Navigating disruption

The new energy model

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FOREWORD

Inflation has soared to a 40-year high, driven by the confluence of geopolitical uncertainty after Russia's invasion of Ukraine, and the aftermath of a global pandemic.

Supply chains have struggled to readjust to the rapid recovery in demand after lockdowns were lifted around the world.

At the same time, the recovery from the pandemic has created tensions in the labor market, with demand for workers in key sectors growing faster than supply. Russia's invasion of Ukraine has generated the worst energy emergency since the Middle Eastern crisis of 73 and 79, while the global food chain is also facing a severe disruption.

These factors, among others, are adding pressure to mid-sized businesses, some of them still recovering from the impact of the pandemic.

In the following series, we will analyze some of the most relevant changes our clients and investors are facing and how they can build resilience to ensure growth.

Navigating disruption | 2022

In this report we cover the main challenges and new opportunities affecting the energy sector, following a discussion with Antonio Llardén, Chairman of Enagás, and Nemesio Fernández-Cuesta, former Secretary of Energy in Spain, and moderated by Fernando Lafuente, Partner at Alantra Equities

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ENERGY

Towards a European Energy Model

On June 22nd, the International Energy Agency (IEA) warned that Europe must prepare immediately for the complete severance of Russian gas exports this winter, urging governments to take measures to cut demand and keep aging nuclear power stations open.

As a response to recent developments, European countries have taken emergency measures to reduce gas demand. The cornerstone to reducing Europe's reliance on imported fossil fuels relies on RePowerEU, the blocks' common energy policy which was announced this past May. The plan aims make Europe independent from to Russian oil and gas before 2030 and to accelerate the transition to cleaner energy sources to reach the 2050 commitment.

As part of this plan, the EU is heading toward a certain harmonisation of prices while trying to keep them as low as possible. The plan's goal is to do this by accelerating objectives it already had in place to transition to sustainable sources of energy and by joining forces to create a more resilient energy system within the Union.

Building on the "Fit for 55" proposals the European Commission unveiled in 2021, the REPower EU proposal adds three additional elements.

It emphasizes the need to save energy in preparation for next winter and outlines behavioural changes that can cut energy consumption by 5%. It encourages countries to devise fiscal incentives to encourage energy saving. Antonio Llardén, Chairman of Enagás: "The four largest countries of the European Union - Germany, France, Italy and Spain – until now have had completely different energy structures, the result of their geography and their history.The European Union is now for the first time in its history devising a common policy."



Efforts to diversify energy supplies can be made more efficient by pooling resources, optimising infrastructure use and developing a 'joint purchasing mechanism' to negotiate purchases on behalf of member states.

The EC says the crisis will accelerate its transition to clean energy by fast forwarding targets. For example, it now plans to make renewables 45% of its energy mix by 2030 compared to a previous target of 40%.



Implications of the decoupling of Russian energy supply

Removing Russian oil and gas from the equation is harder than it seems. Russia is the world's second biggest supplier of oil, exporting 5.2m barrels per day. It's the world's largest gas exporter, sending 210 billion cubic metres abroad via pipeline every day, according to the IEA. Europe alone needs to substitute 100bcm-150bcm of gas that until now it has been receiving from Russia.

Crude oil main importers		Crude oil main exporters	
China	11.2	Saudi Arabia	7.0
Europe	9.5	Russia	5.2
USA	5.9	West Africa	4.1
Other Asia-Pacific	5.4	Iraq	3.6
India	4.1	Canada	3.8
Japan	2.5	USA	3.1
Total World	42.2	Total World	42.2

Unit: million barrels per day

Cutting all Russian energy imports would have a far-reaching impact on the global economy and long-term consequences. Given the levels of dependence for some countries, it would take as much as half a decade to recover from such an abrupt change of tack.

The most likely sources for building an alternative natural gas market are the US, Qatar and Australia, the second, third and fifth biggest exporters of gas in the world. Algeria, which last year exported 55.2 bcm to Europe, could become another provider that helps to make up the shortfall by increasing its supply. Last week, the EU signed a memorandum of understanding with Egypt and Israel to supply gas to Europe.

The high cost of energy comes at a time of economic uncertainty. Central banks are raising rates to curb inflation while trying not to hold back economic activity. It's possible that the global economy could have to negotiate a cocktail of rising prices combined with sluggish growth.

Amid this panorama of uncertainty, the oil and gas sectors will still need investment. Fossil fuels will need to continue to be funded and this represents one of the more difficult challenges in the transition as ESG investment disincentivizes investors. Under the International Energy Agency's net zero emissions projections for 2050, demand for oil would decline from 97 million barrels a day in 2019 to 24 million barrels a day. But that would still require investment of \$11 trillion if the world wants to avoid an energy deficit, according to the IEA.



Big Oil's Big Payday

Source: Bloomberg data, company filiings Note: Full-year 2022 figures are companies' guidance

The volume of investment from the private sector needed to fund the transition will require a steady and attractive regulatory environment and possiblyincentives from governments.

Energy companies are already struggling to hold on to shareholders and are having to offer greater dividends to their investors to keep them, meaning there's less capital expenditure available for exploration. Their capex is also increasingly being aimed at renewable energy sources. This makes it complicated for investment in oil and gas exploration that's still needed as we build capacity in sustainable forms of energy.



Fernando Lafuente, Partner at Alantra Equities, during the discussion with Antonio LLardén and Nemesio Fernández-Cuesta.

The UN estimates that achieving a net zero planet by 2050 will require \$125 trillion in climate investment. This implies opportunities not only in increasing production renewable energies but also along the entire supply chain. Electricity storage units will need funding while raw materials such as copper for electricity cables and graphene, cobalt, and lithium for batteries will experience surges in demand. Prices of nickel are already rising.

The long-term goal is to gradually reduce reliance on fossil fuels. But they will continue to be a component of the energy market if it is to ensure a smooth transition. One of the risks for Europe is that as it reduces its share of production of oil, OPEC's control of the market will rise. The IEA estimates that, in a net zero emissions scenario, its quota will rise from 34% to 52% by 2050, giving it more over prices even as the world leverage attempts to wean itself off its products. Just as oil dominated geopolitics in the 20th century and the early 21st century, the countries which can supply the raw materials that will be the backbone of the sustainable energy industry will wield extraordinary power. To achieve net zero, the production of minerals such as copper, nickel, graphite, lithium, manganese, and cobalt will need to increase six-fold by 2050, especially for the electric vehicle sector, according to the IEA.





Nemesio Fernández-Cuesta, former Secretary of Energy in Spain: "To create markets, there must be rules that are very different from those we have today. You are not going to invest significantly in green hydrogen if you don't have a clear and steady regulatory framework and a market to satisfy."

New opportunities in the horizon

The urgency to wean itself off Russian hydrocarbons may be an opportunity for the world to accelerate the green transition and reduce its carbon output. The Kaya Identity calculates carbon emissions as the size of a country's population x its GDP x its energy intensity (the amount of energy consumed per unit of GDP) x carbon intensity (the amount of carbon dioxide emitted per unit of energy).

Energy intensity can be reduced by improving efficiency. This can include measures such as reducing the carbon footprint of certain industries, changing consumption habits, and developing technology that saves energy.

A key area of development will be in electricity storage. The production of increasingly larger volumes of electricity will also require significant investment in storage. Smart meters and networks will allow for electricity to be held back during daylight hours when there's overproduction so that electricity can be stored when it's at its cheapest and sold when it's most expensive, providing equilibrium for the market.

Another technology that will become increasingly popular is pumped-storage hydroelectricity, which works by pumping water between reservoirs on different levels to create energy and effectively acts as a giant battery that can release power when needed.

What determines total CO, emissions

The "Kaya Identity" breaks down total emissions into the key elements driving them.



progress against the world's largest problems.



Hydrogen is an important part of the net zero emissions scenario, but is only one piece of the puzzle

Notes: NZE=Net Zero Emissions Scenario. TFC=total final energy consumption. CUS=carbon capture, utilisation and storage. "Behaviour" refers to energy service demand changes linked to user decisions (e.g. heating temperature changes). "Avoided demand" refers to energy service demand change from technology developments (e.g. digitalisation). "Other fuel shifts" refers to switching from coal and oil to natural gas, nuclear, hydropower, geothermal, concentrating solar power or marine energy. "Hydrogen" includes hydrogen and hydrogen-based fuels. Source: IEA (2021), Net zero by 2050

In a process of reducing emissions, electrification from renewable sources is the key to decarbonizing the energy market. In a net zero emissions scenario, the share of electricity as an energy source will need to grow from 19% today to 49% in 2050. To meet these targets, solar and wind energy production will need to increase by 300%. Today, 3% of electricity is produced from photovoltaic farms. That will need to rise to 19% by 2030 and 33% by 2050 to achieve net zero. Similar investments will need to be made in wind to raise its share of electric production from 6% to 35% by 2050.

Hydrogen is seen as the most viable low-carbon fuel but it requires the creation of a hydrogen market to bring costs down because green hydrogen is still expensive to produce. Regulations need to be changed so that companies can have legal guarantees that their investments will be secure for 10 years.

Hydrogen won't be the only fuel. Heavy transport, especially aviation will use synthetic fuels that are a mixture of hydrogen and carbon dioxide. Ammonia, which is already industrially produced for fertilizers, could be used for fuel for shipping. Biofuels, produced from agricultural, domestic, or industrial biowaste will also play their part.

Nuclear is the final building block. According to a new special report by the IEA, nuclear power can play a major role in enabling secure transitions to low emissions energy systems. Nuclear provides 6,000 hours of production a year compared to 700 from solar, making it much cheaper. In order to meet the objectives of The Paris Climate Agreement it is likely that non-contaminant nuclear energy will need to be a part of the solution. It currently accounts for about 10% of the world's electricity production. There are currently 55 reactors being built globally and the IEA envisages installed nuclear capacity will grow by 26% by 2050. 08

The transition to net zero is a challenge for the world but also an opportunity for investment.

Individuals will need to shift to electric cars and will have to buy new heating and cooling systems, invest in insulation and more sustainable household appliances. Transport companies will need to make their fleets electric. Companies will be required to invest in electrification, heating and cooling systems, energy efficiency and carbon capture. Renewable energy will open whole new areas of growth for the electricity sector, particularly in storage and building smart and reinforced grids. The fossil fuels industry can convert into a sector that specializes in biofuels and synthetic fuels, renewable gases and electricity.

In short, the transition will be costly and difficult to navigate but it could also herald a new era of prosperity for the global economy.



The discussion was a unique opportunity to gain a view of the situation to improve decision-making and navigate the way forward towards the transformation of our energy model.