FRENCH CONVERSION PREMIUM OF 2019
Ex-post socio-economic analysis

International Conference on mobility Challenges, Ecole centrale-supélec
université Paris Saclay

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Summary

1. Introduction – Presentation of the French conversion premium mechanism, statistics

2. Methodology and assumptions

3. Key achievements – Socio-economic and user performance
1. INTRODUCTION:
Presentation of the French conversion premium mechanism, statistics
One word about our office

Ministry of Ecological Transition

Many directions, one is:

Our office: energy and solidarity transition

General Commission for sustainable development -> data production & studies/knowledge/evaluation

Green and Solidarity Economy Service

Economy and evaluation

Macro part: macro models, long term evaluation, carbon tarification

Micro part: mainly a microsimulation model (energy bills [housing and transport], energy check, index of energetic precarity, etc.)

Other subjects: tertiary sector, evaluation of aids device on housing and transport, etc.
Impact Evaluation in France

- **Culturally**, in France: very few impact of evaluation studies
  (lack of data and quality of data, *ex ante/ex post* evaluation…)

But it’s changing **last two decades** because of…

- Growing demand concerning efficacy of public policies (justify the cost borne by taxpayer, efficient allocation of resources,…)
- Development of **new empirical methods and data**
- **Law of 2008**: impact studies became constitutionnal

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**Efficiency of public policies / democratic requirement**

- Conversion premium as an example: i) administrative *ex post* evaluation ii) cost-benefit analysis
French conversion premium - *objectives*

- **Objective of the measure**: accelerate the Energy transition of the automobile fleet by providing a financial incentive for households and enterprises
  - Replacement of *older vehicles (polluting vehicles)*
  - It complements existing bonus/penalty policy

- **Environmental & social objectives**
French conversion premium – background

2015
- Creation of the conversion premium policy

2018
- Expansion of the allocation’s terms
  - 330 000 attributions

2019
- Improved targeting of beneficiaries
  - 250 000 attributions
What are the challenges?

- **Cost-benefit analysis**: 
  - Environmental benefits: (CO2, fine particles, Nox)
  - User benefits (including all taxes): gains in fuel consumption, gains in maintenance costs, extra cost due to the anticipation of the purchase of a new and more efficient vehicle
  - Socio-economic assessment: environmental assessment + user assessment (without taxes)

- **Issues raised**:
  - Particular structure of beneficiaries
  - Building an effective counterfactual
  - User point of view/ collectivity point of view
Database used for the study

- **Comprehensive and administrative** data from the ASP (Agence de service et de paiement)

  - **Gives information** about:
    - Vehicule scrapped
    - Vehicule purchased
    - Beneficiairies

  - **Create information** based on assumptions …
    - Vehicle purchased: *lifetime, maintenance costs, NOx emissions and fine particles…*
    - Vehicle scrapped: *consumption, holding period, household’s annual mileage, vehicle’s circulation zone*

  - And **other data** (Insee, SDES, Citepa, etc.)
    - Emissions, consumption, price, discount rate, maintenance costs, price elasticity, etc.
**Beneficiaries’ and scrapped vehicles’ characteristics**

- **Mainly non-taxable households**

**Specification of beneficiaries**

- **Mainly diesel vehicles**: 85% of the scrapped vehicles are diesel
Characteristics of purchased vehicles

• Purchased vehicles are mostly **secondhand** vehicles:
  70% **secondhand** vehicles

• Purchased vehicles are mostly **diesel** and **gasoline**:
  53% **diesel**, 46% **gasoline**
2. Methodology and assumptions
Main assumption based on behaviour

- The premium **modifies household behaviour**:

<table>
<thead>
<tr>
<th>Reactions</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>They replace older vehicle earlier</td>
<td><em>anticipation time</em></td>
</tr>
<tr>
<td>They buy a new more efficient vehicle</td>
<td><em>counterfactual vehicle consumption</em></td>
</tr>
<tr>
<td>They buy a more expensive (excluding premium)</td>
<td><em>additional cost</em></td>
</tr>
</tbody>
</table>
**Time window of analysis**

**Vehicle scrapped vs new vehicle**
- gains in CO2, Nox, fine particule, consumption, etc

**New vehicle vs counterfactual vehicle**
- gains in CO2, annual consumption

*General Commission for sustainable development, French Ministry for the Ecological Transition*
# Vehicle counterfactual

## What is it? For the user, the society...

<table>
<thead>
<tr>
<th>Different cases</th>
<th>Assumption = counterfactual emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchase of a new vehicle</strong></td>
<td>counterfactual emissions = average emission of new vehicles GO/ES (SDES) * cale ParcAuto revenu (Kantar Sofres)</td>
</tr>
<tr>
<td><strong>Purchase of a second hand vehicle:</strong></td>
<td></td>
</tr>
<tr>
<td>- Vehicle « entering » = vehicle « at the top » of the purchase resale chain</td>
<td></td>
</tr>
<tr>
<td>- The premium has an influence on the purchase behaviour beyond the only purchase allowed by the subsidy</td>
<td></td>
</tr>
<tr>
<td>- The new vehicle entering in the fleet have the same characteristics as the purchased vehicle thanks to the subsidy</td>
<td></td>
</tr>
<tr>
<td>This vehicle counterfactual is the same as the Case A</td>
<td></td>
</tr>
</tbody>
</table>
3. Key achievements – Socio-economic and user performance
Average socio-economic assessment by vehicle

2018 scale

2019 scale

Key achievements – Socio-economic and user performance

General Commission for sustainable development, French Ministry for the Ecological Transition
Average user assessment by vehicle

2018 scale

2019 scale

General Commission for sustainable development, French Ministry for the Ecological Transition
Environmental benefits

3. Key achievements – Socio-economic and user performance

2018 scale

2019 scale
French conversion premium of 2020 …

- Conversion premium became a tool for recovery plan:
- stimulate demand in the automotive industry (bonus revaluation, expansion of elegibility terms)

- Total socio-economic assessment

Source: Calculs CGDD

Comparison between scales:
Thank you for listening...
Bibliography

Links if you are more interested:

• Mathilde Clément, Mathilde NIAY – « Prime à la conversion des véhicules particuliers en 2019 »
• Xavier d'Haultfoeuille, Isis Durrmeyer, Philippe Février - « Le coût du Bonus/Malus écologique : que pouvait-on prédire ? »
  https://www.cairn.info/revue-economique-2011-3-page-491.htm
  →elasticity for anticipation time assumption
• Site du SDES :
  https://www.statistiques.developpement-durable.gouv.fr/

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ANNEX
Average assessments by vehicle:

Detailed socioeconomic assessment by beneficiaries
Average assessments by vehicle:

Detailed user assessment by beneficiaries

- fuel consumption
- maintenance cost
- gain (with premium)
- gain (without premium)
- extra cost

- taxable
- other non taxable
- two deciles
- long distances drivers
- legal entities

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3. Key achievements – Socio-economic and user performance

Detailed socioeconomic assessment by zone
\[-\frac{d_i}{d_i^2} - 1 = \left| -\frac{p_i}{PA_i} \right| \times e_{I/NI} \]

\[\Rightarrow d_i = (1 + \left| -\frac{p_i}{PA_i} \right| \times e_{I/NI}) \times d_i' \quad \text{et} \quad A = d_i - d_i' \text{ (durée d’anticipation)} \]

\[\Rightarrow A = d_i' \left(1 + \left| -\frac{p_i}{PA_i} \right| \times e_{I/NI} - 1\right) \]

\[\Rightarrow A = d_i' \times \left| -\frac{p_i}{PA_i} \right| \times e_{I/NI} \]