

Our Future:

Young Pipeliners Perspective



Prepared for Generation Energy

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Recommendation 1: **Strong Focus on Innovation in Technology**

Recommendation 2: **Public Trust and Confidence**

Recommendation 3: **Maintain Quality of Life / Standard of Living**

Recommendation 4: **Protect the Environment: Land, Air & Water**

Recommendation 5: **Public Perception and Media**

Recommendation 6: **Personal Incentives and Low Carbon Future**

1 Introduction / Background

YPAC is an independent, volunteer based, professional association with a mission to be a Canada-wide network focused on attraction, engagement and retention of young professionals to the pipeline industry; provide opportunities to the full spectrum of young professionals employed in the pipeline industry to learn the breadth and depth of the business; facilitate knowledge transfer across generational gaps in industry and between industry peers to retain the industry memory and facilitate succession; and, last, and most important, look for opportunities to influence the direction of the industry by providing a young professional perspective to the issues of importance.

The projected demand for energy and goods derived from fossil fuels is expected to grow or at the very least, sustain current levels in the near future. Pipelines are the most effective and safe form of transportation for these products and the industry will require a new generation of professionals to operate and manage the vast infrastructure of energy transportation.

The long-term success of any industry depends upon fostering the interests and skills of all employees and ensuring that experiences and knowledge can be passed on from one generation of leaders to the next.

The pipeline industry is an industry that needs such attention, especially to maintain and enhance Canada's existing quality of life and to enable other nations via knowledge-sharing and expertise to offer their citizens enhanced quality of life as well.

Furthermore, the pipeline industry offers much to young pipeliners, including technical challenges, financial benefits and a strong link to what helps Canadians enjoy our quality of life, as well as our economy, including jobs, warmth and mobility. Thus, we focus on the attraction and engagement of young pipeliners through our core values of knowledge transfer, opportunities, networking and influence.

We attract and engage young pipeliners through the development of technical speaker events on topics ranging from landowner consultation in the pipeline industry, carbon capture, Aboriginal engagement, pipeline regulation, integrity, project management, leak detection, and many more wide-ranging related subjects.

We further find ways to encourage collaboration through the development of a mentorship program where mentors and mentees connect and have regular conversations regarding pipelines. Other ways include networking events where we have established a sense of community amongst young professionals within the pipeline industry.

1.1 Vision, Mission and Goals

The Young Pipeliners Association of Canada (YPAC) is guided by the following vision, mission and goal statements.

Vision

Ensuring the Sustainable Future of the Pipeline Industry

Missions

Engagement of Young Pipeliners

Impact on Industry

Organizational Success

Communication

- **Engagement of Young Pipeliners:** Identify, develop and implement accessible networking, educational and industry exposure opportunities for engaging young pipeliners Canada wide.
- **Impact on Industry:** Evaluate, collaborate, and advocate for young pipeliners across the Canadian pipeline space.
- **Organizational Success:** Develop, implement, and optimize our organizational infrastructure to ensure YPAC's long term success.
- **Communication:** Develop, implement and optimize an integrated communication plan to ensure effective engagement across the Canadian pipeline space.

Goals

Network

Opportunities

Knowledge Transfer

Influence

- **Network:** Be a Canada-wide network focused on the attraction, engagement and retention of young professionals to the pipeline industry.
- **Opportunities:** Provide opportunities to the full spectrum of young professionals employed in the pipeline industry to learn the breadth and depth of the business.
- **Knowledge Transfer:** Facilitate knowledge transfer between young professionals and from more experienced to younger professionals, and, as a result, retain industry memory and facilitate succession.
- **Influence:** Look for opportunities to influence the direction of the industry by providing a young professional perspective to issues of importance.

1.2 Who We Are

The current YPAC organization, executives and members, is run by hardworking, dedicated volunteers who adhere to the following organizational values: collaborative, self-motivated, committed, passion and willingness. The volunteers meet the criteria of being a “young pipeliner”.

YPAC represents young pipeliners who are professionals that are 35 years and younger or have less than 10 years in the pipeline industry; be currently employed in the Canadian pipeline industry; be a student with a reasonable chance of entering the pipeline industry; or an experienced person who is new to Canada and working in the pipeline industry.

YPAC provides a platform for anyone who interested continuous learning and improvement. Those that are outside the “young pipeliner” criteria, and are considered *Shoshin* are also welcome to being members. The term *Shoshin* means beginner's mind, which refers to “having an attitude of openness, eagerness, and lack of preconceptions when studying a subject, even when studying at an advanced level, just as a beginner in that subject would”. YPAC encourages and provides a platform for anyone who is interested in having a “beginner's mind” when it comes to pipelines.

Professionals are those of a profession with standards of practice and ethics, including engineers, scientists, technologists, lawyers, accountants, etc. We also work with other organizations to be able to interact who we represent with those outside this group such as trades, the public, first nations and other relevant stakeholders to the pipeline space - a term to not be exclusive to the pipeline ‘industry’, but to all areas where pipelines are of interest - regulatory, government, pipeline companies, non-governmental organizations, etc.

1.3 Importance of Our Industry and Where We Are Today

YPAC's drive is to build a pipeline professional community through the development of technical and networking events, working together with other organizations such as the American Society of Mechanical Engineers, the Canadian Standards Association, the Canadian Energy Pipeline Association Foundation and the Canadian Gas Association, as well as providing YPAC volunteers with opportunities to influence the direction of industry.

The organization was founded on the principle that there is a knowledge and experience gap due to the generational experiences that has presented itself. The gap exists between the baby boomer generation from about the 1940s to the 1960s and the current generation.

YPAC represents a millennial generation, children of the baby boomers, who share a concern with ensuring the succession of the pipeline industry. The millennial generation represents 28 percent of Canadians, with the baby boomers representing 26 percent.

Pipelines are the safest form of transportation for the hydrocarbon products that are required nationwide from coast to coast in our everyday lives. They're also the least carbon-intensive and least environmentally intrusive method of transporting hydrocarbons as most of the infrastructure is buried underground.

Canada has won the resource lottery. We have the third largest proven hydrocarbon reserves in the world, with access to ports in the Atlantic, Pacific and Arctic oceans.

We currently live in a world with increasing demand for oil and gas products globally. This is demand driven by the need to fuel the quality of life for others. Canadian oil produced by companies is held to the highest social and environmental standards, and this Canadian oil should play a part in the global energy mix.

As we transition to a low-carbon future, Canada needs to realize the maximum value for its resources to help bridge us into this low-carbon future. Canadian pipelines are the safest and most socially and environmentally responsible way to get our products to the markets that will generate the greatest return.

These returns from private investment fund Canada's social programs, in addition to the research and development that will enable industry to lower emissions, as well as diversify our energy makeup that helps, again, Canada's transition to the low-carbon future.

To achieve this, we need to ensure that young pipeliners as our next generation of workers have access to the best information and technology to continue Canada's existing role as leaders in building, operating and maintaining pipelines. These aspects are instrumental in building public confidence in the safety and integrity of our energy infrastructure.

It is clear that there is a need to bridge this gap to assure safety, quality and environmental responsibility during the transport of crude oil. It is also clear that the millennial generation is eventually going to be the succeeding generation where we depend on economic prosperity as well as a healthy environment.

1.4 International Presence

YPAC operates as part of a larger organization call Young Pipeliners International (YPI) with similar vision and missions. Together, we work together to branch out young pipeliners and connect them to an international network - a network that would be used to build technical knowledge, solve problems and progress the pipeline industry. Below are the logos of the current Young Pipeliner organizations:



YPI also has members from Argentina, Thailand, Europe on the board as well as reach within India and China.

1.5 YPAC Supporters

YPAC is supported and funded by those across the pipeline space from regulators, associations, educational institutions, owner companies, supply chain, service & product companies, EPC(M) companies, etc. The list below is only a partial list due to the dynamic nature of YPAC, is increasing every day. Those in **bold** are current 2017/2018 Annual Sponsors; those in *italics* are the 2017 YPAC Pipeline Conference and Tradeshow Sponsors. The remaining have either been an event contributor over the 2016 / 2017 year, have had executive representation, have had volunteer representation or had an advisor on our Strategic Advisory Board (SAB).

Owner / Operators

ATCO

Access Pipeline

Enbridge / Spectra Energy

Enhance Energy

Kinder Morgan

TransCanada

Regulator Bodies, Associations and Other

Canadian Pipeliner Accreditation Council (CPAC)

Alberta Association of Surface Land Agents (AASLA)

Alberta Energy Regulator (AER)

***American Society of Mechanical Engineers –
Pipeline Systems Division (ASME PSD)***

American Welding Society (AWS)

Canadian Energy Pipeline Association (CEPA)

**Canadian Energy Pipeline Association
Foundation (CEPA Foundation)**

BC Oil & Gas Commission (BC OGC)

Ducks Unlimited

Canadian Gas Association (CGA)

Canadian Common Ground Alliance (CCGA)

Canadian Standards Association Group (CSA)

National Energy Board (NEB)

International Pipeline Conference (IPC)

Pipeline Research Council International (PRCI)

Young Professionals in Energy (YPE)

Young Women in Energy (YWE)

Educational Institutions

University of Alberta

University of British Columbia

University of Calgary

Supply Chain, Service & Product Companies

Applus

Alberta Innovates

BlueFox Engineering

BRITT Land & Engagement

CCI Solutions

C-FER Technologies

CH2M

CWA Foundation

DMG Events

The Crossing Company

Group 10 Engineering

Triple D Bending

DNV GL

Evraz

FLUOR

Jeffrey Strategic Inc.

McKinsey & Company

Michels

Mott MacDonald

North American Standards Assessment Corp.

Kemira

NDT Global

pureHM

ROSEN

Skystone International

Skytech Solutions

Surerus Murphy

Stantec

T.D. Williamson

TYTEC

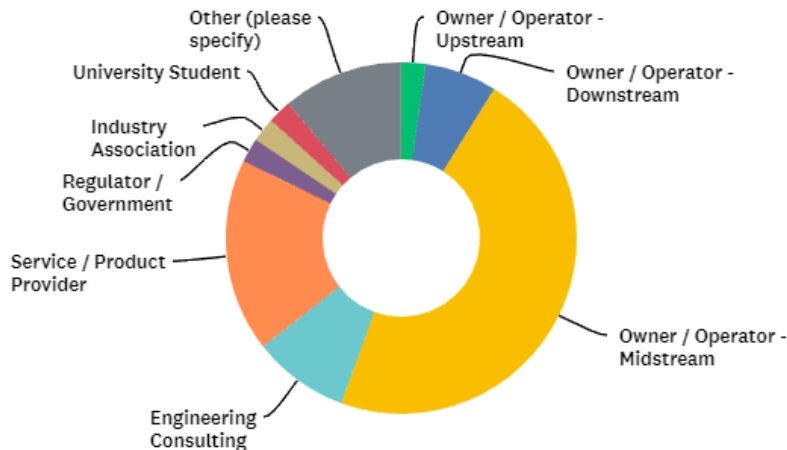
Willbros

2 Young Pipeliner Energy Survey

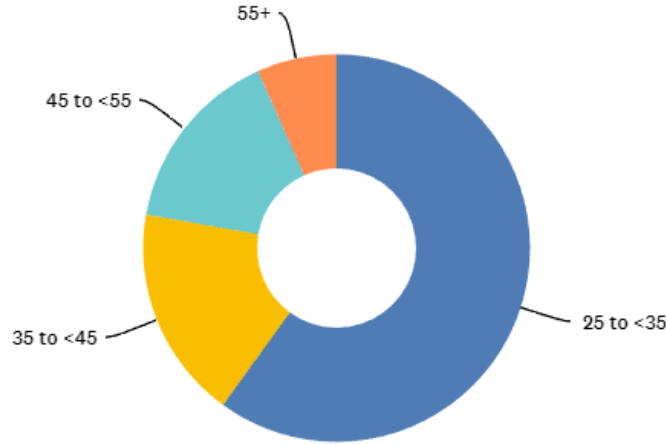
2.1 Introduction

YPAC developed and administered a survey to understand the thoughts of YPAC membership with regards to the future of Canadian energy. The survey was also sent to other pipeliners in the pipeline space, the pipeline space being industry, associations, academia, regulators and government. The survey asked questions about the low-carbon energy future, innovation and technology in the future, the barriers and complications and determining Canada's future energy state. The survey obtained 67 responses with a 57% completion rate and was open for approximately 1 month.

Out of the responses who self-identified (45) their industry, 51.11% identified working for an owner / operator - midstream, 17.78% identified working for a service / product provider, 8.89% working for engineering consulting, 6.67% working for owner / operator - downstream and the remaining from regulator / government, construction, universities and industry association. The responses show a reasonable distribution of pipeliners within the industry.



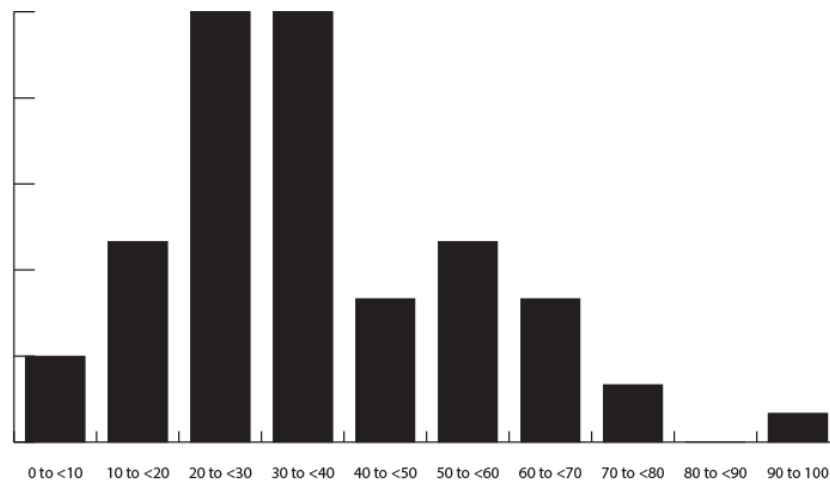
Out of the responses who self-identified (45) 60% were from aged 25 to 35, 17.78% 35 to 45, 15.56% 45 to 55 and the remaining 55+. The responses show a majority from the millennial demographic.



2.2 Importance of Pipelines Today & The Future

It is important to understand what our membership thinks today with regards to energy and pipelines. Therefore, we asked the question “With 100 being a perfect state and 0 being not even close, where are we with achieving a low carbon future?”. The average was 34 out of 60 responses to this specific question. This demonstrates that overall, young pipeliners believe Canada is not at the low carbon future we envision and there is work to be done.

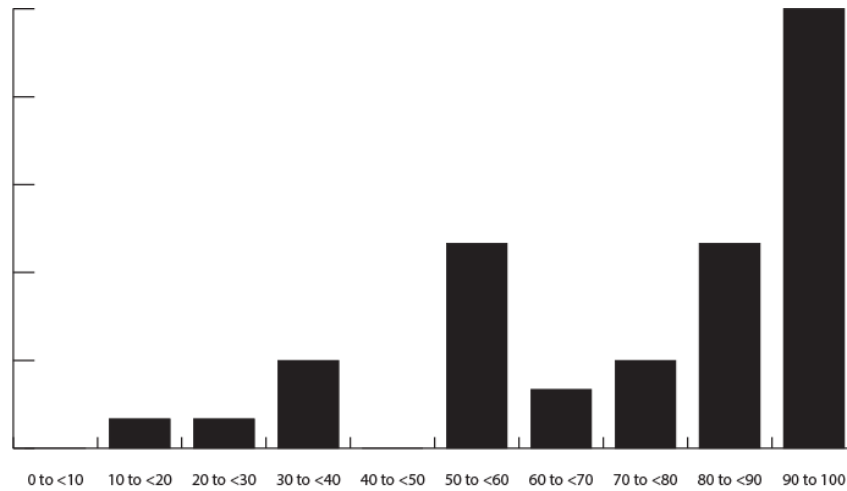
Q1: WHERE ARE WE WITH ACHIEVING A LOW CARBON FUTURE?



Distribution of where are we with achieving a low carbon future.

As we try to understand the future, and the role of pipelines and hydrocarbons, we asked the question, “How important are pipelines, liquids rich natural gas (LRNG) and light tight oil (LTO) to the future of Canada?” and the response was an average of 73. This demonstrates that overall, young pipeliners believe pipelines and hydrocarbons are important to the future of Canada and play a major role as we discover ways to achieve a low carbon state.

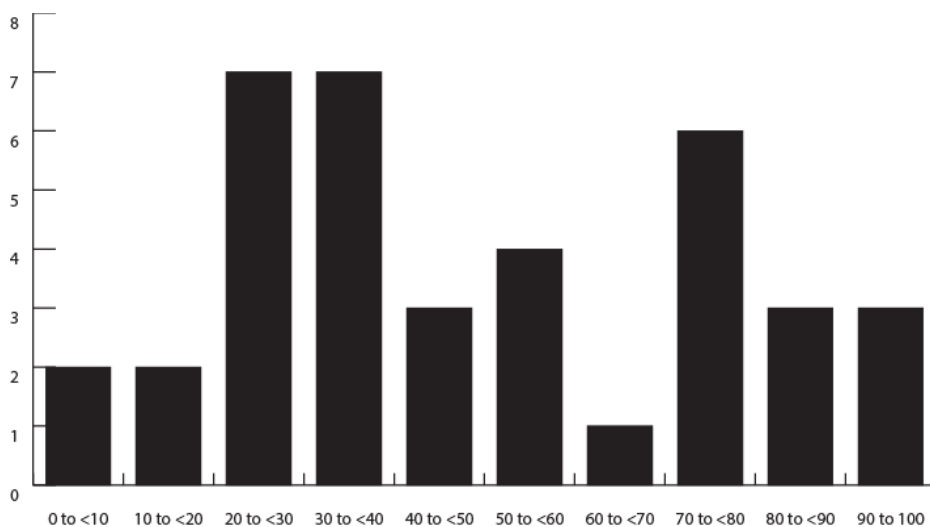
Q2: HOW IMPORTANT ARE PIPELINES TO THE FUTURE OF CANADA?



Distribution of importance of pipelines, natural gas and oil to the future of Canada.

The previous two responses to the questions relating to the future of pipelines and the current state of a low carbon society, we wanted to obtain a level of understanding as to the barriers in place to allow us to obtain a low carbon society. Therefore, we asked, “With 100 being a perfect state and 0 being not even close, to what degree do we have to overcome barriers to reach the desired state of our future energy?”. The average response was 48. Overall, we believe there are barriers still in place that would otherwise prevent us from achieving the desired state of our future energy. Although, it is more positive than Q1 of where we are with achieving a low carbon state. The belief is that Canada and the pipeline industry has been taking action to overcome these barriers, although it also shows there is active work to be done to achieve a final low carbon society. There is also a medium-high split which may suggest that as we transition, constant evaluation would be required to understand the degree to which we have overcome the barriers to achieving our desired future state.

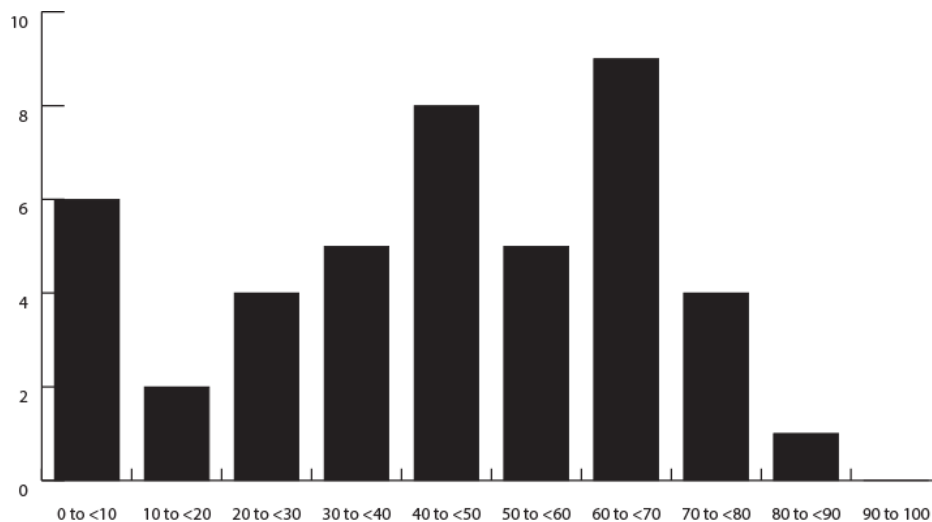
Q3: TO WHAT DEGREE DO WE HAVE TO OVERCOME BARRIERS TO REACH THE DESIRED STATE OF OUR FUTURE ENERGY?



Distribution of the degree we have to overcome the barriers to reach the desired state of our future energy.

Young pipeliners realize that pipelines are critical to our future, that we are not at the low carbon state we intend to be at and that there are barriers to overcome. We also believe that innovation and technology are important to achieve our future energy state - we asked the question “With 100 being a perfect state and 0 being not even close, where are we with innovation and technology to achieve our future energy state?”. The average response was 42. There is a strong group (0 to <10) that show that innovation and technology are important and there was no one who indicated we were complete with innovation and technology. This goes to show that innovation and technology are key to achieving the Canadian goals of a low carbon society.

Q4: WHERE ARE WE WITH INNOVATION AND TECHNOLOGY TO ACHIEVE OUR FUTURE ENERGY STATE?



Distribution of the degree where are we with innovation and technology to achieve our future energy state.

In fact, we could go and say, along with the previous Q1, Q2, Q3 analysis, that pipelines are critical to the future of our industry and that we will need to depend on innovation and technology to achieve a low carbon society. It is our key reliance on innovation and technology that will allow us to balance the three E's - economy, energy and environment. Economy for jobs, energy for quality of life and environment for low carbon emissions. In fact, a low carbon future does not necessarily mean not using fossil fuels, it really means reducing the impact to climate change through innovation and technology - those that can come from more efficient consumer ended products, fossil fuel production technology advancements, technologies that allow changes in consumer behaviors and many more.

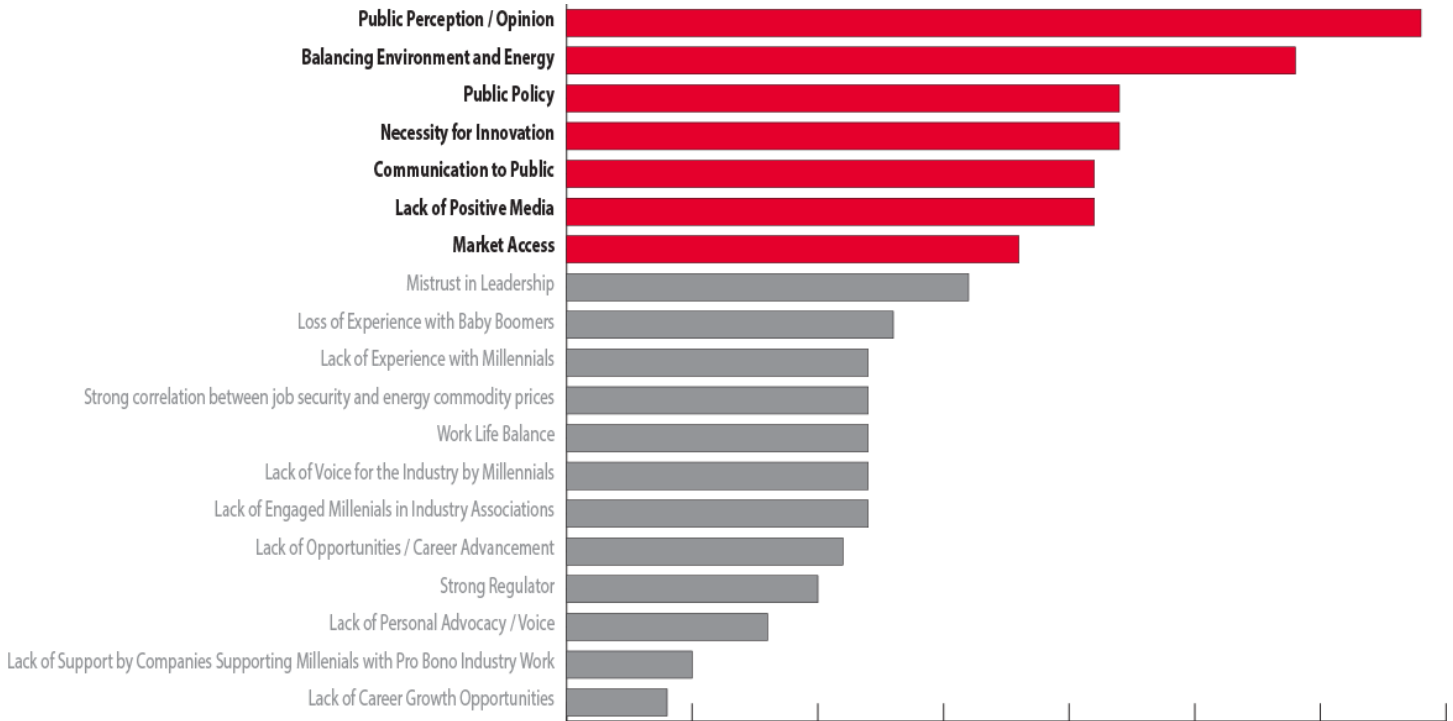
2.3 Challenges Facing the Industry

There are several challenges facing the energy industry. To identify the main challenges, we asked respondents to choose the top seven (7) largest challenges facing the industry.

Q5: WHAT ARE THE LARGEST CHALLENGES FACING THE INDUSTRY?

Public Perception / Opinion	Communication to Public
Public Policy	Lack of Positive Media
Lack of Experience with Millennials	Strong Regulator
Lack of Opportunities / Career Advancement	Lack of Voice for the Industry by Millennials
Loss of Experience with Baby Boomers	Market Access
Balancing Environment and Energy	Necessity for Innovation
Lack of Personal Advocacy / Voice	Lack of Career Growth Opportunities
Strong Correlation Between Job Security and Energy Commodity Prices	Lack of Support by Companies Supporting Millennials with Pro Bono Industry Work
Work Life Balance	Lack of Engaged Millennials in Industry Associations
Mistrust in Leadership	

The top seven (7) challenges (shown in red) are: (1) Public Perception / Opinion, (2) Balancing Environment and Energy, (3) Public Policy, (3) Necessity for Innovation, (5) Lack of Positive Media, (5) Communication to Public, and (7) Market Access.



Challenges facing our industry.

Public perception / opinion was the largest challenge according to the survey. This can relate to many factors including ensuring Canadians have a sufficient level of energy literacy, information being distributed via social media and other sources that do not take a fact and science based approach and the knowledge taught within our education systems.

2.4 The Future of Energy

We wanted to understand what pipeliners thought the future of energy is. Therefore we asked “what will the future of energy including pipelines, liquids rich natural gas (LRNG) / light tight oil (LTO) and other hydrocarbons in Canada and globally look like?”. Because this was an open question, below is a word cloud with the largest words stated more frequently and the smaller words less frequently.

Q6: WHAT DOES THE FUTURE OF ENERGY LOOK LIKE?

New Technologies Worldwide Infrastructure Stage Renewables
 Larger LRNG and LTO Clean Energy Energy Future
 Canadian Canada Question Products Consumer
 Continue Long Term Sources Materials Hydrocarbons Standard
 Wind and Solar

The top six (6) words / phrases were: (1) LRNG and LTO / Hydrocarbons; (2) Canada; (2) Energy Future; (4) Products; (5) Continue; (6) Renewables. Below are summaries of the responses relating to the words.

LRNG and LTO / Oil / Hydrocarbons:

- Hydrocarbon products are deeply rooted in our society for several positive reasons and it will be tough to achieve a low carbon future. To successfully achieve a low carbon future, the entire world must be on the same level.
- While our reliance on existing and future carbon-based fuel will continue to remain strong, there will be a shift to other alternative energies such as solar, tidal, hydroelectric and wind. However, oil and gas will still be used in consumer goods and construction building materials including green infrastructure.
- There will be more emphasis on carbon sequestration and related technologies. There is too much infrastructure set up for hydrocarbons and the only solution is to keep using in and to manage carbon emissions.

Canada:

- Market access is imperative to allow Canada to have the financial support and revenues to transform into a responsible supplier of fuels around the world and Canada.
- The current political environment in Canada makes it difficult to allow the energy industry to grow, especially knowing that the global market is outpacing Canada.
- Canada can be at the front of the line when it comes to being a responsible supplier of fuels around the world. Canada is already a leader as an environmentally sustainable producer.

Energy Future:

- As the cost of renewables is declining, there is also a capacity issue as the world's population continues to grow and demand for energy grows. Therefore, hydrocarbon based consumer products (versus energy) will still be in our distant future.
- We need to think in terms of shifting to non-renewables with new technologies versus non-renewables versus renewables.

Products:

- Consumers do not just rely on stable energy, but they also rely on other petroleum based products, which will be used for a very long time.
- Canada, in order to progress, will need to tap into global markets by increasing exports in both LNG and liquid hydrocarbon products.
- Energy literacy needs to be increased for Canadians when it comes to the types of products carried by pipelines and how it relates to consumption and quality of life.

Continue:

- The requirement for connectivity of energy including power grids, pipelines, rail and road transportation will continue.
- We'll continue to rely on hydrocarbons both as a transportation fuel, and for generating power. We will also continue to export hydrocarbons to meet global demands for the foreseeable future.
- Until North American public understands their energy consumption levels, we will continue to need more energy from traditional sources.

Renewables:

- The future will likely be similar to today, but with pipeline and energy companies owning more renewables as they are the only ones who can afford the large renewable energy projects.
- The transition time for renewable and clean energy to become a main source of energy is not clear.

We wanted to know what pipeliners thought our future in 10 to 30 years would look like. Therefore we asked, “where do we want to be 10 years from now / 30 years from now (2050) and how do pipelines fit in the future of energy?”. Because this was an open question, below is a word cloud with the largest words stated more frequently and the smaller words less frequently.

Q7: WHERE DO WE WANT TO BE 10 AND 30 YEARS FROM NOW?

Low Carbon Balance Future Reliable Technology Carbon Emissions
 Transport Quality of Life Efficient Fossil Fuels
 Industry Canadian Oil strong Economy Canada Leaks Renewables

The top six (6) words / phrases were: (1) Efficient; (2) Transport; (3) Industry; (3) Technology; (3) Oil; (3) Future; (3) Canada. Below are summaries of the responses relating to the words.

Efficient

- Pipelines will continue to provide the necessary means to safely and efficiently transport energy products to markets, both domestically and globally into the foreseeable future.
- We want to be at the competitive innovative level as Silicon Valley, updated with technology in order to improve our efficiency and with the use of smart tools we can make of the pipeline industry a safe, environmentally friendly and innovative industry.
- Our future will need to be more efficient; less wasteful; and therefore, pipelines will be critical.

Transport

- Pipelines are critical. They are currently the safest, most reliable way to transport hydrocarbons and will continue to be for the foreseeable future. If in the future hydrocarbons are no longer in need, pipelines could act as a conduit for fiber optic cables or other power transportation methods. The infrastructure to move green energy is as controversial as pipelines when dealing with landowners and environmental impact.
- Pipelines will still play a role in our distant future, but perhaps in the transport of the next high value commodity - water!

Industry

- Canada is recognized for having a strong industry and best quality of life along with human rights.

Technology

- Acceptance and trust of oil and gas industry doing the right thing, meaning substantial investment in renewables, carbon capture, sequestration and enhanced oil recovery implemented. Presence by oil and gas companies on the consumer-end of emission reducing / eliminating technologies.
- There must be a technological solution in place to address carbon emissions (capture/sequestration, industrial uses of GHGs in the atmosphere that are carbon negative).

Oil

- We need to keep the billions of dollars, spent on third world oil, in Canada buying Canadian energy.
- Until someone perfects the Star Trek Transporter - pipelines will remain the best way to move NG and oil.

Future

- If in the future hydrocarbons are no longer in need, pipelines could act as a conduit for fiber optic cables or other power transportation methods.
- Pipelines will provide the necessary path to transition to a low carbon future but getting the most value out of our resources.

Canada

- Our future is stability and balance in the energy sector. Pipelines are the key to Canada's energy future.

We now understand what our future is like - pipelines will remain as the safest and most efficient way to transport hydrocarbons, more internalization and control over the Canada's oil and an increase in focus toward more efficient and emissions reducing technology / innovations. We then asked, "What government policies will be needed for support?" Because this was an open question, below is a word cloud with the largest words stated more frequently and the smaller words less frequently.

Q8: WHAT GOVERNMENT POLICIES WILL BE NEEDED FOR SUPPORT?

Infrastructure Resource Support Carbon Energy Tax
Policies Environmental Projects Trust Companies Law

The top four (4) words / phrases were: (1) Policies; (1) Energy; (3) Projects; (3) Support. Below are summaries of the responses relating to the words.

Policies

- Government must back up the Regulators and make tough policy decisions for the benefit of the nation.
- Government has to take a long-term view and needs to be strong in their approvals as part of their approvals and need to take the lead/partnership approach with industry.

Energy

- Promote energy company employment across Canada to allow the greatest chance of driving innovation, efficiency and alternative energy infrastructure.
- Be clear about the vision of Canada's energy mix and allow for feedback for working towards a sustainable future so companies can prepare and position themselves for the future.

Projects

- Global review of energy projects rather than individual project review.
- Federal support and guidance on nation building infrastructure projects.
- Consistent application of regulatory rules for project approval that balances the need for investment with protecting our land, communities and relationships.

Support

- Support shall be given to both alternative energy and oil & gas. Consistent and supportive of energy development in all its forms.
- Technology and innovation support shall be provided. Support of the energy sectors as a key component of our economy through effective education.

2.5 Preparing for the Future

We wanted to understand from pipeliners what were the most important aspects to the future of Canada. Therefore, we asked respondents to choose the top six (6) to the question of “Which of these are important to the future of Canada?”.

Q9: WHICH OF THESE ARE IMPORTANT TO THE FUTURE OF CANADA?

Millennial Jobs

Energy Abundance (vs. Scarcity)

Environment - Land, Air and Water

Trust and Confidence in our Regulatory System

Trust and Confidence in our Academic Institutions

Transparency

Innovation in Technology

Highly Efficient Infrastructure

Stability of Oil and Gas Investments

Quality of Life

Kids of the Millennial Generation

Balanced Education System

Trust and Confidence in our Education System

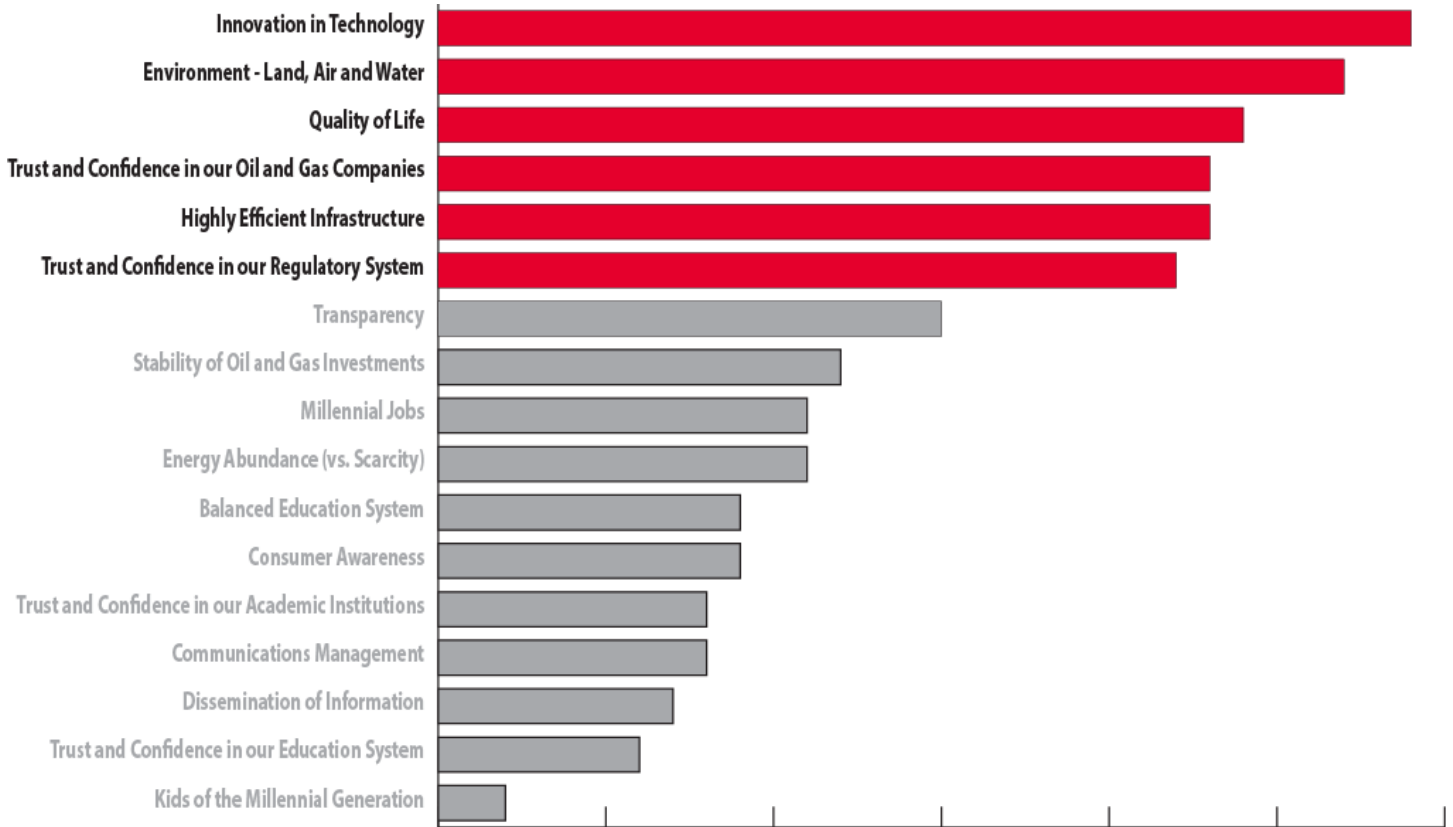
Trust and Confidence in our Oil and Gas Companies

Communications Management

Dissemination of Information

Consumer Awareness

The top six (6) important aspects (shown in red) are: (1) Innovation in Technology, (2) Environment - Land, Air and Water, (3) Quality of Life, (4) Trust and Confidence in our Oil and Gas Companies, (4) Highly Efficient Infrastructure, and (6) Trust and Confidence in our Regulatory System.



Pipelineers want innovation in technology as the number one choice. This is likely because it will help address the other important aspects such as Environment - Land, Air and Water, Quality of Life and Highly Efficient Infrastructure. With successes in innovation in technology (through addressing these aspects) trust and confidence would be gained with our oil and gas companies and our regulatory system.

We also wanted to understand from pipeliners what aspects would be most impacted if we didn't achieve our vision for the future. Therefore, we asked respondents to choose the top six (6) to the question of "Which of these is impacted if we don't achieve our vision for the future?". The choices are the same as Q9.

Q10: WHICH OF THESE IS IMPACTED IF WE DON'T ACHIEVE OUR VISION OF THE FUTURE?

Millennial Jobs

Energy Abundance (vs. Scarcity)

Environment - Land, Air and Water

Trust and Confidence in our Regulatory System

Trust and Confidence in our Academic Institutions

Transparency

Innovation in Technology

Highly Efficient Infrastructure

Stability of Oil and Gas Investments

Quality of Life

Kids of the Millennial Generation

Balanced Education System

Trust and Confidence in our Education System

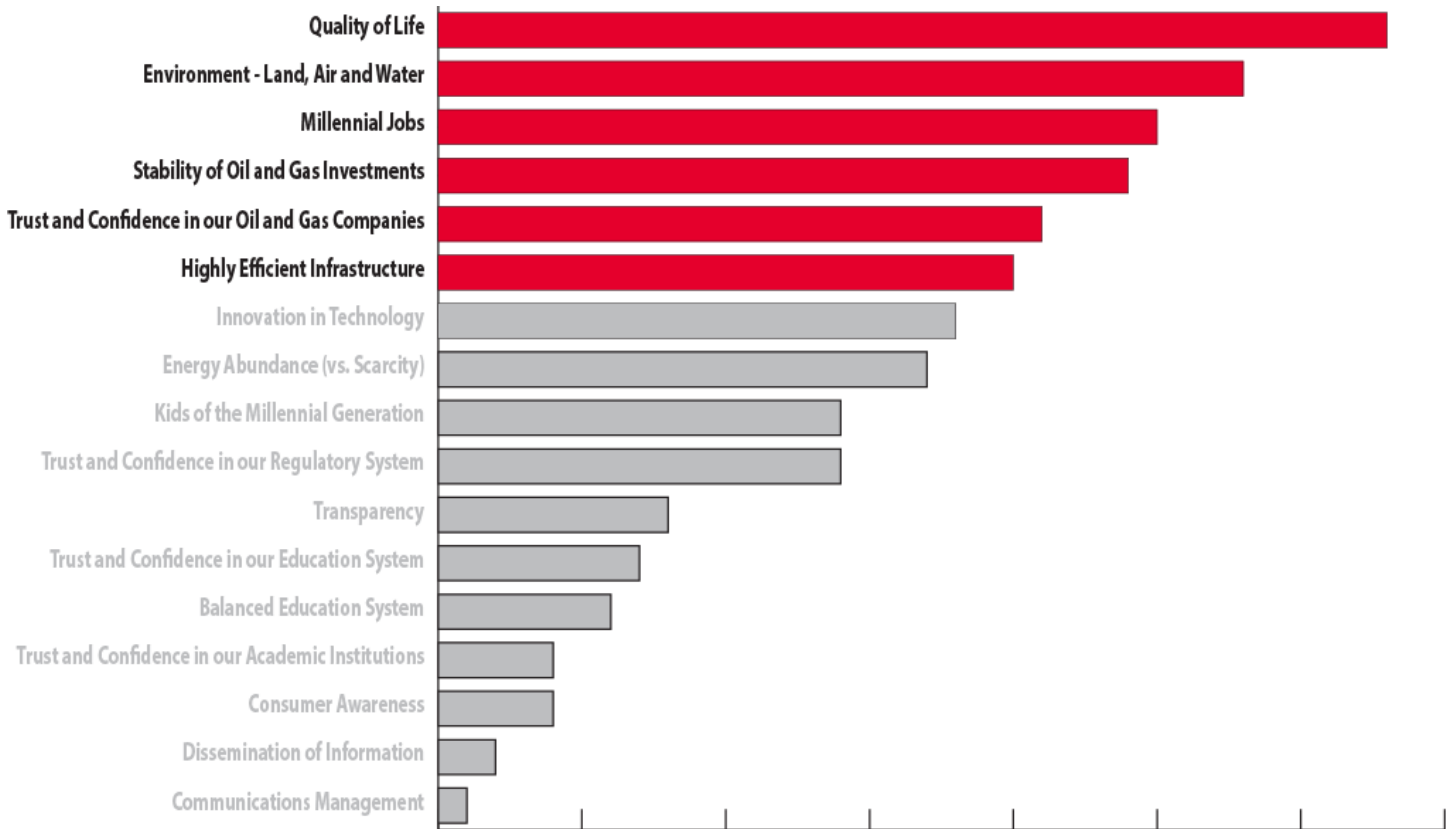
Trust and Confidence in our Oil and Gas Companies

Communications Management

Dissemination of Information

Consumer Awareness

The top six (6) aspects that would be impacted (shown in red) are: (1) Quality of Life, (2) Environment - Land, Air and Water, (3) Millennial Jobs, (4) Stability of Oil and Gas Investments, (5) Trust and Confidence in our Oil and Gas Companies, and (6) Highly Efficient Infrastructure.



Pipelineers have indicated that our quality of life is the most impacted aspect if we don't get our future right. We also value the Environment - Land, Air and Water as a top priority as well. What was different was the indication that Millennial Jobs and the Stability of Oil and Gas Investments would be impacted which could cause a large negative impact to the economy and our Quality of Life. Therefore, we must work towards having Highly Efficient Infrastructure and work towards balancing the Economy, Environment and Energy to maintain the Trust and Confidence in our Oil and Gas Companies.

To prepare for how we will get to our future vision, we wanted to understand what the top energy jobs would be in the future, we asked “What will the top 10 new energy jobs be?”. Because this was an open question, below is a word cloud with the largest words stated more frequently and the smaller words less frequently.

Q11: WHAT WILL THE TOP 10 NEW ENERGY JOBS BE?



The top four (4) key phrases were: (1) Technology; (2) Energy Jobs / Sector; (3) Electrical; (4) Efficiency.

Technology

- Battery / Storage Technology Engineer
- New Technology Utilization Engineer
- Social Technology Programmer (application, augmented reality, artificial intelligence)

Energy Jobs / Sector

- Energy Asset Upgrader
- Energy Asset Retrofitter
- Energy Optimization Engineer
- Sustainable Energy Engineer
- Energy Scientists
- Computational Energy Designer
- Today’s Array of Oil and Gas Energy Jobs Will Remain

Electrical

- Electrical and Instrumentation Technologist
- Electrical Engineer

Efficiency

- Efficiency Engineer
- Urban Planner, Efficiency

Knowing automation and artificial intelligence are becoming future terms, we wanted to see the role they would have in the future. Therefore we asked, “what role will automation and artificial intelligence have?”.

Q12: WHAT ROLE WILL AUTOMATION AND ARTIFICIAL INTELLIGENCE HAVE?

Big Role Increasing Future Reliability Operations Significant Role
 Improved Large Role Automation Tasks
 Huge Role Control Daily Safety Big Data

The top three (3) key phrases were: (1) Automation; (2) Big / Large / Significant / Huge Role; (3) Improved.

Automation

- Further automation of systems to support operations, automation in the construction industry will be required (automation of side booms, backhoes etc.).
- Automation and artificial intelligence will make items and processes energy efficient thus effectively reducing impact on the environment.
- People are gravitating towards higher levels of education and higher levels of education are missing the hands-on attributes in many cases. Therefore, Automation will be much more prevalent.

Big / Large / Significant / Huge Role

- Huge role. Automation is much more cost friendly and less susceptible to errors.
- It has a huge potential in playing a major role within our industry.
- Huge role, especially in control rooms and analytics abilities for all kinds of corporate data (flows, customer, integrity, costs, etc.).
- Large role to reduce costs and improve quality and productivity.

Improved

- Improved reliability.
- Continuous improvement, safety improvement, efficiency improvement.
- We can use AI to improve safe operations and reduce or eliminate accidents.
- Better and faster business decisions. Improved engineering solutions.

3 YPAC Pipeline Conference 2017

In the spirit of continuous improvement and having a “beginners mind” one of the impactful initiatives YPAC undertakes is the organization of a biennial conference. Building trust in the pipeline industry is a challenge—one that is becoming more difficult as the conversation about pipelines becomes more divided in North America. The Young Pipeliners Association of Canada (YPAC) homed in on the topic of “Building Trust” in its 2017 conference in Edmonton on August 24 and 25. The conference focused on bridging various individuals in the pipeline industry with topics including, project updates, regulatory, land, watercourses, competency, risk public engagement among other.

Here are a few of the lessons learned at the event:

Trust is about more than communication – much more

To build trust, the transmission pipeline industry must perform in every aspect of operations – such as planning and engagement, construction, maintenance, emergency preparedness. The pressure is on – even one small incident draws the wrong kind of attention to the industry, which has the potential to damage trust.

Engagement is genuine

It’s easy to look at all the regulatory demands of pipeline planning, construction and maintenance and assume that companies are just going through the motions and checking boxes. That’s not the case. Leaders and employees of pipeline operators believe that engagement is important, which is evident in their stories and approach to informing and involving members of the public ‘early and often’.

Engagement is a priority

One of the more surprising stats mentioned in the conference sessions is that most CEOs spend 35-40 per cent of their time on external engagement. With this commitment to engagement starting at the top of pipeline companies, it’s become an integral part of their culture.

Collaboration is the future

Sharing research and leading practices was a focus of this conference, and it was embraced by attendees. In our blog last week, Meredith Adler of Student Energy said that young people are open to collaboration and sharing around innovation. This was evident throughout the conference — particularly in a well-attended session where three innovative research papers were shared, including [Building Trust: Engaging Canada’s Youth through Experiential Learning](#), winner of the YPAC Paper Award.

4 Past YPAC Events

YPAC is proud to have a history of several events as well as participated in several key events. Below is an incomplete list of the events YPAC has hosted and participated in since 2013:

- 2017-Sep-8: Encana Hosted Generation Energy Workshop
- 2017-Sep-18/20: CEPA Foundation Meeting Fall 2017
- 2017-Aug-24/25: YPAC Pipeline Conference and Tradeshow 2017
- 2017-July-28: Calgary Shop Tour: Triple D Bending
- 2017-June-22: Pipeline Lifecycle Series: Pipeline Construction Management by Aecon
- 2017-May-4: Pipeline Lifecycle Series: Sustainable Project Development by TransCanada
- 2017-Mar-30: Pipeline Lifecycle Series: Connecting Markets by Phoenix Energy Marketing Consultants
- 2017-Mar-2: Vancouver Speaker Series: TransMountain Expansion Project by Kinder Morgan
- 2017-Jan-25: Edmonton Shop Tour: Pipeline Maintenance and Integrity by T.D. Williamson
- 2016-Dec-1: Vancouver Event: Chapter Launch
- 2016-Nov-24: Valves 101 Seminar by Fluor
- 2016-Oct-21: Pipeline Lifecycle Series: Leak Detection by University of Calgary
- 2016-Sep-29: Pipeline Lifecycle Tours @ the International Pipeline Exposition
- 2016-Sept-28: YPAC / IPC Networking Event
- 2016-Sept-25: YPAC Golf Tournament
- 2016-Sept-25/30: International Pipeline Conference 2016 Involvement
- 2016-Sep-12: Edmonton Speaker Series: Future of Energy in Alberta: CO2 Capture and Long Term Vision of the Alberta Carbon Trunk Line
- 2016-Jul-27: Calgary Tour: Tour of ROSEN facilities and Village Brewery
- 2016-June-26: Calgary Workshop: Marine Pipeline Workshop
- 2016-June-22: Pipeline HDD Crossing Workshop
- 2016-June-21: Pipeline Lifecycle Series: Pipeline and Facility Integrity
- 2016-Mar-7: YPAC Annual General Meeting
- 2015-Dec-1: Tiratsoo Technical and Clarion Event
- 2015-Dec: Pipeline Leak Detection
- 2015-Nov-13: Brenda Kenny: ROSEN Innovation Summit
- 2015-Oct-21: Tytec Paul Givens: Life in the Fast Lane? How About Life in the “Pipe” Lane?
- 2015-Oct-20: Manpreet Jassal: Pipeline Project Life Cycle Discussion Series – Business Development
- 2015-Sept-16: CEPA Fall Conference Participation
- 2015-Sept-28: YPAC Golf Torney 2015
- 2015-Aug-28: YPAC Pipeline Conference 2015
- 2015-June-15: Mike Gaudet & Kerry Williams: Contractual Strategy and Financing of Megaprojects
- 2015-June-15: Manly Osbak: Horizontal Directional Drilling in Pipeline Applications
- 2015-June-5: Calgary Focus Group Session – Employee Attraction and Retention
- 2015-May-19: Ingrid Pederson & Natty Aytenfisu: Pipeline System Design and Storage Tanks
- 2015-May-29: Edmonton Focus Group Session – Employee Attraction and Retention

- 2015-May-26: ROSEN: Erosion Coating at Home in Canada
- 2015-May-8: Edmonton Field Trip: EVRAZ & Bayou Perma Pipe
- 2015-April-23: Sean Sanders: Slurry Pipeline Design and Operation
- 2015-April-22: YWE: LNG Canada Insights: Energy for the World
- 2015-April-13-16: Banff Pipeline Workshop: Defining Competency of our Greatest Asset: Our People
- 2015-March-April: CEPA Foundation Survey – Employee Attraction and Retention
- 2015-Feb-12: YPAC Annual General Meeting Featuring Mark Podlasy
- 2015-Jan-16: YPAC Ski Trip
- 2014-Dec-4: Ken Paulson: Pipeline Regulation in Canada
- 2014-Nov-20: Greg Zinter: Pipeline Integrity: What is it, Why is it Important and Where is it Going?
- 2014-Nov-20: Challenges of the Canadian LNG Industry
- 2014-Sept-29 to Oct 3: International Pipeline Conference 2014 Involvement
- 2014-Aug-6: TransCanada Turbine Tour and Networking
- 2014-June: NDT Global's In-Line Inspection Tool Facility
- 2014-June-2: YPAC Summer Mixer
- 2014-May-13: Robert Jones: Importance of Energy Infrastructure in North America
- 2014-April-22: Alan Murray: The Great Wall of China, the Samurai and Modern Pipeline Materials
- 2014-Mar-12: Moving Canadian Oil to Market
- 2014-Feb-6: John Carruthers: The Enbridge Northern Gateway Pipeline Project
- 2014-Jan-23: Frank Durnford: The Energy 4 Everyone Foundation
- 2013-Dec-2: Phil Hopkins & Alan Murray: YPAC Industry Talk
- 2013-Sept-12: Adam Lind: Liquid Pipeline Operations, Overpressure Protection and Reactivating Pipelines
- 2013-July-23: Bob Smyth: CSA Z662 – Cover to cover in 45 minutes

5 Industry Association Collaboration

YPAC collaborates closely with the following organizations on many items including building a professional network, ensuring knowledge transfer between generations, providing young pipeliners with opportunities, and influencing the direction of the industry:

- Canadian Standards Association Group (CSA Group)
- Canadian Gas Association (CGA)
- Canadian Energy Pipeline Association Foundation (CEPA Foundation)
- Canadian Energy Pipeline Association (CEPA)
- Pipeline Research Council International (PRCI)
- American Society of Mechanical Engineers - Pipeline Systems Division (ASME PSD)
- International Pipeline Conference (IPC)

6 Conclusion and Recommendations

Recommendation 1: **Strong Focus on Innovation in Technology**

- Promote and develop the engineering and technical acumen disciplines which are directly tied to problem solving skills to progress innovation in technology within the pipeline industry.
- Incentivize emissions reductions through technology advancements by leveraging tax deductions, grants, etc.

Recommendation 2: **Public Trust and Confidence**

- Ensure transparency, performance, integrity, accountability and relationships.
- Develop and enforce a clear, stable set of rules of engagement for energy development projects.
- Nurture young professionals to speak about the work they do in the energy industry.
- Encourage a balanced understanding to all Canadians with regards to energy systems including pipelines, oil and gas and renewable energy and how it relates to our quality of life.
- Create an accredited program at the university level for pipeline innovation and efficiency (PIE).

Recommendation 3: **Maintain Quality of Life / Standard of Living**

- Create a Canadianized self-sufficient carbon economy through the development of pipeline projects to reduce the need for oil imports in order to increase Canada's control over their carbon future as well as increase the number of dollars kept in Canada to promote / maintain current standard of living.
- Promote technologies and innovations that progress towards our ideal future and do not hamper the Canadian quality of life.

Recommendation 4: **Protect the Environment: Land, Air & Water**

- Ensure high levels of technical expertise within the education system.
 - Expertise leads to efficient and effective management of pipeline systems.
- Consult early and often to ensure all aspects of project development are considered.
- Encourage codes and standards development to ensure protection of our pipeline systems.
 - Connect the environmental scientists with the pipeline integrity and design.
- Encourage research networks at the university and in industry as methods to protect the environment.

Recommendation 5: Public Perception and Media

- Highlight the benefits of Canada's energy industry to Canada and the world.
- Highlight alternatives of hydrocarbon suppliers to the world that are not Canadian.
 - Revenues and other benefits from energy industry will be more productively spent in Canada than most other suppliers of hydrocarbon products.
- Highlight Canada's leadership in carbon capture technology and its potential.
- Support the Young Pipeliners Association of Canada.

Recommendation 6: Personal Incentives and Low Carbon Future

- Study and develop individual level low carbon incentives.
 - Not everyone will change their way of life unless they are benefiting directly from the change. Asking individuals to do something for the greater good will not always work.
- Clearly outline how everyone in Canada benefits from a Canadian hydrocarbon industry and how those benefits can be used to aid in transition to low carbon 'emitting' energy.
 - There should be a realization that low carbon does not mean disregarding the value of hydrocarbons. We should be focused on low emitting (vs low carbon) and finding technologies that benefit the average Canadian as well as promote lower emissions.
 - Regardless of the goal, it will not be achieved if individual is not benefiting directly.