

26th World Gas Conference

1 – 5 June 2015, Paris, France

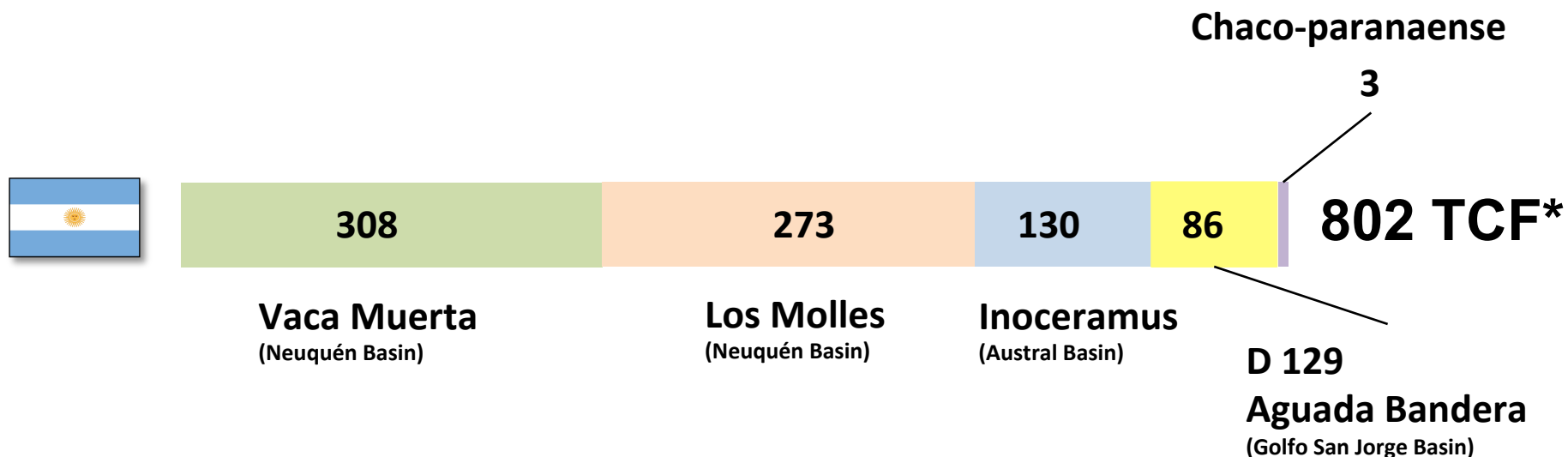


The case of Vaca Muerta

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Major Shale Gas Formations in Argentina



Vaca Muerta - Argentina



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Vaca Muerta
(Neuquén Basin)

Argentina: first steps

Vaca Muerta



- 30.000 km².
- Average depth: 3000 meters.
- Thickness over 400 meters.
- It's the source rock for most of the oil and gas in Neuquén.
- Province with low population density.

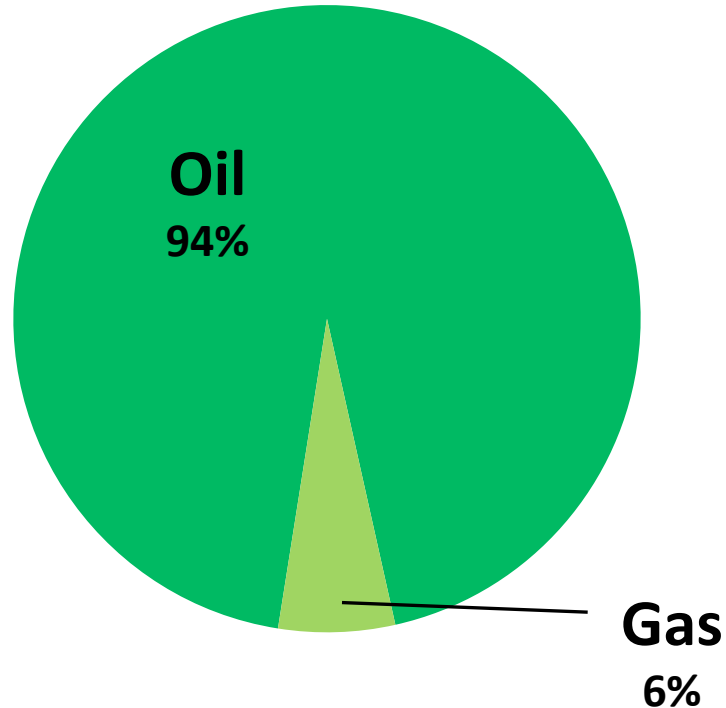
Vaca Muerta



**Loma Campana Field
(Neuquén – Argentina)**

Unconventional Drilling Activity

412 wells

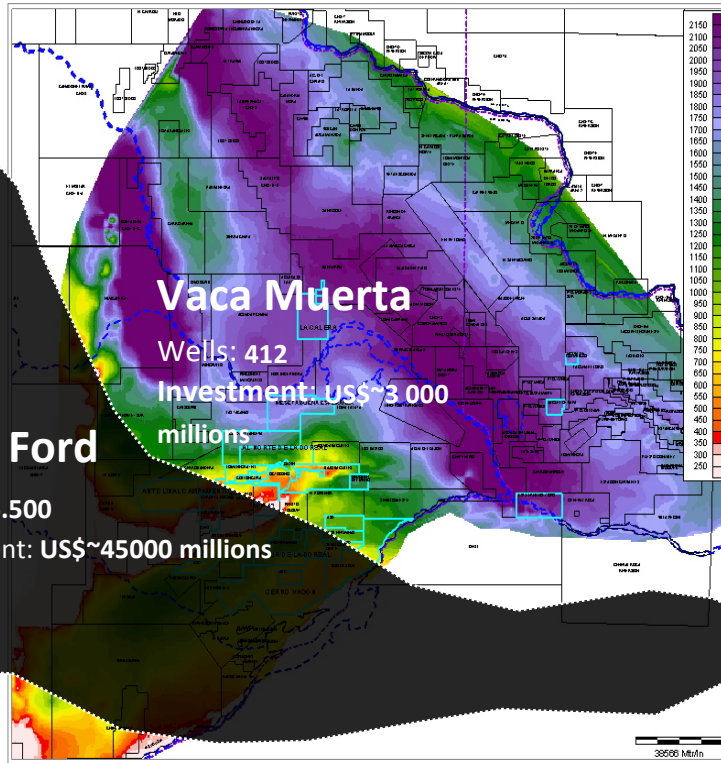


✓ Mostly vertical wells (91%) ,
with five fracture stages.

✓ 94% oil wells.

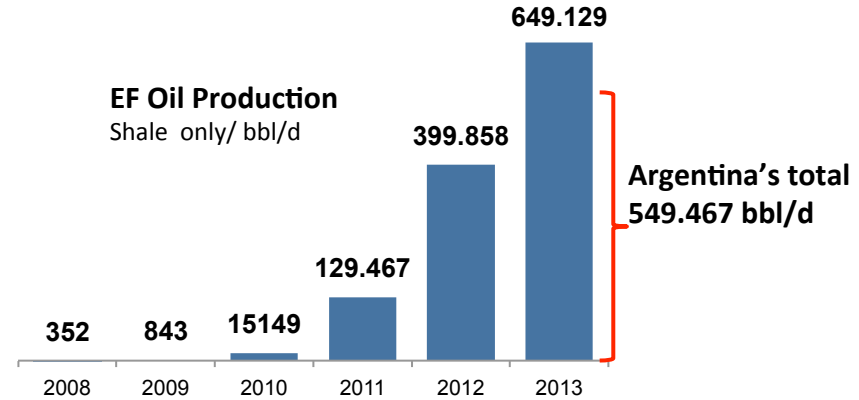


Vaca Muerta vs. Eagle Ford

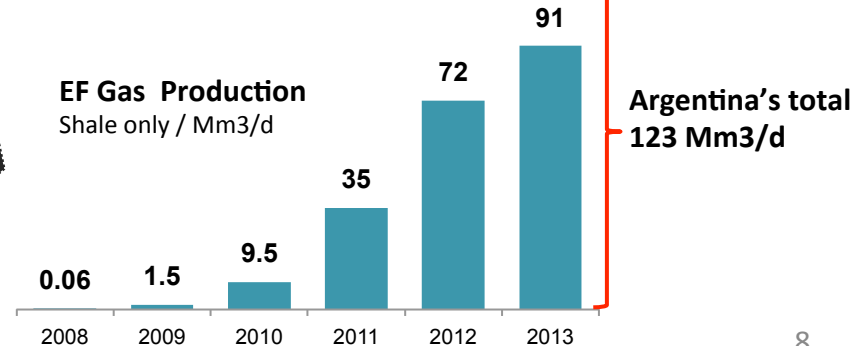


Source: Railroad Commission of Texas Production Data Query System (PDQ)

EF Oil Production
Shale only/ bbl/d



EF Gas Production
Shale only / Mm3/d






Barriers and Challenges





1 Needs for a new Legislation

Amendments over the Hydrocarbons Law

 Legislation is mandatory for all Provinces.

 Sets new terms for concessions, differentiating by type of operation: 25 years for conventional, 35 for unconventional and 30 for off-shore.

 Provinces can extend the concession for an additional 10 year term based on present and future investment plans.

 Increase in royalties allowed up to a maximum of 18%.

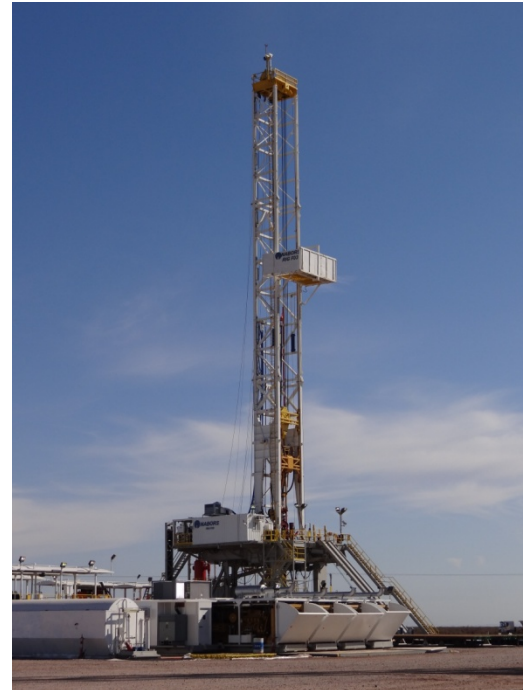




2 Logistics

Logistics

- ✓ Plants, Pipelines, etc.
- ✓ Roads.
- ✓ Transport.
- ✓ Drilling Rigs and Fracking Equipment.
- ✓ Tubulars, Well Heads, others.
- ✓ Water availability and management.
- ✓ Sand availability and management.

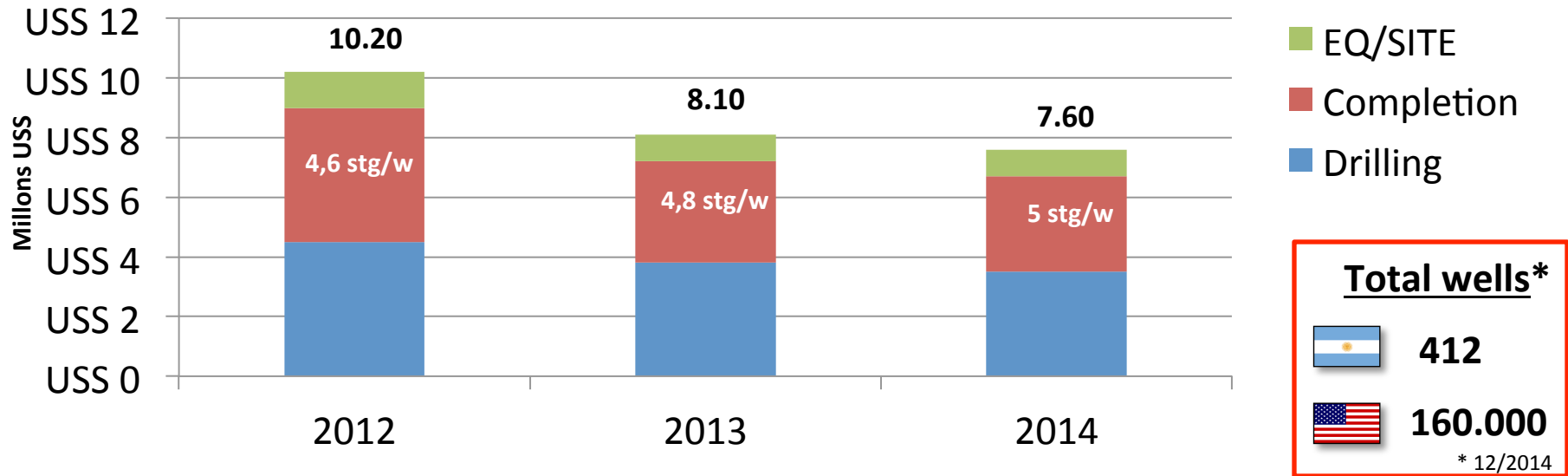


Other Challenges

- ✓ Financing.
- ✓ Investment environment.
- ✓ Access to markets.
- ✓ Costs and Productivity.
- ✓ Technical and operational staff.



Well Cost – Drilling & Completion



Bakken: M US\$ 8 - 12 (10.000 feet Vert. + 8000 feet Horiz.)

Haynesville: M US\$ 9 - 10 (11.300 feet Vert. + 4800 Horiz.)

Eagle Ford: M US\$ 5,5 – 9,5 (9000 - 16000 f. V. + y 5000 – 7000 f.



3 Access to Markets: Natural Gas Infrastructure

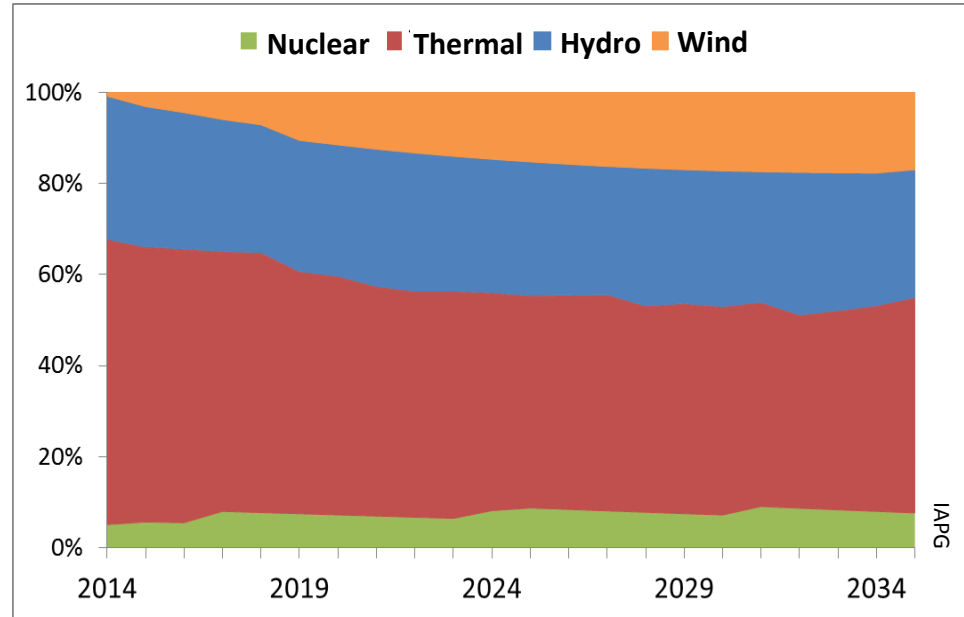
Increase in Transport

- ✓ Natural gas demand will reach 230 MMm³/d with a peak of 290 Mm³/d.
- ✓ Up to 8000 km of new pipelines.
- ✓ 1.3 millions HP of incremental compression capacity.
- ✓ Revamping of existing infrastructure.
- ✓ Total investment in 20 years: up to 22.000 MMUSD.



Increase in Power Generation

- ✓ Around 40.000 MW will be incorporated into the system.
- ✓ The incorporation of new CCGT will increase the system flexibility allowing to install around 11.000 MW of renewables, representing a 17% of the total generation.



Increase in Distribution

- ✓ 5.1 of new End Users (from 8 to 13 millions).
- ✓ 87.000 km of new distribution lines.
- ✓ Reworks on internal installations.
- ✓ Total investments in 20 years: 20.000 MUSD.





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The road to the Social License

Starting Point

- ✓ The community had little information about the industry.
- ✓ Old fashion vision (“dirty” industry).
- ✓ Lack of knowledge regarding technological and environmental developments.
- ✓ Little trust over control authorities.
- ✓ Distrust over foreign operators.
- ✓ Active anti-capitalist movements using the environment as a battlefield.



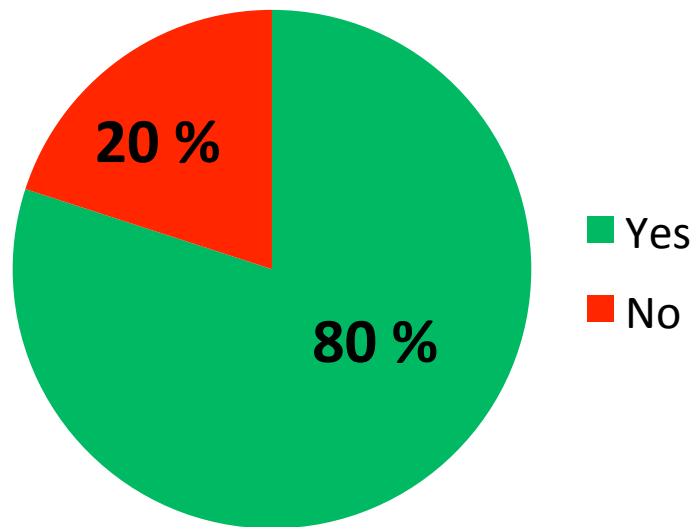
Work Done

- ✓ Technical and non technical publications.
- ✓ Dedicated web page.
- ✓ Positioning IAPG web sites on Google and others.
- ✓ Presentations at Universities, Town Halls, and Chambers.
- ✓ Meetings one on one with the Press.
- ✓ Articles in national and local newspapers.
- ✓ Radio and TV interviews

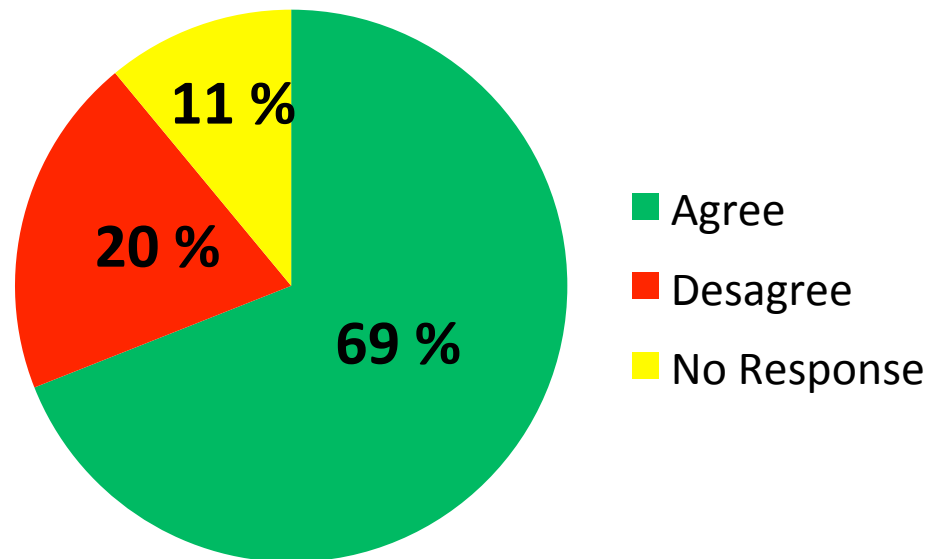


Last Poll in Neuquen

Have you heard about Vaca Muerta?



Are you in agreement with the Exploitation of Vaca Muerta?





Next Steps

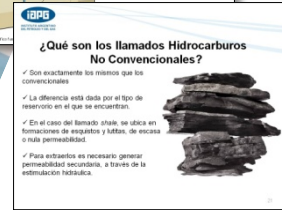
Next Steps: Logistics

- ✓ Committees of operators to analyze cost reductions.
- ✓ Revamping of existing railroad infrastructure.
- ✓ Increase in activity.
- ✓ Local content of equipment and services.
- ✓ Local sand use.
- ✓ Water infrastructure.



Next Steps: Comunicación

- ✓ Energy Education programmes for secondary schools.
- ✓ Schools contests on energy and environment.
- ✓ New and shorter Engineer Programmes.
- ✓ Creation of an Institute for Economic Development.
- ✓ Social and Economic Impact studies.



Final Thoughts

- ✓ Shale gas development is not an easy task.
- ✓ The logistic are complex.
- ✓ The availability of equipment and products might be difficult.
- ✓ Human Resources are a bottleneck.
- ✓ There is a permanent need to work towards a social license.

Thank You



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