Implementation of a Diverter Based Water Conservation System for Showers

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This project will be used to eliminate the amount of water wasted while the water is heating up, by using a simple water diverter connected electronically to a temperature sensor. The user will be able to input a specific temperature of water on a small control panel, preferred for his/her showering/bathing. Any water below the specified temperature would be diverted back down to the source such as the water heater or the inflow pipe so it can be heated back up and used again. Then as the flowing water becomes greater than or equal to the specified temperature, the diverter will allow water to flow out the shower head and into the shower/tub. Thus, no water would be wasted then attempting to heat it up. During this research project, a full-scale model of the device was installed in the researchers home and tested on the basis of effectiveness, user-friendliness, and efficiency. Not only was all the water being used while heating up the shower saved through quick diversion of the water, but a more user-friendly interface was created using an Arduino microcomputer, to form a much simpler medium of controlling the diversion. After testing the diversion, it was concluded that the device could save from approximately 1.45-2.65 gallons of water, on average. This seemingly small amount of water saved has not only a huge impact on the environment, but also an impact on the user's water expenses.