Research Initiative on Sustainable Mobility
March 25. 2019
Coordinated by Jean-Pierre Ponssard

Objectives

Transportation for passengers and merchandises is one of the major sources of CO2 emissions worldwide and urban toxic particles (NOx, fine particles…). Emissions are barely declining in OCDE countries and bound to grow in emerging countries due to the increase in standards of living and urbanization. This situation creates an important challenge for the mitigation of climate change: new technologies have been launched, a set of complementary policies has been designed both national and local, and consuming habits are changing.

Research Topics

- Economics of the new powertrains: evaluation and deployment strategies
- Learning-by-doing, spill-overs and coordination needs along the value chain
- Competition and/or complementarity in usage and infrastructures (lock-in issues)
- Implications of zero emission vehicles for electricity storage and supply/demand balance
- New trends in transportation modes (collaborative transportation modes, development of multimodal journeys, autonomous vehicles…)
- Evaluation of public policies at the national and local levels (carbon tax, subsidies, technical norms, driving restrictions, urban tolls…)
- The financing of the energy transition for land transportation (at what stage and how, public and private funding, joint partnerships, what international framework, sectoral agreements)

Research team (2018-2019)

Jean-Pierre Ponssard, Geoffrey Barrows, Anna Creti, Patricia Crifo, Silvia Concettini, Guy Meunier, Juan Pablo Montero,
Doctoral student Aurélien Bigo, Research assistant Margarita Kirneva

Planning of activities for 2019

1. **Working papers**

- Efficiency and distributional implications of combining road pricing and driving restrictions Juan-Pablo Montero, Leonardo Basso, and Felipe Sepulveda, first draft available for private distribution
- Financing innovative green projects with asymmetric information and costly public funds. Guy Meunier and Jean-Pierre Ponssard, first draft available for private distribution
- Competing green technologies and the dynamic of transition. Guy Meunier, Michel Moreaux and Jean-Pierre Ponssard, ongoing research
- Optimal subsidies in an open economy with learning by doing and environmental externalities: the case of sustainable mobility, Anna Creti, Silvia Concittini, Jean-Pierre Ponssard, on going research
- Analysis of international agreements for green cities, Guy Meunier and Jean-Pierre Ponssard ongoing research
- Pollution, health and urban form, Patricia Crifo and Michaël Auger, ongoing research
- Innovation Policy, Patent Quality, and Environmental Performance: An Empirical Investigation of Supply-Side Subsides vs. Demand-Side Incentives, Geoffrey Barrows, Jean-Pierre Ponssard and Diogo Machado, ongoing research
- How to explain the past trends in transport CO2 emissions in France? A decomposition analysis for the 1960-2015 period, Aurélien Bigo, ongoing research

2. **PhD and Master thesis**
   - Contributions à l'analyse de la transition énergétique dans les transports. Aurélien Bigo, PhD thesis, (Ecole Polytechnique, CIFRE SNCF), 2017.
   - Evaluation of scenarios for the energy transition in French urban areas at the 2030 horizon, Narottam Dalmia, Master thesis (Ecole Polytechnique and Engie)
   - Climate sub-national initiatives, The case of C40 and mobility, Pietro Anget and Lucie Moulin, Master thesis (Ecole Polytechnique)
   - Optimal subsidy for risky green projects in a dynamic context, Margarita Kirneva, Master thesis, (Ecole Polytechnique).

3. **Workshop**

   - Fourth workshop on The Energy Transition in Land Transportation scheduled for Dec. 2019

List of past activities

1. **Publications**
   - Policies and deployment for Fuel Cell Electric Vehicles an assessment of the Normandy project, Brunet, J. and Ponssard, J.-P. (2017). *International Journal of Hydrogen Energy* **42-7**: 4276-4284. http://dx.doi.org/10.1016/j.ijhydene.2016.11.202
   - Defining the Abatement Cost in Presence of Learning-by-doing: Application to the Fuel Cell Electric Vehicle. Anna Creti, Alena Kotelnikova, Guy Meunier and Jean-Pierre Ponssard. *Environ Resource Econ*, *71(3), 777-800 (2018).* https://doi.org/10.1007/s10640-017-0183-y
   - Pour un financement conditionnel des projets risqués bas carbone, Guy Meunier and Jean-Pierre Ponssard, in *Revue de l'Energie,* janv-fév 2018 https://hal-polytechnique.archives-ouvertes.fr/hal-01366181

2. **Working Papers**
   - The importance of considering optimal government policy when social norms matter for the private provision of public goods. Guy Meunier and Ingmar Schumacher, FAERE Working Paper, 2017.17. http://faere.fr/pub/WorkingPapers/Meunier_Schumacher_FAERE_WP2017.17.pdf
   - Optimal Policy and Network Effects for the Deployment of Zero Emission Vehicles, Guy Meunier and Jean-Pierre Ponssard,CESifo working paper, 2018.4 https://www.cesifo-group.de/ifoHome/publications/docbase/DocBase_Content/WP/WP-CESifo_Working_Papers/wp-cesifo-2018/wp-cesifo-2018-04/12012018007026.html

3. **PhD and Master thesis**
   - Analysis of hydrogen-based transport system and the role of public policy in the transition to a decarbonized economy, Oct. 2016, Alena Kotelnikova, PhD thesis, Ecole Polytechnique
   - A Cost Benefit Analysis of Hydrogen for Mobility The Normandy Project and the French Roadmap, Sept. 2015, Julien Brunet, M2 REST, Ecole Polytechnique
   - Comment atteindre le facteur 4 dans les transports ? Analyse comparée de scénarios de prospectives à 2050. Sept. 2016, Aurélien Bigo, M2 Master EDDEE, Ecole Polytechnique
   - Optima and market failures in a spatial model in presence of network effects: the case of hydrogen in transport. Sept. 2017 Floriane Dieuleveut, M1 Master in Economics, Ecole Polytechnique.
   - R&D subsidies for the energy transition : the case of repayable advances. Sept. 2017. Sophie Chela, M2 REST, Ecole Polytechnique.
   - Aide à la décision aux politiques publiques urbaines liées à la qualité de l'air, Meryem Benmahdi, Paul de Guibert, Pierre-Alexandre Guyomar, Juin 2018, PSC, Ecole Polytechnique.
   - Analyse des externalités dans les transports terrestres de marchandises, Sept 2018, Dalia Amara, Master EEET, AgroParisTech.
   - Optimal subsidy for risky green projects, Sept. 2018, Margarita Kirneva, Master in Economics, Ecole Polytechnique.

4. **Technical reports**
   - A cost benefit analysis of fuel cell electric vehicles. Feb. 2015. Anna Creti, Alena Kotelnikova, Guy Meunier and Jean-Pierre Ponssard. Ecole Polytechnique https://hal.archives-ouvertes.fr/hal-01116997
   - The deployment of BEV and FCEV in 2015, Oct. 2015, Julien Brunet, Alena Kotelnikova, and Jean-Pierre Ponssard https://hal-polytechnique.archives-ouvertes.fr/hal-01212353

5. **Workshops (program, summary and presentations are available on the chair website)**
   1. Briefing mobility workshop, 2015.
   2. Briefing mobility workshop, 2016.
   3. Briefing mobility workshop, 2017.
   4. Briefing mobility workshop, 2018.

6. **Media and Press**
   - Presentation programme de recherche sur la mobilité 'Conference on Mobility Challenges Dec 6-7 2018) http://www.chair-energy-prosperity.org/videos/presentation-travaux-mobilite-jean-pierre-ponssard/ https://twitter.com/centralesupelec/status/1070990277882601478
   - Interview ILB, le plan hydrogène, Jean-Pierre Ponssard https://www.louisbachelier.org/ilb-web-tv-les-atouts-et-les-limites-du-plan-hydrogene-francais/
   - What policy should be adopted to encourage deployment of hydrogen vehicles in France? Guy Meunier and Jean-Pierre Ponssard 31 August 2018. http://www.chair-energy-prosperity.org/en/publications-2/politique-encourager-deploiement-vehicules-a-hydrogene-france/
   - Le plan hydrogène La France va-t-elle réussir sa montée en puissance ? Guy Meunier and Jean-Pierre Ponssard 16 oct 2018, https://theconversation.com/mobilite-hydrogene-la-france-va-t-elle-reussir-sa-montee-en-puissance-104125
   - Le train, grand oublié de la transition énergétique? Aurélien Bigo, 26 juin 2018, https://theconversation.com/le-train-grand-oublie-de-la-transition-energetique-98213
   - Interview ILB, Comment réduire les émissions dans les transports terrestres Jean-Pierre Ponssard, sept 6 2017 http://www.xerficanal-economie.com/emission/Jean-Pierre-Ponssard-Mobilite-durable-impulser-le-changement-dans-les-transports_3744998.html
   - Mobility solutions for the energy transition. July 2017. Jean-Pierre Ponssard (ed.) *Les Cahiers de l'Institut Louis Bachelier, n° 25* http://www.louisbachelier.org/wp-content/uploads/2017/07/cahiers-ilb-25-july-2017-en.pdf
   - Advances in Engineering Julien Brunet, Jean-Pierre Ponssard https://advanceseng.com/chemical-engineering/policies-deployment-fuel-cell-electric-vehicles-assessment-normandy-project/