



Environment Accounts and Statistics Division



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Widening the P2 Circle:
Measuring Pollution Prevention in Canada

6th Canadian Pollution Prevention Roundtable

Québec City, Québec

April 25 & 26, 2002

Presented by Jeff Fritzsche



Who we are and what we do

- *Environment accounts and their related indicators
(Econnections -- linking the environment and the economy)*
- *Spatial analysis*
- *Human Activity and the Environment*
- *Environmental surveys*



Environmental Surveys

- *Waste Management Industry Survey: Business Sector*
- *Waste Management Industry Survey: Government Sector*

- *Environment Industry Survey*

- *Household Environment Survey*

- *Survey of Environmental Protection Expenditures (SEPE)*



What is covered by the Survey of Environmental Protection Expenditures?

- *Annual survey 1994 to 1998, biennial since 1998*
- *Collecting variety of operating and capital expenditure data on environmental protection since 1994:*
 - Environmental monitoring
 - Environmental assessments and audits
 - Site reclamation and decommissioning
 - Protection and restoration of wildlife and habitat
 - Environmental charges
 - Purchase of environmental services
 - PAC (end-of-pipe) and pollution prevention



What is Covered, continued

Improvements and expansions over time:

- 1995 added pollution prevention methods
 - 1997 added environmental technologies and processes; environmental management practices
 - 2000 reference year refined questions on energy conservation and efficiency, environmental biological treatment, and environmental management practices
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- ***2000 reference year survey mailed in October 2001***
 - preliminary data scheduled for release Summer 2002
 - detailed report scheduled for release Fall 2002



How do we define an environmental protection expenditure?

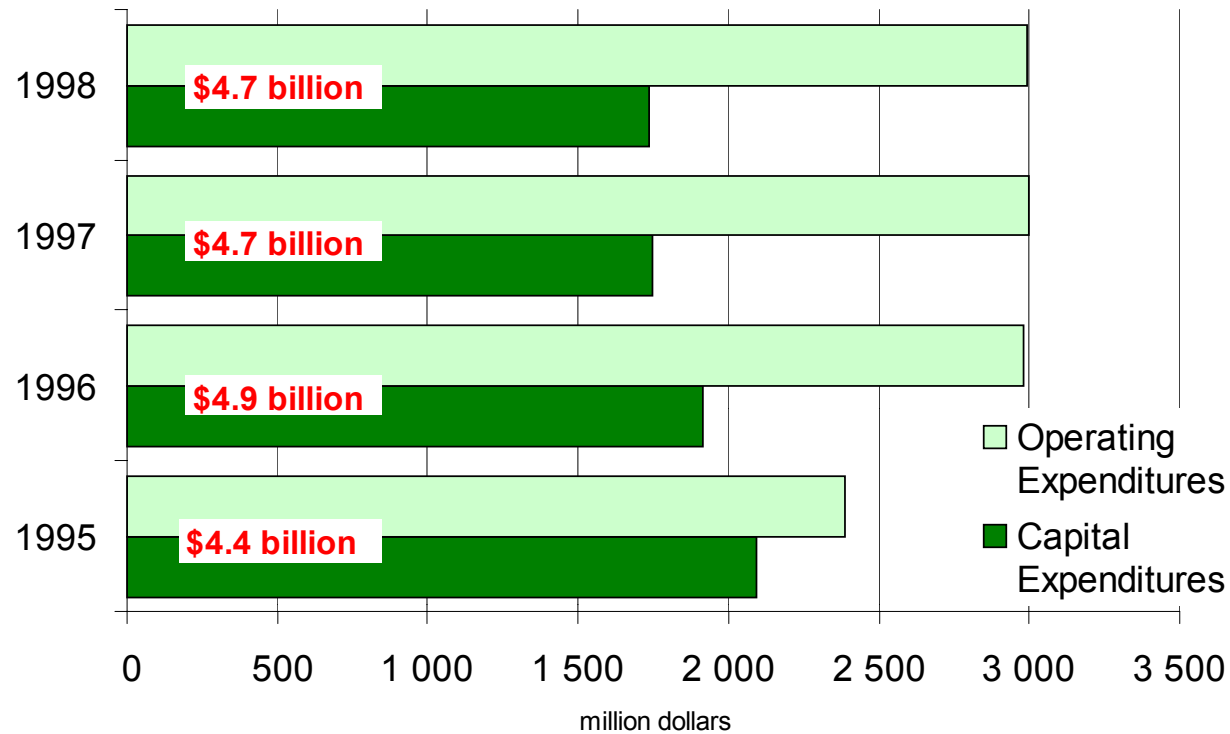
- ***An environmental protection expenditure are made by businesses “to comply with or to anticipate environmental regulation(s), convention (s) or voluntary agreement(s)”***
- ***Limitations of definition***

Who is surveyed:

- ***The survey is establishment-based that provides detailed information for 16 industry groups in primary and manufacturing industries***
- ***Consistently high response rate***

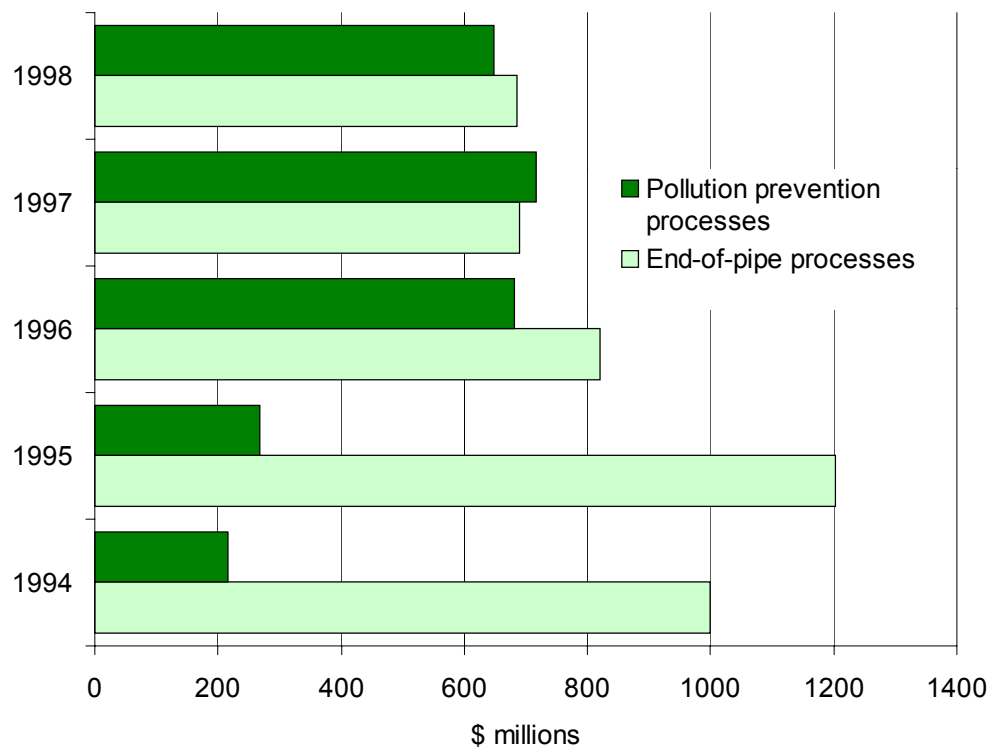


Total Environmental Protection Expenditures





Capital Expenditures on P2 and PAC





- ***The top P2 spenders in 1998 include the following industries:***
 - Pulp, Paper and Paperboard Mills (\$179 million)
 - Chemicals (\$94 million)
 - Primary Metals (\$73 million)
 - Pipeline Transportation (\$64 million)
 - Petroleum and Coal (49 million)
 - Oil and Gas Extraction (\$46 million)

- ***On average, most industries have increased their P2 investments since 1994***
 - Pipeline Transportation industry witnessed the highest average growth since 1995 (142%)



Where was industry directing their investments in 1998?

Pollution prevention:

- almost 70% of capital expenditures directed at reducing air emissions
- the ratio has increased over time (30% in 1995)
- shift from surface waters to air emissions

PAC (end-of-pipe):

- < 50% of capital expenditures directed at air emissions
- remainder split between surface waters and on-site contained solid and liquid waste
- shift from surface waters to air emissions and on-site contained solid and liquid waste



Pollution Prevention Practices

	1995	1996	1997	1998	1999/ 2000
	percent				
On-site recirculation, recovery, reuse or recycling	64	66	64	66	66
Prevention of leaks and spills	51	59	60
Material or solvent substitution	33	37	37	31	37
Substitution or modification of production process	32	31	24	23	31
Product design or reformulation	10	11	15	17	21
Other	5	8	10	10	7



Energy Conservation

- ***Overall, 70% of establishments indicated they used at least one energy conservation process or technology***
- ***The most frequently reported:***
 - use of energy efficient equipment (44% of establishments)
 - waste-to-energy systems (18%)
 - fuel substitution (15%)



Renewable Energy

Biomass energy source:

- 6% of establishments overall
 - Pulp and Paper industry (39%)
 - Wood industry (21%)

Solar power:

- 3% of establishments overall
 - Oil and Gas Extraction industry (36%)
 - Electric Power Generation, Transmission and Distribution (15%)
 - Mining and Transportation Equipment industries (<10%)

Wind energy:

- 1% of establishments overall
 - Electric Power Generation, Transmission and Distribution (15%)



Top Users of at Least One Energy Conservation Process

Four of the top 6 are energy-related industries:

- Pipeline Transportation (95%)
- Electric Power Generation, Transmission and Distribution (88%)
- Oil and Gas Extraction (85%)
- Pulp, Paper and Paperboard Mills (81%)
- Natural Gas Distribution (75%)
- Petroleum and Coal Products (75%)



Environmental Management Practices

- ***Added in 1997 to track progress:***
- ***What type of environmental management practices were in use***
 - environmental management systems
 - ISO 14000 certification
 - participation in voluntary programs
 - Life Cycle Management, Life Cycle Assessment or Design for Environment (DfE)



Environmental Management Practices

Environmental management practice	Establishments	Proportion of
	using the practice	establishments
	number	percent
Environmental management system	888	64
Life cycle analysis	263	19
ISO 14000 Certification	145	10
Environmental voluntary agreements	514	37
Green procurement policy	198	14
Eco-labelling of products	81	6
Annual environmental performance report	478	34
Other	71	20
Total	1 455	82



Environmental Management Practices by Firm Size

Firm Size	Environmental management system	Life cycle analysis	ISO 14000 certification	Environmental voluntary agreements	Green procurement policy	Eco-labelling of products	Annual environment performance report
	percent ¹						
<100	52	17	9	26	10	4	26
100 - 499	64	18	10	34	13	7	33
500 - 999	76	18	16	53	19	6	43
>999	88	34	24	77	31	4	59



Future Directions

- ***2002 reference year survey mailout will be in May 2003***
- ***Climate Change Technologies***
 - improve the classification
 - interdepartmental working group
 - 5-year project to develop the content of two new supplementary questionnaires
- ***Analytical Projects***
 - work more with other professionals to expand our analysis
 - e.g. develop an estimate of environmental protection capital stock



Challenges

- **Classification**
 - overlap between environmental concepts
 - from a survey manager perspective and from a respondent perspective, can be difficult to interpret
- **Cost savings**
 - can we measure cost savings (quantity) from the implementation of such things as pollution prevention methods, environmental management practices or other environmental technologies related to climate change or energy efficiency etc.?



Further Information

- ***Go to Statistics Canada's Website to download our survey reports for free:***
 - <http://www.statcan.ca> : Our Products and Services - Free Publications - Environment
- ***Our email address: environ@statcan.ca***