



MKJA
MK Jaccard and
Associates Inc

The contribution of integrated approaches for providing energy services in Canadian communities

Testimony to *Standing committee on Natural Resources* by:

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Introduction to MKJA and its people

- World class energy and climate policy economists
- Private consulting arm of an academic research group at SFU run by Dr. Mark Jaccard
- Designed, maintains and operates the CIMS hybrid technology simulation model, a tool used by the National Climate Change Process/AMG, NRCan, EC, and NRTEE for national policy/implementation work
- Climate policy analysis work for BC, Alberta, Saskatchewan, Ontario, Nova Scotia, city of Vancouver

Canada's urban & greenhouse gas context

- Canada's GHG targets: 20% below 2006 levels by '20 and 60-70% by '50. Kyoto was 6% below 1990
- Canada's GHG performance: +22% since 1990.
- Personal transport, commercial and residential emissions constitute ~40% of emissions. If light industry and freight transport are included, ~60%.
- Canada is expected to increasingly urbanize, with almost all new population going to urban centres.
- A large part of our GHG issue is an urban issue.
- The scope for integrated urban energy systems

The question - what if we could ...

- Densify our cities
- Drive less, use transit and walk more (i.e., bring all the destinations in our lives closer together)
- Bring our buildings closer together, & link them so that energy could be reused
- Buildings as energy producers as well as consumers (passive & active solar, waste as fuel)
- Utilize smart grid to source cheapest, cleanest and most reliable power at all times.

The Phase I QUEST scoping project

- **Literature review:** On top of energy efficiency & fuel switching, strong and effective policy to induce densification and integration could reduce urban emissions by 40+% (17-20% of Cdn total).
- **CIMS analysis:** Using runs from CIMS including a carbon price path rising to \$200/t, we isolated the urban emissions that remained after the carbon price, and applied the literature reduction values.
- **Result:** A 2020 reduction of ~65Mt. Including the carbon price, this can eliminate international permit purchases or reduce the carbon price.

The results of Phase I are policy dependent

- **Halt geographic expansion** of the city
- **Identify densification nodes and corridors.**
Provide reliable, safe, fast and timely transit services.
- **Change land use zoning, property taxation, site design permitting** to reflect new priorities
- **Apply full cost and externality pricing** on energy, water and waste.
- Based on predicted population and economic growth, **implement demand and supply side planning and policy for water, waste and energy services** for the new urban structure.

Proposed Phase II cost-benefit study

- Integrate the various disciplines (policy, economics, land-use, transport, energy, waste and water) into credible national study that will identify new NRTEE wedge beyond energy efficiency
- Challenging as it is new work and requires collaboration across academic “silos”
- Quest is seeking funding, if short will have to postpone or cancel
- Important to have rigorous analysis to identify pathways for making it happen

Proposed Phase II method

- 1) Run specialized land-use (UBC) & transport (UofT) models to capture spatial & energy integration effects for a small, medium and huge archetype cities for:
 - A. Reference case, and A plus technology stds.
 - B. A plus moderate and aggressive policy to promote densification & energy integration
 - C. B with a carbon price path rising to \$200/t
- 2) Use CIMS as an integrating template, and to capture energy supply & demand interactions.



Key take home messages

- **The urban form is a public policy choice** which sets the stage for developers & households. We *choose* sprawl or dense, walkable & safe cities.
- **Densification & integrated, multistage use of energy between industry, buildings and residences can reduce GHGs, air pollutants, and energy use, & improve urban liveability**
- **The issue is multi-jurisdictional**, involving “rules of the game” at all levels.
- **We lack complete tools for assessing integrated approaches, but PII assembles the pieces.**



Concluding remarks

- We have world class analytical resources in this area: policy, economics, energy, waste, water, building, and urban planning
- Ensure federal academic funding agencies have this on their radar screen
- Lets develop the knowledge and tools to do it right to guide the direction of infrastructure rebuild
- QUEST project can shed light, feds can make happen