview-of-government-targets-for-phasing-out-internal-combustion-engine-medium-and-heavy-trucks/

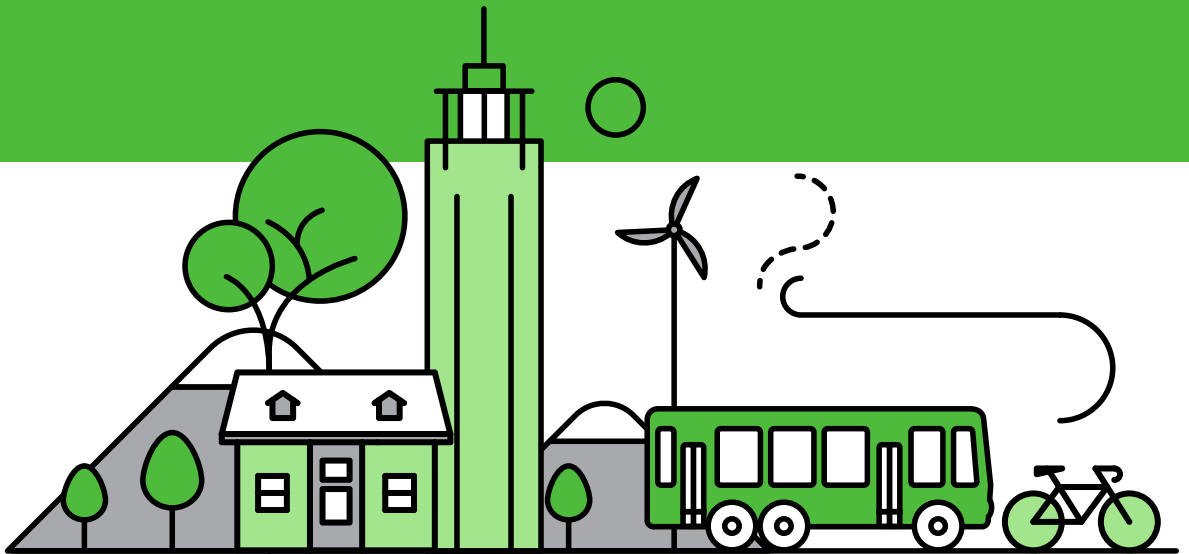


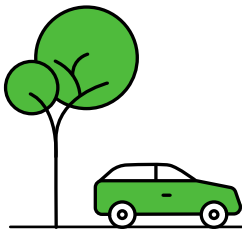
However, aggregating demand also comes with complexities. We know from our work with fleet operators that this effort can be resource intensive and bureaucratic and it is important subnational governments work closely with the private sector (including corporate fleet owners) on this issue. Hearing examples of successful measures, as well as tailored capacity building, can help governments to use aggregated demand as a solution to some of the barriers they're facing.

Subnational governments should also **collaborate more closely and communicate more frequently with energy utilities** to accelerate the deployment of charging infrastructure, streamline the planning and permitting by leveraging joint expertise, and the sharing of data and financial resources.

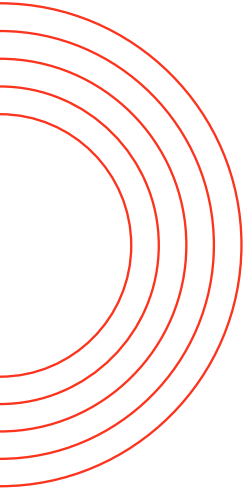
There is tremendous opportunity for subnational governments to play a leadership role in determining where electrification occurs, as fleets rely heavily on specific funding programs to decide to deploy and invest in zero emission MHDVs. Many of the governments surveyed are already taking positive action (see case studies below). It is clear that enhanced and early collaboration between government and wider stakeholders can result in proactive infrastructure development, thereby ensuring a faster and smoother transition to zero emission MHDVs.

Annex





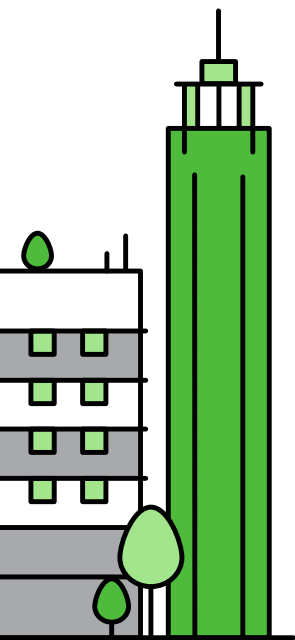
Annex 1: Case studies



Funding the transition: British Columbia

The Go Electric Commercial Vehicle Pilots program encourages and accelerates the adoption of commercial ZEVs and provides funding for alternative financing models.

Successful applicants are eligible to receive funding support of up to one-third of total costs of their ZEV deployments and/or infrastructure projects. The funding call is expected to support on-road MHDVs, as well as marine, rail, air or off-road categories. Due to the flexibility of this program, the Province reviews applications on a case-by-case basis. The application also must pass a competitive process. The Go Electric Rebates program also provides rebates for lease arrangements and provides funding to organizations that offer “EV as a service” options. According to our findings, British Columbia (BC) has only seen these applications coming through the program over the last 1.5 years. One of BC’s public utilities, BC Hydro, funds an EV passenger cars program using revenue from the sale of low-carbon fuel standard credits, which are generated from unmetered residential chargers.



Funding the transition: **New Jersey**

New Jersey directly invests part of the resources received through the Regional Greenhouse Gas Initiative (RGGI), a multi-state cap and trade emission system, in transport decarbonisation.

New Jersey’s RGGI Strategic Funding Plan identifies how the state will invest its share of the RGGI auction proceeds. As of March 2023, New Jersey has dedicated nearly \$163 million in RGGI proceeds to projects and programs for “*Catalyzing Clean, Equitable Transportation*” which includes the NJDEP Medium- and Heavy-Duty Vehicle Electrification Program. Through this programme, 283 EVs and 275 EV chargers have been funded.



The power of collaboration: US States and Quebec

18 US States and Quebec signed the NESCAUM MHD ZEV MOU followed by an Action Plan.

The Action Plan is the culmination of two years of work by the ZEV Task Force identifying barriers and opportunities for rapid and equitable truck and bus electrification and actionable policy and program recommendations for state policymakers, utilities, and utility regulators. On innovative financing tools and business models to improve the economics for fleets, the Plan provides 7 recommendations, including:

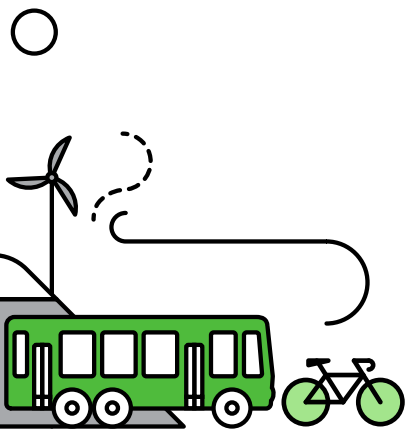
1. Exploring electrification-as-a-service, which provides leased buses, charging infrastructure, and managed charging and maintenance services for a fixed monthly fee.
2. Utilities should offer transferable utility on-bill financing and on-bill repayment to fleet customers ("pay-as-you-save" approach).

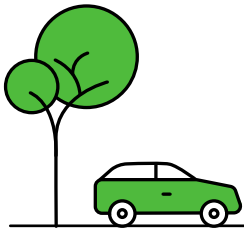


The power of collaboration: Victoria

Victoria, Australia showed the power of collaboration during their Freight Transport Decarbonisation Summit which took place in October 2023.

Over 80 leaders from the freight sector came together to identify the key challenges to decarbonisation and discuss how to overcome them. Industry leaders spoke alongside government members about new technologies, ways to collaborate better, the need for policies and regulations, and the role of government to reach net-zero goals. The results of this summit will inform future government policy and action to best support freight transport decarbonisation in Victoria.



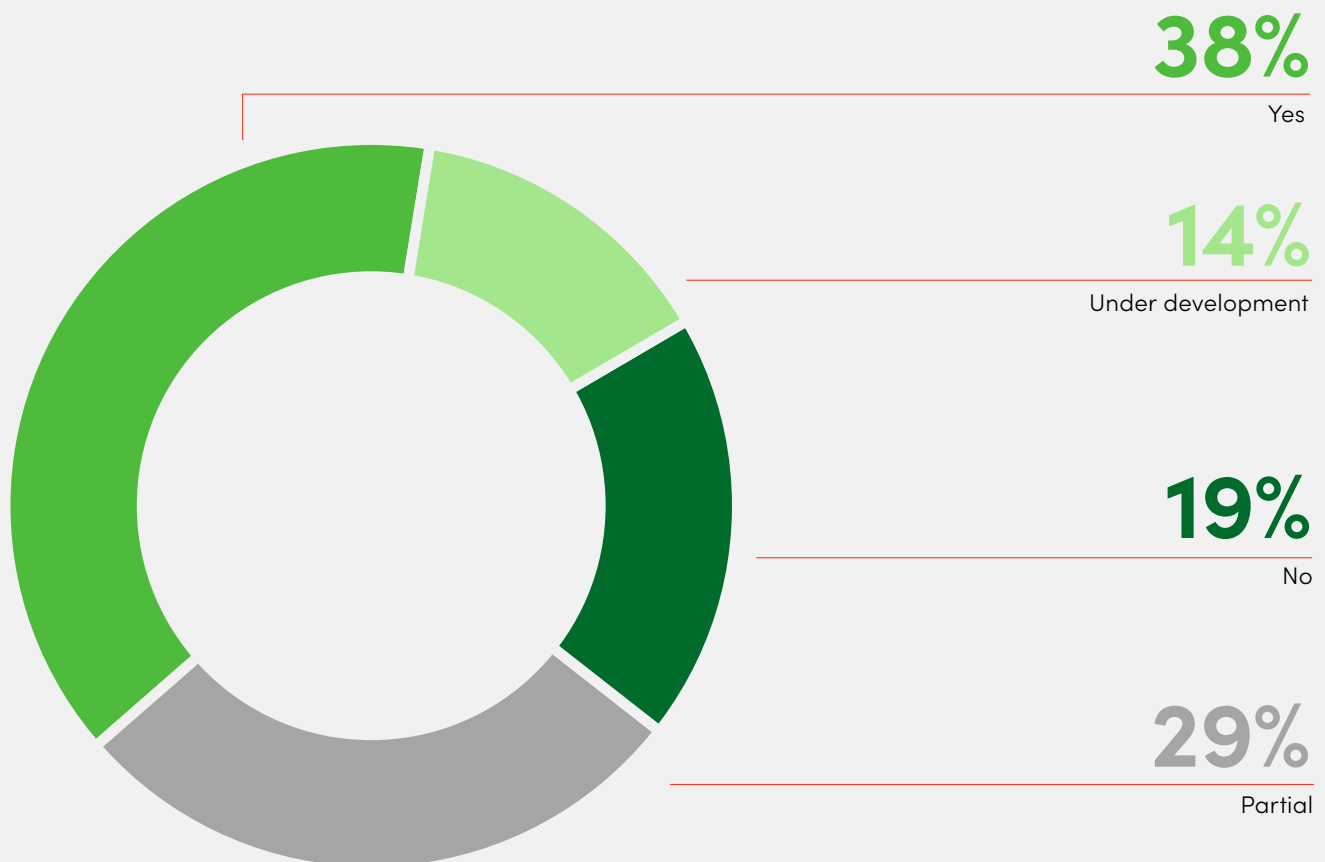


Annex 2: Overview of key charts and findings

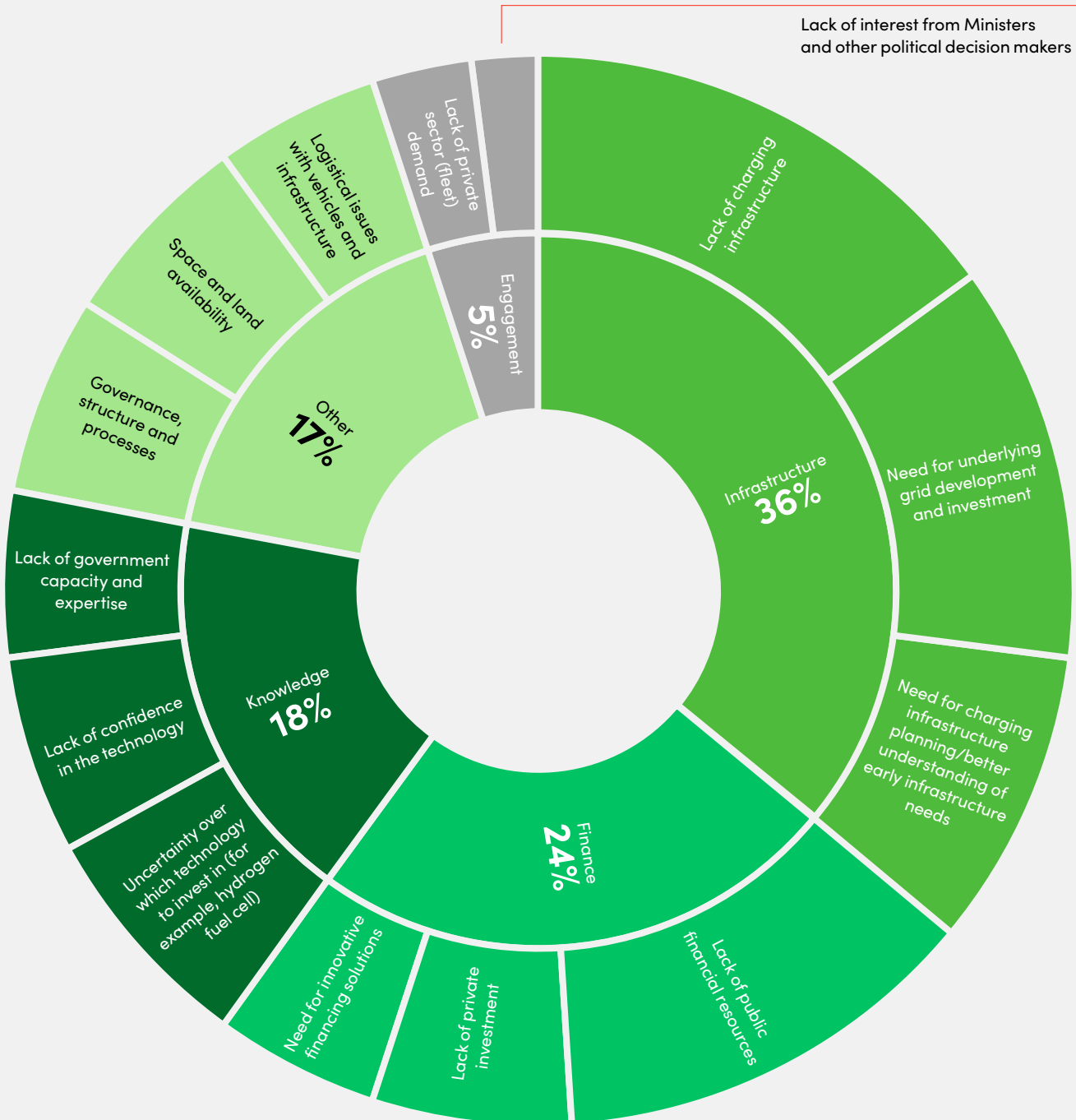
These charts and graphs provide a visual summary of some of our research findings. Please note that this overview does not include results for questions with free text answers.

Section 1: Overarching targets, priorities and challenges of medium and heavy-duty vehicles electrification in your jurisdiction

Does your government have a specific target year to make all public or government-owned heavy-duty fleets zero emission?

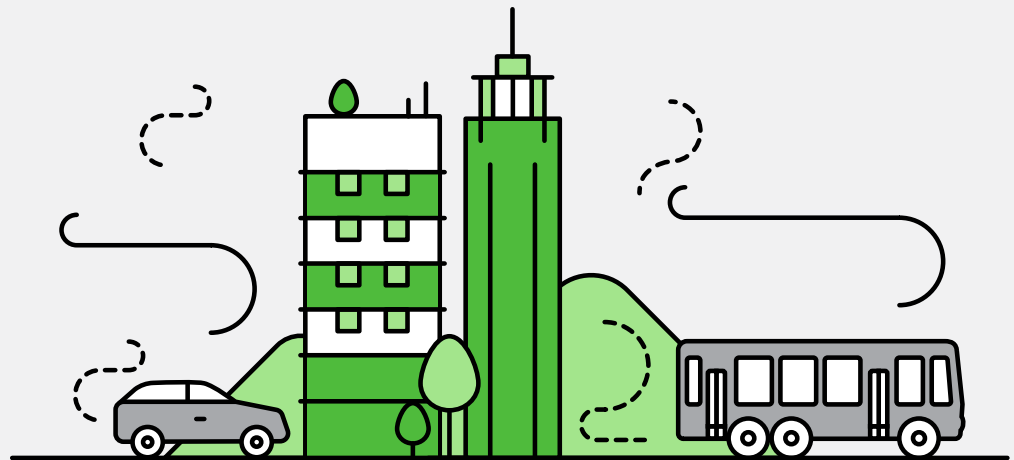
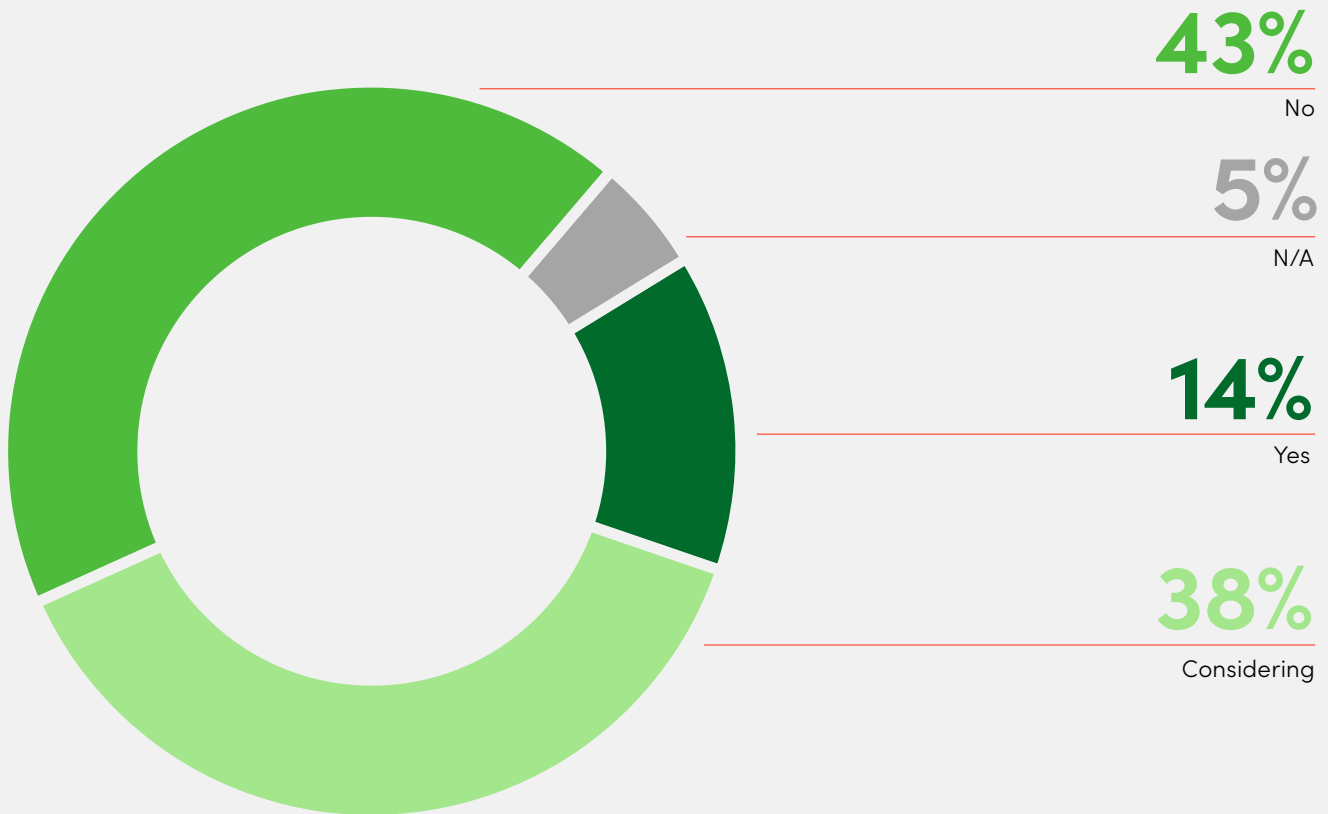


Top overarching challenges for transitioning to zero emission medium-and heavy-duty transport?

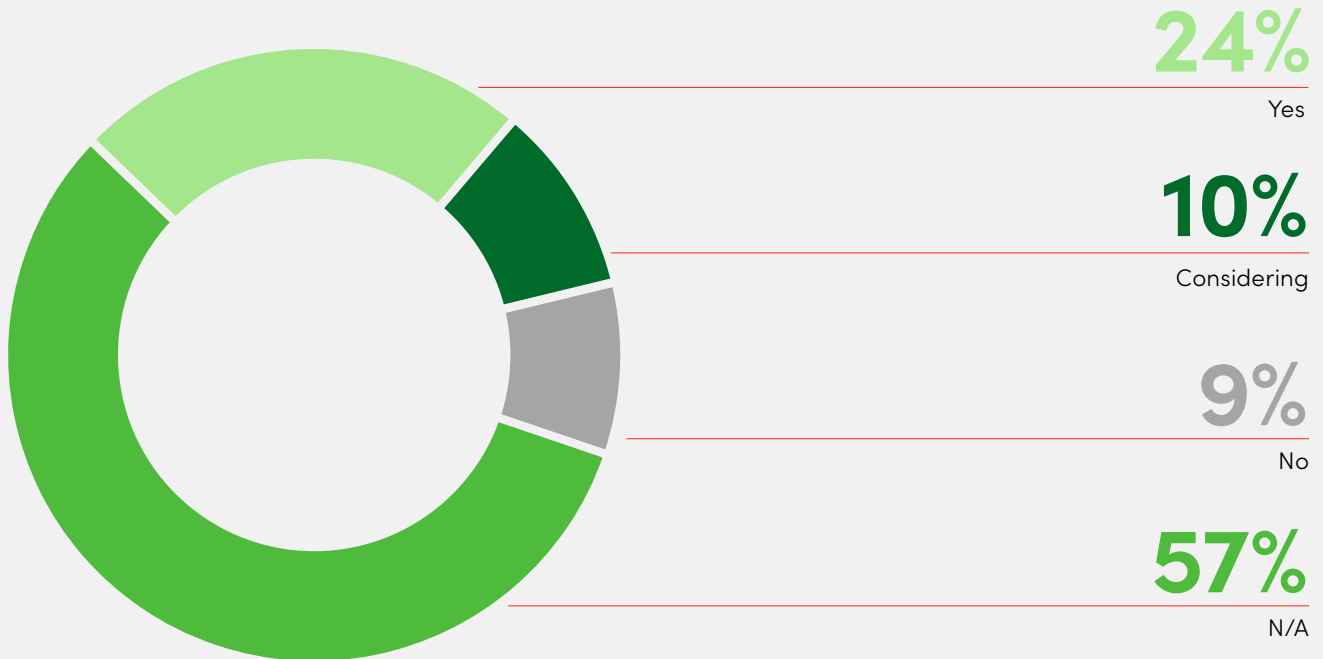


Section 2: Unlocking innovative finance models to increase all medium- and heavy-duty EV fleets

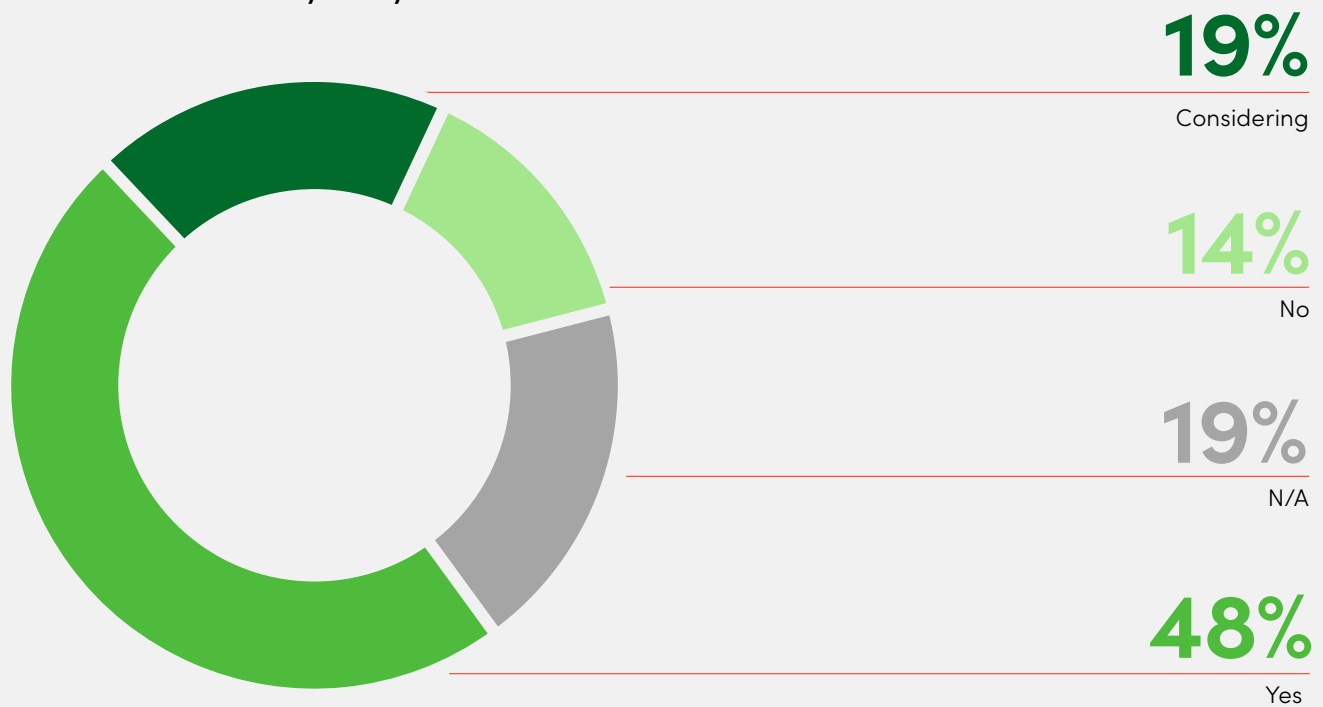
Is your government encouraging uptake of alternative financing models, for example 'as a service models' to support fleet decarbonisation?



Is your government looking at aggregating demand for public electric heavy-duty vehicles and/or infrastructure to help provide scale for financing. If yes, can you please share more details?



Is your government facilitating private sector investment in the decarbonisation of medium- and heavy-duty fleets?



Is your government conducting/involved in any kind of dialogue with private sector and/or investors to explore innovative ways of overcoming investment barriers?



48%
Yes

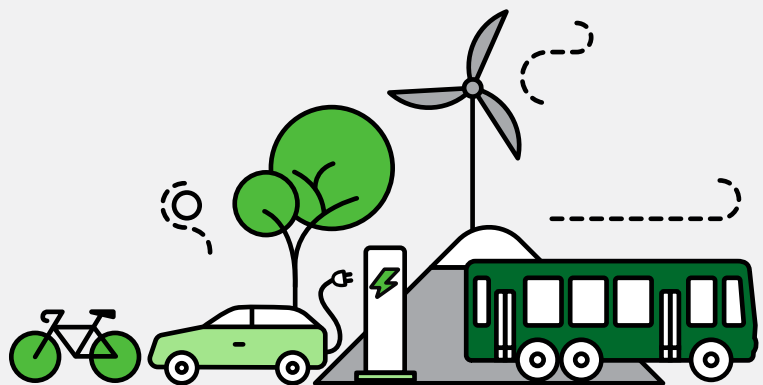
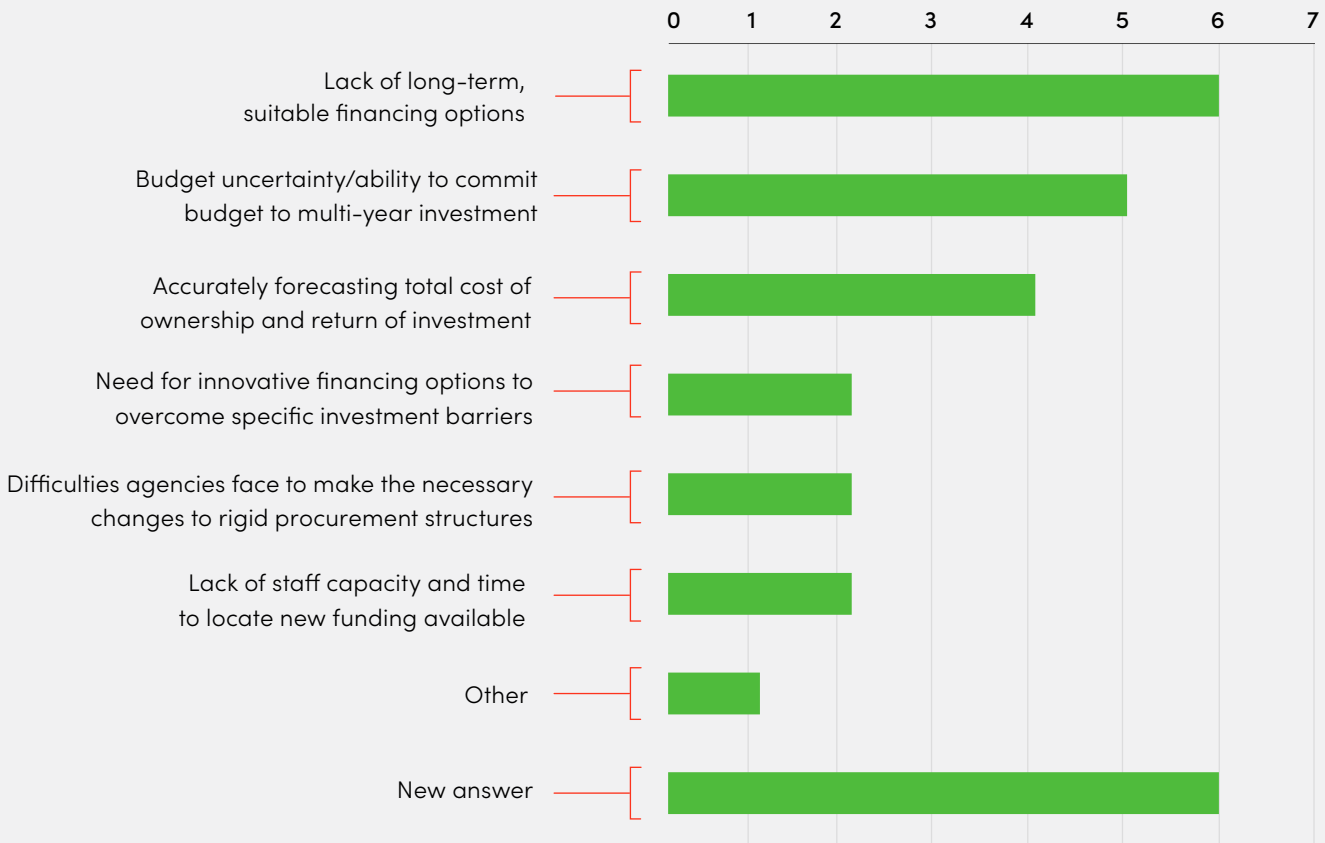
19%
No

33%
N/A

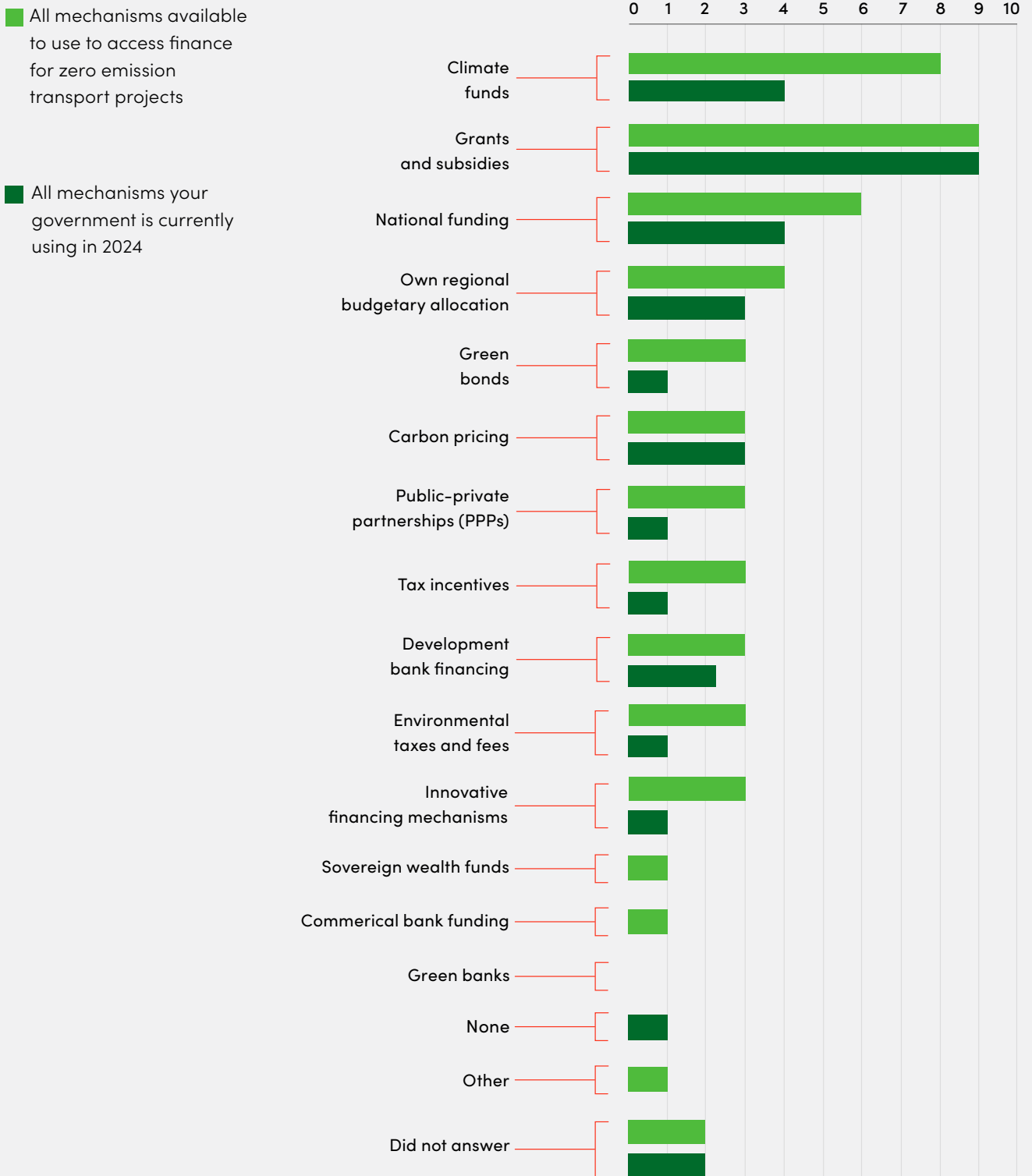


Section 3: Financing the transition of public medium- and heavy-duty vehicles fleets to zero emission

Which financial barriers apply to your government for securing funding to transition your public heavy-duty fleet to zero emission?

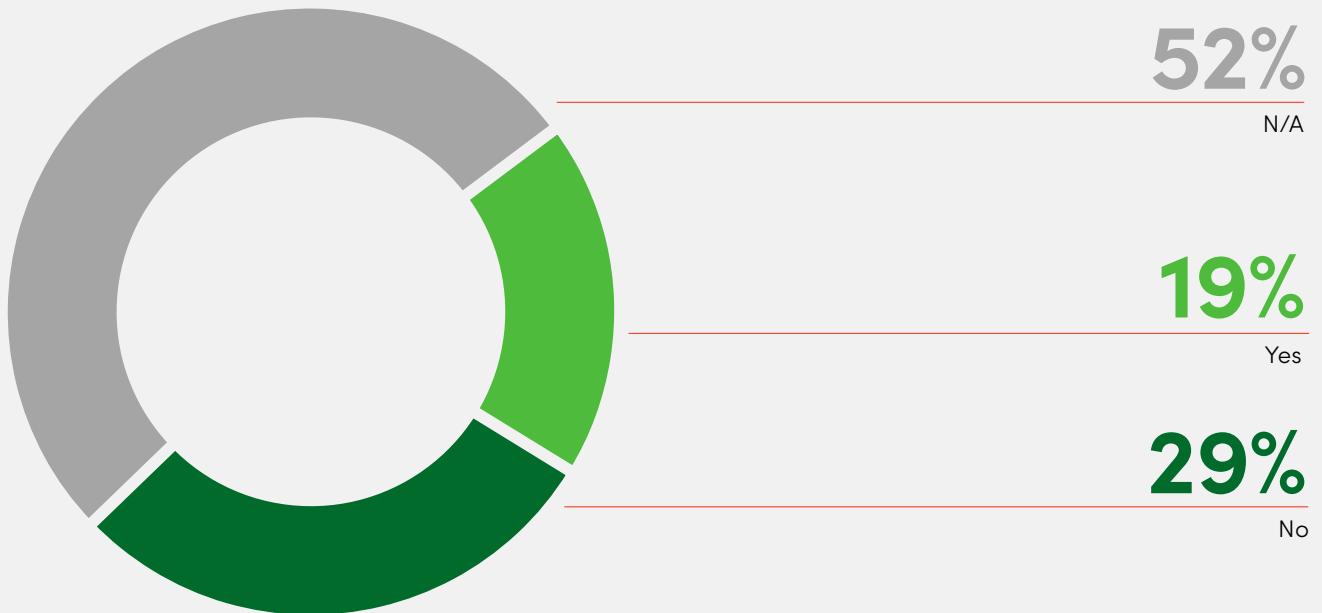


Mechanisms governments have the ability to use to access finance for zero emission transport projects vs the mechanisms they are actually using in 2024

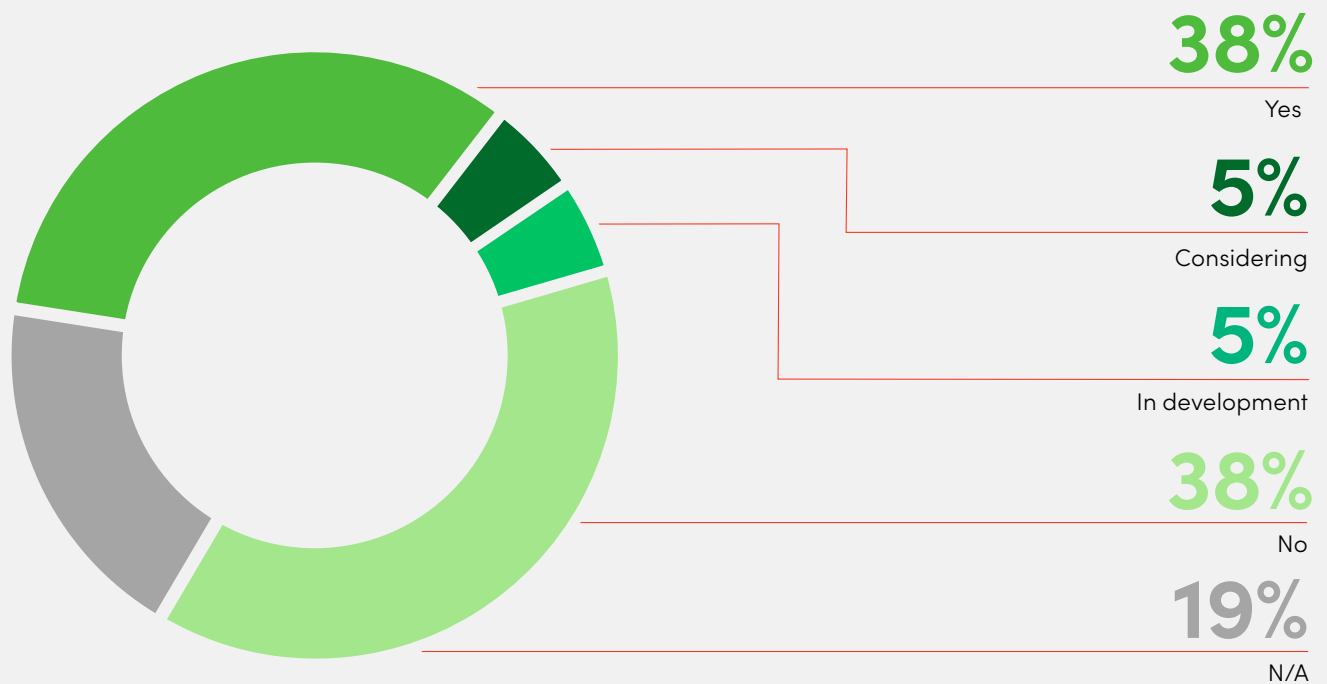


Section 4: Financing the transition of private medium- and heavy-duty vehicles fleets to zero emission

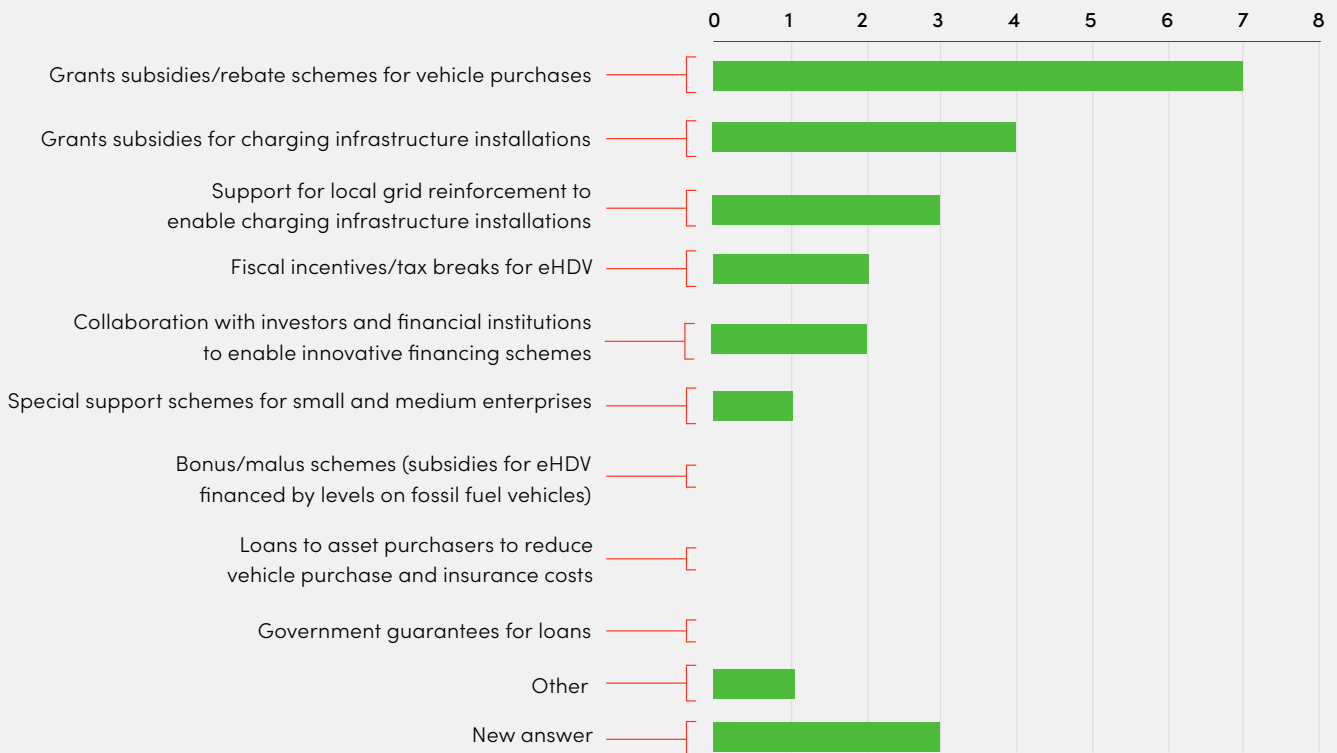
Do medium- and heavy-duty fleets in your constituency benefit from national programmes providing fiscal support for transition to lower or zero emission?



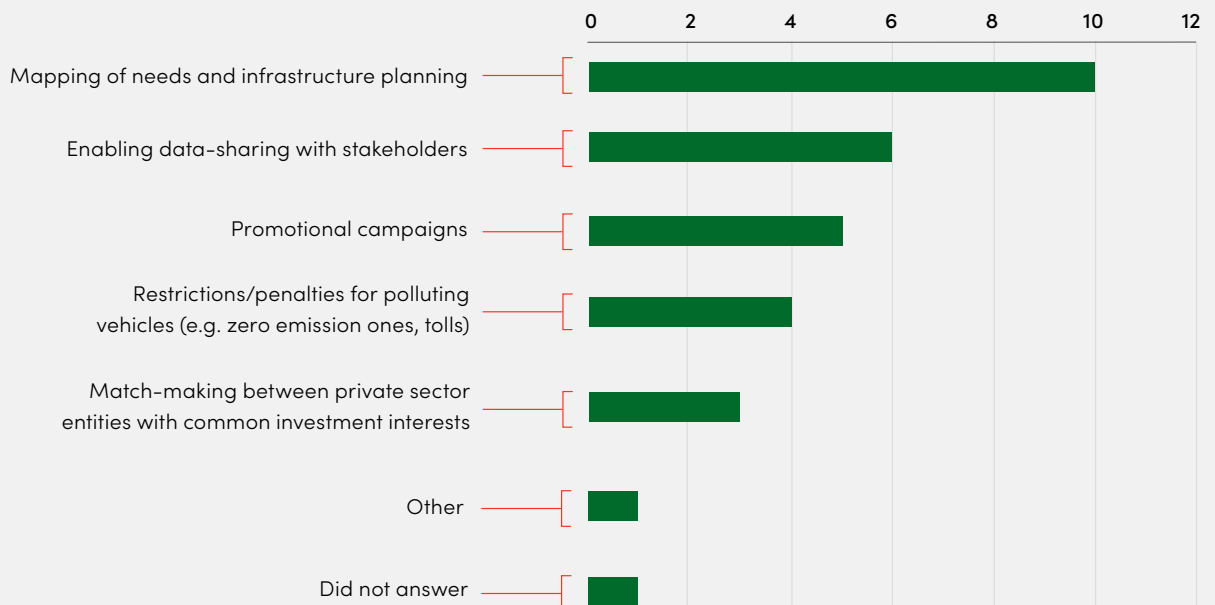
Does your state, regional or local government currently offer any fiscal incentives (e.g. tax breaks, subsidies) to encourage the transition to corporate medium- and heavy-duty vehicles (e.g. commercial trucks, lorries) fleets?



Which of the following types of financial support for freight companies are you implementing?

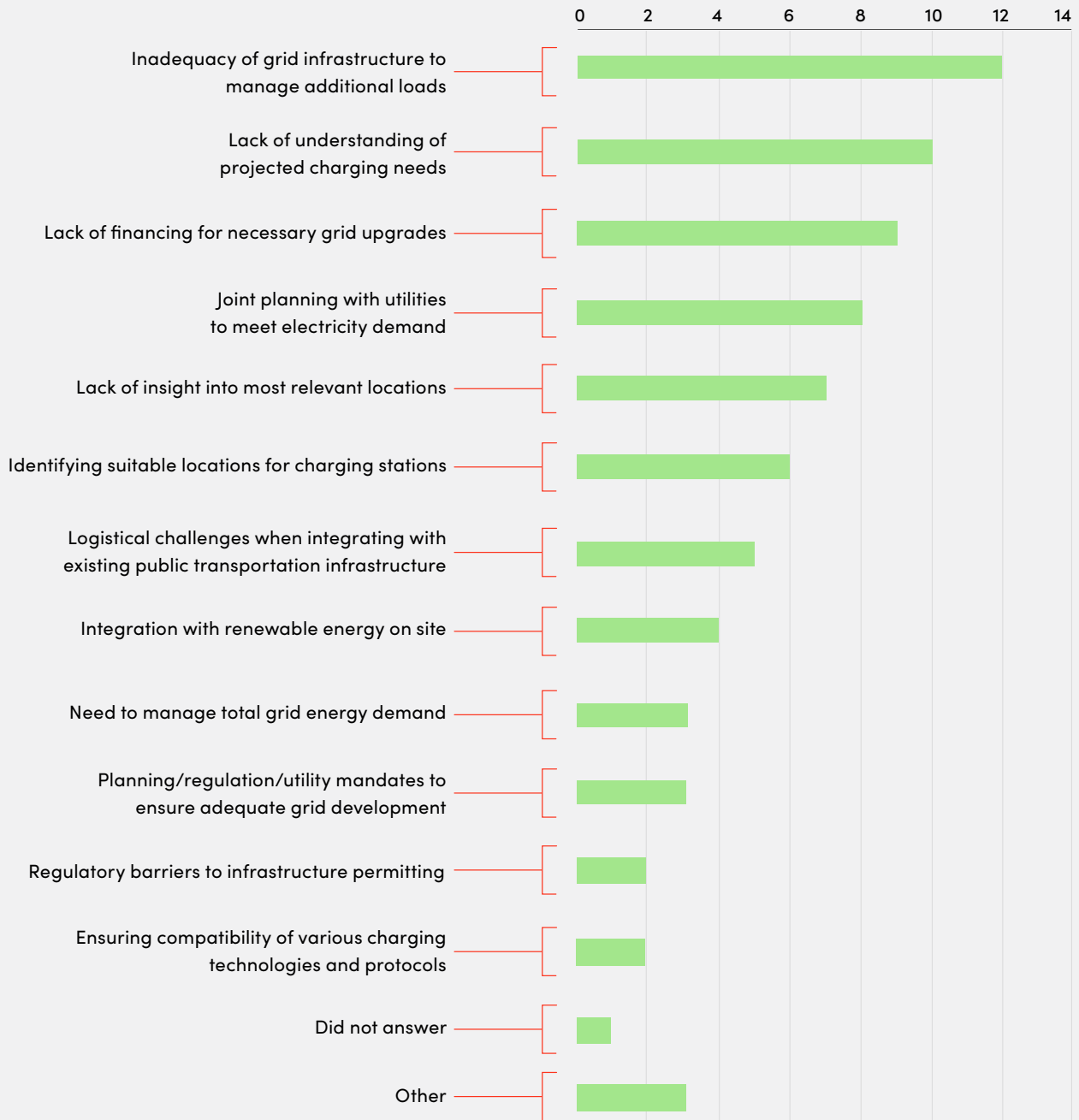


What other types of measures does your government take to support private sector electric medium- and heavy-duty vehicle uptake?

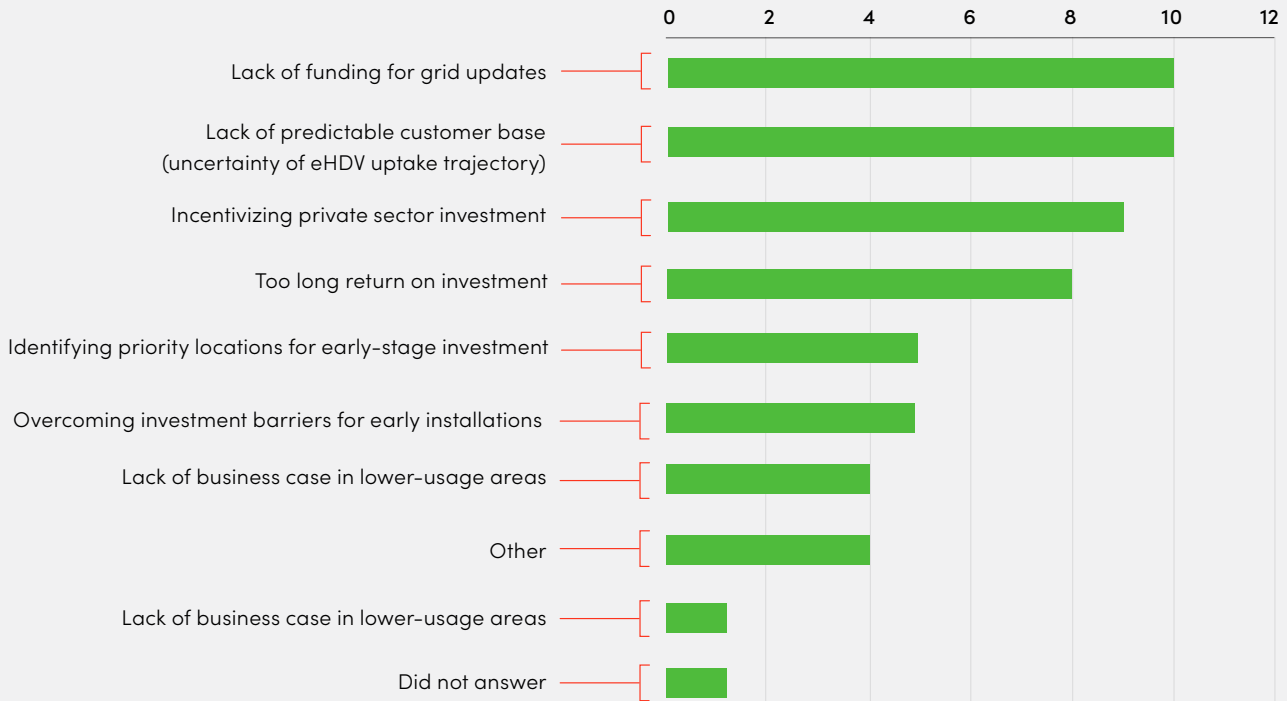


Section 5: Increasing charging infrastructure and ensuring widespread availability

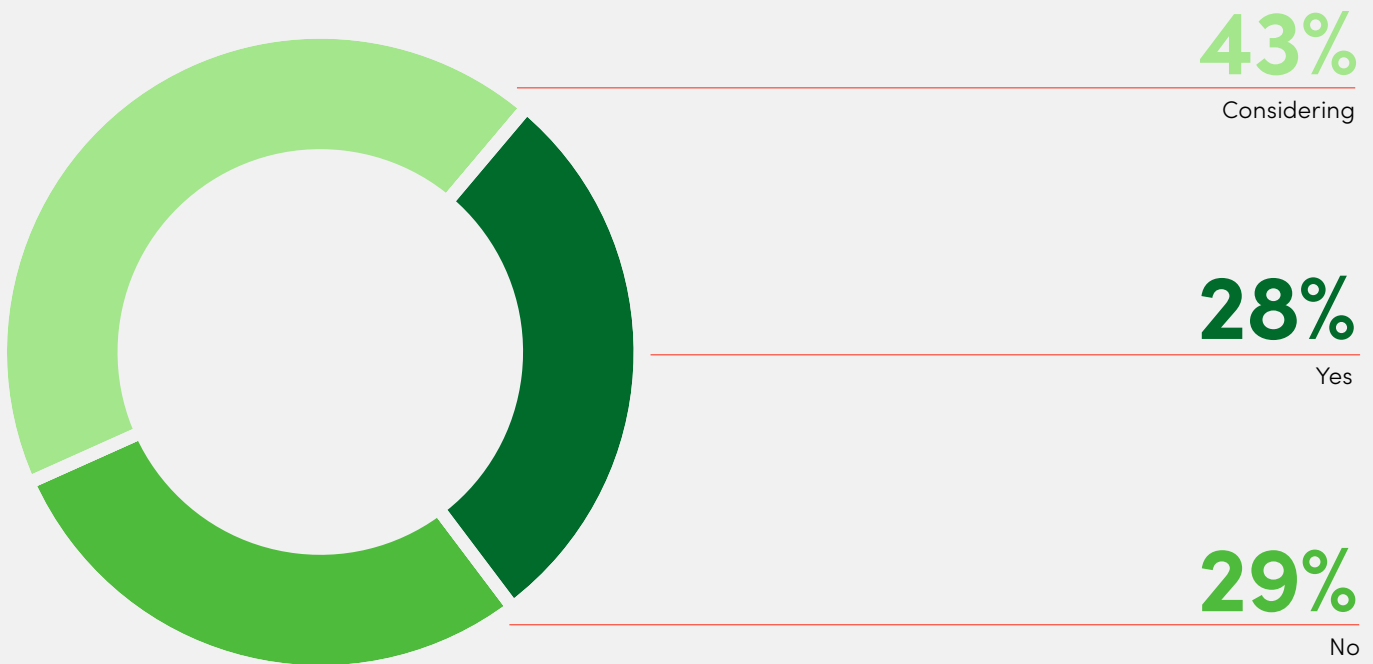
What challenges are most relevant to your government regarding the expansion of charging infrastructure for electric heavy-duty vehicles?

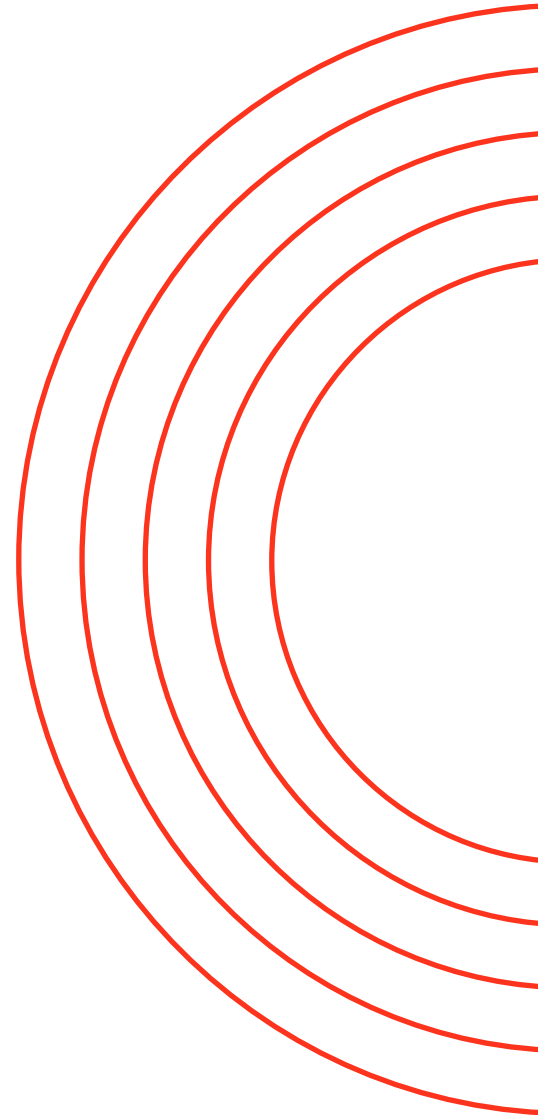


What are the biggest challenges with regards to financing charging infrastructure roll-out?



Are you encouraging shared fleet charging opportunities – e.g. charging facilities used across sectors and users in a specific area, or simplifying chargepoint procurement for all public sector bodies?





Acknowledgements:

The ZEV Community brings together all levels of governments to share best practice to support their ambitions and accelerate vertical integration of policies.

By exchanging information and experiences, ZEV Community members can develop their knowledge and create the partnerships needed to succeed.

We would like to thank ZEV Community members for their support for the initiative and their participation in survey and interviews. This Policy Summary was developed by Climate Group as part of the ZEV Community initiative with the support of the Scottish Government and EV100+.

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