



ANNUAL REPORT 2023

CONCRETE SUSTAINABILITY COUNCIL

CSC- GLOBAL CERTIFICATION FOR RESPONSIBLY SOURCED CONCRETE AND ITS SUPPLY CHAIN

www.csc.eco





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1 DISCLAIMER

This report is intended to provide general annual information for non-commercial purposes only. While every reasonable precaution has been taken to ensure that the content of this report is accurate, errors can occur. Therefore, this report is provided with no guarantees of completeness, accuracy or usefulness.

In no event will The Concrete Sustainability Council (CSC) or its external advisors or any of its Regional System Operators, members or affiliates, or any partners, sponsors or stakeholders assume liability for any decision made or action taken in reliance on the report.

Most of the pictures are taken from the GCCA's 5th annual Concrete in Life photography competition (2023)

As one of the most widely used human-made products on the planet, concrete is all around us: in our houses and offices; our roads and pavements; in the bridges that connect us; the wind farms that provide us with energy; and the sea barriers that protect us. As the sustainable building material of choice, it provides safe, durable and resilient structures as well as providing the basis for renewable energy infrastructure.



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY PHILIP AM GUAY, NATIONAL MUSEUM, DOHA QATAR "THE VERSALITY OF CONCRETE MADE A MAJOR ROLE IN MATERIALIZING THE VISION OF THE ARTICTECTS OF THE MUSEUM INSPIRED BY DESERT ROSE "

2 INTRODUCTION

Dear Stakeholders,

This 2023 annual report represents a significant step towards better understanding the CSC commitment to help society make sustainable choices. It offers an overview of certificates issued, responsible sourcing performance, innovation and continuous improvement, including our envisioned way forward.

This report focuses on 2023 data, aiming to update our stakeholders on the major 2023 events, news and strategic achievements of the CSC in pursuing its goal of building sustainable cities and advancing additional objectives such as environmental responsibility, effective management strategies, social equity, economic viability, transparency, continuous improvement, global collaboration, promotion of sustainable construction practices and enhancing green infrastructure.

Following a fantastic year 2022, 2023 was again intense and 2024 seems to be promising as well.

In 2023 the CSC welcomed the first certifications in Finland, Lithuania, and Norway, reaching more than 900 valid plant certifications over four continents by the year -end. During 2023, the CSC also created a new sponsorship opportunity for companies providing services and equipment for the concrete sector and willing to join the movement of promoting and supporting the production and use of sustainable concrete around the world. We welcomed the first two sponsors in this new program in 2023.

The support we received from concrete, cement aggregates producers and their associations and the in-depth feedback from external stakeholders such as human right experts, labor union representatives, certification bodies, civil society organizations, Green Building Councils and academia enabled us to develop the updated CSC certification system version 3.0 which replaces the previous version 2.1 as of January 2024.

We are confident that CSC-certification remains an important lever to support the sector's sustainability journey.

At CSC we are convinced that it is only by collaborating with different private and public institutions, and companies that we will be able to work towards a sustainable future. Green Building procurement support continues to be key to achieve the Concrete Sustainability Council's goal. In 2023, CSC's efforts were recognized by B.E.S.T. from CEDBIK, the Green Building Council in Turkey and by CASA, the Green Building Council in Guatemala. The CSC is proud to have joined the Global Alliance for Buildings and Construction (GlobalABC), a multi-stakeholder alliance committed to delivering a zero-emission, efficient, and resilient buildings and construction sector.

As we grow our presence worldwide, we have welcomed Grey Matters, based in Dubai, as the new Regional System Operator for the MENA region. Keeping transparency and impartiality ensure credibility and are essential for the success of CSC-certification. We are therefore delighted that FÜZ SÜD and ASACERT, two Certification Bodies meeting the strict requirements of the CSC, decided to join the CSC.

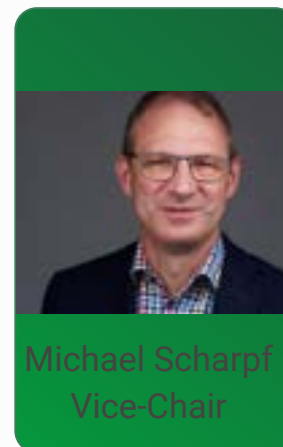
All CSC certifications performed in 2023 under System Version 2.1 were monitored and evaluated, and the results are shared in this report.

As 2024 unfolds, we anticipate numerous new certifications and expansions into new countries and regions growing the CSC community.

Yours sincerely,



Christian Artelt
Chair



Michael Scharpf
Vice-Chair



3 CSC CERTIFICATION

3.1 Scope of Certification

The CSC system is a product certification system, which practically targets the certification of production plants. Typically, the certification applies to all products manufactured and supplied by the respective plant, except from the voluntary modules for recycling and low CO2-concrete, which apply to a defined product range of a plant.

Ready-mix concrete plants and precast concrete plants can obtain a “CSC certificate”. Cement, slag and aggregate suppliers can obtain a “CSC supplier certificate”. Geared towards the comprehensive coverage of the supply chain, CSC supplier certificates are fully recognized in the CSC concrete certification.

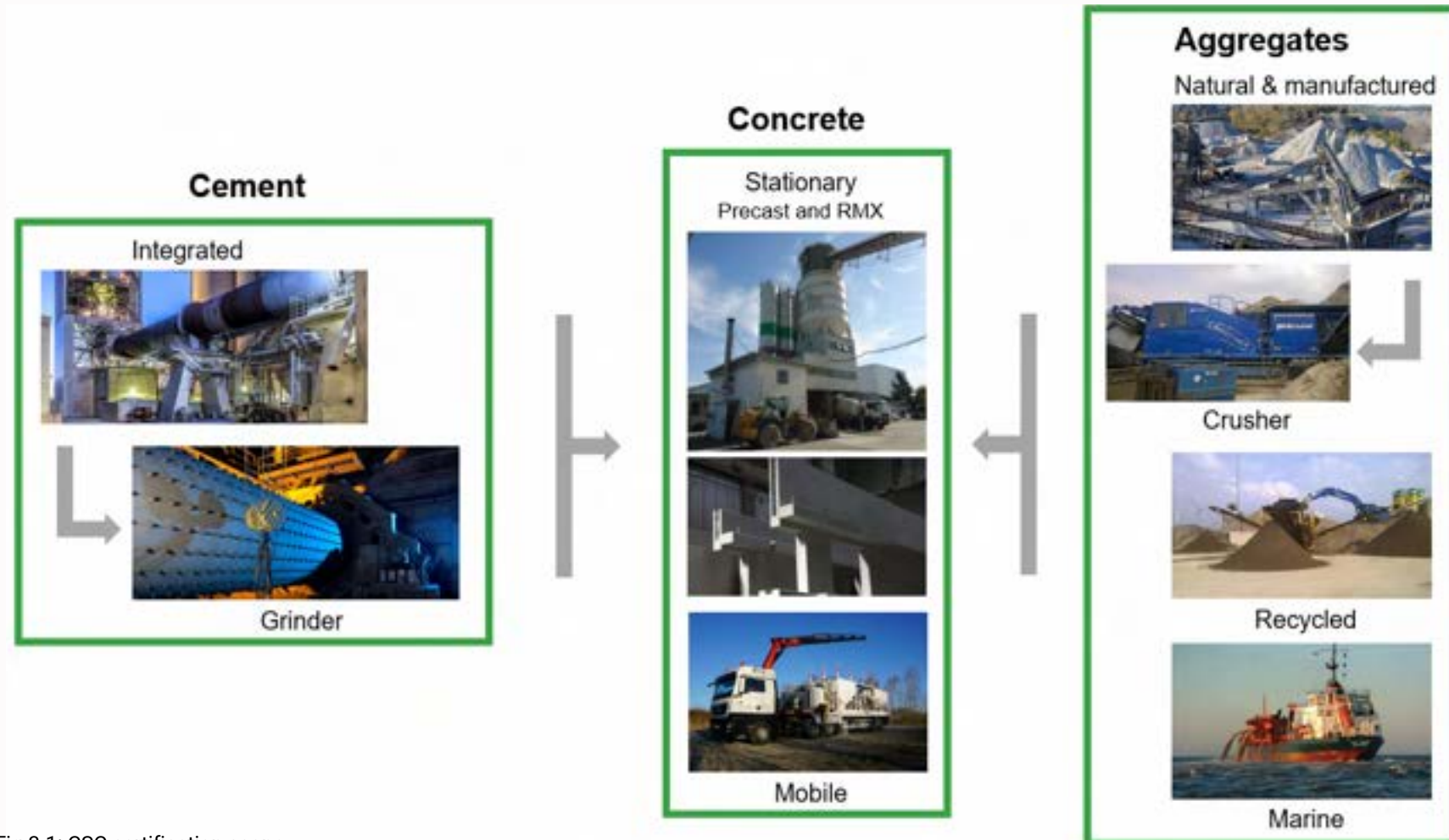


Fig.3.1: CSC certification scope

3.2 Scoring & Certification levels

The CSC certification system follows the concept of continuous improvement. The system currently offers four certification levels (Bronze, Silver, Gold and Platinum) to foster continuous improvement.

For certifying ready-mix concrete and precast concrete plants, the certification level obtained is the result of a scoring system, considering the individual scores from the concrete plant, and the weighted average from its CSC certified cement and aggregates suppliers. Certifying plants need to comply with all prerequisites (see section 3.3), plants aiming to certify at the level Silver or higher furthermore need to fulfill several mandatory criteria.

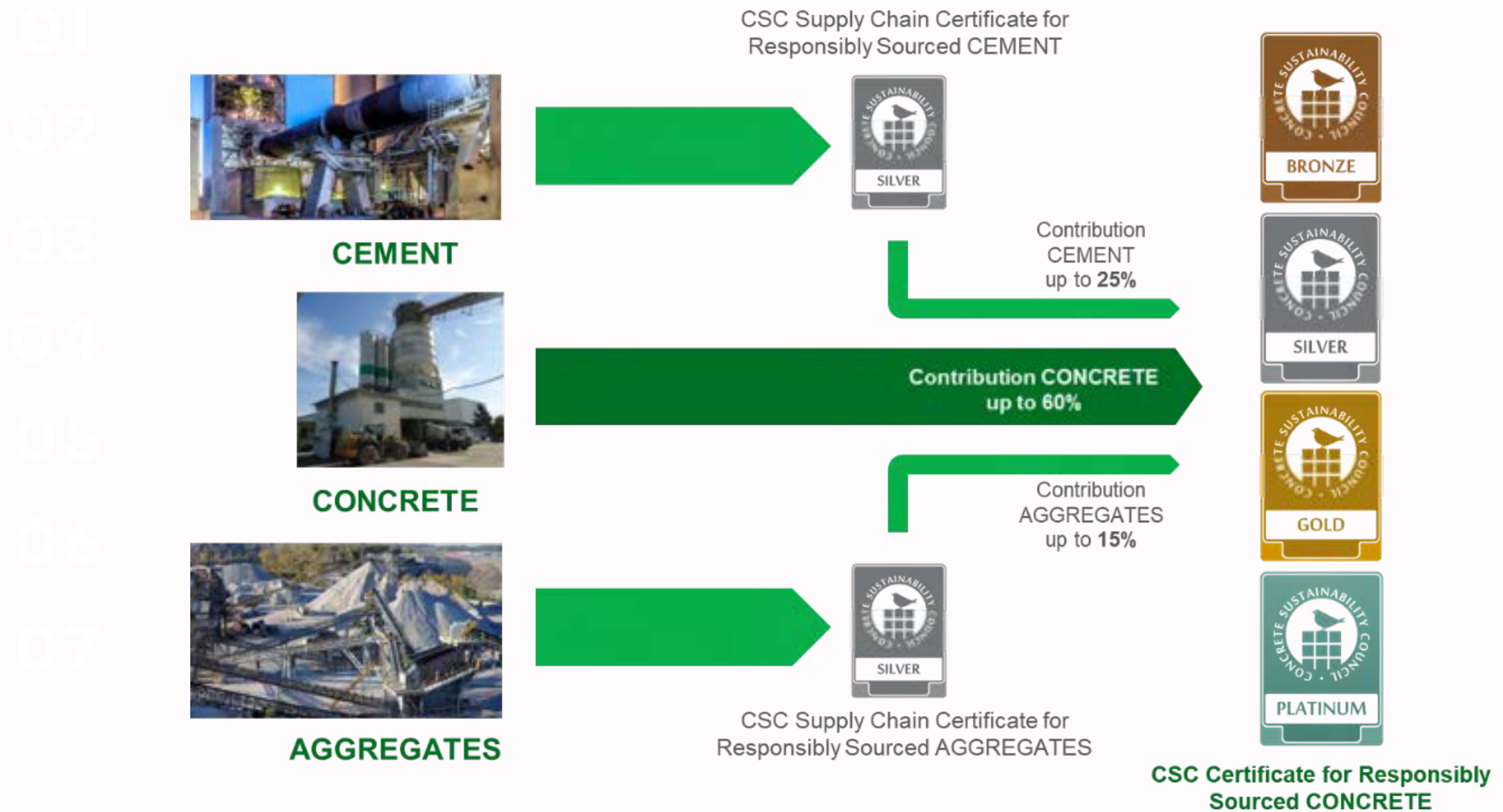


Fig.3.2: CSC scoring principles

3.1.1 Grinding System extended by a system for cement blending stations

The CSC extended the former “Grinding System” with a system for cement blending installations.

Cement production in cement blending plants is performed by blending Ordinary Portland Cement (OPC, CEM I) with secondary cementitious materials in dedicated blenders. Cement blending plants are not equipped with a kiln and own grinding equipment and their cement production consequently depends on (external) Ordinary Portland Cement (OPC, CEM I) supply.

Most of the environmental impact of the cement blending is related to cement (clinker) production and it is consequently necessary for cement blending plants undergoing CSC certification to prove that the processed cement they use is produced in a responsible manner.

If a cement blending station is the object of certification, the new “cement grinding and blending” system must be selected. In this case, only criterion C8 „Cement supply to CSC Cement Blender ” of the category “Chain of Custody” needs to be addressed.



Source Canva picture

3.3 Content of CSC certification

Each plant undergoing CSC certification must fulfill a certain number of prerequisites to obtain a CSC certificate. Provided the prerequisites are met, it can score points in the following categories:

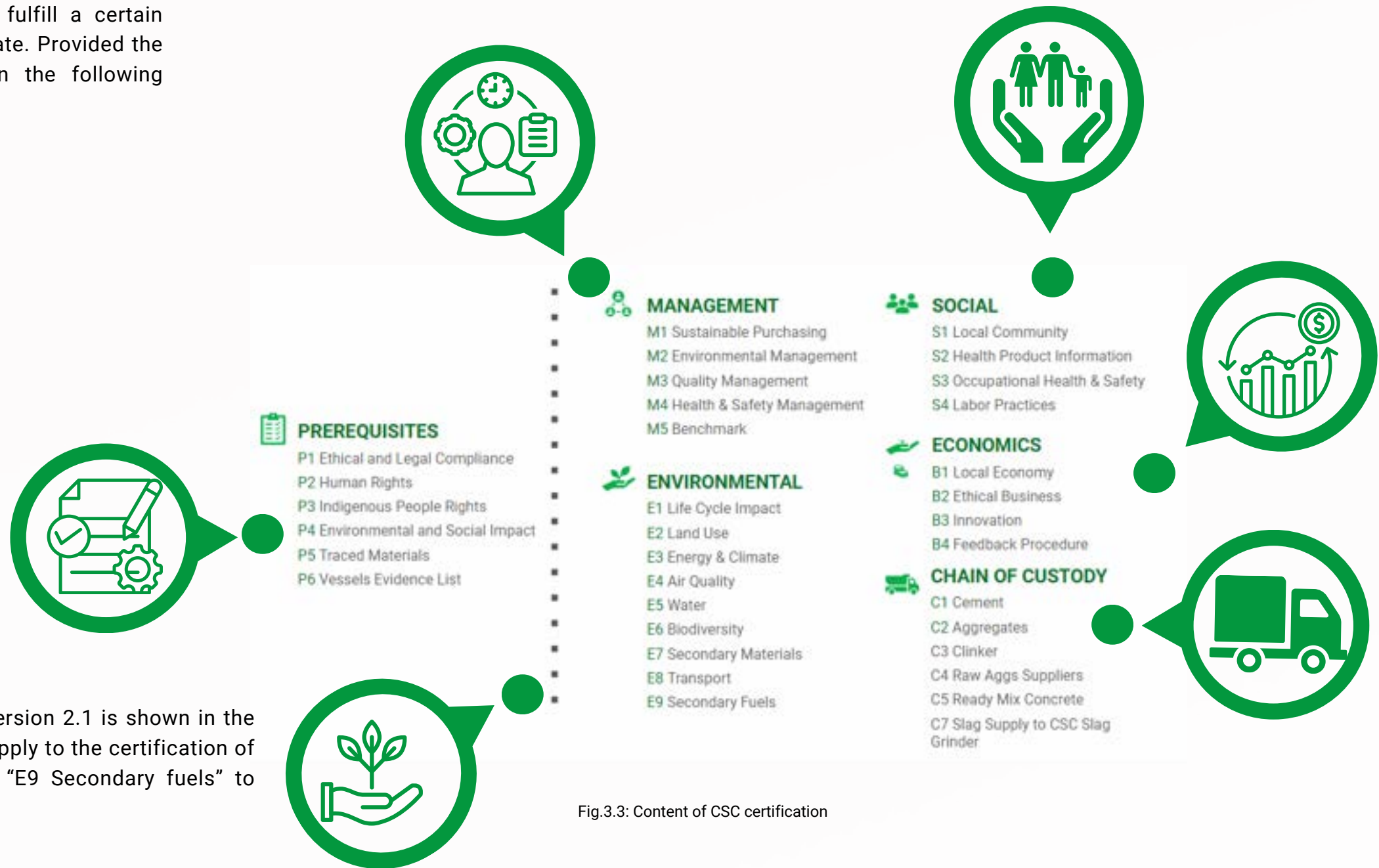
M- MANAGEMENT

E- ENVIRONMENT

S- SOCIAL

B- ECONOMICS

C- SUPPLY-CHAIN



An overview of the credits applicable in CSC version 2.1 is shown in the figure 3.3. Some of the credits or criteria only apply to the certification of a specific part of the supply chain, such as “E9 Secondary fuels” to clinker producing plants.

Fig.3.3: Content of CSC certification



3.4 The "R-Module"

This module enables concrete suppliers to label concrete with a recycled aggregate content of 10% or higher. The R-Module is available for CSC-Silver (or higher) certified concrete plants and rewards maximizing the use of recycled material in fresh concrete by means of a dedicated "Star" system that was introduced with the new CSC R-Module Version 2.1.

The CSC R-Module is expressed in the certificate by a supplementary "R" label and the number of stars awarded.

R-Module

R-Module

Plant Requirements

- R1 CSC certification Silver+
- R2 Traced R-material supply
- R3 R-material Consumption
- R4 Quality management
QMS, Use of certified R-material

Product Requirements

- R5 Concrete mix with minimum R-material content $\geq 10\%$



Fig.3.4: R-Module certification content

R-Module- Levels

| Level | Min. volume-% R-material |
|---------|--------------------------|
| 1 Star | 10 |
| 2 Stars | 20 |
| 3 Stars | 40 |
| 4 Stars | 80 |

Fig.3.5 R-Module certification content

3.5 The "CO2-Module"

This module enables concrete suppliers to label CO2-optimized concrete with a reduction in GHG emissions [kg CO2 equivalents per m³ of concrete] of at least 30 % when compared with a regional CEM I / OPC based reference mix of a given strength class. The CO2-Module is available for CSC-Silver (or higher) certified concrete plants. It is not an EPD, because it adds performance levels to material specific CO2 values in relation to a regional benchmark.

The CSC CO2-Module can be obtained with one to four stars. The color (Silver, Gold, Platinum) of the CSC CO2-Module is the color of the main CSC certificate held by the concrete plant supplying the low CO2-concrete.

CO2-Module



CO₂-Module

Plant Requirements

- L1 CSC certification Silver+
- L2 75% coverage of the cement supply chain
- L3 Monitoring of GHG emissions
CSC certification criterion E3.02 fulfilled
- L4 Quality Management: QMS

Product Requirements

- L5 Concrete Mix with CO2 reduction vs. baseline $\geq 30\%$

Fig. 3.6: CO2-Module certification content

CO2-Module- Levels

| Level | Min. CO2 reduction vs. local baseline |
|---------|---------------------------------------|
| 1 Star | 30 |
| 2 Stars | 40 |
| 3 Stars | 50 |
| 4 Stars | 60 |

Fig. 3.7: CO2-Module certification content

3.6 Supporting the implementation of the United Nations Sustainable Development Goals (SDGs)

CSC certification follows a holistic approach and requires compliance with five fundamental prerequisites and a wide range of social and environmental performance indicators, including “occupational Health & Safety”, “Labor practices”, “Land use”, “Energy & climate”, “Air emissions”, “Water”, “Biodiversity”, “Secondary materials”, and “transport”. With this, the CSC aims to contribute to the implementation of the SDGs in the concrete sector and its supply chain.

Most of the SDGs are directly or indirectly addressed, namely SDG 3 “Good health and well-being”, 6 “Clean water and sanitation”, 7 „Affordable and clean energy”, 8 “Decent work and economic growth”, 9 “Industry, innovation and infrastructure”, 10 “Reduced inequalities”, 11 “Sustainable cities and communities”, 12 “Responsible consumption and production”, 13 “Climate action”, 14 “Life below water”, 15 “Life on land”, and 16 “Peace, justice and strong institutions”.

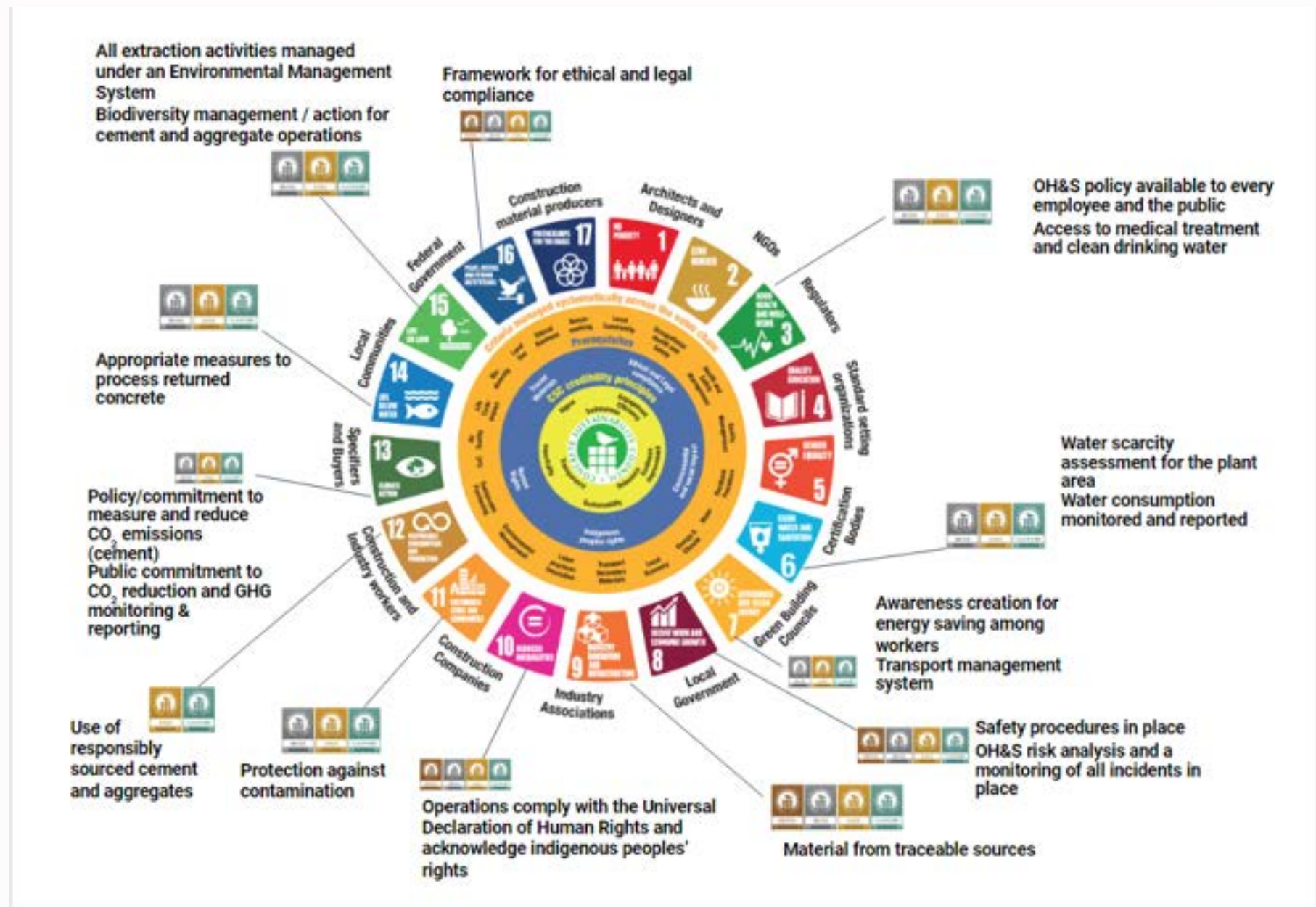


Fig.3.8: The CSC system’s coverage of the SDGs

4 CREDIBILITY OF THE CSC CERTIFICATION SYSTEM

The CSC certification system aims to achieve several clearly identified sustainability objectives, namely

01 Sustainability

- Improving the sustainable use of concrete by promoting responsible practices throughout the value chain and incentivizing continuous improvement;
- Ensuring transparency in the concrete sector by making sustainable practices more visible and enable organizations to demonstrate leadership;
- Raising the public awareness regarding the sustainability of the concrete sector and its products;
- Obtaining tangible benefit for implementing responsible sourcing by receiving recognition for the supply of CSC certified concrete in green building and green infrastructure rating systems such as BREEAM, DGNB, LEED, ÖGNI, ENVISION, CASA, B.E.S.T.;
- Obtaining recognition in “green procurement” government policies and policies for social procurement.

Raising the bar for obtaining CSC certification is an important lever to continuously improve responsible sourcing practices. This is achieved via dedicated measures, including

02 Continuous Improvement

- regular discussions on the level of the CSC Technical Committee;
- the CSC’s annual report including the Regional System Operators’ (RSOs’) and Certification Bodies’ (CBs’) annual feedback;
- regular harmonization meetings between CBs;
- exchange meetings with RSOs;
- exchanges with companies undergoing certifications and certificate holders;
- stakeholder events with CSC Advisory Committee, Civil Society Organizations and Labor Organizations.

Relevance of credits and criteria covered by the system are of highest importance to ensure “fitness for purpose” and progress in responsible sourcing practices. The topics covered by the certification system were consequently identified with the support of a broad range of stakeholders:

**03
Relevance**

- Amongst the environmental key-topics identified are the reduction of CO2 emissions, energy and water consumption, recycling and the use of secondary materials. In the supply chain, i.e. the production of cement and aggregates, biodiversity was identified as another important topic to be carefully considered.
- Amongst the key social topics identified are relations with the local community, occupational health and safety, and labor practices.
- In the field of economics, local economy, ethical business practices and innovation were identified as particularly important.

The CSC system allows adaptations to ensure local applicability.

-

**04
Rigor**

- The system focuses on topics relevant for responsible sourcing. All evidence used for certification first needs to be uploaded in the CSC assessment tool, the so-called “CSC Toolbox”. In a second step, the uploaded evidence is assessed and validated by an independent CB before issuing the certificate.

05 Engagement

The system was developed and updated in a collaborative approach with involvement from internal stakeholders - i.e. enterprises, industry associations and CBs - and external stakeholders - i.e. CSOs, labor organizations, green building councils (GBCs) and academics.

06 Impartiality

- The CSC has a broad range of internal stakeholders comprising concrete, cement and aggregate producers, industry associations, and CBs. Impartiality is ensured by the organization's Governance, namely
- a General Assembly (GA) with equal voting rights for all full members;
- the setup of the Executive Committee (ExCo) ensures appropriate representation of all internal stakeholders;
- the CSC Advisory Committee providing the direct voice of social and environmental stakeholder organizations;
- a dedicated grievance management procedure.

7. Transparency and 8. Accessibility

All relevant information regarding the CSC, its Governance and the certification system can be accessed via the CSC's homepage: www.csc.eco

9. Truthfulness

- The CSC has a broad range of internal stakeholders comprising concrete, cement and aggregate producers, industry associations, and CBs. Impartiality is ensured by the organization's Governance, namely
- a General Assembly (GA) with equal voting rights for all full members;
- the setup of the Executive Committee (ExCo) ensures appropriate representation of all internal stakeholders;
- the CSC Advisory Committee providing the direct voice of social and environmental stakeholder organizations;
- a dedicated grievance management procedure.

10. Efficiency

- CSC certification is aligned with ISO standards, namely ISO 14001, ISO 18001, ISO 9001, ISO 26000, ISO 50001 and other standards. This makes the certification process efficient for companies, who are already following those standards. The CSC continuously seeks a dialogue with green building and green infrastructure labels. Recognition has been achieved within BREEAM, DGNB, LEED, ÖGNI, ENVISION, CASA and B.E.S.T and is an important driver to create value for CSC customers. Recognition by such systems can become an important success factor for the CSC, leading to a growing number of CSC certifications, such as demonstrated in the Netherlands in Germany and in Belgium.
- Local promotion of the CSC certification system among stakeholders other than the concrete sector and its supply chain is key to implementing the CSC system throughout the construction value chain. Local promotion is secured through "system ownership" via RSOs who proactively engage with green building councils and public authorities.

5 CSC IN NUMBERS

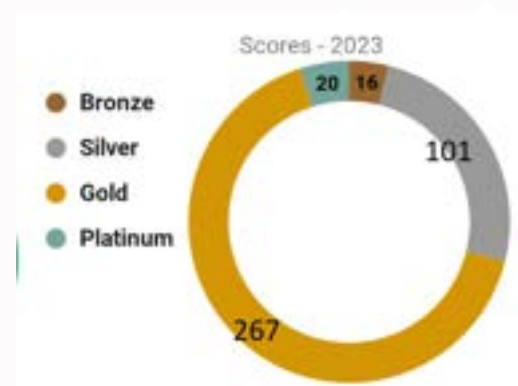
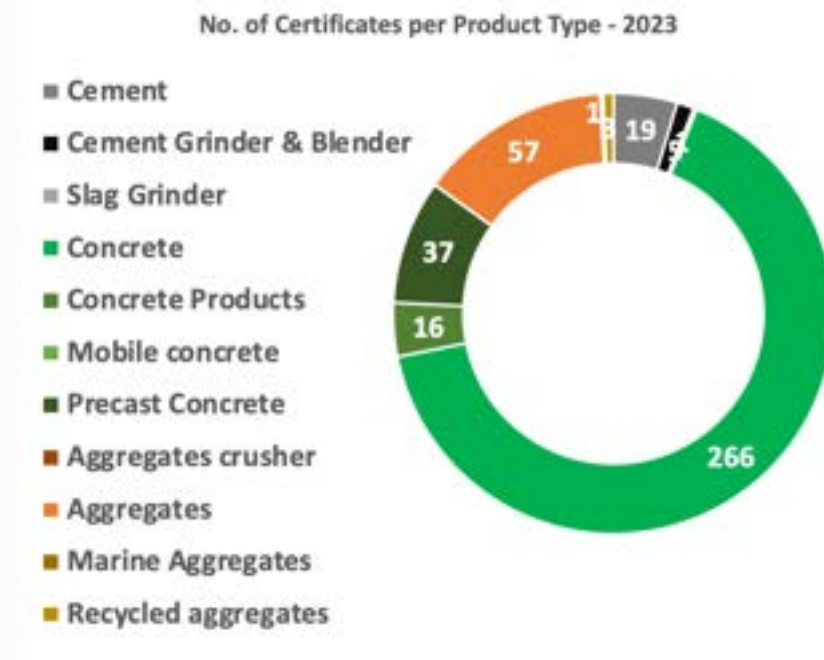
5.1 2023 Annual Report Fact Sheet Summary

The number of annual certifications continued to increase to a record high of 405 in 2023, leading to an increase of 38% compared to 2022, largely driven by Germany, the Netherlands, Belgium and Italy. The CSC certificates are now present in 21 countries with active CSC Certificates in 916 plants.

The 179 CO2 module certificates awarded continue to contribute to reducing life cycle emissions, while the 87 R-module certificates continue to advance the circularity of concrete production. In 2023 CSC certifications continued to expand in a number of countries and regions including Finland, Lithuania and Norway, fostering responsible sourced concrete. Regarding the Certificates per product, 266 concrete plants were awarded certificates, followed by 57 aggregate plants, 37 precast concrete plants, and 19 cement plants, among other products.

CSC certification uptake

- Global coverage:
 - 21 countries
 - 916 plants with active CSC certificate as of Dec. 31st, 2023
- 179 CO2- and 87 R-Modules successfully awarded and expanding worldwide



| CSC Certifications in 2023 vs. 2022 | | |
|-------------------------------------|------------|------------|
| | 2023 | 2022 |
| concrete | 319 | 246 |
| aggregates | 61 | 34 |
| cement | 25 | 14 |
| Total | 405 | 294 |

5.2 CSC-certifications

Since the launch of CSC-certification in January 2017, more than 1300 CSC certificates have been awarded (see Table 5.1). The number of annual certifications continued to increase to a record high of 405 in 2023, leading to an increase of 38% compared to 2022.

| Year* | Cement | Cement Grinder & Blender | Slag Grinder | Concrete | Concrete Products | Mobile concrete | Precast Concrete | Aggregates crusher | Aggregates | Marine Aggregates | Recycled aggregates | Grand Total |
|--------------------|------------|--------------------------|--------------|------------|-------------------|-----------------|------------------|--------------------|------------|-------------------|---------------------|-------------|
| 2017 | 4 | | | 54 | | | | | 5 | | | 63 |
| 2018 | 21 | | | 39 | | | 11 | | 3 | | | 74 |
| 2019 | 11 | | | 87 | | | 1 | | 27 | | 3 | 129 |
| 2020 | 12 | 3 | | 127 | | 1 | 11 | 2 | 34 | | 2 | 192 |
| 2021 | 32 | 2 | | 138 | | 1 | 18 | | 47 | 2 | | 240 |
| 2022 | 10 | 4 | | 227 | 3 | | 16 | | 27 | 4 | 3 | 294 |
| 2023 | 19 | 5 | 1 | 266 | 16 | | 37 | | 57 | 1 | 3 | 405 |
| Grand Total | 109 | 14 | 1 | 940 | 19 | 2 | 94 | 2 | 199 | 7 | 10 | 1397 |

Table 5.2: Number of certificates issued per year and per segment

319 out of the 405 certificates (\cong 79%) awarded in 2023 were concrete plant certificates. Thereof, 266 (83%) for plants producing ready-mix concrete, 16 (5%) for plants producing concrete products and 37 (12%) for precast concrete plants with their own fresh concrete production.

61 supplier certificates (\cong 15%) were awarded for aggregate production sites, thereof 3 for recycled aggregates plants and 1 for marine aggregates.

25 supplier certificates (\cong 6%) were awarded for cement plants, 5 of them for cement grinding and blending plants and 1 for a slag grinder.

In 2023, 16 of the 2023 certificates were awarded at the "Bronze" level, compared to 32 in 2022. 101 certificates (+31% compared to 2022) were awarded at the "Silver level", 267 certificates (+51% compared to 2022) at the "Gold" level, and 20 certificates at the "Platinum level", compared to 8 in 2022. This trend suggests that companies are committing to more sustainable business practices and pursuing higher scores and recognition year on year.

Amongst the 405 CSC certification projects executed in 2023 were 230 in Germany, 110 in the Netherlands, 24 in Belgium, 15 in Italy, 11 in Finland, 5 in Turkey, 3 in Lithuania, 2 in Austria, 2 in Luxemburg, 2 in Colombia and 1 in Norway. This increased the number of active certificates to 916.

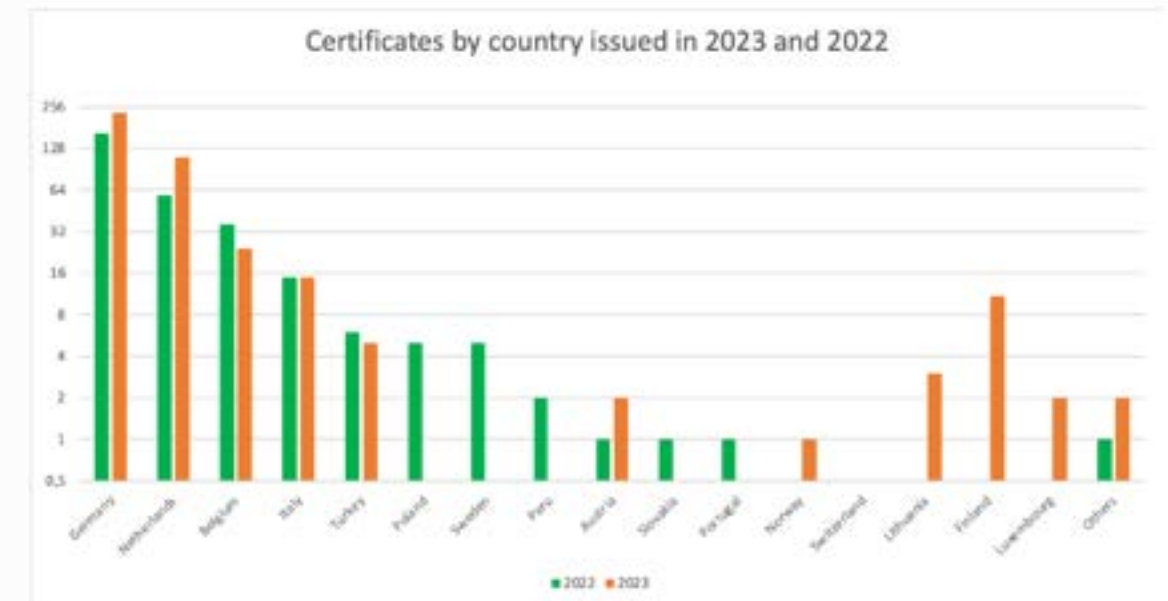


Fig 5.2: Certificates by country issued in 2023 and 2022

5.3 CSC R-Module certifications



PICTURE FROM CANVA

47 R- MODULE

47 R-Module certifications were successfully issued in 2023 vs. 26 issued in 2022. This increased the total number of active R-module certificates from 40 in 2022 to 87 in 2023. Thereof, 53 in Germany, 33 in the Netherlands and 1 in Belgium.



PICTURE FROM CANVA

5.4 CSC CO2- Module certifications

141 CO2- MODULE

In 2023, 141 CO2-Module certifications were successfully issued vs. 38 issued in 2022. Reaching at the end of 2023 a total number of 179 CO2-module certificates, 122 of them in Germany, 31 in the Netherlands and 26 in Belgium.



PICTURE FROM CANVA



6 CERTIFICATES HOLDERS' RESPONSIBLE SOURCING PERFORMANCES

This section provides an overview of the achievements of plants certified in 2023 under the latest CSC system version 2.1. The data allows gaining insight into the implementation status of sustainability practices in the concrete and aggregate sector and is used to steer future updates of the CSC certification system.



MANAGEMENT

- In 2023 more than 97% of all certified plants are performing supplier assessments and have a purchasing policy in place, which includes responsible sourcing as a criterion in their procurement process.
- In 2023 all CSC certified plants have a documented management system in place addressing environmental- quality- and health and safety related issues, while a certified EMS, QMS and HSMS still remain to be implemented in some plants.



SOCIAL

- Nearly all certified plants in 2023 have a local community policy, occupational health and safety policy and a social protection policy in place. Therefore, good relationships with the surrounding community are generally well established and occupational health and safety practices and criteria relating to labor practices are largely complied with.
- Criteria addressing occupational health and safety practices and fair and equitable treatment of the workforce continue in 2023 to be generally fulfilled by all plants.
- All plants implemented corrective actions based on recorded incidents, as this has become good practice in the industry.



ENVIRONMENTAL

- In 2023, the fulfillment rate of life cycle related criteria continued to increase. An increasing number of cement and concrete plants undergoing CSC-certification contributed to sectoral environmental product declarations (EPDs) and released product specific own EPDs, signaling the commitment to measuring, reducing and reporting in a highly transparent way their environmental impact. In the aggregates industry it is not yet common to publish EPDs.
- In 2023, criteria addressing the responsible use of land, protection from pollution, air quality and the implementation of life cycle assessment continue to show high fulfillment rates in CSC certification projects.
- Criteria addressing energy reduction and energy saving awareness are also largely complied with.

6.2 Concrete Producers

319 concrete plants were awarded in 2023 with a Bronze, Silver, Gold or Platinum CSC certificate version 2.1. vs. 246 in 2022.

6.2.1 Management Criteria



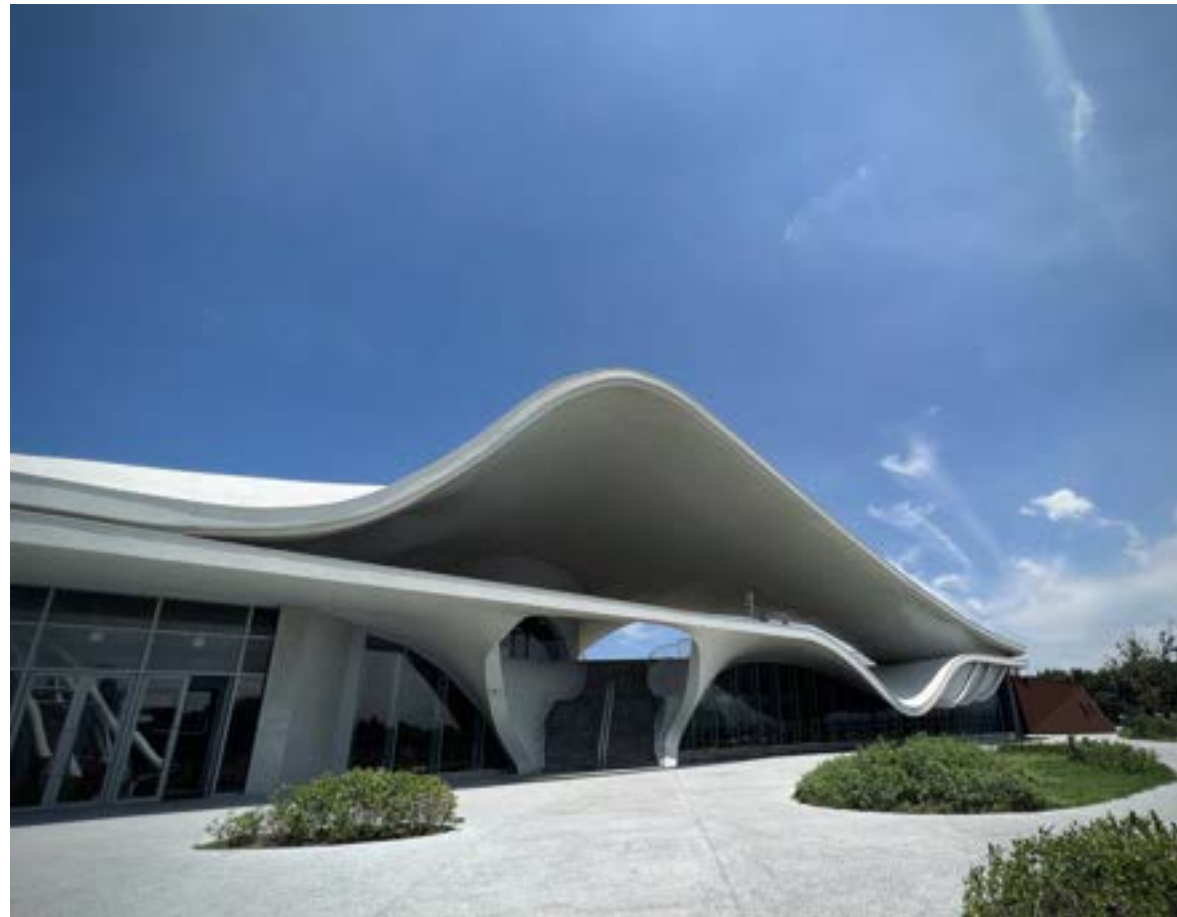
Fig 6.1 Concrete: Management criteria-ratio of criterion achievement ((Bronze, Silver, Gold, Platinum)

Fig. 6.1 provides insight into the achievement of management related certification criteria in 2023 compared to 2022 :

It can be seen that nearly all CSC certified concrete plants certified in 2023 show very good practices in sustainable purchasing (→ M1) and that they have documented management systems in place addressing environmental- (→ M2.01) quality- (→ M3.01), and health and safety (→ M4.01) related issues.

At least 95% of the new CSC certificate holders regularly assess their suppliers (→ M1.02) and promote responsible sourcing (→ M1.05).

The implementation of benchmarking (→ M5) and low to moderate achievement rates of criteria M2.02, M3.02 and M4.02, clearly indicated the implementation of certified management systems such as ISO 14001, ISO 9001 and ISO 45001 still represents a challenge for many plants undergoing CSC certification at the level Bronze or higher and therefore still leaves room for improvement such as in 2022.



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY LEO HUNG, TAIWAN YONGAN CONCH CULTURAL EXPERIENCE PARK, "CONCRETE CAN BE SHAPED INTO ANY CURVED SURFACE HERE USING A HIGHLY DIFFICULT "BEAMLESS AND COLOUMN SURFACE" TO CREATE A CONCH-LIKE CURVE"

6.2.2 Environmental Criteria



Fig 6.2 Concrete: Environmental criteria- ratio of criterion achievement (Bronze, Silver, Gold, Platinum)

Fig. 6.2 provides an overview on the achievement ratio of certification criteria relating to environmental issues in 2023 compared to 2022 for concrete producers:

Notable highlights include:

The overall achievement ratio of environmental criteria improved from 2022 to 2023.

Conducting Life Cycle Assessments (LCAs) has become increasingly common within the concrete sector, reflecting a commitment to understanding and minimizing environmental impacts.

A rising number of companies undergoing CSC certification in 2023 have implemented policies to avoid adverse effects on globally or nationally important sites.

Water monitoring and the implementation of transport management systems have continued to gain traction, indicating a growing emphasis on resource management and efficiency

Key achievements in specific criteria include:

The overall fulfillment rate of criteria addressing the implementation of life cycle assessment (LCA) (→E1.02), responsible land use (→E2.02), energy reduction potentials (→E3.08), energy saving awareness (→E3.11), clean air silos (→E4.08), water scarcity (→E5.01), water monitoring (→E5.02), responsible processing of returned concrete (→E7.04), and transport management system (→E8.02) reached an achievement ratio of 99% to 100% in 2023, marking significant improvements from 2022

The overall fulfillment rate of criteria addressing the protection from pollution (→E2.03), the availability of climate- (→E3.01) and a transport policy (→E8.01) and an assessment of the availability of secondary materials (→E7.01) maintained high fulfillment rates ranging from 91% to 100% in 2023.

The release of sectoral environmental product declarations (→E1.01) and the release of product specific environmental product declarations (EPDs) (→E1.03) saw notable increases in fulfillment rates, rising from 74% and 43% in 2022 to 84% and 56% in 2023, respectively.

in 2023, 90% (compared to 86% in 2022) of the plants undergoing CSC certification in 2023 were monitoring their GHG emissions (→E3.02), However, more than 55% of these plants have not yet implemented GHG emission reporting (→ E3.03, and E3.04) indicating a significant area for improvement. Similarly, around 55% of the plants were not reporting on water use (→ E5.04), highlighting another opportunity for improvement include optimizing the use of secondary materials (→ E7.05 and E7.06) and to implementing trucks with innovative, CO2 emission reducing drive technology (→ E8.04).



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY @THE_AMATEUR_PHOTOGRAPH, WEST JAVA," INDONESIA TRANSPORTATION INFRASTRUCTURE IS ONE OF THE IMPORTANT THINGS IN CARRYING OUT THE COUNTRY'S ECONOMIC ACTIVITIES."

6.2.3 Social criteria

Fig. 6.3 summarizes the achievement of certification criteria relating to social issues in 2023 compared to 2022:

The overall fulfillment rate of criteria addressing social aspects continued to improve 2023. Many of the plants operate in industrial zones located near residential areas. This certainly explains why good relationships with the surrounding communities continued to be strengthened. Nonetheless, an improvement opportunity for around 5% of the certified concrete plants includes implementing a policy committing to engage with the local community on a regular basis (→ S1.01).

An increasing share of the plants undergoing CSC certification in 2023 demonstrated a commitment to fostering health and safety by conducting on-site risk analyses. Moreover, many of these certified plants actively engaged in initiatives aimed at improving the work-life balance of their employees. This dual focus on workplace safety and employee well-being underscores the growing recognition within the industry of the importance of prioritizing both physical and mental health in the pursuit of sustainability. On the other hand, there was no visible progress in implementing a noise/vibration plan (→ S1.05) and a policy on social protection (→ S4.01), nor in reducing lost time injuries (LTI) (→ S3.11).

Undergoing an external control of social standards and compliance with human rights (→ S4.09) clearly remains an opportunity for additional social engagement.



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY MV TANVEER ROHAN @TANVEER.ROHAN, "STUTTGART CITY LIBRARY KNOWN AS A TRUE ARCHITECTURAL MARVEL, KNOWN FOR ITS STRIKING MODERN DESIGN. DESIGNED BY THE WORLD RENOWNED KOREAN ARCHITECT, EUN YOUNG YI. CONCRETE IS A PRIMARY MATERIAL FOR CONSTRUCTING BUILDINGS, PROVIDING STRENGTH AND STABILITY THIS LIBRARY WAS ALSO CONSTRUCTED OUT OF PALE GREY FAIR-FACED CONCRETE THAT VISUALLY FRAMES AN ARRAY OF 9X9 FROSTED GLASS BRICKS"

6.2.3 Social criteria

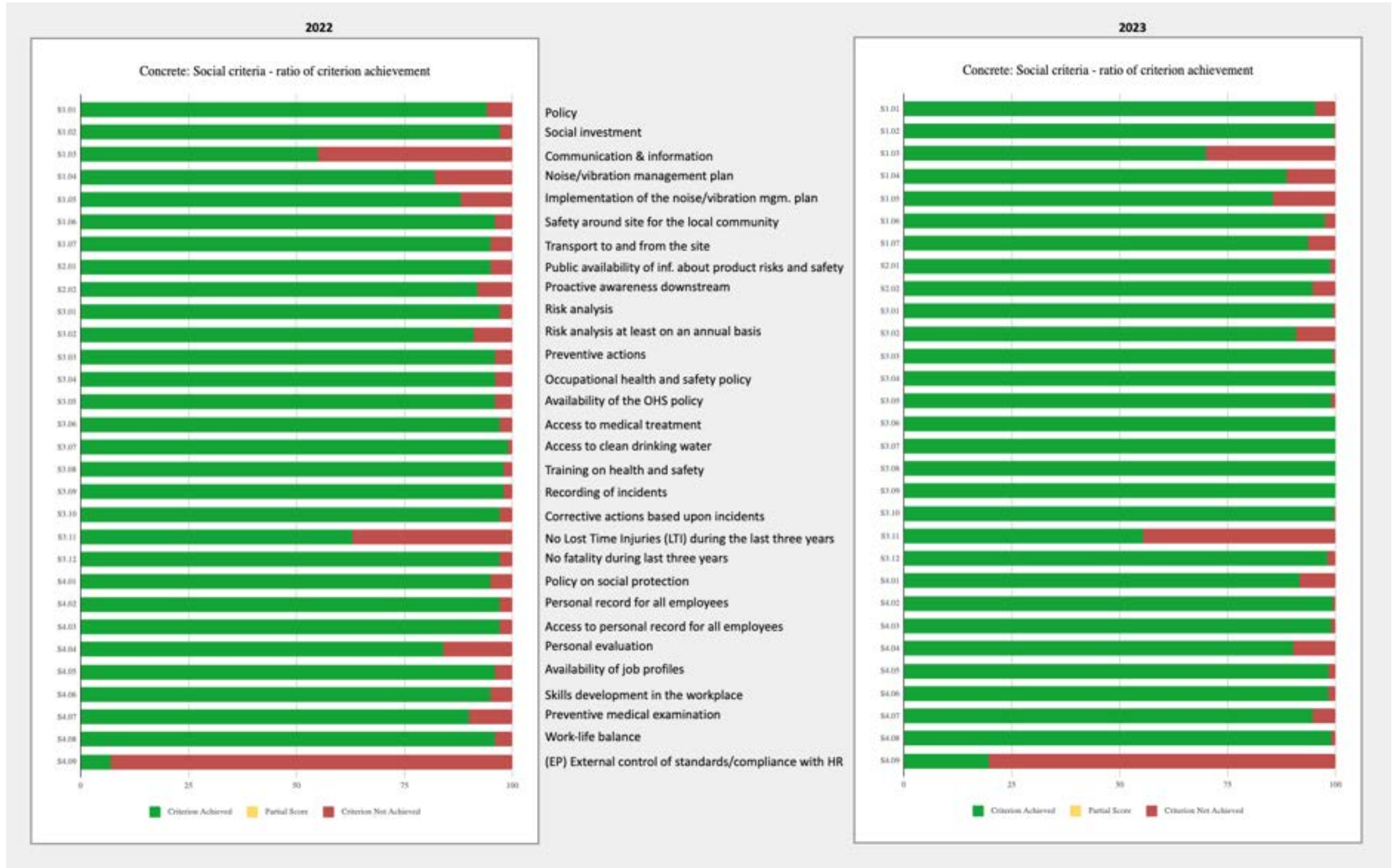


Fig 6.3 Concrete: Social Criteria- ratio of criterion achievement (Bronze, Silver, Gold, Platinum)

6.2.4 Supply chain criteria

Fig. 6.4 summarizes the achievement of the supply chain criteria “C1.01 Cement” and “C2.01 Aggregates” in 2023 compared to 2022. 0% achievement means that a CSC certified concrete plant does not use any CSC certified aggregates or cement, respectively. 100% achievement means that a CSC certified concrete plant uses 100% CSC certified aggregates or cement, and that the respective suppliers achieved a total scoring of 100%. Supplier scores lower than 100% always lead to an achievement rate of less than 100% in the concrete certificate, even if the complete supply is from certified producers.

According to fig. 6.4, 4% of the concrete plants certified in 2023 did not use any CSC certified cement. This is an improvement vs. 2022 where 8% of the plants did not use any CSC certified cement. About 57% (55% in 2022) of the concrete plants reached a scoring between 91% and 100% in 2023. During the same period, the percentage of concrete plants that did not use CSC certified aggregates decreased from 61% to 54%. It is expected that the achievement ratio of the criterion C2.01 will continue to improve as the number of aggregates producers continues to increase. Currently the aggregates market is very fragmented and there is limited availability of CSC certified aggregates in many regions.

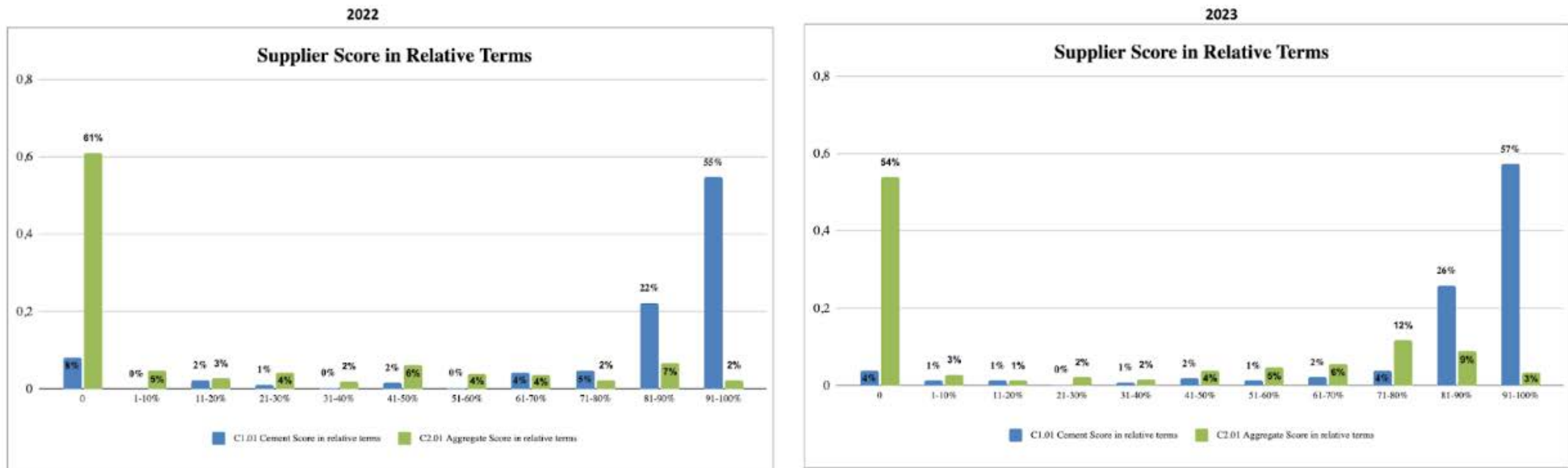


Fig 6.4 Concrete: Supply chain- ratio of criterion achievement (Bronze, Silver, Gold, Platinum)



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY @DANVICPHOTOS LA UNION, PHILIPPINES,
"THE NEWLY CONSTRUCTED 10 KILOMETER UPLAND CONCRETE ROAD SIGNIFICANTLY IMPROVED THE ROAD
SAFETY AND REDUCE TRAVEL TIME FROM A 5-HOUR HIKE TO A 15 MINUTES DRIVE
THIS IS THE ROUTE GOING TO SASABA RICETERRACES AND SIMMINUBLAN FALLS IN LA UNION, PHILIPPINES"

6.3 Aggregate Producers

61 Aggregate production sites were awarded in 2023 with a Bronze, Silver, Gold or Platinum CSC supplier certificate version 2.1., compared to 34 in 2022.

6.3.1 Management Criteria

Fig. 6.5 provides insight into the achievement of management related certification criteria in 2023 compared to 2022:

It can be observed that the fulfillment rate of nearly all management criteria of aggregate production sites undergoing CSC certification in 2023 improved vs. when compared to 2022 results. Exceptions relate to responsible sourcing as a criterion in the procurement process (→ M1.06) and to implementing a certified health and safety management system (→ M4.02).

Regarding sustainable purchasing (→ M1), all criteria improved their fulfillment rates from 2022 to 2023 from 89 % or below to 92% or above, demonstrating the implementation of very good practices since last year in assessing and monitoring the performance of suppliers (→ M1.02, → M1.03), training on responsible sourcing (→ M1.04) and promotion of responsible sourcing (→ M1.05) and ensuring that responsible sourcing is part of the purchasing process (→M1.06).

Furthermore, all certified plants have documented environmental- (→ M2.01) quality- (→ M3.01), and health and safety management systems (→ M4.01) in place, just as in the concrete sector. Although implementation of certified EMS (→M2.02) has made huge progress since last year, the share of plants without certified EMS and certified HSMS (→M4.02) remains slightly higher than 50%, respectively. Further improvement opportunities relate to benchmarking and reporting (→ M5)



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY OSMAN MAASOGLU
DIYARBAKIR TURKEY, "CHILDREN PLAY MERRILY IN THE COLORFUL PLAYGROUND PAVED
WITH CONCRETE INTERLOCKING PAVERS"

2022

2023



- Purchasing Policy
- Supplier assessment
- Monitoring performance of suppliers
- Training on Responsible Sourcing
- Promotion of Responsible Sourcing
- Responsible sourcing
- Sample check
- Environmental management system (EMS)
- Certified environmental management system (EMS)
- Quality management system (QMS)
- Certified Quality management system (QMS)
- Health and safety management system
- Certified health and safety management system
- Publishing annual performance data (KPIs)
- Externally verified KPIs
- (EP) Participation to a benchmarking study



Fig 6.5 Aggregates Management Criteria- ratio of criterion achievement (Bronze, Silver, Gold, Platinum)

6.3.2 Environmental criteria

Fig. 6.6 provides an overview on the overall fulfillment of environmental issues in 2023 compared to 2022.

The achievement of environmental criteria shows a mixed picture.

The achievement ratio significantly improved in 2023 compared to 2022 for certification criteria addressing implementation of Life Cycle Assessment (LCA) (→ E1.02), Climate policy (→ E3.01), Monitoring of GHG emissions (→ E3.02), Public reporting of monitoring results (→ E3.03), Externally verified reporting of GHG emissions (→ E3.04), CO2 emission reduction target (→ E3.06), Energy saving awareness creation (→ E3.11), Water (→ E5) and Biodiversity (→ E6).

On the other hand, there was a decrease in the achievement ratio decrease from 2022 to 2023 for certification criteria addressing sectoral environmental product declaration (→ E1.01), release of environmental product declarations (EPDs) (→ E1.03), achievement of CO2 emission reduction target (→ E3.09), implementation of energy reduction potentials (→ E3.10), process and fugitive dust reduction measures (→ E4.09), water monitoring (→ E5.02), transport policy (→ E8.01) and transport management system (→ E8.02).

There is significant room for further significant improvement particularly in the sectoral environmental product declaration (→ E1.01) and the release of EPDs (→ E1.03) as only 54% and 51% of the certified aggregates producers in 2023 have shown compliance with these criteria.

Furthermore, around 57% of the certified plants have the opportunity to engage in achieving CO2 emission reduction targets (→ E3.09).

Other areas providing opportunities for improvement include the use of renewable electrical energy (→ E3.13) (34% fulfillment rate in 2023 vs. 29% in 2022) and implementing trucks with innovative CO2 emission reducing drive technology (→ E8.04), as only 20% of the production sites undergoing CSC certification (Bronze, Silver, Gold, Platinum) in 2023 were utilizing them.

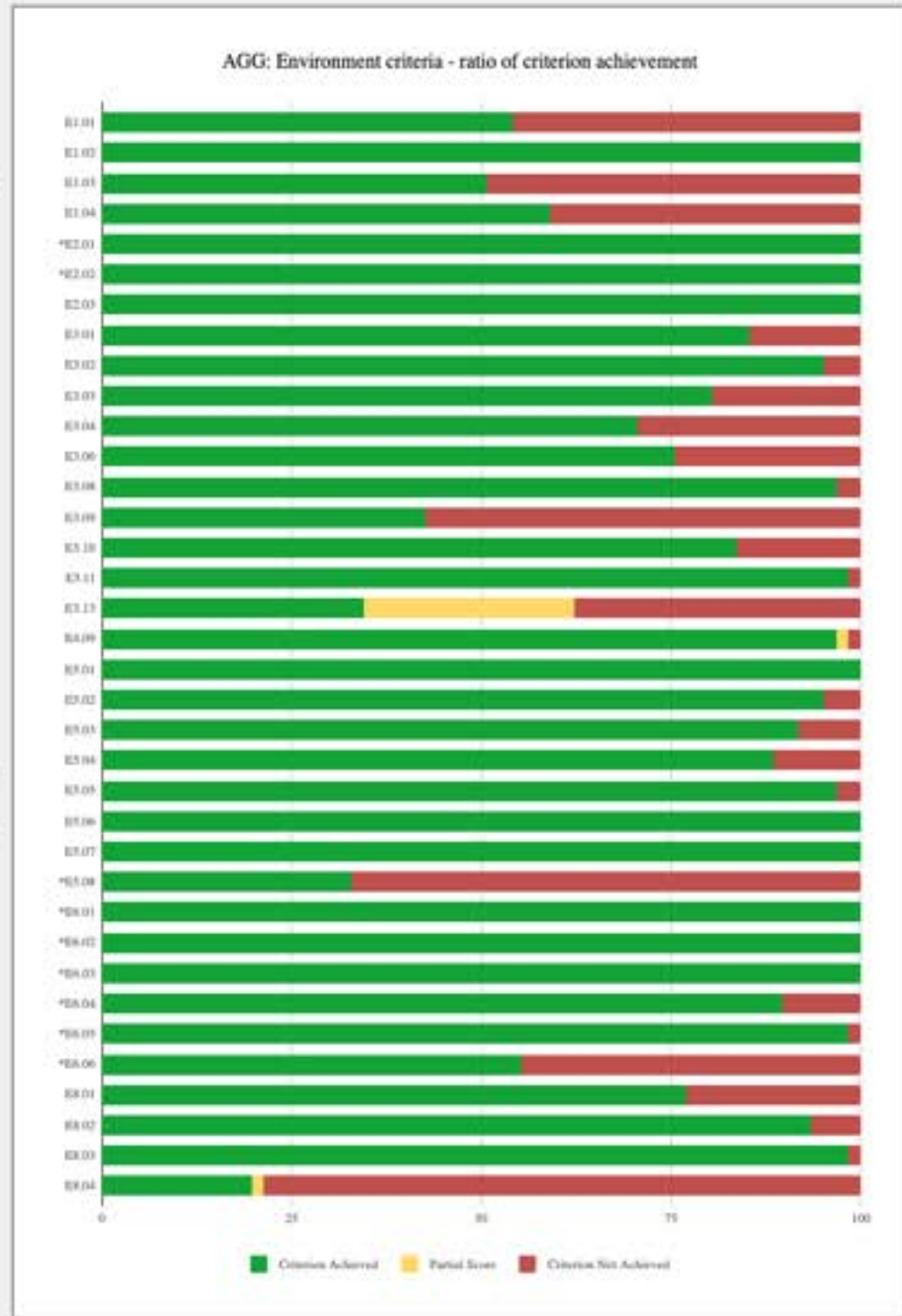


2022

2023



- Sectoral environmental product declaration
- Implementation of life cycle assessment (LCA)
- Release of environmental product declarations (EPDs)
- (EP) Reporting of product specific carbon emissions
- Policy to avoid globally or nationally important sites
- Responsible land use
- Protection from pollution
- Climate policy
- Monitoring of GHG emissions
- Public reporting of monitoring results
- Externally verified reporting of GHG emissions
- CO2 emission reduction target
- Energy reduction potentials
- Achievement of CO2 emission reduction target
- 0 Implementation of energy reduction potentials
- Energy saving awareness creation
- Use of renewable electrical energy
- Process and fugitive dust reduction measures
- Water scarcity and impact
- Water monitoring
- Water target
- Verification of water reporting
- Report on water use and quality of discharged water
- Action for reduction of water consumption
- Action for improving the quality of discharged water
- (EP) Supplying water to nearby communities
- Biodiversity policy
- Biodiversity assessment
- High biodiversity value area assessment
- Regular biodiversity value area assessment
- Biodiversity management/action plan
- Biodiversity impact assessment
- Transport policy
- Transport management system
- Fuel saving awareness training
- (EP) Next generation trucks



*not relevant for recycled aggregate producers, only producers of primary materials are considered in the evaluation

Fig 6.6 Aggregates: Environmental criteria - ratio of criterion achievement

6.3.3 Social criteria

Fig. 6.7 summarizes the achievement rates of certification criteria relating to social issues in 2023 compared to 2022:

The overall scoring in social credits further improved in 2023, with 17 out of 28 criteria fulfilled by all plants. Good relationships with the surrounding community are well established as they are important to secure “the license to operate”.

Nearly all criteria addressing occupational health and safety practices (→ S3) were fulfilled by all plants., The two exception observed relate to 5% of the certifying plants that did not perform a risk analysis on at least an annual basis (→ S3.02), and to lost time injuries (LTI) (→ S3.11), that had been reported during the last three years by 41% of the plants undergoing certification 2023, demonstrating that additional effort can particularly be made to further reduce the risk of accidents in aggregates sites.

Criteria addressing fair and equitable treatment of the workforce (→ S4) are also fulfilled 95% and more of the plants certified in 2023- The only exception is the exemplary performance criterion awarding the external control of social standards and compliance with human rights (→ S4.09). This challenging criterion was met by only around 28% of the aggregate production sites undergoing certification in 2023. However, this is a significant improvement compared to 2022 where the fulfillment rate was only 6%.



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY IBRAHIM AYSÜNDÜ, KAYSERİ TURKEY
"CONCRETE WHICH IS OF GREAT IMPORTANCE FOR HUMANS, PROVIDES CONVENIENCE FOR ANIMALS, CONCRETE STRUCTURES ARE OF GREAT IMPORTANCE IN STORING AND CONTROLLING WATER"

6.3.3 Social criteria

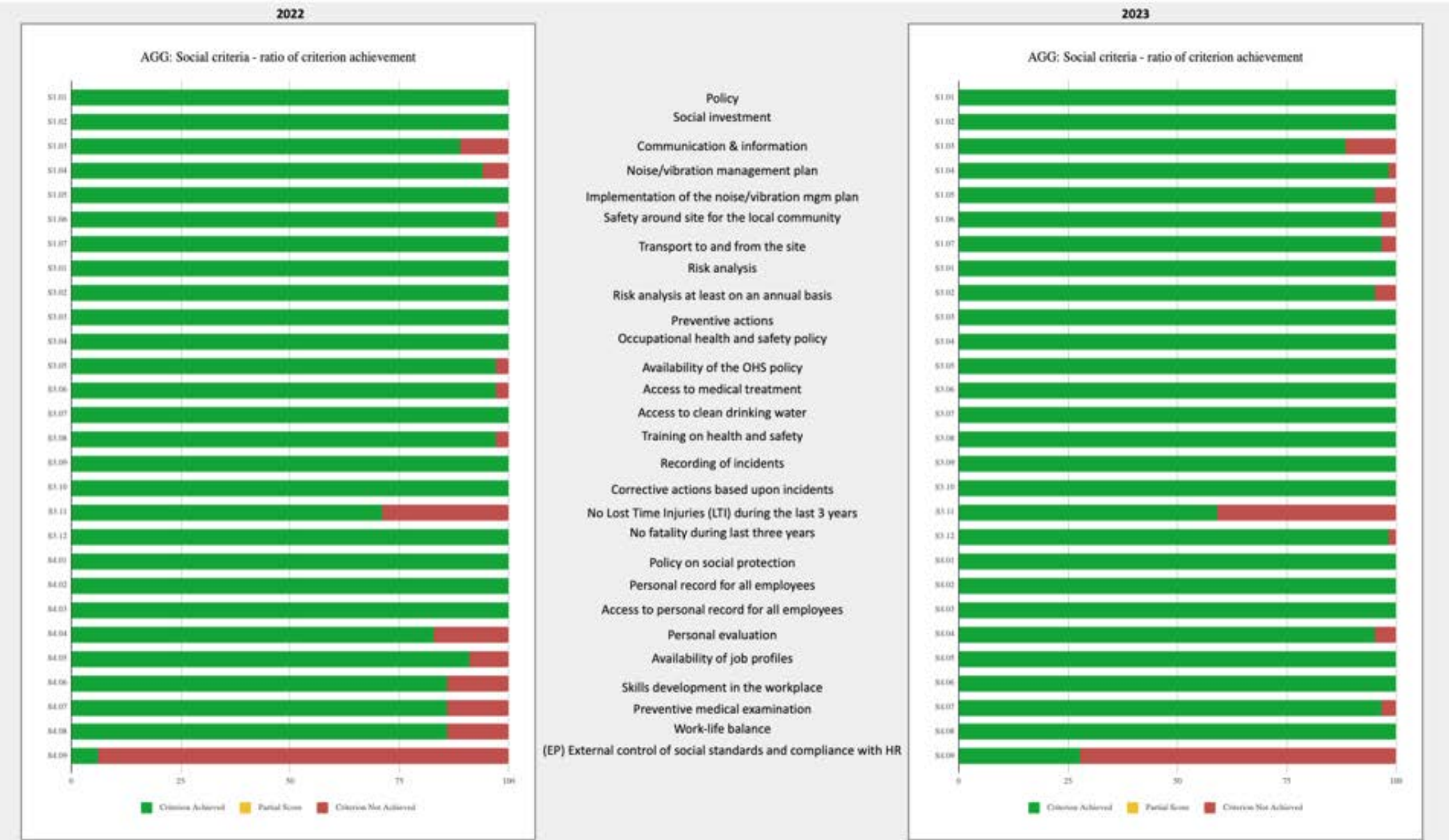


Fig 6.7: Aggregates: Social criteria - ratio of criterion achievement (Bronze, Silver, Gold, Platinum)



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY @KEIZERZACK, TEA PLANTATION DAMARKASIAN, INDONESIA
"ATERNATIVE ROAD BUILT THROUGH A GREEN TEA PLANTATION. WITH A STRONG CONCRETE MAIN BASE, THIS ROAD IS DURABLE, AVOIDS TRAFFIC JAMS AND OFFERS BEAUTIFUL GREEN VIEWS."



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY @OETOPHOTO, INDONESIA, THE BENEFITS OF THIS DAM ARE VERY VITAL FOR THE FARMING COMMUNITY IN WEST JAVA, AS A RICE PRODUCTION CENTER

6.4 Cement Producers

25 cement plants were awarded with a Bronze, Silver, Gold or Platinum CSC supplier certificate version 2.1 in 2023, compared to 14 in 2022

6.4.1 Management Criteria

Fig. 6.8 provides insight into the achievement of management related certification criteria in 2023 compared to 2022:

In 2023 the fulfillment rate improved in all management criteria and 10 criteria out of 16 were fulfilled at a rate of 96% and above.

The implementation of sustainable purchasing practices (→ M1) is well advanced in most plants undergoing certification. Clinker and cement production is performed in plants equipped with mills, kilns and other heavy machinery. This explains why documented management systems (→ M2.01, M3.01 and M4.01) are implemented in all plants.

It is worth mentioning that the share of plants with a certified environmental management system (EMS) (→ M2.02) significantly increased from 67% in 2022 to 96% in 2023, in line with the sector's commitments to limit greenhouse gas emissions and other environmental impacts. On the other hand, implementing a certified HSMS (→ M4.02) still remains an opportunity for further improvement for around 10% of the cement plants certified in 2023.

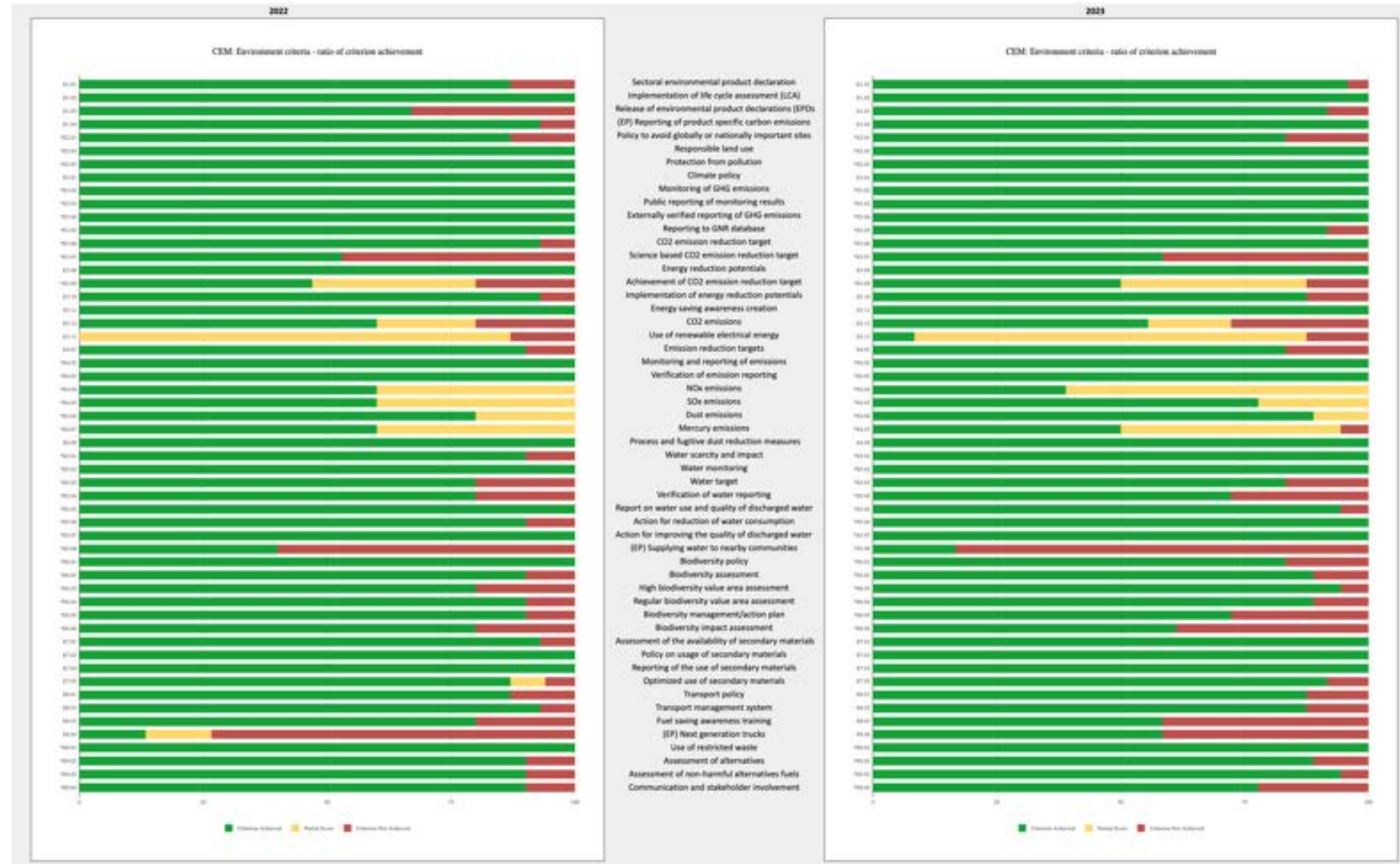
Progress was made in publishing annual performance data: (→ M5.01, M5.02) to ensure transparency and credibility. 96% of the plants that were certified in 2023 previously published their key performance data, 88% of the plants had their data third party verified.



Fig 6.8: Cement: Management criteria - ratio of criterion achievement (Bronze, Silver, Gold, Platinum)

6.4.2 Environmental Criteria

Fig. 6.9 provides an overview on the achievement ratio of certification criteria relating to environmental issues: The achievement ratio of environmental criteria shows elevated fulfillment rates with improvement opportunities in some criteria.



*not relevant for cement grinders, only clinker producers are considered in the evaluation
 Fig 6.9: Cement: Environmental criteria - ratio of criterion achievement (Bronze, Silver, Gold, Platinum)

Fig. 6.9 provides an overview on the achievement ratio of certification criteria relating to environmental issues in 2023 compared to 2022:

The achievement ratio of environmental criteria continued to increase in 2023, while further progress remains possible in several areas.

All plants certified in 2023 were compliant with the criteria relating to responsible land use (→ E2.02) and protection from pollution (→ E2.03). Cement plants are in the spotlight of public attention due to the high amount of energy required for clinker production and the related CO2 emissions.

The contribution to sectoral Environmental Product Declarations (EPDs) (→ E1.01) and the production and publishing of EPDs (→ E1.03) significantly improved from 2022 to 2023. The fulfillment rate of the respective criteria increased from 87% and 67% in 2022 to 96% and 92%. Respectively, in 2023. In many countries EPDs are increasingly requested by customers, hence they are becoming common practice to increase transparency and providing the basis of a fair comparison of products.

The fulfillment rate of criteria relating to energy and climate (→ E3) also continued to increase. All cement plants certified in 2023 scored in the following criteria: climate policy (→ E3.01), monitoring of GHG emissions (→ E3.02), public reporting of monitoring results (→ E3.03), externally verified reporting of GHG emissions (→ E3.04), CO2 emission reduction target (→ E3.06), energy reduction potentials (→ E3.08) and energy saving awareness creation (→ E3.11). However, committing to science-based CO2 emission reduction targets (→ E3.07) and progressing on achieving these (→ E3.09) remains an improvement opportunity for many cement plants. Also, the use of renewable electricity (→ E3.13) can be increased in many cases. This will support to reduce Scope 2 emissions.

All certified plants fulfilled criteria relating to monitoring and reporting of air emissions (→ E4.02), verification of emission reporting (→ E4.03), and process and fugitive dust reduction measures (→ E4.09). Progress was also made in reducing other emissions: All plants undergoing certification achieved partial or full compliance with the emission levels specified in the criteria NOx (→ E4.04), SOx (→ E4.05), dust (→ E4.06) and mercury (→ E4.06).

Full compliance was achieved by all plants with several criteria dealing with water issues (→ E5), namely water scarcity and impact assessment (→ E5.01), water monitoring (→ E5.02), action for reduction of water consumption (→ E5.06), and action for improving the quality of discharged water (→ E5.07).

Biodiversity (→ E6) is a very important topic when it comes to quarrying activities. The achievement ratio of cement plants undergoing CSC certification in 2023 was at 83% and above, with the exemption of the two criteria relating to setting up biodiversity management plans (→ E6.05) and performing a biodiversity impact assessment (→ E6.06), where the fulfillment ratios were 72% and 61%, respectively.

On the other hand, the criteria related to the assessment of the availability of secondary materials (→ E7.01), policy on usage of secondary materials (→ E7.02), reporting of the use of secondary materials (→ E7.03) and use of restricted waste (→ E9.01) were fulfilled by all plants.

Regarding the credit on transportation (→ E8), 88% (a slight improvement vs. 2022) of the newly certified sites have a transport policy and a transport management system in place. However, less than 60% have implemented fuel saving awareness training (→ E8.03). Nevertheless, there was a significant improvement from 2022 to 2023 regarding the use of innovative trucks as 58% of the production sites undergoing CSC certification (Bronze, Silver, Gold, Platinum) in 2023 utilizing trucks with CO2 emission reducing drive technology compared to 13% in the previous year. In any case, addressing the use of next generation trucks (→ E8.04) is still an opportunity area for improvement.

6.4.3 Social Criteria

Fig. 6.10 summarizes the achievement rates of certification criteria relating to social issues in 2023 compared to 2022:

The overall scoring in social criteria, already high in 2022, was improved again in 2023. 22 out of 29 criteria were fulfilled by all plants undergoing CSC certification (Bronze, Silver, Gold, Platinum) in 2023.

Good relationships with the surrounding community (→ S1), occupational health and safety practices (→ S3) and criteria relating to labor practices (→ S4) are generally well established and mostly fulfilled.

The criterion relating to no lost time injuries (LTI) during the last three years (→ S3.11) and the exemplary performance criterion addressing the external control of social standards and compliance with human rights (→ S4.09) increased on a low level: The respective fulfillment rates were 33% and 29% in 2023, vs. both 20% in 2022.

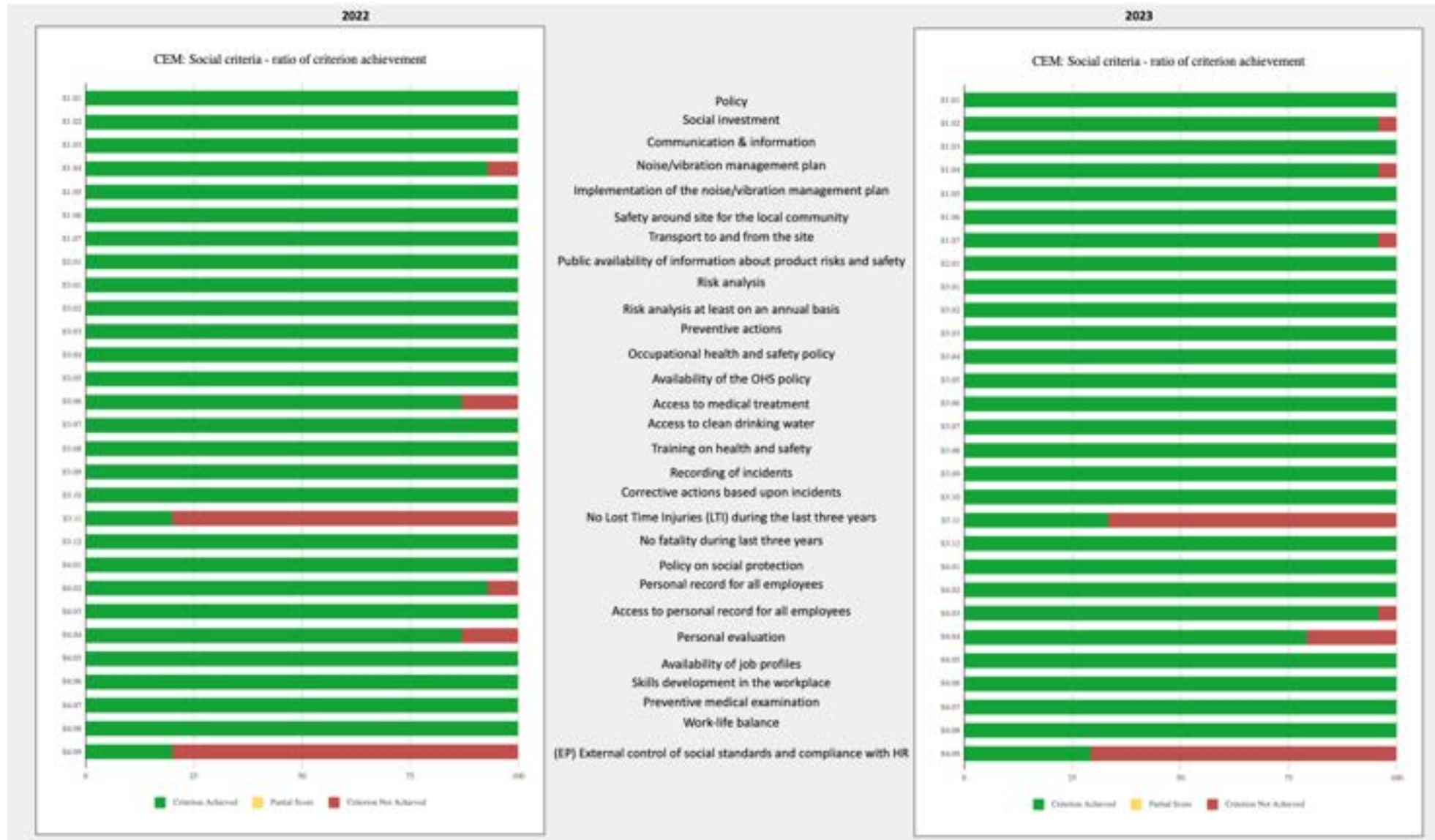


Fig 6.10: Cement: Social criteria - ratio of criterion achievement (Bronze, Silver, Gold, Platinum)



6.5 General Remarks

CSC certification is frequently performed by concrete plants, cement plants and aggregates plants, including marine aggregates and recycled aggregates, with the ambition to advance their sustainability practices and to improve their score.

The scope of certification of the marine aggregates supplier certificate includes dredging zones (supplying excavation sites) and a wharf (where the marine aggregates are unloaded). The dredgers (ships) that excavate and ensure the supply of the wharf are additionally included via a dedicated evidence list.

Recycling plants, unlike traditional aggregate producers, do not maintain a quarry, as they are using secondary raw materials for producing sand and aggregates. The processing of construction and demolition waste (C&DW), concrete rubble and hardened returned concrete into sand and aggregates is similar to the processing of hardrock and includes crushing, sieving and possibly other process steps such as sorting and washing.

The overall responsible sourcing performance of CSC certified concrete, cement and aggregates plants is likely to exceed the sector's average performance and expected to continue increasing over time, reinforcing the commitment of concrete producers to make concrete production circular and to drive lifecycle emissions to net zero.

7 INNOVATION

The CSC certification system promotes innovation via the dedicated innovation credit “B3 Innovation”.

This credit aims at stimulating

- the development and implementation of new solutions that contribute to the sustainability of the operations, its products, its suppliers or other parts of the value chain;
- best practices in the field of sustainability that are not covered by this certification system; and
- exemplary performance under any CSC certification criterion.

In 2023, the CSC’s innovation committee (IC) rewarded 38 innovation applications submitted by projects undergoing CSC certification according to CSC System Version 2.1. Innovation points were granted to all applications submitted with results ranging between 1 and 9 points out of a maximum of 9 achievable points.

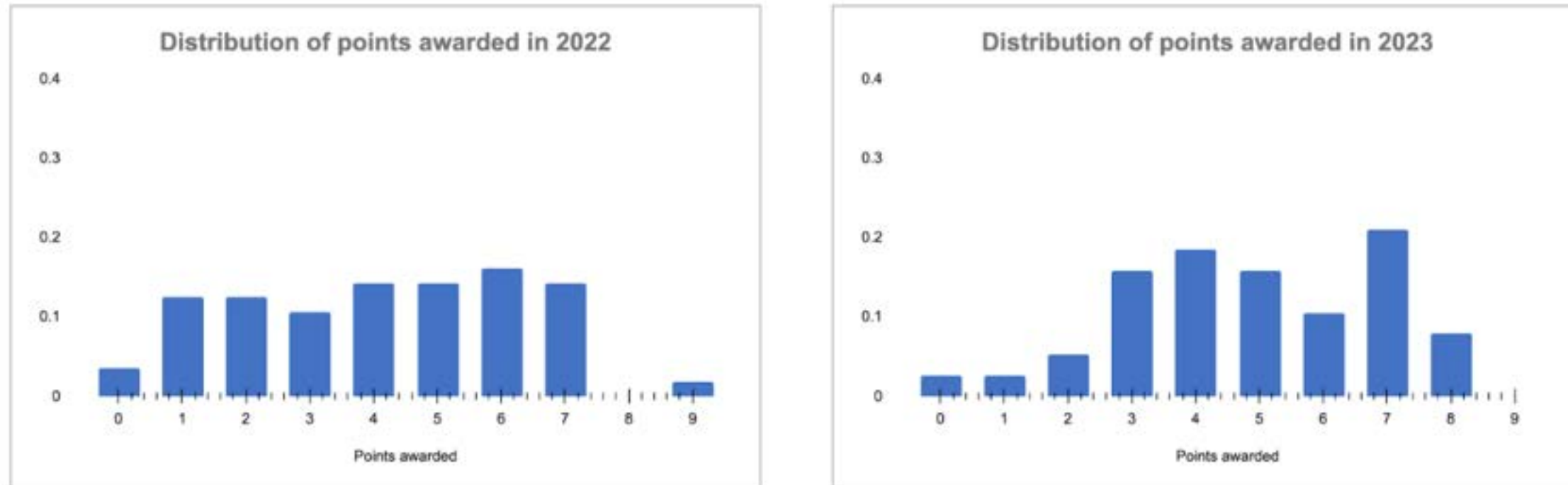


Fig 7.1: Innovation points awarded to CSC Version 2.1 projects

8 CONTINUOUS IMPROVEMENT

Continuous improvement of the CSC certification system, including its toolbox, is a crucial lever to enhance the sustainability performance of CSC certified plants.

Valuable feedback was received in 2022 via RSOs, CBs and plants undergoing certification. Out of the feedback received in 2022, CSC certification system was enhanced in 2023 to

- expand the cement grinding system to include cement blending stations
- include an additional note field for auditors for internal communication allowing less paperwork among Certification Bodies.
- make available a feature to export information regarding R-module and CO2 module
- allow architects and low carbon organizations to support responsible sourcing concrete via the introduction of the CSC sponsorship program
- incorporate an additional filter option (e. g. kilometer-based search option on site location) in order to facilitate the consumer experience, so that clients can find the closest site from which they can purchase CSC certified concrete. This will be extremely useful and highly contribute to the construction of sustainable cities and communities.

Regular discussions on the level of the CSC Technical Committee; annual feedback from CBs and RSOs; CBs roundtable meetings and other stakeholder events identified in 2023 additional improvement suggestions to increase robustness of CSC certification system:

- Additional guidance on water would be necessary. i.e. a policy;
- Mobile plants should provide some kind of evidence in the case of land use, as concrete plants do;
- Transport criteria should clearly show which vehicles are included;
- Use of renewable electrical energy could be more challenging;
- Social criteria should include, where possible a list of risks which can be assessed, i.e. psychological risks;
- Validation by credit vs. validation by requirement

The CSC very much appreciated the feedback received as it provides additional guidance to plants undergoing CSC certification and to CBs in validating evidence provided by their clients. This feedback helped the CSC in criteria in the new CSC certification system version 3.0, which was launched in January 2024. Such continuous improvement ensures that the CSC certification system remains robust, relevant, and aligned with evolving industry standards and best practices.

9 OUR WAY FORWARD

As part of the CSC's continuous improvement process, three workshops on Human Rights were successfully conducted with the support of external experts. The outcome of these workshops contributed to enhancing the improvement of the applicability of the CSC certification credit "P2 Human Rights", which was launched in April 2023 as a pilot project for all new countries registering projects for the first time, regardless of the region.

Additionally, four virtual stakeholder events involving the CSC Advisory Committee, Civil Society Organizations and Labor Organizations were organized to conduct a Consultation Process on the next CSC certification system version. The intention was to identify gaps, avoid redundancies, simplify the process, increase transparency and to make it leaner without compromising robustness.

CSC is striving to be a catalyst for progress in the responsible sourcing of concrete. At CSC, we are convinced that it is by collaborating with different private and public organizations and companies that we will be able to work towards a sustainable future.

10 WEB-PAGE

To enhance accessibility, we have integrated and synchronized the Regional System Operators' websites in the U.S, Latin America, Belgium, the Netherlands, Germany, Turkey and Italy with the CSC Global website www.csc.eco. These regional sites are implemented in local languages, but with the same look & feel as the Global website.

Additionally, we have developed a webpage for the new MENA region's Regional System Operator and connected this to our Global website.

11 GOVERNANCE STRUCTURE

The transparent and effective decision-making process within the CSC is the responsibility of the CSC's Executive Committee.

Continuous engagement with a wide range of stakeholders is guaranteed through the dedicated Advisory Committee, which the CSC was able to establish in 2020 with distinguished experts as well as leading green building councils' involvement.

Additionally, the Technical- and the Communication Committee with defined leadership ensure target orientated work.

The Innovation Committee assesses CSC innovation application and thereby encourages innovative responsible sourcing practices.

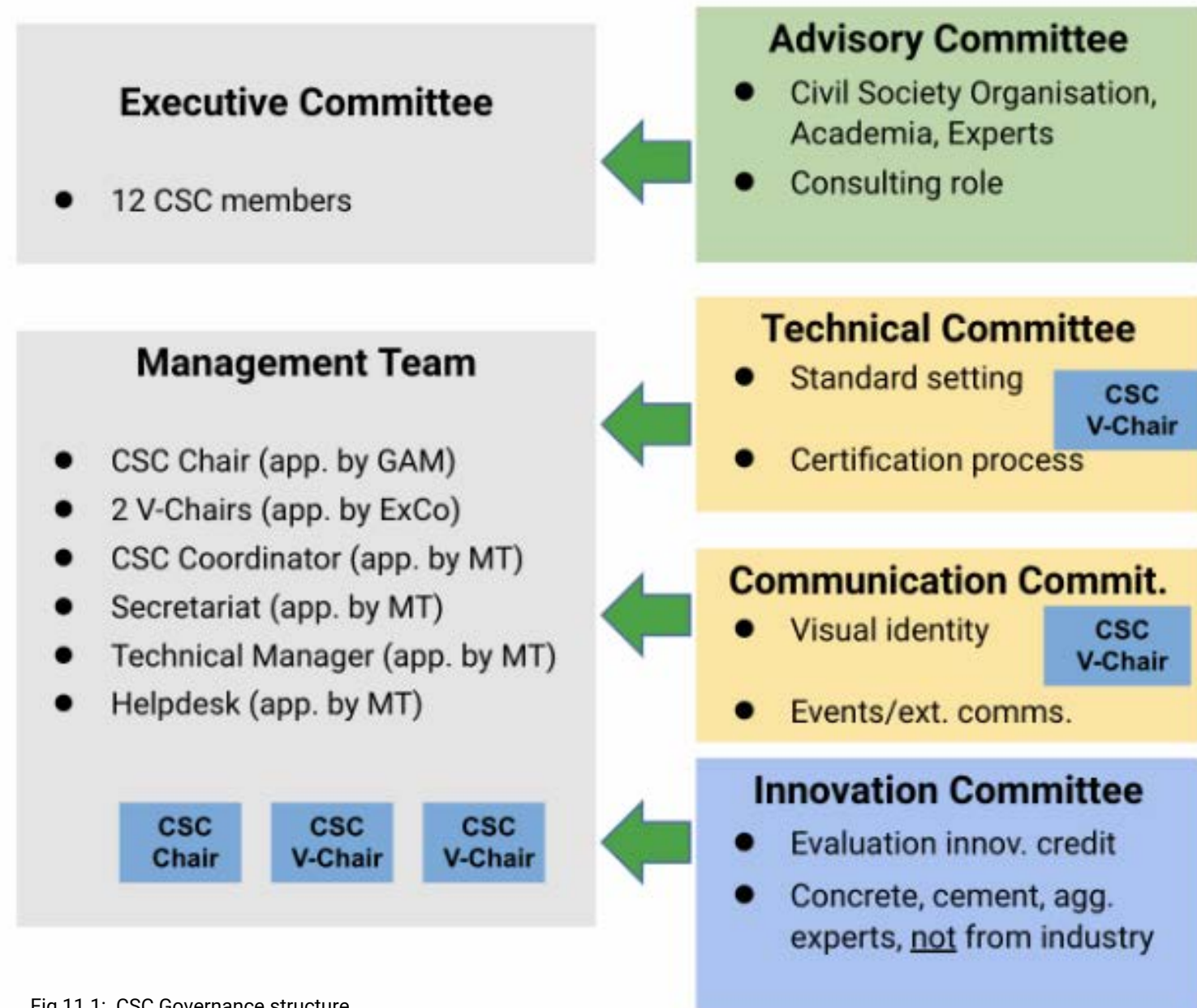


Fig 11.1: CSC Governance structure

12 ABBREVIATIONS

- B.E.S.T Ecological and Sustainable Design in Buildings (residential certification system developed by the Turkish Green Building Council)
- BREEAM Building Research Establishment Environmental Assessment Methodology
- CASA Voluntary certification system developed by the Guatemala Green Building Council (sustainability standard for housing)
- CB Certification Body
- CSC Concrete Sustainability Council
- CSO Civil Society Organisation
- DGNB Deutsche Gesellschaft für Nachhaltiges Bauen – German GBC
- EMS Environmental Management System
- EPD Environmental Product Declaration
- GBC Green Building Council
- GBFS Ground blast furnace slag
- GCCA Global Cement and Concrete Association
- HSMS Health and Safety Management System
- LEED Leadership in Energy and Environmental Design
- MENA Middle East and North Africa
- ÖGNI Österreichische Gesellschaft für Nachhaltige Immobilienwirtschaft - Austrian GBC
- QMS Quality Management System
- RSO Regional System Operator
- SDG Sustainable Development Goal



PICTURE FROM GCCA CONCRETE IN LIFE COMPETITION 2023 BY PEDRO AJURIAGUERRA, NIEMEYER CULTURAL CENTER AVILES SPAIN, "THE DOME OF THE OSCAR NIEMEYER CULTURAL CENTER IN THE CITY OF AVILÉS SPAIN IS MADE OF REINFORCED CONCRETE"



Picture from GCCA concrete in Life competition 2023 by uluk turpcan @trpcn "maiden's hill natural monument" located in the nalihan district of ankara in turkey, since concrete is used in bridge contrcutions, bridges are generally long-lasting and resistant to various environmental conditions. moreover, thanks to the mouldable feature of concrete, bridge designs can be varied and built in accordance with diffferent architectural and engineering requirements



PICTURE FROM CONCRETE IN LIFE COMPETITION 2023 BY GCCA BY AJAS SHAIKH @AJAS_KLICKS, DUBAI, UAE, THE CITY KNOWN FOR ITS REMARKABLE SKYLINE, EMBODIES THE ESSENCE OF URBAN DEVELOPMENT, SYMBOLIZED BY THE EXTENSIVE USE OF CONCRETE.