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## FEATURED Q&amp;A

# Does Hydrogen Fuel Have a Bright Future in Latin America?



Low-emission initiatives in Asia, Europe and California have started to make way for the deployment of hydrogen vehicle fuel stations alongside fossil fuel pumps, Cecilia Aguillón writes below. // File Photo: U.S. Department of Energy..

**Q** The debate around the global energy transition away from fossil fuels has shifted from when it will happen to what it will look like, according to a report by S&P Global Platts released last month. Among the alternatives, hydrogen could achieve emission reductions in industrial settings, as well as in residential and commercial heating and long-haul trucking, the report said. In what ways is hydrogen being developed as a clean energy carrier globally and in Latin America and the Caribbean in particular? What are the advantages and disadvantages of a potential shift toward hydrogen-based fuel, and how does it compare to other clean energy alternatives, such as biofuel? How disruptive will the energy transition be for traditional fuel refining in the region, and how can refiners prepare for it?

**A** Ana Ángel, Latin America manager at Hincio: "Green hydrogen (produced via electrolysis of water from renewable energies) is positioning itself as key piece of the puzzle to decarbonize sectors of the economy in which electrification has limitations, such as the chemical or steel industries and certain transport sectors. Several developed economies, including the European Union, Japan, South Korea, California and Australia, have understood this. Latin America has pilot projects in Costa Rica and Argentina, projects in an advanced state of development in Chile and Uruguay, as well as great interest from energy and hydrocarbon companies in Colombia. Green hydrogen is a molecule free of carbon emissions that can supply existing energy infrastructure, be transported in pipelines, and even by boat, as is currently done with liquefied natural gas (LNG). It allows for the storage

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## TOP NEWS

## OIL &amp; GAS

## Mexico Open to Production Cuts, Nahle Says

Energy Minister Rocío Nahle suggested in a tweet that Mexico could consider cutting oil production.

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## OIL &amp; GAS

## European Nations, U.S., Canada Meet Over Mexico

Representatives from the United States, Canada, the European Union and six European countries have reportedly held joint talks on concerns over Mexico's energy policy.

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## OIL &amp; GAS

## Oil Prices Record Steepest Plunge in Three Decades

Saudi Arabia, under Crown Prince Mohammed bin Salman's rule, and Russia entered a price war this week, prompting the steepest decline in crude prices since the Gulf War in 1991. The price shock will notably affect oil-exporting countries, such as Venezuela, Ecuador and Colombia.

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bin Salman // File Photo: Kingdom of Saudi Arabia.

## OIL AND GAS NEWS

## Oil Prices Record Steepest Plunge in Nearly 30 Years

Oil prices saw their steepest plunge in nearly 30 years on Monday after Saudi Arabia a day earlier said it would raise production and cut prices after talks with Russia on output cuts fell through, sending markets into a frenzy at the same time that the coronavirus outbreak sparked uncertainty worldwide and hurt demand for oil. Crude prices fell as much as 30 percent on Monday after years-long negotiations between Saudi Arabia and Russia collapsed, marking the beginning of an oil price war, BBC News reported. Brent prices on Monday fell to \$31.50 per barrel, and West Texas Intermediate, or WTI, oil prices fell to \$31.02. The oil price shock comes amid the coronavirus outbreak, which has hit demand for crude, prompting the sharpest market rout since the 2009 financial crisis on Monday. Prices have only partially recovered on hopes of an economic stimulus. "The dual impact of COVID-19 and the significant oil price shock will put pressure on some sovereign credit fundamentals and potentially ratings," Fitch Ratings said in a statement on Monday, highlighting emerging markets' additional risks related to commodity export receipts, capital flows and exchange-rate pressures. Among the hardest-hit countries in Latin America are Venezuela, Colombia and Ecuador, whose incomes in large part depend on crude exports, BBC News reported. In Venezuela's case, more than 90 percent of its exports are in the oil sector, and crude is the country's largest source of income. "The sanctions the United States imposed, the drop in local production, and now the decrease in prices in international markets [are] a lethal combination for Venezuela," Francisco Monaldi, an energy economist at Rice University's Baker Institute, told BBC News. For Ecuador, the \$20 fall in oil prices represents a \$8 million daily loss in revenue, or a \$2.9 billion loss in revenue per year, according to President Lenín Moreno, who on Tuesday said he would seek to improve

debt payments and cut \$1.4 billion from the government's budget in response to the oil price crash. The fall in prices has also increased pressure on Mexican state oil company Pemex amid an expected ratings downgrade this year after it posted one of its worst-ever losses in 2019, Reuters reported. "The fact the oil market outlook has deteriorated due to this war is negative for Pemex, no question," said Raúl Feliz, an economist at CIDE, a think tank in Mexico City. "And this could increase talk of a ratings downgrade," he added. Seventeen percent of Mexico's government finances depend on crude oil exports, Expansión reported. However, Mexico's renowned oil hedging program, which allows the country to lock in higher crude revenues by contracting options through an annual hedging program used as insurance against price shocks, could mitigate the price shock's impact on Mexico's budget, Finance Minister Arturo Herrera said Tuesday. He also said Mexico is among several nations seeking to mitigate the dispute between Russia and Saudi Arabia. Feliz told Reuters that Pemex's hedge would directly cushion the blow of an oil price slump, but a prolonged price war could hit Pemex's finances all the same. Other countries in Latin America will be affected by the oil slump, including Brazil and Argentina, though to a lesser extent, since their income is not directly dependent on crude. Meanwhile, the rest of the region, mostly oil importers, is expected to benefit from lower crude prices.

## Head of Guyana's High Court Orders Partial Vote Recount

The head of Guyana's Supreme Court on Wednesday ordered a partial recount of last week's contested general election, BBC News reported. The decision is a major win for the opposition PPP party, which has accused the government of tampering with the vote in favor of incumbent President David Granger. Judge Roxane George-Wiltshire ruled that there had been substantial noncompliance by the electoral officer's declaration of results in one of the country's voting regions, Region

## NEWS BRIEFS

## Peru to Add 39 Megawatts of Non-Conventional Renewables in 2020

Two onshore wind farms and a biomass-fired power plant will begin operations in Peru this year, bringing an additional 39 megawatts of new non-conventional renewable energy capacity, the Peruvian government said, Renewables Now reported Monday. The two 18.4-megawatt wind projects, known as Duna and Humbos, are part of Spanish renewable energy firm Grenergy's portfolio in the country.

## U.S., Canada, European Nations Reportedly Hold Talks Over Mexico Policy

The United States, Canada, the European Union and six European countries have held talks over their concerns regarding Mexico's energy policy, most notably what they see as the erosion of the legal foundation of contracts foreign companies signed under the previous administration, Reuters reported Monday, citing sources. The meeting was reportedly hosted by the U.S. embassy in Mexico City and included representatives from Britain, Canada, the European Union, France, Germany, Italy, the Netherlands and Spain to discuss ways to voice their concerns to the government of Mexican President Andrés Manuel López Obrador, five sources familiar with the gathering told Reuters.

## Solarpack's 123-MW Solar Park in Chile Starts Producing Power

Spanish company Solarpack's 123-megawatt Granja solar photovoltaic farm in Chile began producing power on March 2, the company announced Monday, Renewables Now reported. The project involved an investment of more than \$110 million, with long-term financing of nearly \$91 million provided by Germany's KfW IPEX-Bank, according to the report.

Four, and ordered the results be nullified and voided, Stabroek News reported. She also said that the Guyana Elections Commission cannot declare a final result until the recount of Region Four is properly done, with the process set to begin on Thursday morning. Both Granger of the incumbent PNCR coalition and Irfaan Ali of the PPP have claimed victory in the March 2 election, sparking tensions and some violent protests over the weekend that left one person dead and several injured, BBC News reported. The election campaign was marked by the two sides' plans on how to manage the massive expected oil revenue this year from recently discovered fields that began production in December. Some international election observers, including representatives of the Organization of American States and the European Union, plan to stay in Guyana until final results are declared, Stabroek News reported. Guyana's oil discoveries have attracted the attention of several international companies, including ExxonMobil, Tullow Oil, Repsol and Total. Ali has said that, if he is elected that agreements with such companies, excluding Exxon, would be "examined in totality." The elections followed a prolonged political stalemate after Granger's coalition lost its one-seat majority in Parliament in December 2018. The country remains deeply divided. Last month, Michael Matera, senior fellow and director of the Americas at the Center for Strategic and International Studies, told the Energy Advisor that it was "rumored that both major parties [had] already drafted legal challenges to the election results," which they were ready to file depending on the outcome of the election. [Editor's note: See related [Q&A](#) in the Feb. 21 issue of the Energy Advisor.]

## Mexico Hasn't Ruled Out Cutting Production at Pemex

Mexico has not discarded cutting production at state oil company Pemex following the plunge in oil prices this week, a move that would mark a significant reversal in President Andrés Manuel López Obrador's strategy to

### FEATURED Q&A / Continued from page 1

of surplus intermittent renewables in greater capacities for much longer than batteries allow, and it can supply cars in just four to five minutes with power for more than 700 kilometers, become a solution for zero-emissions transport for long distances, heavy segments and high-intensity operations. Hydrogen is a great opportunity for the diversification toward clean-fuel production and the decarbonization of oil and gas companies. Injected into pipelines to mix to a certain percentage with natural gas, or used to supply refineries' demand, clean hydrogen can drastically diminish carbon footprints. Although this technology has reached technological maturity, as have other innovative technologies, its initial costs remain high, so fiscal and financial policies are required to encourage its adoption. Latin America has exceptional conditions for the production of green hydrogen at highly competitive prices, such as an electricity matrix with a low emission factor, a high potential for renewable energy production, as well as a large availability of space and water sources."

**A** **Cecilia Aguillón, director of the energy transition initiative at the Institute of the Americas:**

"In the near term, electrification of transportation is likely to continue, but hydrogen-based energy can also accelerate the pace of emission reductions. Several global energy companies are already investing in research-and-development and demonstration projects of hydrogen fuels around the world, including in Latin America, where hydroelectricity, solar and wind resources are abundant and cost-effective. Hydrogen production is mostly fueled with non-renewable sources, but in the race to reduce emissions, natural gas is viewed as the bridge in the transition to zero-carbon energy until the cost of producing fuel with renewables through electrolysis can be competitive. According to a report published by the IEA last June, fuel costs add up to 75 percent of the cost of hydrogen produc-

tion. Policies that spur market growth will be required to reduce costs and replace diesel and gasoline for hydrogen in densely populated urban regions. Evolving policies and regulations that encourage low emission standards in electricity and transportation across the Americas are likely to compel retrofitting fuel infrastructure. Indeed, conventional fueling station infrastructure can be retrofitted and used to provide cleaner fuels to heavy duty vehicles, mass transit fleets, ships and even airplanes. In Asia, Europe and California, low emission standards and mandates have started to make way for the deployment of hydrogen vehicle fuel stations right alongside fossil fuel pumps."

**A** **Jose Antonio Castro Nieto, chief scientist at Ad Astra Rocket in Costa Rica:**

"In Costa Rica, there is a strong push toward the maturation of a green hydrogen economy (hydrogen produced by water electrolysis powered by renewables). This is initially geared toward the transportation sector, but there are plans to grow it into a stationary power and back-up power generation solution as well. The Costa Rican Hydrogen Alliance, a group of mostly private companies that represent all the actors present in the green hydrogen value chain (renewable energy, hydrogen infrastructure, gas distributors, vehicle companies, etc.), are leading this initiative. Green hydrogen has the advantage of decarbonizing the light-to-heavy duty transportation sector while enabling Latin American countries to pursue a path toward energy independence. Our region profits from ample renewable energy resources and water, both key ingredients in the production of green hydrogen. If we are able to harness this potential, it could direct the region toward energy independence. Compared to batteries, hydrogen is better suited for the light-to-heavy-duty transportation sector due to its much better energy-to-weight ratio. In this sector, weight and volume are at a premium. Any clean energy alternatives directed

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boost the firm's declining output, the Financial Times reported Wednesday, citing a tweet from the energy minister. "The price of the Mexican [oil export] mix is determined by international oil prices. All producing countries in the latest Opec-Non-Opec meeting expressed our willingness to adjust by a percentage to avoid overproduction," Energy Minister Rocío Nahle wrote on Twitter. "We are in permanent communication." The energy ministry did not immediately respond to the newspaper's request for comment, and Pemex did not confirm a cut in production. The company in January pumped an average of 1.7 million barrels per day (bpd) of crude, up from 1.63 million bpd last year but below government forecasts and about half of its 3.4-million-bpd peak in 2004. Output has declined every year since then, despite reforms aimed at reversing the trend, Reuters reported. Analysts told the Financial Times that Nahle's tweet seemed more diplomatic than a conviction. Most of Pemex's assets need a price of approximately \$50 per barrel to break even, and the company is already facing the threat of a second downgrade, to junk status, in coming months.

## POLITICAL NEWS

## Peru, Panama Close Schools Amid Rapid Spread of COVID-19

Countries across Latin America reported an increasing number of cases of coronavirus on Wednesday and took increasingly aggressive measures to contain the spread of infections as the World Health Organization declared the outbreak a pandemic. In Peru, which has at least 15 confirmed cases of COVID-19, President Martín Vizcarra said all schools in the country would be closed until at least March 30, Reuters reported. Panama took similar action to temporarily shutter schools at least until April 7 in an order that affects both public and private schools in most of the country. Students there will be able to continue their studies through lessons that can be completed

## ADVISOR Q&A

### How Is Metal Price Volatility Affecting Latin America?

**Q** **The coronavirus outbreak has prompted high volatility in metals prices over the past month, as concerns continue over the disease's economic impact on China, which consumes approximately half of the world's metal and mining resources, the Financial Times reported. What have been the major consequences of coronavirus fears on the prices of metals, including copper and gold? Will such trends continue into the foreseeable future? What will be the economic fallout for Latin American metals exporters, such as Brazil, Chile, Peru and Colombia, and what can they do to prepare for potential losses?**

**A** **Jorge Heine, research professor at the Pardee School of Global Studies at Boston University and former Chilean ambassador to China, India and South Africa:** "The coronavirus outbreak has had a severe impact on stock markets and on the price of metals. In combination with the tug-of-war between Russia and Saudi Arabia over oil production, the consequences for the world economy can be severe. The price of copper is down to \$2.49 per pound. It may fall to \$2.33 a year from now. The price of gold, a classic 'refuge to safety' metal, is up to \$1,661 an ounce. Projections are it may rise to \$1,852 a year from now. With the main impact of the

pandemic on China, where it originated, Latin American countries such as Brazil, Chile and Peru, whose number-one export market is China, are especially exposed, though Colombia not so much. In January-February, Chinese exports fell 17 percent year-on-year, though (surprising the markets) imports fell only 4 percent. Given the weak economic performance and political upheavals in these Latin American countries recently, this makes them especially vulnerable—though more so Chile and Peru than Brazil and Colombia, because of their dependence on copper exports and higher share of exports to the Chinese market. Some projections indicate that first-quarter growth in China will be flat, and a mere 4 percent in 2020, the lowest since the 1970s. The good news is that in China the virus seems to have peaked, with only 40 new cases reported on March 8 (all in Hubei province), the lowest since Jan. 20. If this holds—and it's a big if—the Chinese economy should be able to ramp up growth. The question then becomes whether there would be enough external demand to drive it."

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**EDITOR'S NOTE: More commentary on this topic appears in Wednesday's issue of the Latin America Advisor.**

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at home, said a Panamanian education ministry official. Panama's health minister, Rosario Turner, earlier this week announced the country's first death attributed to the highly contagious virus and said there are 10 other confirmed cases of it in Panama. In neighboring Costa Rica, the government on Wednesday confirmed 22 cases of the disease, almost twice the previous count. Countries across the region also

imposed new travel restrictions in an effort to fight the virus' spread. In El Salvador, which still has no confirmed cases of COVID-19, President Nayib Bukele said the government was banning entry to foreigners for 21 days, Agence France-Presse reported. In an address on state television, Bukele said immigration authorities would bar entry "of any foreigner who is not a resident or diplomat in Salvadoran territory."

## NEWS BRIEFS

## IDB Postpones Annual Meeting Over Coronavirus Concerns

The Inter-American Development Bank announced late Tuesday that it was postponing its annual meeting, scheduled for next week in Colombia, over concerns about the spreading coronavirus. The IDB announced the decision jointly with Colombian President Iván Duque and said the annual meeting, planned to be held in Barranquilla, will be pushed to the first half of September, when IDB member countries are also expected to select a new president for the organization.

## Argentina Needs ‘Substantial’ Relief in Debt Talks: Economy Minister

Argentina needs “substantial relief” as it restructures almost \$70 billion in debt, Economy Minister Martín Guzmán told Reuters Wednesday. Guzmán added that a March 31 deadline to reach a deal with bondholders may be affected by the coronavirus pandemic. Guzmán said Argentina will not have capacity to service its foreign currency bonds for a “few years.”

## Chileans Protest in Santiago as Piñera Marks Two Years in Office

Chilean President Sebastian Piñera’s second anniversary since taking office on Wednesday was marked by protests in Santiago in which riot police and students clashed, France 24 reported. The demonstrations also coincided with the 30th anniversary of dictator Augusto Pinochet’s fall and the country’s return to democracy in 1990. In a ceremony, Piñera said the last 30 years had been a “fertile” period during which Chile lifted eight million people out of poverty, while recognizing inequalities that hurt “the soul of the nation.” Piñera’s approval rating stands at a record low of 6 percent.

Bukele added that Salvadorans returning home from countries where coronavirus cases have been recorded would have to be quarantined for 30 days. Bukele also said gatherings of more than 500 people would be prohibited and that schools and universities would suspend classes for 21 days. Elsewhere, the governments of Argentina, Colombia and Peru said travelers from the countries that are hardest hit by the virus would be isolated upon arrival, AFP reported. Argentina, which was the first country in Latin America to confirm a coronavirus-related death, said travelers arriving from China, Italy, France, Germany, Spain, Japan, South Korea and the United States would be in isolation for two weeks. “This is not voluntary, it’s not a recommendation. If you don’t comply

“If you don’t comply [with a quarantine] you’ll be committing a crime, which is putting the public health at risk.”

— Alberto Fernández

you’ll be committing a crime, which is putting the public health at risk,” Argentine President Alberto Fernández told radio station FM Delta. “The person who complies with the 14-day quarantine is obliged to shut himself away at home alone.” Argentina as of Wednesday had registered 19 cases of coronavirus. Brazil, Latin America’s most populous nation, had more cases, at 34. Brazilian President Jair Bolsonaro, however, played down the risk of the fast-spreading virus. “During the past year, obviously, we have had moments of crisis. A lot of that is fantasy. And coronavirus, which is not all the mainstream media makes it out to be,” Bolsonaro said Tuesday during a visit to Miami, Reuters reported. Bolsonaro said the outbreak of the virus and associated turmoil in financial markets resulted from “fantasy” and did not represent a crisis. On Wednesday, Brazilian stocks fell 8.5 percent, and the country’s currency dropped back toward its all-time low against the dollar. Stock trading in São Paulo was halted for 30 minutes in the afternoon when a 10 percent fall in the Bovespa index tripped a so-called “circuit breaker” in order

to pause trading. In the United States, the Dow Jones Industrial Average fell more than 5 percent on the day and slightly more than 20 percent from its high, ending an 11-year bull market on the index.

## Security Forces Hit Protesters With Tear Gas in Caracas

Venezuelan security forces fired tear gas at anti-government demonstrators Tuesday in Caracas during a protest led by opposition leader Juan Guaidó. The demonstration, which drew tens of thousands of Venezuelans into the streets, was the first that Guaidó had called since returning to the country on Feb. 11 from an international trip. He visited Colombia, Europe and the United States, where he met with U.S. President Donald Trump, the Miami Herald reported. Local media showed huge crowds of anti-government protesters in several Venezuelan cities, while state-run television showed images of a large rally of supporters of President Nicolás Maduro in downtown Caracas, the newspaper reported. In the capital, riot police carrying heavy shields and backed by armored vehicles confronted anti-government protesters who had assembled with the goal of retaking the National Assembly, the Associated Press reported. Demonstrators threw sticks and rocks at police, who responded by firing tear gas that scattered the protesters, the wire service reported. Using a megaphone, Guaidó addressed the marchers, saying, “They try to intimidate us with weapons of war. We’ll keep going until we reach our goal.” Guaidó, whom dozens of countries recognize as Venezuela’s legitimate president, then led a smaller group of demonstrators to a calmer part of Caracas and led an impromptu outdoor session of the National Assembly. Speaking to lawmakers, Guaidó repeated his assertion that the only way out of the country’s political and economic crises is a free and fair presidential election. However, even some of Guaidó’s supporters say that a new presidential vote is unattainable for now and that the opposition should focus on legislative elections that are scheduled to be held this year, the AP reported.

## FEATURED Q&amp;A / Continued from page 3

toward this sector must not limit their cargo capacity. Hydrogen is poised to perform this task better than batteries. To compare it to biofuel, there should be a thorough analysis of what production would entail in terms of land use. Solutions with hydrogen do not put at risk the disposition of arable land that could be used for generating food. Traditional fuel refining companies already have the expertise of handling flammable fluids and handling combustion gases at high pressures. These same skill sets could be redirected toward hydrogen, given that hydrogen poses a similar level of risk, albeit with slightly different considerations.”

**A** **Hans Kulenkampff, president of the Chilean Hydrogen Association:** “Hydrogen is being developed globally to accelerate the energy transition and decarbonize hard-to-electrify applications. LAC is no exception. Argentina, Uruguay, Colombia, Costa Rica, French Guiana and Chile are already developing projects. Chile is speeding up in all private, public and academic sectors. The private sector, led by H2 Chile, in January launched ‘Misión Cavendish,’ an initiative to accelerate green hydrogen projects through four workshops. The event is fully booked, with around 180 attendees per workshop. The public sector, led by the Ministry of Energy and CORFO-Solar and Energy Innovation Committee, is working on different initiatives to launch the National Hydrogen Strategy in June. The academic sector is preparing the ‘Instituto de Tecnologías Limpias,’ a R&D institution with public support of \$190 million for 10 years that will pilot and scale up renewables technologies in the Antofagasta desert. I wouldn’t be surprised to see, in a couple of years, a ‘Welcome to CH2ILE’ sign upon arrival at the Santiago Airport. The energy transition can’t be stopped. Hydrogen is being accepted everywhere as part of the solution, and refiners have the know-how to embrace this technology and participate in the coming low-carbon economy. Nevertheless, I do not see the region’s refining sector

moving at the required speed. Today, it is the losing sector, as its clients will all look to electrification; big utility companies are getting ready for that. It has 10 years to shift from refining crude oil to solar or wind energies and embrace Power-to-X technologies. Perhaps it should look more closely at the 2050 vision of FuelsEurope, an association of 40 companies operating refineries in the European Union.”

**A** **Johannah Christensen, managing director and head of projects & programmes at the Global Maritime Forum:**

“Maritime shipping is emerging as a leading sector in the world’s transition to a low-carbon economy. This will happen through a fundamental shift toward zero-carbon energy sources within the next decade. International shipping must reduce its total greenhouse gas emissions by at least 50 percent by 2050. This represents a trillion-dollar market opportunity for suppliers of zero-emission fuels. The total bunker fuel consumption for shipping is estimated to be around 250-300 million tons of fuel annually. While it is often assumed that there are numerous options for marine bunker fuels, many of these can be eliminated from consideration as they are unsuitable for deep sea shipping due to technical specifications and storage constraints. Green hydrogen could play an important role in decarbonizing the international shipping sector. It can be further processed to produce green ammonia or methanol, which have the advantage of requiring minimal adaptation to use with existing ship engines. With its vast renewable resources and significant commercial maritime activity, Chile is ideally placed to become a hub for the supply of hydrogen for the maritime industry. An Environmental Defense Fund study finds that Chile has among the world’s best potential for renewable energy generation with over 1,200 GW of solar potential alone. Supplying hydrogen for all ships departing Chile’s ports could unlock around \$65-\$90 billion worth of investment in clean energy infrastructure.”

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