it is not strictly evaluated as for how much the electricity usage is reduced with respect to the incentive, but only the unit price is replaced with a higher~~cheaper~~ one to simplify the calculation.

[0104] [4-4. Process of Optimizing Next-day Operating Schedule One Day Before]

The process procedure of the electricity and heat storage optimizing device 4 will be explained with reference to the flowcharts of FIGS. 7 and 9. The process explained below is an example case in which the next-day operating schedule of the control-target device 2 in the architecture 1 is optimized in the night one day before. It is appropriate if the operating schedule to be optimized is a future predetermined time period, and is not limited to the next day or a day after the next day.

[0105] [Optimization Execution Starting Process]

First, the start instructor 16 instructs an execution of the optimizing process to the energy predictor 10 at a preset time. When, for example, it becomes 21:00 of one day before, the optimizing processor 40 starts executing the optimizing process. The flowchart of FIG. 7 illustrates a process flow after the execution of the optimizing process is started upon instruction from the start instructor 16.

[0106] [Energy Predicting Process]

The energy predictor 10 predicts (step 01) the consumed energy or supplied energy of the control-target device 2 based on the meteorological phenomenon data and operation data in past predetermined time period stored in the process data memory 22.

[0107] An explanation will be given of an example predicting process by the energy predictor 10. First, the similarity calculator 10a calculates the similarity based on the past day of week, weather, a temperature, and a humidity stored in the process data memory 22 as the meteorological phenomenon data and the operation data. An example calculation formula of the similarity is represented by the following formula (1).

(a) The actual value and predicted value of the supplied energy and the consumed energy

(b) The optimized operating schedule and the actual operating state of the device

[0152] When the difference between the compared data does not exceed each threshold set in the process data memory 22 in advance, the rescheduling necessity processor 17 determines (step 21: NO) that the rescheduling is unnecessary. Conversely, when such difference exceeds the threshold, it is determined (step 21: YES) that the rescheduling is necessary.

[0153] As explained above, when the rescheduling necessity determiner 17 determines that the rescheduling is necessary, the start instructor 16 instructs (step 22) the start of an execution of rescheduling. Hence, as is illustrated in the flowchart of FIG. 9, the rescheduling starts.

[0154] In the operation in the step 11 in the flowchart of FIG. 9, with respect to the initial states of the SOC of the battery 100 and the remaining heat storage quantity of the heat storage tank 105, the current SOC and the current remaining heat storage quantity are set. The other operations are the same as those of the case in which the schedule is planned one day before as explained above.

[0155] [5. Advantageous Effect]

As explained above, according to this embodiment, a time at which the incentive is receivable is determined beforehand, and an operating schedule optimized with an electricity unit price reflecting the incentive only for such a time is derived. Hence, it is possible to obtain an appropriate DR operating schedule meeting the reality.

[0156] In addition, when a calculation in consideration of the incentive is performed, an optimizing calculation is performed based on a presumption that the unit price to the electricity usage is increased~~reduced~~ by what corresponds to the incentive unit price. Hence, it becomes unnecessary to perform a complex calculation through a strict formulation

CLAIMS

1. An electricity suppressing type electricity and heat storage optimizing device comprising:

an energy predictor that sets, for at least one of control-target devices which are an energy supplying device supplying energy, an energy consuming device consuming energy, and an energy storing device storing energy, a predicted value of consumed energy of the energy consuming device or of supplied energy of the energy supplying device within a predetermined future time period;

a schedule optimizer that optimizes an operating schedule of the control-target device within the predetermined time period in accordance with a predetermined evaluation barometer and based on the predicted value, a characteristic of the control-target device, and a unit price of an energy usage fee;

an incentive acceptance determiner which determines a time with a possibility that an incentive is receivable based on the predicted value, an electricity suppression target time that is a time prepared for applying an incentive to electricity suppression, and a base line that is a threshold for whether or not to apply the incentive;

an electricity suppressing schedule optimizer that optimizes the operating schedule of the control-target device within the predetermined time period in accordance with the predetermined evaluation barometer and based on the predicted value, the characteristic of the control-target device, and a unit price of the energy usage fee at a time at which it is determined that the incentive is receivable, the~~having a~~ unit price is increased by taking~~for calculating~~ the incentive ~~taken~~ into consideration; and

an adopted schedule selector that selects either the operating schedule optimized by the schedule optimizer and the operating schedule optimized by the electricity suppressing schedule optimizer based on the predetermined evaluation barometer or a selection instruction input externally.

2. The electricity suppressing type electricity and heat storage optimizing device according to claim 1, further comprising a rescheduling necessity determiner that determines whether or not it is necessary to optimize the operating schedule again based on the operating schedule, and operation data of the control-target device operated based on the operating schedule.

3. The electricity suppressing type electricity and heat storage optimizing device according to claim 1 or 2, further comprising a control information outputter that outputs control information on the control-target device based on the operating schedule selected by the adopted schedule selector.

4. The electricity suppressing type electricity and heat storage optimizing device according to any one of claims 1 to 3, further comprising a preference order memory that stores a preference order of a time at which the incentive acceptance determiner determines whether or not the incentive is receivable.

5. The electricity suppressing type electricity and heat storage optimizing device according to claim 4, wherein with respect to the preference order, the larger the predicted value of energy predicted by the energy

predictor is, the higher the preference order of the time is.

6. The electricity suppressing type electricity and heat storage optimizing device according to claim 4, wherein with respect to the preference order, the smaller the predicted value of energy predicted by the energy predictor is, the higher the preference order of the time is.

7. The electricity suppressing type electricity and heat storage optimizing device according to claim 4, further comprising a preference order inputter that inputs the preference order.

8. The electricity suppressing type electricity and heat storage optimizing device according to any one of claims 1 to 7, wherein:

the incentive acceptance determiner determines a time with a possibility that the incentive is receivable based on an upper limit of electricity which permits an receipt of the incentive; and

the electricity suppressing schedule optimizer optimizes the operating schedule of the control-target device for a time at which the incentive is receivable based on the upper limit and a lower limit of electricity to be reduced.

9. The electricity suppressing type electricity and heat storage optimizing device according to any one of claims 1 to 8, further comprising a schedule display that displays the operating schedule optimized by the schedule

optimizer, and the operating schedule optimized by the electricity suppressing schedule optimizer.

10. The electricity suppressing type electricity and heat storage optimizing device according to any one of claims 1 to 9, further comprising an instruction inputter that inputs an instruction for selecting either the operating schedule optimized by the schedule optimizer or the operating schedule optimized by the electricity suppressing schedule optimizer.

11. An electricity suppressing type electricity and heat storage optimizing method causing a computer or an electric circuit to execute:

an energy predicting process for setting, for at least one of control-target devices which are an energy supplying device supplying energy, an energy consuming device consuming energy, and an energy storing device storing energy, a predicted value of consumed energy of the energy consuming device or of supplied energy of the energy supplying device within a predetermined future time period;

a schedule optimizing process for optimizing an operating schedule of the control-target device within the predetermined time period in accordance with a predetermined evaluation barometer and based on the predicted value, a characteristic of the control-target device, and a unit price of an energy usage fee;

an incentive acceptance determining process for determining a time with a possibility that an incentive is receivable based on the predicted value, an electricity suppression target time that is a time prepared for applying an incentive to electricity suppression, and a

base line that is a threshold for whether or not to apply the incentive;

an electricity suppressing schedule optimizing process for optimizing the operating schedule of the control-target device within the predetermined time period in accordance with the predetermined evaluation barometer and based on the predicted value, the characteristic of the control-target device, and a unit price of the energy usage fee at a time at which it is determined that the incentive is receivable, the~~having a~~ unit price is increased by taking~~for calculating~~ the incentive ~~taken~~ into consideration; and

an adopted schedule selecting process for selecting either the operating schedule optimized through the schedule optimizing process or the operating schedule optimized through the electricity suppressing schedule optimizing process based on the predetermined evaluation barometer or a selection instruction input externally.

12. An electricity suppressing type electricity and heat storage optimizing program that causes a computer to execute:

an energy predicting process for setting, for at least one of control-target devices which are an energy supplying device supplying energy, an energy consuming device consuming energy, and an energy storing device storing energy, a predicted value of consumed energy of the energy consuming device or of supplied energy of the energy supplying device within a predetermined future time period;

a schedule optimizing process for optimizing an operating schedule of the control-target device within the predetermined time period in accordance with a predetermined evaluation barometer and based on the

predicted value, a characteristic of the control-target device, and a unit price of an energy usage fee;

an incentive acceptance determining process for determining a time with a possibility that an incentive is receivable based on the predicted value, an electricity suppression target time that is a time prepared for applying an incentive to electricity suppression, and a base line that is a threshold for whether or not to apply the incentive;

an electricity suppressing schedule optimizing process for optimizing the operating schedule of the control-target device within the predetermined time period in accordance with the predetermined evaluation barometer and based on the predicted value, the characteristic of the control-target device, and a unit price of the energy usage fee at a time at which it is determined that the incentive is receivable, the~~having a~~ unit price is increased by taking~~for calculating~~ the incentive ~~taken~~ into consideration; and

an adopted schedule selecting process for selecting either the operating schedule optimized through the schedule optimizing process or the operating schedule optimized through the electricity suppressing schedule optimizing process based on the predetermined evaluation barometer or a selection instruction input externally.