



Intelligent Cities Challenge

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Esch-sur-Alzette

City Report



European
Commission

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Table of contents

0	Introduction: LGDs for implementing strategies and action plans	8
1	Start building the case	11
2	Appoint a team	14
3	Identify commitments	16
4	LGD Partnership #1 – Measuring industrial pollution and implementing a transparent communication to citizens	18
4.1	Lay the ground for the LGD partnership	18
4.2	LGD financing	19
4.3	Make the deal	20
4.4	Monitor progress and refine	21
4.4.1	Milestones and outlook	21
4.4.1.1	<i>Milestones for Local Government:</i>	21
4.4.1.2	<i>Outlook for Local Government:</i>	21
4.4.1.3	<i>Milestones for ArcelorMittal:</i>	22
4.4.1.4	<i>Outlook for ArcelorMittal:</i>	22
5	LGD Partnership #2 – Heat pump deployment and energy consulting	23
5.1	Lay the ground for the LGD partnership	23
5.2	LGD financing	24
5.3	Make the deal	25
5.4	Monitor progress and refine.	26
5.4.1	Milestones and outlook	26
5.4.1.1	<i>Milestones for Local Government:</i>	26



5.4.1.2	<i>Outlook for Local Government:</i>	26
5.4.1.3	<i>Milestones for Sudstroum:</i>	27
5.4.1.4	<i>Outlook for Sudstroum:</i>	27
6	LGD Partnership #3 – Cargo bikes for local business use (1st phase)	28
6.1	Lay the ground for the LGD partnership	28
6.2	LGD financing	30
6.3	Make the deal	31
6.4	Monitor progress and refine	33
6.4.1	Milestones and outlook	33
6.4.1.1	<i>Milestones for Local Government:</i>	33
6.4.1.2	<i>Outlook for Local Government:</i>	33
6.4.1.3	<i>Milestones for Transition Minett:</i>	33
6.4.1.4	<i>Outlook for Transition Minett:</i>	33
6.4.1.5	<i>Milestones for ACAIE:</i>	34
6.4.1.6	<i>Outlook for ACAIE:</i>	34
7	LGD Partnership #4 – Facilitate e-mobility for citizens by increasing the level of charging stations for electric vehicles	35
7.1	Lay the ground for the LGD partnership	35
7.2	LGD financing	37
7.3	Make the deal	37
7.4	Monitor progress and refine	38
7.4.1	Milestones and outlook	38
7.4.1.1	<i>Milestones for Local Government:</i>	38
7.4.1.2	<i>Outlook for Local Government:</i>	38
7.4.1.3	<i>Milestones for Sudstroum:</i>	38

7.4.1.4 Outlook for Sudstroum:	39
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8 LGD Partnership #5 – New environmental criteria for the analysis grid of cultural projects 40

8.1 Lay the ground for the LGD partnership	40
8.2 LGD financing	41
8.3 Make the deal	42
8.4 Monitor progress and refine	43
8.4.1 Milestones and outlook	43
8.4.1.1 Milestones for Local Government:	43
8.4.1.2 Outlook for Local Government:	43
8.4.1.3 Milestones for Cultural Institutions and Artists:	43
8.4.1.4 Outlook for Cultural Institutions and Artists:	44

9 LGD Partnership #6 – Cultural Artificial Intelligence – Return of Experience from a Future Generation 45

9.1 Lay the ground for the LGD partnership	45
9.2 LGD financing	46
9.3 Make the deal	46
9.4 Monitor progress and refine	47
9.4.1 Milestones and outlook	47
9.4.1.1 Milestones for Local Government:	47
9.4.1.2 Outlook for Local Government:	47
9.4.1.3 Milestones for Educational Institutions:	47
9.4.1.4 Outlook for Educational Institutions:	48
9.4.1.5 Milestones for Tech Companies and Cultural Institutions:	48
9.4.1.6 Outlook for Tech Companies and Cultural Institutions:	48

10 LGD Partnership #7 – Building carports including EV charging infrastructure and generation of solar power 49

10.1	Lay the ground for the LGD partnership	49
10.2	LGD financing	50
10.3	Make the deal	50
10.4	Monitor progress and refine	51
10.4.1	Milestones and outlook	51
10.4.1.1	Milestones for Local Government:	51
10.4.1.2	Outlook for Local Government:	51
10.4.1.3	Milestones for Sudstroum:	52
10.4.1.4	Outlook for Sudstroum:	52

11 LGD Partnership #8 – Deploying micro, grid connected, PV (balcony PV 400Wp-900Wp) 53

11.1	Lay the ground for the LGD partnership	53
11.2	LGD financing	55
11.3	Make the deal	56
11.4	Monitor progress and refine	57
11.4.1	Milestones and outlook	57
11.4.1.1	Milestones for Local Government:	57
11.4.1.2	Outlook for Local Government:	57
11.4.1.3	Milestones for Sudstroum:	57
11.4.1.4	Outlook for Sudstroum:	57

12 LGD Partnership #9 – Photovoltaic Solar Plant Train Moyen Belval (TMB) in ArcelorMittal plant of Belval 58

12.1	Lay the ground for the LGD partnership	58
12.2	LGD financing	59
12.3	Make the deal	60
12.4	Monitor progress and refine	61
12.4.1	Milestones and outlook	61
12.4.1.1	Milestones for Local Government:	61
12.4.1.2	Milestones for ArcelorMittal:	61
12.4.1.3	Outlook for ArcelorMittal:	61

13 LGD Partnership #10 – White slag building in ArcelorMittal plant of Belval and communication with city of Esch-sur-Alzette 62

13.1	Lay the ground for the LGD partnership	62
13.2	LGD financing	64
13.3	Make the deal	65
13.4	Monitor progress and refine	66
13.4.1	Milestones and outlook	66
13.4.1.1	Milestones for Local Government:	66
13.4.1.2	Outlook for Local Government:	66
13.4.1.3	Milestones for ArcelorMittal:	66
13.4.1.4	Outlook for ArcelorMittal:	66

14 Conclusion	67
14.1 Governance	67
14.1.1 Lessons Learnt	68
14.1.2 Next Steps	68
14.2 Integrated Goals	68
14.2.1 Lessons Learnt	68
14.2.2 Next Steps	69
14.3 Action	69
14.3.1 Lessons Learnt	69
14.3.2 Next Steps:	69
14.4 Partnerships	70
14.4.1 Lessons Learnt:	70
14.4.2 Next Steps:	70
14.5 Conclusion	71



ICC – City Report: Esch-sur-Alzette

0 Introduction: LGDs for implementing strategies and action plans

City's Local Green Deal approach to accelerate the implementation of the city's sustainability strategy and action plans

Esch-sur-Alzette (hereafter “Esch”), Luxembourg's second-largest city with a population of 37,000, lies in the southwest near the French border. The city's history revolves around its steel industry, once a pivotal economic force. However, in recent times, the urban landscape has transformed into a hub for culture, education, commerce, and innovation.

Chosen as the European Capital of Culture in 2022, this accolade has propelled Esch-sur-Alzette onto the European stage, magnetising tourists and investors alike. Embracing its evolution, the city is diligently crafting an intelligent future due to its resilience plan as first city in Luxembourg. The Intelligent City Challenge programme encompasses bolstering digital infrastructure and climate resilience, featuring endeavours like implementing smart city applications such as intelligent parking, fostering electric mobility, introducing green spaces to revitalise the urban landscape, and collaboratively engaging with the Association des Commerçants, Artisans et Industriels de la Ville d'Esch-sur-Alzette (hereafter “ACAIE”)¹ to establish, entice, and sustain local employment within the artisanal and retail sectors, thereby creating shorter distances between home and workplace.

With ecology and technology intertwined, Esch-sur-Alzette is unwavering in its commitment to the Green Deal, aspiring to achieve net-zero greenhouse gas emissions by 2030. Energy conservation, green building, waste management refinement, and sustainable mobility promotion form integral components of this vision.

Positioned at the nexus of innovation and dynamism, Esch-sur-Alzette is primed to lead the Intelligent City movement in Luxembourg. Guided by an ethos of enhancing

¹ ACAIE: [Association of retailers, craftsmen and industrial companies of Esch-sur-Alzette](#)

citizens' lives and fostering sustainability, the city stands as a beacon of inspiration and innovation for other municipalities to follow.

The following table depicts the status summary of the 10 Local Green Deals (hereafter “LGDs”) that have been developed throughout the Intelligent Cities Challenge hereafter “ICC”) programme.

				Status	Funding	Issues
LGD 1	Measuring industrial pollution and implementing a transparent communication to citizens		Construction and built environment	Draft LGD	CAPEX + OPEX by ArcelorMittal	Waiting for feedback from ArcelorMittal
LGD 2	Heat pump deployment and energy consulting		Construction and built environment	Signed	CAPEX by the City + Sudstrom	NA
LGD3	Cargo bikes for local business use (1st phase)		Mobility and Transport	Signed	CAPEX by the City	NA
LGD 4	Facilitate e-mobility for citizens by increasing the level of charging stations for electric vehicles		Mobility and Transport	Canceled	CAPEX bu Sudstrom (additional charging stations)	Insufficient number of qualified personnel and dedicated leadership to effectively drive this LGD
LGD 5	New environmental criteria for the analysis grid of cultural projects		Culture and Creative Industries	Postponed	Not yet defined	Lack of ownership to take decisions in absence of the leader and his subsequent quitting. In March 2025, a new director of cultural affairs will start.
LGD 6	Cultural Artificial Intelligence – Return of Experience from a Future Generation		Culture and Creative Industries	Postponed	Not yet defined	
LGD 7	Building carports including EV charging infrastructure and generation of solar power		Mobility and Transport	Signed	CAPEX by Sudstrom	NA
LGD 8	Develop micro, grid connected, PV (Balcony PV)		Construction and built environment	Draft LGD	CAPEX by Sudstrom	Budget to be approved by Sudstrom
LGD 9	Photovoltaic Solar Plant Train moyen Belval (TMB) in ArcelorMittal plant of Belval		Construction and built environment	Signed	CAPEX by ArcelorMittal	NA
LGD 10	White slag building in ArcelorMittal plant of Belval and communication with the city of Esch-sur-Alzette		Construction and built environment	Signed	CAPEX by ArcelorMittal	NA

All LGDs will be aligned with the following existing strategies or work programs:

- These efforts address the observable rise in global temperatures and the consequent increase in the frequency and severity of heatwaves and hot summers due to anthropogenic greenhouse gas emissions.

- [Local Mobility Plan 2035](#): this plan foresees for a large part of the future daily movements from outside and within Esch and provides measures and strategies to be transposed until 2035.
- [Climate Pact 2.0](#) working plan: this work plan with [quantified targets](#) is focused on following topics: urban development, municipality owned buildings, supply and resource management, mobility, internal organisation, communication.
- [Nature Pact work plan](#): this work plan with quantified targets is focused on regenerating nature and biotopes in open- and rural areas.
- [Climate change adaptation plan](#): this plan regroups 30 measures the city plans to implement to encounter climate change impacts in future.
- [Resilience plan](#): this [work plan](#) enhances the city's capacity to address a diverse range of challenges, including natural disasters such as floods and heatwaves, as well as technological disruptions such as cyberattacks and power outages.
- [Concept of resources](#): this concept is mostly based on ecological prescriptions the city wants to adopt concerning sustainable procurement, sustainable mobility, lighting and waste avoidance or reduction and finally Climate conscious redevelopment to reduce the carbon footprint of the city.
- Digitalisation: based on the digital and AI development of the city this concept describes also future developments in these areas including the new chart of ethics and the potential projects of [AI4Gov of the Ministry of Digitalisation](#).
- Decarbonisation strategy elaborated for the [100 cities challenge](#) that is largely prioritising the city's decarbonation areas such as: heat, mobility and local infrastructures.

1 Start building the case

Developing Local Green Deal (LGD) partnerships for the city of Esch-sur-Alzette will provide numerous benefits, including:

- **Enhanced environmental quality through AI-powered solutions:** the first LGD, focusing on forecasting air and noise pollution using AI, sets a precedent for technological innovation in environmental management. This initiative not only improves air and noise quality in green areas and parks but also actively involves citizens through the APP Esch, enhancing community engagement and awareness. This real-time monitoring and forecasting tool can significantly contribute to public health and environmental conservation.
- **Not² selected: Streamlining urban development with AI in building authorisations:** by accelerating and simplifying building authorisation procedures, the city could gain a more efficient and transparent urban planning process to build faster required housing capacity. This integration of technology aids in balancing rapid development with environmental considerations.
- **Promoting decarbonised heating and encouraging energy efficient building renovation:** with an existing quite inefficient building park, which is mostly heated by natural gas heaters, the city sees an urgency to decarbonise this heating needs to achieve climate neutrality goals by 2050. Besides the necessity of decarbonising the heating systems using heat pumps, an important challenge will be to motivate people to renovate their houses, this by charge-free assistance of energy consultants.
- **Promoting sustainable transportation with the regional bicycle sharing platform and the use of cargo bikes for local business:** The "Maison du Vélo" initiative should encourage eco-friendly transportation. This will not only reduce carbon emissions but also foster a culture of healthy mobility and sustainability among residents. Esch-sur-Alzette has the longest shopping street in Luxembourg with a large amount of different small businesses. Due to this situation we plan to implement a cargo bike rent system for business use

² The 2024 verdict of the Administrative Court, which cancels the regulation on separate flats within existing districts in the legally binding land-use plan, is further complicating the collaboration between municipal architecture and other departments on cross-departmental projects like the ICC programme.

only (1st phase) and later (2nd phase) this renting system could be opened to the citizens of Esch. The goal is to decarbonise last mile delivery and procurement by offering a cargo bike renting system and a digitalised renting platform.

- **Not³ started: Advancing e-mobility:** increasing the availability of charging stations for electric vehicles, with real-time status updates through the APP Esch, directly supports the transition to cleaner transportation methods. This initiative not only reduces the city's carbon footprint but also positions Esch-sur-Alzette as a forward-thinking, eco-friendly city. This project hinges upon strategic partnerships either with Sudstroum⁴ or private enterprises.
- **Ecological cultural events to enhance community engagement:** using cultural events as a platform to promote sustainability practices showcases the city's commitment to integrating environmental consciousness in all facets of urban life. One key measure includes sensitivity through training the heads of cultural institutions in “thinking green first in the lifecycle of an event”. This approach not only reduces waste and carbon footprint at public events but also educates and involves the community in sustainable practices beyond cultural events. The city strongly hinges upon existing waste-avoidance programmes largely deployed in any area of the city.
- **Raising awareness of AI risks through digital art:** this innovative approach to education on AI technologies addresses the growing need for digital literacy and responsible technology use. By engaging children and teachers through digital art via a school contest to bring these with digital artists and technology experts together, the city fosters a culture of awareness and critical thinking regarding use and abuse of modern technologies (e.g. violation of intellectual property or of personal data) while recognising the nuanced cultural performance of humans and of AI-based creations.

³ There is an insufficient number of qualified manpower and dedicated leadership to drive this LGD. Thus, the collaboration between the concerned departments lacks the relational bonding for a complex multi-stakeholder project over a longer period.

⁴ Sudstroum is the municipal electricity provider

The success of these LGDs relies on effective collaboration and trust among local stakeholders. This collaboration is facilitated through:

- **Transparent communication:** regular updates, open forums, and collaborative platforms ensure that all stakeholders are informed and involved in the decision-making processes and see a sense of project ownership in it.
- **Shared goals and vision:** aligning the objectives of different stakeholders with the city's sustainability vision creates a unified approach towards common goals highlighted by the Mayor and the Aldermen in their political statements.
- **Public-Private Partnerships:** engaging both public entities and local private companies of different sizes leverages a diversity of resources and expertise in different ecosystems, enhancing hence the effectiveness of these initiatives to become an intelligent city.
- **Community involvement:** actively involving citizens in these initiatives fosters a sense of shared ownership and responsibility towards their city's future.
- **Feedback mechanisms:** implementing channels for feedback and suggestions from stakeholders ensures continual improvement and adaptation of these LGDs by using existing tools such as APP Esch.

In conclusion, developing LGDs in Esch-sur-Alzette offers multifaceted benefits, from environmental conservation to technological advancement, procedural simplification and community engagement. The collaborative and trust-building approach among local stakeholders is key to the successful implementation and sustainability of these initiatives.

2 Appoint a team

Steering Group Structure:

- **Chairperson:** the Mayor & Aldermen, to provide leadership and ensure alignment with municipal policies.
- **Sub-Committees:** sub-committees for specific areas like technology, community engagement, business impact, and scientific research, led by experts from relevant fields such as Luxembourg Institute of Science and Technology (hereafter “LIST”)⁵, University of Luxembourg (hereafter “UNI.lu”)⁶, and Transition Minett⁷ will be formed.
- **Local ICC team:** monthly meeting of LGD owners to discuss progress and unblock possible barriers. The participants included the Secretary General, Jean-Paul Espen; the Head of the Ecology Department, Jeannot Behm; the Head of the IT Department, Philippe Meyers; the Head of Economic Affairs, Christian Bettendorff; and the Director of Cultural Affairs, represented by Anne-Laure Damiani due to the long-term illness of the incumbent, Ralph Waltmans. The meetings were moderated by Pierre, Manager of MANGHINI Consulting, who served as the local ICC officer.
- **ICC overall team:** ICC overall team: next to three thematic experts, namely in cultural management, urban resilience and procurement represented by Amelie Dobi-Weidinger (KPMG Budapest), Jeremy Anterola (Arup Berlin) and Helena O'Rourke-Potocki (ICLEI, Brussels), The city Esch benefits from the insightful support of Thomas Herber as ICC expert who is supervising every two weeks the progress of the ICC subjects with Jean-Paul Espen and Pierre Mangers.

Defining Roles and Responsibilities

- **Strategic oversight:** Mayor & Aldermen to oversee alignment with city goals.
- **Technical expertise:** LIST and UNI.lu to provide scientific and technological guidance.

⁵ LIST: [Luxembourg Institute of Science and Technology](#)

⁶ Uni.lu: [University of Luxembourg](#)

⁷ Transition Minett: [Transition Minette asbl](#)

- **Community engagement:** Transition Minett and FrESCH Asbl to facilitate community outreach and education.
- **Business and economic insights:** ACAIE⁸ and Escher Betriber⁹ to represent the business community's interests and practical implications to implement the "Handwierkerhaff" project (a so-called craftsperson hub).
- **Regional Coordination:** Syndicate for the promotion and development of the Southern Region (hereafter "PRO-SUD")¹⁰ to ensure regional coherence and inter-municipal collaboration.
- **Energy and infrastructure:** Sudstroum and Enovos to advise on energy-related initiatives, especially e-mobility and renewable energy.

Facilitating Collaboration and Trust:

- Regular meetings and transparent communication channels to ensure all voices are heard and integrated into the decision-making process.
- Implement a decision-making process that respects as far as possible the interest and expertise of each member and builds consensus.

Measuring Impact and Progress:

- We will establish clear metrics and goals for each LGD initiative.
- We will also regularly assess the impact of the initiatives against these metrics to guide future actions and policies.

By integrating these diverse stakeholders and ensuring a structured approach to collaboration and expertise sharing, the LGD steering group in Esch-sur-Alzette can effectively drive forward local green initiatives, balancing environmental, economic, and community needs. This multi-disciplinary group, anchored in a strong understanding of sustainability policy and backed by a wide range of expertise, can become a powerful force for positive change in the city.

⁸ ACAIE: [Association of retailers, craftsmen and industrial companies of Esch-sur-Alzette](#)

⁹ Escher Betriber: [a sub-organisation of ACAI regrouping SMEs, industrial companies and self-employed entities](#)

¹⁰ PRO-SUD: [is the syndicate of regional municipalities and promotes and develops the southern region](#)

3 Identify commitments

Existing Policies and Targets in Esch-sur-Alzette:

- **Environmental and energy policies:** initiatives like heat pumps with Sudstroom, smart metering, and public lighting with sensors align with LGD 1 (air pollution), LGD 2 (Heat pump deployment and energy consulting) and LGD 4 (e-mobility facilitation), LGD 7 (Building carports including EV charging infrastructure and generation of solar power), LGD 8 (Deploying micro, grid connected, PV - balcony PV 400Wp-900Wp) and LGD 9 (Photovoltaic Solar Plant Train Moyen Belval (TMB) in ArcelorMittal plant of Belval).
- **Digitalisation initiatives:** Brill Plaat app, EschTV, and digital authorization for building complement LGD 1 (transparent communication to citizens) and LGD 6 (raising awareness of AI risks).
- **Urban and Community Development:** Projects like temporary gardens ("Jardins éphémères"), Klimapakt Gemeng, and revamping the main shopping street (rue de l'Alzette) tie in with LGD 3 (cargo bikes for local business use) LGD 5 (ecological cultural events) and LGD 10 (White slag building in ArcelorMittal plant of Belval and communication with city of Esch-sur-Alzette).

Interfaces, Gaps, and Synergies:

- **Integration of AI and digital tools:** LGDs involving AI interface bode well with the city's digital initiatives, offering a cohesive approach to urban management and initiatives related to the digital artists of the Esch2022 Capital of Culture.
- **Synergy in sustainable urban planning:** LGD 2's heat pump deployment and energy consulting, LGD 3's cargo bikes and LGD 5's cultural events synergise with urban greening and resilience projects, fostering a more sustainable community space.
- **Gaps in comprehensive energy strategy:** While there are individual energy initiatives, a more integrated approach, combining LGDs 1, 2 4, 7, 8 and 9 with existing energy policies, could strengthen Esch-sur-Alzette's overall energy efficiency and sustainability beyond its own territory in the context of the PRO-SUD syndicate of South municipalities.

- **ICC thematic expertise:** thanks to our competent and dynamic ICC expert, who is well connected with the ICC knowledge network, Esch-sur-Alzette can receive critical input from thematic experts for:
 - management of cultural institutions and tourism
 - sustainable procurement policies
 - urban resilience for heat and flood management plans
- **Trade-offs in modernisation and community inclusion:** Balancing technological advancements (like in LGD 6) with inclusive community engagement is crucial to ensure that all citizens will benefit from these developments.

In summary, Esch-sur-Alzette's broad range of sustainability, sectoral, and administrative policies offer a robust foundation for the implementation of the 6 out of 10 LGDs. Recognising and harnessing the interfaces, addressing gaps, bringing additional ICC expertise into the project, connecting the dots and capitalising on existing and future synergies will amplify the impact of these initiatives, paving the way for a sustainable, inclusive, and technologically advanced city.

4 LGD Partnership #1 – Measuring industrial pollution and implementing a transparent communication to citizens

4.1 Lay the ground for the LGD partnership

1. Building the case:

The Local Green Deal is centred around environmental monitoring and transparency. It specifically targets industrial pollution by measuring diffuse emissions from industrial activities, notably from the still-active steel industry near the city. This LGD focuses on the deployment of advanced monitoring technologies and the development of communication strategies to keep the public informed about air quality and industrial impacts on the environment.

2. Mobilising existing staff and local stakeholders:

The ecological department of the City of Esch is systematically involved in the project, primarily to provide guidance and oversee its direction. Other than the residents associations and Arcelor-Mittal, we will need an environmental expertise for measuring and communicating. The partner we have contracted for this role is “Biomonitor” a small company of regional engineers specialised in environmental monitoring.

3. Review existing strategy framework:

The LGD aligns with the City of Esch's work program concerning “Nature Pact” as well as with existing environmental policy strategies, and it also supports the city's broader sustainability goals such as reducing the pollution impact. This LGD should not be seen as standalone initiative. Instead, it is well integrated into the city's overall sustainability strategy.

4. Mobilising external partners:

The city's partner "Biomonitor" that is actively supporting the project will be appointed to measure the impacts of the industrial pollutions emitted by Arcelor Mittal and to create a transparent reporting occurring at least four times per year. Regular status meetings with Arcelor Mittal, Biomonitor, the city and the residents' associations will be planned at least two times per year.

4.2 LGD financing

The funding strategy is under construction. On one hand, ArcelorMittal needs to estimate its overall cost in the next months. The LGD Owner, who is the Ecology department manager estimates the recurring cost for the annual budget in 2025 at approximately € 25,000 and the five-year plan to ensure the long-term funding of this LGD is estimated with € 25,000 per year to € 125,000 in total.

As this LDG is a sort of environmental monitoring and communication, the city needs to assess the legal and fiscal conditions around providing this service, and, if needed, help to put in place some supplementary funding to support Arcelor Mittal in implementing pollution reducing investments. It is not excluded to get national funding if the project is recognised by the Ministry of environment, but this is only a theoretical option that needs to be carefully investigated to respect EU subsidy regulations.

4.3 Make the deal

The Secretary General and the LGD Owner, who is heading the Ecology department has met, also with the ICC local expert, the environmental and sustainability department of ArcelorMittal the 16th and the 27th of May 2024 to discuss the technical details of this LGD.

The main goal is to obtain a substantial reduction of diffuse emissions.

There are technical, environmental and social Key Performance Indicators (hereafter “KPIs”)

The technical KPI measures the percentage of reduction in diffuse emissions.

In addition, there is an environmental KPI related to the quality of air as defined by the administration of environment.

The social KPI measures the number of meetings with the citizens' association. This initiative aims to reduce industrial emissions city-wide, thereby enhancing public health and environmental quality, as well as fostering transparent communication with residents neighbouring the steel plant.

4.4 Monitor progress and refine

4.4.1 Milestones and outlook

4.4.1.1 Milestones for Local Government:

- **Initial Setup and Launch:** Formal announcement of the initiative, outlining the roles and contributions of all partners, targeted for July 2024 (done). ArcelorMittal has preferred not to commit to any binding targets in the LGD, which has unfortunately delayed the signature of the document.
- **Stakeholder Engagement Forums:** Organise three forums/year starting in Q2/25 to ensure ongoing dialogue between the municipal administration and concerned communities next to the steel plant, and Arcelor Mittal.
- **First Report Publication:** Release the first comprehensive report on industrial pollution levels by Q2/2026, including data collected and initial impacts.
- **Review and Adjust Policies:** Based on the first year's data, adjust local environmental policies, or introduce adaptations to regulations by the end of Q2/2025, which is an ongoing process.
- **Annual Review and Planning Meeting:** End of Year 1 (2025) and each subsequent year to evaluate progress, set goals for the next period, and leverage political support for continued or expanded actions.

4.4.1.2 Outlook for Local Government:

- **Expansion of Monitoring:** Expand the monitoring network to include additional pollutants or new industrial areas based on initial findings by Year 2.
- **Increased Community Involvement:** Develop more robust community engagement initiatives, such as educational programs and participatory monitoring.

4.4.1.3 Milestones for ArcelorMittal:

- **Implementation of New Technologies:** Complete installation of upgraded emission control technologies by Q1/2025.
- **First Progress Report:** Collaborate with Biomonitor to publish the first progress report on emission reductions and technology effectiveness by Q1/2025.
- **Enhanced Emission Reduction Goals:** Announce new, more ambitious emission reduction targets based on initial success by Q4/2025.

4.4.1.4 Outlook for ArcelorMittal:

- **Raise Ambition:** Depending on the success of initial efforts, consider setting more stringent internal targets for emission reductions or expanding the scope to include other environmental aspects such as water usage and waste management by Year 2.
- **Corporate Sustainability Initiatives:** Integrate the findings and technologies from this LGD into broader corporate sustainability strategies and possibly roll them out to other facilities globally.

5 LGD Partnership #2 – Heat pump deployment and energy consulting

5.1 Lay the ground for the LGD partnership

1. Building the case:

Esch-sur-Alzette, second largest city in Luxembourg with over 37,000 inhabitants, is marked by an ongoing transformation from a former industrial city into a modern multicultural, university and knowledge-inspired city. With an existing quite inefficient building park that is overwhelmingly heated by natural gas, there is an urgency to decarbonise this fossil gas heating to achieve climate neutrality goals by 2050.

In addition to the imperative of decarbonising heating systems through the utilisation of heat pumps, it will also be crucial to assist individuals in renovating their homes with complimentary consultancy services.

In this LGD we need to define goals for the following target areas:

- Municipality owned buildings
- Private buildings

2. Mobilising existing staff and local stakeholders:

“Sudstroum” as local electricity provider has expressed interest in a project of this nature and is appointed to implement it. The ecological department of the City of Esch is involved in the project, primarily to provide guidance and oversee its direction. Additionally, other departments such as mobility and municipal works also need to be engaged in the process.

3. Review existing strategy framework:

The LGD is in alignment with the City of Esch's work program concerning “Climate Pact 2.0” as well as with existing environmental policies and decarbonisation strategies. It contributes to the city's wider sustainability objectives, including the reduction of greenhouse gas emissions. The LGD is not an isolated initiative but is integrated into the city's overarching sustainability strategy.

4. Mobilising external partners:

The city currently partners with the local electricity provider "Sudstroum", a long-term partner of the City of Esch - who is actively supporting the project to help them launch the project. "Sudstroum" will install at least 50 Heat pumps and at least 500 kWp of additional photovoltaic power until end 2026.

5.2 LGD financing

According to the Ecology department, the renovation works require a capital expenditure that accounts for €18.5 millions until December 2026 to revamp municipal buildings.

For the moment, the funding requirements need to be discussed by the mayor and the aldermen during the budget procedure, before validation by the municipality council.

"Sudstroum" has a funding requirement of €3.1 millions to install at least 50 heat pumps until December 2026. This budget needs to be validated by the advisory board of "Sudstroum".

5.3 Make the deal

The city, primarily through its ecological department, will monitor the LGD's progress by tracking the number of heat pump installations to ensure it meets its goals. In addition, it is key to estimate the future workforce needs to maintain the heat pumps, the new Photovoltaic (hereafter “PV”) installations and its smart meters.

In this respect, the city should as primary shareholder of “Sudstroum” invite the HR director to build a recruitment and training (reskilling and upskilling) strategy to cater for the likely rise of maintenance needs in the future.

In assessing energy efficiency initiatives, meaningful KPIs include the number of heat pumps installed and the availability of technical personnel to support these installations. Additionally, tracking the number of residents who have received advice on energy efficiency measures provides valuable insights into public engagement with sustainability efforts. These KPIs can be sourced from Klima Agence Infopoint, Sudstroum, and the ecological department of the municipality in Esch, offering a comprehensive view of progress in the region's energy transition.

The personnel of Sudstroum needs to be informed about the training (reskilling and upskilling) offers of the company. In addition, Sudstroum should start already end of 2024 a recruitment campaign for new maintenance personnel.

All in all, this LGD aims to have a sustainable impact in reducing the carbon footprint of energy users, supporting hence national goals for energy transition and sustainability.

5.4 Monitor progress and refine.

5.4.1 Milestones and outlook

5.4.1.1 Milestones for Local Government:

- **Policy Development and Approval:** Finalise and approve heat pump incentives and regulations by Q2 of the implementation year 2025 (done).
- **Launch of the Initiative:** Officially launch the heat pump deployment programme in Q3 2025, including public announcements and an informational campaign.
- **Stakeholder Engagement Forums:** Host bi-annual forums starting in Q2/2025 to gather feedback and discuss progress with stakeholders during the Green Deal Day, scheduled for the 26th of June 2025.
- **First Evaluation and Report:** Generate the first annual report by the end of Q4/2025, detailing the program's impact on energy savings and emissions reductions.
- **Program Expansion Discussion:** Review initial results and potential program adjustments or expansions by the end of Year 1 (2025). The programme will continue beyond 2025, as approved by the mayor and the aldermen.

5.4.1.2 Outlook for Local Government:

- **Increase Program Scope:** Depending on the success of the initial phase, consider expanding the programme to include more comprehensive energy efficiency renovations and possibly integrating further solar energy solutions by Year 2 (2026) latest. The first PV balcony entities are expected to be implemented already by the end of 2025.
- **Continuous Improvement:** Enhance incentive schemes and support mechanisms based on stakeholder feedback and technological advancements.

5.4.1.3 Milestones for Sudstroum:

- **Infrastructure Readiness:** Complete the necessary infrastructure upgrades for supporting heat pump installations in targeted areas by the end of Q4/2025.
- **Customer Onboarding:** Achieve a target number of new heat pump installations by Q4/2025.
- **Performance Reporting:** Provide comprehensive performance data on installed heat pumps by Q4/2025.

5.4.1.4 Outlook for Sudstroum:

- **Technological Watch:** Integrate newer, more efficient and noiseless heat pump technologies as they become available.
- **Expand Market Reach:** Extend services to larger commercial buildings and industrial facilities based on the programme's success.

6 LGD Partnership #3 – Cargo bikes for local business use (1st phase)

6.1 Lay the ground for the LGD partnership

1. Building the case:

Esch-sur-Alzette boasts Luxembourg's longest shopping street, home to a diverse array of small businesses. This street is primarily a pedestrian zone; however, deliveries to and from the shops are predominantly conducted by delivery vans, frequently resulting in traffic conflicts. Additionally, these deliveries contribute to unnecessary carbon emissions and local air pollution in the city centre.

To address this issue, we aim to introduce a cargo bike rental system for businesses initially (1st phase), and subsequently (2nd phase), expand this rental service to Esch's citizens as a public offering. In both cases this offer will be free of charge for the user. The objective is to decarbonise the last mile delivery and procurement by offering a cargo bike renting system accessible via an online platform.

2. Mobilising existing staff and local stakeholders:

The department of economic affairs has the lead in this project with additional involvement from the Mobility, Ecological, and Municipal Works Departments. In addition, ACAIE¹¹ is involved to promote the cargo bike use among its members.

3. Review existing strategy framework:

The LGD is in sync with the City of Esch's mobility plan (PLM2035) as well as with existing environmental policies, furthering the city's wider sustainability goals like reducing greenhouse gas emissions and collaborating with local businesses. It forms an integral part of the city's comprehensive sustainability strategy, rather than being a separate initiative.

¹¹ ACAIE: [Association of retailers, craftsmen and industrial companies of Esch-sur-Alzette](#)

4. Mobilising local partners:

A key stakeholder is “Transition Minett”, a local environmental non-profit organisation and long-term partner of the City of Esch providing multi-level advice to support the project’s implementation and promotion. ACAIE – the local federation of Esch’s businesses – also plays a significant role in the project’s rollout, informing and engaging their members.

Moovee, a regional digital service provider, will supply the necessary digital renting platform, enabling the department of economic affairs to analyse statistics that support future decisions of resource allocation.

The Department of Economic Affairs, in partnership with Le Centre d'Initiative et de Gestion Local (hereafter “CIGL”)¹², will develop a maintenance plan ensuring replacement of cargo bikes during repairs.

A 24/7 assistance service with the national automobile association Automobile Club of Luxembourg (hereafter “ACL”)¹³ will offer telephone support, on-site repairs, towing, and user repatriation. Insurance will cover bikes and cargo against theft, vandalism, and transport damage. A single contact point will address onboarding, training, and complaints.



¹² CIGL: <https://www.ciglesch.lu/>

¹³ ACL: <https://www.acl.lu/en/local-authorities/>

6.2 LGD financing

The project is financed exclusively by public funds provided by the City of Esch-sur-Alzette. Both Transition Minett and ACAIE will fund the project indirectly with the provision of manpower.

According to department of economic affairs, the procurement of cargo bikes and the shelter require a capital expenditure that accounts for €80,000 until end of September 2024. **This has been completed.**

This expenditure has already been approved in the summer 2024 by the Municipal Council and the procurement procedure has been executed accordingly.

The LGD is already in its implementation phase and **has been signed** by the mayor and **reflects now** the latest maintenance strategy of cargo bikes.

6.3 Make the deal

The first KPI will simply be the number of users (local businesses) of the cargo bike sharing system. Another meaningful KPI that will allow to monitor the progress of the LG are the usage rate of the cargo bikes that the city - primarily through its department of economic affairs - will calculate by tracking the number of cargo bike reservations done in the system. The system will also provide the number of kilometres covered by the cargo bikes, which will allow the city to calculate the CO2 emission savings.

Besides that, the city has adopted a staggered approach since the project is divided into two consecutive phases.

Phase 1 is exclusively destined to small retailers in the heart of city. The adoption rate of cargo bikes will be tested, and the user experience will be evaluated with a survey after 6 months. Based on the outcome, the city can conclude and may trigger the next phase.

Phase 2 has been designed for private shoppers who like to reduce their carbon footprint, practice light sport and contribute to an enhanced traffic situation in the heart of the city.

Meaningful KPI's are the usage rate of cargo bikes.

To anticipate possible usage limits due to repair needs, CIGL will elaborate a maintenance concept of cargo bikes and sufficient replacement by new bikes during the repair time.

In the event of a breakdown while using the cargo bike, we plan to set up an assistance service with the ACL, which includes telephone assistance, on-site repairs (if possible) or, if not, towing of the cargo bike either to the bike shelter or directly to the CIGL. This service also includes repatriation of the user and the cargo to their commercial space. The service is available 24 hours a day, 7 days a week.

Both the cargo bikes and the users' cargo will of course be covered by insurance (including theft, vandalism, transport damage, etc.). We will also be setting up a 'single point of contact' within the department of economic affairs for all concerns outside of the assistance by ACL ('onboarding', training, complaints management, etc.).

All in all, this LGD aims to have a sustainable impact in reducing the carbon footprint of retailers (using cargo bikes for last mile shipping), improving the traffic efficiency in the heart of the city and supporting hence national goals for mobility and sustainability.

A stakeholder mobilisation¹⁴ event was conducted on December 3, 2024, where nearly 90 retail players gathered for the 2nd edition of the "Meet@Esch – The Luxembourg Retail Networking Event," organised by the City of Esch. This assembly highlighted the Local Green Deal's focus on the cargo bike system initiative. Attendees, including local retailers and city officials, discussed innovative solutions to enhance sustainability in commerce. The testimonies from Esch shopkeepers and insights from Steven Van Belleghem, an expert in customer experience, further enriched the discussions. The successful turnout and engaging content of the event underscored the city's commitment to leading sustainable and inclusive development through Local Green Deals.

¹⁴ [Source 1 | LindedIn.com](#) [Source 2 | LindedIn.com](#)

6.4 Monitor progress and refine

6.4.1 Milestones and outlook

6.4.1.1 Milestones for Local Government:

- **Initial Planning and Approval:** Secure approvals and finalise plans for the cargo bike programme by the end of Q3/2024 (Done).
- **Program Launch:** Officially launch the cargo bike sharing system and announce participating businesses in Q2/2025 (May 2025).
- **First Review Meeting:** Conduct the first review meeting with all stakeholders to assess initial feedback and operational issues in Q1/2026.
- **Expansion Planning:** Evaluate the potential for expanding the programme to include public access in Q3/2026.
- **Annual Review:** Conduct an annual review at the end of the year to measure the impact and plan for future expansions or improvements.

6.4.1.2 Outlook for Local Government:

- **Program Expansion:** Depending on the success, consider expanding the cargo bike service to the public and additional business sectors.
- **Policy Integration:** Integrate findings from the program into broader transportation and environmental policies.

6.4.1.3 Milestones for Transition Minett:

- **Community Outreach Campaigns:** Launch a series of community engagement campaigns in Q2/2025 to promote the cargo bike initiative.
- **Feedback Collection:** Start collecting user feedback and suggestions for improvements in Q4/2025.
- **Impact Report:** Prepare an impact report detailing environmental and social benefits in Q1/2026.

6.4.1.4 Outlook for Transition Minett:

- **Enhanced Community Programmes:** Develop additional programmes based on the cargo bike initiative to promote broader sustainable transportation options.

6.4.1.5 Milestones for ACAIE:

- **Business Onboarding:** Facilitate the onboarding of businesses onto the cargo bike programme in Q2/2025.
- **Workshops for Businesses:** Organise workshops and training sessions for businesses on how to effectively use cargo bikes in Q2/2025.
- **Performance Evaluation:** Gather data and evaluate the cost savings and operational improvements for businesses in Q4/2025.

6.4.1.6 Outlook for ACAIE:

- **Broader Business Engagement:** Work to engage more businesses in the initiative and explore additional benefits such as promotional opportunities through sustainable practices.

7 LGD Partnership #4 – Facilitate e-mobility for citizens by increasing the level of charging stations for electric vehicles

7.1 Lay the ground for the LGD partnership

1. Building the case:

The population of Esch is expected to surpass 50,000 in the coming years. To meet these future challenges, the City of Esch adopted a new mobility plan (Plan Local Mobilité 2035) in April 2023. In addition to public transportation, this plan largely focuses on electric mobility for future daily transportation. In addition to constructing the requisite charging infrastructure, including combined public lighting and charging stations on the same poles, it will also be essential to inform citizens about the availability of these stations through the local Esch APP.

2. Mobilising existing staff and local stakeholders:

“Sudstrom” as local electricity provider and the public lighting department of the city of Esch have shown interest in a project of this nature and will be mobilised to implement it. Additionally, involvement from other departments such as mobility and municipal works is necessary. For integrating this project with the Esch app, collaboration with our IT department will also be required. The successful execution of an LGD depends on dedicated leadership, qualified personnel, adequate financial resources, and strong collaboration among the relevant departments to achieve a common goal.

However, there is currently an insufficient number of qualified personnel and dedicated leadership to effectively drive this LGD. Moreover, the collaboration between the concerned departments lacks the relational cohesion required for managing a complex and multi-stakeholder project over an extended period.

3. Review existing strategy framework:

The LGD aligns with the City of Esch's mobility plan (PLM2035) as well as with existing environmental policies, and it also supports the city's broader sustainability goals such as reducing greenhouse gas emissions. The LGD is not a standalone initiative but is integrated into the city's overall sustainability strategy.

4. Mobilising local external partners:

The city currently partners with the local electricity provider “Sudstrom”, a long-term partner of the City of Esch - who is actively supporting the project to help launch the project. Different departments of the city need to be mobilized (IT-, public lighting- and the municipal works department).

7.2 LGD financing

As a result, an insufficient number of qualified personnel and dedicated leadership to effectively drive this LGD, the local ICC team has focused on LGDs with a higher likelihood of successful execution. Consequently, no financial plan has been developed for this LGD to date.

7.3 Make the deal

By the time of the report submission, the mayor and the college of aldermen did not take a decision regarding the deployment of LGD 4, as well as the appointment of a civil servant to take on a leadership role in overseeing its implementation.



7.4 Monitor progress and refine

This schedule has been prepared and is ready for implementation as soon as the Mayor and the College of Aldermen will have appointed a civil servant to take on a leadership role in overseeing its implementation.

7.4.1 Milestones and outlook

7.4.1.1 Milestones for Local Government:

- **Policy Approval and Funding Allocation:** Secure the necessary approvals and allocate funding for the project by the end of **Q3/2025**.
- **Infrastructure Planning:** Complete the planning and zoning approvals for new charging station locations by the end of **Q4/2025**.
- **Public Launch Event:** Host a public launch event to announce the availability of new charging stations by the end of **Q4/2025**.
- **First Review and Adjustment:** Conduct the first performance review of the charging network and make any necessary adjustments by the end of **Q2/2026**.
- **Annual Assessment and Future Planning:** Review the year's progress and plan for future expansion or upgrades based on usage and technological advancements by the end of Year 1 (Q4/2026).

7.4.1.2 Outlook for Local Government:

- **Expansion of Network:** Plan to expand the charging station network to new residential and commercial areas based on demand.
- **Integration with Renewable Energy Sources:** Integrate more renewable energy sources into the network to power the charging stations.
- **Policy and Incentive Enhancement:** Evaluate and enhance policies and incentives to increase EV adoption among residents and businesses.

7.4.1.3 Milestones for Sudstroum:

- **Infrastructure Development:** Complete the installation of initial sets of charging stations by **Q4/2025**.
- **System Integration and Testing:** Ensure all charging stations are fully integrated with the local grid and the APP Esch for real-time status updates by **Q1/2026**.

- **Customer Engagement Campaigns:** Launch customer engagement campaigns to promote the use of the new charging stations by **Q1/2026**.

7.4.1.4 Outlook for Sudstrom:

- **Technological Upgrades:** Incorporate advanced charging technologies, such as fast charging and smart charging capabilities, as they become available.
- **Service Expansion:** Expand services to include maintenance and potentially the operation of charging stations for other municipalities or private entities.
- **Partnership Development:** Develop partnerships with automotive manufacturers and other businesses to offer promotional deals or co-branded services.

8 LGD Partnership #5 – New environmental criteria for the analysis grid of cultural projects

8.1 Lay the ground for the LGD partnership

1. Building the case:

Since 2018, an evaluation grid incorporating environmental and social criteria has been employed to assess cultural projects and large-scale events (e.g. Francofolies). In 2024, the selection process for financing cultural projects will be updated through specific “calls for proposals” based on defined themes, such as ecological awareness, well-being of populations, promotion of the Portuguese language, and literature. These themes will be established by the cultural governance committee for implementation in 2024. Furthermore, efforts will be made to enhance the selection criteria related to ecological and social transitions, focusing on the environment, corporate social responsibility, and inclusion.

2. Mobilising existing staff and local stakeholders:

The Department of Cultural Affairs will lead the project, involving cultural institutions like the Theatre, Library, Conservatory, [frEsch asbl](#), [Kulturfabrik asbl](#), as well as the Ecological Department and local associations such as Transition Minett. “Think green first” awareness seminars will guide all participants throughout the event's lifecycle.

3. Review existing strategy framework:

The LGD aligns with the City of Esch's cultural strategy [[connexions2](#)] as well as with existing environmental policies, and it also supports the city's broader sustainability goals such as reducing greenhouse gas emissions. The LGD is not a standalone initiative but is integrated into the city's overall sustainability strategy.

4. Mobilising local partners:

Several local, regional and national organisations as “Transition Minett”, “[Oekozen](#)”, “[Superdreckschescht](#)” and “[Theater Federatioun](#)” will actively participate in the formulation of the new criteria. The calls will be addressed to all local associations and creatives.

8.2 LGD financing

The estimated budget of communication accounts for €29,500 and encompasses the organisation of a stakeholder mobilisation event on May 2nd, 2024, at the [Kulturfabrik asbl](#).

In addition, the realisation of events related to this LGD has been organised by the Department of Cultural Affairs, which is funding at 100% all performed activities until 2024 and 2025.

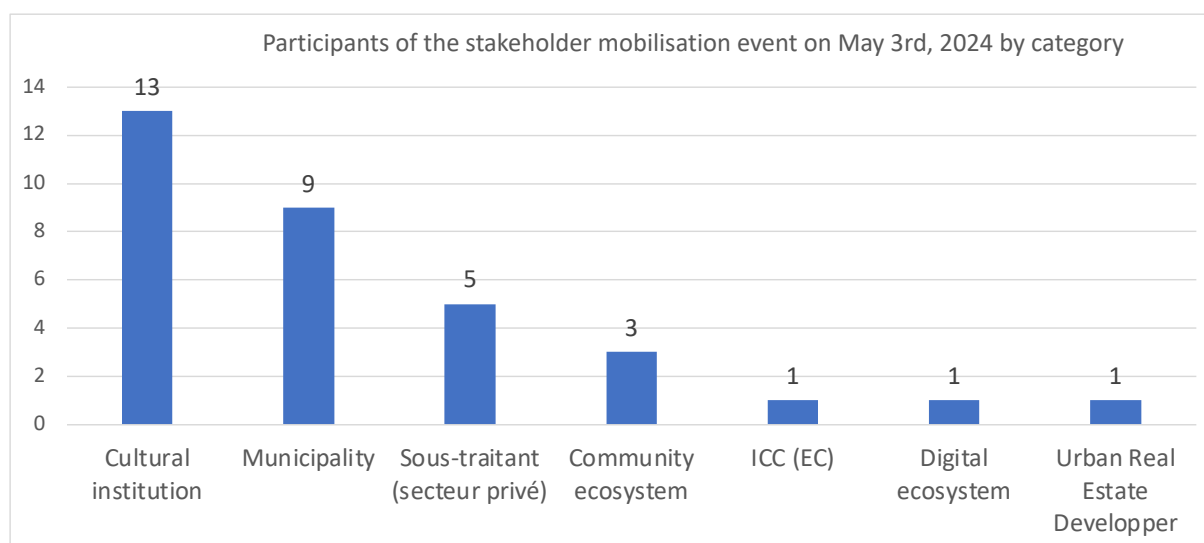


8.3 Make the deal

The first ICC stakeholder mobilisation event that took place the 2nd of May at the Kufa (Kulturafabrik asbl) was able to attract 33 persons.

This event was organised foremost to create a positive dynamic to kick off the ICC spirit in creating green deals to manage the double transition, composed of digitalisation and climate change.

During the event, a lot of creative ideas were born and linked to culture and ecology.



The pursued impact of the LGD is to reduce the environmental impact of cultural events. The most prominent KPIs are percentage reduction of waste, water and wastewater consumption by visitor versus the measured base line.

8.4 Monitor progress and refine

Due to the long-term absence of the Director who is managing Cultural Affairs, all projects and initiatives related to culture need to be postponed. An external consultant needs hence to be appointed to ensure monitoring of this LGD.

8.4.1 Milestones and outlook

8.4.1.1 Milestones for Local Government:

- **Development and Approval of Criteria:** Finalise and approve the new environmental criteria for cultural projects by the end of Q3/2024.
- **Training and Workshops:** Organise workshops for cultural institutions and artists to understand and implement the new criteria starting in Q3/2024.
- **First Call for Proposals:** Launch the first call for proposals using the new criteria in Q3/2024.
- **Evaluation of Initial Projects:** Conduct an evaluation of the projects submitted under the new criteria by the end of Q2/2025.
- **Annual Review:** Host an annual review meeting to assess the impact and refine the criteria based on feedback from stakeholders by the end of Year.

8.4.1.2 Outlook for Local Government:

- **Expansion of Criteria:** Consider expanding the criteria to include additional sustainability aspects based on the initial outcomes and stakeholder feedback.
- **Broader Policy Integration:** Integrate the lessons learned and successful practices from this initiative into other cultural and community development policies as well as public procurement for other departments too.

8.4.1.3 Milestones for Cultural Institutions and Artists:

- **Adoption of New Practices:** Begin integrating the new sustainability criteria into project planning and execution as soon as they are finalised in Q3/2024.
- **Submission of Projects:** Submit projects for the first call for proposals in Q3/2024.

- **Participation in Feedback Sessions:** Engage in feedback sessions to share experiences and suggestions for improving the criteria in 2025.

8.4.1.4 Outlook for Cultural Institutions and Artists:

- **Continuous Improvement:** Continually adapt and improve sustainability practices in cultural projects, incorporating innovative materials and work methods.
- **Leadership and Advocacy:** Become leaders and advocates for sustainability in the cultural sector, inspiring others and promoting broader change.

9 LGD Partnership #6 – Cultural Artificial Intelligence – Return of Experience from a Future Generation

9.1 Lay the ground for the LGD partnership

1. Building the case:

A call for proposals in digital arts will be launched for young people aged 12 to 25. The objective of this project is to raise young people's awareness of the risks linked with artificial intelligence and the environmental impact of digitalisation, while also fostering their creative use of AI. Prizes will be awarded across various age categories.

2. Mobilising existing staff and local stakeholders:

The department of Cultural Affairs will spearhead this project. The coordinator of the new [Elektron digital platform](#) for art, science and culture in Esch-sur-Alzette along with local technology scene experts, teachers, students, and parent associations from Esch's secondary schools, will be actively involved as well.

3. Review existing strategy framework:

The LGD is in alignment with the City of Esch's cultural strategy and existing national digitalization policies and ethical regulations of the new European AI Act.

4. Mobilising external stakeholders:

Key participants such as local high school directors, teachers, students, youth and education departments, parent-teacher associations, artists, and experts from the local technological community will collaborate on this project. In addition, there are plans to integrate [42 Luxembourg campus](#), a two-part education program aiming at developing technical and interpersonal skills and preparing for the expectations of the labour market and a digital career.

9.2 LGD financing

Due to the long-term absence of the Director who is managing Cultural Affairs, all projects and initiatives related to culture need to be postponed.

A new Director has been appointed who is currently (May 2025) studying the city report and defines her future role.

Henceforth the budget planned to plan and execute this LGD has not yet been defined.

9.3 Make the deal

The newly appointed director will propose until June 2025 the mayor and the college of aldermen if and how to pursue LGD 6.

9.4 Monitor progress and refine

This schedule has been prepared and is ready for implementation as soon as the Mayor and the College of Aldermen will have appointed a civil servant to take on a leadership role in overseeing its implementation.

9.4.1 Milestones and outlook

9.4.1.1 Milestones for Local Government:

- **Policy Framework Development:** Establish a supportive policy framework for integrating AI, coding and digital literacy into the educational system by Q1 of the implementation year.
- **Partnership Training:** Formalise partnerships with educational institutions, tech companies, and cultural institutions by the end of Q2/2026.
- **Program Launch:** Officially launch the educational program and initiate the first series of workshops and seminars by Q3/2026.
- **Mid-term Review:** Conduct a mid-term review to assess the initial impact and gather feedback from participants by Q4/2026.
- **Annual Evaluation and Adjustment:** Evaluate the year's progress and outline improvements or expansions for the program by the end of Year 1.

9.4.1.2 Outlook for Local Government:

- **Expansion of Program Scope:** Based on the success of initial implementations, consider expanding the program to include more schools and different age groups.
- **Increased Funding and Support:** Secure additional funding and resources to enhance the programme's reach and depth, potentially incorporating more advanced technologies and methodologies.

9.4.1.3 Milestones for Educational Institutions:

- **Curriculum Integration:** Integrate AI and sustainability themes into the curriculum by the start of the academic year in Q3 of the implementation year.
- **Teacher Training:** Complete training for teachers on the new curriculum and tools by the end of Q2.

- **Student Projects and Competitions:** Launch student projects and competitions related to AI, coding and sustainability by Q4.

9.4.1.4 Outlook for Educational Institutions:

- **Continuous Professional Development:** Offer ongoing professional development for teachers to keep up with advancements in AI, coding and digital arts.
- **Broader Educational Impact:** Evaluate and showcase the broader impacts of AI education on student outcomes, including creativity, critical thinking, ethical understanding and unbiased decision-making.

9.4.1.5 Milestones for Tech Companies and Cultural Institutions:

- **Development of Educational Content:** Develop and deliver the first set of digital arts and AI content for the programme by Q2 in the roll-out year.
- **Technology Access and Deployment:** Ensure that all participating schools have access to necessary technology by Q3.
- **Feedback and Iteration:** Collect feedback on the content and technology used and make necessary adjustments by Q4.

9.4.1.6 Outlook for Tech Companies and Cultural Institutions:

- **Innovation and Improvement:** Continue to innovate and improve the educational content and technologies based on feedback and emerging trends.
- **Expansion of Partnerships:** Extend partnerships to other cultural and educational sectors to broaden the impact and application of their technologies and methodologies.

10 LGD Partnership #7 – Building carports including EV charging infrastructure and generation of solar power

10.1 Lay the ground for the LGD partnership

1. Building the case:

Esch-sur-Alzette, second largest city in Luxembourg with over 37,000 inhabitants, is marked by an ongoing transformation from a former industrial city into a modern, multicultural, university and knowledge-based economy city. With an existing but growing renewable energy production within the city's boundaries, the decarbonisation of the mobility sector is also crucial to achieve climate neutrality goals by 2050.

In this LGD we need to define goals for the following target items:

- Solar panels on carports in public space
- At least 2 EV charging points per Carport (over 22kWp installed PV)

2. Mobilising existing staff and local stakeholders:

"Sudstrom", as a local electricity provider, has expressed interest in a project of this nature and is appointed to implement it. The ecological department of the City of Esch is involved in the project, primarily to provide guidance and oversee its implementation. Additionally, other departments such as mobility and municipal works also need engage in the project.

3. Review existing strategy framework:

The LGD is in alignment with the City of Esch's work program concerning "Climate Pact 2.0" as well as with existing environmental policies and decarbonisation strategies. It contributes to the city's wider sustainability objectives, including the reduction of greenhouse gas emissions. The LGD is not an isolated initiative but is integrated into the city's overarching sustainability strategy for renewable energy production and mobility decarbonisation.

4. Mobilising external partners:

The city currently partners with the local electricity provider "Sudstrom", owned by the City of Esch - who is actively supporting the project by helping to launch the project. "Sudstrom" will install at least a capacity of 630kWp to 880kWp PV solar on carports with at least 16-18 EV Charging stations.

10.2 LGD financing

"Sudstrom" has a funding requirement of €1.97 millions to €2.65 millions until December 2026.

This budget needs to be validated by the advisory board of "Sudstrom". **The date of validation has not yet been defined.**

10.3 Make the deal

The city, primarily through its ecological department, will monitor the LGD's progress by tracking the installed PV capacity to ensure it meets its goals. In addition, it is key to estimate the future workforce needed to maintain the PV installations and its related smart meters.

In this respect, the city, as sole shareholder of "Sudstrom", should invite the HR director to build a recruitment and training strategy (reskilling and upskilling) to cater for the likely, rise of maintenance needs in the future.

Meaningful KPI's are the installed PV capacity as well as the installed number of EV charging stations.

All in all, this LGD aims to have a sustainable impact in reducing the carbon footprint of energy users, supporting hence national goals for renewable energy transition and sustainability.

10.4 Monitor progress and refine

10.4.1 Milestones and outlook

10.4.1.1 *Milestones for Local Government:*

- **Policy Development and Approval:** Finalise and approve PV carports and EV charging stations and regulations by Q3 of the implementation year **2025**. Sudstroum is currently developing a roadmap and preparing a public tender scheduled for release in October-November
- **Launch of the Initiative:** Officially launch PV Carport deployment program in Q1 **2026**, including public announcements and an informational campaign.
- **Stakeholder Engagement Forums:** Schedule bi-annual meetings between the city's departments and "Sudstroum" to gather feedback and discuss progress with stakeholders starting Q4/**2025**.
- **First Evaluation and Report:** Generate the first annual report by the end of Q4/**2026**, detailing the program's impact on energy savings and emissions reductions.
- **Program Expansion Discussion:** Review initial results and potential program adjustments or expansions by the end of Year 1.

10.4.1.2 *Outlook for Local Government:*

- **Increase Program Scope:** Depending on the success of the initial phase, consider expanding the programme and possibly integrating further solar energy generation solutions by Year 2.

10.4.1.3 *Milestones for Sudstroum:*

- **Infrastructure Readiness:** Complete the necessary infrastructure analysis and upgrades for supporting PV Carport energy production and EV Charging infrastructure.
- **Customer Onboarding:** Achieve a target number of installed PV power generation on carports and a target number of EV charging stations by Q4/2026.
- **Performance Reporting:** Provide comprehensive performance data on installed PV carport capacity and EV charging stations by Q4/2026.

10.4.1.4 *Outlook for Sudstroum:*

- **Technological Advancements:** Integrate newer, more efficient PV modules.
- **Expand Market Reach:** Extend services to commercial buildings and industrial facilities based on the program's success.

11 LGD Partnership #8 – Deploying micro, grid connected, PV (balcony PV 400Wp-900Wp)

11.1 Lay the ground for the LGD partnership

1. Building the case:

Esch-sur-Alzette, second largest city in Luxembourg with over 37,000 inhabitants, is marked by an ongoing transformation from a former industrial city into a modern multicultural, university and knowledge-inspired city. Due to the structure of the city, with a lot of apartments where the installation of PV on roofs is not so easy to achieve, the city of Esch and Sudstroum decided to implement a micro-PV (balcony PV for internal consumption) project to help inhabitants with reducing their own electricity bill due to internal consumption. An existing but growing renewable energy production within the city's boundaries is also crucial to achieve climate neutrality goals by 2050.

This Local Green Deal (LGD) also has a social dimension, as many residents of Esch live in apartments and generally do not have access to rooftop photovoltaic (PV) installations. Implementing such installations in co-owned properties requires a democratic majority, which can be challenging to obtain. Additionally, roof surfaces are often limited due to static load constraints and space required for PV installations. A balcony PV system, however, presents a simple and efficient solution to reduce individual electricity bills, as nearly all the electricity generated by such systems is self-consumed.

In this LGD we need to define goals for the following target item:

- Micro PV (balcony PV) deployed

2. Mobilising existing staff and local stakeholders:

“Sudstroum”, as a local electricity provider, has expressed interest in a project of this nature and has been appointed to implement it. The ecological department of the City of Esch is involved in the project, primarily to provide guidance and oversee its implementation. Additionally, other departments such as social office also need to be engaged in the project.

3. Review existing strategy framework:

The LGD is in alignment with the City of Esch's work program concerning "[Climate Pact 2.0](#)" as well as with existing environmental policies and decarbonisation strategies. It contributes to the city's wider sustainability objectives, including the reduction of greenhouse gas emissions. The LGD is not an isolated initiative but is integrated into the city's overarching sustainability strategy for renewable energy production and mobility decarbonisation.

4. Mobilising external partners:

The city is currently collaborating with its long-term partner, the local electricity provider "Sudstrom," which is actively supporting the project by assisting with its launch. In phase 1, "Sudstrom" will install between 250 and 500 micro-PV installations (400Wp-900Wp), consisting of a maximum of 500 PV panels. Should the project prove successful, Sudstrom has committed to implementing a phase 2, which will involve the installation of an additional 500 PV panels (250-500 micro-PV installations).



11.2 LGD financing

“Sudstrom” has a funding requirement of €330,000 until December 2026 for phase 1 and €330,000 for phase 2 beginning 2027.

The end consumer who will get the micro-PV installed needs to cover only €200 of the costs of the installation. The total costs for 250 – 500 installations are situated between €50,000 and €10,000.

This budget needs to be validated by the advisory board of “Sudstrom”. The date of validation has been defined (20th of June 2025) where the budget of the LGD will be presented.

11.3 Make the deal

The planned LGD 8 project—Micro-PV systems for internal consumption—has not yet been signed. The originally proposed project structure proved unfeasible, as Sudstroum, designated as the financial project leader, was ineligible to receive national funding. This is because national subsidies may only be granted to public entities; private companies are excluded from eligibility.

Consequently, the project setup must be revised. The City of Esch-sur-Alzette will assume the role of financial project leader, thereby meeting the eligibility criteria for national funding. The substantive scope and technical content of the project remain unchanged. However, financial contributions will now originate from the City of Esch-sur-Alzette, while Sudstroum will retain responsibility for the administrative and technical implementation of the LGD.

The City is currently awaiting confirmation of national funding approval. Concurrently, it is in the process of drafting a contractual agreement with Sudstroum. Once these elements are finalised, the project and its associated funding will be submitted to the City Council for formal approval.

The city, primarily through its ecological department, will monitor the LGD's progress by tracking the installed Micro PV panels to ensure it meets its goals.

Meaningful KPI's are the installed micro-PV panels as well as the installed number micro-PV power plants.

All in all, this LGD aims to have a sustainable impact in reducing the carbon footprint of energy users, supporting hence national goals for renewable energy transition and sustainability.

11.4 Monitor progress and refine

11.4.1 Milestones and outlook

11.4.1.1 *Milestones for Local Government:*

- **Policy Development and Approval:** Finalise and approve micro-PV and regulations by Q2 of the implementation year 2025.
- **Launch of the Initiative:** Officially launch micro-PV deployment program in Q1/2025, including public announcements and an informational campaign.
- **Stakeholder Engagement Forums:** Schedule bi-annual meetings between the city's departments and "Sudstroum" to gather feedback and discuss progress with stakeholders starting Q4/2025.
- **First Evaluation and Report:** Generate the first annual report by the end of Q4/2025, detailing the program's impact on energy savings and emissions reductions.
- **Program Expansion Discussion:** Review initial results and potential program adjustments or expansions by the end of Year 2 (Phase 2).

11.4.1.2 *Outlook for Local Government:*

- **Increase Program Scope:** Depending on the success of the initial phase, consider expanding the programme and possibly integrating further solar energy generation solutions by Year 2.

11.4.1.3 *Milestones for Sudstroum:*

- **Infrastructure Readiness:** Complete the necessary analysis and chose the appropriated products and workforce to deploy the LGD.
- **Customer Onboarding:** Achieve a target number of installed micro-PV power plants by Q4/2026.
- **Performance Reporting:** Provide comprehensive performance data on installed micro-PV power plants by Q4/2026.

11.4.1.4 *Outlook for Sudstroum:*

- **Technological Advancements:** Integrate newer, more efficient PV modules and inverters.
- **Expand Market Reach:** Extend services to a second phase based on the program's success

12 LGD Partnership #9 – Photovoltaic Solar Plant Train Moyen Belval (TMB) in ArcelorMittal plant of Belval

12.1 Lay the ground for the LGD partnership

1. Building the case:

The proposed Local Green Deal (LGD) between the City of Esch-sur-Alzette and ArcelorMittal is centred around the installation of a photovoltaic (PV) solar plant at the ArcelorMittal steel plant in Esch-Belval. This initiative is designed to significantly contribute to the local production of renewable energy, aligning with the city's climate action and decarbonisation strategies. By leveraging the still-active industrial site, the project aims to reduce carbon emissions and demonstrate the potential for large-scale renewable energy integration within heavy industry sectors.

2. Mobilising existing staff and local stakeholders:

The successful implementation of this LGD requires active involvement and coordination among various city departments and ArcelorMittal's project team. The city's Environmental Department will take a leading role in overseeing the project, ensuring that it aligns with local sustainability policies and regulations. Regular coordination meetings will be scheduled to facilitate communication and resolve any implementation challenges swiftly. Additionally, the city will engage local stakeholders through public consultations to foster community support and transparency.

3. Review existing strategy framework:

This LGD supports and is integrated within the broader framework of Esch-sur-Alzette's Climate Pact 2.0 and the city's decarbonisation strategy. The installation of the PV plant not only accelerates the transition towards renewable energy but also supports the city's target of achieving climate neutrality by 2050. The project is in line with ongoing efforts to enhance energy independence and sustainability, thus reinforcing the city's commitment to innovative and responsible environmental management.

4. Mobilising external partners:

The partnership for this LGD includes ArcelorMittal and TotalEnergies, under a Power Purchasing Agreement (hereafter “PPA”) for the installation and operation of the PV solar plant. ArcelorMittal brings technical expertise and financial investment to the project, ensuring the plant's successful deployment and integration into their existing operations. TotalEnergies, as a key partner, will provide the necessary technology and operational management for the PV system. The collaboration between these external partners and the City of Esch-sur-Alzette exemplifies a strong public-private partnership model aimed at fostering sustainable industrial practices.

12.2 LGD financing

The financing for the photovoltaic solar plant project under LGD primarily involves private investments facilitated through a PPA between ArcelorMittal and TotalEnergies

Cost Estimation: Due to the nature of the PPA, detailed public cost disclosures are not available. However, the City of Esch-sur-Alzette estimates that the investment by ArcelorMittal in this project exceeds €1.5 million.

Funding Sources: The project is financed through private funds, with ArcelorMittal and TotalEnergies bearing the financial responsibilities according to their roles in the PPA. The city's role involves oversight and facilitation, requiring minimal public expenditure primarily directed towards coordination and support, estimated at around €10,000 until Q4/2026.

12.3 Make the deal

The LGD partnership between ArcelorMittal, TotalEnergies, and the City of Esch-sur-Alzette revolves around the installation of a photovoltaic solar plant at the ArcelorMittal facility in Esch-Belval. ArcelorMittal will coordinate with TotalEnergies under a PPA to install and maintain the solar plant. The City of Esch-sur-Alzette plays a facilitating role, ensuring the project aligns with local environmental policies and sustainability goals.

KPIs:

- **Electricity Production:** Target of 2.3 GWh/year from the solar plant.
- **CO2 Reduction:** Expected reduction of 900 tonnes of CO2 emissions annually.
- **Implementation Milestones:** Installation completion by Q3/2025, with initial operation and first comprehensive report due by Q4/2025 – Q1/2026.

It is important to note that ArcelorMittal does not have an explicitly established baseline for current CO2 emissions, which could complicate the measurement of future improvements resulting from the installation of the photovoltaic solar plant. This lack of baseline data presents a challenge in quantifying the precise impact of the initiative on the company's overall carbon footprint reduction efforts.

12.4 Monitor progress and refine

12.4.1 Milestones and outlook

12.4.1.1 *Milestones for Local Government:*

- **Initial Setup and Launch:** Formal announcement of the initiative, targeted **Q2/2025**.
- **Stakeholder Engagement Forums:** Organise regular exchanges between City of Esch and ArcelorMittal to ensure ongoing dialogue.
- **First Report Publication:** Release the first comprehensive report by Q4/2025 - Q1/2026.

12.4.1.2 *Milestones for ArcelorMittal:*

- **Implementation of New Technologies:** Complete installation of all the equipment by Q4/2025.
- **First Report Publication:** Release the first comprehensive report by Q4/2025- Q1/2026

12.4.1.3 *Outlook for ArcelorMittal:*

- **Raise Ambition:** Depending on the success of initial efforts, consider new available, non-production, areas for PV-powerplants on different production sites.
- **Corporate Sustainability Initiatives:** Integrate the findings and technologies from this LGD into broader corporate sustainability strategies and possibly roll them out to other facilities globally.

13 LGD Partnership #10 – White slag building in ArcelorMittal plant of Belval and communication with city of Esch-sur-Alzette

13.1 Lay the ground for the LGD partnership

1. Building the case:

The proposed Local Green Deal (LGD) between the City of Esch-sur-Alzette and ArcelorMittal is centred around the innovative management of white slag, a byproduct of the steel manufacturing process at the ArcelorMittal plant in Belval. This project aims to construct a dedicated hall around the white slag pit to effectively manage and reduce dust emissions. By controlling these emissions, the initiative seeks to minimise environmental impacts, particularly air quality degradation in surrounding neighbourhoods, thereby aligning with Esch-sur-Alzette's broader sustainability and air quality improvement strategies.

2. Mobilising existing staff and local stakeholders:

For effective implementation, the city's Ecology Department will collaborate closely with ArcelorMittal's operational and environmental teams. This partnership will ensure ongoing compliance with national environmental regulations and facilitate the integration of the project into the city's sustainability framework. The city will also engage local community groups, particularly those in neighbourhoods adjacent to the plant, to maintain transparency and address community concerns related to industrial operations.

3. Review existing strategy framework:

This LGD directly supports and enhances Esch-sur-Alzette's environmental strategies aimed at reducing industrial emissions and improving local air quality. It complements existing measures under the city's Climate Pact 2.0 by introducing targeted actions to manage industrial byproducts more sustainably. This initiative will serve as a benchmark for integrating industrial environmental management practices within urban sustainability policies.

4. Mobilising external partners:

ArcelorMittal will take the lead on the technical and construction aspects of the hall around the white slag pit, investing €700,000 in the infrastructure. The partnership will also involve local environmental experts and potentially other industrial partners to explore innovative dust management technologies. Regular bi-annual meetings will be scheduled with all stakeholders, including community representatives, to ensure the project's alignment with community needs and environmental goals.

13.2 LGD financing

The financing for the white slag management project under LGD 10 involves a significant investment from ArcelorMittal, highlighting the private sector's commitment to sustainable industrial practices and environmental stewardship.

Cost Estimation:

ArcelorMittal: Commits €700,000 for the construction of the hall around the white slag pit. This investment covers all costs associated with the project's implementation, including design, construction, and installation of dust control systems.

Funding Sources:

The project is entirely funded by ArcelorMittal through private investment. This approach reflects ArcelorMittal's dedication to enhancing its operations in alignment with corporate social responsibility goals and reducing environmental impacts.

City of Esch-sur-Alzette:

The city's financial involvement is minimal, focusing primarily on coordination and support, estimated at €4,000.

13.3 Make the deal

The Local Green Deal (LGD) between ArcelorMittal and the City of Esch-sur-Alzette focuses on the construction of an enclosure around the white slag pit at ArcelorMittal's Belval plant. This initiative is designed to significantly reduce dust emissions, a key source of local air pollution. ArcelorMittal is responsible for the design, funding, and construction of the hall, while the City of Esch-sur-Alzette oversees regulatory compliance and community engagement.

KPIs:

- **Reduction of Dust Emissions:** Achieve a measurable decrease in particulate matter emissions from the slag handling process.
- **Community Complaints:** Monitor and aim to reduce complaints related to dust from the neighbourhood.

ArcelorMittal has not established an explicit baseline for current dust emissions at the Belval plant, nor have they included quantified metrics for environmental impacts such as specific particulate matter sizes or target levels. This omission makes it challenging to measure the precise effectiveness of the new dust control measures in improving local air quality and assessing their environmental impact.

13.4 Monitor progress and refine

13.4.1 Milestones and outlook

13.4.1.1 *Milestones for Local Government:*

- **Initial Setup and Launch:** Formal announcement of the initiative, targeted for Q1/2025.
- **Stakeholder Engagement Forums:** Organise regular exchanges between City of Esch and ArcelorMittal to ensure ongoing dialogue.
- **First Report Publication:** Release the first comprehensive report by Q4/2025 - Q1/2026.

13.4.1.2 *Outlook for Local Government:*

- **Expansion of Monitoring:** The city of Esch is historical monitoring the impact of the heavy industry on air quality and wants to increase this monitoring
- **Increased Community Involvement:** as the dust emissions have a direct impact on the living quality of the surrounding neighbourhoods, the city of Esch is aware that it is crucial to involve the neighbourhoods' associations in the information process to keep them informed about the project and the achieved results.

13.4.1.3 *Milestones for ArcelorMittal:*

- **Implementation of New Technologies:** Complete installation of upgraded emission control technologies by H1/2025.

13.4.1.4 *Outlook for ArcelorMittal:*

- **Raise Ambition:** Depending on the success of initial efforts, consider new implementations on other sites
- **Corporate Sustainability Initiatives:** Integrate the findings and technologies from this LGD into broader corporate sustainability strategies and possibly roll them out to other facilities globally.

14 Conclusion

Esch-sur-Alzette's journey towards sustainable development through its Local Green Deals (LGDs) has been marked by a commitment to innovation, environmental stewardship, and community involvement.

14.1 Governance

The governance structure established for the LGDs in Esch-sur-Alzette has been pivotal in fostering collaboration across sectors. The city's leadership, notably through the Mayor and Aldermen, provided strategic oversight while local and regional entities like ACAIE and "Transition Minett" offered technical and community expertise. The multi-disciplinary steering group, composed of representatives from different sectors, ensured that decision-making was not only inclusive but also aligned with the city's long-term sustainability goals. Regular updates and transparent communication helped maintain the trust of all stakeholders involved, from local businesses to citizens.



14.1.1 Lessons Learnt

A decentralised yet coordinated governance structure was essential for success. The inclusion of varied expertise allowed for a nuanced approach to each LGD, ensuring that technical, community, and environmental considerations were balanced. However, the complexity of managing multi-stakeholder projects requires ongoing effort to maintain strong inter-departmental collaboration, especially when addressing cross-cutting themes like sustainability and digitalisation. Moreover, reliance on key individuals can pose significant challenges. Instances where essential personnel, such as the Director of Cultural Affairs, are unavailable due to serious illness can lead to project delays and operational bottlenecks. This underscores the necessity of implementing robust contingency plans and fostering knowledge sharing among team members to ensure continuity. Distributing responsibilities more evenly can mitigate the risks associated with unexpected absences and maintain project momentum.

14.1.2 Next Steps

Future governance structures should focus on enhancing the decision-making processes with more agile feedback mechanisms. Establishing dedicated leadership for each LGD, with clearly defined roles, will help in streamlining communication and accountability.

14.2 Integrated Goals

The city's approach to integrating its goals was comprehensive, ensuring that LGDs aligned with broader strategic frameworks such as the Resilience Plan, the Local Mobility Plan 2035, and the Climate Pact 2.0. These synergies between local policies and LGDs created a cohesive vision for Esch's green transition. By embedding LGDs within the existing sustainability strategies, the city ensured that the goals of reducing greenhouse gas emissions, promoting energy efficiency, and fostering community engagement were all pursued simultaneously.

14.2.1 Lessons Learnt

The integrated approach proved effective in creating alignment between short-term actions and long-term goals. However, balancing the ambitions of multiple plans required continuous refinement to address gaps and potential trade-offs, particularly in areas like energy strategy and mobility.

14.2.2 Next Steps

Moving forward, the city should focus on further aligning LGDs with emerging national and EU-wide frameworks, particularly around decarbonisation and digitalisation. This will ensure that local efforts are reinforced by broader policy support and funding opportunities.

14.3 Action

Esch-sur-Alzette adopted a pragmatic and staggered approach to implementing its LGDs, which were built around measurable actions such as AI-powered environmental monitoring, the deployment of heat pumps, and the establishment of a cargo-bike sharing system. These actions will be supported by public-private partnerships and real-time data collection to monitor progress. The incremental approach, including testing concepts like the cargo-bike system with businesses before expanding to citizens, will allow the city to adapt and refine initiatives as needed.

14.3.1 Lessons Learnt

Implementing LGDs in manageable phases allowed for better oversight and risk management. Piloting smaller initiatives first helped to gauge feasibility and stakeholder buy-in before scaling up. However, some projects, like expanding the e-mobility infrastructure, faced challenges due to insufficient leadership, technical capabilities.

14.3.2 Next Steps:

The city should continue its phased approach but must ensure that adequate technical capabilities and leadership are in place from the start of each LGD. Moreover, ensuring that all LGDs are equipped with robust monitoring systems will be crucial for assessing their real-time impact and making necessary adjustments.

14.4 Partnerships

Partnerships were a cornerstone of the LGD journey in Esch-sur-Alzette. Collaboration between the city, private companies like ArcelorMittal, Sudstroum, academic institutions, and community organisations (Transition Minett) helped to leverage diverse expertise and resources. Public-private partnerships, particularly in areas like energy efficiency and e-mobility, were crucial for scaling efforts and ensuring sustainable impact. Citizen involvement, especially through platforms like the APP Esch, fostered a sense of ownership and engagement in the city's green transition.

The partnerships outlined in LGD present risks due to the lack of established baselines for CO₂ and dust emissions, as well as the absence of quantified environmental impact metrics. This limitation primarily restricts the ability to measure and verify the effectiveness of the initiatives, making it challenging to determine whether specific sustainability goals have been achieved.

14.4.1 Lessons Learnt:

Strong partnerships allowed Esch to mobilise a range of resources and expertise. Some LGDs were built on existing partnerships, leveraging established relationships and trust, while others triggered new partnerships, fostering fresh collaborations and opportunities. The success of these partnerships depended on clear communication and shared goals. Engaging local businesses and citizens in the early stages of LGD planning also proved essential for securing long-term commitment and adapting initiatives to local needs.

14.4.2 Next Steps:

Future LGD efforts should focus on expanding partnerships with national (PRO-SUD) and international stakeholders (ICC core cities, twinned cities like Turino, Cologne, Lille, Liège, Turino, Rotterdam) particularly around emerging fields like AI and digital sustainability. Strengthening citizen engagement platforms, such as expanding the functionality of the APP Esch, will also help to deepen community involvement and ensure that LGDs remain responsive to local priorities.

Moving forward, more commitment and a stronger sense of corporate responsibility are essential. ArcelorMittal and the City of Esch-sur-Alzette need to develop more robust methodologies for setting and tracking environmental performance to ensure that these partnerships lead to tangible and verifiable improvements in sustainability practices.

14.5 Conclusion

Esch-sur-Alzette's Local Green Deal journey has demonstrated the power of coordinated governance, strategic alignment, and collaborative action. The city's approach, based on phased implementation and strong partnerships, has allowed it to make significant strides towards achieving its sustainability goals. However, as the city moves into the next phase of its green transition, continued focus on leadership, technical capacity, and citizen engagement will be key to maintaining momentum.

Looking ahead, Esch-sur-Alzette is well-positioned to expand its LGDs, particularly in areas like decarbonisation, sustainable mobility, and digital innovation. By continuing to refine its governance structures, align its goals with broader frameworks, and deepen its partnerships, the city can ensure that its Local Green Deals not only meet today's challenges but also lay the foundation for a sustainable future.