Indigenous Design and Development of a Solar Powered Adsorption Refrigerator (SPAR)

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BACKGROUND

• The aim of the project is to design and fabricate a solar powered adsorption refrigerator (SPAR) that could work on solar energy. The project will produce the desired refrigerating effect based on the solar adsorption cycle.

• A locally designed and developed system will ensure reduced cost and small maintenance of the system. Moreover, it will also open a new area of interest for the local refrigeration industry and help in reducing the pollution with increase in the use of renewable energy resources.

PROPOSED SPAR DESIGN

METHODOLOGY

PHASE 1: Review of Literature
- Indigenous Design and Development of a Solar Powered Adsorption Refrigerator (SPAR)
- Design for Manufacturing & Minimal Procurement

PHASE 2: Fabrication and Integration of Components
- Fabrication
- Integration of Components
- Instrumentation

PHASE 3: Testing and Performance Analysis
- Testing
- Data Recording
- Report

POTENTIAL STAKEHOLDERS

• Planning commission
• Energy regulators
• Ministries relating to energy such as W&P, MP&NR, etc.
• National University of Sciences & Technology (NUST)
• Ghulam Ishaq Khan Institute of Engineering Sciences and Technology (GIKI)
• International development partners e.g. USAID, ADB, etc.
• Local Refrigeration Industry of Pakistan
• Gammon Pakistan Limited

PROJECT ESSENCE

Model-1

Model-2

RESEARCH IMPACT

• The proposed efforts will improve the quality of life especially health care in remote areas of Pakistan.
• The proposed project will improve the people confidence in using renewable energy products.
• The product developed during the proposed work will contribute to the competitiveness of the Pakistani refrigeration industry.
• The proposed product can be used as a training setup for the faculty, students and practitioners in the area of heat transfer, renewable energy, refrigeration and air-conditioning.
• Indigenous development of the product will help in upgrading of the course materials and curriculum in the area of heat transfer, renewable energy, refrigeration and air-conditioning.
• The project will also promote teaching and research collaboration between various Pakistani universities and institutes.
• Indigenous development of the product at GIK Institute may provide an infrastructure for liaison with industry in future.