What drives registration of electric vehicles at the household level in Sweden - from early adopters to the early majority, 2016–2020?

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A knowledge agency for transport policy

- Transport Analysis is a government agency – mainly occupied with questions regarding transport policy

- Transport Analysis is responsible for the production of official statistics in the transport and communication sectors
  - Vehicles statistics
  - Traffic and transport activities for all modes of transportation
  - Public transport and transport services
  - Traffic accidents
  - Travel and commodity flow surveys

- Investigations and analyses
  - Government assignments and regulatory mission letters
  - Self-initiated analyses
  - Tasks according to instructions (vehicle forecasts and monitoring of transport policy goals, for example)

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Background - EVs in Sweden

- There are approximately 5 million passenger cars in Sweden

- About 55 000 of these were BEV, and 122 000 PHEV (end of 2020)

- EV sales have increased rapidly and account for 54% of sales 2022

- A transition from PHEV to BEV from 2020

- A transition from company cars to private owners

- And a transition from buying to leasing
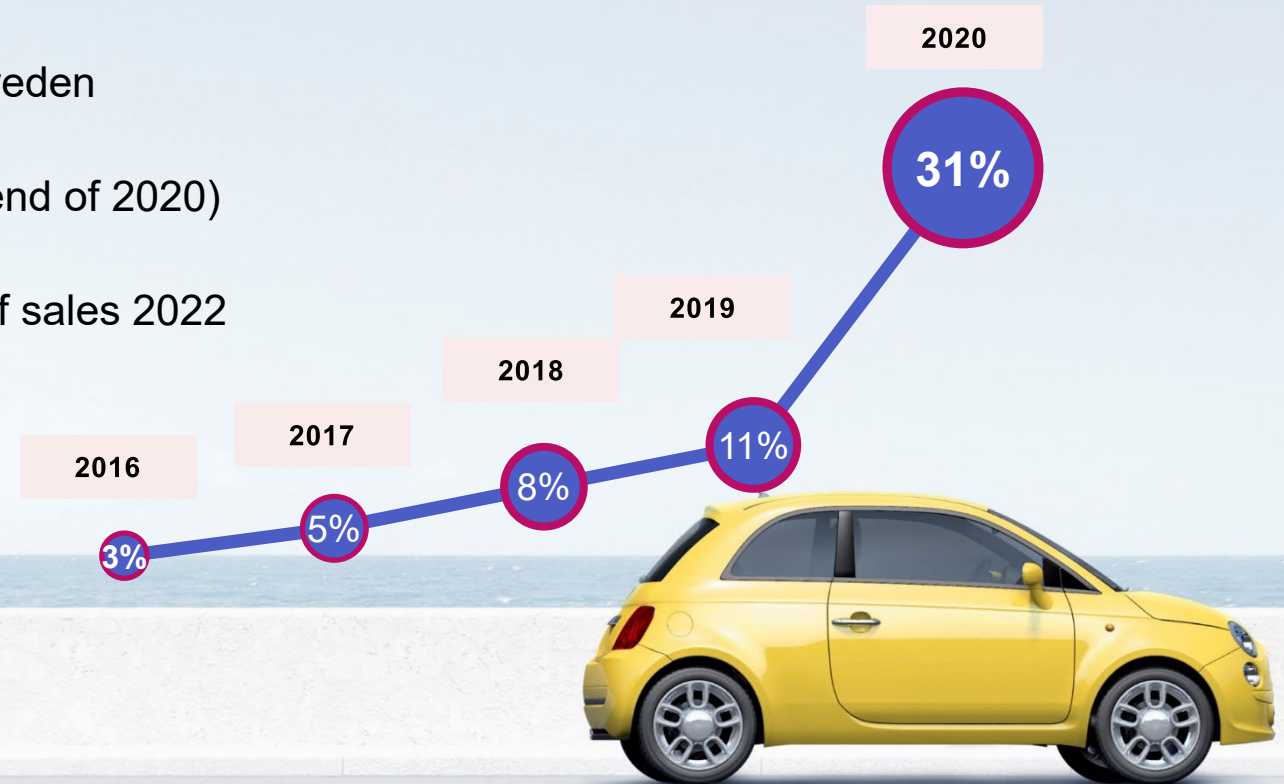
Who are buying and leasing these cars?

2020

31%

2019

2018

2017

11%

8%

2016

5%

3%

Scope of the study

- Studying Swedish households and their registrations of new EVs

- Compare 2016 with 2020, and EV buyers vs. non-EV buyers (ICE)

  - What type of households were early to adopt EVs, and who followed later?

  - Are there any differences between households that lease and those that buy an EV?

  - Does access to public charging infrastructure affect the likelihood that one will choose an EV?

Data and method

- Sweden's official vehicle statistics
  - ~4.1 million vehicles owned by a private owner
  - 2 500 EVs registered in 2016 to private owners
  - 25 000 EVs registered in 2020 to private owners

- Swedish households (4 million) from Statistic Sweden
  - Age
  - Gender
  - Household income
  - Type of housing (house, apartment)
  - Family size
  - Geographical areas ~ 6000

- Latest available data was 2020

- Public charging infrastructure from The Swedish Energy Agency
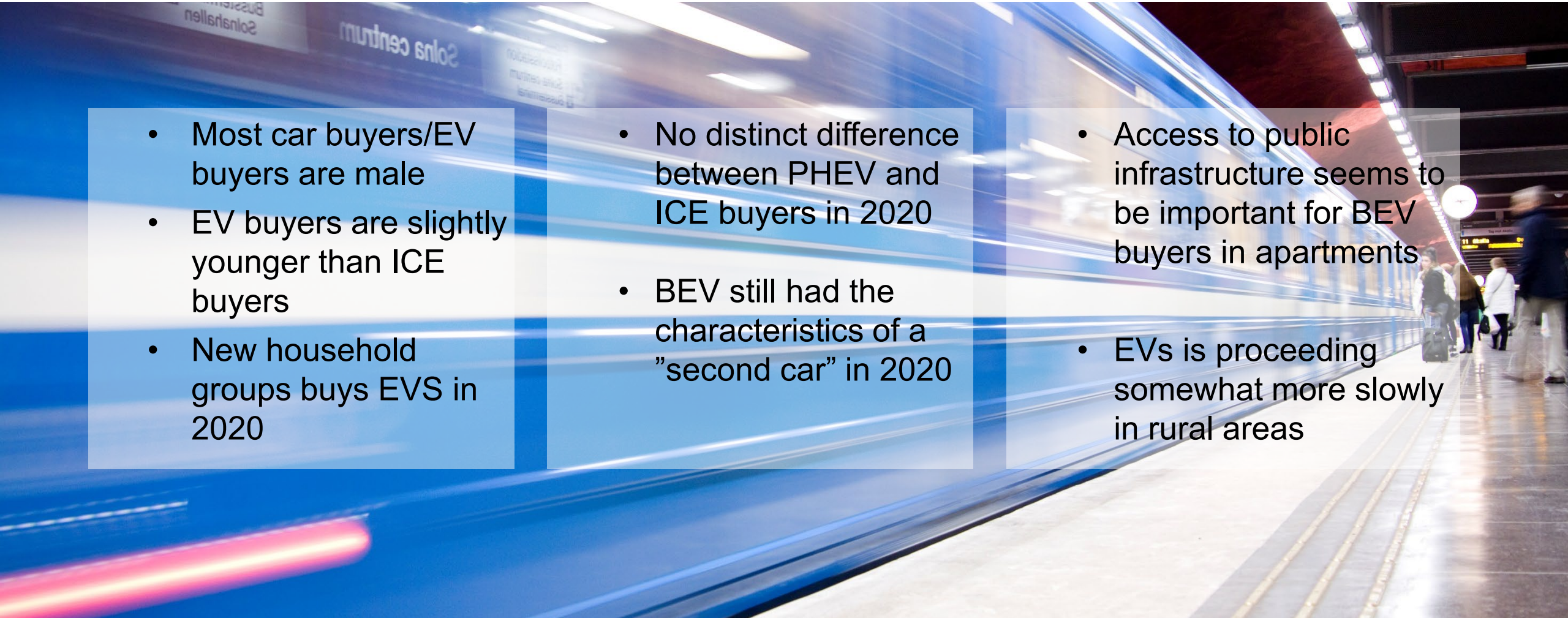
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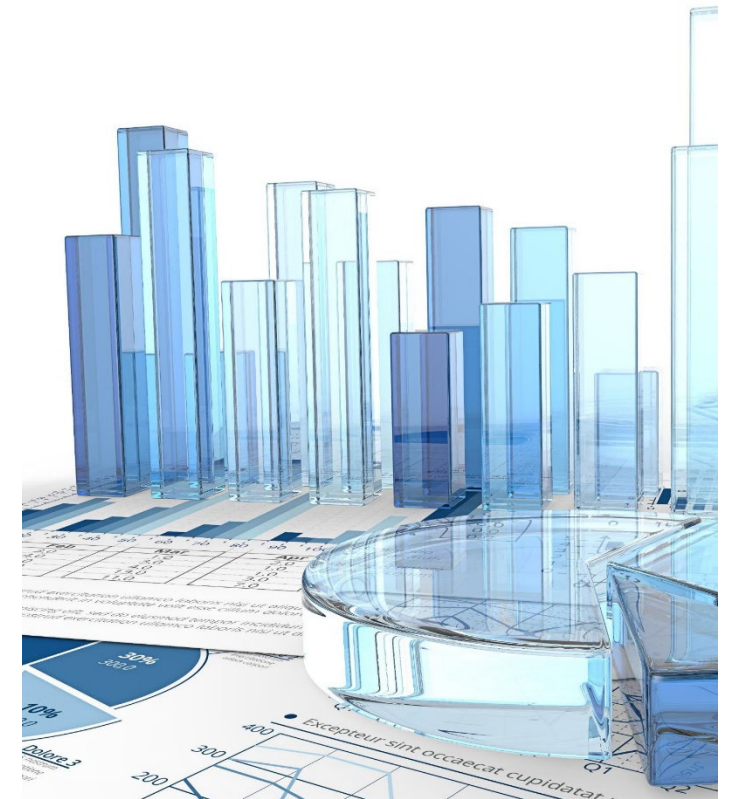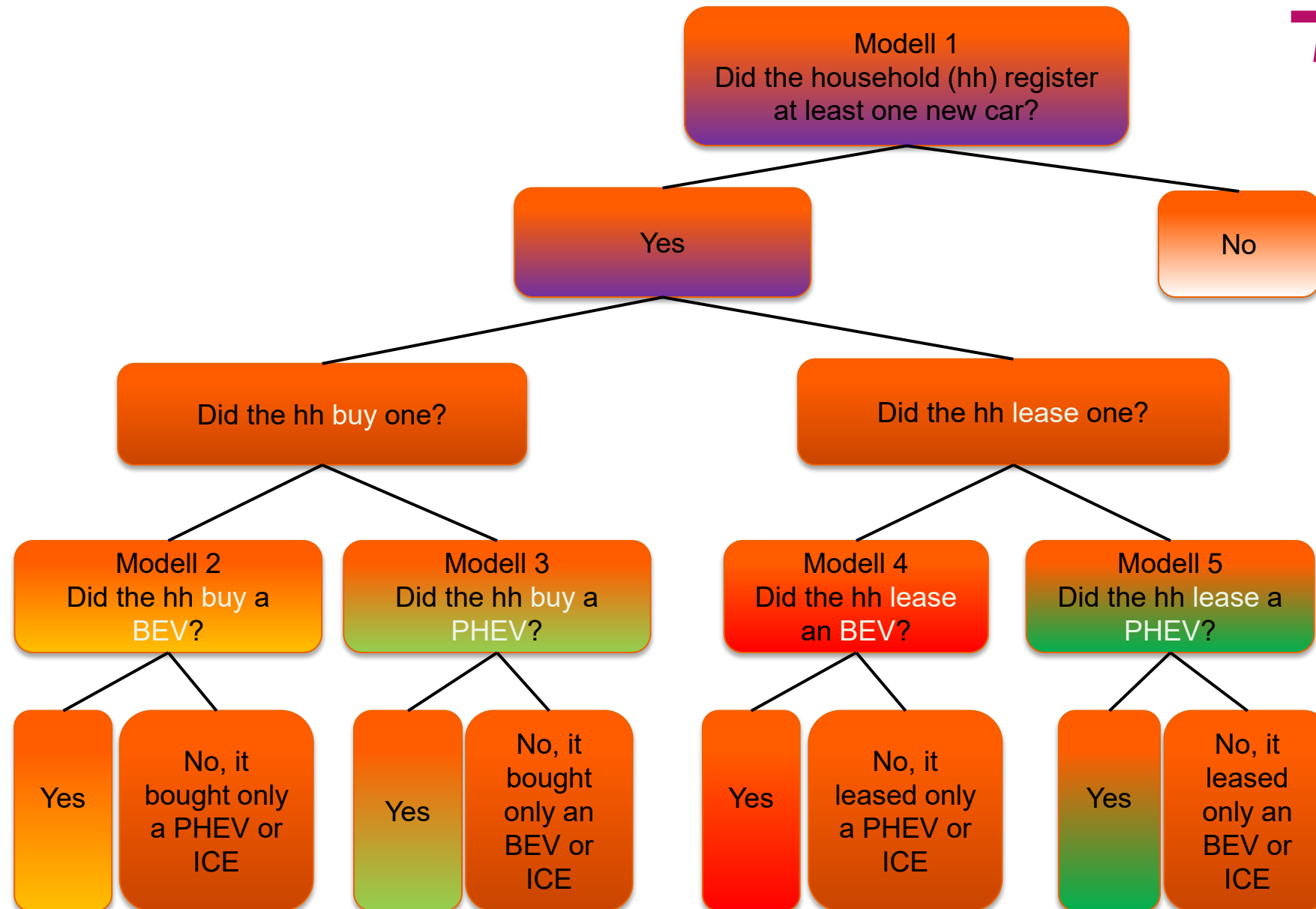
Variabel	All cars 2020 (Modell 1)	BEV purchase 2020 (Model 2)	PHEV purchase 2020 (Model 3)	BEV lease 2020 (Model 4)	PHEV leasing 2020 (Model 5)
Income	+	+	+	+	+
Education	+	+		+	
Housing – Multifamily (owned)	+	+	+	+	+
Housing – Single family	+	+	+	+	-
Housing – Special housing	-	+	+	+	+
Swedish background	+	+		+	
Public transport supply	+				
Cars in the household already	-	+	-	+	-
Central part of the municipality (DeSO(C))	+	-	+	-	
Number of tax benefit cars in household	-		-	+	-
Municipality – Sparsly mixed		-	+	-	+
Municipality – Sparsly populated rual	-	-		-	+
Municipality – Very sparsly populated rural	-	-			
Municipality – Major cities	-	+	+		+
Municipality – Large mixed muncipalities	+		+	-	+
Family – Single – no kids	-	+	+	+	
Family – Co-habitant – with kids	+		+		+
Family – Co-habitant – no kids	+		+		+
Domination of men in the household	N/A	+	+	+	+
Age – -25	N/A		-	-	
Age – 26–35	N/A		-	-	
Age – 46–55	N/A	-	+	-	-
Age – 56–65	N/A	-	+	-	-
Age – 66+	N/A	-	+	-	-

Summary

- Most car buyers/EV buyers are male
- EV buyers are slightly younger than ICE buyers
- New household groups buys EVS in 2020

- No distinct difference between PHEV and ICE buyers in 2020
- BEV still had the characteristics of a "second car" in 2020

- Access to public infrastructure seems to be important for BEV buyers in apartments
- EVs is proceeding somewhat more slowly in rural areas

Conclusions

- The market for new cars is limited, meaning we are studying a rather narrow market

- The EV market can change and expand quickly
  - New household groups are buying EVs
  - Leasing of new cars have contributed to the expanding market
  - PHEV has been normalized, BEVs not quit there yet (2020)

- Based on our results, BEVs should be like buying any another new car by 2024

Thank you for your attention!

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