Household sewage: Not waste, but a vast new energy resource

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In a finding that gives new meaning to the adage, "waste not, want not," scientists are reporting that household sewage has far more potential as an alternative energy source than previously thought. They say the discovery, which increases the estimated potential energy in wastewater by almost 20 percent, could spur efforts to extract methane, hydrogen and other fuels from this vast and, as yet, untapped resource. Their report appears in ACS' journal *Environmental Science & Technology*.

Elizabeth S. Heidrich and colleagues note that sewage treatment plants in the United States use about 1.5 percent of the nation's electrical energy to treat 12.5 trillion gallons of wastewater a year. Instead of just processing and dumping this water, they suggest that in the future treatment facilities could convert its organic molecules into fuels, transforming their work from an energy drain to an energy source. Based on their research, they estimate that one gallon of wastewater contains enough energy to power a 100-watt light bulb for five minutes.

Only one other study had been done on wastewater's energy potential, and Heidrich thought that the results were too low because some energy-rich compounds were lost to evaporation. In the new study, the scientists freeze-dried wastewater to conserve more of its energy-rich compounds. Using a standard device to measure energy content, they found that the wastewater they collected from a water treatment plant in Northeast England contained nearly 20 per cent more than reported previously.

More information: "Determination of the Internal Chemical Energy

of Wastewater", *Environmental Science & Technology*.

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