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NGH Exploitation With Sequestration of Carbon Dioxide: Economic Rationale for a Sustainable Perspective*

Roberto Fazioli
Department of Economics and Management, University of Ferrara, Italy

Abstract: Policy Makers and Financial Institutions are searching for pragmatic solutions to achieve the objectives that have been set as priorities in the so-called New Green deal. In the face of the great potential deriving from scientific innovation, the issue of the ability to attract investments in an appropriate manner for times, quantities and, also, costs arises. The attraction of investments is crucial. In the case of the NGH expoitation strategy examined here, it is possible to promote this attractiveness if: (1) the prospect of the use of Natural Gas in place of the other fossil sources is widely understood as a coherent solution to the Paris Agreements, i.e., part of the New Green Deal and (2) if it is clarified, in the audience of policy makers, how much solution of the NGH exploitation and the simultaneous sequestration of carbon dioxide in a single process is actually attributable to a primary Sustainable Energy Source. So, the new perspectives for extraction of methane from marine NGH and the simultaneous sequestration of carbon dioxide in a single process could be a very good deal for Private Finance, but policy makers have to consider it as an environmental neutral solution, as a new alternative renewable energy source. NGH exploitation could became part of the New Green Deal, part of financial attractive strategy stemming from well pragmatically based environmental policies.

Key words: environmental policy, NGH exploitation, sequestration of carbon dioxide, environmental neutrality, sustainability, new green deal, financial attractiveness, green finance, carbon pricing, public and private investments, natural gas

1. A Pragmatic Approach Toward More Sustainability of Our Quantitative Growth: Improve Methane Quota in Energy Mix

The search for practical and pragmatic solutions to achieve the objectives that have been set as priorities in the Third National Climate Assessment in Pari is including areas of financial funding innovations, capital investment planning, development of engineering standards, etc. To sustain transformations in the energy sector toward a more sustainable energy mix, including the displacement of coal by natural gas along with policy actions at the national, regional, state, and local levels are reducing greenhouse gas emissions. The aim and the Label of such a political and cultural movement is "New Green Deal". With a surging global population, the world's energy needs are going to continue to grow. Fossil fuels meet a vast majority of the earth's energy needs, however, they produce dangerous levels of greenhouse gas (GHG) emissions that are harmful to the environment. Natural gas is widely accepted as one of the cleanest of the fossil fuels.

The awareness of the pragmatic benefit that derives from and will derive from a greater use of natural gas, compared to the current extensive use of coal, is widespread, at least among experts in the sector. Today, more than ever, energy powers human civilization. At the same time, the world needs to mitigate the threat of climate change by reducing greenhouse gas emissions. As populations continue to grow, natural gas can

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Corresponding author: Roberto Fazioli, Professor, research areas: energy and environmental economics. E-mail: roberto.fazioli@unife.it.

provide a cleaner energy solution for power generation than other energy resources.

Further, Natural gas is a relatively clean burning fossil fuel.

- Gas power market share from 18 to 29%
- Up to 3 to 1 ratio per calorific unity vs. oil (previously 5 to 1 with oil at 100). Gas-to-oil potentially feasible
- Re-coupling. Natural gas and LNG growing consumption as transportation fuels resuming (marginal) competition with oil
- Boosting energy intensive industry
- The petrochemical threat: up to 3 to 1 cost of production differential between European and US produced ethylene.

For example, natural gas fired power plants have significantly lower emissions, giving off between 40 and 60 percent less CO_2? than coal-fired power plants. Natural gas is also a cleaner-burning ally to renewable energy sources, like wind and solar, because natural gas-powered generators can be switched on much more quickly than other power sources when wind and sun are limited.

In addition to utilizing natural gas for power generation, it is important to find other ways to gain value from this abundant resource. Cleaner-burning liquid natural gas (LNG) for transportation is a great example. Natural gas can provide a cleaner source of power for the world’s small but growing fleet of electric vehicles and there is growing momentum and excitement about the potential of LNG in heavy vehicles, such as trucks, ships barges and trains.

The natural gas revolution offers the best, most promising opportunity we have today to make substantial, immediate progress toward a more sustainable global energy supply. With continued innovation and further advancements in technology, I’m confident natural gas will continue to play an increasingly important role in the sustainable global energy mix.

Burning natural gas for energy results in fewer emissions of nearly all types of air pollutants and carbon dioxide (CO_2) than burning coal or petroleum products to produce an equal amount of energy. About 117 pounds of carbon dioxide are produced per million British thermal units (MMBtu) equivalent of natural gas compared with more than 200 pounds of CO_2 per MMBtu of coal and more than 160 pounds per MMBtu of distillate fuel oil. The clean burning properties of natural gas have contributed to increased natural gas use for electricity generation and as a transportation fuel for fleet vehicles in the United States. Climate warming, however, could cause the hydrates to destabilize. Furtherly, the methane, a potent greenhouse gas, would escape unused into the atmosphere and could even accelerate climate change, so it’s important to use it instead of loose it.

2. A Classical Question With Up-To-Date Answer: Availability

The subsequent frequent objection concerns the availability of natural gas to fuel the growing demand for energy on Earth. The Over-Supply connected to the current development of the Unconventional Gas is also perceived as a transitory phenomenon, albeit relevant to the change in the scenario of prices and exchanges of raw materials. Perspectives of large scale NGH exploitation emphasizes Gas Oversupply also for the next decades. Such gas oversupply will not be met, at least in the short period, by a corresponding demand growth, but it is the derivative of the implementation of innovative solutions that descend either from basic research, first, and then applied, allowing for introduction of new technologies, tools, solutions for the increase of Unconventional Gas, in the wake of unconventional counterparts such as shale gas, etc. Despite decades of extraction and use, the estimated size of the US natural gas resource has steadily risen since the 1990s, largely buoyed by the increased feasibility of extracting gas from unconventional deposits. Unconventional natural gas, which includes shale gas, tight gas, coal bed methane, and methane hydrates, has been more difficult and costly to exploit than conventional deposits, until recently. Methane hydrates are the most abundant unconventional natural gas source and also the most difficult to extract. While there is much uncertainty about the total size of the methane hydrate resource, it is conservatively estimated to be 4,000 times the amount of natural gas consumed in the United States in 2010.

A further important effects is to be stressed: NGH exploitation associated with sequestration of carbon dioxide in a single process is a topic solution and opportunity to increase over time, over M/L time, an oversupply of Natural Gas so to keep low and low its price, opening opportunities to convenient exploitation in a lot of crucial industrial sectors.

It is estimated that there could be more potential fossil fuel contained in the methane hydrates than in the classic coal, oil and natural gas reserves. Depending on the mathematical model employed, present calculations of their abundance range between 100 and 530,000 gigatons of carbon. Values between 1000 and 5000 gigatons are most likely. That is around 100 to 500 times as much carbon as is released into the atmosphere annually by the burning of coal, oil and gas. Their possible future excavation would presumably only produce a portion of this as actual usable fuel, because many deposits are inaccessible, or the production would be too expensive or require too much effort. Even so, India, Japan, Korea and other countries are presently engaged in the development of mining techniques in order to be able to use methane hydrates as a source of energy in the future.

Huge amounts of methane are stored around the world in the sea floor in the form of solid methane hydrates. These hydrates represent a large energy reserve for humanity at lower and lower price, because, also over M/L time, it generates an oversupply of Natural Gas so to keep low and low its price, opening opportunities to convenient exploitation in a lot of crucial industrial sectors.

Low natural gas prices in the 1990s and early 2000s stimulated the rapid construction of gas-fired power plants. In 2003, natural gas passed coal as the energy source with the largest installed electricity generation capacity in the United States.

Natural gas-fired plants are currently among the cheapest power plants to construct. Historically, their operating costs were generally higher than those of coal-fired power plants because the fuel was more expensive.

Natural gas-fired plants have greater operational flexibility than coal plants because they can be fired up and turned down rapidly. Because of this, many natural gas plants were originally used to provide peaking capacity at times when electricity demand was especially high, such as the summer months when air conditioning is widely used. During much of the year, these natural gas “peaker” plants were idle, while coal-fired power plants typically provided base load power. However, since 2008, natural gas prices in the US have fallen significantly, and natural gas is now increasingly used as a base and intermediate load power source in many places.

A 2011 MIT study calculated that increased utilization of existing natural gas power plants to displace coal-fired power could reduce the electric sector’s carbon emissions by 22 percent in the near term. Natural gas’ contribution to electricity generation is growing rapidly: from only 17 percent in 2001 to 30 percent in 2012.

3. Environmental Friendly Innovations in NGH Exploitation

It’s all folks? No. A deeper innovation could be introduced in Energy System as a whole. Innovation able to face sustainability problem, global warming challenge through a sort of environmental neutrality. Indeed, if environmental issues may become a limiting factor also for Unconventional Gas expansion, on the contrary, NGH exploitation associated with sequestration of carbon dioxide in a single process could became a consistent part of the so-called New Green Deal, both for quantitative expected volumes and for its intrinsic ability to determine an environmentally neutral primary energy extraction solution. Indeed, could be possible to exploit the methane contained within the crystalline structure replacing it by carbon dioxide (possibly sequestered by industrial processes). The replacement is thermodynamically favorable. This process, known as CH_4CO_2 replacement, creates a unique opportunity to recover an energy resource, CH_4, while entrapping a greenhouse gas, CO_2. Hydrate reservoirs can hence function as both CH_4 sources and CO_2 storage sites, enhancing the idea of a carbon neutral fuel source. So, the extraction of methane from marine NGH and the simultaneous sequestration of carbon dioxide in a single process is neutral in terms of climate-changing emissions and therefore equivalent to renewable energy sources.

Just its adaptation as a chance in emission trading systems is actually an economic revolution: a chance to improve and extend efficiency in such a Market, both for improvements in natural gas supply and recovery, and for compensable technical opportunities to obtain natural gas recovery and a simultaneous massive carbon dioxide (CO_2) sequestration.

It’s to be stressed, again, that NGH exploitation associated with sequestration of carbon dioxide in a single process could became a further opportunity to increase over time actual oversupply of Natural Gas so to keep low and low its price also in the next future, opening opportunities to convenient exploitation in a lot of crucial industrial sectors: as an ingredient used to make fertilizer, antifreeze, plastics, pharmaceuticals and fabrics. It is also used to manufacture a wide range of chemicals such as ammonia, methanol, butane, ethane, propane, and acetic acid. Many manufacturing processes require heat to melt, dry, bake, or glaze a product, to generate electricity.

The electric power sector uses natural gas to generate electricity. In 2018, the electric power sector accounted for about 35% of total U.S. natural gas consumption, and natural gas was the source of about 29% of the U.S. electric power sector’s primary energy consumption. Most of the electricity produced by the electric power sector is sold to and used by the other U.S. consuming sectors, and that electricity use is included in each sector’s total energy consumption. The other consuming sectors also use natural gas to generate electricity, and they use nearly all of this electricity themselves.

The industrial sector uses natural gas as a fuel for process heating, in combined heat and power systems, and as a raw material (feedstock) to produce chemicals, fertilizer, and hydrogen. In 2018, the industrial sector accounted for about 33% of total U.S. natural gas consumption, and natural gas was the source of about 32% of the U.S. industrial sector's total energy consumption

The fastest growing use of natural gas today is for the generation of electric power. Natural gas power plants usually generate electricity in gas turbines (which are derived from jet engines), directly using the hot exhaust gases of fuel combustion.

Single-cycle gas turbines generally convert the heat energy from combustion into electricity at efficiencies of 35 to 40 percent. Higher efficiencies of 50 percent or more are possible in natural gas “combined-cycle” (NGCC) plants. NGCC plants first use the combustion gases to drive a gas turbine, after which the hot exhaust from the gas turbine is used to boil water into steam and drive a steam turbine.

4. Gas Hydrates R&D Perspectives

Natural gas hydrates (NGH) are the largest source of carbon on earth and a potential source of clean and renewable carbon-based energy in the future. Gas hydrates consist of molecules of natural gas (the chief constituent of natural gas; methane) enclosed within a solid lattice of water molecules. When brought to the earth’s surface, one cubic meter of gas hydrate releases 164 cubic meters of natural gas. Gas hydrate deposits are found wherever methane occurs in the presence of water under elevated pressures and at relatively low temperatures, such as beneath permafrost or in shallow sediments along deepwater continental margins.

Methane that forms hydrate can be both biogenic, created by biological activity in sediments, and thermogenic, created by geological processes deeper within the earth. Once assumed to be rare, gas hydrates are now thought to occur in vast volumes and to include 250,000-700,000 trillion cubic feet of methane and the formation thickness can be several hundred meters thick.

NGH exist in nature in areas where biogenic or thermogenic gas sources are located under large and cold masses [4]. Such geological conditions occur both in continental sedimentary rocks in polar areas and in marine sediments offshore. Nearly all NGH reservoirs have been found in porous media environments, such as unconsolidated subsea floor sands. Locations of proven and inferred gas hydrate deposits around the globe are shown in Fig. 2.

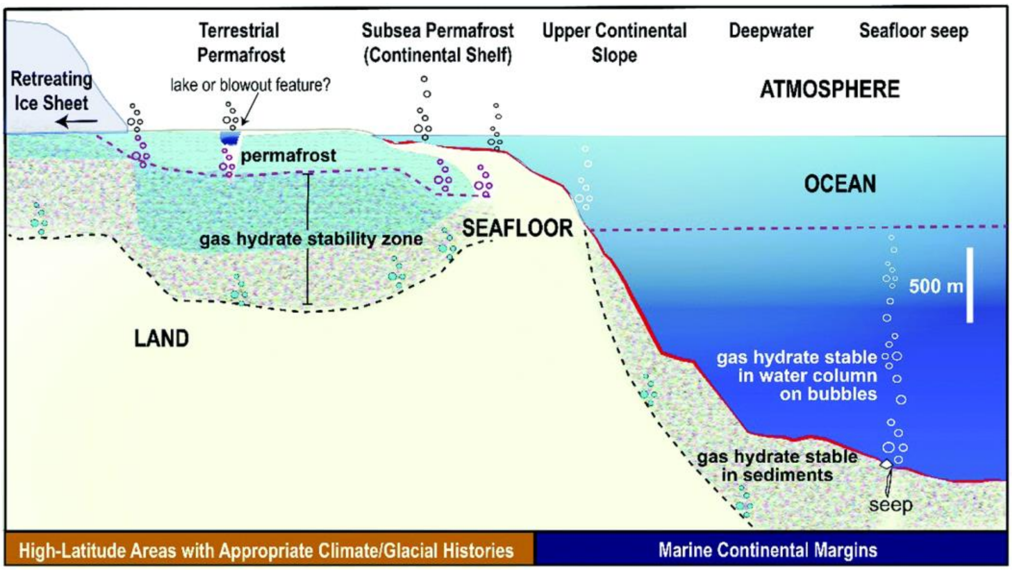

Fig. 1 Schematic shows various terrestrial and marine settings for gas hydrate occurrences and the impact of warming climate on gas hydrates.

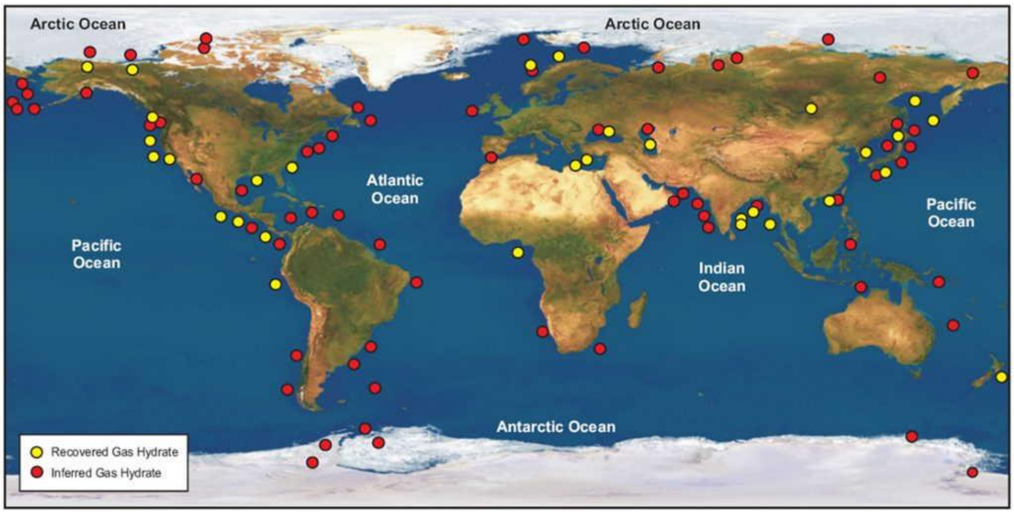

Fig. 2 Inferred and recovered gas hydrate locations [2]. Estimates of world NGH deposits, ranging from 2.5×1015 m^3 to 3.0×1018 m^3, show that the amount of organic carbon contained in NGH reservoirs is twice the amount contained in all currently recoverable worldwide conventional hydrocarbon resources.

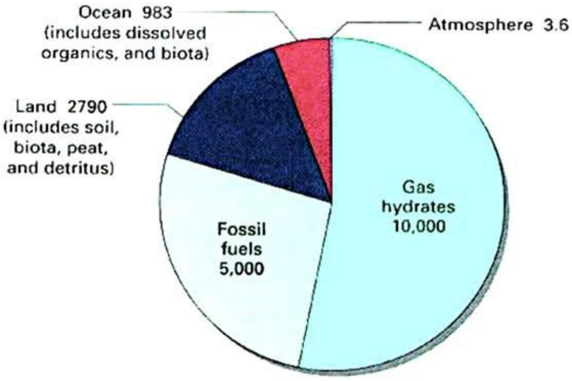

Fig. 3 Distribution of organic carbon in Earth reservoirs in gigatons of carbon.

Given the enormous quantity of NGH and their geographical location, the production of methane from NGH is expected to have high impact on global economy and also on national energy strategies[1].

Early challenges associated with evaluating the production of methane from hydrates included confirming the existence and occurrence of quality reservoirs, demonstrating the ability to reliably locate such occurrences, and developing the techniques/technologies required to enable production. These challenges are being addressed through DOE and internationally supported research efforts. Challenges still exist to fully understand the potential for, and implications of, gas production from hydrates.

Gas hydrates have received considerable attention due to their important role in flow assurance for the oil and gas industry, their extensive natural occurrence on Earth and extraterrestrial planets, and their significant applications in sustainable technologies including but not limited to gas and energy storage, gas separation, and water desalination. Given not only their inherent structural flexibility depending on the type of guest gas molecules and formation conditions, but also the synthetic effects of a wide range of chemical additives on their properties, these variabilities could be exploited to optimise the role of gas hydrates. This includes increasing their industrial applications, understanding and utilising their role in Nature, identifying potential methods for safely extracting natural gases stored in naturally occurring hydrates within the Earth, and for developing green technologies. The exploitation of NGH reservoirs will accelerate the transition of the economy from oil based to natural gas based, furnishing also the opportunity, thanks to the CO_2 replacement, to obtain natural gas which is neutral in terms of emissions.

The feasibility of CO_2 replacement in hydrate sediments could be considered a breakthrough in Carbon Capture and Storage (CCS) research[2] and could have an appreciable impact on the CO_2 accounting.

The Department of Energy Fossil Energy's Gas Hydrates R&D Program's mission is to develop commercially viable technology and methodology for discovering, assessing, and producing gas hydrates, which will lead to advancing the potential for gas hydrates to become a reliable future energy resource through collaboration with industry, academia, international research organizations, and other U.S. government agencies.

The goal of the Gas Hydrates R&D Program is to advance scientific understanding of gas hydrates through early-stage research and to evaluate the occurrence, nature, and behavior of the potentially

[1] In fact, the project's activities address some important long-term national targets as concerns natural gas supply and innovative energy research as set in the SEN 2017 document (Strategia Energetica Nazionale):
• to establish a path towards energy models with reduced emissions;
• to sustain research and development of technologies for the decarbonisation of traditional fuels;
• to establish a path to a more secure, flexible and resilient system;
• to increase the diversification of natural gas supply sources;
• to develop new infrastructures and improve connection infrastructures;
• to improve the margin of safety in case of high demand peaks.

[2] The exploitation of NGH reservoirs, pursued through CH_4-CO_2 replacement with stable CO_2 hydrates after CH_4 recovery could reduce this negative impacts on seafloor stability and indigenous microbial/benthic communities. In the project, all the potential environmental challenges will be quantified as well as the influence on the living communities in the surrounding areas and this constitutes a novel body of knowledge in the field.

enormous naturally-occurring gas hydrates resource within the U.S. The Program also works to confirm the scale and nature of the potentially recoverable resource through complex drilling and coring programs needs to be carried out. The Program will ultimately develop the technologies needed to safely and efficiently find, characterize, and recover methane from hydrates through field testing, numerical simulation, and laboratory experimentation.

The commercial viability of gas hydrate reservoirs is not yet known, but will depend on economic conditions in the future. The Program's objective is to encourage the development of technology and methodology to reduce the overall cost of natural gas hydrate development. Limited number of short production tests have been conducted to date. Therefore a series of controlled scientific field experiments, followed by extended duration production tests are needed to quantify the rates and volumes at which methane can be extracted and to assess any potential environmental impacts.

The U.S. Department of Energy methane hydrate program aims to develop the tools and technologies to allow environmentally safe methane production from Arctic and domestic offshore hydrates. The program includes R&D in:

- Production Feasibility: Methane hydrates occur in large quantities beneath the permafrost and offshore. DOE R&D is focused on determining the potential and environmental implications of production of natural gas from hydrates.
- Research and Modeling: DOE is studying innovative ways to predict the location and concentration of subsurface methane hydrate before drilling. DOE is also conducting studies to understand the physical properties of gas hydrate-bearing strata and to model this understanding at reservoir scale to predict future behavior and production.
- International Collaboration: International collaboration continues to be a vital part of the program since gas hydrates represent research challenges and resource potential that are important on a global scale.

5. Global Energy Investment and Growing Sustainability Concerns

Finally, the economic impact of NGH exploitation is enormous and the potential effects on emission trading systems and natural gas market will be assessed. When the technology passes from a pilot scale to full industrial scale, the transition could generate large cash-out (especially CapEx) of significant impact even in the short term and, therefore, clear evidence of its positive return could not occur in the medium-long term. It is important to study the consistency between the economic and financial profile of the gas price reduction and the sustainability of the necessary investments.

Furthermore, in the face of the great potential deriving from scientific innovation, the issue of the ability to attract investments in an appropriate manner for times, quantities and, also, costs arises. In fact, when the risk and uncertainty of an investment perspective are perceived as not to attract private finance at all, or to be able to attract it only in the face of high IRR (Internal rate of Return), then the only viable financial means becomes that of Institutional Funding (public, in large part to a large extent). The attraction of investments therefore means promoting and making them understand their economic sustainability and the "keeping" of the underlying business line. In the case of the NGH expoitation strategy examined here, it is possible to promote this attractiveness if: (1) the prospect of the use of Natural Gas in place of the other fossil sources is widely understood as a coherent solution to the Paris Agreements, i.e., part of the New Green Deal and (2) if it is clarified, in the audience of policy makers, how much solution of the NGH exploitation and the simultaneous sequestration of carbon dioxide in a single process is actually attributable to a primary Sustainable Energy Source.

So, the new perspectives for extraction of methane from marine NGH and the simultaneous sequestration of carbon dioxide in a single process could be a very good deal for Private Finance, but policy makers have to consider it as an environmental neutral solution, as a new alternative renewable energy source. This is “the challenge”.

To be clear, is always possible to claim for Public Finance. Is, indeed, coherent ask for a fully public financing. But Public Finance is more or less too stressed all over the world. So, faced with climate change, countries have to use both carbon pricing and green bonds to finance their transition to low-carbon economies. Carbon pricing, in the form of carbon taxes or emissions trading schemes, has been used since the 1990s, but poor results and very little efficacy make more complex financial action necessary.

Green bonds (or climate bonds) represent a more recent development in the policy toolkit for financing climate change mitigation, adaptation or conservation of natural capital. First created by the European Investment Bank and the World Bank together with the Swedish SEB in 2007/2008, green bonds are today issued by government agencies, multilateral institutions, and private businesses. Despite their exponential uptake since 2011-12, both instruments are still far too small for containing climate change: less than 5 percent of emissions covered under explicit carbon pricing initiatives is currently priced at a level that would be consistent with the Paris Agreement; and the financing needs for the low-carbon climate-resilient transitions are estimated in trillions per year rather than the cumulative 500 billion issued over the last decade. We have, therefore, to reviews the roles of both instruments, their optimal combination in scaling up mitigation and adaptation, using both the Gas Perspective as an actual pragmatic solution just existing and combining it with fiscal incentives for private M/L Term financial funds, more and more searching for affordable allocation of huge amount of cash, stemming also from decades of Monetary Quantitative Easing.

We have, also to adjust the fundamental purpose of carbon pricing policies with a more pragmatic aim: to implement a consistent solution both for the energy intensive economic growth and its quick time di alternative solution environmental sustainable. Indeed, Both Green Bond and Carbon Pricing could became insufficient, even if are able to make consumers and producers of polluting goods taking into account the costs imposed by this pollution on society as a whole. Carbon pricing policies, such as carbon taxes or emissions trading systems (ETS), can also be used in addition to green bonds to achieve both greater environmental effectiveness and lower overall cost of mitigation.

Otherwise? otherwise we must consider the fear of investors in the natural gas sector, due to the low prices induced by the Methane OverSupply, also and above all caused by the introduction of the Unconventionals. Indeed, frastructure investments in the gas sector have experienced a slight decline in recent years. Global energy investment in Gas sector stabilised are ending three consecutive years of decline, as capital spending on oil, gas and coal supply bounced back while investment stalled for energy efficiency and renewables, according to the International Energy Agency’s latest annual review. The findings of the World Energy Investment 2019 report’s signal a growing mismatch between current trends and the paths to meeting the Paris Agreement and other sustainable development goals.

Global energy investment totalled more than USD 1.8 trillion in 2018, a level similar to 2017. For the third year in a row, the power sector attracted more investment than the oil and gas industry. Today, there are few signs of the substantial reallocation of capital towards energy efficiency and cleaner supply sources that is needed to bring investments in line with the

Paris Agreement and other sustainable development goals.

"Energy investments now face unprecedented uncertainties, with shifts in markets, policies and technologies," said Dr Fatih Birol, the IEA's Executive Director. "But the bottom line is that the world is not investing enough in traditional elements of supply to maintain today's consumption patterns, nor is it investing enough in cleaner energy technologies to change course. Whichever way you look, we are storing up risks for the future."

The world is witnessing a shift in investments towards energy supply projects that have shorter lead times. In power generation and the upstream oil and gas sector, the industry is bringing capacity to market more than 20% faster than at the beginning of the decade. This reflects industry and investors seeking to better manage risks in a changing energy system, and also improved project management and lower costs for shorter-cycle assets such as solar PV, onshore wind and US shale.

Even though decisions to invest in coal-fired power plants declined to their lowest level this century and retirements rose, the global coal power fleet continued to expand, particularly in developing Asian countries.

The continuing investments in coal plants, which have a long lifecycle, appear to be aimed at filling a growing gap between soaring demand for power and a levelling off of expected generation from low-carbon investments (renewables and nuclear).

Without carbon capture technology or incentives for earlier retirements, coal power and the high CO_2 emissions it produces would remain part of the global energy system for many years to come. At the same time, to meet sustainability goals, investment in energy efficiency would need to accelerate while spending on renewable power doubles by 2030.

Among major countries and regions, India had the second largest jump in energy investment in 2018 after the United States. However, the poorest regions of the world, such as sub-Saharan Africa, face persistent financing risks. They only received around 15% of investment in 2018 even though they account for 40% of the global population. Far more capital needs to flow to the least developed countries in order to meet sustainable development goals.

Current investment trends show the need for bolder decisions required to make the energy system more sustainable. Government leadership is critical to reduce risks for investors in the emerging sectors that urgently need more capital to get the world on the right track

Shale remains dynamic, but the investment focus is shifting to conventional assets The signs in 2019 are that the balance of spending is starting to shift again. In our assessment, the fastest growth in upstream investment this year is set to be in conventional projects, rather than in shale. This also means that some upstream markets that have been in the shadow of the United States in recent years are starting to move back into the limelight.

The reaction of the large, conventional operators to lower prices since 2014 has had four main components:

- Maximise revenue from existing operations; the share of brownfield spending has risen, up to 67% of the total in 2018 from less than 60% in 2016.
- Cut costs wherever possible.
- A greater focus on smaller assets that can be brought to market more quickly, notably shale.
- Defer spending on more complex new projects until they are redesigned and simplified to be competitive at lower prices.

These changes were reflected in the composition of upstream spending. Conventional oil and gas projects remain the predominant channel for investment, but their two-thirds share of the total in 2018 was a historical low. Shale assets have rapidly increased their weight in global upstream investment this decade, reaching 26% of the total in 2018. For 2019, we observed a marginal decline in this share, to 24%, as the reduction of investment anticipated by shale pure operators is only partially compensated by rising spending in shale basins announced by some of the majors.

Energy investment has a strong link with country-level financial conditions. Deep availability of capital from private institutions, liquid capital markets, and access to domestic and foreign sources, complemented by limited public finance, are hallmarks of a supportive enabling environment. In 2018, one-third of energy investment was concentrated in areas with both well-developed financial systems and good access to foreign capital (higher-level). This category includes markets such as the United States, a number of European countries and Australia, where private credit, equity markets and foreign sources of capital all play a relatively strong role in the economy.

We must therefore strengthen the attractiveness of investments in the sectors of technological innovation applied to sectors, such as those of the NGH exploitation, which can allow a rapid and effective implementation of solutions capable of re-proposing environmental neutrality and, therefore, the sustainability of in any case, a supply chain of activities necessary to feed the economic growth processes of the world economies. So, NGH exploitation could became part of the New Green Deal, part of financial attractive strategy stemming from well pragmatically based environmental policies.

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