



HÅLLBAR INFRASAMVERKAN 2.0

Subproject 3 - Possibilities and consequences with the next version of CEEQUAL and the effect on the Swedish infrastructure sector

Bilaga 3 till slutrapport Hållbar infrasamverkan 2.0



Foreword

This subproject is a part of the project *Hållbar infrasamverkan 2.0*, which is coordinated by Sweden Green Building Council. Project manager for the project *Hållbar infrasamverkan 2.0* is Sofie Absér, WSP.

Project manager for subproject 3 is Katarina Wärmark, WSP

Steering group: Representatives from Sweden Green Building Council, WSP, Swedish Construction Federation (Sveriges Byggindustrier), Skanska and Volvo CE/CCC.

Reference group: SGBC's division Sustainable Infrastructure

The project is financed with the contribution from InfraSweden2030 and SBUF and through financial means from Volvo CE, WSP, Swedish Transport Administration and Sweden Green Building Council. Several actors in the infrastructure sector have contributed to the project with their time through participation in reference group, workshops, interviews and questionnaires.

Associated with this subproject is a final project report which concludes all three subprojects performed within the project *Hållbar infrasamverkan 2.0*.

Author subproject 3: Katarina Wärmark, WSP.



Content

1	Introduction	6
1.1	Background	6
1.2	Aim	6
1.3	Method	7
1.4	Contributing actors	8
1.5	Expected result	8
2	Mapping of international schemes for sustainability for the civil construction sector	9
2.1	Envision – Sustainability Infrastructure Rating System	9
2.2	IS rating scheme	12
2.3	CEEQUAL	15
2.4	GRESB Infrastructure	17
2.5	SUNRA	19
2.6	Comparison between SUNRA and CEEQUAL	22
2.7	Summary	24
3	Result	27
3.1	Possibilities and consequences with the next version of ceequal and the effect on the Swedish infrastructure sector	27
3.2	Questionnaire	30
3.3	Workshop with three CEEQUAL projects	37
4	Conclusion	39
4.1	Aspects of importance for the Swedish market	39
4.2	Suggestions for future steps for the Swedish market should take to make the most of CEEQUAL	40



Sammanfattning

Denna rapport är slutrapporten för delprojekt 3, *Nästa version av CEEQUAL och dess innebörd för den svenska anläggningsbranschen*, som genomförts inom ramen för projektet Hållbar infrasamverkan 2.0.

Rapporten innehåller en kartläggning av hållbarhetssystem för anläggningsbranschen och en djupdykning i den nya manualen för det hållbarhetssystem som är störst på den svenska marknaden idag, CEEQUAL. En jämförelse görs även mot SUNRA, vilket är det ramverk som även används i ett fåtal Trafikverks-projekt.

Den nya versionen av CEEQUAL-manualen kommer att publiceras under 2019 och innehålla en rad förändringar. Några förändringar är ökad omfattning och fokus på framför allt projektledning samt risk och resiliens. Vad gäller risk och resiliens har båda begreppen en bred definition i nya manualen och omfattar allt ifrån systemsäkerhet, terrorhot, klimatanpassning och anpassning för framtida behov och samhällsliga förändringar. En hel del strukturella förändringar genomförs även, vad gäller layout och betygssystem.

Den svenska marknadens respons på förändringarna har varit till största del positiva. I projektet har en enkät bland CEEQUAL-assessorer genomförts, för att få in synpunkter kring hur de övergripande förändringarna anses påverka assessorernas arbete och projekten som assessorerna är verksamma i. För att utreda konsekvenser på kostnad, organisation och hållbarhetsprestanda genomfördes en workshop med tre CEEQUAL-projekt som fick titta djupare på två av de frågeställningar i CEEQUAL som anses vara några av de största nyheterna i nya manualen. Deltagarna från projekten ansåg att förändringarna kan innebära en initial kostnadsökning och behov av ny kompetens, men att mycket av arbetet redan görs i projektet eller kan adderas till i befintliga arbetsmetoder. En punkt som dock flera var skeptiska till var att krav om lean management introduceras.

Det är mycket viktigt att systemet behåller sin flexibilitet och att man underlättar för användningen av systemet i Sverige, anser den svenska marknaden. Då Sverige den största marknad för är ägaren av CEEQUAL, BRE, utanför Storbritannien anser delprojektet att detta bör ligga i BRES intresse. Konkret så anser assessorerna att det är viktigt med en svensk översättning, att man borde tillhandahålla svenska verifierare samt assessorsutbildningar i Sverige, på svenska. Delprojektet föreslår att SGBC bör ta en roll som samtalspart med BRE, driva assessorsnätverket och ansvara för utdelningen av CEEQUAL-awards i Sverige.



Abstract

This is the final report for subproject 3, *Possibilities and consequences with the next version of CEEQUAL and the effect on the Swedish infrastructure sector*, a part of the project Hållbar infrastruktur 2.0.

A mapping of sustainability schemes within the civil construction sector is presented as well as a more thorough description of the new manual for the most used sustainability scheme for civil construction sector in Sweden today, CEEQUAL. The report also contains a comparison towards SUNRA, a sustainability framework that is used in a number of projects owned by the Swedish National transport administration.

The new CEEQUAL manual is to be published during 2019 and will contain a number of changes. Some of the changes are more extensive than others, and there is a greater focus on project management and risk and resilience. Both risk and resilience have a wide definition in the new manual, including aspects such as cyber security, intentional threats, climate adaptation and resilience planning for future needs and societal changes. Structural changes are also made, in regards of layout and rating levels.

The Swedish market is overall positive with regards to the changes within the new version. Opinions about the general changes in CEEQUAL and how this is affecting the CEEQUAL-projects and assessors' work within these projects was collected through a survey amongst CEEQUAL-assessors in Sweden. In order to specify effects the changes will have with regards to cost, organization and sustainability performance, a workshop with three projects was conducted. Two sections with requirements on project management and risk & resilience were presented to the participants from the projects. The participants thought that the changes could lead to an initial increase in cost and need for additional competence, but deemed some work is already performed in many projects or can be added to existing methods without much extra work. There was some skepticism about the introduction of lean management however.

Some key opinions from the Swedish market are that it is important that the scheme will continue to be a flexible scheme, fit to different projects and markets, and it is also important that BRE will ease the use in Sweden. Since Sweden is the biggest market for CEEQUAL outside of Great Britain, this should be of interest. The assessors' think that a Swedish translation is important for the future use of CEEQUAL, that Swedish verifiers should be introduced, and that assessors training should be held in Sweden, on Swedish. The subproject suggests that SGBC should be the collaboration partner for BRE in Sweden, and with that coordinate the assessors' network in Sweden and be responsible for the CEEQUAL-awards in Sweden.



1 INTRODUCTION

1.1 BACKGROUND

CEEQUAL has been in use in Sweden since 2011. Until the end of 2016, around 30 projects were registered for certification in Sweden. Additionally, we know that there are also projects that are working accordingly to CEEQUAL as a framework for sustainability, but without certification. One example is the new metro line in Stockholm. Thus, the Swedish market is an important market for BRE and since CEEQUAL is the most used scheme for sustainability within the civil construction sector, the development of the scheme is of great interest for the Swedish market.

The next version of CEEQUAL, and the first version after BRE bought CEEQUAL Ltd, is to be launched in the beginning of 2019. Since the pilot BREEAM for Infrastructure scheme is built up in another manner, the changes between CEEQUAL version 5.2 and the upcoming CEEQUAL manual is expected to be quite extensive.

With these changes comes possibilities for inclusion of other sustainability aspects and further support in sustainability integration. Hopefully, this will lead to better sustainability performance within civil construction projects. The changes will probably also entail challenges for civil construction projects. New areas of sustainability will be introduced and with that, new ways of working has to be formalized. There is also a risk of the scheme developing in an undesired direction or in a way that is not suited for the Swedish civil construction sector. Preparing for challenges, and to be able to make the most of the possibilities arising with the new scheme is therefore of interest. A potential risk the project has identified with development and integration of CEEQUAL within BRE is that setting a bar that is too high might impact the suitability for using the scheme within smaller projects. To analyze these changes and making the most of the changes by preparing the Swedish market was the main reason for why this project was conducted.

This report is the final reporting from subproject 3, *Nästa version av CEEQUAL och dess innebörd för den svenska anläggningsbranschen (Possibilities and consequences with the next version of CEEQUAL and the effect on the Swedish infrastructure sector)*, which is a part of the project *Hållbar infrasaamverkan 2.0*.

1.2 AIM

Subproject 3 aims to describe the upcoming version of CEEQUAL and analyze the effect the changes might have on the Swedish infrastructure sector. It also includes a survey of other international systems for sustainability in the civil construction sector, which could be of interest for the Swedish industry.



1.3 METHOD

The subproject consisted of three main activities:

- A. Mapping of international schemes for sustainability for the civil construction sector
- B. Survey of possibilities and challenges with the new CEEQUAL manual within the civil construction sector
- C. Creating acceptance and dissemination of the result within the industry

The mapping of international systems for sustainability for the civil construction sector was conducted through a literature review and use of interviews conducted in projects with adjacent aims. The Swedish Transport Administration (Trafikverket) has also been involved for remittance regarding the sections about SUNRA.

The aim of the mapping was to ensure that the focus on CEEQUAL was unjustified, that we haven't missed another scheme of equal interest for the Swedish market. The choice of which schemes to include in the mapping was made internally by the working group of the project Hållbar infrasamverkan 2.0. Criteria for inclusion was that the scheme should be aiming to cover all aspects of sustainability, and not just focusing on a specific question such as climate, and that the scheme should be suited for a civil construction project.

Benchmark for the mapping was a previous scan conducted in 2014 within the project *Uppstart av HCA*, funded by the Development Fund of the Swedish Construction Industry¹. Since CEEQUAL is the widely most used scheme for infrastructure projects in Sweden, a special focus was given to this scheme. SUNRA is developed by the Swedish Transport Administration, the biggest client for infrastructure projects in Sweden. A more in-depth comparison between benefits and synergies between the different systems CEEQUAL and SUNRA was therefor of interest and is described in section 2.6.

Close contact with BRE and participating in BRE's work with the development was a natural part of activity B. The work BRE is conducting when integrating the two schemes into one is receiving remittance through a working group. The working group consist of several representatives within the industry, familiar with either CEEQUAL or BREEAM for infrastructure. The subproject 3 has participated on the two meetings held in spring 2018.

The analysis of possibilities and challenges within the civil construction sector is based on part A, the mapping of international systems for sustainability in the civil construction sector. However, part B, survey of possibilities and challenges with the new CEEQUAL manual within the civil construction sector, is only focused on CEEQUAL. A survey conducted among the CEEQUAL-assessors in Sweden and a workshop with CEEQUAL-projects was the basis for this activity.

¹ HCA – HållbarhetsCertifiering av Anläggningsprojekt, 2014. Bilaga 3: Omvärldsanalys av hållbarhetscertifieringssystem för anläggningsprojekt.



Since the upcoming CEEQUAL manual is still under development, documents that has been the basis for section 3 in this report are drafts. Conclusions and recommendations should be read bearing this in mind.

The result of the study was partly presented at the CCC-summit in Gothenburg, which make up for activity C. A part of this activity is the communication and feedback that has been given to the CEEQUAL organization during the development of the scheme.

1.4 CONTRIBUTING ACTORS

BRE has been an important part of this project as CEEQUAL is the most widely used scheme for infrastructure projects in Sweden today. The Swedish network for CEEQUAL-assessors and its members have also contributed to the results along with Swedavia, NCC, Tyréns and the Swedish Transport Administration.

1.5 EXPECTED RESULT

The subproject will result in an updated mapping of sustainability schemes for the infrastructure sector, with a focus on CEEQUAL and the possibilities and challenges linked to the new version the CEEQUAL manual . It is also expected to provide an international perspective and have an influence of the work conducted by BRE in developing the new version of CEEQUAL.



2 MAPPING OF INTERNATIONAL SCHEMES FOR SUSTAINABILITY FOR THE CIVIL CONSTRUCTION SECTOR

2.1 ENVISION – SUSTAINABILITY INFRASTRUCTURE RATING SYSTEM

Envision is a sustainability assessment scheme developed by the Zofnass Program for Sustainable Infrastructure at Harvard University and the Institute for Sustainable Infrastructure (ISI)². ISI, which administrates the system, was founded by the American Public Works Association (APWA), the American Society of Civil Engineers (ASCE), and the American Council of Engineering Companies (ACEC) and operates under their oversight.

The Envision system was officially introduced in 2012. The main purpose of Envision is to encourage improvement of sustainability performance and resiliency in physical infrastructure. Moreover, a central point of the scheme is to reach further than the individual project by considering interests of affected communities.

Envision is applicable to all types of infrastructure - energy, water, waste, transport, landscape and information. This includes roads, bridges, pipelines, railways, airports, dams, levees, landfills and water treatment systems.

2.1.1 Scope and Content

The Envision system covers all phases of the project life cycle: planning and design, construction, operation and maintenance, and deconstruction, demolition and disposal. The current guidance manual however, covers the use of the Envision only from the perspective of the planning and design phase.

The Envision rating system includes:

- A guidance manual, which explains how to conduct an Envision assessment
- Self-pre-assessment - a pre-assessment checklist with a simplified series of yes/no questions to help projects identify if Envision criteria are being addressed.
- An online scoresheet, a digital version of Envision for collaboratively conducting self-assessments and sharing results;
- A third-party verification and recognition of project achievement

Envision can be used for evaluating and rating the community, environmental, and economic benefits of the project. The system consists of 64 sustainability indicators, which are divided into five categories.

² Institute for Sustainable Infrastructure, website, March 2018

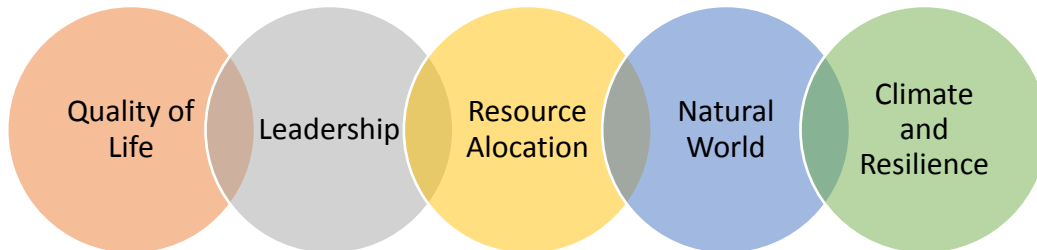


Figure 1. Sustainability categories in Envision

The indicators address the full range of environmental, social, and economic impacts to sustainability in project design, construction, and operation³. Content within the different categories are as explained in table 1.

Table 1. Categories and content of Envision

Category	Content
Quality of Life	Mobility, Community, Wellbeing
Leadership	Collaboration, Economy, Planning
Resource Allocation	Materials, Energy, Water
Natural World	Siting, Ecology, Conservation
Climate And Resilience	Emission, Resilience

Rating levels

Maximum total points in the framework is 1000 points. Awards and recognition are available as an option for the Envision practitioner. The four-grade level includes the following awards⁴:

- Verified Award – more than 20 % of the total amount of points
- Silver Award – more than 30 % of the total amount of points
- Gold Award – more than 40 % of the total amount of points
- Platinum Award – more than 50 % of the total amount of points

³ Institute for Sustainable Infrastructure, website, September 2018

⁴ Institute for Sustainable Infrastructure, website, September 2018



2.1.2 Usage

The first two project verifications were announced in 2013 - The William Jack Hernandez Sport Fish Hatcher, a fishfarm and Placer County Snow Creek Restoration Project, a restoration of wetlands.⁵ In September 2018 there was in total 49 verified projects and about 20 registered projects pursuing an Envision award.

While initially developed for North America, Envision can be applied around the world. The majority of the projects are located in the United States, along with Canada.⁶ The system's checklist has also been used as a framework in both South America, Europa, Asia and Africa but without aiming for an award.⁷

In total Envision has around 230 Envision Qualified Companies, which is an ISI member company with an Envision Sustainability Professional (Envision trained) on staff. Envision also has around 45 agencies supporting and using the system. This includes a variety of public entities, ranging from small town government departments to large, multi-jurisdictional agencies that are owners of infrastructure.⁸

2.1.3 Development

Revision of the latest version of Envision (v3) was done during the autumn of 2017. It was reviewed by practitioners, academics, current Envision users, infrastructure owners and other industry professionals. Feedback was collected on the draft Envision v3 credits.

In the new version, released in April 2018, the number of indicators was expanded from 60 to 64. The categories in v3 are Quality of Life, Leadership, Resource Allocation, Natural World along with Risk and Resilience. The new version has a more extent focus than before - Infrastructure Planning, Design, and Construction, with indicators that include other life-cycle phases such as operations and maintenance, and end-of-life. Additional indicators concerns lifecycle economic evaluation, equity and social justice, sustainable community planning, along with energy consumption, water consumption and waste diversion in the construction phase. The Envision sustainability framework will now only be free for ISI members. During 2018 several tools and resources related to Envision v3 is launched⁹.

During 2018 a new maintenance program for the Envision Sustainability Professionals (ENV SPs) to maintain an active credential is launched. The purpose of the program is to show the relevance of the system and the ENV SPs to the sector.

⁵Institute for Sustainable Infrastructure, website, September 2018

⁶ Institute for Sustainable Infrastructure, website, March 2018

⁷ HCA – HållbarhetsCertifiering av Anläggningsprojekt, 2014. Bilaga 3: Omvärldsanalys av hållbarhetscertifieringssystem för anläggningsprojekt

⁸ Institute for Sustainable Infrastructure, website, September 2018

⁹ Institute for Sustainable Infrastructure, website, September 2018



2.1.4 Benefits

Envision is used in large scale in North America where it has many users. The system is developing towards the trends in the area of sustainability such as resilience. International use is possible since the system is flexible, and there is some examples of projects outside of North America. It is also possible to use the system along with other rating systems, and can therefore work as a framework. Envision includes the whole life span of an infrastructure project from planning to demolition and disposal.

2.2 IS RATING SCHEME

The IS rating scheme is an Australian rating scheme for evaluating sustainability across design, construction and operation of infrastructure. The IS rating scheme is developed and administrated by the Infrastructure Sustainability Council of Australia (ISCA), which is a member-based not-for-profit public and private industry council¹⁰. IS rating scheme is the only award scheme to assess sustainability in design, construction and operation of infrastructure projects in transport, water, communication and energy in Australia.¹¹

ISCA's member organizations represent the full scope of stakeholders in the infrastructure supply chain; contractors, design teams, agencies, and infrastructure owners.

2.2.1 Scope and Content

The IS rating scheme evaluates planning, design, construction and operation of all infrastructure asset classes in all sectors. The scheme consists of: IS rating tool scorecard, IS Materials Calculator and IS Technical Manual. There are two versions in use. Version 2 is the newest version that is used in Australia. Version 1.2 is the version that is possible to use in Sweden at the moment.

The framework in version 2 is divided into four themes.

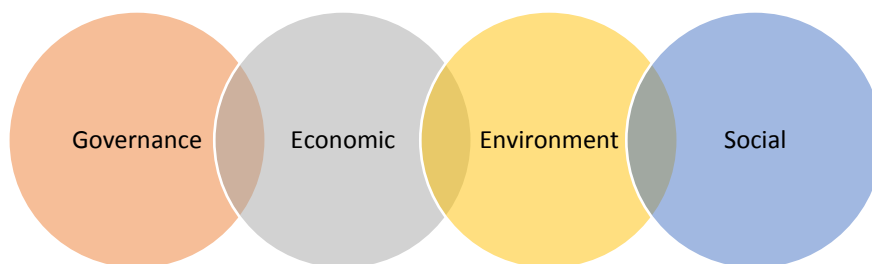


Figure 2. The themes of IS rating scheme.

¹⁰ Institute for Sustainable Infrastructure, website, March 2018

¹¹ Infrastructure Sustainability Council of Australia, website, March 2018



Within each theme, there are several categories. There are 18 categories in total.

Tabell 1. Themes and content of IS rating scheme version 2

Themes	Categories
Governance	Context, Leadership & Management, Sustainable Procurement, Resilience, Innovation
Economic	Business case, Benefits realization
Environment	Energy and Carbon, Green Infrastructure, Environmental Impacts, Resources, Water, Ecology
Social	Stakeholder Engagement, Legacy, Heritage, Workforce sustainability

Rating levels

In total, the project can obtain 110 points¹². In the two versions, the awards differ¹³:

Version 1.2

- If the project obtains less than 25 points no award is received
- Commended – between 25 and < 50 points
- Excellent – between 50 and < 75 points
- Leading – between 75 and 100 points

Version 2

- Bronze between 20 and 39 points
- Silver between 40 and 59 points
- Gold between 60 and 79 points
- Platinum between 80 and 94 points
- Diamond from 95+

The new version 2 includes an expert verifications process.

2.2.2 Usage

The IS Rating Scheme was launched in February 2012. In the beginning of 2014 there was 10 certified projects and in March 2018 there was in total 20 certified projects and 48 ongoing projects.¹⁴

¹² Infrastructure Sustainability Council of Australia, website, March 2018

¹³ Infrastructure Sustainability Council of Australia, website, September 2018

¹⁴ Infrastructure Sustainability Council of Australia, website, March 2018



The scheme is used in civil works projects or assets across Australia and New Zealand. However an international scheme, IS international, is now available for piloting.

2.2.3 Development

ISCA released a new version of IS Rating Scheme, ISv2.0. Version 2.0 in July 2018¹⁵. On a structural level, the development consist of aligning the scheme with the UN Sustainable Development Goals and adaption to work well with global sustainability frameworks such as Global Reporting Initiative (GRI) and United Nations Global Compact (UNGC). IS v2.0 is developed to cover the whole infrastructure lifecycle from strategic planning to deconstruction through either ratings, guidance, training or service offers.

The review also attempts to reduce the evidence burden wherever possible and ensure there is a better balance between effort and reward. Furthermore, credits are written for each phase of the infrastructure lifecycle. Major updates has been made on the categories Culture & Context, Sustainable Procurement, Natural Hazards and Legacy.

Also, new categories are included:

- Business case
- Benefits realization
- Workforce Sustainability
- Resilience
- Green Infrastructure

ISCA have also developed a rating, built upon the IS rating tool v.1.2, that can be applied internationally. The IS International rating tool (Design and As Built) was officially released for piloting on the 19th of September 2017. The IS International rating tool has been developed for application in both Developing and Developed Countries. Sovereigns, donors, multilaterals institutional investors, funding agencies and project delivery partners, can utilize the International version.

2.2.4 Benefits

The IS rating scheme is widely spread in Australia and the development of the scheme is in line with the trends in the area of sustainability, that is resilience and social factors. The international version of IS rating scheme will also help the system to develop and get a wider spread. The system is also fairly easy to use, having a manual, calculator and scorecard.

ISCA is also working with establishing formal relationships with key industry peak bodies to collaborate and share information regarding common opportunities and issues. The new version includes the whole infrastructure lifecycle from strategic planning to deconstruction.

One benefit that differentiates IS rating scheme from many of the other schemes, is that a number of complementary tools have been developed by ISCA. The tools are used in line with the manual in

¹⁵ Infrastructure Sustainability Council of Australia, website, September 2018



order to create awareness about the sustainability impact of the project and visualize the potential for sustainability improvements.

2.3 CEEQUAL

CEEQUAL is an evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects. It was developed by the British organization Institution of Civil Engineers (ICE) and was launched in 2003. The interest for the scheme internationally was increasing, and CEEQUAL for international projects was launched in 2011.¹⁶

The current version of the CEEQUAL manual is version 5. In 2015, BRE Group, who is managing the BREEAM Scheme, bought CEEQUAL. A new manual is under development, which will combine aspects from the pilot BREEAM for Infrastructure and CEEQUAL. The next version of CEEQUAL is to be launched as a draft for public consultation in 2019.¹⁷ This section will describe CEEQUAL in its current stage, that is CEEQUAL version 5. For more information about how the upcoming version is likely to be developed, please see chapter 4.

2.3.1 Scope and Content

CEEQUAL assesses how well a project has incorporated sustainability. The manual has nine different chapters.

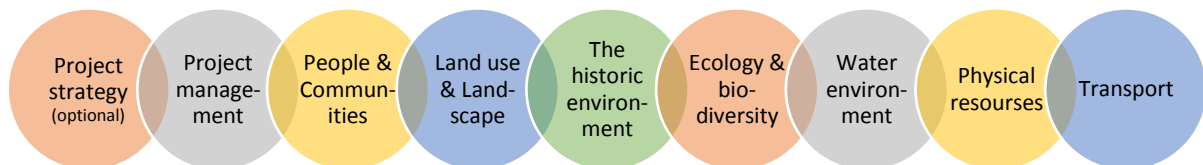


Figure 3. Chapters in the CEEQUAL-manual

Rating levels

The rating levels consists of four grades.

- Pass – more than 25 % of the total score
- Good – more than 40 % of the total score
- Very Good – more than 60 % of the total score
- Excellent – more than 75 % of the total score

The process of assessment starts with an assessment of the outcome or score of the project. This is done by the CEEQUAL-assessor of the project. The assessment is after that verified by a verifier, who is appointed to the project by CEEQUAL. The last step is ratification, which is performed by a third part,

¹⁶ CEEQUAL Website, August 2018

¹⁷ CEEQUAL Website, August 2018



the ratifier.

Type of Project

CEEQUAL is a very flexible scheme and can be used on any type of civil construction project, such as rail projects, roads, water treatment works, wind farms, airport, dams, landscape, business parks etc. There is also the possibility for individual parties of a project to certify their contribution, for example by doing a Design Only award, Construction Only award, Client & Design.

2.3.2 Usage

Most of the projects that are using CEEQUAL are UK projects. More than 300 projects have been certified with CEEQUAL since the scheme began in 2003¹⁸. Sweden is today the biggest market for the scheme outside of the UK but there is a growing interest in other Nordic countries and in Asia.

CEEQUAL has been in use in Sweden since 2011 and up until the end of 2016, around 30 projects were registered for certification¹⁹. There are also several projects in Sweden that are working accordingly to CEEQUAL, but has not yet decided upon whether to certify. One example is the new metro line in Stockholm.

2.3.3 Development

A new manual is to be released for public consultation in January 2019. The new manual will include changes in both structure and content. The changes are described in chapter 4.

Historically, CEEQUAL has developed and updated by launching different versions of the manual. Minor adjustments were made within the version, but major adjustments called for a new version. The current version is as earlier mentioned version 5.

The development made has been done in cooperation with the industry. The former owner of CEEQUAL, CEEQUAL Ltd., set up focus groups within different areas of sustainability, called Technical Advisory Group (TAG). Persons within the business that had some insight to the use of the scheme were summoned to give input about the requirements and guidance within the manual. Above this, CEEQUAL also had appointed experts within different fields of sustainability that was developing the method and scheme.

These groups were used to ensure that the manual was raising the bar for sustainability performance in a pace that was just high enough. The TAG group has for the upcoming version been replaced by what is called "working groups". It is likely that this kind of remittance within the business will continue in the future as well.

2.3.4 Benefits

CEEQUAL is today the most recognized sustainability scheme in Sweden for infrastructure projects. The scheme is developed to be flexible and suitable for all kinds of projects. The focus of the scheme

¹⁸ CEEQUAL website, August 2018

¹⁹ Statistics received from BRE Group, Melanie Manton. March 2018



is in the process and the continuous improvement, based on the projects context and prerequisites. This makes improvement for sustainability to always be a possibility and the knowledge after certifying a project can easily be transferred to the next, since process can be reused even though the context and challenges of the projects might not be the same.

2.4 GRESB INFRASTRUCTURE

2.4.1 Scope and content

GRESB is an industry-driven organization that emerged from a collaboration of the world's largest pension funds and the academics from Maastricht University and the University of California. GRESB Assessments capture information regarding environmental, social and governance (ESG) performance and sustainability best practices for assets worldwide. GRESB has assessments covering real estate, debt (lenders, banks, funds) and infrastructure. Here we will focus on the GRESB Infrastructure Assessment.

The GRESB Infrastructure Assessment provides:

- A common language for the collection of ESG information from companies and funds wide
- A framework for objective scoring of ESG management and performance
- Tools for investment monitoring, due diligence, and comparative analysis

The GRESB Infrastructure Assessment does not rate, score, or certify individual infrastructure projects. The GRESB Infrastructure Assessment recognizes project-focused leadership standards, such as BREEAM, CEEQUAL, ENVISION, SuRe, Infrastructure Sustainability and others, to establish and certify project-level management and performance.

The GRESB Infrastructure Assessment is made up of two complementary components; a Fund Assessment and an Asset Assessment. There is also an optional Resilience Module.

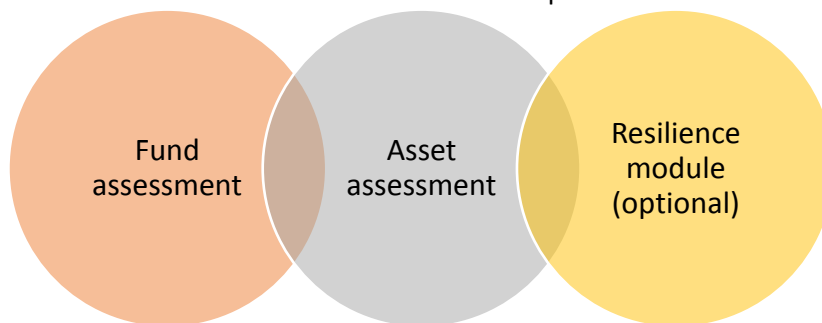


Figure 4. Components of the GRESB Infrastructure Assessment.

The GRESB Infrastructure Fund Assessment is an investor-driven ESG benchmark and reporting framework. It is assessing the performance of infrastructure funds. The GRESB Infrastructure Asset Assessment does the same but infrastructure assets, instead of funds.



The Fund Assessment contains ten indicators focused on management and investment processes. These indicators address foundational ESG plans and policies, leadership and accountability, engagement strategies, communications processes and other factors.

The Asset Assessment is organized around eight core aspects, including Management, Policy & Disclosure, Risks & Opportunities, Implementation, Monitoring & Environmental Management Systems, Stakeholder Engagement, Performance Indicators, and Certifications & Awards.

The resilience module evaluates how infrastructure companies and funds are preparing for potentially disruptive events, changing conditions and becoming more resilient over time. The Resilience Module were released the 1th of March 2018 and aims to provide more information about strategies used to assess and manage risks from social and environmental shocks and stressors, including the impact of climate change. Shocks are big, acute events that disrupt a system, such as floods, fires, earthquakes, terrorist attacks. Stressors are the underlying vulnerabilities that leave companies and communities susceptible when shocks occur, such as poverty, income inequality, environmental degradation and aging infrastructure.

2.4.2 Usage

GRESB Infrastructure is during 2018 used in 65 countries on 75 funds and 280 assests. In terms of regions, participation grew during 2018 across all regions with Europe growing the most, now making up just over half of participants by gross asset value (GAV), followed by North America (25%) and Australia/NZ (16%).

GRESB Infrastructure has the flexibility to accommodate a wide-range of infrastructure types such as as energy generation, energy storage, flood control, water resources, waste management, airports, ports, toll roads, railroads, rolling stock, social infrastructure and more.

Scoring

Each entity receives an overall GRESB Score. Depending on the entity, these may include a Fund Score and/or one or more Asset Scores. The overall scoring methodology reflects GRESB's goal to create meaningful differentiation within peer groups. The final scoring methodology will be determined by the nature of the data submitted by the participants that specific year.

Validation

Information provided by funds or assets is subject to GRESB's multi-level validation process. The validation process includes:

- Automated data checks for all participants
- Random sampling of evidence submitted by selected entities
- Site visits for a small fraction of entities.



The validation process encourages and ensures the submission of high quality data and is an important element of GRESBs' roadmap to investment-grade data that can be used alongside financial information to inform and guide investment decisions²⁰.

2.5 SUNRA

SUNRA is a sustainability framework developed by ERA-NET ROAD, a collaboration between 15 National road administrators (NRA) in Europe in 2013. The aims with the project SUNRA was how to define sustainability, integrate and measure sustainability in transport infrastructure projects.²¹

A Swedish version of SUNRA, SUNRAse, was drafted by the Swedish Transport Administration in collaboration with VTI (Swedish National Road and Transport Research Institute). The aim was to adapt SUNRA to Swedish conditions, national goals and to include railroad projects²².

2.5.1 Scope and content

SUNRA consists of three frameworks²³, where the first two frameworks are more strategical than the third one. The third framework is project focused. Depending on how far the organization (respective NRA) has come with sustainability in general, the three frameworks can be used in a sequence or parallel.²⁴ When the Swedish Transport Administration is talking about SUNRA, it is usually the third framework that is referred to.

- No1: Helps to define sustainability in a **strategic** level in relation to for example the organization's purpose, their commitment and authority/influence
- No2: Support to set appropriate performance targets and identify indicators connected to **organization** in general, program and project level
- No3: Is an output from framework no.1 and no.2. An excel based **project** tool used to scoop relevant sustainability aspects, chose of indicators and to measure and record the outcome

SUNRA consists of 26 sustainability themes. All themes are to be evaluated in the early stage of the SUNRA project tool. The project chose which themes to include in their forthcoming work. Six of the themes are process oriented with focus on planning and organization, figure 5.²⁵

²⁰ <https://gresb.com/gresb-infrastructure/>

²¹ SGBC, Website, July 2018

²² Katarina Nestor, " Två järnvägsprojekt testar hållbarheten genom Sunra " VTI Aktuellt nr 1 2016 VTI, Statens väg- och transportforskningsinstitut

²³ SGBC, Website, July 2018

²⁴ Flodin, A & Sedin, A, Ett hållbart infrastrukturprojekt, Erfarenheter av att använda hållbarhetsverktyget SUNRA i projekt Ostlänken, C-uppsats från Miljövetarprogrammet, Linköpings universitet, 2017-06-01

²⁵ Road ERA-NET, SUNRA Projektverktyg, SUNRA v 2018 1

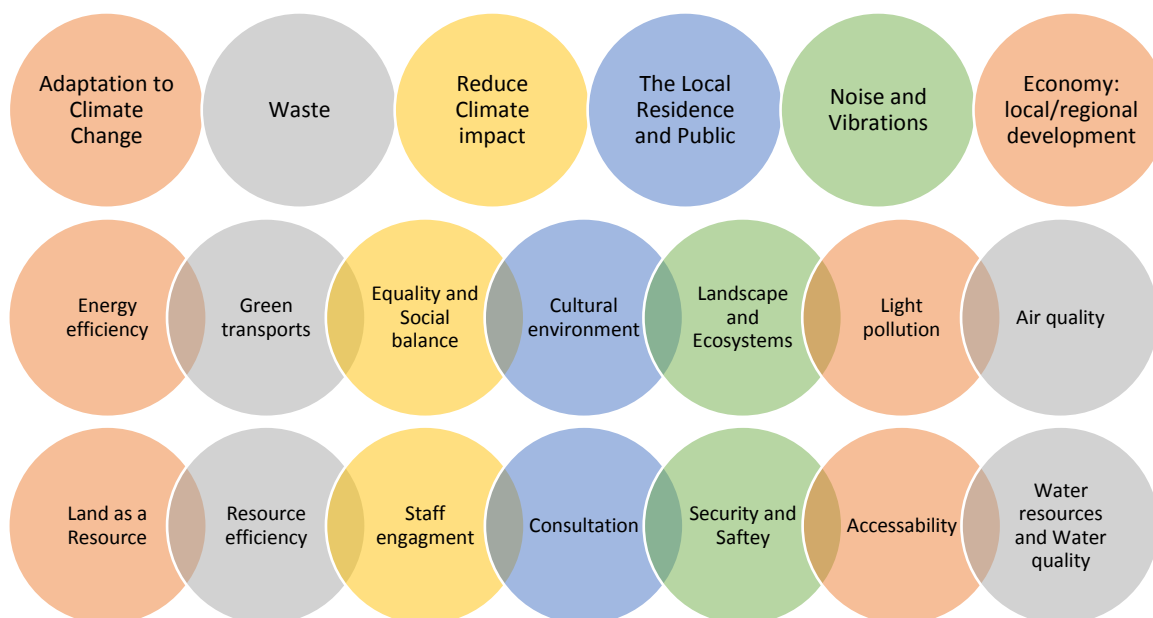


Figure 5. Themes in the SUNRA framework

Rating levels

SUNRA is evaluated on each indicator for each chosen aspect in:

- Target exceeded
- Target achieved
- Target partially achieved (more than 50 % achieved)
- Target not met (less than 50 % achieved)

2.5.2 Usage

The Swedish Transport Administration mainly use the SUNRA project tool. In some other countries, respective National Transport Administrations have chosen to implement the other parts of SUNRA as well, but then the work is more focused on sustainability in the management system of the organization.

No Swedish project is not yet fully evaluated with SUNRA. The Swedish Transport Administration is currently working with SUNRA in about 10 projects. Some of them are test projects, and SUNRA has been introduced in different phases and in different types of projects, for example two big railroad projects; Ostlänken and High speed rail between Borås and Gothenburg²⁶. As of today, SUNRA has

²⁶ Katarina Nestor, " Två järnvägsprojekt testar hållbarheten genom Sunra " VTI Aktuellt nr 1 2016 VTI, Statens väg- och transportforskningsinstitut



primarily been used by the project management of the client organisation, but in the projects Ostlänken and the High speed rail the designer is also using SUNRA as a sustainability tool. ²⁷

2.5.3 Development

The Swedish Transport Administration is currently implementing SUNRA in its organization²⁸. The implementation process includes evaluation of the ongoing SUNRA projects to analyze where in the organization SUNRA can be used successfully²⁹. The intention is to publish the tool on the website and make it accessible for the whole infrastructure sector, along with an instruction on how the tool can be used to increase sustainability within infrastructure projects. The instructions are in other words focused on the methodology for incorporation of sustainability in the project in an effective way. Instructions on how to use the tool are incorporated into the tool itself. ²⁷

The Swedish Transport Administration are also studying the connections to other tools they are using, such as the 2030 Agenda, in order to identify needs for development. At the moment, the Swedish Transport Administration feel that SUNRA is covering the majority of sustainability aspects relevant for the projects.

2.5.4 Benefits

SUNRA is a flexible scheme, with no mandatory parts or descriptions on how the process of implementation should be structured, which allows the user to choose which and how many aspects to include in the sustainability initiatives. Therefore, the user can focus on aspects that are important in the specific project. SUNRA is a holistic scheme that includes a wide range of sustainability themes. Since the scheme uses targets and indicators, it could be possible to compare the project with other projects including the same themes, if other projects have chosen the same areas of sustainability and indicators.

²⁷ Muntlig kommunikation, Åsa Lindgren, Trafikverket 2018-10-18

²⁸ <https://www.trafikverket.se/om-oss/var-verksamhet/trafikverkets-uppdrag/regeringsuppdrag-remisser-och-remissvar/Regeringsuppdrag/trafikverkets-atgarder-inom-ramen-for-miljomalsradet/>

²⁹ Muntlig kommunikation, Åsa Lindgren, Trafikverket 2018-10-18



2.6 COMPARISON BETWEEN SUNRA AND CEEQUAL

The schemes used in Sweden are as mentioned above, SUNRA and CEEQUAL. The schemes have a number of differences that are interesting to highlight. A comparison between the two schemes is therefore included in this project and is described in this section.

One key difference between the schemes is the type of project the schemes are developed for. SUNRA is developed for road infrastructure. The Swedish version also includes rail road projects. Hence, other civil construction projects might not be able to use the scheme in its current format. CEEQUAL can be used in any civil construction project.

One of the biggest differences regarding the governance of the schemes is that SUNRA is a nonprofit rating scheme while BRE, which is a commercial company, owns CEEQUAL. This affects several of things. For one, since SUNRA will become available for the whole sector, it would be possible for smaller market players to work with sustainability without having to spend money on certification fees. Therefore, it would be possible for SUNRA to spread more easily in the civil construction sector. However, the tool is not yet available outside of the Swedish Transport Administration and there is no possibility for official use of SUNRA for other parties, except the ones' involved in a SUNRA-project. CEEQUAL is widely spread today.

Up until now, SUNRA seems to have been developed by keeping only the perspective and the needs of the Swedish Transport Administration in mind. That the tool will become public for the whole infrastructure sector is positive, but it is unclear how much focus and usability the tool and following documents will have on other parties involved in an infrastructure project. This could become a disadvantage if one party, for example a contractor alone, wants to use SUNRA in a project.

CEEQUAL, on the other hand, offers certification for different roles (for example design team or contractor) along with certification for the whole project. CEEQUAL also has a distinct distribution of responsibility between the roles in the project. This makes it possible for designers or contractors to work with sustainability without having a client with sustainability objectives. It also enables design teams and contractors to get a third part certification of their sustainability work.

SUNRA does not contain any mandatory sustainability themes. SUNRA has a scope process in the start of the project, which can lead to that the project does not include "the right" sustainability aspects since it can be difficult to have a complete overview of the project from the start. It is entirely up to the project itself to determine what aspects of sustainability the project wants to work with. CEEQUAL on the other hand, only have the chapter of project strategy that is entirely optional. In the upcoming version of CEEQUAL, it is likely that options like this will not exist (see chapter 3).

However, scoping out is allowed within CEEQUAL, but only if the aspect is not applicable to the project, and some questions are according to CEEQUAL applicable to every project. A requirement for scoping out questions is a proof that the question in fact is inapplicable.

Since CEEQUAL does not allow the user to choose entirely which aspects to include, it can result in that an unexperienced actor or smaller projects will choose not to work with the scheme, since there



is a risk that the project will receive a low score. SUNRA allows every project to focus on important aspects in their certain project. In that sense, SUNRA is more flexible than CEEQUAL. Using CEEQUAL, it is easier to compare the output with other projects since the users has to work with all the same questions. The mandatory requirements in CEEQUAL therefore sets a common standard for what sustainability aspects, if applicable, infrastructure projects should consider and makes it hard for projects with low sustainability ambition to claim that the project is working with sustainability. Projects using SUNRA cannot fully be compared with other projects unless they have the same scope and the same indicators. In SUNRA, the sustainability ambitions in the project can be low, but it would not be apparent until looking into what the project actually have done and achieved in the project. For the Swedish Transport Administration this might not be a problem, since the tool is used on a voluntary basis and the organization have no incentive or interest in comparing performance between projects.

One of the strengths and benefits of CEEQUAL is that the questions are structured in the manor that it, additional to being a sustainability scheme, provides a methodology for the implementation of sustainability aspects. As one of the assessors mentioned in the questionnaire, it can also work as a quality management system.

The extensiveness of the instructions or methodology for how SUNRA can be implemented is yet uncertain. The tool itself does not include instructions on methodology at the moment, but it might be possible that the complimentary instructions will provide this. Another way to accomplish this could be by using training sessions, but this is not something that the Swedish Transport Administration have mentioned. CEEQUAL has public training sessions, which are also requirements before becoming an assessor within the rating scheme.

SUNRA uses indicators to monitor the sustainability output, which can be a motivation and support for the project to increase sustainability. In CEEQUAL, indicators can be used but the project result also includes considering a certain solution, hence CEEQUAL has an aim to encourage change of mindset in the sector, and provides methods that can be used to achieve high goals.

CEEQUAL was developed in 2003 and SUNRA in 2013. Naturally, there are fewer projects that have worked with SUNRA than CEEQUAL, which entails that there could be practical issues of the use of SUNRA that are not yet discovered or solved.

Even though the SUNRA scheme is nonprofit, it is developed by the same actors that are using it which can affect the objectiveness of the scheme. Having a third part reviewer when a project is actually certified by a profit-rating scheme could make the requirements higher and thus also the sustainability output from the project.

A brief summary of the two system is shown in table 3.



Tabell 2. Pros and cons in SUNRA and CEEQUAL the rating schemes

Aspect	SUNRA	CEEQUAL
Flexibility	++ (no mandatory aspects)	+ (not the same focus on indicators)
Objectiveness	- (no verification or mandatory questions)	++ (third part review)
Cost	++ (free)	-- (certification fee)
Usage	+ (Limited to Swedish NTA, only roads and rail roads)	++ (different kinds of projects)
Actors	- (probably only client perspective)	++ (for clients, design team and contractor)
Scope	++ (holistic)	++ (holistic)
Support	- (needs preparations done by sustainability expert)	+ (support in manual)

2.7 SUMMARY

CEEQUAL is well established in Sweden and organizations working with the scheme have invested time and money in developing methodologies and structures that work well with CEEQUAL. Shifting from the CEEQUAL scheme is, because of this, not likely to happen except if;

- there would be changes in the upcoming version of CEEQUAL that would have a very negative impact on the Swedish market
- any of the other available schemes on the market would entail a great value or element that CEEQUAL doesn't have
- the clients in Sweden would be asking for any of the other system used on the international market

The other schemes that could be relevant for the market are considered to be the schemes included in this report. When looking at content, most of the schemes are covering the same sustainability areas. One exception is GRESB, that has a more financial focus and is used for benchmarking. Other BREEAM schemes are included as a parameter in GRESB for buildings, and BRE have the intention of trying to include CEEQUAL as a parameter in the GRESB for infrastructure. Therefore, it is more likely that these schemes will become complementary and used in parallel.

From the level of information that has been collected for this analysis regarding the IS rating scheme and its' content, it is regarded to be pretty much the same as the content in CEEQUAL. However, one recent development in the IS rating scheme, which is not included in the new CEEQUAL manual, is the inclusion of the Agenda 2030 sustainability goals. Many



companies and projects are starting to communicate their sustainability work in terms of alignment with the sustainability goals. The fact that SUNRA is also considering this is another example of the trend. However, the international version of the IS rating scheme is based on the previous Australian version, so the inclusion of the Agenda 2030 goals would not be included in the version that is available for the Swedish market today. Therefore, the subproject sees no elements of the IS rating scheme that would shift the Swedish civil construction sector towards the IS rating scheme instead of CEEQUAL.

The content of Envision is, based on the level of information gathered for this analysis, also similar to the content of CEEQUAL. The scheme can also be used for various kinds of projects, and is possible to use internationally although it is developed in the US. Based on that the maximum level in the rating levels is 50%, the scheme does not seem to be a system that is driving sustainability performance through competitiveness in getting a good grade. Comparing grades between projects is, based on the questionnaire, not the primary focus for projects in Sweden, however it is likely that it will affect the projects that otherwise would have a score just on the verge of a certain grade.

The tool is not available if you are not a member, but the cost is likely to be less of the certification cost when certifying a project with CEEQUAL. However, more and more projects in Sweden are starting to see CEEQUAL as a framework and methodology in the first hand, and are working accordingly to the CEEQUAL manual. That is, projects are not necessarily certifying the whole, or in fact, any part of the project. With this in mind, it is not likely that a model based on membership costs would fit the Swedish market.

SUNRA is also including similar topics of sustainability as CEEQUAL is. The obvious downside with SUNRA is that it is not publicly available as a tool for sustainability. Another key difference from CEEQUAL is that the methodology on how to get actual improvement within the project is not included in the SUNRA-tool and there are no specific requirements within the different topics. The tool is basically a catalogue of different areas of sustainability, and the user has to build the whole content (indicators, integration within project management, monitoring etc.) themselves. The subproject thinks that this makes SUNRA less rewarding and more difficult to use as a tool for assessment and improving sustainability.

However, the Swedish Transport Administration is continuing to develop the scheme and has planned to make it available for the whole market. It is most likely that SUNRA will be used more frequently in Sweden than today. There is however a strong need that complementary documents will provide thorough guidance and examples on what indicators to set, otherwise there is a risk that the tool will be of little use. If the tool continues to be a listing of sustainability areas where the projects will have to do a lot of work to set up goals and indicators, and beyond that, build up and implement a system for



monitoring and follow up progress, it is more likely that CEEQUAL will continue to dominate the market, or that the two frameworks will be used in parallel.

Even though the Swedish Transport Administration is a big client within the civil construction sector, there are a number of other clients, such as FUT, the municipalities or private developers, whom probably will continue to use CEEQUAL regardless of the development of SUNRA.

3 RESULT

3.1 POSSIBILITIES AND CONSEQUENCES WITH THE NEXT VERSION OF CEEQUAL AND THE EFFECT ON THE SWEDISH INFRASTRUCTURE SECTOR

The section provides a description of changes between CEEQUAL version 5 and the upcoming manual and aims to provide an analysis on the effect it will have on the Swedish market. Changes identified are mainly based on a draft of the new manual that was presented by CEEQUAL to the CEEQUAL working group for consultation in October 2017. The draft provided the rough structure for the proposed scheme, which included 12 chapters.

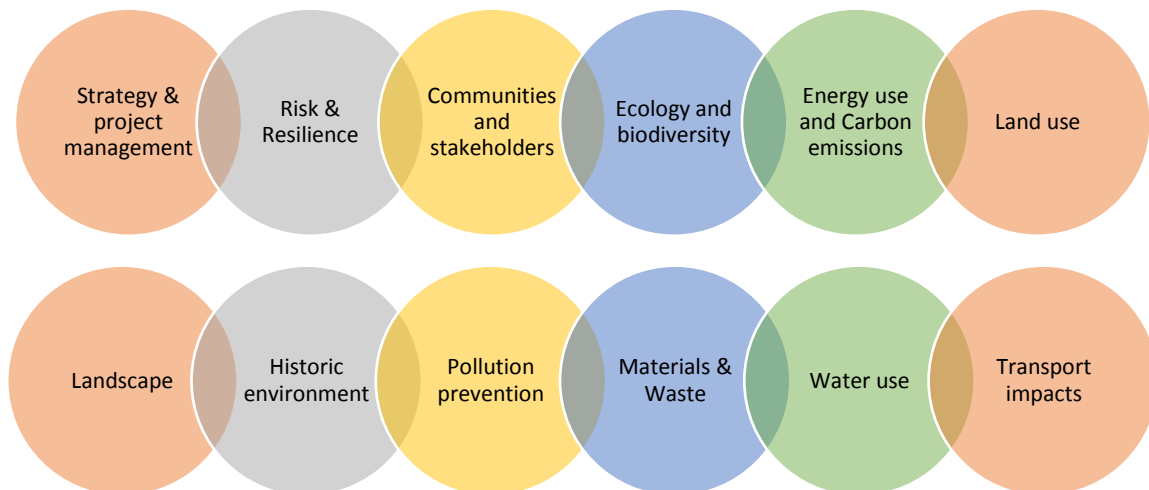


Figure 6. Proposed chapters in the new CEEQUAL manual in the draft for consultation from October 2017

Each chapter consists of several sections within the subject, just as the version 5 does. The different chapters are not yet definite, and some of them might become sections and included in another chapter and the nomenclature might change. However, it is likely that the upcoming version of the scheme will be divided into more numerous, and smaller, chapters.

To the ones that are not that familiar to the content of the CEEQUAL manual v.5, it might seem like there are many new topics included. However, the chapter Physical Recourses in CEEQUAL v.5 included much of the now standalone topics, such as Energy use & Carbon emissions, Materials & Waste and Water use. Risk & Resilience is however a topic that has expanded quite a lot.

3.1.1 Changes in the new version

Risk and resilience in CEEQUAL version 5 was mainly focused on the risk of flooding and resilience towards effects caused by climate change. In the new version issues such as cyber security, physical threats and designing for the future in terms of population growth, customer expectations, resource availability and asset flexibility are raised as important sustainability aspects. To have a risk management system, preferably one that is aligned with the standard Risk 31000, is rewarded.



One additional change that can be noticed by looking at the structure of the chapters in CEEQUAL version 5 and the upcoming version is that Project Strategy is no longer a standalone chapter. In version 5, this chapter is special in the way that it is optional and includes assessment of the more strategic character of a project. Questions such as “should the project even be executed” and “what is the optimal solution to our problem” is to be answered, which entails that this is only possible for early stages, before the project is too formalized.

The strategic questions, included in CEEQUAL version 5, are not removed from the new scheme, but are incorporated into the other chapters. This will probably entail that the voluntariness of the strategic questions, and with that the assessment of the earlier stages, will not be as high.

The content within project management has also got a slightly different focus, with the inclusion of general project management, whereas CEEQUAL version 5 was more concerned with how sustainability is being incorporated into the general management. Now the questions are regarding how the project as a whole is being managed and has a clear focus on asset performance. Lean management and methods for cooperating further over interfaces in the project seems to become rewarding.

An additional change that might affect how the different stakeholders are working together in a CEEQUAL-project is that different questions and credits in the manual will no longer be appointed to the different stakeholder, but will more likely refer to different stages of a project. In other words, the previous Client/Designer/Contractor will become Strategy/Design/Construction.

In the chapter Strategy & Project management in the upcoming version, a question about life cycle assessment (LCA) is also included. The LCA should in this case include several impact categories, if not, the question is to be handled in the respective chapter (for example a carbon calculation is handled in the chapter of Energy use & Carbon emissions). A new small section, but quite an important section, is climate change through changes in land use. The section is in the draft located in the chapter of Energy use & Carbon emissions.

A structural change that cannot be seen through the draft, but has been discussed during working group meetings, is the change in the rating levels and how weighting between different questions is to be performed. The probable development is to adopt the grade system that is used within the BRE family in general. BREEAM currently has 5 different grades;

- Pass – 30% of the total score
- Good – 45% of the total score
- Very good – 55% of the total score
- Excellent – 70% of the total score
- Outstanding – 85% of the total score

The first four levels has the same name as in CEEQUAL version 5, but the levels of the different grades are different. In version 5, only 25% of the total score is needed to pass. Only 40% is needed to achieve Good. However, 60% is the corresponding level for Very good and excellent requires 75%.



3.1.2 Persistent parts of CEEQUAL

There are also some things to mention that probably will not change. One is the availability of a UK-manual and an international manual. As before, the international will be quite similar to the UK one, and in English, but specific references to systems and standards only used in the UK will be removed. The process and roles for a certification will most likely be similar to the process with scoping, assessment, verification and ratification used in CEEQUAL at the moment. The role of the assessor and verifier will almost certainly stay the same.

3.1.3 Uncertainties

As the upcoming version of CEEQUAL still is under development, there are still some uncertainties left for BRE to figure out. One thing the working group for the new version of CEEQUAL has struggled with is finding a good balance between the flexibility that CEEQUAL has provided, and the structure, metrics and comparability that has been some of BREEAMs' strengths.

Another thing that is mentionable is that there are more references towards standards in the draft than in version 5. On more or less each of the chapters and sections, there should be an analysis or survey from an expert within the field or a suitable qualified professional. In the working group meetings, the level of competence within the project team and how one can assure the legitimacy of the documents proposed as evidence, has also been a discussion. It is clear that many of the involved parties feel a need for the projects to be clearer in from where they get their competence within sustainability. However, tying the competence to the sole assessor, for example by a competency requirement for the assessors before performing an assessor's course is however not probable since it would be hard finding a suitable level of requirement, and also hard to check the requirement for the international certifications.

3.1.4 Summary of changes

To conclude, the most pronounced changes in the draft were:

- Introduction of questions regarding "general" project management (such as lean management, asset performance etc.)
- Expanding the risk and resilience to becoming a standalone and more extensive theme
- Higher demands on competence (appropriate consultant/suitably qualified practitioner and more focus on standards)
- Structure-wise more like BREEAM in order to further enable benchmarking/comparing project performance

As earlier:

- Content-wise it should be a mix of CEEQUAL and BREEAM, but CEEQUAL users will recognize quite a lot, especially in the proposed chapters 3-12
- Certification process and roles like CEEQUAL; assessor, verifier/verification and ratification
- Manual for UK-projects and one manual for international projects (at the moment in English)
- Possible to translate and do national weighting exercise after release



3.2 QUESTIONNAIRE

One of the aims of this subproject is to analyze the effect the changes with the upcoming version of CEEQUAL could have on the Swedish infrastructure sector. To answer this question, a questionnaire regarding the changes that we have seen in the material so far (described in chapter 4), was prepared and sent out through the assessors' network in Sweden. The questions asked and the answered given by the CEEQUAL-assessors are described in this chapter.

Out of the approximately 60 assessors in the network, 18 answers were received. Fifteen out of the respondents was using CEEQUAL actively at the time of the inquiry. Since the main part of the 60 assessors are not active in CEEQUAL projects in Sweden, we consider this response rate to be very good. Four of the respondents also have experience from certification by BREEAM.

The areas for questioning can briefly be described as:

- Role of the assessor
- Integration of chapter 1- Project Strategy (old version) into other chapters in the upcoming CEEQUAL manual
- Additional focus on general project management
- Most important in terms of flexibility/comparability
- Alternating from roles to project phases
- Use of standards (for ex. ISO 14040)
- Harmonization of the grade system and structure within BRE family
- Effects integration of CEEQUAL/BRE will have on certification of buildings and infrastructure
- Areas connected to challenges
- Need for Swedish adjustments

3.2.1 Role of the assessor

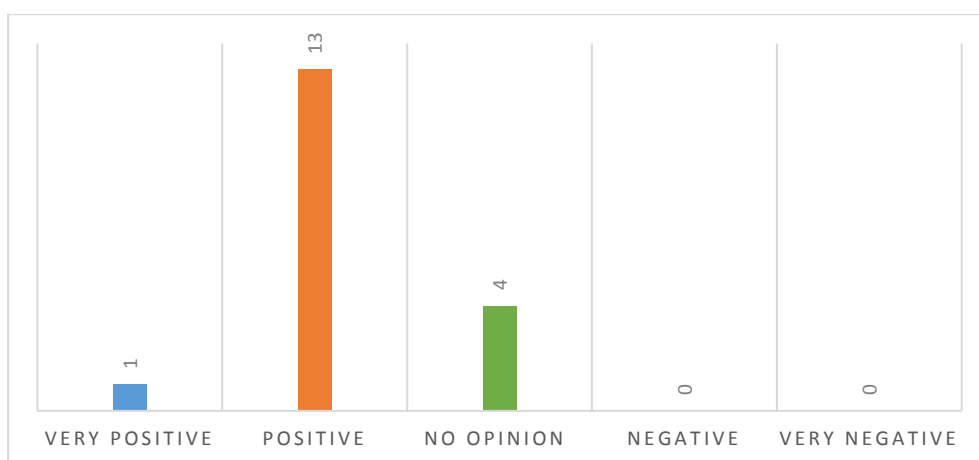
To be able to set the answers in some kind of perspective, questions about how the assessors' are working with CEEQUAL and their role in CEEQUAL-projects was included in the questionnaire. A direct question asking about which field of subject (corresponding to the proposed chapters in the upcoming version of CEEQUAL) the assessor are acting as a coordinator, and in which field of subject they are involved in creating the evidence for questions, maybe as an expert.

In the projects, the assessors mainly act as a coordinate for all areas of sustainability. However, one assessor responds: *"it varies a lot between different kinds of projects"*. The area where it is most common for the assessors to help the project with proofing (i.e. act as an expert/drawing up evidence), is in the chapter about energy use and carbon. There are however still more of the responding assessors that usually only have the role of coordinating the area.

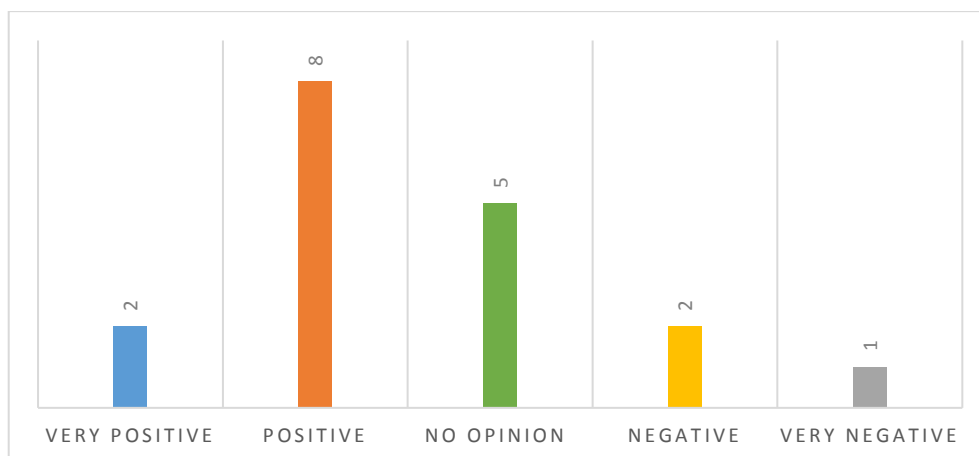


3.2.2 Integration of chapter 1 (Project Strategy in the old version) into other chapters in the upcoming CEEQUAL manual

The assessors were also asked what they think about the integration of chapter 1 in CEEQUAL v.5 (Project strategy). There responses were overall positive. One assessor answered: *“Good that the sustainability issues are put in a larger perspective”* and another that *“The chapters in its current form is unclear and is therefore better suited incorporated into the manual”*. One commented that *“Is not used today in Sweden”* without giving any hint about it being positive or negative.



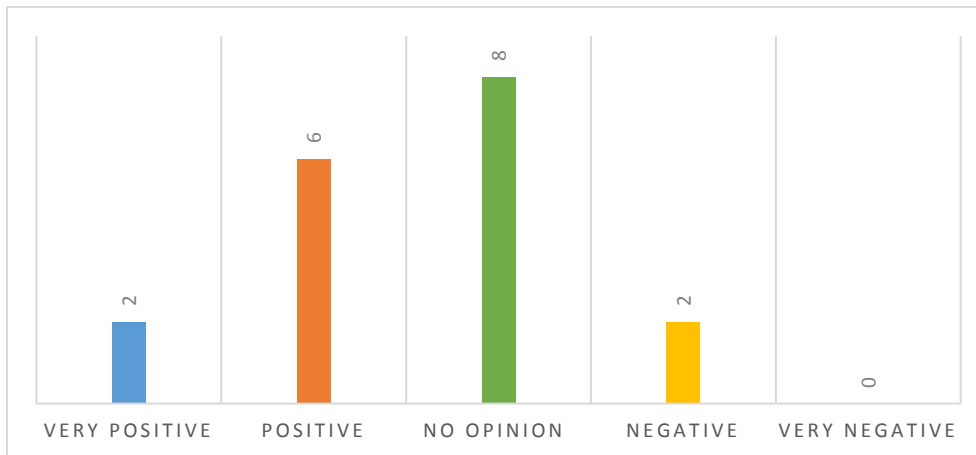
There was a somewhat more negative response towards the fact that will entail that the chapter as a whole will not be optional any more. One assessor pointed out: *“Risk for the work to become a reconstruction since certification often takes part when this stage and the strategic choices in it already has passed (before project initiation is decided upon)”*. Another said that this is *“often handled through government processes required by law”*. A third voice on the same theme said: *“Should be able to skip/not mandatory if the project itself and its involved parties are not able to affect the decisions”*





3.2.3 Additional focus on general project management

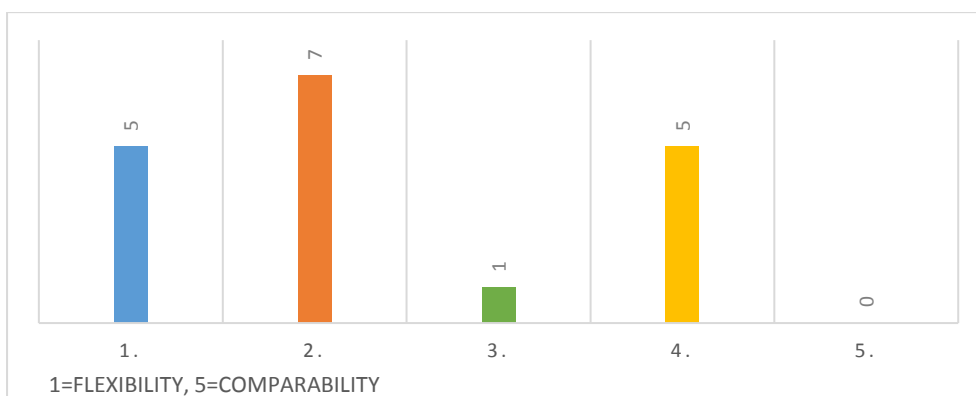
As mentioned earlier, the new version of CEEQUAL will include questions not classically in direct relation to sustainability, such as if the project is using lean management and a clearer focus on asset performance. Regarding the inclusion of this, the assessors gave a slighter more positive response.



Some of the assessors feel that this will make sustainability a natural part of the project. One assessor responds: *“Could lead to more effective work since CEEQUAL will become higher priority on the agenda”*. Another assessor is a little bit unsure what this will bring but also think this might be the effect: *“Hard to determine outcome of introducing general project management in CEEQUAL. Possibility that sustainability will have higher status in the projects”*. Some assessors are less positive or feel that this might bring a risk of the project focusing less on sustainability with this change. Two answers given are *“Project management differs between projects. CEEQUAL should keep focus on sustainability”* and *“Feels like focus on sustainability is lost”*.

3.2.4 Most important in terms of flexibility/comparability

Among the assessors, there is a preference towards flexibility and towards having the opportunity to adjust according to your own project. *“We mainly use CEEQUAL to improve within the project”*, one assessor says.



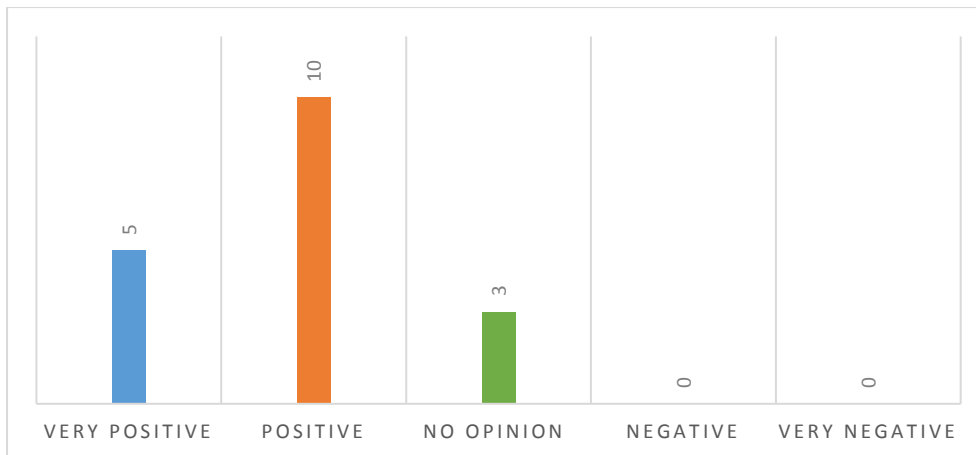


There are also assessors that are questioning the value of projects being comparable; *“Most of the clients are public clients and are therefore not triggered in the same way about the competitiveness in comparisons. The role as a quality management system is way more important and flexibility is therefore key”*. Another assessor think that it is mainly that comparability is not compliant with having a system that suits the whole sector; *“Important to be able to know what a certification and grade means, but it is a real benefit that CEEQUAL today suits different kinds of projects”*.

One of the assessors states that comparison of sustainability performance is a difficult task, *“Sustainability is hard to compare, since there are so many aspects to take into account”*, but this answer is given without hints of weather this means that it is good if the scheme will ease with this or if it should focus more on flexibility. However, there are also assessors that think that comparison between project performances is more important; *“Similar grounds of assessment is important to assure the result of the project”*.

3.2.5 From roles to project phases

The current manual, CEEQUAL v.5 is, by credits, divided into the roles Client, Designer and Constructor. The upcoming manual will have the credits divided by projects phases instead. None of the respondents felt that this is a negative change; it is rather the feeling of this being more natural. One assessor responds: *“It’s natural way of talking about the different stages in a project and when we should do what, rather than who should do it”* and another say: *“We are working more in collaborative projects, which makes this set up more natural”*.



However, some risks were identified, mainly regarding responsibility and ownership for the questions, such as *“Risk that the client is not as engaged if they don’t have a special area of responsibility”*, *“The phases represent phases in a normal project, which will make CEEQUAL easier to integrate. A risk is that it gets harder to identify who is responsible”*, *“Might require more work trying to define who is responsible for what, who has the authority over the question and who shall pay for the extra work needed”* and *“Planning will become easier, but it will become a challenge to appoint the questions to the right role on time”*

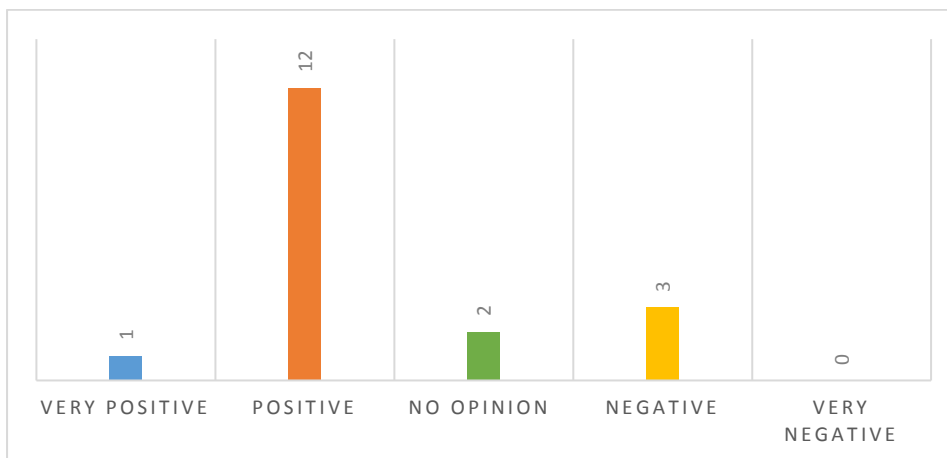


Some see it as a possibility for collaboration: *“This can open up for closer collaboration between parties if it’s the phase and not a sole party responsible”, “Specially good in collaborative projects” and “Is logical since the strategic chapter one is not optional in the new version, and they need to be handled in this way”.*

3.2.6 Use of standards (for ex. ISO 14040)

The new manual has a lot more references to different standards. To analyze how this might affect Swedish infrastructure projects, it was of interest to know how standards are used within the projects today. The current use of standards in CEEQUAL-projects varies. Four of the respondents think it provides support during work with CEEQUAL, four of the respondents never use the standards referenced to in the manual. Ten of the respondents use them sometimes.

However, the respondents are mainly positive towards more references to standards in the new manual. One assessor say: *“Standards make it easier to understand what is asked for and that everything is covered”.* Another think that this ease with proofing: *“If a certificate is enough as proof, proofing will become easier”*



However, looking at quotes given, it is clear that it also depends on how the requirements regarding it’s use is of essence; *“Positive if the standards are used in Sweden”, “Depends on how mandatory the use of standards will become. It is positive that we are aligning methods and performance, but if it is mandatory it will become expensive”, “Hard for smaller projects if it becomes mandatory to use standards and more expensive” and “Should be restricted to well-known and well-used standards”.* One assessor thinks that it can make working with CEEQUAL harder; *“If possible, it is optimal with little and easy support; a standard can become very complex work”.*

3.2.7 Harmonization with the BRE family and effects on combined projects buildings/infrastructure

The main part of the respondents in the Swedish network of assessors do not have much opinion of CEEQUAL grade levels being harmonized towards BREEAM. Perhaps it is because there are only a few that have knowledge of BREEAM. However, there is a slightly positive reaction to harmonization and to adding the outstanding award. The assessors do not think the harmonization will have an

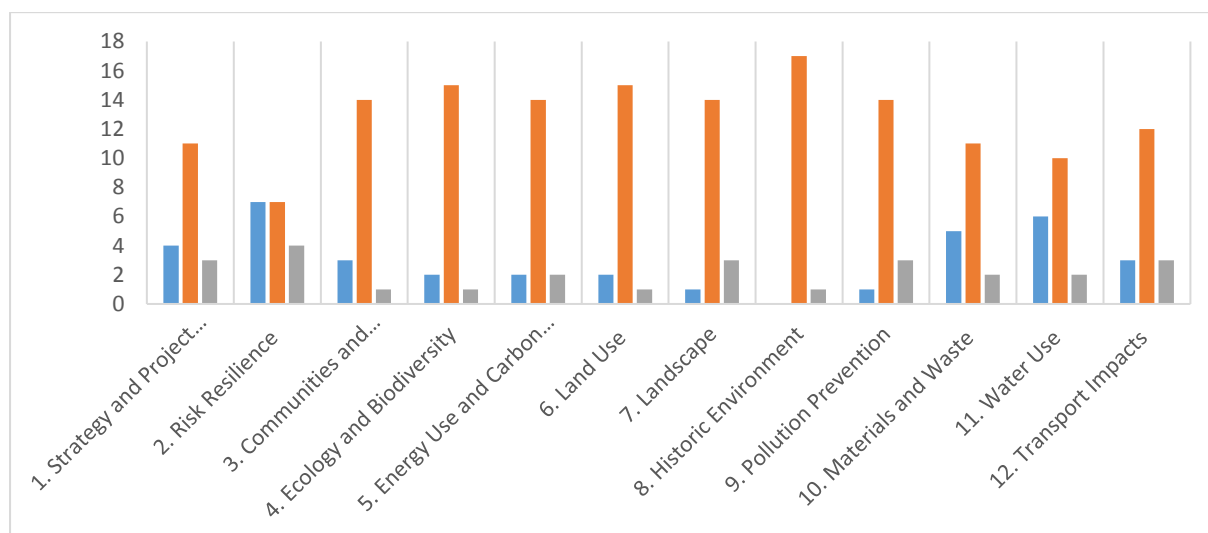


effect on how we work with certifications in projects including both buildings and infrastructure but some think it will ease the use of CEEQUAL.

3.2.8 Areas connected to challenges

The new manual will include a new content. One of the main question regarding the effects the new manual will have on the Swedish market and CEEQUAL-projects in Sweden is the question if there are field of subjects that are challenging to our projects. Based just on the name of the different chapters, we therefore asked the assessors if they think that any of these subjects will become problematic or challenging to include in the assessment of the project.

Areas that the respondents feel are connected to challenges varied a lot between the responses and therefore probably depends on assessor, experience and earlier projects. On a very general level, the area most assessors felt a challenge with achieving the new requirements is the area of risk and resilience, but just as many felt that this was not an issue (7 respondents).



Option	Challenging	Unchallenging	Don't know
1. Strategy and Project Management	4	11	3
2. Risk Resilience	7	7	4
3. Communities and Stakeholders	3	14	1
4. Ecology and Biodiversity	2	15	1
5. Energy Use and Carbon Emission	2	14	2
6. Land Use	2	15	1
7. Landscape	1	14	3
8. Historic Environment	0	17	1
9. Pollution Prevention	1	14	3
10. Materials and Waste	5	11	2
11. Water Use	6	10	2
12. Transport Impacts	3	12	3



Color explanation: Blue is challenging/problematic, Orange is unchallenging/unproblematic and Grey means "don't know".

Many of the respondents chose the alternative "not sure", which probably means that more detail is needed. A more thorough analysis was therefore made on two sections that included many new elements and requirements, see section 0.

3.2.9 Need for Swedish adjustments

Since CEEQUAL has been and will continue to be a certification system developed from the UK, the project also wanted to know how the assessors think about its application in Sweden. Thinkable obstacles are language, or that the sustainability issues might be irrelevant and not customized for Swedish conditions. Discussions regarding the development of a Swedish certification system has been present. CEEQUAL v.5 has been translated, but there is currently no guarantee that the new version will be available in Swedish. Questions regarding these two issues were therefore included in the questionnaire.

The main part of the respondents from the Swedish assessors network think that a translation of the manual is of importance. The comments given from assessors show that this is important both in the process of convincing a client and finding possible CEEQUAL-projects and as well for driving sustainability issues within the ongoing project. The assessor say: *"Above all for the communication with clients and others involved in the project"* and *"It is important to be able to include everyone and make the certification process easier"*. Only 2 of the respondents doesn't think that it is important. One also raises the question about verifiers; *"There should also be some Swedish verifiers"*.

The main part of the respondents does not think that Sweden should develop another certification system, but wants to use CEEQUAL. Some feel that adjustment to Swedish environment could be a benefit.

3.2.10 Summary

- Overall positive responses regarding the proposed changes
- Inclusion of questions/requirements regarding project management seen as a way to put sustainability higher up on the agenda
- One key aspect of CEEQUAL is its' flexibility and that it is possible to use on a variety of infrastructure projects
- The assessors network does not think that Sweden should develop their own scheme for sustainable infrastructure
- The majority of the network think that a Swedish version of the manual is of importance for the use of the upcoming CEEQUAL manual in Sweden



3.3 WORKSHOP WITH THREE CEEQUAL PROJECTS

Three ongoing construction projects using CEEQUAL participated in a workshop within the subproject 3. The projects represented the three different actors in the CEEQUAL scheme – Client, Design and Construction. The partaking projects were:

- Client – Swedavia with the project Pir G in Arlanda Airport (new pier)
- Design – Tyréns with the project Tunnelbana till Barkarby (extension of metro line)
- Construction - NCC with the project NCC:s nya huvudkontor i Järva krog (new officebuilding)

Drafts of chapters *Project management* and *Resilience* in the upcoming CEEQUAL manual was used as a basis at the workshop. In each of the chapters one section was discussed: *Lean tools and activities* and *also Risk assessment and mitigation*. The aim was to analyze what impact the two new sections would have in all three projects in the aspects of Cost, Organization and Sustainability output.

The overall result from the workshop is presented below.

3.3.1 Project management – Lean tools and activities

The section *Lean tools and activities* addresses how to facilitate efficient processes through different stages of the project using lean tools.

A major concern from the partaking projects is the mandate and roll of the CEEQUAL assessor in Swedish projects and how to be able to affect the overall work process in the project. Today the assessors' have limited mandate to change the projects general workflow and therefor this question likely would be deselected. Since none of the projects is using lean processes today, the new section would lead to both a demand for new competence and increased costs. Nevertheless, more probable is the exclusion of the question all together, even though points would be lost.

A conclusion from the workshop was that a structured work process in general could increase sustainability output rather than the specific use of the lean process. The output can increase if the sustainability aspects are addressed early in the project and with a proactive workflow. But lean tools are not thought to be suitable to all projects and it is important to be able to use the quality management systems (QMS) of their choice. Most companies and organizations already have a QMS and it is not likely that the systems in use will change just for the cause of a CEEQUAL-project.

The projects partaking the workshop did not see the value or possibility for CEEQUAL to become a management tool in Sweden. The system should keep to sustainability and how to incorporate sustainability into the general project management.

3.3.2 Resilience – Risk assessment and mitigation

The section Risk assessment and mitigation contains evaluation and minimizing the risks and negative impacts associated with natural hazards, intentional threats and climate change over the life of the asset.



A conclusion from the workshop was that the sustainability aim of including security, cyber and intentional threats into assessment in the upcoming CEEQUAL manual is not obvious. It is desirable that CEEQUAL's definition of sustainability is defined and broadened in the new manual.

Risk assessment is already a part of the current working and the methodology is an established process in larger projects. However, the scope of risks generally needs to be broader to align the content in the section. The projects are already working with security and intentional threats but not necessarily in the CEEQUAL process and maybe not in the required extent. A new way of working and somewhat new technical expertise is probably needed to address the new section correctly. The level of detail in the project risk assessments also needs to be higher in general and more evidence needs to be collected compared to what is collected today to properly address the scope in the section.

The CEEQUAL assessor needs to collaborate with for example the security manager. There is a concern that the rest of the organization will be questioning the reason for this becoming a part of the sustainability scheme, and therefore the need for justification in the manual is key. Documents needed for evidence will in many cases be classified and a risk is that the extra work it will entail in administration for the retrieving and management of documents will not provide value, since it in many cases is already performed, however not within the framework of CEEQUAL.

The projects think that the requirements needs to be able to be applied to smaller projects as well as all kinds of projects. A concern is the increasing cost and work if having to include a technical expertise for security, cyber etc. in a small, limited project where it might not be necessary or relevant. Therefore, the section is believed not to fully achieve its purpose. There is an indication that the costs of the projects risk assessments can increase for all kinds of projects due to the broader scope of risks and the demand of expertise.

The sustainability output for smaller project does not seem to increase with this new section, but for bigger projects, the social and economic aspects could be affected in a positive way seen to the whole society. The projects do not necessarily see a positive connection between ecological sustainability and security/cyber threats.

The resilience planning is also seen as a difficulty, since it is not always possible to decide this within the project itself. Resilience requirements is not fully included in the projects at the moment, hence this will be an addition to the work done today.

All in all the section is seen as a positive addition in the new manual but it needs to be flexible for all types of projects, including small projects.



4 CONCLUSION

The two schemes used in Sweden today are basically SUNRA and CEEQUAL. SUNRA is however exclusive due to the fact that the SUNRA-tool is today only available for the Swedish Transport Administration and the projects already using SUNRA. The only sustainability scheme that is used to any greater extent is CEEQUAL. Since the content in the SUNRA tool isn't considered to contribute as a sustainability management tool, but is more of a listing of areas of sustainability in which one can set up goals and indicators, CEEQUAL will probably continue to dominate the Swedish market.

Analyzing the results from the questionnaire performed within the CEEQUAL assessors Network, the attitude towards the changes in CEEQUAL are mostly positive. From the workshop with CEEQUAL projects, there is a negative attitude towards the inclusion of lean management, but towards project management as a whole and towards the chapter about risk and resilience, attitude in the group was also positive.

The changes are likely to have small effects on cost and organization, but it is mainly an initial cost for the involvement of additional people with specific competence, and making small adjustments to incorporate new themes in the already existing methodology. The changes are in general considered to contribute to sustainability performance, which is why the projects are likely to adapt the new requirements even though it would increase initial cost and have effects on the organization.

4.1 ASPECTS OF IMPORTANCE FOR THE SWEDISH MARKET

Result from this subproject shows that:

- The Swedish market think that flexibility is one of the key benefits with CEEQUAL and that it is mainly used to improve sustainability within projects and not used for comparison between projects. Implementation of key figures for benchmarking is not a primary demand
- The Swedish market consists of a variety of clients, it is therefore of importance that the scheme is also applicable on smaller projects without increasing need for resources or cost too much
- CEEQUAL fulfills the need of a sustainability management tool. There is no need for a management tool, and development towards a management tool might imply losses of sustainability values and users in Sweden
- The potential in the Swedish market is big, which BRE should make more use of;
 - The international version should be translated to Swedish to increase usability and the use within Swedish projects
 - Workshops like the ones performed within this project on risk & resilience and lean management should be performed on each chapter
 - Swedish verifiers should be educated and appointed. It would favor the use in Sweden and increase credibility in the verification process



4.2 SUGGESTIONS FOR FUTURE STEPS THE SWEDISH MARKET SHOULD TAKE TO MAKE THE MOST OF CEEQUAL

A collaboration between BRE and SGBC, who has the potential to be the official coordinating organization for the use of CEEQUAL in Sweden, should be established by:

- Become BREs' party of conversation in Sweden regarding CEEQUAL in questions such as interpretation of requirements, exceptions, differences between countries etc.
- Providing an international manual in Swedish
- Providing Swedish verifiers
- Providing assessor training in Sweden, on Swedish
- Coordinate the CEEQUAL-assessors network in Sweden and organize meetings
- Manage the CEEQUAL awards in Sweden

Further analysis on how SUNRA and CEEQUAL can be used in parallel is of interest. A conclusion from this subproject is that a further project making a GAP-analysis between the two systems and how the chapters in the new CEEQUAL-manual is linked to the SUNRA-tool would be of value.

Onwards, initializing development projects looking at what tools and methods that is needed from the new requirements in CEEQUAL is of interest. When the public version with definitive requirements are presented.