Contemporary Energy Concepts

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Abstract: We need an engine that makes the surrounding's capabilities available and at our disposal. The concept of energy is not yet well defined –if defined at all- and the related knowledge needs a lot of refinement to reach an agreeable concept. An overview of the concepts is presented with a historical background. An evaluation of the path for knowledge of energy is presented. Can we continue with our present efforts? Is our present trail of reasoning for extracting energy safe and reliable?

Keywords: *Energy, availability*

1. Introduction

The concept of energy emerged out of the idea of *vis viva* (living force), which Leibniz defined as the product of the mass of an object and its velocity squared; he believed that total *vis viva* was conserved. du Châtelet in her book ("Lessons in Physics") published in 1740, incorporated the idea of Leibniz with practical observations of Gravesande to show that the "quantity of motion" of a moving object is proportional to its mass and the square of its velocity (not the velocity itself as Newton taught—what was later called momentum). Thomas Young was the first to use the term "energy" in its modern sense, instead of *vis viva*. In the 1807 publication of those lectures, he wrote, The product of the mass of a body into the square of its velocity may properly be termed its energy. In 1918 it was proved that the law of conservation of energy is the direct mathematical consequence of the translational symmetry of the quantity conjugate to energy, namely time. That is, energy is conserved because the laws of physics do not distinguish between different moments of time. The need for work was the driving force to know more. The very name energy is a principle pervading all nature and guiding the investigator in the field of science.

In physics, energy (Ancient Greek: ἐνέργεια *energeia* "activity, operation") is an indirectly observed quantity. It is often understood as the ability a physical system has to do work on other physical systems. Since work is defined as a force acting through a distance (a length of space), energy is always equivalent to the ability to exert pulls or pushes against the basic forces of nature, along a path of a certain length. The total energy contained in an object is identified with its mass, and energy (like mass), cannot be created or destroyed. Energy, like mass, is a scalar physical quantity. A system can transfer energy to another system by simply *transferring matter* to it (since matter is equivalent to energy, in accordance with its mass). However, when energy is transferred by means other than matter-transfer, the transfer produces changes in the second system, as a result of work done on it. This work manifests itself as the effect of force(s) applied through distances within the target system. For example, a system can emit energy to another by transferring (radiating) electromagnetic energy, but this creates forces upon the particles that absorb the radiation. Similarly, a system may transfer energy to another by *physically impacting* it, but that case the energy of motion in an object, called kinetic energy, results in forces acting over distances (new energy) to appear in another object that is struck.

2. Methodology

An overview of energy concepts is presented. How could we be so certain about the conservation of energy if we do not know for sure what energy actually is? How can we decide an abstract? In this work, the discussion was not out of the current context about energy challenges both nationally and internationally. It is not easy to talk in words about energy as it is known to be calculations results.

3. **Discussion:**

Energy economics have some odd characteristics, they are obvious in pricing. What ever the producer paid to reach a sellable product, it has no effect on the final product pricing as long as it is not unique and the market is free of monopoly. The first thing to offer is not the first thing to sell; the conversion processes have their own limitations and constraints; at the end the final price is not controllable and not subject to costs. Our customer primary commodity as energy is electricity and our first step in producing electricity is making heat; the exception is when the source of energy is mechanical like dams, falls and windmills. When dealing with electricity, what is produced is electrical potential difference and what is consumed is electrical current; which imposes restrictions on production versus distribution. Energy business is not a single go–through process; it is a compromise between many other businesses and requires a lot of calculations including rigorous optimizations.

Energy as we now know is a concern of whatever in motion. Heat is motion. Any extracted work must go through the (pdV) evaluation. We think we understand and accept our knowledge of contact forces and zero sum work fields. The none settable dispute is over forces through distances or space. Both statements of the second law state that the reverse of Carnot cycle cannot occur naturally, which means that any cyclic operation based on Carnot cycle which has a forward chronological order cannot have a backward natural process.

Schrödinger equation is

$$\widehat{H}\Psi = -\frac{\hbar}{i}\frac{\partial\Psi}{\partial t} \qquad (1)$$

Where : Ψ: probability function.

$\hbar$: physical constant.

$\hat{H}$: Hamiltonian operator.

i : $\sqrt{-1}$

t : time

As this is a complex equation the projection of it on the real axes is the way to reach physical phenomena's calculations. Because of this equation we cannot think of energy as an identity separated from matter. The calculation of energy balance and energy transfer is not a big challenge. Mathematical operators are instructions that a mathematical operation is to be performed; momentum and energy are examples of mathematical operators. The Hamiltonian operator in Schrödinger equation represents the total energy of the system; in differential form energy does not change unless the probability function of the distribution of mass has changed with time.

In chemical reactions energy is produced as a result of the redistribution of electrons' masses.

Energy has yet four distinctive representations: internal energy, non-flow availability or Gibbs energy, enthalpy, and flow availability or Helmholtz energy. With the help of mere observations, energy as we know could be born within three kinds of fields: electrical, magnetic and gravitational; It is known that time stretches within the last field.

In thermodynamics there are three corners where the whole foundation was built on ; they are a few empirical none proved laws which are totally dependent on observations and experimentation; the rest are mathematics of equations and formulas;

1. Conservation of energy.
2. Work-Pressure-Volume relationship.
3. Entropy generation.

By manipulation of these three threads the whole thermodynamics exists. What is done is an operation that transforms one real-valued function of a real variable into another, in a way that retains all the information of the old variable in the new one.

In thermodynamics the strategy behind the use of Legendre transforms is to shift, from a function with one of its parameters an independent variable, to a new function with its dependence on a new variable (the partial derivative of the original function with respect to the independent variable). The new function is the difference between the original function and the product of the old and new variables. The free energies (Helmholtz and Gibbs), are obtained through further Legendre transforms, by subtracting TS (from U and H respectively), shift dependence from the entropy S to its conjugate intensive variable temperature T, and are useful when it is constant.

The approaches for thermodynamics differ about the point of view from which one is looking to his system. The molecular-microscopic level is different from the macro-system level. On the molecular level we depended totally on energy to evaluate the system thermodynamic related properties.

Until now, there is but one way of getting information; beginning with experiments and ending with unknowns. Thermodynamics in its essence is an applied mathematical science and it retains the qualities of mathematical science illusionary nature. Obtaining energy from our surroundings depends on finding or artificially making a non-equilibrium state which takes a path back to equilibrium of losing energy. The three signs of energy wealth in a system are: motion, temperature difference and/or radiation.

Dark energy which is relatively a new concept has a nature and properties which still a complete mystery (because the whole concept is hypothetical) but the effect is sure. Dark energy does not dilute with the expansion of the universe. The total energy of the universe is neither conserved nor lost- it is just indefinable; this is what Tamara M. Davis's work rises. It rises an inquisitive questioning but dares not to answer. Dark energy term appeared because the universe is expanding with acceleration which needs a continuous supply of energy what they called "Dark" because nobody could see its origin.

Now there are three steps taken by energy to reach us, energy content (internal or enthalpy), availability (flow or non-flow), efficiency of our invented engines, and practicality (our materials and processes limitations).

Clean energy is anything which gives without taking; as we have never done that, the surroundings are rude enough to treat us diplomatically. The system should be unstable with respect to our dead state in order to extract energy out of it; dams, wend mills, burners, turbines, nuclear reactors, solar energy collectors and engines are all unclean if we found sometime that it requires us to compromise our living for theirs'.

Once nuclear energy reached our disposal we thought we had reached a source with no limits; we trusted materials more than good behavior. At Chernobyl, the operators were experimenting over their working engine; they looked to the process as managing a tool, not driving a car, when changing direction a different destination. Taking a path through particulate physics to solve our energy problems is a very long twist. Firstly, we have corrupted our environment and secondly, we have provided for our death a sure murderer. How we can evaluate the dangers of un-charged particles? How we can we control their motion paths a way from us?

The concept of destabilizing a system to reach extracted benefit rose in politics as "Creative echoes" for the Middle East United States' policy.

When we will reach a conclusion saying "Do not trust instruments"? The answer is that when we put some logic in those instruments and discover that another player (The artificial intelligence) is in the environment and part of the rules of the game theory? If we reached that point, we have crystallized a God - isn't this what we are working for?

Webster's dictionary meaning of "Postulate" is: a hypothesis advanced as an essential presupposition, condition, or premise of a train of reasoning; other meaning is axiom. Its relation to its founder is "it is his assumption". Where are our certainties about laws of nature in our postulated thermodynamics science? We are taking out of it more than it puts in; this is a mere disbelief in it.

As our universe does not realize that Mr. Man has utilized some of the energy (created) by the engine for his utilization, we are continuously pumping energy to the dead state of our boundary closed universe as mechanical work. Because of all of this, until now we could not find the origin of the black energy; that is solely because it is a kind of transformation within the same form of work energy; it springs under our seats. What we call an engine is actually creating energy that has never been found or was intended to be found in our universe. The overall process is a typical perpetual-motion machine of the second kind, which states: "A heat engine which produces no other effects than the extraction of heat from a single source and the production of an equivalent amount of work". One might argue that the dark energy is so huge for such a limited source; this is not the case if we are resonating.

Our universe does not recognize inside it a "Dead state." Surely Mr. (Man) has produced heat and transformed it totally into work using his engine. The car work produced from the combustion of fuel does not simply disappear after we drive to our destination; it completes the cycle of entropy.

The concept (availability) is the second step that completes the conversion of the extracted heat into work. The whole process is creating energy; we call "Dark." This is the case in the west but what about us in Jordan:

A new invention has been announced in one of the Jordanian reputable newspapers "Alarabalyawm" on 23, April, 2011 about a Jordanian inventor announcing arranging water molecules in an array subject to outside indirect magnetic field. It was not apparent what he

meant by “Indirect.” A quick research in the internet shows that the writer of the article has not done the simplest procedure of researching. Scientifically the whole concept is an illusionary invention deeming the whole society as unconscious of science. Out of chemistry point of view the provided mechanism will cause the end of biological reactions in the body. Magnetic field will cause the orientation of water molecules to rearrange according to a decrease in the aqueous entropy. As reactions depend on molecular orientation they will all be hindered or precisely de-catalyzed. The claimed inventor is a vocational certificate holder (Jordanian not German) and he has a support from specialized university Doctor, some important agriculture ministry officials, and an American citizen. He has sufficient fund to leave his work permanently and fly to China to purchase his equipment. I think that this kind of self-killing is very dramatic since the victim is actually celebrating its murder. The invention is supposed to be used for water supplies in Jordan. The published successful experimentation is surely faked.
Now when civilized nations are abandoning nuclear energy, some in the Arab world are taking it as a strategic choice; extracting Uranium from the environment and de-stabilizing it. They are just selling their home ceilings for more money or less paying, the only driving force for any mechanical human being. This is the worst kinds of totalism; it is including science into a collective odd wisdom. There are no reflections for the knowledge on behavior.

4. **Conclusion:**

There is a growing need of energy for our activities. If we continue using the present trail of extracting energy, life with it will be more risky if not deadly. Energy decision does not concern a single person and do not affect isolated individual. In our search for more energy we invent new processes, prepare new molecules and discover new particles but we did not ask the question how we can clean our environment when they are out of use. Is dependence on future technology is enough to be confident and ignorant about the real prospective problematic invented Energy-Production materials. A turn point must come along or energy research will kill us.

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