



Industrial Consultancy & Sponsored Research (IC&SR)

SYSTEM AND METHOD FOR COMPRESSED AIR RECUPERATED ENERGY STORAGE IITM Technology Available for Licensing

Problem Statement

- ✓ Current energy storage solutions have **limitations in efficiency and lifespan**, leading to **energy waste and environmental impact**.
- ✓ There is a **need for an energy storage system like CARES** that offers **high efficiency, longer lifespan, and reduced environmental impact** compared to existing solutions.

Technology Category/ Market

Category – Energy Storage System

Applications – Compressed Air Recuperated Energy Storage (CARES)

Industry – Renewable energy, Power generation

Market - The global energy storage systems market size was valued at US\$ 210.92 billion in 2021 and is expected to hit US\$ 435.32 billion by 2030 and poised to grow at a **CAGR of 8.4% from 2022 to 2030**.

Intellectual Property

- IITM IDF Ref. 1759
- IN 476555 (PATENT GRANTED)

Key Features / Value Proposition

Technical Perspective:

CARES employs **high-efficiency compression, controlled expansion, and thermal energy management for efficient energy storage**.

User Perspective:

Users benefit from a **reliable and environmentally friendly energy storage solution** with improved efficiency, **potentially lowering energy costs and reducing environmental impact**.

Technology

The technology behind this invention, **Compressed Air Recuperated Energy Storage (CARES)**, can be summarized in five key points:

High-Efficiency Compressor:

Utilizes a **high-efficiency positive displacement compressor** to compress air isentropically.



Volumetric Control:

Employs a volumetrically controlled expander to maintain constant **isentropic efficiency, irrespective of pressure ratios**.



Cooling System:

Achieves air cooling before compression by utilizing the low-temperature exhaust from the expander.



Thermal Energy Circulation:

Minimizes **thermal cycling losses** by circulating thermal energy from a cold expander outlet to a hot compressor inlet.



Versatile Applications:

Suitable for **diverse applications**, including **renewable energy integration, grid stabilization, and industrial energy storage**, offering improved efficiency and lifespan compared to conventional methods.

Research Lab

Prof. Satyanarayanan Seshadri
Dept. of Applied Mechanics

TRL (Technology Readiness Level)

TRL- 3 Experimental proof of concept

CONTACT US

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Image

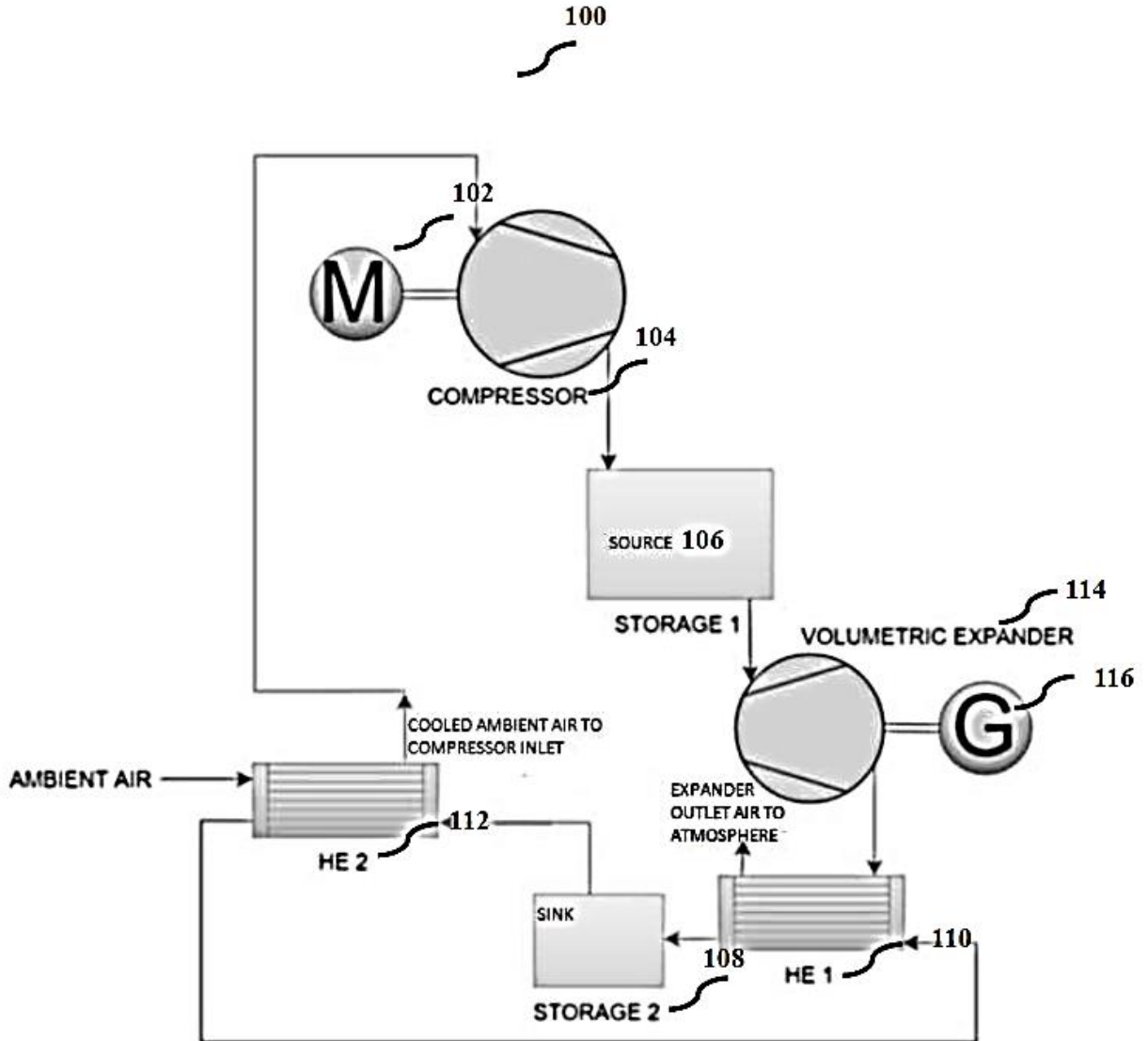


Fig 1 illustrates a schematic of CARES

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