



Decarbonizing the global economy

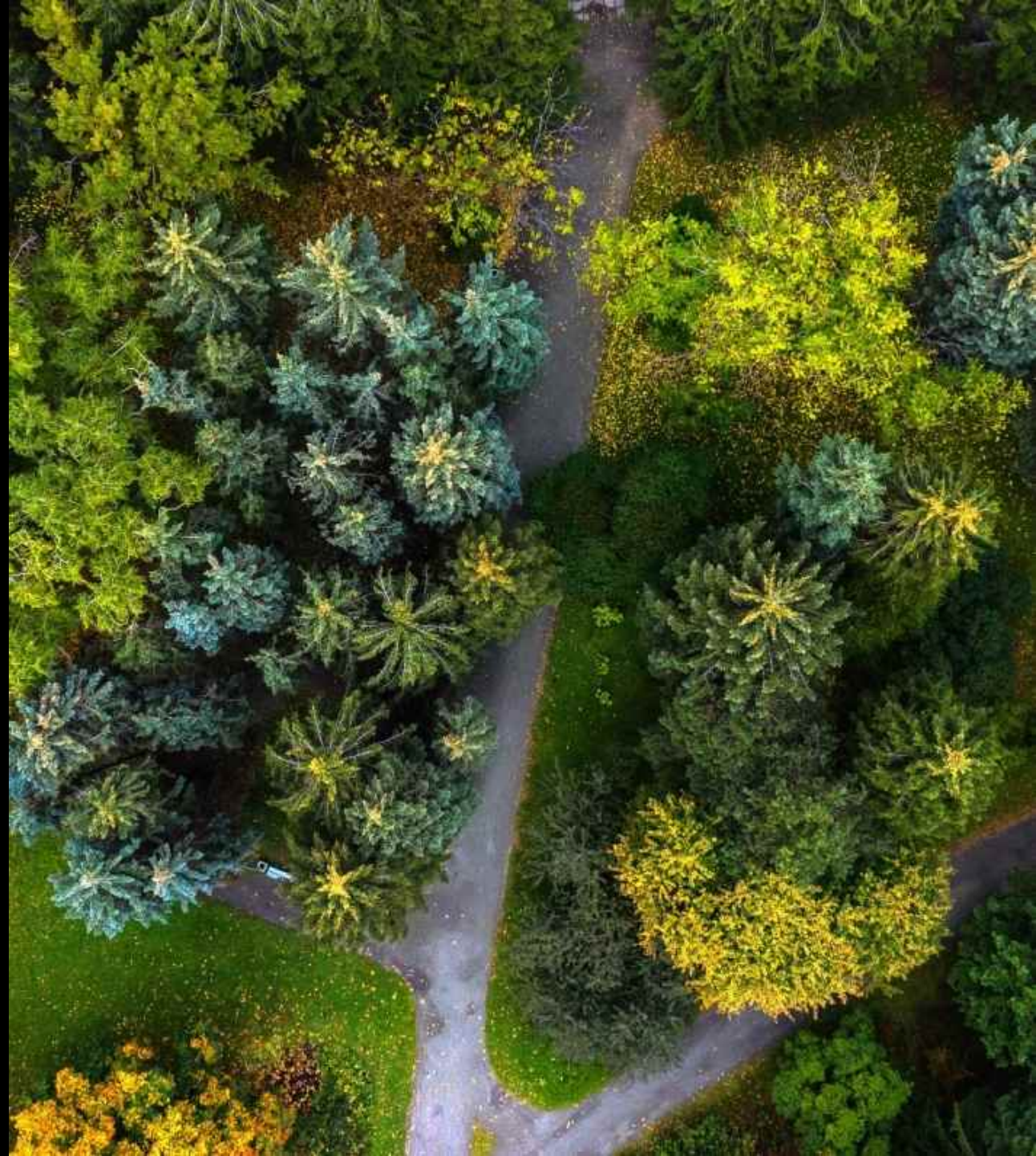
→ How Can the Environmental Remediation Industry Contribute?

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Presentation plan

- The problem statement. Understanding what we're facing.
- Proposed solutions and proven methods. Measuring and reducing the carbon footprint.
- Case study. Challenges and success factors.

Problem statement:

Climate change

- It is unequivocal that human influence has warmed the atmosphere, ocean and land.
- Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered.
- Increases in the frequency and intensity of hot extremes, marine heatwaves, heavy precipitation, agricultural and ecological droughts, intense tropical cyclones, reductions in Arctic sea ice, snow cover and permafrost



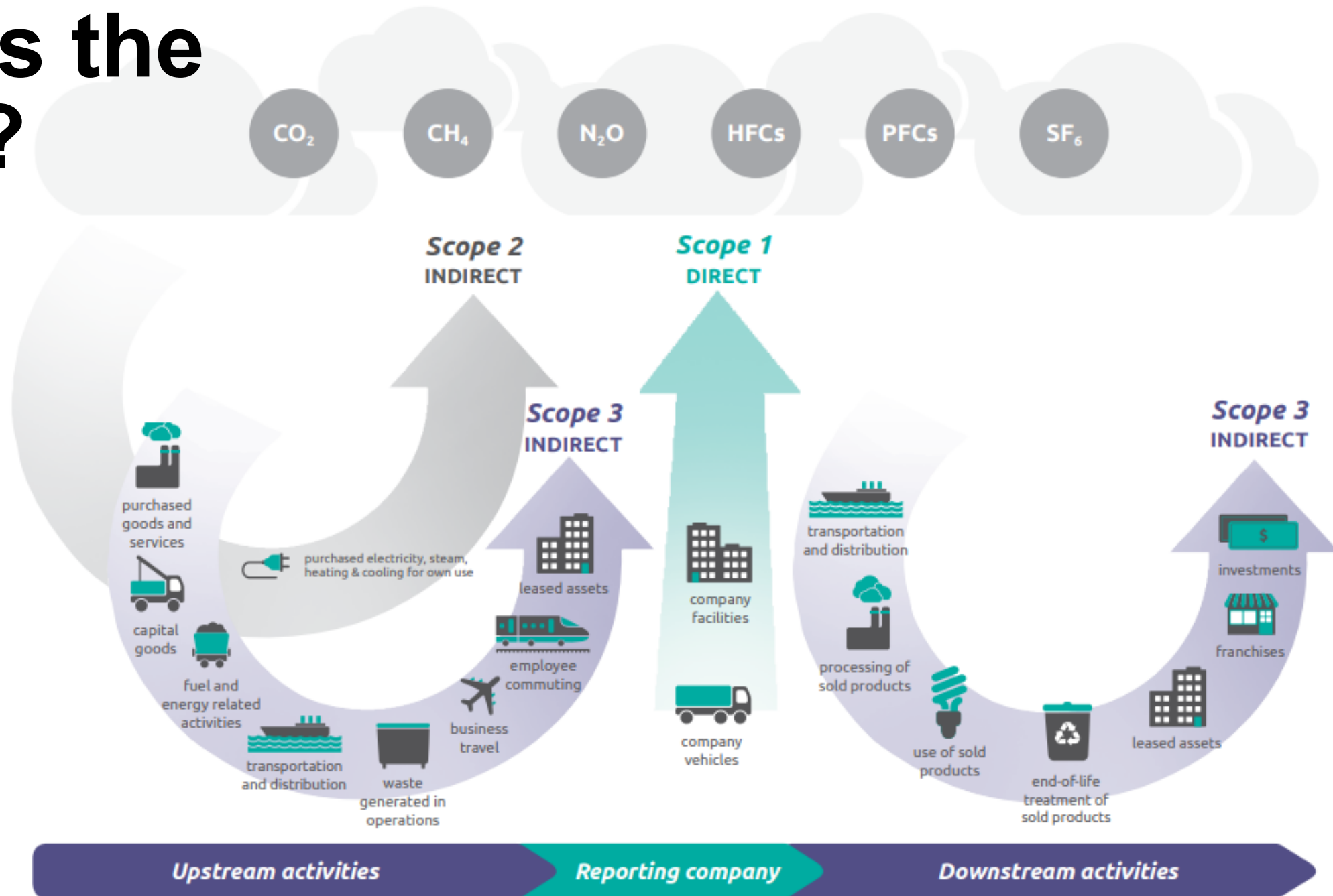
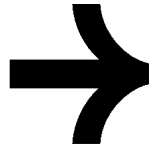
Source: IPCC, 2021: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.

Proposed solution

Supply chain decarbonization



Where is the carbon?



Source: GHG protocol



Case study

Quantification

Verification and development of a GHG Reduction and Offset Plan (2022-2025)

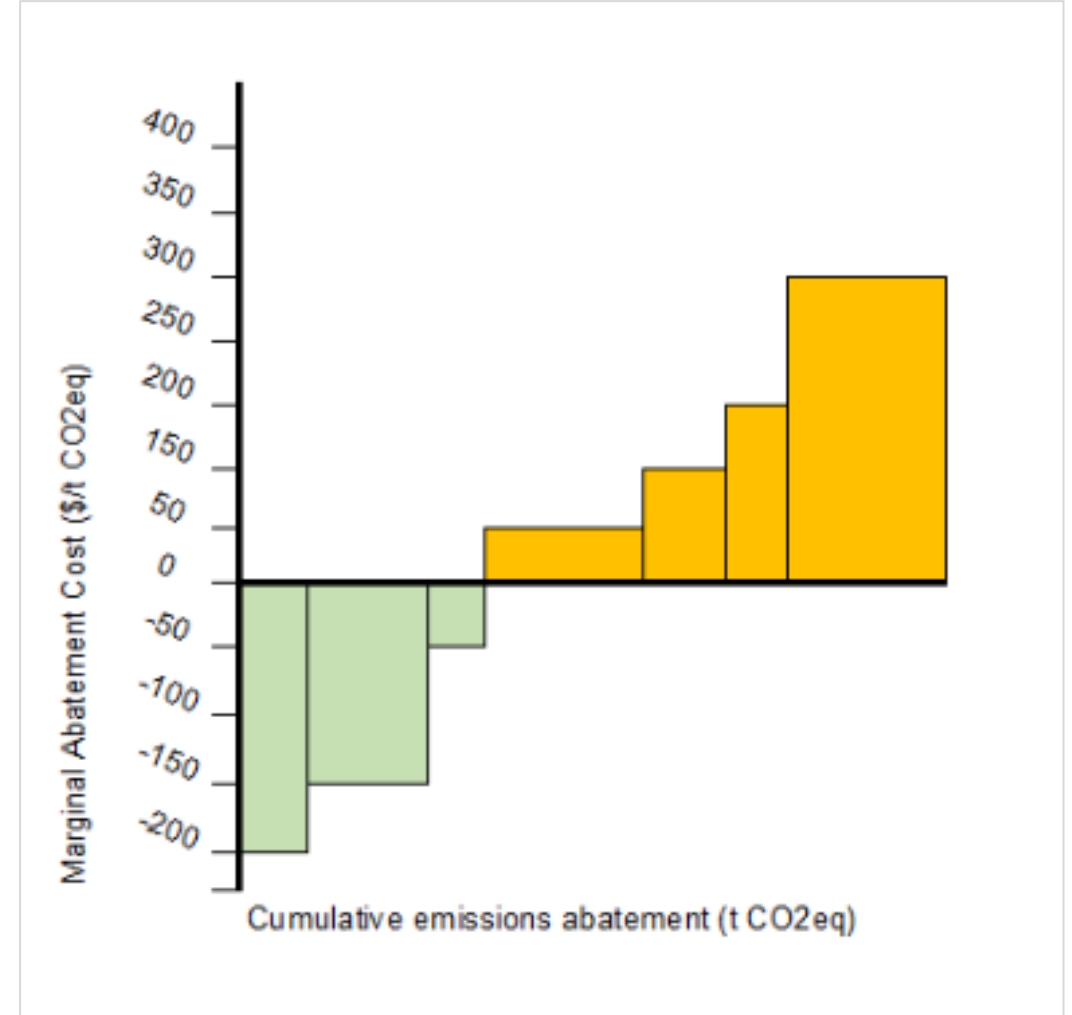
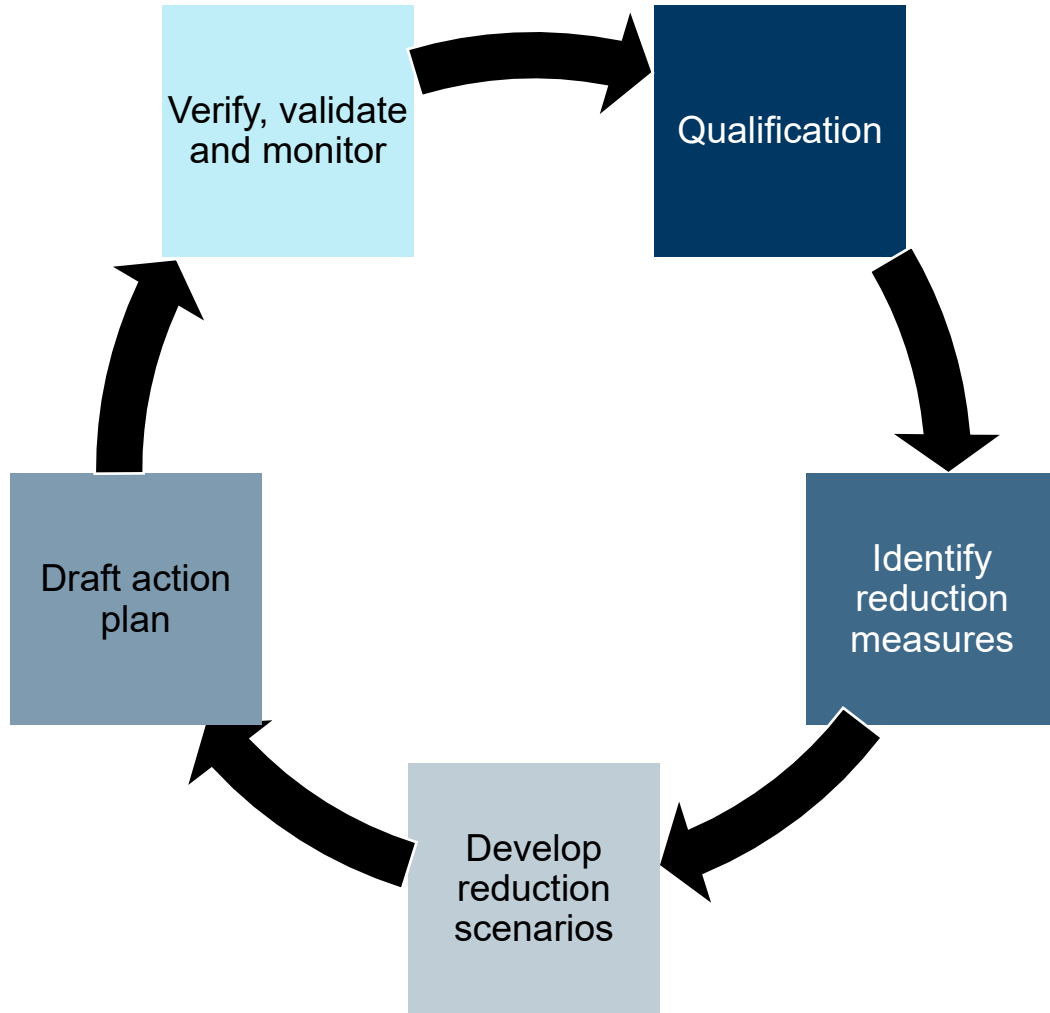
Federal entity

For 2021/2022: \$193.4 million in major work
Infrastructure O&M – Demo/Construction – land management

Federal plan objectives

- 2030: GHG reduction of 40% compared to 2005
- Aim for carbon neutrality by 2050
- Leader in infrastructure management
- Leader in mobility

Decarbonization roadmap



Quantification methodology



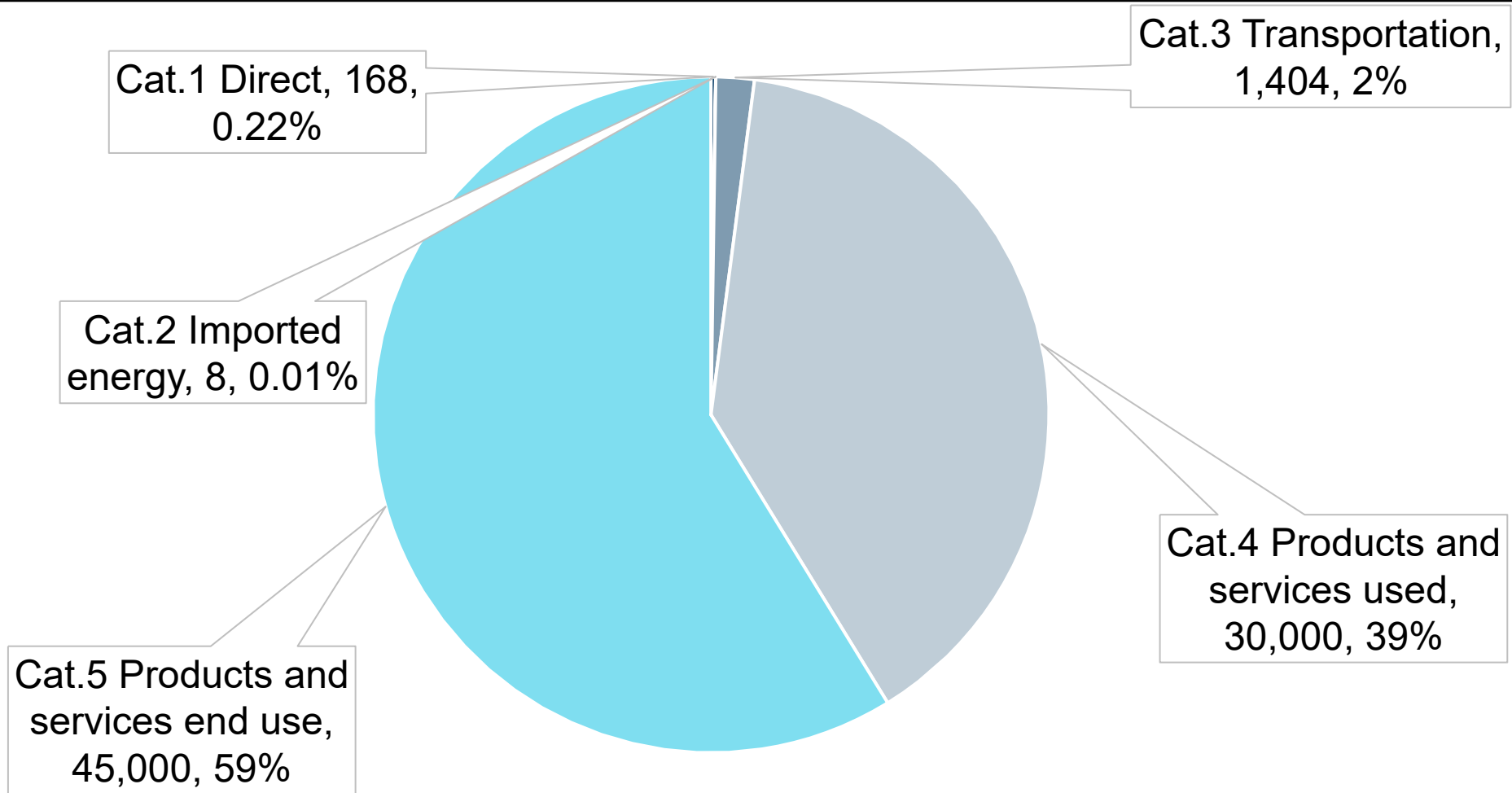
ISO 14064-1 applies to quantification and reporting of GHG emissions and removals at organization level (i.e., regulatory reporting)

- Cat.1: Direct GHG emissions and removals
- Cat.2: Indirect GHG emissions from imported energy
- Cat.3: Indirect GHG emissions from transportation
- Cat 4: Indirect GHG emissions from products used
- Cat.5 : Indirect GHG emissions from the use of products
- Cat.6 : Indirect GHG emissions from other sources

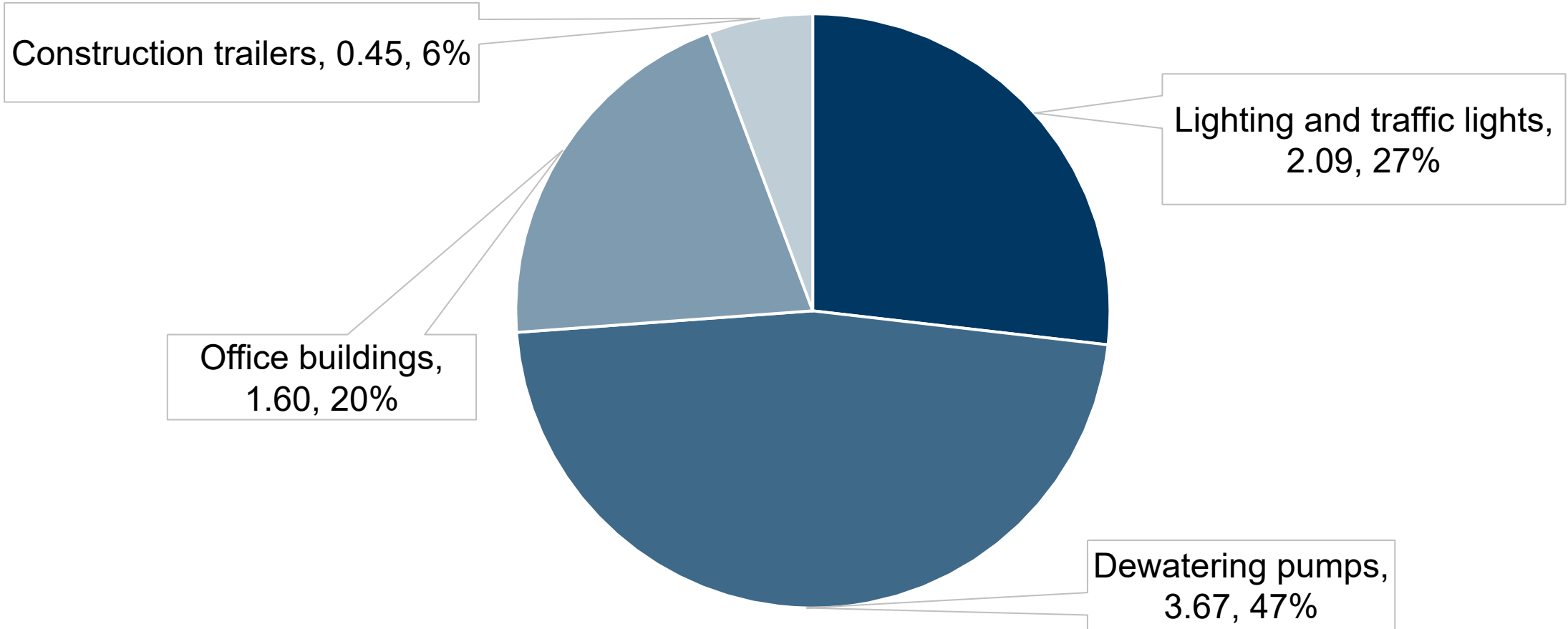
ISO 14064-2 applies to quantification, monitoring and reporting of GHG emission reductions or removal enhancements at the project level (i.e., voluntary or carbon offset projects)

ISO 14064-3 Specification with guidance for the verification and validation of greenhouse gas statements

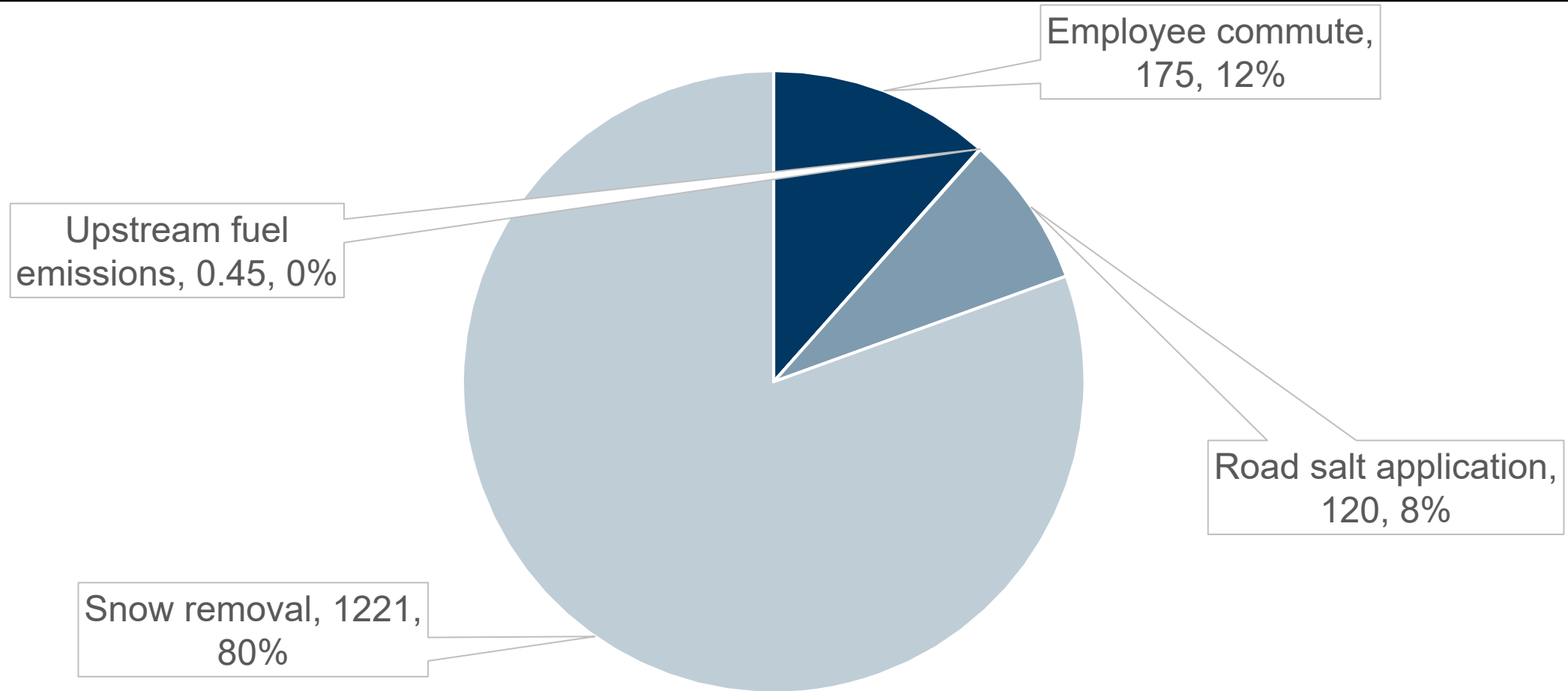
Results: Emissions by category



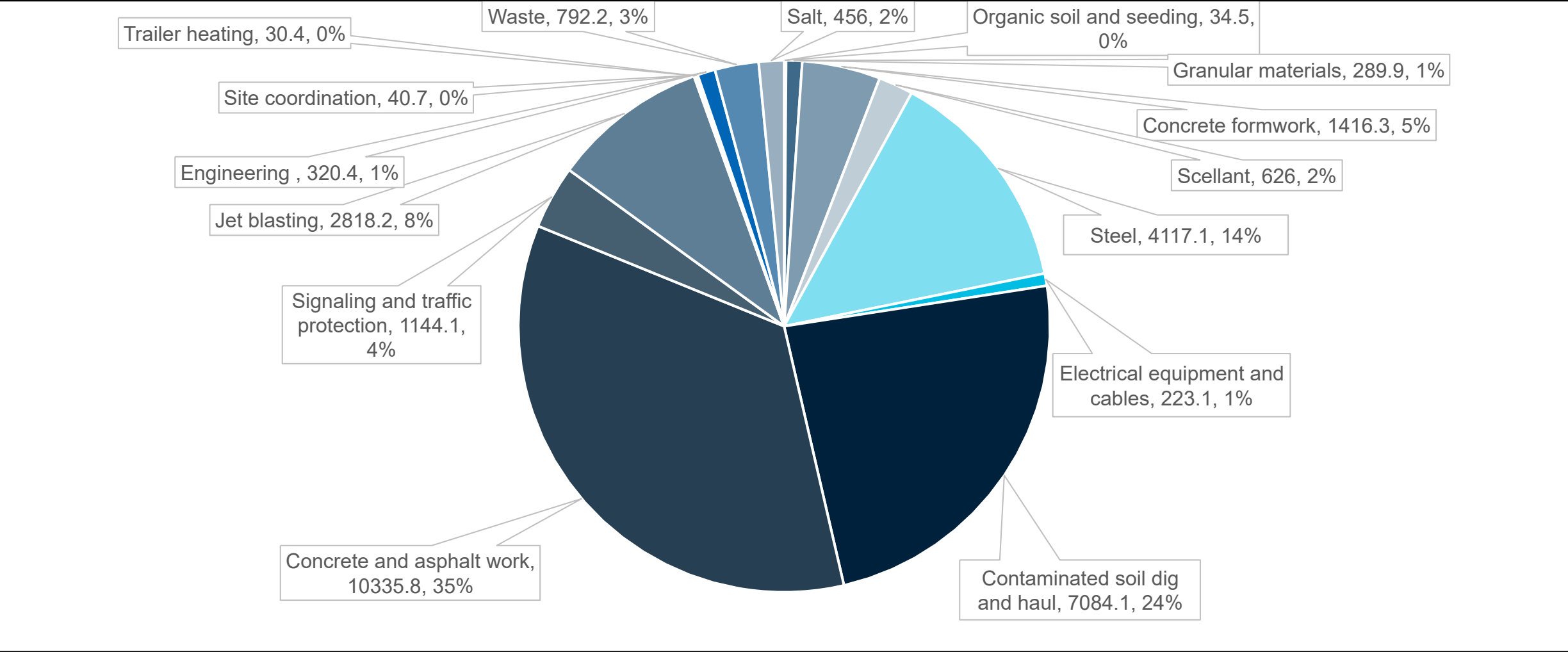
Results: Cat.2 Imported energy



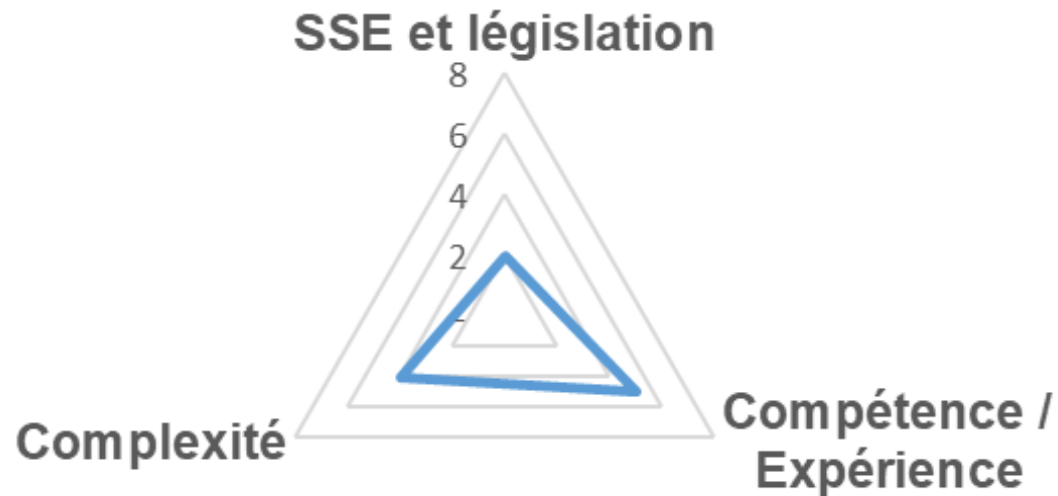
Results: Cat.3 Transportation



Results: Cat.4 Products and services

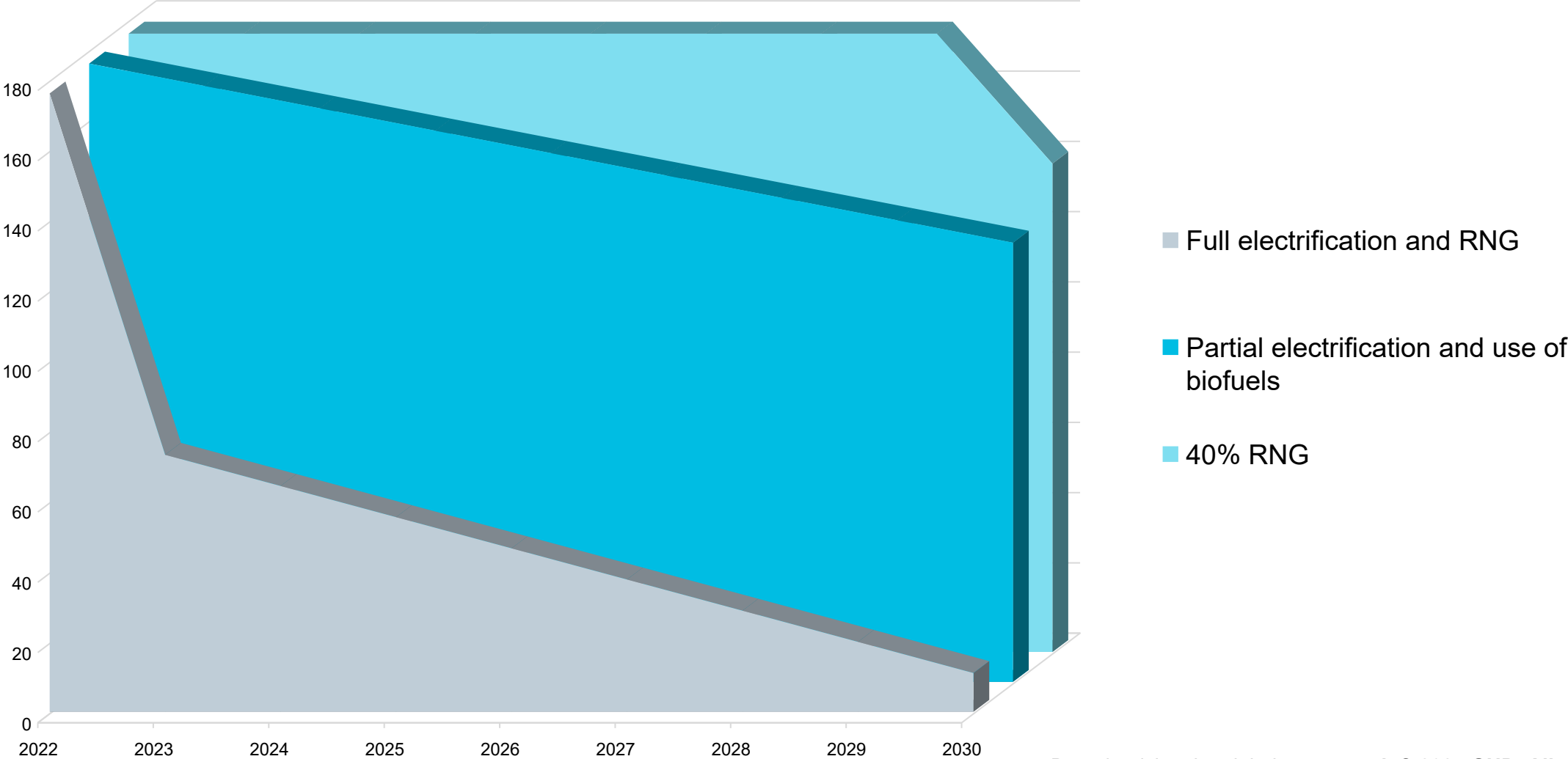


Identify reduction measures



Indicator	Scoring (0/1/2)	Low Risk (0)
Impact on people	1	Gravity of HSE risk people would be exposed to
Environmental Impact	0	Length of time during which there is a risk of impact to the environment
Legal Obligations	1	Degree of understanding of legal obligation
Stakeholders	0	Probability of negative impact on stakeholders
Experience with technology	1	Level of experience with technology or approach
Supply Chain	2	Level of development of supply chain
Impact on Operations	2	Has this been implemented elsewhere in similar conditions and what is the level of operational change needed?
Feasibility	2	Level of knowledge and experience of suppliers/contractor with the approach
Technological maturity	1	To what level has this approach been tested in the industry?
Cost	1	Level of availability of data to estimate OPEX and CAPEX

Reduction scenarios



Lessons learned

Reliable data collection and management processes are crucial, and these need to be constantly improved for accuracy

Don't underestimate the time needed for workshops and communications, especially for indirect emissions

Once the low hanging reductions are captured, these may not be sufficient to reach objectives, need to look at longer term incremental changes

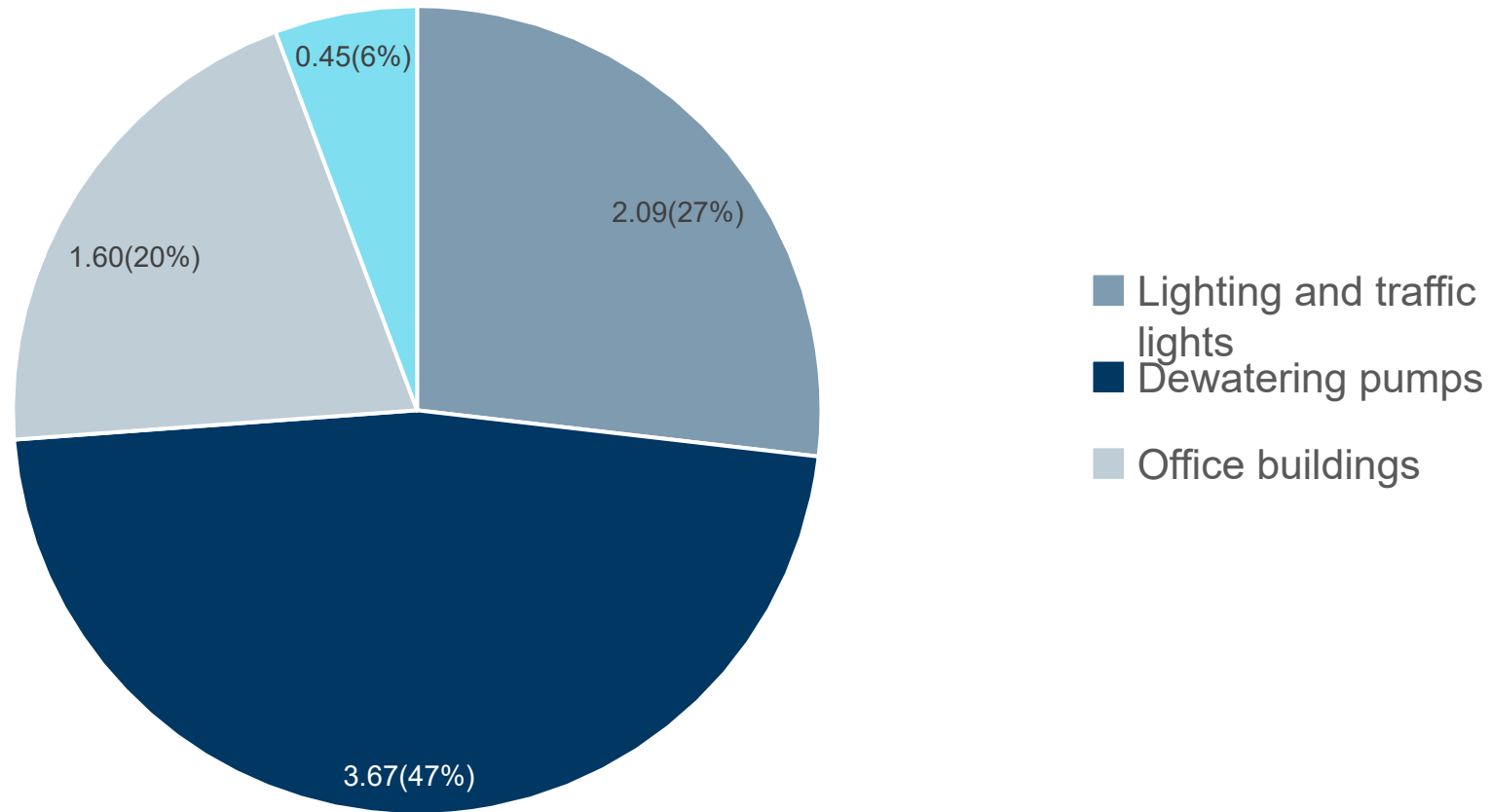
Sustainable procurement practices can have a huge impact on GHG emissions, but these take a long time to implement, so start now!

Awareness and engagement around decarbonization is key to achieving real results

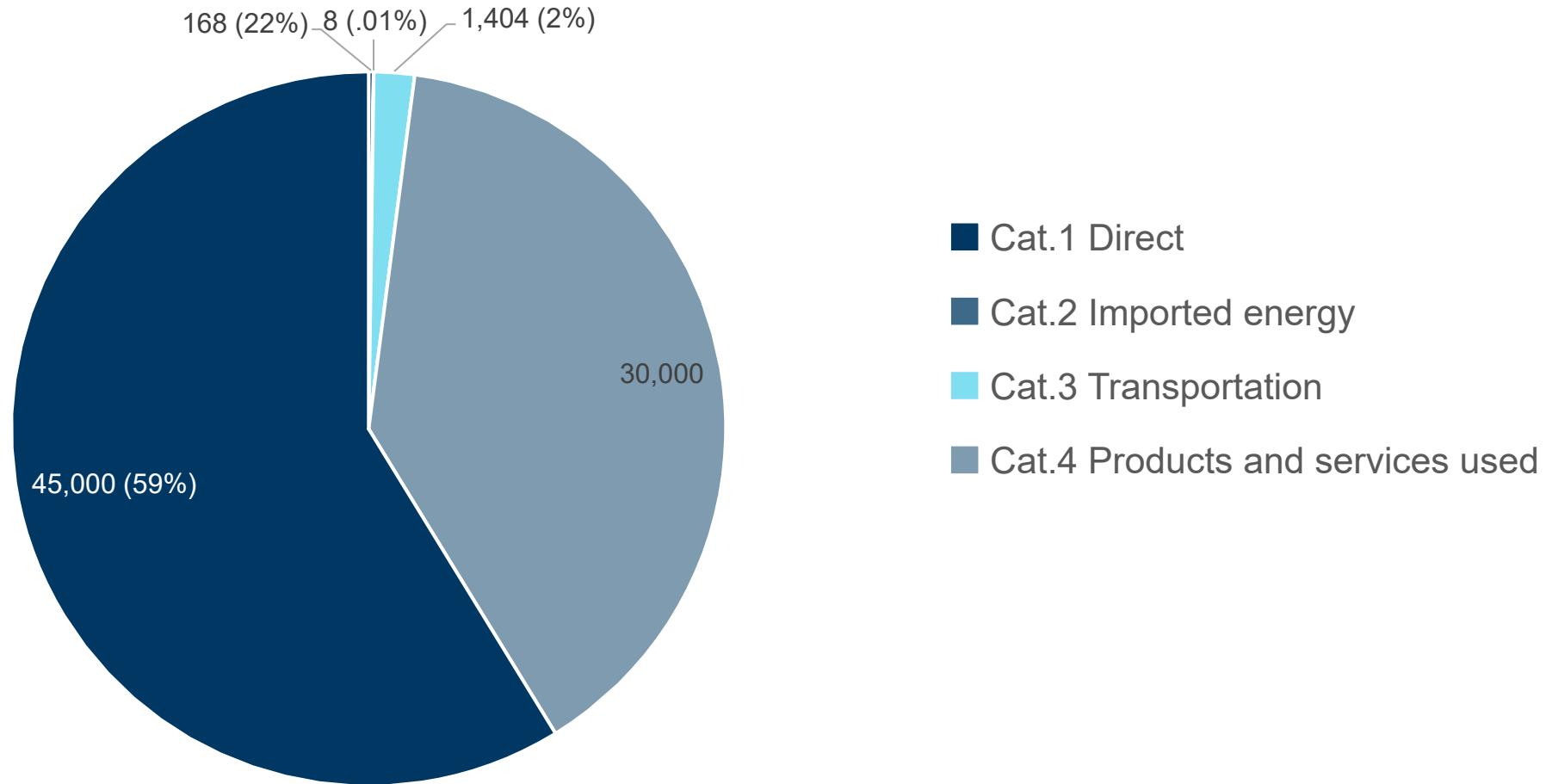


*** Thank You**

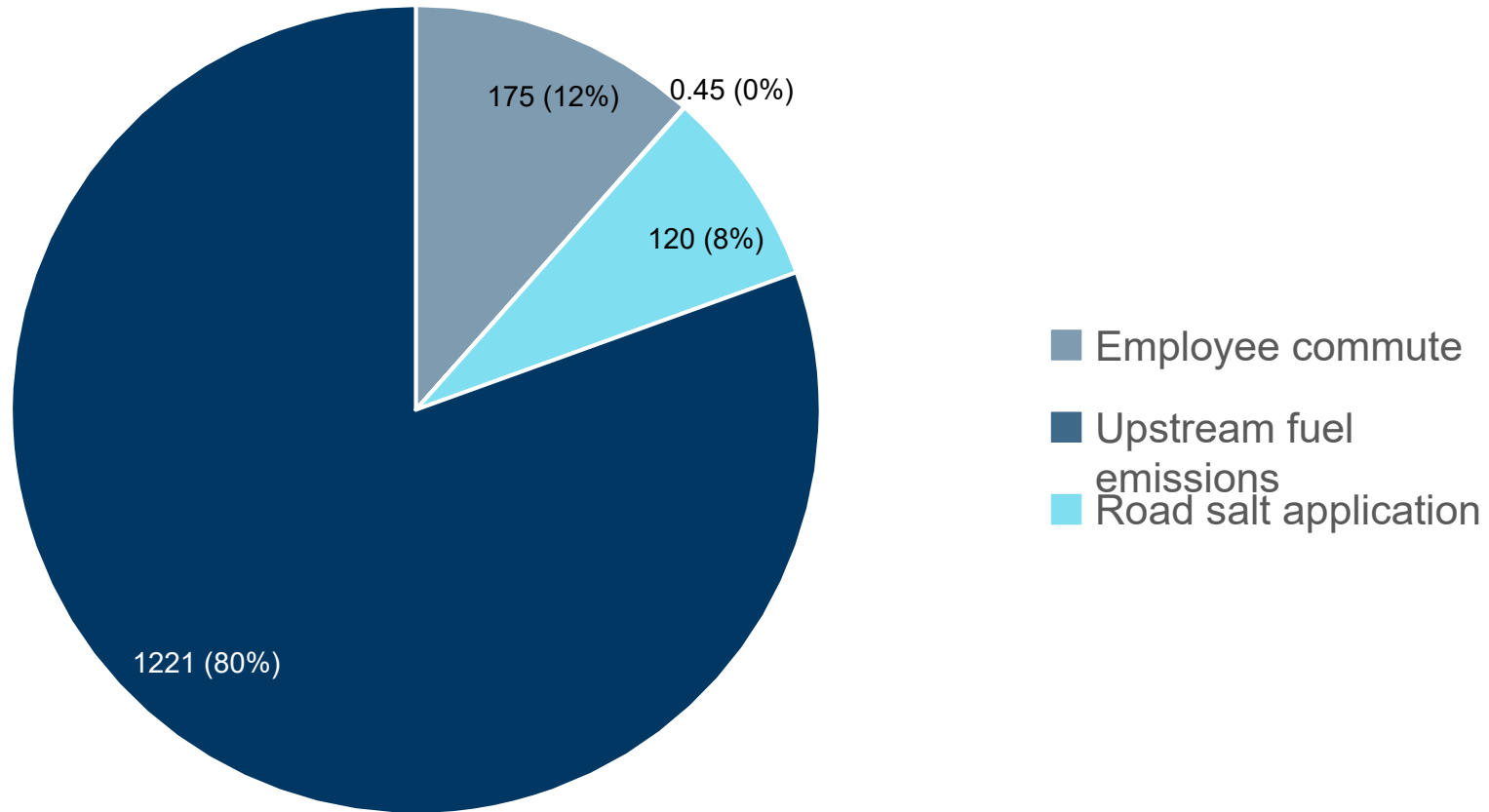
Results: Emissions by category



Results: Cat.2 Imported energy



Results: Cat.3 Transportation



Results: Cat.4 Products and services

