GreenStep Cities Best Practice # 20
- final draft for comment through May 2010 –

❖ ***Efficient Water and Wastewater Facilities:*** Assess and improve drinking water and wastewater facilities.

Optional for all cities

Category: Environmental Management

Summary

Restraining demand for water and wastewater services and making them more energy and materials efficient can contribute significant environmental and economic benefits to a city. Carbon emissions resulting from these two services can easily make up one quarter or more of the city operations' carbon footprint. Excess clear water can cause sewer backups, resulting in threats to human health and the environment.

Best Practice Actions

- Category B and C cities, if they choose to implement this best practice, must complete Actions (1) and (2) and at least one additional Action.
- Should a Category A city provide drinking water services and choose to implement this best practice, complete Actions (1) and (2) and/or Action (4).

(1) Compare the energy use and performance of your facilities with other peer plants using standardized, free tools.
(2) Plan and budget for motor maintenance and upgrades so as to assure the most energy efficient, durable and appropriate equipment is available when upgrades or break downs occur.
(3) Establish an on-going budget and program for decreasing inflow and infiltration into sewer lines, involving at least gutter, foundation drains and sump pump disconnects.
(4) Assess energy and chemicals use, inflow and infiltration volumes, water reuse potential and pollutants, and implement one-third of recommendations with a payback of less than 3 years.
(5) Require property owners to have their private sanitary sewer lateral pipe inspected before a property sale or title transfer.
(6) Implement at least one of the following projects/programs:
    a. Assist local businesses, institutions and/or residents in pre-treating and lowering volumes and toxicity of sewer inflows.
    b. Co-generate electricity and heat from the wastewater treatment plant.
    c. Reuse water (sell reclaimed water) from a wastewater plant for nonpotable ag-processing, irrigation or power plant uses.
    d. A greywater reuse system in at least one public or private building.

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Implementation Resources

(tied to the relevant Action by number)

(1) Several web-based tools exist, including:
    - Minnesota's Buildings, Benchmarks and Beyond (B3) database: http://www.mnbenchmarking.com
    - Energy Star's Portfolio Manager: http://www.energystar.gov/index.cfm?c=water.wastewater_drinking_water
    - U.S. EPA's Check Up Program for Small Systems, a free, easy-to-use, asset management tool for small drinking water and wastewater utilities based on EPA's highly successful Simple Tools for Effective Performance (STEP) Guide series: http://www.epa.gov/cupss/index.html

(2) *Infrastructure Options for Municipal Water Management*. Research and pilot work from Minnesota's West Central Initiative that urges communities to address drinking water, wastewater, and stormwater infrastructure

needs together in a more sustainable way using the Green Community Technology® approach (http://www.greencommunitytechnologies.com/home.html) for addressing infrastructure needs: http://www.wcif.org/?page=Infrastructure_Study

(2) *Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities* (U.S. EPA: 2008) - http://www.epa.gov/waterinfrastructure/pdfs/guidebook_si_energymanagement.pdf

(3) League of Minnesota Cities' *Sewer Toolkit*: http://www.lmc.org/page/1/sewertoolkit.jsp

(4) The Minnesota Technical Assistance Program (MnTAP), a free assistance provider at the University of MN, will develop recommendations that might be fundable using utility rebates: http://mntap.umn.edu/potw/index.htm and http://www.nextstep.state.mn.us/energyconference/090122mccomas.pdf

(4) The Midwest Assistance Program focuses on communities under 2,500 in population: http://www.map-inc.org/

(5) Minnesota Rural Water Association assistance and resources, including sample ordinances: http://www.mrwa.com/

(6a) Minnesota Technical Assistance Program (MnTAP): http://mntap.umn.edu/potw/index.htm

(6b) Albert Lea, MN co-generation case study and other combined heat and power resources: http://www.epa.gov/chp/markets/wastewater.html

(6c) *Recycling Treated Municipal Wastewater for Industrial Water Use* (Metropolitan Council: 2007): http://www.nextstep.state.mn.us/res_detail.cfm?id=4019

(6d) Background on and technology vendors for greywater reuse systems: http://www.nextstep.state.mn.us/res_detail.cfm?id=4128

Benefits

- Minnesota's 1000 wastewater and drinking water plants use 1 billion kWh of energy per year, costing $80 million. Energy efficiency upgrades of 10% at all of them would result in 100 million kWh and $7 million saved.
- Twin Cities metropolitan cities will spend an estimated $12 million in 2009 to reduce inflow and infiltration (I & I). Without such annual expenditures at the local level, the cost to add metro wastewater interceptor and treatment capacity to handle the excess flow from I & I would top $900 million: http://www.nextstep.state.mn.us/res_detail.cfm?id=4142
- When cities work with their businesses to implement pollution prevention programs to minimize water use and contaminant loading, including phosphorus, publicly owned treatment works can benefit by:
    - Maximizing existing sewer and treatment capacity to avoid further investments in water supply and treatment infrastructure.
    - Reducing chemical, energy, and sludge management costs.
    - Improving biosolids quality through reduced loading of heavy metals.
    - Help meeting the increasingly strict National Pollutant Discharge Elimination System (NPDES) permit limits by reducing wastewater loading from industrial users.
    - Strengthening local industry by helping businesses reduce wastes, cut costs and meet regulatory requirements.
    - Minimizing risk of damage to pipes and sewage treatment equipment from industrial solvents and corrosives, thus reducing costs.
    - Lessening workplace exposure of toxic chemicals to POTW employees.
    - Protecting drinking water sources in the community by minimizing discharge of contaminants, especially in wellhead protection areas.
- In households, greywater can account for 60% of total wastewater volume and must be paid for by purchasing water and then by paying to dispose of it.

Connection to State Policy

- Every water utility serving more than 1,000 people must adopt a conservation rate structure by January 2010 in the Twin Cities metro area and by January 2013 outside the metro (with exceptions for those without proper measuring devices in place by July 2008).
- Every water utility in the Twin Cities metro area must create a water capacity and use plan and verify that there is enough water to meet projected needs out 25 years. Water utilities outside the Twin Cities metro area must create a plan and verify that there is enough water to meet projected needs out 10 years.