



PTAC

PETROLEUM TECHNOLOGY ALLIANCE CANADA

ANNUAL REPORT

2005



facilitating  
technology  
solutions

# mission



**Facilitating innovation, collaborative research and technology development, demonstration and deployment for a responsible Western Canadian upstream hydrocarbon energy industry**

**PTAC Technical Areas**

- CO<sub>2</sub> Enhanced Hydrocarbon Recovery
- Coalbed Methane / Unconventional Gas
- Drilling
- e-Business
- Eco-Efficiency / Emission Reduction / Energy Efficiency
- Environment
  - Air
  - Ecological
  - Soil and Groundwater
  - Water
- Health and Safety
- Heavy Oil
- Heavy Oil Transportation
- Inactive Wells
- Innovation
- Instrumentation / Measurement
- Natural Gas Production
- Oil Production
- Oil Sands
- Pipelines
- R&D Funding
- Reservoir / Geoscience
- Resource Access
- Telecommunications
- Well Completion

# 2005 key accomplishments facilitating technology solutions

**Launched technology roadmaps for unconventional gas and unconventional heavy oil**

**Completed the Alberta portion of the Energy Innovation Network (EnergyINet) Increased Recovery of Oil and Gas Business Case**

**Completed the majority of the deliverables for Phase 1 of the Technology for Emission Reduction and Eco-Efficiency (TEREE) initiative**

**Facilitated the launch of 23 R&D projects or new project phases**

**Facilitated the world's largest Unconventional Gas Conference hosted by the Canadian Society for Unconventional Gas (CSUG)**



*Eric Lloyd*

Eric Lloyd, President



*Mike Singleton*

Mike Singleton, Chairman

## Message from the Board of Directors

PTAC Petroleum Technology Alliance Canada is the leading organization facilitating innovation, collaborative research and technology development, demonstration and deployment for a responsible Western Canadian upstream hydrocarbon energy industry. In 2005, PTAC facilitated 23 projects, 16 Technology Information Sessions, 10 forums, 11 workshops and one conference. PTAC brought government, industry and academia together for several important projects and initiatives in 2005. PTAC handled both the project management and banking for 10 projects which totalled \$1.2 million.

One of the most significant projects completed in 2005 was the Alberta portion of the Energy Innovation Network (EnergyINet) Increased Recovery of Oil and Gas Business Case Project. This entire project, valued at \$978 thousand, was developed to provide a detailed business case for increasing recovery factors in reserves of oil and gas in the Western Canadian Sedimentary Basin (WCSB). Funded by the Alberta Energy Research Institute (AERI) and industry, the project has identified in which pools project participants could deploy both existing and new technology to significantly increase oil and gas production and recoverable reserves.

PTAC also launched the Unconventional Gas Technology Roadmap and the Expanding Heavy Oil and Bitumen Resources While Mitigating Greenhouse Gas (GHG) Emissions and Increasing Sustainability Technologies Roadmap in 2005, to provide guidance on future research and technology needs of the industry.

PTAC's Technology for Emission Reduction and Eco-Efficiency (TEREE) initiative, that seeks to identify the top opportunity areas and technologies to reduce GHGs and emissions, completed several significant projects in 2005. These included the Fire Tube Immersion Heater Project to improve heater efficiency and a project on Conventional Heavy Oil R&D Needs Including GHG Intensity Reduction. In addition, PTAC released the Barriers to Deployment of Environmental Technologies Report, which provides a series of recommendations to increase implementation of best practice technologies to improve environmental performance in the upstream oil and gas industry. In total, PTAC facilitated the launch of 23 projects or new project phases valued at \$9.7 million during 2005, bringing the total number of projects launched since inception in 1996 to 200 with a value of \$123.2 million.

In 2005, PTAC facilitated the world's largest Unconventional Gas Conference (hosted by CSUG). PTAC also facilitated forums on:

- Air Research
- CO<sub>2</sub> Enhanced Oil and Gas Recovery
- Distributed Power Generation and Energy Efficiency
- Driving Safety Technology
- Ecological Issues Research and Resource Access Priorities
- Energy Conservation and Air Emissions Technologies
- Innovative Drilling Technologies and Best Practices
- Soil and Groundwater Research
- Water Efficiency and Innovation
- Wireless and Telecommunications Technology

PTAC also launched the Water Innovation Planning Committee, Unconventional Gas Technology Roadmap Committee, Heavy Oil Transportation Committee and the Unconventional Heavy Oil Technology Roadmap Committee in 2005.

PTAC's contact database holds over 10,000 technical contacts from industry, academia, government and others.

On behalf of the Board, we would like to express our appreciation to PTAC staff and volunteers for their outstanding contributions to our success.

# 2005 highlights

## PTAC Launches Technology Roadmaps for Unconventional Gas and Unconventional Heavy Oil

In 2005, PTAC launched two technology roadmaps: the Unconventional Gas Technology Roadmap (UGTR) and the Expanding Heavy Oil and Bitumen Resources While Mitigating GHG Emissions and Increasing Sustainability Technologies Roadmap. The Canadian Unconventional Gas Technology Roadmap for coalbed methane, tight gas, shale gas and gas hydrates outlines the business and societal challenges to development, the state of the current recovery technology and the best avenues for improved or new technology. Canadian unconventional resources may hold the key to greater future gas supply. However, the nature of these reserves, and the way they are trapped in the reservoirs, makes access difficult and costly. Technology development holds the key to unlocking these reserves, both to improve recovery and reduce costs.

The development of a technology roadmap is a way to increase awareness of the opportunity offered by unconventional gas and bring the future development opportunity under the review of a wide stakeholder base. In this way, the industry can gain consensus on the technical challenges, help legislators understand those challenges, and where necessary make an appropriate response to encourage further development of these resources.

The UGTR will cover the WCSB and is expected to be made available to the public by May 31, 2006.

Natural Resources Canada contracted PTAC to develop the Expanding Heavy Oil and Bitumen Resources While Mitigating GHG Emissions and Increasing Sustainability Technologies Roadmap to support research and technology development (R&D) for the eventual development of deposits in the next 20-30 years. The funding contribution for the project is provided by the Climate Change Technology and Innovation Initiative, with the project focused on identifying potential technologies having the potential to lower GHG intensities of future developments. Sustainability, environment (air, water, land), economic and security (societal safety, risk management and energy supply) criteria will also be considered. The resources targeted include:

- Intermediate Zone Oil Sands currently deemed not to be economic with existing technology
- Heavy oil in the "Carbonate Triangle" of Alberta
- Un-cemented deep sands south of Cold Lake and surrounding Lloydminster
- Small surface bitumen deposits in Saskatchewan
- Oil sands under tailings

The PTAC Unconventional Heavy Oil Technology Roadmap Steering Committee was constituted to guide the development of this Roadmap. This roadmap is expected to be made available to the public by May 31, 2006.

Roadmaps have gained wide acceptance as an excellent way to bring industry, government and societal groups together and guide cooperative work.

## PTAC Nears Completion of TERE Phase 1

PTAC's TERE initiative, which takes a one-window approach toward identifying the top opportunity areas to reduce GHGs and emissions and reduce costs, is close to completion.

Providing a toolbox of best practice solutions and proven, cutting edge technologies to the oil and gas sector, TERE has made excellent progress facilitating:

- Recognition and understanding of key emission reduction issues
- Identification and evaluation of existing eco-efficient technology and best practice solutions to address these key issues
- Development of new technologies and best practices that address identified gaps
- Transfer into practice new and existing technology and best practice based solutions

The TERE initiative formed with significant funding from Western Economic Diversification Canada in early 2003 is nearly complete. Since inception, six significant projects: Fire Tube Immersion Heater Optimization Project, Barriers to Deployment of Environmental Technologies Study, Efficiency Enhancements with REM AFR Systems Case Study, SRU Incinerator Optimization, Spectrasyne-Optical Measurement Technology Study and Conventional Heavy Oil R&D Needs Including GHG Intensity Reduction have been completed.

PTAC's TERE initiative has been successful working with producers, industry, non-governmental organizations and government to move projects forward to encourage energy efficiency to reduce GHGs and emissions.

technology transfer

# outlook

## Outlook for 2006

In 2006, PTAC will continue to work with industry, academia, governments and collaborating associations as the preferred vehicle for facilitation of upstream hydrocarbon energy R&D.

PTAC expects to enter into a significant Memorandum of Understanding (MOU) on Research and Innovation with the Canadian Association of Petroleum Producers (CAPP), the Petroleum Services Association of Canada (PSAC) and the Small Explorers and Producers Association of Canada (SEPAC) in May 2006. This MOU is expected to result in improved identification of industry R&D needs, more effective influence of government R&D policy, a new mechanism for funding R&D projects, improved association communication on R&D and greater long-term financial stability for PTAC.

PTAC also intends to build a stronger relationship with EnergyINet by jointly contracting a Director of Increased Recovery focused on both unconventional gas and conventional oil and gas R&D for both organizations.

PTAC expects to proceed with Phase 2 of the TEREI initiative with funding from Western Diversification, the Alberta Government, Environment Canada and industry. Seven new TEREI projects valued at over \$3 million are expected to be launched in 2006. Two remaining TEREI studies, Sulphur Recovery Unit Optimization and Emissions and Efficiency Enhancements with REM AFR Systems, are expected to wrap up TEREI Phase 1 in early 2006.

PTAC will be moving into new office space on the fourth floor of the Chevron Building in June 2006. This new space will ensure our office needs are met for the next five years, while remaining in close proximity to most of our industry contacts in the Calgary downtown core.

PTAC will work toward increasing its membership to include more stakeholders from all points along the hydrocarbon energy continuum, such as emerging production, oil sands, pipeline and service and supply companies as well as royalty trusts.

PTAC will continue to collaborate with stakeholders to complete the British Columbia and Saskatchewan portions of the EnergyINet Increased Recovery Business Case project. PTAC will also complete the ongoing technology roadmaps for unconventional gas and unconventional heavy oil.

PTAC will continue to facilitate the CAPP/SEPAC Environmental Research Advisory Council (ERAC) process in 2006, including facilitating 15 research projects. PTAC expects to host a number of information sessions, workshops and technical meetings in the environmental technical area. Three research forums will address air, soil, and ecological issues.

PTAC will facilitate a two day Water Innovation in the Oilpatch Conference in June 2006. The Shallow Gas Technology Forum will be held in March 2006.

PTAC's Driving Safety Working Group has identified the top driving safety issues in the upstream oil and gas industry and will focus on the physical and behavioural technologies available at the Driving Safety Technology Forum in April 2006.

The PTAC Technology Roadmap for Inaccessible Bitumen and Heavy Oil Resources Workshop and Energy Conservation and Air Emissions Case Studies, Resource Access Technology, Water Innovation in the Oil Patch and Wireless and Telecommunications Technology Forums are planned for late 2006.

# development

# creating value for the industry

PTAC offers a variety of services to its members and the upstream hydrocarbon energy industry. For more information on PTAC's value please visit PTAC's web site at [www.ptac.org/memser1.html](http://www.ptac.org/memser1.html).

**Facilitating innovation, collaborative research and technology development, demonstration and deployment for a responsible Western Canadian upstream hydrocarbon energy industry**

## Ongoing R&D Projects

PTAC facilitated 23 R&D projects or project phases in 2005. PTAC provides a neutral forum for industry to: solicit proposals, launch projects and identify opportunities, problems and potential solutions that require research or technology development. PTAC also ensures existing R&D is identified to raise industry awareness and minimize duplication. R&D proposals that meet the research or technology criteria are invited to present their proposal in a fair hearing of interested industry contacts. Please see [www.ptac.org/projects1.html](http://www.ptac.org/projects1.html) for a current list of projects.

## Technology Information Sessions

PTAC facilitated 16 Technology Information Sessions attended by over 900 participants in 2005. PTAC facilitates Technology Information Sessions for members to: solicit interest, feedback, participation or potential funding for new R&D projects; find industry partners to complete proposed R&D or technology development (such as field test or pilot sites) or to report on field test or pilot results; provide information on technology-related services; and market new technology to the Canadian oil and gas industry. More information is available at [www.ptac.org/fis1.html](http://www.ptac.org/fis1.html).

## Forums, Workshops and Conferences

A total of over 3100 participants attended 22 forums, workshops and conferences hosted by PTAC in 2005. This includes the Seventh Annual Unconventional Gas Conference hosted by CSUG and facilitated by PTAC.

PTAC forums focus on specific needs or technical areas. Information is shared on new technologies, case studies, and the objectives and results of current research.

PTAC conducts workshops to provide opportunities for participants to clearly define R&D issues, to identify potential solutions and to select the best approach to move forward. Potential suppliers of R&D have the opportunity to hear firsthand about issues and to contribute their expertise and ideas for solutions. PTAC hosts the workshops and provides the necessary facilitation, administrative support and coordination to launch projects. When identified, PTAC issues Request for Proposals (RFPs) and Expressions of Interest for each priority issue. Once those who will consider supporting the R&D have been identified, proposals are solicited from potential suppliers. PTAC brings together the interested organizations in a structured way that leads to new R&D, while protecting proprietary interests. Please see [www.ptac.org/forums1.html](http://www.ptac.org/forums1.html) and [www.ptac.org/workshops1.html](http://www.ptac.org/workshops1.html) for more information.

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Eric Lloyd  
President

Denis Gaudet  
Director, Technology Transfer

Arlene Merling  
Manager, Operations

Lorie Frei  
Operations and  
Web Site Administrator



inform

## PTAC Knowledge Centre

The PTAC Knowledge Centre provides public access to non-proprietary technical information on commercially available upstream oil and gas related technologies. The collection focuses on sustainable, eco-efficient, energy efficient and GHG-reducing technologies.

The Knowledge Centre offers access to 13 core energy and premier technical databases. The Information Specialist provides literature searches and documents to technical steering committees, project performers, researchers and others, to help identify technologies and research needs, avoid duplicate research and monitor industry trends.

Knowledge Centre services include literature searches, search alerts, contact information for subject experts in industry, government and academia, and information on local, national and international events.

PTAC members are invited to provide non-proprietary technical information, in hard copy or electronic format, to PTAC for display in the Knowledge Centre. Relevant materials are accepted on an ongoing basis.

## Programs and Incentives

On behalf of Natural Resources Canada's Office of Energy Efficiency, PTAC continues to deliver the energy and emission audit incentive to identify energy and emission reduction opportunities and to provide access to information to encourage implementation of recommendations to reduce energy use.

Several events are hosted by PTAC in Alberta and Saskatchewan that focus on technical issues relating to energy use and encourage energy efficiency in the upstream oil and gas industry.

PTAC added ten new topic areas to the Oil and Gas Energy Efficiency section of the Knowledge Centre in 2005: thermal heavy oil, sour gas, compressors, conventional heavy oil, sweet gas, water management, flare management, fire heaters, cogeneration and vent gas management.

PTAC continues to facilitate the ERAC funding program on behalf of CAPP. ERAC projects are collaboratively funded and managed by PTAC technical steering committees. Fifteen projects were approved for 2005 totaling \$1 million dollars. These projects provide science-based solutions to current and emerging environmental issues that are critical to the industry.

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***"I am currently involved with the Soil and Groundwater Research Committee and Salinity Working Group of PTAC. As an upstream oil and gas industry representative, I feel that this involvement is valuable as PTAC facilitates collaborative R&D work with government and regulators that is an integral part of industry's commitment to improve environmental performance. I greatly enjoy working towards the goal of providing practical, science-based solutions to environmental challenges."***

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Chris Meloche, Husky Energy Inc.

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***"PTAC has facilitated some valuable interactions between industry and government that have led to improved environmental management in Alberta."***

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Gordon Dinwoodie, Alberta Environment

deliver

**Brenda Belland**  
Information Specialist,  
Knowledge Centre

**Heather Traub**  
Innovation and  
Technology Coordinator

**Tannis Such**  
Environmental and  
Research Coordinator

**Eryn Rizzoli**  
Technology Initiatives and  
Communications Coordinator

**Ralf Aggarwal**  
Technology Transfer  
Coordinator



# activities

## Technical Committees

PTAC's technical committees help to identify opportunities for research and technology development; raise awareness of existing R&D; find solutions including soliciting proposals and launching new projects; and inform appropriate industry people of new R&D proposals.

PTAC has 21 technical areas and requires participation from senior technical people to identify important issues that require technology transfer or R&D. To obtain more information please contact PTAC.

PTAC facilitates the following committees:

- Air Issues Research Planning Committee (ARPC)
- CO<sub>2</sub> Enhanced Hydrocarbon Recovery (EHR) Steering Committee
- Drilling Innovators Advisory Group
- Driving Safety Working Group
- Ecological Research Planning Committee
- Heavy Oil Transportation Committee
- Natural Gas and Conventional Oil Recovery (NGCOR) Energy Innovation Network (EnergyINet) Advisory Group
  - EnergyINet Increased Recovery of Oil and Gas Business Case Working Group
- Resource Access Technology Committee
- Soil Research Planning Committee
  - Salinity Working Group
  - Weathered Hydrocarbon Project Committee
- Technology for Emission Reduction and Eco-Efficiency (TEREE) Steering Committee
  - TEREEMarketing Subcommittee
  - TEREEMarketing Project Evaluation Subcommittee
- Unconventional Gas Technology Roadmap (UGTR) Technical Steering Committee
  - UGTR Technical Writer Group
- Unconventional Heavy Oil Steering Committee
- Water Innovation Planning Committee

collaborate

***"I consider my membership in PTAC's ARPC and TEREEMarketing committees to be essential to my role as Environmental Specialist - Air Issues. These committees provide invaluable avenues for information regarding the technology and science of emissions, emissions monitoring and emissions reduction. PTAC currently represents the best opportunity for me to collaborate with industry, government, and non-governmental organizations to not only move emissions technology and science forward but to actually apply the learnings."***

Sean Reilly, Talisman Energy Inc.

## R&D Projects or New Project Phases Launched in 2005

PTAC facilitated the launch of 23 projects or new project phases valued at \$9.7 million during 2005.

### Coalbed Methane / Unconventional Gas

- Unconventional Gas Technology Roadmap

### Environment

- Assessment of Phytoremediation as an In Situ Technique for Cleaning Oil Contaminated Sites Phases 1 and 2
- Assessment of Species at Risk (SARA) Setback Distances Relative to Oil and Gas Activities
- Biodiversity
- Catalytic Combustion for the Elimination of Methane, BTEX and other VOC
- Development of Generic Site Assessment Criteria for Salinity Below the Root Zone
- Effect of Sour Fuel Composition on Flare Combustion Efficiency
- Environmentally Acceptable Endpoints for Weathered/Aged Petroleum Hydrocarbons
- Grizzly Bear Habitat Mapping and Modeling in Alberta
- Imaging the Fate and Transport of Salts with Time-lapse Resistivity
- Measurement of Soot Emissions from Flares
- Native Species for the Sandy Soils Disturbances of the Parkland Ecoregion
- Recovery of Caribou Ranges in Alberta, Boreal and West Central
- Removing the Wellsite Footprint
- Resolving Air Flow over Elevated Terrain to Improve Dispersion Modelling for Sour Gas Flares
- Toxicity Testing for Methanol, Amine and Glycol Quality Guideline Development

### Heavy Oil

- Expanding Heavy Oil and Bitumen Resources While Mitigating GHG Emissions and Increasing Sustainability Technologies

### Innovation

- R&D Oil and Gas Database

### Reservoir Recovery/Geoscience

- EnergyINet Increased Recovery of Conventional Oil and Gas Business Case

### Technology for Emission Reduction and Eco-Efficiency

- Conventional Heavy Oil R&D Needs Including GHG Intensity Reduction
- Efficiency Enhancements with REM AFR Systems Case Study
- Fire Tube Immersion Heater Optimization Project
- SRU Incinerator Optimization Phase 1

For further information, please refer to PTAC's newsletters at [www.ptac.org/ptalk1.html](http://www.ptac.org/ptalk1.html) or to the project index on PTAC's web site at [www.ptac.org/projects1.html](http://www.ptac.org/projects1.html).

innovate



# financials

## Auditor's Report

We have audited the statement of financial position of PTAC PETROLEUM TECHNOLOGY ALLIANCE CANADA as at DECEMBER 31, 2005 and the statements of operations, changes in net assets and cash flow for the year then ended. These financial statements are the responsibility of the organization's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In common with many not for profit organizations, the organization derives revenue from events and other sources, the completeness of which is not susceptible to satisfactory audit verification. Accordingly, our verification of these revenues was limited to the amounts recorded in the records of the organization and we were not able to determine whether any adjustments might be necessary to revenue, excess of revenue over expenditures, assets and surplus.

In our opinion, except for the effects of adjustments, if any, which might have determined to be necessary had we been able to satisfy ourselves concerning the completeness of the revenue referred to in the preceding paragraph, these financial statements present fairly, in all material respects, the financial position of the organization as at DECEMBER 31, 2005 and the results of its operations and its cash flow for the year then ended in accordance with Canadian generally accepted accounting principles.

Lo Porter Hetu  
 Certified General Accountants  
 Calgary, Alberta  
 February 10, 2006

## Summarized Balance Sheet

As at December 31, 2005, with comparative figures for 2004.

Assets	2005	2004
Cash	\$ 51,617	\$ 350,449
Marketable securities	349,375	525,108
Accounts receivable	673,546	505,746
Prepaid expenses	50,266	8,510
	1,124,804	1,389,813
Capital assets	40,299	46,019
	\$1,165,103	\$1,435,832
<b>Liabilities</b>		
Accounts payable, accrued liabilities	\$ 454,248	\$ 705,181
Deferred revenue	320,782	187,821
	\$ 775,030	\$ 893,002
Deferred contributions	-	270,791
	\$ 775,030	\$1,163,793
<b>Net Assets</b>		
Invested in capital assets	\$ 40,299	\$ 46,019
Unrestricted	349,774	226,020
	390,073	272,039
	\$1,165,103	\$1,435,832

## Summarized Statement of Operations

Expenses and Surplus for the year ended December 31, 2005, with comparative figures for 2004.

Revenue	2005	2004
Membership	\$ 467,339	\$ 390,062
Events and Other	816,809	626,686
Contracts and Projects	1,701,560	1,361,661
Interest	9,443	4,497
	\$2,995,151	\$2,382,906
<b>Expenses</b>		
Operating	\$2,877,117	\$2,399,404
Excess (deficiency) of revenue over expenses	118,034	(16,498)
Surplus beginning of year	272,039	288,537
Surplus, end of year	\$ 390,073	\$ 272,039

The complete audited financial statements of PTAC for the year ended December 31, 2005 are available from PTAC offices upon request.

# board

## Board of Directors

As of March 15, 2006

**Mike Singleton**, Chair, PTAC  
Director, Technology Planning & Integration,  
Suncor Energy Inc.

**Rich Kerr**, Past Chair, PTAC  
Chief Engineer, Nexen Inc.

**Eric Lloyd**, President, PTAC  
Petroleum Technology Alliance Canada

**Graham Campbell**  
Director, Office of Energy R&D,  
Natural Resources Canada

**Claude Durocher**  
President, Schlumberger of Canada

**Cal Fairbanks**  
Vice President, Canada HSE Inc.

**Fred Hutchings**  
President & CEO, VaporTech Energy Services

**Eddy Isaacs**  
Managing Director,  
Alberta Energy Research Institute

**Pam Lulman**  
Manager, Exploration, Operations and Services,  
ConocoPhillips Canada Limited

**David Molinski**  
Assistant Deputy Minister,  
BC Ministry of Energy, Mines and Petroleum

**Brian Moreland**  
Vice President, Strategy and Planning  
Burlington Resources Canada Ltd.

**Phillip Murray**  
Vice President, Energy Technologies,  
Alberta Research Council

**Susan Payne**  
Manager, Technical Services,  
Engineering and Project Management,  
Husky Energy Inc.

**Ken Putt**  
Managing Director, K.W. Putt Consulting Inc.

**Randy Rudolph**  
Manager, Air Quality Services,  
AMEC Earth & Environmental

**Dave Rushford**  
Vice President, Calgary BU Upstream  
Operations Onshore, EnCana Corporation

**Laurie Schramm**  
President and CEO,  
Saskatchewan Research Council

**Earle Shirley**  
Executive Manager, Applications Branch,  
Alberta Energy and Utilities Board

**Rolf Stokhuyzen**  
Industrial Technology Advisor, Alberta/NWT,  
National Research Council's Industrial  
Research Assistance Program

**Bill Svrcek**  
Professor, Department of Chemical and  
Petroleum Engineering, University of Calgary

**Chuck Szmurlo**  
Vice President, Enbridge Pipelines Inc.

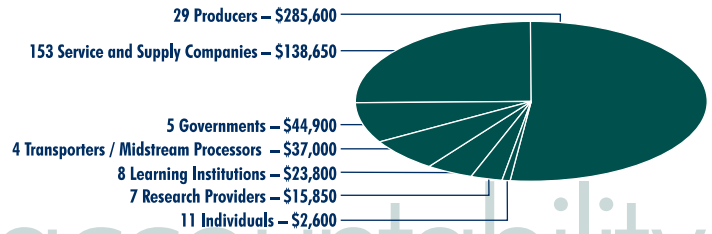
**Murray Todd**  
President, Todd Resources

**Lorraine Whale**  
Consultant to the Shell Global Research  
Program on Oil Sands and Heavy Oil,  
Shell Canada Limited

# measurement

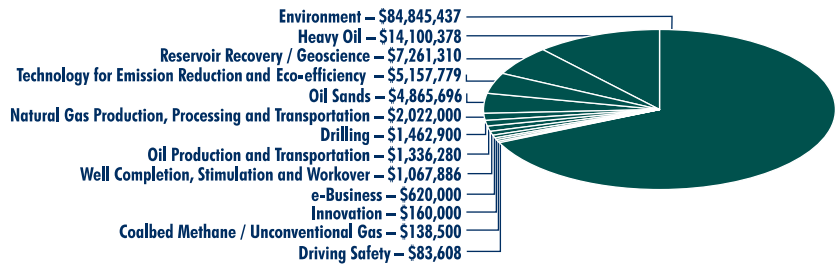
## Membership Revenue by Category

At year-end 2005 PTAC had 217 members grossing \$548,400 revenue as shown in the graph below. PTAC members produce approximately 78% of Canadian oil and gas. Visit [www.ptac.org/members1.html](http://www.ptac.org/members1.html) for more information on PTAC members.



## Project Expenditure by Technical Area since Inception

PTAC has facilitated the launch of 200 projects valued at \$123.2 million since inception in 1996. PTAC facilitated the launch of 23 projects or new project phases valued at \$9.7 million in 2005.



# members

228 Members as of March 15, 2006

## 30 Producers

Anadarko Canada Corporation  
 BP Canada Energy Company  
 Baytex Energy Trust  
 Burlington Resources Canada Energy Ltd.  
 Canadian Natural Resources Ltd.  
 ChevronTexaco  
 ConocoPhillips Canada  
 Devon Energy Corporation  
 Dominion Exploration Canada Ltd.  
 EnCana Corporation  
 EnerMark Inc.  
 Husky Energy Inc.  
 IFP Technologies (Canada) Inc.  
 Imperial Oil Limited  
 MGV Energy Inc.  
 Nexen Inc.  
 Paramount Resources Ltd.  
 Pengrowth Management Limited  
 Penn West Petroleum Ltd.  
 Petro-Canada Resources  
 Pioneer Natural Resources Canada Inc.  
 Point Energy Ltd.  
 PrimeWest Energy Inc.  
 Samson Canada Ltd.  
 Shell Canada Limited  
 Suncor Inc. – Resources Group  
 Talisman Energy Inc.  
 Total Exploration & Production Ltd.  
 Trident Exploration Corporation  
 Western Gas Resources Canada Company

## 4 Transporters/Midstream Processors

Duke Energy Gas Transmission  
 Enbridge Inc.  
 Keyera Energy Ltd.  
 Kinder Morgan CO2 Company, L.P.

## 163 Service and Supply Companies

3M Canada – Oil and Gas Division  
 Accurata Inc.  
 Acres Parsons E&C Ltd.  
 Advanced Geotechnology Inc.  
 Advanced Measurements Inc. – Oil and Gas Division  
 AGAT Laboratories Ltd – Hydrocarbon Division  
 Air & Gas Compression Systems Ltd.  
 Air Liquide Canada Inc.  
 Alfa Laval – Process Technology Oilfield Market Unit  
 Alpine Environmental Ltd.  
 ALS Environmental  
 AMEC Earth & Environmental  
 Amtech Aeronautical Limited  
 APA Petroleum Engineering Inc.  
 Aqua-Pure Ventures  
 Arkril Enterprises  
 Ashton Jenkins Mann Petroleum Consultants  
 Bekaert CEB Technologies Canada Ltd.  
 Bell Mobility  
 BJ Services Company Canada  
 Boreal Laser Inc.  
 Brenntag Stinnes Logistics  
 Brine-Add Fluids Ltd.  
 Burnet, Duckworth & Palmer – Energy Business Unit  
 Caltec Ltd.  
 Canada Tech Corp  
 Canadian Fertilizers Limited  
 Canitron Systems Inc.  
 Cantox Environmental Inc.  
 Century Frac Services  
 Champion Technologies Ltd.  
 Chinook Engineering  
 Chinook Environmental Services Ltd.  
 Clearstone Engineering Ltd.  
 Computer Modelling Group Ltd.  
 Corac Group plc  
 Corion Diamond Products  
 Crane Geomatics Corporation  
 Crimtech Services Ltd.  
 Custom Environmental Services Ltd.  
 Daily Oil Bulletin  
 DataDrill Communications  
 Decision Dynamics Technology, Ltd.

Deep Blue Associates Inc.  
 Deloitte - Research and Development, Tax  
 DHV Canada Inc.  
 EBA Engineering Consultants Ltd. –  
 Research Department  
 electroBusiness  
 Emerson Process Management – Copeland Scroll  
 ENEFEN Energy Efficiency Engineering Ltd.  
 Energy Navigator Inc.  
 Energy Venture Inc.  
 Enhanced Recovery Services Inc.  
 Envirosoft Products Inc.  
 Envision Technologies Corp  
 Epic Consulting Services Ltd.  
 Ernst & Young Chartered Accountants LLP  
 Extreme Telematics Corp.  
 Fekete Associates Inc.  
 Ferus Gas Industries  
 Fleet Safety International Corp.  
 Fugitive Gas Emissions Ltd.  
 GartnerLee Ltd.  
 Gas Liquids Engineering Ltd.  
 G-Chem Environmental Ltd.  
 geoLOGIC systems Ltd.  
 GLR Solutions Ltd.  
 Gowling Lafleur Henderson LLP –  
 Intellectual Property Development  
 GRB Engineering Ltd.  
 GuildOne, Inc.  
 HW Process Technologies, Inc.  
 Innovative Chemical Technologies Canada Ltd.  
 Intermech Technologies Canada – Western Division  
 John Zink Canada  
 Kaizen Environmental Services Inc.  
 Katch Kan Limited  
 Komex International Ltd.  
 KPMG High Technology Practice Group  
 Kudu Industries  
 Lenef Consulting Ltd.  
 Little Guy Oilfield Rentals Inc.  
 LoadTrak  
 Lonkar Services Ltd. – Technology Department  
 LRI Oil Tools Inc.  
 Macleod Dixon – Technology Enterprise Group  
 Macronic Enerflex  
 Matrix Solutions Inc.  
 Meridian Environmental Inc.  
 Millennium EMS Solutions Ltd.  
 Morrow Environmental Consultants Inc.  
 National Silicates – Drilling Fluids Group  
 New Paradigm Engineering Ltd.  
 Newalta  
 Newpark Environmental  
 Nihtat Corporation  
 Noetic Engineering Inc.  
 North West Capital Inc.  
 Norwest Corporation  
 Norwest Labs  
 Oak Environmental Inc.  
 Oasis Emission Consultants Inc.  
 ORMAT Technologies –  
 North America Waste Heat Recovery Group  
 Outland Technologies Inc.  
 P.K. Services International  
 Panasonic Toughbook  
 Pason Systems Inc.  
 Pathcom Wireless Inc.  
 PetroJet  
 Photon Control Inc.  
 Pildysh Technologies Inc.  
 Pinnacle Technologies (Canada) Inc.  
 Plains Marketing Canada, L.P.  
 PointCross, Inc.  
 Portfire Associates Inc.  
 Prairie Mobile Communications  
 Praxair Canada Inc.  
 PressSol Ltd.  
 PricewaterhouseCoopers LLP Technology (TICE) Practice  
 Primrose Drilling Ventures Ltd.  
 Pro-EnviroCore Consulting Inc.  
 ProTechnics  
 Q'Max Solutions Inc.  
 Quadrisse Canada Fuel System Inc.

Questor Technology Inc.  
 Quorum Business Solutions Inc.  
 Rapid Technology Corporation  
 Real Data Analysis Inc.  
 REM Technology Inc.  
 Rigstar Communications Inc.  
 Rockwell Automation – Calgary Oil and Gas Branch  
 Rogers Wireless Alberta  
 RTS Services Ltd  
 Ruud Enterprises Ltd.  
 SAIC Canada  
 Schlumberger of Canada  
 Scientific Drilling International (Canada) Inc.  
 Sierra Systems  
 Spira Data Corp.  
 Sproule Associates Ltd.  
 Stecher Proprietary Interests, LLC  
 Storm Cat Energy Corporation  
 Tansley Associates Environmental Sciences  
 TELUS Business Solutions, Energy Vertical  
 The Moorhead Group LLC  
 T.L. Watson & Associates Inc.  
 TORR Canada Inc.  
 Total Combustion Inc.  
 Trican Well Service Ltd.  
 Tundra Controls Ltd.  
 UNICO Inc.  
 United Oil & Gas Consulting Ltd.  
 VaporTech Energy Services  
 VECO Canada Ltd. – Alliance Group  
 WellDog Inc.  
 Western Corrosion Technologies Inc.  
 Winterhawk Marketing Services Inc.  
 XACT Downhole Telemetry Inc.  
 XERGY Processing Inc.  
 Youility Distributed Power Electronics  
 zed.i solutions – Marketing and Sales Department  
 Zko

## 7 Research Providers

Alberta Research Council  
 Alberta Sulphur Research Ltd.  
 Gas Technology Institute  
 HydroQual Laboratories Ltd.  
 Natural Resources Canada – CANMET  
 Saskatchewan Research Council  
 TIPM Laboratory (Perm Inc.)

## 8 Learning Institutions

Lakeland College – Institute for Innovation Skills  
 Mount Royal College,  
 Institute of Applied Research and Innovation  
 Southern Alberta Institute of Technology  
 University of Alberta  
 University of Calgary  
 University of Northern British Columbia  
 University of Regina, Faculty of Engineering  
 University of Saskatchewan

## 5 Government

Alberta Energy Research Institute  
 Canada Revenue Agency  
 Industry Canada  
 Province of British Columbia  
 Saskatchewan Industry and Resources

## 11 Individuals

Blair, Jim  
 Boreta, John  
 Collins, Patrick  
 Hoopfer, Dwayne  
 Johnston, Brad  
 Kenny, James  
 Maier, Len  
 McBane, Duncan  
 Putt, Ken  
 Todd, Murray  
 Weir, Robert

## Founding Supporter

Canadian Business Networks Coalition (CBNC)



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# communicate

**Facilitating innovation, collaborative research and technology development, demonstration and deployment for a responsible Western Canadian upstream hydrocarbon energy industry**

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