# technology-cavgenx-heat-pump-turbine-process

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**Cavgenx Technology**

**This webpage QR code**

## Structured Data

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The Cavgenx is a heat pump turbine designed primarily to generate hydraulic pressure, which can then be utilized to power various mechanical components such as wheels, gears, machines, and lifting devices like drones. Additionally, it serves a dual function by providing in-situ cooling.

## PDF Version of the webpage (first pages)

# Cavgenx Technology

The Cavgenx is a heat pump turbine with the main objective to provide hydraulic pressure. That pressure can be used to drive things, like wheels, gears, machines, and even lift devices, like drones.

What makes the Cavgenx turbine unique is that its compressor is a combination of a cavitation device and magnetic induction driven on a common shaft from the turbine. A true turboshaft engine. But in this case it is closed-loop, and uses Earth friendly working fluid like closed-loop CO2.

In a true Organic Rankine Cycle, this closed-loop process takes a liquid through phase changes to generate heating, cooling, and hydraulic pressure. Liquid is spun into vapor, pressurized by heating, then evaporated and condensed back to liquid to repeat the process. Cooling is the byproduct of the cycle.

The heat to power the turbine can be supplied from multiple sources, including solar, electric, biomass, conventional legacy fuels, and waste heat.

Using heat to make mechanical power is nothing new. The first steam engine used this principle. But this device takes the concept to a new level by allowing solar thermal or waste heat to derive mechanical power to drive hydraulic devices.

The turbine has one moving part, which allows it to be miniaturized. Small enough to fit under the hood of a Tesla. The turbine can be scaled up to develop enough hydraulic flow to power a CAT earthmover. In these typical applications, a large engine is used to drive a hydraulic pump to develop flow and pressure. In this application, the turboshaft does the work with the heat converted into pressure to make the cycle work.

The heat pump features of this turbine also will make it a prime candidate for home and commercial heating and cooling. With few moving parts, it also has applications for AI GPU farms and data processing centers which use huge amounts of evaporative cooling, typically done with water. Up to .5 liter of water may be used for 50 Chat GPT queries, according to a recent URC university study.

Using solar thermal or waste heat can be used to provide the pumping power needed for desalination Reverse Osmosis (RO) units. Either with an efficient accessory pump as part of the shaft turbine, or through hydraulic pressure to replace an electrically driven RO pump. High pressure pumps consume 60-80 percent of the energy in a desalination plant, which takes around 3 kWh to make a cubic meter of fresh water from saltwater.

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# Technology Readiness Level for Cavgenx

As defined by NASA, the TRL for this project is at or above a 5.

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# Cavgenx Heat Pump Turbine Hydraulic Power Unit

The Cavgenx Heat Pump Turbine can use different (liquid) working fluids, which include CO2 and water. Both of which can be phase changed via cavitation.
The common shaft power can be used to drive a in-line mechanical or magnetically coupled hydraulic pump.
The hydraulic power unit allows this system to retrofit legacy hydraulically powered machines and equipment, including drive units for vehicles.

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# Cavgenx Heat Pump Turbine Process Manufacturing

The Cavgenx Heat Pump Turbine can use different (liquid) working fluids, which include CO2 and water. Both of which can be phase changed via cavitation.
In process manufacturing sonofication and spinning disc reactor can enhance reactivity and shorten processing time for continuous manufacturing.

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# Cavgenx Gas Flow Battery

The Cavgenx heat pump turbine can be used as a gas flow battery using zeolites as the energy storage media.
Some zeolites have the interesting ability to store and release heat when in contact with liquid (in this case water or CO2).
To store heat, simply heat the zeolite.
To release heat, simply add liquid (water or CO2).
The released heat can be used to drive a expander (turbine) which may drive a generator, electrostatic generator, shaft drive, or combination of all of the above.

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# Cavgenx Heat Pump Turbine Propulsion

The Cavgenx Gas Leverage Turbine can be used as a propulsion device using zeolites as the energy storage media. Some zeolites have the interesting ability to store and release heat when in contact with liquid (in this case water or CO2).
To store heat, simply heat the zeolite.
To release heat, simply add liquid (water or CO2).
The released heat can be used to drive a expander (turbine) which may drive a generator, electrostatic generator, shaft drive, or combination of all of the above.
For drones and electric flight applications, the shaft drive may power a rotor (standard fan or vortex rotor), or provide electrostatic energy for plasma and beam applications.
Plasma drive development is underway in many areas including propulsion as well as anti-icing for wings and surfaces.
Electrostatic beam applications may be able to provide wireless transmission of energy for drones which will provide extended times aloft for loitering without need to replenish fuel onboard.
The unique atmosphere conditions where it gets colder as you get higher in altitude, lend itself to a air-to liquid condenser. At 30,000 ft the temperature is generally -48F (-44.5C).

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## Salgenx Saltwater Flow Battery Storage System Development

CavGenX can also be used for flow battery technology.

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