FMGC

Don’t let your production line run out of steam

How AtmosZero can decarbonize the Fast-Moving Consumer Goods (FMCG) sector

Steam powered the first industrial revolution.
Decarbonized steam will power the next one.

Turning up the pressure:

FMCG industry confronts emissions challenges

Steam is the most important heat transfer fluid used today, a bedrock of manufacturing and crucial to the Fast-Moving Consumer Goods (FMCG) sector. Whether you are producing products for the food and beverage market, health and wellness, personal care and hygiene, or beyond, steam is essential to key manufacturing processes, such as heating and cooking, processing and extraction, sterilization, or in-house power generation.

Yet, with steam generation accounting for 8% of global primary energy usage, the equivalent of 2.25GT of greenhouse gas emissions every year, the way we produce steam needs to change.

The EU has introduced extensive industrial emissions regulations,

increasing pressure to dramatically slash emissions from steam.

The EU Industrial Emissions Directive (IED), Energy Efficiency Directive (EED), Fit for 55 Package, and Clean Industrial Deal, in addition to national governments' individual targets, have all introduced regulations that affect industrial steam production. Impending deadlines, often centered around a net zero by 2050 goal but often including targets as early as 2030, mean that businesses need to decide how they will meet these targets promptly.

Businesses in the FMCG sector are under particular pressure, with the World Economic Forum estimating the sector to be responsible for more than one-third of global emissions. FMCG businesses are therefore faced with finding a solution that meets their sustainability targets while being conducive to commercial success.

THE SOLUTION:

AtmosZero Boiler 2.0

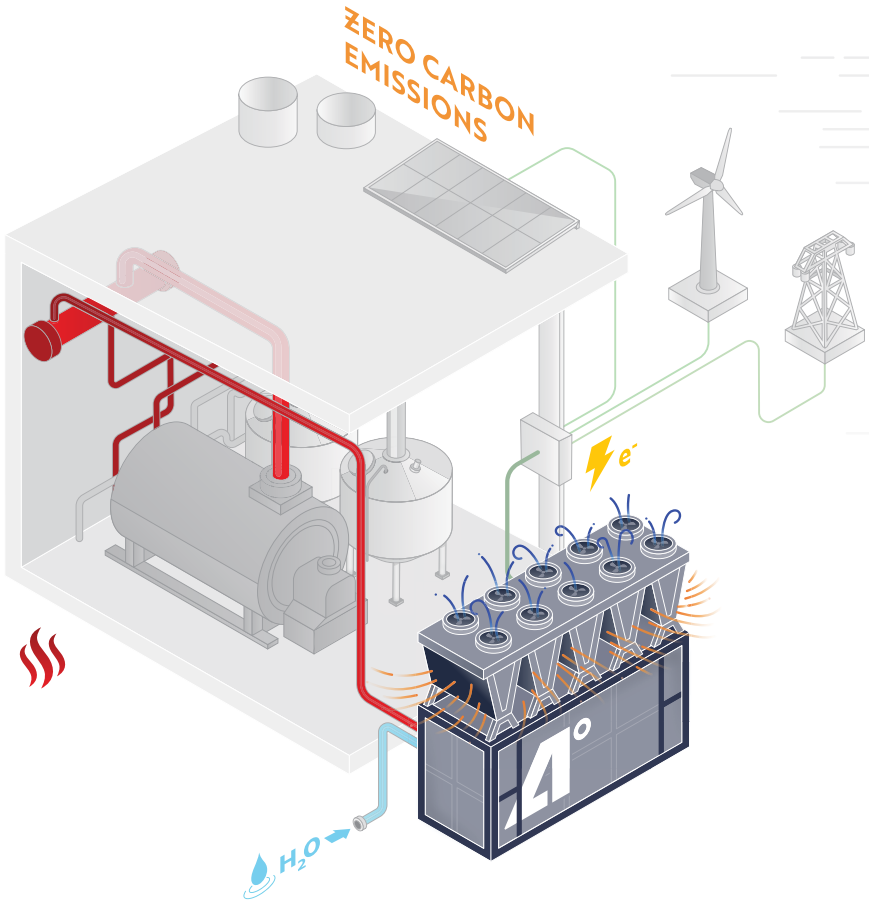
AtmosZero has designed Boiler 2.0, our steam-generating heat pump technology, to meet the new needs of the FMCG sector. A reimagining of fossil-fired industrial boilers, it offers the function of combustion or electric resistive and electrode boilers, but with twice the efficiency and while providing zero scope 1 emissions steam from day one.

Crucially, Boiler 2.0 is not just a solution designed to slash emissions. Its efficiency and plug-in design make it cost-effective, too.

Capable of delivering temperatures of up to 150°C today (expanding up to 200°C by 2028) with a lift from -10°C and delivering 1 ton of steam per hour, Boiler 2.0 is ideal for mid-size plants.

AtmosZero Boiler 2.0:
Producing electrified clean steam

- **15–150 PSIG | 1–10 Bar(g)**
- **120–186°C**
- **24/7**



Charge full steam ahead into the decarbonized future

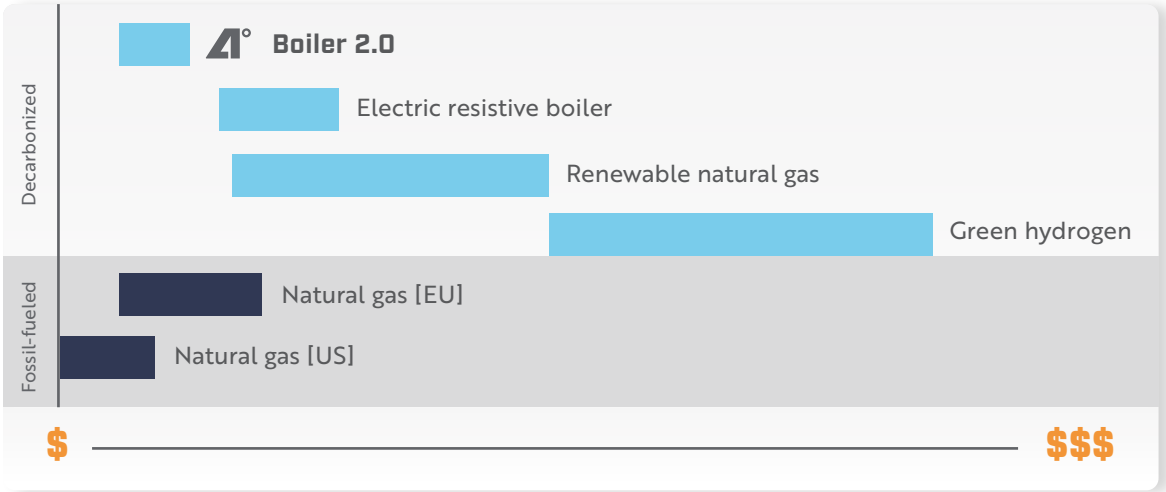
Time is running out to meet emissions targets

2050 is a common deadline for emissions targets, and for some ambitious businesses, this deadline is even closer.

Whether these emission reduction targets are imposed by government regulations or the result of an individual company pledge, missing these targets is not an option. Failing to meet emissions targets means loss of credibility, possible financial penalties, and even lawsuits, as well as the risk of being overtaken by more innovative competition; meeting them strongly demonstrates to customers and investors a high level of reliability, innovation, and responsibility.

For many FMCG businesses, steam is the biggest contributor to scope 1 emissions. Gas-fired boilers, the typical source of steam production, burn natural gas, hydrogen fuel oil, or coal to deliver a 20% efficiency loss, while emitting CO2 and other pollutants. Even resistive and electrode boilers typically suffer a 2% efficiency loss. This wasted energy and carbon emissions in the case of gas-fired boilers make standard boiler room solutions significant contributors to businesses' scope 1 emissions while burning operating costs.

Levelized cost of steam



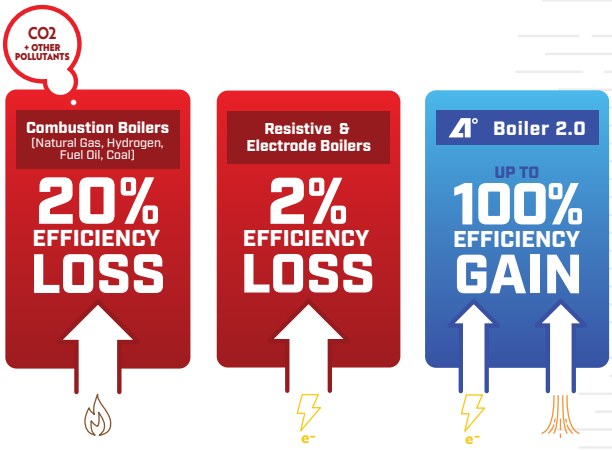
Easy installation, instant results

Redefining boiler room efficiency

In contrast to traditional alternatives, Boiler 2.0 generates steam by sourcing heat from the outside air, thereby offering much greater energy efficiency—up to twice the efficiency of a standard electric boiler—and zero pollutants.

Since AtmosZero's proprietary air-sourced heat pump technology means heat is upgraded and not created, efficiencies can be significantly higher than 100%, slashing facility energy needs.

Boiler 2.0 also emits zero on-site carbon, nitrous oxide, sulfur oxide, or particulate matter. When you install Boiler 2.0, you are producing steam free of scope 1 emissions from day one.



Boiler 2.0 first-gen indicative specifications

Nominal duty
650 kW thermal

Output flow
1 t/hr saturated steam

Output temperature
150°C

Heat source
Ambient air or water

Inlet air temperature
Down to -10°C

Footprint
2.5 x 6 meters

Refrigerant
Low GWP, low flammability, low toxicity

Noise
Sound pressure level 54 dB(A) at 10m

Don’t compromise:

Redefine boiler room efficiency

As important as sustainability is, cost remains a crucial consideration. At AtmosZero, we don’t think businesses should have to choose between sustainability and commercial success. Boiler 2.0 delivers cost benefits for businesses via its efficiency and quick installation.

Double your efficiency gains

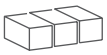
Up to twice as efficient as an electric boiler and more than twice as efficient as burning gas, Boiler 2.0 delivers steam at the lowest long-term cost on the market, helping to reduce energy use and operational expenses.

A product, not a project

Boiler 2.0 is a plug-and-play solution, meaning it is quick and cheap to install with instant results. Sustainability deadlines mean the lengthy installation processes of other custom-engineered heat pump solutions are simply not an option for businesses wanting to meet targets on time. Installing Boiler 2.0 takes just days rather than weeks or months.

No hidden costs of installation

Our drop-in solution enables businesses to update their boilers without disrupting productivity. By installing Boiler 2.0 in days rather than weeks or months, businesses can minimize facility downtime and prevent additional costs from loss of productivity. Our system minimizes upfront costs compared to waste heat-driven heat pumps by avoiding the hidden costs of time-consuming integration work.



Drop it in, drop to zero

Boiler 2.0’s design is flexible and can be adopted to your plant’s specific needs. Unlike an e-boiler, Boiler 2.0 can be placed inside, outside or as a split system—whatever your site requires.

Not just a quick fix

Adaptable and relocatable, our solutions reduce lifecycle waste and enhance long-term value for industries by staying operable for up to 20 years, 24/7. While Boiler 2.0 can be installed quickly, it is a solution built for the future.

Integrate with your process cooling loop; improve efficiency

AtmosZero is the only heat pump provider in the market to offer the option to integrate with your process cooling loop for improved plant efficiency. For facilities that require process cooling, this option can greatly improve plant efficiency.

Low-temperature waste heat streams, such as condenser water, can be easily integrated to boost efficiency. Waste heat integration at 40°C offers a coefficient of performance (COP) of up to 2.4.

USE CASE

New Belgium Brewing Company

In 2025, New Belgium Brewing Company will officially launch its new Boiler 2.0 pilot at its main brewery in Colorado, USA.

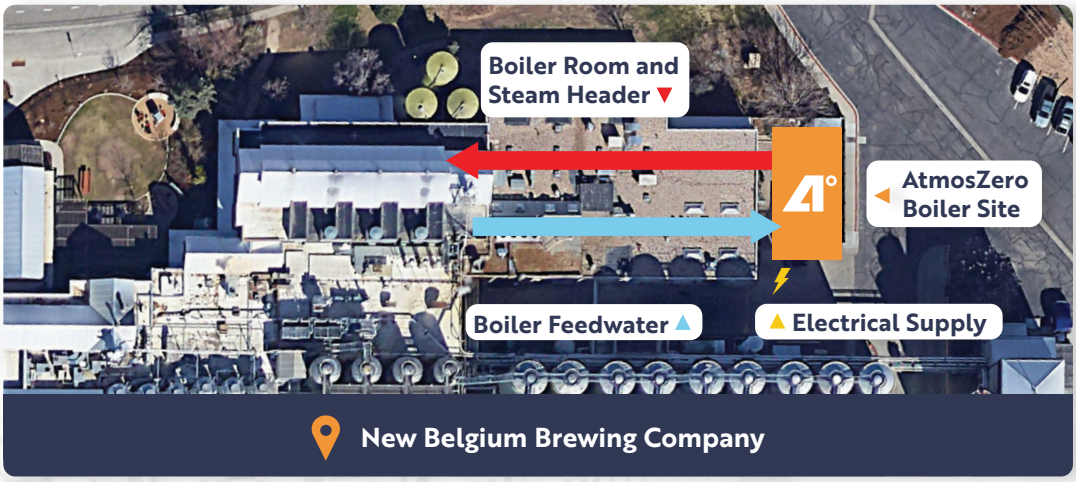
New Belgium is a nationally distributed brewery based in the United States. The company's flagship brewery in Fort Collins, Colorado, uses vast amounts of steam to control the temperatures within its boil kettles, helping to draw out flavors from hops and grains at crucial points of the beer-making process.

A traditional electric boiler for steam generation was not an option for New Belgium, as their reliance on inefficient resistive heating uses too much energy and drives up costs. Similarly, waste-driven heat pump options entailed costly integration work and would require the brewery stopping production for up to weeks. Finally, other heat pump solutions were simply too large for the steam capacity required.

New Belgium chose to pilot Boiler 2.0 because, by using air-sourced heat pump technology, it is up to twice as efficient as other options. The company was also eager to invest in a drop-in, scalable product rather than a project, knowing installation will take just a few days, allowing normal production to continue.

With Boiler 2.0, New Belgium has found a steam-generating solution

that offers ease of installation, efficiency, and sustainability.



Get in touch

Let's talk zero-carbon steam.

AtmosZero will help you achieve your sustainability goals while saving on operating costs and capital expense.

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