

Research Article

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There are Three Big Reasons of Global Warming and their Solutions

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ABSTRACT

As civilization develops, it is remarkable associating with climate change and make the Earth warmer, then it was reported that Arctic ice has been melted several years ago. We don't feel four seasons in Japan around ten years ago. We analyzed the reasons of global warming and climate change and assumed three big reasons. One is the number of cars, and the second is increase of nuclear power plants in the world. The third one is data center station along with the internet technology. Moreover, wars in east Europa make it worse, and our air conditioning seems making warm the air in our daily life. We propose new idea to solve warming Earth and climate change. Three of the idea are current technologies which are hydropower with water circulation system (without no construction of dam), no mega solar power, and no mega wind power.

Another two are advanced technologies, one is thermoelectricity although the power is smaller compared with the methods above. And the other one is nuclear transmutation which we implemented change the radioactivity to non-radioactive materials in the Fukushima contaminated soils (2011). This cutting-edge technology will help to reduce heat in a nuclear reactor even a little, and the original material is water, in which hydrogens play a role, although we need to try heavy elements like uranium and plutonium from now. We propose the collaboration of integrated technology with sustainable development goals.

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Introduction

In Japan we feel there seems no four seasons like spring, summer, autumn and winter in these days. Many flowers bloom in Spring, temperature hot in Summer and people swim in ocean or pool in school. We can look another beautiful flower in autumn leaves (maple tree). In winter people enjoy skiing, seldom snowing. We have no such a characteristic and experience climate change in a year.

It happens big change around ten years. In the world, big fires occur in France, Spain, and Brazil recently. Moreover, war occurred in the east Europa in 2014. Then, the environmental impact of war drives climate change. Here we report life styles make change possibly resulting in climate change, number of cars, nuclear power plants and data center for computers and smartphones. In summer, hot temperature air from large buildings to make cool in room, and car-cooler as well. it is like chasing our tails. In large scale, data center station needs enormous electricity meaning exhausted hot air. Then people say nuclear power plant is necessary for data center.

It is remarkable why warming climate change has occurred in these years. El Niño phenomenon brought about quintessential

affect not only climate but farm and fishery. Therefore, we must regard how we improve these situations on the Earth at least. We propose our step improvement by everyone as well as nation and company in every country must struggle. I hope our essential element formed from water will play a role to cool the Earth, and we introduce the idea to solve three big reasons in the title. We emphasize everyone effort must be necessary in daily life, no matter how small it is.

Methods

People employ nuclear power plant for electrical energy, smartphone/computer for communication, business, engineering etc. to consolidate at data center, and car for transportation, which are daily necessities. Here we discuss the "methods" how we reduce energy and/or frequencies to use every day if only a little. For instances, we take advantage of thermoelectric semiconductor for energy like FeSi₂ which I studied and developed shown later. Moreover, my friend found water circulation electricity with no mega solar and no mega wind in local production for local consumption. We must shift to sustainable development goals (SDGs) rather than nuclear power plant [1]. Instead of cars, we use public transportation as much as possible. Data center station seems "Necessary Evil" for internet world in these days. We will show their good idea later.

Results and Discussion

We simulate and discuss reasons of global warming and climate change, and list three big issues following:

Reduction of the Number of Cars

Figure 1 shows the number of cars in a world (10 million unit) by revenue rather than unit sales. The big reason seems rapid increase in the developing countries since the 2000s.

The change in the world from 1960s to 2025 increased drastically. In other word, the globalization was accelerating in economics early 2000s. The car market was the largest in China around 2010, then east Asia and India increased the market including sports car since 2020. Figure 1 indicates these phenomena. Electric Vehicle (EV) performed full-scale adoption around 2009 to 2010.

Even EV, motor and electric generation emit heat leading to air-warming. The data are based on the EDMC/Energy, Handbook of Economic Statistics (2025) Fuel cell electric vehicle spread is limited because battery electric vehicle becomes widely used rapidly [2]. But no fossil fuel is just for reduction of green house gases. Our purposes are no heat, and more fundamental. How we do not emit heat, and reduce thermal causes.

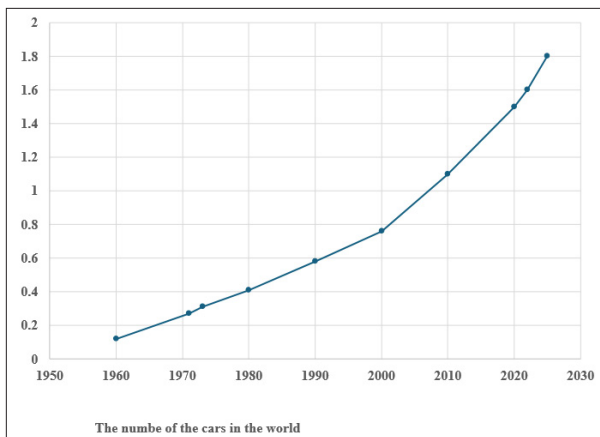


Figure 1: The Number of Cars in a world

Warming Seawater by Electricity from Nuclear Power Plant

Figure 2 shows electricity generated by nuclear power plant based on the giga watt-hour. The number of power station operating is approximately 420, and U.S.A. possesses about 94 units in the most in the world. The next one is France, 56 and China has 55 following Russia, Korea and Japan. The number of 10 is in operating in Japan. What we must do is to reduce seawater warm. Because the nuclear power plant should cool the reactor vessel in which nuclear decay continues all the times. Even shut down or decommissioned, the reactor results in higher temperature by radioactive decay heat. Then, the fuels are melted down at the bottom of reactor vessel, if not cooled, the water in a vessel result in hydrogen explosion.

Therefore, waste water becomes hotter than usual seawater, approximately plus 7 ~ 8 centigrade. The damage in the seawater makes plankton dead and impact marine ecosystem. Moreover, even in nuclear reactor power system, we need electricity, for instances, to make seawater to fresh water, and to send it to the reactor by motors, and vapor in reactor to send outside so that make it cool for exhaust outside. So, there are many systems outside. It is much better to quit soon electricity generated from nuclear power plant in view of nuclear wastes as well. We discuss and propose the alternative energy sources later.

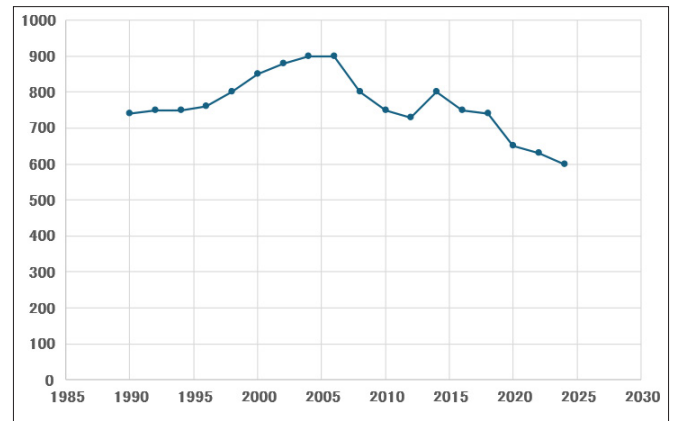


Figure 2: Energy Production by Nuclear Power Station (Giga Watt-Hour)

Nuclear power plant needs the higher initial cost, more over safety measures cost and security costs have increased after nuclear reactor plant accidents in the world. In addition to it, huma doesn't have an idea how disposed nuclear materials were safely handled. Europa move away from nuclear power, phase-out of it and postponed. We consider their good plan.

Heat-Utilization from Data Center Station

The prototype of data center traces back to the introduction of the main frame in 1940th. Since the advent of IT society, there were rush of the number of data center station in the world. Cooling for the data center is necessary prevent out of control in server and graphics processing unit (GPU), and not only these troubles, the center itself generates huge amount of heat. The facility is set Direct Liquid Cooling System (DLC). To where do they dispose hot water? The power and cooling systems for data center station have focused on the materials to find high-voltage endurance, fire retardancy and refrigerant resistance such as Poly-Phenylene Ether (PPE) [3].

This is one idea in Hokkaido in Japan, although it is the system not a material. The station uses the hot water for farm growing the plants in spring season [4]. We can recognize one of big reasons leading to affect warming climate correspond to tendency of Figure 1.

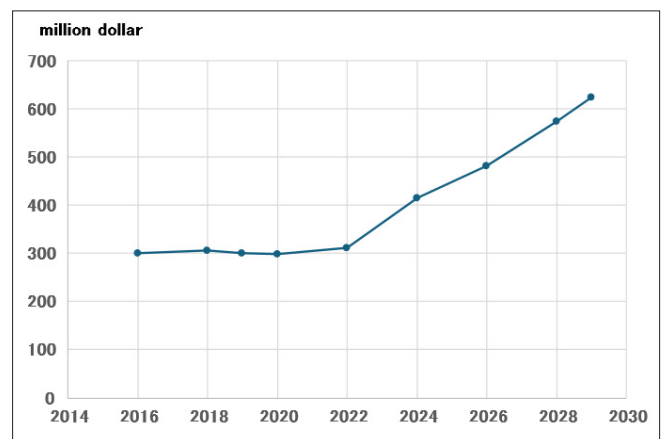


Figure 3: Change of Data Center Station Unit Based on Setting Cost

As shown in Figure 1, we can see fast rise time along with the data center in particular.

High Technology to Solve Warming Climate and Another Utilization of the Heat

We discuss how we can utilize huge amount thermal energy for another object. Our research relates to the up-cycle system of disposed thermal energy, meaning completely different object. We use thermoelectric semiconductor, iron silicide, FeSi_2 and bismuth telluride, Bi_2Te_3 .

As known, the semiconductors are called Seebeck device and Peltier device. The former generates electricity with the temperature difference between one side and another, the latter forms the temperature difference between the two sides by electric current flow. Therefore, we may cool the data station when Peltier devices work by electric current when Seebeck devices work in another place. I experienced the high temperature like more than 40 centigrade in summer time on the back side of solar panel. At that time, I reconsidered the mega-solar should not set on the field for plants as well. To cool the back side, we propose to put the thermoelectric semiconductors so that we can save solar energy into electric cell. One device is too low efficiency, but we may get over the problems by usage of the huge amount devices.

To Cool the Earth with High Technology System

Figure 4 shows the Earth becomes warm satellite since 2000s [5]. The phenomena indicate the remarkable tendencies corresponding to the number of cars, nuclear power plant and data center station where generate huge amount heat. As we propose the advanced technology to employ the thermoelectric device, we utilize the disposed heat which is one of methods shown in previous section.

The collaboration of the SDGs energy system is very important even in small scale now. We show it Figure 5.

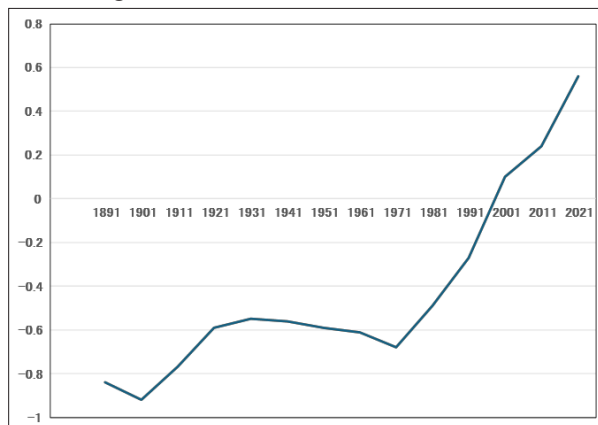


Figure 4: Global Temperature Change from 1891 to 2025

Indirect Relationship of the Developed Water with Global Warming
Before introducing indirect relationship with the water, it is better to discuss the following history of the developed water. I assume the water contains the pico-sized particle, infoton formed in H_2O pressurised at around 100 MPa [6,7]. The electron in hydrogen and the infoton itself moves in precession. The infoton possesses three features; i) nuclear transmutation, ii) chemical reduction, iii) propagation.

We reported the research paper for every feature since 2009, and some papers associating with nuclear transmutation have been published since 2011 [7-10]. We found that radioactive caesium changed to stable barium, lanthanum and cerium in the Fukushima disaster (2011). In the published paper in 2018, we proved heat dissipation by the mass-energy conservation holding.

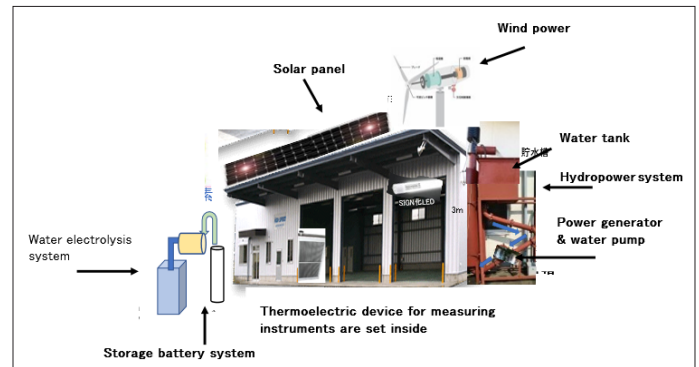


Figure 5: Collaboration of SDGs Energy System for Farm House

Wind power is better to set in cylindrical blade type, solar panel may incline toward sun light, hydropower system of water cycling can change the size of water tank dealing with required capacity, power generator etc. are also changeable [11]. Water electrolysis system forms hydrogen gas, and storage it. We will try the SDGs energy system in a closed primary school, we will use our developed water in SDGs energy system, and the system will increase efficiency because of smaller friction due to the pico-sized particle water.

Conclusion

It is remarkable climate change associating with warmer seawater, then it was reported that Arctic ice has been melted several years ago. In Japan, we have no four seasons like spring, summer, autumn and winter reflected in the plants. We analyzed the reasons of global warming and climate change and assumed three big reasons. One is the number of cars, and the second is increase of nuclear power plants in the world. Europa move away from nuclear power, phase-out of it and postponed. The third one is data center along with the internet technology. Moreover, wars in east Europa make it worse, and our air conditioning seems making warm air in our daily life.

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