

Real Time Simulation of Hybrid Distributed Energy Resource Using Solar PV and Wind Power

Youchao LIU¹ Hiroshi FUJITA² Yoshiki MAKINO^{1,3} Yuto LIM¹ Yasuo TAN¹

Japan Advanced Institute of Science and Technology (JAIST)¹ Fujitsu Hokuriku Systems²
National Institute of Information and Communications Technology (NICT)³

Abstract - This paper present a real time simulation of distributed energy generation - solar PV(photovoltaic) and wind power.It's aimed to implement a stable monitor on the power generation of solar PV and wind power, and show the impact on power generation system as well.

Index Terms - real time, distributed energy resource, power generation management, energy consumption scheme.

1 Introduction

The reason for why setting the research on solar PV and wind power is that they don't cause fuel cost, operating pollution, mining safety or operating safety features. But they both have the same issues: variable and non-dispatch-able. Wind and solar suppose to complement each other. Days without sun there tend to be windy, and vice versa. Therefore, the combination of solar PV and wind power could be a beneficial resolution, no matter on environment or economics[1]. A lot of scholars have done relative researches on the impacts of the integration of wind and solar farms into power system on the voltage stability. It's necessary to take measures in reducing the voltage fluctuation so as to improve the performance of power system operation.

It is known that simulation acts as a critical position in the research of the impacts of grid-connected wind and solar farms on power system operation. Most of existing studies on the simulation pertinent to wind power mainly focus on off-line simulation, which has to go through a long research period and low efficiency.

2 Real Time Simulation Of Hybrid Distributed Energy Resource

Referring to the Smart City Simulator figure 1 [2], what I focus on is the simulation for the distributed energy. A housekeep is served as client side, it will provide real simulation result and then send to city energy management system. Finally, it will be replied with efficient consumption scheme.

First, For recently lots of research has been launched about the real time simulation for solar PV, Wind Power and other distributed energies; However, Because the un-predication and fluctuation of solar PV an wind power, it's very hard to fulfill the purpose of meeting daily demand of power using solar PV and

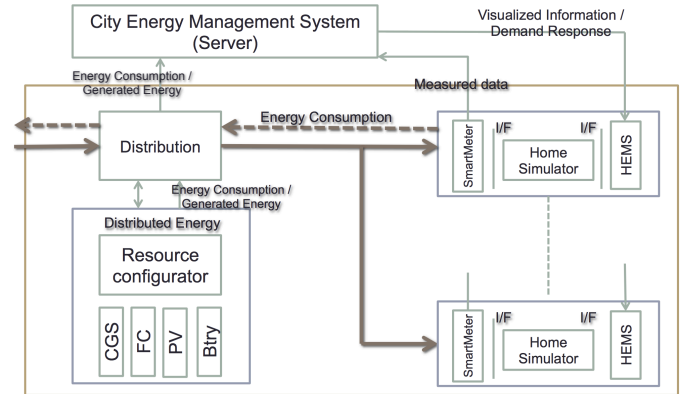


Figure 1: Smart Community Simulator

wind power.

Second, It should be the issue how to make the time interval for the real time simulation. It is impossible to illustrate the result every second. In order to fetch more accurate and timely result, time interval is the big factor. For example, we can set it as thirty minutes, ten minutes or five minutes etc. However if it is too long, the result will not be accurate and timely. By contract, The result will be un-predictable and meaningless. The issue how to consolidate the simulation of Solar PV and Wind Power more timely, accurately and efficiently, would be the main point to be concerned about.

3 The Usage

For recently, the real time simulation of distributed energy resource is still on the primary phrase. And Electricity is one of the most widely used forms of energy in our daily life. Benefit from using renewable energy source and no operating pollution, distributed energy resource(solar PV and wind power) will be applied and spread very soon in the future. So as to the requirement of smart management and monitoring.

References

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