

Building Ceramics Technology Roadmap 2030

Building a sustainable
future together






Our future depends on what we do today

We are on the threshold of change; after decades of intensive energy conservation, we need to make fundamental choices to accelerate energy transition, reduction of nitrogen emissions, and circularity in the Netherlands. Working together and sharing knowledge are essential to achieve these goals. One thing is certain: you may go faster alone, but we will achieve more by doing things together. That is why we would like to introduce you to our 2030 Building Ceramics Technology Roadmap.

Every challenge is also an opportunity

The Dutch Building Ceramics Industry has a long tradition of beautifying the Netherlands; for centuries masonry and paving bricks, ceramic roof tiles and wall and floor tiles have been used constructively and aesthetically in and around buildings to create atmospheric and safe living environments. Not only is river clay a local and renewable resource, but sustainable clay extraction in the flood plains also contributes to climate adaptation and flood protection, while creating new nature and biodiversity at the same time. At plant level the ceramic industry consists of SME companies. However, to make the region and sector future-proof, the sector faces considerable large-scale industry challenges.





Challenges for the Dutch Building Ceramics Industry*:

-  Reduction of CO₂-emissions
-  Strengthening the Circular Economy and good management of Natural Capital
-  Chain optimization and industrialization within the building sector as part of the vast (sustainable) building targets

* Based on the development goals from the 2030 United Nations Agenda for Sustainable Development.

These challenges require responsible, long-term investments. The Technology Roadmap was drawn up to be able to make different choices in conjunction and consultation with the sector, authorities and other stakeholders.

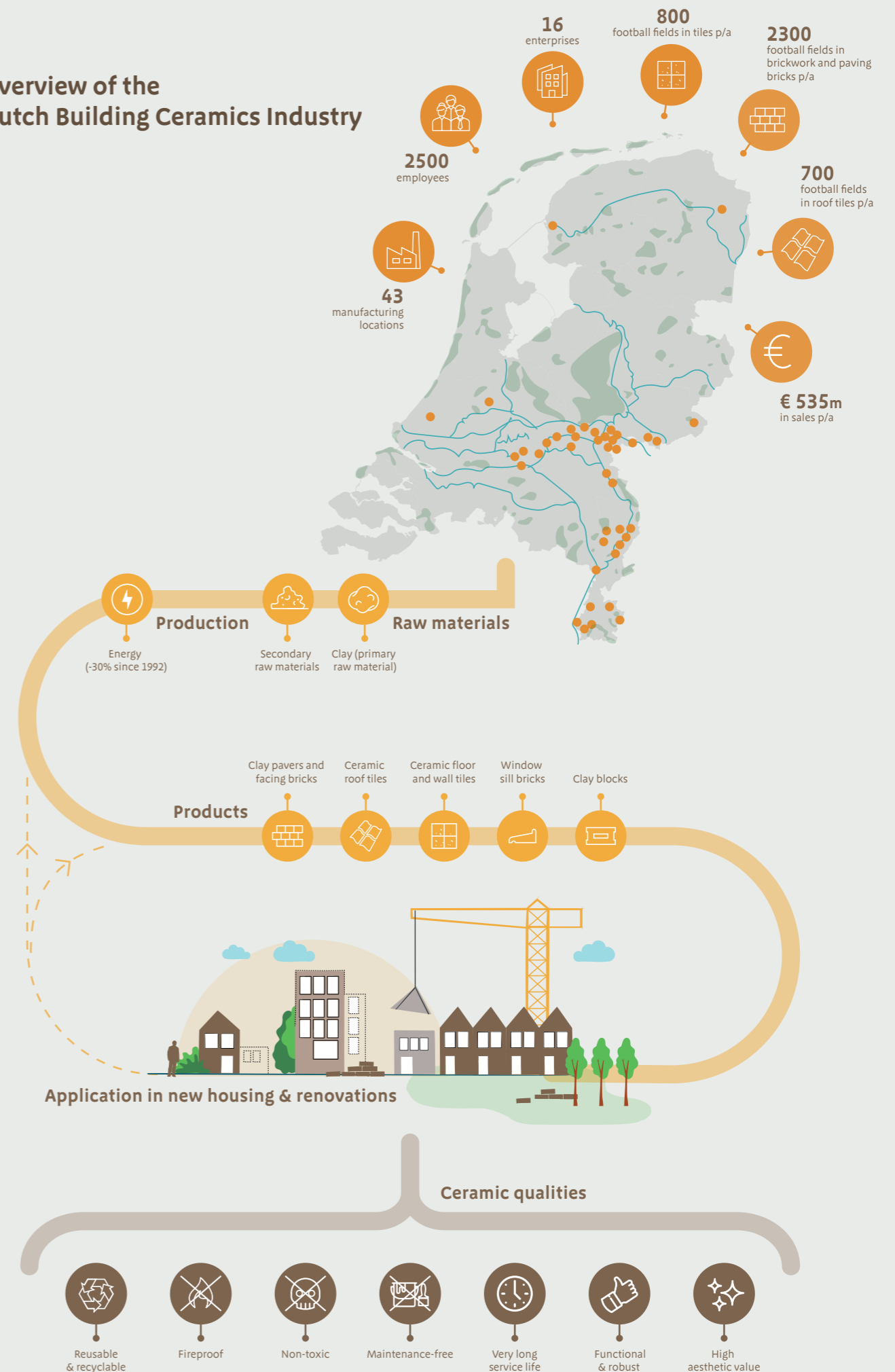
Our four lines of action:

-  1. Sustainable manufacturing
-  2. Product innovation and innovation of production process
-  3. Strengthening circularity
-  4. Sustainable use of raw materials

Building from scratch

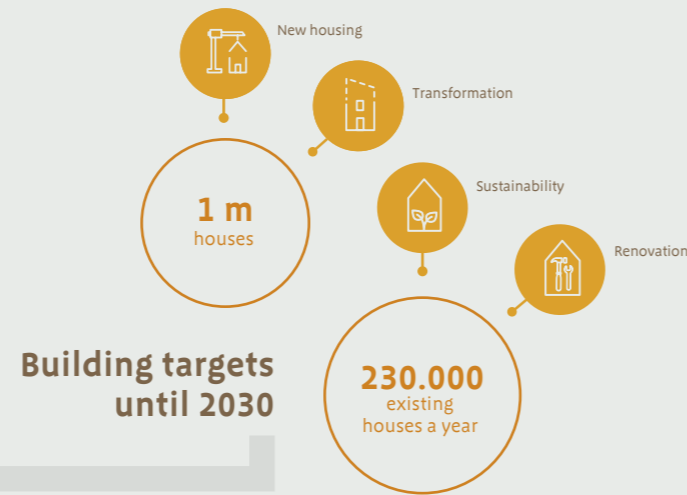
The sector has a relatively small number of players with limited investment opportunities. Therefore, cooperation and sharing knowledge are essential in implementing the Technology Roadmap. The tasks are comprehensive and complex, in technical terms, as well as due to the many preconditions. Examples are the availability of the infrastructure for renewable energy sources, finance options and the location of plants in natural areas. The sector's production resources are capital-intensive, and companies have long-term investment cycles. All this results in a foreseen long transition period and calls for a rapid implementation of the Technology Roadmap.

Overview of the Dutch Building Ceramics Industry



To what social challenges do we contribute?

For a future-proof and sustainable housing stock in the Netherlands, there is a need to develop **one million energy-neutral houses** until 2030, built with circular or renewable raw materials. In addition, at least **230,000 existing houses must be made sustainable** (energy label A) in which facades and roofs are the main focus. With its products, the Dutch Building Ceramics Industry contributes significantly to new construction, transformation, preservation, and renovation projects.



Climate-neutral and Circular



Our contribution to a circular construction economy

<p>Renewable raw materials</p> <p>Clay sediment is constantly deposited / alongside rivers.</p>	<p>Secondary raw materials</p> <p>Increased use of secondary raw materials in the production of ceramic materials.</p>	<p>Recycling</p> <p>Clay pavers, ceramic roof tiles, and facing bricks can be used several times.</p>	<p>New products and production methods</p> <p>We encourage reuse (e.g. use of facing bricks without cement mortar using a dry stacking system).</p>
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This is how we handle nature, biodiversity, water safety and climate adaptation

<p>CO₂ emissions</p> <p>The production of building ceramics is energy-intensive (CO₂-emissions). In use, this is amply compensated by a very long maintenance-free service life.</p>	<p>NO_x</p> <p>The ceramic firing process leads to NO_x-emissions, which remains limited using the best available technologies.</p>	<p>Natura 2000</p> <p>Clay extraction and production often in or near Natura 2000-areas with area-oriented, unwanted nitrogen emissions. Clay extraction provides demonstrable added value for the environment.</p>
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The three major challenges:

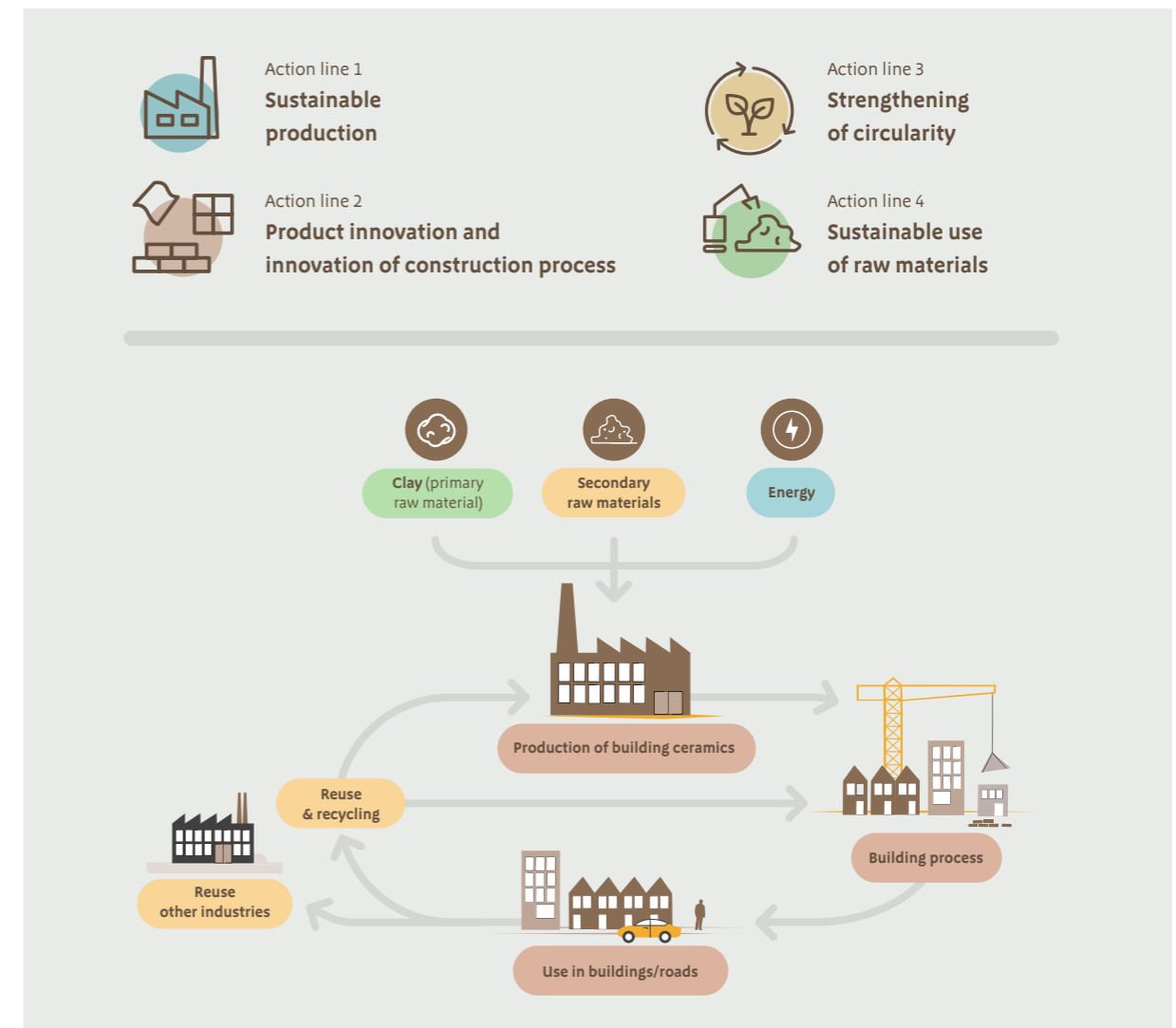
Climate change is a severe threat to a future sustainable development of our society. To transform our world and meet the objectives set in the 2030 Agenda for Sustainable Development, it is essential - among other things - to accelerate the energy transition and nitrogen reduction in our country.

Although sustainable raw material extraction, energy savings, and emission reductions have been key priorities of the ceramic industry for decades, new developments and views have led to (re)formulating our challenges.

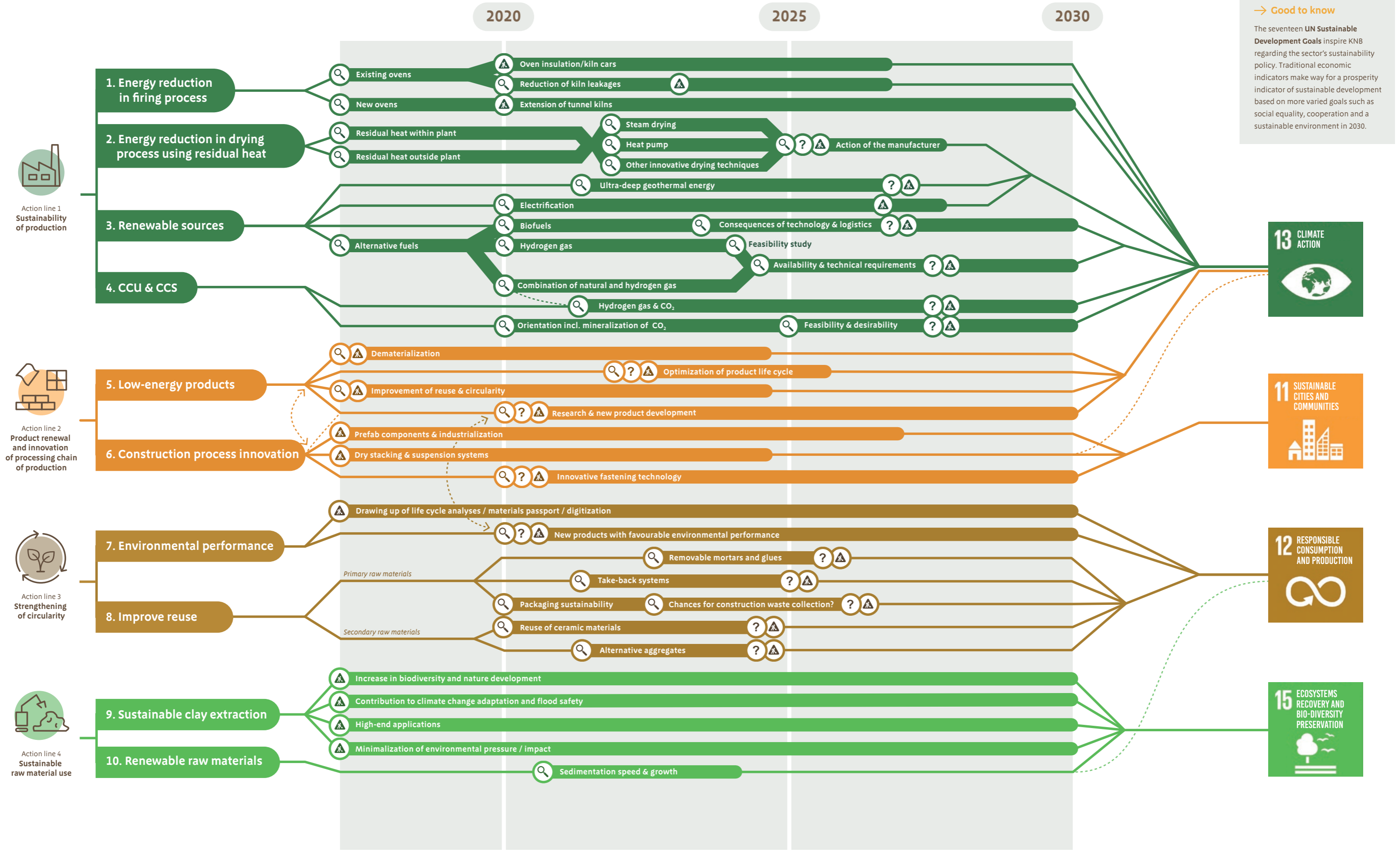


How do we approach this?

Four integral lines of action have been set out that cover the entire chain:



2030 Building Ceramics Technology Roadmap



→ **Good to know**

The seventeen UN Sustainable Development Goals inspire KNB regarding the sector's sustainability policy. Traditional economic indicators make way for a prosperity indicator of sustainable development based on more varied goals such as social equality, cooperation and a sustainable environment in 2030.

Increasing sustainability is something we do together towards a future-proof sector

We need cooperation and liaisons with parties that are facing the same challenges and opportunities to implement this 2030 Building Ceramics Technology Roadmap. For example, governments at central and decentralized levels, cable and pipeline companies / energy transfer companies, power suppliers, other industries, raw material extractors, NGOs, knowledge- and research institutes.



Energy infrastructure

The route(s) chosen for CO₂ reduction often need(s) additional infrastructure for the supply of energy carriers to the various locations and/or the removal or storage of CO₂, for example:

- Residual heat
- Biomass, biogas / green gas
- Electricity
- Geothermics
- Hydrogen
- Wind / Solar
- CCU / CCS

A possible synergy with Regional Energy Strategies and/or Cluster Energy Strategies is vital in this.



Spatial planning

For the development and rollout of existing and new activities, physical land usage must be considered for the planning purposes of:

- Raw material extraction
- On-site energy generation
- Industrialization / prefabrication
- Deployment of secondary raw materials
- Recycling and circularity
- Construction of loading and unloading docks
- Nitrogen-reducing measures



Policies, laws, and regulations

The sector is subject to many local, regional, provincial, national, and European policies, laws, and regulations. The activities planned in the Technology Roadmap must be cleverly linked, where possible, to the requirements of:

- Energy policies
- Competition
- Building regulations
- Environmental Management Act
- Environmental Law
- Policy GuideLine Major Rivers
- Nitrogen policies
- Clear Air Agreement
- Climate Agreement
- Emissions Trading (EU-ETS)
- Fiscality
- International level playing field



Funding

The implementation of this Technology Roadmap doesn't work without a mix of funding sources for:

- Fundamental research and innovation, the initial costs of which are not covered by exploitation
- Wide-scale rollout of energy and (circular) chain measures
- Essential energy infrastructure
- An implementing organization that prepares projects, mobilizes and joins stakeholders, removes bottlenecks and monitors and stimulates progress.