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For Urban Planners, Architects and Environmentalists, Natural Energy Stored in Groundwater Deposits Offers a New Source of Clean Energy

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Abstract

Groundwater deposits, along with photovoltaic cells and wind turbines, are now likely to become the third primary source of renewable energy as fuel, gas and electricity prices rise. These deposits are characterized by unrestricted, clean and friendly to the environment energy with constant parameters that are unaffected by wind and solar energy fluctuations. In FCH HVAC, novel low-carbon methods for converting groundwater energy into heating and cooling are presented in this paper. A study that describes the system that was implemented in the Integrative Sports and Recreation Centre in omianki is a good illustration of the significant reduction in CO_2 emissions that this technology was able to achieve. In the above-mentioned centre, new FCH technology installations will reduce CO_2 emissions and energy used for heating and cooling by at least 50%. The purpose of this article was to explain how to use the energy from underground waters in HVAC installations. The authors present a novel approach to the utilization of forgotten energy that not only is accessible in unrestricted quantities at all latitudes but also has a negligible impact on the environment and has the potential to significantly reduce CO_2 emissions.

Keywords: Innovation • New technologies • FCH HVAC • Operating costs reduction

Introduction

The last ten years has seen an expansion in the utilization of sustainable power sources on the worldwide market. The existing energy carriers will need to change in 2022 as the world struggles with the pandemic, the war in Ukraine and limited supplies of coal, oil and gas alongside a shift from the traditional employment model and the rapid development of information technology. The European Union's CO_2 emission-reduction regulations force numerous changes driven by economic considerations and environmental protection.

Description

The EU has implemented a system based on CO_2 emission allowances (ETS) to cut down on CO_2 emissions. In EU countries, these activities aim to use more environmentally friendly technologies and reduce CO_2 emissions. The majority of the electricity produced in developing nations is based on fossil fuels. The technology with the highest CO_2 emissions and lowest operating costs is this one. The European Union (EU) therefore recommends replacing conventional heating systems. This prompts huge outflows to air and ozone depleting substances, including CO_2. The world will be moving toward reducing the use of non-renewable energy sources and switching to renewable energy in an effort to reduce CO_2 emissions as it searches for alternative, renewable and green energy sources. The authors demonstrate the environmental significance of natural energy stored in groundwater deposits by utilizing the information resources that have been published on the website, as well as the archived results of testing traditional HVAC systems and FCH HVAC systems over the course of the past seven years [1].

There is a carbon footprint associated with each ecological building installation solution currently available on the market and this carbon footprint is always linked to CO_2 emissions in the initial phase. It is also true that the sun's and wind's energy is limited in time and does not provide us with full security without energy storage. People should pay more attention to the energy with the smallest carbon footprint, which is available indefinitely and in sufficient quantities to secure every building in Poland and around the world, in future years, until other alternative solutions are available, as accidents at nuclear power stations have demonstrated. In this case, too, people should focus more attention on the energy that is available in sufficient quantities to secure every building in Poland and around the world. The research was carried out between the years 2014 and 2021 on a number of representative buildings in Poland, such as Warszawa Targówek and Mielec Navigator, which had a combined area of over 90,000 m^2 covered by FCH HVAC systems. The findings of these studies, which showed 50% reductions in CO_2 emissions and reductions in final energy (FE) and primary energy (PE) are discussed [2].

Similar to how we can determine the amount of energy used for cooling, we can also determine how much energy is used for heating. With the FCH technology, the EU anticipates a 75 TWh reduction in cooling energy consumption, or 150 TWh divided by 50%. The EU expected energy utilization decrease for warming with the FCH innovation is 150 TWh × half=75 TWh. Over 150 TWh of energy savings are anticipated for EU FCH HVAC systems for heating and cooling or 90% of Poland's total energy consumption. In the new reality of 2022, energy stores of green energy that are deposited in groundwater and made available to every landowner in Poland and around the world will be a good option for the new decade of fighting CO_2 emissions. The FCH technology works well for heating and cooling groundwater at an average depth of 10 meters in the winter and summer. This paper will go into greater detail about how these parameters affect the operating costs of any investment project. The "WICA" Eastern Innovation Center of Architecture and the Potocki Palace and Park Complex in

Radzy Podlaski represents the value of architecture in nodal locations of the city and could serve as an illustration of future implementations. A lot of crucial information that will enable us to make some daring conclusions at the

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end: FCH plants are a novel approach that demonstrates excellent, unlimited energy storage. Energy is always present. There is no limit to the availability of energy. After the energy is released in units, the technology extracts energy from groundwater in a closed system, which means that the water returns to the ground to the vertical exchangers intact with only a small temperature change. Groundwater is not used by the technology. Every nation has access to energy. The technology is natural, has a very low carbon footprint (less than 10% compared to other options), can cut CO_2 emissions from HVAC by up to 50%, and, most importantly, is 100% renewable. Because it is a closed system that has no effect on groundwater levels, the technology is also 100% ecological [3].

The systems are implemented as closed-circuit, forced-circulation and double-pipe systems. Instead of heat pumps installed at the supply duct for the air handling units, the components that guarantee the agent's desired flow parameters are circulator pumps. In times of low temperatures, a solution of 35% ethylene glycol safeguards the system and ensures that it continues to function normally. The groundwater temperature, serves as the foundation for the FCH technology that is the subject of this paper. We get free energy from the natural world, as depicted in the figure, which has the same parameters as the energy produced by CFC-based systems. For the FCH HVAC technology, the described groundwater parameter is crucial for directly utilizing groundwater without water chillers, resulting in a 50% reduction in operating costs for each system and a similar reduction in CO_2 emissions while maintaining extremely high internal parameters [4,5].

Conclusion

The authors extend an invitation to other scientists and universities in Poland and around the world by presenting their findings and solutions in conjunction with the current state of CO_2 emissions. As demonstrated in a previous paper, this energy has such enormous potential that every university and research team will have enough material to work with, regardless of location. The professional results of the research that have been presented, as well as the actual reduction in energy consumption that has been demonstrated, are excellent examples of environmentally friendly solutions. They also confirm the enormous potential of groundwater stores, which will enable us to effectively utilize CO_2 emissions in any nation.

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Conflict of interest

None.

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