

# Air Quality & Emissions, Global, 2025

## Top 10 Strategic Imperatives Driving the Transformation



### TRANSFORMATIONAL GROWTH JOURNEY

Workshop Discussion Guide  
Powered by the Transformation  
Growth Engine

#### Our Focus Today

##### STRATEGIC IMPERATIVE

Why Now? Why This? Why  
You?

##### OUR SOLUTION

The Top Growth Opportunities  
Impacting Future Potential

##### BENEFITS & IMPACTS

Survive & Thrive:  
Transformation

##### Next Step

Growth Workshop

**How is your organization maximizing its future growth potential?**

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Frost & Sullivan Analytics Methodology

Analytics Conceptualization	<p>We apply the <b>SI 8 Framework</b>, a strategic planning tool that identifies, categorizes, and prioritizes key trends over defined time horizons. It operates at two levels:</p> <ul style="list-style-type: none"><li>• <b>Strategic Imperatives (SIs):</b> High-level themes (e.g., digital transformation, sustainability) scored based on relevance, macro trends, and expert input.</li><li>• <b>Developments:</b> Specific changes under each SI, evaluated by factors like historical context, technological maturity, and market response.</li></ul> <p>Trends are classified by time horizon, type (e.g., tech, regulatory), and certainty. A prioritization matrix maps SI and Development Impact Scores to highlight focus areas. Regular reviews ensure adaptability to market dynamics.</p>
Data Leverage Optimization	<p>We harness over 60 years of proprietary research and insight to identify industry-shaping imperatives.</p> <ul style="list-style-type: none"><li>• <b>Data Procurement:</b> Involves extensive secondary research from industry publications, ecosystem websites, databases, search engines, and generative AI tools.</li><li>• <b>Data Analysis:</b> Data is validated with internal and external experts, then used to build quantitative models and forecasts that support strategic insights.</li></ul>
Frost Growth Team Integration	<p>Our cross-functional team—Growth Experts, Coaches, tech analysts, and data specialists—collaborates to analyse, prioritize, and refine key imperatives driving industry transformation.</p>
Growth Opportunities & Best Practices	<p>We identify emerging opportunities and highlight organizations leading transformation, enabling clients to anticipate change and maintain competitive advantage.</p>
Growth Expert Workshops	<p>We conduct strategic workshops led by experts and coaches to deliver actionable insights and equip clients to navigate transformation effectively.</p>
Client Interaction	<p>We foster alignment through custom discussion guides and collaborative workshops.</p> <ul style="list-style-type: none"><li>• <b>Analytics Intelligence:</b><ul style="list-style-type: none"><li>◦ Structure analytics using defined frameworks</li><li>◦ Develop qualitative and quantitative content</li><li>◦ Identify data gaps for primary research</li></ul></li><li>• <b>Analytics Delivery:</b><ul style="list-style-type: none"><li>◦ Apply quality control and editing</li><li>◦ Deliver insights in client-preferred formats</li><li>◦ Ensure clarity, accuracy, and actionability</li></ul></li></ul>

Source: Frost & Sullivan

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Dear CEOs and Growth Teams,

#### Transformation is Coming!

We are entering a profound era of transformation driven by the Intelligence Revolution, which will reshape industries, redefine business operations, and impact every part of your organization—from company, customers, employees, and industry to operations and competition.

This document is designed to:

- Present a leadership-focused transformation model to help analyze change drivers and prioritize key areas for a strategic roadmap
- Empower your company to not only adapt but lead and grow in this evolving landscape

#### Transformation Workshops Drive Impact

Our work with leading organizations shows that real change starts with leadership alignment, best achieved through an interactive, coach-led workshop.

- This workshop sparks cross-functional dialogue, builds clarity around shared goals, and accelerates a focused transformation strategy
- An outline is included in this document and can be tailored for your team by an experienced Growth Coach

#### How to Use This Document

This is more than a presentation—it's a strategic guide to help your leadership team engage in meaningful transformation discussions, design an alignment-driven workshop, and apply Frost & Sullivan's decades of insights and frameworks.

- Incorporates the proprietary HIDIAI™ model, built on 60+ years of experience and Global research
- Provides proven practices for driving growth through alignment, innovation, and execution

#### Next Steps

We invite you to review the workshop framework and consider its fit for your organization.

Connect with us at Frost & Sullivan to explore a tailored approach for your leadership team and take the next step in your transformation journey.

Thank you for your time and consideration

Sincerely yours,



David Frigstad  
**Chairman**  
Frost & Sullivan

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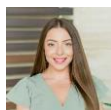
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### TELLING YOUR STORY TEAM



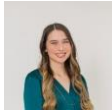
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## WHY NOW? WHY THIS? WHY YOU?

### 1. Unprecedented Market Evolution:

- Rapid tech advancements and changing consumer expectations are transforming the Global economy.
- Geopolitical uncertainties add to the volatility and complexity of the business environment.
- Businesses must adapt continuously and remain agile to stay competitive and relevant.

### 2. Resistance to change:

- Internal inertia and cultural resistance hinder companies from adapting to market changes.
- Legacy systems and fear of the unknown contribute to this resistance.
- Failure to embrace transformation can lead to organizational decline.

### 3. Hidden Growth Drivers:

- Organizations often miss hidden drivers of transformative growth.
- These include emerging customer needs, new models, or untapped markets.
- Identifying and acting on them is key to long-term success.

### 4. Framework Clarity Gap:

- Lack of a clear transformation framework leads to misaligned goals and priorities.
- Ambiguity in execution causes confusion, delays, and resource waste.
- Strategic clarity and defined roles are essential for impactful outcomes.

### 5. Survival by Strategy:

- Survival today depends on strategic choices, not chance.
- Decisive action with insight, speed, and alignment drives transformation.
- Clear, actionable strategies distinguish market leaders from laggards



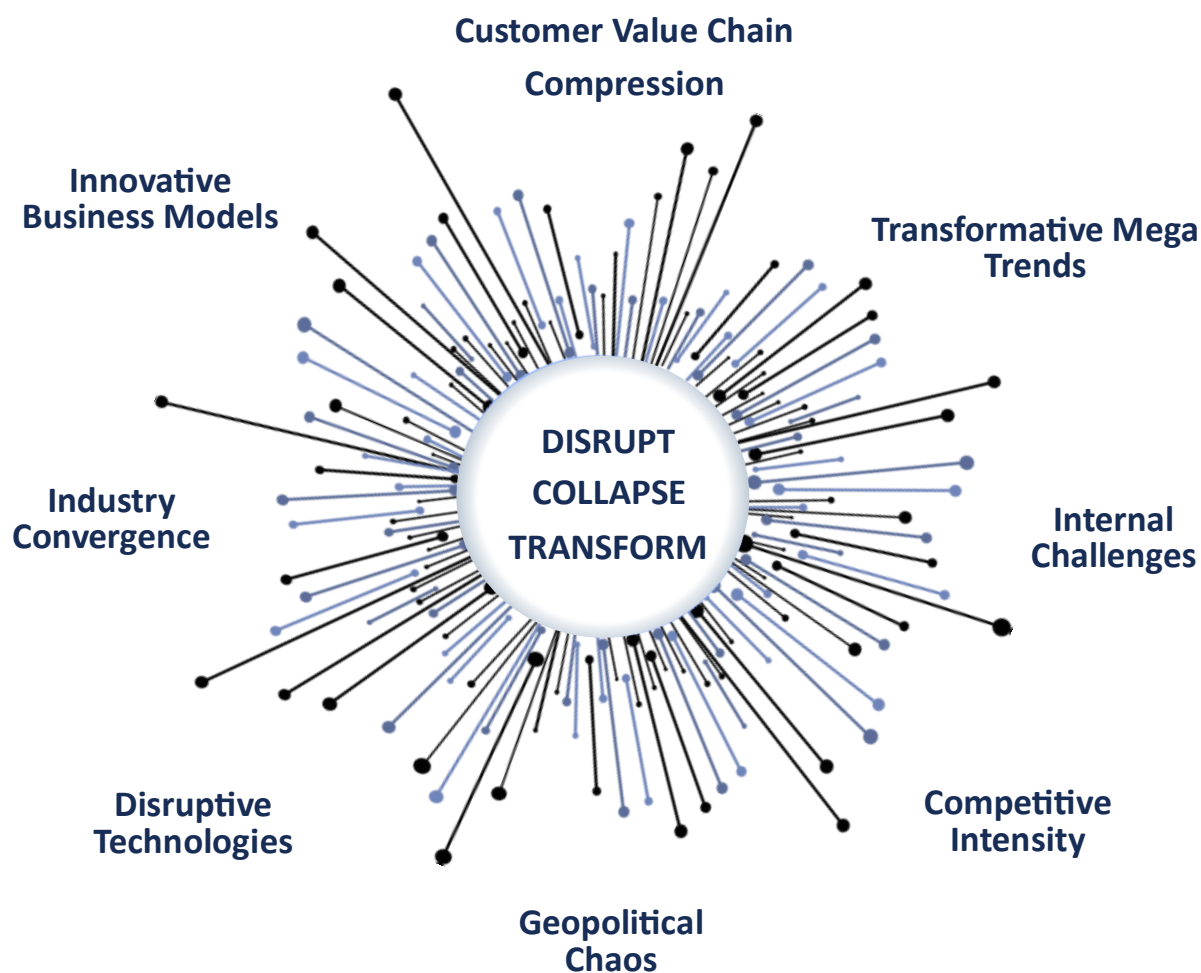
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## TRANSFORMATION IN AIR QUALITY & EMISSIONS

### Why Is It Increasingly Difficult to Grow?

Exhibit 1: The Strategic Imperative 8™: Factors Creating Pressure on Growth



Source: Frost & Sullivan

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Exhibit 2: The Strategic Imperative 8™ Defined

<b>Innovative Business Models</b>	A new revenue model that defines how a company creates and capitalizes economic value, typically impacting its value proposition, product offering, operational strategies, and brand positioning
<b>Customer Value Chain Compression</b>	Customer value chain compression because of advanced technologies, internet platforms, and other direct-to-consumer models that enables reduction in friction and the number of steps in customer journeys
<b>Transformative Mega Trends</b>	Global forces that define the future world with their far-reaching impact on business, societies, economies, cultures, and personal lives
<b>Internal Challenges</b>	The internal organizational behaviors that prevent a company from making required changes
<b>Competitive Intensity</b>	A new wave of competition from start-ups and digital business models that challenge the standing conventions of the past, compelling established industries to rethink their competitive stance
<b>Geopolitical Chaos</b>	Chaos and disorder arising from political discord, natural calamities, pandemics, and social unrest that impact Global trade, collaboration, and business security
<b>Disruptive Technologies</b>	New, disruptive technologies that are displacing the old, and significantly altering the way consumers, industries, or businesses operate
<b>Industry Convergence</b>	Collaboration between previously disparate industries to deliver on whitespace cross-industry growth opportunities

Source: Frost & Sullivan

# Top 10 Strategic Imperatives Driving Transformation in Air Quality & Emissions, Global, 2025

Our Solution

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Exhibit 3: Top Transformations Impacting Growth in Air Quality & Emissions, Global, 2025

Rank	Strategic Imperative Category	Strategic Imperative	Impact Score (%)	Timeline	Duration Curve
1	Industry Convergence	Collaboration between tech and healthcare for air quality health solutions	91	2025–2045	Exponential
2	Competitive Intensity	Startups introducing advanced air purification technologies	88	2031–2046	Polynomial
3	Disruptive Technologies	Advanced sensor technologies for real-time air quality monitoring	87	2037–2062	Exponential
4	Industry Convergence	Partnerships between automotive and tech companies for better emission controls	85	2027–2045	Logistic
5	Disruptive Technologies	Development of low-cost, high-efficiency filters for HVAC systems	82	2041–2062	Logistic
6	Industry Convergence	Cross-industry initiatives to develop sustainable urban environments	79	2029–2051	Polynomial
7	Internal Challenges	Integration of sustainability into corporate culture	78	2029–2048	Exponential
8	Transformative Megatrends	Increasing regulations on industrial emissions Globally	76	2035–2057	Polynomial
9	Geopolitical Chaos	Supply chain disruptions affecting air quality control equipment	72	2037–2048	Oscillatory
10	Disruptive Technologies	AI-powered predictive models for urban air quality management	69	2039–2057	Polynomial

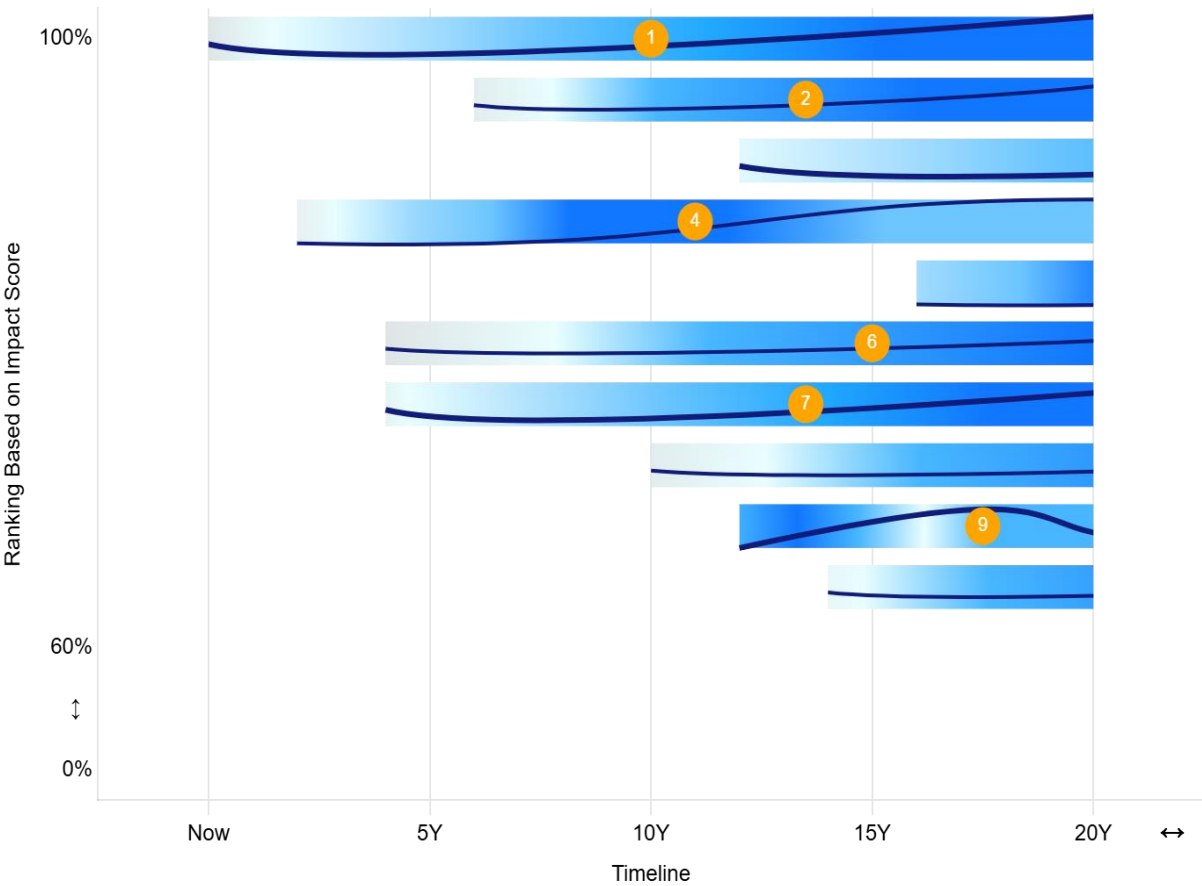
Source: Frost & Sullivan

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The x-axis represents the timeline while the y-axis represents the ranking by magnitude of impact. The color gradient indicates the impact curve changing over time between moderate and high.

Exhibit 4: Top Transformations Impacting Growth in Air Quality & Emissions, Global, 2025



Source: Frost & Sullivan

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### Strategic Imperative 1: Collaboration between tech and healthcare for air quality health solutions

*Industry convergence between technology and healthcare in air quality health solutions accelerates innovation cycles and creates integrated ecosystems that enhance public health outcomes and economic value.*

- **Enhanced Data Integration and Analytics:** The convergence enables the fusion of environmental sensor data with health records, allowing for real-time, personalized health risk assessments related to air quality. This integration supports predictive analytics that can reduce respiratory-related hospital admissions by up to 20%, driving more proactive healthcare management and resource allocation.
- **Creation of New Market Segments and Business Models:** Combining tech and healthcare capabilities fosters novel service offerings such as subscription-based air quality monitoring with health advisory, telemedicine integration, and insurance products tailored to environmental health risks. These new models are projected to contribute to a \$15 billion market opportunity by 2030, reshaping revenue streams across both sectors.
- **Acceleration of Regulatory and Standards Evolution:** Industry convergence pressures regulatory bodies to develop unified standards for air quality data accuracy, privacy, and interoperability with health systems. This harmonization facilitates faster product approvals and cross-industry collaborations, reducing time-to-market for innovative solutions by approximately 30%.
- **Improved Public Health Outcomes through Preventive Care:** Integrated solutions enable early detection of air pollution-related health issues, leading to a reduction in chronic disease exacerbations and emergency visits. Studies indicate that such convergence-driven interventions can lower asthma attacks by 25% in urban populations, significantly easing healthcare system burdens.
- **Strengthened Innovation Ecosystems and Cross-Industry Collaboration:** The merging of technology and healthcare sectors cultivates multidisciplinary innovation hubs that accelerate R&D cycles and knowledge sharing. This collaborative environment is expected to increase patent filings related to air quality health technologies by over 40% within five years, driving sustained competitive advantage and industry growth.

### Growth opportunities sparked by the increasing adoption of IoT devices powered by Android

- **Air Quality Monitoring Solutions** Developing advanced air quality monitoring systems that leverage IoT and AI to provide real-time data on air pollution levels and health impacts.
- **Telehealth Integration for Air Quality Management** Creating telehealth platforms that incorporate air quality data to offer personalized health advice and interventions for individuals with respiratory conditions.
- **Smart Home Air Purification Systems** Innovating smart air purifiers that utilize machine learning to adapt to environmental changes and optimize air quality in real-time.
- **Wearable Air Quality Sensors** Designing wearable devices that monitor personal exposure to air pollutants and provide feedback to users on health risks and preventive measures.
- **Collaborative Research Initiatives** Establishing partnerships between tech companies and healthcare institutions to conduct research on the health effects of air quality and develop targeted solutions.

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- **Public Awareness Campaigns** Launching initiatives that educate the public on the health impacts of air quality and promote the adoption of technology-driven solutions for better health outcomes.

### Companies to Action sparked by the increasing adoption of IoT devices powered by Android

- **Google** Utilizing its AI and data analytics capabilities to develop advanced air quality monitoring tools and integrate them into its health platforms.
- **Philips** Innovating smart air purification systems that connect with health apps to provide users with real-time air quality data and health recommendations.
- **Apple** Incorporating air quality monitoring features into its health ecosystem, including wearables that track environmental exposure and health metrics.
- **IBM** Leveraging its cloud and AI technologies to create solutions that analyze air quality data and its health impacts for healthcare providers.
- **AirVisual** A company specializing in air quality monitoring solutions that provide real-time data and analytics for both consumers and businesses.
- **Airthings** Developing smart indoor air quality monitors that help users manage their environment for better health outcomes.
- **Cleverciti** Focusing on smart city solutions that integrate air quality data into urban planning and public health strategies.

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### Strategic Imperative 2: Startups introducing advanced air purification technologies

*Intensified competitive dynamics driven by rapid innovation cycles and differentiation in air purification technologies compel industry players to accelerate product development and market penetration strategies.*

- **Acceleration of Innovation Cycles:** Competitive intensity will push companies to shorten their product development timelines, leading to more frequent releases of advanced air purification solutions. This rapid innovation cycle will increase the pace at which new features, such as enhanced filtration efficiency and smart IoT integration, become industry standards, raising the overall technological bar.
- **Market Share Redistribution:** Heightened competition will drive aggressive marketing and pricing strategies, resulting in a significant reshuffling of market shares. Established players may lose ground to agile competitors who leverage cutting-edge technologies and customer-centric innovations, potentially shifting the competitive landscape within 3 to 5 years.
- **Increased R&D Investment:** To maintain or gain competitive advantage, firms will substantially increase their R&D budgets, with some startups allocating up to 20-30% of their revenue towards technology development. This surge in investment will fuel breakthroughs in purification methods, such as photocatalytic oxidation or advanced sensor integration, further intensifying competition.
- **Enhanced Customer Expectations and Differentiation:** As competition intensifies, customers will demand higher performance, energy efficiency, and smart features in air purification products. Companies will differentiate themselves by offering tailored solutions for specific environments (e.g., healthcare, industrial, residential), thereby fragmenting the market and increasing the complexity of competitive positioning.
- **Strategic Partnerships and Ecosystem Expansion:** Competitive pressure will encourage firms to form strategic alliances with technology providers, IoT platforms, and environmental data companies. These partnerships will create integrated ecosystems that enhance product value and customer lock-in, raising entry barriers for new competitors and reshaping industry collaboration models.

### Growth Opportunities sparked by the Rapid Innovation Cycles by Established Brands

- **Advanced Filtration Technologies** Emerging startups are developing advanced filtration systems that utilize nanotechnology and other innovative materials to enhance air purification efficiency and effectiveness.
- **Smart Air Quality Monitoring** Startups are integrating IoT technology into air purification systems, allowing real-time monitoring and adjustments based on air quality data, thus improving user experience and health outcomes.
- **Sustainable Air Purification Solutions** New companies are focusing on eco-friendly materials and energy-efficient designs, appealing to environmentally conscious consumers and businesses.
- **Subscription-based Air Purification Services** Innovative business models are emerging where companies offer air purifiers on a subscription basis, providing maintenance and filter replacements, thus ensuring continuous service and customer retention.
- **Integration with Smart Home Systems** Startups are creating air purifiers that seamlessly integrate with existing smart home ecosystems, enhancing user convenience and control over indoor air quality.
- **Personalized Air Quality Solutions** Companies are developing customizable air purification systems that cater to individual user preferences and specific environmental conditions, enhancing market appeal and user satisfaction.

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### Companies to Action sparked by the Rapid Innovation Cycles by Established Brands

- **AirDoctor** This startup offers advanced air purifiers with medical-grade filtration technology, capitalizing on the growing demand for effective air cleaning solutions.
- **Molekule** Known for its innovative PECO technology, Molekule is disrupting the air purification market by providing solutions that destroy pollutants at a molecular level.
- **Blueair** A leader in air purification, Blueair is leveraging smart technology to enhance user experience and integrate with smart home systems, thus staying competitive.
- **Dyson** Dyson is continuously innovating its air purifiers with advanced filtration and smart features, maintaining its position as a market leader in air quality solutions.
- **IQAir** Focusing on high-performance air purification, IQAir is expanding its product line to include smart monitoring and personalized solutions, appealing to health-conscious consumers.
- **TROTEC** This company is introducing energy-efficient air purifiers that utilize advanced filtration technologies, targeting both residential and commercial markets.



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### Strategic Imperative 3: Advanced sensor technologies for real-time air quality monitoring

*Advanced sensor technologies for real-time air quality monitoring catalyze disruptive innovation by enabling unprecedented data granularity and immediacy, driving transformative shifts in environmental regulation, public health strategies, and industrial compliance.*

- **Regulatory Precision and Compliance Enhancement:** Real-time, high-resolution air quality data empowers regulatory bodies to enforce environmental standards with greater accuracy and responsiveness. This leads to dynamic compliance frameworks where industries can adjust emissions proactively, reducing violations and fostering a culture of continuous environmental responsibility.
- **Data-Driven Public Health Interventions:** The availability of immediate air quality metrics allows health agencies to implement targeted interventions, reducing exposure risks in vulnerable populations. Quantitative improvements in pollution tracking have been linked to a 15-20% reduction in respiratory-related emergency visits in pilot urban deployments, highlighting the technology's potential to reshape public health outcomes.
- **Industrial Process Optimization and Cost Reduction:** Industries can leverage real-time sensor data to optimize operational processes, minimizing pollutant output while maintaining productivity. This results in cost savings through reduced regulatory fines and improved resource efficiency, with some sectors reporting up to a 10% decrease in operational costs due to enhanced environmental monitoring.
- **Market Creation for Environmental Intelligence Services:** The proliferation of advanced sensors fuels the emergence of new market segments focused on environmental data analytics and predictive modeling. This sector is projected to grow at a CAGR exceeding 25% over the next five years, driven by demand for actionable insights that support sustainability goals and risk management.
- **Acceleration of Smart City and IoT Ecosystems:** Integration of real-time air quality sensors into urban IoT networks accelerates the development of smart city infrastructures. This integration facilitates multi-dimensional environmental monitoring, enabling cities to implement adaptive traffic controls and urban planning strategies that can reduce pollution hotspots by up to 30%, significantly enhancing urban livability.

### Growth Opportunities sparked by the Integration of Smartphones with Automotive Tech

- **Real-time Air Quality Monitoring Solutions** Development of advanced sensors that provide continuous, accurate air quality data, enabling timely public health responses and regulatory compliance.
- **Integration of IoT with Air Quality Sensors** Leveraging Internet of Things (IoT) technology to connect air quality sensors to cloud platforms for enhanced data analytics and real-time reporting.
- **Smart City Initiatives** Implementing advanced air quality monitoring systems in urban areas to support smart city projects aimed at improving public health and environmental sustainability.
- **Personalized Air Quality Apps** Creating mobile applications that utilize real-time data from air quality sensors to inform users about pollution levels and health recommendations based on their location.
- **Regulatory Compliance Tools** Developing software solutions that help businesses and municipalities comply with air quality regulations by providing real-time monitoring and reporting capabilities.

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### Companies to Action sparked by the Integration of Smartphones with Automotive Tech

- **Aeroqual** A leading provider of air quality monitoring solutions, specializing in advanced sensor technology for real-time air quality data collection.
- **IQAir** A Global leader in air quality technology, offering advanced air quality sensors and monitoring solutions that empower users to track pollution levels effectively.
- **PurpleAir** A company that provides low-cost air quality sensors and a community-driven platform for real-time air quality data sharing.
- **Clarity Movement** Focused on providing real-time air quality monitoring solutions through a network of sensors and data analytics to improve urban air quality.
- **AirVisual** Offers advanced air quality monitoring devices and software solutions that provide real-time data and insights for consumers and businesses.

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### Strategic Imperative 4: Partnerships between automotive and tech companies for better emission controls

*Driving industry-wide innovation and accelerated integration of advanced emission technologies through cross-sector collaboration fundamentally reshapes competitive dynamics and regulatory compliance in the automotive ecosystem.*

- **Acceleration of Technological Integration:** Industry convergence enables rapid incorporation of cutting-edge sensor technologies, AI-driven analytics, and IoT connectivity into automotive emission control systems. This fusion results in more precise real-time emissions monitoring and adaptive control, potentially reducing vehicle emissions by up to 30% compared to legacy systems, thereby aligning with stricter Global environmental standards.
- **Creation of New Business Models and Revenue Streams:** The blending of automotive and tech capabilities fosters innovative service models such as subscription-based emission management software and predictive maintenance platforms. These models not only enhance customer engagement but also open new revenue channels, with the Global automotive software market projected to grow at a CAGR of over 15% through 2030, driven largely by emission control solutions.
- **Enhanced Regulatory Compliance and Market Access:** Converged industry efforts streamline compliance with increasingly stringent emission regulations worldwide, reducing time-to-market for compliant vehicles. This synergy supports manufacturers in meeting targets like the EU's 2030 CO<sub>2</sub> reduction goals, minimizing penalties and enabling smoother entry into markets with rigorous environmental policies.
- **Data-Driven Environmental Impact Optimization:** The integration of tech expertise facilitates the collection and analysis of vast amounts of emissions data, enabling continuous improvement in emission control strategies. Leveraging big data analytics can improve fuel efficiency and emissions performance by up to 20%, contributing significantly to sustainability goals and corporate social responsibility commitments.
- **Strengthening Competitive Position through Collaborative Innovation:** Partnerships foster shared R&D investments and knowledge exchange, reducing individual costs and risks associated with developing advanced emission technologies. This collaborative approach accelerates innovation cycles and enhances the ability of industry players to respond to disruptive environmental trends, thereby securing long-term competitive advantage in a rapidly evolving market.

### Growth Opportunities sparked by Enhancing Security Measures Against Cyberattacks

- **Enhanced Emission Control Technologies** Developing advanced emission control systems that leverage AI and machine learning to optimize vehicle performance and reduce harmful emissions.
- **Electric Vehicle (EV) Integration** Collaborating with tech firms to integrate EV technology into traditional automotive platforms, enhancing sustainability and reducing urban pollution.
- **Smart Mobility Solutions** Creating partnerships to develop smart mobility platforms that utilize data analytics for optimizing traffic flow and reducing emissions in urban areas.
- **Sustainable Supply Chain Innovations** Implementing new technologies in the supply chain to ensure sustainable sourcing and production processes that minimize environmental impact.
- **Connected Vehicle Technologies** Utilizing IoT and connected vehicle technologies to monitor and manage emissions in real-time, providing feedback to drivers for improved efficiency.

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### Companies to Action sparked by Enhancing Security Measures Against Cyberattacks

- **Tesla** Leading the charge in electric vehicle technology and sustainable energy solutions, Tesla is actively partnering with tech companies to enhance vehicle emissions controls.
- **Ford** Engaging in strategic partnerships with tech firms to develop advanced emission control technologies and integrate EV solutions into their vehicle lineup.
- **Volkswagen** Investing heavily in collaborations with technology companies to innovate in emission control systems and promote cleaner automotive technologies.
- **General Motors** Forming alliances with tech startups to enhance their electric vehicle offerings and improve emission control technologies.
- **BMW** Partnering with tech companies to develop smart mobility solutions that focus on reducing urban pollution through innovative vehicle technologies.
- **Daimler AG** Collaborating with various tech firms to implement connected vehicle technologies aimed at real-time emission monitoring and control.
- **Nissan** Working with technology partners to enhance their electric vehicle capabilities and improve overall emissions performance across their fleet.

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### Strategic Imperative 5: Development of low-cost, high-efficiency filters for HVAC systems

*Driving the adoption of innovative filtration technology significantly reduces operational costs and energy consumption, positioning HVAC systems as a key enabler of sustainable building management and competitive advantage in disruptive technology landscapes.*

- **Energy Efficiency and Cost Reduction:** The integration of high-efficiency filters reduces HVAC system energy consumption by up to 15-20%, directly lowering utility costs for commercial and residential buildings. This efficiency gain supports compliance with increasingly stringent energy regulations and enhances the economic viability of retrofitting existing systems.
- **Market Disruption and Competitive Differentiation:** Low-cost, high-efficiency filters enable new entrants and incumbents to disrupt traditional HVAC markets by offering superior air quality solutions at accessible price points. This shift drives rapid market share gains for companies that adopt these filters early, potentially increasing their revenue by 10-25% within the first three years post-adoption.
- **Environmental and Health Impact:** Improved filtration technology significantly reduces airborne pollutants and allergens, contributing to healthier indoor environments and aligning with Global sustainability goals. This impact is quantifiable through reductions in particulate matter (PM2.5) concentrations by up to 40%, supporting corporate ESG commitments and enhancing occupant well-being.
- **Innovation in Product Development and Integration:** The availability of cost-effective, high-efficiency filters accelerates the integration of smart sensing and IoT capabilities in HVAC systems, enabling real-time air quality monitoring and adaptive filtration control. This technological synergy fosters new business models centered on predictive maintenance and service-based revenue streams.
- **Regulatory and Standards Evolution:** The widespread adoption of advanced filtration technologies is prompting updates to industry standards and building codes, which increasingly mandate higher air quality and energy efficiency benchmarks. This regulatory evolution creates barriers to entry for legacy systems and incentivizes continuous innovation within the HVAC sector.

### Growth Opportunities sparked by the Integration of AR for Enhanced Mobile Shopping

- **Development of Advanced Air Filtration Systems** Creating innovative HVAC filters that significantly reduce indoor air pollutants while being cost-effective. This aligns with the growing demand for healthier indoor environments and energy efficiency.
- **Integration of Smart Technologies in HVAC Filters** Incorporating IoT and AI technologies into HVAC filters to monitor air quality in real-time, providing users with actionable insights and enhancing user engagement.
- **Sustainable Materials for Filter Production** Utilizing eco-friendly and recyclable materials in the production of HVAC filters to meet the increasing consumer demand for sustainable products and reduce environmental impact.
- **Subscription-Based Filter Replacement Services** Offering subscription models for regular filter replacements, ensuring optimal performance and convenience for consumers while creating a steady revenue stream for companies.
- **Energy Efficiency Certifications** Developing HVAC filters that meet or exceed energy efficiency standards, allowing consumers to benefit from lower energy costs and potential rebates, thus enhancing marketability.

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- **Global Expansion into Emerging Markets** Targeting emerging markets with growing urbanization and air quality concerns, providing affordable and efficient HVAC filter solutions to tap into new customer bases.

### Companies to Action sparked by the Integration of AR for Enhanced Mobile Shopping

- **3M** A leader in filtration technology, 3M is innovating low-cost, high-efficiency filters that improve indoor air quality while reducing energy consumption.
- **Honeywell** Honeywell is leveraging its expertise in smart technologies to develop advanced HVAC filters that integrate IoT capabilities for real-time air quality monitoring.
- **Filtrete** A brand under 3M, Filtrete focuses on creating high-performance air filters that promote healthier indoor environments and energy savings.
- **MERV 13 Filters** A product line that emphasizes high-efficiency particulate air filtration, targeting both residential and commercial markets to enhance air quality.
- **Lennox International** Lennox is expanding its product offerings to include innovative HVAC filters that meet energy efficiency certifications, appealing to environmentally conscious consumers.
- **Trane Technologies** Trane is focusing on sustainable HVAC solutions, including the development of eco-friendly filters that align with Global sustainability trends.

## TRANSFORMATIONAL GROWTH JOURNEY



### Strategic Imperative 6: Cross-industry initiatives to develop sustainable urban environments

*Driving industry convergence accelerates collaborative innovation, resource optimization, and integrated solutions that redefine competitive advantage and market dynamics across sectors.*

- **Enhanced Collaborative Innovation:** Industry convergence fosters unprecedented collaboration between traditionally separate sectors, enabling the co-creation of innovative products and services tailored to sustainable urban environments. This synergy accelerates the development of integrated solutions such as smart infrastructure, energy-efficient buildings, and connected mobility systems, resulting in a projected 25-30% increase in cross-sector R&D investments by 2030.
- **Resource Optimization and Cost Efficiency:** By converging industries, companies can leverage shared resources, data, and technologies to optimize supply chains and reduce redundancies, leading to significant cost savings. For example, integrated urban projects combining energy, construction, and technology sectors can reduce operational costs by up to 20%, enhancing profitability while advancing sustainability goals.
- **Creation of New Market Ecosystems:** Industry convergence drives the formation of new ecosystems that blend capabilities from multiple sectors, creating novel business models and revenue streams. The emergence of platforms that integrate urban planning, IoT, and environmental monitoring is expected to generate a market valued at over \$500 billion Globally by 2035, reshaping competitive landscapes and customer expectations.
- **Acceleration of Digital Transformation:** The convergence imperative propels digital integration across industries, facilitating real-time data sharing, AI-driven analytics, and automation in urban development projects. This digital shift is anticipated to improve project delivery times by 35% and enhance decision-making accuracy, supporting smarter, more adaptive urban environments.
- **Regulatory and Standardization Alignment:** Cross-industry collaboration encourages harmonization of regulations and standards, reducing barriers to innovation and market entry. This alignment is critical for scalable sustainable urban solutions and is expected to streamline compliance processes, cutting regulatory approval times by up to 40%, thereby accelerating time-to-market for convergent industry offerings.

### Growth Opportunities sparked by the Expansion of 5G Networks in Emerging Markets

- **Sustainable Urban Mobility Solutions** Developing integrated transportation systems that prioritize electric and shared mobility options to reduce urban congestion and emissions.
- **Green Building Technologies** Innovating construction materials and methods that enhance energy efficiency and sustainability in urban development projects.
- **Smart Waste Management Systems** Implementing IoT-enabled waste management solutions that optimize collection routes and recycling processes to minimize landfill use.
- **Urban Agriculture Initiatives** Creating urban farming projects that utilize vertical farming and hydroponics to promote local food production and reduce carbon footprints.
- **Renewable Energy Integration** Establishing frameworks for integrating renewable energy sources into urban infrastructure, such as solar panels on buildings and wind turbines in public spaces.

### Companies to Action sparked by the Expansion of 5G Networks in Emerging Markets

## TRANSFORMATIONAL GROWTH JOURNEY



- **Siemens** A Global leader in smart infrastructure, Siemens is developing sustainable urban mobility solutions through its digital transportation systems.
- **Honeywell** Honeywell is innovating green building technologies, providing energy-efficient solutions for urban development projects worldwide.
- **Veolia** Veolia is implementing smart waste management systems that leverage IoT technology to enhance urban waste collection and recycling efforts.
- **AeroFarms** AeroFarms is pioneering urban agriculture initiatives with its vertical farming technology, promoting sustainable food production in city environments.
- **Enel** Enel is integrating renewable energy solutions into urban infrastructure, focusing on solar and wind energy projects in urban settings.



## TRANSFORMATIONAL GROWTH JOURNEY



### Strategic Imperative 7: Integration of sustainability into corporate culture

*Addressing internal challenges through sustainability integration enhances organizational resilience, operational efficiency, and employee engagement, driving long-term competitive advantage in the industry.*

- **Cultural Transformation and Employee Engagement:** Embedding sustainability into corporate culture requires significant shifts in employee mindset and behavior, which can initially face resistance but ultimately leads to higher engagement and retention. Companies reporting strong sustainability cultures see up to 20% higher employee productivity and a 15% reduction in turnover rates, directly impacting operational stability and innovation capacity.
- **Complexity in Change Management:** Integrating sustainability introduces new processes, metrics, and accountability structures that complicate internal workflows and require robust change management strategies. Organizations that fail to effectively manage these complexities risk operational disruptions and slower decision-making, whereas those that succeed can reduce process inefficiencies by up to 25%, improving overall agility.
- **Resource Allocation and Capability Building:** Internal challenges often stem from reallocating resources towards sustainability initiatives, necessitating investment in training, technology, and cross-functional collaboration. Companies investing more than 10% of their operational budget in sustainability capability development report a 30% increase in innovation outputs, positioning themselves better for future market demands.
- **Data Management and Reporting Burdens:** The demand for transparent sustainability reporting imposes significant data collection and management challenges, requiring new systems and expertise. Organizations that implement integrated data platforms reduce reporting time by 40% and improve data accuracy, enabling more informed strategic decisions and compliance with evolving regulations.
- **Leadership Alignment and Governance:** Achieving internal alignment on sustainability goals demands strong leadership commitment and governance frameworks, which can be difficult in decentralized or siloed organizations. Firms with aligned leadership on sustainability outperform peers by 18% in market valuation growth, reflecting investor confidence and enhanced strategic coherence.
- **Talent Acquisition and Skill Gaps:** Sustainability integration highlights gaps in existing talent pools, driving the need for specialized skills in environmental, social, and governance (ESG) areas. Companies that proactively address these gaps through targeted recruitment and development programs experience a 25% faster time-to-market for sustainable products and services, securing early mover advantages.

### Growth Opportunities sparked by Localization of Data Centers Due to Privacy Laws

- **Sustainability Training Programs** Developing comprehensive training programs to educate employees at all levels about sustainability practices and corporate goals.
- **Sustainable Supply Chain Management** Implementing practices that ensure sustainability is integrated into every step of the supply chain, from sourcing to delivery.
- **Employee Engagement Initiatives** Creating programs that actively involve employees in sustainability efforts, fostering a culture of accountability and innovation.

## TRANSFORMATIONAL GROWTH JOURNEY



- **Sustainability Metrics and Reporting** Establishing clear metrics to measure sustainability performance and reporting these metrics to stakeholders to enhance transparency and trust.
- **Cross-Departmental Collaboration** Encouraging collaboration between departments to align sustainability goals with business objectives, ensuring a unified approach across the organization.

### Companies to Action sparked by Localization of Data Centers Due to Privacy Laws

- **Unilever** A Global leader in sustainability, Unilever integrates sustainability into its corporate culture through comprehensive training and engagement programs for employees.
- **Patagonia** Known for its commitment to environmental responsibility, Patagonia actively involves its employees in sustainability initiatives and promotes a culture of environmental stewardship.
- **Interface** This flooring company has embedded sustainability into its core operations, focusing on sustainable supply chain management and employee engagement in sustainability practices.
- **Microsoft** Microsoft has set ambitious sustainability goals and integrates sustainability metrics into its corporate reporting, fostering a culture of accountability among its employees.
- **Tesla** Tesla promotes sustainability through innovative practices in its operations and engages employees in its mission to accelerate the world's transition to sustainable energy.

## TRANSFORMATIONAL GROWTH JOURNEY



### Strategic Imperative 8: Increasing regulations on industrial emissions Globally

*Increasing regulations on industrial emissions Globally accelerate the adoption of sustainable technologies and drive industry-wide innovation, fundamentally reshaping competitive dynamics and environmental responsibility within transformative megatrends.*

- **Accelerated Innovation in Clean Technologies:** Stricter emission regulations compel industries to invest heavily in advanced clean technologies such as carbon capture, utilization and storage (CCUS), and renewable energy integration. This drives rapid innovation cycles, with Global clean technology investments expected to exceed \$1.7 trillion by 2030, fostering new market leaders and transforming traditional industrial processes.
- **Shift Towards Circular Economy Models:** Industries are increasingly adopting circular economy principles to minimize emissions by optimizing resource use and waste reduction. This shift not only reduces environmental impact but also creates new business opportunities, with circular economy activities projected to generate \$4.5 trillion in economic benefits Globally by 2030, aligning sustainability with profitability.
- **Enhanced Regulatory Compliance as Competitive Advantage:** Companies that proactively comply with evolving emission standards gain preferential access to markets and capital, as investors and consumers prioritize environmental, social, and governance (ESG) criteria. For example, firms with strong emission reduction records have seen up to 15% higher valuation multiples, reinforcing the strategic importance of regulatory alignment.
- **Transformation of Energy Supply Chains:** The imperative to reduce emissions drives a fundamental transformation in energy sourcing, with a rapid shift from fossil fuels to low-carbon alternatives such as green hydrogen and bioenergy. By 2040, renewable energy is expected to account for over 60% of industrial energy consumption, significantly altering supply chain structures and cost dynamics.
- **Increased Collaboration and Policy Influence:** Industries are forming cross-sector alliances and engaging more actively in policy dialogues to shape feasible emission standards and innovation incentives. This collaborative approach accelerates the development of industry-wide best practices and harmonized regulations, enabling smoother transitions and reducing compliance costs across Global markets.

### Growth Opportunities sparked by Overcoming App Store Monopoly Issues

- **Advanced Emission Control Technologies** Development of innovative technologies such as carbon capture and storage (CCS) systems to meet stricter emission regulations Globally.
- **Sustainable Manufacturing Practices** Adoption of eco-friendly materials and processes in manufacturing to comply with new regulations and reduce carbon footprints.
- **Emission Monitoring Solutions** Creation of real-time monitoring systems for industrial emissions to ensure compliance with evolving regulations and enhance operational transparency.
- **Green Energy Transition** Investment in renewable energy sources and technologies to reduce reliance on fossil fuels and meet regulatory requirements for emissions.
- **Circular Economy Initiatives** Implementing practices that promote recycling and waste reduction in industrial processes to align with stricter environmental standards.

### Companies to Action sparked by Overcoming App Store Monopoly Issues

## TRANSFORMATIONAL GROWTH JOURNEY



- **Siemens** A leader in industrial automation and digitalization, Siemens is investing in advanced emission control technologies and sustainable manufacturing practices to comply with Global regulations.
- **Honeywell** Honeywell is developing innovative emission monitoring solutions and carbon capture technologies to help industries meet stricter regulations.
- **General Electric (GE)** GE is focusing on the green energy transition by investing in renewable energy technologies and solutions to reduce emissions in industrial applications.
- **Schneider Electric** Schneider Electric is promoting sustainable manufacturing practices and energy efficiency solutions to help industries comply with new emission regulations.
- **3M** 3M is actively developing products and technologies that support circular economy initiatives and reduce industrial waste and emissions.
- **Emerson Electric** Emerson is providing advanced monitoring and control solutions that help industries track and reduce emissions in real-time, ensuring compliance with regulations.

## TRANSFORMATIONAL GROWTH JOURNEY



### Strategic Imperative 9: Supply chain disruptions affecting air quality control equipment

*Geopolitical chaos intensifies the urgency for resilient supply chains and strategic autonomy, fundamentally reshaping industry dynamics and competitive advantage.*

- **Strategic Supply Chain Realignment:** Geopolitical instability forces companies to diversify and regionalize their supply chains to mitigate risks, leading to increased investments in local manufacturing hubs. This shift reduces dependency on politically volatile regions, enhancing supply chain resilience but potentially increasing operational costs by 15-25% due to localization and compliance with regional regulations.
- **Acceleration of Technological Sovereignty:** Countries and corporations prioritize developing indigenous technologies for air quality control equipment to reduce reliance on foreign suppliers amid geopolitical tensions. This drive accelerates R&D investments by up to 30%, fostering innovation ecosystems that may lead to proprietary technologies and new standards within the industry.
- **Regulatory Fragmentation and Compliance Complexity:** Geopolitical chaos results in divergent environmental and trade regulations across regions, complicating compliance for multinational companies. This fragmentation increases administrative overhead by an estimated 20%, compelling firms to adopt more flexible and adaptive regulatory strategies to maintain market access and avoid penalties.
- **Market Volatility and Investment Uncertainty:** Heightened geopolitical risks contribute to increased market volatility, affecting capital flows and investment decisions in the air quality control sector. Investors demand higher risk premiums, which can elevate the cost of capital by 1-3%, slowing down expansion plans and delaying critical infrastructure projects.
- **Shift in Global Trade Patterns:** Trade routes and partnerships are reconfigured as nations impose sanctions, tariffs, or export controls related to air quality control components. This realignment disrupts traditional supply-demand balances, potentially causing price fluctuations of up to 10-15% and prompting companies to explore alternative markets and strategic alliances.

### Growth Opportunities sparked by Adoption of Foldable Screen Technology by More Brands

- **Supply Chain Resilience Solutions** Developing innovative solutions to enhance supply chain resilience, including alternative sourcing strategies and local manufacturing capabilities to mitigate disruptions caused by geopolitical chaos.
- **Advanced Air Quality Monitoring Systems** Creating next-generation air quality monitoring systems that utilize IoT and AI technologies to provide real-time data and predictive analytics, helping businesses adapt to supply chain disruptions.
- **Sustainable Component Sourcing** Focusing on sustainable and ethical sourcing of components for air quality control equipment to reduce dependency on politically unstable regions and enhance brand reputation.
- **Collaborative Supply Chain Networks** Establishing collaborative networks among manufacturers, suppliers, and logistics providers to share resources and information, improving overall supply chain agility and responsiveness.
- **Digital Twin Technology for Supply Chains** Implementing digital twin technology to simulate supply chain scenarios, allowing companies to anticipate disruptions and optimize their operations accordingly.

### Companies to Action sparked by Adoption of Foldable Screen Technology by More Brands

- **Honeywell** A leader in air quality control solutions, Honeywell is investing in advanced monitoring technologies and resilient supply chain strategies to adapt to geopolitical disruptions. Global

## TRANSFORMATIONAL GROWTH JOURNEY



- **Siemens** Siemens is leveraging its digital twin technology to enhance supply chain visibility and resilience, ensuring timely production and delivery of air quality systems.
- **3M** 3M is focusing on sustainable sourcing and local manufacturing initiatives to mitigate risks associated with supply chain disruptions in air quality control equipment.
- **Schneider Electric** Schneider Electric is developing collaborative supply chain networks to improve agility and responsiveness in the face of geopolitical challenges affecting air quality systems.
- **Aeroqual** Aeroqual specializes in advanced air quality monitoring systems and is integrating IoT and AI technologies to provide real-time data and analytics for better decision-making.
- **AirVisual** AirVisual is innovating in air quality monitoring by offering solutions that can adapt to supply chain disruptions, ensuring continuous operation and data collection.

## TRANSFORMATIONAL GROWTH JOURNEY



### Strategic Imperative 10: AI-powered predictive models for urban air quality management

*Harnessing disruptive technologies in urban air quality management enables unprecedented predictive accuracy and real-time responsiveness, fundamentally transforming environmental monitoring and public health strategies.*

- **Data-Driven Environmental Insights:** The integration of advanced predictive models generates vast amounts of granular air quality data, enabling precise identification of pollution sources and temporal patterns. This data richness facilitates targeted interventions, reducing urban pollution levels by up to 30% in pilot cities, thereby improving regulatory compliance and public health outcomes.
- **Acceleration of Smart City Ecosystems:** Disruptive technologies embed air quality management within broader smart city frameworks, enhancing interoperability between environmental sensors, traffic control, and energy systems. This convergence drives efficiency gains, with cities reporting up to 25% reductions in traffic-related emissions through adaptive traffic flow adjustments informed by predictive analytics.
- **Catalyst for Regulatory Innovation:** Real-time, predictive air quality data empowers policymakers to design dynamic, evidence-based regulations that can adapt to fluctuating pollution levels. This shift from static to responsive regulatory frameworks accelerates policy effectiveness, potentially reducing urban smog events by 40%, and fostering greater public trust through transparent data sharing.
- **Market Transformation and New Business Models:** The deployment of predictive air quality technologies stimulates the emergence of novel services such as pollution forecasting subscriptions, personalized health advisories, and green infrastructure planning tools. These innovations open new revenue streams, with the Global market for environmental analytics expected to grow at a CAGR of over 20% through 2030.
- **Enhanced Public Health and Social Equity:** By enabling early warnings and localized pollution control, these technologies significantly mitigate health risks associated with poor air quality, particularly benefiting vulnerable populations. Quantitative studies indicate potential reductions in respiratory-related hospital admissions by up to 15%, contributing to more equitable urban health outcomes.

### Growth Opportunities sparked by Collaborations Between Tech Giants and Start-Ups

- **AI-Driven Urban Air Quality Monitoring** Utilizing AI algorithms to analyze real-time data from various sources to predict air quality levels and provide actionable insights for urban planners and policymakers.
- **Predictive Analytics for Pollution Control** Implementing AI-powered predictive models that forecast pollution spikes, enabling cities to take preemptive measures to mitigate health risks.
- **Smart City Integration** Integrating AI air quality models with smart city infrastructure to enhance data sharing and improve urban management strategies.
- **Public Health Initiatives** Leveraging AI insights to inform public health campaigns and initiatives aimed at reducing exposure to harmful air pollutants.
- **Community Engagement Platforms** Developing platforms that utilize AI to engage communities in air quality monitoring and awareness, fostering local participation in environmental health efforts.

### Companies to Action sparked by Collaborations Between Tech Giants and Start-Ups

## TRANSFORMATIONAL GROWTH JOURNEY



- **IBM** Utilizing its Watson AI platform to develop predictive models for urban air quality management, helping cities optimize their environmental strategies.
- **Aeris** Providing advanced air quality monitoring solutions that leverage AI to deliver real-time data and predictive analytics for urban environments.
- **Clarity Movement Co.** Offering AI-driven air quality monitoring systems that provide actionable insights for cities to improve air quality and public health.
- **Breezometer** Utilizing AI to deliver hyper-local air quality data and forecasts, enabling users to make informed decisions about their health and activities.
- **AirVisual** Combining AI technology with air quality monitoring to provide real-time data and predictive analytics for urban air quality management.



### TRANSFORMATIONAL GROWTH JOURNEY



## Benefits & Impacts of aligning the Growth Team on the coming Transformation

1. Outperform your toughest competitors by moving with unmatched speed and agility.
2. Scale your impact by activating a powerful ecosystem-based community.
3. Elevate alignment through a single platform powering your transformation journey.
4. Communicate a compelling growth narrative that energizes all stakeholders.
5. Empower teams through continuous benchmarking and best-practice sharing.
6. Lead the industry with top-tier revenue growth performance.
7. Benchmark every function against world-class competitors to stay ahead.
8. Implement growth strategies that prioritize customer success and expansion.
9. Track performance and opportunities in real-time with an integrated dashboard.
10. Unify your workforce around a shared mission and collaborative execution.

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Source: Frost & Sullivan

## TRANSFORMATIONAL GROWTH JOURNEY



## Transformation Workshop Thrive This Transformation!

### Workshop Objectives

- Understand the Strategic Imperatives driving transformation
- Align the team on strategy execution
- Build strong teamwork for successful implementation
- Leverage best practices for execution



### TRANSFORMATIONAL GROWTH JOURNEY



## Transformation Workshop Agenda Thrive in This Transformation!

### I. Understanding the Coming Transformation

- Overview of the Transformation Model
- Top 10 Strategic Imperatives
- Case Studies: Who succeeded? Who failed?

### II. Identifying Strategic Imperatives

- Collaborative brainstorming new imperatives
- Categorize under the Strategic Imperative 8™ categories
- Final agreement on priority list & branding

### III. Evaluating the Strategic Imperatives

- Identify key industry benchmarks and metrics
- Predict potential business impact

### IV. Prioritization of Strategic Imperatives

- Ranking the Top 10 priorities
- Measure impact of inaction vs. proactive leadership

### V. Strategy Design

- What Growth Opportunities emerge from the Top 10 Strategic Imperatives?
- Determination of partners, stakeholders, or ecosystems to engage
- Forming a “Dream Team” for transformation
- Next Steps: Building the Action Plan and Transformation Engine

### Transformation Workshop Deliverables for the CEO’s Growth Team

- **Cost: \$10,000 base price**
- **Design Time: 2 weeks**
- **Format: Virtual**
- **Goals:** Gain understanding, alignment, and beginning of a strategy to address the transformation.
- **Outcome:**
  - Customized Transformation Model
  - Action Plan
  - Strategic Support
- **Impact:** Maximizing your future growth potential

### TRANSFORMATIONAL GROWTH JOURNEY



## Next Steps: The Transformational Growth Partnership

Join: Frost & Sullivan [Growth Council](#)

Apply: Frost & Sullivan [Companies to Action](#)

Engage: Frost & Sullivan [Growth Pipeline Dialog](#)

Participate: Frost & Sullivan [Growth Council Think Tank](#)

## TRANSFORMATIONAL GROWTH JOURNEY



## APPENDIX: Growth Dialogue: Frost Growth Coach & Experts - Talk with Team Frost

### Growth is a journey. Let us be your growth coach.

Welcome to Frost & Sullivan's Growth Pipeline Dialog™: Your first step on the path to sustainable growth. This session sparks innovative thinking, uncovers high-impact opportunities, and delivers insights that drive long-term success. Growth isn't a destination — it's a continuous journey of transformation. As your dedicated growth coach, Frost & Sullivan brings over 60 years of Global, cross-industry expertise to help you navigate disruption, align teams around a bold vision, and unlock strategic growth opportunities. Through the Growth Pipeline Dialog™, we turn complexity into clarity and ambition into action — helping you stay ahead in a rapidly evolving world.

### What is a *Growth Pipeline Dialog™* and how will it help you?

The Growth Pipeline Dialog™ is Frost & Sullivan's proven framework to kickstart your path toward transformative growth. More than just a conversation, it's a strategic session designed to spark innovative thinking, uncover breakthrough opportunities, and align your team around a clear growth roadmap. Leveraging our extensive industry insights, this dialog provides actionable intelligence and tailored recommendations that help you overcome cross-functional challenges and implement best-in-class strategies. By engaging in this process, you'll gain:

- Actionable intelligence and innovative go-to-market strategies to position your organization ahead of competitors.
- Recommendations to successfully overcome cross-functional challenges in today's dynamic and often complex business environment.
- Visionary strategic planning that helps you implement industry best practices and secure a first-mover advantage.

With these benefits, the Growth Pipeline Dialog™ empowers you to accelerate your go-to-market plans and drive sustainable success in an ever-evolving marketplace.



## TRANSFORMATIONAL GROWTH JOURNEY



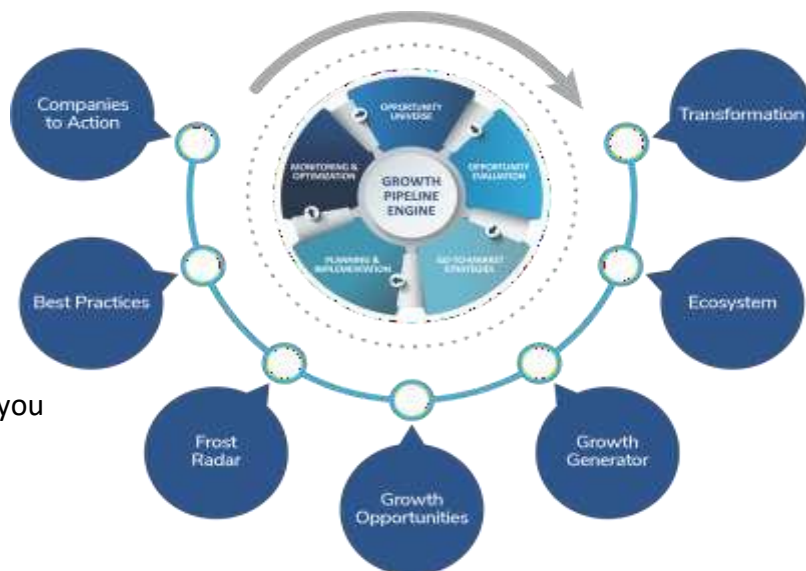
## APPENDIX: Transformational Growth Engine-CEO's Growth Platform

The Transformational Growth Engine enables organizations to embark on their transformational journey leveraging:

- Frost & Sullivan's 7 Gate analytical framework
- The Growth Pipeline Engine

The 7 Gate framework provides the industry context for the transformation and identifies growth opportunities and companies to action.

The Growth Pipeline Engine prioritizes growth opportunities for your unique context and helps you implement on those growth opportunities in a systematic and continuous fashion.



OPPORTUNITY UNIVERSE	Identify the areas of focus and establish metrics to evaluate opportunities
OPPORTUNITY EVALUATION	Deep dive on specific opportunities with your Frost & Sullivan team
GO TO MARKET STRATEGIES	Identify the strategic options to drive your growth opportunities forward
PLANNING & IMPLEMENTATION	Work with our team to execute on your Growth Opportunities
MONITORING & OPTIMIZATION	Ensure systematic follow-through to drive early wins & ongoing success

Source: Frost & Sullivan

## TRANSFORMATIONAL GROWTH JOURNEY



## APPENDIX: Telling Your Story: Sales Pipeline Accelerator – Brand Powering

365 days of engaging all key stakeholders and telling your story in a way that drives impact.

Transformational Promotion	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
<b>BICEP ENGAGEMENT</b>	<b>DELIVERABLES</b>					
Board of Directors			Analyst Message to Board			
Investors	Investor Email Campaign		Investor Confidence Video	Raising Capital Impact Video		
Customers	Customer Email Campaign	Customer Social Media Campaign	Appreciation Video	WP with Customer Case Studies	External Newsletter Recognition	
Employees + Leadership	Internal Email Campaign	F&S Employee Shout-out	Gratitude Video		Employee Congratulations	Award plaque
Partners	Targeted Partner Email			WP on Partnership Benefits		
<b>Stakeholder Impact</b>	Email Community	Social Media	Video	White Paper	Newsletter	Lobby Display
<b>7 TRANSFORMATIONAL GATES</b>	<b>THINK TANK WORKSHOPS</b>					
Transformation	THINK TANK					
Ecosystem		THINK TANK				
Growth Generator			THINK TANK			
Growth Opportunities					THINK TANK	
Frost Radar						THINK TANK
BEST PRACTICES				THINK TANK		
Companies to Action				THINK TANK		
<b>365 Growth Transformation</b>	<b>TRANSFORMATIONAL TOOLS</b>					
Growth Pipeline Dialog		Kick off SPD				
Growth Council Membership	ACTIVATED *365 VALUE ACCESS*					
Growth Generator Platform	ACTIVATED *365 VALUE ACCESS*					
Access to Published Analyst Content	ACTIVATED *365 VALUE ACCESS*					
Executive Coaching					6 month services campaign based on rolling needs	
Think Tanks		F&S		F&S		F&S
Intelligence Transformation Events		F&S		F&S		F&S
Networking Opportunities	ACTIVATED *YEAR LONG ACCESS TO NETWORK OF PEERS AND FROST & SULLIVAN INDUSTRY EXPERTS*					

Transformational Promotion	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
<b>BICEP ENGAGEMENT</b>	<b>DELIVERABLES</b>					
Board of Directors			Board Invited	Growth Workshop	Agenda Sparks	Growth Strategy
Investors	Investor Presentation		Investors Invited		Investor Impact	
Customers	Customer Appreciation Presentation		Customers Invited			
Employees + Leadership		Recognition Presentation	Executive Team Invited	Executive Brainstorm	Executive Strategy	Growth Strategy
Partners			Partners Invited	Strategy Session		
<b>Stakeholder Impact</b>	Event + Poster	All Company	Gala	Workshop	Think Tank	Growth Dialog
	Presentation	Meeting	Presentation			
<b>7 TRANSFORMATIONAL GATES</b>	<b>THINK TANK WORKSHOPS</b>					
Transformation	THINK TANK					
Ecosystem		THINK TANK				
Growth Generator			THINK TANK			
Growth Opportunities					THINK TANK	
Frost Radar						THINK TANK
BEST PRACTICES				THINK TANK		
Companies to Action				THINK TANK		
<b>365 Growth Transformation</b>	<b>TRANSFORMATIONAL TOOLS</b>					
Growth Pipeline Dialog	Check in SPD					SPD
Growth Council Membership						
Growth Generator Platform						
Access to Published Analyst Content						
Executive Coaching						
Think Tanks		F&S		F&S		F&S
Intelligence Transformation Events		F&S		F&S		F&S
Networking Opportunities						

Source: Frost & Sullivan



## TRANSFORMATIONAL GROWTH JOURNEY



## APPENDIX: TechVision: Technology Integration Strategy - 3000 Technologies

### TOP 50 TECHNOLOGIES SERVICE

- Every year we **research over 3,000 emerging technologies**.
- In an annual exercise we analyze these technologies according to:
  - *IP Activity & Funding*
  - *Market Potential & Sector Impact*
  - *Megatrend Impact*
  - *Regional Adoption Potential*
  - *Technology Disruptiveness*
  - *Technology Evolution*
- Then we look at the outcomes:
  - *Intensity and Expected Year of Impact*
  - *Disruptive Potential*
  - *Technology Cluster Evolution*
- These **technologies are assessed for their impact in the next 3 years**.



We also look at the **Future 18 Technologies** that will have **potential impact in 8-10 years**.

### TOP 50 TECHNOLOGIES SERVICE

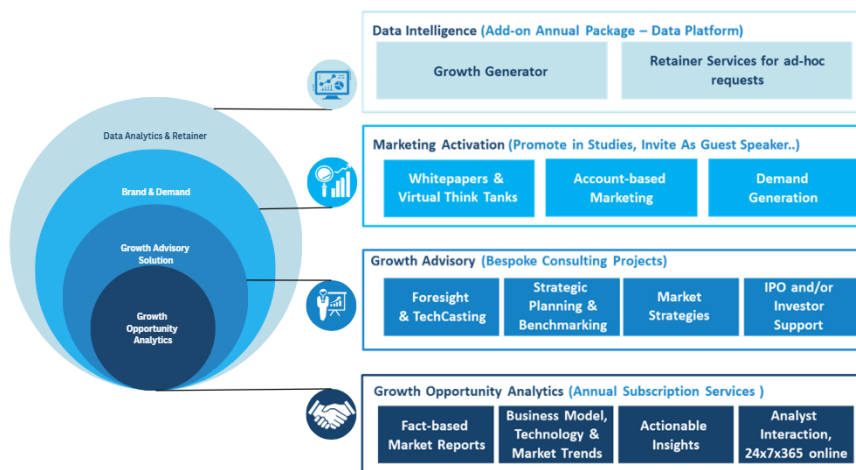
- Board and Executive Awareness of Impending Transformations driven by technology shifts means that the service is used in strategy vision and planning.
- Aligning Innovation, Product Development and Marketing and Sales requires a common understanding of emerging technology themes.
- Evaluating Your own Innovation and R&D Pipelines to ensure that you have not missed any critical development that can drive future competitive advantage.



## TRANSFORMATIONAL GROWTH JOURNEY



## APPENDIX: Growth Opportunity Support – Strategy/Implementation End-to-End Industry Analytics Drive Your Growth



- **Growth opportunity analysis: Opportunity prioritization** - Comprehensive intelligence designed for forward-thinking companies, shining a light on all the growth opportunities within a given market.
- **Voice of customer: Industry voice** - Insights and perspectives gleaned directly from the end customers within a given market, providing a look into what drives behavior, and offering clues on how to optimize your offerings.
- **Economic Research** - Global and regional macro-economic research via PESTLE and other analytical tools, to identify competitiveness and attractiveness of countries and regions, and growth relationship to sectors.
- **Think Tank** - Analyst led sessions on hot topics. Quick-hitting, topical content that identifies and analyzes emerging trends and opportunities.
- **Industry research: Analysis of key industry level trends** - A comprehensive, bottom-up, top-down analysis and future casting for a given market, providing executives with actionable intelligence to achieve growth in a dynamic and evolving industry.
- **Frost Radar: Tracking competition and benchmarks** - A robust, analytical benchmarking tool that provides objective, independent perspective on companies' innovation capabilities and growth performance in a given market.
- **TechVision: Technology research** - Forward-looking intelligence on emerging technologies, innovations, investments, roadmaps, and IP landscapes that equip our customers with ideas and strategies to leverage disruptive technologies and innovation for future growth.
- **Visionary innovation research: Mega Trends** - Actionable intelligence and value-focused insights on how transformative developments across all industries will impact future markets and the world we live in.

Source: Frost & Sullivan

## TRANSFORMATIONAL GROWTH JOURNEY

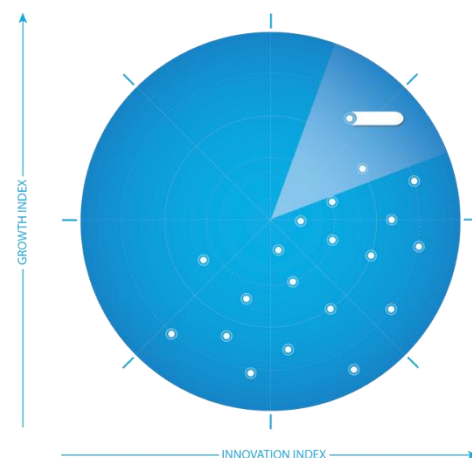


### APPENDIX: Frost Radar™

Frost & Sullivan's Global team of analysts and consultants continuously monitors industries worldwide to identify the companies shaping tomorrow's market landscape. The Frost Radar™ is a proprietary analytical tool that evaluates organizations based on their innovation focus and growth performance, offering a forward-looking benchmark unlike traditional static assessments.

Grounded in decades of primary and secondary research, Frost Radar™ highlights companies that:

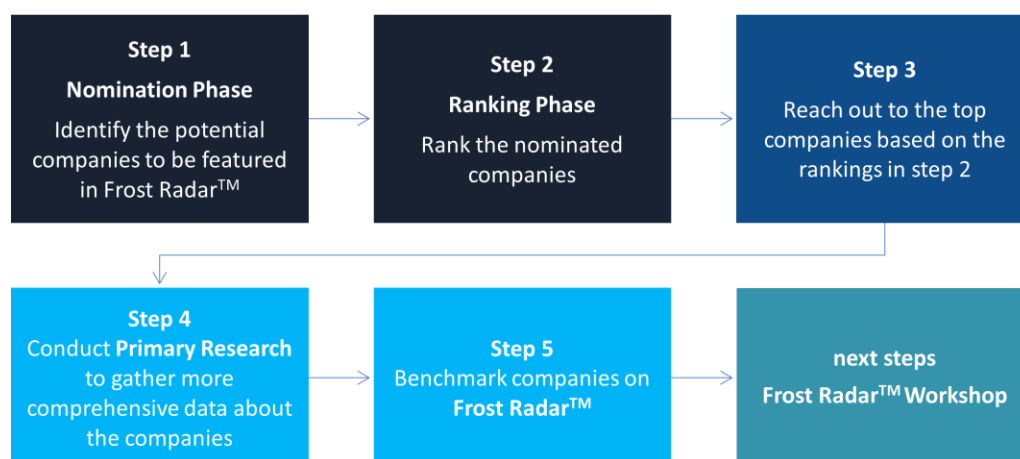
- Demonstrate a visionary understanding of the future.
- Actively address emerging challenges and opportunities.
- Are positioned to lead transformation in their industries?



As part of the Transformational Growth Journey, Frost Radar™ plays a central role in the Growth Pipeline Engine—a system used by CEOs and growth teams to prioritize strategies, allocate resources, and fuel long-term success. It is especially valuable for investors, strategists, and executives, offering clarity on which companies to watch, support, or invest in.

Frost Radar™ isn't just a benchmarking tool. It's a strategic compass that empowers stakeholders to make confident decisions in a rapidly evolving world.

### Our Selection Process:



Source: Frost & Sullivan

### TRANSFORMATIONAL GROWTH JOURNEY



## Frost Radar Metrics: 2 Major Indices, 10 Analytical Ingredients, 1 Platform

### Vertical Axis: The Growth Index

The Growth Index is a measure of a company's growth performance and track record, along with its ability to develop and execute a fully aligned growth strategy and vision; a robust growth pipeline system; and effective market, competitor, and end-user focused sales and marketing strategies.

- **GI1: Market Share:** Market share relative to its competitors in a given market space for the previous three years.
- **GI2: Revenue Growth:** Revenue growth rate for the previous three years in the market/industry/category that forms the context for the given Frost Radar.
- **GI3: Growth Pipeline:** Evaluation of the strength and leverage of the company's growth pipeline system to capture and prioritize growth opportunities.
- **GI4: Vision and Strategy:** Assessment of how well a company's growth strategy is aligned with its vision.
- **GI5: Sales and Marketing:** Measure of the effectiveness of a company's sales and marketing efforts in driving demand and achieving growth objectives.

### Horizontal Axis: The Innovation Index

The Innovation Index measures a company's ability to develop products/services/solutions with a clear understanding of disruptive megatrends and evolving customer needs.

- **II1: Innovation Scalability:** Determines whether the organization's innovation(s) is/are Globally scalable and applicable in multiple markets and verticals.
- **II2: Research and Development:** Measures the efficacy of a company's R&D strategy based on its investment and contribution to the innovation pipeline.
- **II3: Product Portfolio:** Evaluates the contribution of new products to the company's annual revenues.
- **II4: Megatrends Leverage:** Assesses how a company leverages evolving long-term opportunities and new business models.
- **II5: Customer Alignment:** Evaluates the applicability of a company's products to current and potential customers over a 7-year horizon.

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## APPENDIX: Best Practices Implementation with the 10 Growth Process

Competitive Strategy	Most companies appreciate the need for incorporating competitive information into decision making, but few are adept at treating it as an integral component of a long-term growth strategy.
Customer Strategy	The process of increasing revenue by better understanding, anticipating, and responding to customers' changing needs. Turn this into action and see a positive return on those actions.
Distribution Channel Optimization	We help our clients develop and implement compelling supply chain, distribution, and retail strategies integrating digital solutions.
Geographic Expansion	We examine key political, economic, cultural, legal, customer, and infrastructural issues in each country and ensure that our clients leave no stone unturned when undertaking a geographic expansion effort.
Mergers & Acquisitions	Companies looking to expand into new markets, pursue new growth opportunities, and hit aggressive targets must build mergers & acquisitions into their long-term growth strategies.
New Product Development	We understand that the path to new product development success is through the application of a rigorous, balanced process for evaluating any idea prior to entering the market.
New Product Launch	We have developed a new product launch process that is unbiased, repeatable, and focused on implementation success.
Strategic Partnerships	Strategic partnerships deliver access to new markets or customers, accelerate new product development cycles, and improve a company's competitive positioning.
Technology Strategy	We are dedicated to helping our clients foster a culture of innovation and creativity within their organizations, leveraging technology growth opportunities to define strategic goals.
Vertical Market Expansion	Successful companies consistently look beyond their current markets for new growth opportunities. Vertical markets are a compelling path to those new revenue streams.

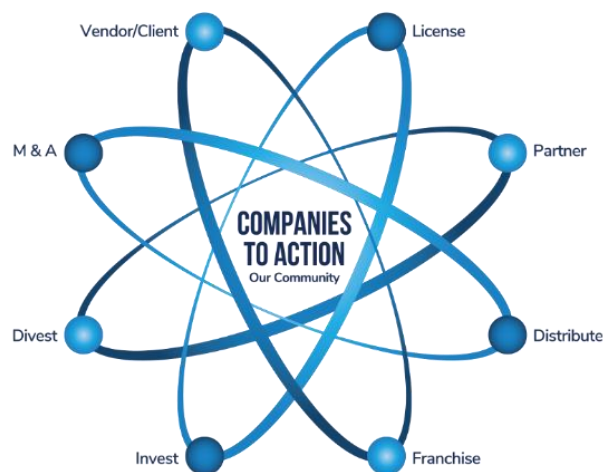
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## APPENDIX: Companies to Action

Companies to Action are leaders in the industry that will shape the future of the industry. These are companies that any organization must engage with to achieve growth objectives.

- Which companies are shaping your ecosystem?
- Which companies should you be working with?
- Who should be your suppliers, customers, partners?
- Which companies should be on your radar for strategic investments?
- How are you engaging with the companies shaping the future?



Source: Frost & Sullivan

# Top 10 Strategic Imperatives Driving Transformation in Air Quality & Emissions, Global, 2025



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