

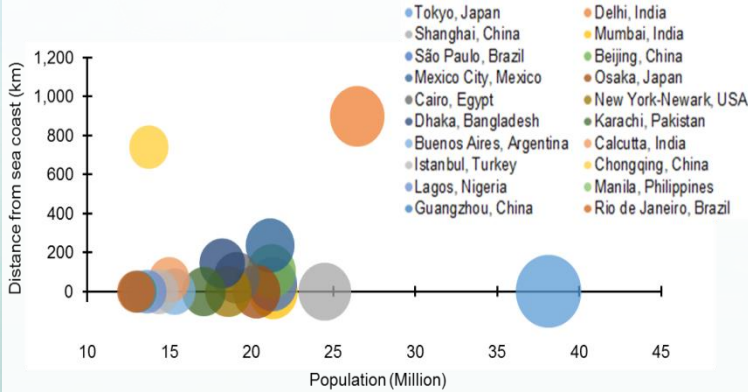
Urban Solar-Thermal Desalination Building



Motivation

Many people live in coastal areas

World 20 Big Cities



U.S. Population Comparison (Coastline vs. Noncoastline, 2017)

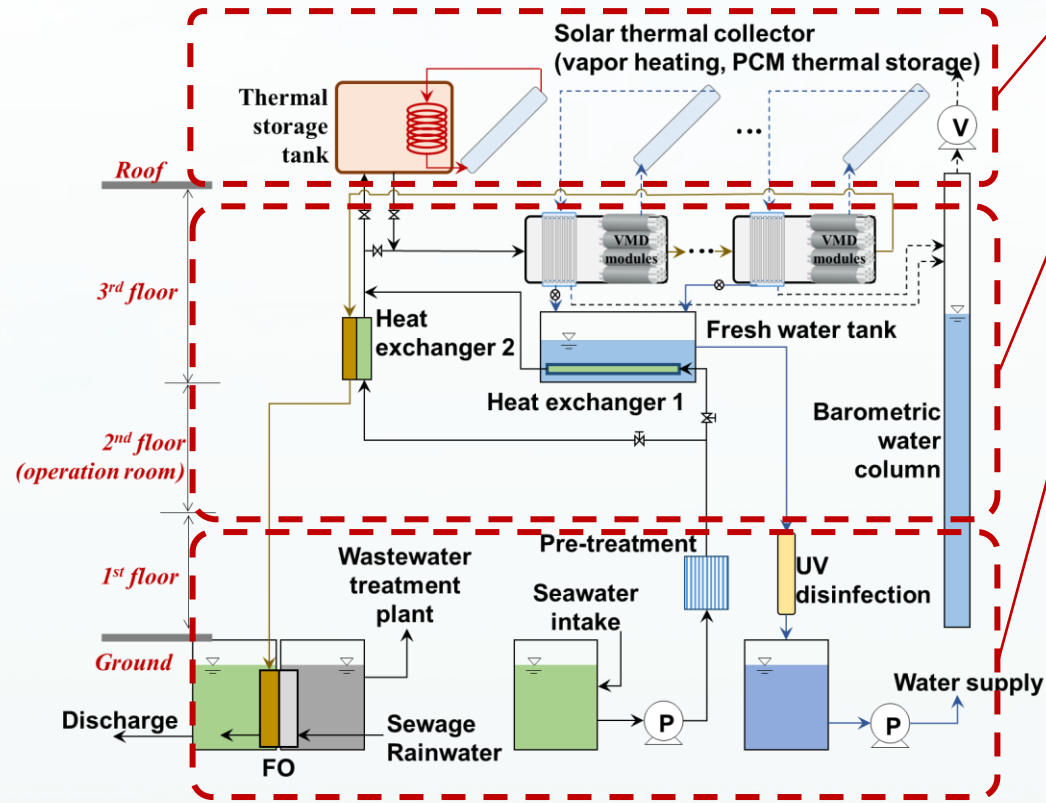
Category	Coastline	Noncoastline
Population, million (%)	94.7 (29.1)	231.1 (70.9)
# of counties	255	2,887
Population per county, thousand	371	80

Source: www.census.gov

The average population per county of the coastline: Almost 5 times higher than the noncoastline region



Proposed Solution and Teaming



▲ Urban Solar-Thermal Desalination Building

- ❖ **Novel:** ① Multi-stage VMD system with self-heated by solar-thermal collector ② Utilizing a barometric water column ③ Using a phase change material for the night operation
- ❖ **Impactful:** ① Vertical and decentralized water supply system targeting cities ② Reuse of grey water, rainwater, and Wastewater before discharging the high saline brine



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Location of the 1st end user

Campus of the University of Maryland: Reuse of wastewater and deicing salt



Location of the 2nd end users

8 sites recommended by the Maryland Department of the Environment