



Promoting Integrated Urban Energy Systems: A Role for the Federal Government

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Integrated Urban Energy System (IUES) Planning: A New Approach

- Integrated Urban Energy Systems (IUES) result from smart, thoughtful planning.
- The alternative is disintegrated energy systems, that arise when...
 - Energy supply is considered separately from local community requirements (communities are viewed as ‘black boxes’ wired to meet peak energy demand)
 - Community planning is considered separately from impacts on energy demand (planning is sequential, and conducted in a cookie-cutter approach)



What's wrong with the old way of planning communities?

- Because supply and demand are subject to different planning regimes, significant inefficiencies are 'built' into the system
 - Power is generated in distant locations and transmitted over vast distances; energy is lost and heat is wasted
 - Infrastructure locks in energy use patterns: natural gas for heat, oil for transportation, electricity for light/equipment, even if these are not the optimal combinations
 - Reducing energy only achievable via end-use efficiency or shutting down services



The options for non-IUES communities are limited

- Communities based on non-integrated energy system planning suffer from an inability to respond creatively to energy crises and climate change
 - Local energy, efficient management opportunities not fully exploited, compete with external supply infrastructure
 - Energy use scales with population growth
 - Deep reductions in GHG emissions more difficult to achieve, more costly (fewer options exist)



A New Approach: IUES planning empowers communities to act!

- IUES planning for new and existing communities realizes opportunities to dramatically lower energy consumption and associated GHG emissions
 - Both energy production (supply) *and* consumption (demand) are considered in the planning stage
 - Options for local energy supply and efficient distribution are considered
 - A whole-system approach to managing energy, water, waste and transportation is possible (an integrated systems approach!)



The movement towards IUES is gathering momentum

- QUEST (Quality Urban Energy Systems of Tomorrow); a collaborative network:
 - Industry
 - environmental groups
 - Governments
 - Academia
 - consulting communities
- Working together to foster integrated, community-based approaches that address energy end-use and reduce related emissions



QUEST Principles

1. Improve efficiency – reduce the energy input required for a given level of service;
2. Optimize “exergy” – avoid using high-quality energy in low-quality applications;
3. Manage heat – capture all feasible thermal energy and use it, rather than exhaust it;
4. Reduce waste – use all available resources, such as landfill gas, gas pressure drops and municipal, agricultural, industrial and forestry wastes;
5. Use renewable resources – tap into local biomass, geothermal, solar and wind energy; and
6. Use grids strategically – optimize use of grid energy as a resource to optimize the overall system and ensure reliability.



The Federal Government has an important role to play in IUES

- 50 per cent of all energy consumed (and GHGs produced) in Canada occur in urban regions and communities
- Integrated urban energy systems is a critical component of a cleaner, greener more sustainable energy framework
- The Federal Government can promote and facilitate IUES through...
 - Policy leadership
 - Investment incentives
 - Skills and knowledge development



Thank You

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