

ALBERTA OIL & GAS INDUSTRY

QUARTERLY UPDATE



Photo: Encana

**SUMMER
2018**

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March 26 - June 20, 2018

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NATURAL GAS MARKET UPDATE



ALBERTA ENERGY MINISTER STRIKES EXPERT PANEL TO HELP BELEAGUERED NATURAL GAS INDUSTRY

Alberta Energy Minister Marg McCuaig-Boyd has struck an expert panel with the mandate to ensure Alberta is receiving maximum value for its natural gas resources from available or potential markets.

The Natural Gas Advisory Panel (NGAP) will outreach broadly with relevant parties in the sector to determine advice and recommendations, including potential support or opposition.

Panel members are: Hal Kvisle, who has served as president and CEO of both Talisman Energy and TransCanada; Brenda Kenny, past president and CEO of the Canadian Energy Pipeline Association; and Terrance Kutryk, former president and CEO of Alliance Pipeline.

The panel's input is essential due to

the struggles facing the province's natural gas industry, perhaps no better illustrated than when Alberta's regional AECO prices dipped to negative levels, McCuaig-Boyd said.

"That's when it first got my attention last summer. It was horrible for the industry. Are there some things we can do to avoid that type of situation again? How can we make this a better situation for Alberta?" she asked.

"It's difficult out there for natural gas producers. I'm hearing a lot about the problems. There are a lot of challenges facing the industry. One of them seems to be a lack of pipeline capacity within Alberta, and also leaving the province. I'm curious to know what are some barriers that are existing that maybe we can help grow access a bit," McCuaig-Boyd added.

"At the end of the day we want to get the best dollar we can for our resources and with that AECO pricing, nobody is making money at it when it's that low. So we've got to do better."

The panel has been instructed to engage with relevant parties including producers, aggregators, storage companies, transmission companies, industry associations, consumers, financial institutions, regulators, and other governments.

The work will commence in June 2018, with advice to government expected in early summer.

"I was pretty excited [the panel members] all agreed to help us as they all bring a wealth of experience. Basically, we've mandated them to give us both verbal and written advice where we could look at what are some of the things we could do to solve some of the issues," McCuaig-Boyd said.

"I'm excited on where we go and hopefully we can come up with some good solutions for ways that we can develop our natural gas resources here in Alberta."

McCuaig-Boyd is hopeful the panel's expertise and guidance, along with input from industry, will help chart a better course forward for the province's natural gas sector.

"We've got some pretty smart people on this panel to pull the right industry people together. They know the business and hopefully they can provide us with some good advice that we can act on," the minister said.

"I've asked the panel to examine some options for immediate action, and then over the next 12 months and the next five years; give me some short-term, medium-term and long-term things that the government can look at."

Gary Leach, president of the Explorers and Producers Association of Canada, supported formation of the panel.

"We had urged the Alberta government late last summer, in the wake of the collapse in AECO prices, to take a keen interest in natural gas prices and the issues that underlie the large disconnect between the AECO hub and other hubs in North America," he said.

"We felt Alberta's interest as resource owner should be well aligned with producers. We are pleased to see the government get behind this topic and look forward to the recommendations." ■

CONVENTIONAL CRUDE MARKET UPDATE

NEW CANADIAN OIL FORECAST RECOGNIZES GREATER POTENTIAL FROM MONTNEY, DUVERNAY

The Canadian Association of Petroleum Producers (CAPP) has increased its forecast for conventional crude oil production, including pentanes and condensate. The reason: increasing confidence in the liquids-rich Montney and Duvernay plays.

CAPP now expects that conventional crude oil production will be about 200,000 bbls/d higher than it did last year through 2030, driven by pentanes and condensate.

From 2014 to 2017, production increased more than 20 percent year-over-year, to 326,000 bbls/d in 2017. This is now expected to grow to a peak of 500,000 bbls/d in 2026, compared to last year's forecast, which had production at 365,000 in 2026.

The vast majority of this production (85 percent) comes from Alberta, and increasingly from the Montney and Duvernay.

"I think that each year our members are realizing the true potential of that play," said CAPP president Tim McMillan.

"It's world class, our members are technologically on the cutting edge and they are able to implement it and replicate it. The liquids-rich is where the economics are really driving the economics today."

Demand for pentanes and condensate from oilsands for blending with bitumen currently exceeds domestic production and is expected to remain strong given projected growth in heavy crude oil

production. In the longer term, declines are anticipated as the Montney and Duvernay fields mature.

Without considering pentanes and condensate, conventional crude oil production from Western Canada (dominated by Alberta) is expected to stay relatively stable at about 1.0 million bbls/d through to 2030.

"With WTI oil prices averaging over US\$60 so far in 2018, conventional oil drilling is expected to be similar in 2018 compared to 2017. However, it is unlikely that increased drilling will return to the highs of 2014," CAPP notes.

"After the higher quality reserves are developed first, producers will move towards developing less prolific plays, which should dampen growth in production in the longer term."

Production could be higher than forecast with improved economics, CAPP said.

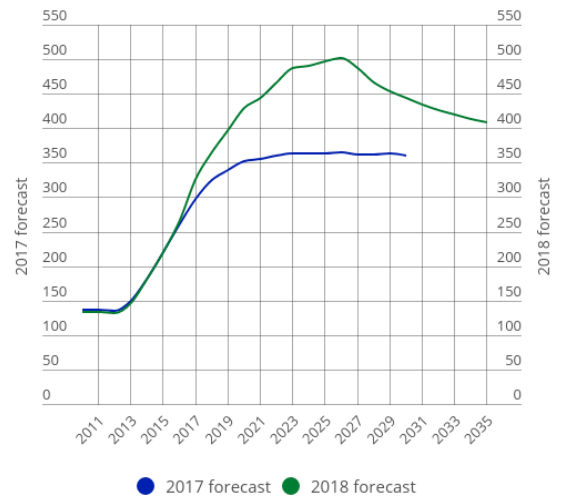
Total Canadian oil production is now expected to reach 5.4 million bbls/d in 2030, up from last year's forecast of 5.1 million bbls/d. The oil sands is expected to grow to 3.82 million bbls/d in 2030, which is up from last year's forecast of 3.67 million bbls/d, and the 2017 actual rate of 2.65 million bbls/d.

The annual forecast is based on a survey of CAPP members. It is a summary of their individualized views of the future, and makes no assumptions about market conditions or pipeline development.

McMillan says the modest increase in growth expectations "a bit of a positive trend."

"There still is some capital spending going in, and companies are working out ways to be more efficient and lower cost. The bigger difference is a line which we

Pentanes and condensate production forecast Western Canada



Source: Canadian Association of Petroleum Producers annual *Crude Oil Forecast, Markets and Transportation*

didn't put on here, which is compared to where we were in 2013 and 2014. Just a few years ago our growth profile was substantially higher."

In 2013, Canadian oil production was expected to grow to 6.7 million bbls/d in 2030 - a full 1.3 million bbls/d more than what's expected today.

CAPP stresses that an increasing competitiveness gap continues to impede Canada when it comes to attracting energy investment.

"Prices have been escalating for quite some time, they're now in the high \$60s and I think people are looking out longer term, they see dramatic growth in crude oil demand globally, and we're seeing capital globally going back in. It's just not coming to Canada," McMillan said.

"The driver there is not global, it's very much Canadian and in some cases provincial of uncertainty in regulation, duplication, inefficiency and the inability to get major pipelines built." ■

OIL PLAYS

The Alberta Energy Regulator (AER) estimates that the province has 1.8 billion barrels of remaining established reserves of conventional crude oil, with ultimate potential (recoverable) of 19.7 billion barrels. The remaining established reserves of conventional crude oil in Alberta represent more than one-third of Canada's remaining conventional reserves.

In 1994, based on the geological prospects at that time, the AER estimated the ultimate potential of conventional crude oil to be 19.7 billion barrels. Given recent reserve growth in low-permeability, or tight oil, plays, the AER believes that this estimate may be low.



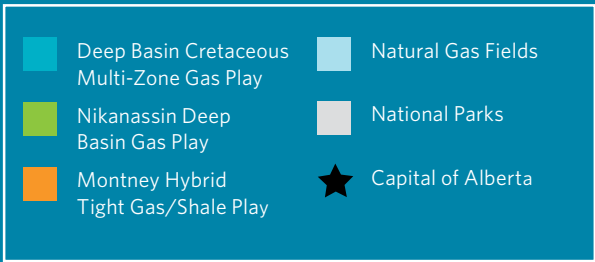
**For information on Alberta's oilsands industry, please see the Oil Sands Industry Quarterly Update.*



NATURAL GAS PLAYS

While the majority of the province's natural gas is still produced from conventional sources, the potential to grow natural gas volumes from coal, shale and tight formations will also be strong contributors going forward.

Alberta has a large natural gas resource base, with remaining established reserves of about 33 tcf and an estimated potential of up to 500 tcf of natural gas from the coal-bed methane resource. In addition, a large-scale resource assessment of shale gas potential in Alberta is underway and could significantly add to the natural gas prospects for the province.



WHAT'S NEW: UPSTREAM

Photo: Shell



■ ■ ■ Drilling activity in the Montney play in Alberta and B.C. surged to some of its highest numbers on record in the first quarter of 2018, according to analysts with Peters & Co.

As a result, Montney natural gas production increased about 24 percent year over year to approximately 7 billion cubic feet per day.

The bulk of the growth was driven by Encana, which produces about 1.3 bcf/d from the Montney, or about 18 percent of the play's natural gas, analysts said.

Encana nearly doubled drilling activity in the Montney play in the first quarter of 2018 following the start up of three new processing plants in the region in late 2017.

Peters & Co. said the company was the most active Montney player in the quarter, spudding 60 wells. This was followed by Seven Generations Energy with 35 and ARC Resources with 26 new well spuds. Overall, 350 new Montney wells were spud in the first quarter of 2018, up from 346 in Q1/2017 and 155 in Q1/2016.

■ ■ ■ Obsidian Energy will spend \$50 million on primary production wells and infrastructure in Alberta's Cardium light oil play, where it has historically focused on water flood operations.

Thirteen wells will be drilled in 2018 at Willesden Green, near Rimbey, Alta., while \$4 million will be spent on

infrastructure that "sets up future development opportunities."

"The short cycle inventory we see in our units and the halo of the play demand more investment," CEO David French said in a statement.

"Our recent results, material acreage position, and low base decline rate enable us to step up growth and provide torque to rising 2019 commodity prices."

All 13 wells are informed by offset producing wells that have exceeded internal expectations, Obsidian said. The new capital will be spent throughout the third and fourth quarter, with production beginning to come on line late this year.

■ ■ ■ Peyto Exploration and Development's drilling activity took a dive in the first quarter of 2018 compared to the previous year period as the company navigated continued low pricing for natural gas in Alberta.

The company drilled only 8 wells in the quarter compared to 45 wells in Q1/2017, deferring capital to later in the year when AECO pricing is expected to improve.

Capital that was invested during the quarter targeted liquids rich opportunities like Alberta's Cardium play, where results confirmed a significant improvement in type curve and investment return, Peyto said.

Despite the outlook for weak AECO

spot natural gas prices for the summer of 2018, Peyto said it remains bullish on the prospect for stronger pricing in the following winter season, and is confident that "much improved returns" in its Cardium play as a result of innovation in completion design will support expanding capital investment going forward, even at current strip pricing.

■ ■ ■ Shell's well productivity in the Montney play has improved by approximately 200 percent since 2016, according to a research report from Peters & Co.

From 2012 to 2015, well rates consistently had initial 30-day flow rates below ~4.0 mmcf/d. This increased to ~5.0 mmcf/d in 2016 as Shell began to drill longer lateral lengths, and averaged ~9.0 mmcf/d in 2017 with 25 new wells coming on-stream.

"Well results have demonstrated a step-change in productivity year-over-year since 2016," Peters & Co. said.

"In 2017, wells produced over 1 Bcf of gas in the first five months (on average), compared to 10 months for wells brought on-stream in 2016. In 2018, the results have shown a marked improvement again; there are six wells with average lateral lengths of ~3,100 meters that Shell brought on-stream in January (on the same pad)." →

■ Crescent Point Energy Corp. has revealed its land position in the emerging East Shale Duvernay light oil resource play, which totals over 355,000 net acres, or approximately 555 net sections, at a low entry cost of approximately \$315 per acre.

Throughout 2017, Crescent Point says it focused on organically increasing its initial land position in the emerging East Shale Duvernay. Since its entry in 2015, the company has completed detailed geological mapping in order to target high-quality land in the emerging light oil resource play.

Land purchases in the Duvernay were a big reason for the rebound in Alberta bonus bids last year.

“The Duvernay is very exciting for Crescent Point and is consistent with our strategy of developing large oil-in-place resource pools with low recovery to date,” said Scott Saxberg, president and CEO.

“Our strategic land base combined with strong production results to date by industry, highlight the potential for scalable growth that is not reflected in our 2018 production guidance or our current five-year plan.”

To date, Crescent Point has participated in two gross (one net) non-operated horizontal wells with a lateral length of one-and-a-half-miles, the first of which has flowed at initial 30-day and 90-day rates of approximately 570 boe/d and 515 boe/d respectively, comprised of approximately 92 per cent oil and liquids. The second well has been flowing for less than 30 days with initial rates similar to the first well.

The company is currently planning to drill a total of four operated net wells in the first half of 2018. This drilling program is reflected in the company’s 2018 capital expenditures budget, which is expected to generate a total payout ratio of 99 per cent as previously disclosed on January 9, 2018.

■ In 2018, Paramount Resources expects that its own company, Fox Drilling, will handle the majority of its drilling operations.

Paramount has a 2018 capital program of \$600 million that includes drilling of 77 wells or approximately 2,500 drilling days. The company estimates that the Fox fleet can accommodate about 1,900 or 76 per cent of those days.

Based in Lethbridge, Alta., Fox owns seven triple-sized rigs that feature pad walking capabilities.

Paramount will focus 2018 drilling primarily in the Montney play, with 54 of 77 planned wells. The Duvernay play will also see investment, with 15 wells, followed by 2 wells in central Alberta and 6 wells listed under “other.”

Paramount has also contracted a dedicated frac unit for all of 2018 in order “to achieve efficient and timely well completions.” Additional frac units will be contracted as required throughout the year.

■ The Petroleum Services Association of Canada (PSAC) has lowered its 2018 drilling forecast by 500 wells as improving oil pricing fails to attract more investment to Canada. Producers are also increasingly shifting to drilling for oil instead of natural gas as prices remain low.

PSAC now estimates that 7,400 wells will be drilled across Canada this year, down from 7,900 forecast in October 2017. That’s comprised of 3,800 wells in Alberta (down from 4,000), 500 wells in B.C. (down from 730), and 2,840 wells in Saskatchewan (down from 2,930 wells). Manitoba on the other hand is forecasted to see 255 wells or a jump of 25 in well count for 2018.

PSAC based its updated forecast on an average natural gas price of \$1.75 CDN/Mcf (AECO), crude oil price of US\$61.45/barrel (WTI), and a Canada US exchange rate averaging \$0.79.

■ Strath Resources is spending \$340 million to acquire Montney properties and infrastructure from Paramount Resources in the Kakwa region of northwest Alberta.

Upon closing, Paramount will hold a 16 per cent equity interest in Strath and Jim Riddell, Paramount’s president and chief executive officer, will join Strath’s board of directors.

The assets include 201 sections of land with proved reserves of approximately 6.3 million boe and proved plus probable reserves of approximately 8.1 million boe as of Dec. 31, 2017. Sales volumes from these lands were approximately 5,300 boe/d (36 per cent liquids) in April 2018 on a restricted basis. Paramount had minimal capital spending planned for the assets for the balance of the year.

Strath is a Waterous Energy Fund-backed private oil and gas exploration and production company with a liquids-rich Montney land base that is immediately adjacent to the assets. Following close of the deal, Strath expects to have approximately 21,300 boe/d of production.

Paramount said it will continue to focus on developing its core Montney assets at Karr and Wapiti in the Grande Prairie region, and Montney and Duvernay assets in the Kaybob region. ■

Drilling in the Montney play in Alberta and B.C. surged to some of its highest numbers on record in the first quarter of 2018, according to analysts with Peters & Co.

As a result, Montney natural gas production increased about 24 percent year over year to approximately 7 billion cubic feet per day.

WHAT'S NEW: MIDSTREAM

Photo: Keyera Corp.



■ ■ ■ The National Energy Board has approved a proposed \$1.4-billion pipeline connecting growing Montney production to North American markets.

The North Montney Mainline was originally tied to the Pacific NorthWest LNG project, but TransCanada subsidiary NOVA Gas Transmission said it would proceed anyway after proponents walked away from the LNG project last year.

The North Montney Mainline is designed with capacity to ship 1.5 billion cubic feet of natural gas per day. It consists of approximately 206 kilometres of 42-inch pipeline, compression and associated metering facilities.

TransCanada says it will boost the economy by supporting thousands of high-quality construction jobs and deliver an estimated \$100 million in construction contracts for Indigenous businesses and workers.

Subject to timely federal approval, construction is expected to start by the third quarter of 2018, with an anticipated in-service date of mid-2019.

■ ■ ■ Keyera Corp. has entered into a 20-year infrastructure development and midstream service agreement with Encana Corporation to support condensate-focused Pipestone Montney development near Grande Prairie, Alta.

Keyera and Encana will develop a liquids hub and a natural gas processing and liquids stabilization plant. In consultation with Keyera, Encana will be responsible for the design and construction of the project

and will initially operate the facilities.

The natural gas processing and liquids stabilization plant will include a total of 200 mmcf/d of sour gas processing and 24,000 bbls/d of condensate processing. Operations of the \$500 million to \$600 million facility are anticipated to begin in 2021.

The \$105 million Pipestone Liquids Hub is currently under construction and will include a total of 14,000 bbls/d of condensate processing capacity. Based on the proposed construction schedule, operations are expected to start up in the fourth quarter of 2018.

Keyera is also proceeding with phase two of its Wapiti Gas Plant near Grande Prairie. The project, which has an estimated cost of approximately \$150 million, will add 150 million cubic feet per day of sour gas processing to the plant, which is currently under construction.

Keyera is also expanding the two gathering systems that will deliver volumes to the plant, supported by commitments from its two primary customers, Paramount Resources and Pipestone Oil Corp.

"With the volume commitments we are seeing, it is evident that producers continue to have confidence in this region as one of the most economic developments in the Western Canada Sedimentary Basin," CEO David Smith said in a statement.

In the same region, the company is also adding processing capacity to its Simonette gas plant, which continues to achieve record processing volumes, the

company says.

A 150-mmcf/d expansion will increase total capacity to 450 mmcf/d from 300 mmcf/d. The \$85 million project is targeted for completion in late in 2019.

■ ■ ■ Pembina Pipeline says it will build a new expansion of its Peace pipeline system to accommodate growth in the Montney and Deep Basin resource plays.

Last July Pembina put its Phase III expansion into service, which increased capacity to transport crude oil, condensate and natural gas liquids from northeast B.C. into the Edmonton area market.

The company is also currently progressing construction of its Phase IV and Phase V expansions to further build out and debottleneck this capacity. These projects are to be placed into service in late 2018.

The latest expansion, Phase VI, includes: upgrades at Gordondale, Alberta; a 16-inch pipeline from LaGlace to Wapiti, Alberta and associated pump station upgrades; and a 20-inch pipeline from Kakwa to Lator, Alberta. The approximately \$280 million Phase VI expansion is anticipated to be in service in early 2020, subject to environmental and regulatory approval.

Pembina say it is continuing to secure long-term contracts on its Peace and Northern Pipeline systems and currently expects peak firm volume commitments will reach approximately 830,000 bbls/d in 2019. ■

WHAT'S NEW: DOWNSTREAM

OPTIMISM GROWS FOR ALBERTA PETROCHEMICALS AS ALBERTA PASSES \$1 BILLION INVESTMENT BILL

■ ■ ■ There's a real sense of optimism about the petrochemical industry in Alberta and not only in the Edmonton area, according to Mark Plamondon, executive director of Alberta's Industrial Heartland Association.

Elsewhere in Alberta, there are opportunities for brownfield expansions at Joffre and Medicine Hat and field opportunities in Grande Prairie.

"We believe that right now there is an opportunity for \$30 billion in petchem investment and value-added energy investment between now and 2030," Plamondon says.

"There are a lot of projects that companies are looking at and a lot of real opportunity and a lot of optimism, given the competitive advantages of Western Canada."

In addition to low-cost, abundant feedstock supply, industry in Alberta also has significant support from the province – support that got \$1 billion bigger in June, when the government passed the Energy Diversification Act. This legislation enables the province to invest up to \$2 billion in energy diversification projects including petrochemicals, petrochemical feedstocks and bitumen partial upgrading.

The bill includes \$500 million for round two of the Petrochemicals Diversification Program (PDP), \$500 million for the new Petrochemicals Feedstock Infrastructure Program, and \$1 billion for the new Partial Upgrading Program.

For more information on the Partial Upgrading Program, see the [Summer 2018](#)



Alberta Premier Rachel Notley. Photo: Government of Alberta

[Alberta Oil Sands Industry Quarterly Update.](#)

PETROCHEMICALS AND PETROCHEMICAL FEEDSTOCK

■ ■ ■ The first round of the Petrochemicals Diversification Program in 2016 offered up to \$500 million in royalty credits for methane and propane upgrading projects. The province said it received double the interest it expected in the program, with 16 applications filed from local players and companies around the world, representing more than \$20 billion in potential new investment in petrochemicals.

Two propane-based facilities were awarded the funding: Inter Pipeline's \$3.5 billion Heartland Petrochemical Complex, which is under construction, and Pembina Pipeline's PDH/PP facility, which is in the front-end engineering stage. Its capital cost is estimated at between \$3.8 billion and \$4.2 billion.

The second round of the Petrochemicals Diversification Program expands focus into ethane in addition to methane and propane. The PDP and Petrochemicals Feedstock Infrastructure Program are complementary in that investments in new ethane processing will likely require investments in new ethane supply in Alberta, the province says. This is because the province's ethane supply and demand is currently in balance.

The feedstock program is designed to

provide the building blocks for investment including new natural gas processing facilities, smaller projects built closer to wellheads or straddle plants, and facilities that are built along major natural gas pipelines that can extract certain components during transportation.

Industry can submit applications Petrochemicals Diversification Program and Petrochemicals Feedstock Infrastructure Program until Oct. 1. The province says that a decision on successful applicants is scheduled for late 2018.

Chemistry Industry Association of Canada CEO Bob Masterson called the province's plan an "incredibly courageous move."

"These two programs complement each other because the greater and more stable the supply of these raw components, the greater the potential of attracting and supporting more value-added developments in Alberta.

"We believe that governments at all levels in Canada need to work with industry to compete for new chemistry sector investments," he said.

"To do nothing means that some other jurisdictions will use our energy resources as feedstock to create value. Taking a balanced approach to share risk and secure new investments here in Alberta will create wealth and opportunity for Albertans. It's the right thing to do." ■

WHAT'S NEW: DOWNSTREAM



Rendering of Inter Pipeline's Heartland Petrochemical Complex, currently under construction. Image: Inter Pipeline

■ ■ ■ Construction of Inter Pipeline's Heartland Petrochemical Complex near Edmonton, Alta. ramped up in the first quarter of 2018, with "significant activities" now underway.

Build of the \$3.5-billion facility, which will turn 525,000 tonnes of propane per year into polypropylene pellets for use in plastics and other products, began in December 2017.

The company said the project is benefiting from a current lack of major project development in Alberta, which results in favorable engineering, procurement and construction environment, including availability of skilled labour.

Civil construction and fabrication activities are ongoing, and the installation of support structures and foundation work has begun. The fabrication of numerous vessels including the 800-tonne propane/propylene splitter are also well underway at off-site locations around Edmonton, and large number of key components have been procured including major compression equipment, turbines, valving and a polypropylene extruder and pelletizer package, the company said.

Major contractors include Honeywell, Fluor, Kiewit Construction Services, Grace UNIPOL and Linde Engineering.

Approximately \$125 million of capital

was invested on the project during the first quarter, with a total 2018 capital plan of approximately \$700 million. The facility is expected to be operational in late 2021.

■ ■ ■ A final investment decision has yet to come on the second of two petrochemical projects with funding committed by the Alberta government, but analysts are expecting positive news to come early next year.

Pembina Pipeline received a commitment of up to \$300 million in royalty credits from the Government of Alberta in late 2016 to build a propane dehydrogenation and polypropylene (PDH/PP) facility. The project would transform low-cost local propane into plastic pellets for products including home electronics and medical devices.

At the same time as the Pembina announcement, Inter Pipeline Limited was committed up to \$200 million in royalty credits for its own PDH/PP facility, the \$3.5 billion Heartland Petrochemical Complex, which is under construction.

Pembina is partnered in its PDH/PP facility with Kuwait Petroleum Corporation. The company said in May that completion of front end engineering and design is expected in late 2018, followed by a final investment decision on the \$4 billion

project in early 2019.

"All signs point to this project going ahead," analysts with Peters & Co. said in a research note.

Executives stressed that there is room for both PDH/PP facilities in the province, added analysts with GMP FirstEnergy.

"Management remains confident that the current surplus of propane in western Canada can support both PDH/PP facilities announced recently, [and] the two LPG export terminals under development in B.C. and still have excessive propane to export via rail. The company views Alberta having major advantage in producing polypropylene given the abundance of low-cost feedstock, attractive labour market, existing connectivity and government support."

■ ■ ■ AltaGas Ltd. says propane has been secured for close to 75 per cent of Ridley Island Propane Export Terminal (RIPET) export capacity and that construction of the facility remains on time and on budget for start-up in the first quarter of 2019. The B.C. project will help ease the glut of natural gas production in Western Canada.

"Producers are starting to see the benefits of having access to new premium markets for their propane," said CEO David Harris.

RIPET is expected to be the first propane export facility off the west coast of Canada. The site is near Prince Rupert, B.C., and has a location advantage given very short shipping distances to markets in Asia, notably a 10-day shipping time compared to 25 days from the U.S. Gulf Coast.

Propane from B.C. and Alberta will be transported to the facility using 50-60 rail cars per day through the existing CN rail network. RIPET is expected to ship 1.2 million tonnes of propane per annum (which is equivalent to approximately 40,000 bbls/d of export capacity). ■



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WHAT'S NEW: TECH



Seven Generations drilling a multi-well pad in Alberta's Montney play.

Improved understanding of its reservoirs and production responses has led Montney producer Seven Generations Energy to challenge its well design assumptions.

At present, a typical 7G completion involves about 40 stages with an average of 120-160 tonnes pumped per stage — “generally on the 160 tonnes per stage side,” Marty Proctor, 7G’s president and CEO, told the company’s Q1 conference call.

Some completions have been bigger, even up to 60 stages.

With improved reservoir understanding, however, Proctor said it’s clear one design doesn’t fit everywhere.

“We have pumped bigger and bigger fracs, with more and more water. There are indications this may have taken us past the point of optimal completion design in some areas.”

The company is still seeing the benefits of more stages, he added, but will probably use less sand per stage in the future.

By refining its completion execution to get better results, 7G’s goal is to maximize each well’s net present value.

“We’ve grown a lot, but we’ve still only completed and put on production around 350 wells,” Proctor said.

“We have thousands ahead of us. It’s only prudent to keep trying to evolve that completion design to optimize our performance.”

Duvernay operators have incorporated technological advances in drilling and completions developed in the Eagle Ford, resulting in reduced capital cost per boe of estimated ultimate recovery. Investors often see the Eagle Ford and Duvernay as fairly analogous in terms of geology and prospectivity.

Plug and perf technology has become dominant in both plays, with sliding sleeve and ball drop technologies also being used. Slick water or hybrid slick water with gel fracs are common. There is also an effort underway to optimize the use of sand as proppant to cut costs.

The biggest change in completions in both plays is in fracturing intensity. Longer laterals, more stages per lateral, more perforations per stage, and vastly increased proppant loads are driving productivity improvements.

With the ability to drill longer laterals, Duvernay operators have been able to rapidly increase the number of fracturing stages per lateral when compared with the Eagle Ford. But again, there is substantial variation between wells.

Average proppant loads per metre of lateral length have been rapidly increasing in both plays, although fracturing intensity is more pronounced in the Eagle Ford. There is, however, a growing belief there are economic limits to the amount of proppant that can be placed.

A number of Eagle Ford operators are testing those limits and loads could slightly

decrease in 2018 as they find their sweet spot.

Petroleum Technology Alliance Canada (PTAC) says it is advancing the technologies needed to allow the oil and gas industry to meet stringent new methane emissions reduction targets while preparing the industry for the coming digital transformation.

Methane emission reductions continued to be the hot topic in 2017 mainly due to the mandated target to reduce emissions by 45 per cent by 2025, according to PTAC president Soheil Asgarpour.

“PTAC’s consortia have developed numerous technologies that currently have the collective technology capacity to reduce overall oil and gas sector methane emissions by over 30 per cent. As a matter of fact, four technologies already developed through PTAC are collectively reducing greenhouse gas emissions equal to taking 160,000 cars off the road annually while reducing industry costs by \$60 million,” he said.

In 2017 PTAC launched 17 methane related projects. PTAC believes the successful peer testing of these technologies will enable industry to increase its technology capacity to achieve 45 per cent reduction by 2020, he said. Longer term, PTAC’s target is to ensure that the industry has the technology capacity to reduce methane emissions by 85 per cent by 2030. ■

WHAT'S NEW: ENVIRONMENT

Image: Alberta Energy Regulator



■ ■ ■ The Alberta government says it will provide more than \$2.3 billion in assistance to the energy sector, including a five-year holiday on carbon levy costs as it introduces regulations to reduce methane gas emissions.

Companies can use the savings to focus on methane reductions, the province announced in April along with the Alberta Energy Regulator's draft regulations designed to reduce methane gas emissions from upstream oil and gas operations by 45 per cent (relative to 2014 levels) by 2025.

The draft directives are designed to minimize the economic impact on industry, providing flexibility for companies to innovate and use technologies best suited to their operations through an outcome-based approach, according to the government. Mandated check-in points will ensure intended outcomes are being achieved.

The requirements address the primary sources of methane emissions from Alberta's upstream oil and gas industry: fugitive emissions and venting, which includes emissions from compressors, pneumatic devices, and glycol dehydrators.

"We know what's at stake here, including good jobs in the energy sector and the health of the planet we leave behind for our kids," said Shannon Phillips, environment and parks minister.

"That's why we took the time to get this

right. We look forward to continued work with industry on cutting methane pollution for the benefit of all Albertans."

Cutting methane emissions is the most cost-effective way to accelerate greenhouse gas reductions, said the government, which said it plans to do so by:

- Applying emissions design standards to new Alberta facilities as applying standards at the planning stage will be less expensive;
- Improving measurement and reporting of methane emissions, as well as leak detection and repair requirements; and,
- Developing a joint initiative on methane reduction and verification for existing facilities, and backstopping this with regulated standards that take effect in 2020, to ensure the 2025 target is met. This initiative will include Alberta industry, environmental groups and Indigenous communities.

Implementation of the new oil and gas methane standards will be led by the AER, in collaboration with Alberta Energy and the Alberta Climate Change Office.

Alberta's Orphan Well Association (OWA) will be stepping up its activity in 2018 with plans to decommission (abandon) 600 oil and gas wells as it continues to work through a backlog of orphans, in part a legacy of the recent downturn.

■ ■ ■ As part of its total 2018-2019 budget of \$105 million, the OWA also plans to reclaim 200 sites and expects to receive 75 reclamation certificates along with conducting an initial assessment of more than 1,000 sites for future reclamation.

As of April 2, 2018, the association had a list of 2,278 wells for abandonment and suspension (1,175 to be abandoned and 1,103 to be suspended) as well as 1,062 orphan sites for reclamation.

In addition to a \$45 million industry levy, the budget includes the first installment of a \$235 million loan to the OWA from the Alberta government designed to speed up the abandonment and reclamation of orphan wells over three years.

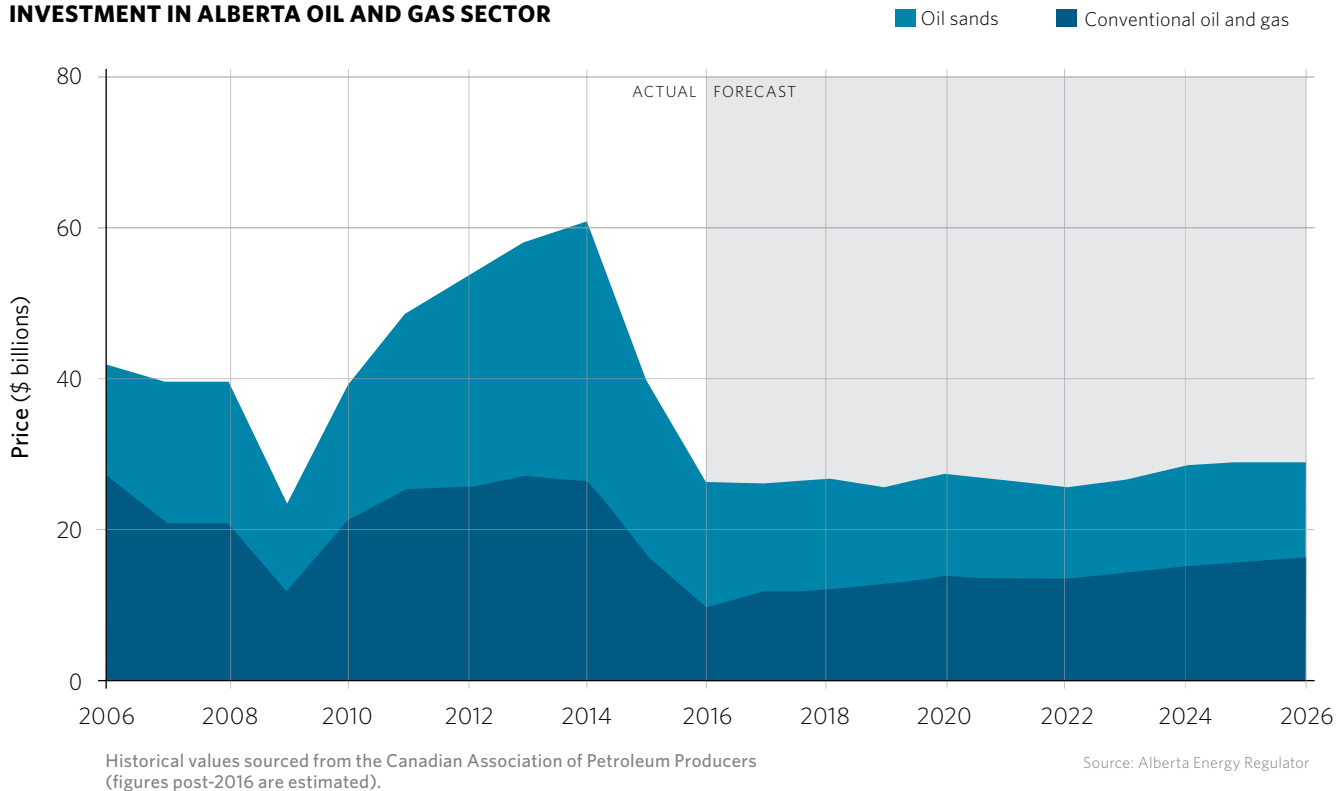
In the future, minimum annual spending requirements for producers on the abandonment and reclamation of inactive wells could be part of the Alberta government's efforts to reduce the number of inactive wells in the province, say industry stakeholders.

Both the Explorers and Producers Association of Canada and the Canadian Association of Petroleum Producers (CAPP) favour the idea as part of a broader reform package.

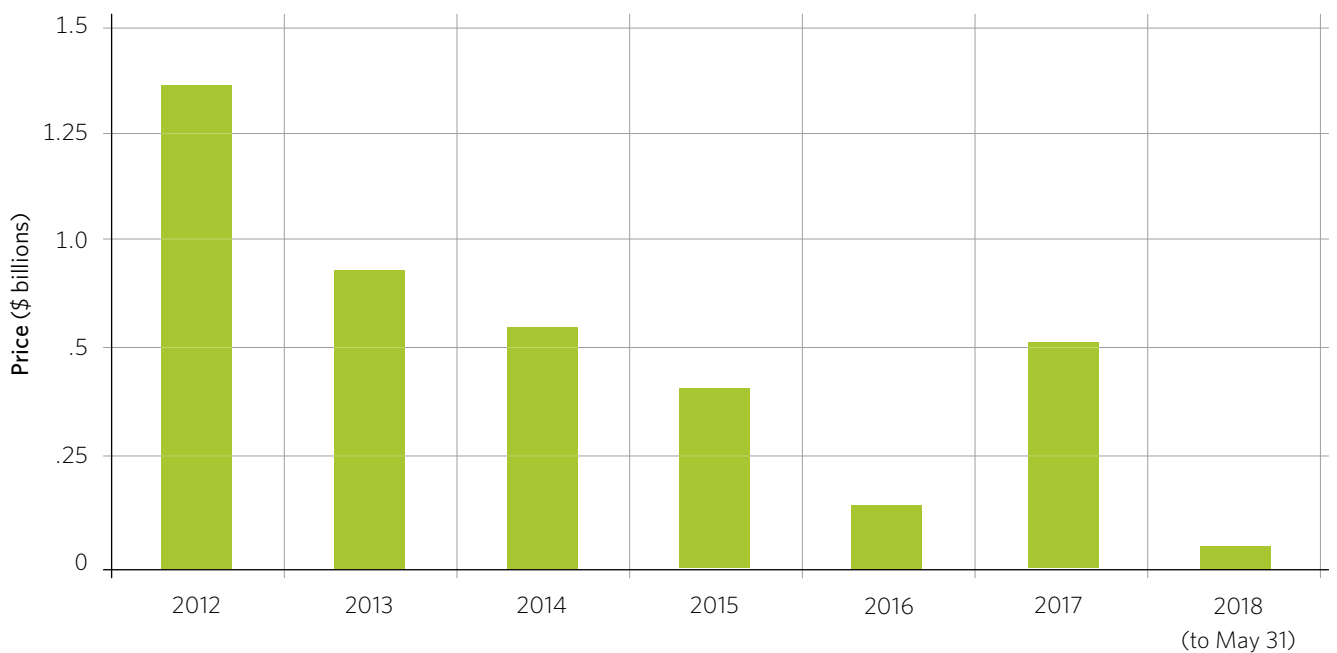
The OWA says that as it has been able to increase spending on wells it is seeing economies of scale and savings of 25 per cent to 40 per cent as it is able to put together portfolios of wells, pipelines and facilities in one area. ■

OIL & GAS STATISTICS

INVESTMENT IN ALBERTA OIL AND GAS SECTOR



ALBERTA CROWN LAND SALES Petroleum and natural gas rights, excluding oil sands



DRILLING RIG COUNT BY PROVINCE/TERRITORY

June 14, 2018

	ACTIVE	DOWN	TOTAL	ACTIVE
Western Canada				(Per cent of total)
Alberta	104	338	442	24
British Columbia	17	33	50	34
Manitoba	2	3	5	40
Saskatchewan	35	83	118	30
WC total	158	457	615	26

Source: JWN

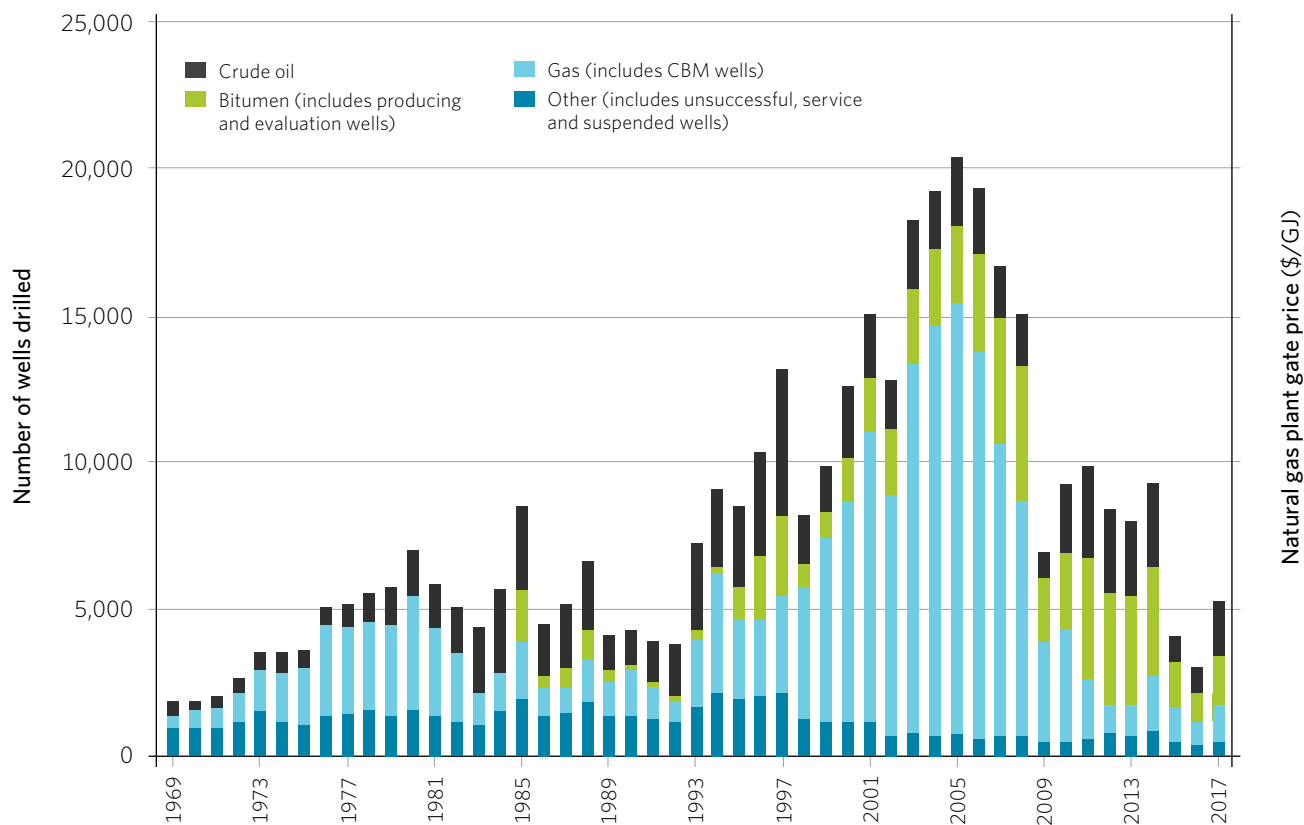
OIL AND GAS WELL COMPLETIONS BY PROVINCE

June 2018

	OIL WELLS		GAS WELLS	
Western Canada	May '17	May '18	May '17	May '18
Alberta	122	138	62	67
British Columbia	2	7	35	38
Manitoba	1	3	-	-
Saskatchewan	49	29	-	-
WC total	174	177	971	105

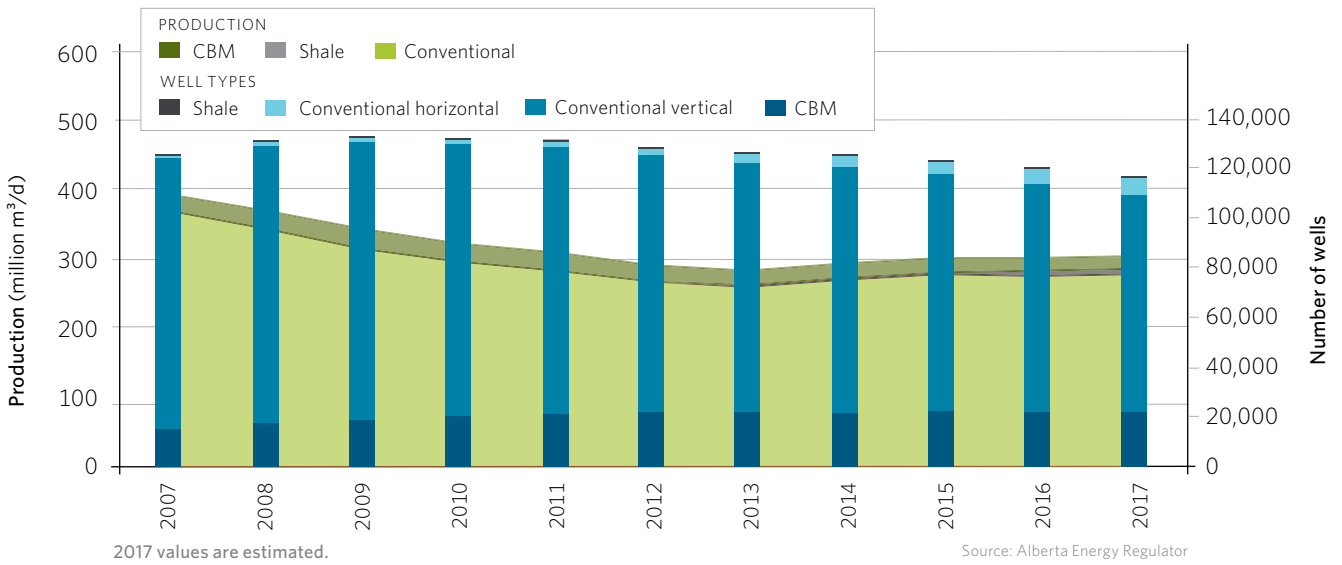
Source: JWN

DRILLING ACTIVITY IN ALBERTA, 1969-2017

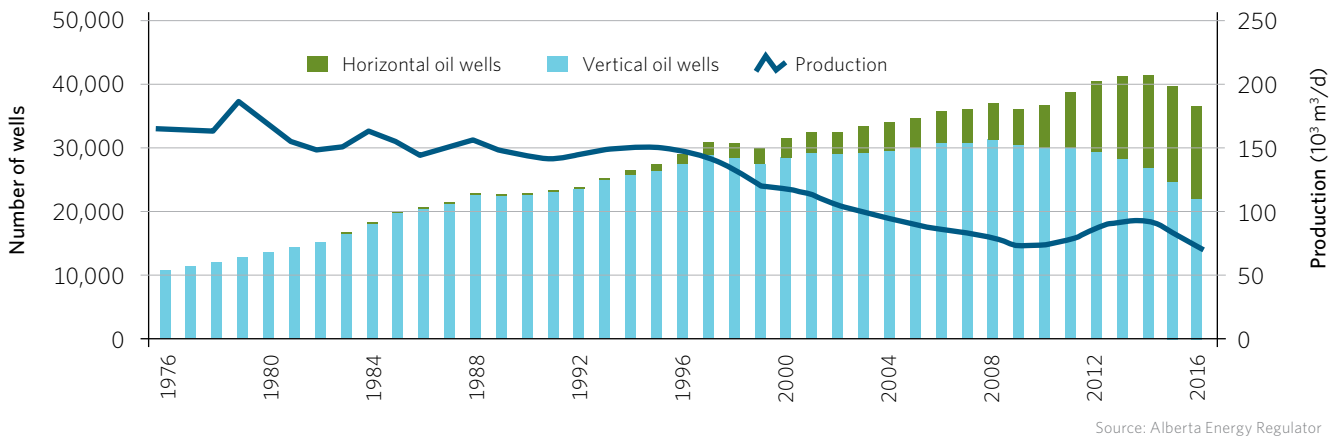


Source: Alberta Energy Regulator

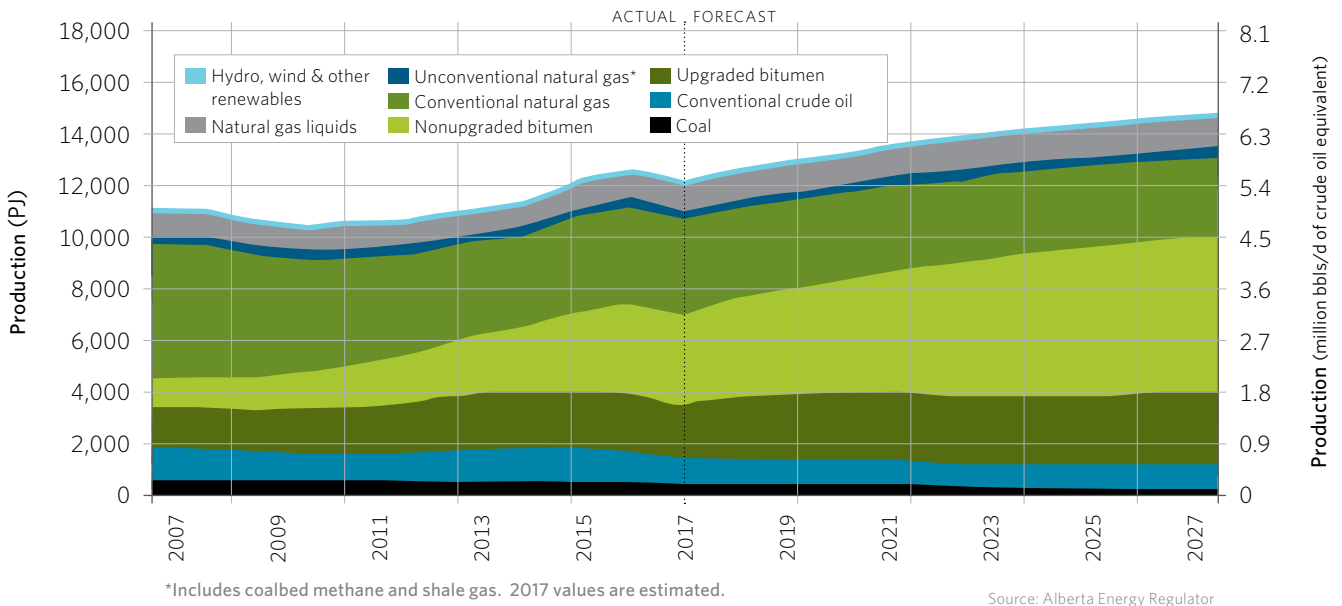
ALBERTA MARKETABLE GAS AVERAGE DAILY PRODUCTION AND PRODUCING WELLS



ALBERTA CRUDE OIL PRODUCTION AND PRODUCING WELLS



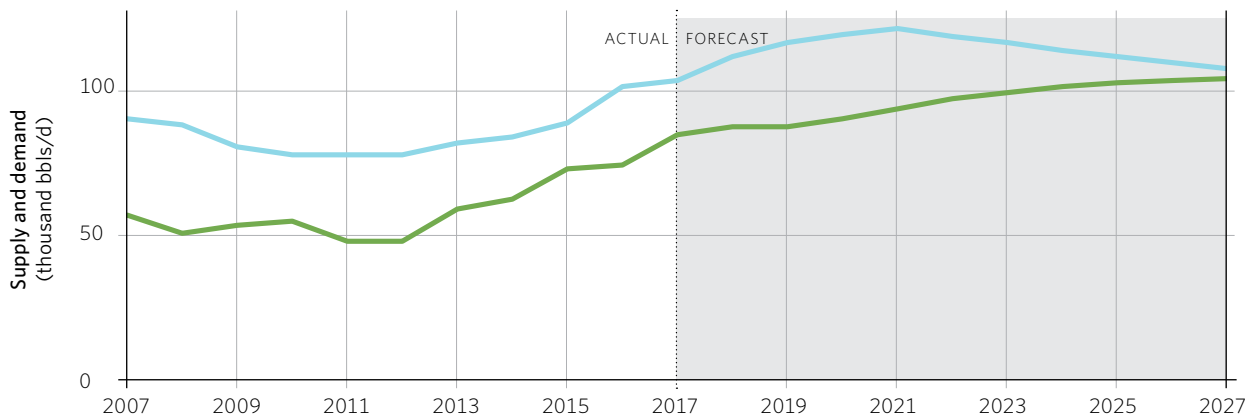
TOTAL PRIMARY ENERGY PRODUCTION IN ALBERTA



NATURAL GAS LIQUIDS STATISTICS

BUTANES SUPPLY FROM NATURAL GAS AND DEMAND

▲ Alberta supply ▲ Total Alberta demand*

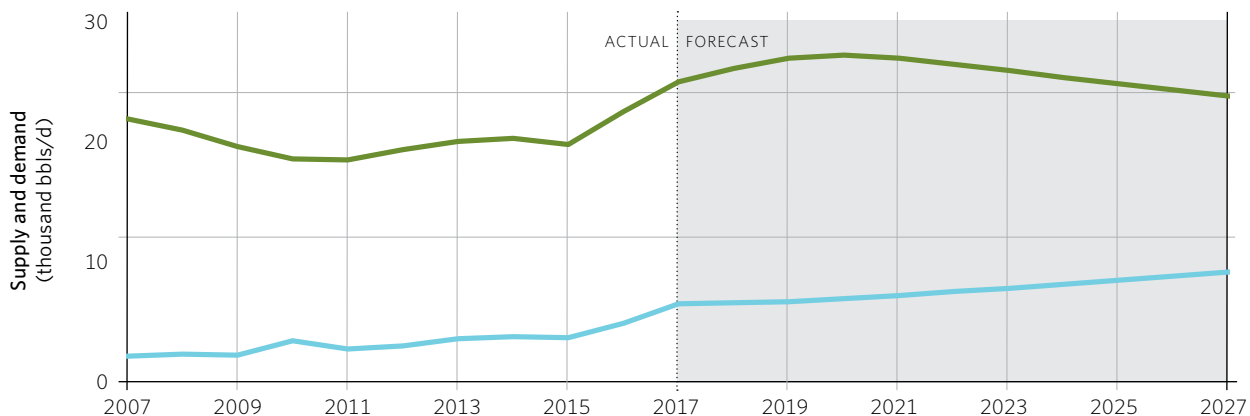


*Excludes solvent flood volumes. 2017 values are estimated.

Source: Alberta Energy Regulator

PROPANE SUPPLY FROM NATURAL GAS AND DEMAND

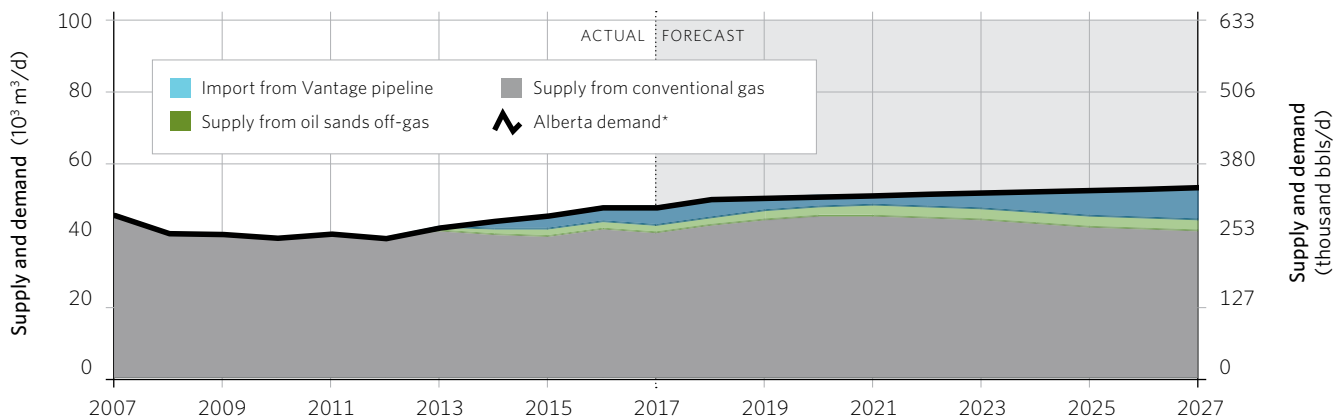
▲ Alberta supply ▲ Alberta demand*



*Excludes solvent flood volumes. 2017 values are estimated.

Source: Alberta Energy Regulator

ETHANE SUPPLY AND DEMAND

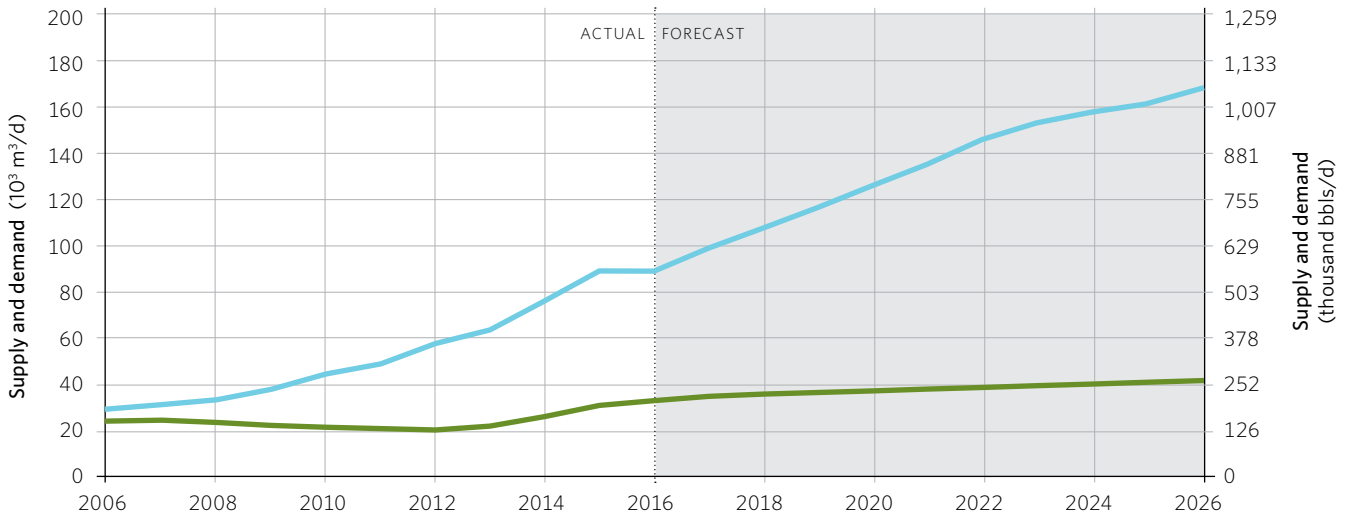


*Excludes solvent flood volumes. 2017 values are estimated.

Source: Alberta Energy Regulator

PENTANES PLUS SUPPLY FROM NATURAL GAS AND DEMAND FOR DILUENT

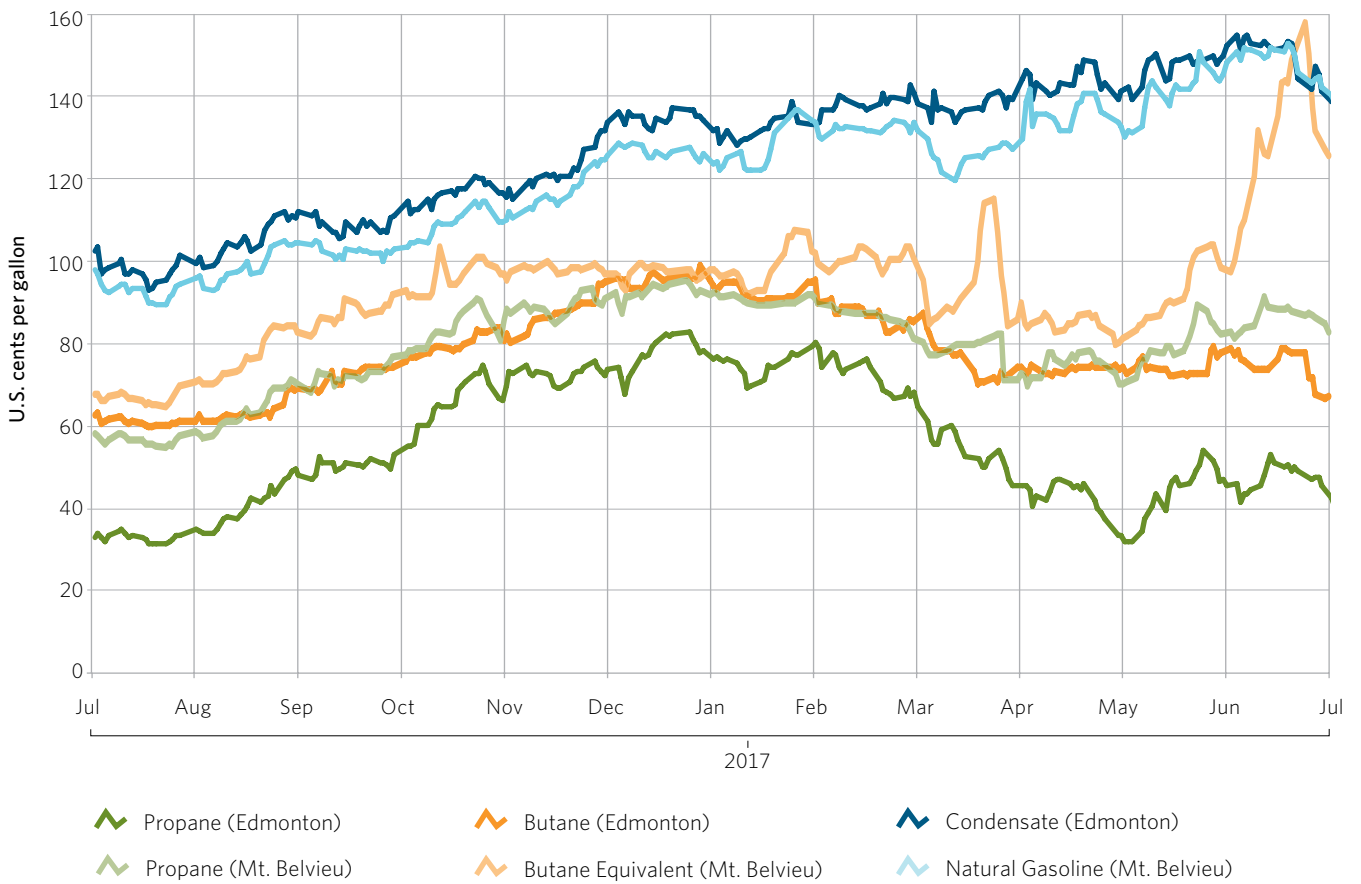
Alberta supply Alberta demand*



*Excludes solvent flood volumes. 2016 values are estimated.

Source: Alberta Energy Regulator

NORTH AMERICAN NGL PRICES



Note: Mt. Belvieu's field grade butane equivalent value is calculated by adding 70% of the value of the Mt. Belvieu Enterprise normal butane price to 30% of the value of Mt. Belvieu Enterprise isobutane price, to allow for comparison with Edmonton benchmark.

Source: Argus, 2017
www.argusmedia.com

CONTACTS

ALBERTA GOVERNMENT

Alberta Advanced Education

www.iae.alberta.ca

Alberta Energy

www.energy.alberta.ca

Alberta Energy Regulator

www.aer.ca

Alberta Environment and Parks

www.aep.alberta.ca

Alberta Geological Survey

www.ags.aer.ca

Alberta Innovates

www.albertainnovates.ca

Alberta Surface Rights Board

www.surfacerights.alberta.ca

INDUSTRY ASSOCIATIONS

Alberta Land Surveyors' Association

www.alsa.ab.ca

Canada's Natural Gas

www.canadasnaturalgas.ca

Canadian Association of Geophysical Contractors

www.cagc.ca

Canadian Association of Oilwell Drilling Contractors

www.caodc.ca

Canadian Association of Petroleum Producers

www.capp.ca

Canadian Energy Pipeline Association

www.cepa.com

Canadian Natural Gas Vehicle Alliance

www.cngva.org

Canadian Society for Unconventional Resources

www.csur.com

Canadian Society of Exploration Geophysicists

www.cseg.ca

Canadian Society of Petroleum Engineers

www.speca.ca

Explorers and Producers Association of Canada

www.explorersandproducers.ca

Gas Processing Association of Canada

www.gpacanada.com

Petroleum Services Association of Canada

www.psac.ca

Petroleum Technology Alliance Canada

www.ptac.org

Photo: Encana

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Feedback, questions and comments on this issue of the *Alberta Oil & Gas Industry Quarterly Update* are welcomed. Please contact editor Deborah Jaremko at djaremko@jwnenergy.com.