WORLD RESOURCES INSTITUTE

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BARRERAS Y CATALIZADORES DE LA ADOPCIÓN DE BUSES ELÉCTRICOS

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BARRERAS

Electric Bus and Hybrid Electric Bus Adoption Worldwide

Sources: WRI, 2016 in Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Locations of 16 case studies

Region	Country	City
Africa	Ethiopia	1. Addis Adaba
	South Africa	2. Cape Town
Asia	China	3. Shenzen 4. Xhenggzhou
	India	5. Ahmedabad 6. Bangalore 7. Manali
Europe	Spain	8. Madrid
	Turkey	9. Izmir
North America	Mexico	10. Mexico City
	United States	11. Philadelphia
South America	Brazil	12. Belo Horizonte 13. Campinas
	Chile	14. Santiago
	Colombia	15. Bogota
	Ecuador	16. Quito

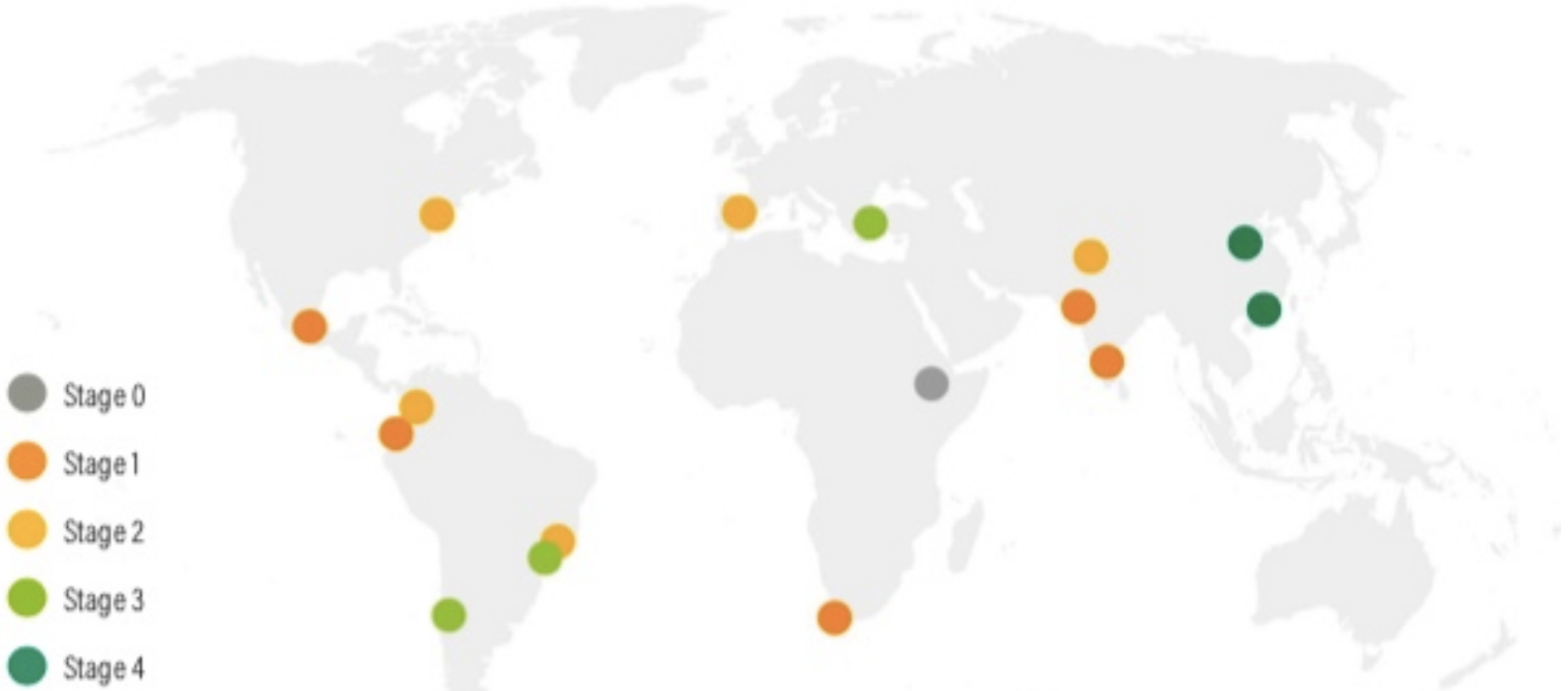
Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Development stages

STAGE	Definition	Case Study Cities
0	No substantial planning	Addis Ababa (Ethiopia).
1	Talks and plans, but no pilot tests	Ahmedabad, Bangalore (India), Cape Town (South Africa), Mexico City (Mexico), Quito (Ecuador).
2	The city is running an initial pilot program	Belo Horizonte (Brazil), Bogota (Colombia), Madrid (Spain), Manali (India), Philadelphia (United States).
3	The city has gone past an initial pilot program	Campinas (Brazil), Izmir (Turkey), Santiago (Chile).
4	Mass adoption	Shenzhen (China), Zhengzhou (China).

Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Case studies by stage



Sources: WRI, 2016 in Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Barriers Matrix to adopting Electric Buses

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E–BUS TRADESPACE ELEMENTS	GENERAL BARRIERS: Technological	Financial	Institutional
Vehicles and Batteries	• Lack of information on the advantages and disadvantages of e-buses. • Range and power limitations of e-buses. • Design flaws in e-buses. • Disjointed or limited e-bus marketplace.	• High up-front capital costs of e-buses. • Lack of financing options.	• Difficulties for manufacturers in engaging with cities . • Lack of a plan to remove current bus stock.
Agencies and Operators	• Lack of information on how to start. • Lack of operational data.	• Rigid financial management and business models. • Scaling investment past initial pilot programs.	• No enabling policies supporting adoption of e-buses. • Negative public perception. • Coordinating maintenance duties. • Weak governmental coordination. • Informal transit.
Grid and Charging Infrastructure	• Lack of understanding of the requirements to upgrade infrastructure. • Limitations of the charging ports and stations. • Grid instability. • Lack of standards and regulations on charging infrastructure.	• Large capital expenses for grid infrastructure. • Difficult to determine grid infrastructure responsibilities.	• Lack of space and land to install infrastructure. • Limited planning for long-term implications.

Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Actions toward electric bus adoption taken by the 16 case study cities

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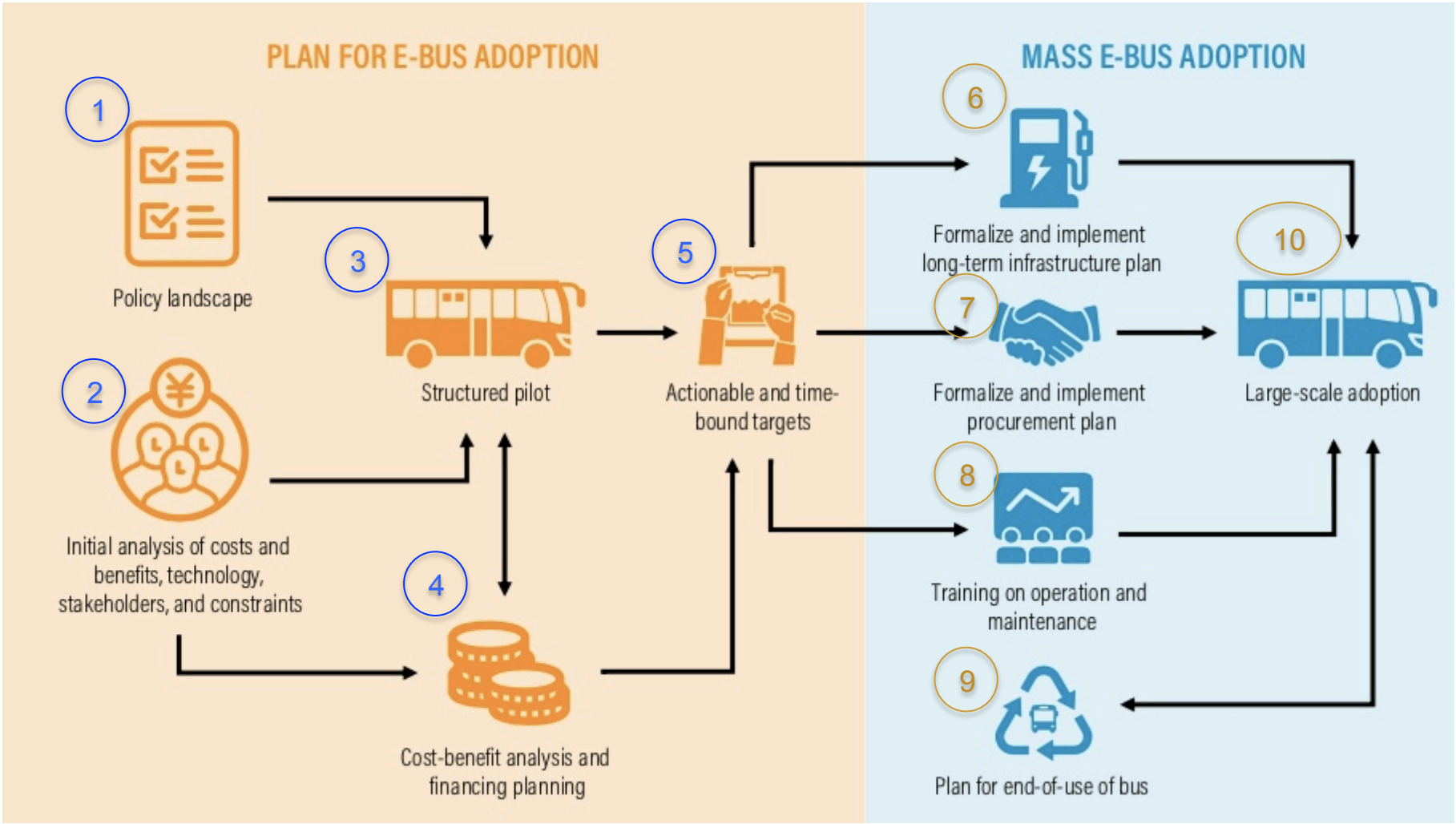
STAGE	CITY	POLICY/TARGET			IMPLEMENTATION			
		Informal discussions	Formal discussions	Policy enacted	Preliminary test	Structured Pilot	Multi-route operations (plan)	Mass route operations (network)
0	Addis Ababa, Ethiopia							
1	Ahmedabad, India							
1	Quito, Ecuador[a]							
1	Mexico City, Mexico[b]							
1	Cape Town, South Africa[c]							
1	Bangalore, India[d]							
2	Belo Horizonte, Brazil[e]							
2	Bogotá, Colombia							
2	Madrid, Spain							
2	Philadelphia, United States							
2	Manali, India[f]							
3	Izmir, Turkey							
3	Campinas, Brazil							
3	Santiago, Chile[g]							
4	Zhengzhou, China							
4	Shenzhen, China							

Notes: GREEN: implemented; YELLOW: ambiguous; RED: not implemented.

Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

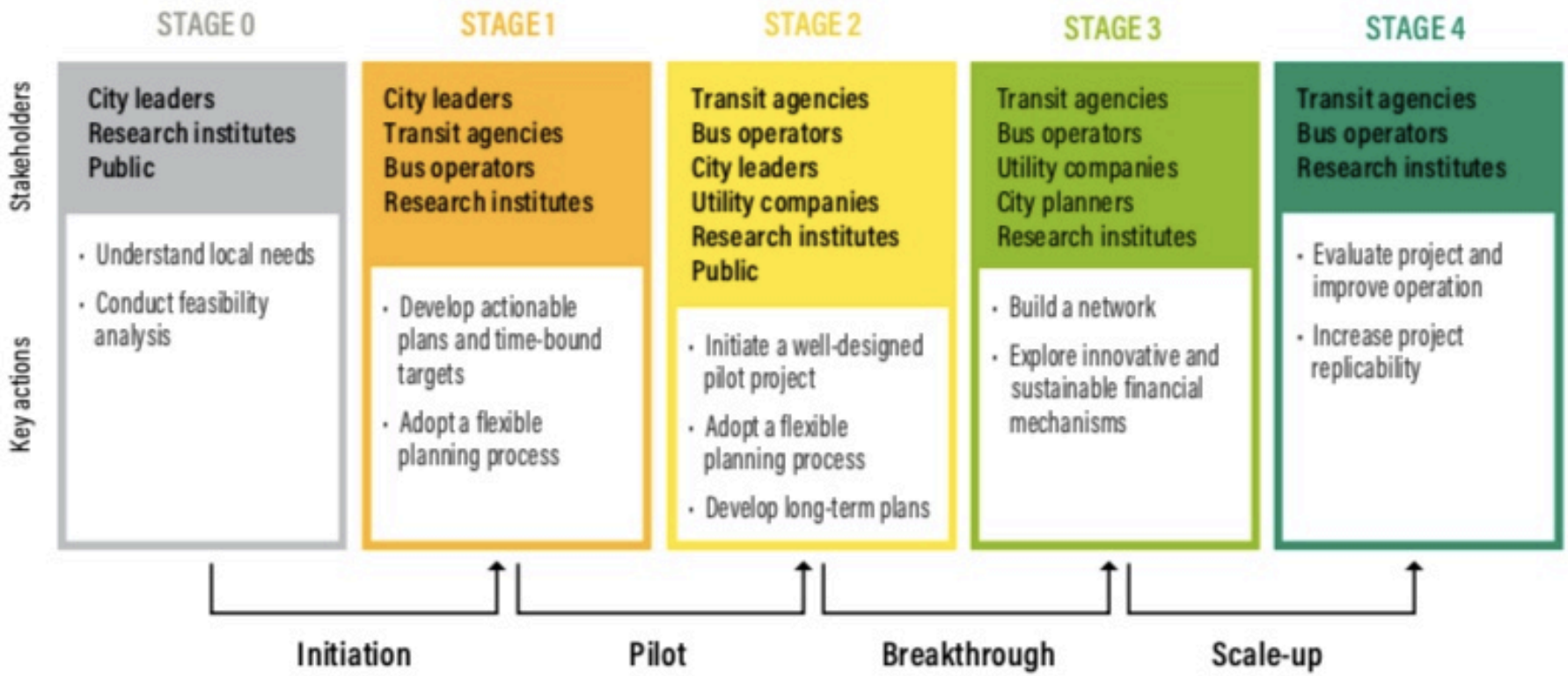
CATALIZADORES

Enabling Factors and Actions in the Planning and Scaled-Up Lifecycle of E-Bus Adoption



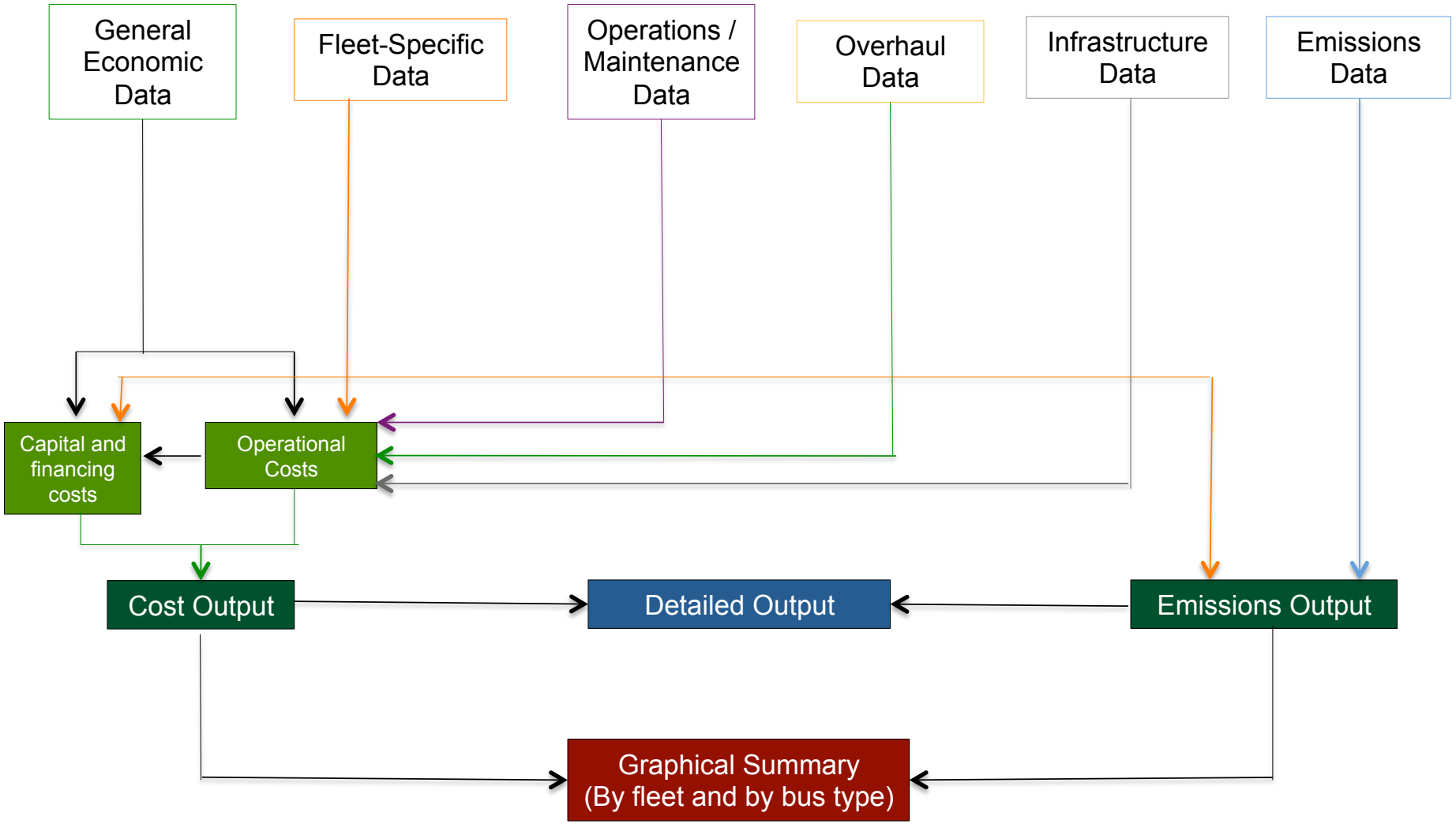
Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Key Actions for City Stakeholders at Different Development Stages



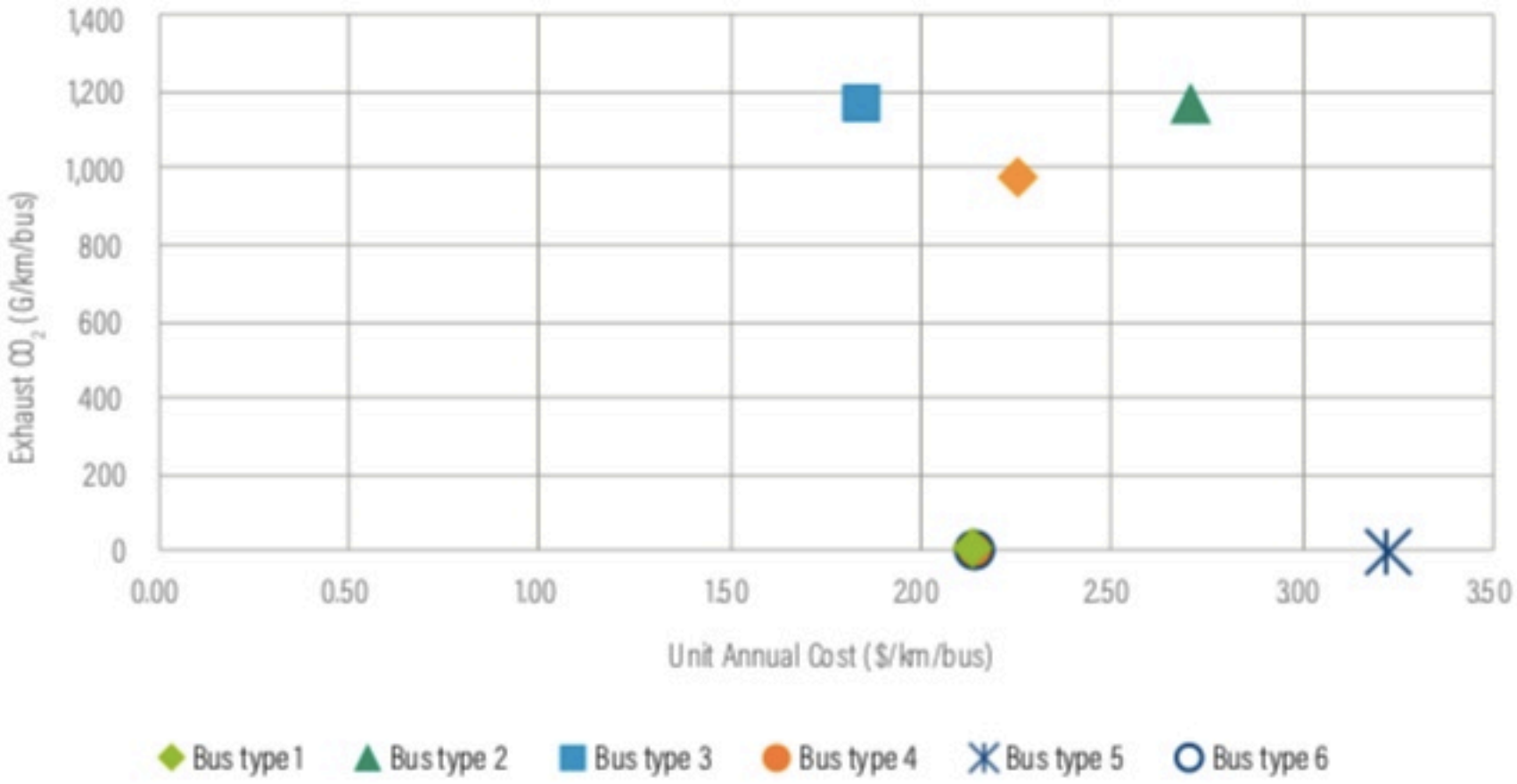
Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Sample input Variables for WRI's Costs and Emissions Appraisal Tool for Transit Buses



Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Sample Output Graphic from WRi's Costs and Emissions Appraisal Tool for Transit Buses



Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

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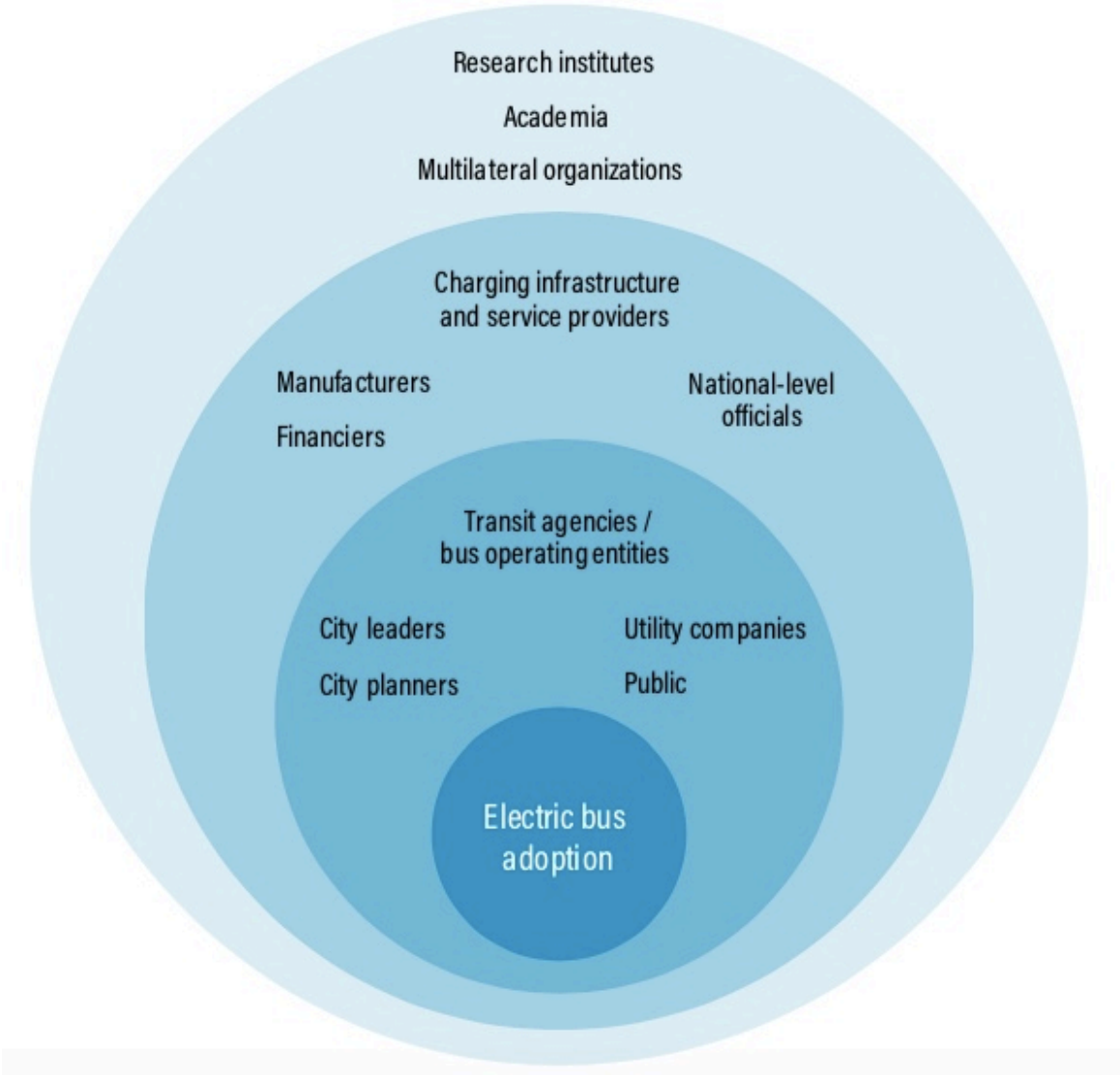
Major Stakeholders Who Are Likely to Be involved in Electric Bus Adoption



Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

SURGE. Descripción general

- A partir de esfuerzos financiados por el Ministerio Federal de Alemania para la Cooperación Económica y el Desarrollo (BMZ), el World Resources Institute (WRI) está formando una amplia coalición de organizaciones.

- Comenzará con 20 ciudades y en 5 años y medio será escalado a 500 ciudades.

- Ello contribuirá a la adopción de 100,000 BEs y la reducción de 15 megatoneladas de emisiones de C02.

SURGE. Tareas específicas

1. Formación de coaliciones en el ecosistema de BEs

Se formará una coalición de organismos internacionales, gubernamentales, privados y de la sociedad civil para impulsar el uso de BEs; y se elegirán, mediante un riguroso proceso, a 20 ciudades líderes. Cada una de ellas definirá, por sí misma, sus metas de adopción de Bes.

2. Transición profunda en 20 ciudades

Las 20 ciudades recibirán asistencia a la medida. Entre los temas estipulados destacan: el desarrollo de especificaciones técnicas y protocolos de evaluación del desempeño para BEs, el desarrollo de planes de infraestructura de recarga, planeación logística y de rutas, planeación financiera, y apoyo en política pública y contrataciones.

3. Escalamiento del proyecto a 500 ciudades

Las primeras 20 ciudades apoyarán con tutoría a otras ciudades que busquen sumarse al proyecto. Cuando sea necesario, la coalición producirá manuales específicos para esta tarea. Cada ciudad líder dará tutoría a 5 nuevas ciudades al año, logrando que al menos 500 ciudades estén involucradas en el proyecto al final del año 2024.

Sources: Sclar, R. Gorguinpour, C. Castellanos, S. and Li, X. (2019). *Barriers to Adoting Electric Buses*. World Resources Institute.

Barreras y catalizadores de la adopción de buses eléctricos