DEBUNKED: THE PROMISE OF ARGENTINA'S VACA MUERTA SHALE PLAY

GREENPEACE

This report was researched and written by Ingo Boltz and Paul Horsman of Greenpeace with contributions from Lorne Stockman of Oil Change International. It was edited by Collin Rees of Oil Change International.

We are grateful to Obervatorio Petrolero Sur (OPSur) for their review, support and work.

Design: paul@hellopaul.com

Unless otherwise noted, all references were accessed on May 23, 2018.

Cover Image: Fracking plant, Rio Negro. ©Paul Horsman/Greenpeace.

June 2018.

This report is one of two reports published simultaneously that question the ongoing push for expanding fossil gas production in G20 countries. Both reports debunk the notion that gas is a clean fuel, and that it is essential for transitioning to a climate safe energy future.

This report, 'Debunked: The Promise of Argentina's Vaca Muerta Shale Play,' focuses on the myths surrounding the development of shale gas in Argentina, particularly the Vaca Muerta shale play. It is published by Greenpeace Andino. The partner report, 'Debunked: The G20 Clean Gas Myth,' focuses on fossil gas development in the G20 and debunking the myth of fossil gas as a clean transition fuel. It is published by Oil Change International and can be found here: http://priceofoil.org/debunked-g20-clean-gas-myth

CONTENTS

Pipeline construction, Loma Campana. ©Jesus Rolle/Greenpeace

INTRODUCTION

"The time spent investing in the development of wind energy for Argentina would be significantly shorter than fracking in Vaca Muerta, which requires a high level of investment."

"[With the money we now spend on fossil fuel subsidies] we can improve education, security, welfare, we can help lift people out of poverty. Subsidising the supply is no longer a rational move [...] It's more efficient to generate wind energy than to burn imported diesel oil in inefficient engines."
Juan José Aranguren, current Argentine Minister of Mining and Energy and former CEO of Shell Argentina, 2015[1]

When Argentina's President Mauricio Macri assumed the presidency of the G20 last year, he chose "Building Consensus for Fair and Sustainable Development" as the overarching theme, with "Infrastructure for development" and "Taking responsibility on climate action" as key working areas.

Considering that Argentina boasts one of the world's best wind resources in Patagonia[2] and excellent solar irradiation,[3] it would be reasonable to expect that wind and solar be prioritized for development when it comes to energy infrastructure. This would be an appropriate response to the need for energy independence and development, while at the same time protecting the climate and creating sustainable jobs.

However, since the discovery of huge shale oil and gas reserves in Patagonia's Vaca Muerta formation, successive Argentine governments have been promoting these fossil fuels – particularly fossil gas[4] – as a so-called 'clean' energy solution. President Macri claims that developing Vaca Muerta is "the country's way to have energy and grow.[5] But there is no such thing as a 'clean' fossil fuel. This report, alongside a simultaneously published report entitled 'Debunked: The G20 Clean Gas Myth,' debunks the myth of clean gas as a dangerous fantasy standing in opposition to meaningful action to address climate change.[6]

Vaca Muerta contains the world's second-largest shale gas and fourth-largest shale oil reserves, and these vast reserves have attracted significant international attention.[7,8] Drilling activity has increased in the past three years, and 2018 shale gas production is expected to nearly triple that of 2015.[9]

However, while the current and previous Argentine governments have talked of a potential fossil gas boom, there are serious questions about why Argentina would choose to further pursue extreme fossil fuels as a priority, despite the well known and dangerous global climate impacts.

Furthermore, little attention has been paid to the economic risk of investing in major new fossil fuel reserves at a time when the world is moving away from these fuels to protect the climate, and when massive financial and technological resources are rapidly reducing renewable energy costs. There has been a dangerous lack of public discussion about the potential losses taxpayers could face if public investment in oil and gas infrastructure – such as the controversial Vaca Muerta cargo train proposed to bring sand, chemicals, equipment, and more to the oil and gas fields – ends up as stranded assets.[10]

Finally, while there has been a strong political push to develop Vaca Muerta as a 'solution' to Argentina's dependence on fossil gas in its energy mix, little mention has been made of the enormous energy savings potential available by expanding energy efficiency programs, such as incentivizing upgrades to the country's heating infrastructure.

This report makes clear that for Argentina, its shale gas:

- Must not be developed to avoid breaking its Paris Agreement obligations;
- Should not be developed to avoid burdening future generations with billions of dollars in stranded assets; and
- Does not need to be developed to serve Argentina's energy needs, which can be met with clean, viable, and economically sustainable solutions that are readily available.

1 Marina Aizen, "How the former head of Shell Argentina turned to clean energy," The Guardian, Sept. 22, 2015. https://www.theguardian.com/environment/2015/sep/22/how-the-former-head-of-shell-argentina-turned-to-clean-energy
2 Asociación Argentina de Energía Eólica, "Energía Eólica en Artentina," July 11, 2010. http://argentinaeolica.org.ar/portal/images/stories/Eolica%20en%20Argentina.pdf; Global Wind Atlas. https://www.globalwindatlas.info
3 Global Solar Atlas. http://globalsolaratlas.info
4 We use the term fossil gas, meaning gas produced from fossil fuel sources, in place of 'natural gas.'
5 Mauricio Macri, "Macri: 'Este es el camino para tener energía y poder crecer,'" Feb. 1, 2017. https://www.casarosada.gob.ar/slider-principal/38520-mauricio-macri-este-es-el-camino-para-tener-energia-y-poder-crecer
6 Lorne Stockman, "Debunked: The G20 Clean Gas Myth," Oil Change International, June 11, 2018. http://priceofoil.org/2018/06/11/debunked-g20-clean-gas-myth
7 U.S. Department of Energy, Energy Information Agency, "Technically Recoverable Shale Oil and Shale Gas Resources: Argentina," Sept. 2015. https://www.eia.gov/analysis/studies/worldshalegas/pdf/Argentina_2013.pdf
8 Ieda Gomes and Roberto Brandt, "Unconventional Gas in Argentina: Will it become a Game Changer?" The Oxford Institute for Energy Studies, October 2016, OIES PAPER, NG 113. https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/10/Unconventional-Gas-in-Argentina-Will-it-become-a-Game-Changer-NG-113.pdf
9 Rystad Energy AS, UCube Database, Apr. 2018. Argentine shale gas production was 3.3 million cubic meters per day in 2015 and is projected to be 12.6 million cubic meters per day in 2018.
10 Andres R. Martinez, Jonathan Gilbert, and Jorgelina Do Rosario, "Argentina Eyes $500 Million Rail Project to Boost Shale Play," Bloomberg Business, Mar. 22, 2018. https://www.bloomberg.com/news/articles/2018-03-22/argentina-to-tender-shale-train-to-develop-vaca-muerta-drilling

"MUST NOT" – THE CLIMATE ARGUMENT

Fossil gas is not a clean fuel. As the partner to this report shows, 'clean gas' is a myth pushed by the fossil fuel industry to sustain its business.[11] Despite the industry's spin, gas production and consumption must be reduced, not expanded, for the Paris climate commitments to be met – just like oil and other fossil fuels.

To keep warming to "well below" 2 degrees Celsius and aim to keep it to 1.5 degrees Celsius – as the Paris Agreement goals outline – reductions in carbon dioxide (CO_2) emissions must be swift and steep. The greenhouse gas (GHG) emissions budget for a 50 percent chance of keeping warming to 1.5 degrees Celsius will be exhausted within just eight years at current rates; the budget for a 66 percent chance of staying below 2 degrees Celsius will be exhausted within 19 years.[12]

Without scaling up the Vaca Muerta shale play or other new hydrocarbon reserves, there are already enough fossil fuels in mines and wells that are currently producing or already under construction throughout the world to produce GHG emissions that will surpass the Paris climate goals.[13] Some of the world's existing fossil fuel production will need to be abandoned and left in the ground before the end of its economic life if we are to avoid more dangerous climate impacts. In this context, opening even more new reserves to production is completely irresponsible.

As shown in the partner briefing, exploiting all of Argentina's shale gas reserves to their maximum potential would consume up to 15 percent of the entire global carbon budget for achieving the 1.5-degree Celsius Paris Agreement target.[14]

There is an urgent need for Argentina's leaders to use climate protection as a starting point for their decisions around the country's fossil fuel energy sources, rather than grasping for ways to justify using the abundant supply that new drilling methods have unleashed. Simply put: climate responsibility and fossil fuel expansion are incompatible.

Cutting plant, Loma Campana. ©Jesus Rolle/Greenpeace

11 Stockman, Oil Change International, *op. cit.*
12 As of end-2011, the remaining carbon budgets were respectively 1,000 and 550 gigatons of CO_2 ($GtCO_2$). IPCC, Climate Change 2014, Synthesis Report, Table 2.2, p.64 http://ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_All_Topics.pdf

Emissions from 2012 to 2015 were 160 $GtCO_2$. Carbon Dioxide Information Analysis Center / Global Carbon Project, 2016 Budget v1.0. http://cdiac.ornl.gov/GCP

Estimated emissions from 2016 and 2017 are 36.4 $GtCO_2$ from fossil fuels plus 4.8 $GtCO_2$ from land use in 2016 and 36.8 $GtCO_2$ from fossil fuels plus 4.8 $GtCO_2$ from land use in 2017. Corinne le Quéré et al., "Global Carbon Budget 2017," Earth System Science Data, Mar. 12, 2018, pp.429-430, https://www.earth-syst-sci-data.net/10/405/2018
13 Stockman, Oil Change International, *op. cit.*, Figure 5.
14 Stockman, Oil Change International, *op. cit.*

"SHOULD NOT" – THE ECONOMIC ARGUMENT

Even if Argentina's leaders were to ignore the impact that their energy policy decisions have on the global climate, pursuing current plans to aggressively develop the country's shale reserves is economically reckless.

Currently, the national budget deficit remains high[15] and the country's rapidly growing debt burden[16] has led to cuts in public spending. Recent discussions with the International Monetary Fund regarding conditional financial assistance for Argentina under an 'exceptional stand-by agreement'[17] could lead to greater austerity and even deeper budget cuts as a condition for any loans, imposing additional economic hardship.

At this critical time, fossil fuel subsidy programs like Argentina's "Gas Plan" – under which public money is used to pay a steep incentive of USD 7.50 per million British Thermal Units (mmbtu) of new shale gas to producers at the wellhead – are ill advised at best. Debt to fossil gas producers from this program amounted to USD 1,500 million for the year 2017 alone; budget limitations have forced the government to delay payment, which will now be made in installments "starting 2019."[18] Meanwhile, new debt piles up as shale gas production at this subsidized "super price" continues.

Furthermore, government-mandated hikes of conventional fossil gas prices since 2016 have placed a heavy economic burden on Argentine citizens and industry alike, with electricity and heating bills suffering increases of hundreds of percent.[19]

Citizens are being told that all of these sacrifices are necessary in order to secure the nation's energy supply and that the fiscal pain today will be compensated for by abundant and cheap energy in the future, as Argentine shale gas production expands to meet both domestic demand and export markets.

However, that future is far from certain. Since 2016, electricity generated from wind and solar energy has been the cheapest option available globally, outperforming generation from fossil gas and all other fossil fuel sources.[20] In Argentina, wind and solar have been winning on cost as well; prices achieved in the RenovAR renewable energy auctions are significantly lower than fossil fuel alternatives.

As renewable energy sources continue to drop in price, they will increasingly replace fossil fuels. Public policy changes favoring renewables around the world are also likely to add pressure to the market for gas; climate protection requires the global power sector to be carbon-free by 2050.[21]

In light of this rapidly changing energy landscape, it is entirely possible that demand for fossil gas will be significantly lower than projected by the industry today – despite Argentina's government sinking billions of dollars into wellhead price incentives and tax cuts for the oil and gas industry, and committing further billions into upgrading train lines, pipelines, and roads for shale gas production. The result will be either stranded assets – as the country abandons expensive gas extraction, transportation, and generation infrastructure before the end of its projected 30- to 40-year economic lifetime[22] – or a lock-in to dirty power generation that fails Argentina's pursuit of climate goals.[23]

For Argentine public finances to be "responsible and sustainable" means immediately stopping public spending on Vaca Muerta and instead beginning a managed decline of fossil fuel production, alongside an ambitious increase of clean renewable energy sources and a wide-reaching energy efficiency program.

This reorientation of policy and investment direction would have multiple positive impacts: cheaper energy, true energy independence, and the chance to build a future-proof local renewable energy industry.

15 Including interest payments, the current national budget deficit is roughly ARS 612,700 million, or 6 percent of Argentina's gross domestic product. Asociación Argentina de Presupuesto, http://www.asap.org.ar
16 Argentina's debt burden was USD 94,800 million in 2017, with an additional USD 24,904 added in the first quarter of 2018. Instituto de Trabajo y Economía de la Fundación Germán Abdala, Observatorio de la Deuda, "Emisiones de Marzo 2018," May 2018. http://itegaweb.org/wp-content/uploads/2018/05/Observatorio-de-la-deuda-Mar18.pdf
17 Mohamed A. El-Erian, "IMF and Argentina Put Credibility on the Line," Bloomberg Quint, May 21, 2018. https://www.bloombergquint.com/business/2018/05/21/imf-and-argentina-put-credibility-on-the-line-in-latest-crisis
18 Luc Cohen, "Argentina plans 2019 payment of $1.5 bln in delayed gas subsidies," Reuters, Mar. 15, 2018. https://www.reuters.com/article/argentina-energy/argentina-plans-2019-payment-of-15-bln-in-delayed-gas-subsidies-idUSL1N1QX1RZ
19 Catriel Etcheverri, "¿Cuánto aumentó el gas, la luz y el agua desde la asunción de Macri?" Minuto Uno, Apr. 7, 2017. https://www.minutouno.com/notas/1545376-cuanto-aumento-el-gas-la-luz-y-el-agua-la-asuncion-macri
20 Lazard, "Levelized Cost of Energy 2017," Nov. 2017. https://www.lazard.com/perspective/levelized-cost-of-energy-2017
21 IPCC, Fifth Assessment Report, Working Group III report, Fig 7.9, p.555. http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter7.pdf
22 Karen C. Seto, Steven J. Davis, Ronald B. Mitchell, Eleanor C. Stokes, Gregory Unruh, and Diana Urge-Vorsatz, "Carbon Lock-In: Types, Causes, and Policy Implications," Annual Review of Environment and Resources, Sept. 2, 2016. https://www.annualreviews.org/doi/full/10.1146/annurev-environ-110615-085934
23 Once the investment in a plant has been made, the owner will keep operating it as long as the revenue from selling its power is greater than the marginal cost of producing it. This crowds out cleaner new generation capacity.

Shifting to Solar and Wind Energy Will Lower Argentina's Electricity Prices Permanently and Boost Job Growth

Since 2016, new global power generation capacity from utility-scale wind and solar has become cheaper to finance, build, and operate than from any other energy source. Renewable energy's advantage over fossil fuels, including fossil gas, is increasing and only set to grow further in the future (see Figure 1).

The same story is true throughout Latin America, and in Argentina in particular (see Figure 2).

The bulk of Argentina's electricity – 66% in 2017 – is generated from fossil fuels, mostly fossil gas. Another 28% comes from big dams, 4% from nuclear, and only 2% from renewables[25] – which means Argentina is falling short of the 8% renewable energy target for 2017 as stipulated in its national renewable energy law.[26]

In March 2018, this mix of energy sources resulted in an average wholesale price of electricity of about USD 72 per megawatt hour (MWh).[27]

The cost of generating a MWh of electricity from fossil gas at the Argentine price of USD 5.20 per mmbtu[28] ranges from USD 75 for combined cycle (CC) to USD 95 for turbo gas (TG).[29]

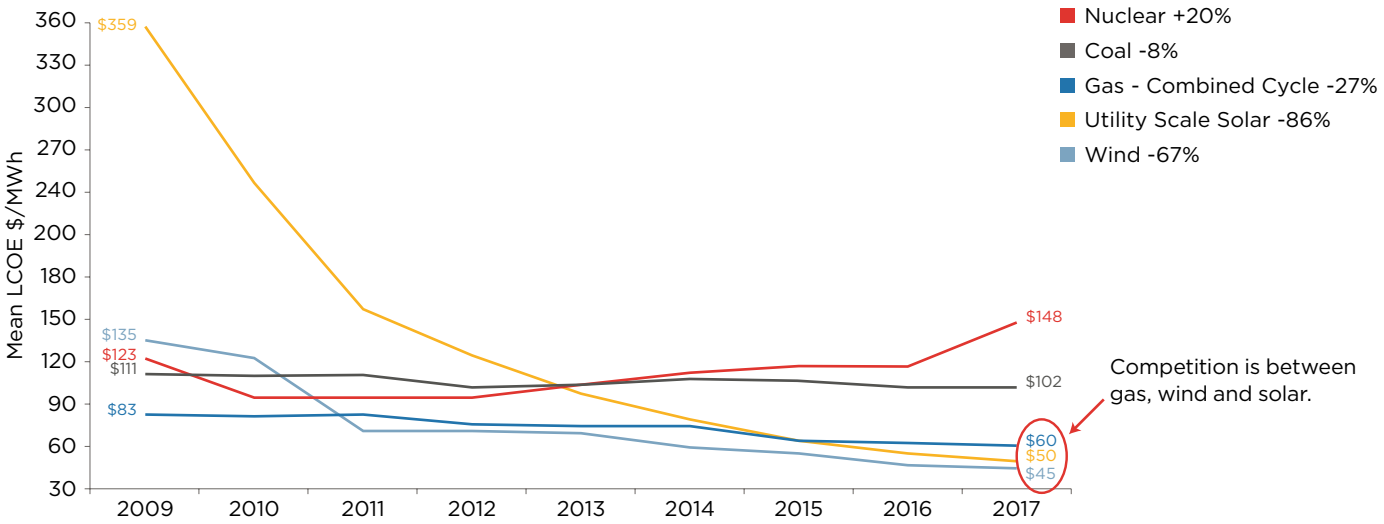
Considering the "rising price path" for fossil gas declared by Energy Minister Juan José Aranguren, which will lead to a gas price of USD 6.80 per mmbtu in 2019, generation costs are expected to rise to roughly USD 85 per MWh for CC and USD 111 per MWh for TG next year.

Even if the Argentine fossil gas price falls in the future due to new supply from Vaca Muerta – for instance, to a level close to current United States (U.S.) Henry Hub prices of USD 2.70 as of March 2018 – the cost per MWh would still be USD 58 to USD 68 per MWh.[30]

Renewable energy is already far cheaper. In late 2017, Argentina's wholesale electricity market administrator Compañía Administradora del Mercado Mayorista Eléctrico (CAMMESA) signed power purchase agreements with average prices of USD 41.23 per MWh for wind and USD 43.46 per MWh for solar in the second round of the RenovAR auctions program.[31]

In 2017 and 2018, auctions in Chile, Brazil, and Mexico achieved wind and solar prices close to USD 20 per MWh,[32] indicating that a further price drop for renewables in Argentina is a likely occurrence.

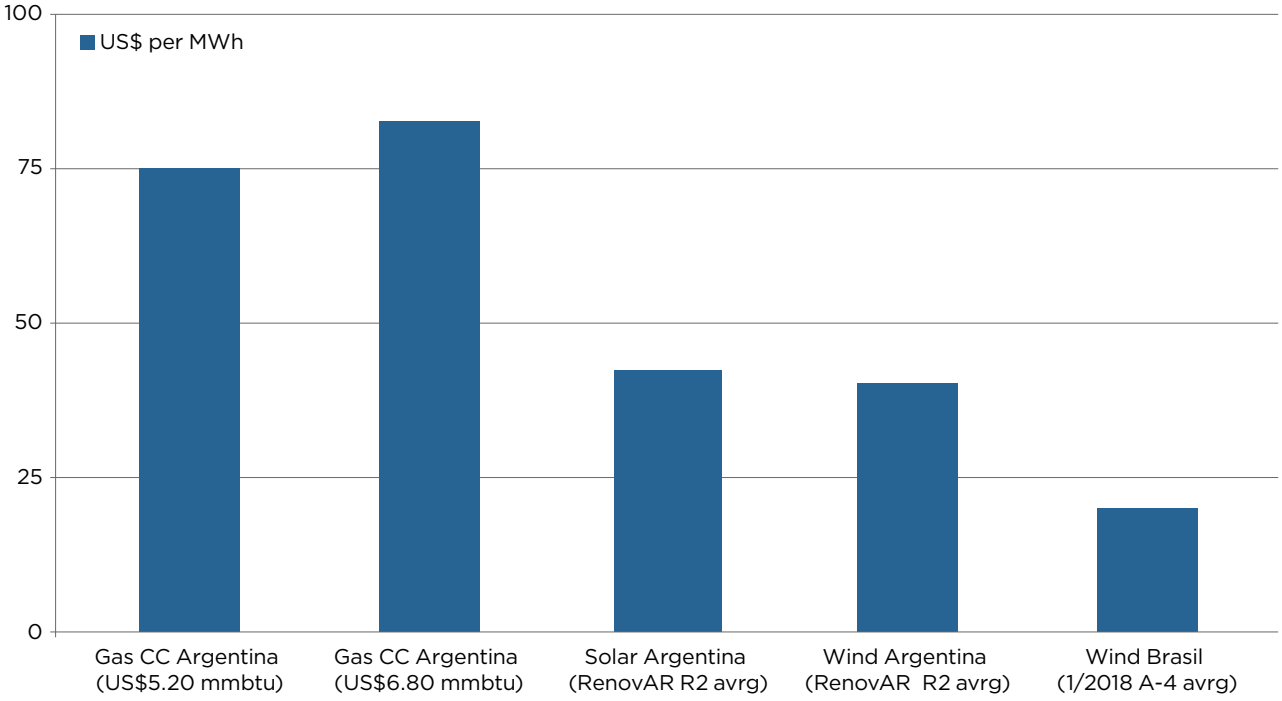
Figure 1: Wind and Solar Are Cheaper than Gas



Source: Lazard 2017[24]

24 Lazard, *op.cit.*
25 Ibid.
26 Ley 27.191, "Régimen de Fomento Nacional para el uso de Fuentes Renovables de Energía destinada a la Producción de Energía Eléctrica. Modificación," Oct. 15, 2015. http://servicios.infoleg.gob.ar/infolegInternet/anexos/250000-254999/253626/norma.htm
27 ARS 1,467.4; CAMMESA, "Informe Mensual – Abril 2018," Apr. 2018. http://portalweb.cammesa.com/MEMNet1/Informe%20Mensual/Informe%20Mensual.pdf
28 2018 final price as per "price path," to be reached in Oct. 2018.
29 Guido Gubinelli, "Con los resultados de la subasta las renovables pasaron a ser más competitivas," Energía Estratégica, Oct. 25, 2016. http://www.energiaestrategica.com/costos-generacion-energia-electrica-los-resultados-la-subasta-las-renovables-pasaron-mas-competitivas-las-fosiles
30 Ibid.
31 Argentine Ministerio de Energía y Minería, "Ofertas Adjudicadas, RenovAr – Ronda 2," Nov. 29, 2017. http://portalweb.cammesa.com/Documentos%20compartidos/Noticias/Renovar2/Resumen%20de%20Ofertas%20Adjudicadas%20RenovAr%202%20FASE%201.PDF
32 Nanda Singh, "En detalle los precios récord que arrojaron las últimas subastas de renovables en Latinoamérica," Energía Estratégica, Apr. 6, 2018. http://www.energiaestrategica.com/en-detalle-los-precios-record-que-arrojaron-las-ultimas-subastas-en-latinoamerica

Figure 2: Current Energy Prices in USD per MWh



Sources: Energía Estratégica (see Footnotes 29 and 32), Ministerio de Energía y Minería (see Footnote 31)

Advances in wind and solar technology have been the primary contributors to lower costs. As progressive governments and renewable energy corporations increasingly focus on optimizing wind and solar power, further progress and price drops are inevitable; according to Bloomberg New Energy Finance, solar and onshore wind will become "the cheapest bulk generation almost everywhere by 2023."[33]

By contrast, the technology to burn fossil fuels, including fossil gas, is old and has changed little over recent years. Global wholesale gas prices are currently near a historical low, and the finite nature of the resource indicates that prices will likely rise over the long term as supply diminishes. As such, any further cost reduction potential for gas-powered electricity is minimal at best.

Considering these trends, starting an immediate and ambitious transition away from fossil gas and towards renewable energy is not only the most responsible path to protect the climate, but also to ensure a resilient electricity supply for Argentina's people at the lowest possible cost.

Last but not least, an ambitious transition to renewables brings great potential for employment. Since 2012, global jobs in the solar photovoltaic (PV) and wind energy sectors have doubled.[34] Nearly ten million people now work in the renewable energy sector globally, and that number is projected to rise to 24 million by 2030.[35] In the United States, the solar PV industry has been adding workers almost 17 times faster than the economy as a whole, growing nearly 25 percent year over year.[36] Likewise, the U.S. wind industry has posted year-over-year job growth rates of 28 percent.[37]

Meanwhile, the fossil fuel industry has been suffering job losses. In 2015-16 alone, 440,000 jobs were lost in the oil and gas industry worldwide.[38] This reinforces the need for an intentional and planned just transition of workers from the fossil fuel industry to clean alternatives.[39]

The fossil fuel industry remains plagued by boom-and-bust cycles, and drastically impacted by the geopolitics of oil and fossil gas supply and wars in major producing regions. Wind and solar energy are more resilient, as supply of these resources is free, constant, and available to all. A national Argentine solar and wind industry, combined with the abundant sun and wind resources of the region, could become a jobs engine for decades to come. Investing in that future and developing a homegrown national renewable energy industry is the clear path forward to safeguard and promote the economic prosperity of all Argentines.

33 Elena Giannakopulou and Tifenn Brandily, "1H 2018 LCOE Update Global," Bloomberg New Energy Finance, March 28, 2018, p.6. Available by subscription only.
34 Rabia Ferroukhi, Arslan Khalid, Celia García-Baños, and Michael Renner, "Renewable Energy and Jobs – Annual Review 2017," International Renewable Energy Agency, May 2017, p.4. https://www.irena.org/documentdownloads/publications/irena_re_jobs_annual_review_2017.pdf
35 Ibid, p.4, p.20.
36 Ibid, p.14.
37 Ibid, p.14.
38 Ibid, p.6.
39 International Labour Organization, "Guidelines for a just transition towards environmentally sustainable economies and societies for all," Feb. 2016. http://www.ilo.org/global/topics/green-jobs/publications/WCMS_432859/lang--en/index.htm

"NOT NEEDED" – VACA MUERTA NOT NEEDED FOR WINTER HEATING

Electricity generation consumes about 40 percent of all fossil gas currently consumed in Argentina – the largest percentage of any usage block. The largest non-electricity usage block is residential heating, with 27 percent of total consumption.

Heating has defined the public discussion around fossil gas in Argentina in recent years. The demand spike from winter heating of buildings has resulted in the country importing substantial amounts of gas, including 11,669 million cubic meters in 2017.[40] During the warm season, there is a surplus as gas demand falls.

The solution to the shortfall in winter is not massive spending on new infrastructure to extract more fossil gas, but rather shifting to demand-side management policies such as increased energy efficiency investment. Demand management policies are a more effective, more efficient, and a less economically and politically painful way to reduce consumption than simply increasing the price for domestic consumers.

There is much low-hanging fruit available to increase energy efficiency in Argentina. For example, the majority of domestic heating appliances are not energy-efficient (see inset). Thermal insulation of homes is poor, particularly in the Patagonian south, where 6.7 percent of gas customers consume 24 percent of the country's fossil gas, and consumption per square meter of heated space is hundreds of percent higher than in European countries with similar annual temperatures.[41]

An astonishing 13 percent of all residential gas in Argentina is currently consumed by the pilot flames of gas water heaters.[42] That is 2,002 million cubic meters of gas each year, or 20.85 percent of all non-conventional fossil gas produced in Argentina in 2016.[43] Modern heaters don't use pilot flames and are manufactured locally, meaning there is enormous potential for reducing gas consumption simply by upgrading heating devices.

A concerted, government-supported energy efficiency plan to incentivize heating unit modernization and home insulation upgrades would tap into this enormous savings potential. Moreover, such a program would provide an additional jobs boost, as both heating appliances and insulation can be provided by local industry.

40 This includes 6,870 million cubic meters by pipeline and 4,799 million cubic meters by LNG tanker ship. Julián Rojo, "La producción de hidrocarburos – Informe Anual Año 2017," Instituto Argentino de Energía, Feb. 2018. http://web.iae.org.ar/wp-content/uploads/2018/02/Informe-anual-de-hidrocarburos-2017-IAE-Mosconi-.pdf
41 Salvador Gil, Pablo Givogri, and Luciano Codesiera, "El Gas Natural en Argentina. Propuestas Período 2016-2025," Aug. 2015, p.42. http://www.camarco.org.ar/File/GetPublicFile?id=3555
42 Ibid, p.41.
43 Ibid, p.41.

CONCLUSION

It is clear that neither Argentina nor the world can afford to massively expand Argentine shale gas extraction.

In order to achieve the Paris Agreement's 1.5-degree Celsius goal, these vast reserves must stay in the Patagonian ground.

The good news is that by investing in Argentina's rich wind and solar energy resources, while at the same time phasing out fossil gas and other fossil fuels, the country can begin a real energy transition that makes sound commercial, environmental, and social sense.

Not only will such an energy policy help save the climate and bear economic fruit – it will also protect Patagonia's communities and nature from the ravages of fracking and preserve its scarce water resources for future generations.

Greenpeace recommends that the Argentine government take the following measures:

- **Halt the development of the Vaca Muerta shale play** to ensure compliance with the objectives of the Paris Agreement – which Argentina signed in 2015 – and to prevent the worst impacts of climate change;
- **End all subsidies to domestic fossil fuel production** by 2020 and all subsidies to fossil fuels by no later than 2025. As G20 President, Argentina should promote those dates to be agreed in the 2018 G20 Summit, aligning with the commitments made by the G7 in 2016;
- **Establish a much more ambitious target for renewable energy** than outlined in Law 27.191 to mark a true, ambitious, and sustainable energy transition plan coupled with a managed decline of fossil fuel extraction and use; and
- **Launch an ambitious incentive program** for households to upgrade outdated heating appliances with energy efficient and solar-hybrid ones, incentivizing local manufacturing to support domestic industry.

GREENPEACE