MISSION

Our mission is to facilitate innovation, collaborative research and technology development, demonstration and deployment for a responsible Canadian hydrocarbon energy industry.

VISION

Our vision is to help Canada become a global hydrocarbon energy technology leader.

Contact Us

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Message from the Board

A New Decade – A New Direction

2010 proved to be a turning point for PTAC as we redefined our role and set new strategies in motion. Over the past year PTAC has achieved goals in diverse areas of our organization: improving our finances, rebalancing our project portfolios to address a broad spectrum of needs, leveraging support for field implementations, and building a measurably more effective and efficient organization. In fact, during the course of 2010 we achieved all the major goals of our five-year plan two years ahead of schedule. PTAC is now in a position of sound financial health and organizational clarity.

At the close of 2010, PTAC set new strategies and direction for the organization. While the goals and targets of the previous five-year plan concentrated on internal development, the new plan targets both external and internal goals. The overarching goal of the new five-year plan is to tangibly increase industry’s capacity for innovation, research, and technology development, demonstration and deployment (IRD3). This new plan clearly supports PTAC’s Mission and Vision, which both focus on strengthening the Canadian hydrocarbon energy industry. Increasing capacity for IRD3 will directly benefit innovative oil and gas companies, enabling them to resolve specific challenges. It will also promote economic prosperity, create employment, help SMEs to flourish, reduce environmental impacts, and provide tax and royalty revenues for the federal and provincial governments.

The Canadian hydrocarbon energy industry grapples with a unique combination of factors. Although Canada has the largest hydrocarbon resources in the world, over 90% of these are unconventional; therefore, sustainable development of these resources requires sophisticated technologies. We believe IRD3 is the key to making the Canadian hydrocarbon energy industry more effective and efficient. Within the framework of the international energy industry, it is becoming increasingly important for Canada to reduce costs, increase production, increase recovery, and improve safety and environmental performance. Consumers are demanding that hydrocarbon production have significantly less environmental impact and shareholders are insisting on significantly higher energy efficiency. At the same time, industry is trying to recover increasingly challenging deposits while reducing costs. Developing new technologies and promoting innovation are the only options, and PTAC hopes to address these challenges in a meaningful way.

Admittedly, the overarching goal of PTAC’s new five-year plan is broad and long-term. Therefore, we have redefined our role and developed three specific strategies to engage industry and move towards a tangible increase in capacity for IRD3: understanding the sense of urgency; facilitating innovation; and developing technologies.

Understanding the sense of urgency encompasses establishing effective communication with stakeholders regarding the need for and value of IRD3. Achieving widespread industry buy-in is the first step to increasing capacity
for IRD3. PTAC has begun developing a strong communication plan, and will engage industry and government leaders in endorsing, supporting, and helping secure funding for the proposed IRD3 program. At the same time, PTAC will aggregate existing research and relevant technology information. We will communicate this information highlighting existing gaps to establish a sense of urgency within industry and promote the development of breakthrough technology among innovators. The desired result of these cumulative communication efforts is the proactive development, demonstration and deployment of new technologies to resolve both current and emerging challenges.

PTAC has a tradition of successfully facilitating innovation, the second strategy of the new five-year plan. This strategy involves aligning, coordinating, and taking a holistic and integrated approach to existing and future technology initiatives. This will continue under the new plan as we facilitate collaboration among research and development organizations. In addition, we hope to further enhance the PTAC collaborative model to establish a robust process for collaborative technology development. The development of an up-to-date website portal will expedite technology transfer, collaboration, and the dissemination of results.

The third strategy, Developing Technologies focuses on accelerating the collaborative development and deployment of a slate of transformative technologies. This includes facilitating the launch of Collaborative Test Facilities (CTF), and launching collaborative research and technology development programs.

While creating our new five-year plan, we recognized that a number of government, industry, and academic organizations are actively involved in hydrocarbon innovation. However, improved coordination and communication among these organizations is needed to enable a meaningful increase in the IRD3 capacity of the Canadian hydrocarbon energy industry. Therefore, PTAC has initiated the formation of virtual organizations that will provide a holistic and integrated approach for collaborative technology innovation. The first virtual organization is focused on sustainable oil sands development and facilitated through PTAC’s Clean Bitumen Technology Action Plan, a consortium of twenty-seven organizations. PTAC is currently in discussion with nine additional research and development organizations to define the terms of reference for this virtual organization. PTAC’s intention is to connect these organizations and coordinate their research and development activities. PTAC is also planning to form a similar virtual organization for sustainable development and production of both unconventional gas and conventional oil and gas in 2011.

To help our new five-year plan come to fruition, PTAC is embracing a new role and literally putting our money where our mouth is. In December 2010 the PTAC Board of Directors approved a motion that allows the organization to begin funding projects. PTAC has approximately $700,000 available in 2011 to use as seed money to develop technologies. Securing seed money is essential to the success of technology development projects as those dollars act as a catalyst for further interest and investment. PTAC has earned a solid reputation for successful financial leveraging, such as the one-to-ten financial leveraging achieved on the 2008 Alberta Department of Energy (ADOE) grant. To date, the original grant has seeded additional participation from 140 organizations and has launched twelve projects to accelerate technology development.

Looking back at 2010, we are pleased to have come so far and accomplished so much. Achieving the goals set out in our five-year plan ahead of schedule speaks to the dedication and expertise of our many volunteers who have served on PTAC’s Board of Directors, board committees, and technical steering committees. It is because of their collective passion for innovation that we find ourselves embarking on a new five-year plan with a focus on industry-wide communication, enhanced collaboration, and valuable technology development. Our goal of effectively increasing industry’s IRD3 capacity is ambitious, but building on PTAC’s successes we are confident that together we can help Canada become a global hydrocarbon energy technology leader through innovation, collaborative research, and technology development, demonstration, and deployment for a responsible Canadian hydrocarbon energy industry.

Soheil Asgarpour, Ph.D., P.Eng.  Earle Shirley
President  Chairperson
Innovative R&D Technology Development

PROJECTS OR NEW PROJECT PHASES LAUNCHED IN 2010
In 2010 PTAC facilitated 38 research and technology development/demonstration projects with consolidated costs equaling $8.9 M.

MANAGE ENVIRONMENTAL IMPACTS

AUPRF
- Development of a Novel Method to Detect and Locate Fugitive Emissions
- Improved Flare Source Parameters for CALPUFF and AERMOD Dispersion Models
- Photolytic Degradation of BTX from the Oil and Gas Sector
- Identifying all Sources of Benzene at UOG Sites/Facilities
- Evaluation of GHG Emissions from Crude Oil and Condensate Storage Tanks
- Improved Emissions Factors for Particulate Matter (PM) From Flares
- Evaluating the Ecotoxicity of PHC F3 in Peat Soils vs. Mineral Soils
- Characterization of the Saturated Conductivity - SAB-EC Relationship in Subsoils
- Assessment of the Environmental Significance of Vapour Emissions During In Situ Remediation activities
- Weathered PHC F2 and the Eco-Contact Pathway - Phase II - The Effect of Soil Texture
- SST Program Refinement
- Petroleum Hydrocarbon Tier 2 Guideline Calculation Software
- A Rapid Bioassay for Predicting Toxicity of PHC-Contaminated Soil
- Test Methodology and Toxicity Study for Boron

• Application of Different Measures of Bioavailability to Support the Derivation of Risk-based (Tiers 2 or 3) Remedial Benchmarks for PHC-Contaminated Sites
• Development of Assessment and Remediation Approaches for Salt Releas to Peatlands in Western Canada
• Strategies for Evaluating the Effectiveness of Reclamation Successes on Native Landscapes, Including the Mixed Grass Prairies, the Northern Fescue Natural Region, Foothills Fescue Natural Regions, the Aspen Parkland Natural
• Evaluating the Ecological Risk of Oil and Gas Development on Ferruginous Hawks
• Plant Species at Risk Responses to Shallow Gas Development
• Removing the Wellsite Footprint - Phase II - Wetland Reclamation and Extended Monitoring of Upland Phase
• Evaluating the Ecological Risk of Energy Sector Development on Burrowing Owls in Native Prairie Habitat. Final Year Proposal
• Grizzly Bear Response to Oil and Gas Development and Activities in Alberta
• The Role of Predation in Woodland Caribou Population Declines in Northwestern Alberta
• Risks to Groundwater from Oil and Gas Drilling and Completion
• Water Well Testing Prior to Drilling

STEERING COMMITTEES AND SUB-COMMITTEES

In 2010, PTAC facilitated the following Steering Committees and Sub-Committees

MANAGE ENVIRONMENTAL IMPACTS
- Air Research Planning Committee
- Soil and Groundwater Research Committee
- Boron Working Group
- Ecological Research Planning Committee
- Water Innovation Planning Committee
- Alternative Energy Solutions Committee
- Technology for Emission Reduction and Eco-efficiency (TEREE)
- Wellsite Abandonment Project Committee
- Alberta CO2 Purity Project (ACPP) Committee
- Clean Bitumen Technology Action Plan (CBTAP) In Situ Steering Committee
- CBTAP Mining Steering Committee
- CBTAP Strategic Planning Committee
- CBTAP Technical Advisory Committee
- CBTAP Breakthrough and Innovation Committee
- CBTAP Knowledge and Innovation Management Committee
- CBTAP Workshop Committee
- CBTAP in Situ Recovery
- CBTAP Production Enhancement and Automation
- CBTAP Surface Bitumen Recovery
- CBTAP Upgrading and Gasification

2010 Volunteer Recognition Awards

PTAC's many successes can be traced directly back to our dedicated volunteers. In 2010, we continued with our volunteer recognition program. At large events throughout the year PTAC held several formal awards ceremonies, presenting individual and corporate awards to outstanding volunteers in recognition of their valuable contributions and dedicated service. The recognition program included individual letters of appreciation thanking all 280 volunteers for their service.

PTAC CORPORATE CITIZENSHIP AWARD
ConocoPhillips Canada

PTAC LIFETIME ACHIEVEMENT AWARD
Mike Ekehund, Alberta Department of Energy

PTAC VOLUNTEER OF THE YEAR
Chris Lehecka, ConocoPhillips Canada
Mark Johnston, Suncor Energy Inc.

PTAC DISTINGUISHED SERVICE AWARD
Chuck Szmarlo, Enbridge Inc.
Randy Rudolph, Millennium EMS Solutions Ltd.
Christopher Holly, Alberta Department of Energy

Ian Potter, Alberta Innovates - Technology Futures

AIR RESEARCH PLANNING COMMITTEE AWARD
Lisa Solomchuk, Shell Canada

SOIL AND GROUNDWATER RESEARCH COMMITTEE AWARD
Gordon Dimwood, Alberta Environment

WATER INNOVATION PLANNING COMMITTEE AWARD
Marc Dubord, Cenovus Energy

TECHNOLOGY FOR EMISSION REDUCTION AND ECO-EFFICIENCY (TEREE) COMMITTEE AWARD
Paul Slobodnik, ConocoPhillips Canada

CO2 COMMITTEE AWARD
Rob Craig, LOC N

UNCONVENTIONAL GAS COMMITTEE AWARD
Rob Galant, Nexen Inc.

VISCOUS OIL COMMITTEE AWARD
Larry Frederick, Nexen Inc.
Key Accomplishments

Three and half years ago PTAC developed an ambitious five-year-plan with the goal of meeting the following targets by year-end 2012: improve financial health, increase the number of projects in specific focus areas, launch projects focusing on field implementation, and build a more effective and efficient organization. In 2010 PTAC achieved and exceeded all the goals of their five-year plan two years ahead of schedule.

PTAC’s financial health has improved steadily since 2007; not only have they set aside sufficient financial reserves for “rainy days”, but PTAC has also accrued a sizeable surplus that has enabled the organization to move forward in exciting new directions. In December 2010, the PTAC Board of Directors passed a motion allowing PTAC to fund projects.

PTAC has implemented a much more balanced approach to technology development. Historically, PTAC projects were heavily weighted towards the environmental management portfolio. Over the past three years PTAC has significantly increased the number of projects in additional focus areas while slowly growing the number of environmental projects. This has resulted in a strong line-up of diverse projects that are in-step with industry demand for sustainable hydrocarbon development.

In 2010, PTAC continued to facilitate The Alberta Upstream Petroleum Research Fund (AUPRF), which provides funding for peer-reviewed environmental research studies. PTAC facilitated two water projects, ten soil projects, six air projects, and seven ecological projects for a grand total of twenty-five new studies collectively awarded $1.6 million in AUPRF funding. Successful leveraging of this funding resulted in these projects having a total cost over $5.1 million. In addition, the Technology for Emission Reduction and Eco-Efficiency (TEREE) Steering Committee developed several new project ideas and launched the Air Fuel Ratio Controller for Low Horsepower Engines project to determine the operational and functional benefits of using low horsepower engines in the field. PTAC also launched the PT Brands MG22D Diesel Fuel Additive Encana Testing Results project, which examines the effectiveness of the diesel fuel additive on emissions reduction.

Balancing a strong environmental portfolio, PTAC also launched several projects in other technology areas. PTAC’s CO₂ EHR Technical Steering Committee launched the Alberta CO₂ Purity Project in May 2010. This collaborative study seeks to determine a balancing point for purity requirements and cost effectiveness as it pertains to all stages of the CO₂ value chain including capture, transport, and enhanced oil recovery. Currently over forty organizations including industry, government, and NGO stakeholders are participating in this study. PTAC’s Alternative Energy Solutions Committee has been working since 2007 investigating potential alternatives to natural gas for bitumen production, and completed phase I and II of this study in 2008 and 2009, respectively. In 2010, the committee solicited proposals from nuclear power plant owners and operators to supply Sample Term Sheets for supplying Combined Heat and Power (CHP). PTAC received a number of proposals and has met for further discussions with several nuclear power plant producers and nuclear technology providers. This project is expected to continue into 2011. Building upon their work in 2009, PTAC continued to facilitate the ERCB and CAPP’s joint Long Term Security of Abandoned Wells Committee in 2010. At the committee’s behest, focused research and experimentation on dump bailing operations is being conducted at Southern Alberta Institute of Technology (SAIT) to assess the current dump bailing practices. This study is of particular importance as both field and laboratory findings would constitute a proven technical foundation for accepted well abandonment practices.

Field implementation has become a priority for PTAC projects, and many of those launched in 2010 include a field-pilot component. Field pilot demonstration is one of the most challenging aspects of development, as inventors and SMEs must secure both a test site and funding. The costs and risks of this are often too high to proceed. However, PTAC has successfully implemented a strategy of collaboration and formation of consortia that simultaneously addresses the needs of the inventors and the needs of industry producers. For example, the Shallow Gas Well De-watering Pump Consortium started in 2010 to bring together the collective knowledge of several major players to develop an economic dewatering pump for shallow gas.

In addition to its many projects, PTAC also formed two networks: The Clean Bitumen Technology Action Plan (CBTAP), and the Resources Emission Technology Action Plan (REMTAP). The purpose of these networks is to bring together experienced people and creative ideas to develop projects that address specific issues. The networks take a systematic approach to develop breakthrough technologies that will materially improve industry performance in the areas of reducing costs, reducing environmental impacts, and increasing recovery. The action plans start with identification of challenges, which leads to an internal and external search to identify technology solutions. This in turn results in the formation of multi-stakeholder consortia
in the areas of applied research, engineering studies, field pilot projects, and commercialization of technologies. The networks serve as a place to share the inventory of technologies, prioritize technology projects for further work, and disseminate results.

Twenty-six organizations including eleven oil sands producers, government organizations, service and supply companies, research providers, and academia have joined the CBTAP. In 2010, the CBTAP developed and published its vision, mission and strategic plan. Three major workshops and a number of committee meetings were held as vehicles for completing the gap analysis and developing an inventory of technologies. At year end, a comprehensive work plan was prepared to outline 2011 activities.

In September, PTAC held a workshop to launch the REMTAP. This newly-formed network is comprised of industry leaders Cenovus Energy, ConocoPhillips Canada, Devon Energy, Encana Natural Gas, and Nexen Inc., and New Paradigm Engineering. The initial workshop addressed challenges and opportunities for energy efficiency, emissions measurement and reduction, best practices and management with due consideration to resource conservation, environmental protection, regulatory compliance and cost management. This network has begun the first steps in addressing the ubiquitous issue of air emissions through studies, research, technology development, and demonstration projects that will benefit a wide range of participants and stakeholders.

Furthering communication and collaboration among industry, government, academia, and SMEs, PTAC hosted a full complement of 2010 events including forums to disseminate information, workshops to facilitate meaningful discussion on pertinent topics, and technology information sessions to introduce new technologies and new opportunities to the industry. As part of facilitating AUPRF, PTAC facilitates four Environmental Management events in the areas of soils, water, air, and resource management each year. In 2010, over 400 participants, 59 speakers, and a number of poster session participants attended these events to share information on current regulatory issues facing industry, to disseminate results of progress on research and technologies, and to discuss upcoming issues in each of these areas. In May, PTAC collaborated with Oxand Canada to facilitate a hands-on workshop on Risk Management for CO₂ where participants used practical examples and case studies to explore risk management in a Carbon Capture and Storage context. In November 2010, PTAC held two separate ‘Towards Clean Energy Production’ events that were both well attended and generated much positive feedback.

PTAC facilitated the 2010 Global Petroleum Conference, which ran over the course of three days and focused on addressing “game-changers” that contribute to the boom and bust cycle, potentially changing the way business is done and how industry functions. The conference aimed to put into perspective the challenges that face the economy, environment, recovery, supply and demand, and regulation, exploring how technology can help address these challenges. Conference sponsors included Halliburton, Kade Technologies Inc, SNC-Lavalin, ConocoPhillips, Aveva, Total Exploration and Production, IBM, HIS, and Solarc. The conference had a very strong and dynamic program and welcomed nearly 300 participants.

Since establishing their five-year plan, PTAC has become a measurably more effective and efficient organization overall. General and administrative costs have decreased by 30% while activities have increased significantly. The organization is accomplishing more with less, and ensuring alignment with industry goals in all the projects and events they pursue. This responsible management has helped PTAC to weather recent economic changes and emerge at the end of 2010 ready to seize new opportunities and meet new challenges.
2011 Outlook

2011 is the embarkation point for PTAC’s new five-year plan. Focused on external development, the aim of the new plan is to tangibly increase industry’s capacity for innovation, research, and technology development, demonstration and deployment (IRD3). PTAC has divided their activities into three specific strategies to move towards this goal: understanding the sense of urgency; facilitating innovation; and developing technologies. In 2011, PTAC will continue to maintain the programs and aspects of the organization that have been carefully cultivated over the past few years, building upon these accomplishments as they pursue new goals and meet new challenges. Project work in 2011 will promote the ‘developing technologies’ and ‘facilitating innovation’ strategies while PTAC’s events and targeted efforts to engage all research and development organizations operating in oil and gas in a holistic and integrated approach to IRD3 will help achieve the goals of the ‘understanding the sense of urgency’ and ‘facilitating innovation’ strategies.

The ‘developing technologies’ strategy focuses on accelerating the collaborative development and deployment of a slate of transformative technologies, while ‘facilitating innovation’ involves aligning, coordinating, and taking a holistic and integrated approach to existing and future technology initiatives. These two strategies permeate all of PTAC’s planned project work for 2011. PTAC will continue to increase the number of projects managed in the areas of “Reducing Costs”, “Improving Oil and Gas Recovery”, and “Improving Value-Added Products”. To maintain the recently-established portfolio balance, PTAC plans to significantly increase 2011 activities in these technology areas. The Hot Water Vapour Project, Ultra Lightweight Proppant, Shallow Gas Dewatering Pump consortium, Air Fuel Ratio Controller for Low Horsepower Engines, and PT Brand Diesel Fuel Additive are all examples of PTAC projects in these areas which will be well underway in 2011. Three of these 2011 projects include multi-million-dollar field-pilot demonstrations: Hot Water Vapour Injection, Shallow Gas De-Watering, and the Ultra Lightweight Proppant project. In emphasizing the importance of field pilot testing, PTAC will continue to close the gap between pure research and commercialization, furthering industry capacity for IRD3.

The Hot Water Vapour Injection (HWVI) is a low-energy, low-cost thermal stimulation process for Cold Heavy Oil Production with Sand (CHOPS) reservoirs aimed at reducing greenhouse gas (GHG) intensity while improving recovery from conventional and non-conventional resources. GHG emissions are a major challenge for Enhanced Oil Recovery (EOR) which often requires increased energy consumption. HWVI will result in reductions in GHG emissions, water usage, and land impact compared to alternative EOR approaches for these formations. The successful commercialization of a new heavy oil EOR technology could open the door for adapting the same technology to cold-produced oil sands. The technology can be deployed in a number of configurations and optimizations. This is a key field pilot project representing the first field evaluation of HWVI, which is a potential low energy and low cost thermal stimulation and gas drive follow-up recovery process for Cold Heavy Oil Production with Sand CHOPS reservoirs.

The Shallow Gas De-Watering project is an exciting Joint Industry Project to develop a suitable solution to lift water for shallow gas. This project is expected to receive $750K in funding from Western Economic Diversification (WED), $250K from Alberta Energy, and $75K from PTAC in their first funding venture. In addition, Cenovus Energy Inc., Encana Corporation, and Enerplus Corporation are each expected to provide $200K in cash as well as their expertise, along with picking up the field test costs. Water loading is the primary cause of production restriction and reserve loss in shallow gas wells across North America. Reliable pumping technology capable of removing water at an economic price point does not currently exist. The creation of a Joint Industry Consortium to investigate and test de-watering pumps/processes for shallow gas wells is expected to develop in 2011 and 2012. PTAC anticipates receiving more than fifteen proposals from manufacturers whose technologies will be screened by a steering committee. About ten will then be selected for bench testing at the Centre for Frontier Engineering Research (C-FER) Technologies. The four most-promising technologies will be selected for field demonstrations.

The Ultra Lightweight Proppant Project will measure the performance of a new fracturing technique: the Grand Canyon process optimized for deeper, hotter oil and gas wells. The project will evaluate this technology and will provide western Canadian producers with a better understanding of the production benefits, environmental benefits, and overall value of this application. Operators generally require hard data and case studies before adopting a technology, and this project will generate a credible data set and an explanatory report. Funding agreements have already been made with several leading producers, with others expressing interest in participation.

PTAC intends these high-profile field pilot demonstrations will enhance capacity for IRD3 by securing sites and funding for inventors who otherwise would have no chance of commercializing their technology, and helping industry identify previously
untapped technological solutions to specific challenges. Bridging the gap between basic research and commercialized technology is not simple—it is a multi-step process fraught with challenges. However, by promoting innovation and collaboration through 2011 projects, PTAC hopes to refine these steps into a seamless process from basic research to commercialization of technology as the future unfolds.

Project development in the area of ‘Manage Environmental Impacts’ will continue in 2011 under the auspices of AUPRF, the CO₂ EHR Steering Committee, TEREE, PTAC’s SME initiative, and the newly formed CBTAP and REMTAP Networks. In 2011, PTAC is expected to facilitate twenty-eight environmental management projects under AUPRF, with over $2M invested from industry leveraging significant additional funding resulting in projects with total costs equaling more than $7.8M. The Alberta CO₂ Purity Project will continue throughout 2011 under the sound direction of the project steering committee which was formed under the PTAC CO₂ EHR Committee and is coordinated with the Integrated CO₂ Network (ICO₂N). PTAC’s wellsite abandonment project, launched in 2009 will continue to address cement dump bailing in cased-hole wellsites. During 2011, this project will complete a series of experiments with a recognized laboratory and wellbore testing facility to evaluate and optimize the physical characteristics of the cement commonly used as a permanent well abandonment plug (contained within casing). The project is expected to conclude in 2011 and the findings will be released immediately for public access. Under TEREE two projects will be completed in 2011. The Low Horsepower Engines Project is projected to conclude in the Fall of 2011. PTAC intends to develop this project into a Phase II, which will involve third party verification of data and subsequent reporting. Findings will be made available twelve months after completion. The PT Brands Diesel Fuel Additive Encana Testing Results will be completed in March 2011, and findings of this study will also be made available twelve months after completion.

In 2011, CBTAP activities will be guided by the Action Plan approved by the Steering Committee at the end of 2010. The Surface Bitumen, In Situ Bitumen and Upgrading Committees have started reviewing and evaluating technology solutions that can be investigated and demonstrated through collaborative projects. Specific areas of interest include next generation technologies, recovery with a smaller environmental footprint and lower costs, improved energy efficiency, and upgrading methods deployable closer to production sites and/or offering cost and environmental advantages. Fostering collaboration, filling gaps, and improving overall effectiveness of the innovation system remain key goals of CBTAP that will be advanced through the Collaborative Test Facilities (CTF) and the virtual forum for technology organizations. The purpose of the CTF is to identify infrastructure that could be built or made more widely available for collaborative technology demonstration. The CTF concept is likely to encompass a number of separate facilities to support projects such as information warehouses, water technology development, environmental research, improvements in instrumentation and equipment, and transformative technologies for surface and in-situ bitumen. Finally, during 2011, CBTAP plans to host three workshops and continue efforts aimed at increasing R&D and innovation funding. In 2011 PTAC will launch a project, under CBTAP, to examine and evaluate innovations in the application of electricity in oil sands.

REMTAP will complete its task of developing an inventory of technologies in the summer of 2011, and will seek to develop and implement these technologies in autumn 2011 and beyond.

As PTAC implements their strategies to achieve an increased capacity for IRD3, the organization will continue to proactively assess long-term industry needs and identify challenges, encourage industry and government to support R&D, provide innovative technical and technology solutions, and effectively disseminate existing and emerging technologies through the CBTAP and REMTAP networks.

In 2011 PTAC will continue implementation of the twelve existing projects born out of the Alberta Department of Energy grant. This grant of $1.5 M was awarded to PTAC in 2008 to provide the foundation and structure to promote additional industry support and focus for projects, and help leverage funding from industry and other organizations. So far over $1.3 million of this grant has been allocated to fourteen projects launched by PTAC for a total cost of $12 million. Over 140 organizations have participated in these projects providing significant leveraging of both financial resources and industry expertise.

With the continued support of National Research Council of Canada – Industrial Research Assistance Program (NRC-IRAP), PTAC will offer its services in 2011 to assist Canadian SMEs in the hydrocarbon industry. SMEs continue to play an integral role in increasing industry capacity for IRD3, but they require assistance to identify current industry needs and provide technology solutions to meet those needs. Building on their successful deployment in 2010, PTAC will once again provide information to help SMEs move their technologies to market. In 2011, PTAC will host the ‘Oil and Gas Fundamentals for SMEs’ seminars/webinars to help educate SMEs and improve their knowledge of industry. PTAC will also host the first SME Showcase of Technologies Forum. This highly informative event will present insights into new and emerging technologies and processes developed by Canadian entrepreneurs that address innovative oil, gas, and oilsands applications for exploration, production,
and environmental protection. The goal of this showcase will be to increase market share within the hydrocarbon industry for successful SMEs.

To implement the strategies set out in the new five-year plan, PTAC is planning several 2011 events to communicate to industry the importance of IRD3 and increase awareness of the sense of urgency in developing technologies for sustainable hydrocarbon development. PTAC will host the Global Petroleum Conference in conjunction with GO EXPO in 2011, a conference featuring three concurrent sessions addressing such topics as Oil Sands, Operations, CO₂ Management, Unconventional Resources, Increased Recovery, Business Strategies, and Health and Safety. The conference will aim to feature sixty speakers over the course of two and a half days to bring the latest updates on conventional and unconventional resources. The conference will focus on reducing overall costs and minimizing the environmental footprint using innovative technology solutions. The highlight of the conference is expected once again to be the Plenary Panel Discussion where dignitaries from around the globe gather to publicly discuss current challenges specific to the economic and political climate of the day. Other PTAC events anticipated for 2011 include an Annual Spring Water Forum, the 2011 Towards Clean Energy Production Conference Series in the autumn, and a series of environmental portfolio events to share the results of AUPRF research.

PTAC's outlook for 2011 communicates a firm belief that the future of the Canadian hydrocarbon energy industry depends on an expanded capacity for IRD3. Through their 2011 projects, programs, and events PTAC will develop the three strategies to move towards this goal: understanding the sense of urgency; facilitating innovation; and developing technologies. PTAC is at its core a gathering of volunteers representing all aspects of the Canadian hydrocarbon energy industry, and working together the organization continue to facilitate innovation, collaborative research, and technology development, demonstration, and deployment for a responsible Canadian hydrocarbon energy industry.

Member Services

PTAC offers a variety of services to its members, and provides opportunities to benefit the Canadian hydrocarbon energy industry. For more information on the many benefits of PTAC membership please visit our website at: www.ptac.org.

Facilitating

Projects
PTAC facilitated 38 new research and development projects or new project phases during the course of 2010. The total costs of these projects was $8.9 M. PTAC provides industry with a neutral forum to work in collaboration, leveraging collective experience and expertise to identify opportunities, challenges, and potential solutions that require research or technology development. These discussions can lead to joint-industry projects where PTAC, as a neutral facilitator, assists with soliciting proposals and launching projects through a fair and balanced process. PTAC also identifies existing research and development to raise industry awareness and minimize duplication.

Small and Medium-sized Enterprises (SME) Program
With the support of NRC-IRAP, PTAC continued to provide support to SMEs to help unleash SME innovations to benefit the hydrocarbon industry. PTAC staff and contracted subject experts provided support to SMEs to help them make significant advances in moving their technology forward in a value-added manner and adapting their technologies to better meet specific industry needs. PTAC provided in-depth advice to SMEs to guide them on marketing their technologies, and facilitated technology information sessions for eight PTAC SME members. PTAC subject experts and staff facilitated meetings with SMEs to provide technology advice, help identify funding and to collaborate with other SMEs or organizations to move their technology projects forward. PTAC provided opportunities for over 70 SMEs to present their research and technologies at PTAC conferences, forums, information sessions and technical steering committee meetings in 2010.

PTAC hosted two seminars geared towards SMEs, a spring session on Conventional EOR needs and an autumn session on Heavy Oil Futures. Over 180 participants took advantage of these seminars. SMEs were extremely interested in learning about technology needs and prospects to develop or tweak their technologies to help address industry challenges. In addition, these seminar/webinars provided excellent networking opportunities for SMEs.
Approved Service Provider for Alberta Innovates – Technology Futures Innovation Voucher Program

In 2010, PTAC continued to provide services under the Alberta Innovates– Technology Futures Innovation Vouchers Program. Innovation vouchers help small technology and knowledge-driven businesses in Alberta accelerate the process of getting their ideas and products to market. The goal of the innovation vouchers program is to enhance the ability of small businesses operating in Alberta to be successful in the marketplace. In 2010, PTAC staff and technical advisors worked with thirteen SMEs, helping to determine the feasibility and viability of proposed projects and reviewing applications.

Networking

Technology Information Sessions

In 2010, PTAC facilitated eleven Technology Information Sessions (TIS) attended by nearly 300 participants. As a service to members, PTAC facilitates TISs for interested companies, providing benefits to both the presenting company and all those in attendance. The company presenting is provided a forum to solicit interest, feedback, participation or potential funding for new research and development projects; find industry partners to complete proposed research or technology development such as field tests or pilot sites; report on field test or pilot results; provide information on technology-related services; and market new technology to the Canadian oil and gas industry. Those in attendance have the opportunity to be exposed to these new projects and ideas through a targeted, facilitated presentation.

Engaging

Forums and Workshops

PTAC hosted six forums and five workshops in 2011 that attracted over 800 participants. These targeted events provide industry members with an opportunity to gather with others to share ideas, opinions, and learning on a specific technical subject. In addition, nearly three hundred participants took part in the 2011 Global Petroleum Conference held in conjunction with the Global Petroleum Show in June.

PTAC forums focus on broader needs or technical areas. These events are comprised of presentations detailing new technologies, case studies, and the objectives and results of current research, as well as providing opportunities for questions and answers. The goal of PTAC forums is to bring together the most up to date information from across the industry into an enriching learning experience.

PTAC workshops provide opportunities for participants to work collaboratively in focused groups to clearly define research and development issues, identify potential solutions, and select the best approach to move forward. Industry members are provided an opportunity to share their needs, and R&D providers are given an opportunity to hear about issues firsthand. Solutions are formed by leveraging the collective expertise and ideas of all participants, while protecting proprietary interests. PTAC hosts the workshops and is pleased to provide the necessary facilitation, administrative support, and coordination to launch projects once identified.

Informing

The PTAC Knowledge Centre provides public access to non-proprietary technical information on commercially available oil-and-gas-related technologies pertinent to the hydrocarbon energy industry. The Knowledge Centre offers access to core energy and premier technical databases to meet the educational, informational, and technical needs of the user community. The Knowledge Centre Manager provides services to SMEs, 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 for PTAC members include literature searches, search alerts, advice on technical document and journal article retrieval, and contact information for subject experts in industry, government, and academia. PTAC members are invited to provide
non-proprietary technical information on their technologies to PTAC for display in the Knowledge Centre. Relevant materials are accepted on an ongoing basis.

Collaborating

**Technical Steering Committees**

PTAC facilitated twenty-seven Technical Steering Committees and one sub-committee during the course of 2010. PTAC Technical Steering Committees consist of PTAC members representing various industry sectors, governments, and non-governmental associations. These technical steering committees help to identify opportunities for collaborative research and technology development, raise awareness of existing research and technology through planning events, find solutions to challenges through the process of soliciting proposals and launching new projects, and promote involvement by informing appropriate colleagues of Technical Steering Committee activities.

Communicating

**Member Communications**

PTAC is committed to ensuring effective communication with members. The PTAC website provides members with access to the most up-to-date information on PTAC projects, events, and activities as well as an extensive archive. Our bi-weekly newsletter, e-talk, delivers all the latest information on upcoming events and opportunities directly to members and interested stakeholders through email.

Board of Directors

(as at December 31, 2010)

Earle Shirley, Chairperson
Executive Manager, Board Projects
Energy Resources Conservation Board

Soheil Asgarpour, President, PTAC
Petroleum Technology Alliance Canada

Randy Cormier
General Manager, Research and Development
Nexen, Inc.

Dr. Marc D’Iorio, Director General
Energy Sector/Office of Energy Research and Development
Natural Resources Canada

Mike Ekelund
Assistant Deputy Minister, Energy Future and Strategic Relations Division
Alberta Department of Energy

Alex Ferguson
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BC Oil and Gas Commission

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Unconventional Gas Resources Canada

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Carbon Management Canada Inc.

University of Calgary

Ian J. Potter
Chief Operating Officer
Alberta Innovates - Technology Futures

Ken Putt,
Independent Director

Randy Rudolph
Principal
Millennium EMS Solutions Ltd.

Dave Rushford
Senior VP and COO
Quicksilver Resources Canada Inc.

Chuck J. Szmurlo
Vice President of Alternative and Emerging Technologies
Enbridge Inc.

Murray Todd
President and CEO
Todd Resources
VOLUNTEERS

MANAGE ENVIRONMENTAL IMPACTS

Technology for Emission Reduction and Eco-Efficiency (TEREE) Steering Committee
- Mark Bohn, Suncor Inc.
- Pierre-Yves Caux, Environment Canada
- Norman Chen, Husky Energy Inc.
- Alex Dickson, CETAC West
- Angela Driscoll, ARC Resources Ltd.
- Joe Dusseault, Cenovus Energy Inc.
- Geoff Frazer, Devon Canada Corporation
- John Harvey, Encana Natural Gas

John Harvey, Encana Natural Gas
- Bruce Peachey, New Paradigm Engineering Ltd.
- Al Rasmussen, Nexen Inc.
- Graham Schmidt, Encana Natural Gas
- Jerry Shaw, Devon Canada Corporation
- Dennis Schmitt, Encana Natural Gas
- Paul Slobodnik, ConocoPhillips Canada Ltd.
- Doris Weiss, Devon Canada Corporation

Air Research Planning Committee
- Lori Adamache, Alberta Environment
- Henry Ewa, Energy Resources Conservation Board
- Randall Daniels, Encana Corporation
- Randy Dobko, Alberta Environment (government co-chair)
- John Drinkwater, BP Canada Energy
- Wayne Hiller, Husky Energy Inc.
- Michael Laper, Natural Resources Canada (NRCan)
- Nathan Maychek, ConocoPhillips Canada
- Russell Morrison, Encana Corporation
- Rosanna Ng, Talisman Energy Inc. (industry co-chair)
- Krista Phillips, Canadian Association of Petroleum Producers (CAPP)
- Brian Ross, Nexen Inc.
- Nicole Sagan, AltaGas Services Ltd.
- Lisa Solomonchuk, Shell Canada Resources Ltd. (industry co-chair)
- Michael Harrass, Borex
- Pierre-Yves Caux, Environment Canada
- Pat Payne, Energy Resources Conservation Board
- Asfaw Bekele, Imperial Oil Limited
- Roy Kanten, Shell Canada Resources Ltd.

Airfuel Ratio Controllers for Low Horsepower Engines Project Committee
- Joe Dusseault, Cenovus Energy Inc.
- Sean Herbert, ConocoPhillips Canada
- Mike Krajina, BP Canada Energy
- Paul Slobodnik, ConocoPhillips Canada
- Boron Technical Working Group
- Asfaw Bekele, Imperial Oil Limited
- Scott Castwell, Maxxam Analytics
- Tim Chadlaw, MWH Canada Inc.
- Bob Corbet, Access Analytical Laboratory Inc.
- Gordon Dinwoodie, Alberta Environment
- Curtis Eickhoff, Maxxam Analytics
- Glyn Fox, BC Oil and Gas Commission
- Shirley Graham, AGAT Laboratories Ltd
- Karim Gaigeau, Franz Environmental Inc.
- Susan Halla, Energy Resources Conservation Board
- Michael Harrass, Borex
- Phil Heaton, Maxxam Analytics
- Greg Huber, Equilibrium Environment Inc.
- Darlene Lintott, Borex
- Anthony Knaff, Equilibrium Environment Inc.
- Pat Payne, Alberta Environment
- Bill Pelech, Alberta Environment
- Roger Saint Fort, Mount Royal University
- Darlene Stokes, Talisman Energy Inc.

Resource Emissions Management Technology Action Plan (REMTAP)
- Joe Dusseault, Cenovus Energy Inc.
- Geoff Frazer, Devon Canada Corporation
- John Harvey, Encana Natural Gas

- Kim Mercier, Encana Natural Gas
- Bruce Peachey, New Paradigm Engineering Ltd.
- Al Rasmussen, Nexen Inc.
- Graham Schmidt, Encana Natural Gas
- Jerry Shaw, Devon Canada Corporation
- Dennis Schmitt, Encana Natural Gas
- Paul Slobodnik, ConocoPhillips Canada Ltd.
- Doris Weiss, Devon Canada Corporation
- Angela Putz, Natural Resources Canada (NRCan)
Ecological Research Planning Committee
• Steve Eberhardt, Athabasca Oil Sands Corp.
• Carol Engstrom, Husky Energy Inc.
• Bruce Greenfield, Energy Resources Conservation Board
• Scott Johnston, Husky Energy Inc.
• Adam Judd, Nexen Inc.
• Sandra Marken, ConocoPhillips Canada
• Kathryn Milne, Nexen Inc.
• Ted Nason, Sustainable Resource Development
• Terry Osko, Alberta-Pacific Forest Industries, Inc.
• Gary Sargent, Canadian Association of Petroleum Producers (CAPP)
• Amrit Saxena, Devon Canada Corporation
• Scott Wagner, Nexen Inc.
• Tracy Young, Encana Corporation

Water Innovation Planning Committee
• Brenda Austin, Energy Resources Conservation Board
• Gail Buchanan, Syncrude Canada Ltd.
• Carrie Dickinson, Energy Resources Conservation Board
• James Douglas, ConocoPhillips Canada
• Sarah Fulton, Penn West Petroleum Ltd.
• Lisa Grul, Nexen Inc.
• Scott Hillier, ConocoPhillips Canada
• Bob Kutzak, Nexen Inc.
• Ludmila Makarov, Husky Energy Inc.
• Paul Martin, Athena, Alberta Energy
• Kathryn Milne, Nexen Inc.
• Keith Minnich, Talisman Energy Inc.
• Richard Nelson, Alberta Environment
• Sarah Ng, Devon Canada Corporation
• Naomi Parker, Encana Corporation
• Ron Quirk, Sustainable Ventures Inc.
• Jennifer Sakana, Husky Energy Inc.
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• Greg Shyba, Telus World of Science Calgary
• Rudy Tamayo, Husky Energy Inc.
• Prasad Valupadas, Alberta Environment
• Monica Varga, NRC IRAP
• Chris Holly, Enbridge Pipelines Inc.
• Bill Reynen, Natural Resources Canada (NRCan)
• Surinder Singh, Alberta Innovates – Energy and Environment Solutions
• Sit Song, Cenovus Energy Inc.
• Michael St. James, Praxair Canada Inc.
• Barry Station, ATCO Energy Solutions
• Charles Smurko, Enbridge Pipelines Inc.
• Remi Talabi, Penn West Exploration.
• Kali Taylor, Integrated CO2 Network
• Steven Thomas, Energy Resources Conservation Board
• Kurt Ulrich, BP Canada Energy Company
• Farid Rentulla, Enhance Energy
• Brian Watt, Husky Energy Inc.

Hot Water Vapour Process Project Steering Committee
• Moubad Belharche, Devon Canada Corporation
• Ken Brown, Petroleum Technology Research Centre (PTRC)
• James Calbeck, Husky Energy Inc.
• Ian Freedland, Devon Canada Corporation
• Luis Romualdez, Devon Canada Corporation

Shallow Gas Well De-watering Pump Consortium Steering Committee
• Francisco Alhanati, C-FER Technologies
• Tim Deerkson, Enersplus Corporation
• Ken Lowe, Cenovus Energy Inc.
• Kelly Piers, C-FER Technologies
• Dave Sask, Encana Corporation
• Francisco Treviño, C-FER Technologies

IMPROVED OIL AND GAS RECOVERY

CO2, E.H.R. Steering Committee
• Garth Ayres, InterpipeLine Fund
• Stefan Bach, Alberta Innovates – Technology Futures
• Don Bradshaw, Alberta Department of Energy
• Ian Bryden, Penn West Exploration.
• Heather Campbell, ARC Resources Ltd.
• Gary Cook, Capital Power
• Robert Craig, Integrated CO2 Network
• Kelly Edwards, Barrick Energy Inc
• Christeen Finzel, Alberta Environment

• John Drennan, Trident Exploration
• Jill Garcia, Canadian Association of Petroleum Producers (CAPP)
• Jack Halliday, ConocoPhillips Canada Ltd.
• Brent Harrison, Encana Natural Gas
• Brad Herald, Canadian Association of Petroleum Producers (CAPP)
• Brent Hughes, Nexen Inc.
• Don Jones, Apache Corp.
• Orest Kotenko, Canadian Natural Resources Ltd.
• Ercun Larsen, Cenovus Energy Inc.
• Anita Lewis, Energy Resources Conservation Board
• Warren Lloyd, Encana Natural Gas
• John Lucic, Nexen Inc.
• Clint Nerbas, BP Canada Energy Company
• Stewart Neuman, Calmana Energy Services
• Eugene Ng, Shell Canada Resources Ltd.
• Julian Mamo, Penn West Exploration.
• Sean Meehan, Penn West Exploration.
• Tara Payment, Canadian Association of Petroleum Producers (CAPP)
• Erin Peachey, Canadian Association of Petroleum Producers (CAPP)
• Chris Perkins, Cenovus Energy Inc.
• Jim Quehl, Devon Canada Corporation
• David Samuelsion, Energy Resources Conservation Board
• Danny Scott, Encana Natural Gas
• Ken Shewan, Frontier Ltd.
• Tyler Simpson, Devon Canada Corporation
• Harold Slater, Penn West Exploration.
• John Skofstra, Talisman Energy Inc.
• Jeff Willick, Canadian Natural Resources Ltd.
• Nevin Wolf, Talisman Energy Inc.
• Alberta CO2 Purity Project (ACPP) Committee
• PTAC recognizes the contributions of the members of this Committee. However, to preserve confidentiality, the individual members are not listed.

Hot Water Vapour Process Project
• Eddy Isaacs, Alberta Innovates – Technology Futures
• Larry Hegan, Natural Resources Canada (NRCan)
• Chris Holly, Alberta Department of Energy
• Anna Maslowsk, Alberta Department of Energy
• Colin Muir, Pengrowth Management Ltd.
• Dav Peet, Devon Canada Corporation
• Frank Perrino, ATCO Midstream
• Fara Rentulla, Enhance Energy
• Bill Reynen, Natural Resources Canada (NRCan)
• Surinder Singh, Alberta Innovates – Energy and Environment Solutions
• Sit Song, Cenovus Energy Inc.
• Michael St. James, Praxair Canada Inc.
• Barry Station, ATCO Energy Solutions
• Charles Smurko, Enbridge Pipelines Inc.
• Remi Talabi, Penn West Exploration.
• Kali Taylor, Integrated CO2 Network
• Steven Thomas, Energy Resources Conservation Board
• Kurt Ulrich, BP Canada Energy Company
• Brian Watt, Husky Energy Inc.

PRODUCERS (CAPP)
• Jack Halliday, Integrated CO2 Network
• Heather Campbell, ARC Resources Ltd.
• Ian Bryden, Penn West Exploration.
• Don Bradshaw, Alberta Department of Energy
• Ian Freedland, Devon Canada Corporation
• Luis Romualdez, Devon Canada Corporation

CO2 E.H.R. Steering Committee
• Robert Craig, Integrated CO2 Network
• Cindy Wolfe, Cenovus Energy Inc.

Ultra Lightweight Proppant (ULWP) Project Steering Committee
• David Braun, Shell Canada Resources Ltd.
• Bob Everett, PennWest Exploration
• Rob Fulton, Canyon Technical Services Ltd.
• Chris Gatfield, 3M Canada – Oil and Gas Division
• Greg Heftel, PennWest Exploration
• Steven Kelly, Husky Energy Inc.
• Dave Lui, Murphy Oil Corporation
• Doug McMillan, Canyon Technical Services Ltd.
• Monte Malik, 3M Canada – Oil and Gas Division
• Garnet Olson, Canyon Technical Services Ltd.
• Sanjiv Vitthal, Shell Canada Resources Ltd.
• Adam Welty, Canyon Technical Services Ltd.
• Brad Wilson, Murphy Oil Corporation

Clean Bitumen Technology Action Plan (CBTAP) In Situ Steering Committee
• Randy Cormier, Nexen Inc.
• Subodh Gupta, Cenovus Energy Inc.
• Brian Harschmitz, JACOS - Japan Canada Oil Sands Limited
• Heather Herring, Total Exploration and Production Ltd.
• Christopher Holly, Alberta Department of Energy (Government Co-Chair)
• Mark Johnston, Suncor Energy Inc.
• David Layzell, University of Calgary – ISEEE
• Chris Lehecka, ConocoPhillips Canada
• Matthew McCulloch, Pembina Institute for Appropriate Development
• Ron Quick, Sustainable Ventures Inc.
• George Rhody, Husky Energy Inc.

CBTAP Knowledge and Innovation Management Committee
• Alex Bolton, Epicentre Consulting
• Brad Gaulin, Scenarios to Strategy Inc.
• Doug James, Energy Futures Network
• Bernie LeSage, ETX Systems Inc.
• Matthew McCulloch, Pembina Institute for Appropriate Development
• Ron Quick, Sustainable Ventures Inc.
• George Rhody, Husky Energy Inc.

CBTAP Workshop Committee
• Rodger Bemar, Quadrise Canada Corporation
• Martyn Griggs, Canadian Association of Petroleum Producers (CAPP)
• Tom Keelan, Energy Resources Conservation Board
• Bernie LeSage, ETX Systems
• Les Little, Alberta Innovates - Energy and Environment Solutions
• Matt McCulloch, Pembina Institute
• Preston McEachern, Alberta Environment
• George Rhody, Husky Energy Inc.

CBTAP Mining Steering Committee
• Ken Brown, Petroleum Technology Research Centre (PTRC)
• Alan Fair, Syncrude Canada Ltd.
• Christopher Holly, Alberta Department of Energy (Government Co-Chair)
• Mark Johnston, Suncor Energy Inc. (Industry Co-Chair)
• Stephen Moran, University of Alberta – Oil Sands Research and Information Network (OSRIN)

CBTAP Strategic Planning Committee
• Shannon Flint, Alberta Environment
• Tom Keelan, Energy Resources Conservation Board
• Matt McCullough, Pembina Institute for Appropriate Development
• George Rhody, Husky Energy Inc.
• Mark Weber, Independent

CBTAP Technical Advisory Committee (Subcommittees to be formed as technology projects are developed)
• K.C. Yeung, Husky Energy Inc. (Chair)

CBTAP Breakthrough and Innovation Committee
• Paul Clark, Vision Gain Consulting
• Victor del Valle, ConocoPhillips Company
• Christopher Holly, Alberta Department of Energy
• Jerry Keller, Alberta Environment
• Steve Larter, Carbon Management Canada
• Stephen Moran, University of Alberta – Oil Sands Research and Information Network (OSRIN)
• Wayne Patton, University of Calgary
• George Rhody, Husky Energy Inc.
• Vincent Saubestre, Total Exploration and Production Ltd.
• Scott Smith, Cenovus Energy Inc.
• Harrie Vredenburg, University of Calgary

CBTAP Production Enhancement and Automation
• John Belgrave, Belgrave Oil and Gas Corp.
• Am e Donovan, INO West
• Brad Gaulin, Scenarios to Strategy Inc.
• Alan Peats, BP Canada Energy Company
• Bernie Philip, ARC Resources Ltd.
• Amiri Saeid, Wave Control Systems Ltd.
• Monica Varga, NRC-IRAP
• Vicki Zhao, Wave Control Systems Ltd.

CBTAP Surface Bitumen Recovery
• Alan Fak, Syncrude Canada Ltd.
• Mark Johnston, Sun Oil Inc.
• Glen Rovang, Syncrude Canada Ltd.
• Mark Schaffer, Total Exploration and Production Ltd.

CBTAP Upgrading and Gasification
• Ken Brown, Petroleum Technology Research Centre (PTRC)
• Wayne Brown, ETX Systems Inc.
• Paul Clark, Vision Gain Consulting
• Victor del Valle, ConocoPhillips Company
• Craig Fairbridge, Natural Resources Canada (NRCan)
• Subodh Gupta, Cenovus Energy Inc.
• Brian Harschmitz, JACOS - Japan Canada Oil Sands Limited
• Mark Johnston, Sun Oil Inc.
• Tom Keelan, Energy Resources Conservation Board
• Bernie LeSage, ETX Systems Inc.
• Les Little, Natural Resources Canada (NRCan)
• Richard McParlane, Alberta Innovates - Technology Futures
• Tony Nakamura, JACOS - Japan Canada Oil Sands Limited
• Parviz Rahimi, Natural Resources Canada (NRCan)
• George Rhody, Husky Energy Inc.

CBTAP In Situ Recovery
• Lukemon Adetunji, Total Exploration and Production Ltd.
• Ken Brown, Petroleum Technology Research Centre (PTRC)
• Randy Cormier, Nexen Inc.
• Victor del Valle, ConocoPhillips Company
• Larry Frederick, Nexen Inc.
• Subodh Gupta, Cenovus Energy Inc.
• Heather Herring, Total Exploration and Production Ltd.
• Mark Johnston, Suncor Energy Inc.
• Tom Keelan, Energy Resources Conservation Board
• Larry Frederick, Nexen Inc.
• Subodh Gupta, Cenovus Energy Inc.
• Heather Herring, Total Exploration and Production Ltd.
• Mark Johnston, Suncor Energy Inc.

CBTAP Surface Bitumen Recovery
• Alan Fair, Syncrude Canada Ltd.
• Mark Johnston, Sun Oil Inc.
• John Belgrave, Belgrave Oil and Gas Corp.
• Bruce Donovan, INO West
• Brad Gaulin, Scenarios to Strategy Inc.
• Alan Peats, BP Canada Energy Company
• Bernie Philip, ARC Resources Ltd.
• Amiri Saeid, Wave Control Systems Ltd.
• Monica Varga, NRC-IRAP
• Vicki Zhao, Wave Control Systems Ltd.

CBTAP Strategic Planning Committee
• Shannon Flint, Alberta Environment
• Tom Keelan, Energy Resources Conservation Board
• Matt McCullough, Pembina Institute for Appropriate Development
• George Rhody, Husky Energy Inc.
• Mark Weber, Independent

CBTAP Technical Advisory Committee (Subcommittees to be formed as technology projects are developed)
• K.C. Yeung, Husky Energy Inc. (Chair)
Independent Auditor’s Report

To the Board of Directors of PTAC Petroleum Technology Alliance Canada:

Report on the financial statements
We have audited the accompanying financial statements of PTAC Petroleum Technology Alliance Canada, which comprise the statement of financial position as at December 31, 2010, and the statements of operations, changes in net assets and cash flows for the year then ended and a summary of significant accounting policies and other explanatory information.

Management’s responsibility for financial statements
Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian generally accepted accounting principles, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor’s responsibility
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 comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor’s judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity’s preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity’s internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion
In our opinion, the financial statements present fairly, in all material respects, the financial position of PTAC Petroleum Technology Alliance Canada as at December 31, 2010, the results of its operations, and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Thompson Penner & Lo LLP
Certified General Accountants
April 12, 2011
Calgary, Alberta, Canada

PTAC PETROLEUM TECHNOLOGY ALLIANCE CANADA
STATEMENT OF FINANCIAL POSITION
As at December 31, 2010

<table>
<thead>
<tr>
<th>ASSETS</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>$4,576,178</td>
<td>$3,048,346</td>
</tr>
<tr>
<td>Accounts Receivable and accrued receivables</td>
<td>$1,348,697</td>
<td>$568,200</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>$57,757</td>
<td>$84,476</td>
</tr>
<tr>
<td><strong>Total Current</strong></td>
<td>$5,982,632</td>
<td>$3,737,022</td>
</tr>
<tr>
<td>Property and equipment</td>
<td>$32,101</td>
<td>$48,066</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$6,014,733</td>
<td>$3,785,088</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIABILITIES</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable and accrued liabilities</td>
<td>$310,190</td>
<td>$345,763</td>
</tr>
<tr>
<td>Goods and services tax payable</td>
<td>$62,933</td>
<td>$13,516</td>
</tr>
<tr>
<td>Deferred membership revenue</td>
<td>$385,140</td>
<td>$400,614</td>
</tr>
<tr>
<td>Deferred contributions</td>
<td>$3,312,687</td>
<td>$1,580,614</td>
</tr>
<tr>
<td><strong>Total Current</strong></td>
<td>$4,070,950</td>
<td>$2,340,514</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NET ASSETS</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invested in property and equipment</td>
<td>$32,101</td>
<td>$48,066</td>
</tr>
<tr>
<td>Unrestricted</td>
<td>$1,400,000</td>
<td>$1,396,508</td>
</tr>
<tr>
<td>Internally restricted</td>
<td>$511,682</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1,943,783</td>
<td>$1,444,574</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$6,014,733</td>
<td>$3,785,088</td>
</tr>
</tbody>
</table>
PTAC PETROLEUM TECHNOLOGY ALLIANCE CANADA
STATEMENT OF OPERATIONS
For the Year Ended December 31, 2010

REVENUE

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project and service revenue</td>
<td>$1,068,956</td>
<td>$1,005,879</td>
</tr>
<tr>
<td>Membership revenue</td>
<td>578,486</td>
<td>583,356</td>
</tr>
<tr>
<td>Event revenue</td>
<td>319,810</td>
<td>211,126</td>
</tr>
<tr>
<td>Rental income</td>
<td>193,455</td>
<td>182,912</td>
</tr>
<tr>
<td>Canadian Association of Petroleum Producers (CAPP)</td>
<td>98,981</td>
<td>100,000</td>
</tr>
<tr>
<td>Interest income</td>
<td>22,408</td>
<td>15,014</td>
</tr>
<tr>
<td>Miscellaneous income</td>
<td>1,608</td>
<td>6,161</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$2,283,704</td>
<td>$2,104,448</td>
</tr>
</tbody>
</table>

EXPENSES

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries and benefits</td>
<td>$766,451</td>
<td>$908,464</td>
</tr>
<tr>
<td>Direct project and service costs</td>
<td>465,327</td>
<td>351,918</td>
</tr>
<tr>
<td>Rent</td>
<td>342,792</td>
<td>334,814</td>
</tr>
<tr>
<td>Direct event costs</td>
<td>77,070</td>
<td>48,841</td>
</tr>
<tr>
<td>Office and equipment leases</td>
<td>31,210</td>
<td>32,353</td>
</tr>
<tr>
<td>Marketing</td>
<td>28,344</td>
<td>20,116</td>
</tr>
<tr>
<td>Amortization</td>
<td>23,126</td>
<td>23,503</td>
</tr>
<tr>
<td>Consulting and professional fees</td>
<td>13,928</td>
<td>6,266</td>
</tr>
<tr>
<td>Training</td>
<td>10,360</td>
<td>13,826</td>
</tr>
<tr>
<td>Printing and publications</td>
<td>8,634</td>
<td>8,187</td>
</tr>
<tr>
<td>Computer and website</td>
<td>7,858</td>
<td>8,865</td>
</tr>
<tr>
<td>Insurance</td>
<td>5,306</td>
<td>5,433</td>
</tr>
<tr>
<td>Bank charges and credit card discounts</td>
<td>4,089</td>
<td>4,195</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,784,495</td>
<td>1,766,781</td>
</tr>
</tbody>
</table>

Excess of revenue over expenses | $499,209 | $337,667 |

Measurement and Accountability

Membership Revenue by Category

PTAC’s 2010 membership was comprised of 165 active members, grossing $578,486.00 revenue at year-end 2010. PTAC provides a variety of services and benefits to our members, including collaborative research and technology development, project facilitation services, event coordination, event registration discounts, access to the knowledge centre, opportunities to serve on technical steering committees, and a complimentary bi-weekly newsletter.

Project Expenditure

PTAC has facilitated 323 projects and project phases with costs equaling $151.8M. Of those, PTAC facilitated thirty-eight research and technology development/demonstration projects with total costs equaling $8.9M in 2010.
PTAC MEMBERS
174 members as of March 31, 2011

PRODUCERS (29)
- ARC Resources Ltd.
- Athabasca Oil Sands Corp.
- Barrick Energy
- BP Canada Energy Company
- Cenovus Energy Inc.
- Chevron Canada Ltd.
- Cenarol Oil and Gas Limited
- ConocoPhillips Canada
- Devon Canada Corporation
- Encana Corporation
- EnnerMark Inc.
- Husky Energy Inc.
- IFP Technologies (Canada) Inc.
- Imperial Oil Limited
- Japan Canada Oil Sands Limited (JACOS)
- Laricina Energy Ltd.
- Murphy Oil Corporation
- Nexen Inc.
- Pengrowth Energy Corporation
- Penn West Exploration.
- Quicksilver Resources Canada Inc.
- Shell Canada Resources Ltd.
- Suncor Inc. – Resources Group
- Syncrude Canada Ltd.
- Synodon Inc.
- Talisman Energy Inc.
- Total Exploration and Production Ltd.
- Unconventional Gas Resources Canada Operating Inc.
- Vermilion Resources Inc.

Research Providers (11)
- Alberta Innovates – Technology Futures
- Alberta Sulphur Research Ltd.
- Chemviro Corp.
- CJS Coiled Tubing Supply
- CIPI – Canadian Institute for Photonic Innovations
- Dew Engineering and Development ULC
- El DuPont Canada
- Natural Resources Canada (CANMET)
- Petroleum Technology Research Centre (PTRC)
- Pure Elements Environmental Solutions
- Saskatchewan Research Council
- TIPM Laboratory (Perm Inc.)

GOVERNMENT (5)
- Alberta Finance and Enterprise
- Alberta Innovates – Energy and Environment Solutions
- British Columbia Oil and Gas Commission
- Canada Revenue Agency
- Saskatchewan Ministry of Energy and Resources

INDIVIDUALS (8)
- Blair, Jim
- Gauvin, Bradford
- Hooper, Dwayne
- Kearsley, John
- Lloyd, Eric
- Pett, Ken
- Rhody, George
- Todd, Murray

Transport, Midstream (2)
- Enbridge Pipelines Inc.
- Keyera Energy Ltd.

Learning (3)
- SAIT
- University of Alberta
- University of Calgary

SERVICE AND SUPPLY COMPANIES (116)
- 3M Canada - Oil and Gas Division
- Advanced Measurements Inc. - Oil and Gas Division
- AGAR Canada Corporation
- AGAT Laboratories Ltd. - Hydrocarbon Division
- Alberta-Pacific Forest Industries, Inc. Woodlands Division
- AEMC Earth and Environmental
- Amperage Energy Inc.
- ARCADIS Canada
- Artsinteg Incorporated
- Boreal Laser Inc.
- Brine-Add Fluids Ltd.
- C5 Oilfield Services
- Canada Tech Corp.
- Canadian Fertilizers Limited
- Canyon Technical Services Ltd.
- CH2M Hill Energy and Chemicals
- Chinook Engineering Ltd.
- Cimarron Engineering
- CJS Coiled Tubing Supply
- Clearstone Engineering Ltd.
- ComplyWorks Ltd.
- Computer Modelling Group Ltd.
- Cybera
- Daily Oil Bulletin
- Delacom Detection Systems, LLC
- Deloitte - Research and Development, Tax
- Delta C Technologies Inc.
- Digital Time Capture
- E3P Technologies Inc.
- EBA Engineering Consultants - Research Department
- Ecnotherm Canada
- Enefen Energy Efficiency Engineering Ltd.
- Envirolution Canada
- Envirolution Canada Limited
- Envirosolutions Products Inc.
- Envirotech Engineering Inc.
- Epic Consulting Services Ltd.
- Expro Group Canada Inc.
- Extreme Telematics Corp.
- Fekete Associates Inc.
- Ferus Inc.
- Fractal Systems Inc.
- Gas Liquids Engineering Ltd.
- Geologic Environmental
- Genalta Power Inc.
- geologic systems Ltd.
- GEOSIS Inc.
- GHG Solutions Corp.
- GreenPath Energy Ltd.
- Graviton Environmental
- GuildOne, Inc.
- Gushor Inc.
- Hatch Energy
- HIF Engineering Inc.
- Horizontal Well Testing Ltd.
- HTC Purenrg
- Insight Emissions Management
- Jacktek Systems Inc.
- JPM Inc.
- Katch Kan Limited
- Kenilworth Combustion Ltd.
- KMPF High Technology Practice Group
- Lakeside Steel Corporation
- Little Guy Oilfield Rentals Inc.
- Lonkar Services Ltd. - Technology Department
- LxData Inc.
- Macleod Dixon (Technology Enterprise Group)
- Maple Leaf Environmental Inc.
- Maxxam Analytics
- McCarthy Tetrault LLP – Technology Group
- Meridian Environmental Inc.
- Millennium EMS Solutions Ltd.
- NWH Canada Inc.
- New Paradigm Engineering Ltd.
- Newco Tank Corp
- N-Solv Corporation
- Oasis Emission Consultants Inc.
- Oilflow Solutions Inc.
- Oxand Canada Inc.
- Paradigm Shift Technologies
- Pason Systems Inc.
- Portfire Associates
- Praxair Canada Inc.
- Pressureline Ltd.
- Process Ecology Inc
- ProTech
- PT Brands LLC
- Q-Max Solutions Inc.
- Quadruple Canada Fuel System Inc.
- REM Technology Inc.
- Remediation Consulting Group Inc.
- RJ Oil Sands Inc.
- RWDI Air
- Schlumberger of Canada
- Seal Well Inc.
- ShawCor Ltd.
- Siemens Product Lifecycle Management Software (CA) Ltd.
- Sky Hunter Exploration Ltd.
- SNC-Lavalin – Studies and Developmental Projects
- Systemware Associates Limited
- Stantec Consulting Ltd.
- Sustainable Ventures Inc.
- Systemware Innovation Corporation
- Techcon Engineering Ltd.
- Terra Water Systems LP
- Terraprog Group
- Total Combustion Inc.
- Total Oil Sands Recovery Ltd.
- Trans Pacific EnviroEnergy Inc.
- Trojan Well Service Ltd.
- Triloid Industries Inc.
- Toudia Boiler and Instrumentation Ltd.
- Wave Control Systems Ltd
- Youkners Welding