

INTRODUCTION TO COSMIC ENERGIES AND FORCES CONVERSIONS

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Abstract. The Industrial Revolution and the inadequate system of values that followed disturbed natural balances to the point that it jeopardizes life continuation on Earth. Apart from the change of living philosophy, it is necessary to use a different approach in understanding and handling our resources. A plan to make fossil and nuclear fuels primary sources of energy has failed. The selection of new energy shapes that will satisfy our needs with capacities and characteristics requires very careful analysis and a different perspective from the one we used.

This article aims to present a different understanding of energies, forces, and their conversions by applying Milankovic's mathematical model used to identify long-term climate changes.

Abstrakt. Industrijska revolucija i neadekvatan sistem vrednosti koji je sledio poremetili su prirodne ravnoteže do te mere da ugrožavaju nastavak života na Zemlji. Pored promene životne filozofije, moramo koristiti i drugačiji pristup u razumevanju i rukovanju našim resursima. Propao je plan da se fosilna i nuklearna goriva učine primarnim izvorima energije. Izbor novih oblika energije koji će kapacitetima i karakteristikama zadovoljiti naše potrebe zahteva veoma pažljivu analizu i drugačiju perspektivu od one koju smo koristili.

Ovaj članak ima za cilj da pretstavi drugačije razumevanje energija, sila i njihovih konverzija primenom Milankovićevog matematičkog modela korišćenog za identifikovanje dugoročnih klimatskih promena.

Keywords: Energies, forces, Cosmic energies, and forces conversions, the matter, Milutin Milankovic.

1. INTRODUCTION

Through everyday events, we are witnessing changes for the worst in many factors that our existence depends on. Climate changes, pollution, shortage of basic resources, overpopulation, new diseases are just some of the problems that destabilizing our way of life. To find solutions, we have to understand the world we live in and the reasons that caused it.

By introducing material values, we have gained extra motivation to work, create, and learn, but made a conflict with nature. The focus of our lives became a hunt for money, more, bigger and better, that introduced the implementation of partially developed technological solutions measured by the possible profit, but not from the perspective of total results. Ironically, our wish to provide kids with a better life accumulated a substantial amount of various chemicals introduced to our lands, water, and air, changing our living conditions and jeopardizing their existence. All this has been absorbed into living creatures through food, water, and air, initiating the spread of cancers, other known and some completely new diseases. Our need to secure a living and production space for the growing population caused migration and destruction of animals and plants, culminating in the extinction of many species. Fossil fuels supported our development so well, that we ignored pollution and heat dispersion caused by combustion for too long. In only a few hundred years, we have disturbed balances that nature was establishing for tens of thousands. To survive, we need fundamental changes in understanding the purpose of our existence.

Science, only motivated by the wish to establish facts and offer the best possible long-term technical, sustainable, and economical solutions should lead to this transformation of our thinking and living. But, apart from changing the perception of life, we will need a vast amount of energy to reverse the wrongdoing.

Our energy sector is already in transformation, searching for the source that can supply us with the long-term solution and the most suitable conversion technologies with minimal disturbances. Apart from previously known energies, it revealed a variety grouped under an umbrella called "renewable energies" that

initiated questions, like: What is energy, how many shapes are available, where it is coming from? The purpose of this article is to look for answers to this and other questions related to the field of energy.

2. DEFINING ENERGY AND THE MATTER INTERACTION

From simple observation of our surroundings, we see objects, colors, movement. Forces and energies are interacting with each other and the matter by absorbing, storing, emitting, and converting. They are bonded to the point that we cannot understand one without the other. Perceiving this relationship looks like the beginning and the end of all sciences, the key for all the answers.

Our world, isolated by the atmosphere, limits our views and understanding. Many terms sound inappropriate when cosmic sciences interact with the Earth's. To see the full picture and connect it into one entity – as nature has done already - we have to broaden our perspective.

2.1. Energy

Our perception of energy is very basic, and sometimes even wrong. All activities that we are involved in depend on various sources of energy. Tools/devices have to be plugged in the socket and switched on to work. Cars need petrol to run. Before start working, we eat. Every change requires some energy, and it seems that there are many shapes and sizes. To be able to utilize it, we have to find an economical, sustainable, and efficient way to transform it into some usable form. Being an integral part of industrial development, energy is often treated like any other product, having a raw material that we refine by applying some technology and "producing" energy in the process. The science sees the term "conversion" more suitable, based on Helmholtz energy conservation law [1] quoting that "Energy cannot be created or destroyed; it can only be changed from one form to another". But, how to explain what is energy? The most suitable definition is that "Energy is the capacity for doing work, and work requires the use of force to achieve a change in energy".

We can distinct kinetic – the energy of motion, and potential energy – various forms of stored energies.

2.2. Forces

Quantum mechanics recognizes four forces that define the universe: gravitational, electromagnetic, weak, and strong nuclear, transferred by the invisible particles – waves - which interact with chemical masses of the Earth and each other, creating our world the way it is and us in it [2]. We will discuss in detail gravitational and electromagnetic forces later but have to mention that the weak nuclear forces are responsible for radioactivity, while strong nuclear holds the content of the nucleus together. Having in mind the above-mentioned relationship between energy and forces, work, and with it, the energy can be expressed in form of body's interaction (attraction, repulsion, and collision), heat, and radiation.

2.3. The matter

The matter is a word describing any type of substance with mass and size [3]. It is represented with 118 chemical elements known to us, related to each other in different forms of molecules, existing in solid, liquid, or gaseous form, producing an almost endless number of combinations, possibilities and responses. The matter is built from atoms that are consisting of even smaller particles, referring to its origins to energies and forces. Energies, as positive and negative charges, and forces as the only way to keep them together in balance.

2.4. Energy conversions

Natural conversions have always been our reliable source of energy from wood, water, fossil fuels, to the currently popular variety of alternatives, called renewable energy. To refine these energies and use them for our needs, all available forms have to be converted with devices or systems [4], using various power generation and conversion technologies. During each energy conversion, a part of the energy is transformed into a less useful and dispersed form of thermal energy. From all known forms, the conversion of heat to other forms of energy is the most inefficient due to friction, heat loss, and other factors.

2.4.1. Fuel

The term „fuel" was related for a long time with solid, liquid, and gaseous substances [5] used to generate heat and light, then the mechanical energy created by combustion, and finally - the electricity. When nuclear energy was introduced, things became slightly different, but still in the line of previously mentioned energy transformation: the raw material – technology - heat - electricity. The latest technological developments in clean energies are still having a raw component to transform into electricity, but bring more variety and complexity to understanding. In an attempt to define the term fuel, we can say that is a word representing any concentration of energy that can be converted into some other shape – with or without our assistance. If we accept the correctness of this definition, then fossil fuels, solar, wind, waves, sea currents, etc. are fuels for generating electricity, fueled by the Sun's radiation and gravity.

2.4.1.1. Electricity

In the variety of usable forms, it was necessary to identify a single energy conversion that can supply all our machinery and equipment with power. Electricity is currently the most convenient and transformable form of energy that involves significant infrastructure, dominating the market to the point that we do not see other options nor the actual energy sources around. All known forms of energy have to be converted into this shape, following certain parameters so that it can be implemented to the single existing energy exchange system called The Power Grid. To work, we distinct three separate sectors: electricity generation, transmission, and distribution, constantly improving and developing [6].

There are many obstacles and complications related to this, especially after fossil fuels and renewable energy mergers. The main challenges inherited from fossil fuels are centralization, low-efficiency energy conversions, chemical and dispersed energy (heat) pollution, losses in transport/transmission of electricity and some of the new ones are supply stability, medium for distribution and transmission, the choice for the most suitable energy source and technology for energy conversion.

2.4.1.2. Fossil fuels

They provide a convenient, storable, transportable, and energy-dense form of chemical energy, able to produce heat and light through the fuel-burning process (combustion), which can be transformed into mechanical or electrical energy [7] with thermal power generation technologies. These energy reserves, formed from decayed plants and animals – life from the past - are divided as petroleum, coal, and natural gas. The negative side of fossil fuels are:

- Greenhouse gas emissions (The global mean temperature increase corresponds with increasing emissions of greenhouse gases into the atmosphere).
- Thermal (The heat dissipation from the human way of life, in general, induce processes that can increase air temperature several degrees °C [8]),
- Chemical and particulate pollution (It generates a large number of particle products consisting of elemental and organic carbon, sulphates, nitrates, ammonium, and metals that create health and environmental risks (small particles more than larger particles) [9]),
- Low efficiency.

Fossil fuels are pointed out to be the main reason for climate change. Apart from this, their reserves are rapidly diminishing.

2.4.1.3. Nuclear fuels

The process of extracting energy out of nuclear fission and fusion [10] was a way to solve humankind's energy needs for the long term. Various incidents, some with catastrophic consequences, its application to weapons of mass destruction, the problem of waste storage, health risk, and security, raised public concern to the point that it cannot compete with renewable energy sources.

2.4.1.4. Renewable fuels

“Renewable” is currently a term representing a fundamental transformation to our way of life. Fossil and nuclear fuels will be replaced with the dynamic group of energy sources, which are "renewing" itself in a

cyclical manner, as per day/night and the cycles of the tides. The reason for this behavior is explained with astronomy, climatology, and quantum physics. This influx of energy has a direct influence, but also spreads through the different natural processes, manifested by various energy and forces discharges and interactions that we can utilize by the different conversion technologies. It is available everywhere in some form, free of charge, and can be used as it is or converted. Its implementation should provide better energy conversion efficiency, significant pollution reduction, variety of applications, and decentralization/localization of energy utilization, but carries challenges in regards to variability and planning. These energy sources - in general - have minor effects on the environment, comparing to the negative effects of fossil and nuclear fuels, are life friendly and most definitely the best choice of all currently available.

3. RESEARCH ON ENERGY SOURCES

Our interests are gravitational forces and electromagnetic energy because they induce a variety of energy transformations in our habitat. Gravity converts to hydro and tidal energies, while solar gives heat and light, from which we can utilize electrical, various forms of mechanical, thermal, and chemical energies [11].

3.1. Gravitational forces

Quantum mechanics categorize gravity as the weakest force of the four mentioned, characterized by the mass and the energy. It acts over large distances and is always attractive, carried by the particle called the graviton. The interaction between space objects is explained by Newton's laws [12], which are used to create complex mathematical models of multi-planetary cosmic systems like Solar [13]. Earth is not a solid object. Its liquid content – water and magma – attracted dominantly by the Moon and the Sun – is changing density and position causing mass redistribution [14], which influences Earth rotation deviations, and with its variations in many natural processes related to insolation. The force increases with the reduction of distance between space objects while mutually attracting each other, influencing changes in orbiting trajectories. The next aspect of gravity is that each space object attracts and holds its contents together. With it, each particle/group receives a characteristic called weight [15], which is different for the same object measured on – for example - Earth and the Moon, causing proportional pressure towards the center. Although liquids and gases are in constant motion, gravity holds them all together in an ever-changing balance. The solids are the least susceptible to its influence. The total gravitational field in one point is simply the vector sum of all the fields that would be produced by each contributing object if it were there by itself. Earth's crust, our habitat, is just balancing between outer and inner forces. When disturbed, the equilibrium is re-established with earthquakes and volcanic eruptions.

3.2. Electromagnetic energy

The Sun's gravitational force creates pressure that generates nuclear fusion, turning hydrogen into helium, and it converts a portion of mass into electromagnetic radiation [16]. All bodies on temperature above absolute zero emit energy as electromagnetic radiation [17], where the Sun is acting as a blackbody with some cyclic variations. Various monitoring and analysis methods have been developed to understand the complexity of the Sun's behavior and its influence on our planet [18], classified as radiative, chemical, dynamical, and electrical. Radiative characteristics have been interpreted by Planck's law and calculated for the perfect black body, emitting [19] from gamma to radio waves as per Figure 1. The nature of electromagnetic radiation is explained by quantum theory, [20] introducing photon. It is a collection of elementary light particles (oscillations), characterized by the frequency and the wavelength, differing with the quantity of energy that the wave is carrying. The electromagnetic characteristics are the consequences of the electrical charge in motion or its change in time, attracting different and repulsing the same electrically charged particles. Although it is manifested as a force, a gravitational force has done the work in process of fusing hydrogen atoms to helium, so it is categorized as energy.

3.3. Matter-photon interaction

Everything we know is composed of atoms [21], characterized by mass and electrical charge. Its center, the nucleus, containing almost an entire atom's mass, consists of protons (positive) and neutrons (neutral), that is orbited by the electrons (negative). The differences between the atoms are formed by the quantity and structural arrangement of these fundamental subatomic particles. Further research revealed that each part of

the atom contains even smaller components. Atoms of the same element can differ in weight due to variable numbers of neutrons and then are called isotopes. A stable atom of every element is electrically neutral, indicating that the positive charges from the protons are balanced by the negative charges from the electrons.

In terms of energy, stable atoms can be in a state of minimum potential energy for which the lowest electron-energy states have been filled and all the higher energy states are empty (ground state), or excited, which contains an electron whose energy is higher than that of an unoccupied state. An excited atom is unstable and will return to its ground state by losing energy. An extreme condition of an unbalanced atom is when one or more electrons are ejected when it is classified as an ion.

A molecule consists of several atoms bound together, which has more possible energy states than a single atom. Since every electron in a molecule must occupy a different state, many molecules have sets of very closely spaced energy levels. Electrons involved in chemical bonding occupy a high-energy band called the valence band that is shared among neighboring atoms.

Atom changes its internal energy state by the emission or absorption of a photon. Such changes are called radiative transitions, which can occur only if the photon energy is equal to the difference in energies between the two states. A highly excited atom can return to its ground state either directly or by a sequence of transitions between energy levels. Collisions with other atoms, ions, or charged particles can also alter an atom's internal energy.

Radiative transitions between atomic energy levels produce spectra characteristic of the atoms of each element. Similarly, the spectra of molecules are made up of groups of many lines close together, giving the appearance of bands.

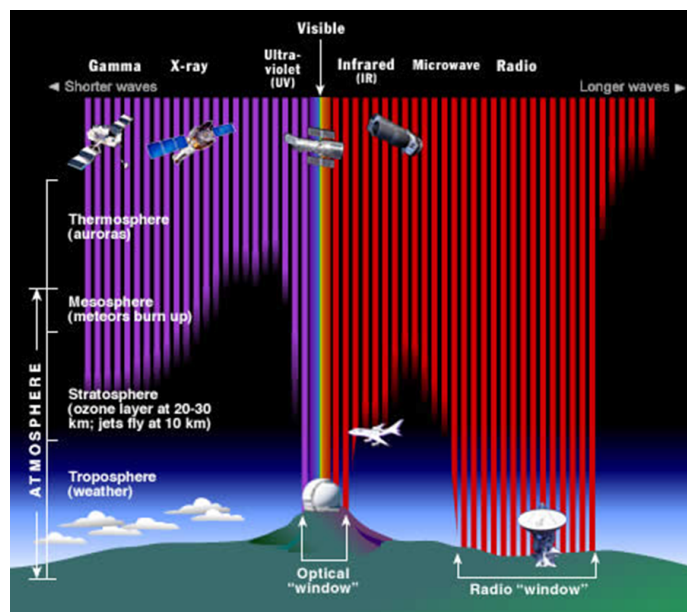


Fig. 1: Sun's radiation spectrum.

(SOURCE: https://imagine.gsfc.nasa.gov/Images/science/EM_spectrum_atmosphere.jpg)

Interaction of Earth's matter with the electromagnetic radiation of the Sun produces excitation (electron rise to higher electron shell) or ionization (ejection of one or more electrons from the atom) [22], as follows:

- Infrared cause electron vibrations and heat emission,
- visible and near-ultraviolet brings the energy that stimulates chemical reactions (molecule creations) by interacting with outer (valence) electrons, and
- Larger photons – Gamma, X, and the rest of Ultra Violet - are breaking the molecular bonds and destroying biological and other molecules [23].

It will not be productive to analyze all available photon interaction with the atoms and molecules of our planet. However, we can identify three distinct mixed mediums that have almost unified response: atmosphere, land and water, and infrared radiation as a dominant from the earth's surface and the atmosphere as per Stephan-Boltzmann law.

3.3.1. Atmosphere

The atmosphere absorbs and reflects more than half of the total Sun's radiation [24] and it protects us from harmful gamma, X, and the majority of UV rays, leaving us with the rest of the electromagnetic spectrum that we know and feel like a Sun's energy. This is a very dynamic, three-dimensional chemical plant [25] receiving and exchanging energy in and from all directions. With intensive industrialization over past centuries, we have emitted various gasses, heat, and particles to the atmosphere in quantities so big that it causes climate changes. The mechanism of these changes is explained with the greenhouse effect [26].

3.3.2. Earth's surface

Radiation that reaches sea level/Earth surface consists of about 6% of UV radiation, about 50% is visible radiation and about 40% is infrared radiation [27]. Its gradual changes caused by the Earth's rotation initiate noticeable temperature variations on a daily level and with it a horizontal and vertical movement of gasses and vaporizing liquids aiming to equalize content's pressure, temperature, potential, and density, influencing many natural processes.

Once received by the planet's surface, the Sun's radiation is partially absorbed and reflected in the atmosphere and space, with very little penetration.

3.3.3. Water

Infrared radiation from the Sun [28] is absorbed by water accumulated in oceans, lakes, and rivers, releasing heat and molecules to the atmosphere during a process called evaporation, as an invisible gas. As the water vapor rises in the atmosphere it cools and condenses into droplets, combining and falling out as drops of liquid or flakes of solid, returning to the surface of the Earth. Apart from this, evaporated water in clouds is responsible for the absorption and reflection of most of the Sun's radiation.

Gravity and temperature variations create and control the hydrological cycle [29] and provide us with all aspects of water-related energies.

When below 0° C, the water turns into ice and snow, which have very strong radiation reflection properties [30].

4. CREATING A SIMULATION MODEL

Any deeper analysis would require a creation of simulation. It should contain a section that defines the energy influx from its source/sources – energies and forces -, the matter interacting with it, and energy conversions as an output as per Helmholtz energy conservation law. Another approach would be to analyze already completed models for a similar purpose that have established a connection between space and the planets in terms of energy, and try using them as a whole or partially and later combining sections.

By analyzing a model that Milutin Milankovic presented in a book called “Canon of insolation and the Ice Age problem”, we can identify the following independent sections, specifically created for the Solar system and the Earth in it that applies to our problem:

- Defining all space objects within the Solar system and their mutual interaction by applying Newton laws. This model includes complex relationships with the moons, each other, and rotation properties individually and around the central point – the Sun. A detailed analysis of Earth trajectory revealed variations called precession, obliquity, and eccentricity that are pointed to be the main reasons for variations of Sun's energy received,
- Sun evenly spreads radiation in all directions in dominant wavelengths calculated from its temperature. How much each planet receives is established as the surface of a “flattened” image of the vertical half of the planet's projection, positioned on the mean distance from the Sun. It is called “The planet's energy balance” which depends on the Solar constant. But, to show how much energy each point of the planet's surface receives, we have to apply the geometrical law of insolation and take off the energy lost during transmission through the atmosphere. Energy is spread over a curved surface following rules of celestial mechanics, changing beam angle due to the planet rotation in time. The methodology used for the analytical and numerical treatment of the secular march of insolation for individual latitudes has been accomplished by the division of a tropical year into two equally long, of which caloric summer of the half-year comprises of all days when the irradiation of the latitude in question is stronger than any day of the caloric winter half-year.

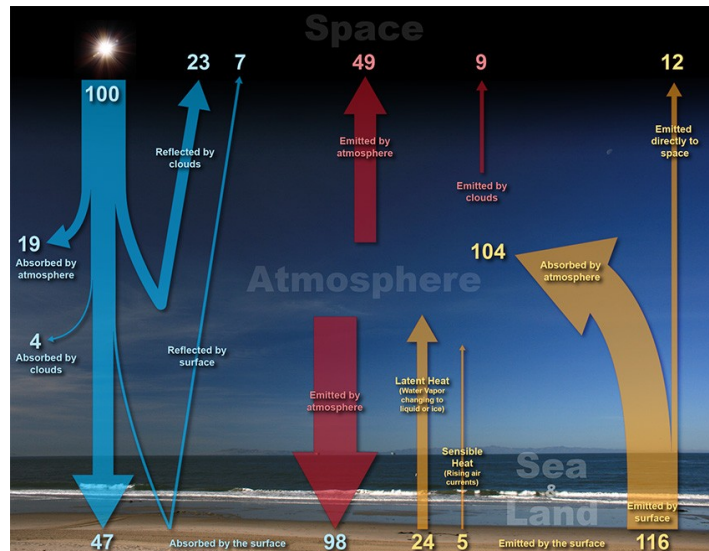


Fig. 2: Incoming energy from the sun balanced with outgoing energy from the earth. (SOURCE: <https://www.weather.gov/jetstream/energy>)

- Interaction with the matter starts when the radiation enters the atmosphere. Here we exit the domain of astronomy and enter the environment defined by the laws of physics. Molecules and atoms of the atmosphere are interacting with photons by reflecting them or absorbing and re-emitting it, both in all directions. The emitted photons will be again reflected, re-absorbed, and re-emitted by the molecules and atoms in the same manner, limiting end product radiation on infrared, visible, and near-ultraviolet spectrum. Solar radiation is reaching Earth's surface as direct, diffuse solar radiation and radiated molecular energy reduced by the energy returned to space and absorbed by the atmosphere. As per Stefan-Boltzmann law, Earth will radiate the infrared spectrum, indicating that energy exchange should be looked at from a heat perspective and available energy through the heat budget.

For understanding energy exchange within the atmosphere, Milutin Milankovic used:

- Climatology (defined as the “investigation and description of the average state and usual course at atmospheric conditions on different places of the Earth’s surface”) and
- Meteorology (“that endeavors to explain the observed meteorological phenomena by physical laws to discover the connection between the climatic phenomena and their causes”).

The atmosphere is a very complex and dynamic environment that needed many simplifications to be mathematically described and confirmed by the real data collection. To produce acceptable radiation balance values, Milankovic used as a constant value The Sun's energy influx (Solar constant), the shape of Earth, characteristics of the atmosphere, and it’s content, focusing on changes of orbital properties. The result was the identification of cyclic variations explained as Ice Ages in a period of 600 millennia's what was firstly confirmed on land as a part of the research of Koppen and Wegener, and later with the ocean bed analysis [31].

5. MODEL APPLICATION TO ENERGY DOMAIN

The model of Milutin Milankovic, in all its complexity, shows full analogy with the requirements. It established forces that control the dispersal of energy from its source, calculate the amount of energy available and spread it over the curved surface that changes in time, introduce scenarios of energy interaction with the gaseous, liquid, and solid matter before reaching the surface in form of heat. Is it possible that we used the same way to achieve two different variables, climate, and energy? If the climate is expressed as temperature, it has to be energy converted by the rules of quantum mechanics that we have introduced earlier.

From the energy perspective, we can say that the climate is indeed a mix of energy conversions produced in the interaction between electromagnetic energy from the Sun, controlled by the gravitational forces, and matter of the planet. The energy of electromagnetic radiation alone directed to Earth is substantial, about 173.5 petawatt (10^{15} W) of energy [32]! The model presented enables us to follow the path of electromagnetic radiation on the way from the Sun to the Earth’s surface, aiming to explain a long-term

influx of electromagnetic radiation and its changes. Variations in energy influx caused by the changes of any of the factors involved will cause variations in energy conversions/climate, what he has proven. All three interconnected models included some simplifications and approximations. Values defined from the Sun up to the atmosphere are still acceptable, but the atmosphere component has been drastically changed. At the time when the simulation was made, about 60% of total solar energy was taken into the heat budget of the planet, while now is 47%, as per Figure 2. Actual measurements relating to Solar Constant [33] (that passed with minor corrections over time) and temperature rise can be seen in Figure 3, confirming that the temperature increase is not related to changes in solar radiation. The science is pointing, that air pollution, consisting of chemicals emission, particles and heat are cause for this.

Although climate changes caused by the variation of the atmosphere content (in a further text called “a short-term climate changes” because COVID 19 pandemic showed that atmosphere pollution declines in a matter of days if the industry is off) were not a part of Milankovic's investigations, there is very interesting and intriguing comment related to it. He states: "The more the atmosphere reduces the solar radiation during its transmission, the greater is the amount of radiation energy stored in its interior due to absorption, and then passed on to the Earth's surface as dark radiation". Apart from the atmosphere - he said - Earth's surface emits it, as well? From the perspective of recent introductions related to visual identification of black holes, the possibility to research the dark matter and dark energy on our doorsteps is a great discovery and opportunity. A team of scientists involved in project Xenon1T [34] is already working in this direction.

Svante Arrhenius, a founder of the greenhouse effect theory, has confirmed Milankovic's statement in regards to the energy transformation within the atmosphere. He applied quantum mechanics to explain the mechanism of this process, stating, "By doubling CO2 concentration, the temperature will rise 3 to 4 °C". Therefore, from an energy perspective, we can conclude that, by changing the chemical content of the atmosphere, we are changing its response - energy conversions/climate/photon characteristics emitted by the matter and disturbing natural flow of energy. The problem in short-term climate changes has even deeper consequences. We are not changing intensity, but the composition of energy that we receive, increasing dark energy content.

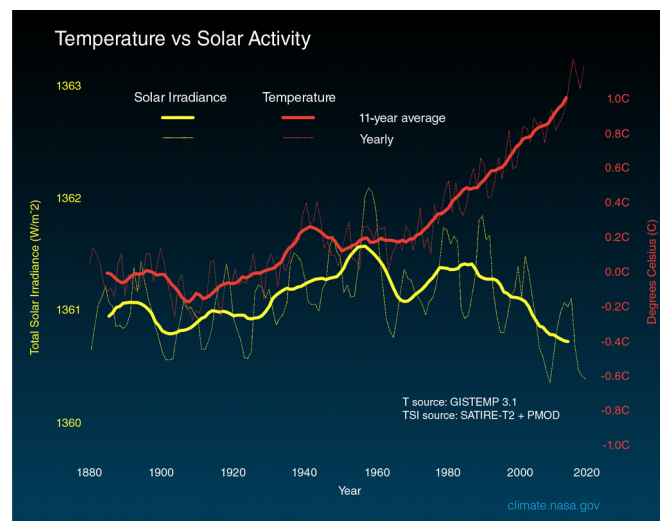


Fig. 3: Statistics related to changes in Solar constant versus average temperature (SOURCE: <https://climate.nasa.gov/causes/>)

It would worthwhile to investigate what kind of influence this will have on our surroundings, where the following energy conversions have been identified within the heat budget:

- Infrared provides us with a sufficient temperature. When above 0° C, water flows with the gravity and induce all kinds of hydro energy [35], wave [36], sea currents [37], tidal [38], metabolic energy exchange [39], and wind [40]. Thermal energy is harvested with OTEC (Ocean Thermal Energy Conversion) [41] and CSP (Concentrated Solar Power) [42] power generation technologies,
- Visible and near Ultra Violet converts into chemical energy like creating sugar with photosynthesis [43] feeding all living organisms, with the famous conversion from the past called "the fossil fuels" [44], and provide electricity from PV (Photovoltaic) technologies [45],
- It is very important to mention that somewhere between cosmic energies, forces, and matter, unique conditions have allowed the development of energy conversion that we call life. Stability and

multiplication of long molecular structures were achieved only after nature has implemented a way to store the energy of light with photosynthesis, gradually improving and advancing it into more complex structures, culminated in the form of mammals. Life continues to exist and thrive while it is capable to supply all its atoms/molecules/cells with sufficient energy, after which it collapses in the process called dying when its contents are decomposed or preserved in form of fossil fuels. History shows that too little energy will have a similar effect as too much of it, but further research should reveal what impact changes in energy composition will have.

- I am sure that, with a better understanding of energy, we will be able to identify more sources.

6. CONCLUSION

The simulation of Prof. Milankovic provides us with a missing link between space and Earth and known and unknown. By connecting the achievements of Newton, Plank, Helmholtz, and many other scientists into one model, we have gained a deeper understanding of what is energy, where it is coming from, how much we receive from the Sun, and how it is structured. It acknowledges the existence and increase of dark energy around us, defines long, but also explains short-term climate changes and with it renewable energies, fossil fuels, and us as energy conversions, as a part of the heat budget. From this mathematical tool we can find out will it rain in a week, what the time is, why the wind blows, and how pebbles were made. Somewhere between these formulas is information about how we were formed, conditions that we are looking for in selection for new habitat in space, and ways to improve them. Everything is connected somehow and there is no end to it. By establishing the influence of electromagnetic radiation on our climate, Milutin Milankovic explained the fundamental relationship between energy and the matter from which everything is created. And with this, our planet hidden by the atmosphere becomes again a part of the universe, both physically and scientifically.

Understanding, defining, and modeling the interaction of energies and matter need further development. The work of Milutin Milankovic contains all natural laws related to electromagnetic energy from the Sun, but it is just a part of the information needed to understand our total energy budget. Dark matter and dark energy are much more dominant content of the universe, which only indicates a variety of possibilities that we do not know about. So, all this impressive knowledge becomes a part of something new and far greater, a base and the guide for further research, the physical and scientific connection between us and the cosmos, an introduction to cosmic energies, and forces conversions.

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