

## Category

Best EcoHealth Solution

## Organization/Company Name

Provide the official name of your company or organization.

Infinite Cooling Inc.

## Overview (Up to 500 words)

Provide key information about the company, including its origins, mission, and core philosophy.

Describe the solution, impact, and sector focus (e.g., water management, renewable energy, circular economy, waste management, sustainable agriculture, net-zero initiatives, etc.).

Infinite Cooling is a climate technology company redefining how industries approach cooling efficiency and water use. Spun out of the Massachusetts Institute of Technology (MIT), Infinite Cooling was co-founded by Dr. Maher Damak, Dr. Karim Khalil, and Professor Kripa Varanasi, experts in fluid mechanics, interfacial phenomena, and industrial sustainability. The company's origin lies in advanced research in electrohydrodynamics and surface engineering aimed at solving a key paradox in industrial cooling: the traditional tradeoff between conserving water and maintaining optimal cooling performance.

Our core mission is to eliminate that tradeoff entirely. With Infinite Cooling's technology, facilities can both reduce water consumption and enhance thermal performance at the same time, delivering sustainability without compromising reliability. We believe that climate adaptation must integrate seamlessly into industrial operations, not hinder them.

Our flagship products, WaterPanel™ and TowerPulse™, are designed to retrofit existing infrastructure and immediately improve environmental performance:

- WaterPanel™ is a modular, electrostatic-based system installed at the exhaust of industrial cooling towers. It captures and recycles evaporated water that would otherwise be lost to the atmosphere.

This closed-loop water recovery reduces water use by up to 20%, significantly curtails chemical drift, prevents bacteria spread, and eliminates visible plumes that often lead to regulatory or community pushback.

- TowerPulse™ is a digital twin platform powered by physics-informed machine learning and proprietary sensor data. It monitors key operational parameters in real time, such as heat rejection efficiency, fill performance, and drift, and provides actionable insights that reduce energy use by up to 50%, improve system uptime, and enable predictive maintenance.

Our solutions are deployed across a wide range of industries including power generation, chemical manufacturing, data centers, food and beverage, and district energy. These sectors are among the largest consumers of water globally, and they face mounting pressure to decarbonize and operate more sustainably.

By combining hardware innovation with intelligent software, Infinite Cooling is creating the blueprint for climate-resilient industrial infrastructure. We empower our customers to meet ESG goals, reduce operating costs, and secure long-term water availability, all while enhancing cooling performance.

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## **Climate Health & Alignment with UN SDGs / National Policy Guidelines (500 words)**

**Please explain how your innovation mitigates or adapts to climate-related health risks and aligns with the United Nations Sustainable Development Goals (SDGs) and national climate policies.**

Infinite Cooling enables industries to both mitigate their contribution to climate change and adapt to the extreme conditions it is already causing. Our technology reduces the environmental footprint of industrial cooling systems, while also increasing their resilience and operational continuity in the face of rising temperatures and widespread drought. By doing so, we address both sides of the climate equation: emissions reduction and adaptation to unavoidable climate impacts.

Evaporative cooling towers are critical to the thermal regulation of industrial facilities, from power plants to chemical and food processing plants. However, these towers are massive consumers of water and frequent sources of chemical-laden drift and visible vapor plumes. Traditionally, improving cooling efficiency has required more water, and water-saving approaches have compromised performance. Infinite Cooling eliminates this tradeoff entirely. Our WaterPanel™ and TowerPulse™ solutions allow facilities to reduce water use while maintaining or even improving thermal efficiency. This has a direct impact on a number of United Nations Sustainable Development Goals (SDGs):

- SDG 6: Clean Water and Sanitation - We dramatically reduce industrial freshwater withdrawals and wastewater production through water recapture and reuse, helping to preserve vital community water resources, especially in drought-prone regions.
- SDG 13: Climate Action - By reducing both water use and energy waste, we support decarbonization of industrial operations and increase resilience to climate stressors such as heatwaves.
- SDG 9: Industry, Innovation, and Infrastructure - Our modular retrofit approach strengthens existing infrastructure and future-proofs it against more frequent extreme climate events (droughts, freezing, etc).
- SDG 3: Good Health and Well-Being - By controlling drift emissions that may carry chemicals or bacteria such as Legionella, we enhance public and occupational health near industrial sites.

In the U.S., Infinite Cooling aligns with key national climate policy priorities including the Department of Energy's Industrial Efficiency and Water Security initiatives, EPA guidelines on air toxics and water use, and state-level water reuse mandates.

Critically, Infinite Cooling enhances industrial reliability by enabling plants to remain operational during heatwaves and droughts, conditions that are increasing in frequency and intensity due to climate change. By capturing water that would otherwise be lost and enabling real-time system optimization, we allow facilities to maintain production without breaching environmental compliance or exceeding limited water allocations.

Through our dual approach of mitigation and adaptation, Infinite Cooling helps industries become both climate-responsible and climate-resilient.

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## **Measurable Impact (300 words)**

**Explain how you benchmark success and impact using scientific validation and quantifiable metrics where possible (e.g., peer-reviewed publications, Life Cycle Assessment (LCA) data, partnerships, net-zero targets, CO<sub>2</sub> reduction, resource efficiency, waste diversion rates, improved health outcomes, etc).**

At Infinite Cooling, we rigorously quantify the environmental, operational, and economic impact of our technologies using real-world data and third-party standards.

Our WaterPanel™ system has demonstrated up to 20% reduction in water consumption at customer sites. This figure is based on site-wide water balances and direct flowmeter measurements before and

after installation. Importantly, the water recovered is of high purity and can be upcycled for a variety of applications requiring high-purity water, providing a closed-loop solution that minimizes reliance on freshwater withdrawals. These results were published in a peer-reviewed industry publication. Water quality results have been verified by multiple independent water quality laboratories.

In addition to water conservation, WaterPanel™ also delivers a significant reduction in drift emissions. In one documented case study, we achieved a 96.9% average reduction in drift from a cooling tower by following the CTI ATC-140 drift measurement protocol, which is an industry-standard method for evaluating droplet escape. Reducing drift improves air quality and mitigates chemical deposition and health hazards from entrained bacteria like Legionella, especially important near residential areas. Our TowerPulse™ software platform has consistently delivered cooling cost reductions exceeding 30% in pilot and commercial deployments. These savings come from improved energy efficiency, minimized thermal inefficiencies (e.g., from fouled fill or low-performing fans), and reduced maintenance downtime. TowerPulse™ tracks dozens of parameters in real time, such as approach temperature, water losses, drift trends, and fan operation, and feeds them into a physics-informed AI model that provides actionable recommendations. Savings are measured directly from electricity meters.

Our work has been supported by the Department of Energy, the National Science Foundation, and the Environmental Protection Agency, each of which subjected our innovations to detailed technical and economic merit reviews. We've also partnered with utilities, industrial, and district energy providers to document and validate performance over multi-month pilots.

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### **Current Stage & Market Potential (500 words)**

**Describe the current stage and potential for scaling your solution to new markets, industries, or geographies. If any, include details on market demand, regulatory considerations, barriers to scale, adoption strategy and long-term sustainability.**

Infinite Cooling is currently in the early commercialization phase, with a proven track record of pilot deployments, full-scale installations, and paying customers across North America and Europe. Our integrated platform, comprised of WaterPanel™ and TowerPulse™, has been validated across sectors such as power generation, waste-to-energy, food and beverage, and district energy. These technologies are now actively operating in challenging environments, from cold Midwest power plants to arid chiller and food processing plants in the American Southwest.

Together, WaterPanel™ and TowerPulse™ provide a comprehensive solution for reducing evaporative water loss, eliminating drift and plume, and improving energy efficiency in cooling towers.

WaterPanel™ captures and recycles clean water from the exhaust of cooling towers, while TowerPulse™ delivers real-time thermal optimization using physics-informed AI and proprietary sensor data. These systems can be deployed independently or together and integrate seamlessly with both new and existing infrastructure.

Recent deployments include:

- A pilot with EDF (Électricité de France) at a nuclear power generation facility, evaluating water recapture rate and water quality.
- A commercial installation at Covanta / LCSWMA (Lancaster County Solid Waste Management Authority), where WaterPanel™ resolved plume visibility concerns while conserving water.
- Installations at chemical plants in Oklahoma, where WaterPanel™ has demonstrated stable performance under high heat and humidity with minimal pressure drop.
- Project in the food & beverage sector in the arid Southwest U.S., helping facilities operate at full capacity in extreme heat conditions.

- TowerPulse™ deployments at district cooling and chiller plants, where customers are improving operational reliability and system-level cooling efficiency.

The total addressable market for Infinite Cooling's technologies is estimated to exceed \$25 billion globally across 500,000 industrial cooling towers globally in the power generation, industrial, and large commercial cooling sectors. This includes retrofit and new-build opportunities for both hardware and software, with substantial recurring revenue potential from our TowerPulse™ SaaS offering.

Key adoption drivers include:

- Drought adaptation, operational resiliency, and risk of shutdowns
- Regulatory enforcement on drift emissions and water withdrawal
- Pressure to reduce cooling costs and improve energy efficiency
- Growing emphasis on ESG compliance and corporate sustainability

We are scaling through a combination of direct sales and partnerships with water treatment firms and OEMs. Our retrofit-friendly architecture, modular design, and short payback periods (typically 6 months to 2 years) make the platform attractive across geographies and industries.

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### **Staff and Advisors (500 words)**

**Describe your team's expertise (e.g., academic standing, intellectual property contributions, research collaborations, and professional communications). Highlight the team's role in innovation, policy influence, and industry leadership.**

Infinite Cooling's team brings together deep technical expertise, world-class academic credentials, and leadership experience in scaling industrial and climate technologies. Our ability to invent, validate, and deploy transformative solutions is grounded in the multidisciplinary strength of our founders, engineers, and advisors.

Co-Founders:

- Dr. Maher Damak (CEO) holds a PhD in Mechanical Engineering from MIT and previously studied at École Polytechnique in France. His doctoral work focused on interfacial phenomena and electric field-based vapor collection. Maher has received numerous innovation awards including Forbes 30 Under 30 (Energy), the Lemelson-MIT Student Prize, the Collegiate Inventors Competition, and the World Technology Award. He leads Infinite Cooling's strategic direction and investor engagement.
- Dr. Karim Khalil (CTO) earned his PhD in Mechanical Engineering at MIT and a BS from Duke University in Mechanical Engineering and Materials Science. His research, conducted in Prof. Kripa Varanasi's group, explored capillarity and thermal-fluid systems using nano-engineered surfaces. Karim leads technology development and systems engineering across hardware and software platforms.
- Prof. Kripa Varanasi (Chairman) is a Professor of Mechanical Engineering at MIT, specializing in surface engineering, heat transfer, and phase change. He holds over 50 patents and has received awards such as the NSF CAREER Award, DARPA Young Faculty Award, and ASME Heat Transfer Medal. He previously led projects at GE Global Research and has co-founded multiple startups in the industrial space. As chairman, he provides vision and technical oversight for Infinite Cooling's innovation strategy.

Board Members:

- Dr. Carmichael Roberts, Board Member and Lead Investor, is a founding partner of Material Impact and a key leader at Breakthrough Energy Ventures. He brings extensive expertise in scaling climate technologies through academic-to-commercial transitions. He previously built and exited several deep tech ventures and holds a PhD in chemistry from Duke and an MBA from MIT Sloan.

• Dr. Mark Little, Board Member, is the former CTO of General Electric and led GE Global Research. Over his 37-year GE career, he oversaw a global R&D team of 3,600 scientists and led strategic transformations in energy, software, and advanced manufacturing. Mark's guidance is central to Infinite Cooling's scale-up strategy, operational reliability, and customer alignment. Together, this team combines scientific leadership, operational experience, and commercial discipline, positioning Infinite Cooling to lead the decarbonization and water-resilience transition for industrial cooling systems globally.

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### **Financial Structure. (500 words)**

**Describe how your innovation is funded and sustained (e.g., key investors, funding sources, financial stakeholders, royalties, grants, revenue-sharing agreements, strategic partnerships such as academic institutions, equity groups, corporate alliances, and angel investors, etc.).**

Infinite Cooling's financial structure reflects a thoughtful combination of venture capital, non-dilutive grants, and early commercial revenue, all strategically aligned to support long-term growth, technological development, and climate impact. Since our founding, we have raised over \$25 million in funding through multiple rounds, enabling us to transition from an academic prototype to commercially deployed technology with a robust customer base.

Our funding history includes:

- Seed Round (2019): \$4M in equity from Material Impact Fund and angel investors. This early capital supported prototype development and validation of our core electrostatic water recovery technology.
- Non-dilutive Grants (2018-2022): \$4M+ in funding from agencies including the U.S. Department of Energy (DOE), National Science Foundation (NSF), and EPA. These grants enabled technical de-risking, pilot demonstrations, and performance validation at customer sites.
- Series A (2021): \$11M, led by Material Impact Fund and a major university endowment, with participation of existing investors. This round funded commercial productization, the launch of TowerPulse™, and our first full-scale deployments in power and industrial facilities.
- Series A2 (January 2025): \$5M, raised to accelerate US and international expansion, scale manufacturing, and enhance software development for TowerPulse™. This round was led by existing investors with strategic participation from new investors focused on industrial decarbonization such as MassVentures and NukeTech.

Our business model is designed for both impact and financial resilience. TowerPulse™ is offered on a recurring SaaS basis, generating predictable annual revenue from active customer sites. WaterPanel™ is sold as a capital equipment retrofit with optional service and support packages. Together, these models support a growing base of recurring and project-based income.

Our strong investor base provides not only financial backing but also deep expertise in market development, manufacturing scale-up, and policy engagement. With this foundation, Infinite Cooling is well-positioned to deliver climate resilience at scale while maintaining long-term financial sustainability.

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### **Regulatory Compliance & Certifications (Optional Uploads)**

**If appropriate, provide any regulatory approvals, environmental certifications, or compliance documents demonstrating adherence to sustainability standards (e.g., ISO 14001, B Corp Certification, LEED, WELL, SBTi commitments, REACH, USDA, etc.).**

\*Kindly clearly label your files with company name and asset name.

N/A

### **Community & Social Impact (500 words)**

**Explain how your innovation benefits local communities, underserved populations, or public health (e.g., job creation, social equity, environmental justice, improved quality of life, tourism, etc.).**

Infinite Cooling's mission extends beyond industrial performance, we aim to deliver tangible environmental, health, and economic benefits to the communities where our customers operate. Our technology helps bridge the gap between industry and environmental justice by reducing the harmful local impacts of cooling systems, improving access to water, and enhancing community quality of life.

Cooling towers, especially in large industrial and energy facilities, often emit visible plumes and chemical-laden drift that negatively affect nearby neighborhoods. These emissions can carry water treatment chemicals, minerals, and in some cases, bacteria such as Legionella. In many underserved or frontline communities, these towers are located near residential zones, schools, and hospitals, raising health and equity concerns.

Our WaterPanel™ system directly addresses this by virtually eliminating emissions and recapturing water that would otherwise be lost as vapor. This improves local air quality, reduces the risk of respiratory illness or contamination, and enhances compliance with health and zoning regulations. In drought-prone areas such as the American Southwest, our technology supports water resilience and local sustainability goals by reducing industrial withdrawals from municipal supplies. This directly benefits agricultural users and rural communities that share increasingly strained water resources with industrial operators. Our partnerships in these regions are helping to create a blueprint for water-smart industry that coexists with public water needs.

Our TowerPulse™ platform also empowers plant operators to track environmental performance and share real-time impact data with stakeholders. This transparency builds trust with local regulators, community organizations, and employees, fostering a shared commitment to sustainability.

Ultimately, our impact is measured not only in gallons saved or emissions reduced, but also in the creation of cleaner, safer, and more equitable environments for the communities surrounding critical industrial infrastructure.

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### **Document Uploads: Supporting Data & Evidence and References**

**Include letters of support, endorsements, or formal commitments from third parties, such as pilot partners, policymakers, academic institutions, news articles, or industry leaders, validating your approach and impact.**

**Provide quantifiable metrics, case studies, third-party assessments, or regulatory approvals to support your application. Please label all files with your company name and asset name.**

\*Kindly clearly label your files with company name and asset name.

Attached Files:

- [Infinite Cooling News articleRecycling of cooling tower water trialled at French plant World Nuclear News.pdf](#)
- [Infinite Cooling News articleHarnessing Cooling Tower Plumes to Provide Purified Water.pdf](#)
- [Infinite Cooling Press releaseNSF\\_Awardee.pdf](#)
- [Infinite Cooling News articleWastetoenergy facility upgrade improves environmental sustainability Central Penn Business Journal.pdf](#)
- [InfiniteCoolingCaseStudyPAPowerPlant.pdf](#)

- [InfiniteCoolingCaseStudyDriftElimination.pdf](#)

## Final Submission

You have now validated and submitted your application and are officially a candidate to the Prix Galien USA 2025.

We wish you great success.