**Forever Fuel**

Helium-3 (He3) is gas that has the potential to be used as a fuel in future nuclear fusion power plants. There is very little helium-3 available on the Earth. However, there are thought to be significant supplies on the Moon. Several governments have subsequently signaled their intention to go to the Moon to mine helium-3 as a fuel supply. Such plans may come to fruition within the next two to three decades and trigger a new Space Race.

In addition to the information below, you can also find out more about this topic in my [Mining the Moon video](https://www.explainingthefuture.com/video_mining_the_moon.html) or in my BBC interview [here](http://www.bbc.co.uk/news/world-asia-28667892). There is also a good article by Fabrizio Bozzato in [this June 2014 article for *The Diplomat*](http://thediplomat.com/2014/06/moon-power-chinas-pursuit-of-lunar-helium-3/), which in turn is based on his extensive and excellent [paper here](http://www.erenlai.com/en/home/item/5892-the-red-side-of-the-moon-china-s-pursuit-of-lunar-helium-3.html). There is also a very good recent article [here](http://www.comiterepubliquecanada.ca/article4889.html).

You may also want to checkout my broader page on [resources from space](https://www.explainingthefuture.com/resources_from_space.html).

**Helium-3 and Nuclear Fusion**

To provide a little background -- and without getting deeply into the science -- all nuclear power plants use a nuclear reaction to produce heat. This is used to turn water into steam that then drives a turbine to produce electricity. Current nuclear power plants have **nuclear fission** reactors in which uranium nuclei are split part. This releases energy, but also radioactivity and spent nuclear fuel that is reprocessed into uranium, plutonium and radioactive waste which has to be safety stored, effectively indefinitely. An overview of this nuclear fuel cycle can be found [here](http://www.world-nuclear.org/info/inf03.html).

For over 40 years scientists have been working to create nuclear power from **nuclear fusion** rather than nuclear fission. In current nuclear fusion reactors, the hydrogen isotopes tritium and deuterium are used as the fuel, with atomic energy released when their nuclei fuse to create helium and a neutron. Nuclear fusion effectively makes use of the same energy source that fuels the Sun and other stars, and does not produce the radioactivity and nuclear waste that is the by-product of current nuclear fission power generation. However, the so-termed "fast" neutrons released by nuclear fusion reactors fuelled by tritium and deuterium lead to significant energy loss and are extremely difficult to contain. One potential solution may be to use helium-3 and deuterium as the fuels in "aneutronic" (power without neutrons) fusion reactors. The involved nuclear reaction here when helium-3 and deuterium fuse creates normal helium and a proton, which wastes less energy and is easier to contain. Nuclear fusion reactors using helium-3 could therefore provide a highly efficient form of nuclear power with virtually no waste and no radiation. A short wall chart explaining this in more detail can be found [here](http://lbl.gov/abc/wallchart/chapters/14/2.html). The aforementioned fission and fusion nuclear reactions are also illustrated in animations in my [Mining the Moon](https://www.explainingthefuture.com/video_mining_the_moon.html) video.

**Mining Helium-3 on the Moon**

One of many problems associated with using helium-3 to create energy via nuclear fusion is that, at least on the Earth, helium-3 is very, very rare indeed. Helium-3 is produced as a by-product of the maintenance of nuclear weapons, which could net a supply of around 15Kg a year. Helium-3 is, however, emitted by the Sun within its solar winds. Our atmosphere prevents any of this helium-3 arriving on the Earth. However, as it does not have an atmosphere, there is nothing to stop helium-3 arriving on the surface of the Moon and being absorbed by the lunar soil. As a result, it has been estimated that there are around 1,100,000 metric tonnes of helium-3 on the surface of the Moon down to a depth of a few metres. This helium-3 could potentially be extracted by heating the lunar dust to around 600 degrees C, before bringing it back to the Earth to fuel a new generation of nuclear fusion power plants.

As reported in an [Artemis Project paper](http://www.asi.org/adb/02/09/he3-intro.html), about 25 tonnes of helium-3 -- or a fully-loaded Space Shuttle cargo bay's worth -- could power the United States for a year. This means that helium-3 has a potential economic value in the order of $3bn a tonne -- making it the only thing remotely economically viable to consider mining from the Moon given current and likely-near-future space travel technologies and capabilities.

Due to the above it is perhaps hardly surprising that a serious interest is being taken in lunar helium-3. In 2006 Nikolai Sevastyanov, head of the Russian space corporation Energia, [was reported](http://www.tribuneindia.com/2006/20060203/science.htm) to have said that Russia is planning to mine lunar helium-3, with a permanent Moon base to be established by 2015 and industrial-scale helium-3 production to commence by 2020. This clearly is not going to happen! American plans from the early noughties to "establish a permanent base on one of the Moon's poles by 2024", with helium-3 signalled as one of the reasons behind this mission, are also sadly likely to come to nothing.

The above noted, China's Lunar Exploration Programme is proceeding apace, and is being led by a scientist with a strong belied in potential helium-3 lunar mining. In December 2013, China managed to land a robot lander on the Moon, so successfully completing stage 3 of its Lunar Exploration Programme. By the end of 2017, the fifth and final stage of the current programme has the intention of sending a robotic craft to the Moon that will return lunar rocks to the Earth. If all goes well, a manned programme may follow in the 2020s, so laying the potential foundation for China to mine for helium-3 on the Moon in the 2030s or beyond . . .

**A Flower in the Darkness?**

The subject of mining helium-3 on the Moon as a fuel for future clean, safe nuclear power plants is a fascinating one that raises many questions. Some of these questions are highly technical, and relate to the feasibility of the involved nuclear physics. Other questions concern the not inconsiderable practicalities associated with getting to the Moon, mining and super-heating large quantities of lunar rock ([Space.com](http://www.space.com/) have reported a suggestion of roughly one million tons of lunar soil being needed to be mined and processed for every 70 tonnes of helium-3 yield), and then getting the precious cargo back to the Earth. However, the far more interesting questions arguably relate to why this is a topic that is receiving so little media and public attention.

As noted above, several of the largest governments on the planet have on various occasions made announcements that they are either actively considering or would like to go to the Moon to mine helium-3. Whether or not the science will actually work, this is surely major news. Given that public debates concerning the construction of future nuclear fission power plants and even wind farms now rage with great vigour and a high media profile, why helium-3 power plants as part of a potential future energy strategy are rarely if ever even mentioned is exceptionally hard to fathom.

Nobody is trying to hide the potential of future lunar helium-3 power generation. However, like a rose in a dark room, there is a potential danger that something of beauty will fail to gain the light it requires if more attention does not start to be languished on what could end up as a very big part of the solution to [Peak Oil](https://www.explainingthefuture.com/peak_oil.html) and other fossil fuel [resource depletion](https://www.explainingthefuture.com/resource_depletion.html), not to mention [climate change](https://www.explainingthefuture.com/climate_change.html).

# **What is Helium-3 and why is it so important?**

Everyone learns about Helium in school. It is the second element in the periodic table having 2 protons, 2 neutrons and 2 electrons - having an atomic mass of 4. But another form of Helium has been in the news lately and it is called Helium-3. Helium-3, also written as 3He, is a light isotope of helium having 2 protons but only one neutron and an atomic mass of 3. The existence of Helium-3 was first proposed in 1934 by the Australian nuclear physicist Mark Oliphant. Helium-3 was originally thought to be a radioactive isotope until it was found in samples of natural helium,, taken both from the terrestrial atmosphere and from natural gas wells. Other than 1H, helium-3 is the only stable isotope of any element with more protons than neutrons. Its presence is rare on Earth, it is sought after for use in nuclear fusion research, and it is abundant in the moon's soil.

### **Fission vs Fusion Reactions**

Currently all nuclear power plants use a nuclear reaction to produce heat which turn water into steam that then drives a turbine to produce electricity. Nuclear power plants have nuclear fission reactors in which uranium nuclei are split part. This releases energy, but also produces radioactive waste which has to be safety stored, effectively indefinitely. Nuclear fusion effectively makes use of the same energy source that fuels the Sun and other stars, and does not produce the radioactivity and nuclear waste that is the by-product of current nuclear fission power generation.

Nuclear fusion makes use of the same energy source that fuels the Sun and other stars. Unlike nuclear fission it does not produce the radioactivity and nuclear waste that is the by-product of current nuclear fission power generation.

### **Equations of Fission and Fusion:**

The fission of one atom of U-235 generates 202.5 MeV = 3.24 × 10−11 J, which translates to 19.54 TJ/mol, or 83.14 TJ/kg. This is around 2.5 million times more than the energy released from burning coal. When 23592U nuclides are bombarded with neutrons, one of the many fission reactions that it can undergo is the following.

FISSION REACTION OF URANIUM 235 BOMBRADED BY NEUTRONS:

**10n + 23592U → 14156Ba + 9236Kr + 3 10n**

FUSION REACTION OF TWO HELIUM-3 ATOMS:

**32He + 32He ---> 42He+ 211p + 12.86 MeV** or

**22He + 32He ---> 42He+ 11p + 18.3 MeV**

FUSION OF DEUTERIUM AND H-3:

**D(21H) + 32He ---> 42He+ 11p + 18.4 MeV**

Temperature barriers in Helium-3 Fusion Reactions:

### **Why is the Moon so important?**

In December 2013, China managed to land a robot lander on the Moon, so successfully completing stage 3 of its Lunar Exploration Programme. It was intended that by the end of 2017, the fifth and final stage of the programme would will return lunar rocks to the Earth. If all goes well, a manned programme may follow in the 2020s, so laying the potential foundation for China to mine for helium-3 on the Moon in the 2030s or beyond. The Russian company Energia claimed in 2006 that it would have a permanent moon base in 2015 and harvest Helium-3 by 2020. But the company appears to be woefully behind in making these claims become reality.

### **How much Helium-3 is on the moon?**

The moon has abundant supplies of helium-3, a light and non-radioactive fusion fuel that is virtually nonexistent here on Earth. Because the moon lacks an atmosphere and has been bombarded by solar winds containing helium-3 for billions of years, the moon has massive volumes of the isotope. Some estimates suggest there are at least 1.1 million metric tons of helium-3 on the lunar surface, enough to power human energy needs for up to 10,000 years.

### **Can Helium-3 actually be used in the near future or is the technology still many decades away?**

So now down to Earth? What is the reality of actually using Helium-3. The reality is not so clear-cut. The most advanced fusion programs in the world are inertial confinement fusion (such as [National Ignition Facility](https://lasers.llnl.gov/)and magnetic confinement fusion (such as[ITER](https://www.iter.org/) and other. In the case of the former, there is no solid roadmap to power generation. In the case of the latter, commercial power generation is not expected until around 2050.  In both cases, the type of fusion discussed is the simplest: Deuterium-Tritium fusion. The reason for this is the very low Coulomb barrier for this reaction; for D+3He, the barrier is much higher, and it is even higher for 3He–3He. The immense cost of reactors like ITER and National Ignition Facility are largely due to their immense size, yet to scale up to higher plasma temperatures would require reactors far larger still. The 14.7 MeV proton and 3.6 MeV alpha particle from D–3He fusion, plus the higher conversion efficiency, means that more electricity is obtained per kilogram than with D-T fusion (17.6 MeV), but not that much more. As a further downside, the rates of reaction for helium-3 fusion reactions are not particularly high, requiring a reactor that is larger still or more reactors to produce the same amount of electricity.

To attempt to work around this problem of massively large power plants that may not even be economical with D-T fusion, let alone the far more challenging D–3He fusion, a number of other reactors have been proposed – [Polywell Fusion](http://www.ialtenergy.com/polywell-fusion.html%22%20%5Ct%20%22_blank), and others, though many of these concepts have fundamental problems with achieving a net energy gain, and generally attempt to achieve fusion in thermal disequilibrium, something that could potentially prove impossible,  and consequently, these long-shot programs tend to have trouble garnering funding despite their low budgets. Bottom line is: "The amount of energy we need to produce the conditions for nuclear fusion is more than the energy we get out"- And we've been coming up short for decade...

**World Bank**

The World Bank has published a report that outlines economy-wide actions to facilitate decarbonization and sustainable development as the world recovers from the COVID-19 global pandemic. The report aims to help countries align their development pathways with the goals of the Paris Agreement on climate change through long-term strategies that promote climate resilience of food and water systems, energy, transport, and cities, among other sectors.

The report titled, ‘World Bank Outlook 2050 Strategic Directions Note: Supporting Countries to Meet Long-Term Goals of Decarbonization,’ highlights the “huge risks” climate change poses to countries’ long-term development and growth, with critical implications for poverty, food security, and health. In a foreword, Juergen Voegele, World Bank’s Vice President for Sustainable Development, cautions that all countries, particularly the poorest and most vulnerable, are now facing “the compound impacts of the twin challenges” of climate change and COVID-19.

The report notes that the ambition reflected in the first round of nationally determined contributions (NDCs) would only limit global warming to 2.7-3.7°C above preindustrial levels. It warns that a continued focus on short- and medium-term targets could make decarbonization more difficult, and calls for long-term strategies to help countries develop sustainably. “By planning ahead, these strategies can boost new economic activity and innovations, creating the jobs of the future, while also securing a safer climate, especially for the poorest and most vulnerable,” said Mari Pangestu, World Bank’s Managing Director of Development Policy and Partnerships, at the report’s launch.

The Outlook 2050 recognizes the need for a “bold economic transformation” to realize the vision of the Paris Agreement and make the SDGs “more achievable,” which includes aligning finance flows with low-emissions, climate-resilient development pathways. It proposes a “whole-of-economy” approach to decarbonization, which prioritizes four economy-wide strategic directions:

·         Embed long-term climate priorities in countries’ macroeconomic frameworks;

·         Embed long-term climate planning in national budgets and expenditure frameworks;

·         Embed long-term climate objectives in financial sector regulations and incentives; and

·         Embed long-term climate objectives in systems planning.

The report identifies cross-sectoral opportunities and makes recommendations across eight areas that are essential for achieving the SDGs: 1) transforming food systems; 2) protecting land-based ecosystems and carbon sinks; 3) transforming energy systems; 4) transforming mobility; 5) building low-carbon, more resilient urban areas; 6) transforming water systems; 7) transforming the ocean economy; and 8) digital transformation. The Outlook 2050 finds that investing in cross-sectoral opportunities, including as part of stimulus packages, can aid in a sustainable recovery from the COVID-19 pandemic.

The report was launched on 24 June, during the ‘[Kickstarting the Sustainable Recovery](https://www.worldbank.org/en/events/2020/05/19/kickstarting-the-sustainable-recovery)’ event series, organized by the World Bank’s Climate Change Group in partnership with Innovate4Climate. The series focused on the role of sustainable finance in the COVID-19 recovery to help countries “build back better and stronger.”

**Earth Inner Structures**

Scientists have discovered a vast structure made of dense material occupying the boundary between Earth’s liquid outer core and the lower mantle, a zone some 3,000 kilometers (1,864 miles) beneath our feet.

The researchers used a machine learning algorithm that was originally developed to analyze distant galaxies to probe the mysterious phenomenon occurring deep within our own planet, according to [a paper published on Thursday](https://science.sciencemag.org/cgi/doi/10.1126/science.aba8972) in *Science*.

One of these enormous anomalies, located deep under the Marquesas Islands, had never been detected before, while another structure beneath Hawaii was found to be much larger than previously estimated.

Scientists led by Doyeon Kim, a seismologist and postdoctoral fellow at the University of Maryland, fed seismograms captured from hundreds of earthquakes that occurred between 1990 to 2018 into an algorithm called Sequencer. While seismological studies tend to focus on relatively small datasets of regional earthquake activity, Sequencer allowed Kim and his colleagues to analyze 7,000 measurements of earthquakes—each with a magnitude of at least 6.5—that shook the subterranean world under the Pacific Ocean within the past three decades.

“This study is very special because, for the first time, we get to systematically look at such a large dataset that actually covers more or less the entire Pacific basin,” Kim said in a call. Though scientists have previously mapped out structures deep inside Earth, this study presents a rare opportunity to "bring everything in together and try to explain it in a global context,” he noted.

Earthquakes create seismic waves that travel through Earth’s interior where they become scattered and distorted by structures deep inside our planet. These warped patterns are captured in seismograms, which are recordings of wave activity inside Earth, enabling seismologists to capture rare glimpses of Earth’s inaccessible underworld.

The team focused on seismograms produced by shear (S) waves that travel along the boundary between Earth’s core and the lower portion of the mantle that borders it. These waves are the slower secondary waves that follow the initial tremors made by earthquakes, called primary (P) waves, and they generally produce clearer signals.

“We normally like to use S waves because they are larger in amplitude and the data is more or less clean because there is less P wave traffic,” said Kim. In particular, the team looked for the shear waves diffracting along the core-mantle boundary. “Because it diffracts along that surface, it’s a great phase to look for these tiny structures on top of the core-mantle boundary,” Kim noted.

When the shear waves hit these structures, they produce a type of echo-like signature known as a “postcursor” (there are [helpful figures](http://doyeonkim.us/sequencing_seismograms) of this process on Kim’s website). These echoes indicate the presence of anomalies deep inside Earth called ultra low velocity zones (ULVZs), which are dense patches on the core-mantle boundary.

Nobody knows exactly how ULVZs are formed or what they are made of, but it’s clear that they have diameters of about a hundred kilometers and that they are dense enough to slow down waves that pass through them.

By running thousands of seismograms through Sequencer, Kim and his colleagues found that the strongest postcursor signals in their dataset emanate from under Hawai’i and the Marquesas Islands. This is tantalizing evidence of the existence of two “mega-ULVZs,” zones that stretch for about 1,000 kilometers, or more.

While the Hawaiian structure has been partially mapped out in previous studies, Kim’s team found that its dimensions are much larger than expected. Meanwhile, the mega-ULVZ detected under the Marquesas Islands represents “a previously unidentified localized wave-speed anomaly,” according to the study.

Mega-ULVZs are intriguing structures not only due to their size, but because they may be composed of exotic materials that date back to a time before Earth had a Moon. These huge anomalous chunks could be partially melted material that predate the Moon formation event, which scientists think was a gigantic collision between early Earth and a Mars-sized object more than four billion years ago.

“This is very interesting because this might indicate that mega-ULVZs are special and may host primitive geochemical signatures that have been relatively unmixed since early Earth history,” Kim said.

The new study demonstrates the applications of algorithms like Sequencer, which use a special type of process called unsupervised learning, in processing complex datasets like those found in astronomy, seismology, and countless other scientific fields. As opposed to supervised learning algorithms, which are trained to sort information based on known labels, unsupervised algorithms are designed to find insights in unlabelled datasets.

“What if we don’t really know what to look for in the dataset?” explained Kim. “This is the typical question we’d like to think about because the lower mantle, the target of our study, still has so many unknowns. It’s not really surprising to find almost anything in the lower mantle because we cannot actually go inside and take a look at it with our bare eyes.”

“When you use a sequencer, what it actually does is find additional information hidden behind this dataset,” he continued. “So, what we did here is find an optimal arrangement in the dataset itself. We’re not actually altering the dataset; we’re not doing anything but just rearranging and finding this optimal arrangement. That’s what Sequencer does.”

The team plans to continue developing this novel way of peering into Earth by examining higher-frequency waves that might yield finer details about the enigmatic structures on the core-mantle boundary. The researchers also hope to expand their dataset to seismograms produced under the Atlantic Ocean.

“We’re hoping that Sequencer will be able to basically let us use all of these diverse datasets and bring them together to look for these lower mantle structures systematically,” Kim concluded. “That is our vision going forward, to answer more questions about the lower mantle in general.”

**Black Holes: Understanding the Gravity**

Black holes – regions in space where gravity is so strong that nothing can escape – are a hot topic in the news these days. Half of the 2020 Nobel Prize in Physics was awarded to Roger Penrose for his mathematical work showing that black holes are an inescapable consequence of Einstein’s theory of gravity. Andrea Ghez and Reinhard Genzel shared the other half for showing that a massive black hole sits at the center of our galaxy.

Black holes are scary for three reasons. If you fell into a black hole left over when a star died, you would be shredded. Also, the massive black holes seen at the center of all galaxies have insatiable appetites. And black holes are places where the laws of physics are obliterated.

I’ve been studying black holes for over 30 years. In particular, I've focused on the supermassive black holes that lurk at the center of galaxies. Most of the time they are inactive, but when they are active and eat stars and gas, the region close to the black hole can outshine the entire galaxy that hosts them. Galaxies where the black holes are active are called quasars. With all we’ve learned about black holes over the past few decades, there are still many mysteries to solve.

**Death by black hole**

Black holes are expected to form when a massive star dies. After the star's nuclear fuel is exhausted, its core collapses to the densest state of matter imaginable, a hundred times denser than an atomic nucleus. That’s so dense that protons, neutrons and electrons are no longer discrete particles. Since black holes are dark, they are found when they orbit a normal star. The properties of the normal star allow astronomers to infer the properties of its dark companion, a black hole.

The first black hole to be confirmed was Cygnus X-1, the brightest X-ray source in the Cygnus constellation. Since then, about 50 black holes have been discovered in systems where a normal star orbits a black hole. They are the nearest examples of about 10 million that are expected to be scattered through the Milky Way.

Black holes are tombs of matter; nothing can escape them, not even light. The fate of anyone falling into a black hole would be a painful "spaghettification," an idea popularized by Stephen Hawking in his book "A Brief History of Time." In spaghettification, the intense gravity of the black hole would pull you apart, separating your bones, muscles, sinews and even molecules. As the poet Dante described the words over the gates of hell in his poem Divine Comedy: Abandon hope, all ye who enter here.

**A hungry beast in every galaxy**

Over the past 30 years, observations with the Hubble Space Telescope have shown that all galaxies have black holes at their centers. Bigger galaxies have bigger black holes.

Nature knows how to make black holes over a staggering range of masses, from star corpses a few times the mass of the Sun to monsters tens of billions of times more massive. That’s like the difference between an apple and the Great Pyramid of Giza.

The fate of anyone falling into a black hole would be a painful "spaghettification," an idea popularized by Stephen Hawking in his book "A Brief History of Time."

Just last year, astronomers published the first-ever picture of a black hole and its event horizon, a 7-billion-solar-mass beast at the center of the M87 elliptical galaxy.

It’s over a thousand times bigger than the black hole in our galaxy, whose discoverers snagged this year's Nobel Prize. These black holes are dark most of the time, but when their gravity pulls in nearby stars and gas, they flare into intense activity and pump out a huge amount of radiation. Massive black holes are dangerous in two ways. If you get too close, the enormous gravity will suck you in. And if they are in their active quasar phase, you’ll be blasted by high-energy radiation.

How bright is a quasar? Imagine hovering over a large city like Los Angeles at night. The roughly 100 million lights from cars, houses and streets in the city correspond to the stars in a galaxy. In this analogy, the black hole in its active state is like a light source 1 inch in diameter in downtown LA that outshines the city by a factor of hundreds or thousands. Quasars are the brightest objects in the universe.

The biggest black hole discovered so far weighs in at 40 billion times the mass of the Sun, or 20 times the size of the solar system. Whereas the outer planets in our solar system orbit once in 250 years, this much more massive object spins once every three months. Its outer edge moves at half the speed of light. Like all black holes, the huge ones are shielded from view by an event horizon. At their centers is a singularity, a point in space where the density is infinite. We can’t understand the interior of a black hole because the laws of physics break down. Time freezes at the event horizon and gravity becomes infinite at the singularity.

The good news about massive black holes is that you could survive falling into one. Although their gravity is stronger, the stretching force is weaker than it would be with a small black hole and it would not kill you. The bad news is that the event horizon marks the edge of the abyss. Nothing can escape from inside the event horizon, so you could not escape or report on your experience.

According to Stephen Hawking, black holes are slowly evaporating. In the far future of the universe, long after all stars have died and galaxies have been wrenched from view by the accelerating cosmic expansion, black holes will be the last surviving objects.

The most massive black holes will take an unimaginable number of years to evaporate, estimated at 10 to the 100th power, or 10 with 100 zeroes after it. The scariest objects in the universe are almost eternal.

**The Global Reset: A Plan to Capture All Souls**

A global plan called the Great Reset is underway. Its architect is a global élite that wants to subdue all of humanity, imposing coercive measures with which to drastically limit individual freedoms and those of entire populations. In several nations this plan has already been approved and financed; in others it is still in an early stage. Behind the world leaders who are the accomplices and executors of this infernal project, there are unscrupulous characters who finance the World Economic Forum and Event 201, promoting their agenda.

What I am about to share with you is the most nefarious and powerful plan to seize the souls of mankind since Lucifer beguiled Eve. Some of you have even been sold part of this agenda. You may have learned about it in school. You may have heard its deadly logic and hopeless compassion in news specials or documentaries. If not, you most certainly will. The following are their words, from their site.

There is an urgent need for global stakeholders to cooperate in simultaneously managing the direct consequences of the COVID-19 crisis. To improve the state of the world, the **World Economic Forum** is starting The Great Reset initiative. The Covid-19 crisis, and the political, economic and social disruptions it has caused, is fundamentally changing the traditional context for decision-making. The inconsistencies, inadequacies and contradictions of multiple systems –from health and financial to energy and education – are more exposed than ever amidst a global context of concern for lives, livelihoods and the planet. Leaders find themselves at a historic crossroads, managing short-term pressures against medium- and long-term uncertainties.

As we enter a unique window of opportunity to shape the recovery, this initiative will offer insights to help inform all those determining the future state of global relations, the direction of national economies, the priorities of societies, the nature of business models and the management of a global commons. Drawing from the vision and vast expertise of the leaders engaged across the Forum’s communities, the Great Reset initiative has a set of dimensions to build a new social contract that honours the dignity of every human being.

Currently, WeForum.org has 619 corporate partners or affiliates. These corporations donate money, contribute infrastructure such as server space, personnel, and of course, money.

The Forum engages the foremost political, business, cultural and other leaders of society to shape global, regional and industry agendas.

It was established in 1971 as a not-for-profit foundation and is headquartered in Geneva, Switzerland. It is independent, impartial and not tied to any special interests. The Forum strives in all its efforts to demonstrate entrepreneurship in the global public interest while upholding the highest standards of governance. Moral and intellectual integrity is at the heart of everything it does.

Our activities are shaped by a unique institutional culture founded on the stakeholder theory, which asserts that an organization is accountable to all parts of society. The institution carefully blends and balances the best of many kinds of organizations, from both the public and private sectors, international organizations and academic institutions.

We believe that progress happens by bringing together people from all walks of life who have the drive and the influence to make positive change.

What change? Well, for that, you can read the 131 page annual report. I will put a link to it in the newsletter. I have found that when organizations get this large and this old, that they become convinced they are invincible. Their craft is unassailable and so there is no fear in sharing their actual plan, less the details of course. Methods are quite different than methodology. That is to say…well, see if you get the same shiver that I get when I read their words.

“For 50 years, the World Economic Forum has had a single guiding vision: to be the platform where business, government, civil society and other stakeholders work together to address critical global issues. This ambition has held constant even as the world has changed almost beyond recognition. Today, we live in a world that has been irreversibly interconnected through communications, technology, trade, culture, markets, finance and people. The world has seen substantial progress. Yet this progress is challenged by its own outcomes. A burgeoning global population has triggered consumption patterns that push against the environmental limits of our world, while the transforming nature of our economies and societies is fundamentally impacting the fabric of inclusion, equality and opportunities for all. Global risks threaten catastrophe, and technological disruption—in the form of the Fourth industrial Revolution—is posing profound questions about what it means to be human.”

They want to identify every human in the world. They are currently launching a shared platform for what they term a **Good Digital Identity** to accelerate the work of coalitions advancing digital identities that empower individuals and protect their freedoms.

Everything, and everyone, will be linked to the Climate Change Agenda. They are investing in and accelerating the pace of innovation in sustainable energy. That is a mask word for rationing and central control. They are using a perception that humans are a threat to the planet, so controlling which sectors and which races get to grow is paramount to meeting global climate goals and prosperity; for them. Through the partnership with Mission Innovation, this alliance between corporate partners, public-private collaboration was reinforced to encourage greater investments in and support of innovation. In common language we call that a shakedown. Each business is required to pay, or they are financially ruined and cancelled.

Energy. Control. Origins,

Over the past 100 years, the Global Syndicate has sought the control of humans through the control of energy. Numerous global wars were fought over it, until the weapons became so devastating that the battles themselves threatened the very planet they were trying so hard to preserve, for them. Where the power lines were laid was where society could grow. Where there were no power lines, there were no people. Except of course for developing nations that did not have electricity. That is why the core of the Global Forum is to lay those lines into countries that have never had them before. South Africa currently has about 4 hours of low-voltage electricity per day in certain areas. That is changing.

Next, comes the control of the source of that electricity. For 150 years, that source has been the oxidation of carbon. Nature likes it. The photosynthetic process reduces carbon and releases the oxygen back to the atmosphere, which maintains the balance we have seen on Earth for millennia.

The Global Syndicate wants to change that source to Hydrogen. That is not in harmony with nature, but be that as it may. Clean hydrogen, if developed at scale, can be applied across various energy uses, industry sectors and in transportation, with the benefit of reducing carbon emissions, providing more flexibility in the energy system and increasing the value of renewable energy. The fact that it has only a fraction of the energy of carbon redox reactions, it will require much more hydrogen to do the same work. Some of the work, such as making or fabrication steel, cannot be done at all with hydrogen, but must be done with powerful lasers or cheap, plentiful and renewable cabon. The Forum initiated a collaboration with the Hydrogen Council, an alliance of over 50 companies from diverse sectors, and encouraged greater collaboration between governments, industry and international hydrogen initiatives.

Nowhere in the Global Syndicate’s plans that I have seen is a place for Helium3 fusion. Although there is at least 10 millennia of energy sitting on the Moon, it is not controlled by them, yet.

The world right now functions of a system of exchange that uses currency. The value from work done in Canada is converted into currency. That currency is then traded to America or Europe or Japan, for example, where it is converted into value again. That value is then returned to Canada by ship, plane, truck or wire.

The Global Syndicate, through the World Bank and the IMF, have sought to seize control of the system of exchange. This not only allows them to control the movement of value, it allows them to siphon a portion of it for themselves, for doing essentially nothing. In other words, they don’t add value to the process. They consume it. Humans have a nature that defies control. We are innately free beings. Americans are just obstinate about it. We agree to drive between the lines in the flow of traffic, but I’m afraid that is about the extent of it. The rest is by agreement only.

Even the control of currency is a very individual thing. We like cash for that very reason. Regardless of the convenience of using a debit card, we like using a 20 dollar bill to buy our beer. Anonymously. Off grid. No traceability. The Global Syndicate calls this a crime. Cash is the currency of crime.

The Coalition to Fight Financial Crime. The illicit proceeds of criminal activity are estimated to be between 2% and 5% of global GDP (equating to approximately $2 trillion). Illegal drugs makes up about 2% of global GDP, but human trafficking makes up about 5%. Less than 1% is ever seized or frozen by law enforcement agencies.

Financial institutions spend tens of billions of dollars annually combating the issue, but there are operational challenges. Every single criminal has cash and uses tech-enabled innovation to accomplish their business, for which there is a global demand. I might add that the demand mostly comes from the very people who populate the affiliates and partners of the Global Syndicate itself. They don’t want to be caught. They want everyone else to be caught, but not them. The rise of crypto currenecies is a symptom of a system that aches to be free of the financial manipulation and zero-sum mentality of the Global Syndicate. That is to say, there is only so much money. In order for the middle class to have some, it takes away from the amount that they can have. So they attrit the middle class.

The Global Forum, which is comprised of a growing list of leading financial institutions, law enforcement agencies, think tanks and business associations, acted during the year to identify key weaknesses in the system, advocate for reforms, and support governments and law enforcement in their efforts to disrupt these unauthorized criminal activities.

**News and Analysis**

What I am doing right now, is actually forbidden by the Global Syndicate. I am educating you on what they are doing. I am showing you what that shade of light they shine means, and where it came from. The division of the Global Syndicate I call the *Global Media Empire*, and believe me it is an empire, is a key partner in the control of humankind.

They have coalesced a function called United for News: A joint venture between Internews and the World Economic Forum, United for News (UFN) is a multistakeholder coalition of industry, media and civil society with a shared mission of supporting and sustaining reputable media in the digital age.

Throughout the past year, two key project streams were defined and launched: sustaining media through *socially responsible advertising*, and *increasing women’s voice in media*. The first is what we now call the cancel culture. Two weeks ago last Thursday, 20 of the top voices in podcasting for news and analysis were terminated. Their avatars were executed as surely as any banana republic changing hands. First, they demonetized them by cutting off their advertising revenue. That didn’t stop the voices. Their subscribers made up the difference and then some by sending money through subscriptions to premium content, Patreon, and direct donations. With the coming 2020 election, they took more drastic measures. The Global Syndicate just deleted their existence. Gone. As though they never existed, 20 of the top voice disappeared in minutes, and their audiences were scattered to the wind.

The Global Syndicate learned something, though. They learned the power of this new economic business model. The coalition significantly increased the number of members, adding Edelman, GroupM, AppNexus, World Association of Newspapers and News Publishers, the BBC’s 50:50 project, Sembra Media, News Gain and George Soros’ Open Society Foundations, and now counts 17 collaborating organizations. Significant progress was made on the Amplifying Women’s Voice in media initiative, with an initial project planned in Canada. UFN also co-designed a session and held a private workshop during the World Economic Forum on ASEAN, and held its first annual meeting in October 2018. Now, the subscriptions are being paid, to them. The platform now focuses on the relationship between subscription and advertising in influencing the media industry’s sustainability.

**Health Security**

With the launch of Operation Corona-Fear, there were several things tested. There was the disease itself. Manually adapting viruses to make the jump from animals to humans is difficult. First, the virus has to be able to sneak through the human immune system, and then it has to have the effect that it was designed for. The next challenge is to get one human to replicate and then transfer the virus to another human. The most effective way is though aerosols, and hopefully in nanoparticles that can easily become airborne and that will survive for hours, perhaps days, on inanimate surfaces such as toilets or doorknobs.

The next challenge is to mitigate mutations. When one human gets sick, that body’s immune system fights of the disease two ways. First, it can build antibodies. Second, it can cause a histamine reaction to help flush the disease from the body. It is the latter, fever, runny nose, cough, and diarrhea that large volumes of the virus can be expelled from the body. It is this latter reaction that we buy medications. There were no medications until this virus that actually attacked the virus and allowed the body to catch up with production.

 the platform examined risks associated with emerging infectious diseases of epidemic and pandemic potential through innovative, cross-industry and cross-sectoral public-private cooperation, helping to strengthen national and global health security. Achievements included:

Designing and launching a platform to improve decision-making, coordination and communications within and between the public and private sectors, relating to risk, travel advisories and border measures

Continuing work to create a capacity for large, trusted and influential employers to readily and reliably increase public messaging on infectious disease outbreaks, manage rumours and misinformation, and amplify credible information to support emergency communications

Engaging the Pandemic Supply Chain network to release WHO Disease Commodity Packages (DCPs), a series of disease-specific data sheets that list the critical commodities and the technical specifications for each commodity per disease. With the DCPs now available, much of the year was spent building related tools, including those necessary for cold chain and inventory management, customs and strategic dialogue around key commodities

In collaboration with WHO, developing the design and development of EPI-BRAIN (Epidemic Big Data Resource and Analytics Innovation Network), a sustainable, shared, accessible and integrated data innovation ecosystem to reduce the impact of outbreaks through forecasting and predictive analytics