Exploring the role of city-level policies in enabling local EV uptake

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Agenda

01	**Cities leading EV transition**
02	**Shanghai case study**
03	**Canberra case study**

Cities leading EV transition

United Nations Climate Change

Race To Zero Campaign.

1,136 cities

C40 KNOWLEDGE

Electric vehicles are zero emission, but they still contribute to air pollution and congestion

EVs have great potential as a way for cities to reduce local air pollution, greenhouse gas emissions and transport sector fossil fuel use. Coupled with renewable energy, EVs can produce zero emissions at the vehicle tailpipe and much lower life-cycle emissions.

However, they still contribute to congestion and air pollution, due to particles released from tyres and while braking. Therefore, a shift to EV should be positioned within a wider plan for most city journeys to be made by public transport, bike or on foot.

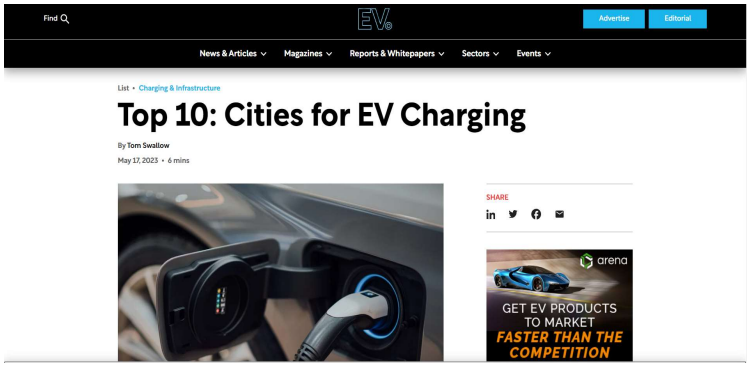
Carbon Neutral Cities Alliance Members

The Carbon Neutral Cities Alliance (CNCA) is a collaboration of leading global cities working to achieve carbon neutrality in the next 10-20 years – the most aggressive GHG reduction targets undertaken anywhere by any city.

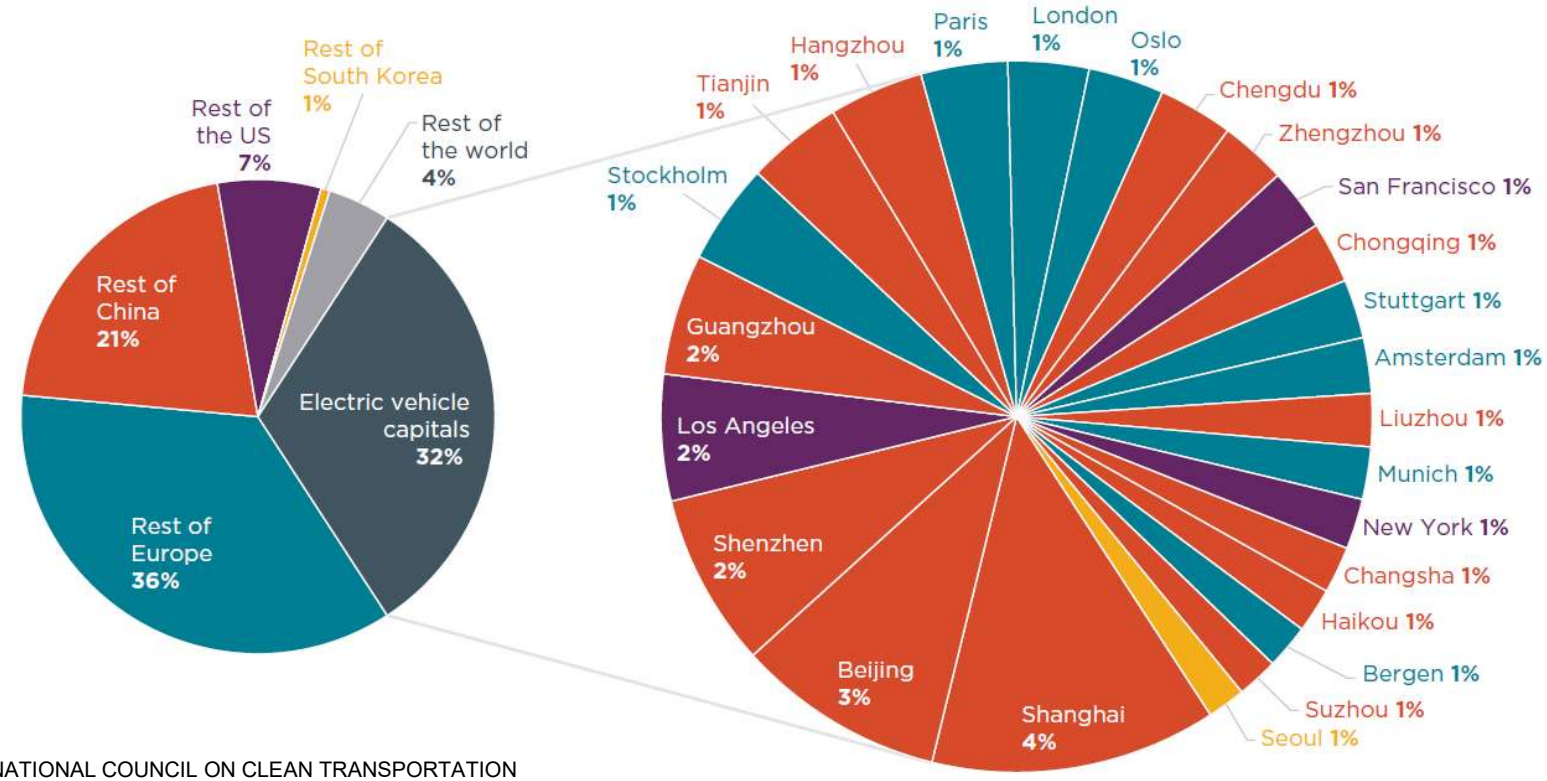
Adelaide

Amsterdam

Boulder



25 EV Capital cities



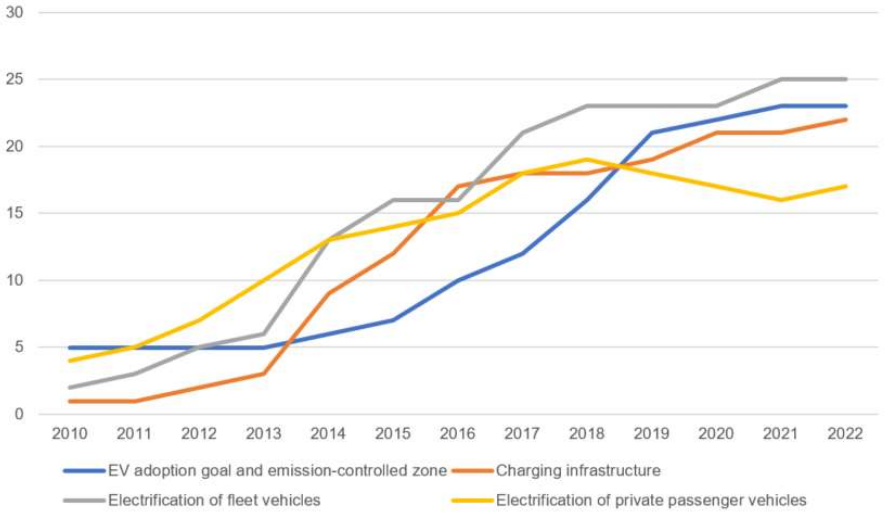
2021 INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Urban EV policies - Summarized from EV capital cities

Table 1. Classification of policy categories and policy instruments under each category

EV adoption goals and emission-controlled zone	100% EV sales goal 100% EV stock goal Zero emission zone Low emission zone
Charging infrastructure	Incentives for public charging infrastructure (Construction) Incentives for public charging infrastructure (Operation) Incentives for private charging infrastructure (Construction) Incentives for private charging infrastructure (Operation) EV-ready building code
Electrification of fleet vehicles	Government vehicle electrification Taxi electrification Company car electrification Bus electrification Utility vehicle electrification Logistics vehicle electrification
Electrification of private passenger vehicles	Purchase rebate in tax credit Purchase rebate for converting ICEV to EV Purchase rebate for second-hand EV Purchase rebate Purchase rebate for low-income License lottery or auction favouring EV owners Preferential parking access EV-exclusive road access privileges Discounts on tolls, bridges, or ferries

Urban EV policies- 25 EV capital cities



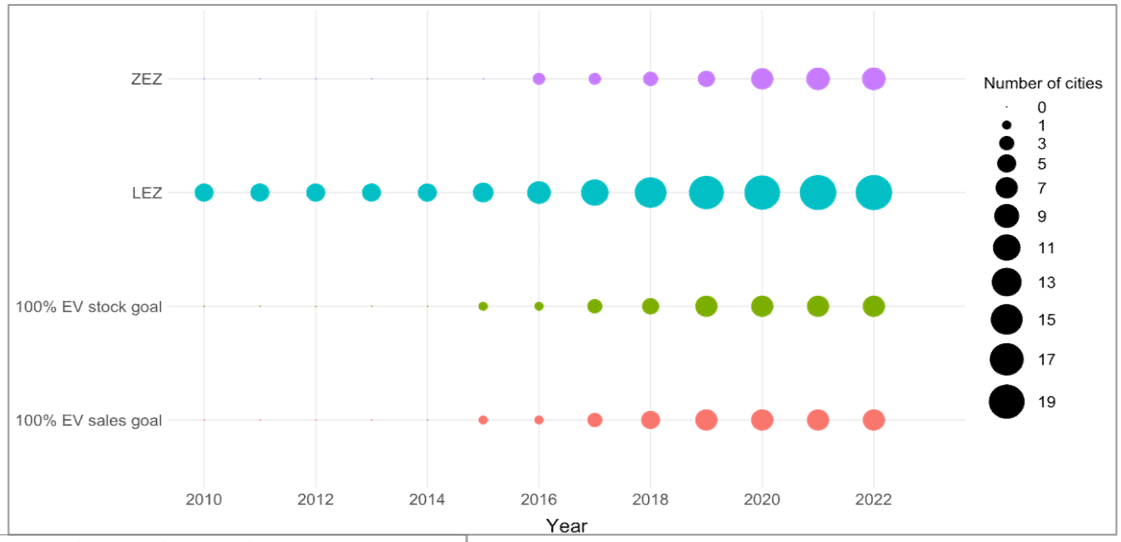
Trend in EV policy implementation in 25 cities (2010-2022). The Y-axis denotes the count of cities implementing at least one policy within the respective category for each year.

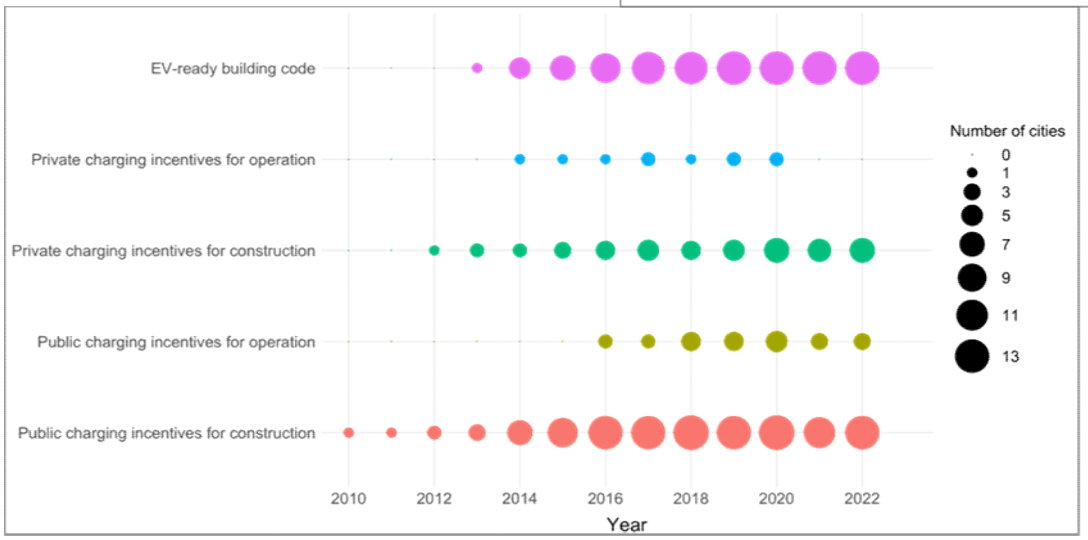
Linear Mixed-Effects Regression Analysis

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	0.104	0.010	4.151	9.902	0.000
z1goal	0.027	0.011	29.315	2.411	0.022
z1charging	0.034	0.015	20.644	2.232	0.037
z1fleet	-0.015	0.016	40.616	-0.930	0.358
z1private	0.042	0.015	15.857	2.791	0.013
z1income	-0.002	0.022	9.790	-0.082	0.936
z1area	0.011	0.016	4.975	0.695	0.518
z1population	-0.033	0.021	7.191	-1.583	0.156

Three types of policies positively correlate to the EV sales rate: **EV adoption goal and emission-controlled zone, charging infrastructure, electrification of private passenger vehicles**

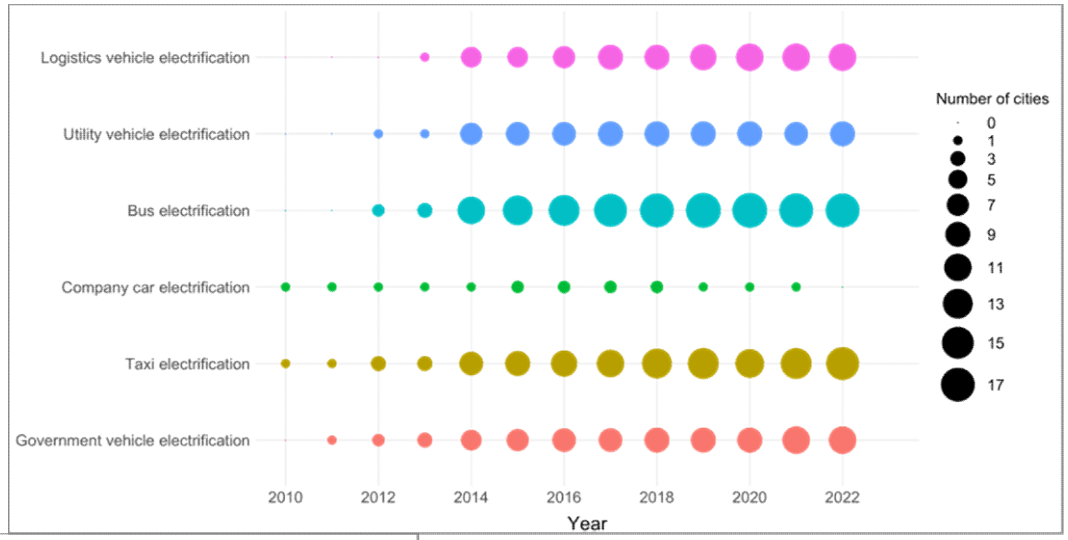
Trend of policies on EV adoption goal and emission-controlled zone. The size of the dots indicates the number of cities having policies in corresponding category

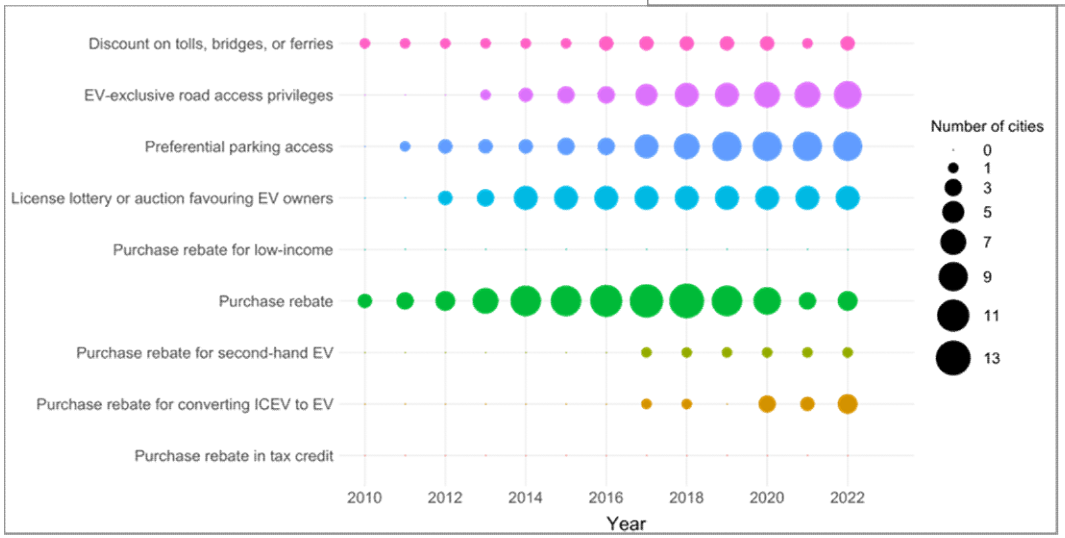




Trend of policies on charging infrastructure. The size of the dots indicates the number of cities having policies in corresponding category

Trend of policies on electrification of fleet vehicles. The size of the dots indicates the number of cities having policies in corresponding category.





Trend of policies on electrification of private passenger vehicles. The size of the dots indicates the number of cities implementing at least one policy within the category.

Case study-Shanghai: Policy efficacy of local incentives

- Urban EV strategies played a critical role in Shanghai's early adoption success
- Locally-tailored measures such as free license plates significantly encouraged EV purchases
- Users' feedback on policy implementation reveals challenges for next-step scale adoption, especially regarding unsupportive installation environment for private chargers and inadequate services

Case study-Shanghai: Public charging infrastructure accessibility

Rated features of accessibility of public charging infrastructure

Category	Attribute	Importance
Use Convenience	Location	23%
	Charging Speed	21%
	Average Queuing Time	14%
		58%
Charging Cost	Charging Electricity Fee	11%
	Charging Service Fee	10%
		21%
Service	Charger Failure Rate	8%
	Number of Chargers	8%
	Battery Swapping Service	3%
		19%
Environmental Benefit	Energy Source	1%

Equity in accessibility?

People with higher income and education find it easier to locate public chargers at their workplace and in their neighbourhood.

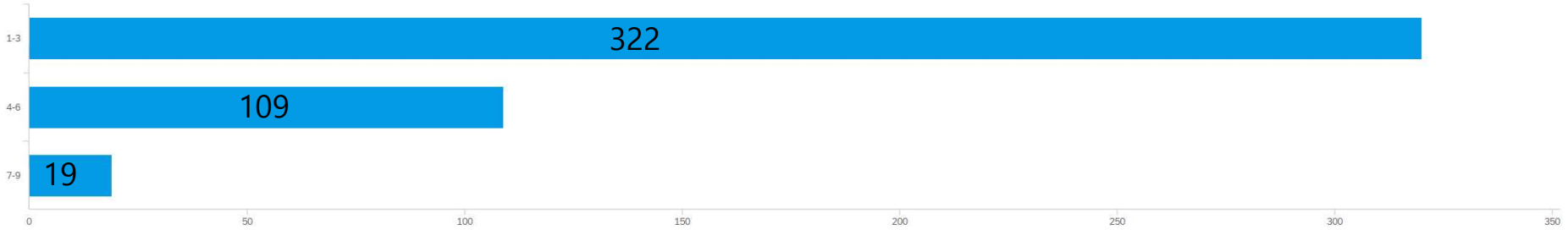
They also find it easier to install home chargers due to better housing conditions.

They care less about charger location and more about queuing time.

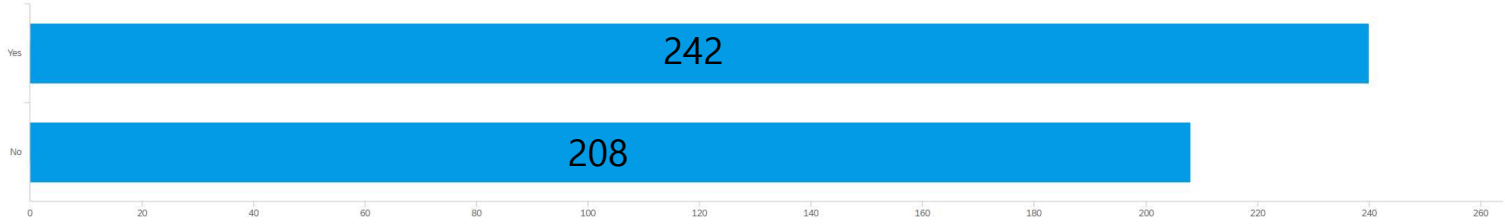
Case study-Canberra (ongoing research)

Current sample size: 450

How many EV-related facts have you ticked?

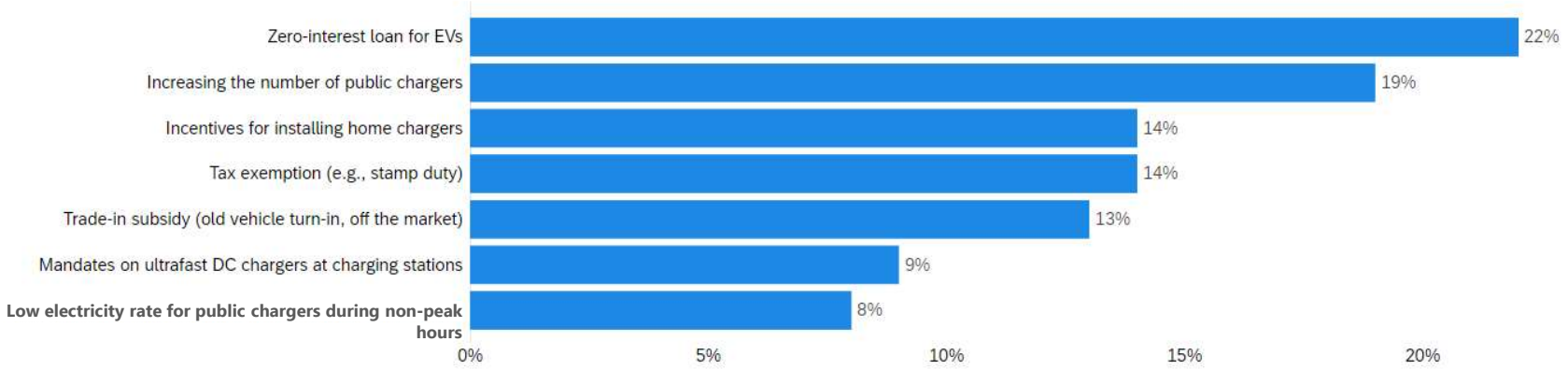


Do you plan to purchase an EV within five years?



Case study-Canberra (ongoing research)

The relative importance of policy measures rated by the ACT residents



Thank you!