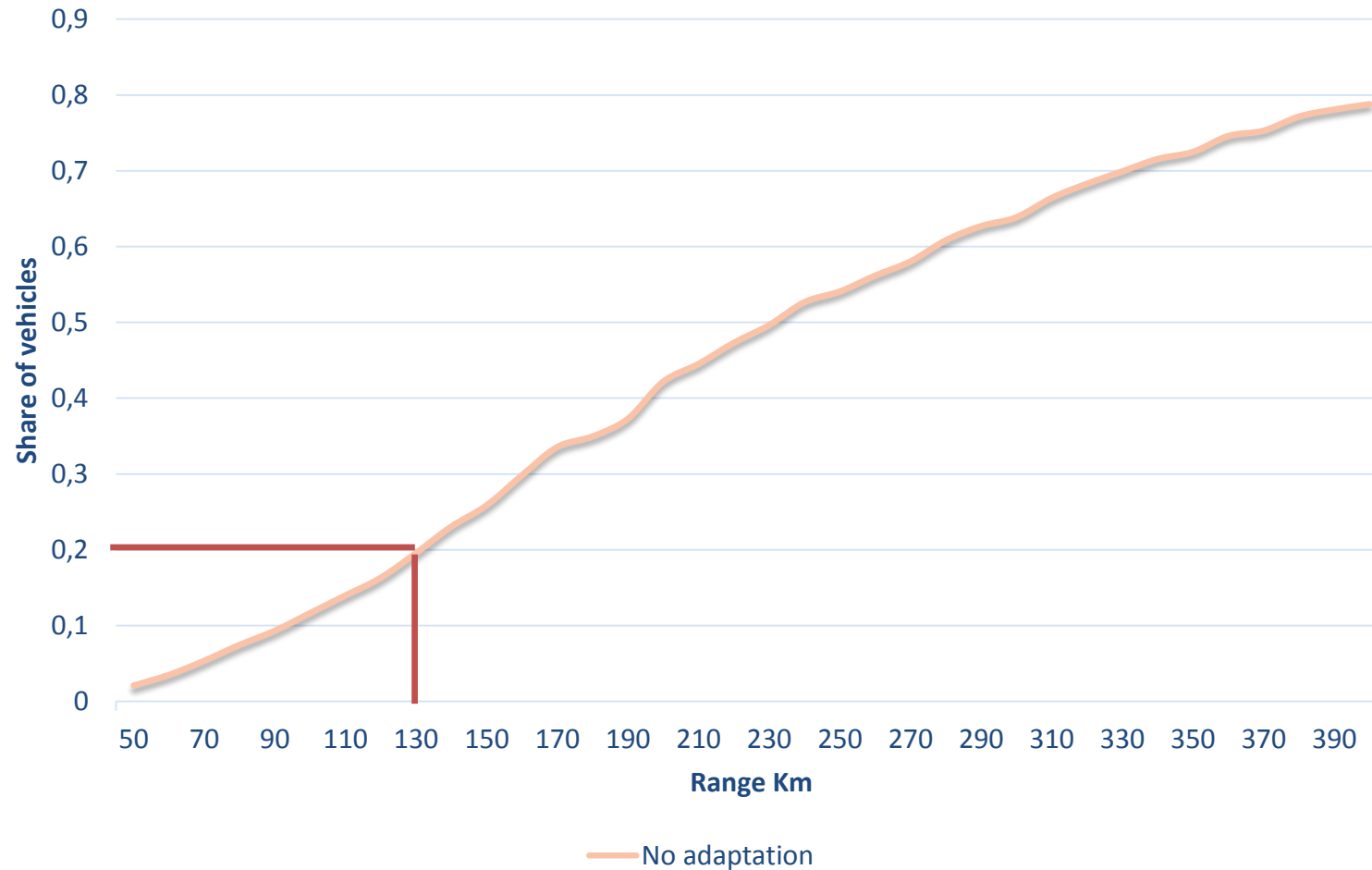




# E-mobility – a research perspective

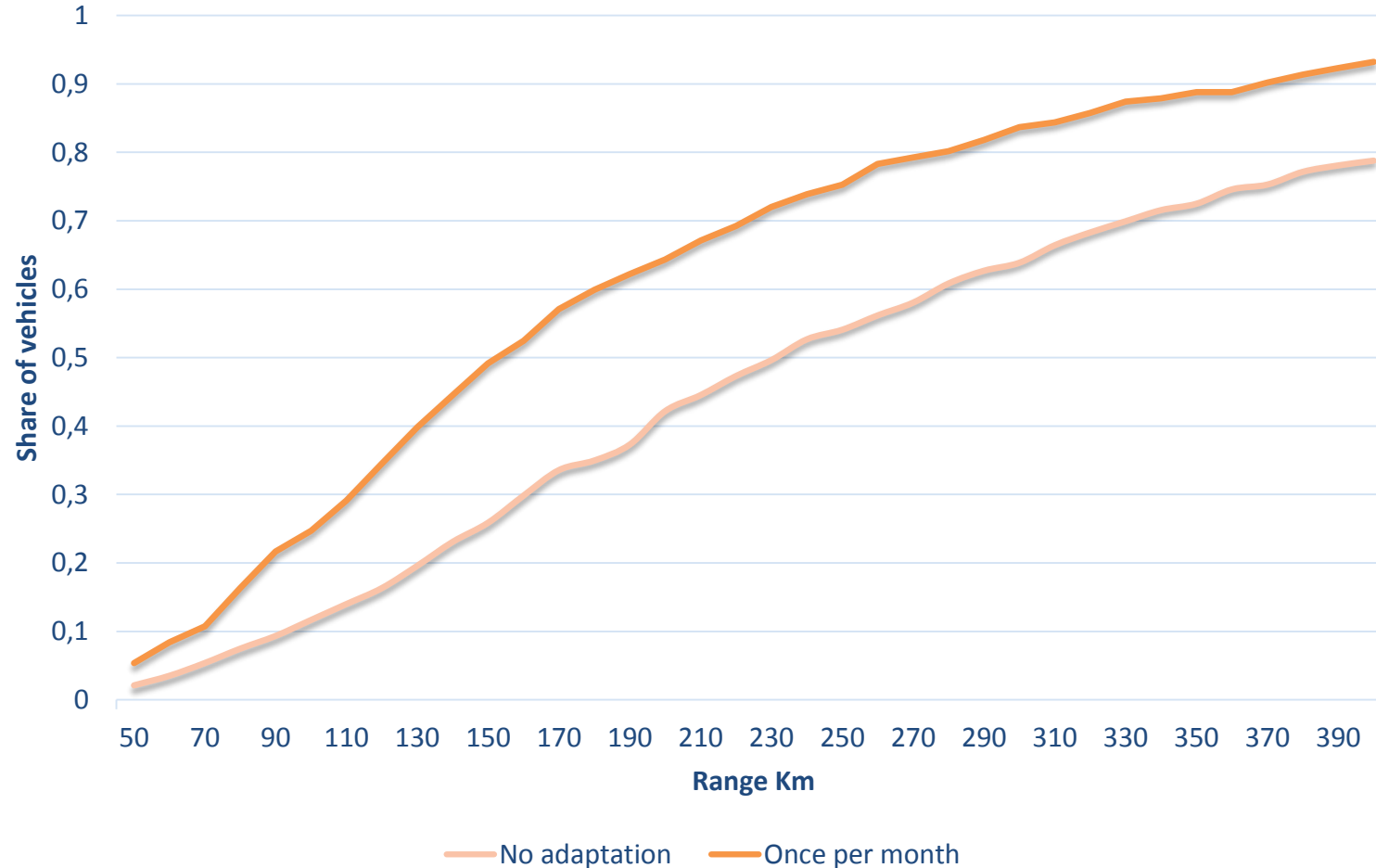
**Frances Sprei,  
Assistant Professor in sustainable mobility,  
Chalmers**

# Share of vehicles that can cover all their driving on a given range



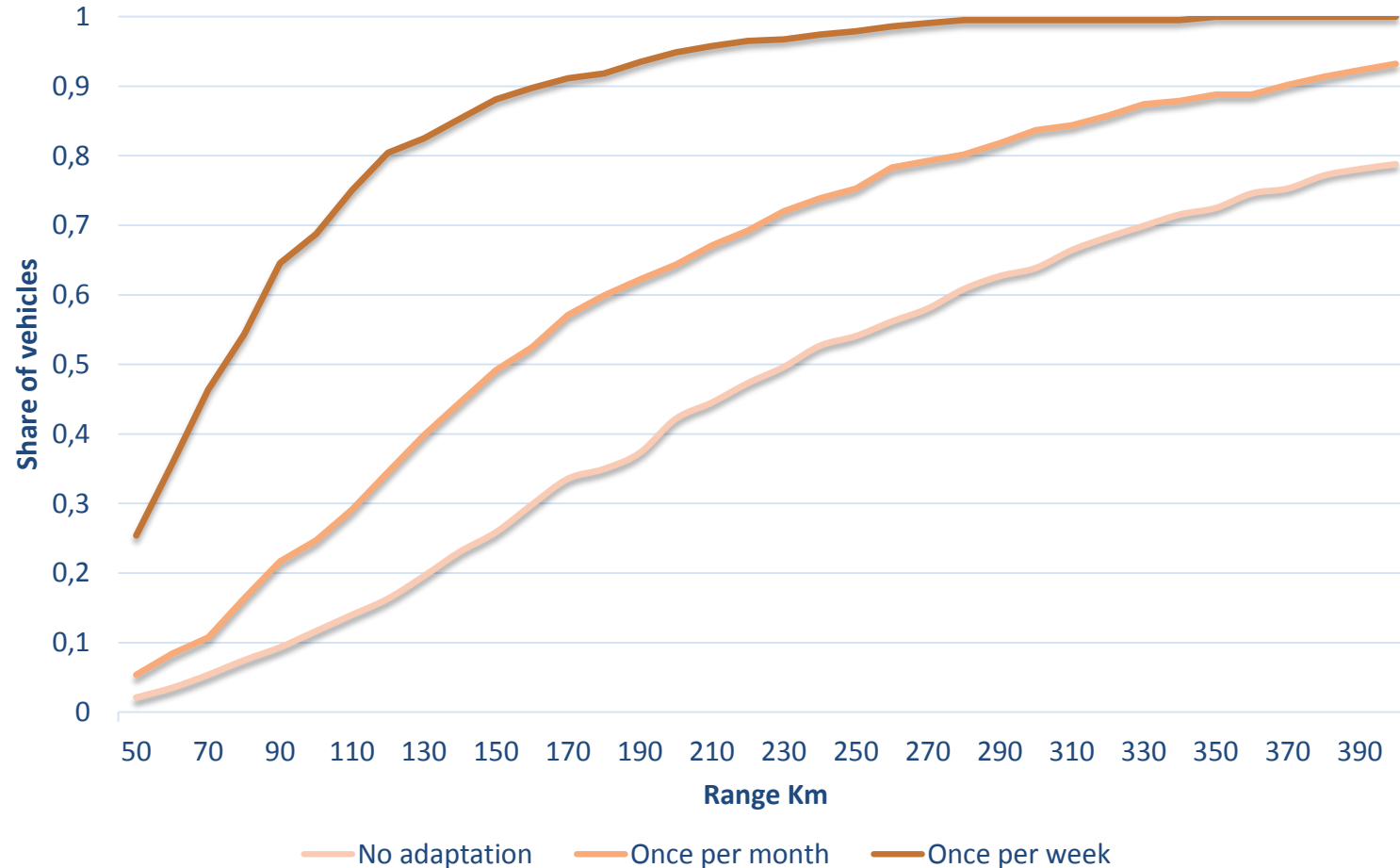
Source: Jakobsson et al, 2016

# Share of vehicles that can cover all their driving on a given range – with adaptation once per month



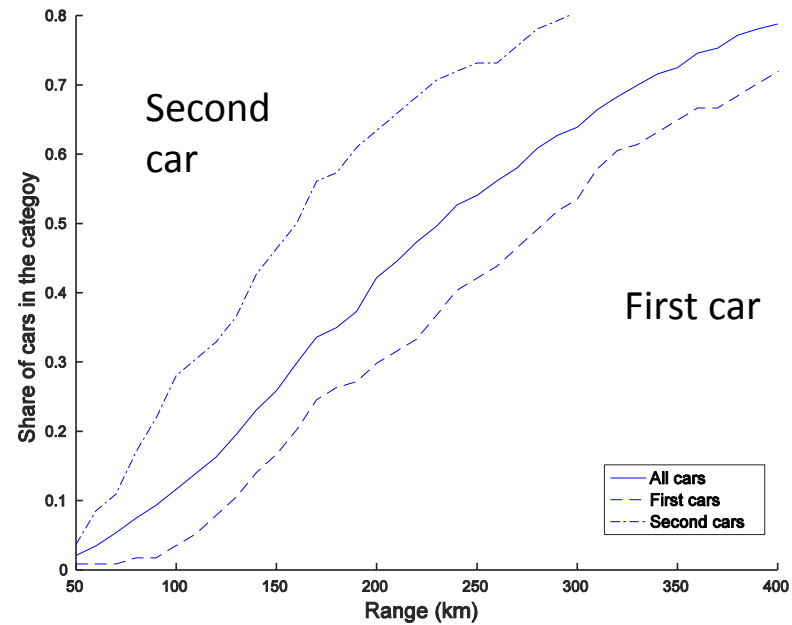
Source: Jakobsson et al, 2016

# Share of vehicles that can cover all their driving on a given range – with adaptation once per week



Source: Jakobsson et al, 2016

# BEVs in Multi-Car Households



**Fulfill all driving at range 120 km:**

First cars < 10%

All Cars ≈ 15%

Second cars ≈ 30%

# How does range and charging power affect charging need?

Power	50 kW		
Range [km]	100	200	300
Time (min)	14.09	22.8	27.0
fast charging stations/1,000 BEV (VRI)	6.8	5.3	3.7

Based on German driving data, queing model, max 5 min waiting

Source: Gnann et al, forthcoming

# How does range and charging power affect charging need?

Power	50 kW			100 kW		
Range [km]	100	200	300	100	200	300
Time (min)	14.09	22.8	27.0	7.0	11.4	13.5
fast charging stations/1,000 BEV (VRI)	6.8	5.3	3.7	2.4	1.8	1.2

Based on German driving data, queing model, max 5 min waiting

Source: Gnann et al, forthcoming



# How does range and charging power affect charging need?

Power	50 kW			100 kW			150 kW		
Range [km]	100	200	300	100	200	300	100	200	300
Time (min)	14.09	22.8	27.0	7.0	11.4	13.5	4.7	7.6	9.0
fast charging stations/1,000 BEV (VRI)	6.8	5.3	3.7	2.4	1.8	1.2	1.4	1.0	0.7

Based on German driving data, queing model, max 5 min waiting

Source: Gnann et al, forthcoming



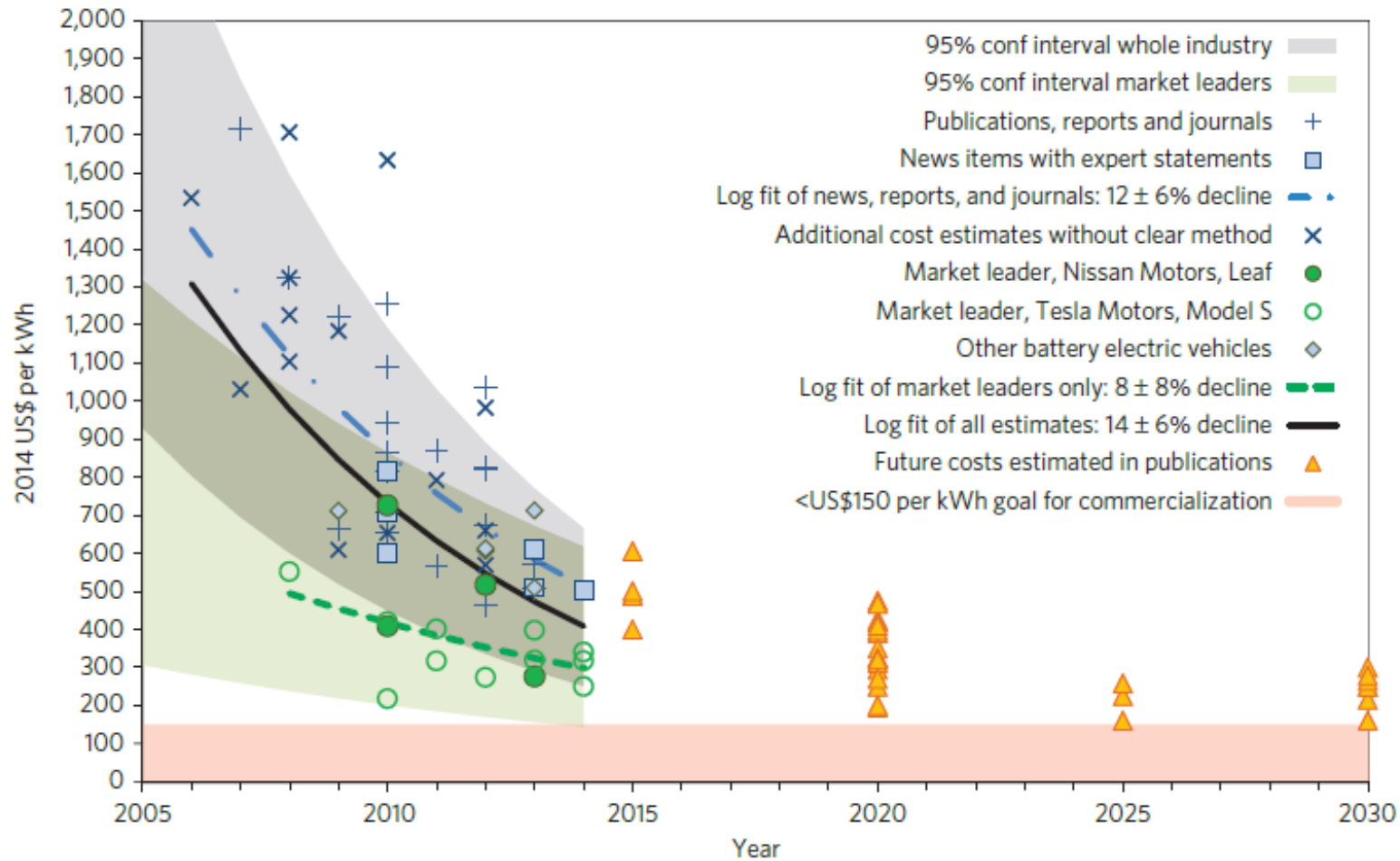
# Insecurity larger barrier than limited range

- Interviews with 25 households that tried e-Golf for 3-4 months
- Insecurities regarding:
  - How much range is really left?
  - Can I trust the charging station?
  - What is the lifetime of a battery and how does it affect second-hand price?



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# Decreasing battery prices



Nykvist & Nilsson, 2015, Nature Climate Change