

# Efficient Electricification of the distillers production

Transforming Distillery Energy Use with WSE Heat Pump Technology



## Overview- Case study

Material Usage for 2025 – Sales Materials Only

All information is WSE Turbo without third-party validation. The information is provided as an indicative basis and may be different in final installations depending on application specific parameters.

# About WSE Turbo



Since our formation in 2019 through the strategic partnership of WSE Turbo and Ecergy, WSE Turbo has been synonymous with cutting-edge energy solutions and turbo machinery innovation. Today, we continue that legacy from our headquarters in Denmark, supported by a network of engineers.

WSE Turbo develops and manufactures high-performance compressors, and industrial heat pump systems. All designed to maximize efficiency and drive decarbonization. Our solutions harness advanced thermal process optimization and waste heat recovery, helping industries reduce emissions while improving operational performance.

Backed by decades of engineering expertise, we combine precision turbo machinery with intelligent energy systems, supported by dynamic simulation and process modeling. WSE Turbo is more than a technology provider, we are a strategic partner.

At WSE Turbo, we don't just decarbonize industrial heat. We redefine industrial energy systems for a cleaner, more efficient future.

## The Energy Dilemma in Brewing alcohol production food & beverage Manufacturing

In distilleries around the world, from bioethanol plants to beverage producers, energy use remains a challenge. Distillation and dehydration are core steps in the process. It demands enormous amounts of steam, traditionally supplied by fossil-fueled boilers.

But with heat often lost through venting and cooling, and fuel prices rising alongside political pressure to decarbonize. That's where **WSE Turbo** comes in.

By capturing and upgrading low-grade waste heat, our steam heat pump delivers high-temperature steam. It's a cleaner and more cost-effective way to power distillation, helping producers cut emissions, control costs, and future-proof their operations without compromising performance

# The Heat Pump Breakthrough



## The Challenge:

- High steam demand: Distillations operations require consistent steam at ~100°C
- Energy waste: Valuable thermal energy from vapor streams was lost through venting and condensation.
- Sustainability goals: Needed a cost-effective way to decarbonize without disrupting production.

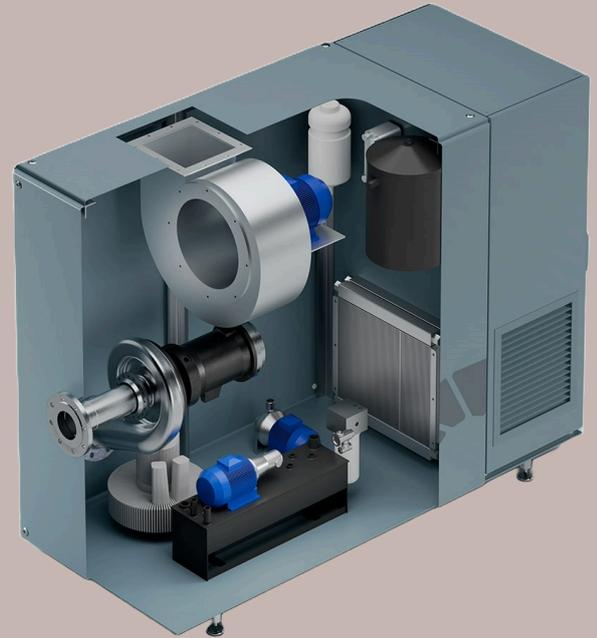
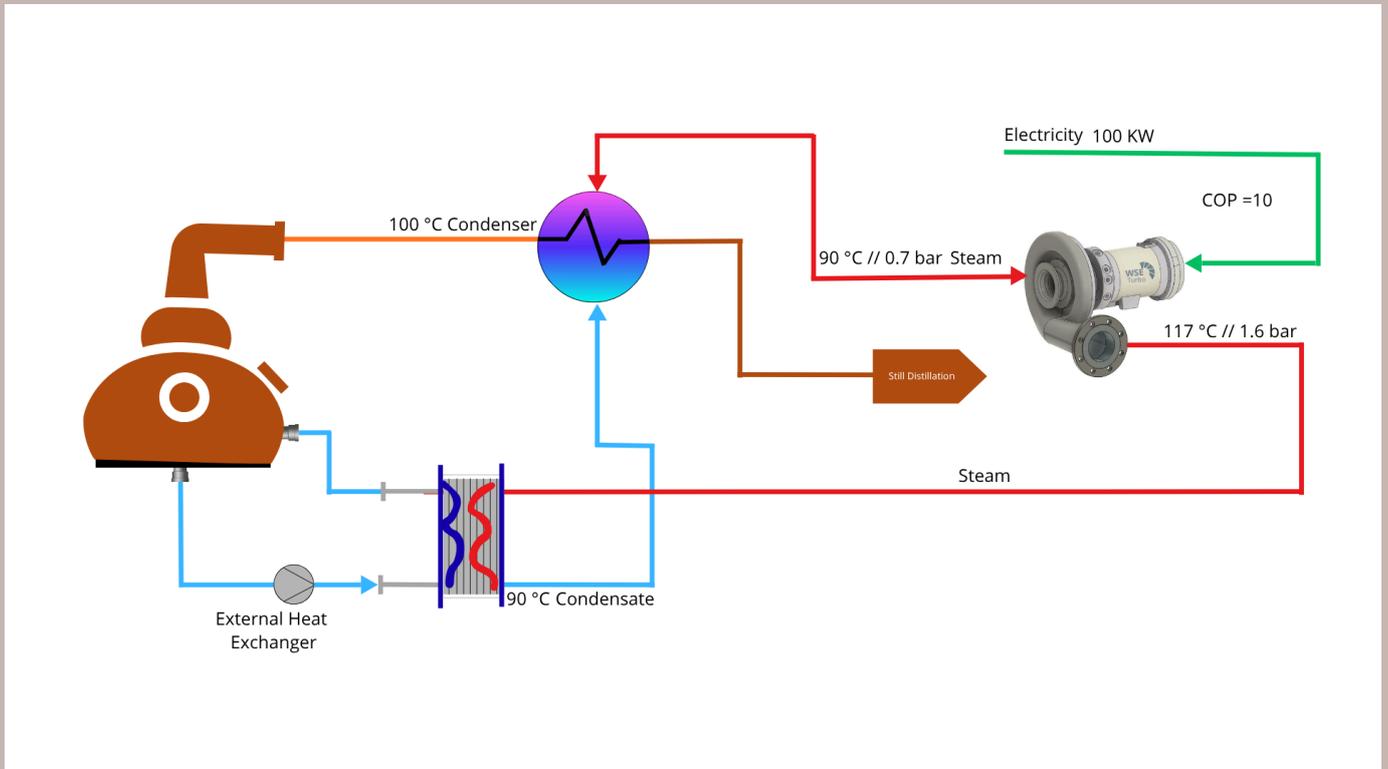


Figure 1 Heat Pump simulation

## Technology: The WSE Turbo System

Component	Specification
Heat Source	Waste vapor from brewing process
Core Technology	Mechanical Vapor Recompression (MVR)
Compressor Type	1 Stage Compressors (Turbo chargers)
Steam Output Temp.	~90 °C (saturated)
Electric Input	Powered by grid or renewable electricity

# The Technial Implentation



Figur 2: Simulation with Heat Pump integration on column C1.

## Process Overview:

Capture: Waste steam is recovered post-boiling.

Compression: WSE Turbo elevates vapor temperature

Steam Delivery steam re-enters the process and no fossil fuels required.

## Performance Metrics

Metric	Value
Fossil fuel displacement	~90-100% of previous oil boiler load
Emissions reduction	50-100% (depending on electricity mix)
COP	10
System reliability	Proven high-reliability design with few moving parts, based on micro gas turbines with millions of operational hours.

# ESTABLISHING SUSTAINABLE PROCESSES

With the elimination of combustion-based heating, the WSE Turbo system plays a central role in advancing industrial decarbonization. It directly supports net-zero goals by significantly lowering the carbon intensity of production. One liter at a time.

From a financial perspective, the system delivers a strong return on investment, with a projected payback period of just 2–5 years. Its compatibility with government decarbonization incentives further enhances their economic appeal.

Designed for flexibility, the modular WSE Turbo system can be easily replicated across multiple facilities, enabling scalable energy transformation with minimal operational disruption.



**Connect with our international sales teams  
—visit our website today**

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