

Executive summary

CoolPower

Redefining Cooling for the Energy-Challenged World



▪ The Air Conditioning-Climate Feedback Loop

Climate change is driving a sharp rise in heatwaves—up by 57% globally since 2000 (WMO, 2023). In response, global air conditioner stock is projected to triple by 2050, adding 10 new ACs every second (IEA, 2018). Yet ACs are a major contributor to global warming:

- **Refrigerant leaks** (e.g., HFCs) are up to **3,800 times more potent** than CO₂ over 20 years (IPCC, AR6).
- **Energy demand for cooling** could **double by 2040**, mostly powered by fossil fuels in many regions (IEA).
- **ACs release heat** locally, raising urban temperatures by up to **2°C** during peak use (MIT, 2018)

CoolPower is pioneering a new era of sustainable air conditioning designed to break this Loop and helps the world's most developing regions. CoolPower delivers **cooling, savings, and energy independence** in one smart solution.

- **Revealing our magic tricks**

CoolPower introduces a revolutionary dual-function air-cooling solution that **not only cools but also generates electricity from absorbed heat**. Using green refrigerants, a hybrid refrigeration cycle(R-cycle), and energy harvesting principles (P-cycle) as shown in figure 1.

CoolPower's unique energy properties making them **ideal for homes, businesses, and institutions in areas with limited or unstable electricity access**.

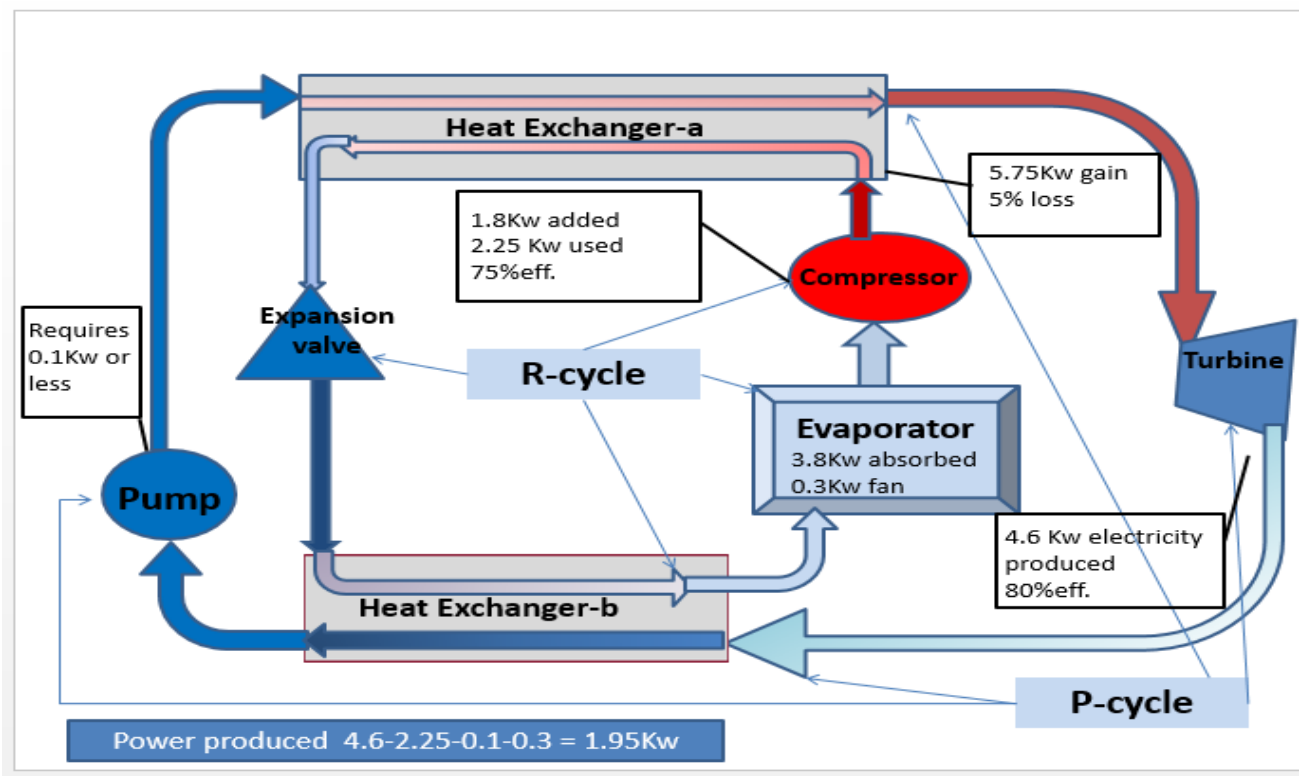


Figure 1 a hybrid refrigeration cycle(R-cycle), and energy harvesting principles (P-cycle)



Figure 2 Experimental set up

▪ What have done so far?

We are initiating the Minimum Viable Product (MVP) phase, CoolPower's technology has undergone extensive research, prototyping, and market validation. Through surveys and interviews with MENA residents and business owners, we confirmed the urgent demand for systems that offer:

- **High energy efficiency** to combat extreme electricity costs.
- **Operational reliability during power outages.**
- **Eco-friendliness without sacrificing affordability.**

Over 70% of respondents indicated a willingness to **pay a premium for air conditioners** that reduce energy bills and remain operational during blackouts. These insights underscore CoolPower's strong product-market fit and competitive edge.

▪ What next?

Our go-to-market strategy starts in Egypt—where the air conditioning market is forecasted to reach **USD 570 million by 2029**, with a 5.7% compound annual growth rate (CAGR) —before expanding across the **Middle East and North Africa** (MENA) region. Our **target customer segments** include:

- Residential users seeking reliable cooling.
- Small businesses and commercial spaces.
- Government and institutional buildings.
- Industrial warehouses requiring mobile, off-grid solutions.

CoolPower's business model combines **direct unit sales, maintenance contracts, spare parts, and extended warranties**, supported by a hybrid distribution strategy (online, retail, and direct partnerships).

Backed by a powerful team with backgrounds in thermodynamics, electrical engineering, mechanical systems, business management, and software solutions, CoolPower is destined to change cooling technology in the world.

In a world where energy equity, resilience, and sustainability are no longer optional, **CoolPower delivers a triple-impact solution**: cooling, power generation, and environmental stewardship—all in one device.

With support from visionary platforms like you at the Lee Kuan Yew Global Business Plan Competition, we are ready to scale, and cool the world sustainably—**one unit, one home, one city at a time**.