



Pan American
ENERGY

ANOS

“Growing up in unconventional resources”



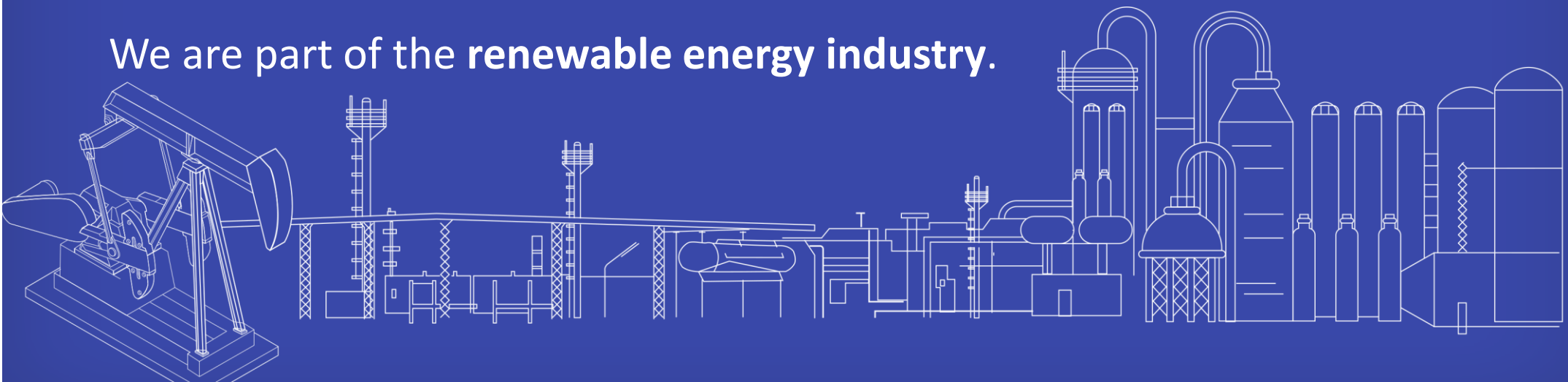


We are the largest privately-owned integrated oil and gas company in the region with operations in the upstream, midstream and downstream.

We explore and produce hydrocarbons in the main basins of Argentina, Bolivia and Mexico, in conventional and non-conventional reservoirs, both onshore and offshore.

We refine crude oil and commercialize fuels and petroleum derivatives in Argentina, Uruguay and Paraguay.

We are part of the renewable energy industry.



PAN AMERICAN ENERGY IN FIGURES

UPSTREAM UPSTREAM



108 Mdb

Oil production

831 MMcfd

Natural gas production

1,562 MMboe

2017 Certified Proved Reserves (SEC)

18%

Argentina Market Share

786 MMboe

2017 Certified Probable & Possible Reserves (SEC)

70/30

Oil to gas P1 + P2 reserves ratio

First international operator to drill in Mexico after the energy reform.

MIDSTREAM & TRANSFORMATION



3 Oil tanking terminals

Main pipelines participation

Power generation

25 MW wind farm
580 MW of thermal power generation capacity

DOWNSTREAM



1 Crude Oil Refinery
90 kbd of refining capacity.
Ongoing expansion to 120 kbd

750 retail sites
in Argentina, Uruguay & Paraguay

UPSTREAM ARGENTINA



Northwest Basin

Onshore operated asset

Neuquina

Onshore operated assets and 3rd party operated assets

Golfo San Jorge

Onshore operated assets and 3rd party operated assets

Renewable energy / Operated asset

Marina Austral

Offshore operated 3rd party operated assets

UPSTREAM MEXICO



UPSTREAM BOLIVIA



GOLFO SAN JORGE BASIN



CHILE

CHUBUT

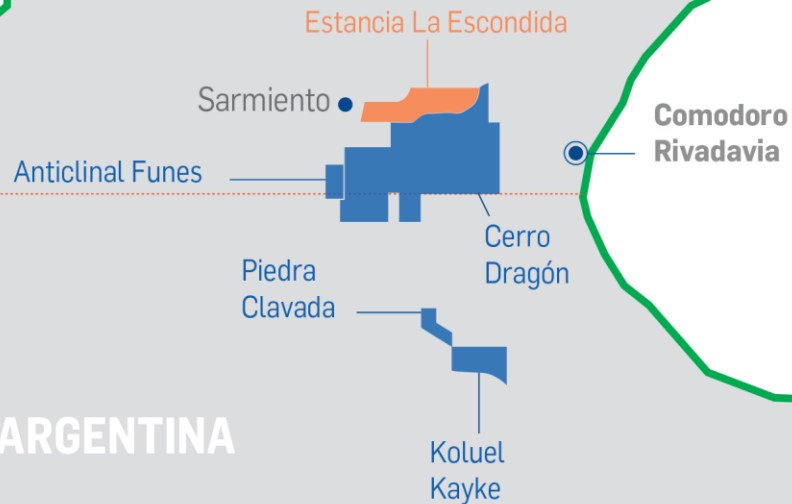
ARGENTINA

SANTA CRUZ

- Operated asset
- 3rd Party Operated Asset

3.480 Km²
Surface area

86.181.109
Km traveled:
(Over the past 12 months)



Cerro Dragon



94,4 Mbopd
Oil Production



299,13 MMcfd
Gas Production

176,40 MMcfd
Gas Sales



3.564
Active producing wells



763
Injector wells

1.242 Mbpd
Water injection



1958 (Amoco)
Acquisition date



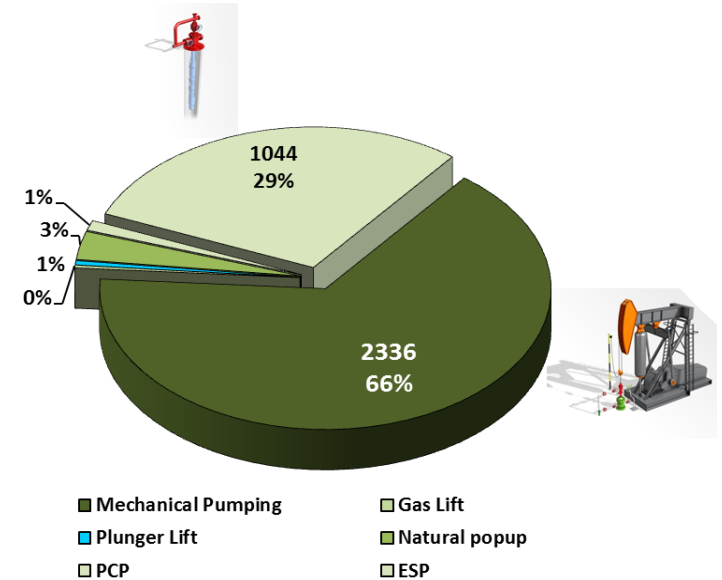
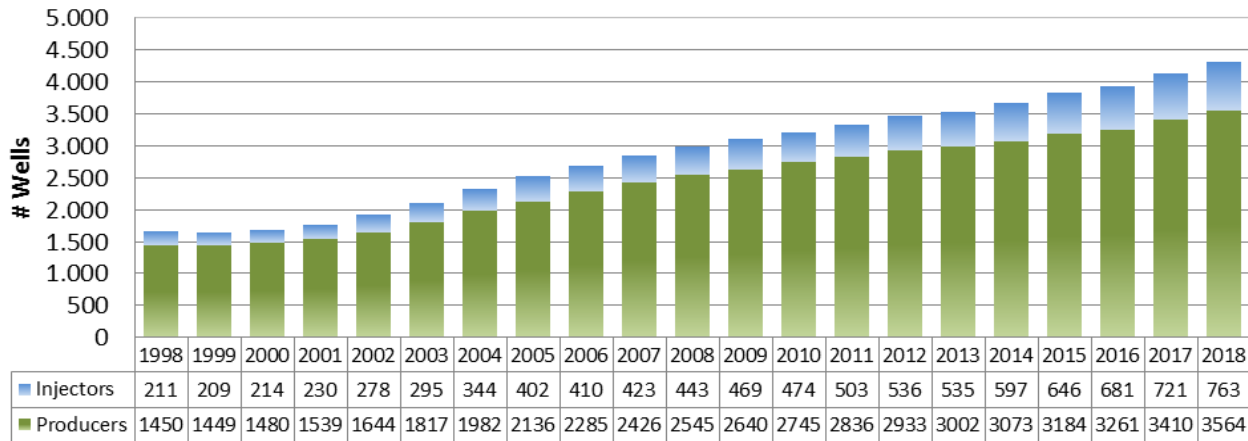
7.880
Employees
(PAE + Contractors)



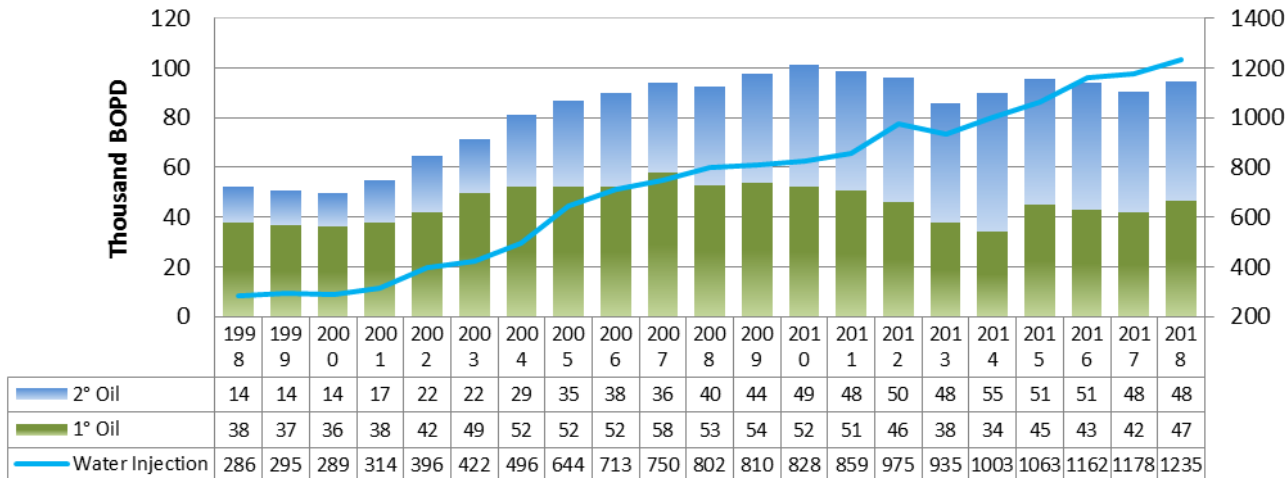
3.456
Vehicles

Cerro Dragón

Producer and Injector Wells



Oil Production



Drilling Services

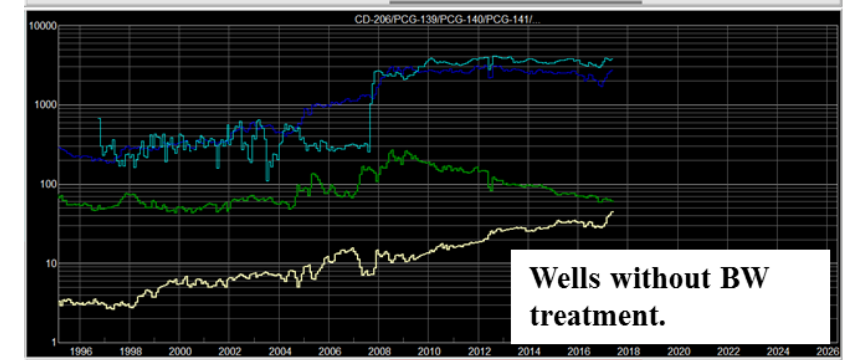
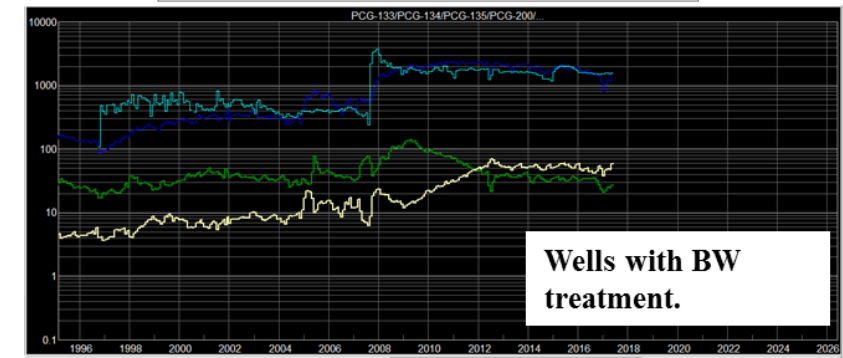
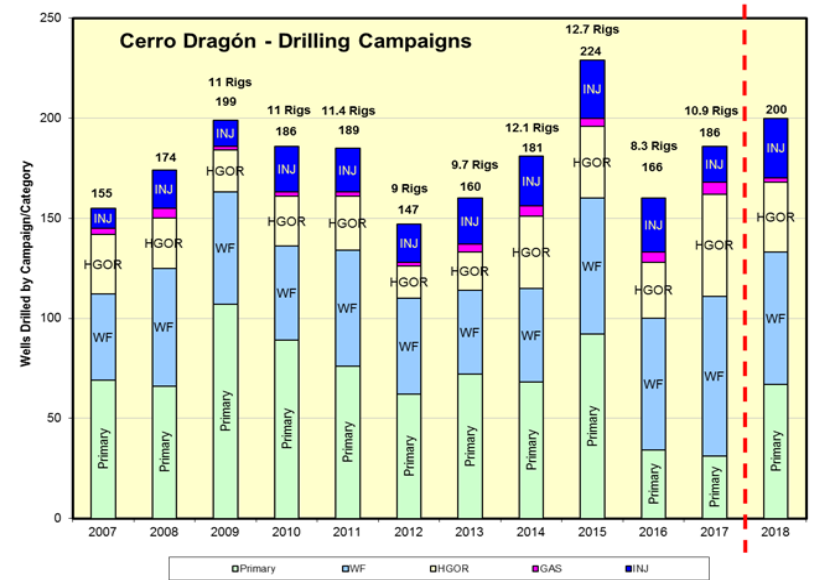
- 12 Drilling Rigs
- 19 WO Rigs
- 16 Pulling Units
- 5 Hydraulic Frac Sets (Stages Guaranteed)
- 1 Coiled Tubing Unit
- 8 Cementing Sets
- 5 Wire Line Units

CD - Development Plan. Creating Value for all the reserves

- 2018: 202 New Wells. Improvement of efficiency in drilling and completions tasks.
- 160 wells/year are necessary to keep flat the field production.
- 1220 Locations P1 Oil, HGOR and WF.
- More than 200 new wells have to be drilled/year
- Better understanding of type of fluid in the reservoir.
- Lower testing time/well.
- Higher numbers of hydraulic frac jobs per well.

- Improvement of WF projects based on simulation
- Up to 2 MM bls/d Capacity to process fluids.
- Improvement the efficiency in the water injection
- Selective water injection up to 20 individuals layers.
- Improvement the water injection quality
- Conformance: match the WI/layer with the study prediction
- Improvement the efficiency on SWIP

- EOR, Improvement of WF projects
- 2 Pilots projects of Bright Water show 2,4% increasing of RF
- 10 New Projects of BW 2018/2020.



NEUQUINA BASIN



Tight Gas Full Development

Shale Oil & Gas Delineation / Pilots & Development

Lindero Atravesado (op.)

Tight gas Development +100 vertical wells drilled, average depths of 4200m. New facilities built. First horizontal well in VM to be drilled during 2018

Bandurria Centro (op.)

Shale oil Pilot Project currently on going. EPF under construction. First tight gas well drilled.

Coiron Amargo (op.)

Two re-entries in existing well in VM shale oil (1500 m drain) completed and producing.

Aguada Pichana Oeste – Aguada de Castro (op.)

Pilot Project on going – first gas since 27th April 2018

Aguada Cánepa (op.)

Partnership with GyP for shale oil exploration.

Aguada Pichana Este

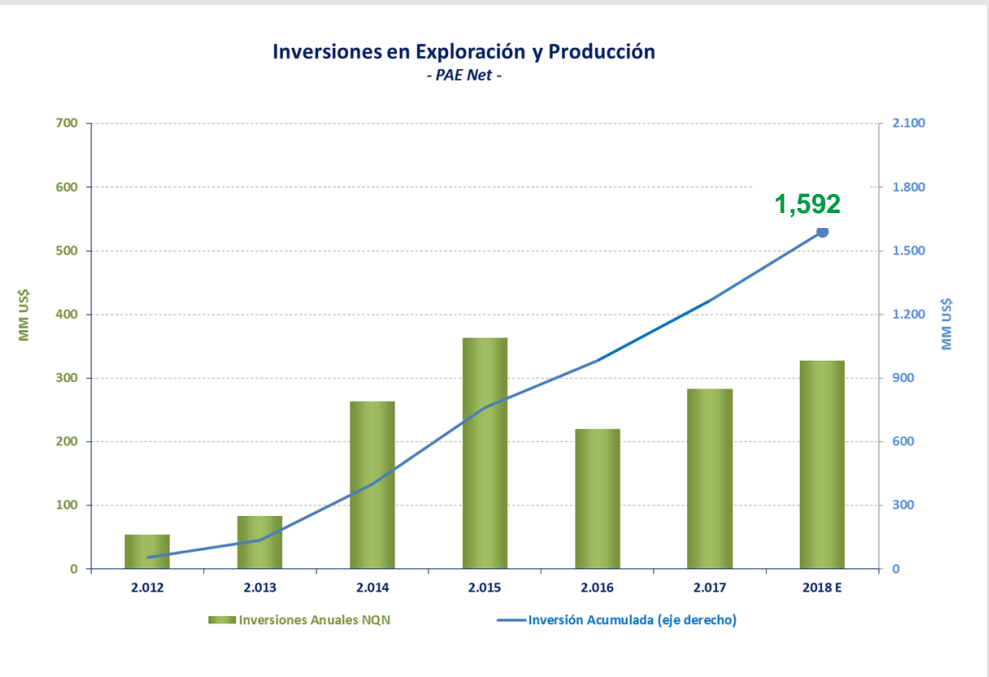
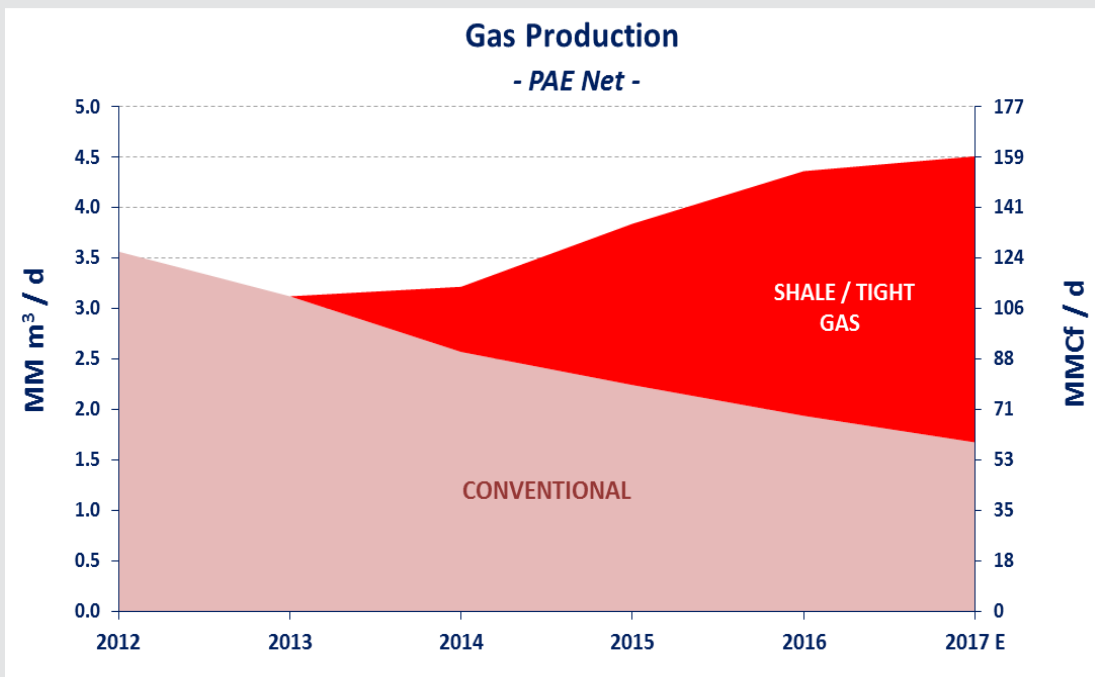
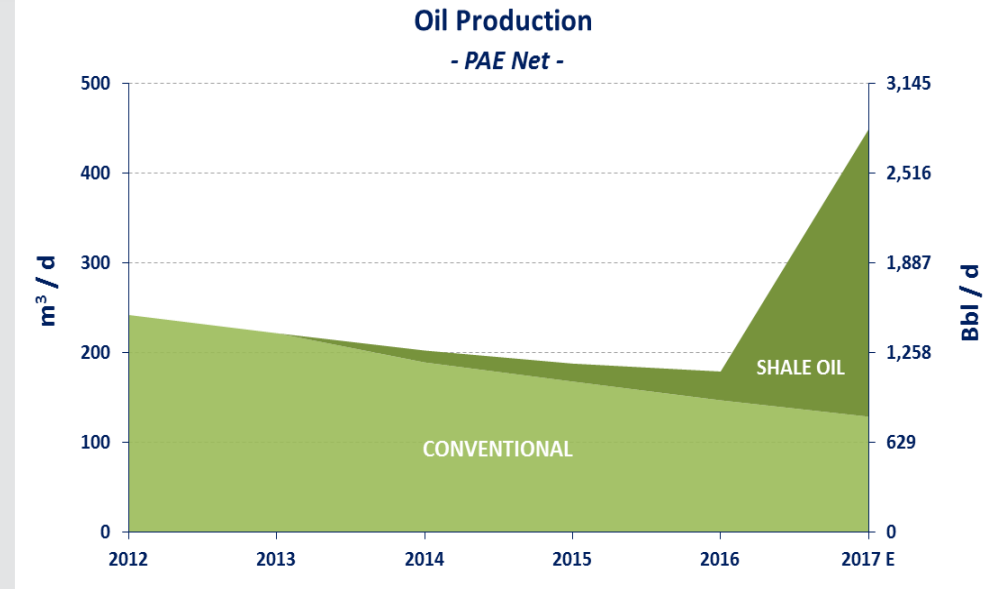
Tight Gas & Shale Gas Pilot Projects completed. Phase 1a of Full Development ongoing

San Roque

First shale oil PADs drilled

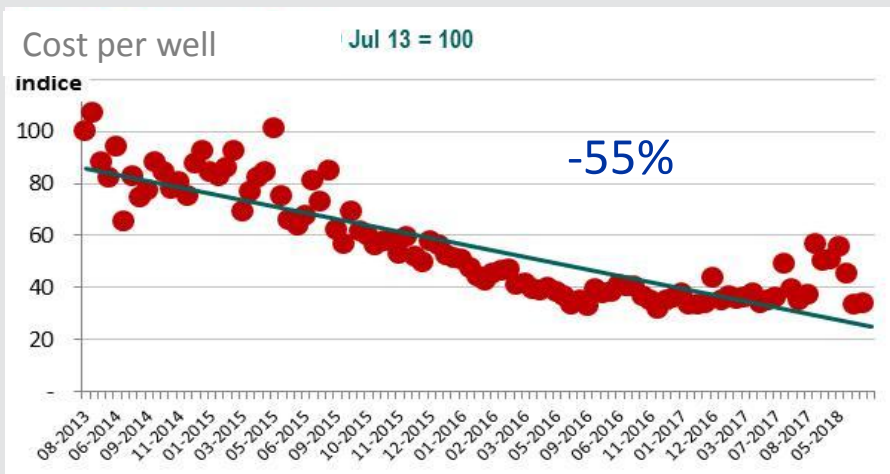
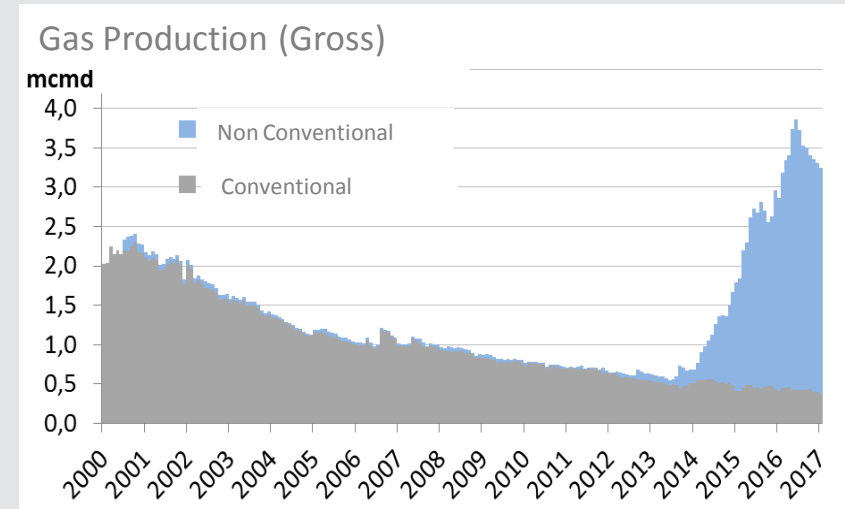
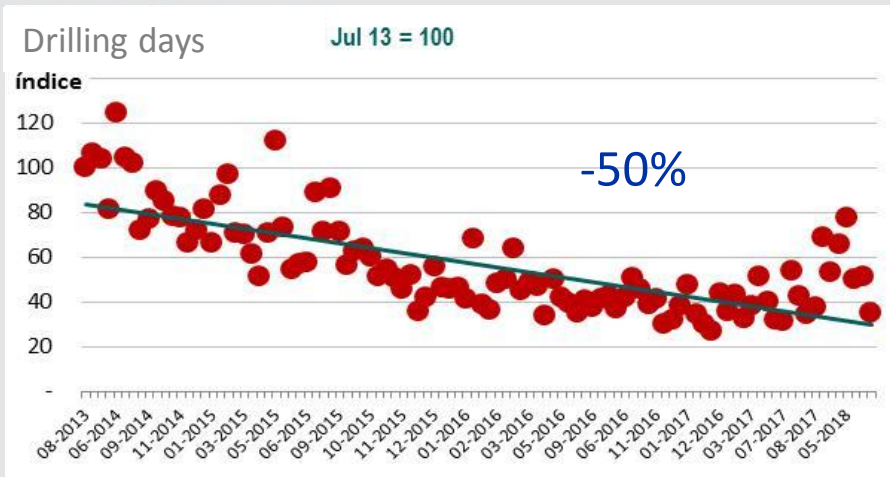
HOW WE ARE DOING IT

Pan American Energy's activity indicators in unconventional



HOW WE ARE DOING IT

UNCONVENTIONAL EFFICIENCY IMPROVEMENT



Main Highlights

Operational Optimization & Technology

- Incorporation of drilling rig with *walking system*
- Switched from Water-Based-Mud to Oil-Based-Mud in intermediate and productive sections
- Switched to *Factory Model*, drilling multipad wells
- Use of sliding sleeves technology for annular fractures

Logistics

- Direct purchase of massive consumption products (frac sand, mud products, others)

FUTURE CHALLENGES

Unconventional Sizing of Future Activity



Future Activity for Unconventional Resources is estimated in the need of 39.000 new wells

- The Neuquina Basin is considered a World Class Unconventional Play not only for the VM Fm, in terms of both shale oil and shale gas, but also for the tight gas potential in the Grupo Cuyo and Los Molles Fm.
- The VM Fm extends along an area in the range of **30,000 Km²** (7,4 MM Acres)
- VM depths ranges +/- 3000 mts (10.000 ft).

wells by oil and gas windows

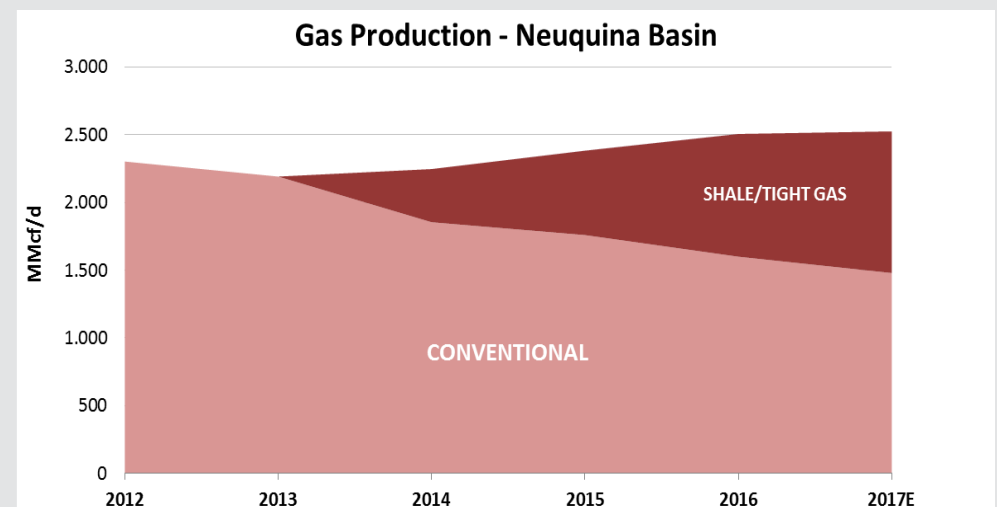
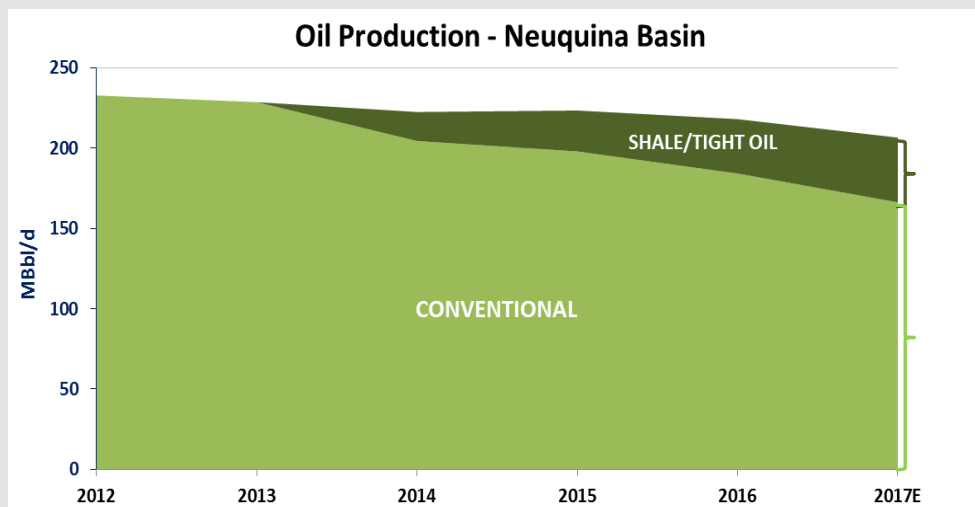
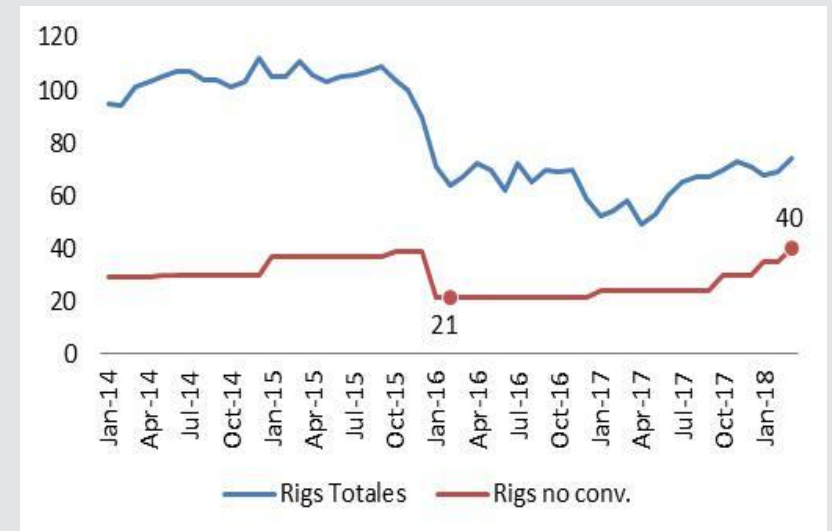
	Surface		Density (Acres/well)	% Development	# WELLS
	Total	Perforable			
Grupo Cuyo 1	49	49	40	100%	300
Grupo Cuyo 2	65	65	40	100%	400
TOTAL TIGHT					700
VM DRY GAS	7.564	4.787	140	87%	7.320
VM WET GAS	2.278	1.660	100	100%	4.101
VM OIL 1	4.315	2.815	80	100%	8.690
VM OIL 2	3.783	2.400	80	100%	7.410
VM OIL 3	5.962	4.431	80	50%	6.841
TOTAL VM	23.902	16.094			34.362
LOS MOLLES	2.877	2.877	180	100%	3.948

FUTURE CHALLENGES

Unconventional Sizing of Future Activity

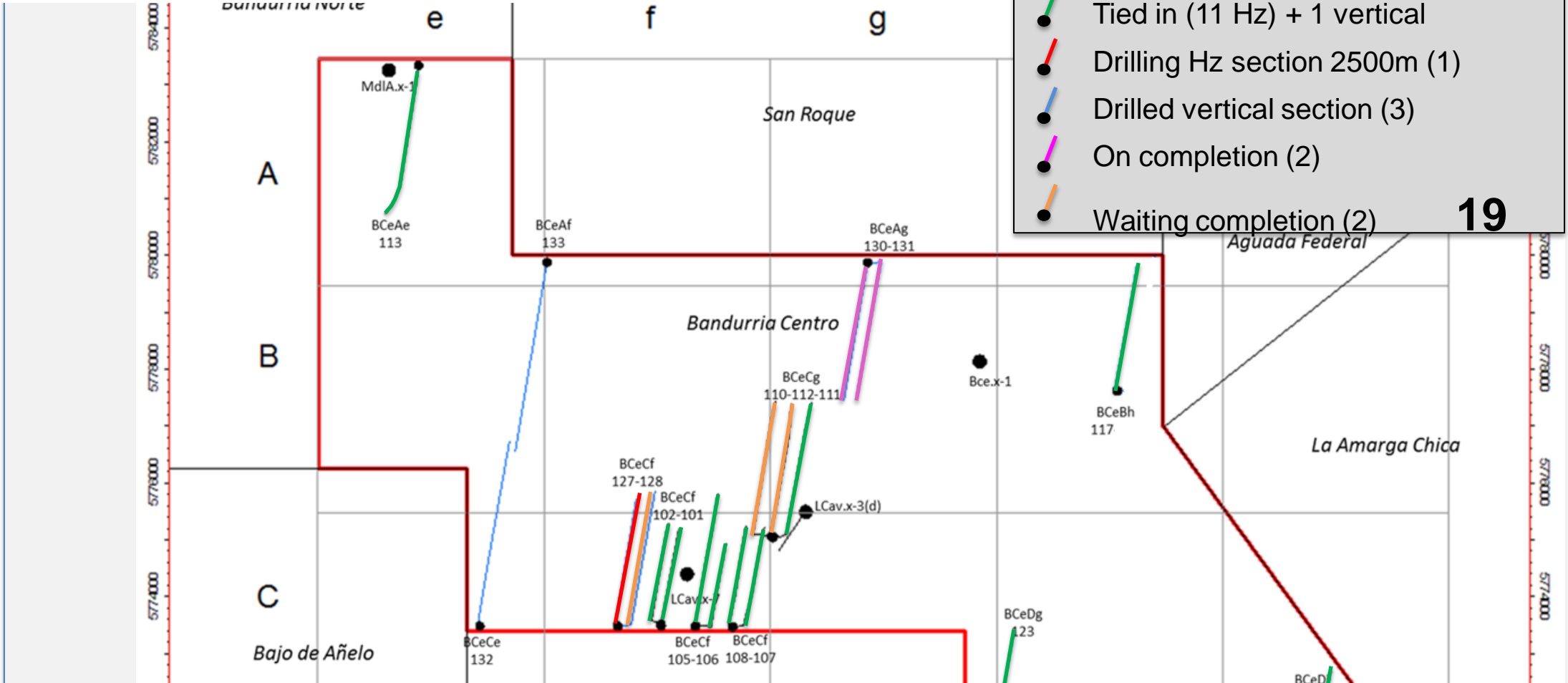
Despite that unconventional developments in Argentina are at its early stage the production and activity has increase during the last four years.

Several tenders for new rigs are currently undergoing increasing the rig count from 35 to 40

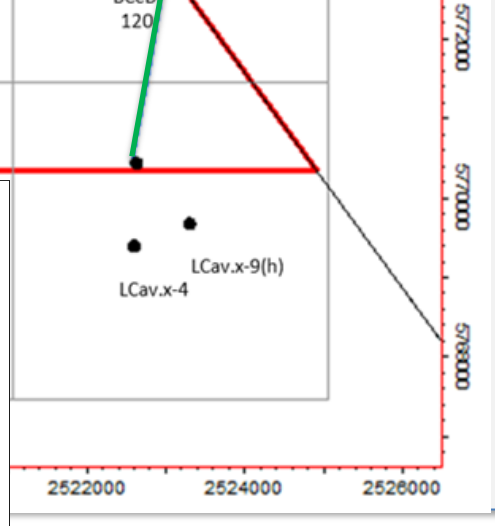
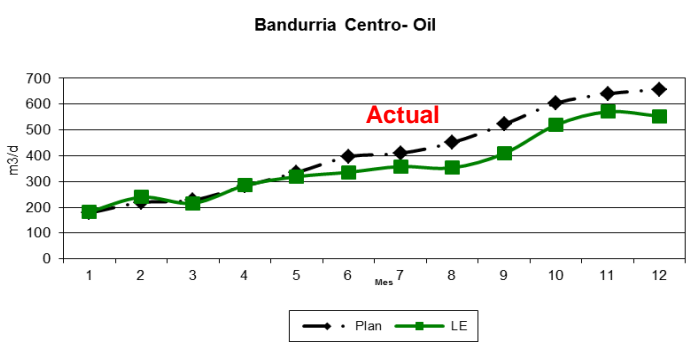


VM Shale Oil wells

1000 2512000 2514000 2516000 2518000 2520000 2522000 2524000 2526000

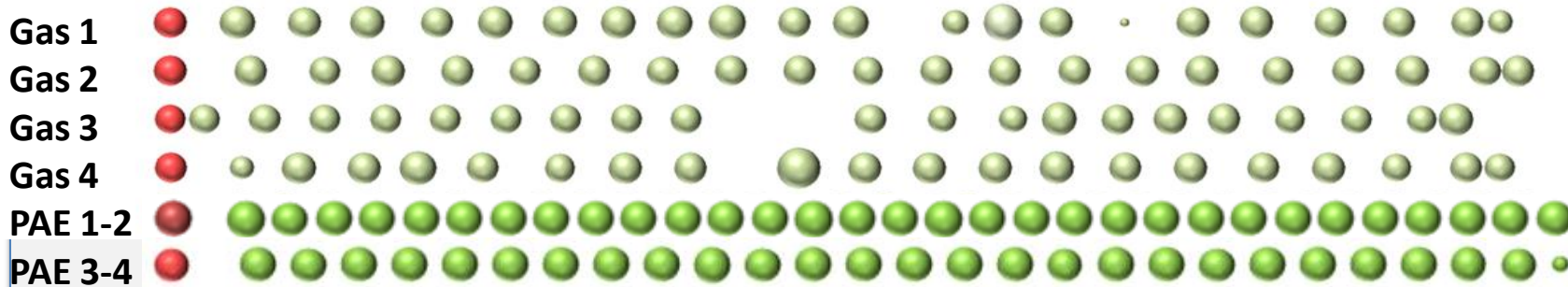


Nombre	Hz Drain	GOR	EUR 01/6/2018		
			MMBbl	BCF	MMBoe
POZO	m	m3/m3			
BCE-101h	1500	300	0,405	0,68	0,523
BCE-102h	1500	300	0,319	0,54	0,412
CAS-15h	900	40	0,264	0,00	0,264
CAS-14rh	1500	40	0,556	0,12	0,577
BCE-105h	2000	300	0,571	0,96	0,737
BCE-106h	1200	300	0,301	0,51	0,388
BCeCf-107h	1500	300	0,397	0,67	0,512
BCeCf-108h	1500	300	0,545	0,92	0,703
BCeDi-120h	1680	150	0,66	0,56	0,756

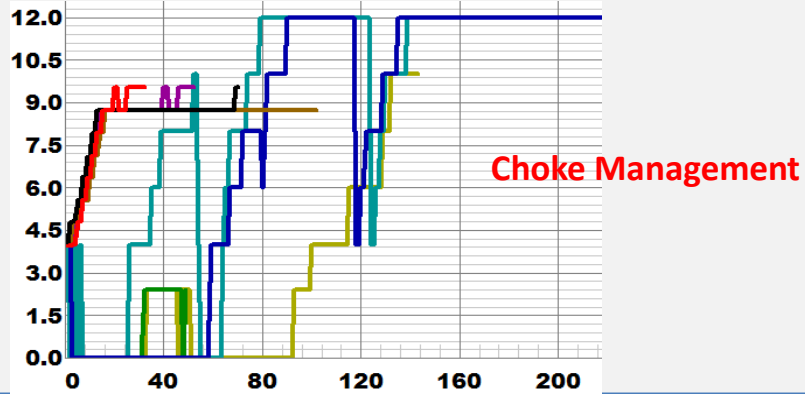
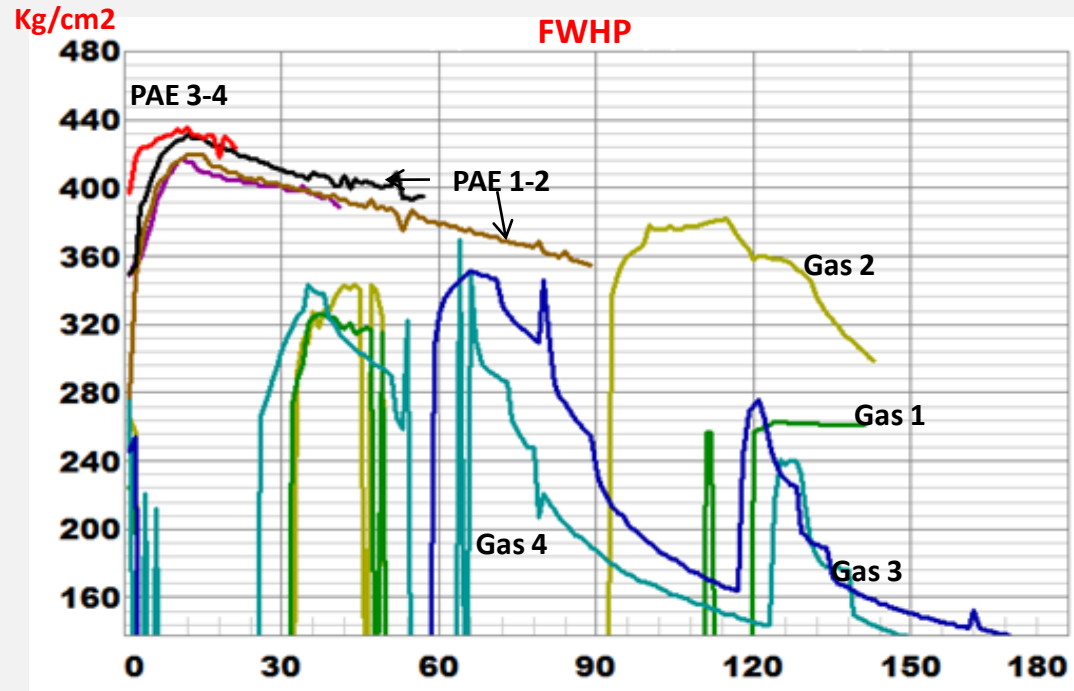
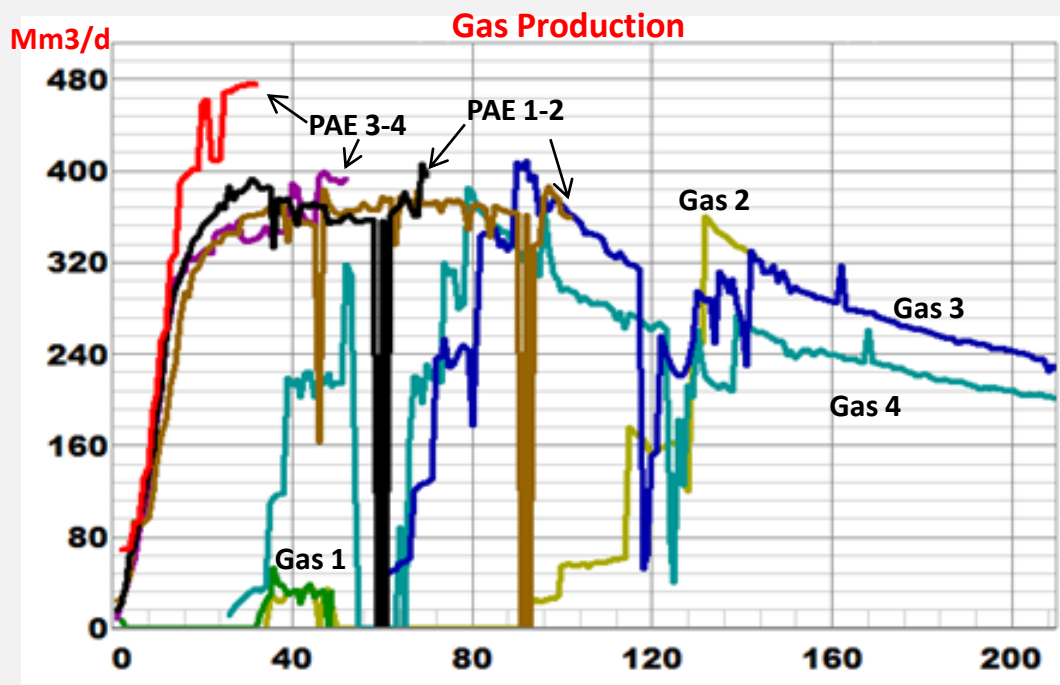


19

VM Shale Gas wells 2000 m Horizontal Drain

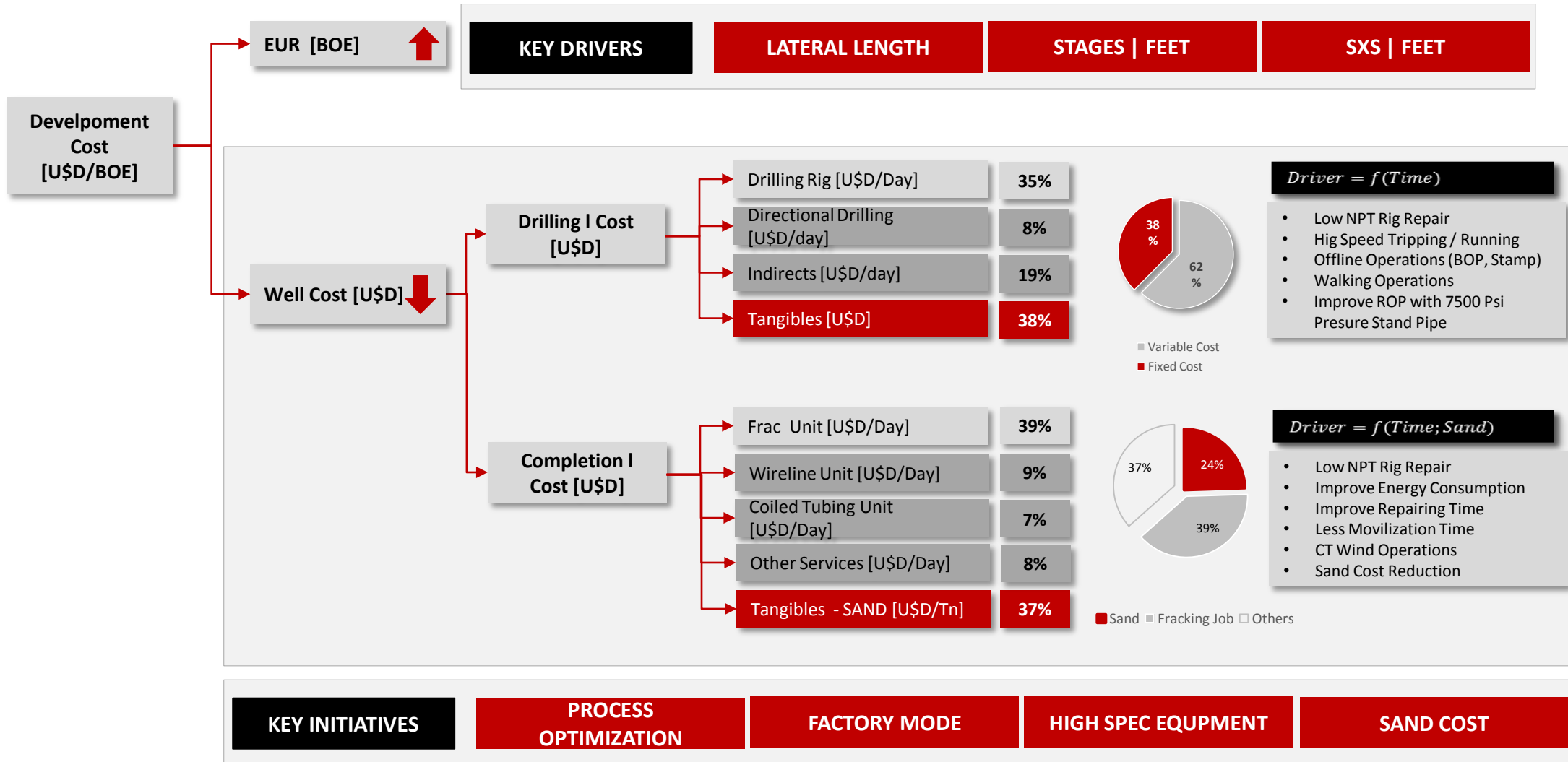


98.1 M s/p – 1542 lb/ft
 97.4 M s/p – 1513 lb/ft
 81.1 M s/p – 1323 lb/ft (16 Bcf)
 93.4 M s/p - 1473 lb/ft (15 Bcf)
 143.9 M s/p – 2208 lb/ft



UNDERSTANDING KEY DRIVERS

WAYS TO REDUCE DEVELOPMENT COST





FUTURE CHALLENGES

Unconventional Development

- We are in the right direction in terms of improving efficiency
- All players need to look for sensible and realistic solutions
- A joint effort which should involve all industry players: operators, contractors/suppliers, unions, provincial and federal governments.

Hydrocarbon Producers and its Production Chain:

Efficiency improvement, in order to allow more development projects to be carried out. We are working in the **contract services focused on efficiency, including variable rates subject to productivity.**

Increase amount of Operators and its productive environment. More competition should be generated. In the meantime the industry should continue working with suppliers looking for efficiency through tasks' standardization and rationalization.



FUTURE CHALLENGES

Unconventional Development

Reach a higher level of technical & geological knowledge required for these type of developments.

New service companies willing to arrive to Argentina will have the chance to work in an environment with growing activity

Unions:

- Are called to take part in this challenge by working in continuous improvement of efficiency and social peace.
- Without this compromise, it will be very difficult to maintain the activity levels.
- By improving work productivity new genuine jobs will be created.

Provincial & Federal Governments:

- We understand that the role of the State is to create conditions that will provide for a more competitive environment for the industry.
- This requires a huge rationality and effort in order to align the regulations with the requirements of sustainability that needs VM for the development of the country.

A photograph of an oil drilling rig in a desert landscape. The rig is a tall, yellow and red structure with a derrick, situated in a flat, arid area with sparse vegetation. In the background, there are low hills and a clear sky. The rig is surrounded by some smaller structures and equipment.

FUTURE CHALLENGES

Unconventional Development

- *Unconventional Development is at an early stage, there is a lot of work to be done.*
- *We are still learning about geology and well productivity.*
- *VM sweet spots are yet to be determined and we are still developing and testing the appropriate techniques for such developments.*
- *We should assume that our competitiveness level still needs a fast and full improvement.*
- *The gap in efficiency and costs that separates us from more competitive international producers is still broad.*
- *With focus in the long term, we should work together in order to reach the above mentions standards.*

Pan American
ENERGY

The logo for Pan American Energy, featuring the text "Pan American" in blue and "ENERGY" in green, with a red horizontal bar below the word "ENERGY".

SPE Neuquén, August 2018