POLICY UPDATE

OCTOBER 2025

SUMMARIZES REGULATORY AND OTHER DEVELOPMENTS RELATED TO CLEAN TRANSPORTATION WORLDWIDE

The regulation of Brazil's Green Mobility and Innovation (MOVER) vehicle emissions program

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INTRODUCTION

The Green Mobility and Innovation Program (MOVER, from the Portuguese *Mobilidade Verde e Inovação*) aims to promote the development of Brazil's automotive industry, with a focus on fostering the production of new technologies and improving the energy efficiency of vehicles sold in the country. Established by Law No. 14.902[1] on June 27, 2024, MOVER replaced the previous industrial policy for Brazil's automotive sector, the Rota 2030 Program.[2]

The MOVER Program establishes mandatory requirements for commercialization and grants reductions in the industrial production tax (IPI) for vehicles that meet minimum criteria for energy efficiency, carbon dioxide emissions, vehicle recyclability, and structural performance and safety. New regulatory measures enacted in 2025 specified several aspects of the MOVER Program, establishing implementation schedules and parameters for calculating energy efficiency and well-to-wheel greenhouse gas (GHG) emission targets. Decree No. 12.435, of April 2025, defines the rules, methodologies, and timelines for implementing the energy efficiency policy and targets for light vehicles.[3] Ordinance GM/MDIC No. 176, of July 2025, establishes the implementation schedule for the energy efficiency policy for heavy vehicles.[4] Finally, Decree No. 12.549, of July 2025, establishes new tax incentives for light vehicles based on their propulsion technology, fuel usage, engine power, and recyclability.[5]

This policy update examines the emissions targets and timelines established by MOVER and ensuing regulations. In the following section, we give an overview of the energy efficiency and CO_2 emissions targets established by the MOVER Program. We then

1 Law No. 14.902, of June 27, 2024, https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2024/lei/l14902.htm.

2 Law No. 13.755, of December 10, 2018, https://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/lei/L13755.htm.

3 Decree No. 12.435, of April 15, 2025, https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2025/decreto/D12435.htm.

4 GM/MDIC Ordinance No. 176, of July 7, 2025, https://www.in.gov.br/en/web/dou/-/portaria-gm/mdic-n-176-de-7-de-julho-de-2025-641610640.

5 Decree No. 12.549, of July 10, 2025, https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2025/decreto/D12549.htm.

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analyze the targets for passenger vehicles and light commercial vehicles, followed by a discussion of the timeline for implementing the first targets for heavy-duty vehicles. Finally, we examine the *feebate* system proposed in the program, which aims to promote the purchase of lower-emission vehicles with incentives financed by taxes on more polluting ones, and variations in the Industrialized Products Tax (IPI, from *Imposto sobre Produtos Industrializados*) based on vehicle propulsion technologies.

ENERGY EFFICIENCY AND CARBON DIOXIDE EQUIVALENT EMISSION TARGETS

The law that established the MOVER Program stipulated that energy efficiency targets will be determined according to the tank-to-wheel cycle, while carbon dioxide equivalent (CO_2e) emission targets will be determined according to the well-to-wheel cycle. The tank-to-wheel cycle approach considers only emissions generated at the tailpipe during vehicle operation. The well-to-wheel cycle also includes emissions associated with energy extraction, production, and distribution. Starting in 2027, the program plans to account for "cradle-to-grave" emissions, which cover all stages of the vehicle's life cycle, including the production of raw materials, the manufacture of batteries and other auto parts, and vehicle assembly, use, and final disposal.

Decree No. 12.435 establishes that light vehicle energy efficiency targets must be met by 2027, based on the weighted average of annual new vehicle sales per manufacturer. The targets are expressed in megajoules per kilometer (MJ/km). The decree also specifies well-to-wheel emission targets, which must be calculated using official carbon intensity parameters for fuels and electricity and an ethanol utility factor for flex-fuel vehicles. The Energy Research Office (EPE, from *Empresa de Pesquisa Energética*), a government body, has published a technical note that will serve as a reference for defining the carbon intensities of the MOVER Program;[6] however, the official values are yet to be released by the National Energy Policy Council (CNPE, from *Conselho Nacional de Politica Energética*).

For heavy vehicles, Decree No. 12.435 establishes that manufacturers and importers must submit, in 2028, the first energy efficiency report for the first segments to be regulated: tractor trucks with 6x2 and 6x4 axle configurations. According to Ordinance GM/MDIC No. 176/2025, energy efficiency targets will be set in 2029 and must be met by 2033.

PASSENGER CARS

ENERGY EFFICIENCY TARGETS

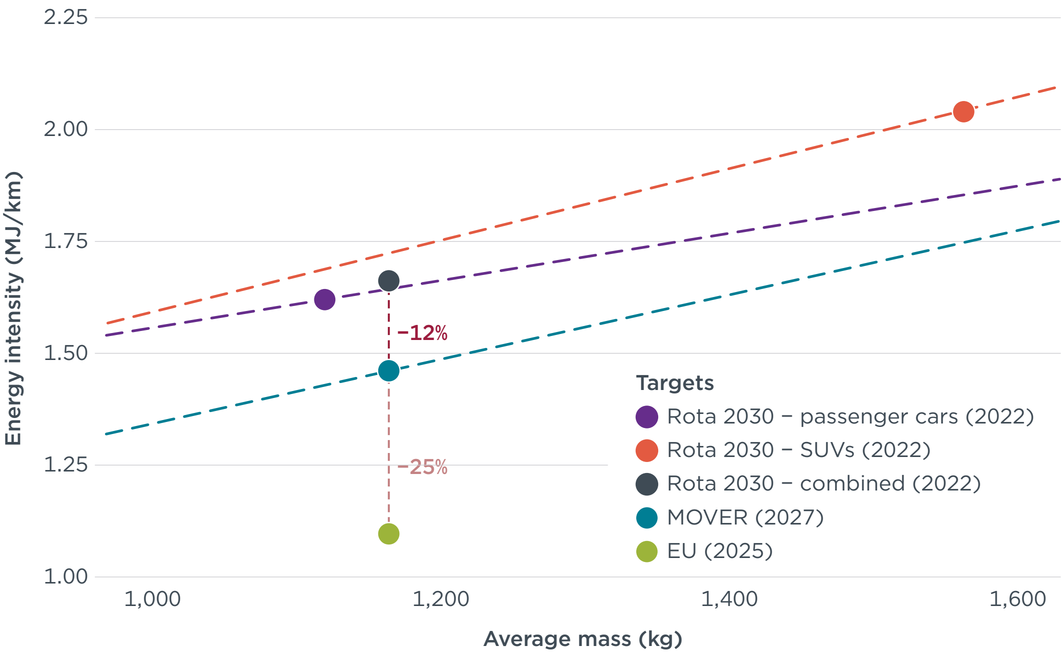
Passenger cars must reduce energy consumption by 12% by 2027 compared to 2022. This target is very close to the targets of the programs that preceded MOVER, Rota 2030 (2018–2022) and InovarAuto[7] (2013–2017), which targeted energy efficiency gains of 11%. Furthermore, MOVER's targets for passenger cars are modest by international standards: in 2027, after achieving MOVER's targets, the average passenger car sold in Brazil would still consume 25% more than comparable vehicles in the European Union (EU) in 2025 (Figure 1).

6 EPE, *Nota Técnica: Descarbonização do Setor de Transporte Rodoviário, Intensidade de Carbono das Fontes de Energia* [Technical Note: Decarbonization of the Road Transport Sector, Carbon Intensity of Energy Sources] (2025), https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-708/topico-770/NT-EPE-DPG-SDB-2025-03_Intensidade_de_Carbono_Transporte_Rodovi%C3%A1rio.pdf.

7 Decree No. 7.819, of October 3, 2012, https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/decreto/d7819.htm.

Figure 1

Comparison of the MOVER target (2027) with the targets of the Rota 2030 program (2022) and the European Union (2025) for passenger cars



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The Rota 2030 Program set different targets for large SUVs (2.04 MJ/km) and other passenger cars (1.62 MJ/km), represented by the orange and purple colors in Figure 1. These targets correspond to the circles on each curve, considering the average masses of large SUVs (1,564 kg) and other cars (1,121 kg). We calculated the combined target of the two Rota 2030 curves (1.66 MJ/km), weighting each target by the sales of their respective vehicles, considering approximately 10% large SUVs and 90% other passenger cars. The combined average mass was 1,165 kg.

The MOVER Program sets a single target for all passenger cars. Considering the same average mass of 1,165 kg, MOVER's estimated energy efficiency target is 1.46 MJ/km, 12% lower than the 1.66 MJ/km determined for Rota 2030 in 2022. However, this 12% target may change if the average mass of vehicles sold in 2027 varies, since the target to be achieved is determined by a straight line that increases as a function of the average vehicle mass.

We used a methodology presented in a previous ICCT report[8] to estimate the sales percentages of battery electric vehicles (BEVs), plug-in hybrids (PHEVs), and conventional hybrids (HEVs) that would result in a fleet with the energy efficiency level proposed by the MOVER Program in 2027. In summary, the method consists of simulating many scenarios, randomly varying the market shares of different powertrains in 2027, while keeping the sales share of each passenger car category fixed and assuming a fixed annual gain of 2% in the efficiency of combustion engines. This annual gain is close to that obtained during the Rota 2030 program, which provided an energy efficiency gain of 10.5% in 5 years (2.1% per year). The objective is to analyze in which scenarios the energy consumption target is achieved. Using this

8 André Cieplinski, *O Potencial de Descarbonização do Programa MOVER: Explorando Variações nas Vendas de Veículos de Diferentes Tecnologias até 2027* [The Decarbonization Potential of the MOVER Program: Exploring Variations in Sales of Vehicles of Different Technologies through 2027] (International Council on Clean Transportation, 2024), https://theicct.org/publication/o-potencial-de-descarbonizacao-do-programa-mover-explorando-variacoes-nas-vendas-de-veiculos-de-diferentes-tecnologias-ate-2027-jul24/.

methodology, we also assess what the share of these technologies should be in order to achieve a more ambitious, yet plausible, reduction in energy consumption of 17.5% compared to the 12% proposed by MOVER.

The results are presented in Table 1. The first four columns show the annual sales percentages for each technology between 2022 and 2025.[9] The two columns to the right present the market shares required to achieve the 12%[10] energy consumption reduction target set by MOVER and those corresponding to a more ambitious reduction of 17.5%. The sales percentages for HEVs and PHEVs are broken down between vehicles powered exclusively by gasoline and flex-fuel models.

Table 1
Estimated market shares to achieve the MOVER program target and a more ambitious feasible target

	Market share in the Brazilian market				Estimate	
					MOVER target	Possible target
	2022	2023	2024	January–August 2025	-12	-17.5% or greater
BEV	0.4%	0.9%	2.5%	2.9%	4%	11%
Gasoline PHEV	0.6%	1.6%	2.5%	3.7%	2%	3%
Flex-fuel PHEV	-	-	-	-	4%	4%
Gasoline HEV	0.1%	0.4%	0.6%	0.6%	2%	2%
Flex-fuel HEV	1.1%	1.0%	0.8%	0.7%	5%	7%

The results of the simulations presented in Table 1 indicate that we are already close to the percentage of electric vehicle sales that would result in a 12% reduction in energy consumption, as proposed in the MOVER target—which we can therefore consider unambitious. In turn, to achieve a reduction of at least 17.5%, it would be necessary to increase the share of BEV sales by 8 percentage points, PHEVs by 3 percentage points, and flex HEVs by 1.5 percentage points by 2027. Considering recent developments in the domestic market, this more ambitious target can be considered feasible, particularly if the MOVER Program were to encourage the introduction of new electric vehicle models through more ambitious targets.

WELL-TO-WHEEL CO_2E EMISSIONS TARGETS

The MOVER program established well-to-wheel CO_2e emission targets for the first time for cars sold in Brazil. The equations that determine the corporate emissions target, as well as the calculation of emissions for models with different powertrains, were published in Decree No. 12.435. The calculation of emissions basically consists of multiplying the vehicle's energy efficiency by the carbon intensity of its energy source. For PHEVs, it is necessary to weigh the use of the vehicle in combustion and electric mode.[11] In the case of flex-fuel vehicles, it is necessary to weigh the carbon intensities

9 Brazilian Electric Vehicle Association (ABVE), *Eletromobilidade* [Electromobility], database, accessed June 12, 2025, https://abve.org.br/bi-geral/.

10 We calculated the average percentages for each propulsion technology among the scenarios that showed energy consumption reduction levels between 11.9% and 12.1% compared to the 1.66% level in 2022.

11 The electric mode utilization factor is calculated based on battery range, according to equations D.1, D.2, and D.3 of the Brazilian Association of Technical Standards, *NBR 16567 – Veículos Rodoviários Híbridos Elétricos Leves — Medição de Emissão de Escapamento e Consumo de Combustível e Energia — Métodos de Ensaio [NBR 16567 – Light Hybrid Electric Road Vehicles — Measurement of Exhaust Emissions and Fuel and Energy Consumption — Test Methods]* (2016), https://www.normas.com.br/visualizar/abnt-nbr-nm/11864/abnt-nbr16567-veiculos-rodoviarios-hibridos-eletricos-leves-medicao-de-emissao-de-escapamento-e-consumo-de-combustivel-e-energia-metodos-de-ensaio.

of gasoline and ethanol by the biofuel use factor. All equations and emission factors used to calculate the targets are available in the appendix.

Since programs prior to MOVER did not have emission targets, there is no official reference point from which to infer the expected percentage reduction in emissions between 2022 and 2027. To evaluate the target proposed by the program, we calculated the average emission level and average mass of vehicles sold in the first half of 2025. With this information, it is possible to compare the current level of emissions with the program's target. To calculate average emissions, we matched energy efficiency data from the Brazilian Vehicle Labeling Program (PBEV, from *Programa Brasileiro de Etiquetagem Veicular*)[12] with sales data for each model from market intelligence data provider Jato Dynamics.[13] The average well-to-wheel CO_2e emissions, weighted by sales of models marketed in the first half of 2025, were 95.5 g CO_2/km. The average mass obtained was 1,257 kg. This represented an increase of 92 kg compared to the 1,165 kg calculated for 2022 by the National Association of Motor Vehicle Manufacturers (ANFAVEA, from *Associação Nacional dos Fabricantes de Veículos Automotores*).

The equation that defines the emissions target depends on a parameter that represents the average carbon intensity (ICM, from *intensidade de carbono média*) of the energy sources used by passenger vehicles, using the emission factors for sources in 2022 weighted by shares of ethanol and gasoline consumption in 2023. Given that the official ICM value has not yet been made official by the CNPE, we calculated this parameter as the average CO_2e emission level of the models sold in 2023, weighted by the number of sales, divided by the average energy consumption weighted by the number of sales of these models. The ICM value we obtained for passenger cars was 60.5 g CO_2e/MJ. The EPE, in turn, calculated the ICM for light vehicles (passenger cars and light commercial vehicles) at 64.1 g CO_2e/MJ in 2022 and 61 g CO_2e/MJ in 2024. If we include light commercial vehicles in our calculations, we arrive at a value of 63.1 g CO_2e/MJ, close to EPE's estimates.

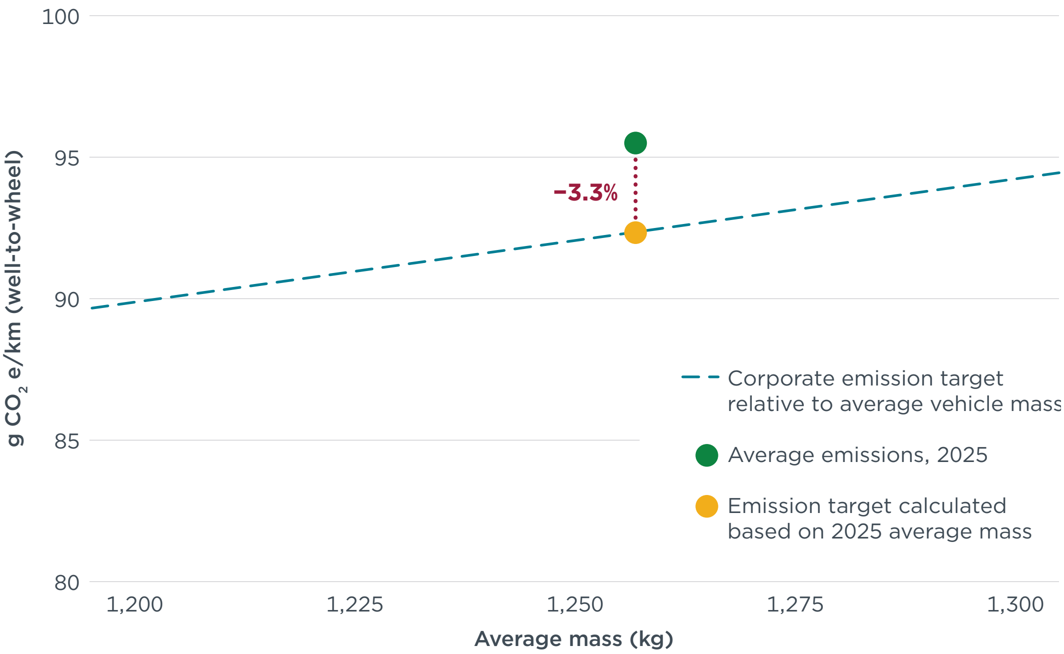
Using an ICM of 60.5 g CO_2e/MJ and the average mass for 2025 of 1,257 kg, **the estimated target for 2027 is 92.4 g CO_2e/km, only 3.3% below the average emissions level estimated for the first half of 2025.** It is worth noting that this ICM value is not official and the target is directly proportional to its value, so that the higher the ICM, the less restrictive the target will be.

Figure 2 illustrates the line that defines the corporate CO_2e emissions target determined by the MOVER Program, based on the average mass of passenger cars. The green dot represents the average emissions of models sold in the first half of 2025, while the yellow dot represents the target calculated considering the average mass for that same period.

12 National Institute of Metrology, Standardization and Industrial Quality (INMETRO), *Programa Brasileiro de Etiquetagem Veicular – PBEV 2022* [Brazilian Vehicle Labeling Program – PBEV 2022] (2022), https://www.gov.br/inmetro/pt-br/assuntos/avaliacao-da-conformidade/programa-brasileiro-de-etiquetagem/tabelas-de-eficiencia-energetica/veiculos-automotivos-pbe-veicular/pbe-veicular-2022.pdf/view.

13 *Jato Dynamics, Venda de Carros de Passageiro e Veículos Comerciais Leves, 2021–2024 [Passenger Car and Light Commercial Vehicle Sales, 2021–2024],* database, https://info.jato.com/pt-br/jato-brasil.

Figure 2
CO_2e emissions target for passenger cars under the MOVER program (2027)



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Like the energy efficiency target discussed above, this estimated target will require little additional effort from automakers, particularly in relation to the sale of new technologies such as BEVs and PHEVs. On the one hand, manufacturers whose sales are predominantly of imported gasoline vehicles are likely to find it more difficult to meet their targets. On the other hand, the largest automakers in the Brazilian market, which mainly produce flex-fuel models, should achieve their targets with relative ease.

LIGHT COMMERCIAL VEHICLES

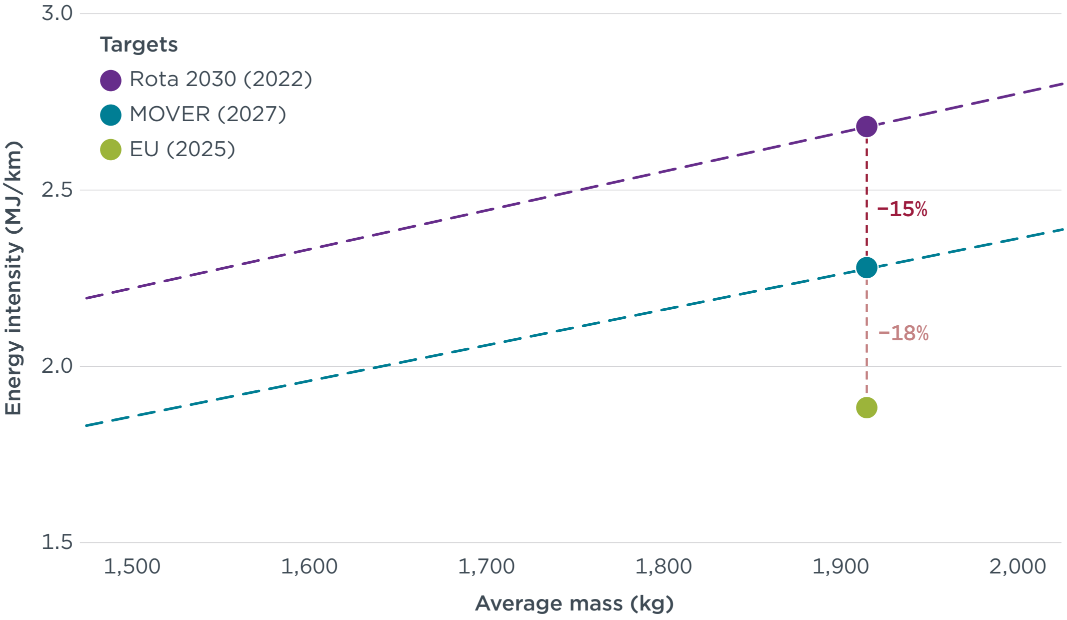
The estimated energy consumption reduction target set by MOVER for light commercial vehicles (LCVs) is more ambitious than that for passenger cars. Using the target specified in Decree No. 12.435, compared to the previous target of the ROTA 2030 Program, **we calculated a 15% reduction in energy consumption for LCVs between 2022 and 2027,** compared to 12% for passenger cars.

Figure 3 shows the curve that defines the energy efficiency target for LCVs based on their mass in the MOVER Program, compared to the targets set by Rota 2030 (for 2022) and the European Union (for 2025). The target shown for LCVs corresponds to the average vehicle mass in the category, 1,915 kg. The energy consumption target for LCVs set by Rota 2030 for 2022 was 2.68 MJ/km, while that of MOVER for 2027 is 2.28 MJ/km and that of the European Union for 2025 is 1.88 MJ/km. Therefore, it is estimated that the average LCV sold in Brazil in 2027 will still consume 18% more than comparable vehicles in the European Union in 2025.

Similar to passenger cars, the MOVER target may change if there is a variation in the average mass of LCVs between 2022 and 2027. For example, if the average mass in 2027 decreases to 1,815 kg, the target will be 2.18 MJ/km, and the reduction compared to 2022 would be 19%. On the other hand, if the average mass increases to 2,015 kg, the target will be 2.38 MJ/km, and the reduction compared to 2022 would be 11%.

Figure 3

Comparison of the MOVER target (2027) with the targets of the Rota 2030 program (2022) and the European Union (2025) for light commercial vehicles



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HEAVY VEHICLES

Decree 12.435 establishes that, as of January 2027, the sale of heavy vehicles will be conditional on manufacturers and importers committing to submit energy efficiency reports to the Ministry of Development, Industry, Trade, and Services (MDIC) for monitoring compliance with energy efficiency targets. Ordinance GM/MDIC 176/2025 establishes the policy schedule, with verification of compliance with the targets scheduled for 2033.

The implementation of the policy requires the use of a simulation tool. Ordinance GM/MDIC 176/2025 requires that fuel consumption and CO_2 emissions be calculated using the Vehicle Energy Consumption calculation TOol (VECTO), a tool developed by the European Commission.[14] The tool must be adapted to national conditions, including driving cycle, testing procedures, and the type of truck body. These activities have been under discussion by technical groups from the Brazilian Association of Automotive Engineering (AEA, from *Associação Brasileira de Engenharia Automotiva*), in support of the MDIC, since 2024.

Ordinance GM/MDIC 176/2025 defines that the segments subject to regulation will be defined based on axle configuration, application, mass, and load or passenger capacity. The first segment to be regulated, Group 01, covers tractor-trailers with a mass greater than 12 tons with 6x2 and 6x4 axle configurations. Other segments will be defined by the HDV Energy Efficiency Steering Committee,[15] with a two-year interval between the

14 "Vehicle Energy Consumption calculation TOol – VECTO," European Commission, https://climate.ec.europa.eu/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/vehicle-energy-consumption-calculation-tool-vecto_en.

15 The HDV Energy Efficiency Steering Committee, established by Ordinance GM/MDIC 176/2025, will be responsible for providing technical support to the MDIC in implementing the energy efficiency policy for heavy vehicles under the MOVER Program. Coordinated by the MDIC, the committee will be composed of representatives from INMETRO, AEA, ANFAVEA, ABVE, and the ABC Metalworkers' Union. Although not formally part of the committee, the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) may participate as a permanent guest at meetings.

inclusion of each new segment. The policy implementation schedule is structured in three cycles, as shown in Figure 4.

Figure 4
Implementation schedule for the heavy-duty vehicle energy efficiency policy

	2025	2026	2027	2028	2029	2030	2031	2032	2033
First cycle (2025-2026)	■	■							
Publication of regulations		■							
Finalization of the simulation tool		■							
Second cycle (2027-2028)			■	■					
Validation of the simulation tool			■						
Submission of the energy efficiency report				■					
Definition of baseline values				■					
Third cycle (2029-203)					■	■	■	■	■
Setting of targets					■				
Submission of the energy efficiency report					■	■	■	■	■
Publication of results (label)						■	■	■	■
Verification of target compliance									■

FIRST CYCLE (2025–2026)

The first cycle of policy implementation, scheduled for 2025 to 2026, includes the publication of regulations regarding testing procedures and the definition of truck body types (e.g., trailer or semi-trailer) to be used in simulations, which are to be completed by March 2026. The definition of representative routes must be completed by June 2026. The adaptation of VECTO is expected to be completed by December 2026. It should be noted that Ordinance GM/MDIC 176/2025 establishes that any delays in the adaptation or validation of the tool will result in the automatic postponement of the schedule, which means this stage may present the highest risks to the policy implementation schedule.

SECOND CYCLE (2027–2028)

The second cycle, between 2027 to 2028, includes the definition of the energy efficiency baseline. The baseline will represent the average energy efficiency of regulated vehicles before the targets come into force and will serve as a reference for measuring the progress of the policy. To this end, by June 2027, the HDV Energy Eficiency Steering Committee must validate the adapted version of VECTO developed in the first cycle. Based on this official version, manufacturers and importers must submit to the MDIC, by November 1, 2028, the simulated results of fuel consumption and CO_2 emissions for Group 01 vehicles, referring to production between October 1, 2027, and September 30, 2028. These data will be used to calculate the baseline, to be completed by December 31, 2028.

THIRD CYCLE (2029–2033)

The third stage of the policy covers the period from 2029 to 2033. By April 2030, mandatory energy efficiency targets for Group 01 vehicles must be defined. Verification of compliance with these targets will begin on October 1, 2033. During this cycle, manufacturers and importers must submit the results of simulations for the previous 12 months to the MDIC by November 1 of each year, in order to monitor the performance of the regulated segment. Additionally, as of January 1, 2030, public disclosure of the results will be mandatory through the PBEV, coordinated by the National Institute of Metrology, Standardization, and Industrial Quality (INMETRO, from *Instituto Nacional de Metrologia, Qualidade e Tecnologia*).

BONUS-MALUS (FEEBATE) METHODOLOGY

Decree No. 12.435 also established rules for the MOVER Program's feebate system. Feebate systems increase the price of more polluting vehicles to discount the prices of lower-emission vehicles; they aim to provide incentives without fiscal costs—that is, the revenue collected from the taxed vehicles should offset the subsidy provided to low-emission vehicles. The decree establishes that the MOVER Program's feebate will be defined in seven CO_2e/km emission ranges, and that these ranges will be updated every 5 years.

Feebate systems are effective tools for encouraging the adoption of low-emission vehicles, with experiences in Norway, France, Singapore, and other countries.[16] However, the relative efficiency of feebate programs may vary. Best practices recommend adopting a linear system rather than a banded system, with constant updates. A banded system may not encourage improvements in vehicles that fall in the middle of the bands. On the other hand, vehicles positioned close to the transition between bands can obtain large tax advantages with small gains in emissions. As new vehicles become more efficient, it is also necessary to update the system so that efficiency gains do not render the system ineffective.[17] In this context, as Brazilian authorities prepare to implement MOVER, that could consider evaluating and adjusting the feebate rules in accordance with best practices adopted in other jurisdictions.

REDUCTIONS IN THE TAX ON INDUSTRIALIZED PRODUCTS

Finally, Decree No. 12.549 of July 2025 established variations in the rates of the tax on industrialized products (IPI), as defined in Article 11 of the law that established the MOVER Program. Also known as the "Green IPI," this decree establishes tax rate reductions based on propulsion technology, fuel usage, engine power, structural performance, assisted driving technologies, and vehicle recyclability. The decree also establishes IPI exemptions for smaller vehicles produced in Brazil that achieve a combination of emissions reductions and recyclability.

These variations are valid until December 31, 2026, before the date on which the first light vehicle target must be achieved under the MOVER Program. Until that date, in addition to IPI reductions based on the criteria above, light vehicle manufacturers may receive an additional 2% IPI reduction for vehicles that meet the energy efficiency targets of the Rota 2030 Program, which remain in effect until the date of compliance with the first target of the MOVER Program.

Table 2 shows the variations in the IPI tax rate based on vehicle technology and fuel. In general, reductions are granted for BEVs and flex-fuel hybrids; the latter receive

16 Sandra Wappelhorst, *Incentivizing Zero- and Low-Emissions Vehicles: The Magic of Feebate Programs* (International Council on Clean Transportation, 2022), https://theicct.org/magic-of-feebate-programs-jun22/.

17 John German and Dan Meszler, *Best Practices for Feebate Program Design and Implementation* (International Council on Clean Transportation, 2010), https://theicct.org/publication/best-practices-for-feebate-program-design-and-implementation/.

greater reductions the higher the degree of electrification.[18] On the other hand, vehicles that use only gasoline or diesel will see tax increases. In particular, tax rates for internal combustion engine vehicles (ICEVs) and mild hybrid electric vehicles (MHEVs) powered exclusively by gasoline will increase by 6.5% and 4.5%, respectively.

Table 2
Variations in the IPI tax rate for passenger cars based on propulsion technology and energy source

Fonte de energia e tecnologia de propulsão do veículo	Variação de alíquota
BEVs	-2,0%
Flex-fuel PHEVs	-2,0%
Flex-fuel HEVs	-1,5%
Flex-fuel MHEVs	-1,0%
Ethanol ICEVs	0,5%
Flex-fuel ICEVs	0,0%
Gasoline PHEVs	2,0%
Gasoline HEVs	2,0%
Diesel PHEVs	3,0%
Diesel HEVs	4,0%
Gasoline MHEVs	4,5%
Gasoline MHEVs	5,5%
Gasoline ICEVs	6,5%
Diesel ICEVs	12,0%

Source: Decree No. 12.549 of July 2025

Engine power. In addition to the above tax rate variations, models may obtain tax rate reductions based on power. Vehicles with power up to 55 kW will receive a reduction of 2.5% (the minimum), while models with 290 kW or more will see a tax rate increase of 6.5% (the maximum).[19]

Recyclability. The decree establishes an IPI reduction of 1% or 2% for models that meet the recyclability criteria of items 17 and 18, respectively, of Annex III of Decree No. 12.435 of April 2025. Under the requirements, a 1% reduction is granted if 80% of the vehicle's mass is recyclable and a 2% reduction is granted if 85% of the vehicle's mass is recyclable, in accordance with the methodology established in ISO 22628:2002.

Structural performance and assisted driving technologies. A 1% reduction in the IPI tax rate can be obtained if vehicles meet a series of general safety requirements, such as having a rear warning or visibility system, emergency braking indicators, seat belt warning, and stability control system. Vehicles must also meet other innovative

18 Despite the tax rate increase of 12% for diesel combustion vehicles and 5.5% for diesel MHEVs, these represent a very small share of passenger cars sold in Brazil. Among light commercial vehicles, gasoline ICE and diesel ICE vehicles will see a tax rate increase of 2.25% and 2.5%, respectively.

19 It is important to note that the decree defines specific standards for calculating the power of combustion engines (ISO 1585:2020) and electric motors. See Regulation No. 85 of the United Nations Economic Commission for Europe (UNECE) — Uniform Provisions Concerning the Approval of Internal Combustion Engines or Electric Traction Units Intended for the Propulsion of Motor Vehicles of Categories "M" and "N" Concerning the Measurement of Net Power and Maximum 30-Minute Power of Electric Drive Units, OJ L 323 (2014), https://op.europa.eu/pt/publication-detail/-/publication/44471446-bc46-44f0-bc97-0de997b18106.

requirements, such as a pedestrian protection system, automatic emergency braking systems for moving and stationary obstacles, and a lane departure warning system.

IPI exemption. By meeting a set of requirements, a small number of models may qualify for total IPI exemption. To do so:

- the vehicle must be in the subcompact, compact, compact SUV, or compact pickup categories;
- 80% or more of its mass can be recycled or reused;
- it must emit no more than 83 g CO_2/km in the well-to-wheel cycle, or about 15% below the Brazilian market average in 2024, according to our estimates; and
- it must be manufactured in Brazil, including the stages of stamping external panels, welding, painting, engine manufacturing, and assembly.

Only a few models meet all these requirements.[20] The carbon intensities of the energy sources used to assess whether a vehicle is eligible for the IPI exemption were published in Ordinance GM/MDIC No. 183, of July 2025.[21] The carbon intensity values of the energy sources in this ordinance differ from those disclosed in the EPE technical note, which will be used to verify compliance with the corporate target. This is a point of attention for the program, which, ideally, should adopt the same carbon intensity values in all contexts.

The current IPI tax rate for passenger cars is 6.3%. Therefore, it is likely that vehicles that meet most of the requirements listed above will receive an IPI reduction similar to the exemption. For example, a BEV (-2% IPI rate), with energy consumption below the Rota 2030 Program target (-2%), and which meets the requirements for assistive technologies (-1%) and 85% recyclability of its mass (-2%), would be eligible for a 7% tax rate reduction and would therefore have a tax rate of zero. On the other hand, a gasoline-powered combustion vehicle (+6.5%) that meets all of the same requirements above (-5%) would be subject to an IPI tax rate of 7.8%.

20 Government of Brazil, "Montadoras Credenciam Cinco Modelos em Diferentes Versões Para IPI Zero" [Automakers Accredit Five Models in Different Versions for Zero IPI], press release, July 11, 2025, https://www.gov.br/mdic/pt-br/assuntos/noticias/2025/julho/montadoras-credenciam-cinco-modelos-em-diferentes-versoes-para-ipi-zero.

21 GM/MDIC Ordinance No. 183, of July 11, 2025, https://www.in.gov.br/en/web/dou/-/portaria-gm/mdic-n-183-de-11-de-julho-de-2025-641538097.

APPENDIX A . CALCULATIONS OF ENERGY EFFICIENCY AND EMISSIONS TARGETS

A.1 EQUATIONS

The equations that designate the energy efficiency and CO_2 emissions targets for light vehicles in the MOVER Program were presented in Decree No. 12.435.

The corporate energy consumption target for light passenger vehicles, category 1 light commercial vehicles, compact SUVs, off-road 4-wheel drive (4x4) vehicles, and large SUVs is calculated based on the average mass weighted by the number of sales, as shown in Equation 1:

$$CE1' = 0{,}621492 + 0{,}000720 \times M' \qquad \text{(Equation 1)}$$

Where M´ is the average curb weight of vehicles in the above categories imported or sold in Brazil by legal entities, weighted by sales between October 1, 2026, and September 30, 2027. The target remains valid until 2031, when the targets for the second phase of MOVER come into effect.

The energy consumption target for category 2 light commercial vehicles is calculated according to Equation 2:

$$CE1'' = 0{,}344199 + 0{,}001009 \times M'' \qquad \text{(Equation 2)}$$

Where M´´ is the average curb weight of category 2 light commercial vehicles imported or sold in Brazil by legal entities, weighted by sales between October 1, 2026, and September 30, 2027. The target remains valid until 2031, when the targets for the second phase of MOVER come into effect.

The CO_2 emissions target from well-to-wheel for light passenger vehicles, light commercial vehicles category 1, compact SUVs, off-road 4x4 vehicles, and large SUVs is calculated using Equation 3:

$$ECM1' = CE1' \times ICM' \qquad \text{(Equation 3)}$$

Where *ICM´* is the average carbon intensity of energy sources weighted by use among vehicles in the categories mentioned.

The CO_2 emission target from well to wheel for category 2 light commercial vehicles is given by Equation 4:

$$ECM1'' = CE1'' \times ICM'' \qquad \text{(Equation 4)}$$

Where *ICM´´* is the average carbon intensity of energy sources, weighted by use among category 2 light commercial vehicles.

ICM´ was calculated in the EPE technical note, while *ICM´´* has not yet been released.

A.2 CARBON INTENSITY OF ENERGY SOURCES

A.2.1 Compliance with corporate target

The base year for carbon intensities is 2022, while the base year for the renewable fuel use factor is 2023. Table A1 shows the carbon intensity values used to calculate the CO_2e emission target shown in Figure 2, expressed in g CO_2e/MJ.

	Carbon intensity (2022) (g CO_2e/MJ)
Hydrated ethanol (E100)	22.65
Gasoline C (E27)	73.61
Diesel B	81.04
Electricity	21.78
Ethanol usage factor as a percentage of energy content	28.7

Source: Energy Research Company, *Technical Note.*

A.2.2 Sustainable car

Table A2 shows the carbon intensity values used to calculate the benefits of the Green IPI reduction, in g CO_2e/MJ:

	Carbon intensity (g CO_2e/MJ)
Field ethanol	28.52
Field gasoline	75.07
Field diesel	79.57
Reference electricity	31.77
Ethanol usage factor as a percentage based on energy content	32.1

Source: GM/MDIC Ordinance No. 183, dated July 11, 2025.

A.2 ELECTRIC MODE UTILIZATION FACTOR FOR PLUG-IN HYBRID VEHICLES

The electric mode utilization factor in PHEV vehicles is calculated based on the electric motor's range. Decree No. 12.435 determined that the utilization factor adopted by the MOVER Program follows equations D.1, D.2, and D.3 of NBR 16567, presented below:

Ranges up to 85 km per day:

$$FU = 1{,}2 \times 10^{-7} \times d^3 - 0{,}000112 \times d^2 + 0{,}0185 \times d \qquad \text{(Equation 5)}$$

Autonomies from 85 km to 200 km per day:

$$FU = 3{,}25 \times 10^{-8} \times d^3 - 2{,}2 \times 10^{-5} \times d^2 + 0{,}0052 \times d + 0{,}5383 \qquad \text{(Equation 6)}$$

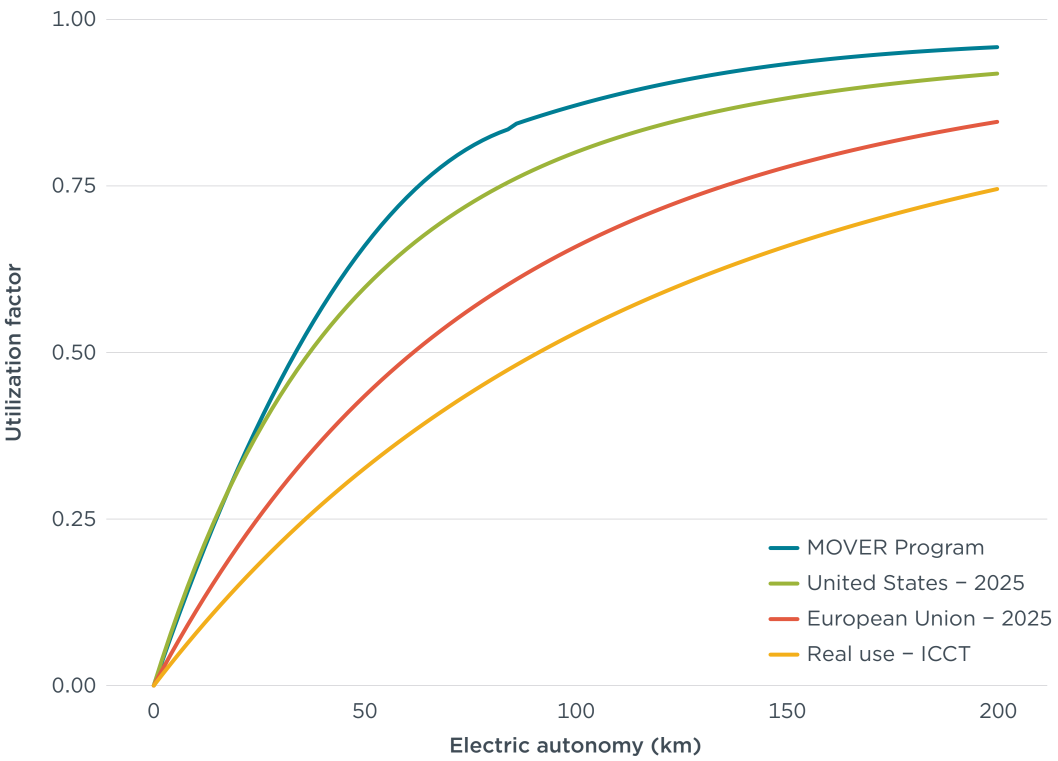
Autonomies above 200 km per day:

$$FU = 1{,}04 \times 10^{-9} \times d^3 - 1{,}57 \times 10^{-6} \times d^2 + 0{,}0008 \times d + 0{,}8569 \qquad \text{(Equation 7)}$$

Figure 5 shows a comparison between the MOVER Program's utilization factor curve and those used in the United States, the European Union (6e-bis), and the curve calculated by the ICCT from actual usage data obtained from PHEV users in the United States. Previous ICCT publications discussed the utilization factor of PHEVs in Europe[22] and in the United States.[23]

Figure 5

Comparison between the MOVER (2027) PHEV utilization factor curve and those of other international programs



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It should be noted that the curve used by MOVER assumes the highest utilization factors in electric mode for PHEVs. Given the low carbon intensity of electricity generation in Brazil and the energy efficiency of electric motors, a higher utilization factor implies lower well-to-wheel CO_2 emissions. Therefore, the MOVER Program curve is the one that will result in the lowest emission levels for PHEVs compared to the curves used by other countries.

22 Patrick Plötz et al., *Real-World Usage of Plug-In Hybrid Vehicles in Europe: A 2022 Update on Fuel Consumption, Electric Driving, and CO2 Emissions* (International Council on Clean Transportation, 2022), https://theicct.org/publication/real-world-phev-use-jun22/.

23 Aaron Isenstadt et al., *Real-World Usage of Plug-In Hybrid Vehicles in the United States* (International Council on Clean Transportation, 2022), https://theicct.org/publication/real-world-phev-us-dec22/.