PTAC Technical Areas
- CO2: Hydrocarbon Enhanced Recovery
- Coalbed Methane / Unconventional Gas
- Drilling
- e-Business
- Emission Reduction / Eco-Efficiency
- Energy Efficiency
- Environment
- Fundamental Research
- Health and Safety
- Heavy Oil
- Inactive Wells
- Innovation
- Instrumentation / Measurement
- Natural Gas Production
- Oil Production
- Oil Sands
- Pipelines
- R&D Funding
- Reservoir / Geoscience
- Security
- Telecommunications
- Well Completion

members

203 Members as of March 7, 2005

26 Producers
- Alberta Resources Canada Corporation
- BP Canada Energy Company
- Burlington Northern Canneal Energy Inc.
- Chevron Canada
- ConocoPhillips Canada Ltd.
- Devon Energy Limited
- drill Thornton Energy Corporation
- Dome Exploration Canada Inc.
- EnCana Corp.
- Enbridge Inc.
- Husky Energy Inc.
- BP Technologies (Canada) Inc.
- Imperial Oil Limited
- Enbridge Energy Inc.
- MDV Energy Inc.
- Nexen Inc.
- Paramount Resources Ltd.
- Nexen West Petroleum Ltd.
- Petro Canada Resources
- Suncor Energy Inc.
- Shell Canada Resources Ltd.
- Suncor Energy Inc.
- Talisman Energy Inc.
- Telkwa Exploration Corporation

2 Transporters
- Alliance Gas Transmission Enbridge Inc.

141 Service and Supply Companies
- Allen Peters EBC Inc.
- Advanced Geotechnology Inc.
- Advanced Measurement Systems Inc.
- AGIP Laboratories Ltd. - Hydrocarbon Division
- Air & Gas Compounding Systems Ltd.
- Air Liquide Canada Inc.
- ALCOM - Pumps Technology
- Oilfield Market Unit
- Alpine Environmental Inc.
- AEC, Art, & Environmental
- Atlantia Aeronautical Limited
- APM Petroleum Engineering Inc.
- Aquafin-Vertrieb
- A total Enterprises
- Atlantic Aluminum Petroleum Consultants
- Bellant CIE Technologies Canada Ltd.
- Beyond Compliance Inc.
- Bonded Inc.
- Bowling Bros Logistics
- Bow ADD Fluids Ltd.
- Bowser Laboratories Inc.
- Bowser Technology Inc.
- Carbide Systems Inc.
- Carman Environmental Inc.
- CDE Services Ltd.
- Chaney Environmental Technologies Ltd.
- Chemosphere Engineering
- Climax Engineering Ltd.
- Computer Modelling Group Ltd.
- Cona Group Ltd.
- Corian Diamond Products
- Creted Systems Inc.
- Critical Control
- Custom Environmental Services Ltd.
- Daily Oil Bulletin
- Deep Rive Associate Inc.
- DeltaTech - Research and Development, Tex
- DFS Canada Inc.
- Digital OTI Inc.

Earth Canada Corporation
- ESA Engineering Consultants Ltd. - Research department
- electricdrive
- ENTEF Energy Efficiency Engineering
- EnvironX Systems Ltd. - Environmental
- Energy Navigator Inc.
- Enhanced Recovery Services Inc.
- EnvironInc.
- EnergySoft Products Inc.
- Emison Technologies Corp.
- EnerCom Consulting Services Ltd.
- Environ Science & Technology Associates Inc.
- Environ Sleyons Corp.
- Environ Safety Inc.
- Environ Inc.
- Environ Technologies Ltd.
- G-Chem Environmental Ltd.
- geosys Inc.
- GIC Systems Inc.
- GIC/Soft International Inc.
- GII Solutions Inc.
- Gilling Air ProSound Ltd
- Intellectual Property Development
- GME Engineering Ltd.
- HMC Canada Ltd.
- Industrial Catalytic Technologies Inc.
- Information Builders
- Innovative Chemical Technologies Canada Ltd.
- IRT Teams and Well Servicing Ltd.
- John Zink Canada
- Kelco Inc Limited
- Kobold Production Services
- Korama International Inc.
- KPMG High Technology Practice Group
- Kudzu Industries
- Laval University Technology Innovation Group
- Macrae Engineering and Software Ltd.
- Maine Solutions Ltd.
- Marine Environmental Inc.
- Millennium DSS Solutions Ltd.
- Moment Environmental Consultants Inc.
- National Utilities - Cooling Plant Group
- New Paradigm Engineering Inc.
- New Paradigm Gas Processing Ltd.
- Newman
- Neptune Environmental
- Nexen Directional & Horizontal Drilling Services
- Nordic Engineering Inc.
- NonRen Corporation
- NonRen Labs
- Ones Emission Consultants Inc.
- Omniscion Composites
- Optima Energy Solutions Inc.
- OR. Services International
- Passif Technology Corporation
- Passif Systems Inc.
- Phoenix Control Inc.
- P follic Industries Inc.
- PEA Marketing Canada, L.P.
- Perforate Associates Inc.
- Power Canada Inc.
- Premier Production Solutions
- Spirework Energy/Compliance LLP Technologies (PTC) Progress
- Pro EnvironCare Consulting Inc.
- ProSafe
- Qlik Solutions Inc.
- Quantum Technology Inc.
- Quincery Business Solutions Inc.
- Rapid Technology Corporation
- Region Pumps Inc.

RDIS Technology Inc.
- Rigel and Associates Ltd.
- Rigger Communications Inc.
- Rockwell Automation - Calgary Oil and Gas Branch
- RIES Services Ltd.
- Root Enterprises Ltd.
- SAC Canada
- Saskatchewan Oil and Gas Technology Forum
- Scientific Cutting International (Canada) Inc.
- Sierra Systems
- Sierra Products Inc.
- Sherritt International (Ontario) Ltd.
- Shell Oilfield Corporation
- Shell Research International
- Siemens Canada Inc.
- Suncor Canada Resources Group
- TELUS Business Solutions, Energy Vertical
- The CO2 Hub
- The Wood Group Ltd.
- T. Webster & Associates Inc.
- T. Wicks Ltd.
- Texas Well Service Ltd.
- Tropic Control Ltd.
- UNICO
- Unocal
- Verisys, GE Oilfield Technologies Services
- Westech Energy Services
- WEGO Canada Ltd. - Alliance Group
- Weyerhaeuser Canada Ltd.
- WideEye Inc.
- Whederfield Marketing Services Inc.
- WY Technologies
- XERO Processing Inc.
- Xelixion Solutions - Marketing and Sales Department

8 Research Providers
- Alberta Research Council
- Alberta Spatial Research Institute
- Gas Technology Institute
- HydroQual Laboratories Ltd.
- National Resources Canada (CNAMT)
- Petroleum Technology Research Centre (PTRC)
- Saskatchewan Research Council
- TIPM Laboratory (TBP Inc.)

3 Learning Institutions
- Alberta Institute for Innovation Skills
- Alberta Institute of Applied Research and Innovation
- Alberta Institute of Technology
- University of Alberta
- University of Calgary
- University of British Columbia
- University of Regina
- University of Saskatchewan
- University of Saskatchewan

5 Government
- AB Technology Development Research Institute Canada-Business
- Government Canada
- Province of British Columbia
- Saskatchewan Industry and Resources

13 Individuals
- Bob, Jim
- Bore, John
- Boreta, John
- Collins, Patrick
- Doerr, Alan
- Doerr, Philip
- Eaves, James
- Eaves, Lee
- Edwards, David
- Fair, Dan
- Field, Merry
- Towson, DJ
- Ward, Robert

Founding Supporter:
Canadian Business Networks Coalition (CBNC)
Project Expenditure by Technical Area since Inception
PTAC has facilitated the launch of 186 projects valued at $113.5M since inception in 1996. PTAC facilitated the launch of 23 projects or new project phases valued at $6.0M in 2004.

Membership Revenue by Category
At year-end 2004 PTAC had 187 members grossing $388,700 revenue as shown in the graph below. PTAC members produce approximately 70% of Canadian conventional oil and gas. Visit www.ptac.org/members1.html for more information on PTAC members.

Facilitating Technology Solutions
- Facilitated two key recommendations of the Spudding Innovation report: the Energy Innovation Network (EnergyNet) Increased Recovery of Oil and Gas Business Case Project and the Innovative Energy Technologies Program (IETP)
- Launched five projects through 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)

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 2004, PTAC facilitated 23 projects, 18 Technology Information Sessions, seven Request for Proposals, six forums, two workshops and one conference. PTAC is frequently approached by members and others in the industry to facilitate initiatives and events.

PTAC brought government, industry and academia together to launch several projects and initiatives in 2004. One of the most significant projects launched in 2004 was the Energy Innovation Network (EnergyNet) Increased Recovery of Oil and Gas Business Case Project. This project valued at $899,000 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 will identify in which pools project participants could deploy both existing and new technology to significantly increase oil and gas production.

PTAC’s Technology for Emission Reduction and Eco-Efficiency (TEREE) initiative, that seeks to identify the top opportunity areas and technologies to reduce greenhouse gases (GHGs) and emissions, made great strides in 2004. TEREE has made significant progress toward creating a toolbox of best practice solutions. PTAC has launched several jointly-funded projects under the TEREE initiative.

In 2004, PTAC facilitated the world’s largest Unconventional Gas Conference and several successful forums. PTAC’s first Drilling Peaks, Valleys and Other Basins (WCSB). Funded by the Alberta Energy Research Institute (AERI) and industry, the project will identify in which pools project participants could deploy both existing and new technology to significantly increase oil and gas production.

PTAC facilitated the launch of 23 projects or new project phases valued at $6.0M during 2004, bringing the total number of projects launched since inception in 1996 to 186 with a value of $113.5M.

PTAC’s large contact database continues to grow with the multitude of technical committees, projects, events and sessions facilitated. PTAC is pleased to assist the prosperous upstream oil and gas industry in achieving socially and environmentally responsible recovery of Western Canada’s hydrocarbon resources through effective, market-driven collaboration, innovation, research, development and technology deployment.

On behalf of the Board, we would like to express our appreciation to PTAC staff and volunteers for their outstanding contributions to our success.
Outlook for 2005

In 2005, PTAC will continue to work with industry, academia and governments to become the preferred vehicle for facilitation of energy Research and Development (R&D) initiatives like EnergyNet. PTAC will work towards securing an agreement to facilitate the Improved Recovery, CO2 and Water areas of EnergyNet. PTAC will work towards increasing its membership to include more stakeholders from all points along the hydrocarbon energy continuum, such as emerging producers, oil sands, pipeline, service and supply companies and royalty trusts. We will continue to collaborate with stakeholders to implement the Spudding Innovation report recommendations, including completing the business case and creating technology roadmaps for unconventional gas to significantly increase recoverable reserves and production in Western Canada.

PTAC will continue to facilitate the TEREE initiative for the third year. Two TEREE projects proposed in 2004, the Sulphur Recovery Unit Optimization Study and Emissions and Efficiency Enhancements with REH AFR Systems Study, begin in early 2005.

PTAC’s call to join the CO2 Enhanced Hydrocarbon Recovery (EHR) Steering Committee generated significant interest in 2004. Formed to identify the conditions required to commercialize successful CO2 EHR pilots in Alberta and Saskatchewan, this committee plans to hold a CO2 event in the fall of 2005.

The Seventh Annual Unconventional Gas Conference will be held in November 2005 in Calgary. This conference is facilitated by PTAC and hosted by the Canadian Society of Unconventional Gas (CSUG) to communicate and facilitate technology development with the goal of increased commercialization of unconventional gas technologies. In 2005, PTAC’s role as CSUG’s secretariat will cease and CSUG will directly employ those PTAC employees and contractors previously provided to CSUG under its joint agreement. This is a logical step as CSUG continues to evolve and grow. PTAC will continue to provide office space and related services to CSUG until June 2006.

PTAC plans to launch a water innovation planning committee and to host a water event focused on reducing fresh water use by industry.

PTAC’s Drilling Innovators Advisory Group (DIAG) and project funders will oversee the Seasonal Load Leveling Project to build a business case and companion presentation to convince industry to reduce winter drilling activity and spread that activity out more evenly throughout the year.

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 2005.

PTAC will continue to facilitate the Canadian Association of Petroleum Producers (CAPP) Environmental Research Advisory Council (ERAC) process in 2005, including the ERAC funding, as performed since 2000. PTAC expects to host a number of information sessions, workshops and technical meetings in the Environmental technical area. Four forums will address air, soil, water and ecological issues.

PTAC will receive continued financial support for 2005/06 from Natural Resources Canada (NRCan) to deliver their Industrial Energy Audit Incentive, to promote the benefits of audits and energy efficiency, and to offer access to supporting literature and resources through the PTAC Knowledge Centre.

A second Energy Technology Capital Forum is planned for June 2005.

A second Energy Conservation Case Studies Forum is scheduled for 2005. PTAC has set a goal to facilitate the launch of 15 new projects with a value of $10 million and is striving for a significant financial surplus to build its cash reserves to 50% of its annual operating budget. PTAC will continue to operate in an open and collaborative fashion to provide focus on issues which are relevant and of value to its members and the upstream petroleum industry.

Auditor’s Report

We have audited the financial statement of position of PTAC PETROLEUM TECHNOLOGY ALLIANCE CANADA as at December 31, 2004 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 Association 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 Association 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 been determined to be necessary had we been able to satisfy ourselves concerning the completeness of the revenues referred to in the preceding paragraph, these financial statements present fairly, in all material respects, the financial position of the PTAC PETROLEUM TECHNOLOGY ALLIANCE CANADA as at December 31, 2004 and the results of its operations and the changes in its net assets and cash flow for the year then ended in accordance with Canadian generally accepted accounting principles.

Hamiton & Rosenthal Chartered Accountants Calgary, Alberta February 28, 2005

Summarized Balance Sheet


<table>
<thead>
<tr>
<th>Assets</th>
<th>2004</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$230,449</td>
<td>$309,922</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>529,108</td>
<td>245,764</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>505,746</td>
<td>203,001</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>8,510</td>
<td>9,028</td>
</tr>
<tr>
<td>Total assets</td>
<td>$1,389,813</td>
<td>$590,715</td>
</tr>
<tr>
<td>Capital assets</td>
<td>$1,435,832</td>
<td>$649,655</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities and Surplus</th>
<th>2004</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable, accrued liabilities</td>
<td>$705,181</td>
<td>$213,747</td>
</tr>
<tr>
<td>Deferred revenue</td>
<td>187,821</td>
<td>145,371</td>
</tr>
<tr>
<td>Funding advances</td>
<td>270,791</td>
<td>270,791</td>
</tr>
<tr>
<td>GST payable</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$1,163,793</td>
<td>$361,189</td>
</tr>
<tr>
<td>Net Assets</td>
<td>$272,039</td>
<td>$288,537</td>
</tr>
<tr>
<td>In excess of capital assets</td>
<td>$463,019</td>
<td>$58,940</td>
</tr>
<tr>
<td>Unrestricted</td>
<td>272,039</td>
<td>288,537</td>
</tr>
<tr>
<td>Total net assets</td>
<td>$1,435,832</td>
<td>$649,655</td>
</tr>
</tbody>
</table>

Summarized Statements of Operations


<table>
<thead>
<tr>
<th>Expenses</th>
<th>2004</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership</td>
<td>$390,062</td>
<td>$342,977</td>
</tr>
<tr>
<td>Events and Other</td>
<td>630,686</td>
<td>705,194</td>
</tr>
<tr>
<td>Contracts and Projects</td>
<td>1,361,661</td>
<td>688,349</td>
</tr>
<tr>
<td>Interest</td>
<td>4,497</td>
<td>3,893</td>
</tr>
<tr>
<td>Total expenses</td>
<td>$2,382,606</td>
<td>$1,148,415</td>
</tr>
<tr>
<td>Operating</td>
<td>$2,382,606</td>
<td>$1,148,415</td>
</tr>
<tr>
<td>Revenue</td>
<td>$2,399,404</td>
<td>$1,649,517</td>
</tr>
<tr>
<td>Excess (deficiency) of revenue over expenses</td>
<td>(16,498)</td>
<td>98,899</td>
</tr>
<tr>
<td>Surplus (deficiency) of year</td>
<td>298,537</td>
<td>189,639</td>
</tr>
<tr>
<td>Surplus, end of year</td>
<td>$272,039</td>
<td>$288,537</td>
</tr>
</tbody>
</table>

The complete audited financial statements of PTAC for the year ended December 31, 2004 are available from PTAC offices upon request.
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 22 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
- CO₂ Enhanced Hydrocarbon Recovery (EHR) Steering Committee
- Drilling Innovators Advisory Group
- Driving Safety Working Group
- Ecological Research Planning Committee
- Natural Gas and Conventional Oil Recovery (NGCOR) Energy Innovation Network (EnergyINet) Advisory Group
- EnergyNet Increased Recovery of Oil and Gas Business Case Working Group
- Soil Research Planning Committee
- Salinity Working Group
- Weathered Hydrocarbon Project Committee
- Technology for Emission Reduction and Eco-Efficiency (TEREE) Steering Committee
- TEREE Marketing Subcommittee
- TEREE Project Evaluation Subcommittee
- Water Innovation Planning Committee

For further information, please refer to PTAC’s 2004 newsletters at www.ptac.org/ptac2k4.html or to the project index on PTAC’s web site at www.ptac.org/projects.c1.html.

**Technical Committees**

**R&D Projects or New Project Phases Launched in 2004**

PTAC facilitated the launch of 23 projects or new project phases valued at $6.0M during 2004.

**Environment**
- A re-evaluation of the Toxicity of CCME Petroleum Hydrocarbon Fraction 3, and Interaction Effects Between Fractions
- Assessment of Phytoremediation as an In-Situ Technique for Cleaning Oil Contaminated Sites Phases 1 and 2
- Biodiversity
- CCHE Fraction 3 Gap Study
- Caroline Livestock Study
- Compost Amendment of Oil Field Waste to Remediate High Concentrations of Petroleum Hydrocarbons F3 and F4 Fractions
- Controlled Human Exposure Studies to HTS Investigation of Neurobehavioural Potential API
- Development of Drought Tolerant/Salt Tolerant Native Griss, Forb and Legume Ecotypes for use on Disturbed Land in the Prairies and Boreal Forest
- Flame Performance Research Initiative
- Foothills Model Forest Grizzly Bear Research Project
- Imaging the Fate and Transport of Salts with Time-lapse Resistivity
- Monitored Natural Attenuation
- Native Species for the Sandy Soils Disturbances of the Parkland Ecoregion
- Reclaimed Soil Quality Benchmark Study
- Recovery of Caribou Ranges in Alberta, Boreal and West Central
- Removing the Wellsite Footprint

**Reservoir Recovery/Geoscience**
- Energy Innovation Network (EnergyNet) Increased Recovery of Conventional Oil and Gas Business Case
- Enhanced Gas Recovery by Downhole Compression

**Technology for Emission Reduction and Eco-Efficiency**
- Barriers to Deployment of Environmental Technologies Study
- Fire Tube Immersion Heater Optimization Project
- Efficiency Enhancements with REM AFR Systems Case Study
- Spectrasyne-Optical Measurement Technology Study
- Summary of Emission Reduction Opportunity Areas in Upstream Oil and Gas Industry Project

For further information, please refer to PTAC’s 2004 newsletters at www.ptac.org/ptac2k4.html or to the project index on PTAC’s web site at www.ptac.org/projects.c1.html.

**2004 highlights**

**PTAC Launches Momentous EnergyNet Increased Recovery of Oil and Gas Business Case Project**

One of the most significant projects PTAC brought government, industry and academia together to launch in 2004 was the Energy Innovation Network (EnergyNet) Increased Recovery of Oil and Gas Business Case Project. The project 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). The project is largely funded by the Alberta Energy Research Institute (AERI) matching industry and other government dollars. The total project cost to develop the business case for Alberta, Saskatchewan and British Columbia is $899,000.

The Spudding Innovation report identified this business case project as an important initiative in its recommendations. This initiative was deemed necessary for industry to learn in which pools they could deploy both existing and new technology to significantly increase oil and gas production. The goal of the project is to realize increased recovery of five billion barrels of oil and 25 trillion cubic feet of natural gas by 2015, in Alberta alone, through new technology and research. Participants will gain access to templates, tools, and methodologies for evaluating the potential impact of existing and new technologies. The project includes all pool types for which there is publicly available data, including tight gas. Results on the Alberta portion are expected to be made available to participants in June 2005.

The Alberta Department of Energy (ADoE) will be using the results of this project as a key consideration in their funding decisions under the $200 million Innovative Energy Technologies Program (IETP). The ADoE presented its Innovative Energy Technologies Program to an attentive audience at PTAC Technology Information Session (TIS) in October 2004. Citing the 2003 Spudding Innovation report’s assertion that if innovation were encouraged via programs like the IETP, the ADoE announced that Alberta’s recoverable reserves of conventional oil could be increased as much as 14% of original oil in place or some 8.7 billion barrels. For more information on the EnergyNet Increased Recovery of Oil and Gas Business Case Project please go to www.ptac.org/techresp.html.

**PTAC Makes Significant Progress with TEREE Projects**

With the Kyoto Protocol coming into effect February 2005, many companies are realizing that reducing greenhouse gases (GHGs) and emissions may indeed be more of an economic opportunity than a cost. PTAC’s Technology for Emission Reduction and Eco-Efficiency (TEREE) initiative takes a one-window approach toward identifying the top opportunity areas to reduce GHGs and emissions and reduce costs. TEREE provides a toolbox of best practice solutions and proven, cutting edge technologies to the oil and gas sector.

With significant funding from Western Economic Diversification Canada, TEREE has made excellent progress focusing on reducing GHGs and emissions using new and existing technologies. The TEREE Steering Committee, comprised of members from industry, government and non-government organizations, has formed two subcommittees, one to evaluate projects and the other to market the message that environmental technologies offer positive returns as well as help producers discern the wheat (best-practice technologies) from the chaff (all the environmental technologies marketed to them).

Several jointly-funded projects were launched in 2004. PTAC launched the Barriers to Deployment of Environmental Technologies Study to examine the barriers preventing the upstream oil and gas companies from adopting emission-reducing technologies. In addition, the Fire Tube Immersion Heater Optimization Project was undertaken to improve the efficiency of fire tube heaters used in oil and natural gas processing. Final reports from both projects are expected to be available to project participants in 2005. TEREE supported the Spectrasyne-Optical Measurement Technology and Summary of Emission Reduction Opportunity Areas in Upstream Oil and Gas Industries projects in 2004.

TEREE hosted the Energy Conservation and Air Emissions Case Studies Forum in the fall of 2004 and is planning to hold a similar event in 2005.
PTAC offers a variety of services to its members and the upstream hydrocarbon energy industry. For more information on PTAC’s role please visit PTAC’s web site at www.ptac.org/ members1.html.

“The PTAC approach to facilitating collaboration for R&D and technology transfer has been a tremendous success. Not only has it worked well for many technology areas, from IT to reservoir optimization, but also for all industry participants, from producers to service companies to R&D providers to government.”

Frank J. McIntyre,
Husky Energy Inc.

“Since its establishment PTAC has done a marvelous job of identifying research and development projects needed to progress the energy industry in Alberta and Canada beyond its already strong capability. PTAC has been instrumental in facilitating interaction between industry groups and research providers.”

Dr. Thomas Harding,
University of Calgary

“PTAC is a valued partner and industry contact. They are consistently able to bring together the knowledge and resources of industry, government and technology research institutes to tackle tough issues in upstream oil and gas. The collaborative approach provides a win-win for all.”

Lynn Sweeney,
Climate Change Central

2004 ANNUAL REPORT

creating value for the industry

Ongoing R&D Projects

PTAC facilitated 23 Research and Development (R&D) projects or project phases in 2004. PTAC provides a neutral forum for industry to: identify opportunities, problems and potential solutions that require research or technology development, solicit proposals and launch projects. 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 for a current list of projects.

forums, Workshops and Conferences

A total of over 1300 participants attended nine forums, workshops and conferences hosted by PTAC in 2004. This includes the Sixth 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 and www.ptac.org/workshops1.html for more information.

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 resources to support the TEREE initiative that facilitates sustainable, eco-efficient, and GHG-reducing technologies.

In 2004, the Knowledge Centre acquired a subscription to access 13 core energy and premier technical databases. The Information Specialist offers support by providing literature searches and documents to technical steering committees, project performers, researchers and others, to help identify technologies and research needs, avoid duplicate research, monitor industry trends and prepare for meetings and make informed decisions.

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.

Surveys and Questionnaires

PTAC conducts surveys and questionnaires as requested by PTAC committees and members to seek industry feedback on various topics. PTAC received high response to the four surveys conducted in 2004.

PTAC conducted a survey to assess social, regulatory and other non-technical barriers associated with the deployment of environmental technologies in the oil and gas industry (oil sands and offshore excepted). The Barriers to Deployment of Environmental Technologies in the Upstream Oil and Gas Industry report is available at www.ptac.org/techheat terse.html.

The Driving Safety Questionnaire identified top driving safety issues in the upstream oil and gas industry providing the PTAC Driving Safety Working Group sound direction and insight. The questionnaire proved valuable in developing the agenda for the Driving Safety Technology Forum to be held in April 2005. The results of the questionnaire can be found at www.ptac.org/techhass.html.

In support of NRCan’s Industrial Energy Audit Incentive initiative, PTAC issued a questionnaire to determine the level of support for energy audits and for energy conservation in the Western Canadian oil and gas industry. The results of the questionnaire are available at www.ptac.org/iei1.html.

The PTAC CSUG Research and Development Survey conducted during the Sixth Annual Unconventional Gas Conference sought to identify research interests and needs in unconventional gas. The survey results identified common issues and R&D needs as well as individuals interested in forming an unconventional gas research and development committee.
PTAC offers a variety of services to its members and the upstream hydrocarbon-energy industry. For more information on PTAC’s web site visit PTAC’s web site at www.ptac.org/members1.html.

The PTAC approach to facilitating collaboration for R&D and technology transfer has been widely acknowledged. Not only has it worked well for many technology areas, from IT to reservoir optimization, but also for all industry participants, from producers to service companies to R&D providers to government.”

“PTAC is a valued partner and industry contact. They are consistently able to bring together the knowledge and resources of industry, government and technology research institutes to tackle tough issues in upstream oil and gas. The collaborative approach provides a win-win for all.”

Lynn Sveinson, Climate Change Central

Creating value for the industry

Ongoing R&D Projects
PTAC facilitated 23 Research and Development (R&D) projects or project phases in 2004. PTAC provides a neutral forum for industry to identify opportunities, problems and potential solutions that require research or technology development, solicit proposals and launch projects. 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 for a current list of projects.

Technology

Information Sessions
PTAC facilitated 18 Technology Information Sessions attended by over 900 participants in 2004. 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/tis1.html.

Forums, Workshops and Conferences
A total of over 1300 participants attended nine forums, workshops and conferences hosted by PTAC in 2004. This includes the Sixth 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/workshops1.html and www.ptac.org/forums1.html for more information.

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 resources to support the TEREE initiative that facilitates sustainable, eco-efficient, and GHG-reducing technologies.

In 2004, the Knowledge Centre acquired a subscription to access 13 core energy and premier technical databases. The Information Specialist offers support by providing literature searches and documents to technical steering committees, project performers, researchers and others, to help identify technologies and research needs, avoid duplicate research, monitor industry trends and prepare for meetings and make informed decisions.

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.

Surveys and Questionnaires
PTAC conducts surveys and questionnaires as requested by PTAC committees and members to seek industry feedback on various topics. PTAC received high response to the four surveys conducted in 2004.

PTAC conducted a survey to assess social, regulatory and other non-technical barriers associated with the deployment of environmental technologies in the oil and gas industry (oil sands and offshore excluded). The Barriers to Deployment of Environmental Technologies in the Upstream Oil and Gas Industry report is available at www.ptac.org/techbullet.html.

The Driving Safety Questionnaire identified top driving safety issues in the upstream oil and gas industry providing the PTAC Driving Safety Working Group sound direction and insight. The questionnaire proved valuable in developing the agenda for the Driving Safety Technology Forum to be held in April 2005. The results of the questionnaire can be found at www.ptac.org/techhass.html.

In support of NRCan’s Industrial Energy Audit Incentive initiative, PTAC issued a questionnaire to determine the level of support for energy audits and for energy conservation in the Western Canadian oil and gas industry. The results of the questionnaire are available at www.ptac.org/eai1.html.

The PTAC CSUG Research and Development Survey conducted during the Sixth Annual Unconventional Gas Conference sought to identify research interests and needs in unconventional gas. The survey results identified common issues and R&D needs as well as individuals interested in forming an unconventional gas research and development committee.
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 22 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
- CO₂ Enhanced Hydrocarbon Recovery (EHR) Steering Committee
- Drilling Innovators Advisory Group
- Driver Safety Working Group
- Ecological Research Planning Committee
- EnergyNet Increased Recovery of Oil and Gas Business Case Working Group
- Soil Research Planning Committee
- Salinity Working Group
- Weathered Hydrocarbon Project Committee
- Technology for Emission Reduction and Eco-Efficiency (TEREE) Steering Committee
- TEREE Marketing Subcommittee
- TEREE Project Evaluation Subcommittee
- Water Innovation Planning Committee

2004 highlights

PTAC makes significant progress with TEREE Projects

With the Kyoto Protocol coming into effect February 2005, many companies are realizing that reducing greenhouse gases (GHGs) and emissions may indeed be more of an economic opportunity than a cost. PTAC’s Technology for Emission Reduction and Eco-Efficiency (TEREE) initiative takes a one-window approach toward identifying the top opportunity areas to reduce GHGs and emissions and reduce costs. TEREE provides a toolbox of best practice solutions and proven, cutting edge technologies to the oil and gas sector.

With significant funding from Western Economic Diversification Canada, TEREE has made excellent progress focusing on reducing GHGs and emissions using new and existing technologies. The TEREE Steering Committee, comprised of members from industry, government and non-government organizations, has formed two subcommittees, one to evaluate projects and the other to market the message that environmental technologies offer positive returns as well as help producers discern the wheat (best-practice technologies) from the chaff (all the environmental technologies marketed to them).

Several jointly-funded projects were launched in 2004. PTAC launched the Barriers to Deployment of Environmental Technologies Study to examine the barriers preventing the upstream oil and gas companies from adopting emission-reducing technologies. In addition, the Fire Tube Immersion Heater Optimization Project was undertaken to improve the efficiency of fire tube heaters used in oil and natural gas processing. Final reports from both projects are expected to be available to project participants in 2005. TEREE supported the Spectrasyne-Optical Measurement Technology and Summary of Emission Reduction Opportunity Areas in Upstream Oil and Gas Industries projects in 2004.

PTAC hosted the Energy Conservation and Air Emissions Case Studies Forum in the fall of 2004 and is planning to hold a similar event in 2005.

R&D Projects or New Project Phases Launched in 2004

PTAC facilitated the launch of 23 projects or new project phases valued at $6.0M during 2004.

Environment

- A re-evaluation of the Toxicity of CCME Petroleum Hydrocarbons Fraction 3, and Interaction Effects Between Fractions
- Assessment of Phyto-remediation as an In Situ Technique for Cleaning Oil Contaminated Sites Phases 1 and 2
- Biodiversity
- CCNE Fraction 3 Gap Study
- Caroline Livestock Study
- Compost Amendment of Oil Field Waste to Remediate High Concentrations of Petroleum Hydrocarbons F3 and F4 Fractions
- Controlled Human Exposure Studies to H2S Investigation of Neurobehavioural Potential API
- Development of Drought Tolerant/Salt Tolerant Native Grasses, Forb and Legume Ecosystems for use on Disturbed Land in the Prairies and Boreal Forest
- Flame Performance Research Initiative
- Footills Model Forest Grizzly Bear Research Project
- Imaging the Fate and Transport of Salts with Time-lapse Resistivity
- Monitored Natural Attenuation
- Native Species for the Sandy Soils Disturbances of the Parkland Ecoregion
- Reclaimed Soil Quality Benchmark Study
- Recovery of Caribou Ranges in Alberta, Boreal and West Central
- Removing the Wellsite Footprint

Reservoir Recovery/Geoscience

- Energy Innovation Network (EnergyNet) Increased Recovery of Conventional Oil and Gas Business Case
- Enhanced Gas Recovery by Downhole Compression
- Technology for Emission Reduction and Eco-Efficiency

- Barrier to Deployment of Environmental Technologies Study
- Control of Air Emissions from Refineries
- Efficiency Enhancements with REM AFR Systems Case Study
- Spectrasyne-Optical Measurement Technology Study
- Summary of Emission Reduction Opportunity Areas in Upstream Oil and Gas Industry

For further information, please refer to PTAC’s 2004 newsletters at www.ptac.org/ptalk1.html or to the project index on PTAC’s web site at www.ptac.org/project1.html
Outlook for 2005

In 2005, PTAC will continue to work with industry, academia and governments to become the preferred vehicle for facilitation of energy Research and Development (R&D) initiatives like EnergyNet. PTAC will work towards securing an agreement to facilitate the Improved Recovery, CO2 and Water areas of EnergyNet.

PTAC will work towards increasing its membership to include more stakeholders from all points along the hydrocarbon energy continuum, such as emerging producers, oil sands, pipeline, service and supply companies and royalty trusts. We will continue to collaborate with stakeholders to implement the Studying Innovation report recommendations, including completing the business case and creating technology roadmaps for unconventional gas to significantly increase recoverable reserves and production in Western Canada.

PTAC will continue to facilitate the TEREE initiative for the third year. Two TEREE projects proposed in 2004, the Sulphur Recovery Unit Optimization Study and Emissions and Efficiency Enhancements with REH AFK Systems Study, begin in early 2005.

PTAC’s call to join the CO2 Enhanced Hydrocarbon Recovery (EHR) Steering Committee generated significant interest in 2004. Formed to identify the conditions required to commercialize successful CO2 EHR pilots in Alberta and Saskatchewan, this committee plans to hold a CO2 event in the fall of 2005.

The Seventh Annual Unconventional Gas Conference will be held in November 2005 in Calgary. This conference is facilitated by PTAC and hosted by the Canadian Society of Unconventional Gas (CSUG) to communicate and facilitate technology development with the goal of increased commercialization of unconventional gas technologies. In 2005, PTAC’s role as CSUG’s secretariat will cease and CSUG will directly employ those PTAC employees and contractors previously provided to CSUG under its joint agreement. This is a logical step as CSUG continues to evolve and grow. PTAC will continue to provide office space and related services to CSUG until June 2006.

PTAC plans to launch a water innovation planning committee and to host a water event focused on reducing fresh water use by industry.

PTAC’s Drilling Innovators Advisory Group (DIALOG) and project funders will oversee the Seasonal Load Leveling Project to build a business case and companion presentation to convince industry to reduce winter drilling activity and spread that activity out more evenly throughout the year.

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 2005.

PTAC will continue to facilitate the Canadian Association of Petroleum Producers (CAPP) Environmental Research Advisory Council (ERAC) process in 2005, including the ERAC funding, as performed since 2000. PTAC expects to host a number of information sessions, workshops and technical meetings in the Environmental technical area. Four forums will address air, soil, water and ecological issues.

PTAC will receive continued financial support for 2005/06 from Natural Resources Canada (NRCan) to deliver their Industrial Energy Audit Incentive, to promote the benefits of audits and energy efficiency, and to offer access to supporting literature and resources through the PTAC Knowledge Centre.

A second Energy Technology Capital Forum is planned for June 2005.

A second Energy Conservation Case Studies Forum is scheduled for 2005.

PTAC has set a goal to facilitate the launch of 15 new projects with a value of $10 million and is striving for a significant financial surplus to build its cash reserves to 50% of its annual operating budget. PTAC will continue to operate in an open and collaborative fashion to provide focus on issues which are relevant and of value to its members and the upstream petroleum industry.

Auditor’s Report

We have audited the financial statement of position of PTAC PETROLEUM TECHNOLOGY ALLIANCE CANADA as at DECEMBER 31, 2004 and the statements of operations, changes in net assets, 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 examin

The complete audited financial statements of PTAC for the year ended December 31, 2004 are available from PTAC offices upon request.
2004 key accomplishments

Facilitating Technology Solutions

- **Facilitated two key recommendations of the Spudding Innovation report: The Energy Innovation Network (EnergyNet) Increased Recovery of Oil and Gas Business Case Project and the Innovative Energy Technologies Program (IETP)**
- **Launched five projects through 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)**

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 2004, PTAC facilitated 23 projects, 18 Technology Information Sessions, seven Request for Proposals, six forums, two workshops and one conference. PTAC is frequently approached by members and others in the industry to facilitate initiatives and events.

PTAC brought government, industry and academia together to launch several projects and initiatives in 2004. One of the most significant projects launched in 2004 was the Energy Innovation Network (EnergyNet) Increased Recovery of Oil and Gas Business Case Project. This project valued at $899,000 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 will identify in which pools project participants could deploy both existing and new technology to significantly increase oil and gas production.

PTAC’s Technology for Emission Reduction and Eco-Efficiency (TEREE) initiative, that seeks to identify the top opportunity areas and technologies to reduce greenhouse gases (GHGs) and emissions, made great strides in 2004. TEREE has made significant progress toward creating a toolbox of best practice solutions. PTAC has launched several jointly-funded projects under the TEREE initiative.

In 2004, PTAC facilitated the world’s largest Unconventional Gas Conference and several successful forums. PTAC’s first Drilling Peaks, Valleys and Energy and Oil and Water Efficiency in Mature Operations forums were held in 2004 along with PTAC’s second Shallow Gas Production Technology Forum. PTAC also held its third annual Air Issues Forum and fourth annual Technology for Emission Reduction and Eco-Efficiency (TEREE) initiative.

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