

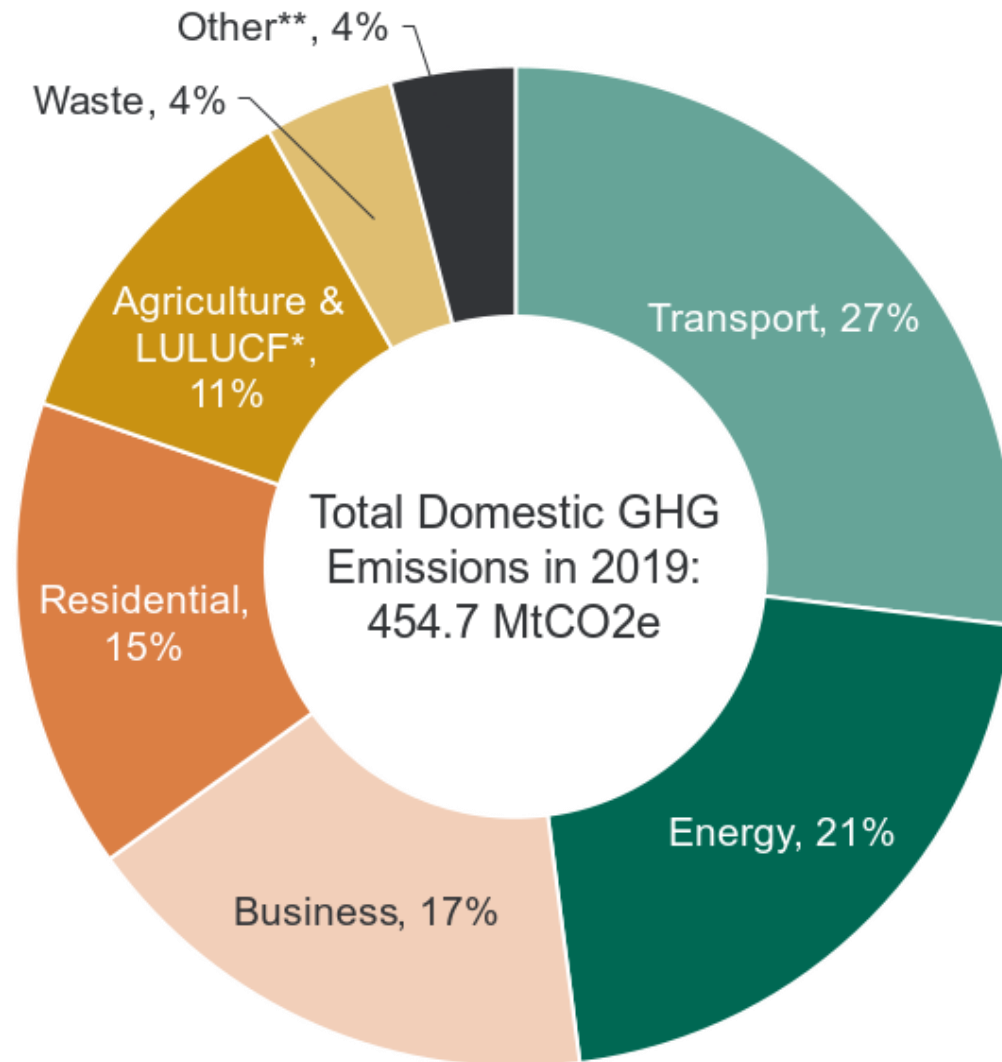
Behavioural Heterogeneity in EV & V2G Markets

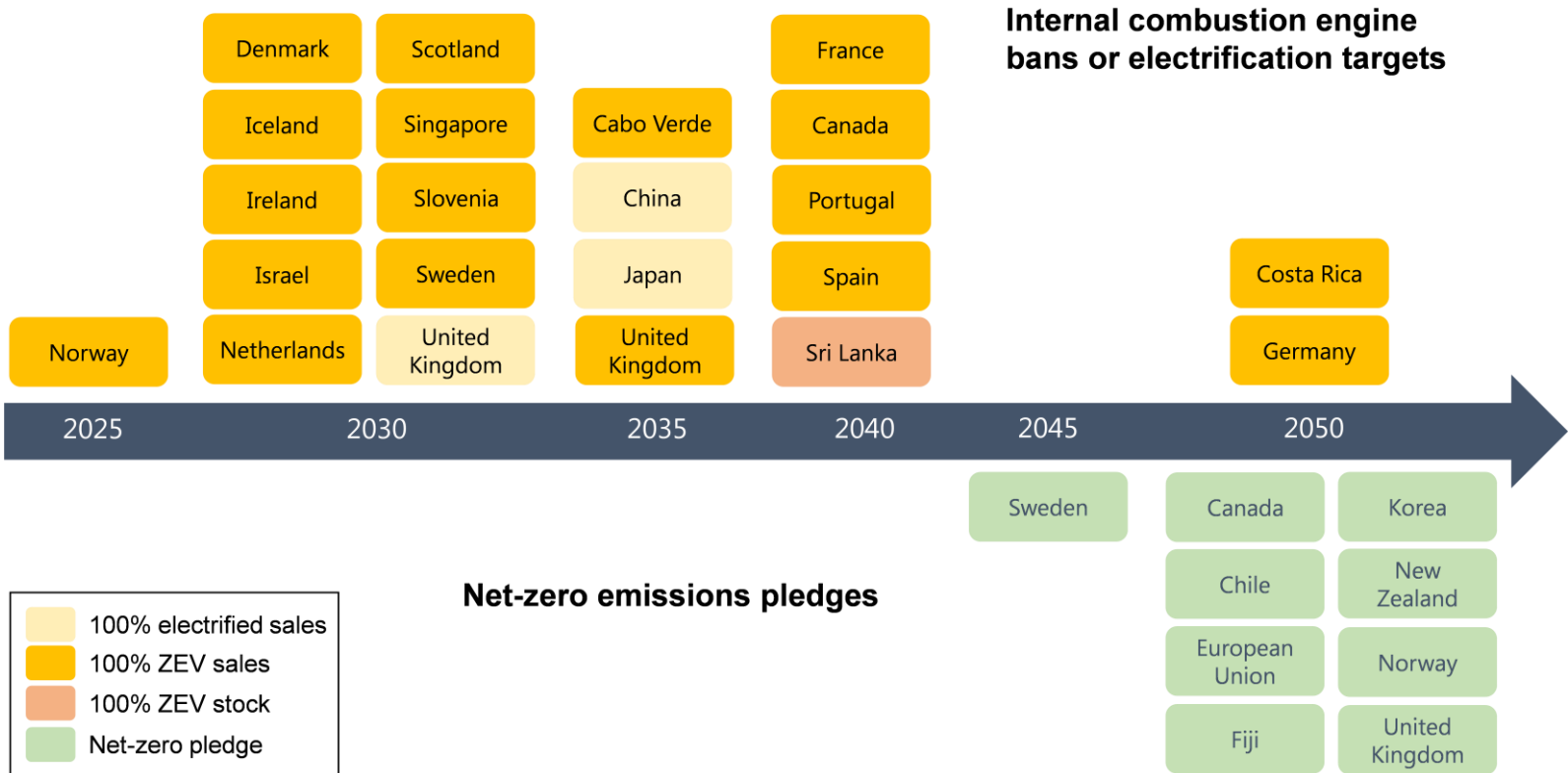
Zie Chen Chua, Masao Ashtine, Scot Wheeler



Oxford Energy Seminar
18 October 2022

(Image Credit: Scosche)





(Source: Global EV Outlook 2021, IEA)

Financial Incentives

Tax exemptions and credits

Preferential tariff for charging

Parking waiver

Charger install grant

Purchase subsidy

Research and development support

Mandates & Standards

Low emissions zones

Public procurement

ICEV ban

Emissions standards

Fuel economy standards

Climate targets

Indirect Incentives

Access to restricted zones and bus lanes

Unique license plate

Awareness and outreach programmes

Public charger installations

Legend:



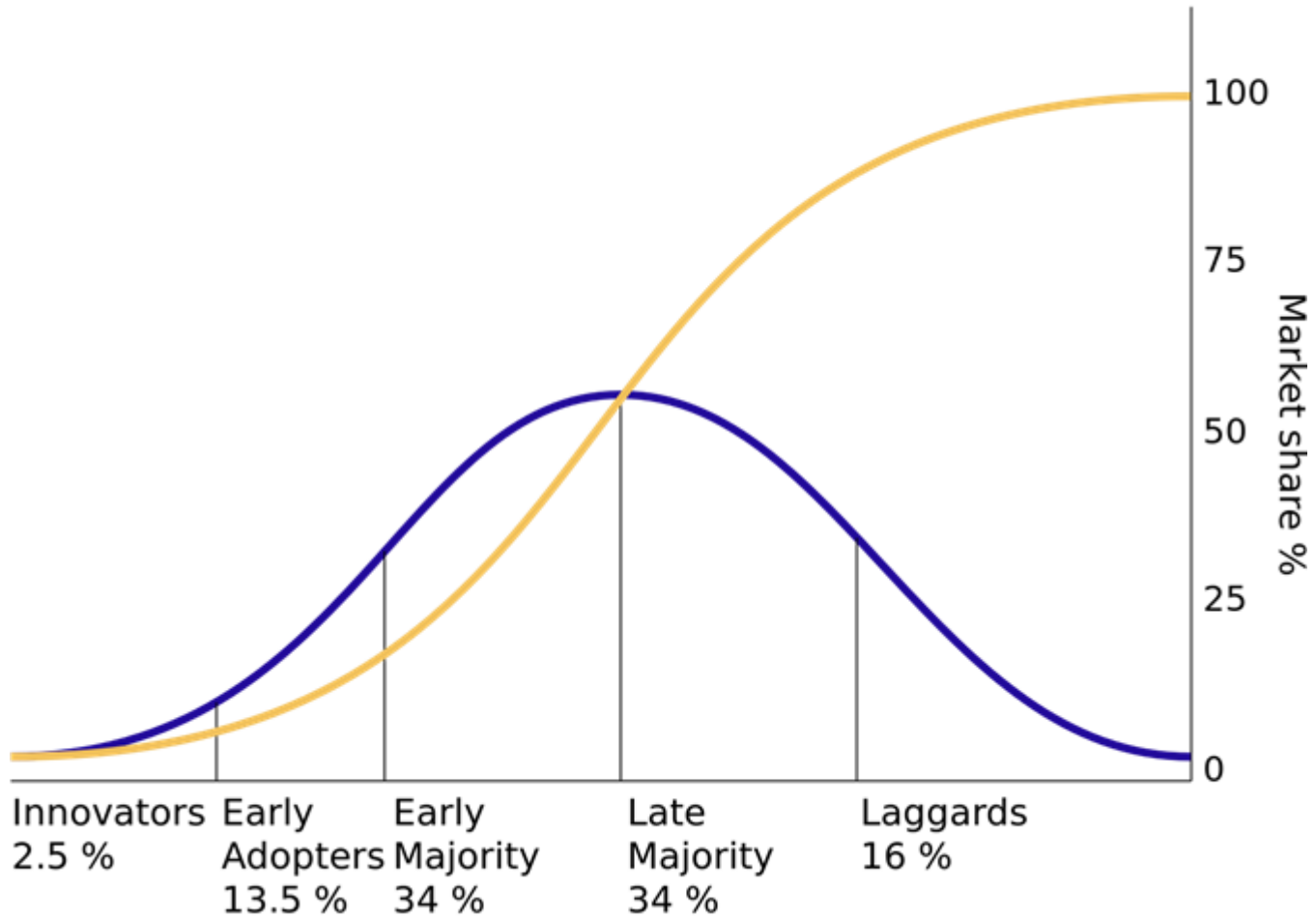
Consumers



Manufacturers

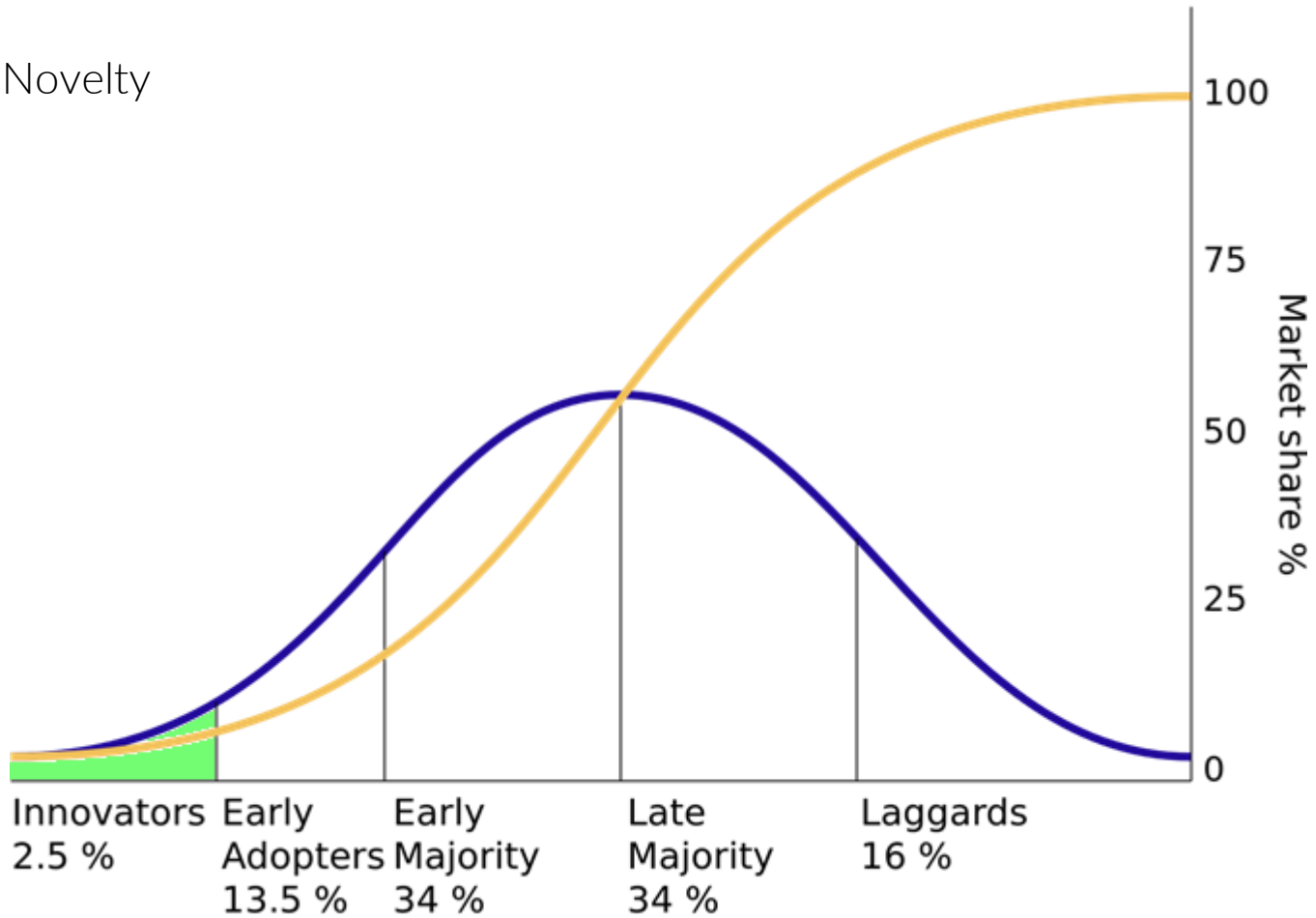


System-wide



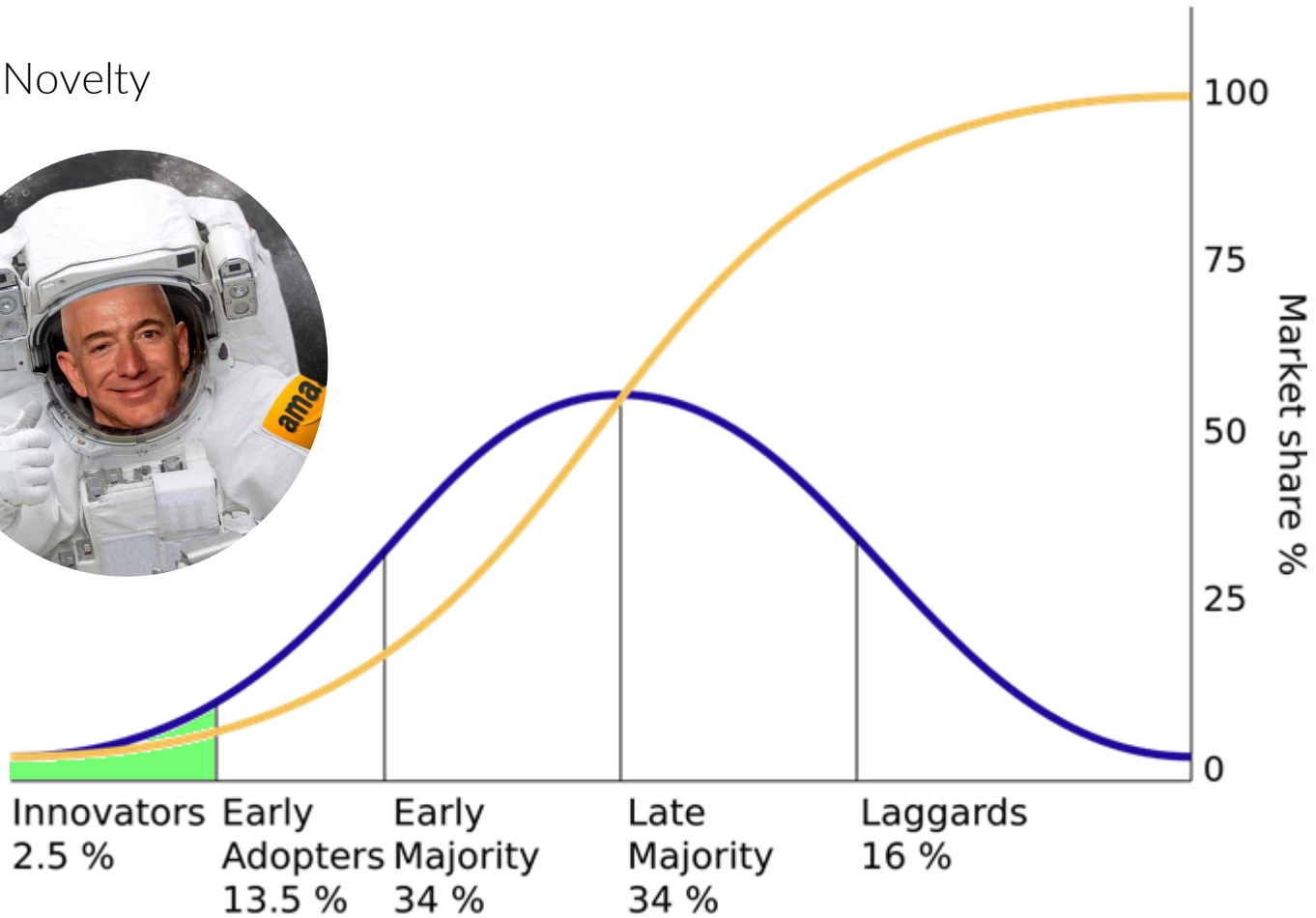
(Adapted from: Diffusion of Innovations, Rogers, E. 1962)

- Novelty



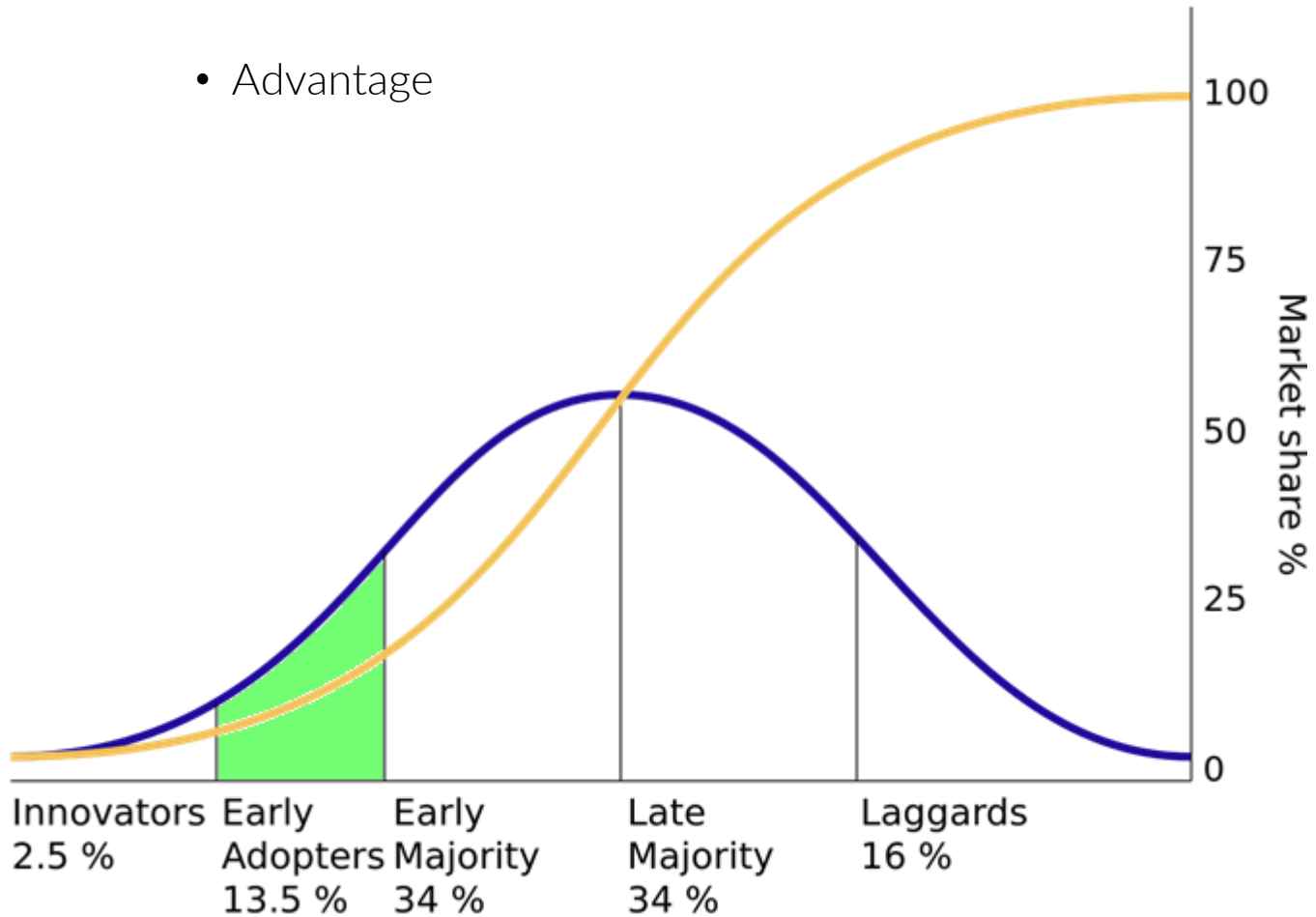
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- Novelty

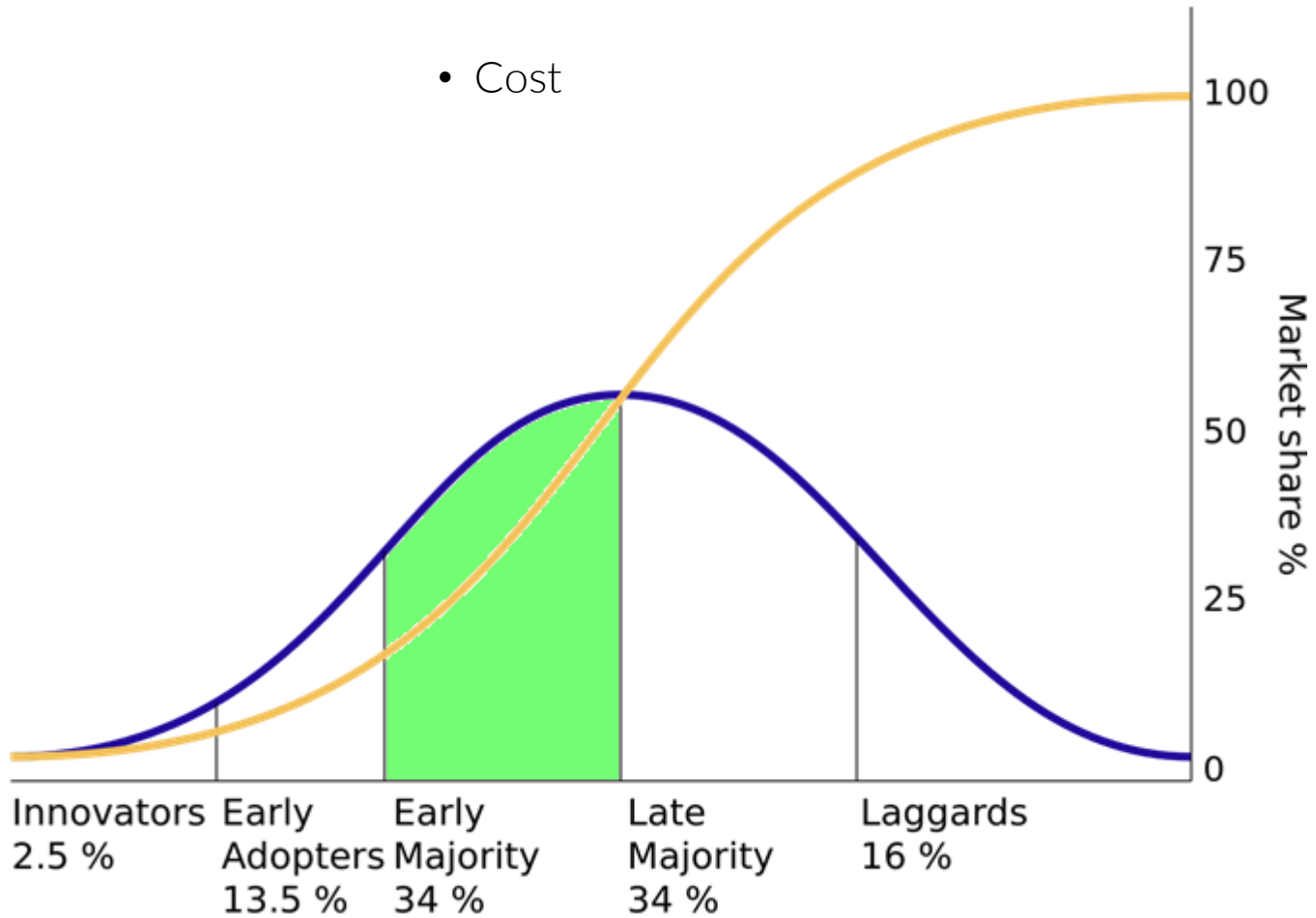


(Adapted from: Diffusion of Innovations, Rogers, E. 1962)

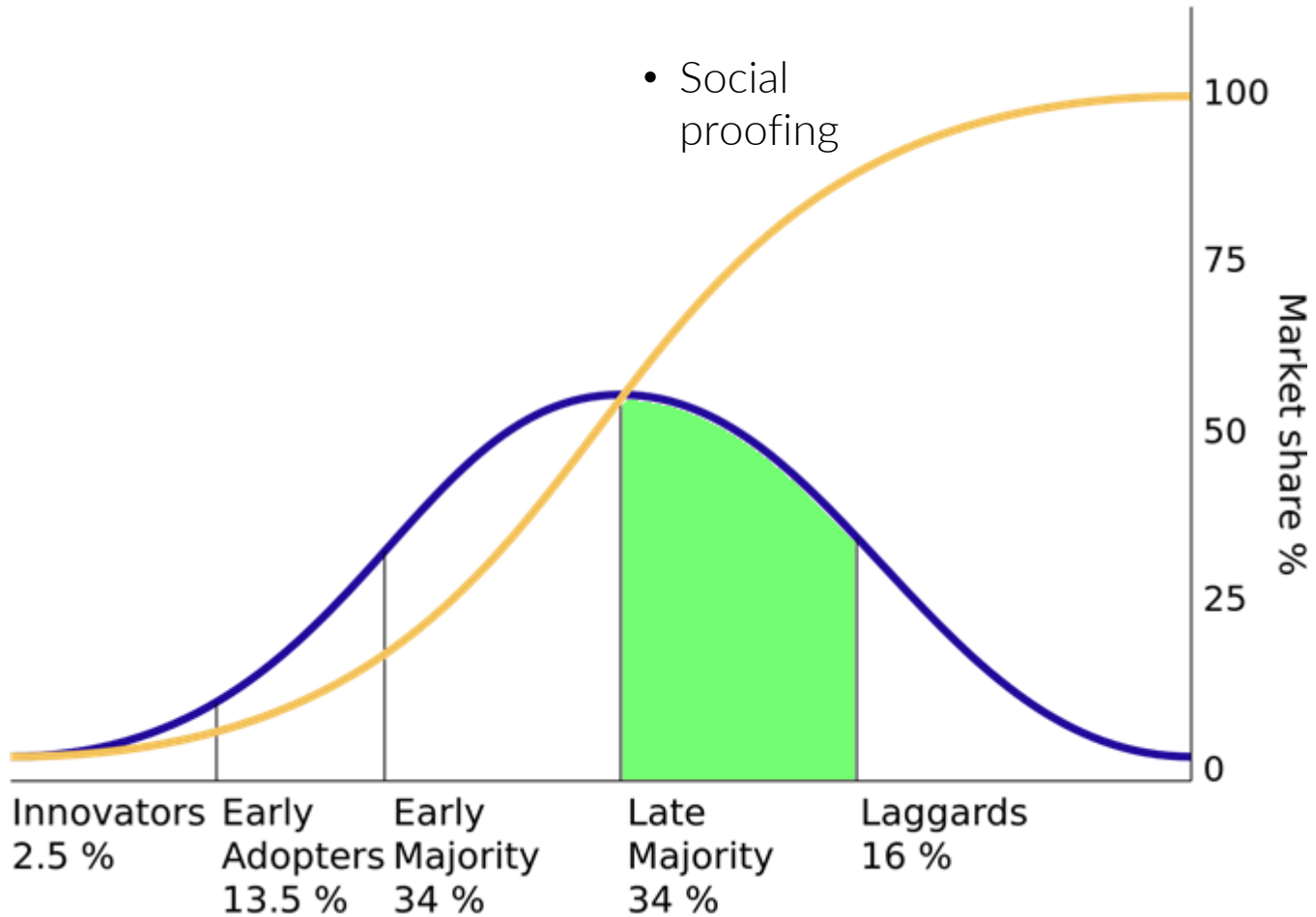
- Advantage



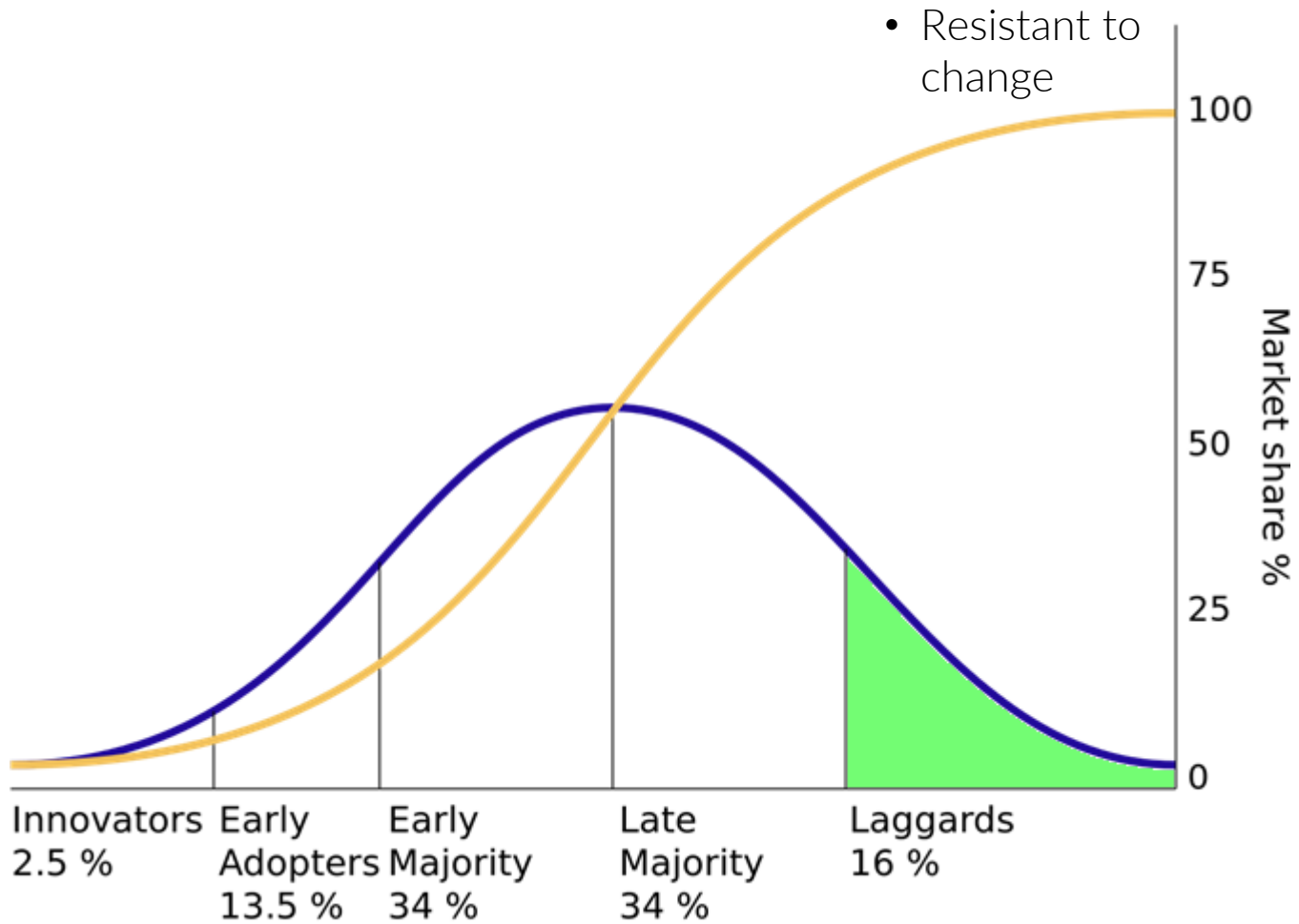
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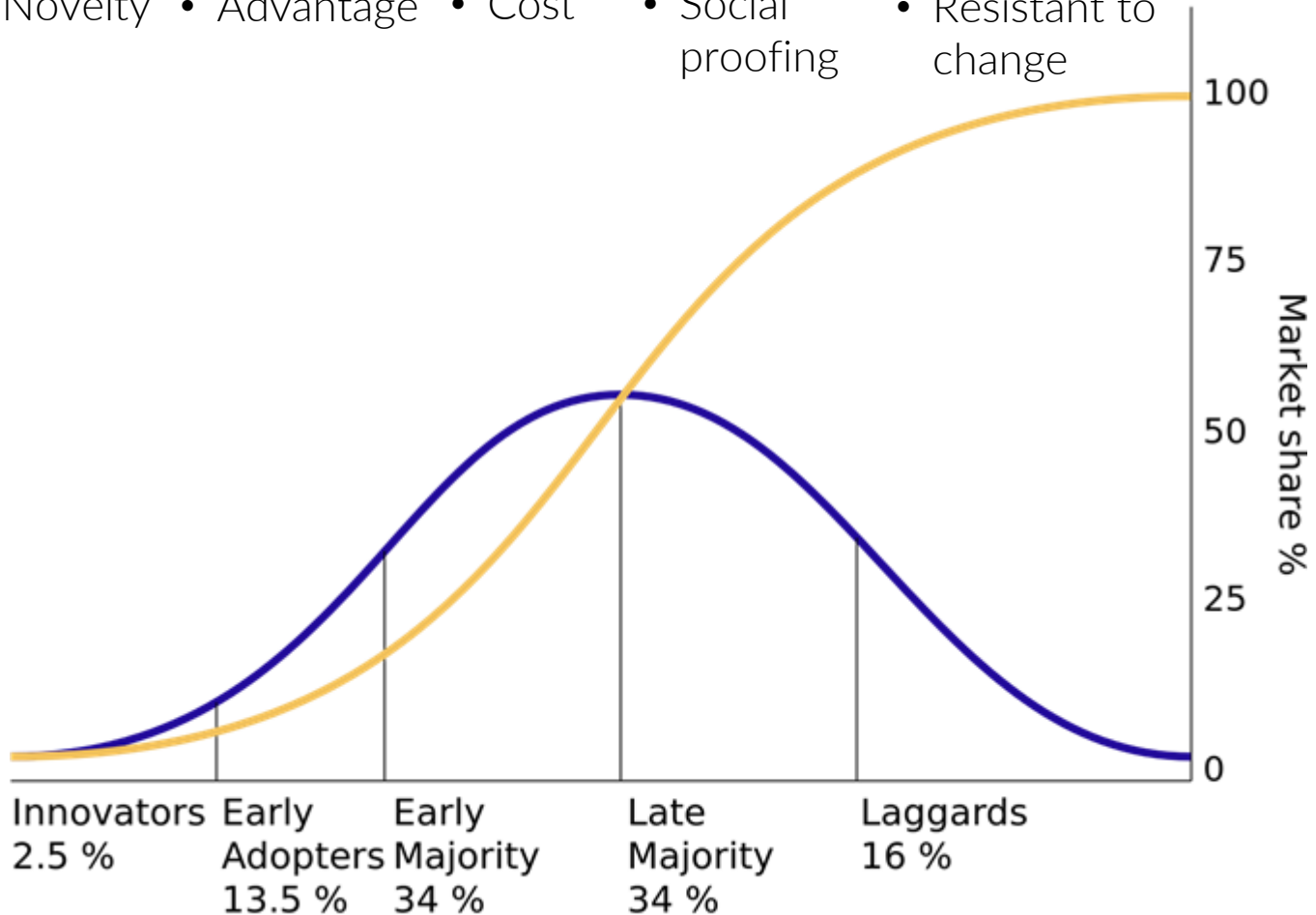


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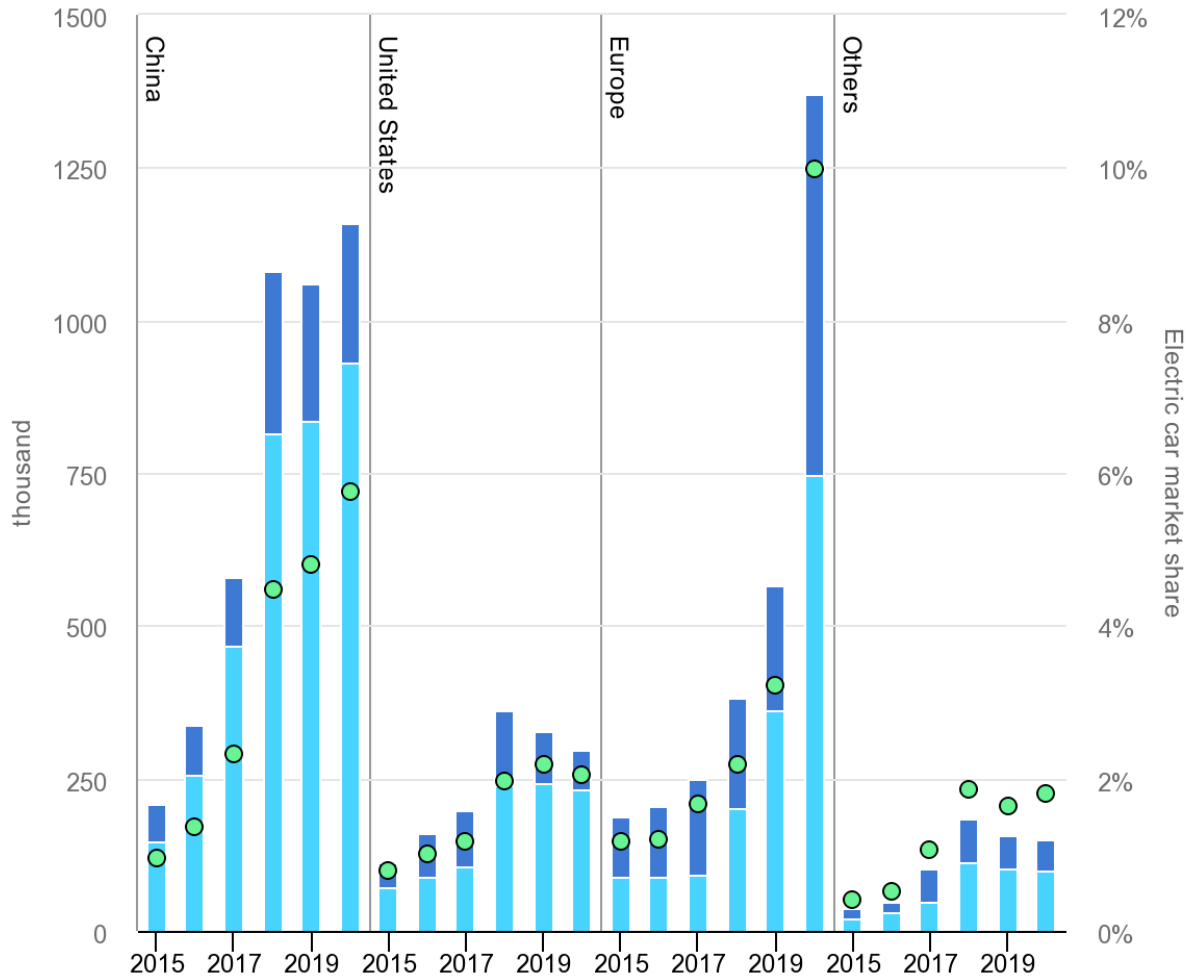


(Adapted from: Diffusion of Innovations, Rogers, E. 1962)

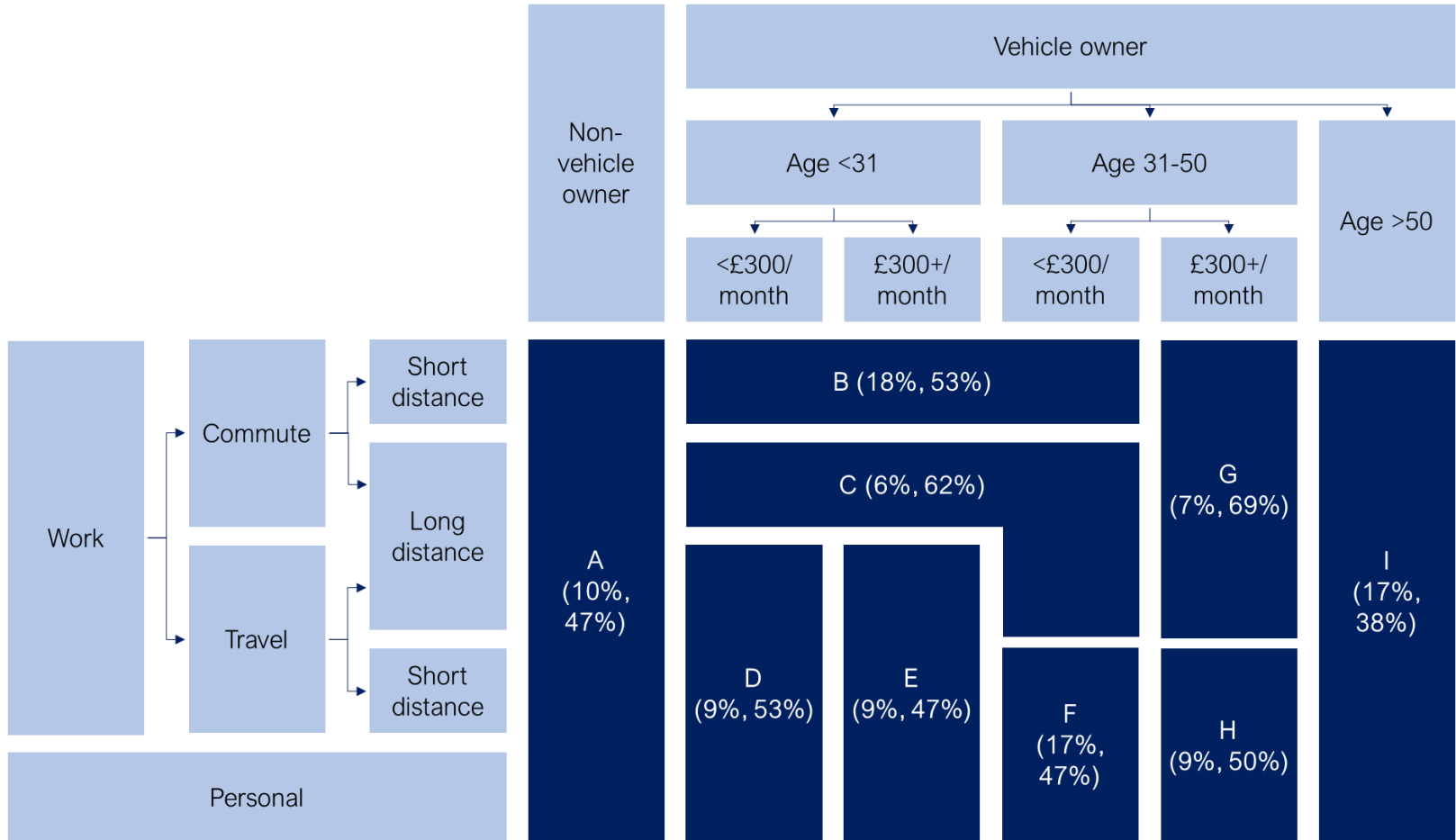
- Novelty
- Advantage
- Cost
- Social proofing
- Resistant to change



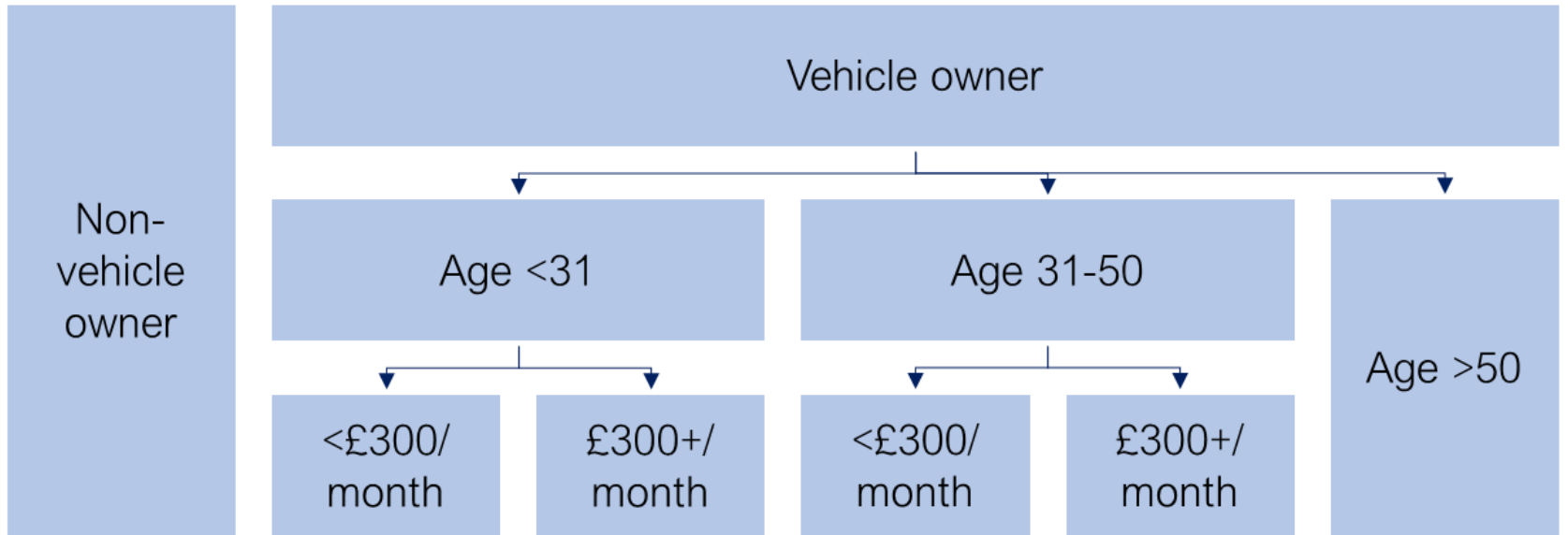
(Adapted from: Diffusion of Innovations, Rogers, E. 1962)



(Source: Global EV Outlook 2021, IEA)



(Adapted from: Woodward et al., 2020)



B (18%, 53%)

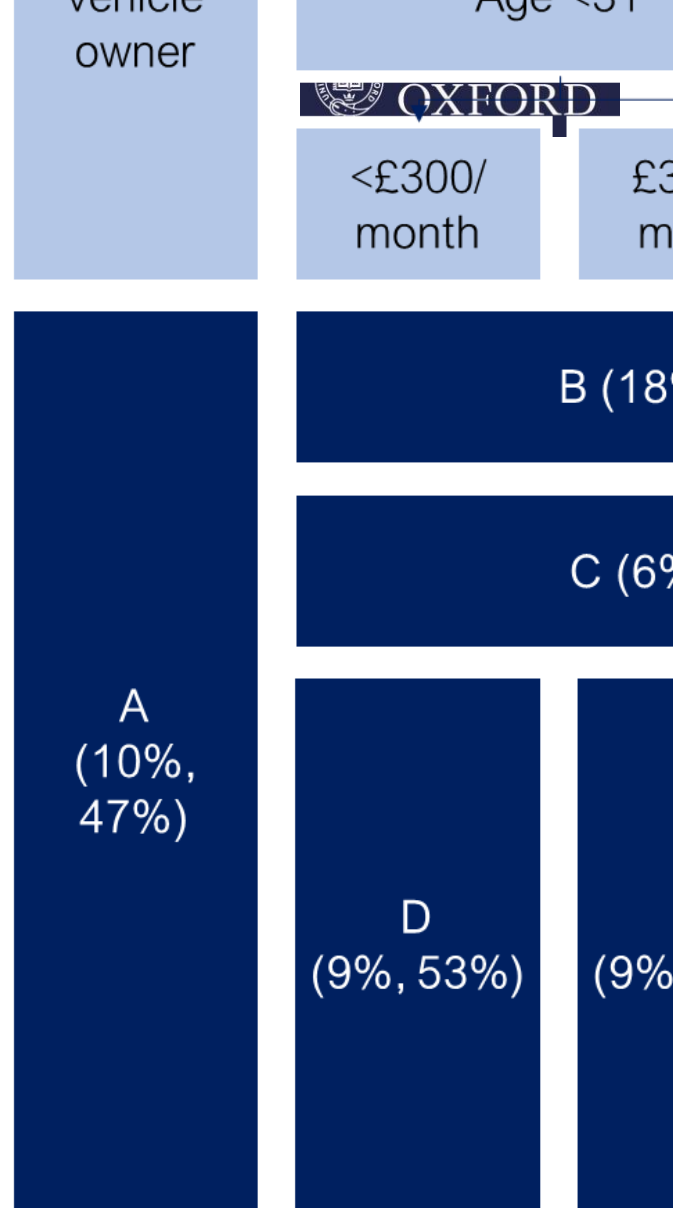
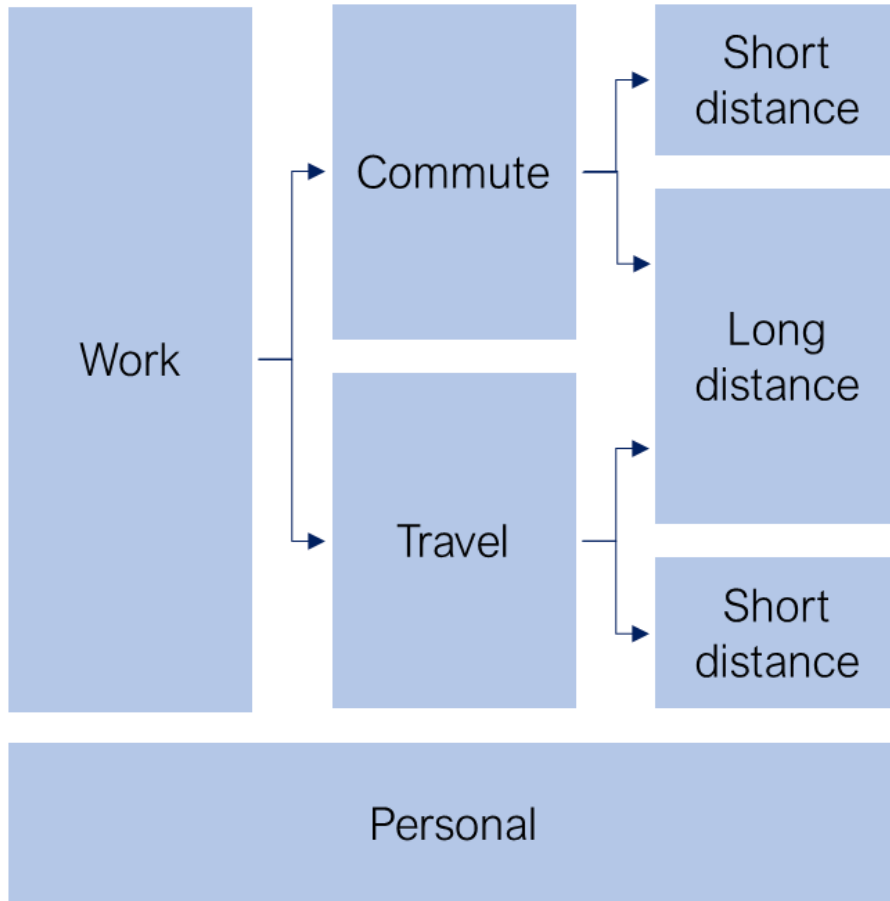
C (6%, 62%)

**G
(7%, 69%)**

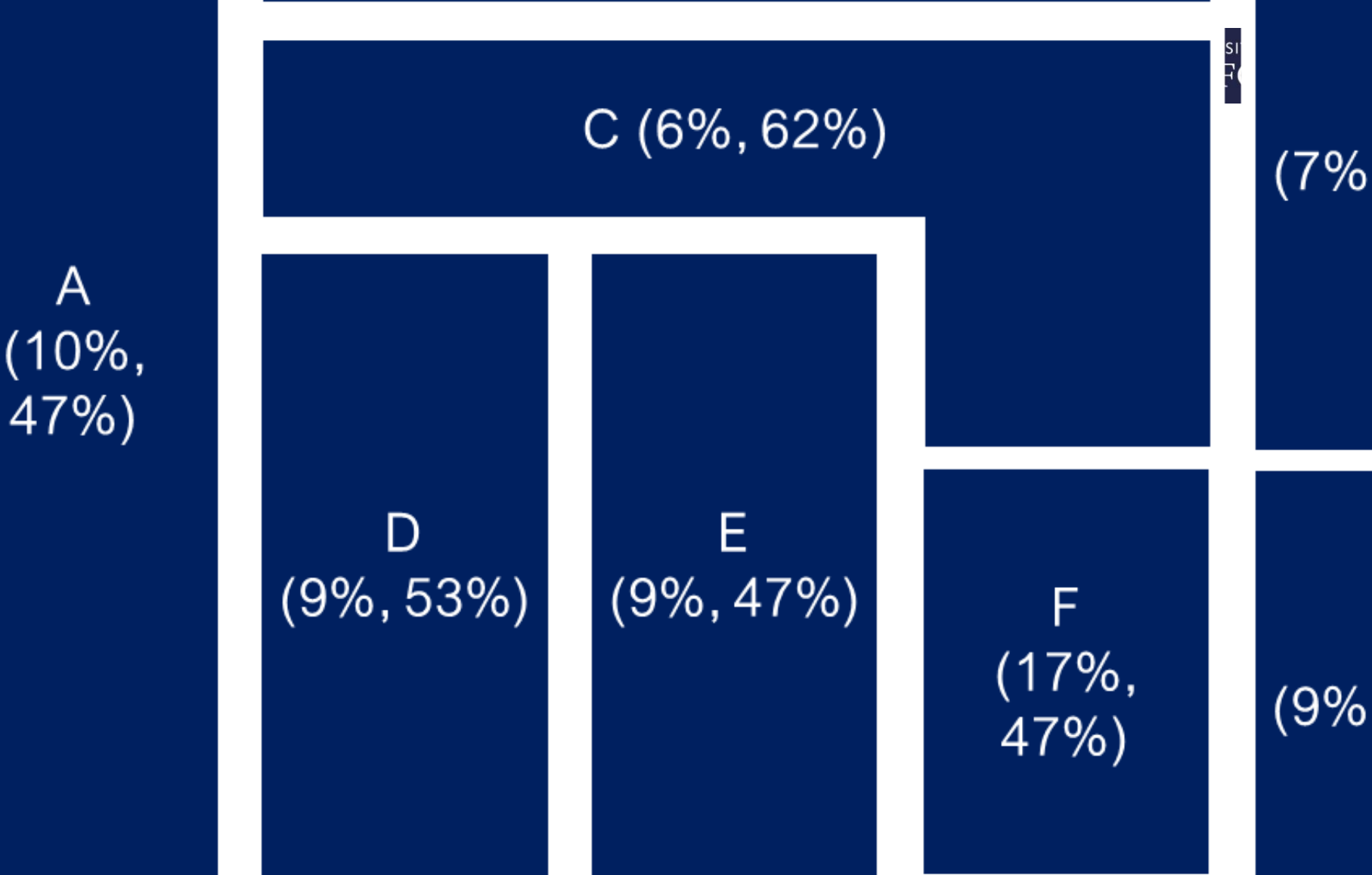
(Adapted from: Woodward et al., 2020)

A

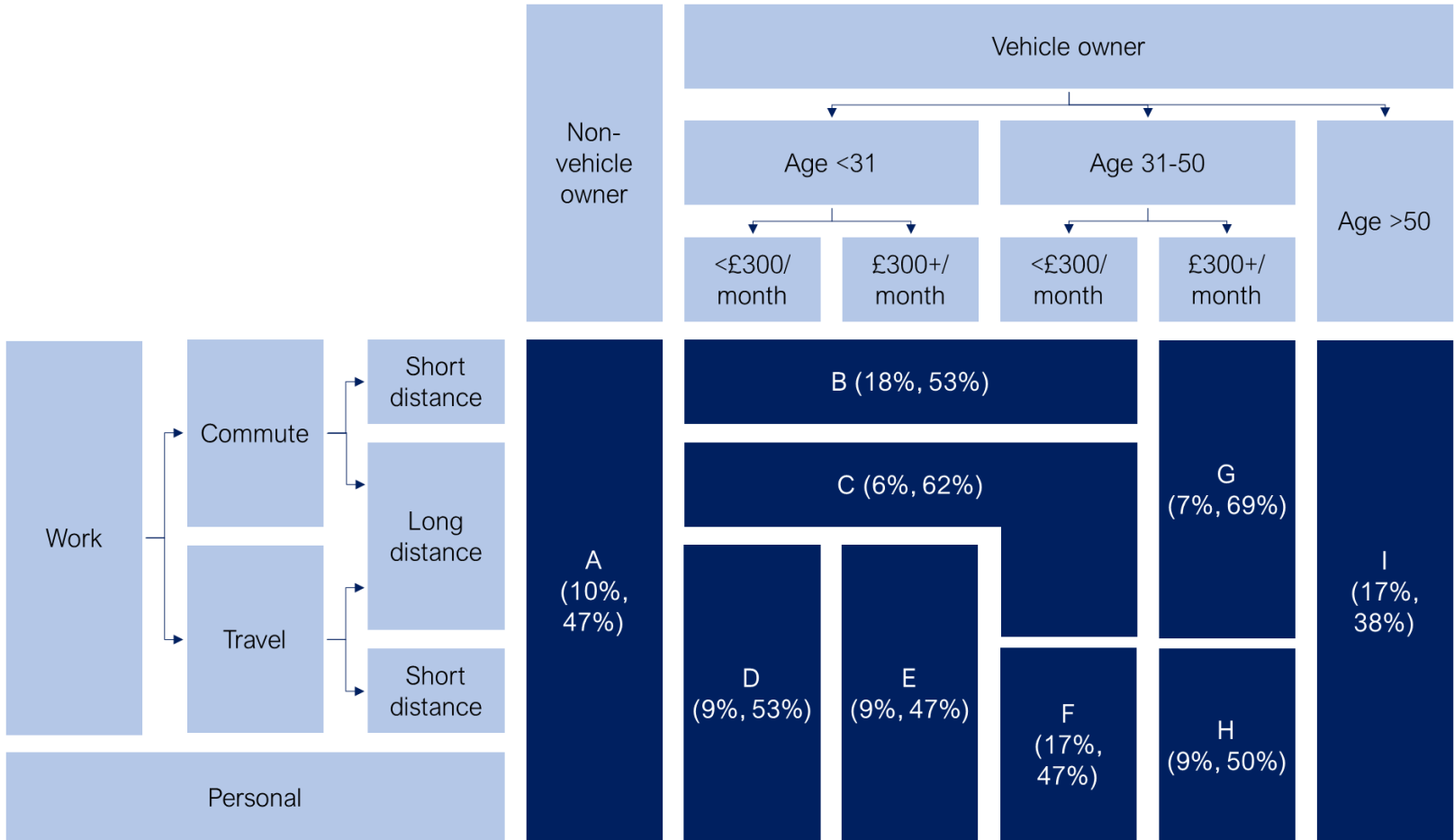
I



(Adapted from: Woodward et al., 2020)



(Adapted from: Woodward et al., 2020)

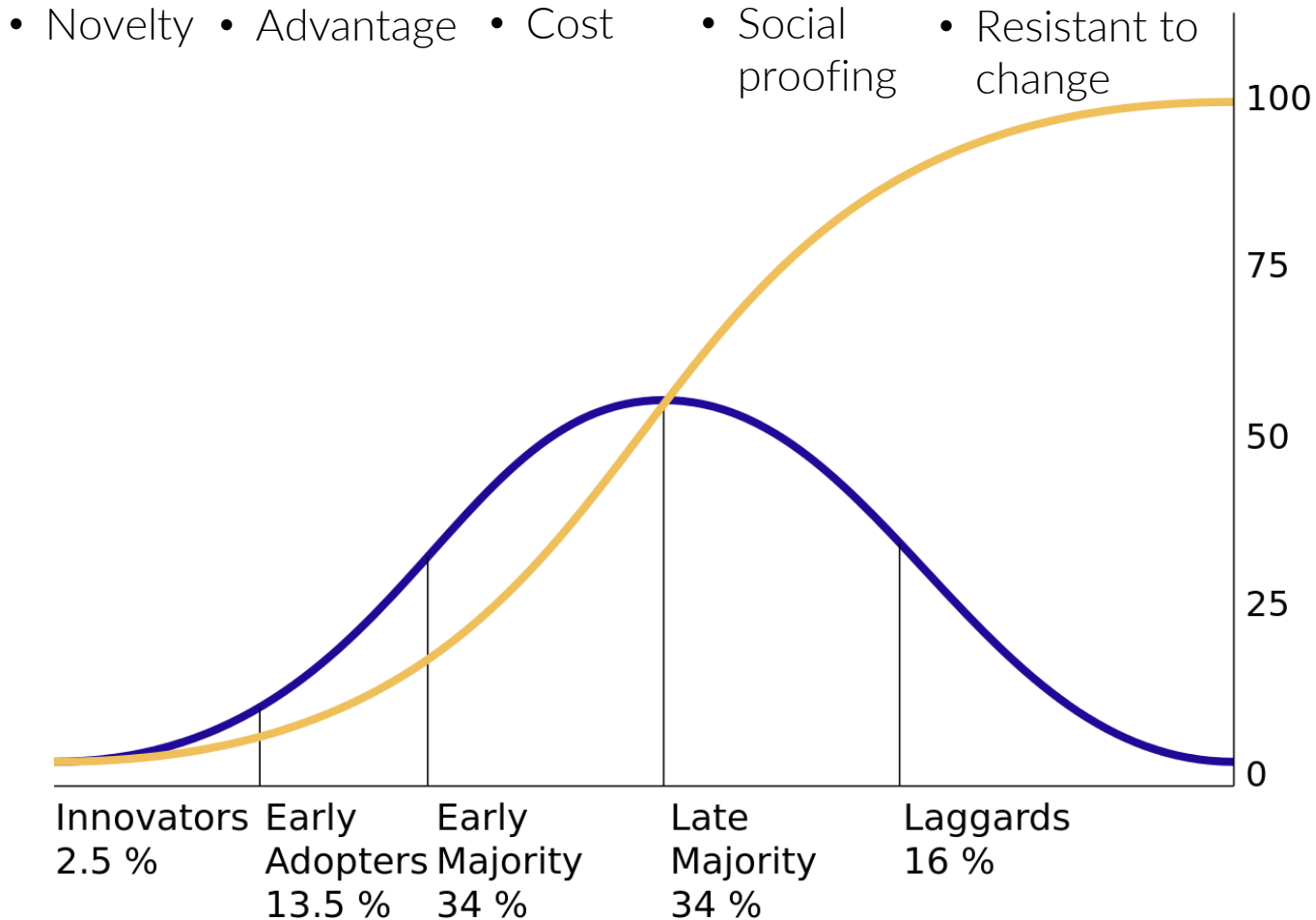


(Adapted from: Woodward et al., 2020)

Consumer Segments	EV Purchase Likelihood
A	47%
B	53%
C	62%
D	53%
E	47%
F	47%
G	69%
H	50%
I	38%

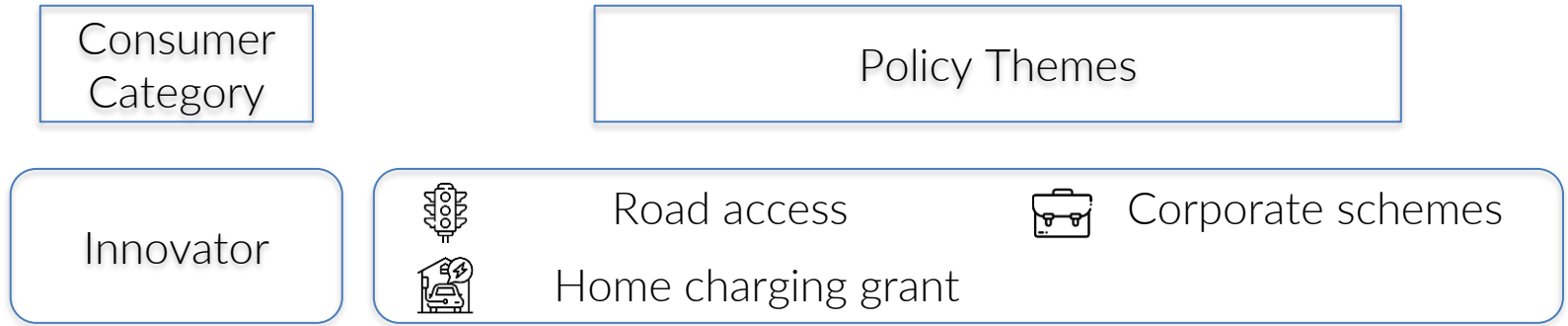
Consumer Segments	EV Purchase Likelihood
G	69%
C	62%
B	53%
D	53%
H	50%
A	47%
E	47%
F	47%
I	38%

Consumer Segments	EV Purchase Likelihood	Segment Size	
G	69%	7%	Innovator - 2.5%
C	62%	6%	Early Adopter - 13.5%
B	53%	18%	Early Majority - 34%
D	53%	9%	
H	50%	9%	
A	47%	10%	Late Majority - 34%
E	47%	9%	
F	47%	17%	
I	38%	17%	Laggards - 16%



(Adapted from: Diffusion of Innovations, Rogers, E. 1962; Woodward et al., 2020)

- Novelty
- ✓ Comfort
- ✓ Brand loyal
- Advantage
- ✓ Long distance travel
- ✓ Maintenance costs
- Cost
- ✓ Short distance travel
- ✓ Climate concern
- Social proofing
- ✓ First time buyer
- ✓ Driving experience
- Resistant to change
- ✓ Retired
- ✓ No research before purchase



Consumer
Category

Policy Themes

Innovator



Road access



Corporate schemes



Home charging grant

Early Adopter











Street charger installation






























Corporate schemes



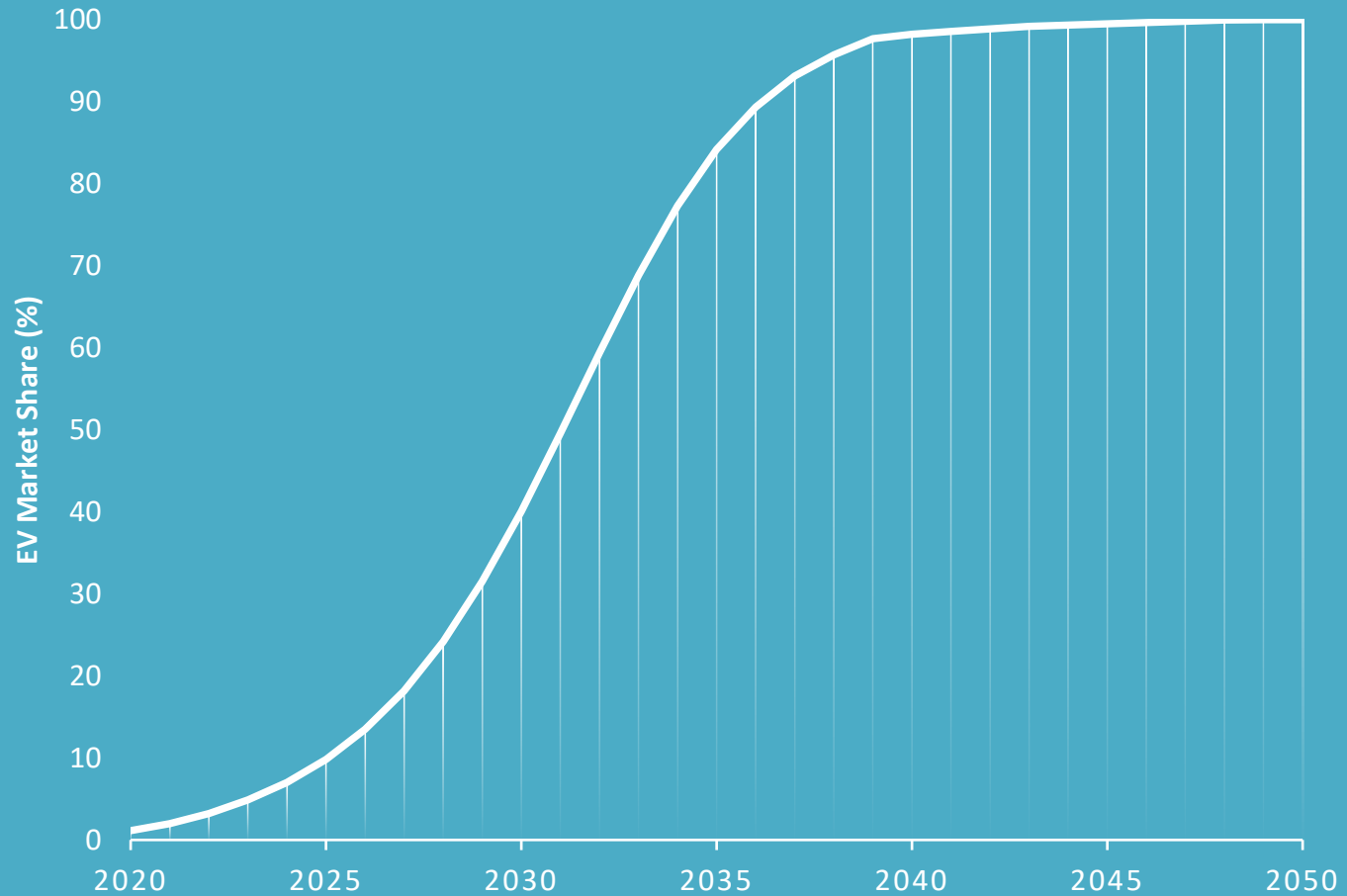
Purchase subsidy

Consumer Category	Policy Themes	
Innovator	 Road access  Home charging grant	 Corporate schemes
Early Adopter	 Street charger installation £ Purchase subsidy	 Corporate schemes
Early Majority	 Used market regulation  Street charger installation	£ Purchase subsidy  Corporate schemes

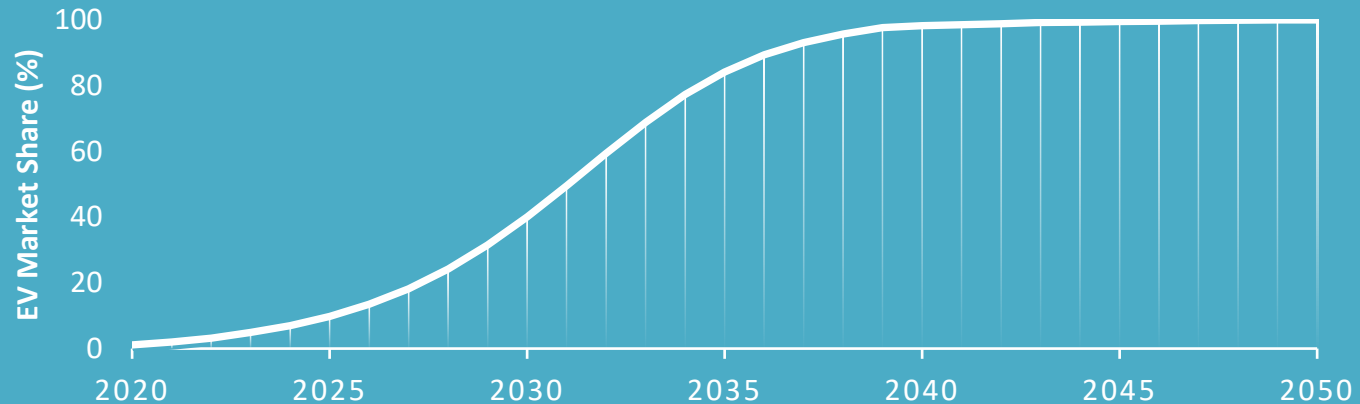
Consumer Category	Policy Themes	
Innovator	 Road access  Home charging grant	 Corporate schemes
Early Adopter	 Street charger installation £ Purchase subsidy	 Corporate schemes
Early Majority	 Used market regulation  Street charger installation	£ Purchase subsidy  Corporate schemes
Late Majority	 Used market regulation  Street charger installation	£ Purchase subsidy  Corporate schemes

Consumer Category	Policy Themes	
Innovator	 Road access  Home charging grant	 Corporate schemes
Early Adopter	 Street charger installation  Purchase subsidy	 Corporate schemes
Early Majority	 Used market regulation  Street charger installation	 Purchase subsidy  Corporate schemes
Late Majority	 Used market regulation  Street charger installation	 Purchase subsidy  Corporate schemes
Laggards	 ICEV sales and tailpipe emissions ban  Corporate schemes	

UK EV GROWTH TO 2050



UK EV GROWTH TO 2050



Adopter Phase	Innovator	Early Adopter	Early Majority	Late Majority	Laggards		
Year	2020	2025	2030	2035	2040	2045	2050
Indirect Incentive	Road access						
Financial Incentive		Company plug-in car grant / charger installation					
		Purchase subsidy					
		Home charging scheme					
System		Street charger policy					
		Used market regulation					
				ICEV / Tailpipe emissions ban			

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Automotive industry

UK sales of secondhand electric cars more than double in a year

Number of transactions rose from 6,600 in first three months of 2021 to 14,600 in first quarter of 2022



📷 Average prices for mass-market secondhand electric vehicles rose from £18,500 in April 2020 to £25,800 in April 2022. Photograph: Murdo MacLeod/The Guardian

Jasper Jolly

🐦 @jjpjolly

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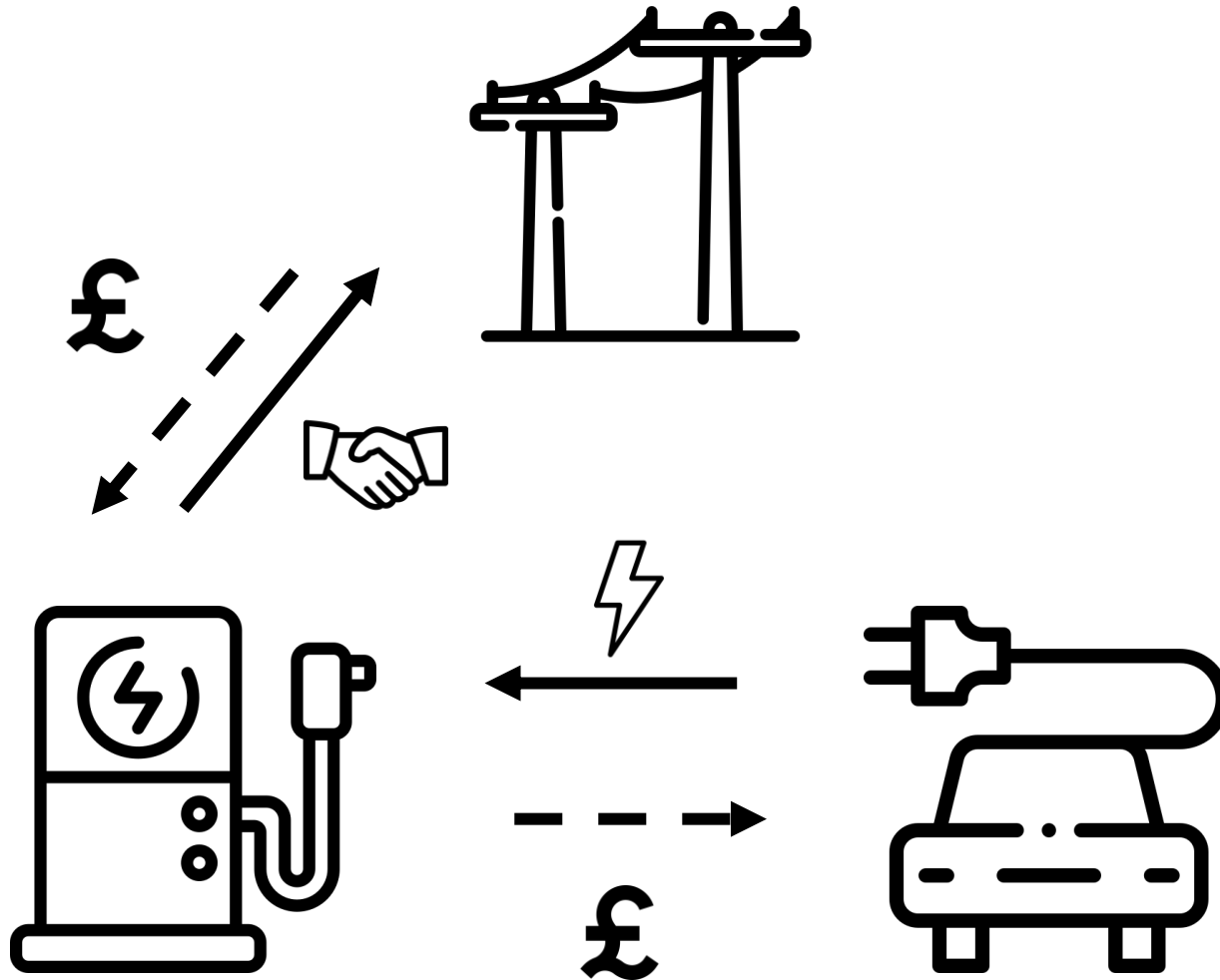


Confidence



Confidence

Supply



Top
Innovator



Fast
Follower



Follower



RENAULT



GEELY



Laggard



Top
Innovator



Fast
Follower



To summarise...



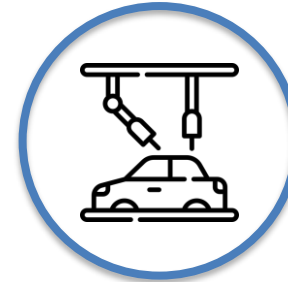
IDT

- Consumer-centric
- Flexible



EVs

- Corporate policies
- Used vehicle market



V2G

- Increase 2nd hand supply
- Targeting the right brand