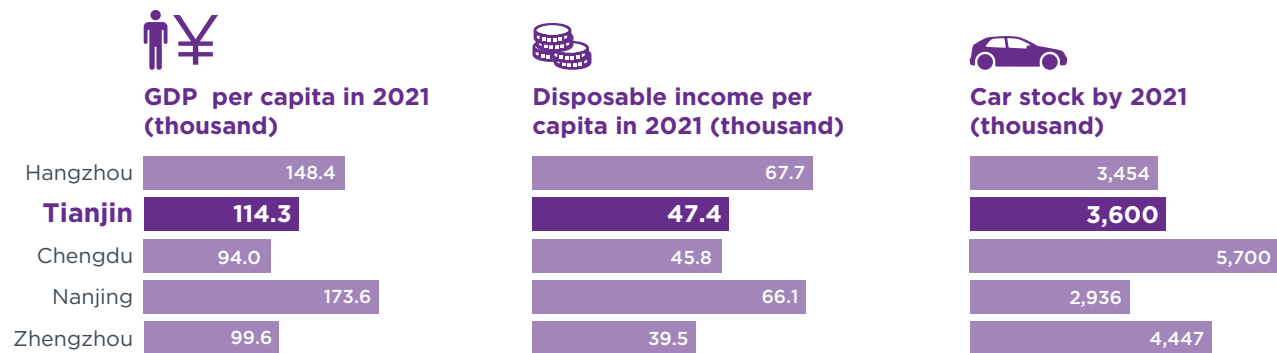
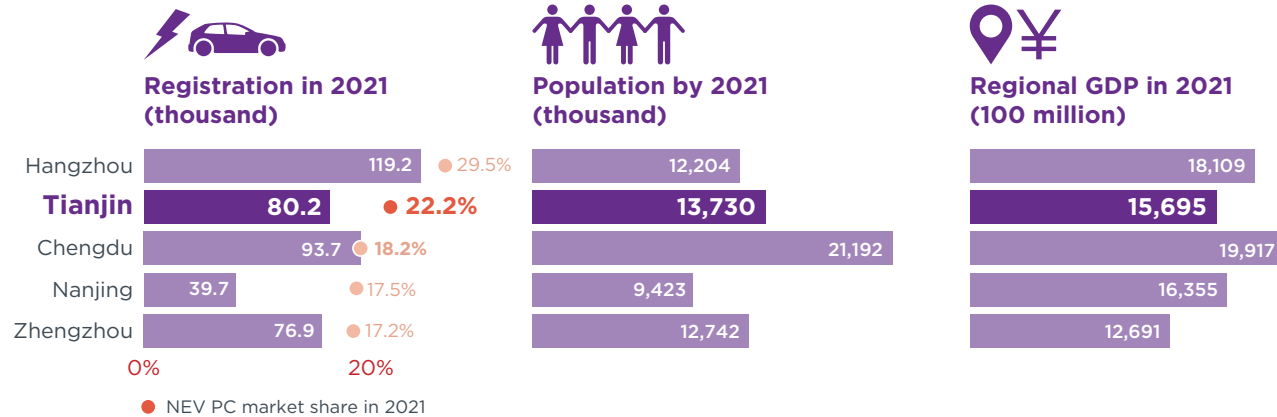


EV CITY PROFILE

PASSENGER CAR MARKET, TIANJIN

YIDAN CHU



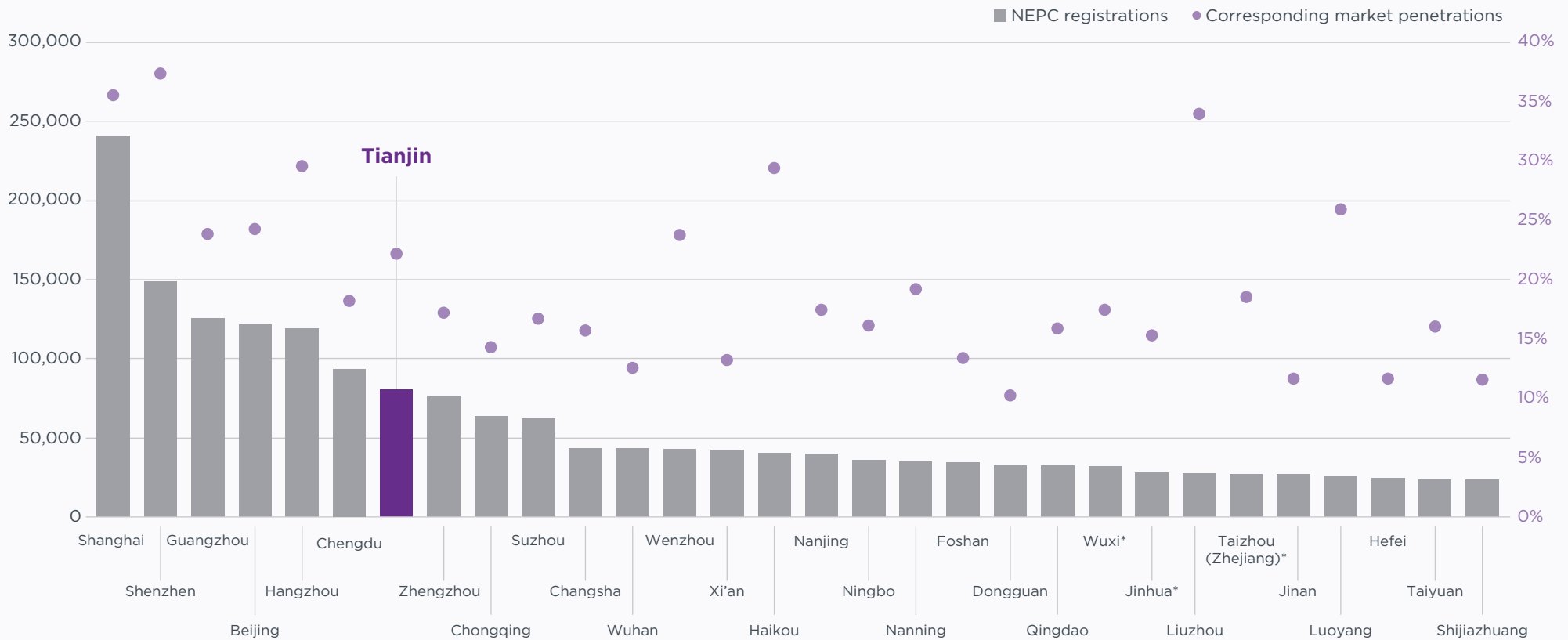
KEY FACTS ABOUT THE CITY

Tianjin, a municipality bordering Beijing, is a New Tier 1 city with a population of 13.7 million people. One of 15 New Tier 1 cities, Tianjin has 3.6 million cars, compared with 6.1 million cars in Beijing. The city's disposable income per capita in 2021 was CNY 47,000, 35% higher than the national average.

MARKET PERFORMANCE

- » In 2021, Tianjin sold more than 80,000 new energy passenger cars (NEPCs), putting it in seventh place among all Chinese cities for NEPC registrations.
- » Among all New Tier 1 cities, Tianjin ranked second in terms of NEPC market penetration; 22% of all new car registrations were NEPCs in 2021.

FIGURE 1
Market performance in top 30 cities for new NEPC registrations, 2021

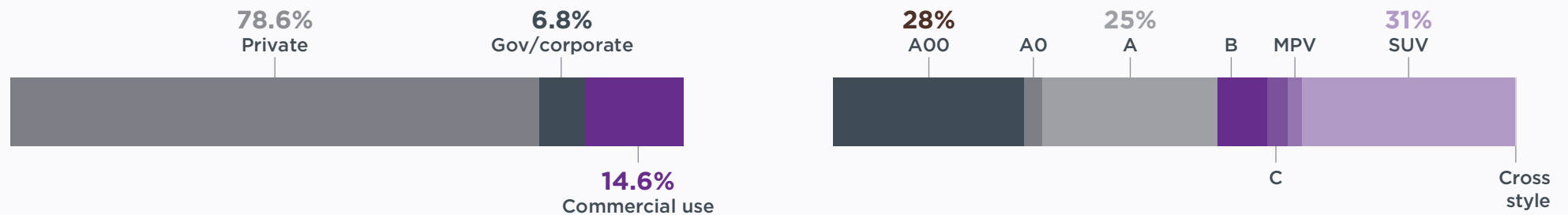


*Denotes cities that were new members of the top 30 list in 2021.

MARKET SNAPSHOT

- » In 2021, the majority (78.6%) of NEPCs registered in Tianjin were for private use.
- » SUVs, minicars, and compact cars were the most popular car segments in Tianjin, with a market penetration of 31%, 28%, and 25%, respectively, of all NEPC registrations.
- » In 2021, the most popular BEV model in Tianjin was the ORA Black Cat, a minicar. The average BEV battery capacity was 47 kWh, equal to the national average.

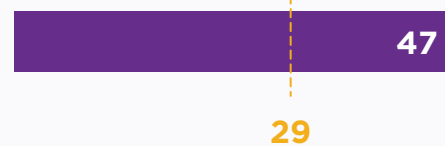
FIGURE 2
New energy passenger car market snapshot for Tianjin, 2021.



2021 BEV sales-weighted E-range (km)



2021 BEV sales-weighted battery capacity (kWh)



2021 Most popular BEV model and its market share in local BEV market



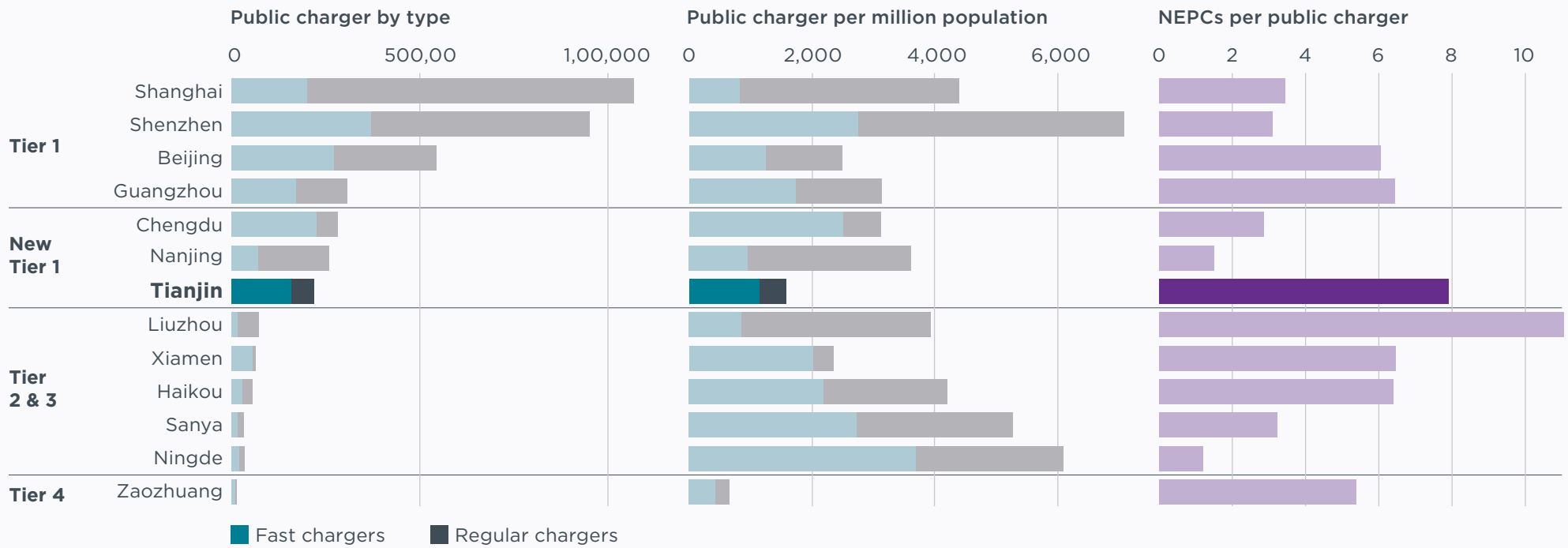
Note: Yellow indicate the corresponding lowest and highest values of all the top 30 cities for new NEPC registrations.

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CHARGING INFRASTRUCTURE

By 2020, Tianjin had a stock of 22,000 public chargers, with 73% being fast chargers. This was 7.88 NEPCs per public charger, and 1,587 public chargers per 1 million people.

FIGURE 3
Charging infrastructure status in selected leading cities, 2020.



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POLICIES AND DRIVING FACTORS

Tianjin deployed a variety of policies to incentivize the NEPC market in 2020.

Other driving factors include:

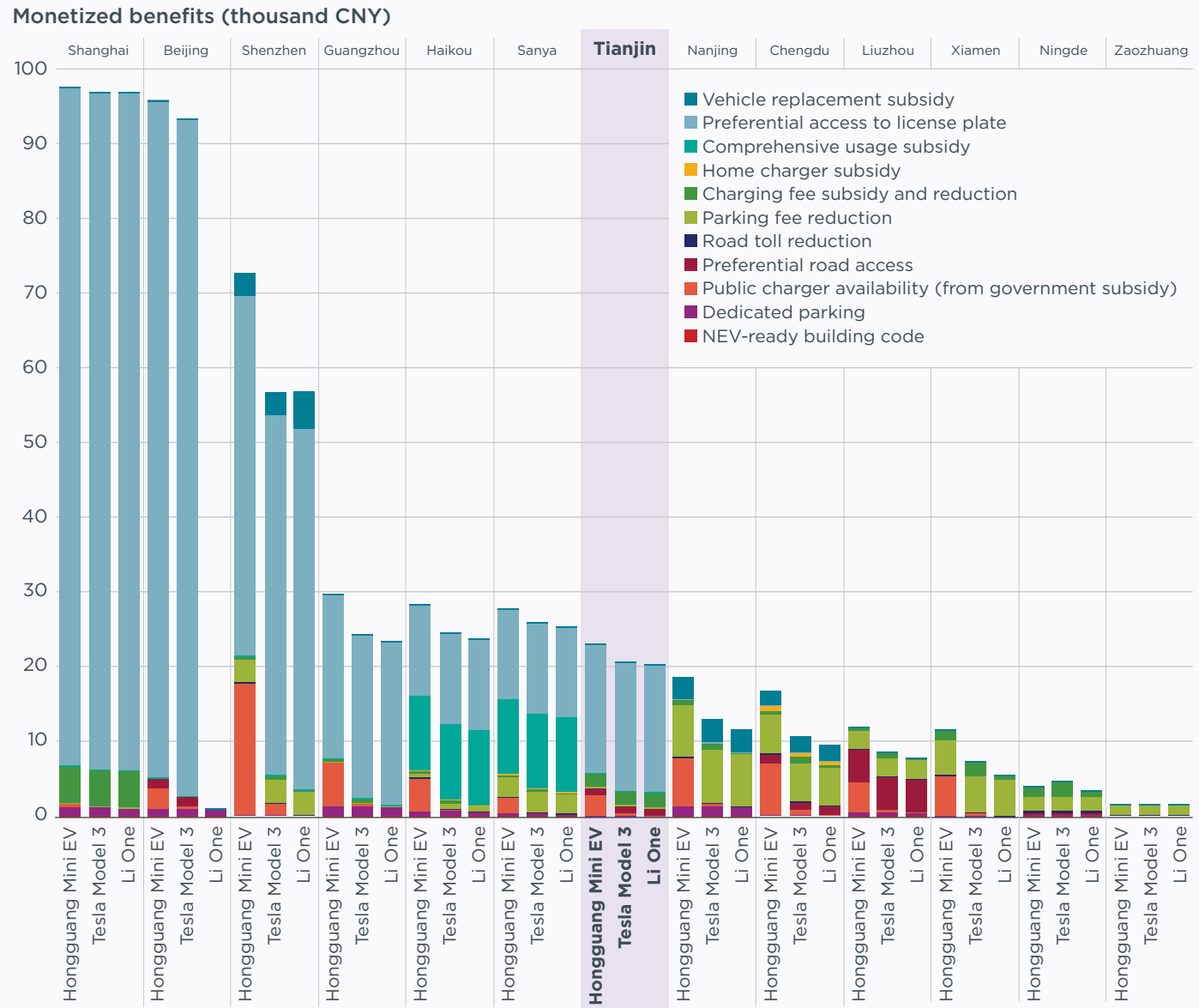
- » Tianjin is a pilot city of the national “Ten Cities, Thousand Vehicles” program and one of the first test bed city partners for new energy vehicle technologies in the Tenth Five-Year Plan’s 863 Program for high-tech innovation.
- » Tianjin has production facilities for automaker FAW-Volkswagen and for Lishen Battery, a company with an annual lithium-ion battery production capacity of 15 GWh.

City planning	NEV development target	Goal for annual sales of NEVs to reach 20,000 per year from 2018 to 2020; the number of NEVs to grow to 4.5% of all vehicles in 2020
	Charging infrastructure planning	Total number of public chargers reached 20,000 by 2020
Consumer incentives at the time of vehicle-purchase	License plate privilege	No restrictions on license plates for NEPCs. Buyers of cars with internal combustion engines must enter an auction or lottery to receive a license plate; the total quota for internal combustion engine cars in 2020 was 135,000
Consumer incentives during vehicle use	Charging fee subsidy or reduction	A charging-fee subsidy of CNY 2,000 per vehicle, limited to 30,000 vehicles
	Public charger subsidy	Construction subsidy covers 80% of the cost for chargers in residential areas and 40% of the cost for other public chargers
	Road-access privilege	NEPCs were exempted from rush hour and heavy-pollution-day traffic restrictions
	Charging in existing neighborhoods	Selected old residential neighborhoods as pilots for charger installation
	NEV-ready building code	Required buildings in all new residential areas to be NEV-ready; 10% of spaces in new public parking lots must be NEV-ready

MONETIZED CONSUMER BENEFITS

- » The overall benefits of Tianjin’s policy suite for NEPC owners were in the magnitude of CNY 21,000 in 2020.
- » License plate privilege was the incentive most valued by consumers in Tianjin. On average, an EV owner saves CNY 17,100 from this policy.
- » The value of increased-range confidence from government-subsidized public chargers is estimated at over CNY 2,600 for shorter-range minicars such as Model 1—the Wuling Hongguang Mini EV.

FIGURE 4
Monetized private consumer benefits from city incentives for the three selected models in 2020.



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DEFINITIONS, ASSUMPTIONS, AND METHODOLOGIES

- » New energy vehicle (NEV) refers to battery-electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and fuel-cell electric vehicles (FCEVs).
- » Passenger cars: ≤ 9 seats and maximum designed gross vehicle weight ≤ 3,500 kg.
- » The top 5 cities in the New Tier 1 class were ranked based on the new NEPC market penetration in 2021.
- » The top 30 cities in Figure 1 were ranked based on new NEPC registrations in 2021.
- » Data in Figure 2 was based on new NEPC registrations in 2021.
- » Data in Figure 3 was based on the NEV Annual Statistics Yearbook (charger), China Statistics Yearbook (population), and 2012–2020 cumulative registrations of NEPCs.
- » Quantitative analysis of monetized consumer benefits
 - Assumptions: average vehicle retainment: 4 years; vehicle discount rate: 4.35%.
 - Main specifications of selected models:

Specification	Model 1: Wuling Hongguang Mini EV	Model 2: Tesla Model 3	Model 3: Li-One
Technology	BEV	BEV	PHEV
Battery capacity (kWh)	9.3	52.9	38.5
Electric range (km)	120	445	148
Energy consumption (kWh/100 km)	8.8	12.4	16.9

- Monetized consumer benefits were calculated from direct fiscal incentives and indirect incentives. Direct fiscal incentives usually have clear values, either in the form of subsidies or fee reductions, and were added up directly; for indirect incentives, benefits were estimated via multiple methods (see the following sections).

- Indirect incentive estimation methods:

Preferential access to license plate: In 2020, some cities continued to impose an upper limit on new passenger car registrations by restricting vehicle license plates of internal combustion engine (ICE) cars but offering NEPCs preferential access. There were three mechanisms to get a license plate in those cities—auction, lottery, and the two forms combined. For cities with an auction mechanism, we regard the annual average auction price of the license plate for an ICE counterpart as the consumer benefit. For cities that adopted a lottery mechanism only, we refer to the annual average auction price of another city of the same city class and adjust the values with the lottery winning probability.

Preferential road access: Many cities exempted NEVs from traffic restrictions during weekday rush hours or heavy pollution days. Those consumers who enjoyed preferential road access would not need to pay to take a taxi or a bus to travel on traffic restriction days. These saved travel expenditures are counted as monetized consumer benefits of this policy.

Public charger availability: A sufficient public charging network will benefit consumers by saving on alternative car rentals for trips that exceed electric mileage per charge. This monetized consumer benefit was calculated from the saving of rental car expenditures by referring to the annual travel distribution pattern from the Oak Ridge National Laboratory research.

Dedicated parking: The consumer benefit of this policy was estimated via the consumer’s willingness to pay (WTP) to avoid looking for a parking lot. WTP was based on cooperative research from the University of Pennsylvania and Cornell University.

NEV-ready building code: The relevant estimation was based on hours saved multiplied by the average national hourly wage. Only residential parking benefits were quantified here. The estimate assumes that it takes six hours to install a charger in a residential spot where there is no NEV charger infrastructure. If the spot is NEV-ready, the installation work will take two hours less. We adjust this consumer benefit for cities that have detailed requirements for the percentage of buildings that must have chargers installed in residential areas.

For more details regarding methodology and more information, please refer to our published report.¹

¹ Lingzhi Jin et al., “Assessment of Policies for Private Passenger Cars in Leading City Markets,” (ICCT: Washington, D.C., 2023), <https://theicct.org/publication/pv-chinese-cities-nev-policies-feb23/>.



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www.theicct.org

communications@theicct.org

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