

## Case Study 4.C

### Leuven Climate Neutral 2030 (LKN2030): An Ambitious Plan of a University Town

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<b>Keywords</b>	Baseline emission inventory, climate action plan, housing and transportation, adaptation and mitigation
<b>Population (Metropolitan Region)</b>	99,075 (IBZ, 2016)
<b>Area (Metropolitan Region)</b>	56.6 km <sup>2</sup> (IBZ, 2016)
<b>Income per capita<sup>a</sup></b>	US\$41,860 (World Bank, 2017)
<b>Climate zone<sup>b</sup></b>	Temperate, without dry season, warm summer (Cfb) (Peel et al., 2007)

In 2011, the city of Leuven signed a Declaration of Intent to become “climate neutral” by 2030. It established the ambitious climate goal to cut greenhouse gas (GHG) emissions by 80% by 2030 compared to a 2010 baseline.<sup>1</sup> Although the concept of “climate neutrality” might not be scientifically sound,<sup>2</sup> it has been used successfully in several cities and provinces in Belgium to gather public and political support to implement strong climate action (Vandevyvere, 2014). Leuven Climate Neutral 2030 (LKN2030) has since evolved into a multiactor project and process, engaging a broad spectrum of stakeholders in order to collectively design transition paths to climate neutrality. First, a baseline emission inventory of Leuven was carried out, followed by a citywide project to create a roadmap for LKN2030. In 2013, the nonprofit organization Leuven Climate Neutral 2030 was founded, charged with overseeing the envisioned transition of Leuven.

#### Baseline Emission Inventory of Greater Leuven

The baseline for the emissions inventory was executed for 2010, the year with the most appropriate available data. For LKN2030, only scope 1 (direct emissions) and scope 2 (indirect emissions from imported energy) emissions were quantified and considered. Scope 3 emissions (indirect emissions from imported goods and services) were qualitatively assessed.<sup>3</sup> In

2010, Greater Leuven emitted 808,000 tons of CO<sub>2</sub>eq or 8.5 ton CO<sub>2</sub>eq per capita (scope 1+2) (Vandevyvere et al., 2013: 41–58).

Leuven has a strong knowledge-based economy and almost no industry or agriculture. As a result, building-related emissions (household and tertiary sector) amount to nearly 60% of total GHG emissions. Together with transport emissions, they make up 82% of GHG emissions in Leuven. Transition scenarios therefore focus on the renovation of the existing building stock, on greening the energy supply, and on switching to sustainable transport modes (Vandevyvere et al., 2013).

#### A Scientific Roadmap to Climate Neutrality

Following the Baseline Emission Inventory, a roadmap project was launched, structured along an explicit, combined top-down and bottom-up approach to ensure and maximize public support. The bottom-up process consisted of six thematic groups (energy; built environment; mobility; consumption; agriculture and nature; participation, public support, and transition), each with around fifteen people from civil society, city departments, local businesses, and the university. Simultaneously, there was the local “G20,” a transition group with twenty key decision-makers from knowledge institutions, enterprises, local government, and civil society that developed top-down high-level strategies for the city of Leuven. This combined process was supposed to build the necessary local knowledge, create widespread public support for the project, and have a real policy impact (Jones et al., 2012). Both top-down and bottom-up approaches were coordinated by a scientific team of Leuven’s University, which simultaneously served as communication link between the two approaches. All the recommendations were combined into a final scientific report (Vandevyvere et al., 2013). In total, some 200 people were active in different sections of the roadmap project. The goal was to shift the process from the city government and the university – the initiators of the process – to a citywide participatory process among civil society, businesses, the university, and the city since participatory processes are vital for building support for the plan and realizing its long-lasting success (Vandevyvere, 2014).

The scientific report made a distinction between immediate and long-term actions and used different scenarios: business-as-usual, Leuven Climate Neutral by 2030, or by 2050. The report focused on five sectors (residential buildings, nonresidential

<sup>1</sup> These goals were adjusted to GHG reductions of 67% by 2030 and 81% (“climate safe”) by 2050, after the scientific report of LKN2030.

<sup>2</sup> The concept of “climate neutrality” generally indicates a GHG emission reduction target of 80% or 90%.

<sup>3</sup> Scope 3 emissions are estimated at 2,440,000 tons of CO<sub>2</sub>, eq

buildings, mobility, nature and agriculture, and energy) and proposed a list of recommendations, concrete measures, and projects for each sector to reduce GHG emissions. For each measure, the reduction in GHG emissions and economic gain/cost was quantified. Some examples of measures proposed are: five refurbishment “waves” to stepwise retrofit the complete building stock of Leuven, starting with the oldest buildings; a modal shift to 33% bike, 33% public transport, 33% car mobility by drastically improving public transport and bike infrastructure and making the city center completely car-free; and the deployment of renewable energy technologies.

The report concludes that, when all sectors are considered simultaneously, aggregated emission cuts of 55% and 67% are possible by 2030 and 2050, respectively. This would lead to a net profit of €39 (US\$46) million per year and €34 (US\$40) million per year for 2030 and 2050, respectively. These projections include GHG emissions from local industry, a sector that was not considered for intervention in the report. When GHG emissions of local industry are omitted, the LKN2030 and 2050 scenarios lead to a reduction of 67% and 81%, respectively. This means that a climate neutral scenario can be reached by 2050 starting from the proposed LKN-scenarios of the report.

The final recommendation of the scientific report was to formalize LKN2030 into a long-lasting organization. The non-profit Leuven Climate Neutral 2030 was established by sixty city stakeholders in 2013. The mission of this organization is to inspire, inform, measure, and facilitate and to involve partners and activate them in regards to Leuven’s transition to climate neutrality. In 2013, the organization also launched the public

campaign Mission Zero Emission, aimed at increasing the visibility of LKN2030 and putting several initiatives in the spotlight (see Case Study 4.C Figure 1).

In 2015, the Board of Experts – counting ten climate specialists – was charged with translating the scientific report into explicit, yearly operational targets for the nonprofit organization and its partners. At present, some twenty preferential projects have been formulated as transition experiments, and appropriate stakeholders and financing schemes have been identified (Vandevyvere et al., 2015).

## Lessons Learned

Several aspects proved vital for establishing a transition project with reasonable chances for success: the scientific support given by the local university, securing engagement from stakeholders and public support by fostering shared ownership in order to gain the required momentum, opening the way for practical implementation through concrete measures and projects, monitoring GHG emissions, and establishing appropriate financing and communication mechanisms. Securing these operational aspects remains a continuous struggle for LKN2030 (Vandevyvere, 2014). Innovation capacity, shared enthusiasm, tangible engagement, and a good balance between bottom-up and top-down actions are promising conditions for the future of LKN2030. Challenges to this optimism are lack of financial input, built-in structural barriers, and the dictates of short-term agendas. Empowerment and leadership now play an important role to secure the success of LKN2030.



**Case Study 4.C Figure 1** Image of public campaign Mission Zero Emission on the Ladeuze square in Leuven (translation: “Insulate with us 500,000 m<sup>2</sup> of Leuven roofs, 50 times the area of the Ladeuze square, so we save €3 (US\$3.5) million each year!”).

Photo: RobbeMaes

## References

- Jones, P. T., Vandevyvere, H., and Van Acker, K. (2012). Leuven Klimaatneutraal 2030, project proposal, Stad Leuven/KU Leuven, Leuven. Accessed April 16, 2015: <http://www.leuvenklimaatneutraal.be/ontstaan-en-mijlpalen>
- IBZ - Ministry of the Interior - General Directorate Institutions and Population (2016). Retrieved November 3, 2016 from [http://www.ibz.rn.fgov.be/fileadmin/user\\_upload/fr/pop/statistiques/population-bevolking-20160101.pdf](http://www.ibz.rn.fgov.be/fileadmin/user_upload/fr/pop/statistiques/population-bevolking-20160101.pdf)
- Leuven. (2014). Leuven in numbers. Accessed April 1, 2015: <http://www.leuven.be/bestuur/leuven-in-cijfers>
- Peel, M. C., Finlayson, B. L., and McMahon, T. A. (2007). Updated world map of the Köppen-Geiger climate classification. *Hydrology and Earth System Sciences Discussions* 4(2), 462.
- World Bank. (2017). 2016 GNI per capita, Atlas method (current US\$). Accessed August 9, 2017: <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD>
- Vandevyvere, H. (2014). Climate neutral city initiatives: Wishful thinking or thoughtful wish? Research paper 7, Steunpunt TRADO, Mol. Accessed April 16, 2015: <http://steunpunttrado.be/documenten/papers/trado-research-paper-7-1.pdf>
- Vandevyvere, H., Jones, P. T., Aerts, J. (2013). De transitie naar Leuven Klimaatneutraal 2030: Wetenschappelijk eindrapport. Februari 2013. Accessed April 16, 2015: [https://www.leuven2030.be/sites/default/files/attachments/LKN\\_Wetenschappelijk%20Eindrapport\\_1302.pdf](https://www.leuven2030.be/sites/default/files/attachments/LKN_Wetenschappelijk%20Eindrapport_1302.pdf)
- Vandevyvere, H., and Nevens, F. (2015). Lost in transition or geared for the s-curve? An analysis of Flemish transition trajectories with a focus on energy use and buildings. *Sustainability* 7(3), 2415–2436.