



Energy Technologies for Sustainable Buildings

Jim Clark

Commercial Building Incentive Program
Office of Energy Efficiency



Natural Resources
Canada

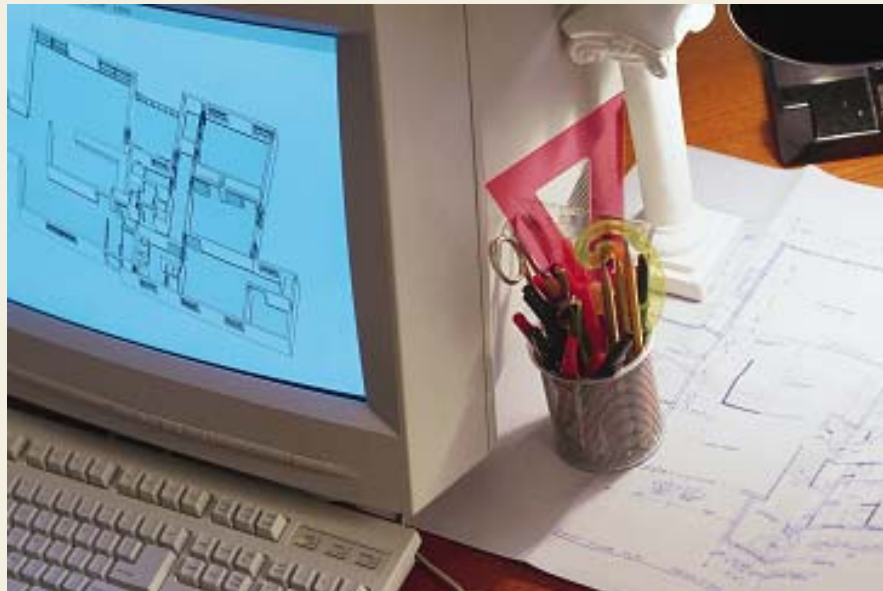
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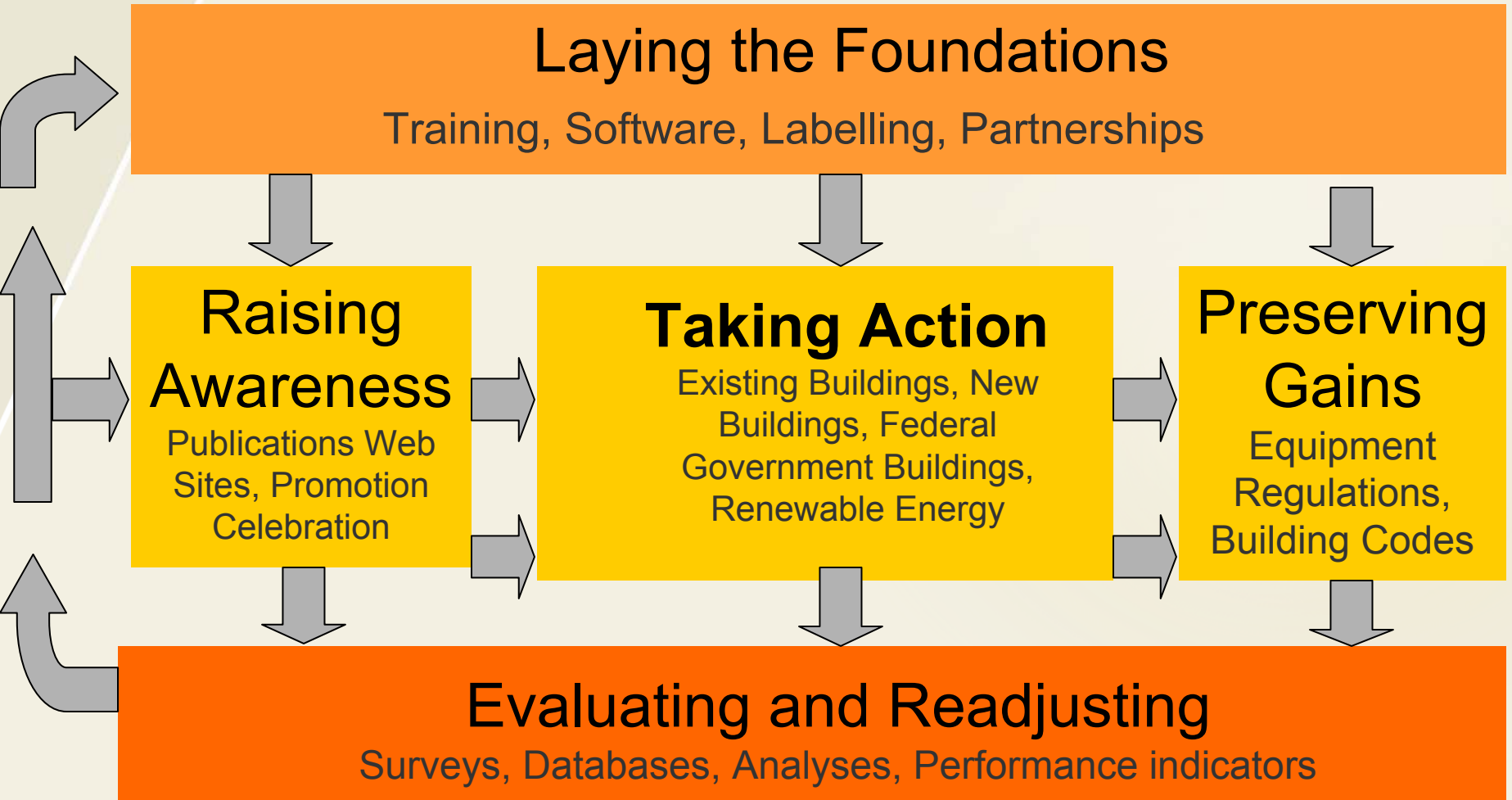
Summary

- Natural Resources Canada (NRCan), through its Office of Energy Efficiency (OEE), employs a number of policies, programs and financial incentives to
 - encourage market transformation, and
 - build capacity toward greater energy efficiency (EE)





2 - Market Transformation Strategy





Laying the Foundation

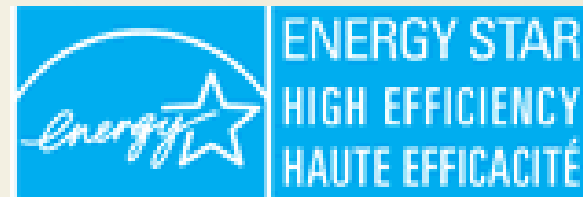
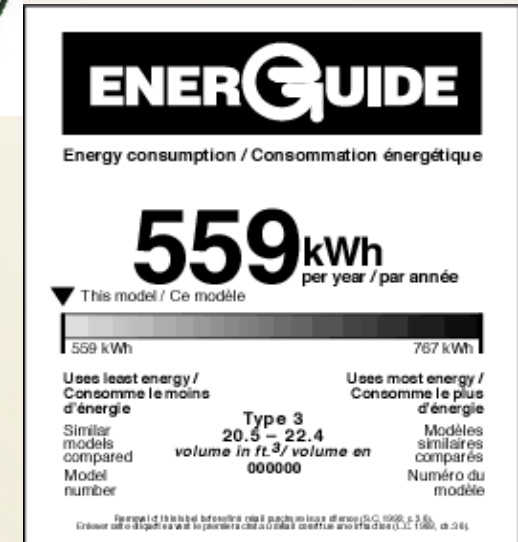
- **Developing and implementing a series of tools such as:**
 - **1 - Training**
 - Dollars to \$ense workshops for facility managers, decision makers, etc.
 - Building Energy Simulation software training for design professionals
 - Design charettes
 - **2 - Advanced Software**
 - Desktop Building Energy Simulation software (EE4)
 - On-line Building Energy Simulation software (EE Wizard)
 - Screening tool



Laying the Foundation

3 - Labelling:

- For buildings, including:
 - Linkages to LEED Canada
 - Leadership in Energy and Environmental Design - Rating System for New Construction
- For equipment, including:
 - EnerGuide
 - information on energy consumption of major appliances, automobiles, HVAC
 - ENERGY STAR®
 - Identifies the most EE products in over 40 categories.





CBIP Partners



Climate Change Central



Manitoba Hydro

Gazifère



Office of Energy Conservation



GazMétro
la vie en bleu



Sustainable Buildings Canada





Taking Action

- **Developing and implementing EE programs and financial incentives for commercial and institutional buildings:**
 - **1 - Existing Buildings:**
 - EnerGuide for Existing Buildings (formerly the Energy Innovators Initiative)
 - **2 - New Buildings:**
 - Commercial Building Incentive Program (CBIP)
 - Industrial Building Incentive Program (IBIP)
 - **3 - Federal Government Buildings:**
 - Federal House in Order
 - Federal Buildings Initiative
 - **4 - Renewable Energy**
 - Renewable Energy Deployment Initiative





Existing Buildings

EnerGuide for Existing Buildings

- Helps **commercial and institutional** organizations implement EE retrofits
 - Training, publications, information, promotion, awards
 - Alliances with service providers, partnerships with key associations
 - Support for innovative and renewable energy technologies
 - Special considerations for complex projects and those in Northern, Aboriginal and remote communities
- **Financial incentives for energy planning and retrofits**



Fairmont Royal York Hotel in Toronto





Existing Buildings

■ Results to Date:

- Over 2000 members representing more than 30% of the sector floor space in Canada
- Incentives provided to over:
 - 300 retrofit projects involving 4800 buildings, over 32 million m²
 - 600 planning projects
- Average energy savings of 20%
- Clients investment vs. incentive 17:1
- Over 20 partnerships with utilities, non-profit associations, and other governments
- Expanded awards for non-funded projects
- Energy savings:
 - \$160M annually
 - 1.1 Mt GHG

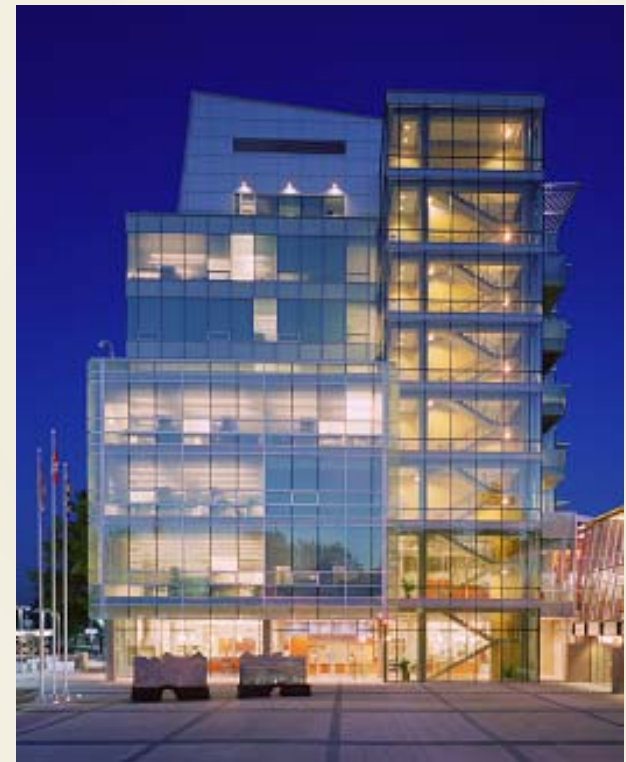




New Buildings

Commercial Building Incentive Program (CBIP) Industrial Building Incentive Program (IBIP)

- Encourages EE in new buildings through:
 - Financial incentives for the design of buildings, to be at least 25% more efficient than the Model National Energy Code for Buildings (MNECB)
 - Simulation and modeling software, integrated design practices, training
 - Support for technology innovation
 - Building labelling (e.g. LEED Canada)
 - Partnerships
 - Support for adoption of MNECB



Richmond City Hall

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New Building Incentives

- Incentive equals twice the modelled energy cost savings
- Up to \$60,000 per building (CBIP) and \$80,000 (IBIP)
- Up to 6 projects per organization or a maximum of \$250,000
- Building design must be at least 25% better than MNECB
- Mandatory improvements requirement to Building envelope, HVAC, lighting, service water heating systems and electrical





Commercial Building Incentive Program Objectives

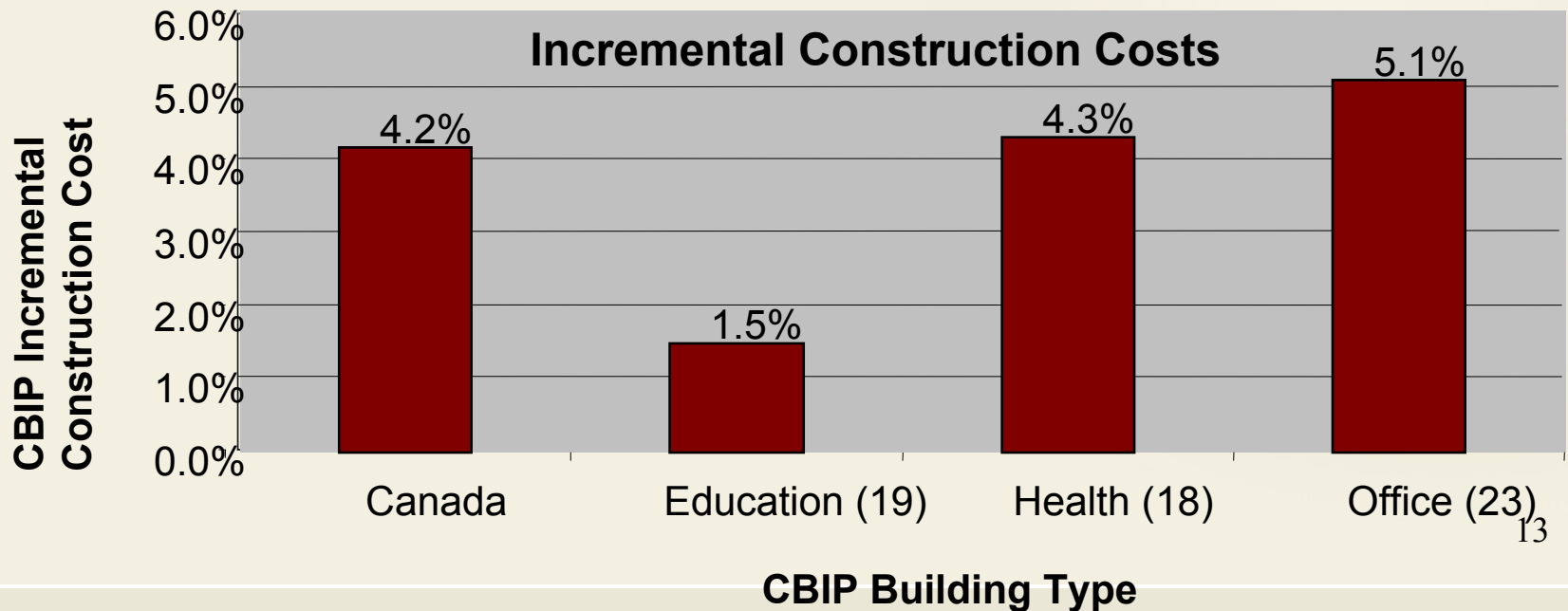
- Encourage investments in cost-effective and energy-efficient buildings
- Transform attitudes and design practices in favour of energy efficiency
- Foster the integrated design process (IDP) within the professional community, regardless of the tools being used to model energy design



Objective 1: Encourage investments in cost-effective and energy-efficient buildings

CBIP average ONE TIME incentive of \$47,000

- levers average capital investment of 4.2% or about \$277,000 per building and 6:1 leverage
- provides average ANNUAL energy savings of \$41,000 per building

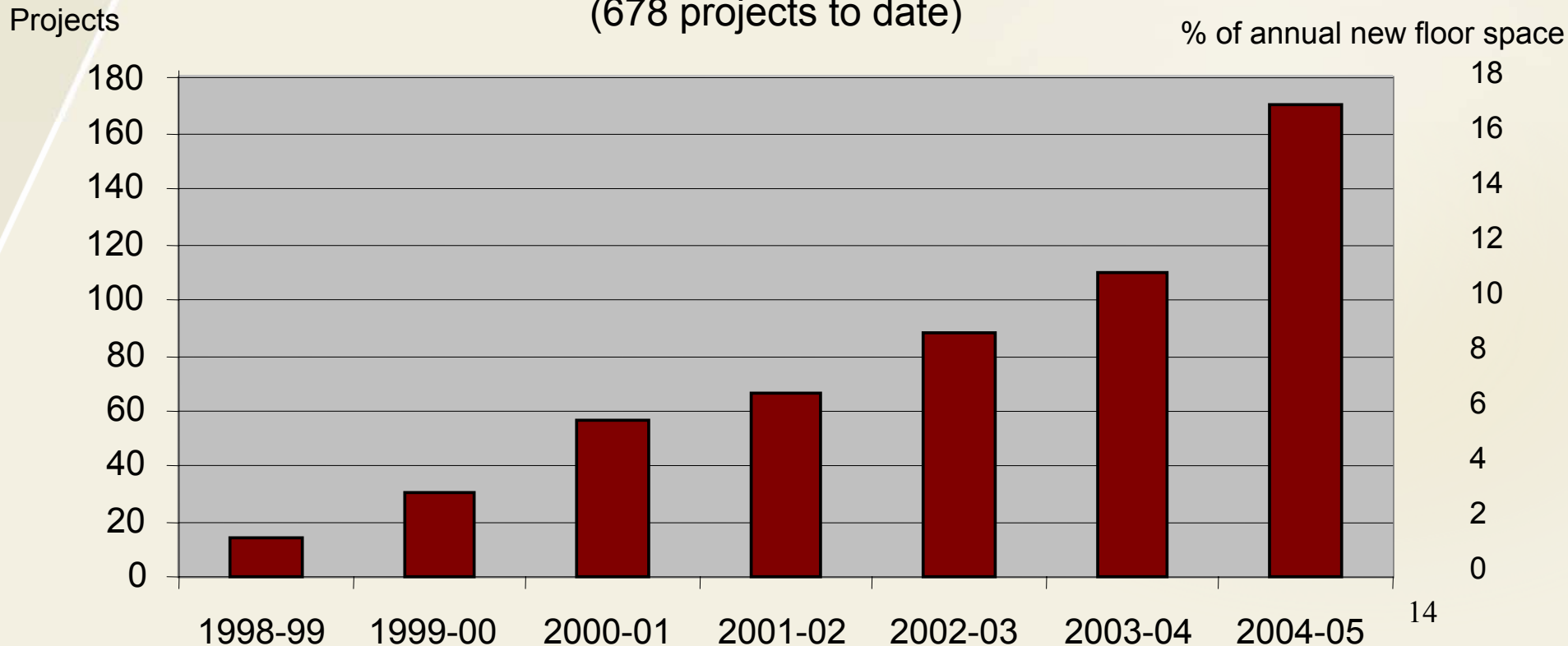




Objective 1: Encourage investment

Number of projects and % of CBIP relative to all new CI floor space additions per year

(678 projects to date)



Oct 14: 89 to date 05-06



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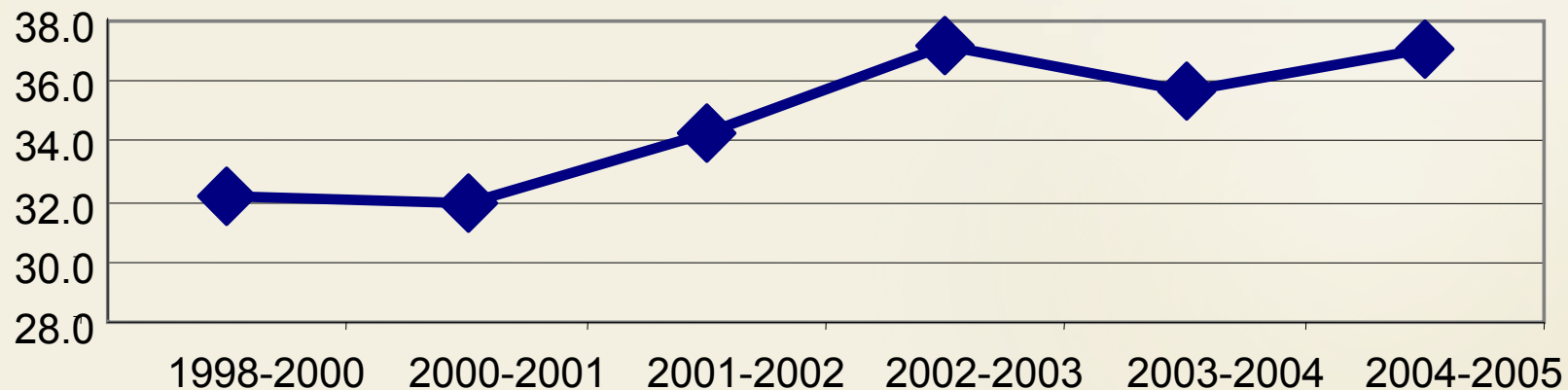
Actual

Canada 



Objective 2: Transforming Design Practice

CBIP % Better Than Model National Energy Code for Buildings (MNECB)



Objective 3: Integrated Design Process

- Integrated Design Process = Increased collaboration by traditional and non traditional stakeholders in a non-linear design process
- Crucial to successful integration of advanced equipment into high performance designs
- IDP Roadmap to be published in 6 months, funded by BC LEED Steering Committee, written by Busby/Stantec



UBC's Technology Futures III laboratory

- Value in Process to be published soon, funded by BC LEED Steering Committee, written by Dr Ray Cole, UBC

BC LEED Steering Committee =
BC Hydro, Terasen, BCBC, CMHC,
GVRD, CBIP, CaGBC





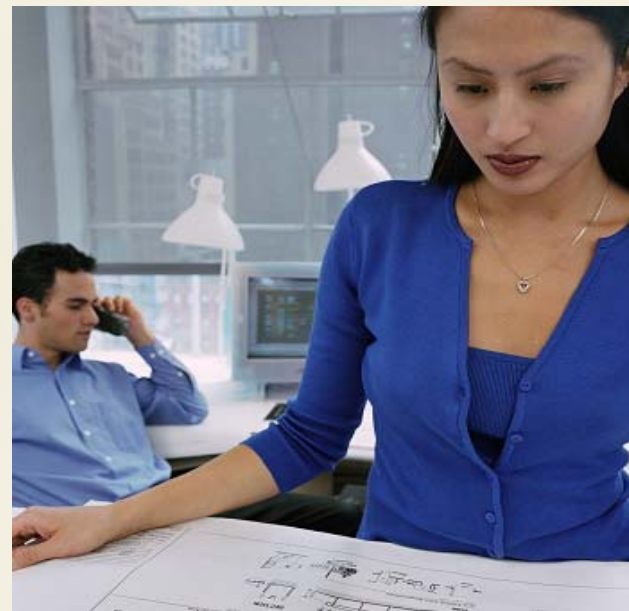
Remaining Barriers for EE new buildings?

Accessibility

- “Acute shortage of energy engineers” - CaGBC
Mentoring program attached to CBIP/EGB projects?
May be best delivered
in a multi-agency model

Awareness

- IDP and Value of Process
- Feedback loops
not institutionalized
- No Daylighting labs in Canada





Barriers for EE MURBs?

Accessibility

- Little experience with high performance MURB HVAC systems

Awareness

- Appearance vs Performance – Price to be paid for all glass MURBs in energy and comfort

Availability

- Cost of high performance glass





For More Information

- For more information on OEE programs and incentives for buildings
 - www.oee.nrcan.gc.ca/buildings
 - info.services@nrcan.gc.ca
 - 1 877 360-5500 (toll free)

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