

## Review Article

### The Oil Industry and Its Relation to the Pandemic COVID 19

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In recent years, many different authors had strongly suggested petroleum is essential for running the world, as we know it. In fact, survival of humankind depends of oil as a valuable commodity. It is known petroleum world reserves are limited. In fact, it is expected the natural reserves are depleted in the near future [1,2].

This certainty made world's reserves to be constantly monitored (some indicators were measured every three months). Suddenly, at the beginning of 2020 there were abrupt changes. The World Health Organization (WHO) declares Public Health Emergency of International concern on January 30<sup>th</sup>. After the alert, governments around the world started making travel restrictions and closing borders. Some of the world largest economies started quarantine. There was a generalized fear of an imminent crises and recession.

Every measure taken to prevent further spread of COVID-19 considerably decrease the amount of petroleum needed worldwide. Workers were kept in their households making home office. In a few days, most flights were canceled either fear of travel ban/ restrictions. The decrease in the demand of petroleum and a dispute between Saudi Arabia and Russia resulted in an unexpected price change. During April, oil prices decreased, in fact, at some points the price was negative. These changes had a substantial impact worldwide.

The organization of the Petroleum Exporting Countries (OPEC), and countries like Mexico and Russia, made an agreement to decrease the production in 9.7 millions of barrels a day during May and June. The agreement stated the reduction would continue for two years. This was the only way to stabilize the prices. Another important factor affecting petroleum prices was the electoral year in the United States of America. USA has been the first in the list of oil production since 2018. It has been said, that President Donald Trump reelection depends of shales states: Texas, Pennsylvania and Ohio. Fears associated to the storing capacity triggered the worst drop in the prices of West Texas Intermediate (WTI). The

dip reached a low point of -37.63 USD/barrel. In the following weeks, there was a significant improvement in WTI prices [3-6].

It is difficult to accurately predict the economic impacts of the COVID-19 crises. More specifically, it is the first time an economic crisis was caused by a global health event. More specifically the change in lifestyle set in motion, a domino effect involving central bank's low interest rates, instability of stock markets and a generalized decrease in global tourism. The International Air Transport Association (IATA) estimated a loss of income 6,500 million dollars for 2020.

Predictions estimate the recovery phase will take months (late May, June or even longer). It seems likely after some reorganization economic activity will go back to normal. Albulescu et al., (2020) has already started analyzing the relation between WTI and COVID-19 [7-10].

In USA, the COVID effect on worker's health has been marginal, however it can be change. The United Steelworkers (USW) made a deal to change the working shifts to curtail the risk of contracting COVID-19 at working facilities. The USW is also pressing health checks and screening to ensure workers' safety. In Brazil, COVID-19 crises started shortly after the massive Petrobras strike. The company and its 63,000 workers has been seriously affected. At the moment, Brazil is the third country with most COVID-19 confirmed cases. In fact, the syndicates are deeply concerned by the way President Bolsonaro has been minimizing the health crisis and death toll.

Countries around the world had had a different approach on how to guarantee workers' safety and continue production. In some cases, the syndicates were not consulted to make decisions (Norway was a remarkable exception). Diana Junquez Curiel, Energy Industry Director at Industry ALL Global Union statement was both encouraging and inspiring: "We are facing an unprecedeted situation. In the short term, we need to protect the likes and support of workers. On the long term we need to be

prepared for the developing crises. We need to share information during these difficult moments and act with solidarity. Together we can overcome this [11].”

Not being cautious enough at making the decision of when to start the quarantine had been a very expensive mistake. The pandemic has been equally cruel with societies of all the cultural, economic and political ideologies (Theocratic, Social democracy and Free Market). For instance, California could have started their quarantine earlier than New York but they decided not to. They had a head start of only three days. From an overall perspective, New York is paying an excessive price for a reasonably small delay in the quarantine starting day. Unfortunately, some countries haven't been learning from the previous failures. A good example of this is how China handled the first month of the outbreak. In addition, the health and quarantine measures of the Trump administration were too soft [12].

Interestingly, during the COVID-19 pandemic period there has been plummet in the amount of elective surgeries around the world. Surprisingly, Japan has had an opposite trend, it is the only country where esthetic surgeries increased in the same period (comparing it with the pre-pandemic figures) [13].

In order to increase the amount of COVID-19 patients that a hospital could care and prevent more infections a decision was made. England's National Health Service alone reports more than 12,000 surgeries were rescheduled. The coronavirus COVID-19 has swiftly affected our daily life. World trade, transport and business were interrupted to prevent further infections. The virus has been efficiently transmitted because person to person contagions are frequent. [13].

The COVID-19 pandemic has also sped the way science is made. Twitter has played a major role in scientist real-time communications. For instance, Big Data processing with responsible use of personal data has made possible, to identify people that visited high contagion areas or trace and isolate their contacts. Being able to track the virus down and quarantine, possible vectors is vital to contain further spread. We highlight the statement made by the Puebla Health Office a more than a hundred years ago (Puebla is located in Mexico). Their advice was: "Germ-carriers... who should be considered dangerous... (must) avoid handshakes, kisses and hugs." So far, this instruction has been one of the best public policy of Health Service in the world [14-16].

Most countries have decelerated the manufacture of all their products. Many industries and sectors have been negatively impacted by the virus (pharmaceutical industry, solar energy, tourism, information and electronics industry). This virus has important repercussions in citizen's daily life as well as in the global economy [13,17,18].

One of the things to note is that with the pandemic outbreak of COVID-19, airplane, automobile and people mobility was consistently reduced in world's largest cities. Efforts were made

to control the transmission of the virus and decrease the death toll. Nevertheless, all these travel restrictions had also a positive environmental impact. Compared with last year CO<sub>2</sub> emissions have been considerably decreased. For instance, CO<sub>2</sub> emissions in Kolkata, India had a sudden drop. New York emissions almost halved because of the lock down [19,20].

One of the underused energy sources is hydrogen. It produces threefold energy per gram than the rest of fuels. In addition, hydrogen is the most abundant chemical element in the universe. It is readily available since roughly 75% of Earth's surface is covered in water, and each water molecule has two hydrogens. Since energy demand worldwide had been increasing in a steady rate fuel should be obtained from a clean and abundant energy source. Modern technology allows hydrogen to provide energy and readily available. In order to get clean energy from hydrogen one or several processes should be made. The first option is a motor driver to provide the work necessary to get hydrogen. Renewable energy sources could be used as primary energy sources to dissociate water and acquire hydrogen [21].

Unlike other fuels, hydrogen can be generated and consumed without producing CO<sub>2</sub> as a byproduct. As a result, it has a lower ecological footprint and it is more environmentally friendly. It makes possible an energy source proving by a clean energy cycle of three abundant sources: water, oxygen and hydrogen. This fuel can be turned into a functional and ubiquitous way to store and transport energy. It could be the foundation of future energy systems that function without environmental pollution.

The Research supports hydrogen based economies as a viable clean energy solution. Hydrogen is a good candidate to avoid environmental pollution and its negative health impacts in humans and the rest of the species. It could also stabilize the atmospheric composition and even the global climate [22].

It is interesting to see that there are advances in research and development (R+D) of nanotechnologies applied to the energy sector, a topic that must be properly analyzed. For now, international efforts had been focused on solar technology as a clean energy source. Japan, China and USA are in possession of the majority of publish papers and patents, especially in areas like biofuels, electricity and storage technology (NanoNature, 2020). American authors have dedicated more resources to the topic. In fact, they achieved 23.45% of the energy nanotechnologies in 2016 [23].

According to Bell & Wietschel (2009) transport sector represents 18% of primary energy and contributes with 17% of the CO<sub>2</sub> global emissions. Norway's petroleum is the major primary fuel for energy production and supplies more than 95% of the transport energy demand. Thus, any interruptions of oil supply would severely impact transportation.

It is vital to find alternatives to fuel our daily activities. More options are needed to prevent the heavy dependence on petroleum and its trading patterns (a few countries concentrate the imports). In a globalized world, we rely upon transport to our daily activities which generate greenhouse gases. However, hydrogen could provide almost unlimited clean energy with the available technologies [24].

Rosenbloom & Markard suggest nations should take the opportunity to readjust their economy to all the changes induced by the COVID-19 epidemic. Adapting to the new stage will lead to a sustainable and prosperous future [25].

A successfully hydrogen based economy yields uncountable advantages: for the environment, the economy, and end users. There are safe, compact light and profitable methods to store hydrogen. The conventional system of storing pressurized hydrogen in gaseous and liquid states has security concerns and its pricy, which makes it unlikely to switch to a hydrogen based economy in the near future.

Technological advances of storage systems of solids, based on metallic hydride had demonstrated a huge potential to safely store big amounts of hydrogen in a compact and accessible way. However, in order to get to hydrogen based economy more R+D are needed. The world is experiencing in this beginning of century an important energy transition from fossil fuels to renewable energies and to the hydrogen energy [26,27].

The oil and derivatives industry represents, with data from the International Labor Organization, the source of more than 2 million direct jobs or more in the world. It also generates indirect work for many millions more people. The COVID 19 pandemic has undesirable effects associated with global health, for example, it is said that patients with HIV will suffer problems because the production of retrovirals will not be achieved in Asia and especially in Africa. The same can be said of diseases such as Malaria or Tuberculosis that may have a rebound, due to adverse economic effects in various countries, associated with damage by the coronavirus.

According to figures from the World Health Organization (WHO), the Latin American region is now the active center of the epidemic of COVID 19. As of June 4th a total of 6,440,940 patients are reported worldwide, and the deaths total more than 382,016 as published in The Washington Post, citing official sources from WHO.

The current outbreak of racial violence in the United States adds another layer of uncertainty to global investors. For this reason, the United States West Texas Intermediate oil rise up 81% in May to stand above \$35 per barrel, while Brent oil shoots up an even more perplexing 96%, achieving up to more than \$37 each barrel.

Today, the Economist wrote: "Millions of people have lost their jobs and countless more have taken pay cuts or furloughs. Even those fortunate enough to have a secure job may be more thankful for aspects of work that were once taken for granted".

In a globalized and complex world, we must be cautious but optimistic; a coin in the air always has two faces, humanity must advance as a global community and we are sure that this test will be passed. The authors of this writing are sure of it [28-33].

You can't always get what you want

But if you try sometime you find

You get what you need ....

(Popular song, by The Rolling Stones)

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