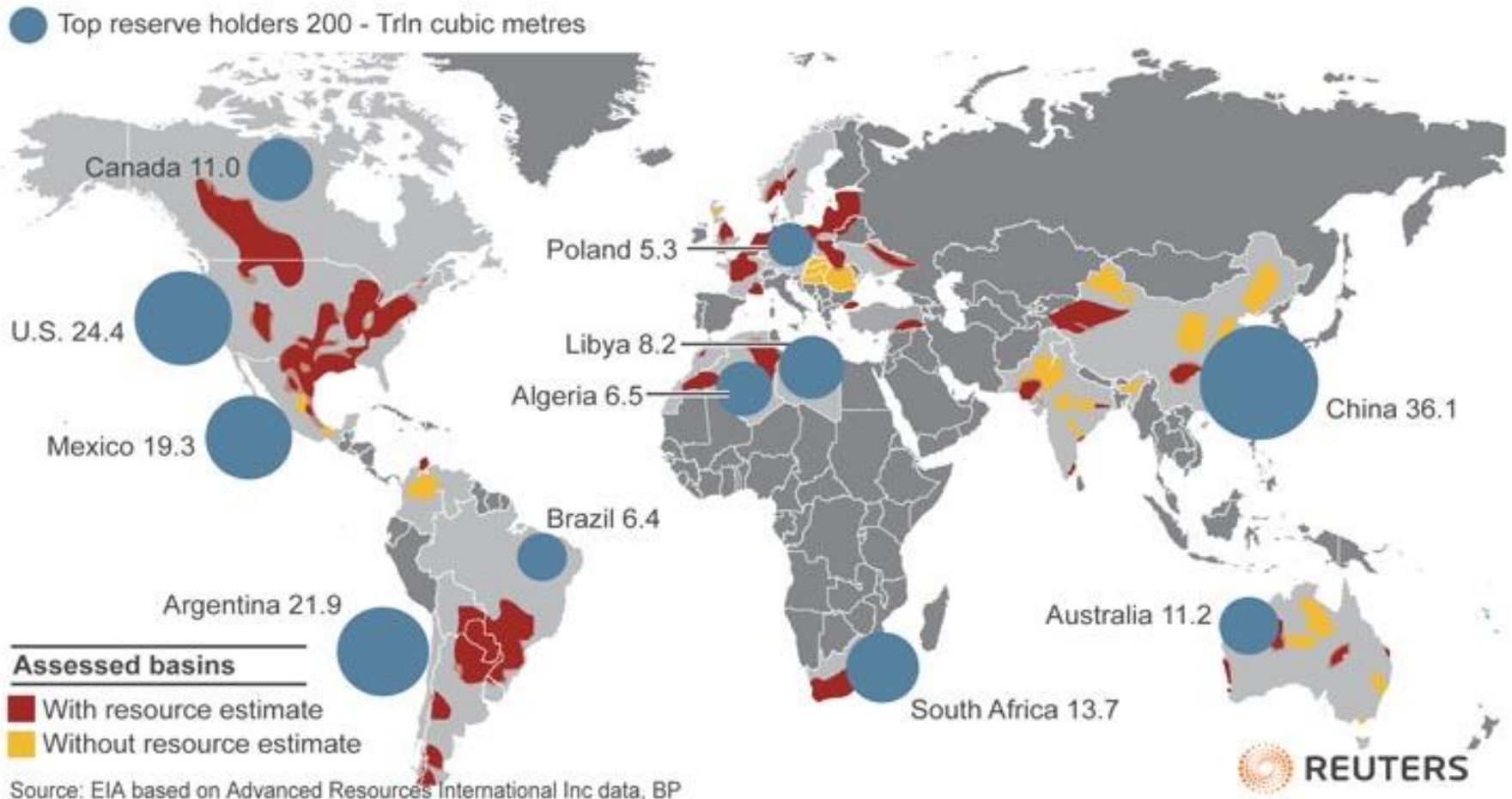


Effects of the North American Shale Revolution in Latin America

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Mapping a new energy resource:

Global shale gas basins, top reserve holders

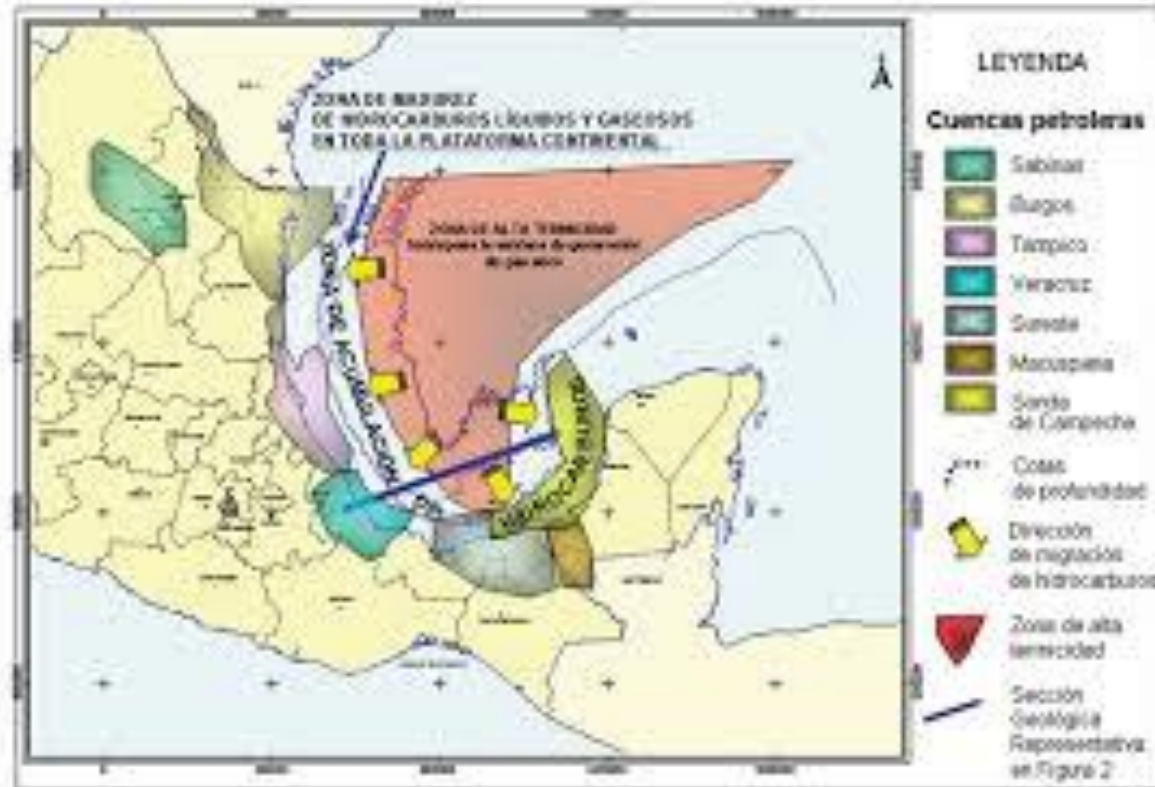


Enigma until 2013 path-breaking energy reforms are implemented and therefore evaluated

Peak in 2004 at 3.5 m/b/d;
fall to 2.5 m/b/d 2013-4.

Three main types of crude:

- 1) Mayan: heavy, sour produced offshore and mostly exported to U.S.
- 2) Istmo: light, less sour and produced off and onshore mostly for local consumption.
- 3) Olmeca: superlight and sweet produced onshore for local consumption.



Colombia: the latest darling for oil prospectors

Big growth potential in oil, natural gas, coal and sugar-based ethanol.

Fourth largest world coal exporter: privatization of industry in 2004. Significant Chinese interest (talk of construction of 'dry canal'). 25% of total export earnings.

Diversified energy matrix in power-generation led by hydro, which can expand substantially.

Market opening of Ecopetrol (oil and gas) following Brazil example in 2000.

Less intense social and political conflict than in past but it remains very significant in some regions.



Venezuela

Top ten world oil producer,
founding member of OPEC (1960).

A petroled economy and a petro-
state: more than $\frac{3}{4}$ total export
revenues; $\frac{1}{3}$ of GDP; 50% of total
government revenue; PdVSA,
largest employer in the country.

Great natural gas and hydro
potential growth: an energy
powerhouse more broadly:
significant bets on LNG.

Energy resources will remain
strongly politicized and resource
nationalism is part of country's
psyche.



Brazil: hubris and need for correction?

- Could be 4th largest oil world producer if pre-sal reserves are exploited according to plan.
- Legal framework change in 2010 coupled with shale revolution tamed the flair and enthusiasm for pre-sal.
- Petrobras is overburdened and cannot fulfill its dual mandate (business and development).
- Brazil will remain a growing importer of natural gas and has plan to develop its significant shale reserves in Minas Gerais and Paraná.



Argentina: mismanaged energy powerhouse

Oil production and future sources: in blue – Neuquén and Chubut (Golfo San Jorge). Among largest proven shale reserves in the world.

Significant potential offshore in South Atlantic.

Gas production: blue – Neuquén; red – Salta; blue – Santa Cruz and Tierra del Fuego.

Hydro: brown – Buenos Aires. Santa Fe, Entre Rios, Corrientes, Misiones; blue – southern provinces.

Wind: blue – southern provinces.

Biofuels: red – Tucumán, green – Santiago del Estero, Corrientes, Misiones.

Nuclear: brown – Buenos Aires and Córdoba.

Map source: Tulane University

