DIGITALIZATION FOR THE SUSTAINABLE ART OF COFFEE

Coffee is about much more than the drink itself – it's about the experience, ritual, and emotional connection people have with their coffee. Cimbali Group strives to provide both a high-quality drink, and an incomparable holistic coffee experience. Millions of people around the world look forward to coffee every day – Cimbali Group is committed to delivering them invaluable moments of joy every time they enjoy their cup.

The New Perfetto

Today's coffee lovers are mindful of their impact on ecosystems and sustainability efforts. After all, producing sustainable coffee requires ethical sourcing and processing, sustainable, efficient transportation chains, and minimal energy consumption from crop to cup. That's why Cimbali Group is dedicated to making the coffee experience as sustainable as possible throughout the entire production and value chain.

And it's no small task – coffee production and consumption is one of the world's most intricate value chains. The bean passes through many hands – including the barista's, the roaster's, the maintenance technician's, the grower's, the transportation worker's, and more – all before it reaches the final consumer's cup.

To craft a high-quality, consistent cup of coffee, precision is key. Never is this more important than in the final leg of the value chain – production. For example, to create the perfect cup of coffee, machines must heat and pressurize water to exact decimal points and deliver the exact grinding grade for the beans every time.

Cimbali Group's goal is to perfect this penultimate step in the value chain. Doing so must incorporate sustainability. The company can achieve this with more transparent processes and data and a commitment to digitalizing all areas of value creation to make sure nothing's going to waste. The end goal, as always, is great coffee.

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LEFT: A Giro d'Italia team captain needs to pedal 300W, even in a slipstream driving constellation.
RIGHT: A 6kW oven can heat a 10m^2 sauna.

Energy: Reducing Heat Loss

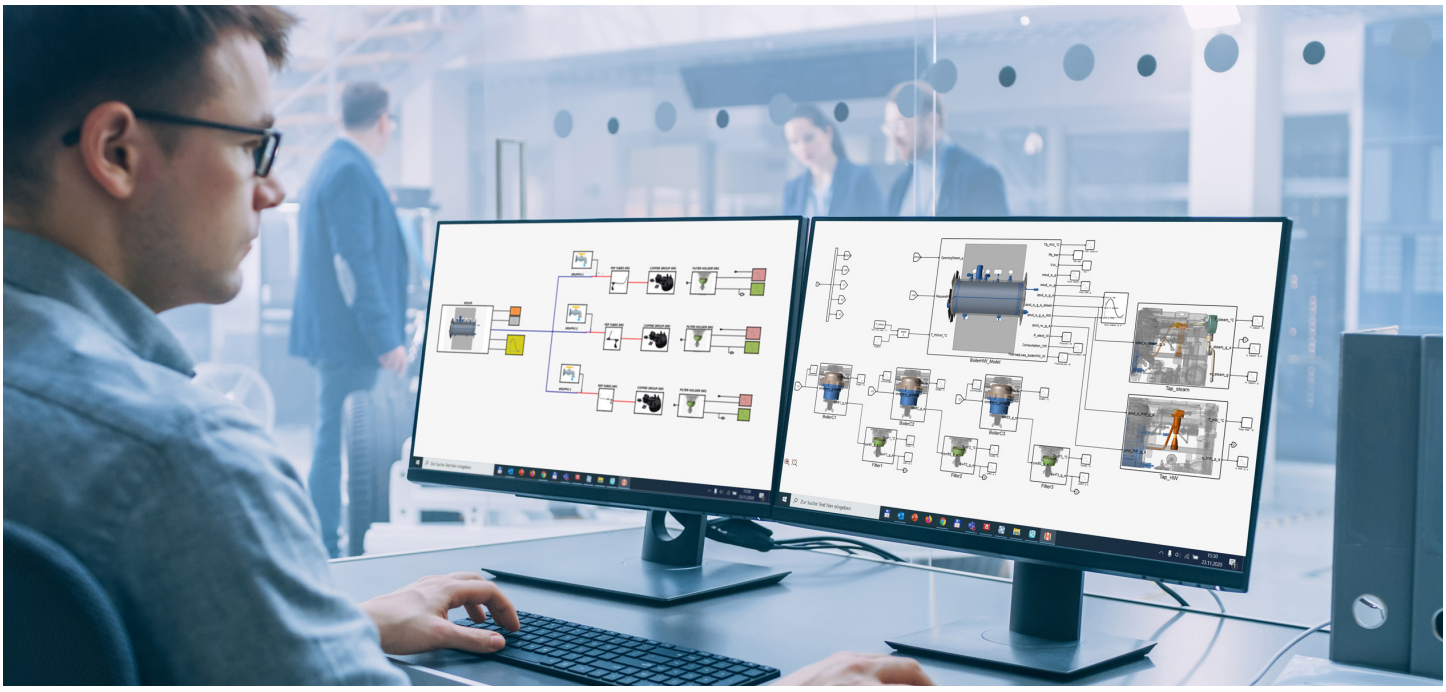
Making coffee is very energy intensive. Even professional coffee machines can lose more than 300W of power through heat loss alone – which is nearly equivalent to the power a Giro d'Italia captain generates. Using heat (while losing heat) to simply warm cups is unsustainable.

Energy: Balance Peak Load Power

Additionally, the peak load power requirements of many espresso machines exceed 6kW, which could power a 10m^2 indoor sauna.

Digitalization: Game Changer

This is where digital twin technology can be a game-changer. With it, Cimbali Group can **reduce energy loss, balance peak loads,** and develop more **efficient operating strategies.**



Digital Twin in Action: Reduce energy loss, balance peak loads, and develop more efficient operating strategies with an Altair Activate system model.

With digital twin technology, they can improve machine efficiency and realize significant energy savings – thereby making each cup of coffee more sustainable. Cimbali Group achieves these savings through early, extensive virtual prototype testing, which empowers them to optimize their products better and faster than ever before.

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Why – From the Desk of Maurizio Tursini

"By maintaining our technology leadership, we can create unique customer experiences. By providing sleek, reliable, energy-efficient products, we are an industry leader.

With Altair's comprehensive toolset, we can create physics- and data-driven digital twins and connect them with each other. This allows us to optimize functionality at the system level for the entire design and product lifecycle.

The primary focus of the physics-based digital twin is the physical modeling, simulation, and optimization of the thermodynamic process, including a real-time human-in-the-loop view. This helps us make better products faster.

Maurizio Tursini,
Chief Marketing & Solution Officer,
Cimbali Group

Coffee is one of the world's most cherished products. Altair helps us give consumers a unique coffee experience that delivers both the best of our modern cutting-edge technology and time-tested traditional experience. People are serious about how their coffee looks, smells, and tastes – and we are too.

In fact, this has already improved our machines' performance and efficiency, and cut energy loss by 25% in our latest generation of products. This is a substantial sustainability win.

In addition, the reduction in physical testing means we require fewer prototypes, can reduce prototyping costs, and better define the design exploration space, which reduces overall material and energy usage. And lastly, the digital twin workflow has significantly shortened the length of the development cycle.

Our digital twin approach, with the help of Altair and their unique One Total Twin® platform, has streamlined our processes and improved our machines. Together, we're developing more efficient, more sustainable ways to enjoy coffee.

Energy efficiency is a key development goal. Compared to the predecessor machines of the E71 with traditional thermal technology, we realized an **improvement of 20%** with an independent boiler structure. For future machine generations with new technical solutions, we strive for more energy improvements with the goal to **reduce the energy loss by further 40%.**

Outlook

Digital twin technology is already helping us deliver on our unique vision for coffee and the machines that make it. By merging sleek design with data-driven innovation and sustainability, we're pioneering the way people enjoy coffee.

And in the future, we envision even more innovation – ultimately, our goal is to create machines that give baristas, café owners and operators real-time data, feedback, recommendations, and more than will further enhance the way they produce coffee. Together with Altair, we're helping people savor their coffee one exquisite cup at a time."

ENERGY LOSS
REDUCED BY
25% ▼

PROTOTYPE TESTING
REDUCED