

# Canadian climate and energy policies: strategic assessment with the new model TIMES-Canada

---

## **THEMATIC WORKSHOP, MAY 10, 2012**

**HEC Montréal (3000, chemin de la Côte-Sainte-Catherine, Montréal, QC, Canada, H3T 2A7)**

**Room Nancy et Michel-Gaucher, first floor, green section**

Within the Energy Technology Systems Analysis Program (ETSAP) of the International Energy Agency, TIMES (The Integrated MARKAL-EFOM System) models are currently used by more than 80 institutions in nearly 70 countries for various purposes including economic analysis of climate and energy policies. The TIMES-Canada model covers the energy system of the 13 Canadian provinces and territories having their own reference energy system, but linked together through energy, material as well as emission flows. Such a system typically includes extraction, transformation, distribution, end-uses, and trade of all energy forms in all sectors. The use of a new technology-rich model such as TIMES-Canada represents an interesting contribution to policy analysis in Canada. We first introduce key aspects of the updated database regarding emerging energies and technologies that are particularly relevant in the Canadian context. We then present various optimal energy paths for Canada under different baseline scenarios and greenhouse gases emission reduction scenarios on the 2050 horizon. Finally, we discuss the outcomes of sensitivity analyses on interesting matters for policy making such as electricity trade between provinces and to the USA, liquefied natural gas imports, minimum biofuel requirements, oil sand production and exports, nuclear generation, renewable power, shale gas extraction, etc.

## **Guest speaker**

### **Maurizio Gargiulo**

Maurizio Gargiulo holds a degree in Environmental Engineering at the Politecnico di Torino. He collaborates in industrial safety and reliability and power plants environmental impact analysis, and later he specializes in energy system modeling and scenario analysis at regional and multiregional level.

Since 2002 he has collaborated with Politecnico di Torino, the Italian Association of Energy Economist (AIEE), the Energy Foundation, Fondazione Eni Enrico Mattei, the Italian research centres ENEA (Italian National for the New Technologies, Energy and Environment) and RSE (former CESI and ERSE - Research on the Energy System) on national and international research projects (including several FP6-FP7 European Projects) in the field of energy environmental planning and modeling with MarkAl/TIMES.

He is currently involved in several international activities as consultant, on scenario analysis and models preparation, in Ireland, Portugal, and Kazakhstan.

Since 2006 he is also Professor under contract at the Politecnico di Torino (Italy) of the course: Modeling and Scenarios for Energy Planning.

He participates actively to the activities of the Implementing Agreement for a Program of Energy Technology Systems Analysis of the International Energy Agency (IEA-ETSAP)

## Speakers from Energy Environment Team at GERAD (E2G)

### Jean-Philippe Waaub

Since 1993, Jean-Philippe Waaub is professor (Full professor, since 1999) at the Geography Department, University of Quebec in Montreal. He is directing the Interdisciplinary Research Group in Geography and Regional Environment (GEIGER, UQAM) and the Group for Research in Decision Analysis (GERAD: HEC, Polytechnique, McGill, UQAM). He is Co-director of the Energy Environment Team at GERAD (E2G). His research in Quebec, Canada, Europe and Africa deals with Strategic environmental assessment (SEA), multicriteria and multi stakeholder decision aid tools and modeling of industrial systems related to climate change.

### Olivier Bahn

Since 2003, he is Professor (Associate, since 2007) in the Management Science Department of HEC Montréal, where he is teaching management science courses both at the undergraduate and postgraduate levels. He is a member of the Group for Research in Decision Analysis (GERAD), where he is Co-director of the Energy Environment Team at GERAD (E2G). He is also a member of the Group for Interdisciplinary Research on Sustainable Development (GRIDD). His current research interests are in energy economics (climate change adaptation and mitigation strategies), dynamic game theory (design of international environmental agreements) and applied mathematics (computation of economic equilibrium, optimal control and stochastic programming).

### Kathleen Vaillancourt

Kathleen Vaillancourt is research associate at GERAD, where she is coordinating the development of a techno-economic model for Canada covering the energy systems of all provinces and territories. She is also working as a consultant in energy and climate policy analysis for more than 10 years, namely on renewable electricity generation, bio-energies, energy efficiency and emerging technologies. Finally, she is also Associate Professor in Geography at UQAM. She holds a PhD in Environmental Sciences from UQAM and a postdoc from McGill University on the economic assessment of emerging technologies for GHG emission abatement

### Camille Fertel

Camille Fertel is economist postdoctoral fellow at GERAD in the Energy and Environment Team where she is working specifically on energy corridors and energy security modeling. She holds a PhD in economic analysis of sustainable development from university of Versailles (France). She is also a research award holder of the government of Canada. Her research deals with Multicriteria decision aid tools, techno-economical modeling of energy system related to climate change, energy security analysis, and sustainability assessment of public policy.

---

## **\*\*REGISTRATION\*\***

**Registration is free but necessary.** We would highly appreciate if you could [confirm](#) your attendance before May 5, 2012. Be aware that the number of participants is limited to 40.

---

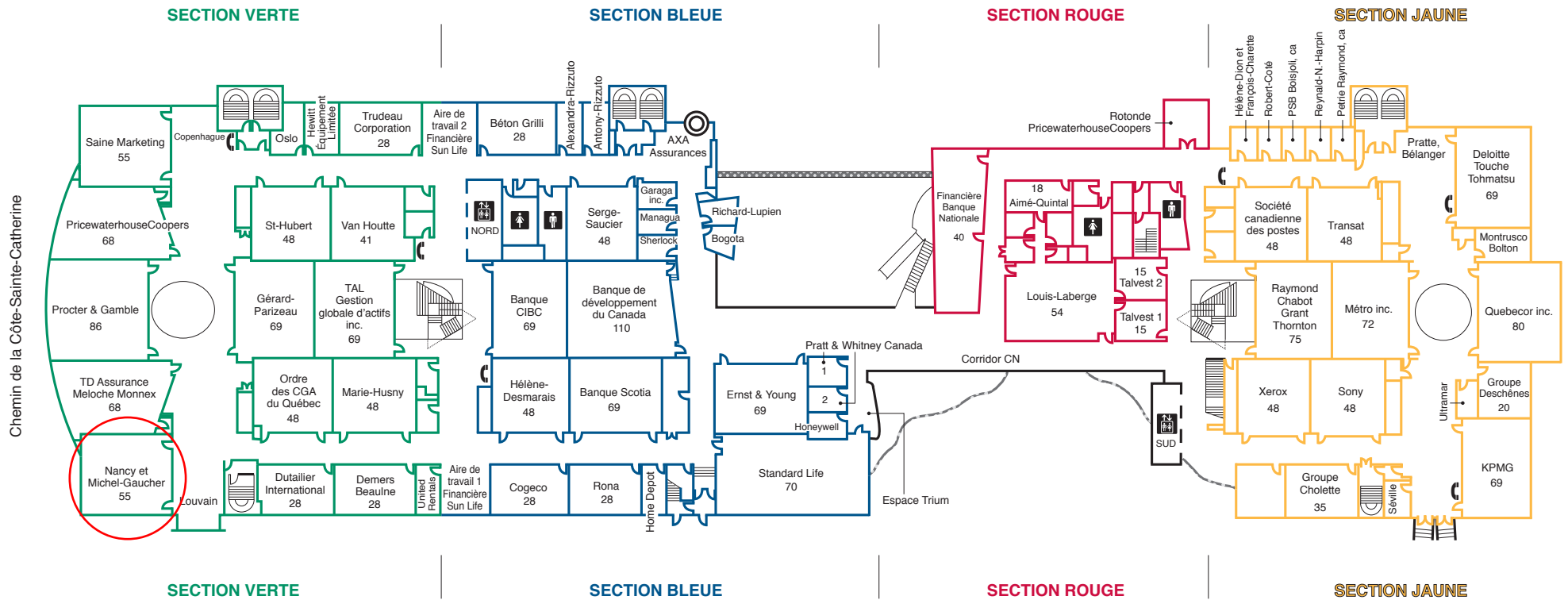
## SCHEDULE

| Time               | Presentation   | Speakers  |
|--------------------|--|---|
| <b>08h30-09h00</b> | <b>Registration</b>  |   |
| <b>09h00-9h15</b>  | <b>Welcome and presentation of the program</b>   | Prof. Jean-Philippe Waaub   |
| 09h15-10h00        | Introduction to energy models<br>Philosophy behind TIMES energy models<br>Other methodological approaches  | Prof. Olivier Bahn<br>Maurizio Gargiulo, President E4SMA<br>Prof. Jean-Philippe Waaub |
| <b>10h00-10h30</b> | <b>Coffee break</b>  |   |
| 10h30-11h15        | Global structure of the TIMES-Canada model<br>Reference energy systems and databases<br>Fossil and renewable energy sources<br>Baseline scenarios and final energy consumption calibration | Kathleen Vaillancourt, Ph.D.  |
| 11h15-12h00        | Application examples with focus on...<br>- New transportation fuels : electricity, biofuels, hydrogen<br>- Electricity production<br>- Carbon capture and sequestration                    | Kathleen Vaillancourt, Ph.D.<br>Prof. Olivier Bahn                                    |
| <b>12h00-13h30</b> | <b>Lunch</b>   |   |
| 13h30-14h30        | Application examples with focus on ... (continuation)<br>- Liquefied natural gas and non-conventional (shale, tight CBM)<br>- Conventional oil and oil sands                               | Kathleen Vaillancourt, Ph.D.<br>Students (to be determined)                           |
| <b>14h30-15h00</b> | <b>Coffee break</b>  |   |
| 15h00-15h45        | Modeling of energy corridors<br>Multicriteria indices for energy security<br>Modified objective-function of the model  | Camille Fertel, Ph.D.<br>Prof. Jean-Philippe Waaub                                    |
| 15h45-16h00        | Conclusion: brief demo, costs and transfers issues, link with other approaches (GIS, macro module), next steps, etc.   | Kathleen Vaillancourt, Ph.D.<br>Prof. Jean-Philippe Waaub                             |
| 16h00-16h30        | Open discussion  | All participants  |
| <b>16h30</b>       | <b>End of the workshop</b>   | Prof. Jean-Philippe Waaub   |

**HEC Montréal**  
**3000, chemin de la Côte-Sainte-Catherine**  
**Montréal (Québec) H3T 2A7**

**PLAN DES SALLES DE COURS ET CUBICULES – 1<sup>er</sup> ÉTAGE**

Faculté de l'aménagement de l'Université de Montréal



Collège Jean-de-Brébeuf

Le chiffre inscrit en dessous du nom de la salle indique le nombre de places disponibles.

Avril 2011