

# Study and Survey on Urban Environment Measure Redounding Prevention of Global Warming in Sewerage Enterprise

Whole term

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## (Purpose)

In May 2002, the Outline for Promotion Effects to Prevent Global Warming was determined and it had been targeted to reduce emission rate of greenhouse gases by 6% compared to 1990 in Japan. After that, in June 2002, the Law concerning the Rational Use of Energy was amended and saving of energy and effective utilization of energy involving the viewpoint of prevention of global warming had been promoted.

From this background, this study and survey summarized the measures for global warming such as adoption of energy-saving equipments, change of facilities operating system aiming to save energy, utilization of unused energy, etc.

## (Survey contents)

In this study, concerning of following facilities segment, the concrete technical contents for attempting to save energy were organized.

- Grit chamber facilities and main pumping facilities: intermittent operation of screen facilities, intermittent operation of sand-lifting facilities, sequential and alternating operation of tanks, appropriate control of the number of tanks for influent quantity, promotion of efficiency of main pumping operation, equalization of main pump discharge
- Primary sedimentation tank facilities: appropriate control of the number of tanks for influent quantity, intermittent operation of collectors, intermittent operation of sludge drawing-out pumps, advancement of removal efficiency of scum skimmers
- Reaction tank facilities: optimization of blast volume, advancement of oxygen transfer efficiency of diffusers, prevention measures for clogging of diffusers, reduction of the amount of electric power used, optimization of flow rate of defoaming water, intermittent water spray
- Final sedimentation tank facilities: intermittent operation of collectors, return sludge pumps, intermittent operation of excess sludge pumps, advancement of removal efficiency of scum skimmers
- Advanced treatment facilities: underwater mixing machines, nitrification liquid recycling pumps, return sludge pumps, sand filtration units, optimum operation schedule of cleaning processes of biofiltration units
- Sludge concentration facilities: advancement of concentration performance, advancement of solids recovery rate, reduction of mechanical power usage
- Sludge digestion tank facilities: concentration control of sludge in digestion tank, heat control of digestion tanks, enhancement of warmth retaining property of digestion tanks, reduction of power usage of digestion tank agitators, enhancement of heat insulation of steam piping warming equipments, automatic control of warming boilers and hot-water heaters, effective utilization of steam and hot water
- Sludge dehydration facilities: concentration control of provided sludge, reduction of moisture contents of dehydration sludge, control of dehydrator system including carrying facilities, reduction of mechanical dehydration power usage
- Sludge incineration facilities: conformation of operation plan of sludge incinerator to production rate of dehydration sludge, appropriate load operation, reduction of moisture contents of dehydration sludge, reduction of auxiliary fuels, expansion of self-combustion time, heat recovery facilities, enhancement of heat insulation, reduction of treating water which is generated from exhaust gas, leakage prevention of heat mediums, automatic control system of incinerators
- Deodorizing facilities: reduction of deodorized air volume, intermittent operation of fans
- Sewage heat effective utilization facilities: heat sources of air conditioners, supply of hot water
- Digester gas effective utilization facilities: digester gas power generation system, auxiliary fuels of incinerators, heat sources of air conditioners, gas supply to other industry
- Incinerator waste heat facilities: steam turbine power generation, heat sources of air conditioners, warming digestion tanks, supply of hot water

Moreover, in order to interpret the situation of saving of energy in sewage treatment plants, unit factors related to appropriate use of energy were discussed.

## (Summary)

Several measures for energy saving have been adopted to many sewage treatment plants. Moreover, there are others except measures summarized in this study. Therefore, it is necessary to discuss measures considering conditions in each sewage treatment plants when measures are adopted.

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