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RESEARCH

Independent Multi-Disciplinary Analysis of the Global Energy Sector

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The Changing Landscape of the Global Energy Sector

For most of the past century, geopolitical power was intimately connected to fossil fuels. The fear of an oil embargo or a gas shortage was enough to forge alliances or start wars, and access to oil deposits conferred great wealth. In the world of clean energy, a new set of winners and losers will emerge. Some see it as a clean energy "space race". Countries or regions that master clean technology, export green energy, or import less fossil fuel stand to gain from the new system, while those that rely on exporting fossil fuels — such as the Middle East or Russia — could see their power and influence decline.

The transition will be painful for energy companies that produce oil and gas without modifying their business models. In a statement that would have once been unthinkable, BP's 2020 Outlook claimed that "peak oil"[1]may have already occurred in 2019.

Shell CEO Ben Van Beurden predicts that electricity will be the mainstay of its business in the very near future. "The fundamentals of how we win in power are going to be really different from how you win in resources extraction," he says. "In oil and gas, you need an asset base. It is about having the best rocks, the lowest cost of production." That equation is turned on its head in the green power sector, where the electricity from one solar farm is just as good as the next.

There are other differences as well: unlike gas pipelines, electricity trading can go in both directions. Renewable power is also more dispersed, rather than concentrated in a few locations like fossil fuels. "When we talk about wind, solar, biomass, hydropower, ocean energy, geothermal — they are actually available in one form or another in most countries," says Van de Graaf[2]. For places such as Morocco, which imports more than 80 per cent of its energy but also has abundant solar resources, the transition could be an economic gift.

Philosophical Underpinnings of our Research Methodology

A most important distinction exists between the two primary uses of language, the scientific and the emotive.

Scientific language is intrinsically connected with the process of differentiating between what is true or false. With emotive language, many arrangements of words evoke attitudes without any reference to truth or falsehood as it matters not at all in such cases whether the emotional references are true or false.

It is precisely the ability to differentiate between these two uses of language, scientific and emotive which is at the root of a science-oriented research process.

Uncovering Snake-oil Science and the *post hoc ergo propter hoc* fallacy

The language of Snake-oil is deliberately deceptive, dwelling exclusively in the realm of emotion, and particularly suited to subtle persuasion. It is a product of a most common human error: the *post hoc ergo propter hoc* fallacy. In this most subtle form of deceptive persuasion, the fact that pain relief follows treatment does not necessarily mean that the treatment caused the pain relief. The fallacy lies in concluding based *solely* on the **emotions** triggered by the order of events, rather than considering other factors that might rule out the connection.

[1] the hypothetical point in time when the global production of oil reaches its maximum rate, after which production will gradually decline.

[2] Associate professor at Ghent University and lead author of an influential 2019 report from the International Renewable Energy Agency

Science as a Misnomer

It is our objective when engaging in any research endeavor, to apply principles of reason and rationality, which differentiate itself from simple belief, without eliminating the value of well-grounded intuition.

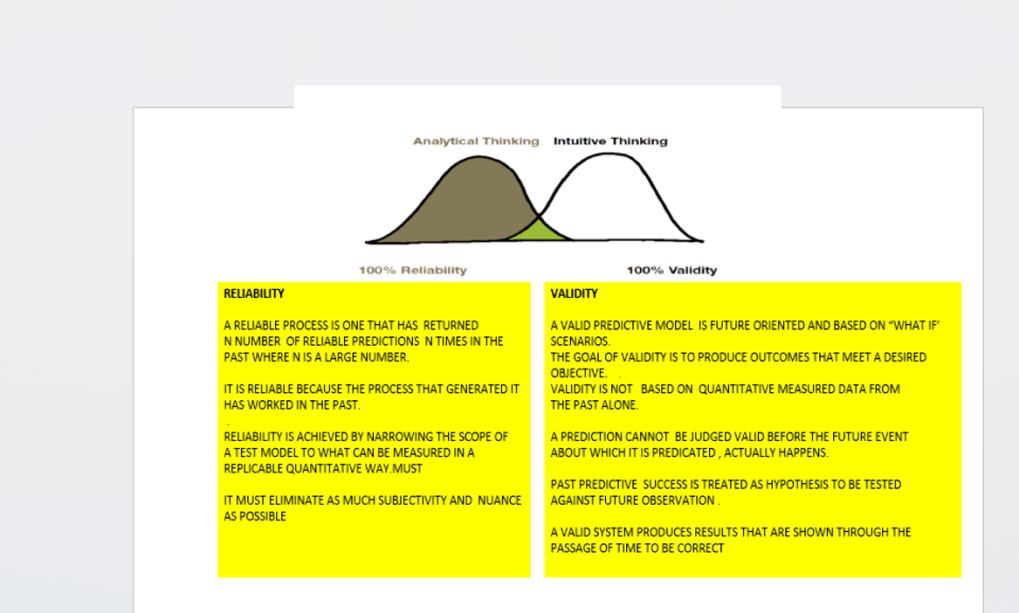
Scientific methodology, however, does not reside in the realm of fixed goalposts. Rather, it is a constantly evolving dialogue amongst peers globally, with shifting assumptions based upon new discovery and experiment. The greatest respect one can provide a Scientist after publication of a significant paper is to immediately challenge it. This is the process whereby the evolution of science remains dynamic, rational, and free of dogma.

Abductive Reasoning the Key to Forward Thinking Research

"No new idea can be proved deductively or inductively using past data".
Charles Sanders Peirce.[i]

New ideas arise when a thinker observes data that does not fit with existing models The next step to make sense of the observation by making an inference to the best explanation.
This form of reasoning is neither deductive nor inductive as it cannot rely on past data.
It is a speculative process of what might be a possibility.
Pierce named this form of reasoning abductive logic. It is not declarative reasoning with the goal of declaring a conclusion definitively true or false. Rather it is a reasoning process with the goal to posit what could possibly be true.

Abductive Reasoning drives the intuitive spark that leaps across the gap separating the world as it is from the world as it might be. This mode of reasoning is a counterfoil to the reliability bias and makes room for intuitive methodologies.



[i]Charles Sanders Peirce (1839–1914) was the founder of American pragmatism (after about 1905 called by Peirce "pragmaticism" to differentiate his views from those of William James, John Dewey, and others, which were being labelled "pragmatism").

The most important extension Peirce made of his earliest views on what deduction, induction, and abduction involved was to integrate the three argument forms into his view of the systematic procedure for seeking truth that he called the "scientific method." As so integrated, deduction, induction, and abduction are not simply argument forms anymore: They are three phases of the methodology of science, as Peirce conceived this methodology. In fact, in Peirce's most mature philosophy he equates the trichotomy with the three phases he discerns in the scientific method.

- Scientific method begins with abduction or hypothesis: because of some surprising goings on.
- This hypothesis should be such as to explain the surprising phenomenon, such as to render the phenomenon as true.
- Scientific method then proceeds to the stage of deduction: by means of necessary inferences.
- Conclusions are drawn from the provisionally adopted hypothesis about the obtaining of phenomena other than the surprising one that originally gave rise to the hypothesis.

At this point scientific method enters one or the other of two "feedback loops." If the deduced consequences do obtain, then we loop back to the deduction stage, deducing still further consequences of our hypothesis and experimentally testing for them again. But, if the deduced consequences do not obtain, then we loop back to the abduction stage and come up with some new hypothesis that explains both our original surprising phenomenon and any new phenomena we have uncovered. Then we pass on to the deduction stage, as before.

Stanford Encyclopedia of Philosophy (edited)