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Accelerating the transition - how the UK and Canada are delivering the demand, supply and infrastructure for electric vehicles

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Executive Summary

The UK Government and Government of Canada have set ambitious road transport targets to achieve net zero emissions by 2050, in line with the Paris Agreement. In support of these targets, both Governments have made commitments to phase out the sale of new internal combustion engine vehicles by 2035 for light duty vehicles, and by 2040 for heavy duty vehicles, where feasible. As zero emission vehicle market share continues to grow in our countries and across the globe; this paper explores the similarities and differences in policies introduced, and next steps for decarbonizing transport in both the UK and Canada.

Keywords: global, government, market, policy, regulation

1 Government Commitments

Climate change is one of the most pressing challenges of our time. There is overwhelming scientific evidence that we need to take action and doing so is a clear priority for the UK Government and the Government of Canada. Following similar paths, both countries are pursuing ambitious efforts to decarbonise transport by rapidly accelerating the deployment of electric vehicles (EVs).

Transport is the largest contributor to domestic GHG emissions in the UK and the second largest contributor in Canada, contributing respectively 27% and 25% of domestic emissions in 2019. But the aims of both countries are not only to cut transport emissions through electrification, but to also create new green jobs, win a share of new global investments in clean transport technologies, and boost exports.

1.1 UK

In June 2019, the UK became the first major global economy to pass a law that requires the nation to achieve 'net zero' greenhouse gas (GHG) emissions by 2050 [1].

The UK Government published ‘Decarbonising Transport: A Better, Greener Britain’ (the TDP) in 2021 [2]. This was the first such plan in the world to set out a Government’s transport commitments and path to reaching net zero by 2050, in line with the Paris Agreement. The TDP takes a holistic and cross-modal approach and sets out a credible and ambitious decarbonisation path for the sector.

The UK will end the sale of all new non-zero emission road vehicles by 2040. It has confirmed that it will end the sale of petrol and diesel cars and vans by 2030, and new non-zero emission heavy goods vehicles

(HGVs) 26 tonnes or less by 2035. From 2040, all new vehicles must be fully zero emission. Consultation has been carried out on the appropriate dates to phase out the sale of new non-zero emission motorcycles and mopeds.

1.2 Canada

Canada's 2030 Emissions Reduction Plan [3] set out new federal sales targets and requirements for new zero emission vehicles (ZEVs) and committed to developing sales regulations for both the light-duty vehicle sector and the medium- and heavy-duty vehicle sector.

1.2.1 Light-Duty Vehicles

Canada's light-duty ZEV sales regulations will set annually increasing requirements towards achieving 100% new light-duty ZEV sales by 2035, including mandatory interim targets of at least 20% of all new light-duty vehicles offered for sale by 2026 and at least 60% by 2030. Canada released proposed light-duty vehicle regulations through Canada Gazette Part 1 in December 2022 and will look to finalize the regulations shortly.

Canada has also committed to aligning light-duty vehicle greenhouse gas emissions regulations with the most stringent performance standards in North America post-2025, whether at the U.S. federal or state level. Presently, the U.S. government has the most ambitious greenhouse gas standards for vehicle model years up to 2026 and intends to pursue the most ambitious greenhouse gas standards for light-duty vehicle fleets for model years 2027 and beyond. Canada intends to align with the final standards, which are expected to be released by July 2024.

1.2.2 Medium and Heavy-Duty Vehicles

Canada's medium- and heavy-duty ZEV sales regulations aim to reach 35% of total new medium- and heavy-duty vehicle sales by 2030. In addition, Canada will develop a medium- and heavy-duty ZEV regulation to require 100% of new medium- and heavy-duty vehicle sales to be ZEV by 2040 for a subset of vehicle types based on feasibility, with interim 2030 regulated sales requirements that would vary for different vehicle categories based on feasibility, and explore interim targets for the mid-2020s.

Canada also has greenhouse gas emission standards for medium- and heavy-duty vehicles, which have historically been aligned with those from the United States. The U.S. government is finalizing two new rules with the first applying to model year 2027 to 2030 and the second setting stricter greenhouse gas standards for model year 2030 vehicles and beyond, which is also expected to be finalized around July 2024.

1.3 Coordinating on policy development

The UK Government is supporting the rollout of EVs and transport decarbonisation, through collaboration across multiple government departments. Joined up thinking across the Department for Transport, Department for Business and Trade and the Department for Energy Security and Net Zero allows policies to be developed, with due consideration for the impacts on all key aspects of EVs, such as vehicle design, vehicle manufacture, infrastructure rollout, grid connections and energy resilience.

The Government of Canada has also adopted a whole-of-government approach to transition to electric vehicles. While Transport Canada plays the lead convening role at the federal level on this transition, several other key departments feed into this collaborative work, such as Environment and Climate Change Canada (ECCC), Natural Resources Canada (NRCan), Innovation, Science and Economic Development Canada (ISED), Infrastructure Canada (IC), the Canada Infrastructure Bank (CIB), and the Treasury Board Secretariate of Canada (TBS). These departments work hand in hand to ensure electric vehicles are more available to and affordable for Canadians and have the necessary supporting infrastructure and federal regulation.

In addition to domestic collaboration, both Government's participate in a number of EV related international working groups and councils. The UK is a co-chair of the Zero Emission Vehicle Transition Council (ZEVTC) [4], a ministerial forum which collectively supports accelerating the global transition to zero emission vehicles. Canada is a member of ZEVTC. Both governments are also members of the International Zero Emission Vehicle Alliance (IZEVA) [5], an international policy exchange working group to allow

collaboration between governments to support the expansion of global zero emission vehicle markets and policies.

The Government of Canada and the UK Government are also both members of the Clean Energy Ministerial – Electric Vehicle Initiative (CEM-EVI) [6], a dialogue for international energy ministers to support a clean energy transition. Alongside the CEM-EVI, both governments are also members of the Hybrid and Electric Vehicle – Technology Collaboration Programme (HEV-TCP) [7], where member countries collaborate on shared research projects to better understand EV deployment challenges and provide guidance to policy makers.

Our success in meeting our ZEV sales targets and eliminating tailpipe emissions from on-road transportation will require strong collaboration across all orders of government and the private sector, both domestically and abroad. Strengthening international partnerships on ZEVs through multiple fora – such as IZEVA and CEM-EVI, is essential, recognizing that we can better meet our ZEV sales targets when moving in tandem with other large markets.

2 Support for vehicles

2.1 Light-duty vehicles

2.1.1 UK

There are now over one million licensed plug-in vehicles in the UK, around 60% of which are fully battery electric [8], and during 2022 over 1 in 5 new cars sold had a plug. Since 2011, the UK Government has provided over £1.6bn in grant funding to bring ultra-low and zero-emission vehicles onto UK roads. The majority of this funding was to support the upfront purchase price of new cars, through the plug-in car grant. This scheme was closed to new orders in June 2022, after supporting the purchase of over 355,000 ultra-low and zero emission vehicles. The full impact of cars supported, and funding provided through this scheme is yet to be determined, whilst vehicle orders and subsequent grant payments are completed. The plug-in car grant had significant impacts on building the early electric car market in the UK, and despite gradual reductions to the grant value over its lifetime, the sale of zero emission vehicles continued to soar. The UK Government published a report which highlighted the reducing impact this grant was having on demand [9], and so a decision was taken to end the grant. However, the same report identified that the plug-in van market would benefit from continued grant support, helping fleets to make the switch to zero emission vehicles. The UK Government has confirmed that purchase incentives will continue to 2023/24 for taxis and motorcycles, and to 2024/25 for vans and trucks.

The UK also continues to offer favourable tax incentives through reduced vehicle excise duty and benefit in kind rates, in comparison to the most polluting vehicles. However, the Government has been clear that upfront purchase incentives will eventually end, and as the sale of zero emission vehicles becomes mainstream, it is right to start normalising the tax treatment of these vehicles.

The UK Government will end the sale of new petrol and diesel cars and vans by 2030. From 2035 all new cars and vans must be fully zero emission at the tailpipe, and between 2030 and 2035, new cars and van will only be able to be sold if they offer significant zero emission capability. To provide certainty to consumers, energy providers, the chargepoint industry, vehicle manufacturers and supply chains during this transition, the UK Government will introduce a zero emission vehicle (ZEV) mandate setting targets requiring a percentage of manufacturers' new car and van sales to be zero emission each year from 2024. This will include regulating the tailpipe CO2 emissions of new non-zero emission cars and vans to limit their emissions until 100% of new sales are zero emission. The Government is considering different pathways for regulating emissions from other forms of road vehicles.

2.1.2 Canada

Canada has invested over $2.3 billion in Transport Canada's Incentives for Zero-Emission Vehicles (iZEV) Programme which was launched in May 2019 and offers incentives of up to $5,000 for eligible light-duty ZEV. As of February 28, 2023, the iZEV Program includes 48 eligible vehicle models and has provided over 195,000 incentives to Canadians and Canadian businesses. Additionally, eight of Canada's provinces and territories have their own provincial/territorial incentives that can be combined with the federal incentive. These incentives have helped Canada reach a light-duty ZEV market share of 8.9% in 2022, increasing from 5.6% in 2021 and 3.8% in 2020. Tax incentives are also available through the Canada Revenue Agency in the form of a capital cost allowance (CCA) for Canadian businesses who have purchased a ZEV for the purposes of earning income. The CCA allows businesses to deduct a portion of their ZEV's value from their taxable income, however, it cannot be combined with the federal iZEV Program.

Whilst the UK no longer offers purchase incentives for cars as Canada does, it must be recognised that the UK ZEV car market was supported for over a decade, and its market share was 16.6% in 2022. Over its lifetime the plug-in car grant had a reducing impact on demand. Canada's iZEV Program was launched much more recently, and already appears to be having a positive impact on increasing ZEV market share. In time it may be useful to compare both incentive schemes to evaluate the key factors influencing demand, which may help better support developing markets internationally.

2.2 Medium and Heavy-duty vehicles

2.2.1 UK

After cars and vans, HGVs are the largest contributor to UK domestic transport CO2 emissions (19% in 2020). To ensure that the UK transport sector can reach net zero by 2050, HGVs must also be zero emission. Following consultation, at COP26, the UK Government announced that it will phase out the sale of new, non-zero emission HGVs less than or equal to 26 tonnes from 2035. From 2040, all new HGVs must be zero emission, putting the UK on course to be the fastest G7 country to decarbonise HGVs. Ahead of these phase out date, and in recognition of the complexity of HGV use cases, the Government has consulted with industry to identify potential suitable exemptions for vehicles below 26 tonnes that need further time to transition. The UK remains neutral on the best technology to decarbonise the UK's HGV fleet, and as set out in the TDP, the Government acknowledges that hydrogen will likely play a significant role in decarbonising heavier transport applications.

To support consumers with the upfront purchase costs of zero emission HGVs, the UK Government offers a plug-in van and truck grant. These grant rates are set at 20% of the purchase price, with up to £25,000 of funding available for the largest HGVs [10]. In 2022, this grant was modified, to amend eligibility refocussing the grant on the heaviest HGVs in greatest need of support for uptake.

Further support for zero emission HGVs includes the UK's Zero Emission Road Freight Demonstrator (ZERFD) programme [11]. This programme is supporting industry to conduct feasibility studies into developing cost-effective, zero-emission HGVs and their associated infrastructure in the UK. It has also supported the deployment of small-scale battery electric truck demonstrations. The first competitions were focused on battery electric and hydrogen fuel cell, long haul zero emission HGVs; applications are now being reviewed. The ZERFD programme will create an evidence base on which technology or technology mix will be best suited to decarbonise the heaviest road freight vehicles in the UK, providing confidence to the sector and enabling long-term investment.

2.2.2 Canada

Budget 2022 invested $547.5 million to provide purchase incentives to encourage Canadian businesses to adopt medium- and heavy-duty ZEV. Launched in July 2022, the Incentives for Medium- and Heavy-Duty Zero-Emission Vehicles (iMHZEV) Programme provides incentives of up to $200,000 for eligible vehicles. As of February 28, 2023, there are 67 eligible vehicle models from 27 manufacturers and over $8.9 million has been provided in incentives to Canadian businesses. The parameters of this programme, such as the incentive amounts, are comparable with those in other leading North American jurisdictions such as Quebec, British Columbia, and California to maximize alignment in these closely integrated markets.

Canada's iMHZEV Programme offers a significantly higher incentive for the largest eligible vehicles than the UK's plug-in van and truck grants, with more eligible vehicle models compared with approximately 40 eligible models on the UK's scheme. As programmes such as ZERFD progress in the UK, it may be beneficial to draw comparisons with other international markets such as Canada, to understand how to bring more suitable zero emission medium and heavy duty vehicles onto the market and encourage greater market share overall.

3 Support for infrastructure

3.1 Charging for light-duty vehicles

3.1.1 UK

The UK Government has set out its vision and commitments to make EV charging cheaper and more convenient than refuelling at a petrol station. In 2022 the UK Government published it's EV charging infrastructure strategy [12], setting out its plans to accelerate the rollout of EV chargepoints across the UK. The strategy states that it expects approximately 300,000 public chargepoints will be installed across the UK by 2030.

To date, the UK Government has supported the installation of over 400,000 chargepoints in homes and businesses. There will also be many more domestic and workplace chargepoints that the Government has not funded, representing a significant off-street charging infrastructure across the UK. The Government continues to offer grants to offset the cost of EV chargepoints in flats and rental accommodation, as well as businesses.

The majority of UK EV drivers charge at home, a trend that is expected to continue. However, the Government must ensure that public chargepoints are in place to support those without off-street parking and to enable long distance journeys. The Government and industry have already supported the installation of over 38,700 publicly available charging devices, including more than 7,400 rapid devices [13]. Public chargepoints have more than tripled in the last four years; with total numbers of public chargepoints increasing by 31% in 202 (rapid or above devices increased by 34%).

To ensure that the transition to EVs takes place in every part of the country, the Local EV Infrastructure (LEVI) Fund will support local authorities to work with industry and transform the availability of charging for drivers without off-street parking. The Government launched a pilot for the LEVI fund in 2022, and expanded it further this year, to support the development of the full fund. The pilot provides almost £60 million in public and private investment to 25 local authorities across England, for the delivery of almost 3,500 chargepoints and 1,000 gullies [14]. An additional £8 million in resource funding has also been awarded via the LEVI Capability Fund, to support local authorities to secure dedicated staff to plan, procure and tender the delivery of local chargepoints in their areas. It is expected that this funding will develop in-house expertise and capability to design EV strategies and work alongside private operators and investors to support local chargepoint rollout. Furthermore, the On-Street Residential Chargepoint Scheme (ORCS) remains available to all UK local authorities to provide public chargepoints for residents without access to private parking, with £37 million being made available for the ORCS scheme this year.

The UK Government is also stepping up the delivery of ultra-rapid chargers on the strategic road network for people making longer journeys. The Government is supporting motorway service area operators and the private sector to deliver ultra-rapid, open access chargepoints at every motorway service area in England. The Rapid Charging Fund (RCF) is designed to accelerate industry investment in transport decarbonisation, by funding a portion of the cost of upgrading the electricity grid at strategic locations, where it is prohibitively expensive to do so. The RCF will ensure that the private sector can continue to expand the charging network and future-proof electricity network capacity 10 years ahead to a minimum of 2035, with a stretch target of 2050.

To further support a robust charging network, later this year the Government intends to lay regulations to improve the consumer experience when using public chargepoints in the UK. The regulations will ensure there is a 99% reliability rate across each rapid charging network, alongside a 24/7-hour helpline for when

something goes wrong while charging. Drivers will also benefit from easier payment methods including contactless and payment roaming, as well as the ability to compare prices and access real-time information about chargepoints. In addition, chargepoints will need to have open data so that they are easy to find using maps and apps.

3.1.2 Canada

With more ZEVs on the road, comes the need for more infrastructure. To meet identified targets, Canada will continue to support the development of ZEV infrastructure across Canada, in a strategic, targeted way. Building these stations not only ensures Canadians can access them, but also offers good business opportunities in the infrastructure, technology, and utilities sectors.

Since 2017 the Government of Canada has allocated $1.2 billion for the build-out of ZEV charging and hydrogen refuelling infrastructure, making ZEVs more accessible for Canadians. This funding will support the installation of 84,500 chargers and hydrogen refuelling stations across Canada. To date, NRCan's ZEV infrastructure programming has approved projects that will result in more than 34,400 chargers, including over 1,000 direct-current fast chargers along Canada's vast national highway system, making in possible today to drive an electric vehicle from one end of Canada to the other. NRCan's Infrastructure Programming ($680 million since 2017) is complemented by $500 million that Canada's CIB will invest in large-scale ZEV charging and refuelling infrastructure that is revenue generating and in the public interest.

Canada reconizes that meeting light-duty ZEV sales targets will require even more charging stations. According to an analysis prepared by Dunsky Energy Consulting [15], meeting Canada's targets will require a substantial increase in the deployment of publicly accessible charging stations. Canada's investments in 84,500 chargers will help establish a business case for the private sector to increase its funding for Canada's electric vehicle charging network on route to reaching the scale outlined in the report, namely, 442,000–469,000 publicly available chargers by 2035. While all orders of government will continue to play a role in building charging and refuelling stations, success will depend on investments from other public and private partners to meet our future needs, including utilities, businesses, and industry. Canada is committed to continue working with industry to dive deeper into the charging and refuelling station requirements at a regional or provincial/territorial level with further analyses and studies.

Given that over 1/3 of Canadians live in multi-unit residential buildings (MURBs), providing access to home charging for such a large portion of Canada's population is key to accelerate the transition towards ZEVs. NRCan's Zero Emission Vehicle Infrastructure Program (ZEVIP) [16] provides funding to increase the availability of localized charging where Canadians live, work, and play, including for MURBs . To date, more than 74 projects [17] have been funded under ZEVIP's that will result in more than 4,500 chargers in MURBs, workplaces and for use by light-duty fleets. NRCan also commissioned a study entitled Zero-Emission Vehicle Charging in MURB and Garage-Orphans [18] that sheds light on the barriers and opportunities to installing ZEV chargers in MURBs

In order to address other underserved areas such as rural, remote and indigenous communities, ZEVIP also launched a special stream to fund charging infrastructure deployment in these regions.

In addition to direct funding for ZEV charging and hydrogen refuelling stations, Canada also offers businesses a temporary first-year tax write-off for investments in electric vehicle charging stations and hydrogen refuelling stations. Canada's investments in ZEV infrastructure helps to de-risk private sector investments. Success will depend on investments from both public and private partners to meet our future needs, including utilities, businesses, and industry.

Canada is also working with the United States to leverage existing collaboration on charging and hydrogen refueling infrastructure to support greater access to ZEV infrastructure, including in underserved communities, by working to harmonize charging standards and develop cross-border alternative fuel corridors. Canada will also continue to develop and align binational codes and standards for ZEVs and support infrastructure to ensure the safe deployment of ZEVs in both countries. This collaboration will help to move people and goods in cleaner and more efficient ways.

3.2 Charging for medium and heavy-duty vehicles

3.2.1 UK

The UK intends to convene industry stakeholders to develop a robust plan for HGV infrastructure delivery, and the role of the public and private sectors in achieving this. The plan will build on data gathered through the ZERFD programme and draw on experience of the Freight Council. Trials of zero emission HGVs through the ZERFD programme will support the initial deployment of new HGV refuelling and recharging infrastructure and provide data to make an informed decision about future HGV infrastructure roll-out. In addition, the UK Government continues to keep the inclusion of HGVs within the scope of the RCF under review.

3.2.2 Canada

While federal infrastructure investments have mostly focused on light-duty vehicles with new investments in incentives for medium and heavy-duty vehicles, Canada is beginning to invest in supporting infrastructure. For example, Canada launched a targeted request for proposals for commercial fleets under the Zero-Emission Infrastructure Program. Included in Canada's funding for ZEV infrastructure is $500 million from the Canada Infrastructure Bank to invest in large-scale ZEV charging and refuelling that is revenue generating and in the public interest. These investments are paving the way for charging and refuelling infrastructure for medium-duty ZEV in Canada, however, more dedicated efforts will still be needed.

It is clear that whilst both Canada and the UK are committed to providing support for infrastructure that can be used by medium and heavy-duty vehicles, there is still more work to be done in this space and more research needed into the best solutions going forwards.

3.3 Energy infrastructure & balancing the grid

3.3.1 UK

The UK Government is working with the energy industry to plan for EV uptake and ensure the energy system can meet future demand in an efficient and sustainable way. In 2021, the Government made legislation to mandate that most private chargepoints in domestic and workplace settings must include smart charging functionality and meet minimum device-level requirements, such as on cybersecurity. Most of the requirements came into force in June 2022, with the cybersecurity requirements coming into effect in December 2022. These regulations lay the groundwork for smart charging to become the norm for all private charging. This will ultimately benefit electricity consumers by reducing the energy system investment needed for EV uptake, keeping electricity costs lower, and being able to use clean, renewable energy when it is abundant, providing greater flexibility to the grid. Earlier this year the Government published it's EV smart charging action plan [19].

3.3.2 Canada

In 2016, Canada created an Infrastructure and Grid Readiness Working Group to inform infrastructure and grid readiness efforts. At the beginning of 2020, Canada commissioned a study to help Canadian utilities better understand the expected electrical energy demands from future vehicle fleets and its potential impact on the grid. Following that study, a request for information was sent to Canadian stakeholders to better understand the grid readiness impacts of the policies aimed at faster electric vehicle use. Insights gathered from this request for information has helped to understand stakeholder and system needs for grid readiness and future work to support these needs.

As we look ahead to more Canadians using ZEV, it becomes increasingly clear that more work is needed to make sure that Canada's grid can support the increased electricity demand. While Canada has one of the cleanest electricity grids in the world, there is much work still to do. The electrical grid of tomorrow will need to undergo an important shift to ensure that the electricity being provided to ZEV is coming from non-emitting sources. According to the Canadian Climate Institute [20], as transportation becomes more electrified, electricity systems must undergo three transformational changes, becoming bigger, cleaner, and

smarter. This will require ambitious changes to Canada's electricity systems; however, it is achievable given Canada's strong starting position.

Canada's *Clean Electricity Regulations* will ensure that Canada's electrical grid become net-zero by 2035 while also making sure that Canadians can still access reliable and affordable electricity. These regulations will complement the government's efforts to speed-up the use of ZEV by making sure Canadians will be charging their electric vehicles from cleaner electricity.

Both Canada and the UK are confident that the grid will meet demand as use of EV's increases, whilst being cautious that this must be done in an efficient and sustainable way. It is likely that both countries will benefit from future developments in vehicle-to-grid technologies, providing greater flexibility in the electricity system.

4 Supporting an equitable transition

Transport has a huge role to play in reaching net zero. The scale of the challenge demands a step change in both the breadth and scale of ambition, and governments have a duty to act quickly and decisively to reduce emissions. However, consideration must be given to the needs of all consumers, to ensure that no one is left behind in the transition to zero emission vehicles.

4.1 UK

One in five people in the UK self-report a disability [21]. Analysis indicates that by 2035 there will be 2.7 million disabled drivers in the UK, with up to half – 1.35 million [22] – either wholly or partially reliant on public EV chargepoints. The UK Government is aware that the majority of EV charging takes place at home, a trend which it expects to continue; disabled people are less likely to have off street parking, and will therefore be more reliant on public charging infrastructure.

In 2021, the UK Government launched a plug-in vehicle grant specifically for vehicles to be converted to wheelchair accessible, recognising these vehicles are necessarily larger and more expensive for consumers who can be heavily reliant on vehicles as a mode of transport. Uptake of this grant has been slow, and research shows that disabled consumers still face several barriers when purchasing and using EVs [23].

In October 2022, the UK Government, alongside British charity Motability, co-sponsored Publicly Available Standard (PAS) 1899, which was published by the British Standards Institution (BSI) [24]. PAS 1899 provides a world-leading specification on the design and installation of accessible public EV infrastructure, following a call from industry to provide standardised guidance on what accessible public chargepoint design consists of and how it can be deployed.

PAS 1899 covers specifications including: the location, placement and spacing of chargepoints, along with aspects such as kerb height, the height of the chargepoint, and the force required to lift the charger cable and insert the charge connector. The standard also considers chargepoints in the context of their wider built environment, to ensure pedestrians' and other road users' needs are reflected. PAS 1899 also includes good practice guidance on how to support consumer safety, by ensuring an inclusive environment around public chargepoints, for example through the provision of lighting and CCTV.

4.2 Canada

More work lies ahead to make sure that all Canadians can make the switch to ZEV, which will be key to Canada's goal of achieving net zero emissions by 2050. There is an opportunity for all orders of government to further analyze policies to encourage certain demographic groups, including marginalized or disadvantaged communities, to adopt ZEV. Canada will continue to work with those living in these communities to help overcome these barriers. This includes building ZEV infrastructure in the North, increasing access to affordable clean electricity or hydrogen, and researching, developing and demonstrating that ZEV can meet the needs of consumers and businesses in these regions.

The government is committed to working closely with Indigenous peoples to help them prepare for the adoption of zero-emission vehicles in the future. Decarbonizing transportation and the transition to net

zero also presents important opportunities for Indigenous organizations, Indigenous communities and the government as we work together towards reconciliation. Several Indigenous organizations and communities across Canada are leading ZEV and clean fuels-related initiatives to help transition to a cleaner more sustainable future. Building off several past and current Indigenous awareness projects, Canada has created launched a dedicated funding stream for an Indigenous-led awareness Pilot funding projects that promote the knowledge, use, and benefits of ZEV and clean fuels. Canada is also leveraging behavirourl science and consumer insight tool, (e.g. surveys, field testing, public opinion research) to analyze the drivers and motivators for Canadians making the switch.

Making sure the switch to ZEV is done in a fair way also involves preparing workforces to fully participate in the low-carbon economy, while minimizing the impacts of labour market transitions. This involves identifying and supporting inclusive economic opportunities for impacted workers and putting them and their communities front and centre in discussions that affect their livelihoods.

5 Future policy challenges and next steps

5.1 UK

As the UK approaches phase out dates for the sale of new non-zero emission vehicles, consideration must be given as to how policies can be shaped to ensure that no one is left behind in the transition. The UK is now beyond the early adoption stage and upfront purchase incentives are being gradually withdrawn, thus it may become more challenging to support those who do not yet see EVs as the solution to reducing transport emissions, or those who are less technology confident to make the switch. There are of course challenges to overcome in ensuring different societal groups can access and use EVs, where continued support may be needed over the coming years.

In addition, the UK must consider how to support the acceleration of zero emission HGVs over the coming years, while the most effective solution is identified, through programmes such as ZERFD, and as further technologies emerge. Collaboration and knowledge sharing on an international scale will be particularly necessary to ensure that international freight vehicles are able to cross borders to deliver essential goods; and to understand and overcome barriers collectively.

5.2 Canada

Canada’s Action Plan for Clean On-Road Transportation [25] reflects the Government of Canada's initiatives announced and implemented since 2016 to show how these measures are working together to help Canadians and Canadians businesses make the switch to ZEV.

Going forward, Canada will finalize its regulations regarding light-duty ZEV sales, will develop a medium- and heavy-duty ZEV regulation, and will continue to align with the US greenhouse gas emission standards for medium- and heavy-duty vehicles. Canada will continue its incentive programmes for both light-duty and medium- and heavy-duty ZEV, and will continue to invest in charging infrastructure across the country. Canada will also continue its work to support grid readiness and an equitable transition to ZEV.

Canada will continue to collaborate with partners and stakeholders, for example, through the newly launched Zero-emission Vehicle Council that held its inaugural meeting in March 2023, with industry associations, non-governmental organizations, and provincial governments. The goal of the council is to work collaboratively to address opportunities and challenges to increase ZEV adoption.

Given the pace of change we are now witnessing in the transportation sector, the government's approach to ZEV will evolve over time. The Government of Canada's future actions for cleaner on-road transportation will be detailed through the progress reports required under the *Canadian Net-Zero Emissions Accountability Act*, the first of which is set for 2023.

5.3 Conclusion

Whilst Canada and the UK have made good progress to date on the transition to ZEVs; each country faces slightly different barriers to overcome. It is clear that both countries are putting consumers at the forefront of their strategies, providing incentives and infrastructure to give drivers and businesses the confidence to make the switch. Whilst both countries are facing similar challenges overall, the differences in geographic size and consumer demands have resulted in different approaches in overall strategy from each country; for example with Canada remaining focused on ensuring ZEV infrastructure is in place for long distances, and the UK focused on ensuring it's significant number of households without off-street parking are able to charge more easily than they are able to refuel at a petrol station.

As well as learning from one another, comparing the approaches other countries committed to this transition will be crucial to achieving our international climate goals. Utilising international working groups, councils and conferences to continue sharing knowledge on best practice for ZEV policies will help us to develop a more robust evidence base in this sector, and ultimately reach net zero more efficiently.

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Presenter Biographies

Nick Shaw has been Joint Head of the Office for Zero Emission Vehicles since July 2022, leading the UK government team supporting the transition to zero emission vehicles and the rollout of charging infrastructure. Prior to this, he was Deputy Head of Decarbonisation Strategy in the Department for Transport (DfT), including developing the 2021 Transport Decarbonisation Plan. Before DfT, he worked in Cabinet Office covering energy, environment and transport, and the Department of Energy and Climate Change.

Zoiey Cobb is the Director of On-Road Decarbonization and Electrification at Transport Canada. In this role, she is responsible for Transport Canada's policies related to both light-duty and medium-heavy duty ZEV, providing policy oversight on Transport Canada's Incentive programming, as well as convening the whole-of-government Community of Practice on On-Road Decarbonization. A seasoned public policy professional, Zoiey joined the Public Service in 2007 and has worked in a variety of roles across many departments and central agencies. She is known to be a collaborative and enthusiastic leader who likes to get stuff done and make a difference.