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# Municipalities and the sustainability crisis: daring to dream

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## **Liveable Peel Conference**

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# What is Liveable?



**Rooted in principles of sustainable development**

April 29, 2004

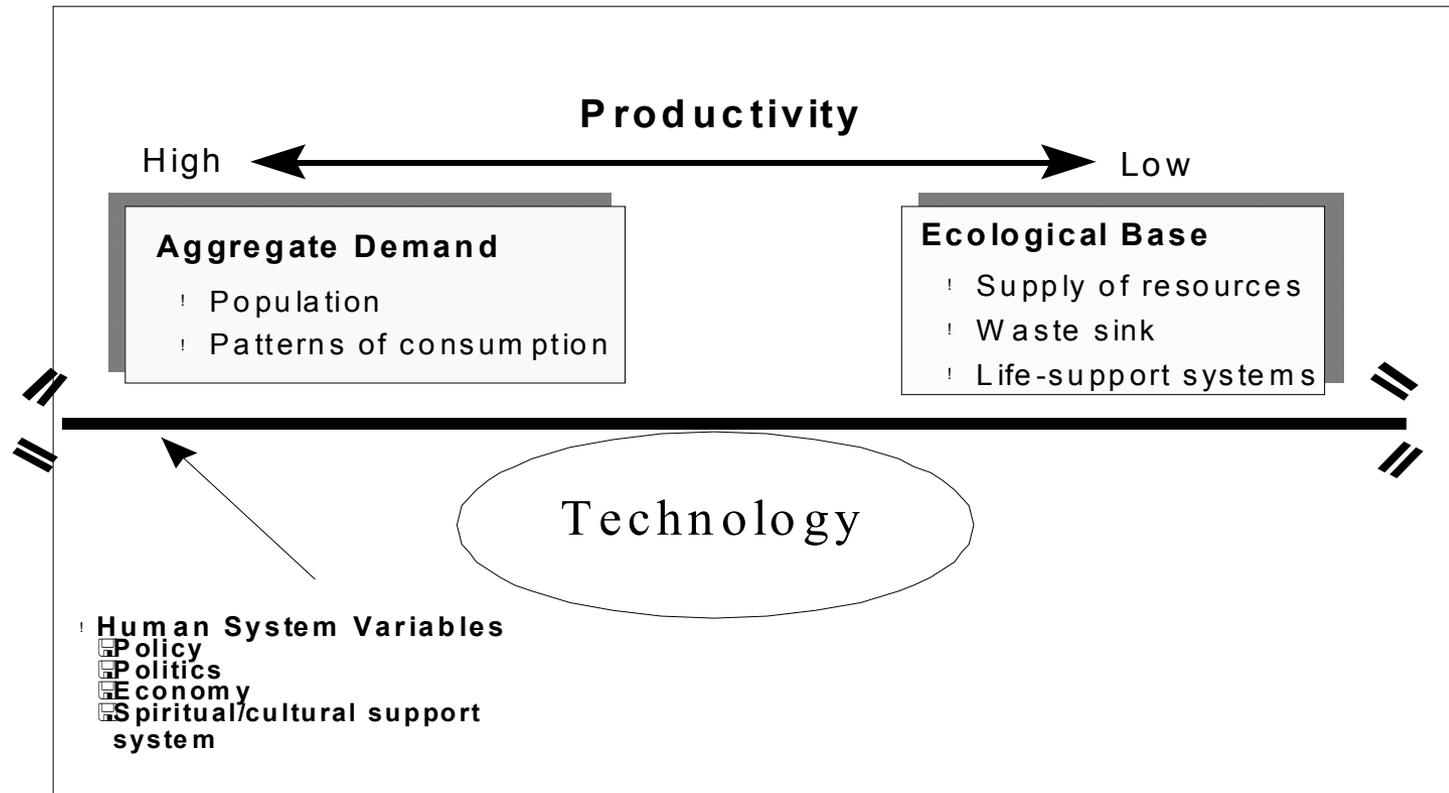
Council Workshop

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# Scope of presentation

- The analytic framework
  - Federal response to energy dimension of sustainability crisis
    - Canada's commitment to Kyoto
    - Climate Action Plan – policy instruments and targets
  - Role of municipalities in the federal CCAP agenda
  - Municipalities acting outside and beyond policy
    - Prospects
    - Reality check
-

# The challenge of sustainability



# To achieve the balance we need to ...

- Decarbonise,
- Dematerialise, and
- Humanise our  
production and  
consumption system

# The federal response to the energy dimension of sustainability crisis

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# Energy policy makers' dilemma

- How to balance three important but seemingly conflicting objectives:
    - ❑ Security –reliable, affordable, and secure sources of energy
    - ❑ Prosperity –prosperity and quality of life of all Canadians
    - ❑ Environment – maintenance of environmental integrity
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# Policy ‘inadequacies’ reflect inconsistencies in Canadian attitudes and wants

“The Canadian public wants the economic benefits of energy development – jobs, tax revenues and cheap energy for SUVs and large homes, while at the same time demanding environmental performance from industry, environmental leadership from governments ...” (*Canada’s Energy Policy*, p.2)

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# Policy-makers' dilemma – reflected in the Kyoto Protocol

- Reduction of 5.2 % of GHG emissions from 1990 levels over 2008 to 2012, but
  - 50 to 60% (80%?) reduction is needed by 2050 if we are to stabilise atmospheric GHGs concentrations at twice the pre-industrialised levels
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# Canada's commitment:

- Over 2008-2012, reduction of 6% of actual emissions in 1990
    - Equivalent to a limit of 560MT over the period, so
    - We need to reduce at least 270MT from the projected *Business as Usual* emissions
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# Federal Climate Action Plan: 6 pillars

- Competitive and sustainable industries for the 21<sup>st</sup> century
  - Harnessing market forces
  - Partnership among different levels of government
  - Engaged citizens
  - Sustainable agricultural and forest sectors
  - Sustainable cities and municipalities
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# Canada's 2005 Climate Change (CC) Action plan: policy instruments and targets

- **45MT to Large Final Emitters (LFE)**
    - *via changes in CEPA*
    - Affects 700 companies in oil and gas, thermal electricity, mining and manufacturing (e.g., chemical industries) sectors
  - **5.3MT to automobile industry**
    - *Voluntary agreement*
  - **At least 220 MT**
    - *voluntary* actions
    - by Canadians and their [provincial and municipal] governments
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# Under the plan, major responsibility lies with us (220 MT - 3 of 6 pillars)

- We and our local governments need to make choices and decisions
  - We need to think of CC Action Plan as more than a compliance issue
  - We are facing a sustainability crisis
  - We need to decarbonise and dematerialise, and humanise our economy if we are to leave to our children and our children's children, a *liveable* future
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The Chinese Word  
"CRISIS"

is composed of two  
separate characters:

危

DANGER

機

OPPORTUNITY

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*Decarbonisation* creates opportunities to be competitive ...

<b>Region</b>	<b>Energy/capita</b>	<b>Energy/GDP</b>
<b>Canada</b>	<b>122</b>	<b>160</b>
<b>Germany</b>	<b>50</b>	<b>66</b>
<b>USA</b>	<b>100</b>	<b>100</b>
<b>EU -15</b>	<b>50</b>	<b>69</b>
<b>Rest of the World</b>	<b>13</b>	<b>261</b>

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# *Dematerialisation* enhances productivity

- Industries practicing Cleaner Production (P2) – tremendous productivity and profitability increases
    - 3M's 3P Program, Interface Model,
  - Tremendous opportunity: Canadians have the third largest *ecological footprint* in the world, 7.25 ha of land and sea, to sustain our life needs *and* wants
    - Japanese – 4.77 ha
    - Peel RM has 7.83 (Ave= 7.25; PRM single occupancy travel = 69% in 1997)
  - Planet only has 1.9 ha available for each person
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# Humanising our consumption enhances our security ...

Product	Annual expenditure	Social or economic goal	Additional annual investment needed to achieve the goal
Makeup	\$18B	Reproductive health care for all women	\$12B
Perfumes	\$15B	Universal literacy	\$5B
Pet food in Europe and the USA	\$17B	Elimination of hunger and malnutrition	\$19B
Ocean cruises	\$14B	Clean drinking water for all	\$10B
Ice cream in Europe	\$11B	Immunizing every child	\$1.3B <i>(State of the World 2004)</i>

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# Municipalities must dare to dream

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Redefine “What it is to  
be a Canadian”

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# A Canadian is one who ...

- Demands and purchases low-energy, low-material intensity, low-toxicity products
  - Advocates and participates in land use and transportation systems that accentuate access to jobs and services over automobility
  - Dissociates *quality of life* from level of consumption, and therefore minimises conspicuous consumption
  - Builds and engages in networks in his/her neighbourhood, the workplace, in sports, in culture, and in faith-based circles
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Can we do it?

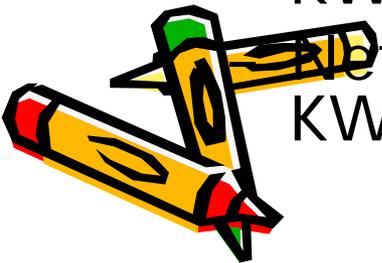
**Prospects, prospects and  
prospects**

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# Yes, we can *decarbonise* homes and buildings (Garforth 2005)



- **Commercial / institutional**
  - Ave US building -  $500\text{KWh}_e/\text{m}^2/\text{yr}$
  - New US building ~ 200 to 500  $\text{KWh}_e/\text{m}^2/\text{yr}$
  - New EU/CA building ~ 150 to 250  $\text{KWh}_e/\text{m}^2/\text{yr}$
  - Emerging low energy practice ~ 45 to 120  $\text{KWh}_e/\text{m}^2/\text{yr}$
- **Homes**
  - Ave US home - up to  $500\text{KWh}_e/\text{m}^2/\text{yr}$
  - New US home ~ 200 to 350  $\text{KWh}_e/\text{m}^2/\text{yr}$
  - New EU low energy homes ~ 80 to 110  $\text{KWh}_e/\text{m}^2/\text{yr}$
  - Net-zero / passive homes ~ 40 to 70  $\text{KWh}_e/\text{m}^2/\text{yr}$

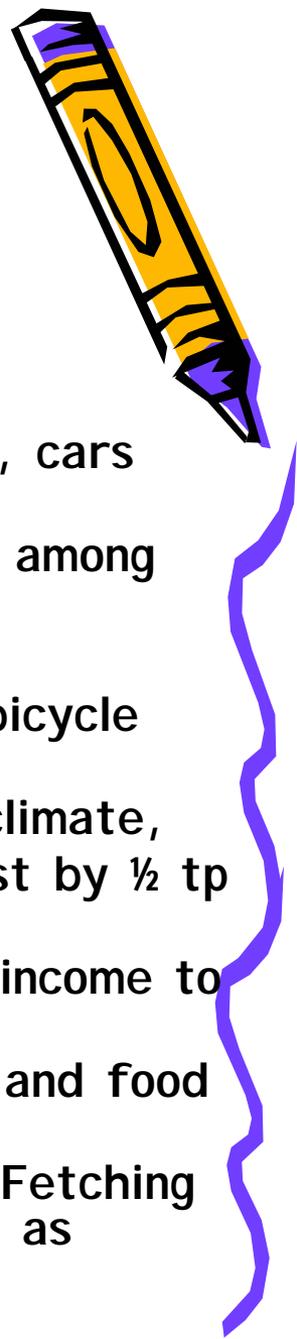


Yes, we can *decarbonise*, *dematerialise* and *humanise* our workplace (Hawken et al 1999)

- In 1987, in southwestern Amsterdam, 538,000 sq ft of Bank office complex was built
  - 10 towers linked by an undulating internal street
  - Inside, the sun reflects off coloured metal - only artwork in the structure - bathe the lower stories in everchanging hues
  - Indoor and outdoor gardens fed by rainwater from the roofs
  - Every office has natural air and natural light
  - Heating and ventilation largely passive, no AC
  - Water splashes down the bronze handrails along staircases
  - Results: absenteeism down 15%, productivity up, complex used by workers for social and cultural events
- Costs recovered in 3 months (saving \$2.9M/yr), one of the most energy-efficient building in Europe
- of Bank (NMB now ING), now second largest in Holland



# We can *decarbonise, dematerialise* and *humanise* our neighbourhood ... build communities, not houses



- In 1970s, Village Homes, Davis California...
  - Mixed housing types facing one another on narrow streets, cars parked around the back under trees
  - Landscaped greenbelts with fruit trees, agricultural zones among the houses,
  - Natural drainage swales instead of underground concrete,
    - drainage swales form part of the greenways; provide bicycle and pedestrian circulation and focus of community life
  - Narrow streets reduce traffic and paving, creating microclimate,
  - Passive solar design and site orientation reduce energy cost by 1/2 to 2/3
  - Community organic gardens and edible landscaping provide income to maintain parkland
  - By 1980s, there were 240 homes on 70 acres, low utility and food costs, strong community spirit

One of the highest resale price per square foot in Davis. Fetching prices above the market (\$11/sq foot in 1999); described as "Davis' most desirable subdivisions"



# We can *decarbonise* our transportation system: the tale of Curitiba (Hawken et al 1999)

- Capital city of Parana, nestled between the capitals of Brazil, Argentina, Uruguay, Paraguay
- 1990 – population of 2.2M, 42% under 18, another million expected in 2020
- Agricultural economy transformed into an industrial and commercial powerhouse with rail, road and two airports
- Has the second highest number of cars per capita in Brazil, 1 car per 2.6 persons; yet
- It has no traffic problem, has the lowest rate of car ridership and cleanest air in Brazil
- Widely believed to have the finest bus system in the world
  - express routes operated like subways
  - Each lane of express bus carry 20,000 passengers per hour
  - over 2000 taxis and 100 miles of bicycle paths
  - No traffic jams, vandalism is unknown
  - Bus system is entirely *self - financing*



# Yes, we can *dematerialise* our cities ...



- **Curitiba**

- A gunpowder magazine became a theatre
- A glue plant , a children's creativity centre
- A foundry into a popular shopping mall
- A derelict quarry into an amphitheater and opera house, another became Free University of the Environment offering courses to journalists, teachers, building managers, etc.
- A garbage dump, into the famous 11-acre botanical garden home to 220,000 species
- Depreciated buses (3.5 yrs) become mobile job training centres, clinics, classrooms, babysitting centres, soup kitchens, etc.
- Industries required to dispose of their solid wastes on their own land
- Households sort recyclables for thrice a week curbside collection; estimate: paper recycling saves 1200 trees a day
- Unreachable poor neighborhoods: garbage swapped for tickets for food, bus, school supplies



# *We can humanise our consumption* ...Curitiba

- Special transport for handicapped, including travel to 32 specialised schools
- Pre-installed low-income dwellings, schools, services, cultural facilities, bus links
- Poor children receive regular visits from health workers; city has 88 health stations 5 of which operate 24 hours; each has a drugstore dispensing both traditional and commercial medicines for free
- 27% of budget is on education: 120 schools, many reused for adult education at night; over 94% literacy rate by 1996



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Curitiba exists,  
therefore we can

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Reality check:  
with what resources?

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# Working for change ...

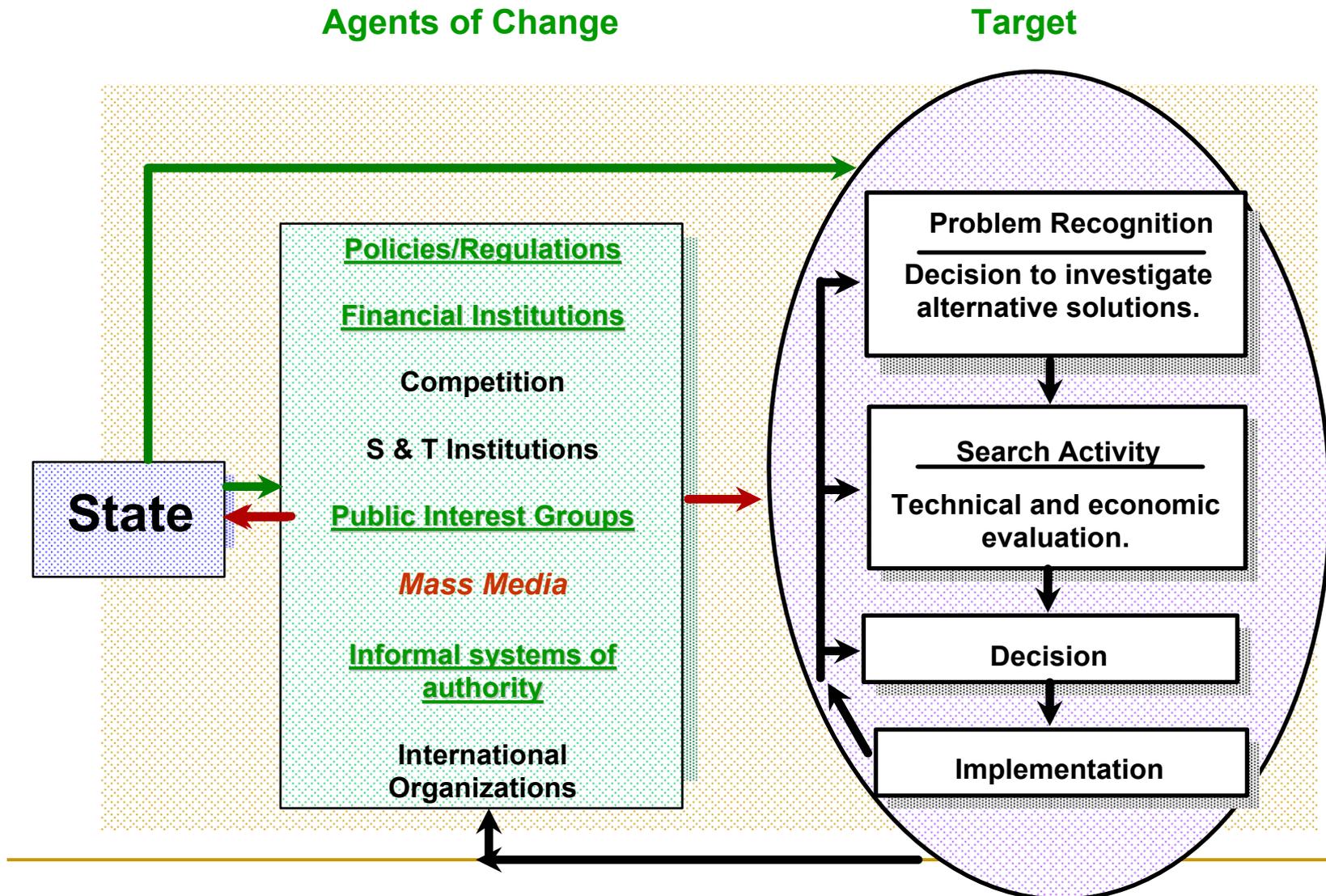


Figure 1: Framework for Change

(Adapted from: Yap 1988)

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# Federal budget 2005: \$10B to 2012

- Climate Fund: < \$1B → 75 to 115MT
  - Partnership Fund: \$250M (possibly \$2B to \$3B post 2010) → 55 to 85MT annually
  - Renewable Energy → 15MT annually
    - \$200M (WPPI-1M homes),
    - \$100M (RPPI- 200,000 homes) and
    - \$300M (tax incentives for efficient and renewable energy generation)
  - Existing CC Programs: \$2B → 40MT annually
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# Federal programs ...

Program Name	Recipient	Funding
Home energy efficiency Retrofit Grants /OEE	Homeowner	Up to \$3,348, grant
Energy Star	Consumer, builders and developers	Varies, grant
New housing	Builders of energy-efficient homes	\$200/house, grant
Cdn Industry Program for Energy Conservation(CIPEC)	Industrial companies	Up to 50% of cost of energy audit (max \$5K), grant
Commercial Building Incentive Program (CBIP)	Owners of new commercial and institutional buildings, retail food stores and arenas	Up to \$60K, grant
Commercial transportation energy efficiency and fuels initiative /FLEETSMART	Owners of Class 6, 7, 8 diesel- powered trucks or buses	Up to \$1400 rebate
Energy Retrofit Assistance for commercial and institutional buildings	Commercial businesses, universities, colleges, hotels, multi-unit residential buildings	Varies, rebate
Industrial Buildings Incentive Program	Industrial buildings with new designs/ energy innovators	Up to \$80K, incentive

# More federal programs ...

Program Name	Recipient	Funding
Renewable Energy Deployment Initiative	Private sector, Federal departments and public institutions	25% of the purchase and installation cost up to \$80K per installation and a max of \$250K per corporate utility, refund
Govt purchase of electricity from renewable resources	Energy distributors	Unspecified, contribution
Class 43.1 (ACCA)	Taxpayer	CCA of 30% for certain RE/EE equipment
Emerging Technologies Program	Canadian industry	Up to 50% of cost up to field trials
Industry Energy R&D	Canadian industry	35% of project costs
Technology Early Action Measures	Municipal, provincial or federal govts, businesses (Cdn or foreign)	Unspecified, contribution
Green Municipal Fund (\$550M)	Municipal govts	Grants up to 50% of eligible expenses (max \$350K), loans covering 15% to 25% of eligible capital costs
IRAP/Technology Partnership Cda	SMEs	Up to 33% of total eligible costs

# Provincial (Municipal Act 2001): Use of LICs to finance EE/RE changes (Pembina Institute Study)

## Advantages

- Repayment of the cost of efficiency improvements with the property rather than with the current owner; therefore
- Removes barriers such as
  - Hesitation to accept long paybacks
  - Preference for low first cost improvements
  - Lack of access to capital to improve existing buildings
  - Lack of access to capital to build new efficient buildings
- Permanent comprehensive improvements with long payback periods, e.g., high-efficiency windows, wall upgrades, heating, ventilation and AC would be more attractive to home and building owners because both their costs and benefits are passed on to new owners if the property is sold before the investment is paid off
- Energy savings less than cost of LIC repayment
- Full cost is shared by owners over time and not borne by original owner.
- Future owners benefit because they take the full benefits of energy savings but only pay an equitable share of the cost.

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# In Ontario, some road bumps

- Legislation explicitly defines what types of improvement can be financed under LIC (unlike other provinces –BC, Alberta, Quebec, Nfld, Labrador (flexible), Sask. Manitoba and PEI (limited with some flexibility) , and EE/RE is not on the list
  - However, legislation allows improvements on private property, and it appears that new uses can be approved by the Municipal Board
  - Conclusion of study: Use of LIC to finance EE/RE improvements - non-conventional but legal
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# Agents of change within Peel RM

- Committed municipal leaders and staff, e.g., Caledon – co-winner of TVO's Greenest town contest; Britannia landfill gas capture and redevelopment
  - Think district energy for new CI buildings; local alternative energy generation – wind, cogen, geothermal
- Construction industry open to building pedestrian – friendly and high density housing, e.g., Amacon *Twin Towers*, the *Capital*
  - Think Rodeo Fine Homes, move towards *green roofs*, *EE/RE*
- Other industries → think Cleaner Production, Carbon Fund, CDM
- Peel Board of Education – sponsors youth conferences
  - Redefine “what is cool”-Think Sacred Heart Catholic School
- Imaginative non-governmental organisations, e.g., PEN – “EcoBuzz” (Mar 2006), PEYA – “Youth can move the world symposium” (02/06/06) “Green Team Challenge” “Intl eco-heros”
  - Help redefine “what is cool” – think Katie Gardner of Newmarket
- Agent(s) of change who need to be galvanised
  - Ethnic associations – new Canadians, new immigrants
  - Religious leaders
  - Help redefine Canadian culture → value *low consumption*

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# Education (of young and old) is key...

If you are thinking a year ahead,  
sow a seed

If you are thinking ten years ahead,  
plant a tree

If you are thinking 100 years ahead,  
educate the people.

*Kuan Tsu* (Chinese poet)

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# Thank You!

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# Even China is waking up to two major fault lines in its economic growth ...

- In 2002, 16th National Congress of the CCP pledged to:
    - quadrupling of its GDP (2005 – \$1.4T)
    - **social equality**
    - **recovery and protection of environmental integrity**
    - Establishment of a ‘circular economy’ by 2020, to be achieved through a cleaner production strategy.
    - By 2020, RE share of 10%, and production of 20GW of wind
  - 2002 NPC passed
    - Cleaner Production Promotion Law, the first in the world
    - National green building standards, surcharges for large vehicles (20%), gas stations in 9 provinces switched to ethanol blend
  - 2006: guaranteed fixed grid price for power generated from wind
  - Now, 3<sup>rd</sup> largest ethanol producer in the world
  - Now, a world leader in PV production
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# Curitiba: the first salvo...

- Historic boulevard, Rua Quinze de Novembro was to be destroyed for an overpass
  - Mayor, an urban planner and architect had a different vision
  - On a Friday evening after the law courts closed, city workmen jackhammered the pavement, replaced them with cobblestones, planted tens of thousands of flowers, installed streetlights and built kiosks
  - 48 hours later, the boulevard was so thronged that shopkeepers who had threatened to sue because they feared lost traffic, petitioned the city for its expansion
  - The following weekend, automobile owners tried to retake the streets “but were repulsed by an army of children painting watercolors on paper”
  - The boulevard is now known as Rua das Flores
-