# 2022 Energy Landscape & Outlook

Perspectives from the Institute of the Americas Energy & Sustainability **Non-Resident Fellows**

INSTITUTE OF THE AMERICAS®

ENERGY SUSTAINABILITY PROGRAM

# INTRODUCTION

Beyond eating and drinking too much, the holiday season provides time to reflect and contemplate the new year. The calendar change took place against the backdrop of (more) duress from COVID. But, also just after the COP26 summit in Glasgow and with volatility coursing through the global energy sector. Indeed, the adage "may you live in interesting times" now feels passé and unhelpful. Instead, as Marta Jara titled her essay "the good, the bad and the ugly" feels more relevant.

Having pondered how we ended 2021, the new year provides an opportunity to consider what key trends and issues face the energy sector. Once again this year, the Institute of the Americas invited our Non-Resident Fellows to prepare short essays with their views on the landscape and outlook for the sector.

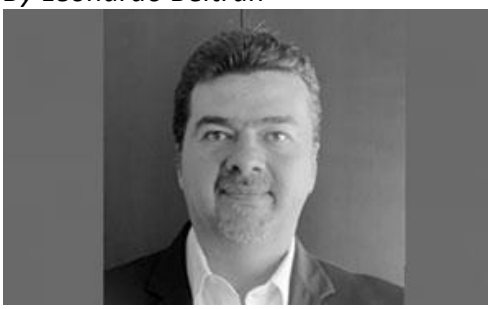
Our Fellows are based across the Western Hemisphere and UK and thus provide a unique angle to better understand the contours and possibilities for the next twelve months. Their essays set forth a high-level overview and outlook based upon two principal issues:

- What is the key energy trend to watch this year and why?
- Volatility, inflation and energy prices – why 2022 is not 2008

What follows is a compilation of essays prepared by our distinguished group of experts. With this document, we are keen to provide an overview of key insights heading into yet another exciting and important year for the Western Hemisphere's energy sector.

## Environmental Regulation and Finance – Key Levers of the Energy Transition

*By Leonardo Beltran*



The key energy trend to watch this year is clean generation supported by environmental and financial levers. On the environmental side, last year´s COP26 brought together the international community to renew their commitment to limit global temperature increase to 1.5°C and the corresponding need for all stakeholders to develop their decarbonization pathways to meet Net Zero Green-House Gas (GHG) emissions by 2050.

Governments will assess a whole suite of policies and regulation to determine their optimal pathways, including clean generation and energy efficiency targets, mandatory retirements of highly pollutant assets, or setting up a price on carbon. In turn, the private sector would increasingly need to prepare for a Net Zero world and assess market opportunities to expand market share or at least remain competitive in a decarbonized world.

On the financial side, at COP26 there were developments that can transform how we think on climate action. Developed countries renewed their pledge to mobilize US$100 billion in climate finance by 2023 at the latest. The private sector committed to align 40% of global assets (US$130 trillion) to Paris Agreement goals. Moreover, starting this year, companies in the European Union must comply with the disclosure requirements of their Taxonomy for Sustainable Activities which would be the basis to measure progress against those goals. These requirements are likely to increase interest in developing regions, especially in Latin America and the Caribbean, given their natural resource endowment.

However positive environmental and financial forces for the energy transition might be, volatility in energy prices and inflation must be acknowledged and will likely be persistent, given the stress of an industry with little to no spare capacity to accommodate demand growth, which could increase risk perception in the region. A possible effect could be seen in the increasing cost of capital and eventually losing investments to more competitive and stable economies.

## Chile's Energy Crossroads

*By Trinidad Castro*

The energy sector in Chile has undergone a revolution and transformation that began several years ago. In less than a decade, we went from a traditional energy matrix to one that has 50% renewable generation and it is expected to reach 100% by 2040.

On the other hand, in terms of digitalization, decarbonization through distributed generation and electricity portability and diversity, we are at a crucial moment in the energy sector.

This is a source of pride and great joy, but of course, it is a fact that brings with it an enormous responsibility.

Both the private and public sectors have a broad agreement and concrete will to achieve carbon neutrality by 2040 for our country.

But the energy system is not isolated from social reality. We are a country that has experienced accelerated progress and growth in the last 40 years. We went from having poverty indicators close to 54% to an indicator close to 12% today.

Accelerated progress is not free, there are populations that are left behind if we do not have direct and clear policies. Social capital is fundamental and oftentimes economic growth is not enough to satisfy everything.

And that is something that happened in Chile. We saw it widely reflected towards the end of 2019 when we experienced a disruptive and violent social uprising.

In that context, today we are facing a change of political leadership with a young President-Elect, the youngest in our history who comes from a trajectory of social movements and with left-leaning and what some have termed, radical tendencies. At the same time, we have a Congress balanced in the powers of the different sides of the pendulum.

So, in my opinion, we are at an important turning point. The transformation of our energy system always focused on the greater welfare of the people cannot be stopped. We will have to reach agreements, congruencies, flexibility, among other matters.

The energy system and mining in Chile are a source of national pride. And this is something that is built by all of us.

## Supply Crunch and Energy Prices

*By Andres Chambouleyron*

The key energy variables to watch this year will be wholesale oil and natural gas prices. These will be the result of the readjustment speed between demand (GDP growth) and supply (production + logistics and proven reserves) in the aftermath of the COVID 19 pandemic. During 2021 world GDP bounced back very fast to pre-pandemic levels in most developed and developing economies (+5.9% in 2021 according to the World Economic Outlook of the International Monetary Fund after falling -3.1% in 2020) while supply remained sluggish creating a crunch in many markets including (and especially) those of natural gas, coal, liquefied natural gas (LNG), oil and fossil fuels. The result of this temporary mismatch between demand and supply has been a sharp increase in energy prices throughout the world especially in Europe with natural gas prices

surpassing the 100 Euro per MMBTU and wholesale electricity prices reaching 400 Euro per MWh in some countries.

As the supply crunch in energy markets subsides once (mostly logistical) disruptions in supply chains are fixed, the prices of oil, coal and natural gas converge to their pre-pandemic levels and the prices of alternative renewable sources of energy and storage continue to fall, we should see countries vigorously resume their transition from conventional hydrocarbon-based power sources to renewables consolidating their march towards full decarbonization, digitalization and decentralization.

The COVID-19 crisis is very different from the 2008 crisis in the sense that the latter was a financial crisis originated in the sub-prime mortgage sector that extended into the banking sector finally affecting the real sector through a credit crunch. This crisis created a sharp recession (-4% reduction of World GDP between 2008 and 2009) but a slow recovery (2% per year) aided by government bailouts. The COVID crisis on the other hand produced a sharp drop in GDP due to movement restrictions, lockdown measures and supply chain disruption but as soon as those restrictions were lifted the economy quickly bounced back following its pre-pandemic trend.

Recovery of demand during the COVID pandemic was fast and this is precisely why it was accompanied by inflationary pressures: supply of raw materials, energy and manufactured goods could not keep up with the rapid surge in demand thus creating a temporary increase in certain prices. Once these supply restrictions are lifted production will start flowing again and prices of raw materials and energy commodities will start coming down to their pre-pandemic levels thus easing inflationary pressures.

## Outlook 2022: The Good, the Bad and the Ugly

*By Marta Jara*

The *Good*: Climate Change denial is over. We had to feel it close to home in 2021, in the form of droughts, wildfires and severe polar vortex collapse, so we confirmed the more abstract evidence that scientists had been offering for some 20 years since the Kyoto Protocol.

The *Bad* is that, even given this acknowledgement, action is not following with the necessary urgency required to prevent serious damage. Now is the time for introduction of key policies to provide the certainty needed to accelerate change: Clear, ambitious standards in corporate governance, industry, construction, product stewardship and revision of trade agreements to incorporate all of the foregoing elements. Carbon pricing initiatives have already been implemented in 45 national jurisdictions covering a fifth of the global GHG emissions, with China

having just launched its Emissions Trading System (ETS). However, these mechanisms seem to have failed in reaching the transparency and liquidity that would make them relevant to achieve the necessary emissions reduction. More focus on straightforward capping regulations and/or its symmetrical alternative, e.g. mandated increasing shares of clean energy, which obviously would trigger spontaneous market arbitrages, might be a trend to watch as time runs out. Certainty is becoming a key success factor for transitioning; disruptions and volatility of energy markets can become a fatal boomerang to net-zero progress.

The *Ugly*: Populism can be its major threat. If, for addressing social pressure, symbolism matters, there are better actions than others for governments to be seen as responsive to price surges in a volatile market. Some measures, while not yielding a material effect (like US counter-OPEC movement), go in the right direction (e.g. China forbidding Bitcoin mining). How much individual freedom are we willing to give up in exchange for standards regulating the reasonable use of resources? Surely, if subsidies are in place, society at large is paying the price for inefficiencies. As an anecdote that keeps me awake at night: in Argentina many middle class professionals are making extra income by renting properties with good air conditioning and filling them with computer racks that mine crypto currency on the back of lagging and heavily subsidized electric tariffs.

## A Very Brazilian Energy Crisis

*By Nelson Narciso*

Brazil is experiencing a particular energy crisis that is intertwined with the global crisis. The country has around 60% of its electricity generation based on hydropower, and it is currently undergoing the worst drought of the last 91 years. Therefore, gas-fired power plants had to be dispatched to guarantee electricity supply. Thus, the country has increased LNG imports, which were already operating on historic highs in Europe and Asia, and consequently Petrobras had to readjust gas prices by 50% for local distribution companies, who are responsible for the supply to final consumers.

As a result, several local distribution companies took Petrobras to court alleging abusive price mechanisms and filed lawsuits to prevent the price readjustment. At the same time, ANP has been championing a regulatory agenda to promote the reorganization of a new gas market. The unfolding of these legal cases and the establishment of the new gas market will be two main topics for the Brazilian energy year in 2022.

Another relevant topic will be Petrobras' fuel pricing policy. Brazilian logistics infrastructure is heavily dominated by road transport. Therefore, most economic sectors are strongly sensitive to fuel price variations. Moreover, there will be presidential elections in 2022. The country has been in economic crisis with rampant inflation, high unemployment and currency devaluation. Internationally, there has been a rise in oil prices on the global markets, which puts pressure on Petrobras to increase fuel prices accordingly. However, due to macroeconomic conditions, a rise in prices is extremely unpopular for the incumbent president and other candidates. This could affect the dynamics of the Petrobras' fuel prices.

With regards to the energy transition, the current administration has not been able to make the most out of the country's comparative advantages. Despite having the Amazon rainforest and one of the cleanest energy matrixes on the planet, Brazil has lost the leading role it once had in the environmental agenda. With the presidential elections looming, the debate on energy transition and environmental policy, that are crucial for Brazil's reintegration into the international scenario, will be resumed with force.

Overall, the perspectives for the Brazilian energy year in 2022 are uncertain. The water crisis could turn into a full-scale energy crisis, continuous rise in international prices could affect fuel pricing and rise in fuel prices, which is extremely inflationary. As the Brazilian economy is already in a perilous state and 2022 is an electoral year, the Bolsonaro administration might even intervene in the Petrobras' fuel pricing policy, which could bring worst consequences in the future.

## The Energy Sector and the Socio-Political Environment

*By Francisco Xavier Salazar Diez de Sollano*

Trying to visualize trends in the energy sector without taking into account the socio-political environment can lead to the wrong conclusions. Historically, geopolitical analysis has been essential to understand the development and evolution of the energy sector, not only in the field of oil and gas, but also in the electricity sector. Many of the energy crises humanity has experienced in recent years stem from geopolitical conflicts. At the international level, a recent example is what has happened in Europe with the rise in electricity prices as a result of the lack of gas coming from Russia, with whom there is a political conflict. In South America, political tensions between different countries have also generated supply crises in the past.

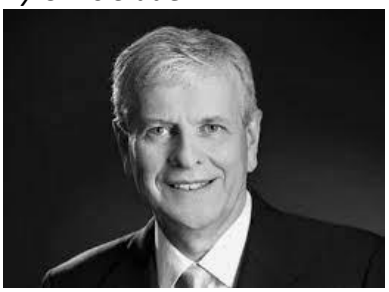
As part of our analysis, in addition to major geopolitical conflicts, today it is essential to take into account socio-political conditions at an increasingly regional level. What happens in the local

environment can be crucial for the energy transition to succeed or fail. In this sense, we have to pay attention to what is happening currently in various countries. In particular, we must consider the reality in countries where political conditions have favored the emergence of populist leaders with an outdated extractivist and statist vision. These leaders and their administrations are not only far from favoring the energy transition, but in many cases actually hinder it.
However, increasingly, our analysis has to go far beyond national realities and understand local dynamics. For the energy transition to be successful, it is necessary to develop new infrastructure that requires not only the so-called "social license," but more importantly, a true shared vision between investors and communities of a sustainable future that begins locally.

As much as world and national leaders are convinced of the urgency of the energy transition, as long as communities and their local leaders do not feel this urgency and share the same vision, the energy transition may be at risk.

## The Rise of Heat Beneath Our Feet

*By Chris Sladen*



The geothermal decade is underway. Geothermal offers a clean and inexhaustible energy supply available 24/7 everywhere. It can be used for heating, cooling, hot water and producing electricity. There are multiple heat applications for agriculture, buildings and industrial processes. Geothermal is ideal for meeting the Net Zero decarbonization challenge, however in recent years it has fallen a long way behind wind, solar and battery storage as a renewable investment choice. With so many different applications and a vast untapped potential, geothermal should be a foundation of the energy transition. It is an ideal base-load without the issues of weather dependency. It is yet to breakthrough but technology, carbon pricing, clean energy policies, and a transfer of subsurface and project skills from the oil & gas sector is leading to rapid change.

Geothermal opportunities exist throughout the Western Hemisphere. There are three major opportunities:

1. The Ring of Fire which runs north-south through the hemisphere creates ideal conditions with elevated heat flow due to the Pacific tectonic plates colliding and being subducted beneath north, central and south America. The most obvious indication of elevated heat-flows are the hundreds of active and recently active volcanoes, as well as widespread hydrothermal vents, geysers and springs. These stretch all the way from Chile in the south through Bolivia, Ecuador, Peru,

Colombia, most of central America (for example Costa Rica, Nicaragua, El Salvador and Guatemala), then continuing northwards through Mexico, the western USA and thence into western Canada. Many of these countries are now pursuing this gigantic resource base with high temperature fluids (75-315$^{o}$C) suitable for power generation often accessible at relatively shallow depths (<2kms).

2. The repurposing of oil & gas wells to extract heat has great potential with many millions of onshore wells across the region, typically with bottom-hole temperatures 40-150$^{o}$C. Extending the life of these wells and postponing abandonment costs adds to the attractiveness of conversion to geothermal uses. The technology is evolving rapidly; both the US and Canada are leading the race to retrofit oil & gas wells. Here, around half a million wells produce less than 2 boe/d and millions of others are partly plugged & abandoned, whilst others are orphaned without any operator. In the US states of Texas, Oklahoma, Louisiana, Kansas, Indiana & California, and the Canadian provinces of Alberta & Saskatchewan, the well stock is enormous numbering many millions, even if not all wells may be suitable. Argentina, Brazil, Colombia, Ecuador, Mexico and Venezuela are also obvious candidates with substantial numbers of onshore wells.

3. Shallow low grade (low enthalpy) heat is available everywhere. Its use in heating and cooling buildings is growing rapidly. This heat is typically accessed by either placing underground coils & loops or drilling shallow wells, and combining these with heat pumps. The resulting shallow geothermal is ideal for heating and cooling homes, offices, warehouses, indoor stadiums, airports and typically operating at 5-35$^{o}$C. These solutions have great potential to replace systems that run on natural gas or heating oil, and can be made more efficient with better building design. Water in abandoned coal mines and no longer used water boreholes offer other routes to access low grade heat. Again, there are hundreds of thousands across the region.

Added value operations: Mineral-rich geothermal fluids have been known for centuries in the mining industry. Focus has now turned to processing these for battery-grade lithium, with lithium the principal source of value and heat as a by-product. With lithium an essential component for electric vehicle batteries which are key to decarbonising transport, and for storage of energy from intermittent solar and wind, demand is growing rapidly. Geothermal lithium also offers long term energy security and the opportunity to supply a rapidly expanding global market. The price of lithium soared 500% in 2021. A leader is California where pressurised brines can reach 300$^{o}$C. Processes to extract lithium more efficiently are advancing rapidly with much investment coming from vehicle manufacturers. With hundreds of new electric vehicle models, and the phase out of new gasoline & diesel vehicle sales, the hunt for geothermal battery-grade lithium is set to grow dramatically.

Summarizing geothermal in 2022: The future decade looks extremely promising with vast numbers of projects available. The hemisphere is richly endowed with suitable geology, skilled engineers, and grids to distribute power and heat. Investors remain wary of project execution risks and high initial costs. There will be a notable uptick in projects and investment in 2022, even so geothermal remains a very long way off matching wind or solar investment which are also more suited to rapid deployment. The industry has to deliver on bringing down costs, finding

technology solutions and extracting added value. Breakthroughs in retrofitting millions of old oil & gas wells would transform the industry.

## Mineral Reflections

*By Roger Tissot*

With a little bit of luck, 2022 will be the year we finally say goodbye to the pandemic. Although we would like to think an official end would be announced on TV and, suddenly, we all would pick up where we left off in March 2020. I doubt that would happen. More likely, the end will be slow, arriving at irregular times and locations depending on the rate of vaccination, and many other variables. But let's be optimistic and hope that by December 31, 2022 COVID is finally behind us. 2022 will have to be the year of healing and repairing. Repairing broken infrastructure and global supply chains - and healing from our increasing political polarization if we want to achieve the ambitious Net Zero goals.

Independently of the noise emerging from the different political positions regarding the energy transition in 2022, there are some fundamental "truths" that would force Latin America to rethink its development strategy and role in the global economy: i) the electrification of transportation, ii) the reliance on renewable sources to power to electrification of "everything", and iii) the need for energy intensive industries to relocate close to the energy sources.

All of these trends imply a significant rise in the demand for minerals. In fact, an average Electric Vehicle requires seven times more minerals than an Internal Combustion one. Demand for lithium and cobalt is likely to increase by 500% to meet the required expansion of wind and solar power (Martin, 2021). According to the World Energy Outlook there is a significant gap between the expected demand for minerals to meet Net Zero goals and their availability. (Manrique, 2021).

Latin America is well-positioned to play a central role in the supply chain of the energy transition because of the abundance of key minerals. The vast copper resources of Chile and Peru ensure a large supply of molybdenum, a key component for solar panels. Brazil is also well-positioned to challenge the monopoly of "rare earth" minerals from China, and Bolivia could diversify its exports by developing its rich nickel potential. Ecuador could expand its production and export of balsa wood, used in the manufacturing of wind propellers ( Red Latinoamericana sobre industrias extractivas, 2021). However, the promises of the energy transition seem to leave Latin

America once again at the periphery of the industrial development, limited to be a supplier of raw materials.

At the most basic level there have been two traditional “models” for mineral and hydrocarbon development in Latin America: the concession model, leaving the development to private investors or the nationalistic approach where the state creates state-owned enterprises (SOEs) tasked with exploiting the resource, deemed of strategic importance. In between these two options there have been several variations where both state and private investors coexist. But for now it seems appropriate to note that none these options have fulfilled the expectations of society in terms of sustainable and equitable development.

How can Latin America capture the “potential” of the energy transition without addressing the numerous limitations that exist from the prevailing governance models?

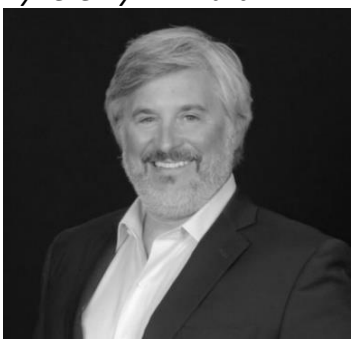
A pro-extraction strategy – formed by an alliance of political elites and foreign investors – is likely to be rejected by local communities increasingly concerned by the impact of large-scale projects in their territories. A nationalistic model, where distant bureaucrats in capital cities make decisions “for the benefit of the nation” are less likely to succeed.

At the core is the need to revisit key concepts of governance and ownership. After years of international governance aimed at promoting “sustainable extractive development” and efforts by mining and petroleum corporations to garner the social license to operate, severe doubts remain over the value of those propositions. Too often, many of those “best practices” tend to be ignored, challenged or poorly implemented. In the best of cases, public consultations are vulnerable to cooptation to a pro-extraction agenda often ignoring the value of a region or country’s natural capital. The focus then is on a short-term transaction between the provision of specific benefits by project developers in exchange for support -- or perhaps better qualified as acquiescence -- to a proposed project from local communities.

Latin America, as with the apocryphal Alphonse Daudet story “The man with the Golden Brain” seems condemned to eat its own resources until nothing is left to secure its own survival. These are difficult questions that our political leaders must address if they want to use the energy transition to pursue a profound transformation of our global economies and societies into the dream of a more sustainable and equitable economic development model for the region. What is clear is that globally and locally, there is an increasing effort to redefine the centralization of the extractive economic model, incorporating additional forms of value, other than just those from mineral rents.

## On Rhetoric and Reality – Climate Action, Politics and Energy Transition

*By Jeremy M. Martin*



Daniel Yergin, the energy historian and analyst, defines energy security as "the availability of sufficient supplies at affordable prices." These two fundamental and overarching facets have forced many politicians into an undesired contortionist career – how to keep prices affordable and balance supply-demand in an age of climate concerns. That is: how to ensure more energy and less carbon but keep it reasonably priced for your citizens.

There is surely nothing that keeps a leader and cabinet up at night more than surging energy prices. This fact is only exacerbated by the delicate economic moment for most of the world, with inflation soaring in many locales and daily stories of supply chain disruptions. But we must now add the layer of the climate emergency and the agreed-upon desire to confront why our planet is warming. Unfortunately, the near-term outlook is clearly more volatility, not less.

With the global economic engine revived, combined with severe weather in much of the world, the demand for energy, but particularly fossil fuels for power generation, transport, heating and manufacturing appear to have primed the pump for another high-price cycle. To wit, several analysts forecast oil demand surpassing pre-COVID levels.

This points directly to a key trend for the year: the uncertainty of oil market supply and demand and OPEC+ jostling as to the right path for framing output targets, boosting investment and meeting demand growth. The long shadow cast by inflation from high prices and market imbalance shows no sign of receding.

The Biden administration's release of 50 million barrels of oil from the Strategic Petroleum Reserve (SPR) in November 2021 was an early though prescient peek at 2022. This was particularly the case with regards to what proved to be a rather limited impact from such a highly debated move.

But it also underscores another truism that will hold in 2022: high energy prices are a political third rail. That is, an issue that can be politically fatal. No candidate has won a campaign on a

platform that requires citizens to pay much higher prices at the pump or when they flip on their lights.

Pursuing major energy demand reduction policies that potentially translate to elevated prices whether from a carbon tax or other fiscal and regulatory measures demands massive political will. Certainly, the climate emergency and commitment reaffirmed at Glasgow indicates there is a level of political will, perhaps greater than ever before. Yet, high energy prices and the derived inflationary pressures on cost of living and key inputs for the economy are never trivial, especially for countries such as Brazil, Costa Rica, Colombia and the US where key elections are on tap.

Look no farther than the European Commission's move to categorize nuclear and natural gas as green investments to understand how politicians on the Continent hope to strike the balance between energy security and climate action. "There is a role for natural gas and nuclear as a means to facilitate the transition towards a predominantly renewable-based future" a January 1 statement from the European Commission read.

# OUR NON-RESIDENT FELLOWS

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Mexico City, Mexico

Leonardo Beltran was Deputy Secretary for Planning and Energy Transition en the Administration of President Peña Nieto (2012-2018). As part of his responsibilities he was appointed non-executive director of CFE and Pemex. He was the Chief Planning Officer and the Chief Technology Officer in the Mexican Energy Sector. He studied a Master´s in Public Administration in International Development from the Harvard Kennedy School, a Bachelor of Science in Economics from Instituto Tecnologico Autonomo de Mexico, and studied Law in the Faculty of Law of the Universidad Nacional Autonoma de México.

## Trinidad Castro
Santiago, Chile

M. Trinidad Castro Crichton is the Executive Director of the World Energy Council Chile, a platform for open dialogue between high-level leaders from the public and private sectors and academia, where the most important issues of the country's energy sector are addressed. Castro is a commercial engineer and has extensive experience in management in the nonprofit and corporate sectors, specifically in the design, operation and commercial execution of projects. She has a strong orientation toward achievement and management by objectives.

## Andres Chambouleyron
Buenos Aires, Argentina/
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Andres Chambouleyron is non-resident fellow at the Institute of the Americas. He has worked extensively in the private sector as an economist and consultant for public utilities (electricity, natural gas, water and sanitation, and telecommunications) and other regulated and non-regulated businesses. His work involves economic analysis, pricing and rate setting, valuation, business advisory, regulatory design and analysis mostly in the energy sector.tions (2000), where he helped design and implement the country's new regulatory framework.

## Marta Jara Otero
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Ex President of ANCAP (Administración Nacional de Combustibles, Alcohol y Portland), Uruguay • After more than 20 years international experience at Royal Dutch Shell, Marta left her position as President of the Shell companies in Mexico to join the energy industry in her native Uruguay • Chemical Engineer graduated from the University of Buenos Aires • MA in Strategic Financial Management at Kingston University, UK, executive education programs at IMD in Lausanne and Harvard Kennedy School of Government.

## Nelson Narciso Filho
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Nelson Narciso Filho holds graduate degrees in Industrial Administration and Economic Engineering from the Universidade Federal do Rio de Janeiro and an undergraduate degree in Mechanic Engineering from Souza Marques University. He has held multiple senior executive positions at Exploration and Production (E&P) companies and service providers in the oil and gas industry, such as HRT Africa, Halliburton, ABB, Vetco Gray and Hughes WKM.

## Francisco Xavier Salazar Diez de Sollano
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Francisco Xavier Salazar Diez de Sollano is a partner at Gadex, Enix and Trust Mexico. Gadex is a consulting firm specialized in the natural gas market in Mexico, Enix is devoted to energy regulation while Trust Mexico analyses socio political risks for infrastructure projects in the country. Francisco is also the Coordinator of the International Confederation of Regulators (ICER).

## Chris Sladen
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Chris is an advocate for better energy solutions than the ones we have used so far! Chris is well known across the energy sector, particularly for laying a framework for co-investment between public and private sector energy companies, whilst explaining the different elements of project, contract and country risk. He has a track record of helping governments and regulators to optimise private and co-investment.

## Rene Roger Tissot
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Rene Roger Tissot is an economist, MBA and a CPA with deep experience in international energy policy and geopolitics. Roger started his career at the Canadian Energy Research Institute (CERI), where he led the Institute's international research, particularly in Latin America. He also worked as international government relations for a large Canadian oil company with largely focused on Ecuador, Colombia, Brazil, and Argentina.