NETHERLANDS

Royal Netherlands Standardization Institute (NEN)

Keeping buildings cool in the Netherlands

Overview

The Netherlands plans to build approximately one million new houses over the coming years. It is important, therefore, that they are well adapted to the climatic conditions they will endure during their lifetime to ensure the comfort and well-being of their occupants and limit the production of greenhouse gases. The changing climate means summers are getting warmer and heatwaves are likely to occur more often. The hot spells experienced in the Netherlands these past three years will be no exception in the future. In this context, it is important for homes to remain healthy and comfortable to avoid serious health impacts. As an example, 650 people died in the latest heatwave in August 2021.

The warmer it gets, the more we use air conditioning, which discharges substantial amounts of additional greenhouse gas emissions, as well as excess heat, to the environment. Adequate building design can contribute significantly to buildings that are both comfortable and conducive to residents' well-being, while avoiding the use of environmentally damaging air conditioning systems. Through the OSKA Platform, the Netherlands platform for standards and climate change adaptation, a wide range of companies, governments and knowledge institutions are working together to make the country more resilient to the effects of climate change by incorporating new insights on climate change into standards.

As a first step, OSKA developed a Declaration of Intent for the Cooling of Buildings, which was signed by a wide range of companies, government institutions and knowledge organizations in April 2021. The stakeholders involved in its drafting agreed to start developing a technical guideline whose insights could later be integrated into the country's national standard NTA 8800 on the energy performance of buildings at its first big revision (foreseen for 2025).

The Declaration gives a list of standards to be developed or revised to create a portfolio that offers guidance on the design and construction of buildings which take into consideration the impacts of a changing, hotter climate. One of the standards highlighted is EN-ISO 15927-4, which is currently under revision by ISO/TC 163/SC 2, the ISO subcommittee dealing with calculation methods for thermal performance and energy use in the built environment. It specifies a procedure for

constructing a reference year of hourly climatic information. While it currently refers to historical climatic data, experts are working to provide a systematic approach for describing a future reference year.

The OSKA Declaration was developed with the objective that building design and maintenance practices should take into account the effects of climate change in a structured manner. An important element is the "cooling ladder", which works on the principle that one should start by creating a cool environment, trying as much as possible to keep the heat out, and only then look at environmentally friendly cooling systems.

Outcomes and benefits

A key element in the OSKA approach is that stakeholders are involved early in the process. Both formal standards (ISO, EN, NEN) and technical guidelines and manuals were taken into consideration, which made it possible to identify standards that needed revising while defining opportunities for new standards development. It offered a pragmatic way of moving forward in the early stages of the project, which garnered support for the approach.

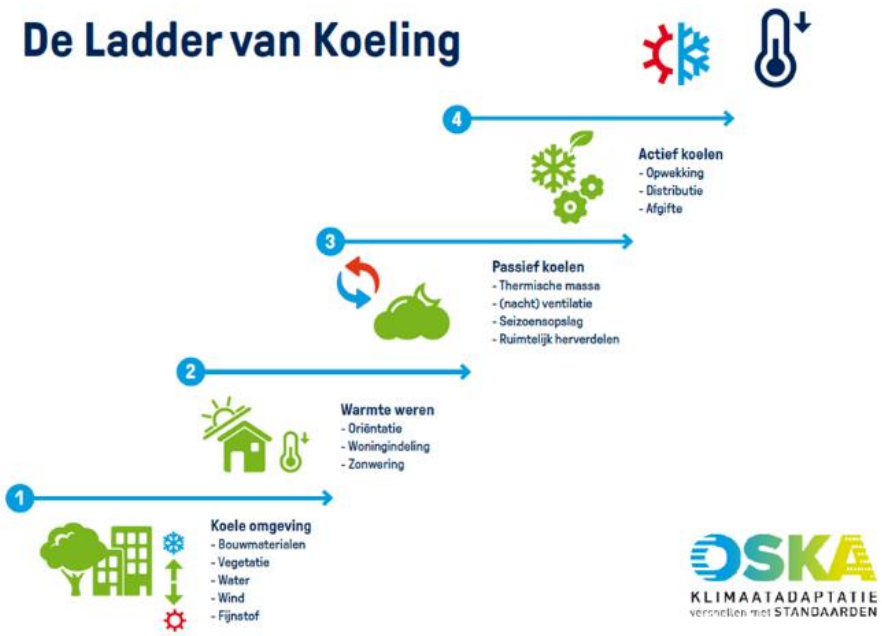
As indicated, first, a technical guideline will be developed which contains the most recent insights on our future climate and the prevalence of heatwaves. It will offer a systematic approach for dealing with the issue of cooling (the so-called "cooling ladder") with new and innovative technical solutions that respond to the increased demand for air conditioning. Experience gained from using this guideline will then be incorporated in the NEN standard on energy performance of buildings at its first large-scale revision. The current edition is already referred to in the Dutch national legislation for buildings, so that all new constructions must comply with the principles and calculation methods given in the standard.

The "cooling ladder" consists of four steps that must be followed to make buildings adaptive to high temperatures and heatwaves. These include:

1. Creating a cool environment around the building (i.e. with trees and shade)
2. Preventing heat from entering the building (i.e. using solar screens)
3. Discharging heat/passive cooling (i.e. with night ventilation)
4. Using an environmentally friendly way for cooling

See figure on following page (in Dutch).

The OSKA approach will result in buildings that are better equipped to deal with extremes of temperature, ensuring the thermal comfort and well-being of residents. The limited use of air-conditioning units in buildings will lead to lower energy consumption and reduced global emissions. Reliance on air conditioning has the potential to drive significant increases in energy and the OKSA Declaration will go a long way in changing that.



Cooling ladder diagram

Partners involved

The OSKA Platform was initiated and is supported by the Netherlands government. Its secretariat is held by the Royal Netherlands Standardization Institute (NEN).

Timeline

Penned in April 2021, the OSKA Declaration agreed on the development of a technical guideline that would later be merged with national standard NTA 8800 on the energy performance of buildings at its revision in 2025.

References

- OSKA (in Dutch)
- OSKA Declaration of Intent Adaptation to Climate Change (in Dutch)
- European project "Adaptation to climate change"
- CEN Climate Change Adaptation
- ISO/TC 163/SC 2