



RadoNorm
Managing risks from radon and NORM

Marketing and Societal Challenges of Alternative Cementitious Binders Made with NORM-Contained By-products (Industry's Perspective)

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The Guardian

Cement makers across world pledge large cut in emissions by 2030

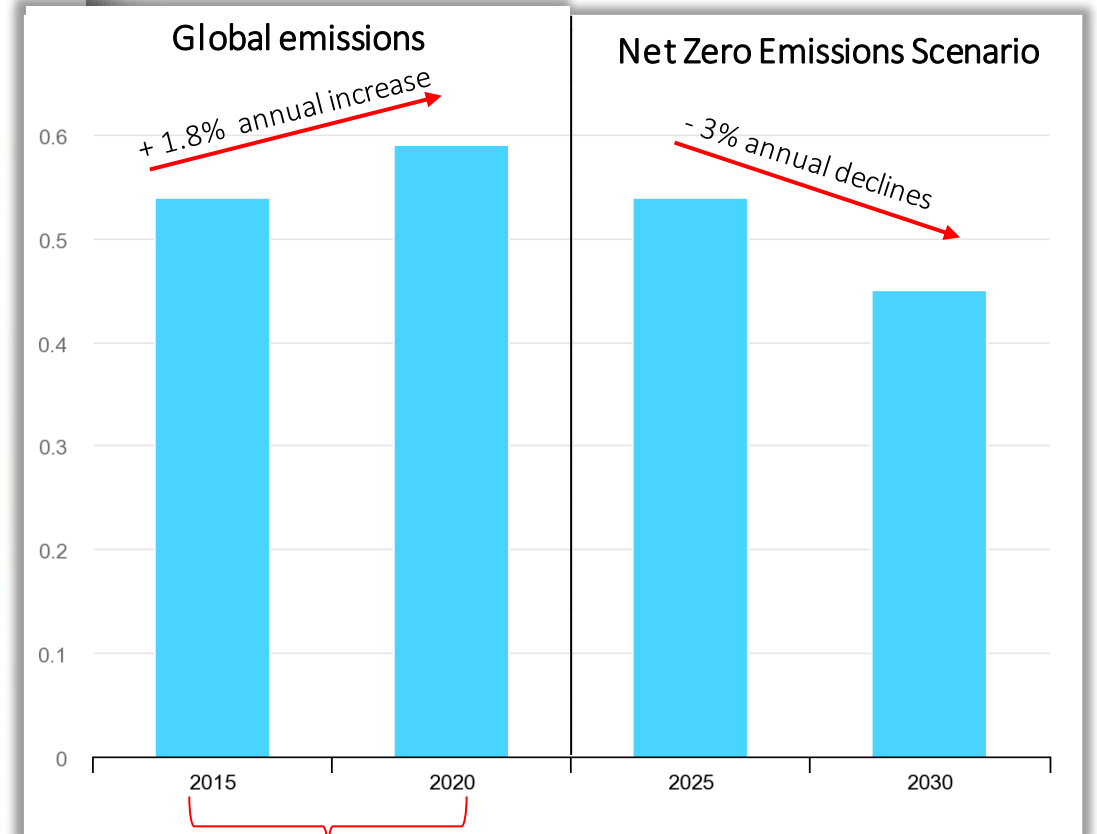
Industry responsible for about **8%** of CO2 emissions commits to reaching net zero by 2050 without offsetting



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 - main ingredient in cement
 - the amount used is directly proportional to the CO₂ emissions

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- Different industrial by-products have the potential to substitute clinker
 - Reduce CO₂ emissions
 - Contribute to circular economy through usage of secondary raw materials

Alternative Cementitious Binders for Sustainable Society

- Currently there are two main by-products used in cement and concrete industry
 - Blast furnace slag (by-product of steel industry)
 - Fly ash (by-product of coal power plants)

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Reducing 7% of global CO₂ emissions has great societal impact...

Research Questions

- Is the industry interested to use these alternative cementitious binders?
- What are their selection criteria?
- What are their concerns?

Methodology

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- Semi-structured interviews with concrete industry representatives including concrete producing companies and related associations in Belgium
 - Online interviews (Oct 2021-Jan 2022)
 - 14 participants (Data Saturation)
 - 1 hour each interview
- Participant recruitment
 - Snowball sampling



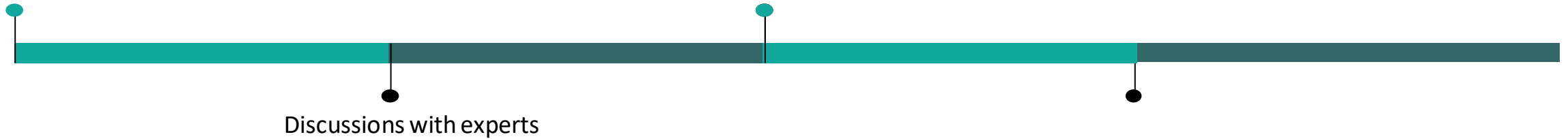
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List of questions based on the literature review of similar product (e.g., carbon capture product)



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1. Company's current decision making process for choice of cement type
2. Sustainability
3. Cementitious binders
4. NORM-contained cementitious binders

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Results

Industry's Current Sustainable Actions

- Push factors
 - The CO₂ taxes
 - Availability of by-products

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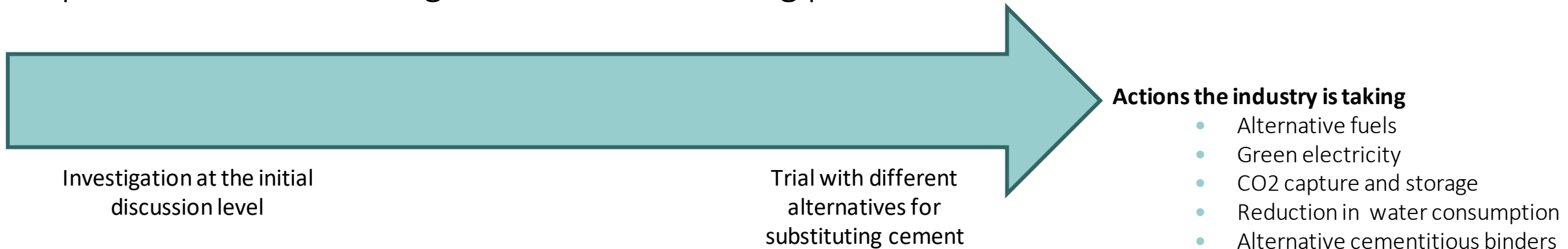
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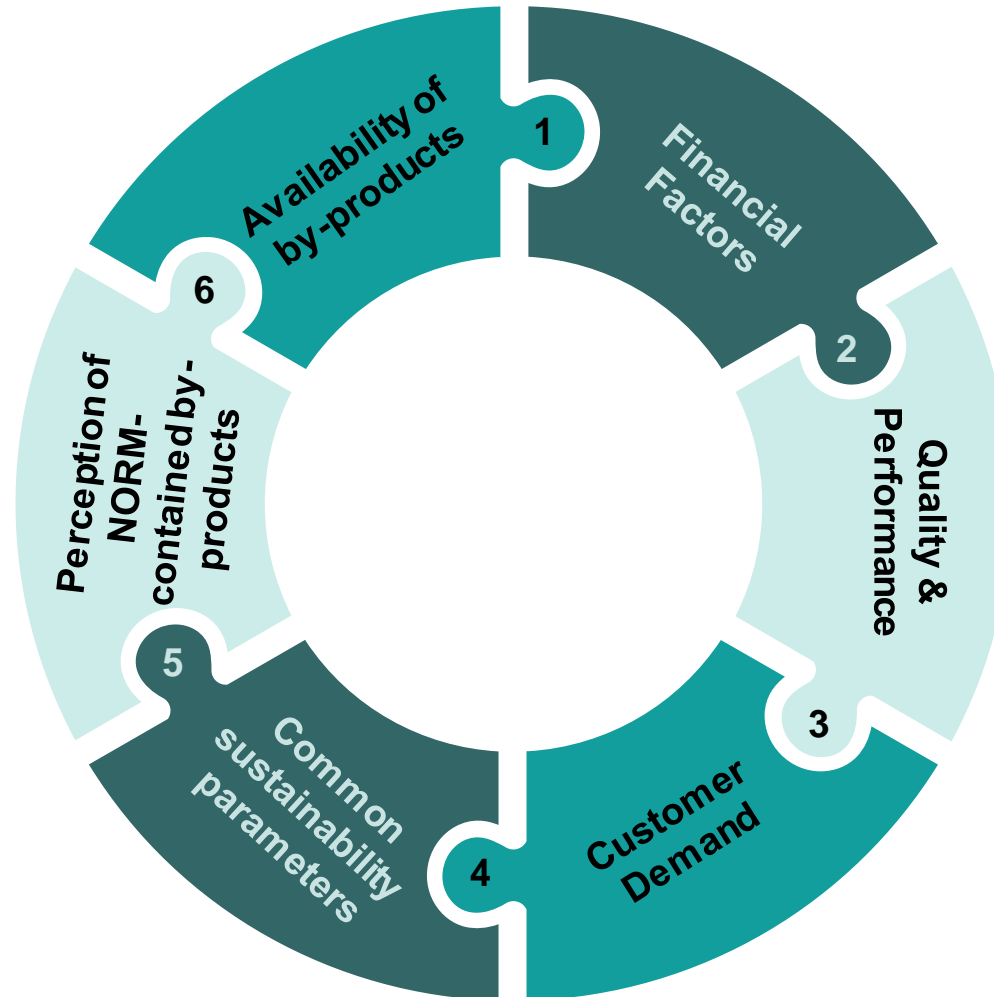


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Six main Factors Affecting Concrete Industry's Perception



1. Availability of By-products



- Selection criteria
 - Available in certain scale
 - Available locally
- Concerns
 - Importing by-products and cement outside Europe
 - Reducing the CO₂ on the paper but global emissions is the same
 - Financial threat

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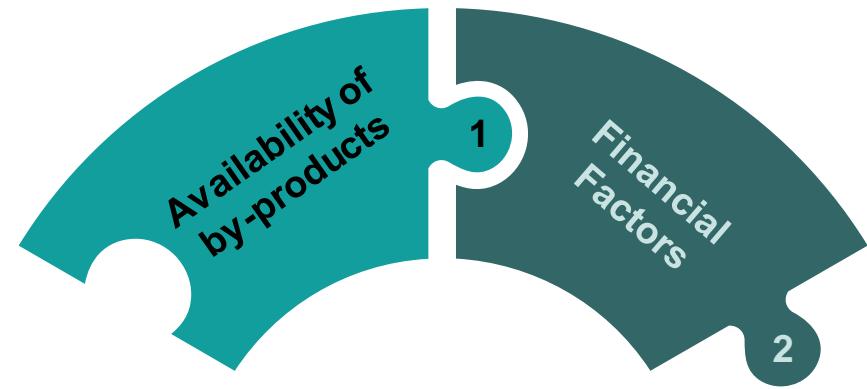
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3. Quality and Performance

- Selection criteria
 - Technical specifications
 - Specification of strength in certain time
 - Resistance to freeze and thaw cycle
 - Level of reactivity
 - Durability
 - Workability

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“I hope not to end up with three different legislations on three different parameters.”

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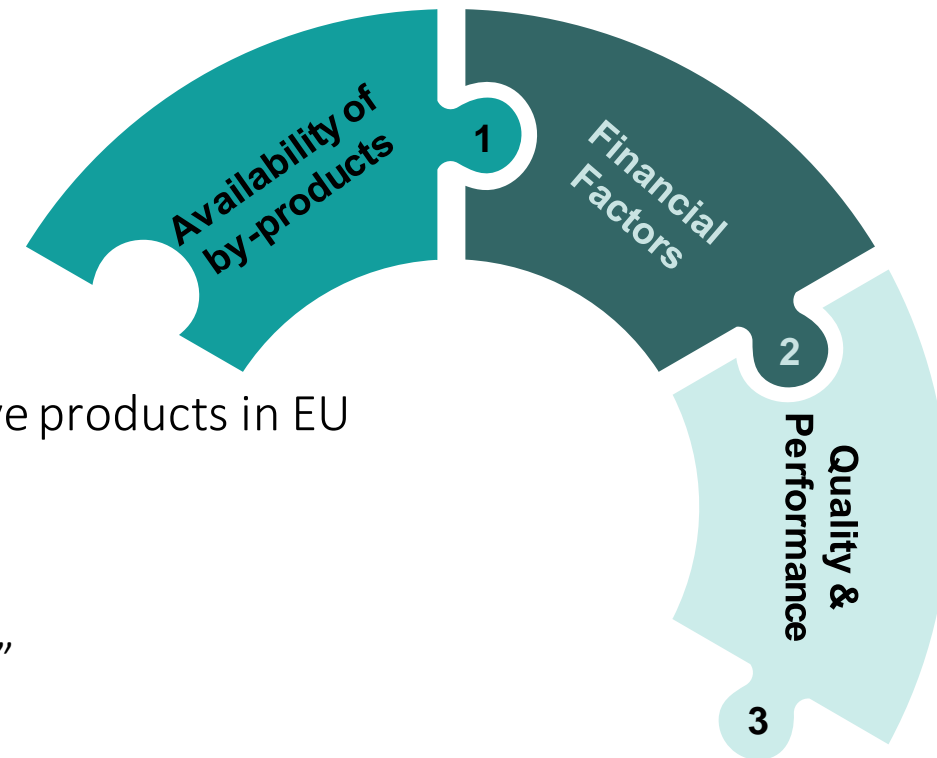
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“On the floor in 99.6%, nothing has changed so far. So most of them just do business as usual and they just want concrete that's cheap and okay in terms of quality.”

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“just want something new that sounds green”

“a little bit of sustainability awareness in our product”

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- Facilitators
 - Government setting an example by demanding sustainable concrete
 - Stimulating demand for sustainable products through regulations

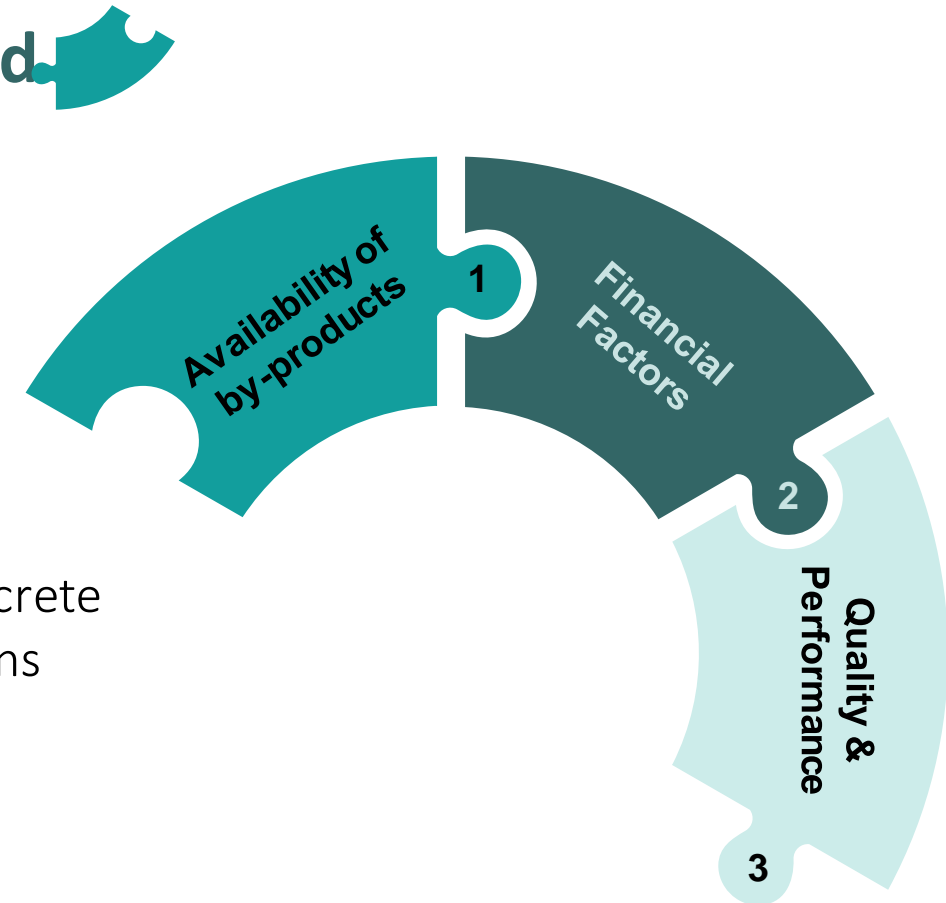
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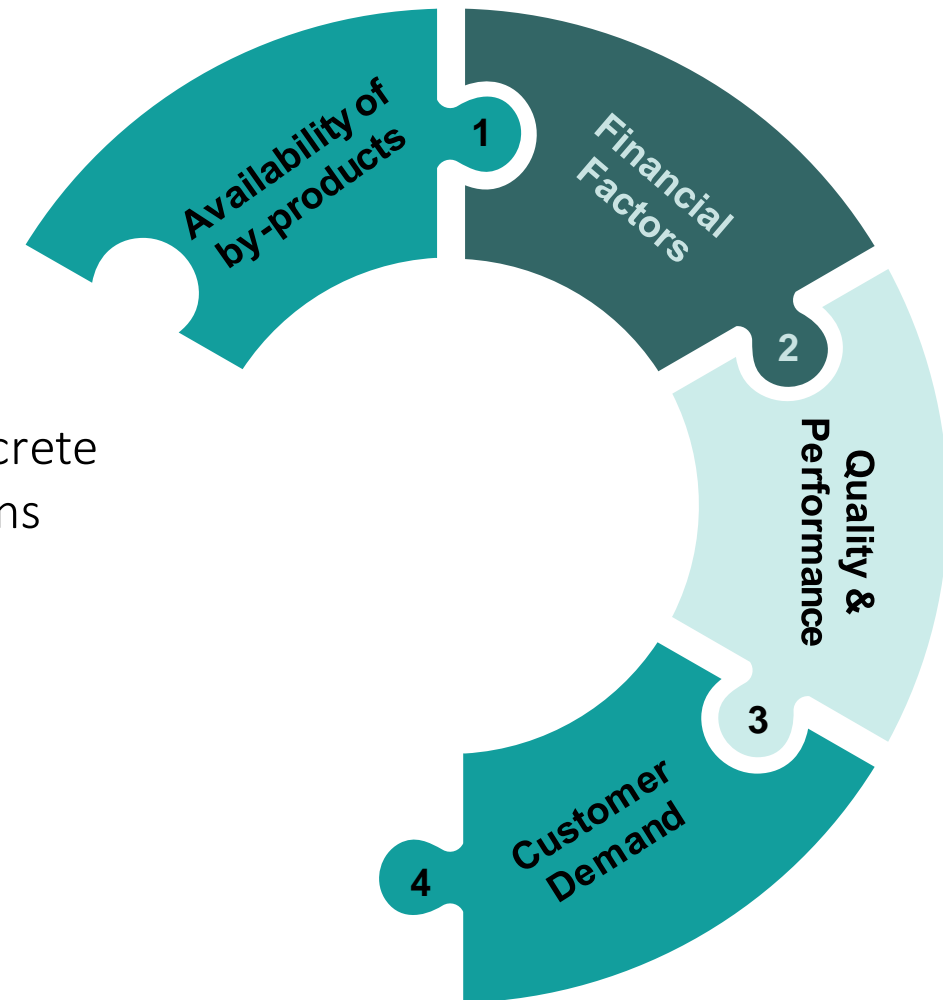


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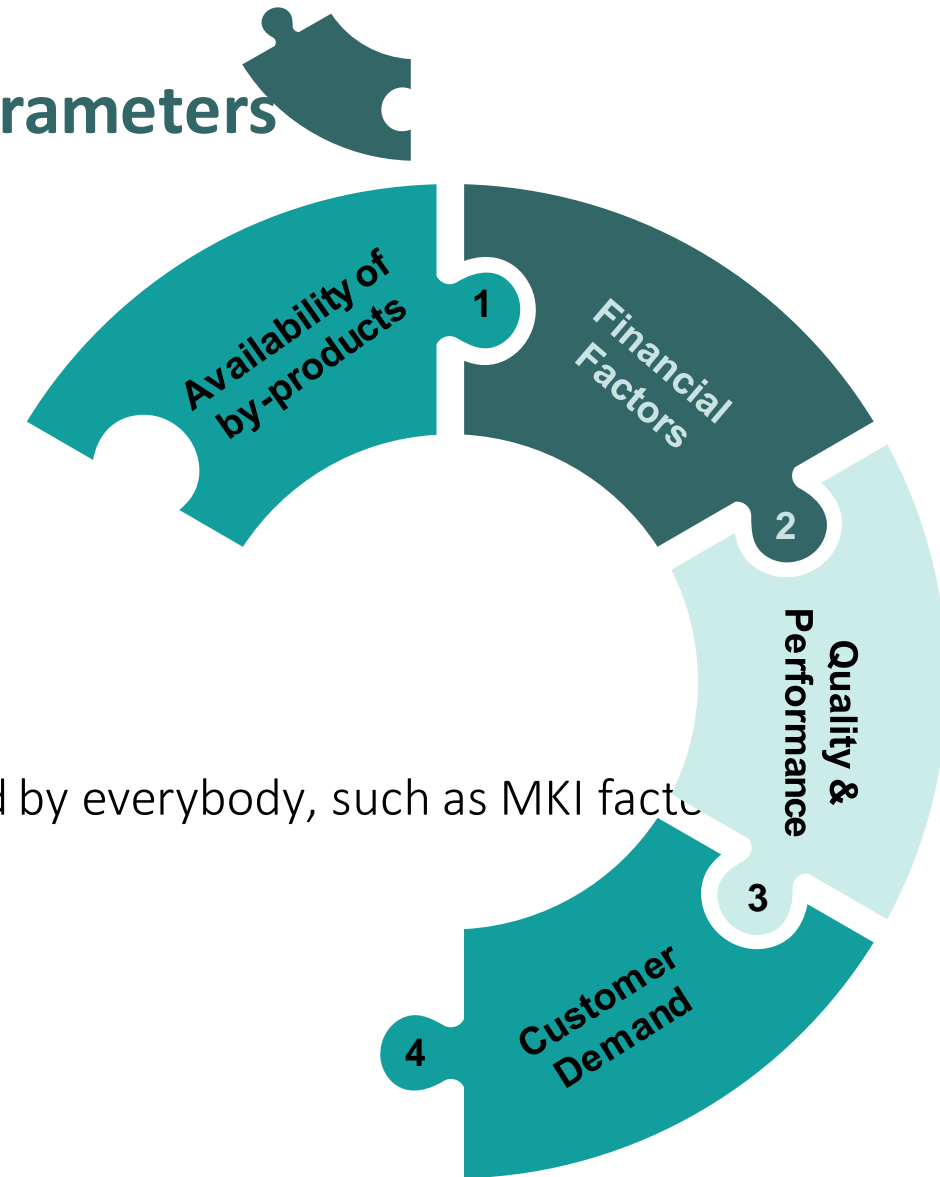
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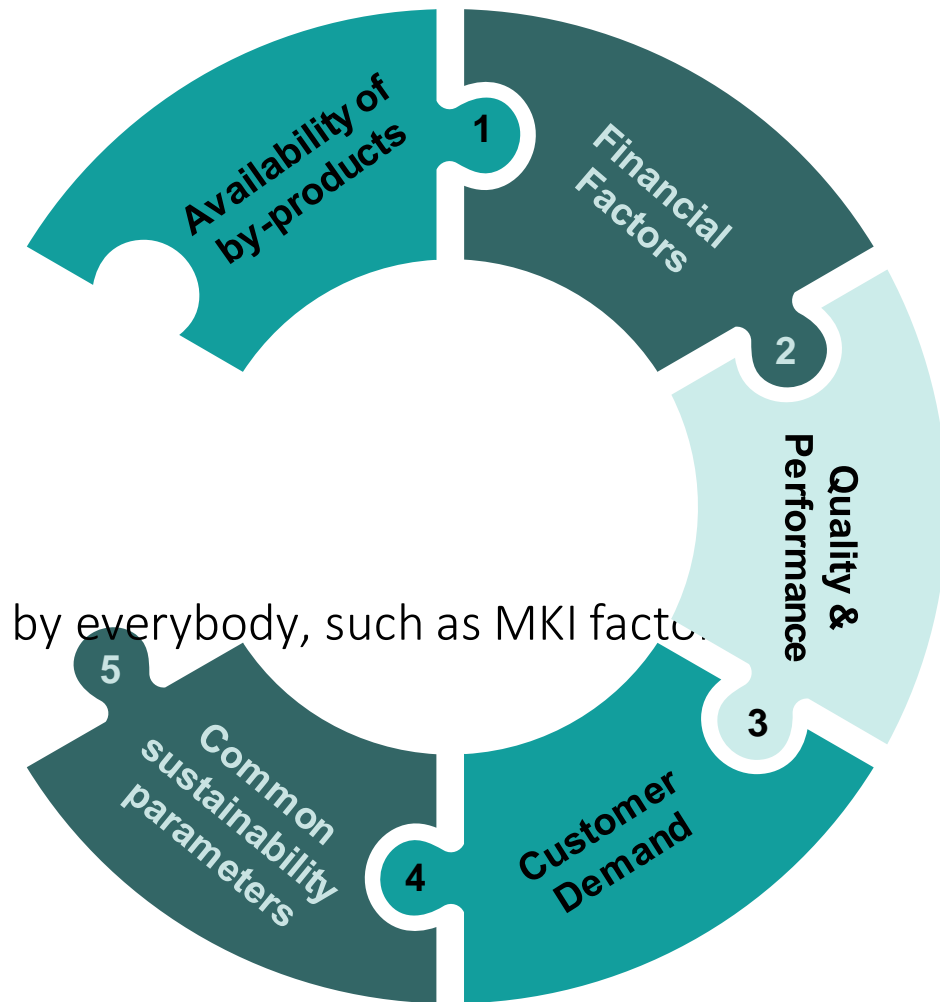


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- Those who had higher perceived risk were more sceptical about it

6. Perception of **NORM-contained** By-products



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- Selection criteria
 - Being certified
 - End of life (different expectations)
 - Not encountering issues similar to asbestos
 - Being able to use the crushed column as aggregate to make another column
 - Being able to make new concrete with exactly same capacities as today's fresh concrete
 - Being able to use it in its third or fourth life without leaching problems

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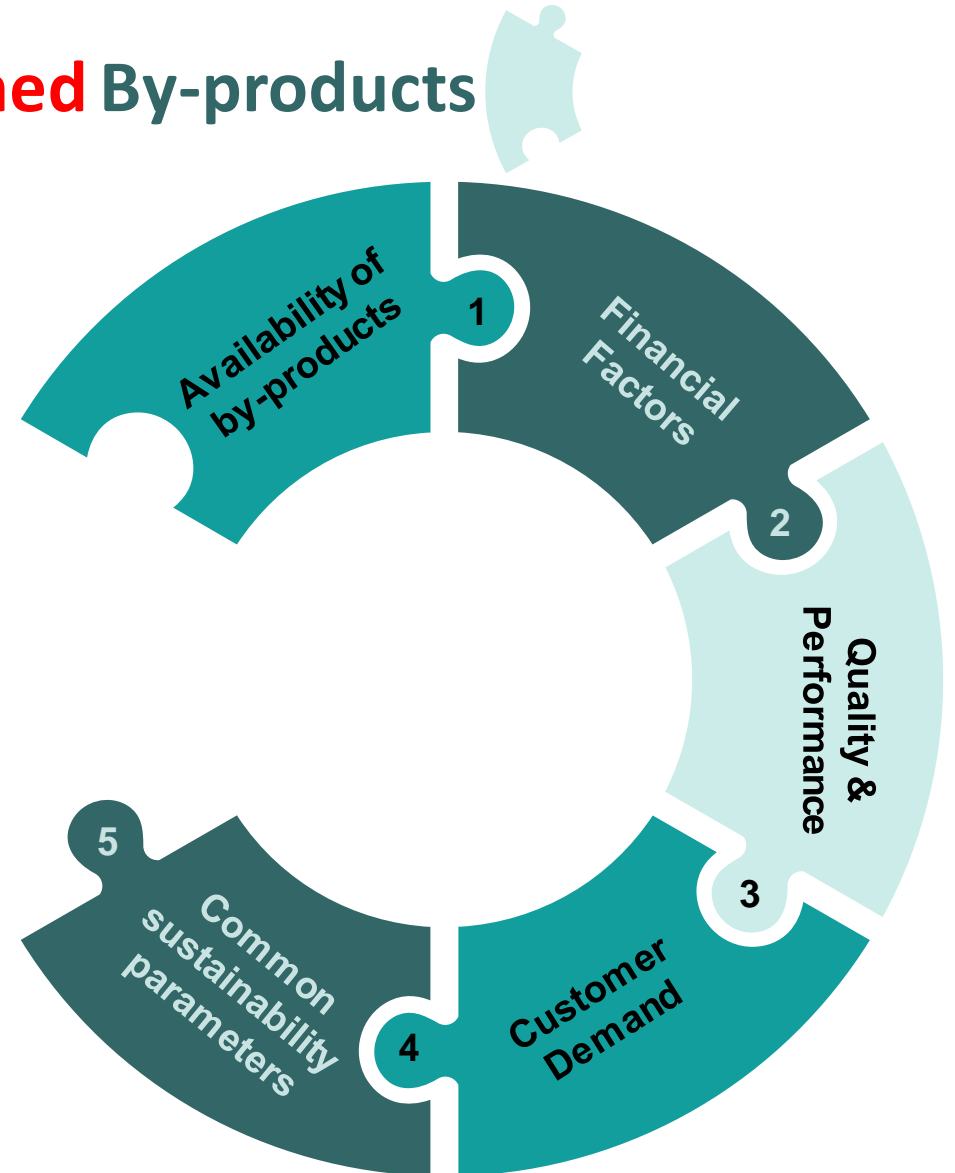
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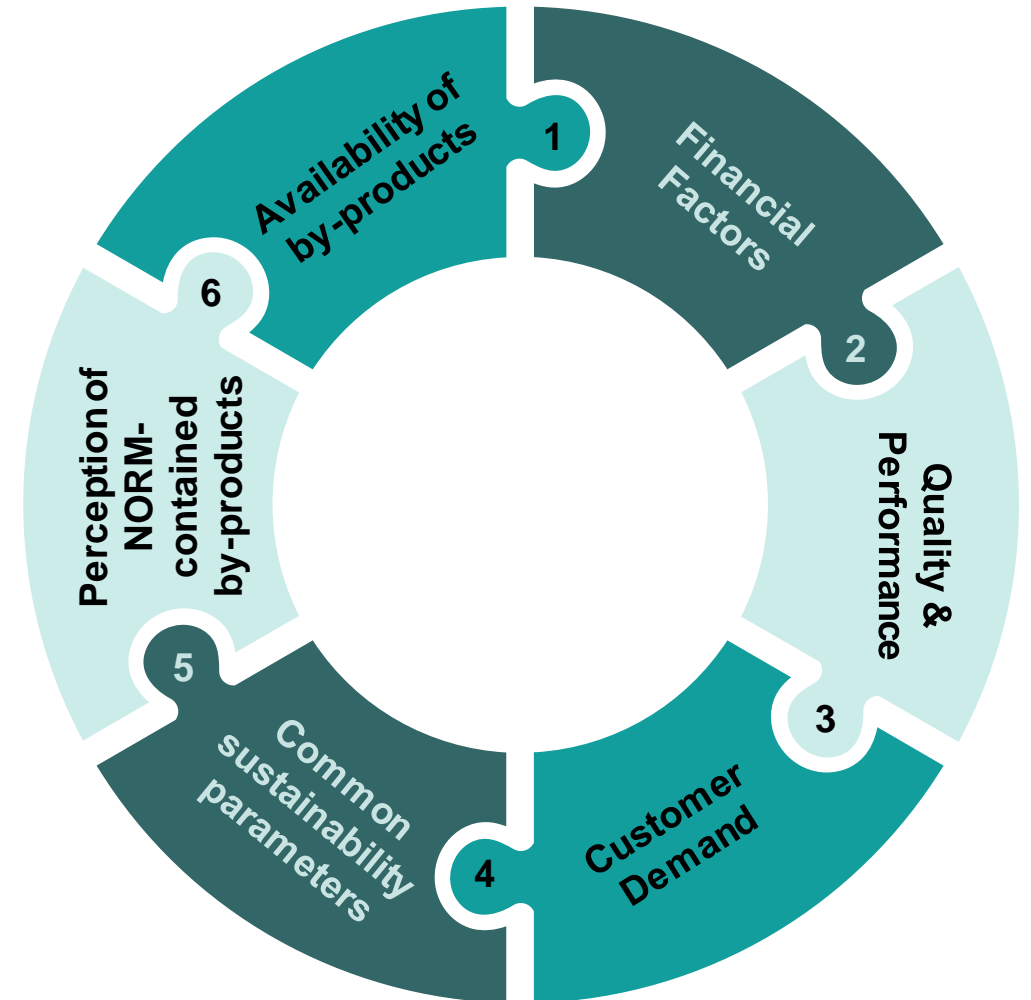
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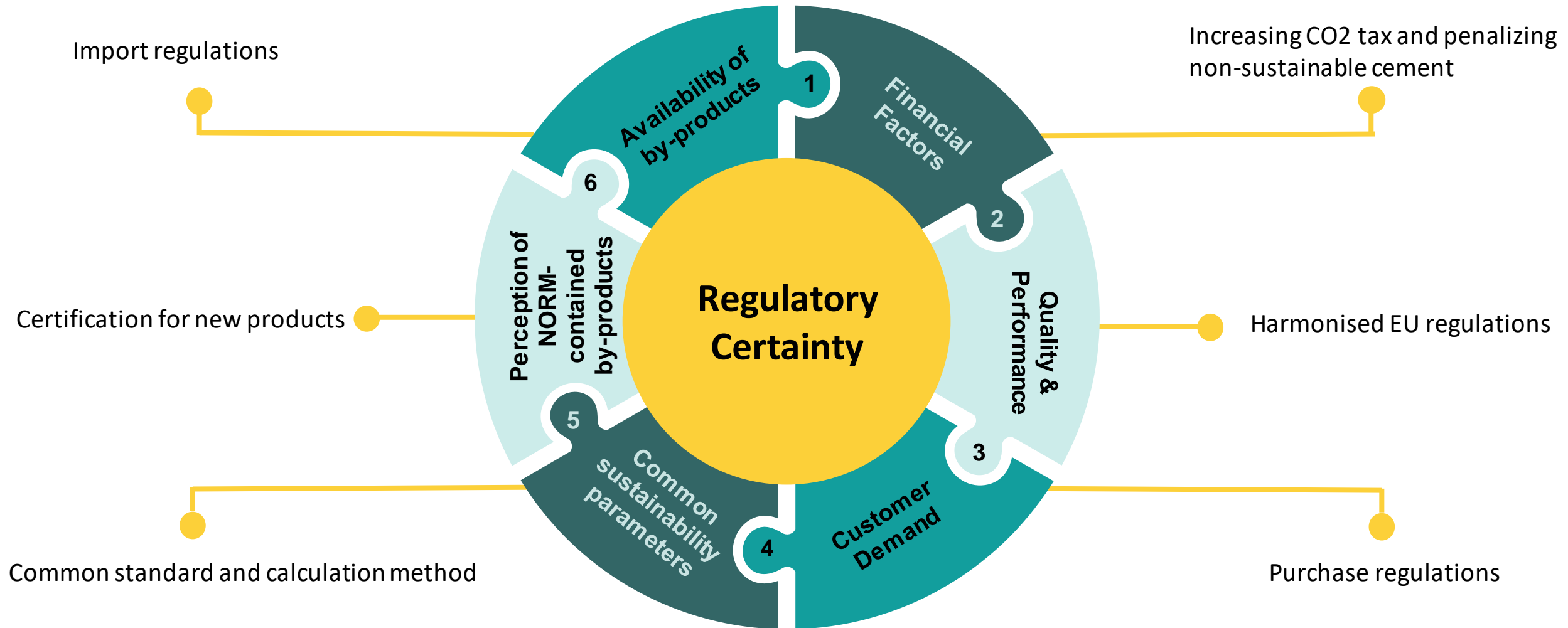


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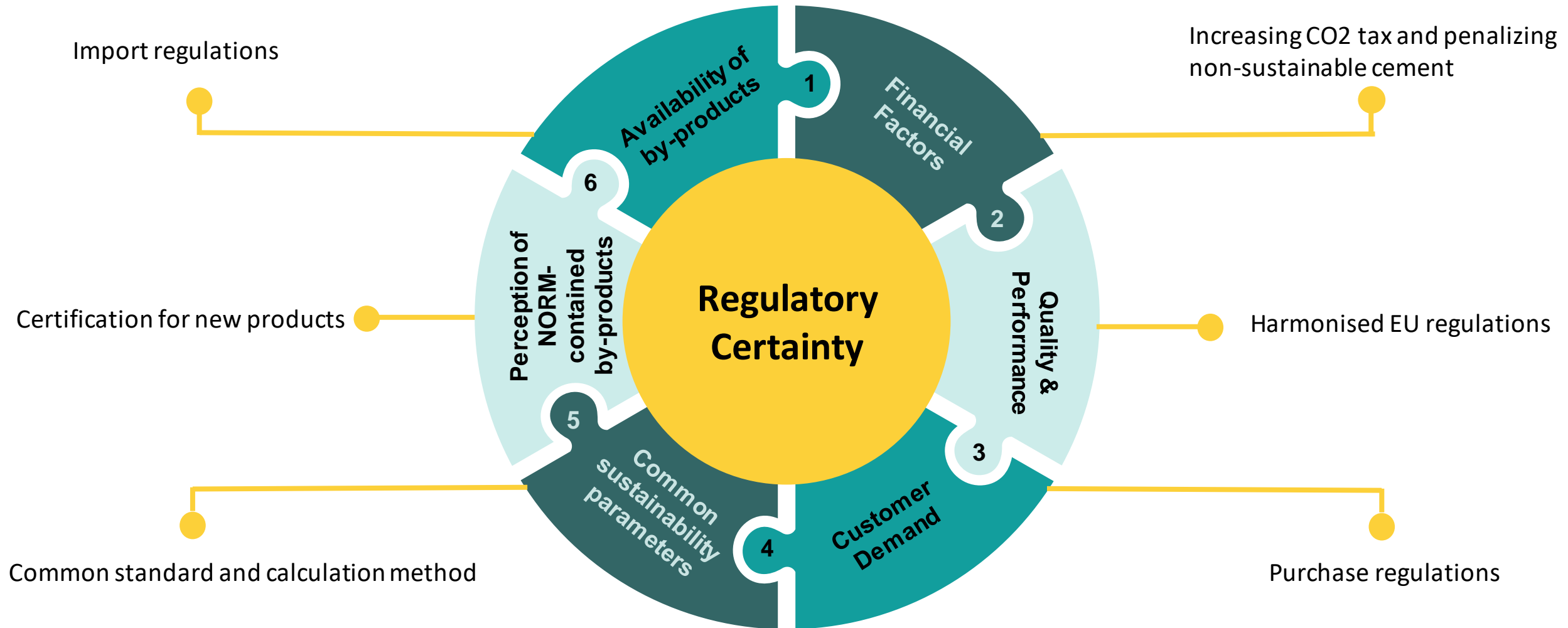
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- End-users' perspective (those who are building or renovating their home or working place)
- Regulatory perspective


Thank you for your attention



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