

Almaty Air Initiative (AAI), Kazakhstan

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Is the project a case of...:

- State-initiated co-creation
- Entrepreneur-driven co-creation
- Grassroots-based co-creation (NGO)

Integrated case analysis

1) Background, history, and national, regional, and local contexts of the case

The Almaty Air Initiative (AAI) emerged in 2024 as a response to one of Almaty's most acute environmental challenges — chronic air pollution, particularly severe during the winter months. The project was launched at the initiative of entrepreneur and inDrive founder Arsen Tomsy, who, after spending a winter in Almaty, personally experienced the heavy smog and poor air quality. This personal experience became a turning point: Tomsy was struck by the absence of any systematic organization addressing air pollution and decided to establish a foundation that would promote practical solutions and shape public discourse around this issue.

The idea to create a foundation was reinforced after several meetings with residents, eco-activists, civil society representatives, and business actors, where Tomsy observed a lack of coordination, cooperation, and systemic work in this area.

The initiative was joined by co-founder Kairat Akhmetov, an entrepreneur and creator of Sergek Group, who had already shown interest in environmental issues. Together, they developed the concept of a foundation based on business-oriented management efficiency rather than traditional NGO mechanisms. One of the first tasks was to form a team capable of bringing together experts from different fields — IT, ecology, communications, and civil society.

In practical terms, the initiative operates as a privately funded foundation established by two entrepreneurs, with a clear strategic objective of improving ambient air quality in Almaty. Rather than functioning as a classical advocacy NGO or a grant-making body, the foundation acts as an implementing and coordinating organization that designs, selects, and executes a portfolio of applied projects aligned with this objective.

These projects include the development and maintenance of a public air quality data dashboard aggregating information from a network of sensors installed across the city; the production of media content (documentary films and short digital videos) aimed at raising public awareness and sustaining attention to air pollution as a policy issue; and the implementation of sociological and applied research. The latter encompasses public perception studies related to low-emission zones and other regulatory measures, as well as technical and field studies, such as assessments of vehicle catalytic converter performance and related sources of urban emissions. Through this project-based approach, the foundation

combines data generation, public communication, and applied research to support evidence-informed discussions on air quality in Almaty.

The project's emergence coincided with a period of heightened public concern in Almaty: citizens were actively discussing air quality issues and even measuring pollution levels with personal sensors. While awareness was growing, there was little visible action from state institutions. It was during this context of rising civic concern and institutional inertia that the initiative began to take shape and formalize as a foundation.

Ideologically, the project is built on the principle of environmental justice: polluted air is not only an environmental problem but also a matter of social inequality. In Almaty, there is a clear spatial and social divide — wealthier residents live in areas with cleaner air, while vulnerable groups are exposed to higher pollution levels. The foundation's team views this as an injustice and defines one of its central goals as reducing inequality in access to clean air.

Kazakhstan is a unitary presidential republic with a highly centralized system of governance, where most regulatory and administrative competences remain at the national level. Although recent reforms have introduced elements of decentralization, local authorities continue to operate with limited fiscal autonomy and constrained decision-making power, especially in environmental and urban policy domains. This institutional structure shapes how environmental initiatives emerge and function: state agencies retain the formal mandate for environmental regulation, while non-state actors often fill the gaps in data, public communication, and problem-specific project implementation.

Almaty, Kazakhstan's largest city and former capital, is located in a mountain valley at the foot of the Tian Shan range. Its geographic position—combined with rapid urbanization, high levels of private car use, aging industrial and heating infrastructure, and frequent temperature inversions—creates a unique concentration of air pollution sources and prevents the natural dispersion of emissions. As a result, Almaty consistently records one of the highest levels of particulate pollution in Central Asia and has repeatedly appeared among the world's top five most polluted cities in daily international air quality rankings over the past two years. These environmental pressures make air quality one of the city's most persistent and publicly salient challenges. The specific physical and socio-economic characteristics of Almaty therefore form an essential backdrop for understanding why data transparency, public engagement, and applied environmental projects have become central components of local initiatives aiming to improve air quality.

At the national and regional level, the case fits into the broader agenda of sustainable urban development and environmental governance. Locally, it addresses a high concentration of pollution sources and the need for coordination among diverse actors; practically, it emphasizes transparent data collection, public dialogue, and the implementation of tangible solutions. Thus, the project was born out of personal experience and a strong societal demand, quickly institutionalized into a foundation format, and began to build a systemic approach to reducing air pollution in Almaty.

2) The aims of the project and the sustainability problems that it seeks to address

The main declared goal of the *Almaty Air Initiative (AAI)* is to restore for the residents of Almaty their right to clean air, understood not as a privilege but as a fundamental human right. The project is rooted in the recognition of environmental and social injustice and seeks to make access to clean air universal, sustainable, and institutionally protected.

AAI is aimed not only at improving the environmental situation but also at shaping a new culture of public participation and responsibility. Its strategic purpose is to draw attention to the problem of air pollution, to unite citizens, experts, businesses, and government institutions in the search for solutions. A special

emphasis is placed on engaging the private sector, which had previously been largely uninvolved in environmental initiatives, often perceiving them as “oppositional” to government policy. The project demonstrates that environmental action can be constructive, unifying, and mutually beneficial.

The initiative operates through three interrelated pillars:

- a) **Awareness-raising** – disseminating knowledge about the harmful effects of air pollution, fostering understanding of the links between air quality, health, and social inequality, and promoting a culture of civic responsibility.
- b) **Infrastructural transformation** – advocating systemic changes necessary for sustainable air quality improvement: converting coal-fired power plants to gas, expanding the use of renewable energy, developing public transport, enlarging pedestrian and low-emission zones, and introducing green technologies.
- c) **Regulation and institutional frameworks** – establishing normative and institutional mechanisms to ensure long-term improvements: new emission standards, monitoring and accountability systems, and the advancement of environmental legislation.

At the operational level, AAI employs a clear framework-based approach for selecting and implementing projects, prioritizing those that contribute to systemic transformation. Each initiative is assessed according to whether it accelerates one of the key processes — awareness-raising, infrastructural reform, or regulatory enhancement. Only projects that strengthen at least one of these areas are integrated into AAI’s activities. This approach allows the initiative to act not merely as an environmental NGO but as a platform for systemic change.

3) The participants and their interaction and communication in and between meetings

The Almaty Air Initiative (AAI) was built around a small but multidisciplinary team that combines managerial, creative, technological, and expert capacities. At the initial stage, the project began with two people — Arsen Tomsy (inDrive) and Kairat Akhmetov (Sergek Group), the founders and ideological initiators whose personal motivation stemmed from the struggle for environmental justice and the right of citizens to clean air. Later, Zhuldyz Saulebekova, who became the Executive Director (CEO), joined the initiative, taking responsibility for operational management, the development of the project framework, and team-building. Gradually, the project expanded to include specialists in IT, communications, ecology, research, and public relations, creating a stable managerial and operational structure.

The team grew step by step — from two founding members to five core staff — while maintaining stability in its central composition. New experts were recruited as the scope of activities expanded, from analytics and technology to visual communications and partnership initiatives. The key selection criterion was not narrow professional specialization but personal engagement, empathy toward the issue, and readiness to work under uncertainty without commercial motivation. As the team members emphasize, professional expertise in environmental issues can be developed over time, but genuine interest and inner drive are essential — without them, participation in AAI would be impossible.

From the outset, the team was formed at the intersection of business, IT, academia, and civil society, which enabled the initiative to build a broad cross-sectoral collaboration network. In addition to partnerships with eco-activists, research institutions, banks, and private companies, the public sector has played a targeted but important role in several project components. The Akimat and municipal agencies engaged with AAI by involving the team in the development of local air protection regulations, inviting representatives of the foundation to official events and expert discussions on air quality, and allocating specific locations across

the city for the installation of monitoring sensors. While public authorities do not participate in all projects, their engagement has provided institutional access, technical input, and a degree of operational support.

Citizen involvement has also been central to the initiative's co-creation processes. Residents took part in surveys and focus group discussions, contributing perspectives that informed both project design and communication strategies. Representatives of civil society were engaged as consultants on specific activities, including the preparation of a documentary film, and were invited to project-related events organized by AAI. In addition, many citizens contributed informally through public discussions on social media, providing feedback, criticism, and ideas that helped refine project priorities. This combination of municipal engagement, expert collaboration, and structured and informal citizen participation has enabled AAI to operate as a flexible coordination platform that connects environmental, technological, and communication solutions.

AAI's key partners and sponsors include:

- a) Nurlan Smagulov Foundation — a charitable foundation established by businessman and founder of Astana Motors Nurlan Smagulov. The foundation provided funding for the installation of air-quality monitoring sensors in Almaty.
- b) Halyk Bank — the largest bank in Kazakhstan by asset volume, which provides ongoing sponsorship support to AAI.
- c) Kazakh-British Technical University (KBTU) — a higher education institution in Almaty that cooperates with AAI through research collaboration, sharing infrastructure (equipment, laboratories) and personnel, as well as data exchange.
- d) Satbayev University (Kazakh National Research Technical University) — another key academic partner of AAI in the field of environmental research and technical cooperation.
- e) Akimat of Almaty (City Administration) — a central institutional partner of AAI. Cooperation between AAI and the Akimat takes several forms:
 1. Policy collaboration: AAI representatives were included in the Working Group on the Rules for the Protection of Atmospheric Air, where they successfully advocated for several key initiatives, including the introduction of Low Emission Zones (LEZ).
 2. Information and awareness campaigns: AAI assumed responsibility for developing educational and outreach materials on air pollution, while the Akimat committed to disseminating them through its official communication channels.
 3. Infrastructure support: The Akimat provided AAI with access to municipal infrastructure for installing air-quality sensors across the city.
 4. Public events and engagement: At events organized by Open Almaty (a structural unit of the Akimat), AAI representatives established direct contacts with university partners and civic groups.

Each team member has a defined area of responsibility, but decisions are made collectively through regular meetings and discussions. Internal coordination is maintained through digital tools — primarily Telegram chats and shared online documents.

Thus, the Almaty Air Initiative functions as a flexible network-based structure, uniting individuals from diverse backgrounds under a shared set of values and a clear sense of mission. Its informal yet coordinated interaction model — combining horizontal communication with clearly defined roles — ensures both resilience and adaptability, allowing the project to maintain internal cohesion while progressively expanding its partnerships and fields of activity.

4) How often do they meet, and do they communicate between meetings?

Communication within the Almaty Air Initiative (AAI) combines regular meetings with continuous informal interaction in the online environment. The team maintains a consistent rhythm of communication that ensures both strategic coherence and operational responsiveness in day-to-day work.

Weekly working meetings are a key element of internal coordination. They are usually held on Mondays and Thursdays and focus on discussing the current status of projects, allocating tasks, and planning the next steps. At the end of each week, the team conducts brief summaries — participants share updates on completed work and highlight any challenges encountered.

In addition to regular meetings, AAI holds ad-hoc sessions whenever it becomes necessary to discuss a specific project or issue in detail. These discussions can occur spontaneously, depending on current priorities and the stage of implementation of individual initiatives.

Interaction with donors and strategic partners (primarily the co-founders and corporate sponsors) takes place in a more formalized format, typically once a month. During these meetings, the team presents reports on achieved results, discusses new initiatives, funding matters, and key challenges.

Overall, AAI's communication structure balances regularity and flexibility. Day-to-day coordination relies primarily on continuous online interaction through a shared Telegram group, where team members exchange updates, share data, and make quick operational decisions. The channel is lightly moderated in the sense that core staff keep discussions focused on project-related issues, but communication remains informal and allows for ad hoc problem-solving and rapid clarification between participants. More formal coordination tools—such as email and shared documents—are used mainly for interactions with external stakeholders who are not part of the foundation's internal team.

While this online layer creates a sense of “continuous presence” and enables fast coordination, regular weekly or bi-weekly meetings remain the central mechanism for maintaining strategic alignment, clarifying responsibilities, and integrating work across different directions. Among all communication formats, the combination of the main Telegram group for rapid operational exchange and the structured meetings for strategic coherence is the most essential for the effective functioning of the initiative.

5) The role and forms of knowledge sharing, coordination and joint problem-solving

Within the Almaty Air Initiative (AAI), knowledge exchange and coordinated action are key elements of project functioning. The team operates as an open and learning-oriented organization, where experience sharing and joint decision-making are integrated into daily practice. These processes ensure not only internal coherence but also extend the project's influence beyond its own boundaries — through collaboration with experts, government institutions, media, and international partners.

Team members interact continuously, both in the office and online, exchanging ideas and feedback through discussions, short presentations, and collective sessions. Problems are addressed through dialogue and prompt discussion, taking into account the opinions of all participants.

Through their collaborative work, AAI team members have developed concrete new knowledge about air quality in Almaty. Using sensor data, they identified the main sources of pollution, mapped the most and least contaminated areas of the city, and determined which pollutants appear in the highest

concentrations. In parallel, sociological surveys and public engagement activities allowed the team to understand how residents perceive different environmental initiatives, including proposed low-emission zones. These insights have directly informed the design and adjustment of the initiative's projects.

In addition to regular working meetings, AAI holds strategic sessions that bring together external experts, representatives of business, academia, and NGOs. These sessions are aimed at joint problem-solving, strategic planning, and exploring new directions for development. Their format emphasizes horizontal interaction and equality among participants — invited experts engage in open discussions on an equal footing with team members.

The project actively employs multiple channels of knowledge dissemination — from documentary films and social media campaigns to public discussions and awareness events. One of the most notable examples was the documentary “Almaty: is it OK to live with smog?” directed by the well-known filmmaker Kanat Beisekeyev, which became a tool for public engagement and collective reflection on the issue of air pollution. Following public screenings and media coverage, the topic of air quality gained a prominent place in the city's policy agenda.

Another key direction of knowledge exchange is linked to research and open data. The project's website publishes survey results and analytical reports on citizens' perceptions of air pollution, behavioral patterns, and attitudes toward environmental reforms. These datasets are made publicly available, enhancing transparency and creating opportunities for civic engagement and research collaboration. Additionally, AAI developed an interactive information dashboard, also accessible on its website, enabling users to monitor real-time air quality data.

Thus, the Almaty Air Initiative has built a collaborative ecosystem in which knowledge exchange and joint problem-solving transcend organizational boundaries, transforming the initiative into a platform that integrates diverse actors — from public authorities and businesses to citizens and researchers.

6) The relation between consensus and conflict and the handling of the latter

According to participants of the Almaty Air Initiative (AAI), the organization is characterized by a high level of internal consensus and mutual trust among team members. The team cultivates a culture of open dialogue and mutual respect, which helps to prevent serious conflicts at early stages. Differences of opinion are not perceived as signs of confrontation but rather as a natural part of collaborative work and an opportunity to improve the quality of decisions.

Most participants emphasize that the project has not experienced acute conflicts or persistent tensions. Divergences usually concern minor operational details — such as approaches to task implementation, timelines, or role distribution. These issues are addressed through open discussions during meetings or in daily communication. The team prefers to raise contentious points immediately, document agreements, and seek compromises that satisfy all parties. As a result, misunderstandings rarely escalate into conflicts and instead become points of growth that refine the team's shared vision.

Decision-making within AAI is collective and consensus-oriented. While key managerial responsibilities rest with the Executive Director and project leads, the leadership style is participatory and feedback-driven. Internal discussions typically take the form of short “sync” meetings or online exchanges where every participant can voice an opinion or propose a solution. This approach fosters broad engagement and a strong sense of shared responsibility for outcomes across the team.

7) The role and form of leadership: lead actor, steering group and/or collective leadership

Within the *Almaty Air Initiative (AAI)*, a hybrid model of leadership has emerged, combining individual direction, collective decision-making, and distributed responsibility. This structure maintains a balance between strategic vision, operational management, and broad team involvement.

The formal leader and operational manager of the project is Executive Director Zhuldyz Saulebekova, who oversees coordination, internal communication among team members and external partners, and ensures the strategic alignment between objectives and actions. She defines priorities, monitors task implementation, organizes working meetings, and provides continuous feedback to the team.

At the strategic level, the initiative's founders — Arsen Tomsky and Kairat Akhmetov — play a significant role as the project's visionaries and benefactors. They shape the long-term vision, provide financial and reputational support, and participate in key strategic decisions related to budgeting, partnerships, and engagement with local authorities. Through their social capital and personal networks, the project has gained stability, credibility among businesses and government institutions, and opportunities for integration into the broader context of urban environmental policy.

At the same time, AAI's leadership model remains hybrid and network-based. While key decisions are made by the Executive Director, the internal interaction structure is largely horizontal. Team members emphasize that there is no rigid hierarchy within the organization: decisions are developed collectively, discussed at weekly meetings, and initiatives can come from any member of the team.

Leadership within AAI serves not only administrative but also coordinating and facilitating functions. The Executive Director acts as an intermediary between the internal team and external stakeholders — including sponsors, the Almaty city administration (Akimat), civil society organizations, international partners, and experts. This role ensures a coherent communication environment and alignment of interests among different actors.

Overall, the leadership structure integrates elements of entrepreneurial and civic governance: on one hand, strategic thinking, discipline, and a results-oriented approach typical of the business sector; on the other, openness, trust, and collective participation inherent to civic initiatives. This combination allows AAI to maintain a balance between efficiency and democratic inclusivity, contributing to the project's sustainability and the internal cohesion of its team.

8) The temporal unfolding of the co-creation process: major shifts and ups and downs

The development of the Almaty Air Initiative (AAI) reflects an evolution from a local civic movement into a sustainable co-creation ecosystem that unites businesses, government institutions, experts, and the public. The foundation began its work in 2024, initiating a trajectory marked by gradual growth, alternating phases of experimental exploration and stabilization, and a flexible response to emerging challenges.

At its inception, the project functioned as a small start-up-like initiative, driven by enthusiasm and the personal commitment of a compact team. Over time, AAI developed its own project management methodology, largely inspired by the *Lean Startup* principles of hypothesis testing, evaluation, and iterative improvement. This approach enabled the team to work in short cycles — generating ideas, testing them in practice, assessing outcomes, and refining solutions. Through experience, the team assembled a distinctive

toolset of effective practices, which have since become a permanent part of the initiative's operational model.

A clear example of this learning process is found in AAI's media projects aimed at raising environmental awareness. The documentary film and YouTube series created specifically for Almaty residents became tools not only for communication but also for gauging public response. Following their release, audience reach exceeded one million views, and the topic of air pollution gained widespread visibility in both media and public discourse. This success led the team to institutionalize media engagement as a core component of AAI's long-term communication strategy.

Over time, the initiative expanded both geographically and conceptually. While continuing to pilot solutions locally, the team began exploring the scalability of successful tools to other cities in the region — such as Bishkek.

AAI has also undergone several phases of critical reflection and reassessment of its strategies. In some cases, the team deliberately abandoned initial ideas after determining they were impractical or premature. These discussions took place openly and inclusively, reinforcing internal trust and fostering a culture of critical thinking. This capacity for self-reflection has allowed AAI to adjust its strategy without losing motivation or cohesion.

The initiative has played a major role in increasing public attention to the issue of air pollution. Through collaboration with the IQAir platform, Almaty was included for the first time in the global ranking of cities by air quality. This milestone generated significant public resonance, doubled AAI's follower base, and became a turning point in shaping environmental awareness — a growing recognition among citizens of the seriousness of the issue and the need for collective action.

The evolution of AAI is characterized not only by its achievements but also by its capacity for self-critique and constructive dialogue with government institutions. The team emphasizes that sustainable environmental governance requires political will, clear accountability, and public support for reforms. In its communication with the Akimat (city administration), the initiative maintains a balance between partnership and constructive criticism, helping identify weaknesses in local environmental policy and encouraging greater transparency and responsiveness in decision-making.

9) The most important governance factors

The success of the Almaty Air Initiative (AAI) was primarily driven by several governance factors that enabled cooperation, innovation, and the inclusion of diverse actors despite weak formal institutions. The most significant among them were the perceived importance of biosphere conditions, relative openness of public governance paradigms, building and harnessing institutional platforms and arenas, inclusion and empowerment of relevant and affected actors, use of experimental tools for innovation, and exercise of facilitative leadership.

The acute visibility of Almaty's air pollution created a strong motivational foundation, turning the environmental crisis into a unifying public cause. This urgency coincided with a period of relative openness within the city administration, which allowed the formation of new collaborative spaces between civic, business, and governmental actors. AAI successfully built institutional platforms that bridged expert

knowledge and policymaking, while its inclusive approach empowered citizens, researchers, and private partners to participate meaningfully in shaping urban environmental policy.

Equally important were the initiative's adaptive tools and leadership style. By applying experimental methods — testing communication formats, pilot monitoring systems, and public awareness campaigns — AAI promoted learning and innovation across institutional boundaries. Facilitative leadership ensured coordination, trust, and shared responsibility within the team, transforming AAI into a model of co-created urban environmental governance.

10) The generated outputs and outcomes

The activities of the Almaty Air Initiative (AAI) have produced a wide range of concrete outcomes — both tangible (technological and research products) and intangible (social and cultural effects). These results demonstrate how the project evolved from a local civic initiative into a sustainable platform for co-creating urban environmental solutions and fostering public participation.

a) Technological and Research Achievements

One of the most significant technological outcomes of AAI is the creation of an interactive air quality monitoring dashboard. Following its public presentation at a press conference, the platform received broad media attention and attracted more than 7,000 active users, with around 300 daily visitors. During testing, the team conducted an internal assessment and adjusted the data visualization system: initially based on the AQI model, the developers later adapted the methodology to improve the accuracy of NO₂ and PM indicators. As a result, the dashboard became not only an information tool but also an example of practical co-creation and adaptive problem-solving, incorporating user feedback into system design.

In parallel, AAI launched an ambitious project to deploy a network of air quality sensors across Almaty and the Almaty region. At the time of interviews, approximately 200 sensors were being installed, aiming to build one of the most comprehensive monitoring systems in Central Asia — comparable to those in Chicago, San Francisco, and London. The Akimat of Almaty further committed to installing an additional 200 devices at schools, hospitals, and public spaces, expanding the network's coverage. This cooperation represents a notable case of institutional synergy between a civic initiative and municipal authorities.

b) Media and Public Awareness Products

AAI actively employs creative and artistic formats to engage the public in environmental issues. Among the most notable projects are documentary and feature films, YouTube series, and short videos produced in collaboration with renowned Kazakh filmmakers. One of the series, addressing domestic heating and household waste burning, reached over 1.4 million views, becoming a prominent media event. These projects communicated environmental problems not through technical reports, but through emotional storytelling, imagery, and humor — thereby increasing youth engagement and public empathy toward air quality issues.

Through its media activities, AAI also succeeded in shaping a sustained information agenda. Notably, thanks to its initiative, Almaty was included for the first time in the IQAir Global Air Quality Ranking, which drew considerable public attention, doubled AAI's subscriber base, and elevated media interest in the city's pollution problem. This step became a turning point in the emergence of what the team described as “environmental alarmism” — a heightened public awareness of the crisis and the need for collective action.

c) Analytical, Expert, and Policy Contributions

At the analytical level, AAI contributed to strengthening the knowledge base and policymaking capacity on urban environmental management. The organization funded expert consultations and seminars involving international specialists, organized capacity-building events for local officials and environmental professionals, and conducted a series of sociological surveys. One key survey of 500 respondents — including pedestrians, drivers, and taxi operators — revealed that over half of Almaty residents support restrictions on emissions and the establishment of low-emission zones. These findings were later used in policy discussions, confirming a public mandate for environmental reform.

In addition, AAI helped to fill the communication gap left by public institutions, leading its own outreach campaigns, media publications, and roundtable discussions. Through these activities, the initiative became a bridge between experts, citizens, and policymakers, ensuring continuous knowledge exchange and enhancing the social legitimacy of environmental decisions.

11) Lessons learned about the conditions for co-creating green solutions

The experience of the Almaty Air Initiative (AAI) shows that successful co-creation of green urban solutions depends not only on formal frameworks or government mandates but primarily on shared motivation, adaptive collaboration, and flexible leadership. The project emerged from a clear environmental crisis — visible smog and health risks — that created a strong moral consensus and urgency among citizens, experts, and business actors. This sense of common threat allowed cooperation to evolve even in a governance environment with limited institutional openness. The case demonstrates that environmental initiatives in hybrid political contexts can thrive when they build legitimacy from below, translating public concern into credible, evidence-based and media-supported action.

A key lesson is that co-creation requires hybrid platforms that bridge civic innovation, expert knowledge, and local administration. AAI's collaboration with the Akimat, universities, and private sponsors illustrates how informal networks can perform the functions of formal governance — creating arenas for experimentation, consultation, and mutual learning. The initiative's success was rooted in its ability to combine advocacy with partnership: maintaining constructive dialogue with public authorities while preserving independence and critical voice. This balance proved essential for gaining both public trust and institutional access.

Another central lesson concerns the importance of adaptive, facilitative leadership and iterative learning. AAI's use of experimental tools, data-driven decision-making, and open communication allowed it to adjust strategies quickly and scale up what worked. Instead of rigid planning, the team applied short learning cycles, incorporating feedback from citizens, experts, and the media. This flexible approach fostered innovation and resilience, turning AAI into a living ecosystem of co-creation rather than a conventional NGO. Overall, the case underscores that the conditions for co-creating green transitions include not only resources and partnerships but also trust, shared purpose, and the freedom to experiment.

Independent variables: scoring and analysis of governance factors

1. Perceived importance of biosphere conditions

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Environmental and biospheric conditions form the core motivational and structural basis of the Almaty Air Initiative (AAI). All respondents emphasized that environmental concerns—particularly air pollution in Almaty—constitute not merely a background issue but the central driver behind the establishment and continuation of the initiative.

The participants consistently described the environmental frame as both collective and personal, highlighting that the issue of air quality directly affects the daily lives of Almaty residents and thus creates a strong sense of shared responsibility and urgency.

Furthermore, the initiative’s strategic focus on air quality demonstrates a clear prioritization of biospheric conditions within its operational framework. Other environmental topics—such as waste management or recycling—are intentionally excluded from the agenda to maintain a sharp and results-oriented focus.

Official communication channels of AAI—including the project’s website, press releases, and public reports—also consistently highlight the protection of air quality and citizens’ right to clean air as the project’s foundational value and long-term mission. The emphasis on environmental protection and awareness-raising is systematically integrated into the project’s strategy, public messaging, and institutional partnerships.

Beyond recognizing air quality as a central issue, respondents emphasized that each core member of AAI brought a strong personal motivation rooted in their own experiences. Arsen Tomsy described being shocked by Almaty’s winter pollution, which prompted him to initiate the creation of the foundation; Zhuldyz Saulebekova highlighted her concerns as a mother of two children; and Ravkat Mukhatov noted that he had been trying to draw public attention to air quality for years through civic activism and even by running for the city Maslikhat. These individual motivations created an unusually strong shared sense of purpose, which in turn facilitated collaboration. According to participants, the common environmental goal reduced internal disagreements, accelerated decision-making, and made coordination between technical, communication, and research teams more natural. The shared mission also made it easier to engage external partners—government officials, civic activists, and experts—who recognized the urgency of the issue and were therefore more willing to participate in joint activities.

Overall, the ecological dimension is deeply embedded in the mission, identity, and collaborative dynamics of AAI. It shapes project collaborative processes, partner engagement, and public communication.

2. Legislation, programs, and formal goals

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

The Almaty Air Initiative (AAI) operates within a partially developed but evolving legal and programmatic framework that provides a general foundation for environmental action but still contains notable gaps. Kazakhstan’s Environmental Code formally regulates air protection and defines permissible emission standards; however, according to several participants, the Code does not adequately address key sources of urban air pollution, particularly mobile sources such as private vehicles and small-scale enterprises. These regulatory omissions have historically limited the effectiveness of air quality management in Almaty.

In response, AAI became actively involved in addressing these deficiencies by contributing to the development of the Rules on Atmospheric Air Protection—a new legal instrument designed to close the gaps in national legislation through by-laws adopted at the municipal level. The initiative played an analytical and consultative role in this process, participating in working groups, conducting legal and sociological research, and facilitating expert input. This engagement marked an important step toward institutionalizing environmental governance mechanisms at the city level and linking local practice with national reform efforts.

At the same time, despite this active participation, the overall legal framework remains incomplete and transitional. The new rules are still undergoing final approval, and the implementation mechanisms have yet to be fully tested. While international guidelines, such as those from the World Health Organization and the U.S. Environmental Protection Agency, are used as reference points, their integration into national law and practice remains limited.

The Almaty Air Initiative operates within an emerging regulatory environment, contributing to its improvement and alignment with international standards, yet the broader legislative and institutional system remains partially developed and only gradually consolidating.

3. Relative openness of public governance paradigms

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Kazakhstan’s governance system is characterized by a strong presidential authoritarian model and a high degree of administrative centralization. Most regulatory, fiscal, and policy-making powers remain concentrated at the national level, while regional and municipal authorities operate with limited autonomy and significant upward accountability to central government. Local governments (akimats) implement national priorities but have restricted discretion in designing their own policy instruments, especially in areas such as environmental regulation, urban planning, and budgeting. This institutional architecture creates a context in which bottom-up initiatives and participatory practices are not structurally embedded, and collaboration with non-state actors depends largely on political will rather than formalized procedures.

The interaction between the Almaty Air Initiative (AAI) and local authorities is characterized by partial institutional openness and the emergence of purpose-built formats that facilitate input from non-state actors. After an initial period of resistance and ineffective communication, a gradual shift occurred: the Akimat established a working group on the *Rules for the Protection of Atmospheric Air*, invited external experts and activists to consultations, and organized targeted meetings (including contributors from online public discussion platforms). It also provided infrastructural and administrative support, such as assistance in placing air quality sensors and offering communication venues for awareness campaigns. These formats

directly facilitated the collection of inputs from society and experts, contributing to a more regular dialogue among stakeholders.

At the same time, this openness remains incomplete and highly dependent on personnel changes and the shifting priorities of municipal leadership. Some interview evidence indicates irregular participation of public bodies, episodic support, and the absence of systematic inclusion in public events. Therefore, although the authorities have created several project-related initiatives to solicit societal inputs — corresponding to the “Significance” level — the evidence that these initiatives have consistently and substantially improved collaborative problem-solving across all dimensions remains mixed.

4. Formalized institutional channels for citizen participation and community mobilization

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

In Kazakhstan, formal mechanisms do exist that provide for the participation of citizens and non-governmental organizations in decision-making processes. These include the Open Legal Acts portal for public consultations, the system of public and expert councils attached to government bodies, the petition mechanism for addressing state institutions, as well as the National Chamber of Entrepreneurs and several specialized feedback platforms. In formal terms, these instruments create a legal and institutional framework for civil society and business participation in joint initiatives with the state.

However, as several respondents emphasized, these mechanisms are largely declarative and weakly effective in practice. Public consultations often take place only formally, with little real influence on decision-making, and the degree of citizen and NGO involvement remains low. Many decisions are made before consultations are concluded, and existing institutions tend to perform a representative rather than substantive role in the policy process.

In the context of the Almaty Air Initiative (AAI), formal channels did exist — for instance, participation of the foundation in the Akimat’s working group and the discussion of the Rules for the Protection of Atmospheric Air. Yet their impact on the collaboration process remained limited: NGO participation occurred through self-initiative rather than as part of systematically functioning state mechanisms.

Therefore, while the existence of formal channels for civic participation can be confirmed, their actual role in enhancing the effectiveness of collaborative governance remains marginal.

5. Mechanism for ensuring top-down government and bottom-up social accountability

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Within the Almaty Air Initiative (AAI), there are no formal or informal accountability mechanisms either toward public authorities (*top-down accountability*) or toward citizens and local communities (*bottom-up accountability*). Representatives of both the foundation and government bodies confirmed that no requirements for regular reporting are in place.

The foundation is not obliged to submit reports on its activities, progress, or results to the Akimat or the general public. All existing communication formats are voluntary and initiative-based: the project team independently publishes annual reviews and press releases, provides air pollution monitoring data, and prepares status briefs to inform new municipal officials. These actions reflect a commitment to transparency but are not rooted in any formal obligations or expectations from authorities or society.

In sum, the scope of these top-down and bottom-up accountability mechanisms are limited and thus do not have any sustained impact on the overall organizational infrastructure and accompanying collaborative processes.

6. Strategic agenda-setting by means of translation

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

The Almaty Air Initiative (AAI) does not employ the United Nations Sustainable Development Goals (SDGs) as a strategic framework for shaping or advancing its local agenda. None of the interviewees mentioned a systematic use of the SDGs, and most participants found it difficult to name specific goals relevant to the project. They emphasized that the initiative has evolved independently of the UN's global framework, and any alignment with particular SDGs — such as those related to the environment, climate, or health — is incidental and intuitive rather than consciously embedded in the project's strategy.

The foundation's documents and official materials contain no references to the SDGs and do not use them to justify project decisions, communication, or reporting. Some participants noted that SDGs are occasionally mentioned only in the context of engagement with international partners (e.g., in discussions with UNEP), but they have no practical influence on project implementation or stakeholder mobilization.

Thus, it can be concluded that the Almaty Air Initiative operates within the broader logic of environmental and social responsibility, yet without any strategic alignment or explicit integration of the Sustainable Development Goals into its agenda or communication.

7. Construction of narratives about successful multi-actor collaboration

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Interviewees mentioned several positive examples of collaboration between government bodies and non-state actors in Kazakhstan that took place prior to the launch of the Almaty Air Initiative (AAI). Such

examples included cooperation between NGOs and Akimats or ministries in areas such as child protection, social inclusion, and environmental issues, as well as various forms of public–private partnerships — for instance, in the fields of transport, video surveillance, and urban development. Some respondents noted that the state occasionally seeks cooperation with NGOs when it faces challenges in delivering certain functions, which reflects a degree of constructive experience in state–civil society interaction.

However, this experience remains fragmented and unsystematic, without forming a stable collective narrative that new initiatives could build upon. Most participants struggled to recall concrete cases or expressed skepticism about the effectiveness of such collaborations, suggesting that successful examples are isolated and dependent on personal connections rather than institutionalized practices.

Thus, while the interviews reveal the existence of certain positive memories of multi-actor cooperation, these have not evolved into a shared or inspirational success story that could serve as a reference point for current or future collaborative projects. This is, in part, due to the mixed experiences of earlier initiatives aimed at improving air quality in Almaty, which also had a negative impact on the prospects of this initiative.

8. Building or harnessing institutional platforms and arenas

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

The Almaty Air Initiative makes active use of both physical venues and digital tools to facilitate effective interaction and collaborative problem-solving.

Physical spaces play a particularly important role: most respondents emphasized that having a dedicated office and meeting spaces ensures operational coordination, consistency of actions, and a strong sense of team dynamics. The office functions not only as a workspace but also as an arena for joint discussions, internal meetings, and online sessions involving remote staff. Several participants highlighted the importance of in-person contact and informal communication for strengthening team cohesion and improving overall effectiveness.

In terms of physical infrastructure, respondents noted that AAI had access to a dedicated office from the very beginning of its development. This was possible because the initiative operated within commercial premises provided by inDrive, a company that had long been established prior to AAI. As a result, the foundation immediately benefited from a fully equipped workspace with stable internet access and a suitable environment for meetings and coordination. The office is used on a daily basis by all full-time staff members. Although the presence of a permanent workspace clearly facilitates coordination, respondents did not describe any explicit norms, structured moderation practices, or other embedded governance routines—either formal or informal—that regulate how these physical or digital platforms are used.

Thus, the project not only possesses physical and digital interaction channels but also actively leverages them as part of its collaborative processes, enhancing communication quality, task efficiency, and public perception of the initiative.

9. Provision of access to blended financing

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

The Almaty Air Initiative is financed exclusively through private sources, primarily from the personal funds of entrepreneurs and corporate donations. The main investors include Arsen Tomsy (inDrive), Kairat Akhmetov (Sergek Group), and several private companies and foundations such as Nurlan Smagulov Foundation and Halyk Bank, as well as individual business figures who provide targeted funding for specific initiatives — for example, the purchase of air quality sensors or support for particular events.

All interviewees emphasized that the project does not receive any public, donor, or international funding. Likewise, there are no public donations, as the foundation’s team deliberately decided against crowdfunding, viewing it as overly time-consuming and potentially risky for the organization’s image. Although the project has several private funding sources, they all belong to the same category — private business — which means that it does not constitute blended financing in the classical sense, where public and private resources are combined. Furthermore, there is no evidence of adaptation to different types of donor requirements: cooperation terms are individual but do not affect the overall strategy or implementation mechanisms of the project. The owners also clarified that the lack of public funding was also a conscious and principled decision to maintain operational independence and potential additional obligations that may constrain the organizational mission.

Thus, the Almaty Air Initiative is characterized by financial independence and self-sufficiency, but it does not exhibit the institutional or structural features of blended financing.

10. The capacity to leverage support from authorities to enable local collaboration

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Despite the absence of formal or financial support from public authorities, the Almaty Air Initiative (AAI) maintains access to local government channels and periodically receives responses or assistance from them. This is reflected in the participation of project representatives in working groups under the Akimat of Almaty, particularly in the development of the Rules for the Protection of Atmospheric Air, as well as in joint events, discussions, and consultations related to the implementation of low-emission zones. The Akimat also provided venues for meetings, assisted with the installation of air monitoring sensors at social infrastructure sites (such as schools and hospitals), and displayed the foundation’s informational materials on municipal digital screens and communication platforms.

However, such interaction remains episodic and unsystematic. Several interviewees noted that the Akimat’s support is often expressed in a “non-obstruction” principle rather than in proactive facilitation. Administrative reshuffles tend to slow down processes, and there are no formal mechanisms for requesting or securing government assistance. The project has no financial or administrative dependence on the state, and the foundation deliberately avoids it in order to preserve its independence.

Thus, the Almaty Air Initiative maintains communication channels with public authorities and receives partial, situational support, yet this support is not consistent and does not play a decisive role in overcoming challenges or advancing the project's development.

11. Inclusion and empowerment of relevant and affected actors

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

The Almaty Air Initiative implemented a range of specific and deliberate measures to ensure the inclusion of all key groups in the co-creation process — experts, government representatives, businesses, academia, and citizens, including socially vulnerable populations.

First, sociological surveys and focus groups were actively used to study the attitudes of different population groups toward air pollution and the measures planned to reduce it. Participants included car owners, pedestrians, taxi drivers, residents of the most polluted districts, and entrepreneurs. The collected data served not only for analytical purposes but also for adjusting the project's approaches, as confirmed by participants who reported that findings and recommendations were shared with the Akimat for consideration.

Second, the project regularly organized multi-actor events such as foresight sessions, expert workshops, and meetings with NGOs, businesses, government agencies, and international consultants. These events provided platforms for exchanging opinions, discussing risks, and developing joint solutions. Importantly, both activists and government representatives were invited, which strengthened trust and engagement.

Third, the foundation made a deliberate effort to reach different social groups, including marginalized populations. Project representatives noted that perceptions of environmental problems vary widely across society, but the team sought to bridge these gaps through creative communication and public awareness campaigns. However, the scope of influence that, for example, citizens and laypeople had was also limited to providing inputs, but the ultimate authority resided at the core members. In this sense, despite empowering actors to provide inputs, the collaborative dynamics were still highly uneven. This might, in theory, also have blocked specific collaborative influences, simply because the core group would override such suggestions.

At the same time, the participation of certain groups, particularly small businesses and low-income residents, remains limited: while they are engaged in research and consultation processes, they are not consistently involved in decision-making. Nevertheless, the systematic inclusion of their perspectives in public discussions and communication materials indicates substantial efforts toward inclusivity and empowerment.

Overall, the project not only sought to include all relevant and affected actors but also took active steps to ensure their voices were heard and reflected in its strategy and outreach. However, the degree of continuous participation remains limited and thus led to an ambiguous influence on the collaborative processes, preventing a full score for this factor.

12. Clarification of interdependence vis-à-vis common problem and joint vision

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

The Almaty Air Initiative demonstrates a clear understanding of interdependence among participants and a shared awareness of the need for collective effort to achieve the common goal of improving air quality in Almaty.

First, members of the foundation and partner organizations repeatedly emphasized that the project’s success depends on the contribution of each participant. This is evident both within the internal structure—where each team member is responsible for a specific direction such as IT, communications, research, or finance—and within the broader network context, where collaboration between the foundation, businesses, public authorities, and experts is essential. Several respondents noted that “some projects simply cannot be implemented without certain participants and their resources,” which reflects a deep awareness of mutual dependence.

Second, there is a built-in culture of shared responsibility and teamwork. While no formal steps or trainings have been introduced to institutionalize interdependence, the working style and organizational structure themselves encourage collective responsibility. Participants emphasized that “we all came together and immediately started working as one team; it’s our shared responsibility,” illustrating an informal yet consistent mechanism for recognizing collective dependence.

Third, this interdependence extends beyond the internal team to the broader ecosystem of the project. Both the foundation and its partners acknowledge that solving environmental challenges requires joint efforts from government, business, media, and civil society. The foundation actively seeks to balance these interests to ensure that the actions of one side do not harm another—demonstrating not only shared goals but also strategic coordination across sectors.

Nevertheless, this awareness of interdependence remains largely organic rather than institutionalized. There are no formal procedures or instruments—such as structured joint plans or regular cross-sectoral evaluation sessions—designed specifically to strengthen it. Nonetheless, the informants also make repeated mentions of this reciprocal interdependence, suggesting that it is embedded firmly in the organizational routines and mindset, suggesting a consistent contribution to enabling collaborative processes within the project.

13. Trust-building and conflict mediation

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

The project demonstrates a high level of mutual trust among participants, grounded in personal responsibility, professionalism, and open communication. The team is characterized by strong cohesion and a willingness to collaborate in solving problems. Any disagreements that arise are resolved promptly through discussion and consensus-building, which helps maintain a constructive atmosphere and effective cooperation.

In addition, several respondents mentioned that the team regularly engages in informal practices that strengthen interpersonal trust, most notably the routine of shared lunches. These gatherings serve as a space for open conversation, mutual support, and the informal exchange of ideas outside the constraints of formal meetings. While not a structured or targeted trust-building interventions, these recurring social rituals contribute overall to maintaining a positive atmosphere, reinforcing team cohesion, and preemptively addressing potential tensions before they develop into conflicts.

However, formal or systematic mechanisms for building trust and managing conflicts are absent. Participants note that trust develops naturally based on shared values and experience, without the need for special interventions. Practices aimed specifically at reinforcing trust—such as facilitated sessions, mediation procedures, or regular team-building trainings—are not applied.

Thus, trust clearly exists and plays a central role in daily operations, but it emerges organically rather than as the result of deliberate or institutionalized processes.

14. Use of experimental tools for innovation

QCA score:

- 0
 0.33
 0.66
 1

Scoring confidence:

- Low confidence
 Medium confidence
 High confidence

Data sources:

- Interviews
 Documents
 Observations

The Almaty Air Initiative demonstrates a systematic and deliberate use of experimental tools and testing methods for developing, verifying, and scaling its solutions. The practice of iterative experimentation (“trial and error”) is an integral part of the foundation’s organizational culture and reflects its self-identification as a startup operating under conditions of uncertainty.

AAI regularly develops and tests prototypes, hypotheses, and pilot solutions — from environmental sensors (detecting pollen, allergens, microplastics) and digital products (complaint bots, air quality dashboards) to creative communication tools (video formats for youth audiences). The results of these experiments are actively analyzed, and unsuccessful hypotheses are consciously discarded.

Moreover, a feedback mechanism is embedded in the design cycle. The team systematically collects input from users, media, partners, and citizens, conducts sociological surveys, and uses the findings to refine its approaches. A notable example is the testing of air-quality sensors and the online dashboard, where audience feedback directly influenced the structure and functionality of the product.

The use of experimental instruments and data not only increases the effectiveness of project solutions but also fosters collective learning and collaborative problem-solving, enhancing participant engagement and expanding opportunities for innovation as the feedback mechanisms allows them to continuously incorporate the emergent feedback into iterative improvements.

15. Ongoing critical self-reflection and learning (i.e., process and/or developmental evaluation):

QCA score:

- 0
 0.33
 0.66
 1

Scoring confidence:

- Low confidence
 Medium confidence
 High confidence

Data sources:

- Interviews
 Documents
 Observations

The Almaty Air Initiative demonstrates a regular practice of critical self-reflection and learning, although these processes are not institutionalized in the form of formal evaluation procedures. Participants note that discussions of results and assessments of effectiveness occur continuously within the team, most often during monthly or final meetings. After each completed project, the team holds informal reviews—discussing what worked, what should be changed, and which approaches proved effective—indicating a stable element of a reflexive learning cycle within the organization.

Elements of the Lean Startup model are also evident: hypothesis formulation, testing, evaluation of results, and portfolio adjustment based on the findings. This approach ensures continuous learning through experience and experimentation, while forming an internal “toolset” of effective practices that can later be scaled to new initiatives (for example, applying AAI’s methods in other countries).

At the same time, formalized evaluation and reporting procedures are absent. Assessments are mostly oral or conducted during internal meetings, without official self-evaluation documents or external reviews. Thus, the AAI consistently practices reflection and learning through action, though without an institutionalized framework.

16. Exercise of facilitative leadership:

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

The Almaty Air Initiative demonstrates a clear structure of formal leadership, headed by an Executive Director who coordinates both strategic and operational processes. The leader defines the project’s main directions, priorities, and focus areas while ensuring alignment of team actions and effective interaction with external stakeholders — including sponsors, government agencies, and civil society organizations.

The leadership style can be characterized as facilitative, emphasizing productive collaboration and team synergy rather than administrative control. The director conducts weekly meetings, clearly formulates goals and tasks, monitors their implementation, ensures communication transparency, and encourages feedback. Participants highlight that task distribution and responsibility sharing are effective, while regular discussions of progress foster engagement and discipline within the team.

The leader also plays a key integrative role, building connections among internal and external actors — uniting the project team, donors, local authorities, and civic groups around shared objectives. Thanks to her experience, commitment, and personal involvement in Almaty’s environmental agenda, project management remains flexible, cooperative, and results-oriented.

OUTCOME VARIABLE: SUCCESSFULLY CO-CREATED GREEN TRANSITIONS

The scoring of this variable is done in two parts:

1. Is the developed solution based on collaborative problem-solving spurring creativity/innovation?
2. Does the developed solution engender a green transition?

1. Is the developed solution based on co-creation?

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Survey

Interviews

Documents

Observations

The results of the Almaty Air Initiative (AAI) demonstrate a substantial, though not yet complete, degree of successful co-creation of green transition solutions. According to survey data, most respondents noted that the project effectively brought together diverse stakeholders — including NGOs, businesses, academia, and government bodies — around the issue of air pollution in Almaty. Collaboration led to new forms of interaction and several concrete initiatives, such as the development of the Rules on Atmospheric Air Protection, AAI’s participation in a municipal working group, and the creation of communication and monitoring tools for air quality.

While the project did not establish radically new institutional mechanisms, it transformed the overall approach to the air pollution problem by drawing sustained attention from both state and civil actors to air quality as a systemic environmental challenge. On a perceptual level, AAI acted as a catalyst for practical and discursive change: air pollution began to be recognized not merely as a technical, but as a social issue requiring joint solutions. The initiative is clearly generating new practices and frameworks for the green transition, though these have not yet been institutionalized into enduring governance structures.

Most respondents agreed that AAI has produced tangible co-created outcomes, fostering cooperation among different sectors and raising local awareness of environmental policy. However, only a limited number of participants identified long-term, sustainable mechanisms emerging from this collaboration. The project succeeded in building crucial bridges between governmental and non-governmental actors, yet much of this interaction continues to rely on personal networks and informal coordination rather than formalized, institutionalized processes.

The survey findings provide strong evidence that the solution developed within the Almaty Air Initiative (AAI) is based on co-creation in a comprehensive and meaningful way. Respondents consistently evaluated the collaborative processes very positively, with exceptionally high levels of agreement on items assessing knowledge integration, creativity, and the mobilization of diverse experiences.

Items measuring whether the collaborative problem-solving process mobilized different forms of knowledge and enabled new perspectives (questions 1–3) received the highest evaluations. Across these questions, 55.6% of respondents selected “Agree” and 44.4% “Strongly agree,” producing mean scores between 2.36 and 2.44. This indicates a clear shared perception that the project successfully brought together heterogeneous actors to generate new ideas and jointly search for unconventional solutions.

Questions related to the novelty of the co-created outcome (questions 4–6) reveal that participants view the solution as innovative within the Kazakhstani context. While respondents were more cautious regarding whether the solution breaks established practices or disrupts conventional wisdom (mean **0.44–**

1.67), they strongly affirmed that the initiative introduced new ideas and approaches to addressing the green transition problem (mean 1.78). This supports the interpretation that AAI's outputs represent social–technical innovation relative to local norms, even if not globally disruptive.

Questions measuring support for the co-created solution and satisfaction with the collaboration (questions 7–9) also showed consistently positive evaluations, with mean scores between 1.33 and 2.11. Participants expressed overall endorsement of both the process and the outcomes, highlighting the perceived value and legitimacy of the co-creation efforts.

Finally, the items assessing broader impact, innovativeness, and long-term sustainability (questions 10–15) demonstrated moderate to high confidence in the project's effectiveness (mean 1.44–2.11). Respondents agreed that the co-created solution aligns with the project's goals, has had an innovative effect, and holds potential significance for the community, even if its long-term durability is still emerging.

Taken together, the survey results demonstrate:

- a) strong and consistent recognition of cross-sectoral knowledge integration,
- b) clear evidence of joint creativity and co-development,
- c) affirmation that AAI introduced locally innovative approaches,
- d) broad satisfaction with the collaborative process.

These findings support the conclusion that AAI has achieved a high level of genuine co-creation, justifying an increased score of 1, as the developed solutions clearly stem from collaborative processes that mobilized diverse actors, resources, and knowledge systems.

	Strong. dis.	Dis.	Slight. dis.	Neither agr/dis	Slight. agree	Agree	Strong. agree	Mean
1. Problem-solving mobilized different experiences, and/or ideas and/or forms of knowledge to develop new perspectives						5 (55,6%)	4 (44,4%)	2.44
2. Through the collaborative problem-solving process, different experiences and/or ideas and/or forms of knowledge have been mobilized to search for unconventional solutions						5 (55,6%)	4 (44,4%)	2.44
3. The collaborative problem-solving process mobilized different experiences, and/or ideas and/or forms of knowledge to search for solutions that go beyond standard/text-book solutions						5 (55,6%)	3 (33,3%)	2.36
4. The co-created solution breaks with established practices				1 (11,1%)	2 (22,2%)	5 (55,6%)	1 (11,1%)	1.67
5. The co-created solution disrupts conventional wisdom		1 (11,1%)	2 (22,2%)		2 (22,2%)	4 (44,4%)		0.44
6. The co-created solution offers new ideas to address the green transition problem					4 (44,4%)	3 (33,3%)	2 (22,2%)	1.78
7. I'm supportive of the co-created solution					3 (33,3%)	4 (44,4%)	2 (22,2%)	1.89
8. I'm content with the overall collaborative process of the project					2 (22,2%)	4 (44,4%)	3 (33,3%)	2.11
9. I feel the multi-actor collaboration process was a prerequisite for the success of the project			1 (11,1%)	1 (11,1%)	3 (33,3%)	2 (22,2%)	2 (22,2%)	1.33
10. I'm satisfied by the results of the co-creation effort in terms of expected impact on the welfare of the community				1 (11,1%)	1 (11,1%)	5 (55,6%)	2 (22,2%)	1.89
11. The collaborative interaction in the project has led to an innovative solution				1 (11,1%)	4 (44,4%)	3 (33,33%)	1 (11,1%)	1.44
12. The actors involved in the project are engaged in collaborative interaction that stimulated creative problem-solving					2 (22,2%)	4 (44,4%)	3 (33,3%)	2.11
13. The co-created solution meets the proposed goals of the project					3 (33,3%)	3 (33,3%)	3 (33,3%)	2.00
14. The co-created solution will be durable and robust in the long run					2 (22,2%)	6 (66,7%)	1 (11,1%)	1.89
15. The co-created solution is expected to significantly improve sustainability for the whole community					3 (33,3%)	5 (55,6%)	1 (11,1%)	1.78

2. Does the developed solution engender a green transition?

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Survey

Interviews

Documents

Observations

The solutions developed within the Almaty Air Initiative (AAI) demonstrate a moderate but tangible contribution to the process of a green transition in Almaty. According to the survey results, most respondents disagreed with the statement that the project had *not* led to the development of a green transition solution and merely maintained the status quo. At the same time, the vast majority agreed that the initiative's actions were aimed at improving the existing situation. These measures include the installation of a network of air pollution sensors, the creation of an open online dashboard for data

visualization, and participation in the development of the Rules on Atmospheric Air Protection — a document that became a step toward shaping the city’s new environmental policy.

At the same time, the systemic transformation toward a green economy remains partial. Although AAI has become a catalyst for important changes in public discourse and intersectoral cooperation, the achieved results mainly relate to awareness-raising, communication, and pilot initiatives, rather than structural or regulatory reforms. Many respondents noted that the project contributed to a shift in public attitudes and values — an increased interest in environmental responsibility and recognition of clean air as a social priority — yet institutional and infrastructural transformations (such as the transition to cleaner energy and the introduction of low-emission zones) are still at an early stage.

Overall, it can be concluded that AAI’s activities promote the principles of the green transition by fostering environmental awareness, expanding civic and expert participation, and influencing urban environmental policy. However, the process remains incomplete and requires further institutionalization — the integration of achieved solutions into formal governance mechanisms and urban planning systems.

1. The project:	Yes	No	Don't know
...did not produce any green transition solution	1 (11,1%)	8 (88,9%)	
...is expected to produce/has produced a green transition solution aiming to avoid a worsening in the status quo	9 (100%)		
...is expected to produce/has produced a green transition solution aiming to maintain the status quo	3 (33,3%)	6 (66,7%)	
...is expected to produce/has produced a green transition solution aiming to improve the status quo	8 (88,9%)	1 (11,1%)	

Please list all the informants you have interviewed for the case study (list project role + interview date):

The following informants have been interviewed since August 21, 2025 to October 20, 2025:

Co-founder of AAI, CEO and owner of inDrive

Co-founder of AAI, former CEO and owner of Segek Group

CEO of AAI

Project Manager in AAI

Communication Specialist in AAI

Solutions Engineer in AAI

Ecologist in AAI

Representative of KBTU
Civil Society Representative, Consultant for the film "Almaty: is it OK to live with smog?"

Lawyer, Member of the working group for the development of the "Rules for the Protection of Atmospheric Air"

Deputy Head of the Department of Ecology and Environmental Protection of Almaty

Researcher, scientist, Al Farabi Kazakh National University, Center of Physical-Chemical Methods of Research and Analysis

Please list all the observations you have made (type of meeting/workshop/etc. + observation date):

None.

Please list all the documents you have analyzed (document name + source + year):

Almaty Air Initiative official website

What Almaty residents were breathing: NO₂ air pollution levels in 2023–2024, June 2025

A study of public attitudes toward the introduction of low-emission zones (LEZ) in Almaty, 2025

Almaty LEZ Implementation: Workshop Report, May 26, 2025

Unfiltered Air: Why Don't Catalytic Converters Save Almaty? 2025

Draft resolution of the Maslikhat "On the introduction of special environmental requirements in the field of atmospheric air protection in the city of Almaty", 2025

Law of the Republic of Kazakhstan dated November 2, 2015 No. 383-V ZRK "On Public Councils"

Environmental Code of the Republic of Kazakhstan

Modern Technologies for Applied Ecological Modeling: Prospects for Almaty, May 23, 2025

Please note the response rate for the survey/measurement of outcome variable:

The response rate in the survey was 75%. All core participants of AAI, apart from one co-founder, completed the survey. To peripheral members that were initially interviewed also did not complete the survey. Overall, the results are reliable given the broad coverage.