

POLICY UPDATE

MAY 2021

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The second phase of China's new energy vehicle mandate policy for passenger cars

On January 1, 2021, China's *Parallel Management Regulation for Corporate Average Fuel Consumption and New Energy Vehicle Credits* entered its second phase.¹ In this paper, we refer to this as “the Phase 2 policy” or “the 2020 policy,” and to the previous phase as “the Phase 1 policy” or “the 2017 policy,” as it was finalized in September 2017. In China, new energy vehicles (NEVs) include battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell electric vehicles (FCVs). The Phase 2 policy includes the following changes:

- » NEV credit percentage targets for car manufacturers are set to increase from 14% to 18% between 2021 and 2023
- » The per-vehicle NEV credit is reduced and the criteria for determining the credit value are tightened
- » Fuel-efficient conventional fuel vehicles are included as a compliance option
- » The NEV credit carry-forward provisions are relaxed
- » The definition of affiliated companies for the purpose of compliance is expanded

This paper describes the contents of the Phase 2 policy and highlights the differences from the Phase 1 policy. In addition, on February 8, 2021, China issued an announcement that revised the process of accounting for credits generated in 2020.² We also include details of that announcement.

1 Ministry of Industry and Information Technology (2020). 乘用车企业平均燃料消耗量与新能源汽车积分并行管理办法 [“Parallel Management Regulation for Corporate Average Fuel Consumption and New Energy Vehicle Credits for Passenger Cars”]. https://www.miit.gov.cn/zwgk/zcwj/flfg/art/2020/art_2337a6d7ca894c5c8e8483cf9400ecdd.html.

2 Ministry of Industry and Information Technology (2021). 关于2020年度乘用车企业平均燃料消耗量和新能源汽车积分管理有关事项的通知 [“Announcement on the Implementation of Parallel Management Regulation for Corporate Average Fuel Consumption and New Energy Vehicle Credits for Passenger Cars in 2020”]. https://www.miit.gov.cn/jgsj/zbys/qcgy/art/2021/art_b7ea5735e3d8488fa05f24d0d3d9d77a.html.

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HOW DOES THE PHASE 2 POLICY WORK?

The general structure of the Phase 2 policy remains unchanged from the Phase 1 policy, which was summarized in an ICCT policy update published in January 2018.³ Broadly, China's NEV mandate regulates how both corporate average fuel consumption (CAFC) credits and NEV credits are calculated and traded. Each auto manufacturer's CAFC target and actual CAFC are determined by China's passenger vehicle fuel consumption standards.⁴ Manufacturers also need to meet prescribed targets for NEVs as a percentage of newly produced conventional fuel passenger cars in a given year, except qualified small volume manufacturers.⁵ A company's NEV credits are calculated from its production volume of NEVs and the technology mix of its fleet.

As shown in Table 1, there are multiple options to comply in the case of a deficit. To offset a CAFC deficit, manufacturers can use their own current or banked CAFC credits or those transferred from affiliated companies, or use NEV credits either banked by the company itself or purchased from other companies.⁶ In the case of an NEV credit deficit, manufacturers can use their own NEV credits or qualified NEV credits purchased from others. The changes in the Phase 2 policy are marked in bold in the table.

Table 1. Compliance pathways

NEV deficit (Actual NEV credits < NEV targets)	<ul style="list-style-type: none">• Purchase NEV credits from other companies.• Use banked NEV credits from own company.
CAFC deficit (Actual CAFC credits < CAFC targets)	<ul style="list-style-type: none">• Use banked CAFC credits from own company.• Use banked or current year NEV credits from own company.• Transfer CAFC credits from affiliated companies.• Purchase NEV credits from other companies.

WHY DID THE MINISTRY OF INDUSTRY AND INFORMATION TECHNOLOGY (MIIT) REVISE THE POLICY?

In addition to the fact that the Phase 1 targets did not extend beyond 2020, MIIT also intended to accomplish the following with Phase 2:

- » *Encourage fuel efficiency technologies.* In order to encourage the production of fuel-efficient conventional vehicles, MIIT made two adjustments. Manufacturers whose CAFC does not exceed the fuel economy standard by 123% in a given year are given the right to carry forward up to 50% of their NEV credits. Manufacturers can also meet the NEV targets through producing vehicles with lower fuel consumption instead of through NEVs only.

3 Hongyang Cui, *China's new energy vehicle mandate policy (final rule)*, (ICCT: Washington, DC, 2018), <https://theicct.org/publications/china-nev-mandate-final-policy-update-20180111>.

4 Ministry of Industry and Information Technology (2019). 乘用车燃料消耗量评价方法及指标 ["Fuel Consumption Evaluation Methods and Targets for Passenger Cars"]. <http://www.miit.gov.cn/n1146285/n1146352/n3054355/n3057585/n3057589/c6616416/part/6616424.pdf>

5 A small volume manufacturer is one that produces or imports fewer than 30,000 conventional fuel passenger vehicles in a year.

6 Only NEV credits that are assigned multipliers ≥ 1 are allowed to be traded.

- » *Avoid NEV credit supply-demand imbalance.*⁷ NEV credit trading, in terms of value and volume, has been relatively limited because supply exceeds demand. In 2019, manufacturer surpluses totaled 4.17 million NEV credits and deficits were only 0.86 million NEV credits.⁸ One reason for the NEV credit surplus is that technology advancements led to an increasing number of long-range BEVs, and these were given high credits in the 2017 policy. Therefore, MIIT lowered the credits given to BEVs with long electric range and instead Phase 2 encourages energy-efficient EV models.⁹
- » *Promote vehicles using methanol and alternative fuels.*¹⁰ In 2019, MIIT emphasized the necessity of diversifying fuel types through promoting methanol and alternative fuels vehicles. These vehicles are included in the category of conventional fuel vehicles in the 2020 policy.

KEY CHANGES IN THE PHASE 2 POLICY

The Phase 2 policy incorporates a series of revisions regarding how to calculate the NEV credit percentage target, the per-vehicle NEV credit, and compliance. Table 1 summarizes the changes and also the revisions in the February 2021 announcement. Importantly, the Phase 1 policy only set the 2019 NEV credit percentage target at 10% and the 2020 target at 12%. Under the Phase 2 policy, the 2021, 2022, and 2023 targets are 14%, 16%, and 18%, respectively.

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- 7 Ministry of Industry and Information Technology (2020). 两部门负责人就《关于修改〈乘用车企业平均燃料消耗量与新能源汽车积分并行管理办法〉的决定》答记者问. ["Highlights from the Press Conference on 'Decisions about Revising the *Parallel Management Regulation for Corporate Average Fuel Consumption and New Energy Vehicle Credits for Passenger Cars*'"] https://www.miit.gov.cn/zwgk/zcwj/flfg/art/2020/art_2337a6d7ca894c5c8e8483cf9400ecdd.html.
- 8 China Association of Automobile Manufacturers (2020). 2019年度中国乘用车企业平均燃料消耗量与新能源汽车积分情况公告 ["Report on the Corporate Average Fuel Consumption and New Energy Vehicle Credits for Passenger Cars in 2019"]. http://www.caam.org.cn/chn/1/cate_2/con_5230951.html.
- 9 Ministry of Industry and Information Technology (2019). 工业和信息化部关于《乘用车企业平均燃料消耗量与新能源汽车积分并行管理办法》修正案（征求意见稿）的说明 ["Notes on the Amendments to *Parallel Management Regulation for Corporate Average Fuel Consumption and New Energy Vehicle Credits for Passenger Cars* (Draft for Comments) by MIIT"]. <https://www.miit.gov.cn/n1278117/n1648113/c7027769/part/7027781.doc>.
- 10 Ministry of Industry and Information Technology (2019). 八部门关于在部分地区开展甲醇汽车应用的指导意见 ["Guidance on the Application of Methanol Vehicles in Some Regions"]. http://www.gov.cn/xinwen/2019-03/20/content_5375348.htm.

Table 2. Summary of differences between the 2017 and 2020 policies

Item		2017 policy	2020 policy
Annual percentage NEV credit target		2019: 10% 2020: 12%	2021: 14% 2022: 16% 2023: 18%
Per-vehicle credit*		BEV: <ul style="list-style-type: none"> • Base credit (BC) = (0.012 x electric range + 0.8) • Final credit = BC x EC • Capped at 6 	BEV: <ul style="list-style-type: none"> • Base credit (BC) = (0.0056 x electric range + 0.4) • Final credit = BC x ER x BD x EC • Capped at 5.1
		PHEV: <ul style="list-style-type: none"> • Base credit (BC) = 2 • Final credit = BC x EC • Capped at 2 	PHEV: <ul style="list-style-type: none"> • Base credit (BC) = 1.6 • Final credit = BC x EC • Capped at 1.6
		FCV: <ul style="list-style-type: none"> • Base credit (BC) = 0.16 x rated power • Final credit = BC x RP • Capped at 5 	FCV: <ul style="list-style-type: none"> • Base credit (BC) = 0.08 x rated power • Final credit = BC x RP • Capped at 6
Compliance	Scope of conventional fuel vehicle	Gasoline, diesel, gas fuel	Gasoline, diesel, gas fuel, alcohol/ether fuel
	Fuel-efficient passenger vehicle (FEV) multiplier	Category not included	FEVs are counted using the following multipliers into a manufacturer's total conventional fuel vehicle production volume: 2021: 0.5 2022: 0.3 2023: 0.2
	NEV credit carry-forward provisions:	2019 NEV credits can be carried forward in full for 1 year	<ul style="list-style-type: none"> • 2020 NEV credits can be carried forward at a discounted value (0.5) for up to 3 years • 2021 and 2022 NEV credits can be carried forward by manufacturers meeting certain conditions, at a discounted value (0.5) for up to 3 years
	Definition of affiliated companies	<ul style="list-style-type: none"> • A domestic original equipment manufacturer (OEM) and a domestic group holding ≥ 25% of its shares • Two domestic OEMs with the same domestic shareholder holding ≥ 25% of each of their shares • An import agent of a foreign OEM, and the OEM's domestic joint venture with ≥ 25% of its shares held by the OEM 	<ul style="list-style-type: none"> • A domestic OEM and a domestic group holding ≥ 25% of its shares • Two domestic OEMs with the same domestic or foreign shareholder holding ≥ 25% of each of their shares • An import agent of a foreign OEM, and the OEM's domestic joint venture with ≥ 25% of its shares held by the OEM • An import agent of a foreign OEM, and the OEM's domestic shareholder holding ≥ 25% of its shares
	Benefits for manufacturers producing less than 2,000 vehicles a year	2018-2020: <ul style="list-style-type: none"> • If the CAFC drops by 6% compared to the previous year, the CAFC standard is relaxed by 60% • If CAFC drops by 3%-6% compared to the previous year, the CAFC standard is relaxed by 30% 	2021-2023: <ul style="list-style-type: none"> • If the CAFC drops by 4% compared to the previous year, the CAFC standard is relaxed by 60% • If CAFC drops by 2%-4% compared to the previous year, the CAFC standard is relaxed by 30%
Item	2020 mandate	2021 announcement	
Off-cycle technology	Not included in CAFC credit calculation.	In 2020: <ul style="list-style-type: none"> • Models with idle stop-start are given an additional 0.15 liters (L)/100 kilometers (km) in CAFC credit calculation • Models with regenerative braking are given an additional 0.05 L/100 km or 0.15 L/100 km depending on the voltage of the rechargeable energy storage system (REESS) • Models with manual transmission gear shift indicator are given an additional 0.1 L/100 km 	
NEV credit carry back	2020 NEV credit can be carried back to 2019 . Whether 2021 NEV credit could be carried back was to be decided later.	2021 NEV credit can be carried back to 2020 .	

* ER = electric range multiplier, BD = battery energy density multiplier, EC = energy consumption multiplier, and RP = rated power multiplier

NEW COMPLIANCE MULTIPLIER FOR FUEL-EFFICIENT VEHICLES

The Phase 2 policy created a new category, fuel-efficient vehicles (FEV), and assigned these vehicles special multipliers toward manufacturers' NEV credit compliance accounting. FEVs are defined as conventional fuel vehicles that meet China's weight-based fuel consumption standard on a per-vehicle basis.¹¹ Figure 1 plots the fuel consumption standards as a function of vehicle curb mass for the final implementation year 2025 and interim years 2021–2024. In each given year, FEVs are those with a lower fuel consumption level for their vehicle weight, in other words, those with fuel consumption below the annual standard curves. In 2021, each FEV is counted as 0.5 conventional fuel passenger car when calculating a manufacturer's total vehicle production volume upon which the NEV credit percentage targets apply. This multiplier reduces to 0.3 and 0.2 for 2022 and 2023, respectively.

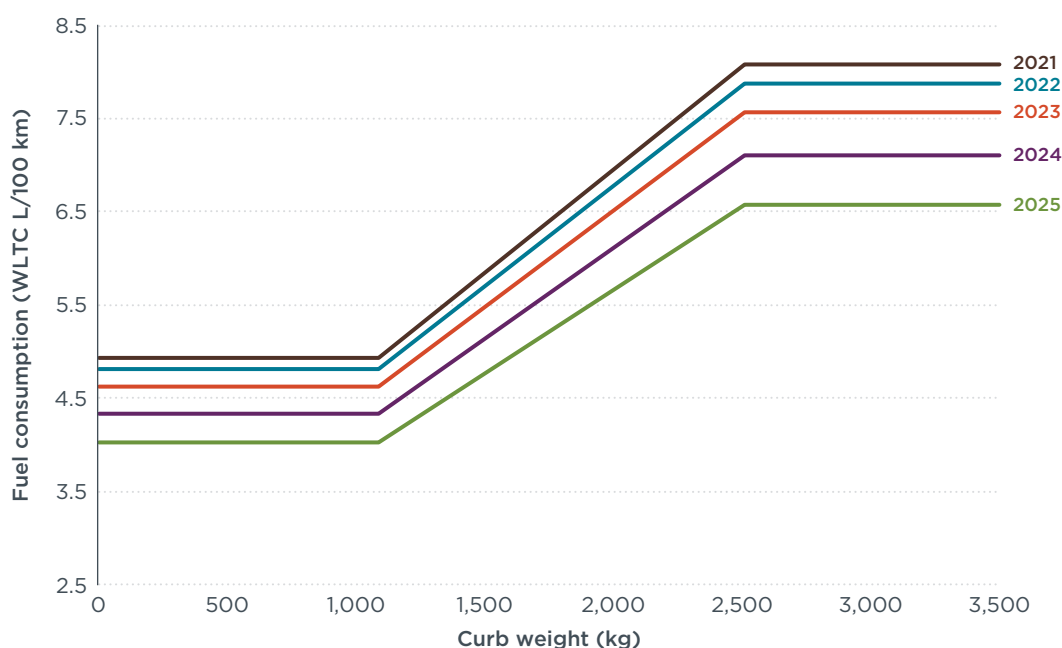


Figure 1. Fuel-efficient vehicles criteria from 2021 to 2025.

Note: This only applies to passenger vehicles with no more than three rows of seats. For others, 0.2L/100 km needs to be added to the standards.

The FEV multipliers offer manufacturers greater flexibility in meeting the NEV credit targets and we use the following examples to illustrate. To simplify our compliance pathway scenarios and only focus on the impact of FEV multipliers, we assume the manufacturer in our example does not purchase NEV credits from other companies or use its own banked NEV credits. We assume the car manufacturer produces 1,000 conventional fuel vehicles annually.

Under the 2017 policy, to meet the 2020 NEV credit target of 12%, the manufacturer would have had to generate $12\% \times 1,000 = 120$ NEV credit points. The manufacturer could have complied by producing 60 NEVs with 2 credit points each (“the NEV compliance option”).

Under the Phase 2 policy, to meet the 2023 NEV credit target of 18%, the manufacturer must generate $18\% \times 1,000 = 180$ NEV credit points. It can accomplish

¹¹ Ministry of Industry and Information Technology (2019). 乘用车燃料消耗量评价方法及指标 [“Fuel Consumption Evaluation Methods and Targets for Passenger Cars”]. <http://www.miit.gov.cn/n1146285/n1146352/n3054355/n3057585/n3057589/c6616416/part/6616424.pdf>

this by producing 90 NEVs with 2 points each, the NEV compliance option, or it may choose to produce 200 FEVs within the 1,000 conventional fuel vehicles. These 200 FEVs are only counted as 40 vehicles (200 x 0.2 the multiplier) in the manufacturer's total vehicle production volume. Consequently, the manufacturer's total conventional fuel vehicle production volume becomes 840 (1,000 - 200 + 40), instead of 1,000. The manufacturer's NEV credit target then becomes 151 (18% x 840) and can be met by producing 76 NEVs with 2 credits each ("the NEV + FEV compliance option").

Compliance strategies for other interim target years are specified in Table 2.

Table 3. Compliance scenarios with and without FEV credits for a hypothetical manufacturer that produces 1,000 conventional fuel vehicles annually.

Year	2017 policy		2020 policy		
	2019	2020	2021	2022	2023
Required NEV credit %	10%	12%	14%	16%	18%
Required NEV credits	100	120	140	160	180
Multiplier for FEVs	—	—	0.5	0.3	0.2
NEV compliance option	Produce 50 NEVs with 2 credits each	Produce 60 NEVs with 2 credits each	Produce 70 NEVs with 2 credits each	Produce 80 NEVs with 2 credits each	Produce 90 NEVs with 2 credits each
NEV + FEV compliance option	n/a	n/a	Produce 200 FEVs and 63 NEVs with 2 credits each	Produce 200 FEVs and 69 NEVs with 2 credits each	Produce 200 FEVs and 76 NEVs with 2 credits each

RELAXED NEV CREDIT CARRY-FORWARD PROVISIONS

The Phase 2 policy allows manufacturers to carry forward excess NEV credits for a longer period of time, but with conditions. Under the 2017 policy, NEV credits generated in 2019 could be carried forward in full for 1 year. The new Phase 2 policy allows credits generated in 2020 to be carried forward for up to 3 years, but at a discounted ratio of 0.5. Credits generated after 2020 can be carried over at a discounted value of 0.5 for up to 3 years only if (1) the average fuel consumption of conventional fuel vehicles of a company is no higher than 123% of the CAFC target; or (2) a company only produces or imports NEVs.

The new announcement made in February 2021 also allowed NEV credits generated in 2021 to be carried back to 2020.

LOWER PER-VEHICLE NEV CREDIT

The 2020 policy reduces the maximum per-vehicle NEV credit and tightens the technical requirements for determining the credit value. A BEV or PHEV can earn up to 5.1 and 1.6 credits per vehicle, respectively, compared with 6 and 2 in the 2017 policy. Similar to the 2017 policy, the base per-vehicle credit for BEVs is a function of electric drive range, and the final per-vehicle credit is adjusted by a few multipliers. There are more multipliers in the 2020 policy than in the 2017 policy, including a separate electric range multiplier, which means that electric range plays a double role in the per-vehicle NEV credit determination. The equations used in the successive policies are below.

$$2020 \text{ per-BEV credit} = \boxed{\text{base credit} \times ER} \times BD \times EC$$

$$2017 \text{ per-BEV credit} = \text{base credit} \times EC$$

ER = electric range multiplier

BD = battery energy density multiplier

EC = electric energy consumption multiplier

Figure 2 shows the compound effect of electric range in per-vehicle credit value for BEVs; this is the portion in the box in the above 2020 per-BEV credit equation. Following that, Table 4 and Figure 3 specify how the BD and EC are determined.

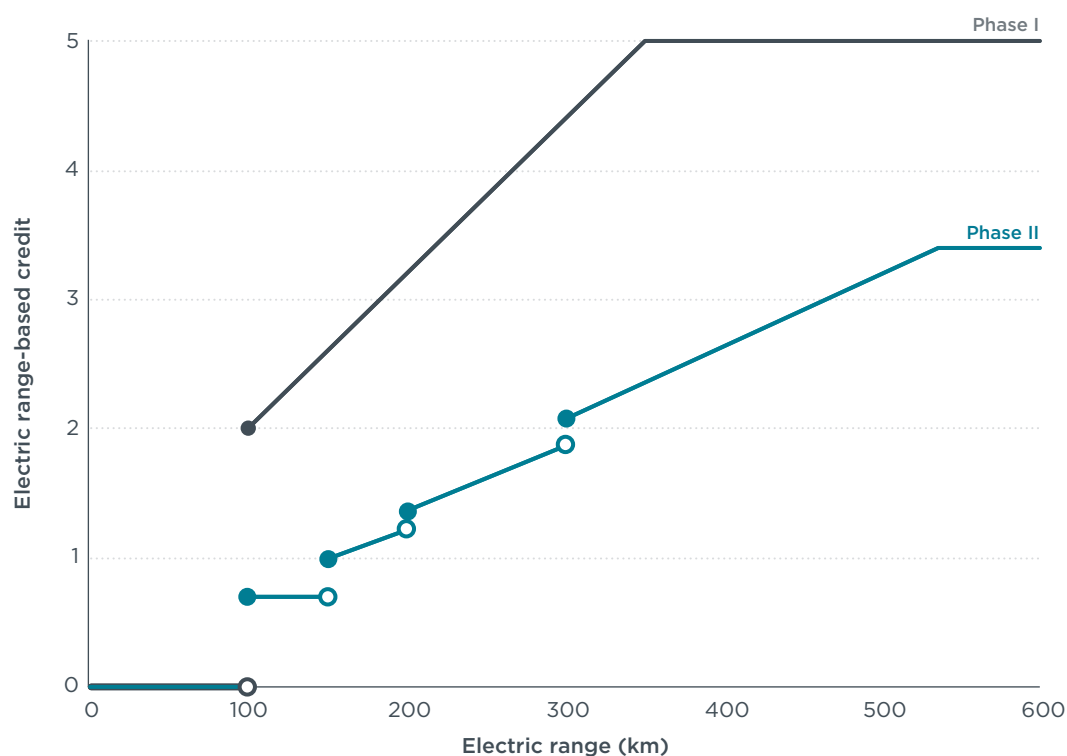


Figure 2. Per-vehicle BEV credit value determined by electric range.

Table 4. BEV battery energy density multiplier

BD (E, Watt-hour (Wh)/kg)	E < 90	90 ≤ E < 105	105 ≤ E < 125	E ≥ 125
Multiplier	0	0.8	0.9	1

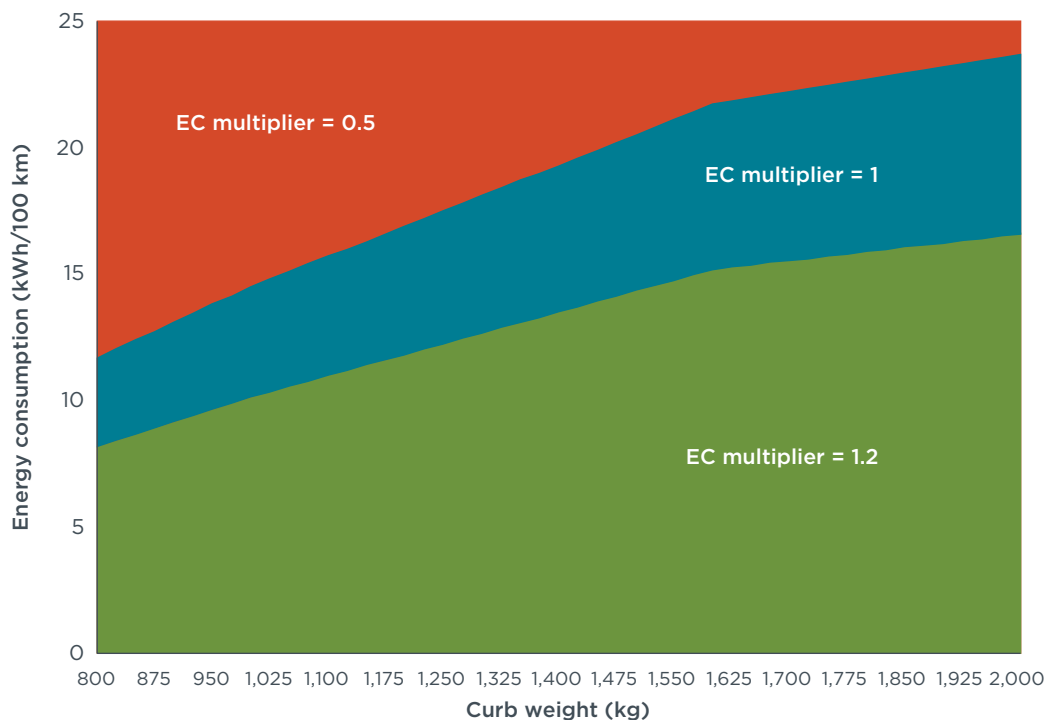


Figure 3a. BEV EC multiplier in the 2017 policy.

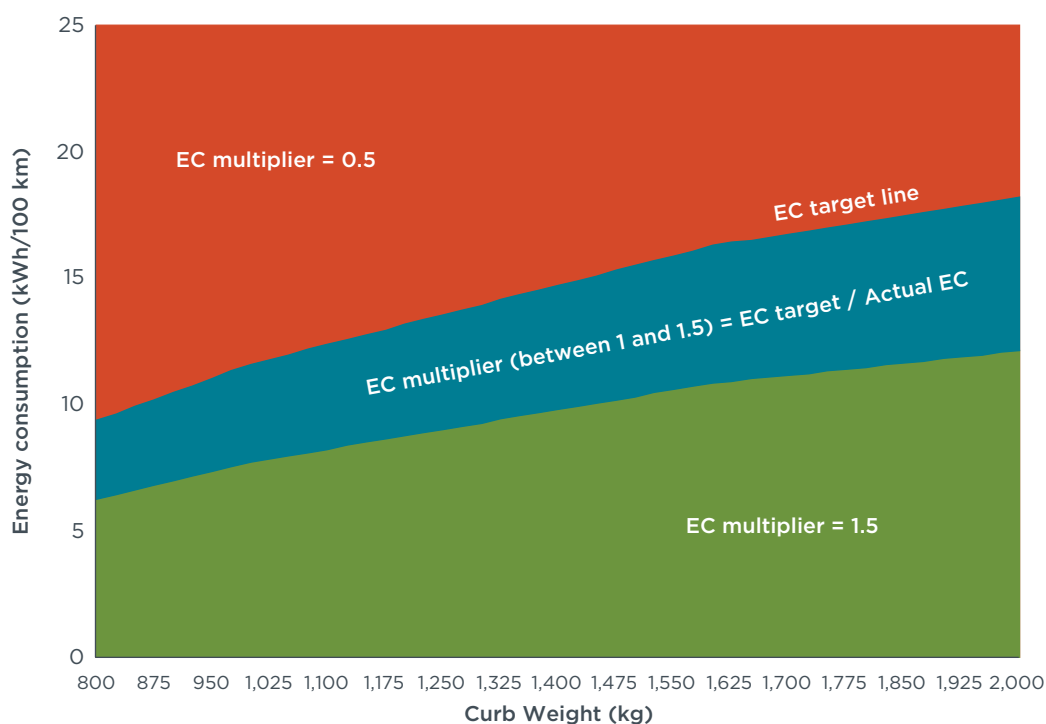


Figure 3b. BEV EC multiplier in the 2020 policy.

In both policies, the PHEV credit is a function of the base credit and an energy consumption multiplier. The base credit decreases from 2 in the 2017 policy to 1.6 in the 2020 policy. In the 2017 policy, the multiplier was determined by either the fuel consumption under the non-electric mode, or electricity consumption under the electric mode, depending on its electric range. In the 2020 policy, the multiplier is determined by both, no matter how long the electric range is.

Under the 2017 policy, if the electric range was less than 80 kilometers (km), a multiplier of 0.5 would be applied for a PHEV with fuel consumption not lower than

70% of the vehicle's fuel consumption limit.¹² If the electric range was no less than 80 km, the multiplier applied when the vehicle's energy consumption fell in the red area in Figure 3a. Under the 2020 policy, the PHEV credit will be cut in half if the vehicle does not meet both of the following criteria: (1) fuel consumption under non-electric mode is lower than 70% of the vehicle's fuel consumption limit;¹³ and (2) electricity consumption under electric mode is lower than 135% of the EC target in Figure 3b.

The technical characteristics relevant to NEV credits for a BEV model and a PHEV model are shown in Table 5, and the NEV credits they receive are shown in Table 6.

Table 5. Technical specification of two example vehicle models^a

Model	2019 BYD Song MAX	2019 BYD Tang
Type	BEV	PHEV
Electric range (km)	401	100
Battery energy density (Wh/kg)	160	n/a
Curb weight (kg)	1830	2390
Electric energy consumption (kilowatt hour [kWh]/100 km)	15.1	20.5
Fuel consumption under Condition B ^b (L/100 km)	n/a	7.6

[a] Ministry of Industry and Information Technology (2020). 新能源汽车推广应用推荐车型目录 (2020年第6批) ["List of Recommended New Energy Vehicle Models (Vol. 6, 2020)"]. <http://www.miit.gov.cn/n1146295/n1652858/n1652930/n4509607/c7917069/part/7917094.pdf>.

[b] Condition B refers to the status when the battery is depleted and reaches the minimum state of charge.

Table 6. NEV credits for the two example models

Type	2017 policy		2020 policy	
	BEV (BYD Song Max)	PHEV (BYD Tang)	BEV (BYD Song Max)	PHEV (BYD Tang)
Base credit	5	2	2.65	1.6
Energy consumption multiplier	1.2	1	1.15	1
Range multiplier	n/a	n/a	1	n/a
Battery energy density multiplier	n/a	n/a	1	n/a
Final per-vehicle NEV credit	6	2	3.05	1.6

FCVs also receive NEV credits, and the FCV credit is determined by the base credit and a multiplier. The base credit was calculated as $0.16 \times$ rated power of the fuel cell system (capped at 5) in the 2017 policy and adjusted to $0.08 \times$ rated power of the fuel cell system (capped at 6) under the 2020 policy. The FCV multiplier is not changed in the Phase 2 policy. Under both policies, the credit will be halved via an additional 0.5 multiplier if the FCV does not meet all of three criteria: (1) The range is no less than 300 km; (2) the fuel cell system's rated power is not lower than 10 kW; and (3) the fuel cell rated power is no less than 30% of the rated power of the driving motor.

12 Ministry of Industry and Information Technology (2019). 乘用车燃料消耗量限值 ["Fuel Consumption Limits for Passenger Cars"]. <https://www.miit.gov.cn/n1146285/n1146352/n3054355/n3057585/n3057589/c6616416/part/6616422.pdf>.

13 Ibid.

EXPANDED DEFINITION OF AFFILIATED COMPANIES

In both the 2017 and 2020 policies, CAFC credits can be transferred among “affiliated companies” as an additional compliance flexibility. The 2020 policy expands the type of companies that can be categorized as affiliated companies. The first and third pathways illustrated in Figure 4, which are a and c, remain unchanged from the 2017 policy. The second pathway, Figure 4b, is newly added in the 2020 policy and defines two domestic OEMs with the same foreign shareholder as affiliated companies. Pathway four, in Figure 4d, allows a foreign OEM’s domestic shareholder and its authorized agent to transfer CAFC credits to each other starting in 2021. Examples of these relationships for the four pathways are included in Figure 4 in parentheses.

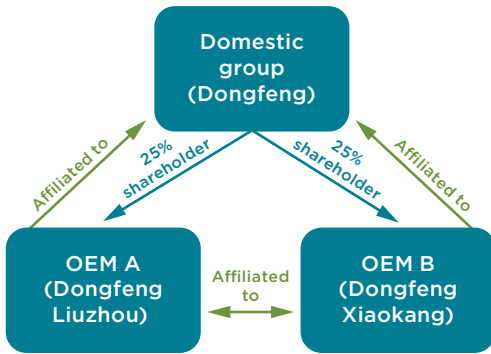


Figure 4a. Pathway one

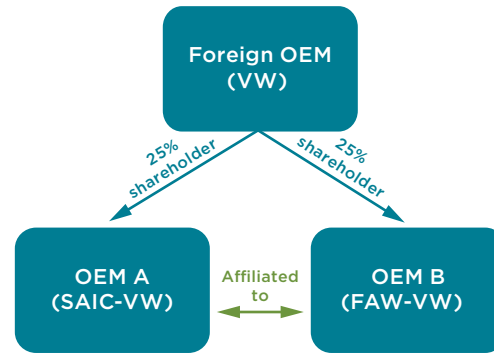


Figure 4b. Pathway two, new in 2020

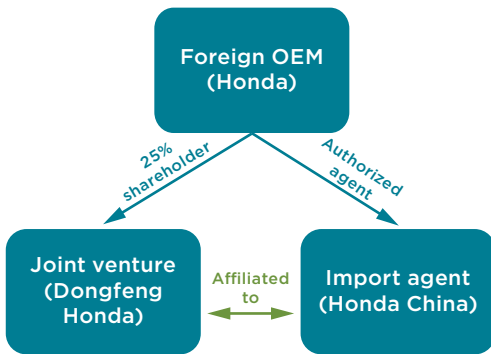


Figure 4c. Pathway three

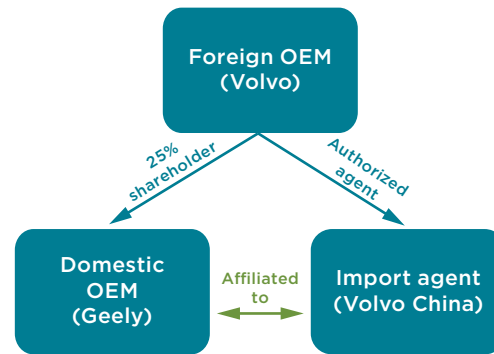


Figure 4d. Pathway four, new in 2020

OTHER REVISIONS

In the 2020 policy, methanol/ether fuel vehicles are included as conventional fuel vehicles. In addition, while both policies give CAFC credit compliance flexibility to domestic manufacturers and import agents with yearly production or import volume not more than 2,000, the 2020 policy adds new rules for benefits given to these small manufacturers from 2021 to 2023.