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ESADEgeo-CENTER
FOR GLOBAL ECONOMY
AND GEOPOLITICS

9 Book reviews on global economy and geopolitical readings

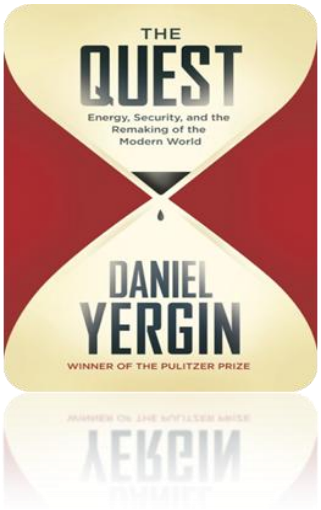
ESADEgeo, under the supervision of Professor Javier Solana and Professor Javier Santiso.

Fundación REPSOL

Obra Social "la Caixa"

The Quest: Energy, Security and the Remaking of the Modern World

Yergin, Daniel (2011), New York: The Penguin Group



"The world's appetite for energy in the years ahead will grow enormously."

"The emphasis on innovation across the energy spectrum is greater than ever before."

"Concerns about climate change and carbon are changing the modern energy world we have developed."

"In the years ahead, new surprises will upset whatever is the current consensus, change perspectives, redirect both policy and investment and affect international relations."

Basic Idea and Opinion

Yergin tells a story about how our modern energy world developed, how it has evolved over time and how it is shaping our future. This book is about the quest for the energy on which our society so completely relies and the security it provides, but it is also about the quest for a better environment in an ever-changing world in which carbon and climate change are one of the biggest challenges of our future, where technology will certainly be key to finding solutions to those challenges. The author reveals the biggest resource we have at our disposal, which will also determine the future of world energy: human creativity.

Yergin tackles three fundamental questions: 1) Will enough energy be available to satisfy the world's growing appetite? 2) How are the renewed uncertainty and insecurity about energy going to affect its whole system and how can it be protected? 3) What consequences is the new environmental consciousness –including climate change– going to have and how will it impact the future of energy? According to Yergin, we might not have all of the answers to these questions, but once thing is certain: innovation will be critical.

While the book provides a comprehensive overview of our relentless past, present and future thirst for energy, Yergin is careful in his analysis and never polemical. He is sometimes too cautious in his conclusions and is reluctant to take the energy industry to task for its intransigence and irresponsibility on environmental issues. In spite of

this, The Quest –given its broad scope –is an incomparable resource for understanding the modern energy world and its future challenges.

The author

Daniel Yergin, a world-renowned expert in the global oil industry and the geopolitical battle that surrounds it, holds a BA from Yale University and a PhD from Cambridge University. He is a writer, a speaker and an economic researcher. Dr. Yergin received the Pulitzer Prize for his previous book *The Prize: the Epic Quest for Oil Money and Power* (1991). He is currently Chairman and Founder of HIS Cambridge Energy Research Associates and serves as CNBC's Global Energy Expert as well as on the U.S. Secretary of Energy Advisory Board.

The interplay between world events and oil

Yergin describes the new era that has emerged in the decades since the Gulf War, defined by the political consequences that came with the dissolution of the Soviet Union, the Iraq War, the turmoil in the Middle East and China's emergence in the global energy equation. Still today, the world is suffering from its high reliance on oil and is facing its challenges in an unstable geopolitical context.

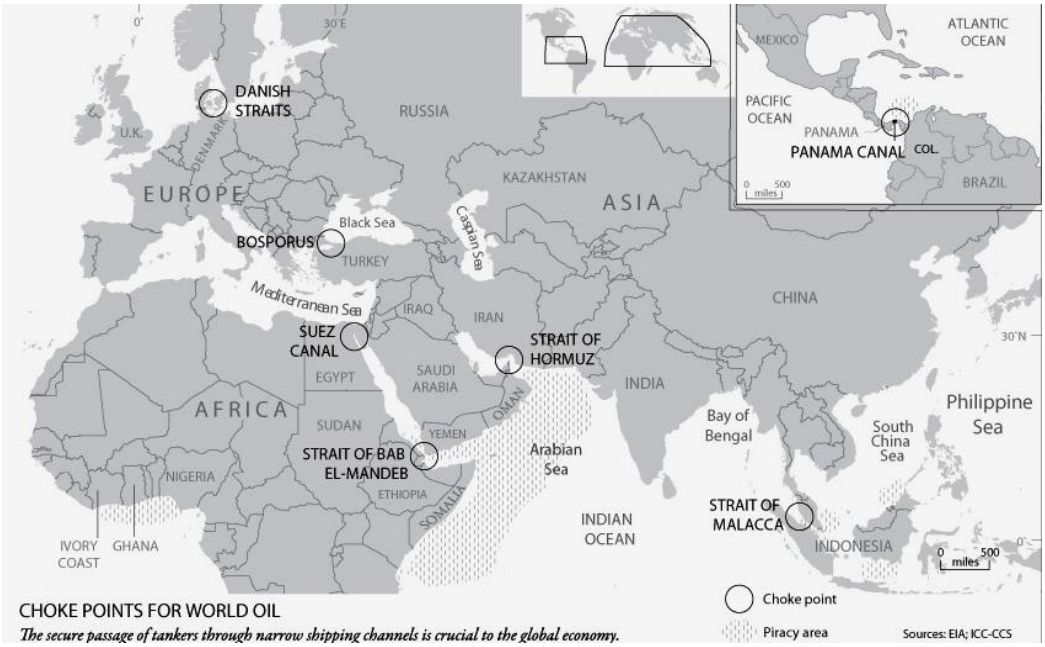
First of all, Yergin analyzes the deep changes the Russian oil industry has gone through since the collapse of the Soviet Union. Although there was a desperate need for investment, Western companies or investors were not allowed to enter the energy market under any circumstances. However, as time went by, the oil industry evolved until it was made up of companies with many differences in leadership, culture and approaches, and Russia turned out to be the largest producer of oil and the second largest exporter in the world. Indeed, today oil and gas are the greatest sources of wealth and they will be for years to come, but the country's heavy reliance on those energy sources is triggering a national debate over it.

Another important issue that deeply affected international relations was the dispute between countries over the Caspian's petroleum resources, which had first been developed by the Soviet oil industry. Once again, this heated discussion made Russians see Western influence in the region as an attempt to undermine Russia and its Great Power Status. The battles over pipeline routes for oil and gas became known as the Caspian Derby. Yergin carefully goes over all of the changes and breakthroughs the whole region went through, as well as the various outcomes and agreements that were reached, such as the Trans-Afghan Pipeline, the Central Asian Oil Pipeline or the BTC pipeline, finished in 2006 after the Deal of the Century.

Following the dissolution of the Soviet Union and the resolution of the Gulf crisis in 1991, countries took security off the table. The world was a globalized and secure

place until September 11th. That day disrupted security and international affairs and altered thinking about oil and dependence, but it did not interrupt energy supply. With regard to the war in Iraq in 2003, Yergin indicates that the oil industry in this particular country still suffers from years of lack of investment. In 2004, due to the collapse of Sadam's regime, communication broke down and the whole country was in chaos. That same year, the oil industry went under attack by the former Baath Party (S. Hussein), which blew up the pipelines. Iraq is currently still producing below its capacity, and it was not able to reach the pre-war level of 2001 until 2009.

The remarkable ascent in oil prices began in 2004 as a result of supply and demand, as well as of expectations and financial markets. In 2007-2008, with the start of the "great recession", the demand decreased as prices doubled. On the other side of the world, however, China's rapid growth in oil demand was generating great anxiety. This country, which two decades ago hardly figured in the global energy equation, is now central to this new world.



CHOKE POINTS FOR WORLD OIL
The secure passage of tankers through narrow shipping channels is crucial to the global economy.

Energy supply at risk: Is the world running out of oil?

Our energy system is thought to be quite vulnerable. The fear of running out of energy – oil, essentially – has troubled people for a long time. This concern is commonly known as "peak oil", a theory that establishes when the maximum rate of global oil extraction is reached, after which the rate of production enters a relentless decline, which creates anxiety and, as a result, usually makes oil prices rise.

According to Yergin, 80 percent of the world's energy is provided by oil, coal and natural gas, and even though supplies are much more abundant today than was ever imagined, the biggest challenge we are facing is securing energy availability for the future. The author talks about the "globalization of energy demand", according to which billions of people are now taking part in the global economy. This makes the development of new resources and innovation a big and expensive challenge if we want to meet the requirements of a growing world.

However – Yergin firmly says – we are not running out of oil. He estimates a continued growth of the world's total stock of oil as well as a production increase of about 20 percent between 2010 and 2030. Nevertheless, reaching such a level will not be an easy task; more challenging resources will be needed and, quite probably, non-traditional or unconventional oils – which are heavier and harder to extract – will have to be included in the energy mix.

The author states that the security of our energy system around the globe has to be reinforced due to its growing complexity and reach, as well as the threats to which it is exposed in the twenty-first century. Energy security – known as the availability of sufficient supplies at affordable prices – is also about the relations among countries, the way they interact with each other and how energy impacts their national security. One way or another, we all depend on energy. And as energy trade becomes more global and crosses more borders on both land and water, securing the supply chain becomes a truly critical matter. For instance, waters are the main route for the tankers carrying oil and liquid natural gas from the Persian Gulf – which holds over half of the world's proved oil reserves – to Europe and North America, which causes a big concern over piracy in that region. The geopolitical instability of the Gulf itself also represents risks and threats that need to be taken into account. Finally, cyber attacks are another important danger to the security of the energy system, due to the complex and critical infrastructures in the production and delivery of energy.

But is oil the only energy source we can rely on? Yergin points out that the new supply will comprise natural gas – for which demand has tripled over the last 30 years and could still grow another 50 percent over the next two decades–, liquefied natural gas, which is creating another global energy market, and finally shale gas, which has a huge potential despite the multiple arguments over safety and regulation of its industry. Shale gas is produced from rocks that were previously unprofitable by the use of the controversial practice of injecting water, sand and chemicals into the rock to fracture it and release the gas. However, he states it is the biggest energy innovation since the start of the new century. The U.S. alone could potentially have access to a hundred-year supply, and other spots have recently been discovered around the world.

The book emphasizes that, because of the vulnerability and the risks that threaten our energy system, it is important to dedicate vast resources to innovate further in the current energy sources, and especially to promote new renewable sources of energy.

Climate change: The bridge between conventional energy and the rebirth of renewables

The author dedicates an important chapter of his book to climate change, which starts with the beginning of research carried out by a few scientists in the Alps in the 1770s. Climate change is today one of the dominant energy issues of our time, together with the success of renewable energies. Over 80 percent of U.S.'s energy and that of the world is supplied by the combustion of fossil fuels. Nowadays the income per capita of many countries such as China or India is increasing, which means we are releasing an even bigger proportion of CO_2 into the atmosphere. Therefore, the issue of climate change and global warming has become an urgent matter and is reshaping countries' energy policies.

A few scientists and naturalists first introduced the issue of climate change in earlier centuries; they were simply curious about where the glaciers had come from and asked themselves if they would ever return and crush human civilization. John Tyndall, for instance, learned how the atmosphere retained some of the heat from the sun and stabilized temperatures. In 1958, Charles Keeling found out that the atmosphere was about 315 parts per million composed of CO_2, which half a century later is about 387 parts per million. Some fear an iceless age, others say the knowledge of how climate works is less developed, that there have always been fluctuations in weather. Whatever the debates, the efforts to regulate our CO_2 emissions are transforming our energy policy and stimulating technological research, which is leading up to greater energy efficiency and the rebirth of renewables.

Regarding energy policies, Yergin introduces us to the key breakthrough in the science of climate change during the 1980s, when it was proved that carbon concentration had been lower in the preindustrial age. This made Al Gore determined to turn climate change into a political issue, appealing not just for more research, but also for some true action. All of this lead up to the Earth Summit in Rio de Janeiro in 1992, where an agreement was reached on a greenhouse gas convention: The UN Framework Convention on Climate Change (UNFCCC). From then on, climate change would be an important issue on the political agendas of many countries. The next big conference took place in Kyoto, which marked the first steps towards actually creating a political regime for preventing human-induced climate change. However, the implementation of Kyoto Agreement was already politically unrealistic due to the commitments countries had to make, as well as the political and economic situation. The next two conferences, the Copenhagen Conference in 2009 and the Cancún Meeting in 2010, were quite disappointing, although expectations for a global agreement were high. In the Cancún Agreement, countries adopted specific pledges for emissions reductions and established a process of monitoring and verification.

Some countries are now focusing on new energies – the so-called renewables – such as wind, direct sunlight, biofuels, biomass, geothermal or hydropower. A good example of this is Germany, whose share of renewables in 2009 reached 14 percent, exceeding its 2010 target. Yergin reviews the most important renewable energy sources and carefully explains each one of them by providing some key technical facts. For instance, wind power has been utilized for thousands of years, but it is only in the past decade that it has started to achieve scale. The science of photovoltaics was first explained by Albert Einstein in 1905, but its practical application was still decades away. And solar cells, while they remain costly, are considered one of the most-promising long-term prospects for providing large-scale carbon free electricity.

Yergin also introduces the concept of conservation or energy efficiency. There is a new consensus that recognizes that improved energy efficiency is required for sustaining economic growth without placing unsustainable burdens on the world's energy supplies. China has put energy efficiency at the top of its energy policy and implements it with "an iron fist"; the EU has set a target for 20 percent improvement in energy efficiency by 2020; in Russia, Medvedev set a goal of reducing the energy intensity of the Russian economy by 40 percent in 2020; in the U.S., Obama has focused on energy efficiency investments as an engine of economic growth; finally, Japan has doubled its energy efficiency, although it has always been an energy-efficient country due to its scarce resources. Additionally, the author presents an industry that has always been looking to save energy: the airline industry. Airlines have been seeking higher fuel efficiency since the 1970s, and it has successfully more than doubled since then.

How long will oil be the dominant source of energy as biofuels and batteries are being introduced in our transportation system? A century ago, a great contest emerged between Edison and Ford. In the end, Ford was the one to capture a rapidly growing share of the automobile market. The internal combustion engine became the "heart and soul of the modern car", and it also saved the oil industry. However, the race that started in 1911 is on again: the electric car is back, especially if issues of cost, complexity and scale can be resolved, and the outcome will have enormous significance in terms of both economics and geopolitics. Whether it is electric cars, hybrids, biofuels, natural gas vehicles, more efficient internal combustion engines or fuel cells at some later date, the race to remake our transportation system is on.

In this exciting guide to the past, present and future of energy, Yergin offers a valuable thought on the importance of innovation and creativity. Although there is currently no assurance or guarantee that they will make a difference, it is critical to promote innovation and knowledge to ensure the sustainability of energy in a prosperous and growing world.