



# The energy transition's 'necessary evil'

*Natural gas may have fallen out of favour with investors, but it could still play a significant role in the shift to low carbon energy, reports **Charles Waine***

Who said gas is dead?" asked Alberto Ponti, head of strategy and business development at Italian infrastructure fund manager F2i, during an energy transition panel at the *Infrastructure Investor* Global Summit held in Berlin in March. "Accelerating renewables is all very well, but how do you manage the grid without gas? Gas is a necessary evil."

Many conference delegates echoed that view, particularly in the wake of

*"We thought we had to save the planet by 2050 to 2100 and we find ourselves having to save our own countries today"*

**ALBERTO PONTI**  
F2i

Russia's invasion of Ukraine, escalating energy prices and the monumental shift in European energy policy seen in recent weeks.

"We thought we had to save the planet by 2050 to 2100 and we find ourselves having to save our own countries today," added Ponti.

Barely a month into Russia's assault, Germany had greenlit several new LNG terminals, the EU had outlined plans to phase out Kremlin fossil fuel imports, and nuclear energy was back on the agenda.

In February, the EU even extended its green finance taxonomy to include

both natural gas-fired power and nuclear power.

The implications could prove enormous for decarbonisation ambitions and timelines, particularly with governments set to prioritise energy security. “The Russian situation and the European energy crisis will increase interest in natural gas as a long-term, cleaner-burning source of power generation,” says Andrew Ward, founder and managing partner at private equity firm Clearstream Capital. “Recent market volatility highlights the need for a diversified energy plan including both fossil fuel and renewable sources.”

### Fluctuating prices

Price volatility should increase the attractiveness of renewables. It also raises the prospect of greater coal production, particularly in Asia. In early March, LNG spot prices to Asia hit record highs of over \$59 per million British thermal units. In response, China has backtracked on its climate agenda and is increasing domestic coal mining, putting the country sharply at odds with its pledge to reach carbon neutrality by 2060.

“There is clearly a coal boom going on right now,” says Norman Bissett, foreign legal consultant at Indonesian law firm HHP, a member firm of Baker Hughes. “Only a few months prior to this, we saw large coal mining projects struggling to find development cash, as international and regional lenders stopped, or scaled back, their coal financing arms.”

Even before the recent escalation in price volatility, a wall of gas-fired capacity was looming. According to research from the Global Energy Monitor, East Asia has nearly 121GW of capacity under construction or in pre-construction – the largest global increase, and an almost 50 percent rise on existing gas capacity.

Just behind, Southeast Asia has 120GW expected to come online over the next few years, which would more than double current capacity. The



## US senses opportunity

**Of opportunities to increase gas exports to Europe in the wake of the Russian invasion of Ukraine, Emily McClain, senior gas analyst at research consultancy Rystad Energy, says: “It is just a no-brainer. We have ample amounts of gas here in the US.”**

In March, Germany agreed to expand its LNG liquefaction capacity. European leaders have since promised to end dependence on Russian gas by 2027. “The real caveat for the US is infrastructure,” explains McClain. “I think we will see a shift in the global landscape in the coming decade, with more LNG terminals and more regasification terminals.”

From next year, bottlenecks are expected to appear in the Permian Basin, in Texas, unless more pipeline capacity is sanctioned. Private exploration and production has already surpassed pre-pandemic levels and is expected to soon exceed peak drilling levels. High energy prices could also accelerate consolidation in all three major US gas basins.

But without greater midstream capacity, operators will find themselves unable to exploit the shifting energy policy. Tailbacks could also increase flaring in the shale patch, hurting investors’ ESG balance sheets.

*“Almost every ‘net-zero by 2050’ scenario you look at does have natural gas declining”*

**ANDY LUBERSHANE**  
Energy Impact Partners

Middle East and North Africa, home to the world’s second largest gas-fired capacity, is guiding a 25 percent increase based on facilities currently under development. In Europe, the continent is projecting a 31 percent rise in gas-fuelled capacity, while the US is set to expand capacity by 7 percent. The latter has over 528GW of existing capacity, the largest worldwide.

But some believe that the massive expansion could present a significant stranded asset risk if renewables become the dominant energy source.

## Analysis

“I do think that the industry needs to be careful not to over-invest because, at the end of the day, almost every ‘net-zero by 2050’ scenario you look at does have natural gas declining,” explains Andy Lubershane, managing director at global investment platform Energy Impact Partners. “It often does not go to zero, but it is going to decline as a source of primary energy.”

While some gas infrastructure may eventually be repurposed to feed hydrogen, it is unlikely to be entirely reclaimed. “Broad-scale repurposing of assets toward hydrogen is more difficult than many realise and likely will not occur until the commodity is more widely available,” says Ward.

“The timeline will be reduced in Europe, where hydrogen is better distributed today and the transport distances are shorter. Existing gas infrastructure is already handling renewable natural gas, but in very small volumes relative to overall gas flows.”

Lubershane agrees: “Most studies show you can get up to 20 percent hydrogen by volume through a natural gas pipeline, transmission pipeline or distribution system without mucking it up.”

Lubershane adds that 20 percent hydrogen by volume is only about 7 percent by energy content, which hardly pushes the needle from a carbon standpoint. Repurposing significant gas infrastructure is most likely to be achieved in regions like West Texas, where oil and gas pipelines could be repurposed to move green hydrogen produced by wind turbines to industrial clusters.

### Temporary solution

With rising energy volatility and many countries backpedalling to coal in the short-term, natural gas offers an important alternative energy source to help clean up emissions as renewables mature. “There is a complicated balance between meeting global energy demand and accelerating investment in renewables – and we believe natural gas will play a key role in delivering the bridging fuel as we move towards net

zero,” says Dave Noakes, co-founder and senior managing director of private equity firm Prostar Capital. “It is cleaner than other hydrocarbons, reliable as a source of base load electricity, and provides developing economies a relatively cheap, accessible and lower emission source of energy.”

In early March, independent gas producer EQT released a strategy plan for ending the world’s coal habit and shifting to gas. The firm estimates that switching to US gas could cut CO2 emissions globally by 60 percent. This would be equivalent to the combined emissions reduction potential of



## Argentina plays catch-up

**Argentina has the potential to join the top tier of natural gas producers. The Vaca Muerta shale basin running along the spine of the Andes holds the world’s second-largest unconventional gas deposits, and ambitions are high that one day the Latin American country could emulate the successes of the US.**

Yet despite the great resource potential, Argentina’s efforts to become a global LNG exporter have stalled. A combination of midstream constraints, the pandemic and a record-setting IMF bailout in 2018 forced the state-owned oil and gas firm YPF to shelve plans to build an LNG liquefaction plant in 2020.

In response, the government has tried to accelerate domestic production through price incentives. Producers including private equity-backed Pampa Energy, Argentina’s fifth largest gas producer, participated in the Plan Gas incentive scheme, with contracts lasting four years and future rounds expected.

While this will encourage domestic production growth, a report from the Oxford Institute for Energy Studies estimates that Argentina still needs \$50 billion to transform into a significant LNG exporter by the end of the decade.

“Although Argentina is arriving late, and in bad shape, to the global LNG market, it still has an attractive resource that is far away from the geopolitical sensitive areas of the world,” says Pablo Rueda, partner at Argentinian law firm Martínez de Hoz & Rueda.

electrifying every US passenger vehicle, powering every home in the US with rooftop solar panels, and doubling US wind capacity.

Yet investors are increasingly unwilling to touch fossil fuels. “Our LPs tell us they do not want to invest in gas, and banks are becoming stricter and stricter at providing financing to gas projects,” added Ponti in Berlin. “Even some insurance companies are thinking about not insuring gas assets.”

In truth, if renewables are not deployed fast enough, many developing countries will likely continue to depend on coal for their energy security. 176GW in new coal plant capacity is currently under construction around the world. EQT argues that natural gas imports should instead serve as a safety net, offering cleaner energy in the interim before renewables can realistically dominate the energy mix.

### Fork in the road

Renewable natural gas arguably has a role to play in cleaning the transportation sector. “I think it is a necessary piece of the energy transition, especially when thinking about heat processing and heavy-duty transportation,” says Cody Myers, managing partner at Green Rock Energy Partners, a sustainable infrastructure-focused private equity firm which invests in renewable energy. “Electricity alone just does not have the same punch, particularly when it comes to long-haul, heavy-duty transportation.”

Typically, heavy-duty vehicles are equipped with diesel engines, a potent source of nitrogen oxide and CO<sub>2</sub>. In 2019, heavy-duty engines contributed 24 percent of all US transportation CO<sub>2</sub> emissions, according to the US Environmental Protection Agency.

By contrast, natural gas engines produce ultra-low levels of nitrogen oxide and can have a near-zero or negative carbon footprint. Left unprocessed, landfill and agricultural waste releases methane into the atmosphere,



## Brazil lays the groundwork

**Brazil is another emerging market with significant gas resource potential. Over the next decade, associated gas supply is expected to rise sharply from the offshore pre-salt basin, in the Atlantic Ocean, but significant new takeaway capacity will be needed to meet demand.**

In response, the Brazilian government has already taken tentative steps to liberalise the sector and expand both gas infrastructure and pipeline capacity. Divestment from national oil and gas firm Petrobras has also caught the attention of private equity players.

“We have seen interest from private equity funds for transportation assets,” says Felipe Boechem, partner at Brazilian law firm Lefosse Advogados. “EIG is currently negotiating with Petrobras the acquisition of the TBG transportation system, which includes the GASBOL pipeline.”

The GASBOL pipeline is the longest pipeline in South America. It connects Bolivian gas supply to the Brazilian market.

Like Argentina, Brazil hopes to one day become a liquefied natural gas exporter. The South American country currently imports all of its LNG and has no liquefying capacity. Domestic prices are also high compared to international norms, limiting the country’s capacity to become an LNG exporter in the short term.

Rising domestic natural gas is, however, likely to play an important role in decarbonising the country’s energy mix, especially if climate change increasingly affects hydropower. “Thermopower plants fuelled by gas have increased their participation in the energy matrix and are seen as a relevant alternative to ensure power supply in cases of dry seasons and to address the intermittency of renewables,” says Boechem.

with as much as 28 times more global warming potential than CO<sub>2</sub>. Capturing these emissions will have a profound impact on the climate, while providing an important energy source.

New regulations in US states such as California are already making

renewable natural gas cost-competitive. While the ultimate goal is to scale electric vehicles, these regulations offer an important opportunity to clean the waste sector while capturing emissions and gradually decarbonising transportation. ■





# Chile leads LatAm's green hydrogen push

*The geographically diverse nation is laying the groundwork to become a major clean producer over the next decade, writes [Charles Waine](#)*

Chile may be affectionately known as the country of poets, but it could soon become better known as a global leader in green hydrogen. By 2030, the government aims to transform the country into the world's cheapest source of alternative fuel and eventually become a leading international exporter.

Stretching from the Atacama Desert in the north to the glacial fjords of the Patagonian south, Chile can draw on an abundance of renewable sources of energy. Renewables capacity has already grown five-fold over the past six years and the government expects 70 percent of the national power grid to be supplied by renewables by 2030.

“Chile has the most potent solar radiation on the planet, located in the north of the country,” says Adalberto Castañeda Vidal, research assistant at the Center on Global Energy Policy at Columbia University, in New York. “Wind power in the south of Chile yields capacity factor of over 60 percent, which is one of the highest in the world.”

Chile also boasts infrastructure that could be repurposed for green hydrogen production, particularly the mining sector in the Atacama Desert. “Given its status as an exporter of commodities such as copper, Chile has a much-needed infrastructure base to position itself as one of the largest exporters of green hydrogen over the next decade,” says Andres Labbe, director of green

hydrogen investment at public-private non-profit Fundación Chile.

By 2025, the government expects to reach 5GW of electrolysis capacity and by 2030 to produce green hydrogen below \$1.5/kg, equating to electricity generated at roughly \$15-20/MWh. According to research from information provider IHS Markit, the levelised cost of energy in Chile could be \$25-30/MWh by 2030 for an average utility-scale solar PV unit and an onshore wind project. This should result in hydrogen production at around \$2-3/kg, which is closer but still almost double the original target.

Chile will also have to compete with other nations for market share. Likely entrants include Australia, given its extensive renewable resources and access

to Asian markets, while Middle Eastern producers have the industrial capability and know-how to adapt to green and blue hydrogen production.

Already, early mover Saudi Arabia has greenlit what could become the world's largest green hydrogen plant, near the planned city of Neom. The kingdom realises it needs to radically diversify its economy away from oil and gas dependency if action matches rhetoric and the world finally breaks with fossil fuels.

### Testing the waters

The Chilean government maintains that proactive public-private co-ordination will be key to lowering barriers to entry. Several asset managers and public operators have already taken strides in that direction.

In January, Copenhagen Infrastructure Partners announced it was teaming up with renewables providers AustriaEnergy and Oekowind to develop a 1.7GW green hydrogen project in southern Chile. The \$3 billion project will produce ammonia from green hydrogen, powered by onshore wind power.

Fundación Chile also aims to raise \$300 million for its hydrogen fund and ultimately plans to invest in 12 to 15 ventures. Over the next decade, the firm expects Chile to capture around 5 percent of global green hydrogen investment, roughly \$23.5 billion, and reach at least \$10 billion annually in exports.

"Given that these are relatively new technologies, and a market is in the process of formation, traditional financial institutions are cautious about the businesses that they finance," says Labbe.

"In this sense, public-private co-operation through blended finance structures will facilitate the reduction of certain risks and enable the entry of long-term private capital."

In late December, the Chilean



## What's in a colour?

**While there are various definitions and labels for hydrogen products based on their carbon footprint and origin, 'green hydrogen' is generally taken as the variety produced via electrolysis of water from variable renewable sources.**

The 'colour' of hydrogen is important because it has implications for the pace of the energy transition. Today, the most common form is grey hydrogen, produced from natural gas, while coal yields the more carbon intensive black hydrogen.

"The same infrastructure we are using for natural gas now can be adapted for blending hydrogen into methane pipelines, CCS [carbon capture and storage] and the transport and storage of future fuels like hydrogen and ammonia," adds Dave Noakes, co-founder and senior manager at private equity firm Prostar Capital.

Another form, blue hydrogen, is essentially the same as grey hydrogen but the emissions are captured and stored underground via CSS. There are other more experimental forms, including turquoise hydrogen, which is produced from thermal cracking of methane, and pink hydrogen, which is generated by nuclear power.

*"The biggest challenge in developing a green hydrogen project nowadays is that it's still too expensive"*

MIRCO HILGERS  
Baker McKenzie

government also sanctioned six new green hydrogen projects, valued at more than \$1 billion in investment. This takes the country's total to more than 40.

The largest development is the H2 Magallanes project in southern Chile, led by a subsidiary of French energy giant Total. The venture is projected to add 10GW in installed wind capacity once it launches in 2027.

The increase in green hydrogen should also ease the expansion of renewables capacity. The government anticipates 200GW of renewable capacity by 2040, up from a power base of just 25.5GW in 2021.

"Without hydrogen as a long-term

storage solution for renewable energy, we will have to either continue to rely on natural gas to meet peak demand or waste renewable power during periods of low demand,” cautions Jo Bamford, founder of UK hydrogen distributor Ryze Hydrogen.

Anne-Sophie Corbeau, global research scholar at the Center on Global Energy Policy, highlights that the ‘colour’ of hydrogen hardly matters at this early stage. “I think we ought to be colour-neutral on low carbon hydrogen and try to kick-start the hydrogen economy as much as possible,” she says.

“We also need to reduce the cost of hydrogen. Remember \$1/kg is about \$8 per million British thermal units, so cheap hydrogen is actually not so cheap in million British thermal unit terms.”

Mirco Hilgers, a partner at law firm Baker McKenzie, agrees that cost could be one of the main barriers. “The biggest challenge in developing a green hydrogen project nowadays is that it’s still too expensive to be as beneficial as desired,” he says. “Other challenges include the current lack of engineers and other human capital specialised in green hydrogen production.”

But the Chilean government is at least conscious of some of these factors and plans to make things more transparent for the private sector. Measures being discussed include a public and private roundtable to decide the tax regime, regulations to protect the hydrogen value chain and a task force to accompany project developers.

Last December, a bill was introduced in the lower chamber of the National Congress to establish a blending mandate for hydrogen into the gas network. The mandate is still under review.

### Opportunity knocks

While Chile may be a frontrunner in Latin America, several other nations have also started to make baby steps into green hydrogen. Last year, Colombia published its green hydrogen

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**ANNE-SOPHIE CORBEAU**  
Center on Global Energy Policy

roadmap and expects 1-3GW of electrolysis installed capacity by 2030. Hydropower already generates 75 percent of the country’s electricity supply, while wind and solar potential in the north could prove an abundant supply of green hydrogen.

The government estimates that by 2030 green hydrogen will be cost-comparable with both Chile and Australia. Before then, blue hydrogen is seen as the most favourable low-carbon hydrogen blend considering Colombia’s industrial infrastructure and rich hydrocarbon resources.

From 2030, the government expects green hydrogen in the north to reach cost parity with blue hydrogen. The green variety should become the most

competitive blend in the country from 2040.

The government is also projecting at least 1,500-2,000 light-duty fuel cell vehicles, 1,000-1,500 heavy-duty fuel cell vehicles and the industrial sector taking 40 percent consumption of low-carbon hydrogen feedstock by 2030.

Like Chile, Colombia hopes to eventually become a global exporter of green hydrogen. The government puts Asian hydrogen demand at 190Mt by 2050, with 60Mt from the EU and 60Mt from the US. Strategically close to North America, Colombia has direct access to Europe through the Caribbean and to Asia via the Panama Canal or its Pacific coastline.

Last year, Latin American neighbour Uruguay also released its green hydrogen strategy plan. The country is offering between 8 and 18 blocks off the coast to increase wind production for potential green hydrogen production. The World Bank estimates that the country has 275GW in offshore wind capacity, while the government estimates that project investment could eventually reach between \$1 billion-\$3 billion.

Brazil is another South American country starting to think about green hydrogen. “Even though a specific regulatory framework has not yet been established, foreign investors and partners have shown a special interest in developing green hydrogen in the country, while local governments have been fostering the creation of hydrogen hubs,” says Ligia Schlittler, partner at Brazilian law firm Felsberg Advogados.

As a case in point, renewables provider Enegix is developing the \$5.4 billion Base One project in the northeast state of Ceará. The project is expected to produce over 600 million kg of green hydrogen, tapping into 3.4GW of baseload capacity generated by wind and solar power. ■