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An Empirical Study of the Policy Processes behind Norway's BEV-Olution

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Abstract: Norway's large battery electric vehicle (BEV) market and fleet are not the result of a comprehensive policy plan. Using the multiple streams (MS) framework and document analysis, it was identified that the most important Norwegian BEV policy decisions were made using inadequate policy processes that fall outside of traditional politics. This is contrary to the MS framework postulate that three independent streams of problems, policy solutions, and politics must align to pave the way for new policies. Politicians had limited information about the effects of policies they introduced in this "learning by doing process". Impact assessments were rarely made. The decision rationale was often not documented. The future market expectation and thus the national budget consequences were low when important policy decisions were made, whereas the political gain was high. The processes were more aligned with traditional politics after 2014. The ambitious ZE vehicle targets for 2025 and the climate policy targets for 2030 locked in incentives, despite rising tax losses. In sum, these developments created the world's largest per-capita BEV market. To avoid negative issues and keep the BEV policies' potential to support the BEV transition, politicians should ensure that sufficient knowledge is available when making decisions about future policies. Such decisions should be taken transparently within traditional politics, be properly assessed as with EU policy processes, and regularly reviewed as with the California ZEV mandate process. The required knowledge should be developed in open-access research.

Keywords: policy; incentive; strategy; passenger car; government

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1. Introduction

Norway is the world leader in per capita BEV diffusion (battery electric vehicle) [1]. In total, 690,000 BEVs were on the road at the end of 2023, which was 24% of the passenger car fleet. Another 7% were plug-in hybrid vehicles (PHEVs) [2]. The BEV market share passed 79% in 2022, with PHEVs accounting for another 8.5% [2], as seen in Figure 1. In 2010, there were only 3000 BEVs in Norway [3]. BEVs are now pursued as a measure to reduce transport GHG emissions, and the current target is to only sell ZEVs from 2025, which is the world's most ambitious timeline. The consensus among most automakers is that BEVs will become the dominant technology for passenger vehicles. PHEVs will not count towards the EU's new vehicle 0 g CO_2/km 2035 target, and the sale of hydrogen fuel cell vehicles (FCEV) is miniscule, despite having the same incentives as BEVs. FCEVs were discredited after a filling station explosion in 2019 and subsequent filling station closures. Only two models have been available in the market, the Toyota Mirai and the Hyundai NEXO.

The incentives for BEVs include the exemption from registration tax from 1990, the 1996–2003 exemption from annual tax and the reduction from 2004, the zero rate value-added tax (VAT) on BEV purchases from 2001 and BEV leasing from 2015, free parking from 1999 to 2017 and a parking fee reduction from 2018, free road tolls from 1997 to 2017 and a road toll reduction from 2018, reduced ferry rates from 2009, and access to bus lanes in the Oslo area from 2003 and nationally from 2005, with some rush hour limitations from 2015. Finally, there has been a re-registration tax exemption from 2018 and there was a reduction in 2022, as well as a reduced benefit tax on company cars from 2000 to 2022.

Support schemes for normal chargers have been in place in Oslo since 2008 and nationally since 2009. Support for fast chargers was introduced in 2011 and scaled to cover all main roads between 2015 and 2020. Most fast chargers are now deployed on commercial terms.

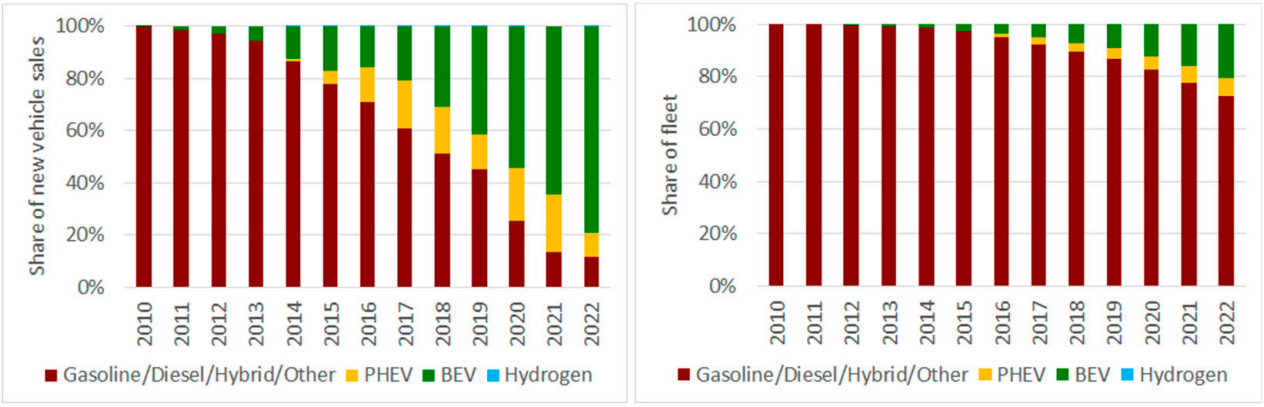

Figure 1. Sales shares and fleet shares for ICEVs, PHEVs, BEVs, and hydrogen FCEVs from 2010 to 2021. Source: Statistics Norway.

Norway established through these incentives a market where BEV producers competed on equal terms and where BEVs became competitive with ICEVs earlier than elsewhere. This gives rise to the research question of this article: How and why were the BEV policies and incentives established and what did the politicians know about BEVs when the actual decisions were made? Understanding how these policies came about can be used to improve the policy processes ahead and help other countries seeking to accelerate the transition to ZEVs. They need to understand how a country like Norway, without an automotive industry, could become such a leader in the ZEV transition in order to develop efficient policies.

Section 2 of this article includes a description of the methods and materials used in this study. The results are in Section 3, the discussion is in Section 4, and the conclusion is in Section 5.

2. Materials and Methods

2.1. Literature Review

The rapid market introduction of BEVs in Norway is the result of large incentives that were introduced in 1990 [3–5]. The first incentives were intended to enable market experiments and establish knowledge about BEVs' technical potential in Norway's demanding climatic conditions [3,4]. Further incentives were introduced [3–5] to build a niche market and establish a BEV industry between 1999 and 2002 and 2007 and 2010. Norway had then a world-leading BEV developer, THINK [5], which Ford owned from 1999 to 2002. Ford needed low-cost BEVs for the California ZEV mandate. The market remained small up until 2011. It was limited by the high cost and limited supply and quality of BEVs [3,5]. Norwegian BEV industrialisation ended in 2010 due to a lack of funding for THINK and other entrepreneurs in the wake of the global financial crisis. [3,4]. The market took off in 2011 with the availability of high-volume OEM BEVs that were competitive with ICEVs due to the Norwegian incentives [6]. The OEMs expanded their offerings further in 2016, which allowed a BEV regime to gradually emerge [5] and compete with the existing ICEV regime. A long-term policy framework was a prerequisite for success [7], and the user value of the incentives was high, according to user surveys [8–10]. BEV sales expanded in 2020 with the availability of longer-range models [11,12]. An expanding charging infrastructure ecosystem supported long-distance travel and single-vehicle ownership [13], but user-friendliness was lacking due to a myriad of different suppliers with different apps and payment systems [14]. The policy focus since 2021 has been a controlled downscaling of incentives, as signalled by the publishing of the principles for the future of vehicle taxation

in Norway in the 2021 National Budget [15]: "A sustainable vehicle taxation system must include technology neutral equitable taxes on purchase and use of vehicles and take into account the transition to ZEVs towards 2025".

The Norwegian 1990 to 2022 societal BEV development process has previously been analysed using the technology innovation system framework [3,4] and the multi-level perspective (MLP) [5,16]. These analyses found that an alignment of the factors required to achieve rapid BEV diffusion occurred after 2010. The costs, effectiveness, and impacts of policies [17–22], including the total cost of ownership [6], have been analysed, with the conclusion that the incentives have been vital in the development of the market. Downscaling the incentives while keeping sales up may be possible according to the latest research [23], although user surveys show that most of the incentives have been and are still important [8–10]. The knowledge available to politicians when introducing BEV policies has been limited [24]. Cities had an important role in BEV policy development [5,25] due to local incentives such as free parking and support schemes for chargers. Local assets such as clean electricity and policy learnings over time have also been important. [7,26]. Some criticisms of the policies do exist, especially on the combined size of the incentives [27,28], but most research has focused on the positive or factual aspects of the electromobility transition and how to reach national targets. Politicians have focused on making BEVs a story, as seen in the Appendix A overview of the suggested policies in party programmes and government declarations from 1990 to 2023.

Norway became the world leader in BEV adoption without anyone having analysed in detail exactly how and why the Norwegian BEV policies and incentives were established or what politicians knew about BEVs and the impacts of the policies when the actual decisions were made. This article aims to fill this knowledge gap and improve the understanding of policy processes. This knowledge can aid policy development for the electrification of light commercial vehicles and trucks and should be of interest to other countries seeking to accelerate their transition to ZEVs. This understanding may also be relevant for other policy areas.

Understanding the BEV policy development processes has also not been an important research theme in other countries. There are singular examples for Sweden and Denmark [29], Germany [30], France [31], and the UK [30], and for regions such as the EU [32], the Nordic countries [33], and California [31,34]. California and the EU conduct large, transparent, and publicly available impact assessments when introducing new ZEV and vehicle CO_2 policies [35,36] so there is less need to study how these processes proceeded. Cross-country analyses have provided additional information about the efficiency of BEV policies in different contexts [26,29–31,33,37,38] and, sometimes, on how they came about [26]. The conclusion is, however, that BEV policy development processes are understudied in general. Yet, this topic is of special interest in the Norwegian case as the policies led to market shares above 80%. This achievement came at a considerable tax loss cost but without much resistance. There is thus a need to increase the understanding of the overall process in Norway.

2.2. A Brief Overview of Norwegian Politics and Policy Processes

Norway has a tradition of technology-neutral politics developed in thoroughly documented processes defined by the "Instructions for official studies and reports" ("Utredningsinstruksen") [39–41]. A strong social economics bureaucracy in the Ministry of Finance oversees the national budget process and has written procedures and methods for how policy changes should be evaluated [42–45]. The essence of these requirements is that all relevant aspects of all types of governments that internally or externally develop policy proposals should be thoroughly evaluated using a specific method that captures the economic impacts.

Large policy changes are normally introduced in gradual policy processes, as illustrated in Figure 2. They start with a public report evaluating policy change needs and implications for the national budget, the public, businesses, and stakeholders. The gov-

ernment develops the suggested changes into a proposal in the annual national budget. A debate in parliament on the budget and policy changes follows. A recommendation from one of the parliament committees is made before making a decision in plenum. Large policy changes are often anchored as broad political agreements between the parties in parliament for stability reasons. New governments build politics from the existing situation and rarely reverse recent reforms.

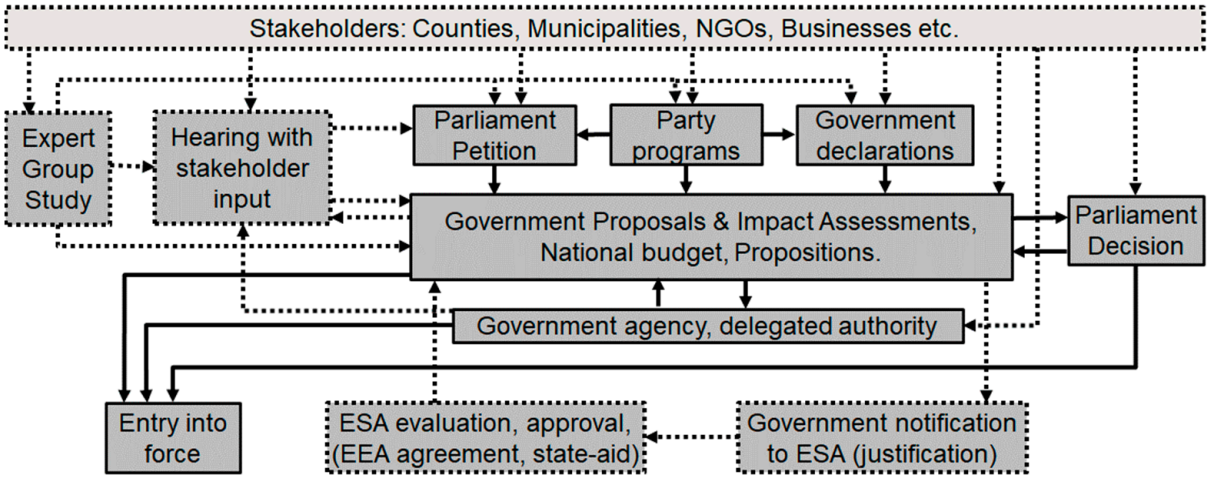

Figure 2. Generic BEV policy development process flow. Source: Author.

Taxes are adjusted in small steps in a government's internal annual national budget process to provide stability for market actors. Vehicle importers have, for instance, already pre-ordered vehicles for the following year when a national budget has been made public in early October. Large, unexpected tax changes can influence the value of a dealer's stock of new and second-hand vehicles and can thus be a challenge.

Policies that require a law change and affect businesses, consumers, or other governance levels go through a structured process with a public hearing after parliament or the government has proposed a law change. Potentially unwanted effects can be identified, and adjustments can be made before the law enters into force. Law changes that only affect the national governance level can be made directly by parliament. Parliament can also petition the government to introduce specific policies. The government responds with an analysis of the impacts in the next national budget documents or propositions to parliament.

Norwegian politics is, however, less stable than before as cross-party coalitions have become the rule. This leads to very detailed government declarations that regulate the policies that the government will pursue up until the next election, including vehicle taxation and BEV incentives. These declarations are the result of long negotiations in which party programmes are the starting point. This means that decisions can have been made about politics even before any impact assessments have been made about their effectiveness, costs, or other impacts. Small pro-BEV parties can in this way have a high impact on BEV policies.

The Norwegian relationship with the EU is regulated via the EEA agreement, which essentially means that the four freedoms of the EU—the free movement of goods, capital, services, and people—applies also to Norway. The EFTA Surveillance Authority (ESA) has the role that the EU court has within the EU, i.e., to verify the legality of the policies proposed in terms of state aid and EU regulations related to the four freedoms.

2.3. Method

This study of Norwegian BEV policy development processes was based on a systematic document analysis. This method was chosen because all the relevant facts about the development of the large and costly Norwegian BEV incentives should have been properly documented in publicly available documents if the structured Norwegian policy processes

depicted in Figure 2 were followed. A second reason is that documents are the only reliable source of information that span the entire 1990 to 2023 timeframe of this study. A third reason was to avoid memory bias.

The first target of the document study was to identify the level of knowledge of BEVs and the expectations for future developments at the time when important BEV policy decisions were made. The second target of the document study was to identify the degree to which structured Norwegian political processes were followed and, specifically, the instructions for official studies and reports and the guidelines for policy analysis. Combined, these two approaches make it possible to answer this article's research question. The actors that were involved in the decisions would not have had access to the full information gathered retrospectively in this article. They may also have acted on biased information from market actors and stakeholders. Neutral information on BEV usability in Norwegian conditions was hardly available up until 2010.

The 1990–2023 BEV policy development process has been split into seven periods and evaluated against the structured Norwegian governance processes using Kingdon's [46] multiple streams (MS) framework. This framework is appropriate for the study of policy development processes. Kingdon states that policy agendas are set by the dynamics of three "streams" of processes that are essentially independent of each other: a stream of problems, a stream of policies, and a stream of politics—the 3Ps [34]. When these three streams align, a policy window is created that provides opportunities for policy actors to push their views on policy problems and solutions and set the policy agenda, i.e., pave the way for BEV support policies. An agenda is defined by Kingdon [46] as "the list of subjects or problems to which government officials, and people outside of government closely associated with those officials, are paying some serious attention at any given time". Collantes and Sperling [46] found the framework useful for EV policy analysis but questioned if these three streams are independent of each other.

2.4. Materials

Great effort was put into identifying all the relevant documents that deal with different aspects of BEV development since 1990. The materials included 261 articles, reports, books, and other documents from research, government and civil services, consultants, NGOs, and industry, as shown in the overview in Table 1. In addition to these documents, the analysis draws on information from the annual national budget documents and protocols of policy decisions and debates in parliament. Documents with relevance to the policy development processes were subsequently included in the analysis and complemented by press articles identified through the Norwegian Retriever news archive service. Many of the reviewed documents prior to 2000 are not publicly available now but were disseminated to the public and policy makers when they were published. They fill a void in the knowledge of the early development and come from the author's archive. Most documents up to 2010 and most of the press articles are in Norwegian language.

Table 1. Overview of the documents analysed.

	Electromobility Norway	Theory/International	Total
Peer-reviewed research articles	22	18	40
Editor-reviewed research articles	2	1	3
Monographs (scientific book, PhD thesis)	3	2	5
Book chapter in scientific book	3	3	6
Scientific research paper	3	3	6
Reports—research/scientific	28	3	31
Reports—authorities using scientific approach	2	0	2
Reports—consultants	10	0	10
Reports—organisations	2	1	3
Popular science book	2	0	2
Press articles	66	9	75

Table 1. *Cont.*

	Electromobility Norway	Theory/International	Total
Other news articles, websites	14	3	17
Private actor documents	17	6	23
Public actor documents	10	1	11
Political documents	18	0	18
Law texts	1	2	3
Other references	4	2	6
Total	207	54	261

3. Results

Sections 3.1–3.7 analyse the detailed policy processes behind the introduction and revision of each policy and incentive—split into seven periods—before assessing the overall process in Section 3.8. Each subsection starts with a brief overview of the main activities of the period and contains a flowchart that shows a chronological chain of the market, policy, and knowledge development.

3.1. 1990–1997—Policies Enabled Market Experiments to Verify BEVs' Potential

In 1990 when the first was imported, BEVs were unknown [3]. A vehicle registration code for BEVs did not even exist. The gasoline three-way catalyst became obligatory in 1989, but local pollution was still a problem in cities. Politicians saw BEVs as a local pollution reduction measure, whereas the energy sector saw BEVs as a new electricity market [3]. The first incentives—the registration tax (1990) and the annual tax exemption (1996)—enabled market experimentation. PIVCO saw potential for producing BEVs, being inspired by California's ZEV mandate requirements for BEV sales from 1998 and French and Swiss BEV activities. PIVCO (THINK) tested BEV prototypes 3–4 years before starting industrialisation. The target was to produce 5000–10,000 BEVs/year [3]. PIVCO BEVs were advanced for their time, having Ni–Cd batteries, an ABS, a driver airbag, and a 50–80 km range [3]. The competitor Kewet had BEVs with lead–acid batteries and a 30–40 km range. A small number of Peugeot, Citroën, and Renault Ni–Cd-battery BEVs were also available. The National Institute of Technology tested BEVs' capability [3], with inconclusive results. BEVs were seen as a positive concept with good potential, but they were small, had low top speeds, and the build quality and durability were poor. They were also too expensive, even with incentives [6]. The Electric Vehicle Association (EVA, Norstart) was established to increase BEV interest, improve incentives, and support industrial development [47]. Free road tolls were introduced in 1997 to make BEVs more competitive, after NGO lobbying [3,47,48]. This incentive became important in later years with toll roads everywhere. At the end of this period, the BEV fleet counted 105 and two models were sold. They had a range of 30–60 km. The timeline is shown in Figure 3.

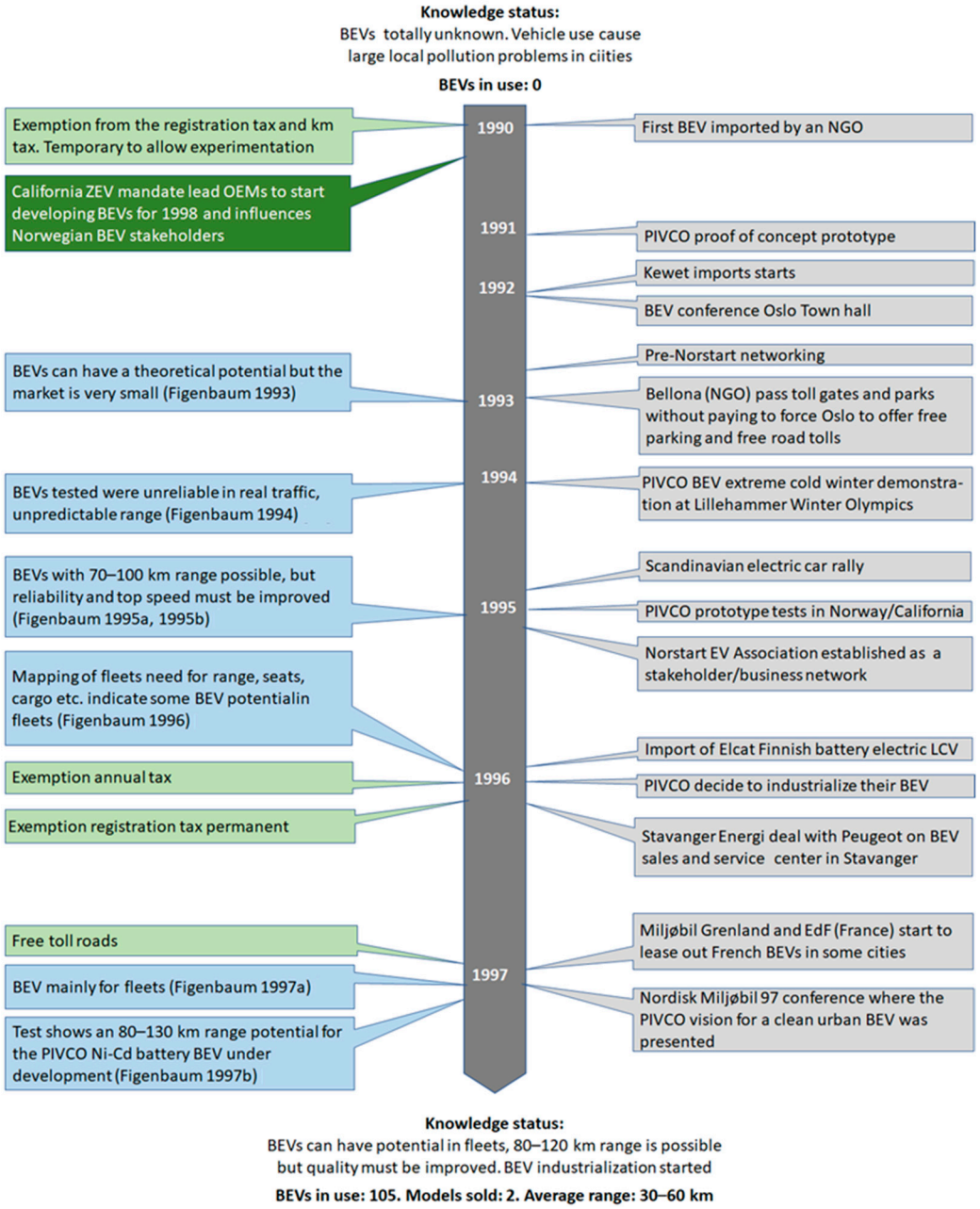

Figure 3. Timeline of policies, market activities, and research publications 1990–1997 [49–55]. Light green: Norwegian policies. Dark green: international policies. Blue: research results. Grey: market activities. Source: Author.

Exemption from registration tax and km tax (1990, 1996)

High vehicle registration taxes generate government income. Because taxes doubled 1990 BEV prices [6], NGO and industry actors lobbied for an exemption [47] to enable market tests. The finance minister was positive [56]. A temporary exemption in the 1990 National Budget [57] was endorsed by parliament [58]. BEVs were also exempted from km tax. No impact assessments were made. The tax loss was negligible, with five BEVs in the fleet [3]. The exemption became permanent when Parliament adopted the 1996 National Budget vehicle tax reform [59,60]. This was again without an impact assessment, contrasting the well-prepared reform itself [59,61]. The exemption lasted until 2023 when a weight tax was introduced for all vehicles [62].

Exemption and reduction from annual tax (1996)

The annual tax exemption was decided in the parliament's 1996 National Budget vehicle taxation reform debate and was documented in a sentence in the minutes [60]. There was no impact assessment as it had not been proposed in the reform [59]. With 50 BEVs in the fleet [3], the budget impact was negligible. BEV owners had to pay [63] a traffic accident tax (EUR ~40) from 2004 after it became part of the annual tax. A 2015 vehicle taxation policy settlement [64] decision to introduce half annual tax in 2018 was broken in 2016. Parliament instead decided on a full tax exemption from 2018 [65] during a process to change the annual tax to a vehicle insurance tax [66]. In the national budget process for 2021, parliament endorsed the government's 70% ICEV rate proposal [15]. The incentive was removed in April 2022 [67].

Free road tolls (1997)

An environmental NGO and the pop group A-ha, supported by the EV Association and Oslo Energi (DSO), wanted an exemption from road tolls and parking fees for BEVs in Oslo in the early 1990s. They thus refused to pay [47]. The pressure [3,5,24,47] made Oslo decide to offer free toll roads in 1995 [47,68] and free parking from 1997 [69]. Oslo wanted to reduce pollution and have PIVCO/THINKs BEV factories in Oslo [70]. National laws inhibited the introduction. The Norwegian Public Roads Administration (NPRA) stated that road tolls could by law only be used to build roads. Parliament changed the law in 1997 without any impact assessment, stating that BEVs were environmentally comparable to the already exempted buses [71]. The Minister of Transport stated that toll road companies were not impacted, but longer payment periods or higher rates could be required. In the 2017 National Budget, parliament decided that BEVs could pay maximum 50% of the rate for ICEVs for parking and road tolls, to be decided by local authorities [65], which was changed to 70% in 2023 [62].

3.2. 1998–2002—Policies Supported BEV Industrialisation

This period started optimistically. PIVCO changed its name to THINK and industrialised a city BEV that was launched at the 1998 Brussels World Electric Vehicle Symposium. Lotus Engineering (UK) improved the quality of the product and aided the production start-up. The 1998 Asian crisis hit the Norwegian economy with falling oil prices. THINK lost capital and went bankrupt in 1998 [3]. Ford bought THINK in 1999 to obtain a low-cost BEV to meet California's ZEV mandate [3]. Production started in late 1999 after product improvements and the introduction of a better-quality assurance system. Sales started in Norway and some European markets. A model for California was developed [47]. THINK reached the global BEV forefront. Small numbers of Kewet and French BEVs were imported and sold to fleets, enthusiasts, and free-road-toll beneficiaries. Politicians became BEV proponents with Ford owning THINK and introduced free parking and a zero-rate VAT on BEVs. Ford sold THINK in 2002 after it became clear that the 2003 California ZEV mandate no longer required BEVs as they were seen as technically immature by the legislators. THINK also had technical problems with the California model, and Ford had economic problems and had to save costs [3]. THINK was sold to an Indian investor. The period ended pessimistically with a global downturn. BEVs were seen as not being market-ready. The fleet had, however, grown to 871 by the end of 2002 [3]. The complete timeline is shown in Figure 4.

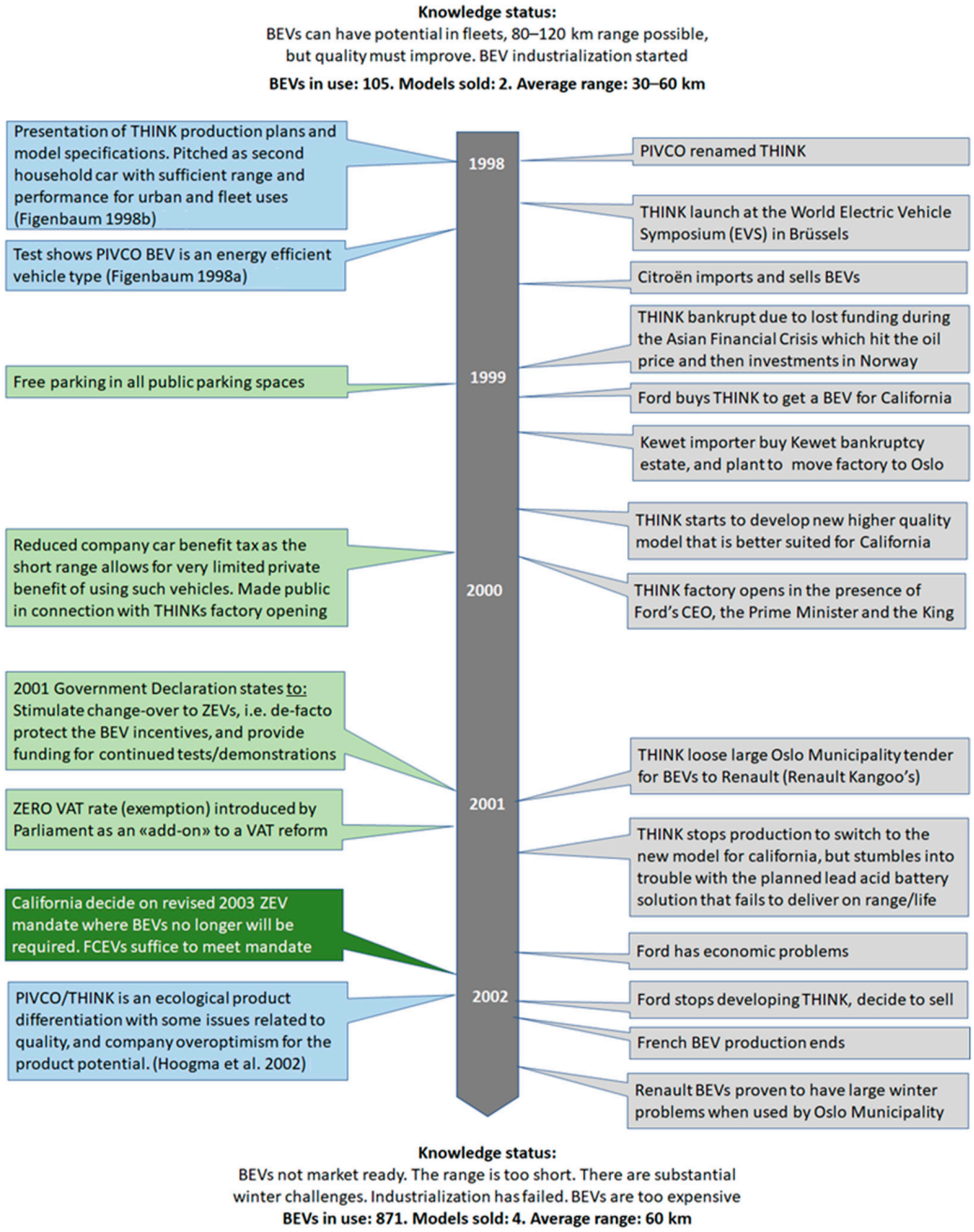

Figure 4. Timeline of policies, market activities, and research publications 1998–2002 [72–74]. Light green: Norwegian policies. Dark green: international policies. Blue: research results. Grey: market activities. Source: Author.

Free public parking (1999)

Free public parking (see also Section 3.1) came [75,76] after a Ministry of Transport parking law revision [77] and law change process [78]. The fee losses were negligible, with only 285 BEVs in the fleet [3]. In 2016, parliament followed up on the 2015 vehicle tax policy settlement [64] and decided to let local authorities decide on BEV parking fees from 2017. During the 2017 National Budget debate, parliament decided on a maximum of a 50% ICEV rate, to be decided by local authorities [65], but it was never implemented.

Reduced company car benefit tax (2000)

The prime minister introduced—without any impact assessment—a reduced company car benefit tax at the 1999 THINK factory opening to support industrialisation [79,80]. The

rationale was that BEVs had lower private benefits due to their short range and long charge times. BEV company car sales were low as the zero-rate VAT did not apply to leased BEVs until 2015. A tax revision from 2005 set BEVs' value to 75% of their list price before calculating tax [81]. It was set to 50% in 2009 [82], 60% in 2018 [66,83], 80% in 2022 [84,85], and 100% in 2023 [62].

Zero-rate VAT (Value-Added Tax) (2001)

THINK BEVs were too expensive [3], but Ford, preferring mandatory public fleet targets [3] as in the US, was inactive on tax incentives. So, EVA and Bellona (NGOs) lobbied [47] for a VAT exemption during the 2001 National Budget VAT reform process. This reform, which was based on a VAT expert group report [86], but a BEV exemption was not part of the proposed reform. The EVA and Bellona told parliament that a VAT exemption was needed to support THINK. Politicians were positive according to an EVA document [87]. Parliament decided [88] on a zero-rate VAT to make BEVs more economical to buy as part of the reform [89]. A NOK 10 million tax loss for 250 BEVs sold was estimated for 2001 [3]. There was no impact assessment in the national budget to support the decision [90]. A gradual VAT re-introduction from 2018 was proposed in the 2015 Revised National Budget [91], but parliament decided to keep it in place through 2017 after EFTA Surveillance Authority (ESA) approval (see Section 3.5) [92]. It was later extended through 2020 [93] and to 2022 [94]. In the 2022 Revised National Budget [95], it was proposed that the zero VAT rate be replaced by a support scheme covering the VAT up to a price of NOK 500,000. Parliament decided on a full exemption up to NOK 500,000 and full VAT on the part of the price above NOK 500,000. This scheme, formalised in the 2023 National Budget [62], will last until 2025 [96].

3.3. 2003–2006—Policies Remained in Place as Global BEV Markets Collapsed

A four-year global BEV downturn followed the previous periods' optimism [3,5]. BEVs were not considered market-ready, Ford had left THINK, and the French activity ended. Norwegian activity also plummeted. The EV Association lost most of its members and barely survived [3]. THINK went bankrupt again, in spite of BEVs obtaining access to bus lanes in the Oslo area from 2003 and nationally from 2005. THINK was bought by Norwegian investors who saw the potential for BEVs in the increased global interest in GHG emission reduction [3] measures. ElbilNorge had bought the bankrupt Kewet in 1999 and in 2005 established a small production of the 4-wheel MC (L7e registration) Buddy based on the Kewet model. New actors imported used French BEVs [3,5]. The 2001 government declaration contained a sentence on keeping the incentives in place, which was important for future developments. The government-appointed Low Emission Committee [97] found BEVs to be vital for Norway to become a low-emission society by 2050 and suggested supportive policies. A slow market continued to develop through this difficult period. The BEV fleet now counted 1656 [3]. Several models were imported in this period. In the end, two were available. The timeline is shown in Figure 5.

Access to bus lanes (2003/2005)

In 2001, the NPRA planned to ban minibuses from bus lanes [98]. Consumers used them to avoid rush hour queues. This would [5] thus make room for environmentally friendly BEVs, and lobbyists [99] also hoped to turn around Ford's decision to sell THINK [47] with such an incentive. The Minister of Transport [100,101] agreed to test it out in the Oslo area in 2003 to see if buses were delayed by the (then) slow BEVs [3]. Buses were not delayed, BEV demand increased [102,103], and the incentive became permanent and nationwide in 2005. Minibuses were thrown out in 2009 [104]. The test replaced the impact assessment normally required for policy changes. The motivation was to reduce pollution and support the market [105,106]. It had no budget impacts and was not state aid [92]. A passenger has in some places been required in rush hour in some places since 2015 [107–109] due to increased bus lane congestion.

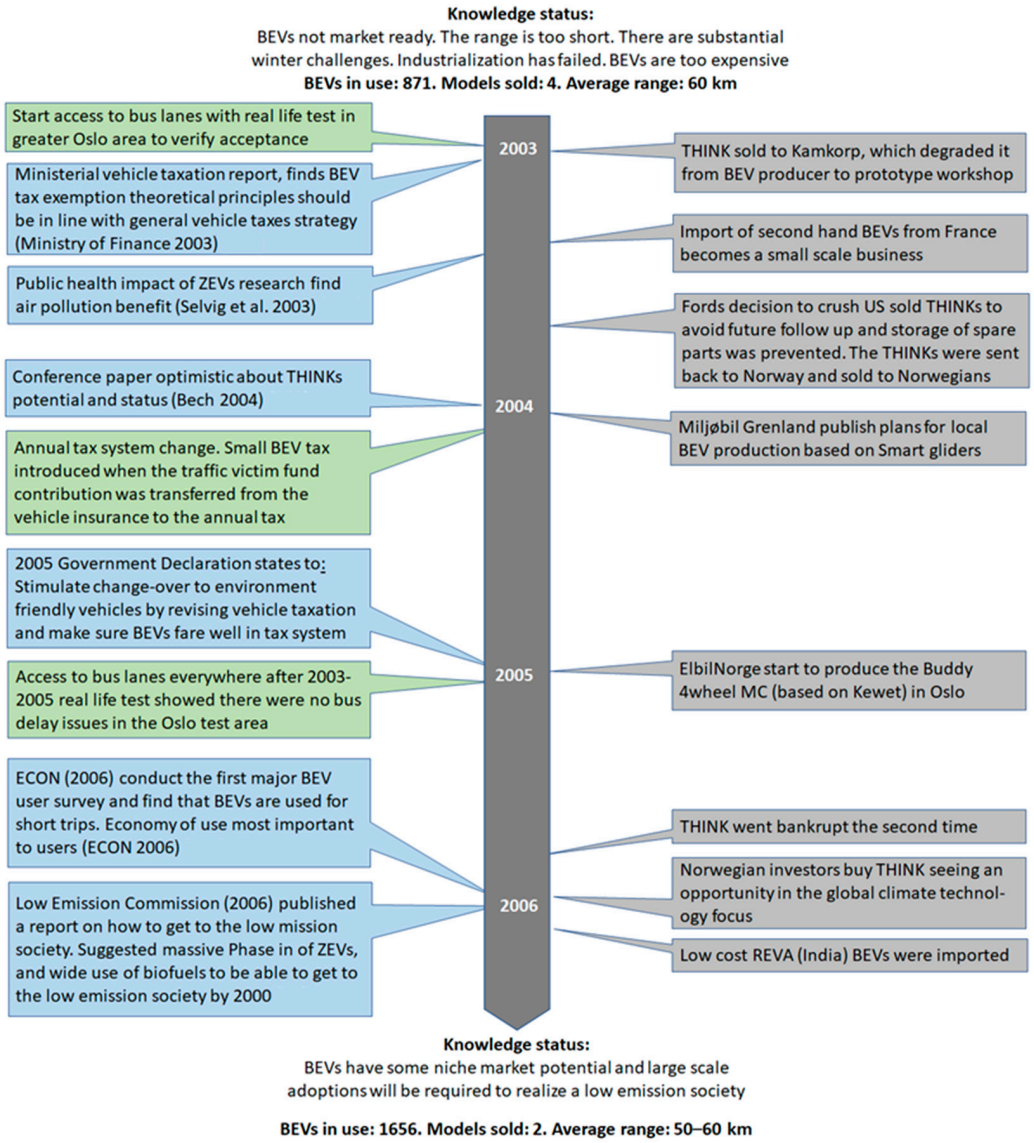

Figure 5. Timeline of policies, market activities, and research publications 2003–2006 [97,103,110–112]. Light green: Norwegian policies. Dark green: international policies. Blue: research results. Grey: market activities. Source: Author.

3.4. 2007–2010—Policies Supported BEV Industrialisation in the Global Climate Policy Spur

THINK expanded with international investors, hired previous staff, and, in 2008 at the Geneva Auto show, launched the model developed under Ford for the Californian market [3]. It had double the range of other models (130 km) but used expensive Li–Ion and Ni–$NiCl_2$ batteries. ElbilNorge improved the Buddy and increased production. The incentives were still in place and a new one was added—the reduced ferry rate from 2009 [5]. A new vehicle GHG emission reduction target was introduced. The first public charging networks were put in place in the Oslo municipality in 2008 and across Norway from 2010 with support from Transnova, a new government agency. The Electrification Resource Group appointed by the Ministry of Transport saw great BEV potential leading up to 2020 and suggested new incentives [113]. The global financial crisis hit THINK and ElbilNorge hard. Both went bankrupt in 2010/2011 [3] when the BEV breakthrough started with sales of OEM BEVs. The fleet had increased to 3360 and six models were sold [3]. The timeline is shown in Figure 6.

Average new vehicle CO_2 emissions target of 120 g/km by 2012 (2007)

Norway's first average new vehicle CO_2 emissions target of 120 g/km by 2012 came during a 2007 government press conference [114]. The 2007 Climate Policy Bill [115] had no specific vehicle target, only a sentence about phasing in ZEVs. The vehicle importers had lobbied for the 120 g/km 2012 target to favour diesel ICEVs, which, in theory, reduce CO_2 emissions by 20–25% compared to gasoline ICEVs. The target was to be achieved by tuning the CO_2 element of the registration tax. No impact assessment was published. The parliament majority formalised the target as part of a climate policy settlement [116]. It was more ambitious than the EU's voluntary 130 g/km target for 2015, which became an EU regulation in 2009 [117].

Increased vehicle allowance for business trips (2008)

A higher km allowance for government employees' use of private BEVs for business trips was introduced, without impact assessment, by the government in 2008 [118]. It was introduced as a measure to support THINK's reopened factory and because BEVs' total cost of ownership was higher than that for ICEVs.

Reduced ferry rates (2009)

In 2009, the Minister of Transport introduced [119] reduced ferry rates. This was based on a voter's idea [120]. The BEV was free of charge, but the driver paid the regular fee. No expert group study or impact assessment was made. No stakeholders were involved. The idea came from a voter and the rationale was to support industry, reduce energy consumption and environmental impacts, and spread BEVs to coastal areas [120]. The NPRA had the delegated power to implement the change. With 2424 BEVs in the fleet in 2008 [3], mainly in cities, the incentive would not strain ferry operators' budgets. Ferry operators could from 2018 charge BEVs 50% of the ICEV rates [65].

Transnova funding agency (2009) transport GHG emission reduction measures, first charger support programme

In parliament's climate policy settlement [116] for the 2007 Climate Policy Bill [115], it was decided that a new funding agency, Transnova, should fund clean transport projects. To battle the 2009 financial crisis, the government decided to support the installation of chargers across Norway [121]. Transnova thus established [122] a national NOK 50 million, first-come-first-serve support scheme for normal public chargers [123]. Standard Schuko household-type outdoor sockets were chosen due to a lack of standards and 2500 chargers were supported. Transnova supported the first 24 fast chargers in 2011–2012 [124] with leftover funds.

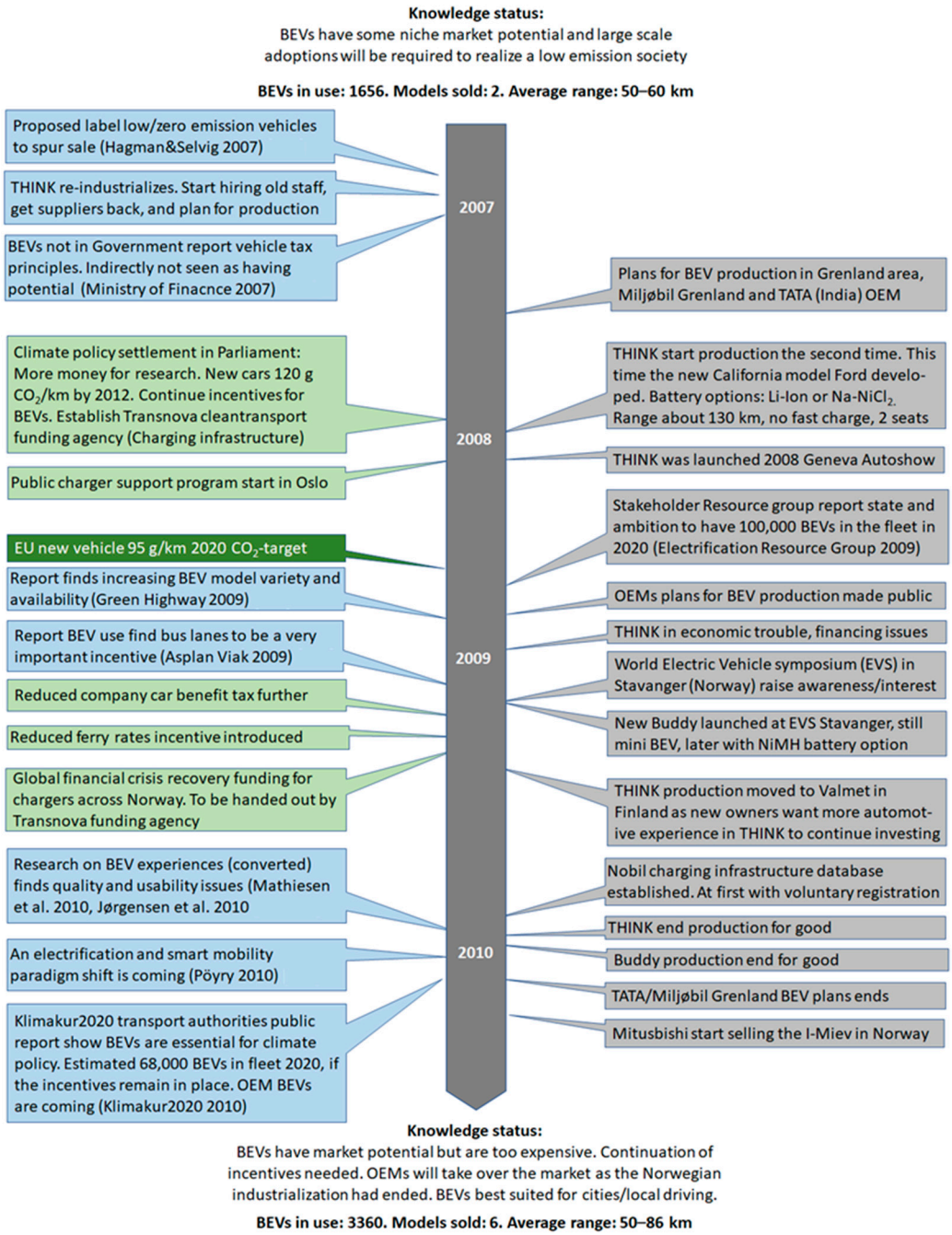

Figure 6. Timeline of policies, market activities, and research publications 2007–2010 [125–132]. Light green: Norwegian policies. Dark green: international policies. Blue: research results. Grey: market activities. Source: Author.

3.5. 2011–2015—Policies Supported the Roll-Out of Increasing Numbers of OEM BEVs

BEVs from the Mitsubishi, Citroën, Peugeot, and Nissan OEMs sold well. Buyers saved time using bus lanes and saved money on road tolls and parking fees. More models came on the market when other OEMs started production. Existing outdoor sockets were used for charging, but "wall-box" installations expanded after dealers bundled them with BEV purchases. Improved Li–Ion batteries enabled longer ranges at a decreasing cost. Public chargers and fast chargers supported the market. A national fast charger infrastructure connected southern Norway's cities by 2015. Tesla developed the first long-range-capable BEV, supported by their growing network of superchargers. Dealers gave buyers a one-year-free EV Association membership. The EVA became a large consumer NGO supporting

BEV owners across Norway and influencing policy processes. The policy processes became more complex as sales increased and the impact on tax revenues became noticeable. The new average vehicle CO_2 emissions of 85 g CO_2/km by 2020 target (introduced in 2012) meant that BEVs, PHEVs, or FCEVs had to be sold [133]. Politicians simultaneously decided to continue the incentives until 2015 or until 50,000 BEVs had been sold. In 2015, Norway stated its intention in the Paris Agreement to reduce GHG emissions by 40% compared to 1990 levels. The average range of the BEVs sold more than doubled during this period, so BEV user appeal and sales increased substantially. The fleet reached 69,134 at the end of 2015, with 14 models sold. The average range was 120–176 km. The timeline is shown in Figure 7.

Average new vehicle CO_2 emissions of 85 g/km by 2020 (2012)

The 2012 Climate Policy Bill [134] proposed a reduction in average new vehicle CO_2 emissions to 85 g/km by 2020, which would de facto require the sales of BEVs, PHEVs, or FCEVs [134]. The Klimakur 2020 expert study [132] provided a knowledge base for CO_2 reduction measures in 2020, without proposing this specific target. The measure was inspired by the EU's voluntary 95 g/km by 2020 target from a 2009 EU regulation [117], which became a firm policy in a 2014 regulation [135].

Keep incentives in place until there are 50,000 BEVs in the fleet or through 2015 (2012)

Parliament decided in the 2012 climate policy settlement [136] to keep incentives in place until 50,000 BEVs were in the fleet or through 2015. This reduced uncertainty about the incentives, although, in 2011, the government stated that it had no plans to change them [137]. Parliament thus linked for the first time the level and timeframe of BEV incentives to both a long-term vehicle (85 g CO_2/km by 2020) and climate policy targets. No impact assessment supported the decision, apart from the Klimakur 2020 report [132].

Keep incentives in place until the end of 2017 (2013)

The 2013 government declaration [138] specified that the BEV incentives should last through 2017, regardless of sales. The small party Venstre was a strong BEV policy proponent and had this included in the declaration as a condition for supporting the new government. Impact assessments were partly found in the 2012 Climate Policy Bill [134] and the Klimakur 2020 [132] report.

Zero-rate VAT for BEV leasing and battery replacement (2015)

In the 2014 National Budget process, parliament petitioned [139] the government to introduce zero-rate VAT on BEV leasing and batteries [140] based on an NGO/auto-sector report [141]. The rationale was to treat leasing as equal to purchase and address battery replacement cost concerns [8,142]. It had been discovered that the EFTA Surveillance Authority (ESA), which supervises the European Economic Area agreement with the EU, had to be notified [92] to evaluate the impacts on the trade agreement between the EU and Norway. Notifications should have been sent also for other BEV incentives. The government proposed the incentive in a 2015 Revised National Budget (RNB) document [91] after notifying the ESA [143]. The ESA confirmed compliance through 2017 [92], including also the zero rate for BEV purchases. A formal decision was made during the RNB 2015 debate [91] over VAT law changes [144]. It entered into force in 2015 with a NOK 40 million first-year estimated tax loss [91]. This process followed the political tradition in Norway because the ESA notification required a proper rationale and impact assessment. The ESA found that the bus lane access was not state aid and that the registration tax exemption and free parking were in place before the 1994 EEA agreement, so these incentives were acceptable. The remaining BEV incentives were found to be proportional to targets.

Vehicle taxation policy settlement (2015)

The RNB 2015 document [91] stated that BEVs should fare better than ICEVs in the tax system to support the 2020 and 2030 climate policy targets and the 85 g CO_2/km target for 2020. Yet, several policy changes were proposed to limit the increasing tax losses from BEV sales. The incentives were expected to last through 2017 and the registration tax exemption

was expected to last through 2020, but the zero-rate VAT was to be replaced by a support scheme after 2017, initially set as equal to the zero-rate VAT, as proposed by the Green Tax Committee [145]. This support was to be reduced as the technology improved and sales increased. A re-introduction of annual tax from 2018 and a removal of the company car tax advantage was also proposed. Parliament agreed [146] to this in a settlement with the government. It was also decided that local authorities should define parking fees and allow access to bus lanes and that the government should develop an environmental tariff differentiation system for toll roads and ferries. In the 2017 National Budget, parliament dismissed [65] the VAT support scheme and annual tax re-introduction. The 2025 target to only sell ZEVs introduced in 2017 was more important.

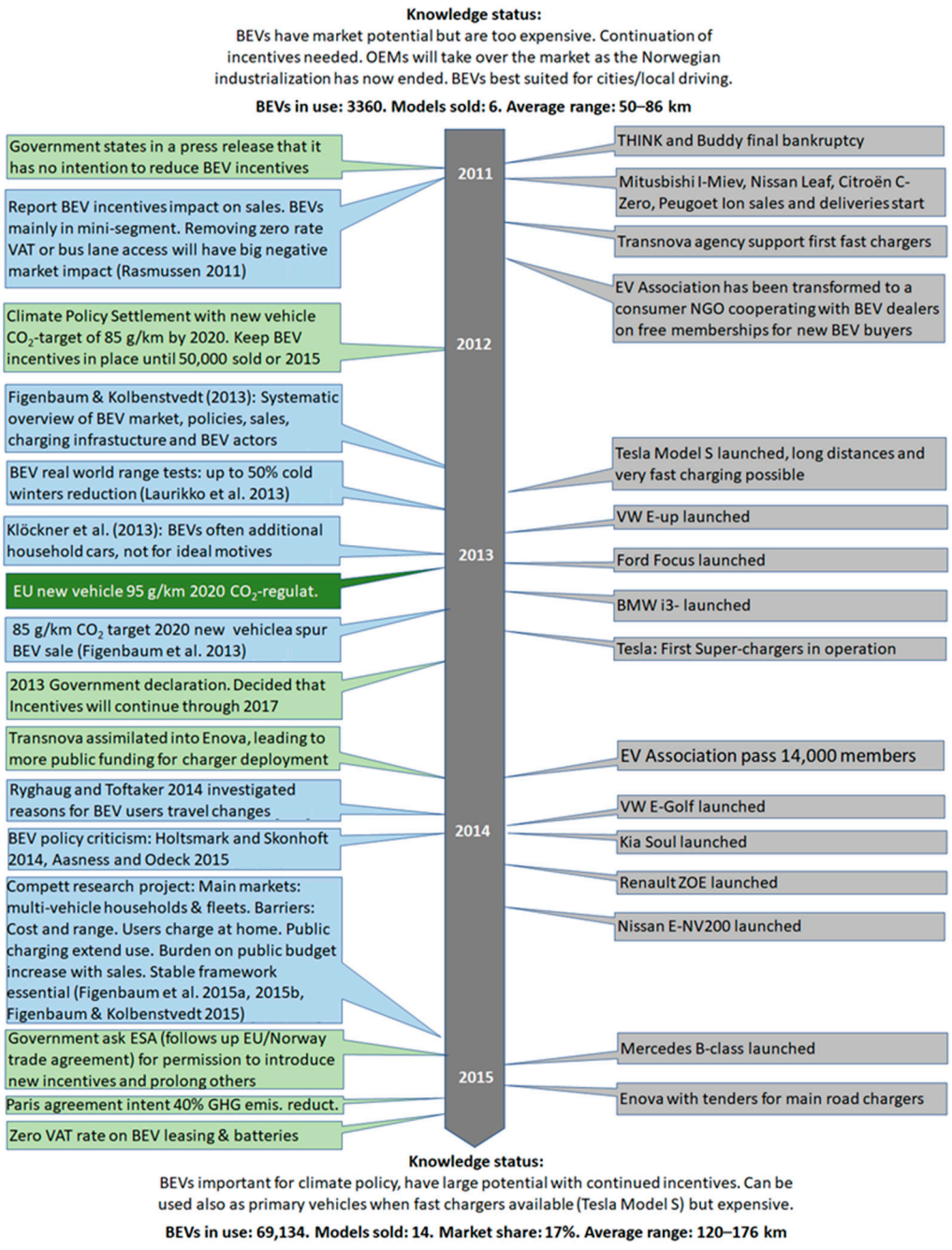

Figure 7. Timeline of policies, market activities, and research publications 2011–2015 [7,27,28,37,133,147–152]. Light green: Norwegian policies. Dark green: international policies. Blue: research results. Grey: market activities. Source: Author.

3.6. 2016–2020—Policies Supported the Mass Market to Achieve GHG Emission Reductions

BEVs now had a good foothold in the market, although the market share in 2016 was 1% lower than in 2015. The first year without growth. The reason for this was that buyers were waiting for longer-range BEVs that had been announced. When these longer-range and lower-cost BEVs became available from traditional and new Chinese OEMs, the market expanded rapidly. BEVs average range doubled, and the model variety expanded. BEVs became an alternative for all households. Charging networks supported long-distance driving across Norway. The national target that only BEVs were to be sold from 2025 was, however, so ambitious that the politicians kept the incentives in place, despite growing tax losses and criticism. The EU 2019 CO_2 targets for 2025 and 2030 de-facto required European ZEV shares, and access to BEVs improved further and costs continued to decrease. The electromobility transition accelerated. The Klimakur2030 public report by the environment, transport, and energy authorities [153] saw BEVs as a top priority for reducing national GHG emissions. Yet, a Ministry of Transport toll road expert group suggested road tolls for BEVs [154]. This was because the purpose of these tolls is to finance road and transport reduction measures and public transport in cities [154]. Norway's Paris Agreement NDC to reduce GHG emissions by 40% by 2030 compared to 1990 entered into force in 2016 and was increased to 50% to 55% in 2020. The fleet had now reached 339,912 (12% of the total fleet) and 43 models were sold [3]. The average range increased from 209 to 393 km [3]. There was a broad understanding among stakeholders and politicians that BEVs were the future. Figure 8 shows the timeline.

Keep incentives in place through 2020 (2016/2017)

In the 2017 National Budget negotiations, parliament petitioned the government [65] to continue the zero VAT rates until 2020, introduce an annual tax exemption from 2018, and ask for ESA notification [155]. The rationale was to keep up the momentum towards the 2025 100% ZEV target. No impact assessment was made apart from in the "after the fact" ESA notification. ESA gave approval through 2020 [93].

Only sell ZEVs from 2025 (2017)

The 2016 National Transport Plan (NTP) suggested a target [156] of only selling ZEVs from 2025 and increasing biofuel use to reduce transport GHG emissions by 50% by 2030 compared to 1990. This target was derived from the national 2030 40% GHG emission reduction commitment of the Paris Agreement [157]. Insights came from an Environment Agency report [158]. Parliament approved the NTP and thus the ZEV target [159,160] in 2017. The incentives remained mostly unchanged until 2022 following this decision.

Exemption from re-registration tax (2018)

In 2014, the EV Association had proposed [161] an exemption from re-registration. In the negotiations over the national budget for 2018, parliament decided to ask the government to obtain ESA approval for the exemption [155], which the ESA approved until the end of 2020 [93]. It was adopted as part of the national budget for 2018 [155]. No expert group report supported the decision, but the ESA notification and the 2018 National Budget did contain an impact assessment. The rationale was to reduce the transaction cost and value loss of BEVs. In 2022, the tax was set to 25% of ICEVs [67] and, from 2023, it was set back to 100% [62].

Right to charge for flat owners in joint properties (2018)

The right to charge for flat owners in joint properties came about in a 2017 law change process [162], following a petition from parliament to the government, which was preceded by EV Association pressure. The law stated, "A section owner may, with the consent of the board, construct a charging point for electric cars in connection with a parking space available to the section, or other places designated by the board. The board can only refuse to consent if there is a valid reason". Later, a new sentence was added: "A section owner who has the right to park on the owner section association's property, but without disposing of his own space, may demand that a charging point be set up for an electric car. The board

shall comply with the claim unless there is objective reason to refuse. The board decides where to set up the charging point" [163].

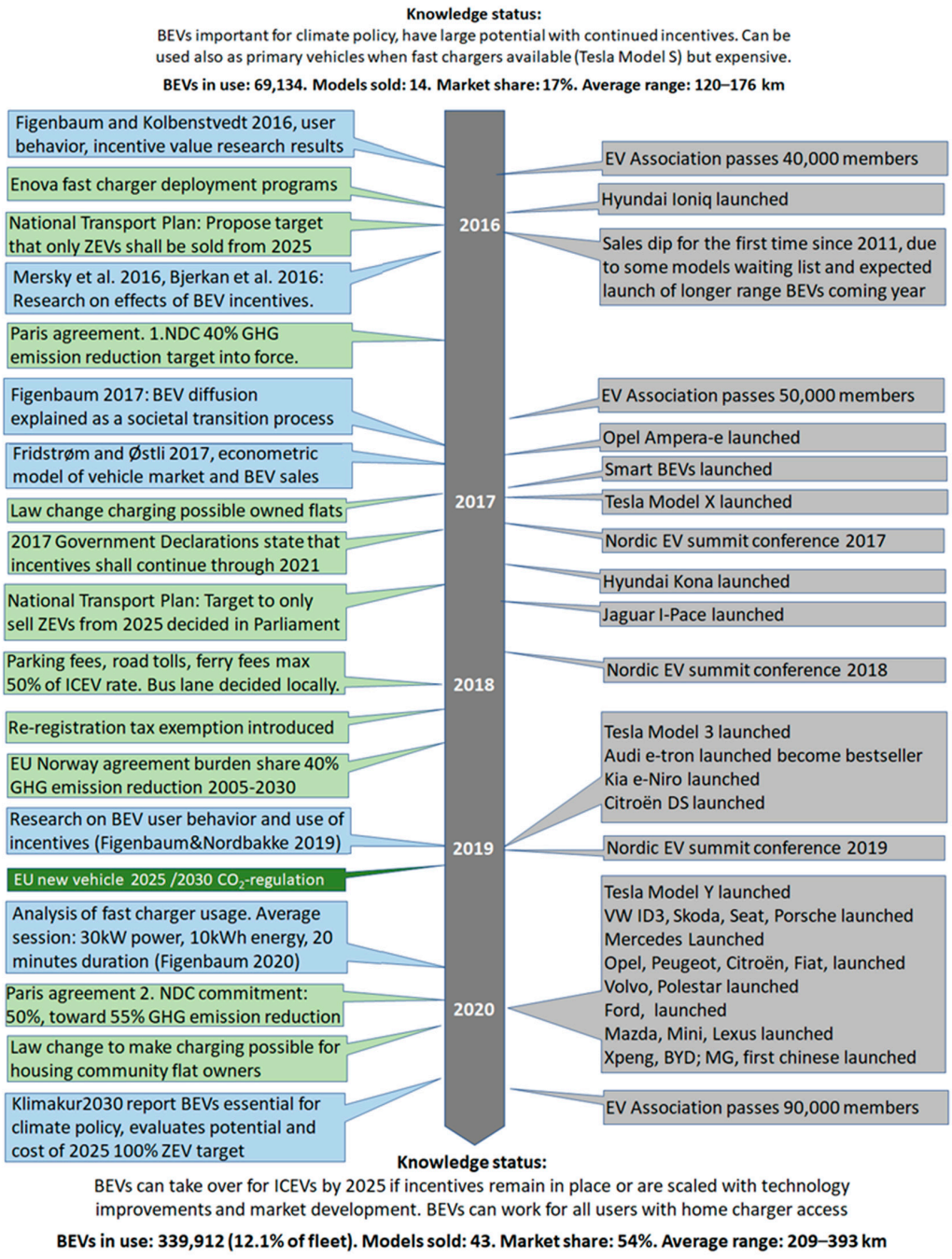

Figure 8. Timeline of policies, market activities, and research publications 2016–2020 [5,9,10,13,18–20,153]. Light green: Norwegian policies. Dark green: international policies. Blue: research results. Grey: market activities. Source: Author.

The 50% rule for road tolls, parking fees, and ferry tickets, and acknowledging local authority co-decisions (2018)

In the national budget negotiations for 2017, parliament decided [65] that ZEVs should pay a maximum of 50% of the ICEV rates for toll roads, parking, and ferries to reduce the income losses associated with the exemptions while keeping some ZEV incentives. Municipalities were allowed to make decisions within this limit. Changes to the toll road tariff system [164] and the NPRAs National Ferry Tariffs [165] for national main

roads followed. This was thus a combination of a major national law change and minor administrative changes. No impact assessments were made. The 50% rate for parking was never implemented [166]. The 2017 parking regulation revision had replaced the obligatory exemption, with a possibility to offer exemption [167]. Municipalities could thus in practise charge BEVs 100% of the rate of ICEVs, despite the parliament's decision.

Action plan for infrastructure for alternative fuels in transport (2019)

The Oslo municipality funded the first large deployment of chargers in 2008 [168]. A national scheme followed in 2009 with financial crisis funding [121,122]. Normal and fast chargers had since then been supported by the Transnova [169] and Enova [170] funding agencies, counties [171], and municipalities [172,173], without a coherent national plan. The government's alternative fuel infrastructure plan published in 2019 [174] targeted a coherent alternative fuel infrastructure deployment and support for the implementation of the EU Dir. 2014/94/EU on infrastructure for alternative fuels [175]. The plan was presented in an expert group report followed by a public hearing. A final plan has yet to be adopted.

Keep incentives in place through 2021 (2020)

A decision to keep the zero VAT rates and registration tax exemption in place until 2021 came after the 2018 government declaration [176] had stated this intention. An ESA notification [177] was sent asking to extend the incentives through 2022, which the ESA approved [94]. No formal impact assessment was made but both the notification and the ESA decision contained a thorough evaluation of impacts and a justification.

Strategy for post-2025 vehicle taxation (2020)

Vehicle taxes provide a large portion of government income and are normally adjusted in small annual steps in the national budget process to avoid market distortion. The post-2025 general vehicle taxation principles were presented in the national budget documents for 2021 [15] and in the Climate Policy Bill to parliament [178] to provide market actors with a long-term perspective on vehicle taxes. The main principles stated were as follows: "A sustainable car tax system has a stable tax base, put a price on the external costs of vehicle use, taxes purchase and ownership of vehicles technology neutral, and takes care of distributional effects".

Right to charge for flat owners in housing communities (2020)

The right to access to charging infrastructure for flat owners was expanded to housing communities in 2020 following a thorough law change process. The results were included in a 2020 bill to parliament [179], which then made the formal decision. The law on housing communities was updated accordingly [163].

3.7. 2021–2023—Policies Downscaled to Preserve Government Income but Still Meet Targets

In 2023, Norway increased its Paris Agreement GHG emission reduction obligation to 55% [180]. The BEV market share passed 80% and the fleet share reached 24% at the end of 2023. The BEV fleet reached 690,000 [2]. Politics was focusing on reaching the target of only selling ZEVs, i.e., BEVs, from 2025. A gradual incentive downscaling was, however, initiated to preserve government tax income and because of diminishing user barriers. Home charging access in dense cities and for flat owners was still a barrier. The remaining 75–80% of Norwegians live in detached, semi-detached, and row houses where charging is easily accessible. Fast charging networks now covered all of Norway and were mainly built on commercial terms without support. There were, however, increasing charge queues at peak travel times as the building of chargers was outpaced by the expanding fleet and because more users drove long distances with BEVs. Long-range BEVs were available in all sizes and segments from traditional and Chinese OEMs, but some use areas, such as heavy, long-distance towing, could still not be covered satisfactorily. The timeline is shown in Figure 9.

Charging infrastructure strategy proposal (2022)

The development of a charging infrastructure strategy was started in 2022 after a parliament petition that the government should secure the building of a comprehensive charging infrastructure [181], which researchers, the EVA, and other NGOs saw as a major barrier to meeting the 2025 ZEV target [182]. The petition was sent during a parliament debate and public hearing [183] over the climate policy bill [178]. Another petition asked the government to develop a national charging infrastructure strategy to secure coordination between public authorities and develop more user-friendly charging infrastructure [184]. A charging expert group report was published in March 2022 [185], and stakeholders were invited to comment on it [186].

Proposal of the removal of zero-rate VAT, to be replaced by a support scheme (2023). VAT to be introduced on the part of the purchase price exceeding NOK 500,000

An expert group report [145] and a previous government [91] had proposed replacing zero-rate VAT with a support scheme. In the revised national budget for 2022 [95], the government proposed a scheme equal to 25% VAT up to NOK 500,000, i.e., capped at NOK 125,000. The incentive would move from the national budget income side, which is balanced by oil sector income, to the expense side, balanced against all other spending. It was stated to be a more equitable system for the future. Parliament decided, however, to keep the VAT exemption in place for a price up to NOK 500,000 and introduce VAT on the part of the purchase price exceeding that sum from 2023 [187,188], and to keep this scheme until 2025.

New weight tax on all vehicles (2023)

This tax on all new vehicles above 500 kg came as a big surprise in the 2023 National Budget [62]. BEVs, due to their heavier weight, had a higher tax than ICEVs. No impact assessment was published.

Removal of reduced re-registration tax incentive (2023)

The re-registration tax incentive was removed in the 2023 National Budget [62] proposal, which was endorsed by parliament [189]. No impact assessment was published.

Removal of reduced company car benefit tax (2023)

The reduced company car benefit tax was removed in the 2023 National Budget [62] proposal and endorsed by parliament as the budget proposal was not changed [189]. No impact assessment was published.

The 70% rule for toll roads (2023)

It was decided during the national budget process for 2023 that BEVs can from 2023 be charged up to 70% of the toll road rate charged for ICEVs [62,190].

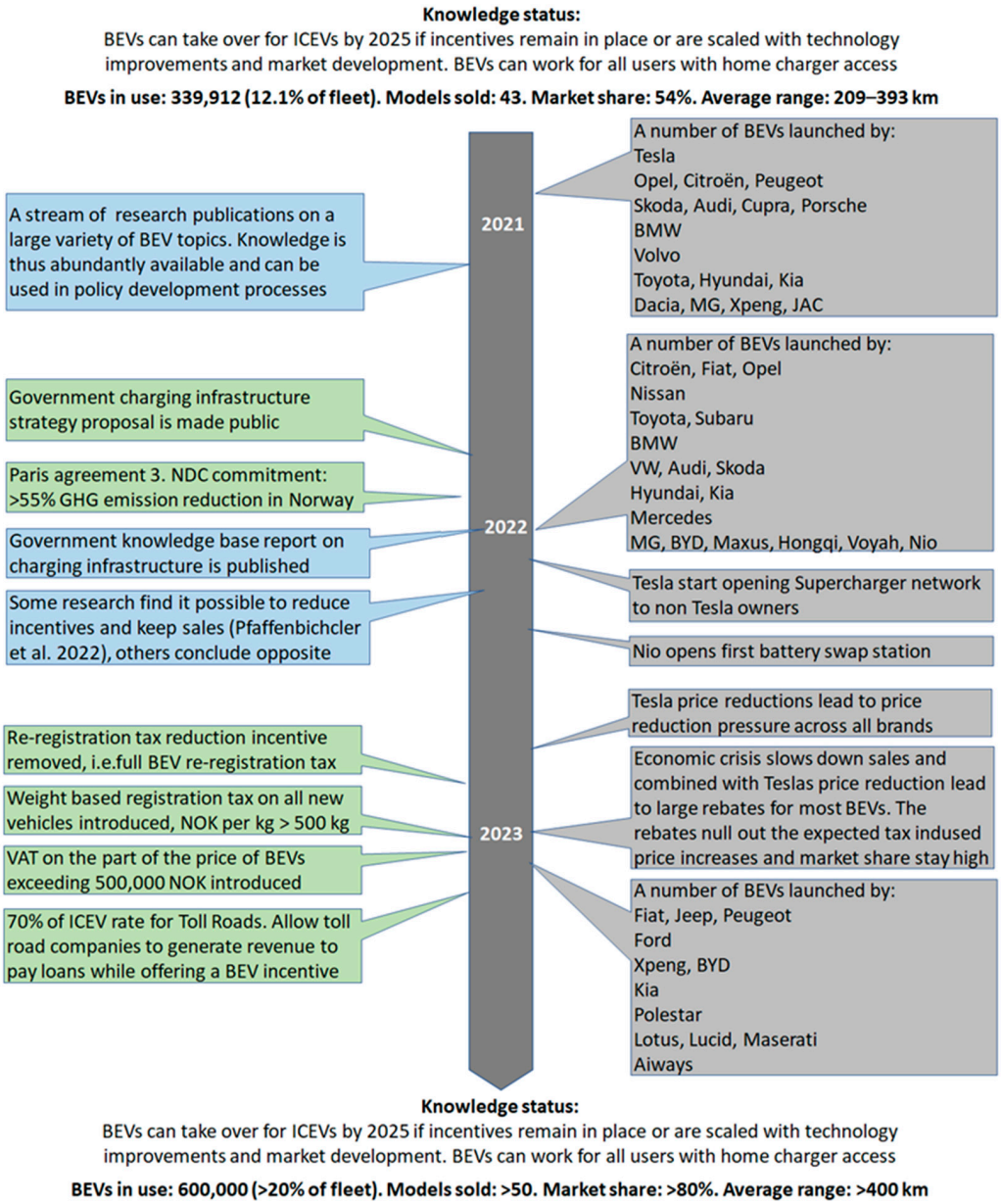

Figure 9. Timeline of policies, market activities, and research publications 2021–2023 [23,191]. Light green: Norwegian policies. Dark green: international policies. Blue: research results. Grey: market activities. Source: Author.

3.8. 1990–2023—The Policy Processes from Infancy to Mass Market and Beyond

The 33-year-long time horizon of the Norwegian BEV policy framework stands out. Large incentives covering many aspects of BEV purchase and ownership remained in place for a long time after their introduction, as seen in Table 2. The incentives came about in a learning-by-doing process where politicians introduced BEV-friendly policies based on stakeholder input and pressure. Lobbyism is easier in a small country like Norway with good access to politicians compared to large countries. BEV interest thus developed broadly, and the policies were adopted into party programmes and government declarations over time, as seen in Appendix A.

Table 2. Timeline of the main incentives and their 2023 status. Source: Author.

Incentive	Introduction	1st Major Revision	2nd Major Revision	3rd Major Revision	4th Major Revision	5th Major Revision	Status 2023
Registration tax exemption	1990, temporary	1996, permanent	2023, weight tax element introduced				Weight tax as for ICEVs, other parts exempted
Annual tax exemption	1996	2004, partial reduction	2018, BEVs fully exempted, changed to tax on insurance	2021, partial reduction	2022, full tax as for ICEVs		Full tax as for ICEVs
Road toll exemption	1997	2018, max 50% of ICEVs, local decision	2023, max 70% of ICEVs, local decision				Max 70% of ICEVs, local decision
Parking fee exemption	1999	2017, local authorities can decide	2018, BEVs 50% of ICEVs				50% rate still not implemented
Reduced company car benefit tax	2000	2005, new tax system, BEVs 75% of ICEVs	2009, 50% of ICEVs	2018, 60% of ICEV	2022, 80% of ICEV	2023, full tax as for ICEVs	Full tax as for ICEVs
Zero-rate VAT purchases	2001	2023, full VAT on price above NOK 500,000					Full VAT on price above NOK 500,000
Reduced ferry rates	2009, national car ferries	2018, max 50% of ICEVs, ferry operator to decide, includes county ferries					Max 50% of ICEVs, ferry operator to decide, includes county ferries
Zero-rate VAT leasing	2015	2023, full VAT on price above NOK 500,000					Full VAT on price above NOK 500,000
Re-registration tax exemption	2018	2022, 25% of ICEV rate	2023, full tax as for ICEVs				Full tax as for ICEVs
Access to bus lanes	2003, Oslo area test	2005, access to all bus lanes in Norway	2015, passenger in the car in rush hour, local authority decides				2015, passenger in the car rush hour, local authority decides

About 20% of the policy processes were improper from a traditional politics point of view, as seen in Table 3 and the flowcharts in Figure 10. Another 28% were inadequate. Some were parliamentary add-ons to traditional political processes. One example is the zero-rate VAT that was added by parliament to an otherwise well-prepared VAT reform.

Another is the 2012 decision to keep the BEV incentives in place until 2015 or when 50,000 BEVs were sold, which came during a parliamentary climate policy debate. Several incentives came during late-night parliament national budget negotiations (Table 3, policy nos. 4, 8, 18). Others originated from parliament (Table 3, policy nos. 5, 27) and were thus not "prepared" by the government. No impact assessments, therefore, supported these decisions, but policy no. 27 went through an after-the-fact process. In some cases, only a sentence shows that the decision was made. The temporary registration tax exemption became de facto permanent when a vehicle taxation reform was passed by parliament, without even being mentioned in the reform documents. Incentives affecting consumer-oriented laws have been carried out as proper law change processes (Table 3, policy nos. 6, 28, 30). Most processes since 2014 have been proper (Table 3, policy nos. 22–25, 27, 29–31, 33–35) apart from the last year's incentive downscaling (Table 3, policy nos. 26, 32, 37–40).

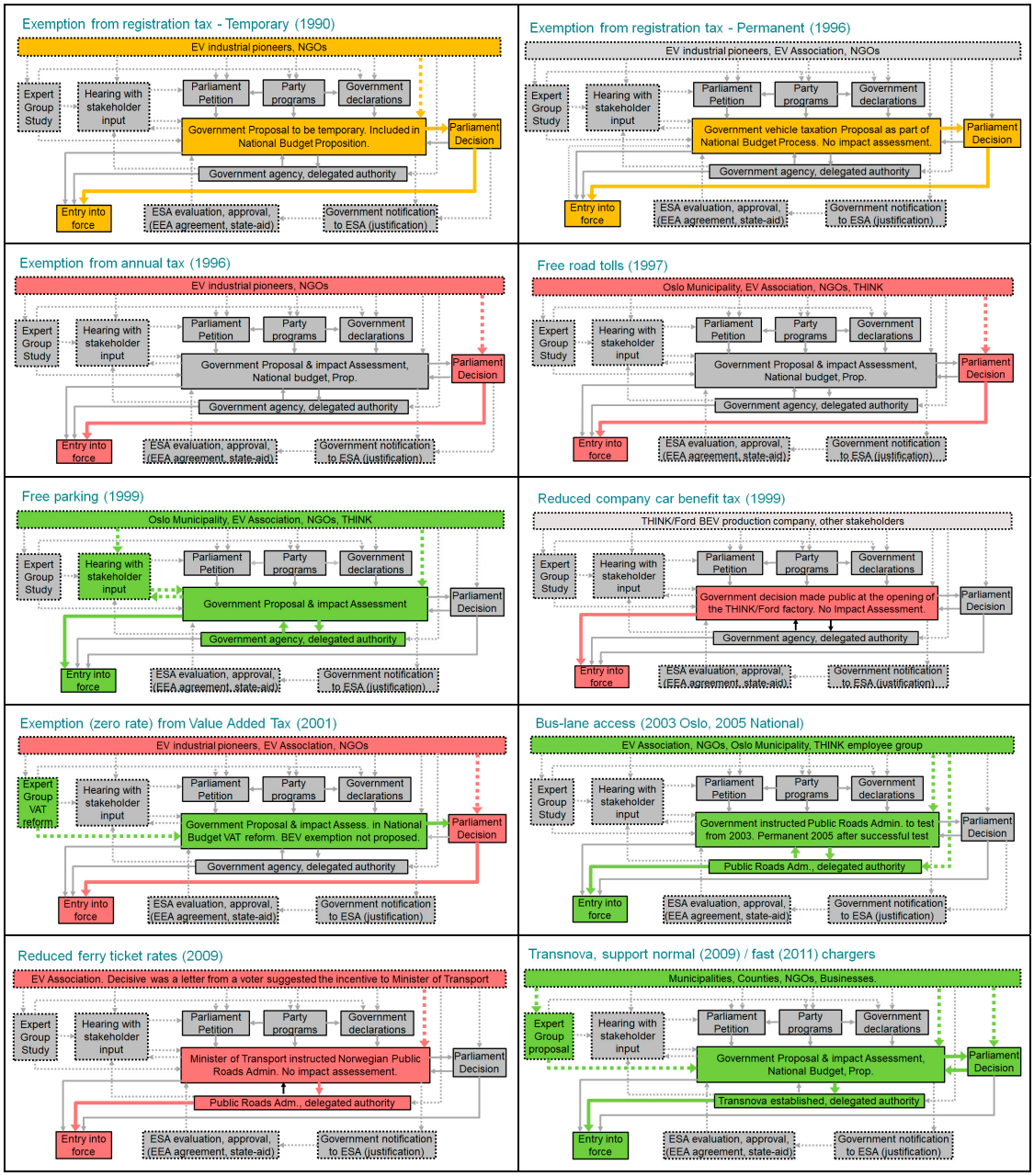

Figure 10. *Cont.*

Figure 10. BEV policy development process flows. Green = OK, orange = inadequate, red = improper. Grey: Elements of the traditional policy processes, as seen in Figure 2. The thick arrows shows the actual policy process flow for each policy. Source: Author.

Table 3. BEV policy and incentive process summary. Green = normal, yellow = deviations, red = improper. Source: Author.

	No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
	1	Registration tax exemption, temporary	Tax	1989	1990	Market pull	High	No	National budget doc.	5	0.0%	5	30	0	0	-	1
	2	Km tax exemption	Tax	1989	1990	Market pull	Low	No	National budget doc.	5	0.0%	5	30	0	0	-	1
	3	Registration tax exemption, permanent	Tax	1995	1996	Market pull	High	No	Gov. prop. to parliament	10	0.0%	50	60	11	0	27	1
	4	Annual tax exemption	Tax	1995	1996	Market pull	Medium	No	National budget debate	10	0.0%	50	60	11	0	27	1
1990–1997	5	Toll road exemption	Fee/Law	1997	1997	Market pull	High	No	Parliament law change	42	0.0%	147	60	30	0	49	0
	6	Parking fee exemption	Fee/Law	1999	1999	Market pull	Medium	Yes	Law change w. hearing	101	0.0%	285	60	No data	0	89	0
	7	Reduced company car benefit tax	Tax	1999	2000	Market pull	Low	No	National budget doc.	101	0.1%	285	60	No data	0	89	0

Table 3. *Cont.*

	No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
1998–2002	8	Zero-rate VAT BEV purchase	Tax/Law	2000	2001	Market pull	High	No	National budget process	207	0.2%	468	60	No data	0	71	0
2003 –2006	9	Bus lanes Oslo area (test 2003–2005)	Adm.	2003	2003	Market pull	High	No	Real-life test	15	0.0%	1081	60	No data	0	208	0
	10	Bus lanes Norway (Oslo test ok)	Adm.	2005	2005	Market pull	High	No	Experienc from test	26	0.0%	1320	50	No data	0	285	1
	11	New car average CO_2 emis. <120 g/km	Target	2007	2012	Supportir target	Low	No	Governm process	240	0.0%	1903	50	No data	0	1276	2
	12	Increased car allowance for business trips	Adm.	2008	2008	Cost compensation	Low	No	Governm process	443	0.1%	2424	77	No data	0	2002	1

Table 3. *Cont.*

	No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
	13	Ferry ticket price reduction	Adm.	2008	2009	Market pull	Medium	No	Governm process	443	0.1%	2424	77	No data	0	2002	1
2007–2010	14	TRANSN funding agency start	Adm.	2009	2010	Barrier reduction	Medium	Yes	National budget doc.	295	0.1%	2753	56	No data	0	4482	5
	15	Transnov support for normal chargers	Adm.	2009	2010	Barrier reduction	Low	No	Parliamer proposition	295	0.1%	2753	56	No data	0	4482	5
	16	Transnov support for fast chargers	Adm.	2010	2011	Barrier reduction	Low	No	Transnov decision	599	0.2%	3360	86	1163	0	4041	5
	17	New car average CO_2 emis. <85 g/km	Target	2012	2020	Supportir target	Medium	No	Governm process	3950	2.9%	9581	131	3433	58	4215	11
	18	Keep incentives to 2015/50,(BEVs	Decision	2012	2015	Market stability	High	No	Parliamer agreement	3950	2.9%	9581	131	3433	58	4215	11

Table 3. *Cont.*

	No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
	19	Keep incentives in place through 2017	Decision	2013	2017	Market stability	High	No	Governm declaration	7888	5.6%	18,916	185	4538	131	6680	19
	20	TRANSN merged into ENOVA	Adm.	2014	2015	More resources	High	Partial	Governm process	16,830	13%	38,652	185	5744	270	10,389	13
	21	ENOVA strategy for fast chargers	Adm.	2015	2016	Barrier reduction	High	No	ENOVA internal process	25,785	17%	69,134	176	6550	449	10,539	14
2011–2015	22	ENOVA support for fast chargers 2015–2022	Adm.	2015	2016	Barrier reduction	High	No	Delegatec authority	25,785	17%	69,134	176	6550	449	10,539	14
	23	Zero-rate VAT BEV leasing/batte	Tax/Law	2015	2015	Market pull	Low	Yes	Parliamer petition	25,785	17%	69,134	176	6550	449	10,539	14

Table 3. *Cont.*

	No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
	24	Only sell ZEVs from 2025—proposal	Target	2016	2025	Proposed target	High	No	National Transport Plan	24,222	16%	97,532	209	7830	757	9196	24
	25	Only sell ZEVs from 2025—decision	Target	2017	2025	Supportir target	High	No	National Transport Plan	33,025	21%	138,983	301	6858	1211	11,876	17
	26	Keep incentives in place through 2020	Decision	2017	2020	Market stability	High	No	Parliamer petition	33,025	21%	138,983	301	6858	1211	11,876	17
	27	Re-registrati tax exemption	Tax	2017	2018	Market pull	Low	Yes	Parliamer petition	33,025	21%	138,983	301	6858	1211	11,876	17
	28	50% of ICEV rate parking/road toll/ferry	Fee/Law	2017	2018	Incentive reduct.	Medium	No	National budget agreement	33,025	21%	138,983	301	6858	1211	11,876	17

Table 3. *Cont.*

	No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
	29	Right to charge, flats/join properties	Law	2017	2018	Barrier reduction	Low	Yes	Parliamer petition/law revision	33,025	21%	138,983	301	6858	1211	11,876	17
	30	Action plan for alternative fuels infrastr.	Strategy	2019	n/a	Barrier reduction	Low	No	Governm strategy	60,316	42%	260,692	397	12,132	2399	18,316	44
	31	Right to charge, flats/hou communities	Law	2020	2021	Barrier reduction	Low	Yes	Governm law revision	76,804	54%	339,912	393	14,073	3390	15,161	50
2016–2020	32	Keep incentives in place through 2021	Decision	2020	2021	Market stability	High	Yes	Governm declaration	76,804	54%	339,912	393	14,073	3390	15,161	50
	33	Policy strategy for post-2025 vehicle taxes	Strategy	2020	2025	Market stability	Low	Yes	National budget doc.	76,804	54%	339,912	393	12,962	3390	15,161	50

Table 3. *Cont.*

No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
34	Partial re-introduct re-registrati tax	Tax	2021	2022	Incentive reduction	Low	Yes	National budget doc.	122,539	66%	461,661	>400	12,962	4035	19,390	No data
35	Charging infrastructure strategy proposal	Strategy	2022	n/a	Barrier reduction	Low	Yes	Governm strategy	152,707	78%	600,464	>400	17,558	5667	18,738	No data
36	Re-introduct VAT price > NOK 500 k	Tax/Law	2022	2023	Incentive reduction	Medium	Yes	National budget doc.	152,707	78%	600,464	>400	17,558	5667	18,738	No data
37	Full re-registrati tax	Tax	2022	2023	Incentive removal	Medium	Yes	National budget doc.	152,707	78%	600,464	>400	17,558	5667	18,738	No data
38	Weight-based registration tax	Tax	2022	2023	Incentive reduction	Low	Yes	National budget doc.	152,707	78%	600,464	>400	17,558	5667	18,738	No data

Table 3. *Cont.*

	No.	BEV Policy	Type	Year Decided	Year Initiated	Effect	Market Impact	Impact Assessm.	Process	New BEVs Sold	Market Share	BEV Fleet (Incl. Used)	Average Range km	Public Chargers	Fast Chargers	Press Articles	Reports Articles
2021–2023	39	Reintrodu of full company car tax	Tax	2022	2023	Incentive removal	Low	No	National budget doc.	152,707	78%	600,464	>400	17,558	5667	18,738	No data
	40	Road tolls can be up to 70% of ICEVs rates	Fee/Law	2022	2023	Incentive reduction	Medium	No	National budget doc.	152,707	78%	600,464	>400	17,558	5667	18,738	No data

The reasons for the lack of proper policy processes up to 2010 could be the large political interest in BEVs, a lack of knowledge [24], a sense of urgency as BEVs were uncompetitive without incentives, the need for transport sector GHG emission reductions [6], a willingness to support BEV industrialisation, and that the expected tax losses were low for the first few years after each incentive was introduced.

4. Discussion

Development in the problems stream: Air pollution was a major issue in Norwegian cities in the 1990s. The three-way catalyst became obligatory in 1989, but the slow fleet turnover caused cities to look to BEVs to reduce air pollution. Energy companies needed a new electricity revenue stream after an energy market reform. The BEV developer PIVCO saw an opportunity to produce a city BEV using a low-volume production process. This market was uninteresting for the OEMs. They saw BEVs as California-ZEV-mandate-compliance cars. Norwegian actors were inspired by French and Swiss BEV developments and the California ZEV mandate. Market experiments started after the costly registration tax was exempted in 1990. The actors established the EVA to improve the policy framework. Research found the early BEVs to be of poor quality and in need of improvements to be marketable. PIVCO planned to solve these issues through industrialisation. The clean air motivation had been reduced by 1998–2000. The focus shifted to industrialisation when Ford owned THINK (PIVCO) from 1999 to 2002 and in 2010 when other investors had taken over. The total cost of ownership was almost competitive with ICEVs for users, with free parking and free road tolls when the zero-rate VAT was introduced. A GHG emission reduction focus emerged when it became clear that the Kyoto Agreement GHG emission trading system did not work, and national policies would be required. The obligations of the Paris GHG emission reduction agreement would not be possible without BEVs as other transport measures had low potential and would be unpopular [192]. Local pollution came back on the agenda with rising diesel shares and the EU diesel emission regulation scandal [193]. Research showed that BEVs became multi-vehicle households' "workhorse" after OEM BEVs became available in 2011 [8–10]. The limited range was not an issue as they also owned an ICEV. The range of the latest generation of BEVs of all sizes was also sufficient for single-vehicle households. The market share reached 17% in 2015, 54% in 2020, and 80% in 2022. The EU's 2020–2030 vehicle CO_2 regulations de facto require ZEVs to be sold and show that Norway is on the right track, but ahead of other European countries.

Development in the policy solutions stream: BEVs have never been mandated in Norway. The market is too small for automakers to develop specific vehicles. Market pull incentives were used at first to allow for experiments and reduce local pollution, and later to support the build-up of a Norwegian BEV industry. High vehicle taxes since the 1960s made it possible to support BEVs through large tax exemptions. Politicians and municipalities were pressurised by NGOs to introduce incentives such as free parking and free road tolls. The policy effects were not well understood but the tax losses were initially low. The Norwegian BEV industry was globally leading at a time when OEMs saw BEVs as California "compliance" cars. Politicians failed, however, to support the BEV industry through the 2009 financial crisis. A government fund invested a small amount in THINK but demanded experienced auto industry involvement, which led to a production relocation to Valmet in Finland. All Norwegian BEV industry activity had ended by 2011. OEMs developed BEVs to meet the EU's vehicle CO_2 regulations and the policy focus shifted to support climate policy by replacing ICEVs with BEVs when they became available. The market took off. BEVs contributed significantly to GHG emission reduction 2020 targets. By backcasting the 2030 Paris Agreement GHG emission obligation, it became clear that the national target had to be to only sell BEVs from 2025. This was so ambitious that the incentives remained in place likely longer than they would have without the target. Increased research on user needs and the effects of policy changes supported policy development through the 2010s. The increasing vehicle tax losses were masked out by the increased oil sector income. BEV policies thus did not get in the way of other priorities. The BEV tax loss was about 5% of

the oil income that balanced the 2020 National Budget, as seen in Figure 11. The incentive reductions from 2023 had little impact as Tesla lowered their prices and forced other OEMs to do the same.

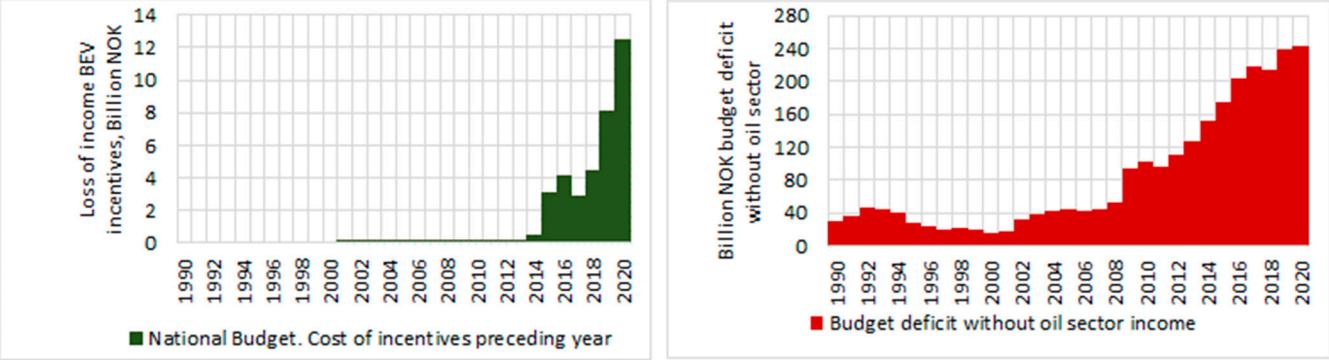

Figure 11. National budget, cost of BEV incentives for preceding years, and budget deficit without the oil and gas sector. Billion NOK. Source: author, based on data from the 1990–2020 national budget documents.

Developments in the political stream: The structured development processes of Norwegian politics were not followed for important BEV policies up until 2014. Decisions were made in poorly documented ad-hoc processes in parliament. The incentives would likely not have fared well in regular political processes with rigorous cost-benefit analyses. There was a lack of information about BEVs' potential and effects on government income in the early years. Such decisions were to some extent anchored in the party programmes, as seen in the overview in Appendix A. The party programmes became more positive to ZEVs over time. The government's reliance on small, pro-environment parties as coalition partners and the 2025 ZEV target caused BEV policies to continue despite increasing tax losses. They became "protected" by government declarations. Politicians were disproportionally receptive to BEV policies suggested by advocacy groups and entrepreneurs. Industrialisation, a policy area where political and financial risks seem to be more accepted, was a strong policy driver for the 1997 to 2010 developments. The most important incentives were agreed across parties in parliament to ensure stability. BEV policies found little opposition as they consisted of positive measures, and Norway did not have to worry about an incumbent ICEV production industry as other countries do. Some precedence for substantial vehicle tax exemptions existed before BEVs for, for instance, airbags and three-way catalysts. BEV policies contributed to Norway's international environmental standing. The discovery that BEV politics violated the EEA agreement with the EU led to an alignment of BEV politics with traditional politics.

Politicians did not want to make the best-informed decisions. When the two large studies [113,126] of climate policy measure options were carried out by energy, transport, and environment authorities in 2010 and 2020, the government's mandate precluded recommending packages of policy measures based on the best available knowledge. The 2020 mandate reads as follows: "A specialist group is established to carry out an investigation of possible measures and means of implementation of climate policy targets in 2030 but shall not make recommendations". The 2010 mandate was similar. It seems that the politicians did not want expert advice so that they could cherry-pick options matching party programmes. These authorities are, however, underlying government ministries. This may have led to the conclusion that they could only present possibilities, not policy suggestions. The actual targets and measures that were decided upon by politicians were not the same as those evaluated in these studies, and the impact assessments were thus not representative. This lack of competence-based politics was also seen in the National Transport Plan process where politicians often prioritised uneconomic projects over good projects [194].

The politics stream was side-lined. The main incentives were developed in the policy solutions stream outside of traditional politics as a response to issues in the problem stream.

These issues were put on the political agenda by lobbyists, i.e., industrial entrepreneurs, NGOs, and local authorities, and later by traditional vehicle importers. The Norwegian BEV policy process thus did not follow the multiple streams (MS) framework postulate that the 3Ps—the problems, policy solutions, and politics streams—must align to pave the way for new policies.

The lack of knowledge within all three streams was an issue through the 1990s and 2000s. Politicians lacked knowledge about how BEVs could function in Norway and solve issues in the problem stream. BEVs' potential to reduce pollution was, for instance, vastly overestimated, given THINK's low level of planning for BEV production. Research on the potential of BEVs was therefore initiated. The earliest incentives were intended to be temporal to build knowledge to enable decision making within traditional politics. Later policies supported industrial development, a policy area with high risk and lower documentation requirements, so the incentives were decided ad-hoc, without impact assessments. The policy results were inconclusive. The market remained slow, and more incentives were added with unclear effects but high political visibility at a low initial cost. The incentives were on the less-visible-income side of the national budget, and they did not compete against policies on the expense side of the budget, where competition for funding is hard.

The feedback from the problem stream was not clear. The early buyers were fleets seeing a marketing advantage and "irrational" enthusiasts. They made large sacrifices in terms of comfort, vehicle size, usability, quality, and reliability. This may have led to a misconception in the politics stream of BEVs' potential to solve issues in the problems stream. The user base expanded with the zero-rate VAT from 2001 and the bus lane access from 2003, but sales were hampered by the low access to BEVs, again leading to mixed signals to the other streams. The market did not respond until the OEMs took over in 2011. Norway's demand-side measures have from then on perfectly matched the EU's supply-side measures.

Researchers have supplied increasingly enhanced knowledge to all three streams since 2010. User behaviour and needs have been analysed and statistical models of future demand have been established since 2010. This knowledge has been used to investigate how to reach the increasingly ambitious ZEV targets. It could have been used to develop impact assessments that would have aligned BEV politics with traditional politics earlier. This did not happen until the government had to assess the impacts and justifications in the notifications sent to ESA in 2014.

It is unlikely that the large package of BEV incentives could have been established within traditional politics. Traditional politics requires sufficient information to be able to write impact assessments and make well-documented decisions. BEV policies before 2014 were mainly decided outside traditional politics in a poorly documented "learning-by-doing" process, not following the instructions of official studies and reports ("Utredningsinstruksen") [39–41], nor the Ministry of Finance procedures for evaluating policies [42–45]. The reasons for this could be a lack of knowledge, strong political interests, and minority governments' reliance on small, BEV-friendly parties. Economists' first best solution for reducing GHG emissions, the Kyoto global trading system, failed, so national policies became the focus. Finally, there was an increasing GHG emission reduction urgency through the 2010s. The three streams of problems, policies, and politics were not fully aligned until 2017 when parliament endorsed the target to only sell ZEVs from 2025. The three streams came close to being aligned two years earlier when the government found out that it had to consult the ESA about the legality of the policies. The first notifications to the ESA did contain impact assessments in line with traditional Norwegian politics, but they were written after the decision had been made.

The tax income losses may have been higher than necessary, and the industrial support may have been too low. It is not certain that the entire incentive package is really needed to be able to reach the target of only selling ZEVs from 2025. Some incentives could potentially have been gradually scaled back earlier. The target itself may also not be optimal. The costs could have been lower if the target had been 80% or 90% or if the 100% target had

been phased in over a few years. Another issue is that the large incentives failed to build a Norwegian BEV industry. Norway could potentially have had a BEV industry today had some incentives been refocused to industrial support, especially during the 1998 and 2009 financial crises when private funding became unavailable to BEV producers.

The effectiveness of the BEV incentives should have been monitored, given the high cost of the incentives. Norway spent, according to the 2024 National Budget [195], NOK 28.6 billion on tax incentives for BEVs in 2023 and NOK 39 billion in 2022. Compared to the tax income on ICEVs, the tax incentive costs were even higher due to the loss of fuel taxes (electricity tax is lower) and because registration tax is partially based on a vehicle's CO_2 emissions. Given these high costs, governments should have invested more in research on the effectiveness of BEV policies.

The transition to BEVs continues and deepens. Norway will in the coming years spend large resources to transform the transport sector into a zero-emission sector mainly powered by renewable electricity. All new city buses shall be zero-emission from 2025. Every new, small LCV shall be zero-emission by 2025 and every new, large LCV shall be zero-emission by 2030. The transition will spread to the trucking sector, which must transition much faster than BEVs to reach the National Transport Plan target that 50% of trucks sold should be zero-emission in 2030, as few were in the 2023 fleet [196]. Parliament changed the 2030 truck target to 100% but included biogas during the national budget negotiations for 2024 [197]. The main recommendation for the truck segment is to link incentives to a long-term plan, with regular public reviews of the progress and the need for policy changes. These plans and reviews should, due to the large resources that will have to be used to speed up the truck transition, be supported by policy cost-effectiveness research.

The Norwegian BEV policy processes deviate from those of other countries and regions. The oil income made it easy to continue the incentives when the market took off in 2011. Other countries must evaluate BEV policy expenses against other policy needs or use budget-neutral measures such as ZEV mandates or bonus/malus systems. Norway has no ICEV producers, whereas some countries must consider the effects on their vehicle producers. Norwegian electricity is almost 100% hydro-electric based and without GHG emissions, and most Norwegians have or can obtain access to home charging. The stable Norwegian tax exemptions are on the less-visible-income side of the national budget. The support schemes in other countries are on the expense side, are affected by frequent policy changes, and often run out of money mid-year. The large user privileges were enabled by the spare capacity in the bus lanes and the toll roads spread across the country. The ad-hoc policy process differs from other countries' structured processes.

5. Conclusions

The Norwegian BEV policy process was investigated using a combination of document analysis and the multi-stream (MS) policy analysis framework. The MS framework states that policies can gain traction when the three streams of problems, policy solutions, and politics align. The analysis reveals that this prerequisite was not fulfilled when powerful BEV policies were decided in Norway, not as part of a comprehensive plan but in an ad-hoc "learning-by-doing" process outside traditional politics. The early BEV policy decision processes were also inadequate in terms of traceability and the documentation of their impacts and rationale. Politicians and other actors had until 2010 no or inadequate information about the effects of the BEV policies they introduced. They were disproportionally receptive to arguments from the problems stream about the need for BEV support policies.

At first, the stated target in the problem stream was to improve air quality; then, industrialisation became the focus, before it shifted to GHG emission reduction. Incentives that addressed these problems were developed in the policy solutions stream outside traditional politics. Given the market status and expectations for the future when the most important policy decisions were made, the immediate consequences, budget impacts, and risks were seen as low, and the political gain was seen as high. The post-2010 processes when the market share increased from <1% to above 80% have been more in line with traditional

politics after politicians discovered that they had to notify the ESA. ESA notifications contain proper justifications and impact assessments, as is expected for decisions made in the politics stream. The 3Ps of the MS framework aligned, although some of the processes were still inadequate in terms of transparency. The ambitious target to only sell ZEVs from 2025 and the ambitious climate policy targets for 2030 led to a lock-in that protected the incentives from down-scaling. These developments created the world's largest per-capita BEV market.

To avoid negative issues but keep the potential to support the transition to ZE vehicles, politicians should ensure that sufficient knowledge about status and uncertainties is available when decisions about BEV policies are made. Decisions should be properly assessed within traditional politics as with EU policy processes and regularly reviewed as with the California ZEV mandate mid-term reviews. The required knowledge for decision making should be developed in continuous open-research activities and in other publicly available documents.

New insights into BEV policy development processes can be gained by comparing the Norwegian process with that of other countries. This would be of particular interest to countries that aim to expand their BEV market. The analysis of policy processes should also be expanded to heavy-duty truck electrification while it is still in an early stage. The knowledge of the policy processes for passenger vehicle electrification can then be used to devise better policy processes related to the target of only selling ZE trucks in Norway by 2030. More research is also required on policies to improve the knowledge of charging infrastructure deployment strategies and policies that improve usability.

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Data Availability Statement: Data are contained within the article.

Conflicts of Interest: The author declares no conflict of interests.

Appendix A

Table A1. BEV policies in Partyk programmes per parliament period. Grey color: The ruling parties over the full or main part of the period.

	Socialist		**Labour**	**Centre**				**Conservative**	
	Rødt	**SV**	**AP**	**SP**	**MDG**	**V**	**KRF**	**H**	**FRP**
	The Reds (Socialist)	The Socialist Party	Labour Party Sociodemocrat	Centre Parti (rural/farmers)	The Green Party	The Liberal Party	The Christian Democratic Party	Conservative Party	Progress Party (populist)
1989–1993		Stricter emission regulations. Use of natural gas in the transport sector.	Less vehicle use in cities, use road tolls. Emission reductions for diesel cars, BEVs/ZEVs were not mentioned.	Use best available emission reduction technology for all vehicle types.	Not available	Use fuel/other taxes to stimulate a switch over to gas and electricity. No tax on safety/ environment equipment.	Differentiate taxes based on emissions. No tax on safety/ environment equipment.	Reduce tax on environment equipment (i.e., catalytic converters).	Proposes strong reduction in vehicle taxes to enable people to buy safe and less polluting cars (i.e., new cars).
1993–1997		Favourable conditions for BEVs, low fuel consumption vehicles, and biofuels.	BEVs or ZEVs not mentioned. Transfer from vehicles to pub. Transport. New tech. mentioned to reduce pollution but no details.	Favourable conditions for BEVs. Move taxes from purchase to use and exempt BEVS. Work to reduce vehicle use in cities.	Reduce transport as much as possible, prioritise electricity-based transport. Avoid fossil-fuel transport. Introduce restrictions on ICEVs and later bans.	Move taxes from purchase to use, use gas as the main alternative energy carrier. Adjust purchase tax to enable installation of emission-reducing equipment.	No mentions apart from requiring more stringent emission limits.	Stimulate change over to vehicles using less fuel.	Chapter on motor vehicles. Proposes reduction in vehicle taxes. Tax income from transport to be transfer-ed back to the sector.

Table A1. *Cont.*

	Socialist		**Labour**	**Centre**				**Conservative**	
	Rødt	**SV**	**AP**	**SP**	**MDG**	**V**	**KRF**	**H**	**FRP**
1997–2001		Support use of BEVs to improve air-quality in cities. Increased use of biodiesel, car sharing support, testing of hydrogen.	Stimulate increased testing and change to gas, electricity, or H_2 for transport, using vehicle tax system. Increase diesel tax.	BEVs to be 100% exempted from taxes. Reduce vehicle use in cities and increase public transport use.	Reduce vehicle-based transport. Vehicles should be powered by clean electricity and biogas. Develop car sharing with cleaner vehicles. Ban ICEVs in cities in 10 years.	Support increased use of electric vehicles. Move taxes to vehicle usage. Differentiate tax based on fuel consumption.	Norway a front-runner for more environmentally friendly transport. Vehicle users pay real societal costs. Tax system to stimulate BEVs and other low-emission vehicles	No mention of vehicles in particular. A general text on how taxes shall reflect environmentall costs.	Chapter on motor vehicles. Propose strong reduction in vehicle taxes. Tax income from transport to be transferred back to the sector.
2001–2005		Use taxes to support low energy use/alternative fuels. Support testing and increase adoption in public fleets. Rebates for car sharing. Less traffic volume with city road tax.	Same as 1997 apart from diesel tax not mentioned. New in 2001: Action plan for large cities that target increased use of ZEVs.	Full-tax-exempt BEVs (VAT, reg. tax, etc.). Continue local incentives (road, toll parking). Support BEV demo projects, H_2 in transport. 10% of the fleet to be emission-free by 2005.	Reduction in car-based transport. Vehicles should be powered by clean electricity and biogas. Nat. gas preferred over other fossil options. Car sharing with cleaner vehicles. Higher taxes on ICEVs, later bans.	Stimulate buying, testing, and use of ZEVs. Make use of vehicles in cities more expensive. Move taxes from purchase to vehicle usage.	Norway a front-runner for more environmentally friendly transport. Vehicle users pay real societal costs. Tax system to stimulate BEVs and other low-emission vehicles. Natural gas as alt. fuel. Support H_2.	Stimulate use of BEVs and other low- and zero-emission vehicles. Reduce total taxes on vehicles.	Chapter on motor vehicles. Proposes strong reduction in vehicle taxes as measure to renew fleet and reduce emissions. Increased BEV adoption, reduced city pollution.

Table A1. *Cont.*

	Socialist		**Labour**	**Centre**				**Conservative**	
	Rødt	**SV**	**AP**	**SP**	**MDG**	**V**	**KRF**	**H**	**FRP**
2005–2009		No mention of policies for vehicles other than support the opposite, i.e., public transport.	H_2 cars same incentive as BEVs, indirectly support BEV incentives. No mention of new BEV policies. Build H_2 fuel stations.	Support increased use of biofuels incl. sales obligation. Support ZEVs and LEVs through the tax system. Keep BEV incentives in place.	Not available.	Focused moved to a hydrogen society as the vision of the future with same tax advantages for hydrogen as BEVs. Biofuels also in focus.	Norway a front-runner for environmentally friendly transport. More focus on use of and research on H_2 and other ZEVs. Hydrogen tax exempt. Support biofuel use/prod.	Reduce vehicle taxes to make it easier to buy safe and more environmentally friendly vehicles.	Expand use of NG in transport sector by building infrastructure. Increased use of BEVs/HEVs and fleet renewal to reduce city pollution.
2009–2013	Focus on public transport measures and policies for reduction of vehicle-based transport.	2015 ban on car only using fossil fuel. Plan scaling up sales of ZEVs, incl. importer obligations. Public ZEV procurement. Plan for charging infrastructure deployment.	Reward ZEVs and LEVs in the tax system so that they take over as soon as possible. Also use biogas for transport.	Taxes support ZEVs, PHEVs, LEVs, HEVs, and biofuels. Minimum 20% ZEVs sold 2020, rest LEVs. Build charging infrastructure. H_2 available. Scrappage bonus of NOK 40,000 for buying environmentally friendly car.	Ban on gasoline and diesel cars from 2013. Certified biofuels. Registration tax based on CO_2 emissions and immediate ban on high emitters. Vehicles OK where public transport does not suffice, but new technology should be used.	Vehicle taxes stim-ulate use of LEVs, BEVs, and FCEVs. Adjust annual (CO_2) emission targets for new cars from 2015, ban sale of fossil cars. Public fleets should buy LEVs/ZEVs. Minimum 10% share of biofuel and H_2 by 2013. Build more infrastructure for ZEV, H_2, and biofuel.	Increased use of hydrogen, HEVs, PHEVs, and BEVs. Increased use of CO_2-neutral fuels (biofuels). Public fleets to only procure LEVS or ZEVs. Norway should push for an end to global ICEV production by 2020.	Reduce vehicle taxes to make it easier to buy safe and more environmentally friendly vehicles. Remove taxes on ZEVs. Build alternative fuel and charging infrastructure.	Reduce vehicle taxes.

Table A1. *Cont.*

	Socialist		**Labour**	**Centre**				**Conservative**	
	Rødt	**SV**	**AP**	**SP**	**MDG**	**V**	**KRF**	**H**	**FRP**
2013–2017	BEVs or vehicles not mentioned. Focus on public transport, vehicle-based transport reduction policies.	BEVs compete with ICEVs. Keep incentives. Support other emission-free options and infrastructure, i.e., chargers. 50% of public fleets shall be BEVs/PHEVs.	Continue to use the tax system to reduce emissions from transport.	Reduce GHG emissions from transport, support 2nd-gen. biofuels. Phase in new and environmentally friendly vehicle technology.	All new vehicles BEVs or HEVs, but highest priority is public transport. Use road pricing to curb city traffic. Stimulate car sharing solutions Remove VAT for BEV lease/batteries. Keep/expand BEV incentives to 2020.	Target world's most environmentally friendly transport. Keep BEV incentives. Build fast chargers between cities. Remove VAT for BEV leasing/batteries. Support 2nd-gen. biofuel development. Strenghten Trans-nova and BEV, H_2, and biofuel infrastructure. Expand biofuel and H_2.	Increased use of H_2, HEVs, PHEVs, BEVs, and biofuels. Public fleets only LEVS or ZEVs. Norway push end of global ICEV production by 2020. Build charging stations. Keep incentives until 10% PEVs on road or 2020.	Continue tax exemption for ZEVs. Build infrastructure for BEVs and hydrogen, use public procurement. Develop biofuel strategy.	Strong reduction in vehicle taxes and increase in scrappage bonus to renew vehicle fleet to make it safer and more environmentally friendly.

Table A1. *Cont.*

	Socialist		**Labour**	**Centre**				**Conservative**	
	Rødt	**SV**	**AP**	**SP**	**MDG**	**V**	**KRF**	**H**	**FRP**
2017–2021	Build good, fast charger capacity in all municipal centres. Focus on public transport measures and vehicle-based transport reduction policies.	Keep BEV incentives in place through 2021. Max half rate of ICEVs for ZEVs for road tolls, parking, and ferries. Biofuel production to be developed. Use 2nd-gen. biofuels in intermedium term.	Pursue ZEVs and biofuels. Build biofuel fueling stations and charging infrastructure.	Continue ZEV support. Keep purchase incentives, slowly phase out local incentives by 2030. Use taxes to get 100% ZEV share by 2025. Stronger focus on biofuels. Intensify building of charging and energy stations. Strong support for H_2 use.	Phase out sales of ICEVs by 2020. Public fleets must buy ZEVs. Higher ICEV taxes. Build energy stations to support ZEVs everywhere. Always be cheaper to select a ZEV. Less traffic in cities and support ZEVs in districts. Support charging station building and BEV leasing. Continue ZEV advantages until competitive.	Keep incentives until ZEVs competitive by themselves, at least until 2025. ZEVs have lasting advantage of half price of ICEVs for road tolls/ferries. Ensure good infrastructure for fast/normal charging across the country. Cooperate w. companies on nationwide energy stations with chargers and biofuel and H_2 dispensers. Public fleets buy ZEVs (not police).	Emission-free sector by 2030. Increase BEVs, H_2, HEVs, PHEVs, and biofuel. Public fleets to only procure LEVs or ZEVs. Norway push end to global ICEV production by 2020. Build charging, hydrogen, and biofuel stations faster. Keep incentives until l10% PEVs on road or 2020.	Zero emission vision for transport. Shall be worthwhile to go for ZEVs. Support for infrastructure.	Proposes strong reduction in vehicle taxes and increase in scrappage bonus to renew vehicle fleet to make it safer and more environmentally friendly.

Table A1. *Cont.*

	Socialist		**Labour**	**Centre**				**Conservative**	
	Rødt	**SV**	**AP**	**SP**	**MDG**	**V**	**KRF**	**H**	**FRP**
2021–2025	References NTP target. Build BEV fast-charging capacity in municipal centres. Maximum-limit BEV subsidies. Tax above limit. Increase H_2 efforts.	Reach 2025 target 2 years earlier/2023. Economic to buy a ZEV. Increase BEV tax followed by a larger ICEV tax. VAT price > NOK 600,000. Investigate an ICEV ban and BEV sharing. Tighten ICEV vs. BEV loop-hole leasing.	Reach the 2025 ZEV target. Reduce tax incentives on expensive BEVs and increase CO2 tax on ICEVs. VAT on prices exceeding NOK 600,000. Increase ICEV taxes. Build fast chargers.	Reach the 2025 ZEV target for new vehicles. Avoid single BEV focus due to blackout risk. VAT on price > NOK 600,000. Propose building of 10,000 fast chargers and national plan for charging infrastructure. Gradual reduction in user advantages.	Reach the 2025 ZEV target for new vehicles 2 years earlier/2023. Support rural environmentally friendly transport and BEV leasing and large-scale building of chargers, incl. for flat owners. Stimulate car sharing. Incentives until ZEVs competitive. Increase taxes on ICEVs and CO_2.	Reach the 2025 ZEV target for new vehicles. We are the BEV advocate and will ensure BEV advantages through 2025. The advantage must remain until BEVs reach a competitive price. Secure charging infrastructure is available in the whole country.	Reach the 2025 ZEV target for new vehicles. Build charging infrastructure (housing communities and common garages mentioned specifically). Establish a sustainable taxation system ensuring it is economical to buy a BEV over an ICEV.	Follow up the 2025 target for new vehicles. Build fast and ultra-fast chargers incl. for flat owners. Gradually step down ZEV incentives, starting with the most expensive, but always more economic to buy a BEV.	Proposes strong reduction in vehicle taxes in general, BEVs only mentioned as an example.

Table A2. Overview of BEV content of government declarations and BEV incentives/targets governments have introduced.

Government	**Period**	**Parties**	**Support in Parliament**	**Government Declaration**	**BEV-Related Topics in Declaration**	**BEV Incentives and Targets Introduced**		
						Year Decided	**Intro Year**	**Description**
Brundtland	9 May 1986–16 October 1989	AP	Minority	Brundt-land 1986 "Speech"	No mentions of climate or CO_2, no measures within transport related to greenhouse gas emissions. Note that the Brundtland commision (UN) "Our common future" report came in 1987, leading to a higher political focus on environment issues, including climate, following years.	1989	1990	Temp. registration tax exemption to allow BEV experiments.
						1989	1990	Km tax exemption to allow BEV experiments.

Table A2. *Cont.*

Government	Period	Parties	Support in Parliament	Government Declaration	BEV-Related Topics in Declaration	BEV Incentives and Targets Introduced		
						Year Decided	Intro Year	Description
Syse	16 October 1989–3 November 1990	H, KrF, SP	Minority	Lysebu 1989	None, CO_2 emission reduction of high priority, reforestation to reduce CO_2. Reduce local pollution from transport with 3-way catalysts and traffic measures			Carried through the decicions in parliament in late 1989 to provide exemptions from registration and km tax.
Brundtland 3	3 November 1990–25 October 1996	AP	Minority	Brundt-land 1990 "Speech"	None, prioritise global climate policy agreement, focus on sector overarching environmental policies	1995	1996	Permanent registration tax exemption.
						1995	1996	Annual tax exemption.
Jagland	25 October 1996–17 October 1997	AP	Minority	Jagland 1996	None, but talks about an ecologically sustainable society.	1996	1997	Road toll exemption.
Bondevik 1	17 October 1997–17 March 2000	KrF, SP, V	Minority	Voksenåsen 1997	None, high priority to reduce greenhouse gases, focus on Kyoto negotations and reaching an agreement. Transportation: Focus on reducing and supporting public transport.	1997	1999	Free parking.
						1999	2000	Reduced imposed benefit tax on disposing a company car, 50% reduction.
Stoltenberg 1	17 March 2000–19 October 2001	AP	Minority	Stoltenberg 2000, "Speech from the throne"	None specific, mentions Kyoto as a breakthrough, Norway being a frontrunner on environmental issues.	2000	2001	VAT exemption.
Bondevik 2	19 October 2001–17 October 2005	KrF, H, V	Minority	Sem 2001	None, high priority to reduce greenhouse gases, focus on Kyoto negotiations and reaching a global agreement. Transportation: Focus on reducing and supporting public transport.	2002	2003	Bus lane access test—Greater Oslo.
							2004	Traffic insurance tax moved to annual tax, BEV owners had to pay that tax.
						2005	2005	Bus lane access permanent and national.

Table A2. *Cont.*

Government	Period	Parties	Support in Parliament	Government Declaration	BEV-Related Topics in Declaration	BEV Incentives and Targets Introduced		
						Year Decided	Intro Year	Description
Stoltenberg 2	17 October 2005–7 October 2009	AP, SV, SP	Majority	Soria Moria 1 2005	Follow up Kyoto, work for more ambitious global climate policy agreement, strive for increased use of environmentally friendly vehicles, make it economical to buy low-emission vehicles, biofuel focus.	2008	2009	Reduced ferry rates.
						2008	2008	Increased km allowance for electric car use on business trips.
						2008	2012	Average new vehicle CO_2 emissions below 120 g/km by 2012. Broad agreement in parliament.
						2009	2009	Creation of support agency Transnova.
						2009	2010	Financial crisis support programme for chargers.
	7 October 2009–16 October 2013	AP, SV, SP	Majority	Soria Moria 2 2009	Work for a strong international climate agreement, exceed Kyoto obligations by 10%, transport policy shall support climate policy, action plan for ZEV/LEV introduction, biofuels support, charging stations to be built.	2011	2011	First support programme for fast chargers.
						2012	2020	Average new vehicle CO_2 emissions below 85 g/km by 2020.
						2012	2015	Keep incentives in place until the end of 2015 or 50,000 BEVs are in the fleet. Broad agreement in parliament.

Table A2. *Cont.*

Government	Period	Parties	Support in Parliament	Government Declaration	BEV-Related Topics in Declaration	BEV Incentives and Targets Introduced		
						Year Decided	Intro Year	Description
Solberg	16 October 2013–17 January 2018	H, FrP	Minority, supported by V, KrF	Sundvolden 2013	Continue BEV tax regime until 2017, go through tax policy, follow-up on 2012 climate policy settlement in Stortinget.	2013	2017	Keep purchase incentives in place until the end of 2017.
						2013	2015	Zero VAT rate for leasing and battery replacement.
						2014	2015	Restriction on bus lane access on west corridor to Oslo in rush hour introduced.
						2014	2015	Transnova assimilated into Enova.
Solberg continued						2015	2015–18	Support programme for fast chargers along major roads.
						2016	2016	Restriction on bus lane access on southeast corridor to Oslo in rush hour introduced.
						2016	2017	Only sell ZEVs by 2025. Broad agreement in parliament.
						2016	2017	Re-registration tax exemption.

Table A2. *Cont.*

Government	Period	Parties	Support in Parliament	Government Declaration	BEV-Related Topics in Declaration	BEV Incentives and Targets Introduced		
						Year Decided	Intro Year	Description
Solberg continued							2018	Law change parking: Parking facilities and public parking can charge full rate for BEVs, and must offer up to 6% of spaces with charging access.
						2016	2018	Parliament decide rule that maximum rate for toll roads, parking, and ferries shall be 50% of the rate of ICEVs, local authorities to decide on the level up to the maximum.
						2017	2017	Law change for condominiums to regulate access to charging in common parking facilities.
						2017	2018	Full exemption from annual tax, or rather the tax on insurance that replaced the annual tax.

Table A2. *Cont.*

Government	Period	Parties	Support in Parliament	Government Declaration	BEV-Related Topics in Declaration	BEV Incentives and Targets Introduced		
						Year Decided	Intro Year	Description
Solberg continued	17 January 2018–22 January 2019	H, FrP, V	Minority, KrF support	Jeløya 2018	40% greenhouse gas emission reduction by 2030 over 1990, suggest new ambitious target to Paris Agreement. NTP vehicle targets basis for policy (only ZEVs sold from 2025).	2018	2021	
	22 January 2019–13 January 2020	H, FrP, V, KrF	Majority	Grana-volden 2019	More ambitious climate policy target, 50% reduction in transport sector by 2030, NTP vehicle targets (only ZEVs sold from 2025).	2019	2021	Keep purchase incentives in place until end of 2021.
						2019		Action plan for alternative fuel infrastructure.
	13 January 2020–end 2021	H, V, KrF	Minority	Grana-volden 2019	See above	2020	2020	Law change for housing communities to regulate access to charging in common parking facilities.
						2020	2021–22	Keep zero-rate VAT through 2022.
						2020	2021	Reduced-rate insurance tax (30% below ICEV rate).
						2020	2025	Future principles for vehicle taxation post-2025 transition period 2022–2025.

Table A2. *Cont.*

Government	Period	Parties	Support in Parliament	Government Declaration	BEV-Related Topics in Declaration	BEV Incentives and Targets Introduced		
						Year Decided	Intro Year	Description
Støre	14 October 2021-This day	A, SP	Minority, with SV primary supporter	Hurdals-platt-formen	More ambitious climate policy target, -55% reduction of Norwegian emissions by 2030 compared to 1990.			
					Reduce GHG emissions from transport and contribute to meeting national climate policy goals.			
					Make it attractive to select LEVs and ZEVs, 100% of new vehicles fossil-fuel-free from 2025, contribute to ZEVs keeping their competitive advantage vs. ICEVs.	2022		Strategy process for charging infrastructure initiated.
					Arrange the tax system so that it is fair and contributes to cuts in greenhouse gas emissions.	2022	2023-	Proposal to replace zero-rate VAT with support scheme.

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