Households' WTP for the Security of Transport Fuels Supply

For the panel:
"Transportation Modeling: Urban Studies and Willingness to Pay"

Stanford, July 2011

Wan-Jung Chou and Alistair Hunt (Bath University),

Anil Markandya (Vasque Centre for Climate Change, Bath University)

Andrea Bigano and Roberta Pierfederici (FEEM)

Stéphane La Branche Head (Climate and Energy Research Chaire, Institute of Political Studies, Grenoble, and IPCC)

Pacte
Politique-Organisations

This presentation is part of a larger study:

Consumer valuation of energy supply security: an analysis of survey results in three EU countries (France, UK and Italy)

An economics and sociological study conducted for the European commission by

CEPS - the Centre for European policy studies

Pacte
Politique-Organisations

Methodology

A choice experiment approach to investigate energy users' willingness to pay (WTP) for potential policy measures to tackle:

1- reducing the dependence on crude oil

2- cutting CO2 emissions for the transport sector

Focus Groups

- 725 households from UK, France and Italy were interviewed: Two groups of 25 in the UK and one each in France and Italy.
- Participants were selected so as to have representativity - socioeconomic groups, gender, employment status, education level and age.
- Pilot surveys were implemented beforehand the surveys, carried out in late March and April of the year 2010, using computer assistant personal interviewing (CAPI).
- The raw data included 303 households (heads of household) in the UK, 222 in Italy and 200 in France.

Pacte
Politique-Organisations

Focus groups II

- Each respondent in the UK was required to complete 4 different choice exercises, each with two options.
- Respondents in Italy and France were asked to complete 16 choice exercises.
- Respondents were asked about their experience of the use of energy in their homes and daily transports, their attitudes towards some contextual statements related to energy supply and quality and their socio-economic backgrounds.

Pacte
Politique-Organisations

The choice card experiments : example

"Imagine that your vehicle could be powered by the combined use of a fossil fuel and a substitute fuel. All potential substitute fuels have lower CO2 emissions than petrol/diesel, but some produce more emissions than others.

- A higher percentage of substitute fuels required to power your vehicle means that you would be less dependent on oil and thus less vulnerable to fluctuations of oil prices and supply. Lower average CO2 emissions produced by your vehicle mean lower climate change effects. Note that the use of substitute fuels will not affect the energy efficiency of your vehicle".

Example of choice to be made

	Alternative A	Alternative B	Alternative C
Share of substitute fuel used by your dual-fuel vehicle(s)	5%	10%	1%
Average CO2 emissions (in grams) per kilometre of your vehicle(s) when in motion	136g/km	144 g/km	160g/km
Increase in ANNUAL fuel costs	£117 (£9.75 per month)	£156 (£13 per month)	No increase (£0)

Pacte
Politique-Organisations

A formula!

- The probability of individual i choosing alternative j in a given choice situation is
- logit and can be written as the following closed form:
- Pr OB(Yi=J)=$\frac{\exp(S' Xij+YijZi),}{\Sigma J/g=1\exp(\beta ' Xig+Y' gZi)}$

where Y is the index of the choice made

Pacte
Politique-Organisations

Results:
WTP for a reduction in CO2 emissions

- **French** respondents WTP for a reduction in CO2 emissions (+0.625 €)
- **UK** respondents are WTP for a reduction in CO2 emissions (+2.51 €)
- **Italians** respondents are WTP for a reduction in CO2 emissions (+1.4 €).

Pacte
Politique-Organisations

Results:
WTP for fuel substitution

- **Italians** are WTP for an increase of 1% in substitute fuels (+8.4€).
- **French** are not WTP for an increase in substitute fuels (-1.625 €).
- **UK:** no result about WTP for substitute fuels (0€). Respondents tend to opt for the status quo option.

Pacte
Politique-Organisations

Results:
Age and Educational level

- **UK** age effect : 35 and 54 have higher WTP to cut CO2 emissions than younger cohort. Older cohorts have lower WTP.
- **French** Age effect: 45-64 more WTP to reduce emissions than other age groups.
- **Italy** Age effect: only those aged between 55 and 64 WTP for CO2 abatement and not as high as same French age group.
- **UK and France** Educational level : the higher, the higher the WTP for a cut in CO2 emissions. NOT Italy - only small effect for fuel substitution.

Pacte
Politique-Organisations

Lessons:

- Lesson : the richer, the more WTP ? Up to a point. The more educated, the more WTP? It depends: yes in France and UK , but not in Italy. WHY?
- French least WTP for both sub fuel and co reduction anything!

But also:

In all three countries, WTP for both substitute fuels and lowering emissions is higher for energy industry workers. Thus, knowledge and awareness of energy-climate issues play a role.

But also…:

Pacte
Politique-Organisations

Oh Brother rationalis economicus, where art thou?

- Cost of energy and transports is ONE of many factors playing a role in individuals' perceptions of dependency.

- Knowledge, evaluation of personal risks and gains; comfort; perception of individual freedom; national energy structure (highly nuclearised in France, but not for transports, still perception of dependency on carbon based energy may be affected); personal preferences and values as well as representations reg. transports; evaluation of vulnerability to price fluctuation and climate impacts…

Pacte
Politique-Organisations

POLICY IMPLICATIONS FOR EU WIDE ENERGY-CLIMATE POLICY

VS

- national and local… energy structures
- national and local… political cultures
- national and local… levels of knowledge reg. climate and energy issues.

Many national, local and individual non economic incentives and constraints.

What about new transportation technology? Rebound effects…

Pacte
Politique-Organisations

thanks

Pacte
Politique-Organisations

Oil dependency on the transport sector in three countries

Consumption of petroleum productions of the nation's total consumption by the transport sector :
- about 80% in the UK;
- about 70% for Italy and ;
- about 65% for France.

Dependency is high on cars for daily life, especially work and family buisiness.

This dependency has a direct impact on CO^2 emissions

Pacte
Politique-Organisations