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Eco-Friendly Zero-House Modeling Based on Mobile Home Network

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Abstract. Countries in the world as well as Korea are continuing to study the structure of low energy consumption type which enables the building to be operated with a small amount of energy in order to reduce greenhouse gas emission. Therefore, this study conducted the eco-friendly zero-house modeling Based on mobile home network) advanced from the structure of low energy consumption type. It was designed to be self-sufficient in energy by self-producing energy through new renewable energy, applying all sorts of zero-house technology, minimizing the use of energy used in the building, and continuing to monitor and control energy through the mobile appliance

Keywords: Zero-House, Mobile Home Network, Eco-Friendly

1 Introduction

The amount of energy consumed by structures such as housing and building in Korea accounts for 25% of the total energy consumption. Korea aims to reduce 30% of greenhouse gas emission up to 2020 by adopting low-carbon green growth as the national long-term strategy in 2008. And seeing that Korean government is planning the national roadmap to obligate newly-built housing to secure zero-energy performance in 2025, it is necessary to conduct a study of the environment-friendly design technique and environment-friendly technology.

Therefore, this study attempts to introduce the home network system using the mobile appliance to implement the structure in which the sum of annual energy budget equals zero(0).

For this purpose, chapter 2 attempts to make a theoretical investigation of the concept, function and major technology of environment-friendly zero house, the home network and the mobile home network.

Chapter 3 discusses GT(Green IT), MEMS(Mobile Energy Management System), 3.3 Mobile Smart Home Control System to conduct a study of the zero house model based on the mobile home network. Chapter 4, the concluding chapter, mentions the appropriateness and expected effect of the elicited model and the future direction of study.

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2 Theoretical Investigation

2.1 Environment-friendly Zero-House

The zero house is the structure in which the sum of annual energy budget equals zero by enhancing the use of passive design use and the efficiency of machinery and equipment, greatly reducing the amount of annual energy consumption and using the self-produced renewable energy for the rest of consumption. As it rises to the higher grade, the percentage of energy use reduces but the percentage of new renewable energy becomes high. Accordingly, the zero house should be self-sufficient in necessary energy through new renewable energy without fossil fuel and external power supply. The Code for Sustainable Homes sets a single national standard within which the home-building industry can design and construct homes to higher environmental standards. Performance is measured across 9 key sustainable design categories, including energy/CO2, water consumption, materials, ecology, pollution and waste.

2.2 Home Network

The home network is the system to interconnect and control communications and home appliance within the home into one communications network in the ubiquitous residential environment based on the high-speed Internet. The home services of combined communications and broadcasting are provided for the home, such as WPAN technology-centered home automation and interactive smart TV and the like in the early form of providing simple home automation and home appliance control service. The typical wire home network technology may include Ethernet, HomePNA, PLC(Power Line Carrier), IEE 1394, USB, DVI, HDMI and so on.

2.3 Mobile Home Network

The mobile home network is the system that can remotely control all sorts of home appliances within the home through the network. It is the system through which at home or in the external environment, the user can control all sorts of digital equipment within the home through the smart phone. For example, its user can turn on or off gas or electronic products with the smart phone, check the outsider's invasion into the home through application and use and control distance education, healthcare, information appliances and so on with the mobile system by connecting diverse IT appliances.

3 Zero-House Modeling Based on Mobile Home Network

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3.1 GT(Green IT)

The actual configuration system is designed according to the role played by each social stratum in order to save energy. The general environmental sensor of temperature and moisture, RFID for object check, RF communication instrument for location recognition, the sensor for occupant detection, WHM(Watt Hour Meter) for the remote measurement of the amount of electricity used are installed in the mobile environment.

3.2 MEMS: Mobile Energy Management System

The function of analyzing information on energy use feedback and data on energy use with the mobile appliance and handling total energy management.

Fig. 1. Mobile Intelligent Energy Management Application of Owon Company

3.3 Mobile Smart Home Control System

In the smart home system, all sorts of systems are controlled through the mobile appliance.

- Smart Home Surveillance System
- Smart Home Alarm System

- Smart Home Lighting Control
- Smart Home Entertainment System
- Smart Home Information Centre
- Smart Home Software Portal

4 Conclusion

It was designed to be self-sufficient in energy by self-producing energy through new renewable energy, applying all sorts of zero-house technology, minimizing the use of energy used in the building, and continuing to monitor and control energy through the mobile appliance. The problem of the global environment should be resolved by reducing the use of energy and reducing greenhouse gas emission through the reduction of carbon dioxide. For this purpose, it is necessary to make a continual study of the fields linked such as greenhouse gas abatement technology, energy-saving technology, new renewable energy technology and the like based on this modeling in the future.

References

1. Kim, Y.S.: Design and Implementation of Real-time Control System using Embedded User Device for Intelligent Home Network: Kyungnam graduate school(2009)
2. Lee , B.R., Choi, S.K., Cho, Y.H.: A Study on Modem for Home Network High- Speed Power Line Communication System in Home Network: The Korea Contents Society, Vol.5 No.5, pp. 65--77 (2005)
3. Choi, H.J., Moon, S.J.: Ubiquitous Home Network Based on Mobile Platform: The Korean Institute of Communications and Information Sciences, No.11, pp.565--566 (2010)
4. http://www.owon-smart.com/uploadfile/upload/Owon-smart%20brochure.pdf
5. http://www.planningportal.gov.uk/uploads/code_for_sust_homes.pdf
6. http://zerohouse.net/wordpress/how-it-works
7. http://www.mydigitallife.info/control-4-ec-100-an-intellingent-energy-management-home-control-system-in-digital-home/

