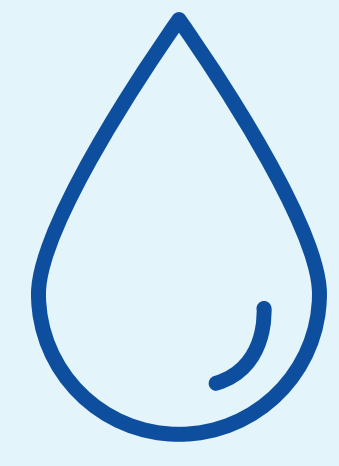


NET ZERO PURE WATER PRODUCTION

Presented by Team DubsTheBuilder
Yoav Ackerman, Kota Murakami,
Asa Norman, Meera Patel, Tayin Pillay

System Overview

Background



Pfizer produces pure water for cancer medication

Our current state



Uses distillation, which requires natural gas

Our Goal



Net Zero Emissions

Eliminate carbon output by replacing gas distillation with renewable energy sources



Safe

Meet pharmaceutical-grade water quality standards required for cancer medication

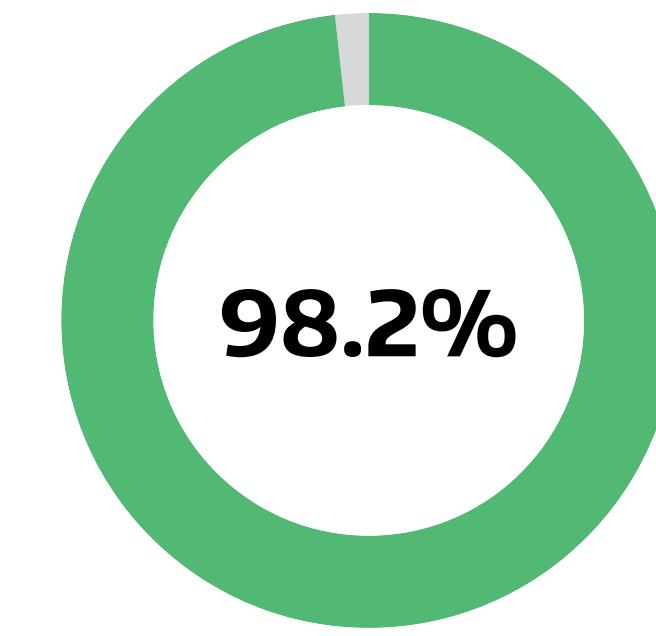


Cost Effective

Reduce long-term operating costs compared to current gas distillation methods

Our recommendation:

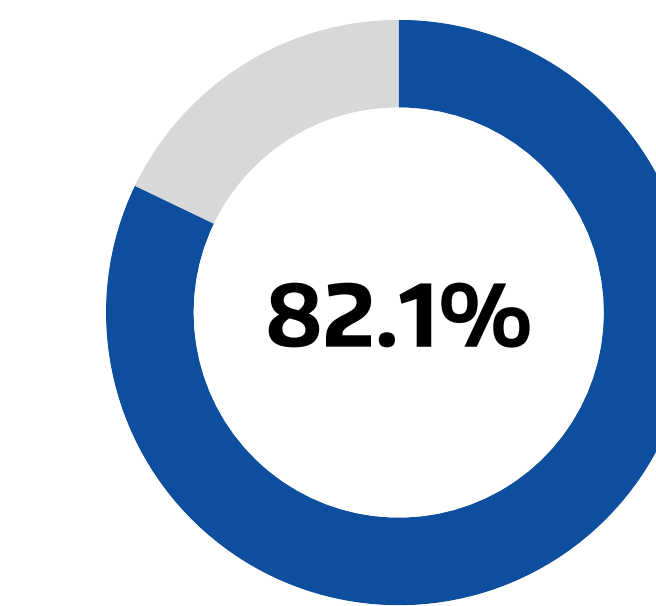
MEMBRANE + HEATPUMP



~98% Lower Carbon Emissions



Up to **\$4 million** saved over 20 years



~82% Lower OPEX

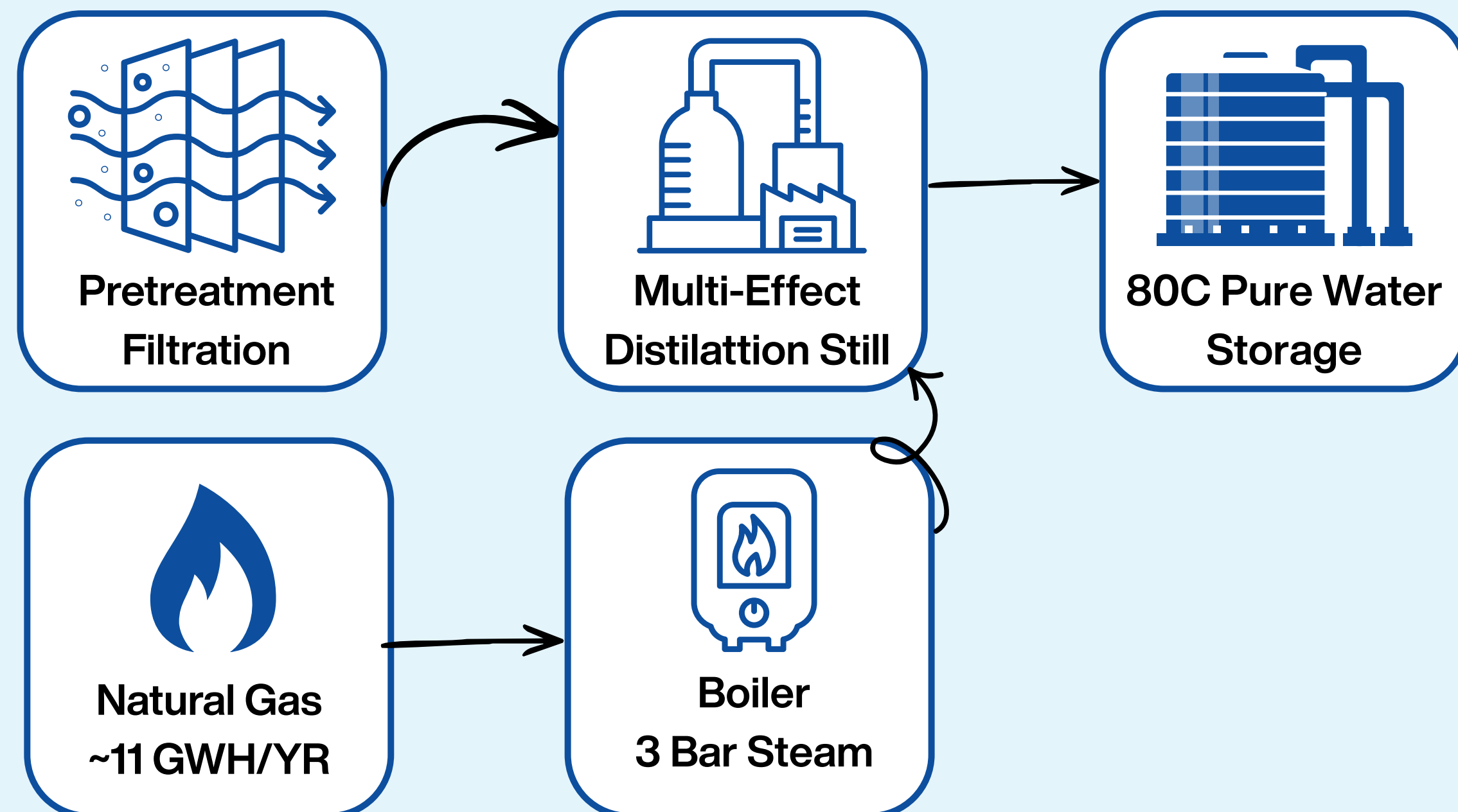


Payback in 2.8 years of operation

**Assuming 23 GPM production for all systems*

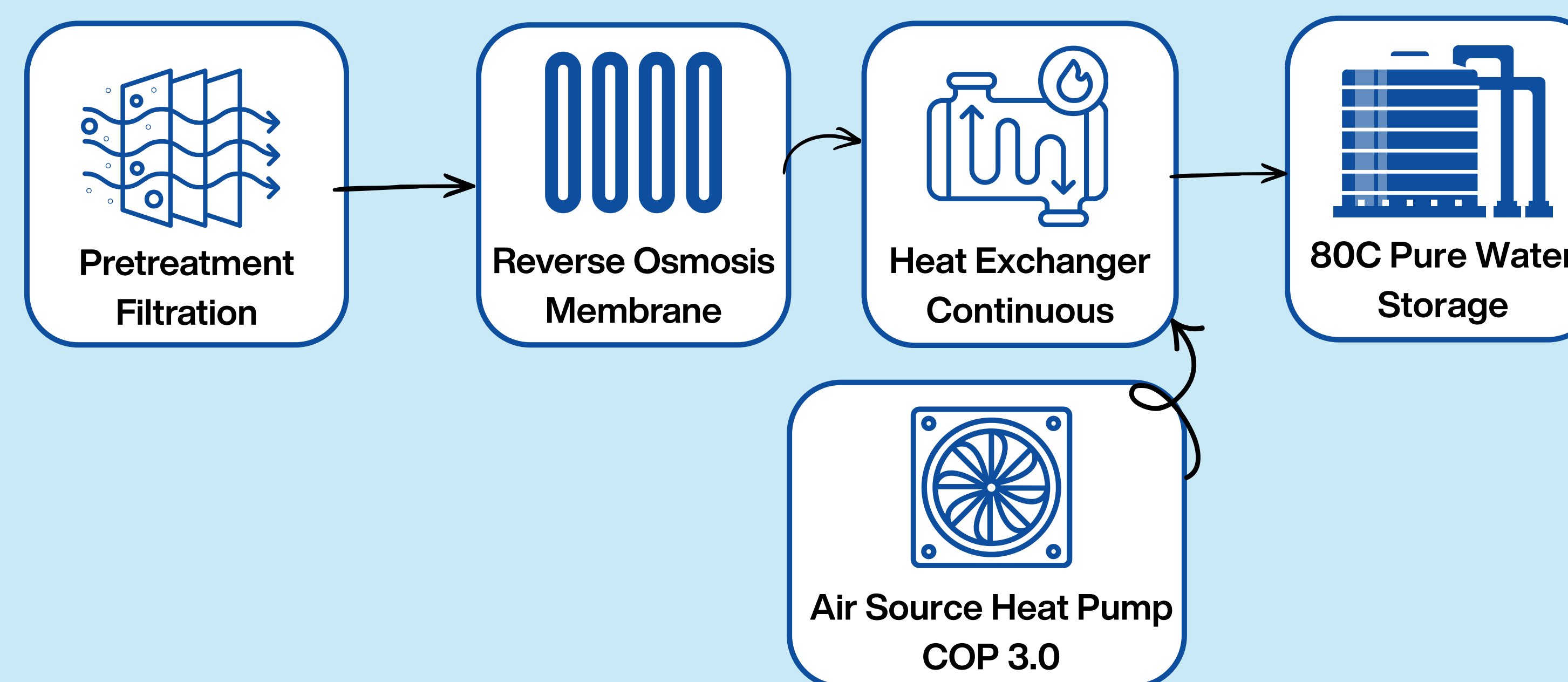
Do Nothing: MED + Natural Gas

OPEX: \$498k | CAPEX: \$0M | CO₂ / Year: 1,997 tonnes



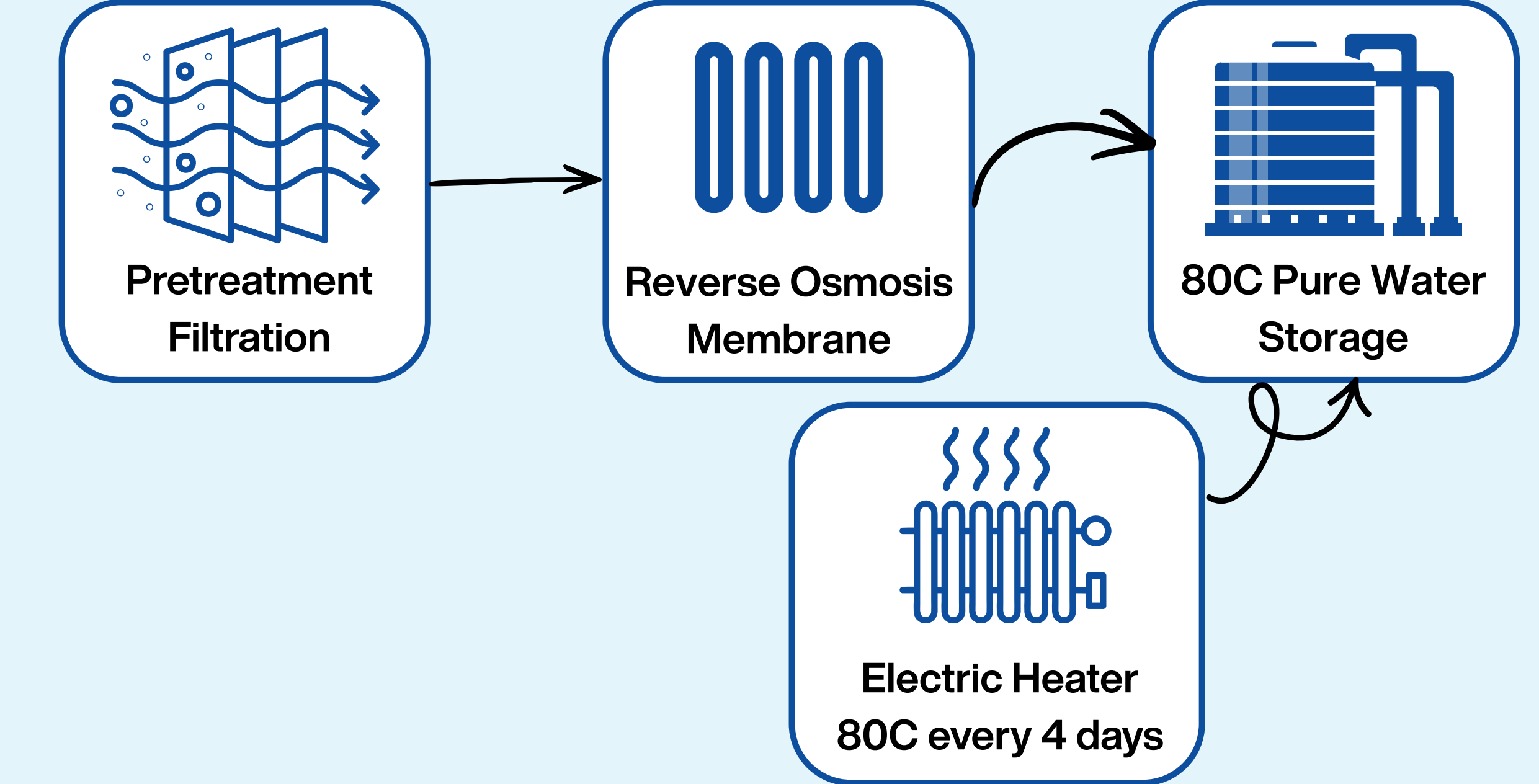
Membrane + Heat Pump

OPEX: \$89k | CAPEX: \$1.15M | CO₂ / Year: 35.0 tonnes



Membrane + Electric Heater

OPEX: \$204k | CAPEX: \$1.09M | CO₂ / Year: 86.9 tonnes



SAVED: 1,962 Tonnes of CO₂
by converting to
Membrane + Heat Pump

1,962 Tonnes of CO₂
In Things You Can Picture

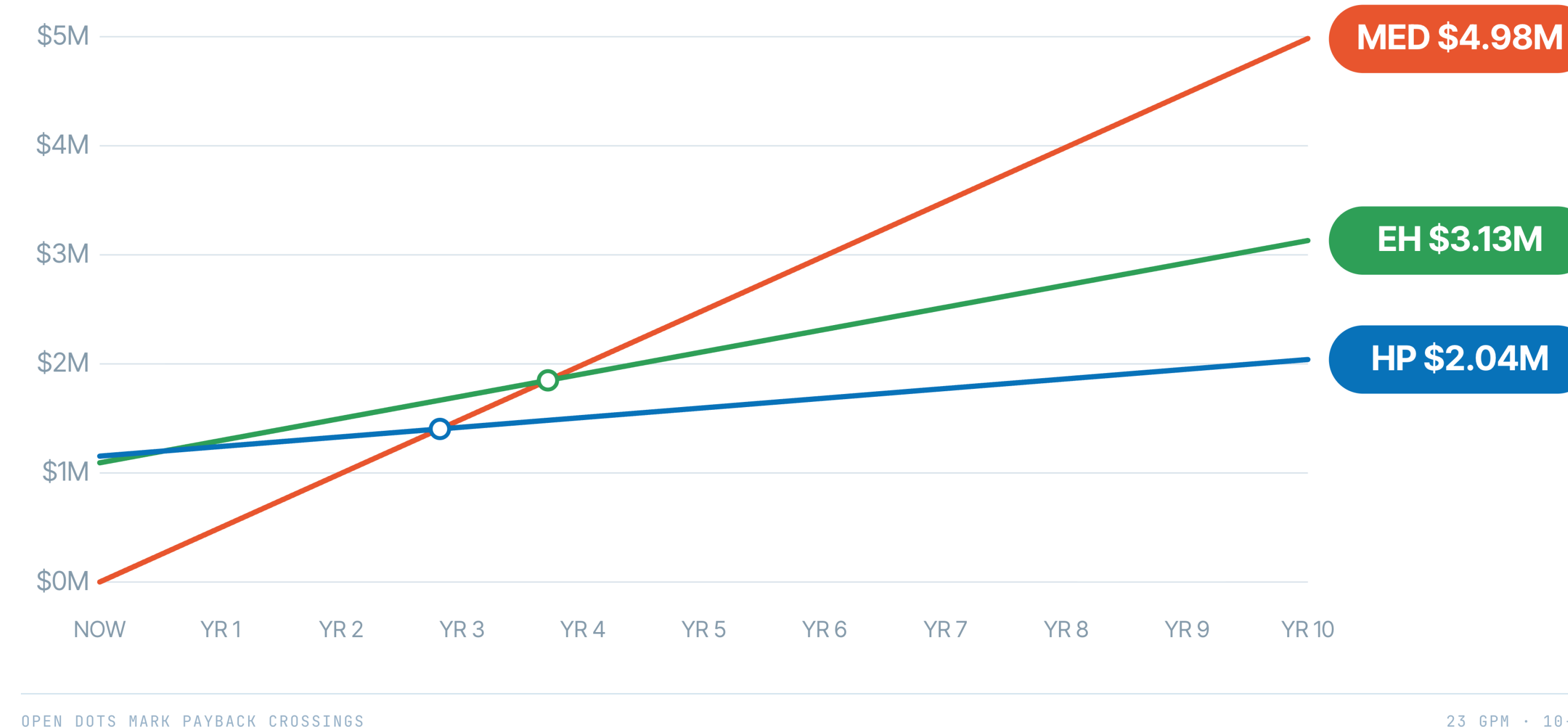
427 gasoline cars <small>off the road for one year</small>	387 US homes <small>powered for one year</small>	220,763 Gallons of Gas <small>never burned</small>
2,336 acres of forest <small>absorbing CO₂ for one year</small>	32,699 tree seedlings <small>grown for ten years</small>	3,164 LA ↔ NYC trips <small>in economy flights</small>

10 – Year Financial Outlook: Payback in 2.8 Years

Multi-Effect Distillation
\$4.98 M
100% Natural Gas

Membrane + Heat Pump
\$2.04 M
2.8 Year Payback

Membrane + Electric Heater
\$3.13 M
3.7 Year Payback



Why Membrane?

Proven Effectiveness

Successful implementation in Pfizer Puurs Belgium Facility.

- No contamination in circulation loop
- Lower Energy Use
- Lower Carbon Emissions

Safety

Accepted in US, EU, JP, and Chinese Pharmacopoeia.

Production Volume

Produce at 23 GPM, a 766% upgrade in production capacity.

Special Thanks: Darren Golomb, Pedro Blanco, Chris McBride, Tony Krautbauer, Randy Rhoades, Steve Klutchka, Dr. Patty Buchanan, Thea Higgins

