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Designing energy-saving water distribution pipes

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Our daily lives and supporting activities revolve around water. The much needed water has to be transported from far-distance sources to the consumers. This transportation process requires much effort or energy. Several approaches, including gravitation and pressure pumps, have been employed to provide the energy required for water transportation. This current paper seeks to make further contribution to this effort by proposing the effect of the use of nanotechnology; and also proposing how the most commonly used water transportation devices, known as pipes, can be designed for energy minimisation.

Results show that the use of nanopipes brings about significant reduction of required transportation energy. The energy derived from the use of nanotechnology or nanopipe that facilitate water flow increases with the density of the nanoparticles, reaching a level where further increase in nanoparticles density does not bring further increase flow-facilitating energy. The impacts of changing-sizes of pipes are also revealed: for example, reducing pipe sizes reduces the amount of required energy to transport water.

Keywords: