



## Air-Conditioning Rejected Heat Smart Utilization

### ELEVATOR PITCH

Typically, households spend approximately 120 riyals each month on water heating. Our innovative system leverages waste heat from air conditioners to efficiently heat water, thereby reducing monthly costs to under 120 riyals. Offering a return on investment within just two years. Our solution not only provides significant cost savings but also plays a crucial role in reducing greenhouse gas emissions.

### OBJECTIVE

To design and develop an innovative water heating system that harnesses waste heat from air conditioning units. The system will feature a highly efficient heat exchanger designed to transfer heat between the refrigerant at high temperatures and water at low temperatures. Additionally, it aims to reduce operational costs compared to conventional water heaters. The system will also include remote control functionality through a mobile application for enhanced usability and monitoring.

### PROBLEM STATEMENT

Global systems, particularly air conditioning (AC) and water heating, consume excessive energy and contribute to high carbon emissions due to reliance on fossil fuels. Our project seeks to address this by integrating AC and water heating into a single, efficient solution that reduces utility costs and promotes sustainability.

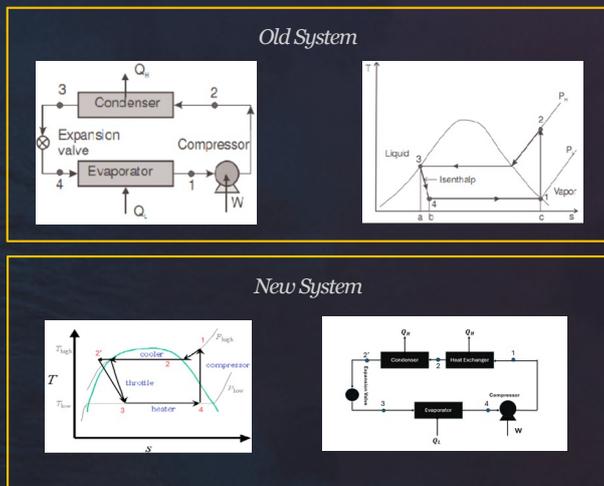
### TARGET SPECIFICATIONS

Water Temperature: 35 to 50°C	Heating Time: 18 minutes	Installation Space: <0.75m <sup>2</sup>
Cost Reduction: < 123.75SR/month	Assembling Time: < 1 hour	Tank Pressure: <150 psi

### CONSTRAINTS

- Generated Power
- Safety
- Weather conditions
- Facility layout

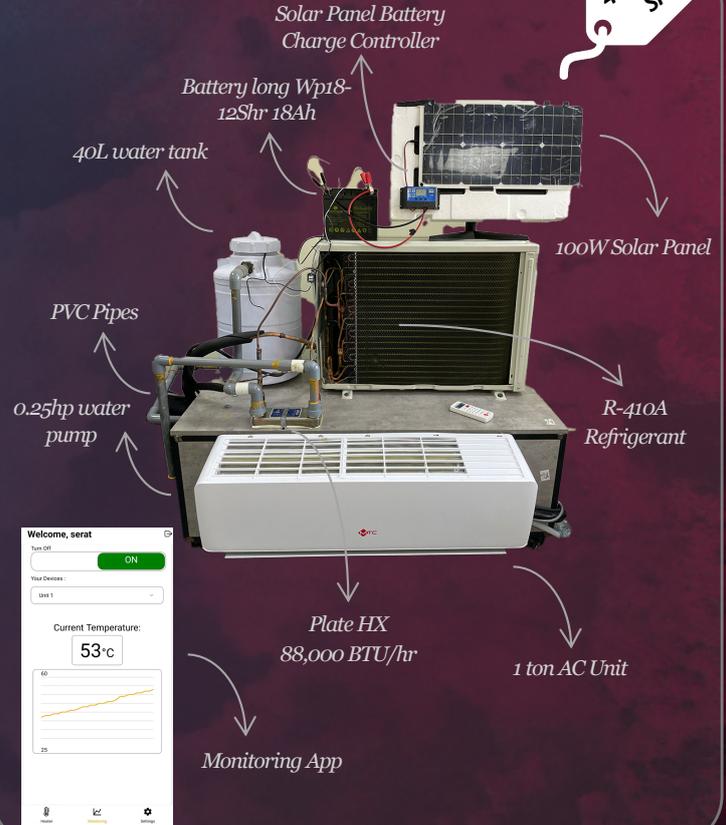
### SYSTEMS COMPARISON



### PROJECT IMPACT

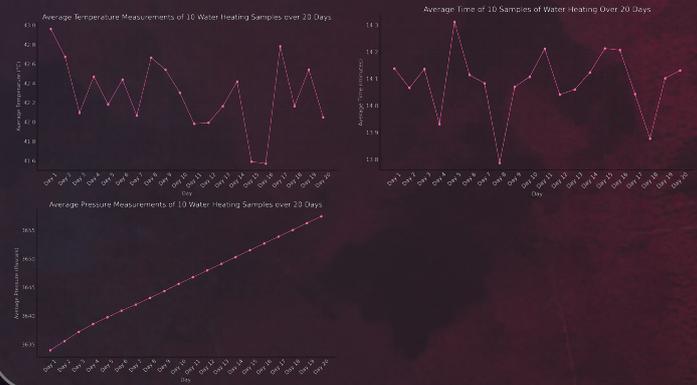
This groundbreaking initiative harmonizes air conditioning and water heating systems, slashing energy consumption, expenses, and carbon footprints, and advancing sustainability and accessibility with cost-effective solutions.

### PROTOTYPE



### TESTING & VALIDATION

- Actual assembling time is 49 minutes.
- Installation space is 0.6m<sup>2</sup>
- Charge controller is designed to regulate the voltage and current from a solar panel to ensure that the battery is not overcharged or damaged.
- Heating Coil: Material: Stainless Steel, Heat transfer: 120W
- Charge controller: Designed to regulate the voltage and current from a solar panel to ensure that the battery is not overcharged or damaged.
- Heating Coil: Made of stainless steel with a heat transfer of 120W.



### CONCLUSION

In conclusion, our integrated AC and water heating system offers an innovative solution to address energy consumption and carbon emissions. By efficiently utilizing waste heat from air conditioners, it promotes sustainability and reduces utility costs. Additionally, with remote control functionality and a focus on data analysis, it contributes to an enhanced usability and monitoring in the recycling and waste management industry.