lux airport

ROADMAP TO

NET ZERO 2030

NET ZERO

NET ZERO STRATEGY

NET ZERO BY	AIRPORTS ENGAGED	PILLARS
2030	>90	5

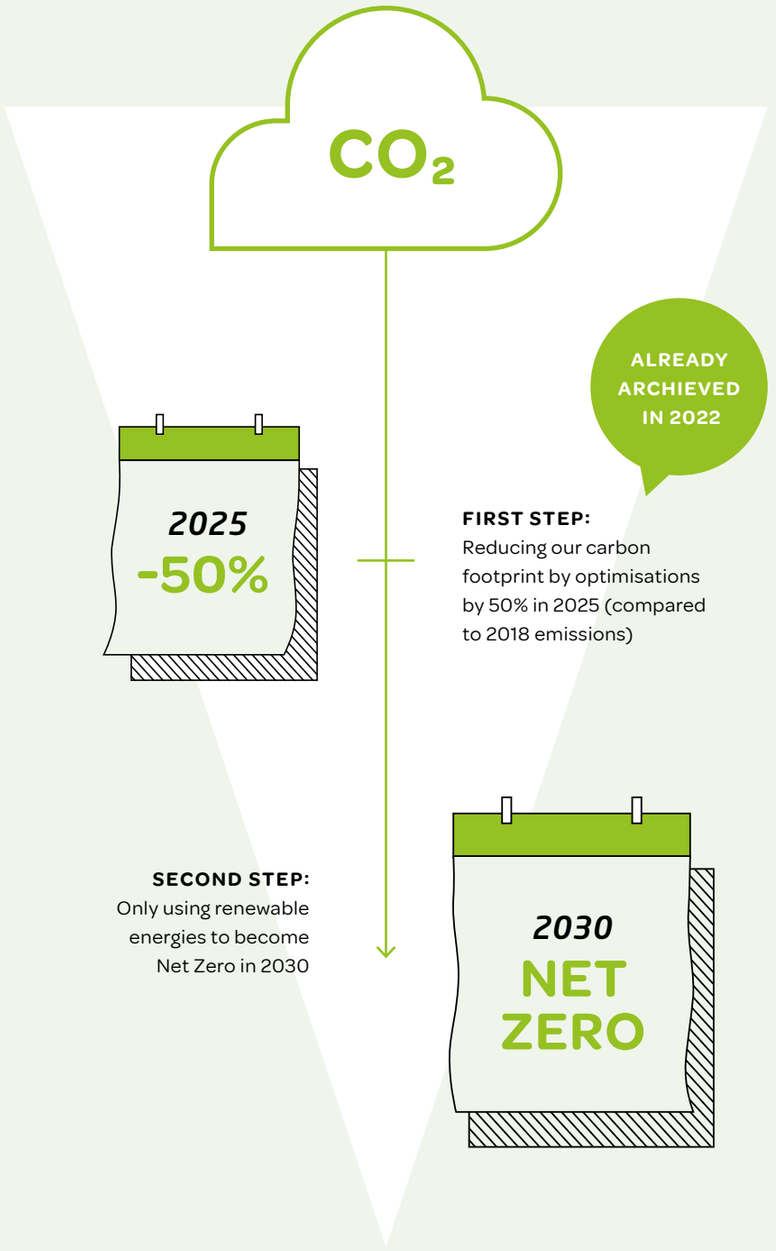
COMMITTING TO NET ZERO BY 2030

LUX-AIRPORT IS ONE OF ALMOST 100 AIRPORTS THAT HAVE COMMITTED TO ACHIEVING NET ZERO, ABSOLUTE CARBON NEUTRALITY, BY 2030.

In order to avoid the most acute repercussions of Climate Change, our civilization needs to reach "Net Zero carbon emissions" by 2050 at the latest. Net Zero in the definition proposed by the International Panel on Climate Change (IPCC) is that state "when anthropogenic CO_2 emissions are balanced globally by anthropogenic CO_2 removals over a specified period."

In other words, to achieve this we either need to stop producing new CO_2 or compensate for any emissions by removing existing emissions from the Earth's atmosphere.

OUR GOALS:



European countries where one or more airports are commited to Net Zero by 2030.

IN GOOD COMPANY: EUROPEAN AIRPORTS ARE PULLING TOGETHER

Airports have bold ambitions on their path to carbon neutraility, with experience in carbon management dating back over a decade. In their landmark Resolution adopted in June 2019, they committed to Net Zero carbon emissions from operations fully within their own control by 2050 at the latest. **lux-Airport is one of almost 100 airports that have committed to achieving Net Zero, absolute carbon neutrality, by 2030.**

EMISSION INVENTORY AND DEFINING TARGETS

CARBON FOOTPRINT BASELINE ASSESSMENT

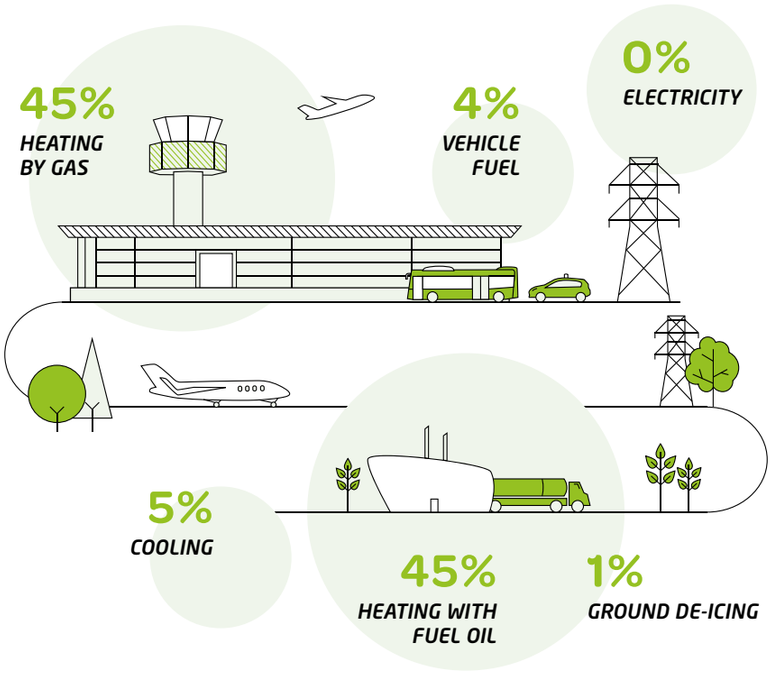
2018 was chosen as the baseline year for the road map. This decision was based on clear data availability for electricity, heating, cooling and vehicle fuel.

Once the baseline had been decided, a detailed analysis of emission sources was prepared to understand where the major opportunities for improvement at the airports are.

An extensive list of solutions used at other airports and in other industries has been studied and the potential of their application to lux-Airport has been analysed in detail. With this approach, the different opportunities available to reach Net Zero Carbon, their potential impact and the challenges involved have been analysed. From this, the list of possible solutions applicable to lux-Airport has been extended.

OUR CARBON EMISSIONS SOURCES

(reference year 2018)



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SCENARIO: 5 PILLARS

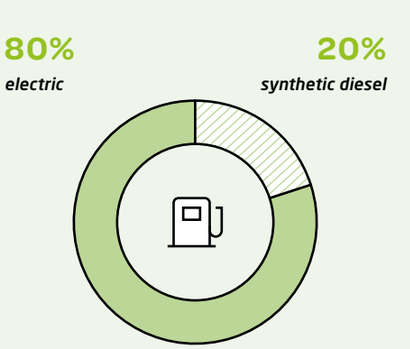
We created an emission inventory (reference year: 2019) and established a baseline emission forecast until 2030.

We considered four pillars: vehicle fuel, heating, cooling and electricity. For each of these main pillars, we developed and assess possible measures, including a technical feasibility check, an assessment of possible CO_2 reductions, as well as a timeline and cost estimation (CAPEX / OPEX). The resulting feasibility scenario matrix determine our actions.

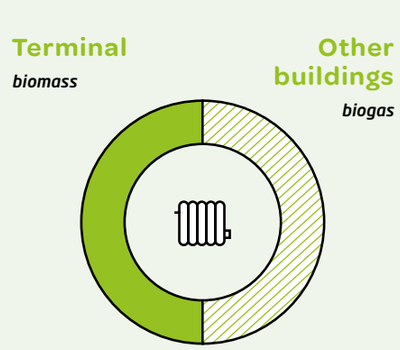
This roadmap is not an end in itself but is continuously adapted according to technological innovations and further feasibility studies.

The 5th pillar is the consumption of floor de-icing products. This consumption is strongly dependent on weather conditions. The products currently used (format and propylene glycol) are those with the lowest emission factor currently on the market. The use of products can, however, be optimized by more precisely adapting the quantities used according to precise weather records, while guaranteeing the safety of operations.

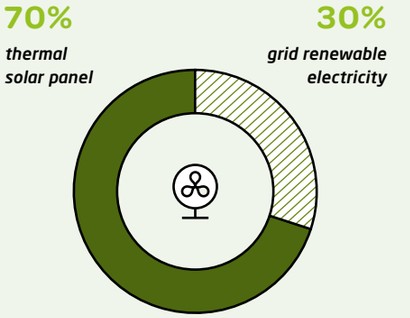
VEHICLE FUEL



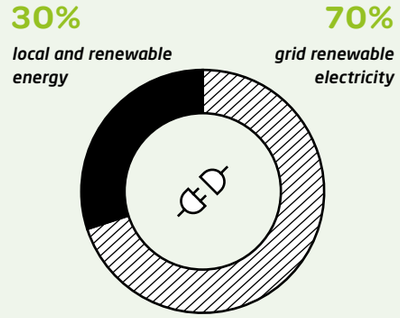
HEATING



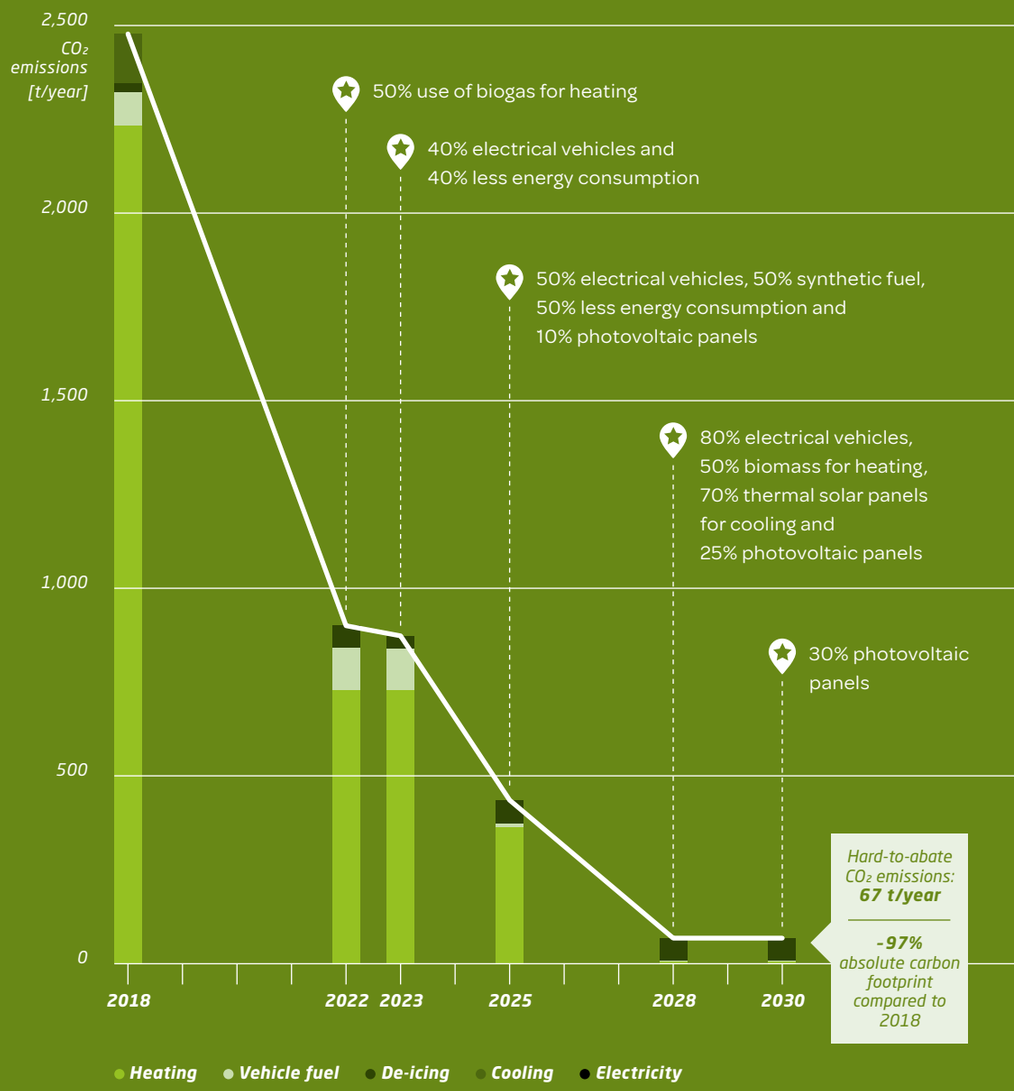
COOLING



ELECTRICITY



FINAL PATHWAY



HARD-TO-ABATE EMISSIONS

Although the developed scenarios describe pathways that aim to ensure lux-Airport becomes a Net Zero Carbon airport, a few hard-to-abate emission sources are expected to remain. lux-Airport will choose a solution called "Offset Removals" which consist of withdrawal of a GHG from the atmosphere by different method: ecosystem-based (Afforestation, Reforestation), engineered (Direct Air Carbon Capture, enhanced weathering or bioenergy with carbon capture and storage) or Hybrid (Biochar).

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NET ZERO

ACTIONS TO REDUCE CO_2 EMISSIONS

HEATING IN 2022/23	COOLONG IN 2022/23	PV PLANNED MWP
-43%	**-38%**	**2**

ENERGY OPTIMISATION

Since July 2014, lux-Airport has only been supplied with green electricity, via Enovos. The renewable energy certificates are issued by the Institut Luxembourgeois de Régulation (ILR) and also validated by the European Energy Certification System (EECS). Our electricity mainly comes from hydraulic energy. Since 2020, the gas used to heat the terminals has also been climate-neutral.

Nevertheless, energy is too precious to be wasted, even if it comes from renewable sources.

lux-Airport's journey towards optimisation started by taking inventory of the airport's energy consumption and overall energy management. After an analyze of the existing situation, a statutory energy audit of the buildings on the airport grounds was completed to get an overview of their energy consumption and management.

After 10 years of energy management at Terminal A, with an initial design already thought to be energy efficient, it is now time to review all aspects of energy management at the terminal. The airport's efforts to optimise Terminal A involve the revision of energy metering through the analysis of existing meters, their operation, their suitability, and their replacement according to specific needs, as well as their integration into the GTC control system. After creating a work group dedicated to energy management, existing set values have been controlled and adapted to optimise the different installations in terms of efficiency and energy saving potential.

Several project were already carried out in 2021, such as replacing of the energy meters (hot / cold), revising the set points, and the replacing part of the lighting with LED.

In 2022, optimizations and adjustments continued with new parameters implemented for public and office areas, which allows some temperature variations, but significantly reduces overall energy consumption. For instance, in the offices, the air conditioning will start cooling only when the temperature reaches 24°C according to the thermostat setting. We already reach an average of **40% reduction in energy consumption** in the terminal A between 2022 and 2023 and more savings are expected in the coming years.

Most of the carbon footprint is concentrated in the heating by fuel oil of older buildings. lux-Airport analysed heating processes and management systems of these buildings to identify areas of consumption reduction potential. In 2022, LAP conducted a study to find possible solutions to heat the old Cargocenter building, biomass is one of them. In 2023, we changed the heating-cooling installation for GAT-SH by efficient heat pump. The change of other old heating installation are planned in the coming year according the roadmap to reach Net Zero by 2030.

lux-Airport also carry out a study of new concepts such as a progressive replacement of energy-intensive light sources with LED lighting. The **replacement of LED** continues with the old Cargocenter and takes place progressively in the terminal.

Moreover, we will soon support our measures of energy savings by implementing an Energy Management System, under **ISO 50001 certification** (planned for end 2024).

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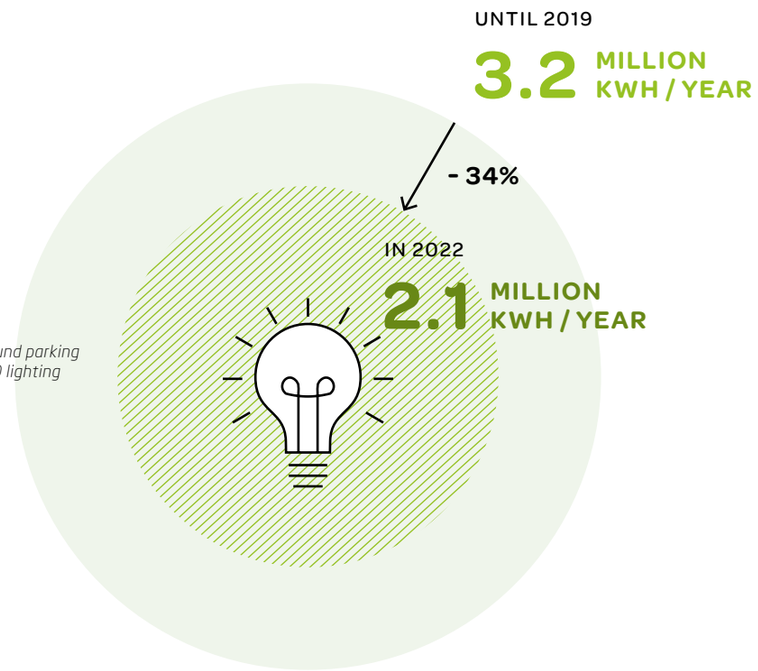
LED DIMMING UNDERGROUND PARKING

The underground car parks used to remain lit 24/7, resulting in high energy consumption and high operating costs as a result. There were two issues at stakes because we had to remain consistent with our overall approach to reducing environmental impacts while ensuring the safety of pedestrians and drivers. Approximately 5,500 lights and 1,500 emergency lights were replaced with new LED lights, offering a better quality of lighting with a longer life span. These LED lights are “smart” because they are coupled to presence detectors, which allow the lights to dim the light in areas where there are no users and turn them up to maximum brightness instantly. The lights are also designed to be dimmed when people or vehicles enter the area (3 m distance from the luminaire to detect pedestrians/cars Thanks to this work, we have been able to save more than 1,1 MWh/year since installing the new lighting, which is equivalent to a **34% reduction in the overall electricity consumption** of the car park.



Underground parking smart LED lighting

RENEWABLE ENERGY PRODUCTION

lux-Airport is conducting a study of photovoltaic potential in the airport. The safety assessment is under validation by the dedicated entities.

The following project are already planned for a total production of **2,000 kWp**, with a production estimated around **2,000 MWh/year**:

2023–2024:

- New fireman CGDIS building
- New aircraft maintenance hangar Luxair and new security entry point E111

2024:

- Terminal A
- Skypark Buisness Center
- New carpark

Two different types of vertical wind turbine are order to be tested on the new Luxair Maintenance and Skypark building. Philéole offers a bio-sourced wind turbine using gust of wind and Wind My Roof offers Windbox using the wind coming from the facades.

The expected production will be around 50,000 kWh/year.

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DESIGN & IMPLEMENTATION

LEKKERWERKEN GMBH

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