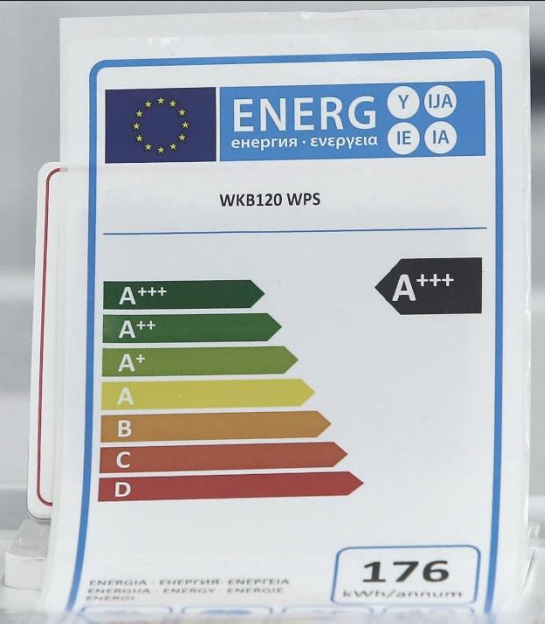
THE IMPACT OF ENERGY COST INFORMATION ON CONSUMER PREFERENCES FOR ENERGY EFFICIENT CARS



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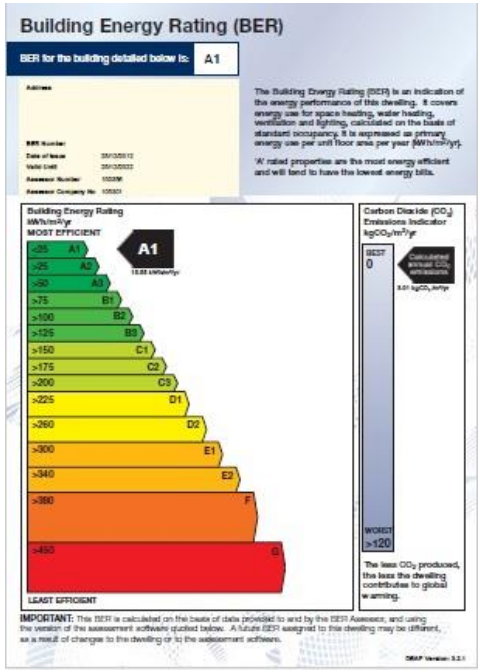
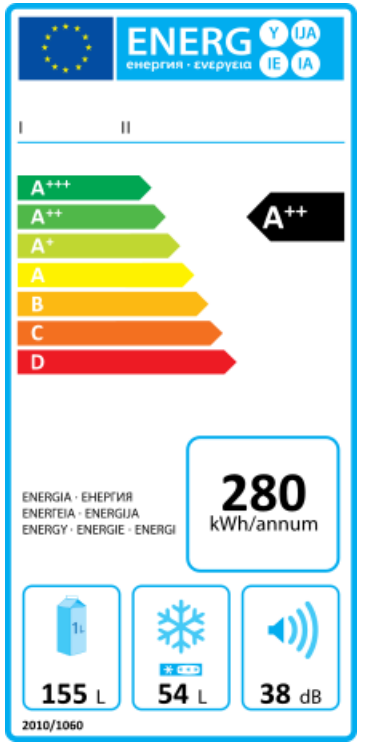
Energy Labels

- Required by legislation in a number of sectors and jurisdictions (BER, EU Energy Labels)
- Designed to help individuals and businesses make better decisions
- Provision of information as a means of encouraging the purchase of more energy efficient goods
- Demand management approach, help reduce the impact of purchases on the environment
- Designed to address an “information gap”





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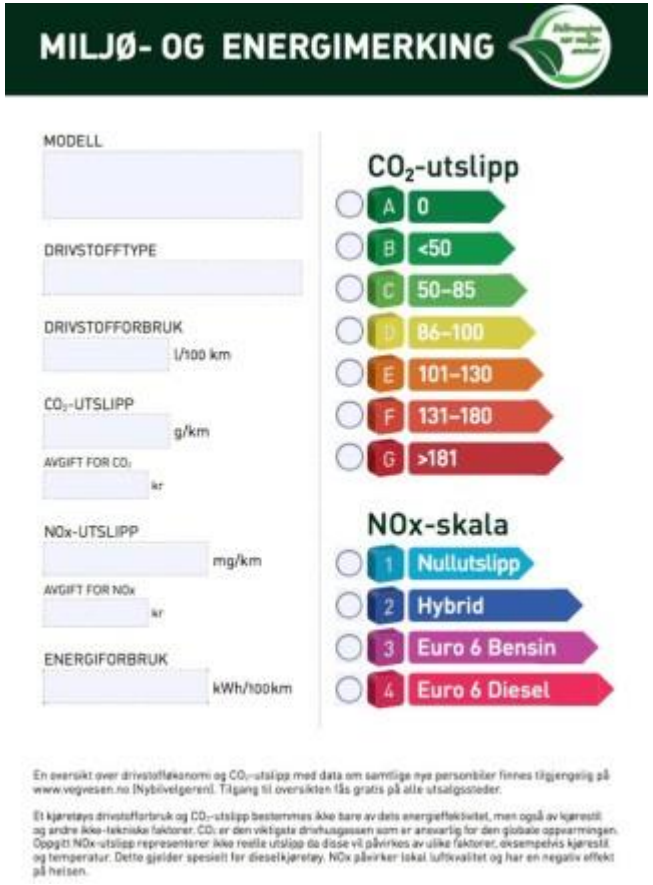
Research Objective

To examine how the re-framing fuel of consumption information in terms of monetary costs can change consumers' willingness to pay for more fuel efficient vehicles

Specifically, looking at the sale of new conventional vehicles in the Norwegian market, using a stated preference discrete choice experiment

Car Sales in Norway

- Current labelling required for new car sales in Norway
- Contains carbon dioxide and nitrogen oxide emissions information
- Similar colour coding and alphabetical classification to other labels
- Emissions information in grams of CO2 per kilometre
- Norway is an atypical car market
- Large amount of electric car and hybrid adoption and a wealthy consumer base



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Discrete Choice Modelling

- Discrete choice modelling aims to replicate the conditions of a real world market place in a controlled experiment
- Alternatives (cars) represented as bundle of component attributes
- Probability of a given alternative (car) being selected will be a function of the underlying utility the consumer derives from the levels of the product attributes
- We examined the role of **attribute framing** in consumer choices-underlying attributes values are common across designs
- Note: This should be considered primarily as an information framing experiment

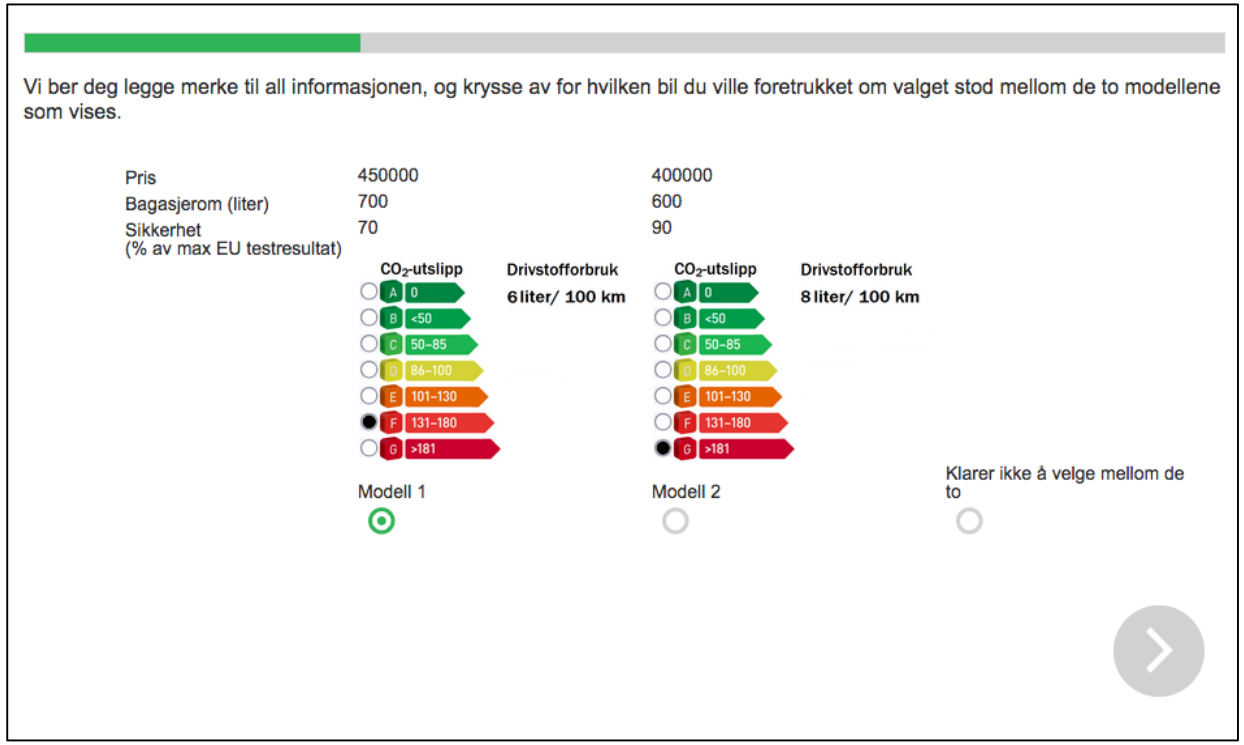
Experimental Design

- Four attributes selected for the experiment
- Attributes identified from focus groups from a previous stage of the project
- Half of participants assigned to control group (just fuel consumption information litres/100km)
- Half assigned to the treatment group (fuel consumption + monetary information)

Cost (NOK)	Fuel Consumption	Safety	Capacity
500K	0.8	90	700
450K	0.7	80	600
400K	0.6	70	500
350K	0.5		400
	0.4		

Sample Scenarios

Control



Treatment

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Survey Description

- Survey distributed to ~1000 individuals in late 2017
- Formed part of a larger Norwegian study examining the importance of energy labelling and the desire for more energy efficient products
- Sample provided by a third party survey collection specialist organisation
- Respondents must have bought a **new car** in the last 5 years or are currently intending to do so
- Aimed to be representative of the new car buying population, not the general population of Norway

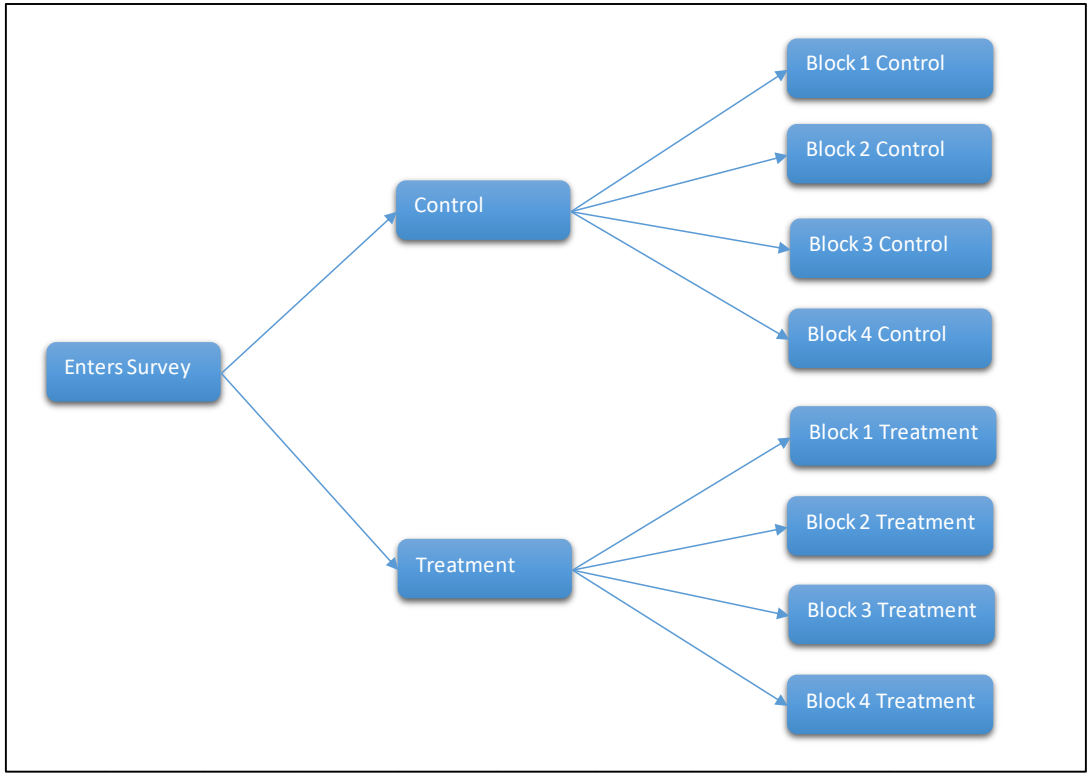
Sample

- Control and treatment samples very similar in terms of:
  - Age
  - Gender
  - Geographic representation
  - Socio-economic divisions/education

	Control		Treatment	
Mean Age	48.4		49.16	
	Male	Female	Male	Female
Gender Ratio	281	274	266	272

Respondent Assignment

- 32 choice scenarios
- Split between 4 blocks of 8 choices
- Replicated for both control and treatment options



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Modelling

- Multi Nomial Logit Model with a linear utility equation
- “No choice” represented by constant in utility equation
- Demographic and attitudinal variables were included in initial models, however these emerged as non-significant so are not included in these results
- Interaction modelling approach used rather than splitting the sample and creating a control and treatment group models

Results

	Value	Stand Err	Z
Cost	-.57D-05***	.3329D-06	-17.23
Fuel Consumption	-.49462***	.01827	-27.08
Treatment	.72588***	.16591	4.38
Interaction	-.09417***	.02484	-3.79
Capacity L1	REF	REF	REF
Capacity L2	.32556***	.03970	8.20
Capacity L3	.59540***	.04184	14.23
Capacity L4	.59201***	.05115	11.57
Safety L1	REF	REF	REF
Safety L2	.30861***	.03468	8.90
Safety L3	.66782***	.04403	15.17
Constant	-6.15921***	.19372	-31.79

*** significant @ p=0.01

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Willingness to Pay

- How much will consumers pay for a one level increase in the value of an attribute
- Function of the estimated fuel consumption parameter and cost parameter
- WTP for fuel efficiency increases by **19%** when fuel consumption information is augmented with monetary information
- 10 NOK ~ 1€

Model	Willingness to Pay Lower Fuel Consumption
Control	**86235 NOK**
Treatment	**102653 NOK**

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Limitations

- New car sales are a complex and nuanced area that is hard to accurately replicate in a simple experiment such as this
- A number of important attributes had to be excluded such as: brand, model type, additional features, warranty etc.
- However, the purpose of this experiment wasn't to create totally accurate WTP estimates for fuel efficiency
- It was to examine relative differences arising from different framing effects

Conclusions and Implications

- Results indicate that the provision of monetary estimates increases consumer valuations of fuel efficiency
- Highlights the information failures that are present in current labelling approaches

- Consumers can then compare fuel consumption with other recurring monetary costs such as car tax, insurance, purchase price, as well as estimated resale value etc.
- May help promote the sale of more efficient vehicles
- Although tested on conventional vehicles, very applicable to EV with low fuel costs

Thank You

- Questions?
- http://www.conseedproject.eu/

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