

# ***ADOPTERS OF ELECTRIC VEHICLES IN SWEDEN: ATTITUDES, NEED FOR MEASURES, AND REBOUND EFFECTS***

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# BACKGROUND AND AIM

- Current status – about 35.000 **PHEV** (*Plug-in Hybrid Electric Vehicle*) & **BEV** (*Battery Electric Vehicle*) in Sweden Q3 2017
  - Still on an early adoption stage
- Ownership structures for PHEV and BEVs?
- How do these early adopters view the need for measures to stimulate the purchase and use of EVs instead of conventional petrol/diesel vehicles?
- The risk for rebound effects, i.e. increase in car use after the purchase of an EV
  - Is there signs of such an effect among the early adopters?
  - Are there group differences (changed/unchanged car/PT use) in attitudes and every day travel?

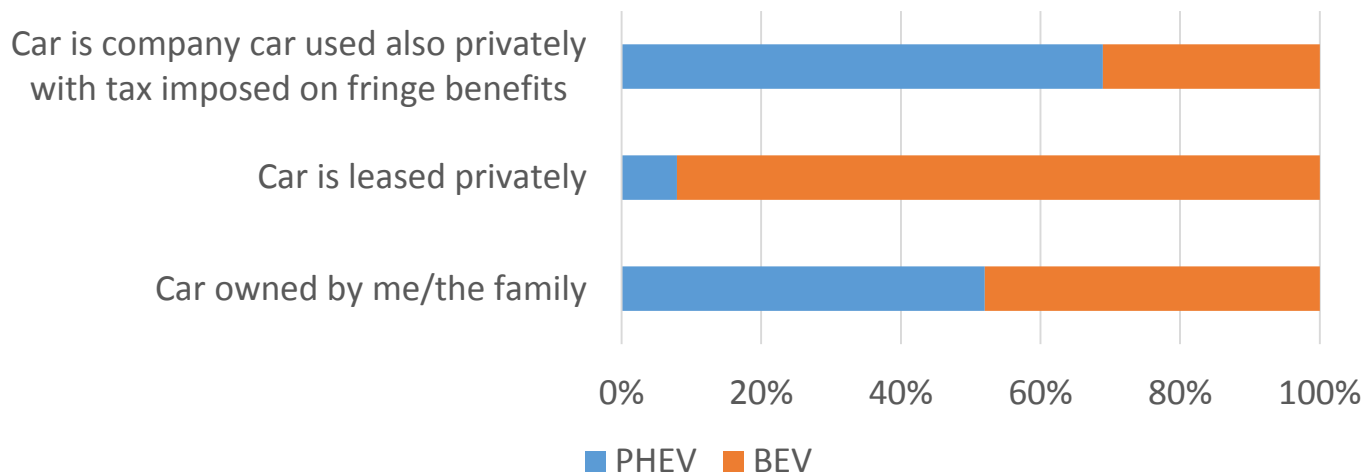
# METHOD

- Online survey sent to 10.167 PHEV/BEV owners in Sweden 2016
  - Plug-in Hybrid Electric Vehicles owners (PHEV) N=5999 (n=1331, return rate 22,2%)
  - Battery Electric Vehicle owners (BEV) N=4167 (n=1183, return rate 28,4%)
  - Overall return rate 24,7%

# MEASURES OF INTEREST IN THIS STUDY

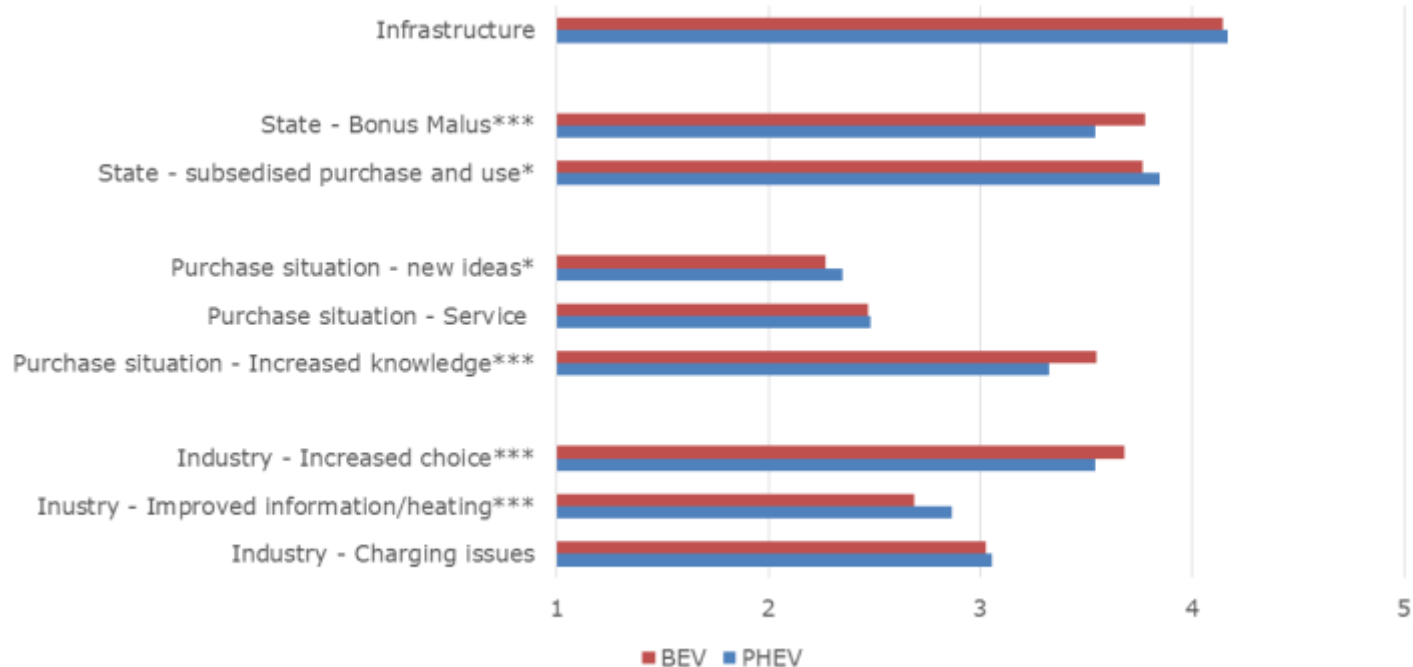
- Ownership type
  - Company car used privately with tax imposed on fringe benefits
  - Leased privately
  - Owned by me/my family
- View on needed measures for stimulation of EV purchase and use
  - Infrastructure, Bonus Malus, Subsidizes, Purchase situation, Car industry)
- Attitudinal factors
  - NEP, Ascribed responsibility, Problem awareness, Social norm, self-efficacy, personal norm, Emotions (hedonistic, nervous, No guilt)
- Everyday travel mode use and changes in general travel mode use after switching to PHEV/BEV
  - Car, Public transportation, bicycle, walking

# OWNERSHIP AND EV TYPE



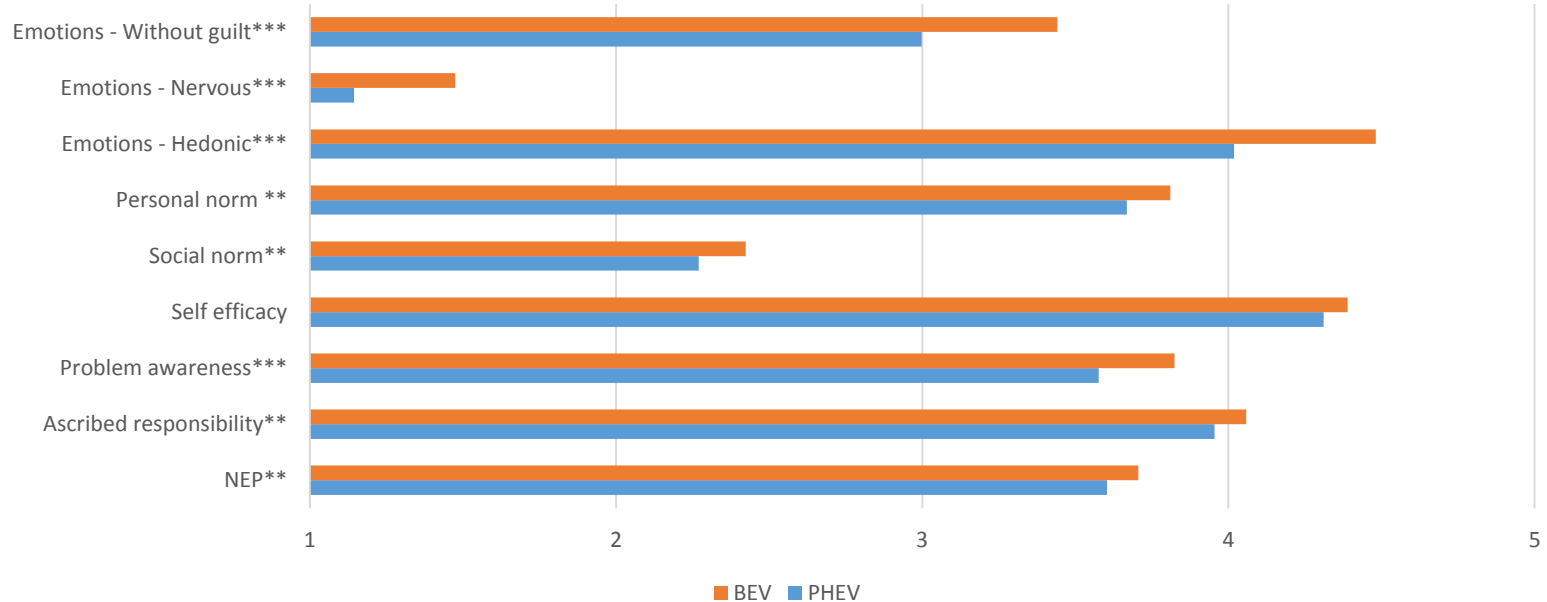
# WHAT MEASURES ARE NEEDED FOR FUTURE EV ADOPTION?

(SCALE 1 = OF NO IMPORTANCE AT ALL, TO 5 = OF OUTMOST IMPORTANCE)



# GENERAL ENVIRONMENTAL & EV-SPECIFIC ATTITUDINAL FACTORS

(SCALE: 1 = NOT IN AGREEMENT AT ALL TO 5 = IN TOTAL AGREEMENT)



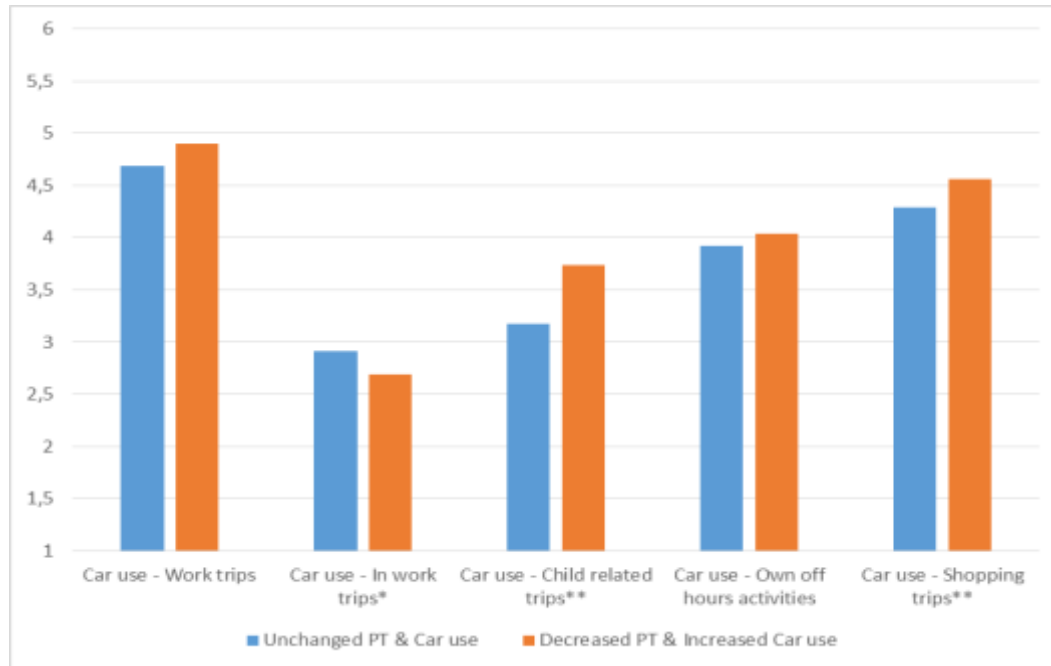
# CHANGES IN TRAVEL MODE USE AFTER SWITCHING TO A PHEV OR BEV

Table 1. Percentage of participants reported changes (Decreased, Unchanged, or Increased use) in travel mode use (Car use, Public transportation use, Bicycle use, and Walking) after the purchase of an EV. The results are controlled for change of residence between the purchase and the data collection.

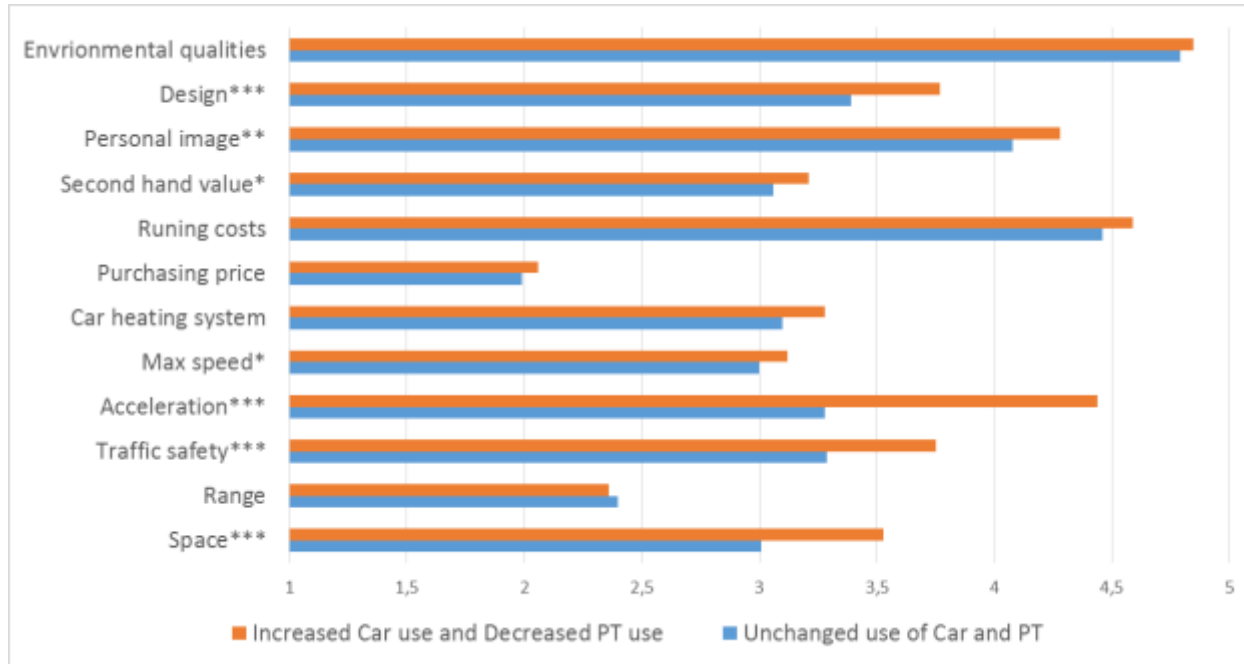
<i>Changes in use (%)</i> :	Significantly less use		Less Use		Unchanged use		More use		Significantly more use	
	PHEV	BEV	PHEV	BEV	PHEV	BEV	PHEV	BEV	PHEV	BEV
Car	0.5	0.1	3.4	3.3	85.1	65.8	9.0	<b>25.7</b>	2.0	5.1
Public transportation	5.5	<b>8.3</b>	2.5	<b>10.5</b>	86.8	76.8	4.5	3.8	0.6	0.7
Bicycle	1.9	2.5	4.6	10.0	86.2	80.8	6.5	6.1	0.9	0.7
Walking	0.7	0.4	1.9	3.6	91.2	88.5	5.5	7.1	0.7	0.4



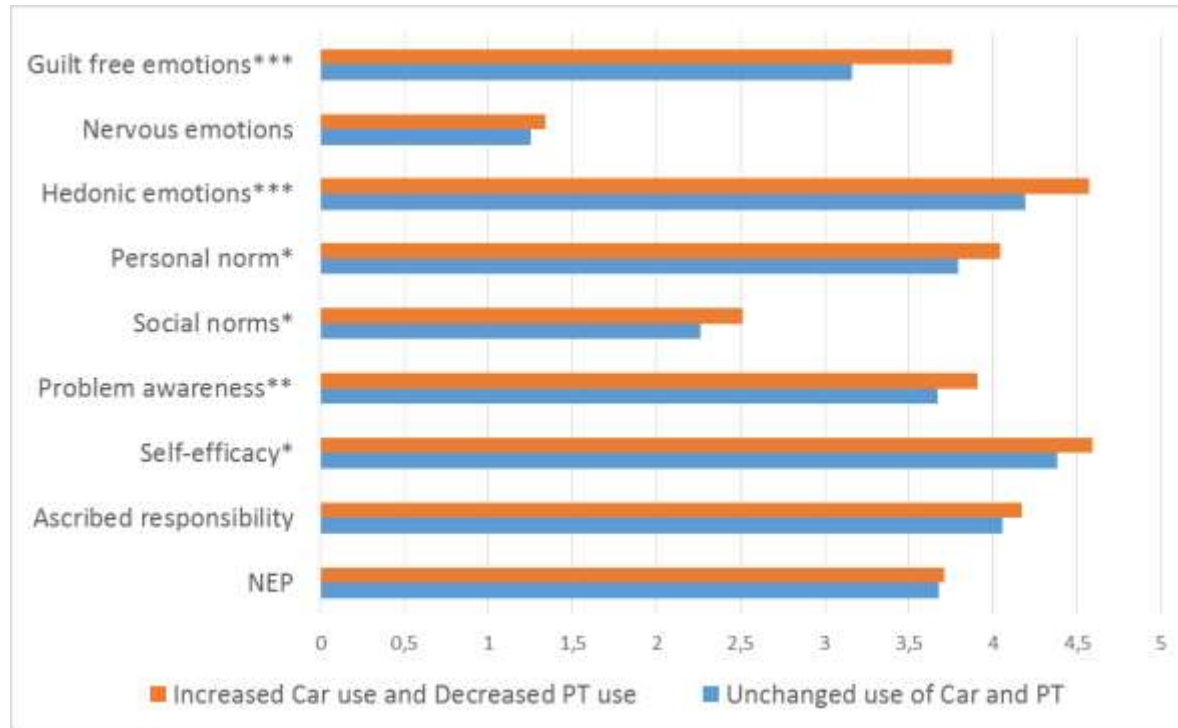
# EVERYDAY CAR USE



# GROUP DIFFERENCES IN VIEWS ON EV COMPARED TO CV



# GROUP DIFFERENCES IN ATTITUDES



# CONCLUSIONS

- Private leasing seems to be a way to get people to try out a BEV
- The myth of infrastructure ...
- There are signs of rebound effects (using the car more after they have switched to an EV & decreasing the use of PT) – especially among BEV owners
- Given that the rebounders are strong in their environmental attitudes (personal norm, problem awareness, etc.) and feel guilt free using their car
  - A sense of “I've done my part, now I can drive as much as I want” may have come upon them...





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