# Numerical simulation of solar wind energy towers

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**ABSTRACT:**
A numerical investigation is conducted to study the performance of solar wind energy towers. The two-phase flow of air and water droplets in the tower is modeled following an Euler–Lagrange approach with air representing the continuous phase and water droplets the discrete phase. Results demonstrate that energy towers perform best in hot and dry environments. Water injection at the inlet to a tower increases the strength of the downdraft current with the rate of increase diminishing as the flow at exit approaches saturation. At a given water injection rate and tower diameter the downdraft strength increases as the height increases, while it is independent of the diameter at constant height. Energy analysis shows that for towers of low height the cost of electricity is expensive and commercially unfeasible, while it is cheap for towers of heights higher than 100 m.