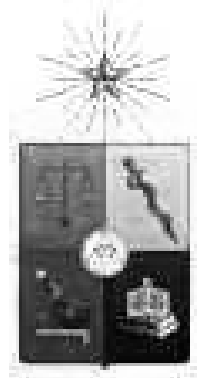




# **IEEE: Argentina INTERNATIONAL SEMINAR: ENERGY EFFICIENCY - Triple Bottom Line**



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**August 2004**

# Energy efficiency and the “triple bottom” line

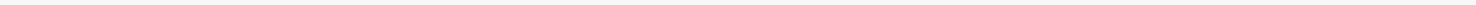
 **Thank you**

 **Opportunity to share**

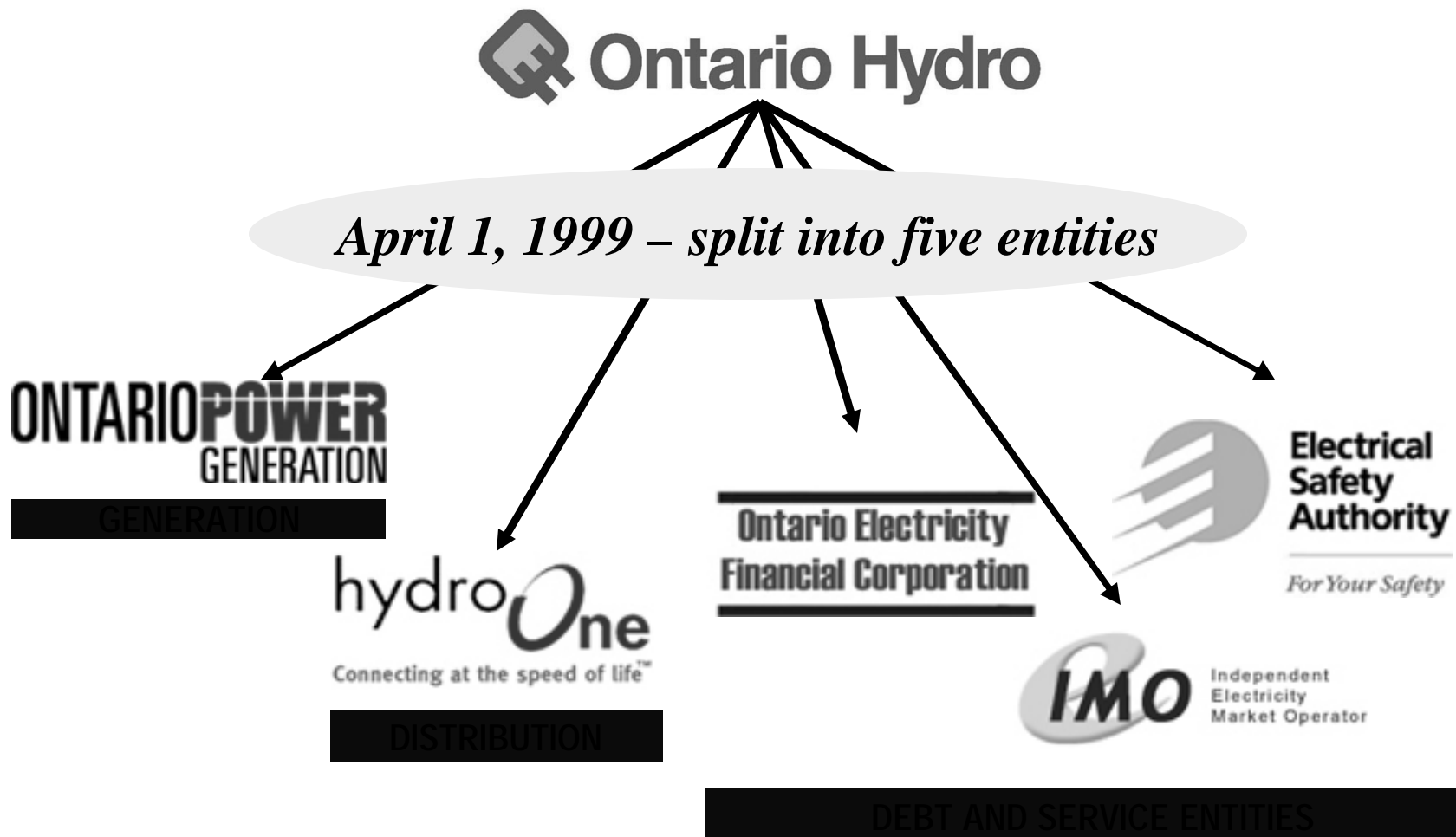
- economic**
  - environment**
  - socially responsible, decisions**
- PLUS**
- Security**

# Canada

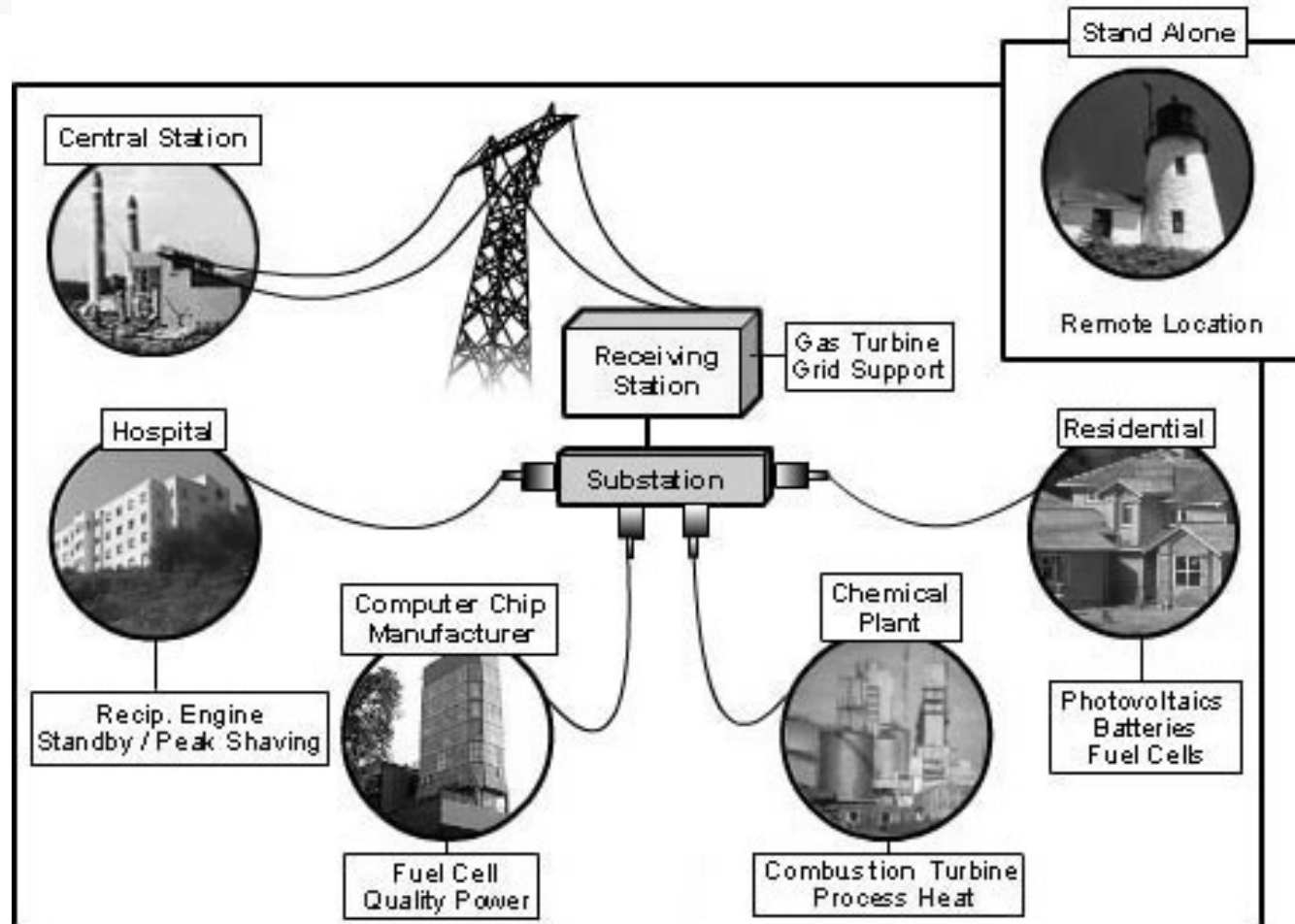




# Ontario Hydro Restructured – Planning?



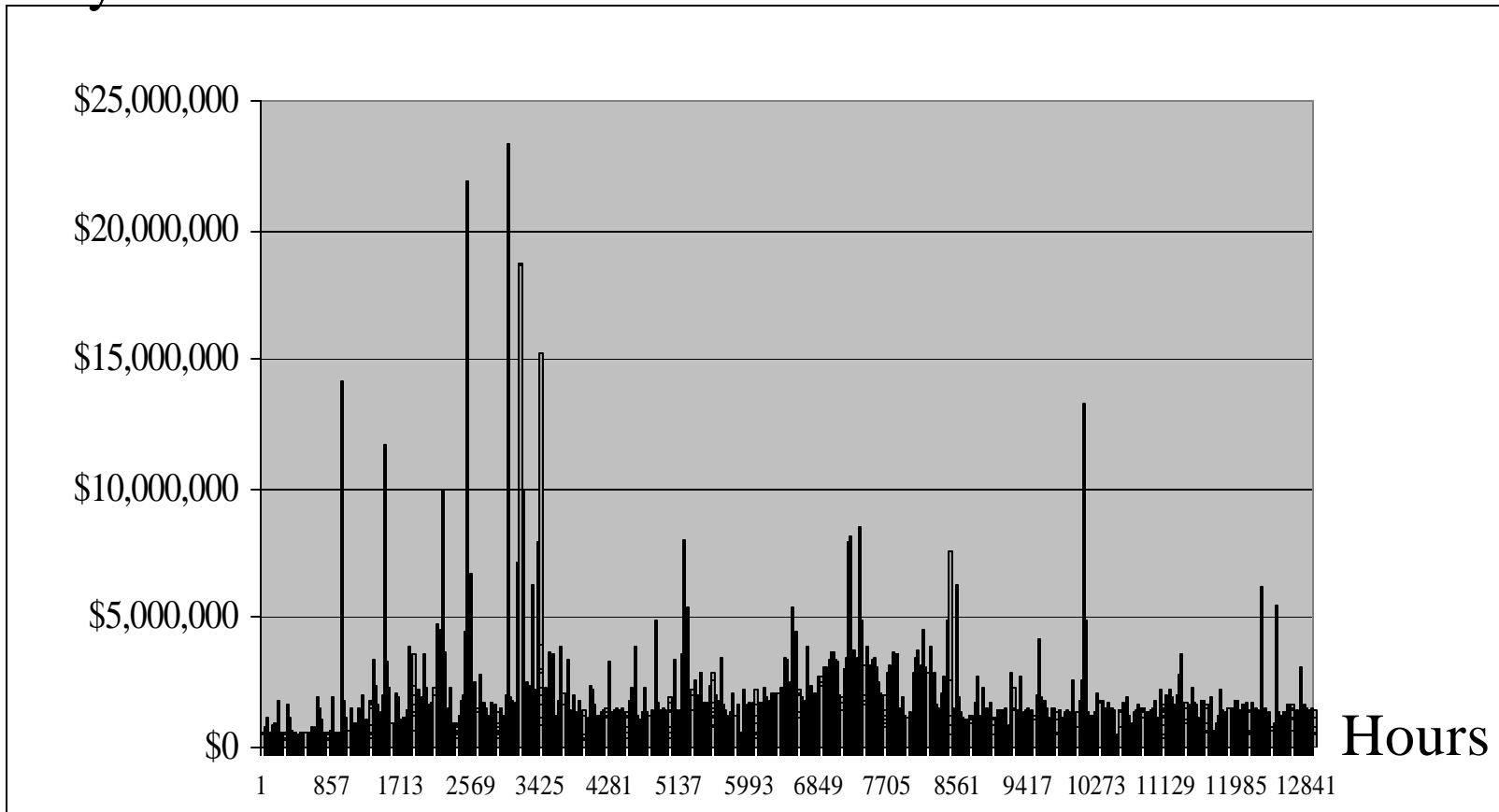
# Look at 'whole' system



<http://www.wbdg.org/design/resource.php>

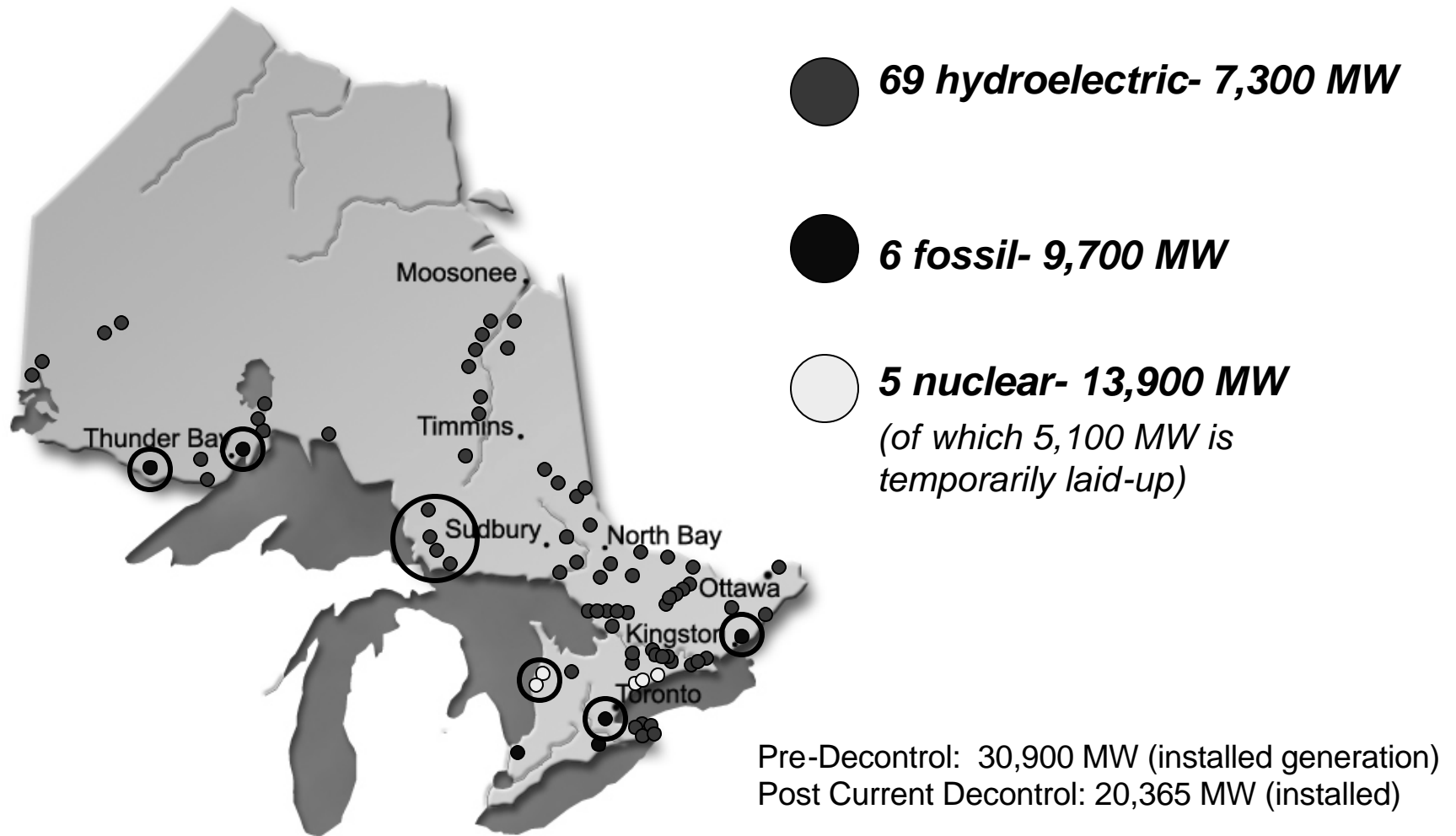
# Energy Price / Volatility

## Hourly Cost to Ontario



Ontario Electricity Market's Hourly Cost  
from May 1, 2002 to October 21, 2003

# Assets Before Decontrol






# Confusion / Lack of Clarity

## External

- **Legislation**
  - What, when, how?
- **Large numbers of competitors**
  - Many companies addressing many different issues


## Internal

-  Roles & Responsibilities
-  Utility vs. Capital vs. Operating Budgets
-  Cost centres have no data

**Confusion Translates  
to Risk**



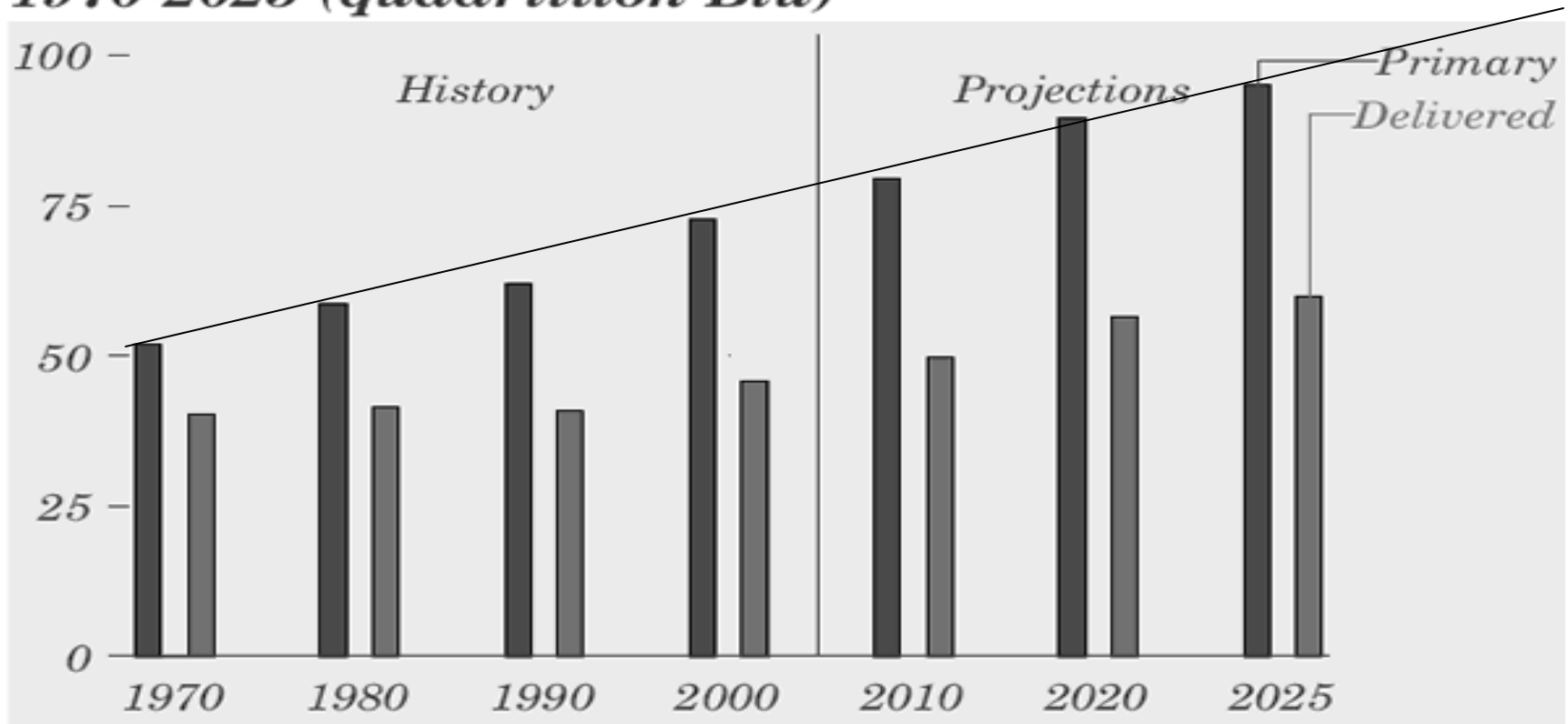
# Blackout

- 
- ✍ **Economy suffered worst monthly setback in seven years;**
  - **Massive blackout brought industrial engine to its knees, economy contracted 0.7% in the month**
  - **Sharper decline than 0.6% Slump from 9/11**

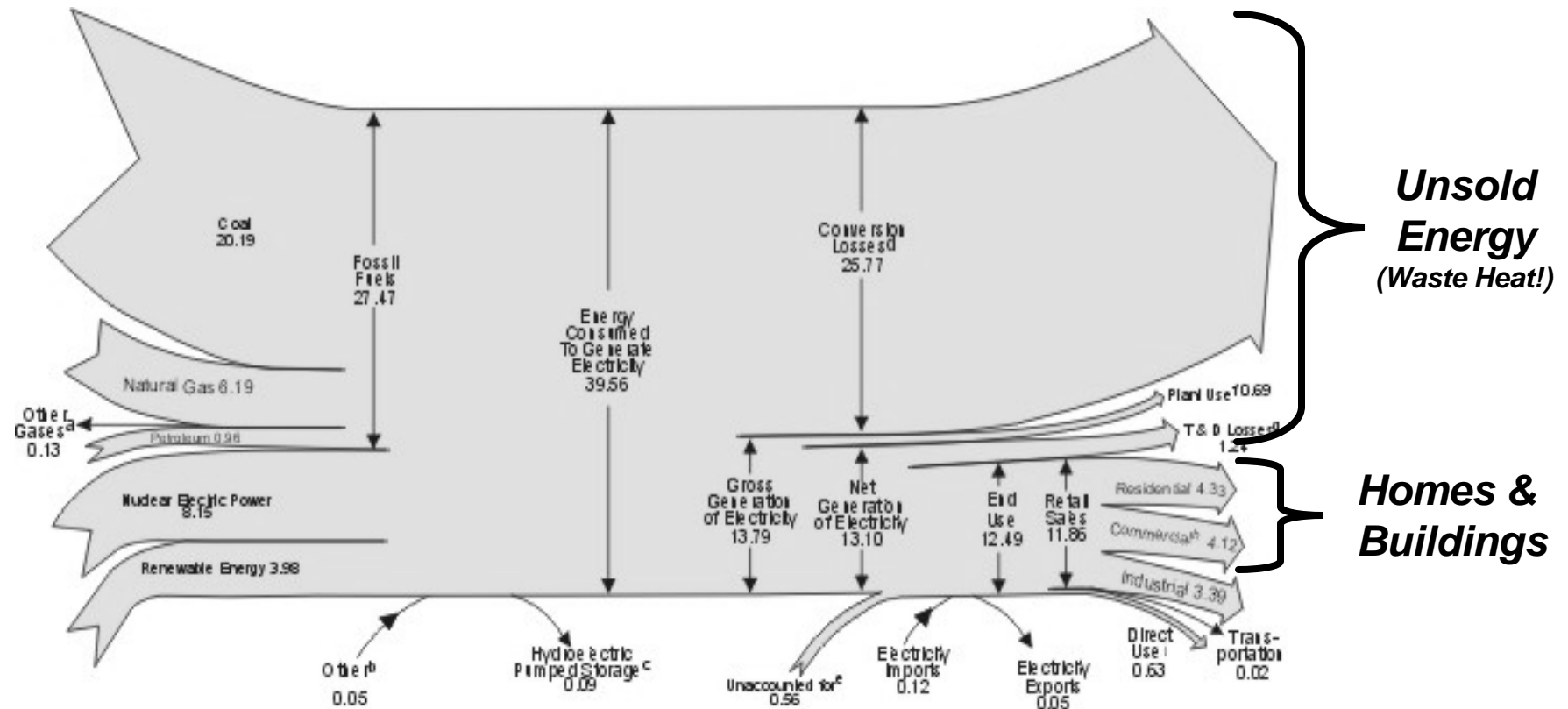
**Source: National Post, November 1, 2003**

# Big Picture

**Figure 45. Primary and delivered energy consumption, excluding transportation use, 1970-2025 (quadrillion Btu)**




# Source: 'Unsold Energy' - 70%



Source: US DoE EIA

# Energy

- 
- ✍ **Little has or will change if we continue to defend the existing 'paradigm'.**
  - ✍ **We need to ask new questions.**

# Are There Better Solutions? YES



- ✍ **Who accepts 70% Loss?**
  - economic
- ✍ **Why pollute?**
  - environmental impacts are here
- ✍ **How do we answer to future generations?**
  - socially responsible
- ✍ **Plus: Provide security for today and tomorrow**

**Cost effective solutions exist - today**

# Business as usual?



## RISK:

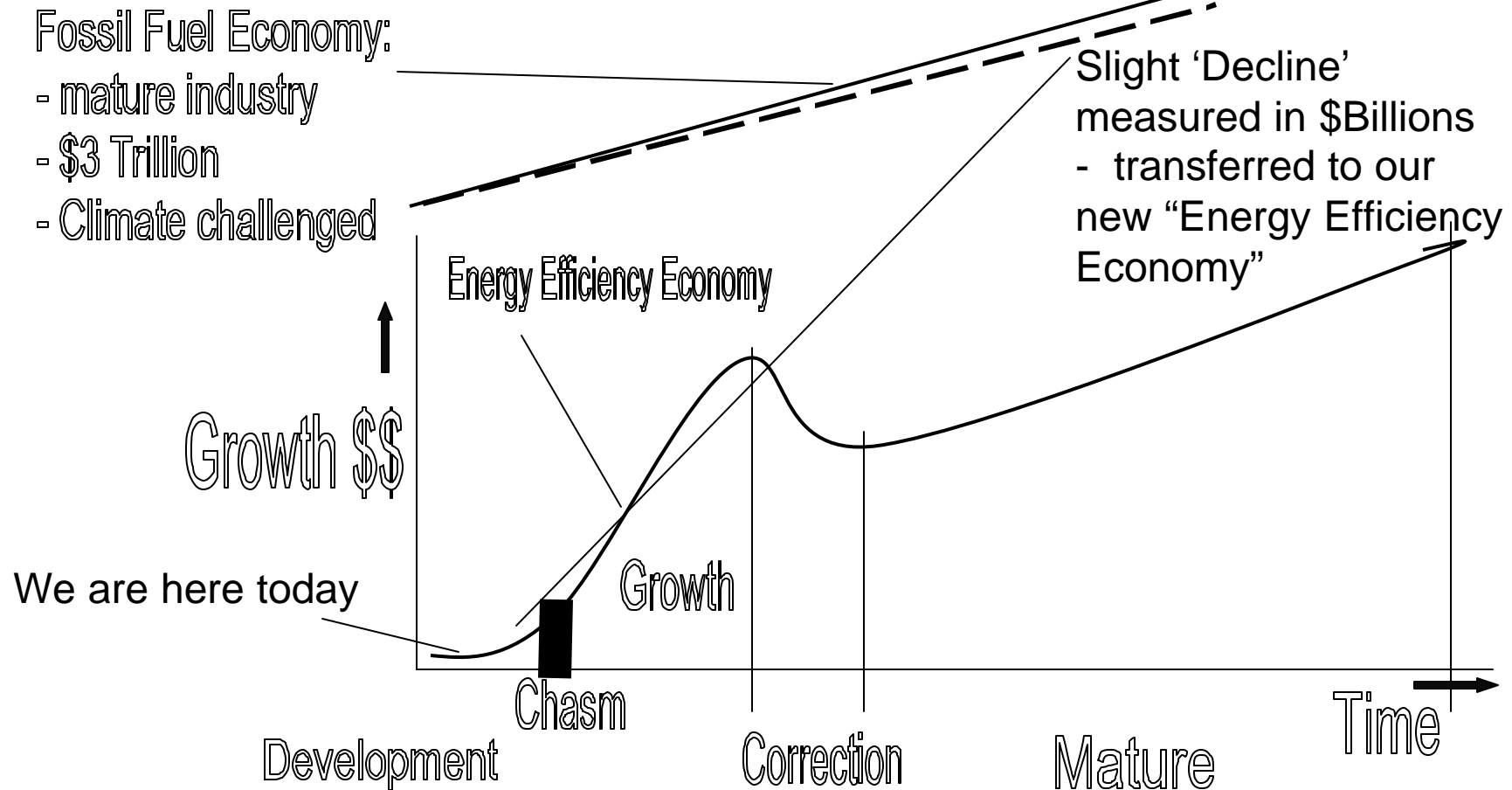
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Tools, Techniques and  
strategies Needed to Navigate

AND

Access the help, success and  
IDEAS that are available

# New and Emerging “Energy Efficiency” Sector



Courtesy of Energy @ Work & MECH and ASSOCIATES

# **New Economy: Driven by “Triple Bottom Line”**



 **Economic Prosperity**

 **Environmental Performance**

 **Social Responsibility**

**(Security and ‘people solutions’)**

# *Opportunities and Challenges for the Energy Industry*



Chairman of the World Energy Council, Antonio del Rosario;

**“Energy underpins all aspects of modern life .... fundamental to maintaining peace, prosperity and health.**

**“The effects of the Iraq war on the energy sector; the continuing worries about greenhouse gas emissions and their effect on the environment; the respective roles of fossil fuels and renewables; the need to encourage technology transfer and new investment in energy; the issues of pricing, subsidies and market reforms; and the question of how to provide access to energy and alleviate energy poverty, are all topics:**

**Theme: ‘*Delivering Sustainability: Opportunities and Challenges for the Energy Industry*’.**

Sydney, Australia: 5 - 9 September 2004

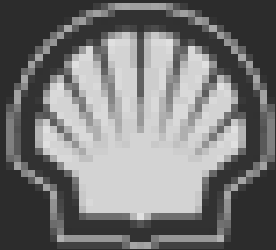
[www.tourhosts.com.au/energy2004](http://www.tourhosts.com.au/energy2004)

## Global Warming

**Consensus is growing among scientists, governments, and business that they must act fast to combat climate change. This has already sparked efforts to limit CO2 emissions. Many companies are now preparing for a carbon-constrained world**

[http://www.businessweek.com/magazine/content/04\\_33/b3896001\\_mz001.htm](http://www.businessweek.com/magazine/content/04_33/b3896001_mz001.htm)

# New Business Solutions, e.g., Shell

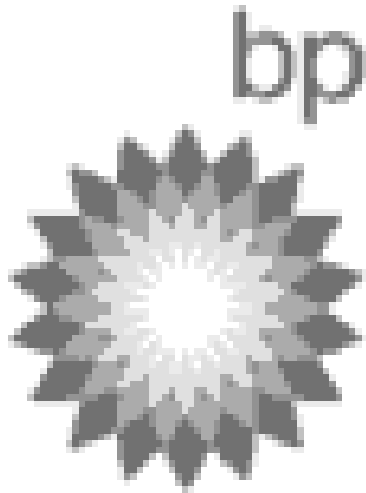


**Shell Global Solutions**

***“If we can save energy here, we can save it anywhere”***  
**Plant director of a top-performing energy sector client**

[http://www.shellglobalsolutions.com/solutions\\_for/industrial/energy\\_sol.htm](http://www.shellglobalsolutions.com/solutions_for/industrial/energy_sol.htm)

# “Walking The Talk” BP



“encouraging our customers to use energy more efficiently and making a radical reduction in our own energy consumption.”

<http://www.bpgas.co.uk/community>

**“BP Makes First Emissions Trades”**

<http://www.bpgas.co.uk/perspectives/environmental/041502.html>

## BP – Beyond Petroleum

# It is happening! But by too few



“ we have integrated both the Annual and Triple Bottom Line reports into one comprehensive document that provides the public and our shareholder with information on our **economic** performance, and **environmental** and **social performance**”

<http://www.bchydro.com/info/reports/reports853.html>

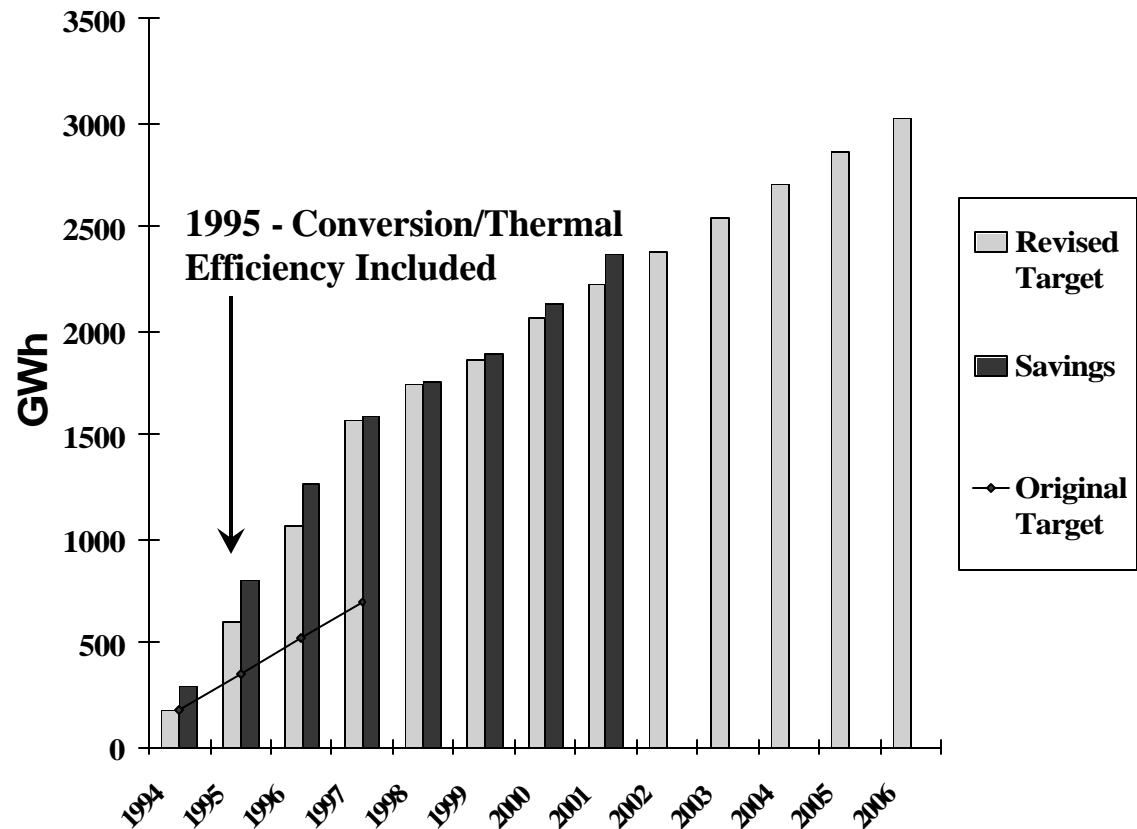
# Canadian Award 1999 and US EPA in 2002

✍ **2,368 GWh/yr  
Energy Savings**

✍ **\$90 Million Saved  
Annually**

✍ **2.5 Million Tonnes  
Emission Savings**

✍ **\$2.2 Million in  
Emission credit  
creation**





Natural Resources  
Canada

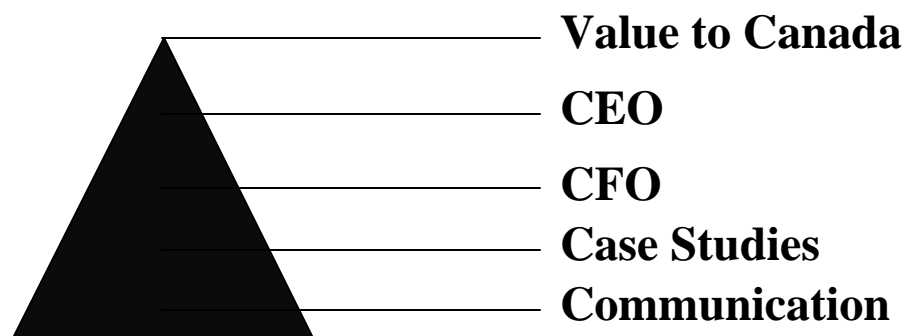
Ressources naturelles  
Canada

Canada



# ENERGY 2003

*“Energy is part of  
everyone’s business”*



“Partnership” Industry Led & Government supported;

Scott Rouse

Chair, CIPEC Energy Managers Network

<http://oee.nrcan.gc.ca/cipec/ieep/newscentre/presentations.cfm>

# Energy 2003 Taught Us:



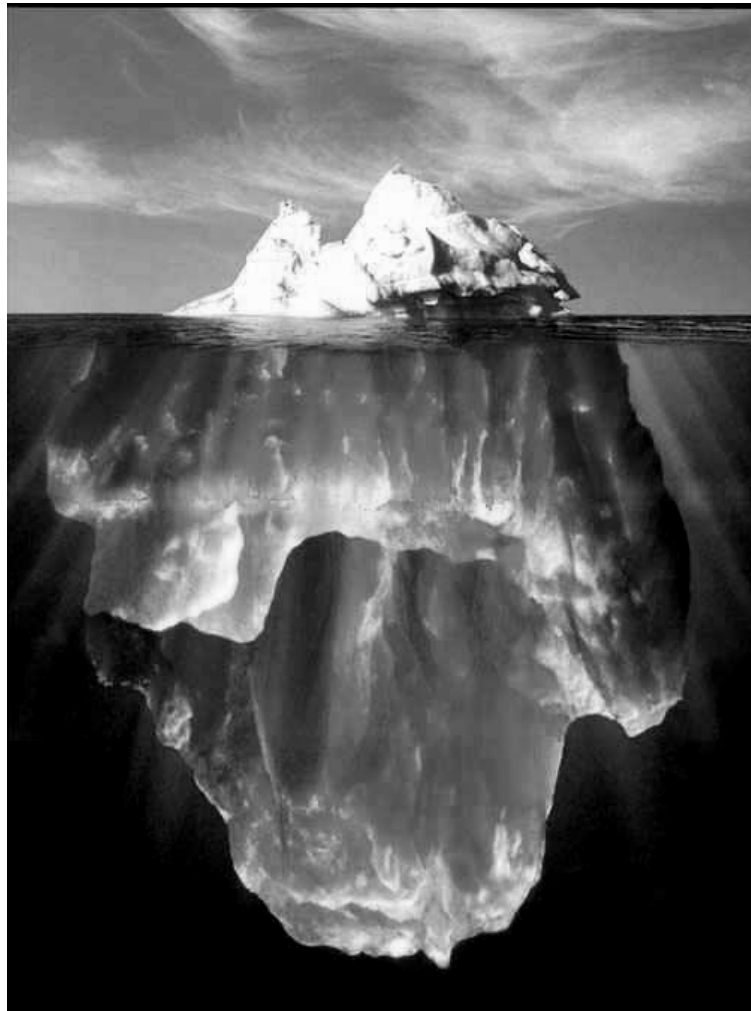
1) Think “Strategically”

2) Understand and Manage “Financially”

3) Value of “Communication”

**CONFIRMED: “Energy is part of everyone’s business”**

# Triple Bottom Line



## Seeing the whole picture:

- **decrease risk**
- **increase opportunity**

---

### 1) ECONOMIC

- Increase Productivity!
- O&MA Savings plus better Reliability
- Therefore - increase Profits

### 2) ENVIRONMENTAL

- Reduce pollution and waste
- Cost-effective KYOTO response

### 3) SOCIAL

- Corporate citizenship & partnerships

# ECONOMIC: Risk Vs Return



High  
Return

Energy Efficiency  
- 20% IRR, Low Risk

Stocks  
- 15% return, higher risk

Treasury Bills  
-3% return, low risk

High Risk

<http://www.energystar.gov/ia/business/Introduction.pdf>

# Environment



✍ Unite Environment / Production / Finance issues:

- **Emission Reductions**
- **Production improvements & flexibility**
- **Cost reduction**

✍ Monetize Environmental Benefits

- **Provides a visible \$\$ value for Emissions**

✍ Engage and improves Employees / Stakeholders

- **Practical way to identify success**

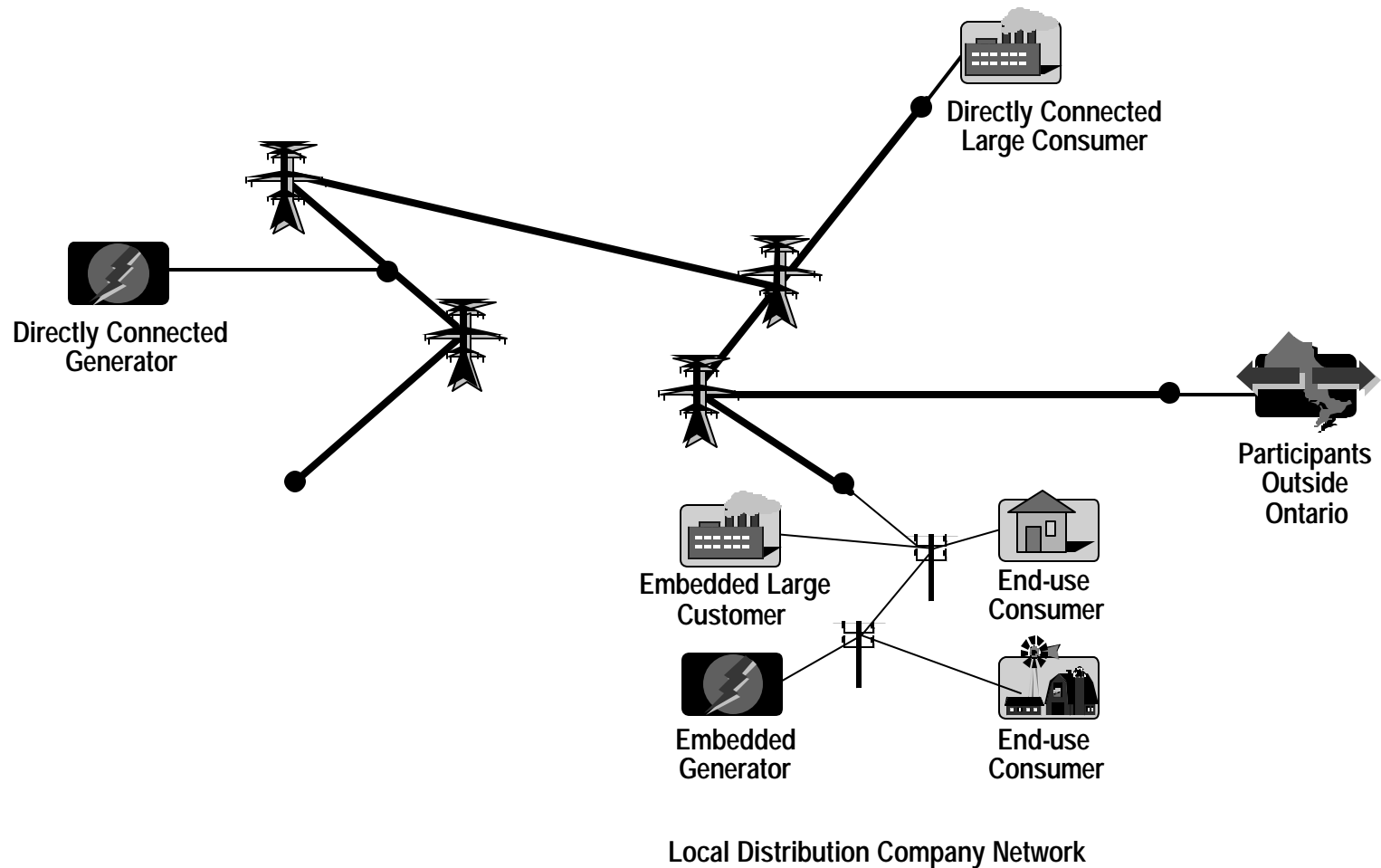
# Social Responsibility



- ✍ **500 corporate fraud convictions or guilty pleas.**
- ✍ **Charged more than 900 / 60 CEO**
- ✍ **30 charges against Enron**  
**- 11 convictions**

**Source: Corporate Fraud Task Force,  
United States Department of Justice**

# Integrated Markets: Supply & Demand



# NEW TOOLS / SKILLS: Metering

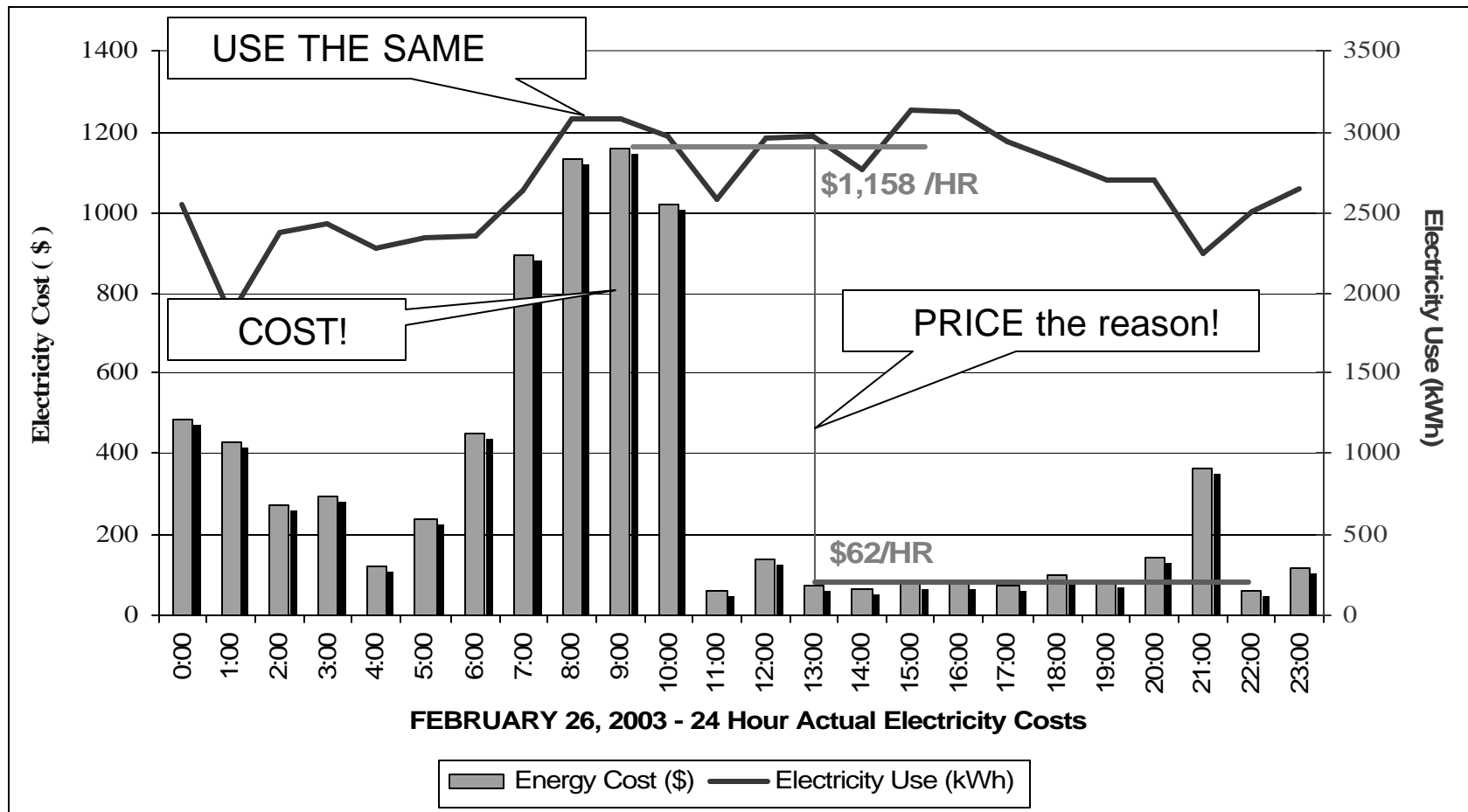


Metering, Billing & Customer Management!

- ✍ **Secure utility's revenue and reduce non-technical losses:**
- ✍ **Revenue protection**
- ✍ **Share experiences**
- ✍ **Learn first-hand from an innovative metering and losses control center:**
- ✍ **Gain information from more than fifty industry experts from utilities, governmental bodies, associations, manufacturers, suppliers and consultants**
- ✍ **Master AMR implementation**

**Faltam apenas alguns dias para o início do evento Medição, Faturamento, CRM/CIS América Latina 2004 – inscreva-se já e faça parte da sessão Latina Americana do setor de medição, faturamento, CRM/CIS em seu encontro annual para explorar as últimas tendencias em medição, faturamento e gerenciamento de [www.metering.com/events/mlam2004/port](http://www.metering.com/events/mlam2004/port)**

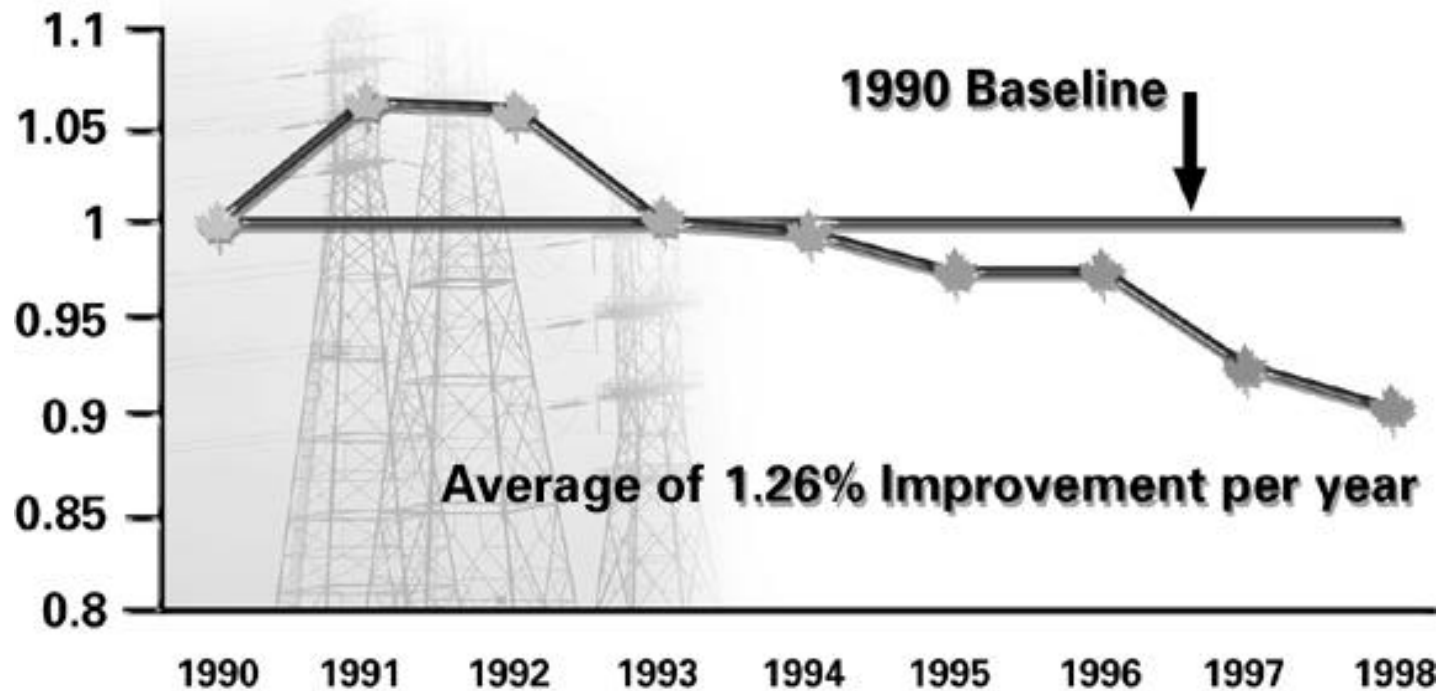
# Real Time Use and Price Needed



# Industry Performance

## Energy Intensity Performance

Source: CIPEC, 2001



# Testimonial: Some companies get it!



## Unilever

- \$3M annual savings

## Dupont

- Energy use flat
- 35% production increase
- 85% GHG reduction

## OH/OPG

- \$90 M annual savings
- 2.6 M tonnes reduced GHG
- \$2.2 M Emission credits
- Canada / USA Awards

## LaFarge

- 11% cut in emissions

## Eastman Kodak

- 33% lower energy consumption

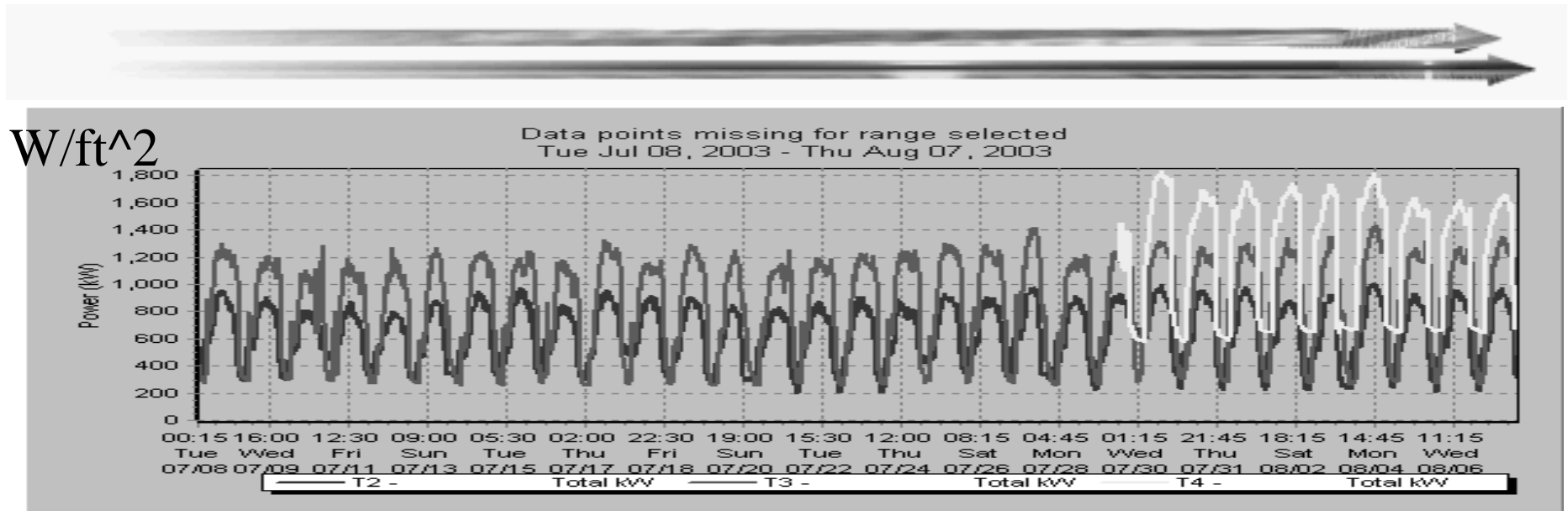
## Owens Corning

- '98 Base \$260 M
- '02 Base \$225 M
- 18% Production
- 10% Unit Energy increase

## Hudson's Bay Company

- “Companies not taking energy seriously will not be competitive.”

# THREE BUILDINGS



Facility	Date	Technology
----------	------	------------

Red	1991	T12-electromagnetic lighting, RTUs (rooftop units) with economizers, (facility for free cooling)
-----	------	--

Green	2001	T8-electronic, RTUs w/o economizers w/BAS
-------	------	---

Yellow	2003	T5, T8, RTUs, economizers / latest BAS/controls
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Argentine FINAL SEPT 2004, [Scott.Rouse@Energy-Efficiency.com](mailto:Scott.Rouse@Energy-Efficiency.com) 416-806-1807  
[WWW.Energy-Efficiency.com](http://WWW.Energy-Efficiency.com)

Courtesy: PSG,<sup>35</sup> Ted Draack

# Complete Heating/Cooling Evaluation

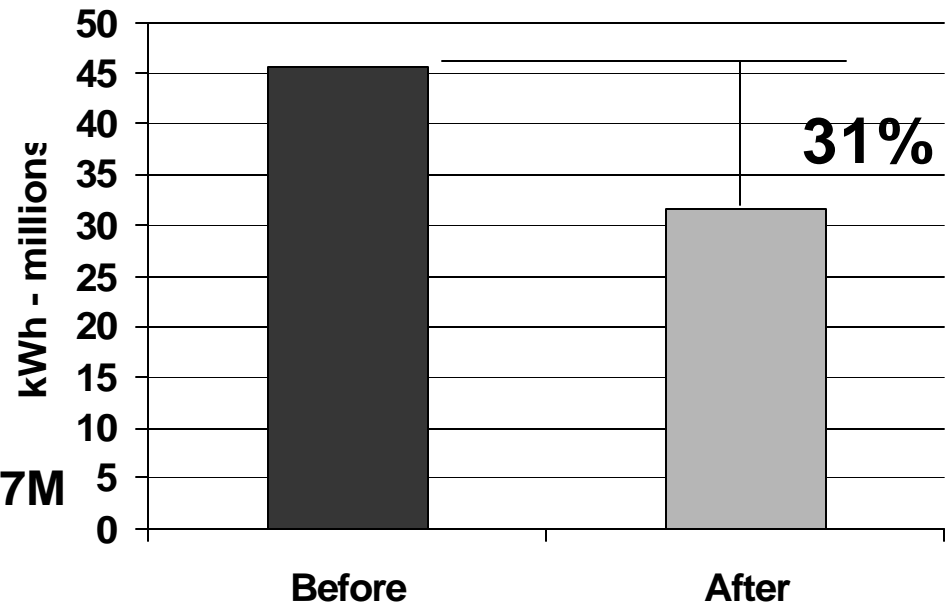
✍ **Investment: \$4.7M**

✍ **Annual Energy Savings:**

- 31%
- 50,396 GJ

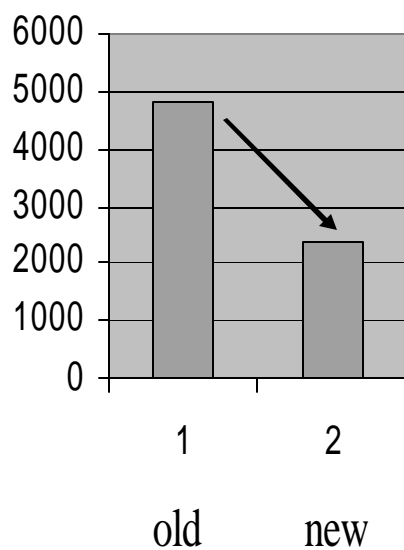
✍ **Financial:**

- Annual Savings **\$1.317M**
- IRR: **25%**
- NPV (10 yrs @ 6%): **\$5 M**
- Payback Period: **<3.5 yr**

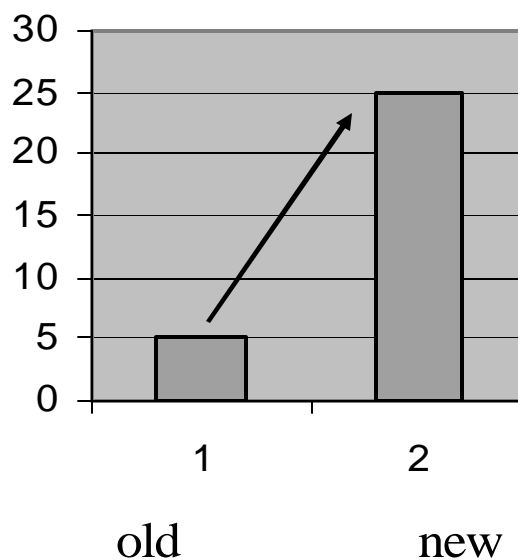


# Lighting

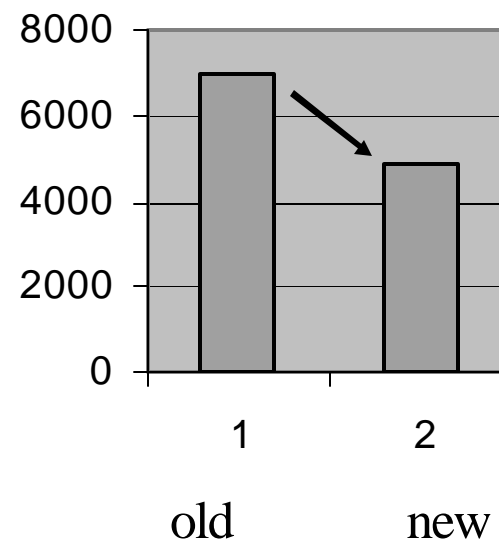
Reduction in number of  
fixtures



Increase in light levels  
foot candles

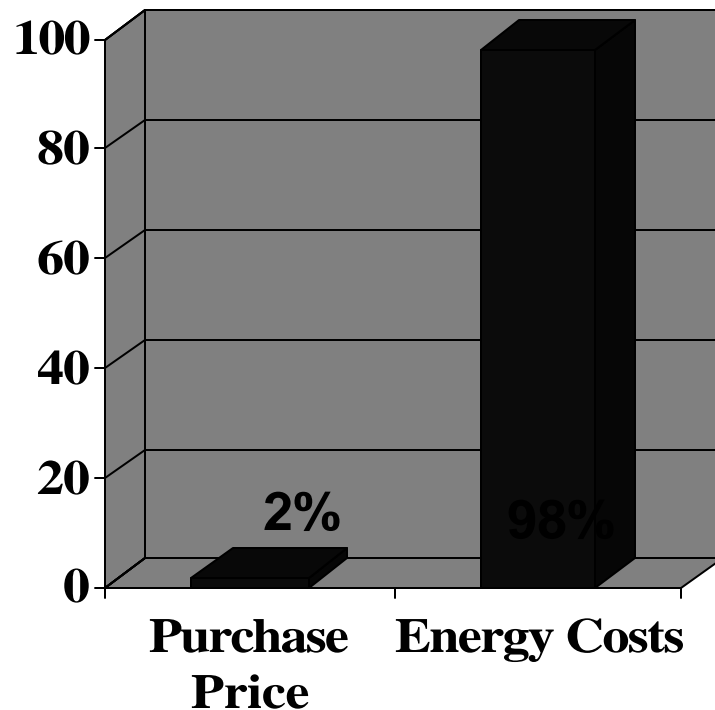


Reduction in Energy  
Use MWh/yr.



# MOTORS

**Motor Costs;  
Compare motor cost to  
energy cost**



**Benefits of Motor Management:**

- **Higher reliability**
- **Higher efficiency = lower O&M costs**
- **Flag problems**
- **Integrate motor management program with predictive maintenance**

# New Construction



- ✍ Encourages energy efficient investments early in building design
- ✍ Eligible projects are 25% better than the Model National Energy Code

## **Darlington Service Centre**

- **27% energy reduction**
- **\$115,000/year savings**
- **\$80,000 CBIP grant**

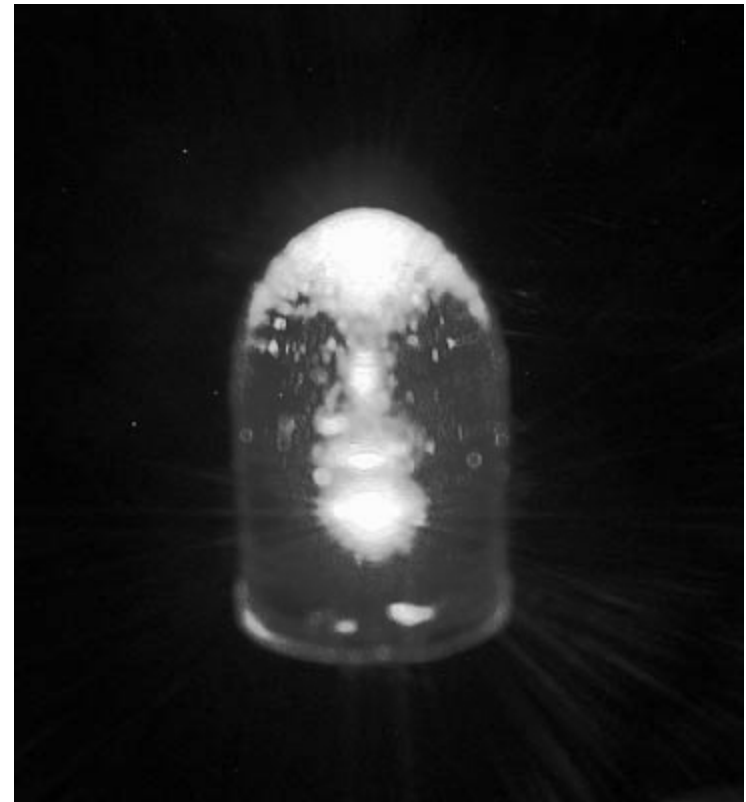
## **Pickering #2 Engineering Services**

- **27% energy reduction**
- **\$20,000/year savings**
- **\$65,000 CBIP grant**

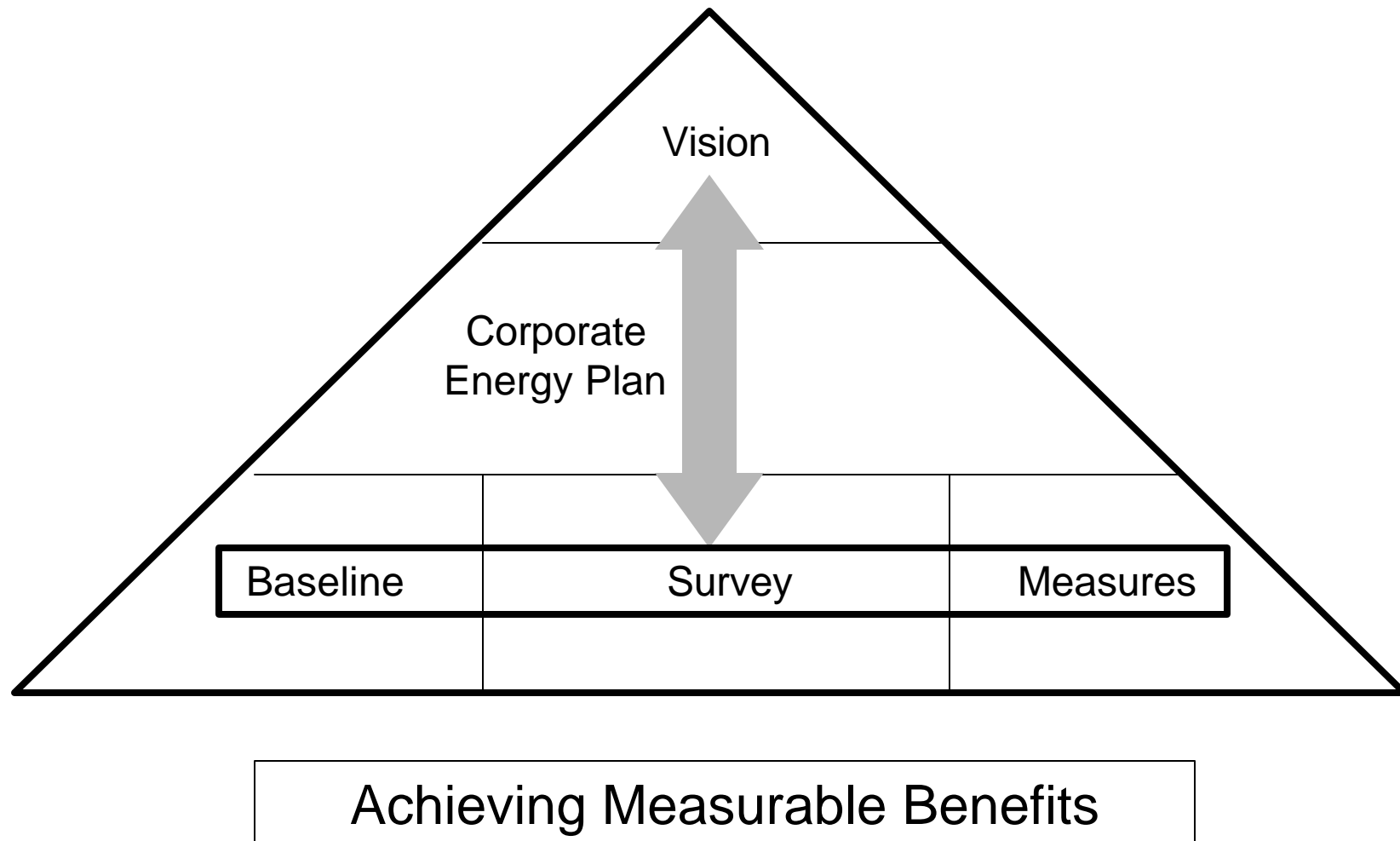
## **777 Brock Road**

- **30% energy reduction**
- **\$56,000/year savings**
- **\$80,000 CBIP grant**

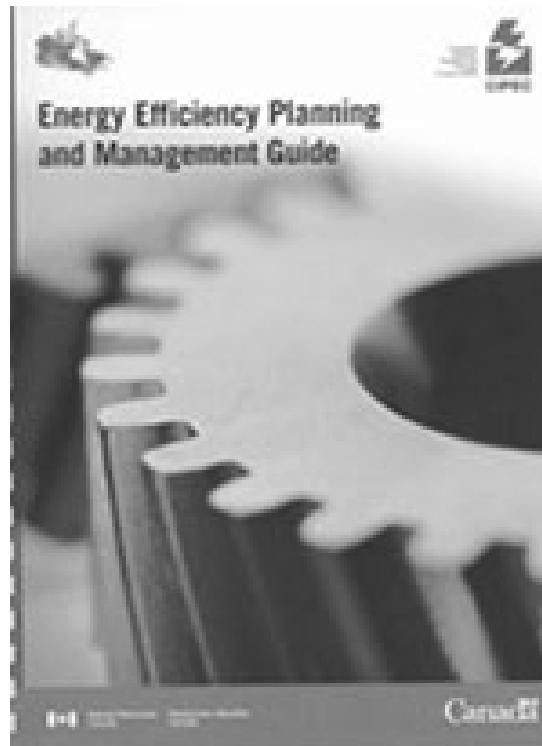
# Simple choices – proven solutions



## ***“Corporate Energy Plan”*: Tactical support to Vision**



# Models Available




<http://oee.nrcan.gc.ca/>

# Energy @ Work



- ✍ Environmental concerns growing
  - **Climate change & greenhouse gases (GHG)**
  - **Health & fitness issues**
  - **Strict obligations expected**
  
- ✍ Electricity market changing
  - **Competition introducing new market mechanisms**
  
- ✍ Solutions are available!
  - **Energy Efficiency leading to Emission Reductions**

# BEST PRACTICE GUIDE for EE

- 
- 1) Top Level Commitment**
  - 2) Clearly Defined Goals Tied to Rewards and a Communication Plan**
  - 3) Assignment of Responsibility**
  - 4) Documented Energy Use Tracking System**
  - 5) Process of Project Identification with Appropriate Risk vs. Return**
  - 6) External Comparison and Information Exchange**
  - 7) Recognition of Achievement**

# Corporate Energy Plan:Best Practice Matrix

		COMMITMENT	GOALS	RESPONSIBILITY	TRACKING	I.D. PROJECT	COMPARISON	RECOGNITION
P A R T I	100%							
	75%							
	50%							
	25%							

Existing  Target 

Part Two – Success / Failure

Part Three – Specifics

ALL ON SINGLE PAGE FOR COMMUNICATION

# Energy Efficiency Best Practice Guide Matrix

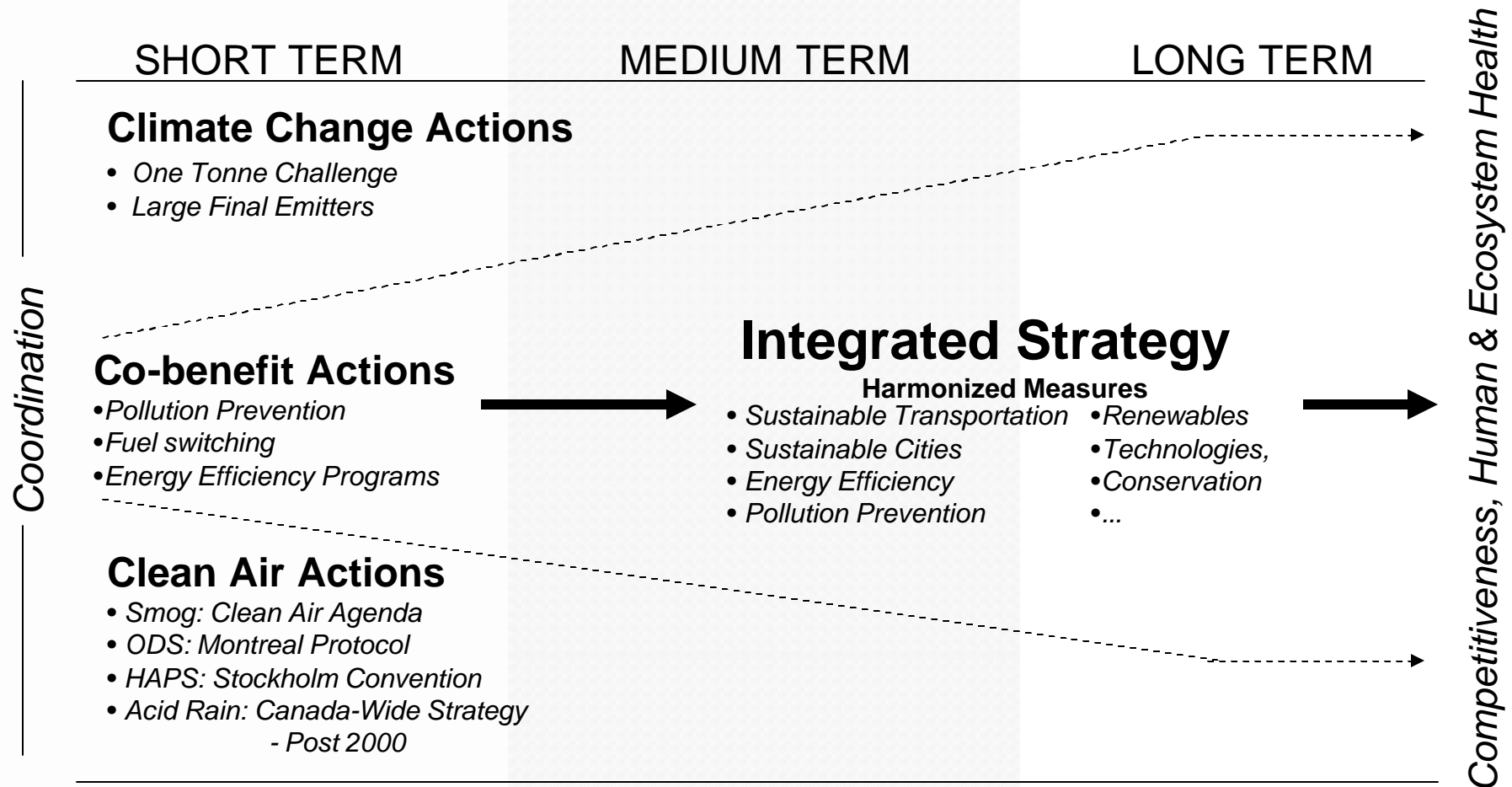
**Business:**

**Date:**

PART I	100%							
	75%							
	50%							
	25%							
II	Success							
	Gaps							
III	Criteria Measure	Energy Policy Reference	Annual Energy Target	Single Point of Contact List	KWhs per unit output	Reference List	Identify Network	Proposed Program
	Criteria	1. Top Level Commitment *Energy Policy	2. Clearly Defined Goals Tied to Rewards and A Communication Plan	3. Assignment of Responsibility	4. Documented Energy Use Tracking System	5. Process of Project Identification with appropriate Risk Vs Return	6. External Comparison and Information Exchange	7. Recognition of Achievement

Refer to the *Energy Efficiency Best Practice Guide* to use this matrix and help improve your energy efficiency program. The matrix will help engage others to determine the criteria that are being met and to what extent these have been met.

- Canada's focus on immediate action;**
- while we develop/initiate longer term integrated solutions**





**Scott Rouse, P. Eng, MBA, CEM**

**Energy @ Work**

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