POLAR DYNAMIX

We make complex things simple

SUSTAINABILITY & IMPACT STATEMENT

Engineering Resilience

Empowering Sustainable Consumption & Production through Simulation

CI-SCP Programme Partner

UN 10-Year Framework of Programmes on Sustainable Consumption and Production

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1. Company Statement

The built environment is at a critical juncture. As global building regulations tighten and the impacts of climate change become undeniable, construction and engineering firms can no longer rely on guesswork or generalized property development rules. To meet the objectives set out by the UN One Planet Network, architects, drafters and engineers must pivot to verifiable, data-driven structural designs from the very first sketch. At Polar Dynamix, we are creating practical and accessible tools to facilitate this transition.

As a specialized software firm, our value lies in empowering our clients to decarbonize their operations by applying rigorous, physics-based data to operating model updates. By democratizing access to professional-grade simulations, we are enabling small- and medium-scale building designers as well as homeowners and students to optimize homes and other structures before a single brick is laid. By making rapid simulations readily available and affordable, we are facilitating better health outcomes and lowering energy consumption across a wide range of construction projects.

About Polar Dynamix

Mission: Our mission is to make high-fidelity computational fluid dynamics (CFD) simulations accessible for optimizing ventilation and energy-efficient building designs with AirSketcher.

Strategic Alliances: In 2012, the United Nations established the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP). One of the programmes that operates under the 10YFP is the Consumer Information for Sustainable Consumption and Production (CI-SCP) programme. With a commitment to providing reliable, verifiable product sustainability information, we are proud that Polar Dynamix is an official CI-SCP partner.

2. Governance & Strategy (TCFD-Aligned)

2.1 Governance Structure

Climate-related risks and opportunities are integrated directly into our core business strategy. Our leadership team oversees the ongoing development of AirSketcher to ensure that the product continues to be aligned with foundational environmental building principles, thereby ensuring that it remains a vital early-stage design and optimization tool for our clients.

2.2 Strategy: The Transition Opportunity

The global regulatory shift toward "performance-based design" is our primary market opportunity. As building codes continue to be strengthened, the need for verifiable energy and ventilation performance data is increasing. Accordingly, early-stage CFD simulations, which highlight design flaws, are transitioning from "optional" to "essential" assets for mitigating the risk of costly, post-design re-engineering for a wide range of users—from professional engineers and architects to independent designers, students and proactive homeowners.

2.3 Risk Management: Mitigating Transitional Risks

As environmental regulations become more stringent, the time delays and costs associated with traditional engineering compliance checks pose a significant transitional risk to building developers and designers. AirSketcher mitigates this risk by providing rapid, foundational physics data early in the design process.

As AirSketcher licences are perpetual, licensed users may run an unlimited number of design iterations, each of which provides performance insights within minutes. This benefit fundamentally disrupts the traditional, costly model of outsourcing single-iteration simulations to engineering consultants. As a result, designers are empowered to optimize and validate airflow and ventilation performance long before the formal compliance stage.

3. Product Handprint: The AirSketcher Impact

While we maintain a lean operational carbon footprint, our ultimate environmental contribution is reducing the substantial carbon footprint of the houses and other buildings that we help to design and optimize via our CFD simulator. Even modest reductions in cooling energy demand can translate into significant lifetime emissions savings.

3.1 Fighting Greenwashing with Physics

As a CI-SCP programme partner, Polar Dynamix is committed to the goal of providing "reliable and verifiable information" to building designers. Through AirSketcher, we facilitate this by moving the construction industry away from vague marketing claims about "natural ventilation" or "eco-friendly cooling". Instead, we provide simulation-backed evidence. Our physics-based data allows consumers to substantiate sustainability claims with engineering-grade insights, thereby ensuring transparency in green building marketin.

3.2 Contribution to the UN Sustainable Development Goals (SDGs)

SDG 3	**Good Health & Well-being** We facilitate improved indoor air quality (IAQ). By enabling designers to map airflow pathways and optimize natural air distribution, we assist them in purging stale air and replacing it with fresh air without over-reliance on mechanical systems. This directly contributes to healthier occupant environments.
SDG 12	**Responsible Consumption & Production** By allowing structural designers to rapidly iterate and optimize natural and mechanical ventilation strategies digitally before construction begins, we enable them to avoid the physical and financial waste that is associated with post-construction remediation.
SDG 13	**Climate Action** By validating the effectiveness of natural ventilation and optimizing mechanical air distribution using AirSketcher, property owners can significantly reduce their reliance on energy-intensive cooling systems, thereby lowering the lifetime carbon emissions of their buildings.

3.3 Case Study: The RMUTI Protocol

Project:

Simulation-Led Design: The Smart Classroom Ventilation Project

Context:

This project was undertaken as a strategic collaboration with Rajamangala University of Technology Isan (RMUTI), Sakon Nakhon Campus, Faculty of Nursing. The project objective was to assess and optimize classroom environments for better indoor air quality and ESG outcomes.

The 'Unbuilt' Advantage:

This project is an illustration of the power of simulation-led design. In this ongoing collaboration, AirSketcher users have already identified several key optimization opportunities that are not reliant on any physical implementations. Via the modelling process, RMUTI stakeholders are avoiding potential capital waste because variables are being tested digitally rather than physically. With no expense on physical resources, digital verification is an easily sustainable first step in any infrastructure project.

Data Highlight:

Up to 50%	Up to 78%	3 Goals
CO_2 Reduction	**Energy Savings**	**SDGs Supported**
indoor CO_2 reduction potential	energy use reduction via hybrid ventilation	SDG 3, SDG 12, SDG 13

Preliminary modelling showed significant improvements in natural air distribution pathways. Implementation of the proposed smart classroom ventilation (SCV) system has the potential to result in up to a 50% reduction in indoor CO_2 levels and a 78% reduction in energy use through optimized hybrid ventilation strategies, which could include exhaust fans, ceiling fans and smart air conditioning controllers.

4. Operational Footprint

We operate with a highly efficient business model, ensuring that our organizational carbon footprint remains minimal.

4.1 Digital Infrastructure & Efficient Computing

Unlike software as a service (SaaS) platforms that rely heavily on continuous, energy-intensive cloud computing farms, AirSketcher is an optimized, offline software solution. Our direct digital infrastructure carbon footprint is limited to lightweight website hosting. By engineering our software to run efficiently on local hardware, we avoid the need for massive, carbon-intensive cloud server operations during the simulation production process.

> **AirSketcher's offline-first architecture means zero ongoing cloud compute emissions per simulation run — a fundamental design choice aligned with our sustainability values.**

4.2 Remote-First Operations

Polar Dynamix uses a remote-first working model. This fundamentally eliminates daily commuting emissions and drastically reduces the energy intensity and resource consumption associated with maintaining a traditional commercial office space.

5. Future Roadmap & Commitments

5.1 Research Goals

We are committed to securing further academic validations and expanding our research collaborations, scaling the methodology proven in the RMUTI protocol to other institutions globally.

5.2 Future Reporting Focus

In future reporting cycles, Polar Dynamix aims to track and report on Scope 4 (Avoided Emissions). While our operational footprint remains lean, our primary environmental contribution is our "handprint"—the quantifiable aggregate energy savings and carbon reductions achieved within the built environment as a direct result of clients using AirSketcher to optimize their structural designs.

6. Appendix: Reporting Indices

6.1 GRI Content Index

GRI Standard	Disclosure Topic	Section Reference
GRI 2	General Disclosures (Activities, workers, governance)	1, 2.1, 4.2
GRI 302	Energy (Reduction of energy requirements of products)	3.2, 3.3, 4.1
GRI 416	Customer Health & Safety (Product impacts on health)	3.2 (SDG 3)

6.2 CI-SCP Principles Check

Our alignment with the United Nations guidelines for providing product sustainability information is presented below.

Principle	How Polar Dynamix Aligns
Reliability	Claims are backed by foundational physics and CFD mathematics.
Relevance	We focus on two high-impact areas: built environment ventilation and indoor air quality.
Clarity	AirSketcher translates complex airflow data into visual, easy-to-understand metrics.
Transparency	AirSketcher generates data-based evidence to substantiate sustainability claims.
Accessibility	CFD simulation tools made accessible through perpetual licensing and rapid processing.

Note: The Task Force on Climate-related Financial Disclosures (TCFD) is a global corporate disclosure framework regarding climate change risk mitigation.