Future water and energy

Water conservation and renewable energy

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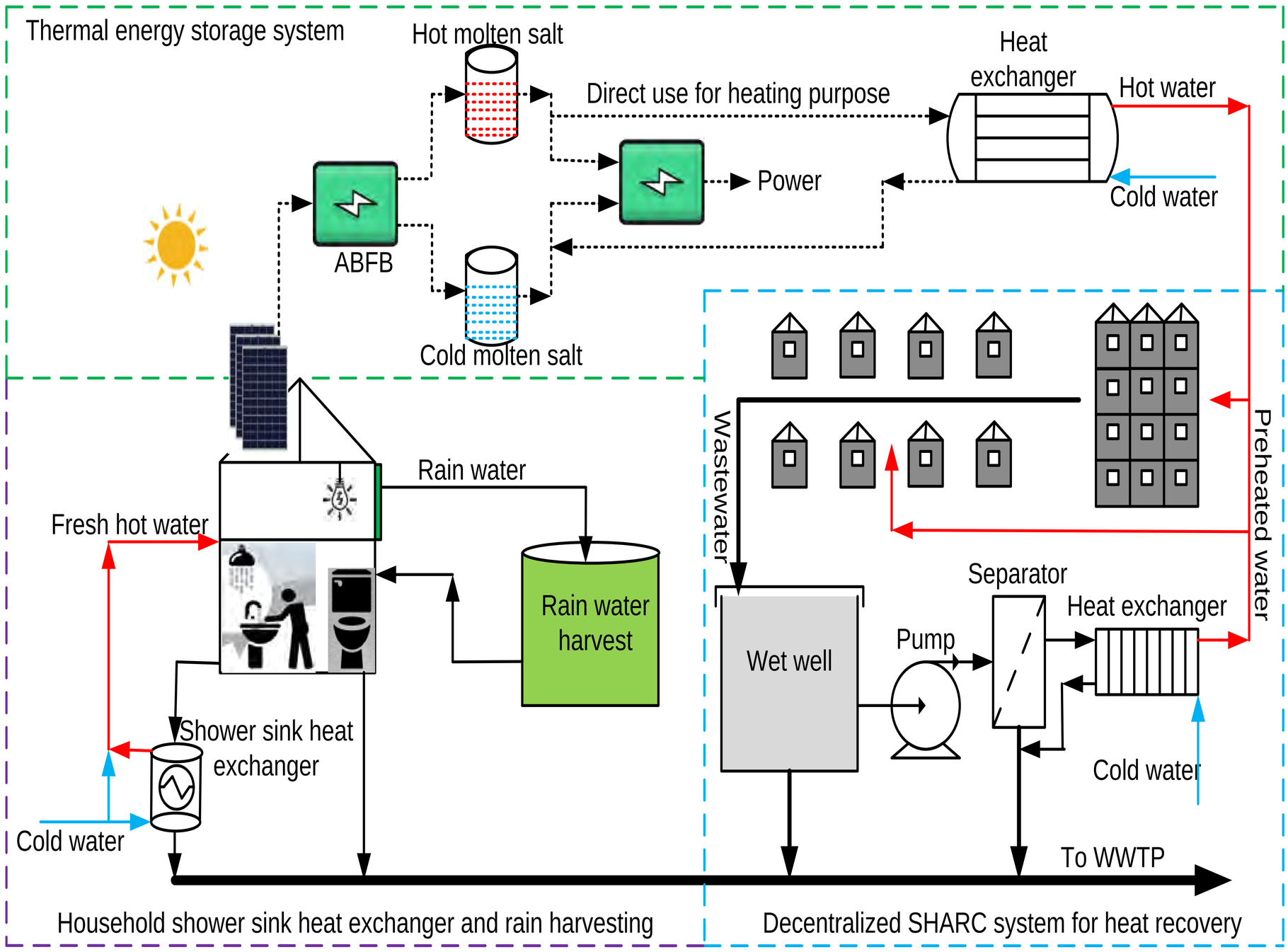
Introduction and challenge

The demand of energy in the city of Amsterdam is getting higher than the energy supply and burning of fossil fuels causes CO_2 emissions that damages local environment. Therefore, Amsterdam has the ambition that all energy used in the city comes from renewable sources in 2040.

It's a challenge to built smart and decentralized solutions for renewable energy resources and implement this new energy network in the dense infrastructure of Amsterdam.

Solution

A feasible decentralized energy web for small scale solutions in the dense infrastructure of Amsterdam, to lower energy costs and also reduces CO_2 emission



Energy storage

- PVT solar panel
- Acid base flow battery (ABFB)

Sink heat exchanger

- Heat recovery from shower drain water
- Saves 30 million Nm^3 gases
- Reduction of 54kton CO_2

SHARC system

- Can implementation in apartment or buildings
- Primary energy cost decreases 30-85%

Rain water harvest

- Can save $25m^3$ of water per house per year

Economics

- LCOS of ABFB → 0.259 €kWh^{-1} per cycle
- Sink heat exchanger → 400€ capital cost/unit
- SHARC system → Medium sized, 20 year payback
- Rain harvest → 500€ per house, 12 years payback

Advantages

- Efficient and economical energy storage
- Reduction in water and energy consumption
- Decentralized cheap and easy heat recovery
- Water and energy conservation

Wetskills-South Korea 2019 is suported by:

Study case owner: