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Infinity Turbine  
LLC

Organic Rankine Cycle Waste Heat Energy  
Grid Power and Battery



## Structured Data

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PDF Version of the webpage (first pages)

<https://infinityturbine.com/index.html>



## ORC Organic Rankine Cycle by Infinity Turbine

**ORC Turbine Generator:** Waste heat to energy turbines available for licensing and building. Use temperatures as low as 31 C (89F) to make power including hydraulic power. Organic Rankine Cycle systems are capable of:

- Generating rotational power for generators or hydraulics
- Store thermal energy
- Desalinate seawater
- Demand side arbitrage for grid savings and income
- This type turbine can be used for ORC or CAES (Compressed Air Energy Storage) up to 300 psi.

## **IT10 Waste Heat to Power System with ROT12 Radial Outflow Turbine DC Generator**

10 kW System with the ROT12 Radial Outflow Turbine with DC Generator, specially crafted for the IT10 system.

This type turbine can be used for ORC or CAES (Compressed Air Energy Storage) up to 300 psi.

- Buy a completed: IT10 kW system for \$50,000 USD | IT10 ROT Turbine for \$10,000 USD | IT10 System Plans and Turbine Generator Plans with unlimited production license: \$10,000 USD.

Revenue potential from IT10 (24 hours x 365 days per year x 10 kWh = 87,600 kWh per year):

- At a rate of \$0.80 per kWh, earn \$70,080 USD annually.

## IT250 ROT ORC Empowering Sustainable Energy Generation with a 250-300 kW Waste Heat to Energy System

Introducing the IT250, a high-performance system engineered to generate 250 kW of net AC power, commonly configured for a Grid-Tie connection. We have successfully developed a single IT250 system, which typically takes approximately 6-12 months to complete. For convenient transportation, the system can be shipped in an open top 20 ft. shipping container.

To ensure top-notch quality, we collaborate with a trusted sub-contractor based in Toronto, Canada, specializing in constructing ASME certified pressure tested heat exchangers. This partnership enables us to deliver the IT250 system to any location worldwide, ensuring reliability and customer satisfaction.

Revenue based on gross sales or savings, not including cost of acquiring waste heat flow or pumps.

Revenue from IT250 (24 hours x 365 days per year x 250 kWh = 2,190,000 kWh per year):

- \$.20 per kWh = \$438,000 USD per year
- \$.40 per kWh = \$876,000 USD per year
- \$.80 per kWh = \$1,752,000 USD per year

Add the [Salgenx salt water battery](https://salgenx.com) storage for added savings and USA based tax credits.

This type turbine can be used for ORC or CAES (Compressed Air Energy Storage) up to 300 psi.

## **Saltwater Battery Conference Zurich Thursday April 25 and Friday April 26**

One-day: The purpose of the one-day conference is to introduce the saltwater battery for grid-scale energy storage, and the challenges and benefits of commercialization. Includes live demonstration.

Two-day: The purpose of the second day is focussed for licensed manufacturers and addressing the challenges in bringing this unique technology to market, including tax credits, carbon credits, and a more in-depth understanding of the manufacturing and assembly process. Special focus on the electrolyzer cell.

## Grid Scale Salt Water Battery Technology

Salgenx (division of Infinity Turbine LLC) has developed a revolutionary grid-scale saltwater flow battery which also acts as a thermal battery. Available in container mounted sizes of 250 kWh, 3000 kWh, 6000 kWh, 12MWh, and 18MWh.

Lower cost and faster product access compared to Tesla Megapack, which may take two years to deliver.

Does not use any Lithium, Vanadium, or a membrane.

Using a CO2 heat pump, you can double down on the payback for this new concept of a battery which stores heat as well as power.

When combined with a ORC (Organic Rankine Cycle) turbine, this concept is further extended to produce power, especially at oil and gas wells which have geothermal heated brine producer water. Imagine storing power at the oil well, to use to power the downhole pumps.

Grid based rate arbitrage for purchasing power during off-peak times, then using power during on-peak daylight times to save money.

**Salgenx: The flow battery.** Store electrical and thermal energy simultaneously with [Salgenx](https://salgenx.com).

## Compressed air energy storage (CAES)

Compressed air energy storage (CAES) is an intriguing method for storing energy, especially in contexts where renewable energy sources, like solar and wind, generate power intermittently. This storage system plays a pivotal role in balancing energy supply and demand, showcasing a notable capacity for large-scale applications.

Note: Our ORC turbines are tested on air, so they are good candidates for compressed air storage.







## Unlock the Power of Waste Heat with the Infinity Turbine IT50 System DC or AC Power Generation at Your Fingertips

The IT50 is designed to produce 50 kW of AC power (typically configured for a Grid-Tie connection). We have produced several IT50 systems in the past few years. They take about 6 months to complete, and can be shipped in a standard 20 ft. shipping container. Built yourself with your machine shop or assemble components via subcontractors.

This type turbine can be used for ORC or CAES (Compressed Air Energy Storage) up to 300 psi.

Design Heat Exchangers ASME Rated Pressure - Evaporator R-245fa: 450 psi at 300 F shell side, and 150 psi 300 F on tube side. Welding procedures included. Condenser R-245fa: 450 psi at 250 F shell side, and 150 psi 250F on tube side.

Turbine may be used most efficiently at 50 kW, but may also be used for a range of turbines from 30 kW to over 100 kW.

New nano additives can increase heat exchanger efficiency.

Revenue based on gross sales or savings, not including cost of acquiring waste heat flow or pumps.

Revenue from IT50 (24 hours x 365 days per year x 50 kWh = 438,000 kWh per year):

- \$.20 per kWh = \$87,600 USD per year
- \$.50 per kWh = \$219,000 USD per year
- \$1.00 per kWh = \$438,000 USD per year

Add the [Salgenx salt water battery](https://salgenx.com) storage for added savings and USA based tax credits.

## Radial Outflow Turbine 3MW AC Generator ORC Power Pack in Shipping Containers

Infinity Turbine now has a megawatt ORC radial outflow concept turbine. Infinity is working on a concept design for a 3 MW ORC turbine generator system power pack.

This type turbine can be used for ORC or CAES (Compressed Air Energy Storage) up to 300 psi.

IT3MW Revenue based on gross sales or savings, not including cost of acquiring waste heat flow or pumps.

Revenue from IT3MW (24 hours x 365 days per year x 3000 kWh = 26,280,000 kWh per year):

at \$.20 per kWh = \$5,256,000 USD per year

at \$.40 per kWh = \$10,512,000 USD per year

at \$.80 per kWh = \$21,024,000 USD per year

IT3MW System Starting at: \$6 Million USD

System Pricing: Starting at \$2,000,000 per MW

Note: This ORC system works on solar thermal heat, or waste heat from industrial operations, or heat from engine generator sets.

Engineering Study: The first step in a large MW-class ORC system is a engineering study. The study fee can be deducted from the system price.

Coming Soon: Hydraulic Power Pack.

# Thermal Energy Storage by Comparing Thermal Energy Density and Capacity of Sand Salt and Paraffin Wax

From the chart and the values, we can observe that combinations involving paraffin wax generally show higher thermal energy density storage capacities, with the Salt and Wax combination exhibiting the highest capacity among the ones calculated. This is primarily due to the inclusion of paraffin wax's significant latent heat contribution, which enhances the overall energy storage potential. Paraffin wax itself also shows a high capacity due to its phase change properties, despite its lower density compared to the other materials.





## Hydraulic Power and Process Cooling From a New Type of Turbine

**CavGenX.** The [heat pump](https://cavgenx.com) turbine.

- Process cooling
- Hydraulic pump

Combining Organic Rankine Cycle with high COP and hydraulic drive options. CO2 compressor pump with one moving part. This remarkable turbine is the next step in gas and liquid turbines... [click here](https://cavgenx.com/index.html).





## **Strategic Guidance and Consulting**

Infinity Turbine LLC is delighted to introduce its comprehensive range of consulting and analyst services. With our extensive experience since 1985 in the renewable energy industry as research/development, we have successfully developed sales and marketing strategies, as well as numerous inventions and innovations.

We offer flexible consulting options, including communication via telephone, email, or other agreed-upon written media, typically email.



## Understanding Organic Rankine Cycle (ORC) Turbine Expander Technologies

Comparing various Organic Rankine Cycle (ORC) turbine expander technologies, we'll cover the basics of ORC systems, delve into the types of turbine expanders used, and compare their performances, efficiencies, applications, and suitability for different energy sources. We will also incorporate charts to visualize key differences and performance metrics.

The Organic Rankine Cycle (ORC) is a thermodynamic process that converts thermal energy into mechanical power, which can then be transformed into electricity. Unlike traditional Rankine cycles that use water as the working fluid, ORC systems use organic fluids, allowing them to operate efficiently at lower temperatures and with smaller temperature differences. This capability makes ORC technology particularly suitable for renewable energy sources such as biomass, geothermal, and waste heat recovery.

Please click on the link to read the articles...

## Comparing Organic Rankine Cycle Working Fluids to Liquid CO<sub>2</sub> in the 40-150 C Range

The Organic Rankine Cycle (ORC) is a highly versatile technology for converting low-grade heat into electricity. A critical factor in the efficiency and effectiveness of ORC systems is the choice of working fluid. Traditional ORC systems utilize a variety of organic fluids, each with its unique properties and performance characteristics. However, recent advancements have introduced liquid carbon dioxide (CO<sub>2</sub>) as a potential working fluid, particularly in the moderate temperature range of 40-150°C. This article explores the comparison of various organic working fluids against liquid CO<sub>2</sub> within this temperature range, highlighting efficiency, environmental impact, and operational advantages and disadvantages.

Read more about ORC working fluids with link below...

