Architects Sweden

The way forward

Action plan for how architects can contribute to the transition to an ecologically sustainable built environment

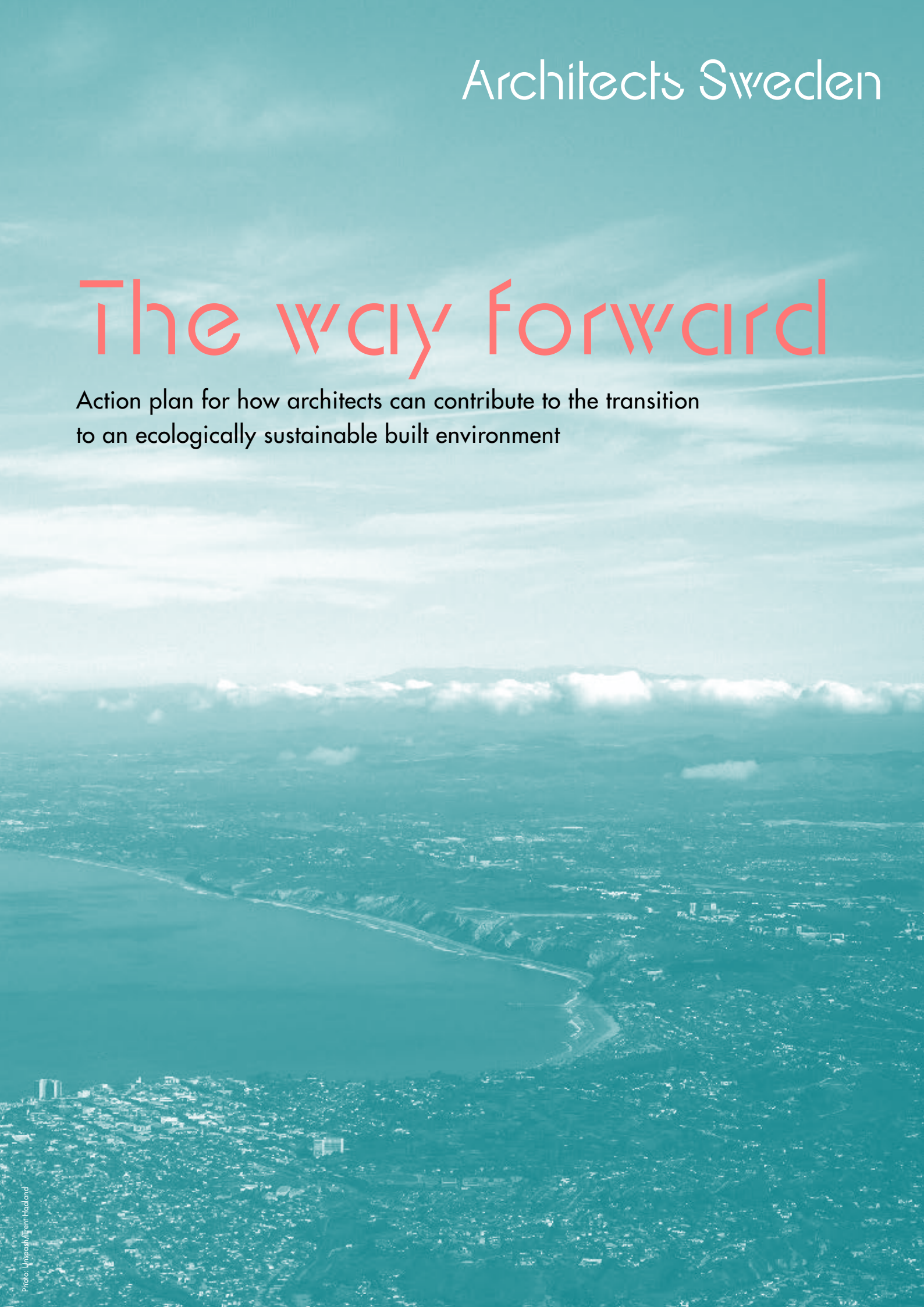


Photo: Unsplash/Trent Haaland

Content

Preface

The transition to an ecologically sustainable built environment amounts to an enormous opportunity for us in the architectural profession to show the full breadth of our expertise. What role we take in the design process, with whom we choose to work, and which materials we prescribe will be important for a more sustainable community building.

Society and politics are making new demands. Many new laws related to our climate and to climate change are being implemented, but those are not enough for Sweden to become climate neutral by 2045. In the architectural and buildning construction industry, a number of pioneering projects are underway that aim to increase the pace towards ecologically sustainable buildning construction. But we need more pioneers with high ambitions if we are to achieve the climate goal.

Those we make architectural drawings for have new values and behaviours that we must keep in step with. We can achieve value through long-term functionality, adaptability, and aesthetically pleasing living environments, created with wise design and with a minimal climate footprint. We can do this by taking advantage of existing buildings instead of building new ones, by limiting the use of materials, and by contributing to a low climate impact from a life cycle perspective. All this is decided at an early stage in the design process where the architect has crucial influence. Some of us have great power and can do a lot, others have fewer opportunities. Everyone can do something, and something is always better than nothing. No one has a choice anymore to remain on the side-lines, be passive, or continue as before. Those options have been removed by alarming climate change as well as legal requirements and political decisions.

Architects Sweden's sustainability council has mapped out how architects can best contribute to the urgent transition to an ecologically sustainable built environment – in terms of both what each individual architect can do and what the architectural offices can do. Based on the mapping, the board of Architects Sweden has developed this action plan. See it as a source of inspiration when you have to transition your own work and your business in a direction that is both kind to the planet and improves your chances of getting the most exciting assignments.

'We want all architects to understand that we now have the chance to occupy a key position. If we don't, then someone else will.'

Changes in progress

New strict requirements

According to UN's global goals under the 2030 Agenda and the Paris Agreement, it is no longer just an option but a requirement to switch to ecologically sustainable production, buildning construction and design. Sweden's climate law, which states that we must be climate neutral by 2045, has initiated major adjustments of other laws.

A clear example of this is the forthcoming Swedish Act on Climate Declarations, which means that developers must declare the impact on the climate of new buildning construction of buildings as of 1 January 2022. This is a first step in the government's policy towards a reduced climate impact from buildings based on a life cycle perspective.

The requirement is necessary but not sufficient if we are to reduce the climate impact of the buildning construction sector and for the climate goals to be met. The Swedish National Board of Housing, Building and Planning has submitted a proposal to the government, as a next step for stricter climate declarations, to introduce limit values for climate emissions for the buildning construction of buildings in 2027. The declaration requirement is also proposed to be extended to include more stages of the building life cycle and additional parts of the building. The proposal is that the limit value will then be tightened gradually in 2035 and 2043.

Sustainability will also be a regulated area for the financial industry through the European Commission's action plan for sustainable finances and new rules on taxonomy. This entails requirements as to when an investment may be described as sustainable, and on describing the sustainability risks associated with an investment. This will quickly translate into making investments that are not sustainable very costly, difficult to finance, and associated with high risk. This in turn places new and great demands on architects' knowledge and solutions. New EU directives on waste management also push countries' legislation in this area. These are just a few examples of new rules and requirements – more are to be expected if we are to become climate neutral no later than 2045.

Climate pioneers are one step ahead of legislators

In the architectural and buildning construction industry, a number of pioneering projects are underway that aim to increase the pace of the transition to ecologically sustainable buildning construction. As knowledge about the importance of the carbon footprint has increased, there are also new insights that materials with a minimal carbon footprint, such as wood, cannot always be used and also have a limit in their availability. This makes it more important to reduce the use of materials, and to make greater use of what already exists by reusing existing buildings and building materials.

Architects' major clients often have their own ambitious goals, which are usually about classifying their buildings according to one of the established systems such as Miljöbyggnad (Swedish certificate for 'Environmental building'), LEED, BREEAM, Well, Nordic swan, Citylab, Hållbar interiör (Swedish certificate for 'Sustainable interior') or passive houses – classifications that have to focus more

Photo: Pexels/Tatiana Syrikova

on the carbon footprint throughout the life cycle. In several ongoing projects, there are goals for carbon-neutral or even climate-positive buildning construction projects. A new extension certification – NollCO2 (Swedish for Zero CO2) for climate-neutral buildings that include the entire life cycle – has been developed with the aim of achieving a net-zero climate impact of new buildings.

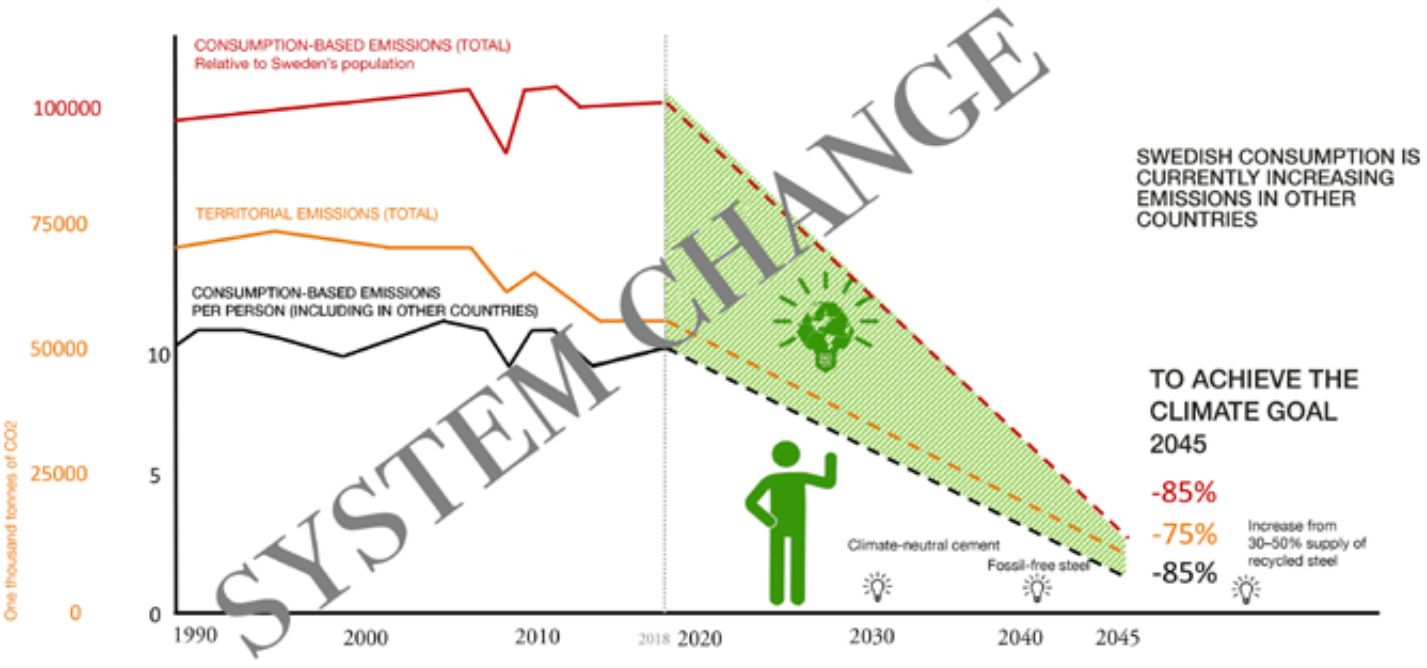
There is also major transition work underway in the various industries in Sweden within the framework of the government's platform Fossil Free Sweden. Within our industry, the buildning construction and civil engineering sector, a roadmap has been drawn up for how the sector should change. The roadmap has been signed by a large number of property managers, developers, contractors, producers, consultants and architects – and been submitted to the government. The road map, which follows Sweden's climate legislation, means halved emissions already in 2030 and climate neutrality by 2045.

But so far, several emission curves are going up, so the challenge is growing with each passing day. Succeeding in the comprehensive transformation will require collaboration, strengthened leadership, and increased knowledge. An understanding of the climate impact is needed throughout the planning and buildning construction process, as well as a shift from linear to circular processes.

There are many good initiatives and legal requirements that are underway. But the climate declaration requirement will in its first step only cover certain new buildning construction. Infrastructure/non-building structures, furnishings or alterations are not covered, and neither are all types of buildings or all parts of the buildings.

Therefore, we cannot afford to wait for mandatory requirements. We must be more ambitious, and we need many additional pioneers with high ambitions if we are to achieve the 2045 climate goal.

We are to reduce emissions by 75% and 85% respectively



From now and for about 10 years onwards, we will build twice as many homes, schools, care facilities, roads and infrastructure investments. And innovations in steel and cement are taking too long. How should we move forward?

Graphics: Lateral Living / Holmström

How you can transition and get a key role

The minimum requirement for our occupational group going forward must be to work to save resources, design for climate neutrality, and maintain profit and value in the built and designed environment for a long time. But it is not enough to just minimise damage. The ambition for the not-too-distant future must be to aim for climate-positive design, the development of life-sustaining ecosystems, the preservation of green spaces and carbon sinks, and the creation of new values in a sustainable social structure.

Creating a sustainable built environment requires long-term functionality, adaptability, high value for the end user, and aesthetically pleasing living environments that are created through wise design with a minimal climate footprint. Therefore, we must make better use of existing buildings rather than build new ones, use limited materials, invest in reused and recycled materials, and contribute to a low climate impact from a life cycle perspective. All this is decided at an early stage in the design process, a stage during which the architect's role and responsibility become of increased and decisive importance.

Unless the needs and lifestyle of the future user are not given a place in the designed environments, they will not be sustainable. People have begun to value their time differently. Interest is growing in reducing ownership, dependence and commitments. This opens up new ways of residing, living, working, being educated and cared for, meeting, and being transported. All this must be taken into account in the shaping of a sustainable society. It gives the architect a broader and more important role than before.

In the creation of a sustainable built environment, the various disciplines of the architectural profession must work together and contribute with their holistic view. Within the framework of each architectural area, there are both challenges and opportunities that all architects must be aware of and committed to.

Photo: Petra Bindel/Arvet

The Strandparken block of flats in Sundbyberg outside Stockholm. Architect: Wingårdhs. Client: Arvet

‘If we are to be able to comply with the new climate laws, we cannot use new builds to the same extent.’

We need to work more with existing buildings and structures, shared surfaces, green areas as carbon sinks, wood and recycled materials.

Creating ecologically sustainable models and solutions must permeate all activities in our built environment, especially within the framework of design, where functionality, choice of materials and durability are determined. A shift in approach, design methodology and thus also architecture and design is required.

It is a challenge but also a great opportunity for architects. By becoming part of the solution, architects can for the first time in almost 100 years take the opportunity to play a key role in a real paradigm shift and ensure a constant delivery of quality and value for decades.

Emission-free design

The forthcoming legal requirement that builders constructing new buildings in Sweden must make climate declarations from 1 January 2022 is necessary but not sufficient. If we are to reverse the development, the entire industry must already now make even more comprehensive life cycle analyses of everything that is built and rebuilt – but also of everything that is planned, decorated and furnished. Life cycle calculations will need to be made to a much greater extent than what the forthcoming law states.

The competence and knowledge of life cycle analysis must increase in all parts of the buildning construction sector and the architectural profession. Despite widespread insights in the industry about what is required, despite pioneering projects, and despite the availability of open climate calculation tools and tutorials, not enough is happening to make substantial difference.

Here is an opportunity for architects to get in during the early stages when the crucial choices have to be made. This also applies to the design. Without knowledge and tools, the architect is ill-equipped when more and more decisions that affect the design will be made early in the buildning construction process. Therefore, the architect needs to have knowledge about life cycle analysis and access to tools that make it possible to make life cycle calculations for design choices.

Reuse more

Using recycled or reused materials and rebuilding existing environments can meet as high expectations of a functional, aesthetically pleasing, and modern environment as any new production. Recycled materials are a resource, an asset that will be used to a much greater extent in future buildning construction. But there are obstacles revolving about time and money.

Time often becomes a problem as there is a great deal of uncertainty built into the process when working with reusing, as access to materials or unexpected discoveries in an existing building can affect schedules. The linear way of planning, designing and building is partly put out of play. But there are great opportunities for architects to take greater responsibility than they traditionally have done, by using a flexible and iterative approach to lead processes where the end result cannot always be predicted. Most things today are still valued in money, and the notion that recycling and rebuilding often results in a more expensive end result is widespread. Rational, industrial buildning construction methods have pushed down project times and the need for manpower in traditional projects. Imports of cheap building materials from low-cost countries also have the same impact.

But when other values such as minimised climate impact and cultural-historical considerations come into play in the assessment and are priced, local production and anchoring will be valued higher. Many smaller scaled projects are

Photo: Pexels/Catherine Sheila

actually not becoming more expensive. But planning and buildning construction have had to be done in new ways, with greater uncertainty during the process.

Take a bigger role in the buildning construction process

Sustainable buildning construction – based on people's need for quality of life, good health and economy with resources – places demands on increased space for the architectural design process. It is about how the built environment and green structure relate to the social and cultural context (people), to the carbon dioxide impact and ecosystems (the planet), and the long-term effects of this. In the early stages of a community's formation, it is decided whether the design will be sustainable or not, and what effect and what values the design can give to society, people and business (profit). Architectural design should create value on many levels: environmental, social, aesthetic, cultural and economic.

If the role of architects is to be strengthened and developed, our work must contribute to a reduced climate impact and environmental impact, while at the same time ensuring a high architectural quality in both the short and long term.

To succeed in this, architects must take a bigger role than they have traditionally had, considering how the early stages, the user's needs, and the design with materials and functionality are becoming increasingly crucial for sustainable choices. It is partly about deciding whether it is really necessary to build new at a time when other solutions and existing structures must be used to a greater extent. And it is partly about the stage where trade-offs between the preservation of green areas and new exploitation are decided. It can also be about weighing the wave of urbanisation against new lifestyle patterns that enable a more vibrant countryside.

Here, architects must also dare to take on greater responsibility and be able to generate and verify good examples with good effect and back it up with rhetoric, financial knowledge and evidence-based facts – and highlight the effect of forecasts, new exploitation, lifestyle changes and design. Architects should also convey knowledge to other parts of society about the importance of user focus, design and choice of materials for reduced climate impact – both in a short and long perspective.

Drop the short-term deal

It will be expensive not to build sustainably – carbon dioxide emissions will be priced through new taxes and penalties. At the same time, new rules on sustainable financing, EU's so-called taxonomy, will mean that unverified sustainable projects are considered a higher risk and become more expensive and more difficult to finance. It automatically directs demand towards sustainable solutions. The transition from linear to circular business models means that we will see a different type of production- and operating

cost calculations with new methods for how to calculate value, costs, profits and substantial assets. It also means that architects need to strengthen their knowledge in finance and also attach new information to project deliveries and design proposals.

In the transition the world is undergoing, what is not ecologically sustainable will be costly and in the long run constitute an economic risk. When laws and requirements make carbon dioxide emissions and environmental impact costly – in the form of taxes, fees, fines or non-payment of loans and insurance – sustainable design and long-term quality in design will not only be a direct value for humans and our planet, but also a really good deal.

Architects need to understand, demonstrate and motivate economic values in design, planning and buildning construction in a new way – both by clarifying visions and by delivering concrete figures, facts and data. As a key part of design decisions and life cycle analyses, architects need to be able to report, evaluate and make sustainability calculations on resource extraction and remaining resource or material availability early in the process. Architects must also provide data related to new types of financial calculations and projections.

A high quality in design and embodiment where people are in focus will be necessary for sustainable buildning construction and for the long-term economic value.

Design for new needs

No design is sustainable unless it can grow, change, upgrade and adapt to human needs in a resource-efficient and climate-neutral way over time. Sustainable design generates very low climate impact and lasts a long time. It must also be able to be adapted and upgraded to changing needs in a simple way, and with a low climate impact, and finally be dismantled and reused.

It requires a greater focus on and knowledge of today's and tomorrow's users. The architect is the one who represents the needs of the often unknown user and translates these into their design. In the rapidly changing and global world in which we live, this means that architects must increase their knowledge of the value shifts and behavioural changes that are taking place more and more rapidly as a result of globalisation and digitalisation. Architects need to increase their knowledge of the lifestyle of the future. What do we value in the future? What is success? How do we live? How do we work? How are we cared for? How are we educated?

The buildings, urban environments, green structures, and rural areas we design and plan for today must be able to solve both today's and tomorrow's changing human needs. Only then do they become sustainable and circular with minimal climate impact, minimal resource extraction, and generate minimal waste.

This is a fantastic opportunity for architects as it increases the opportunities for higher quality and increased focus on design and functionality. At the same time, it also captures the humanistic and social perspective that the architectural profession has traditionally held high but lost opportunities to influence during the linear and short-term buildning construction processes of recent decades.

THE INDUSTRY'S CLIMATE AND ENVIRONMENTAL IMPACT

The construction and real estate sector generates approximately one-fifth of Sweden's total greenhouse gas emissions. That is before including the extensive imports of construction products.

The construction and real estate sector also accounts for a significant part of society's other environmental impacts, such as emissions of sulphur dioxide, nitrogen oxides, environmental toxins and other environmental impacts. The sector's environmental impact from its waste is steadily increasing according to the National Board of Housing, Building and Planning's environmental indicators, and the industry accounts for almost a third of all of Sweden's waste production.

Action plan for architects

The architect's new and developed role is to lead a design process that must include the entire structure of society, from city via region and countryside, through spatial planning, urban planning, landscaping, house building and interior architecture. In all parts, the design process must be based on human needs, with nature's resources as a framework.

Below we list what is required for architects to be able to be strong drivers for an ecologically sustainable community building. We have based the list on the principle that everyone takes responsibility for their own business. The list is based on realistic goals and indicates what architectural firms and individual architects themselves can do and how they can best make a difference.

The action plan is based on the conclusions of Architects Sweden's sustainability council, the commitments found in the Architects Declare call and Sweden's Roadmap for fossil free competitiveness: the buildning construction and civil engineering sector.

1 Architects design for low emissions

To achieve this, architects must:

- Include life cycle cost, full life cycle modelling, and post-use evaluation in the design work.
- Develop competence in life cycle analysis (LCA).
- Use LCA in the design process.
- Propose or prescribe, preferably at an early stage, resource-efficient solutions with a low climate impact from a life cycle perspective.
- Create efficient, flexible floor plans and demountable constructions to reduce the need for new material during rebuilding or maintenance.
- Create conditions in the design phase so that buildings and facilities can be climate-neutral in the use phase.
- Prescribe the most durable materials possible from a life cycle perspective.
- Create awareness of economic and environmental consequences caused by material flows and use of materials.
- Contribute with climate-positive functionality in their design by, among other things, creating carbon sinks, producing local energy, clean water and air, creating ecosystem services, and contributing to increased biodiversity.

To achieve this, the architectural offices must:

- Adopt regenerative principles that go beyond the standard for zero energy building in the design of architecture and urbanism.
- Develop competence in LCA among its employees.
- Provide tools or develop their digital design tools with LCA and Environmental Product Declaration (EPD).
- Provide technical expertise in life cycle analysis that complements and supports the architects.
- Contribute to the digitisation of the planning or construction process to support waste minimisation and resource-efficient production, logistics and material use.

2 Architects design for circularity

To achieve this, architects must:

- Design buildings for material recycling and reuse by making materials and products demountable and able to be separated from each other.
- Collaborate with engineers, clients and customers (at an early stage) to continue reducing construction waste and material spillage.
- Visualise the options for the customer ('If you choose this, your CO2 emissions will be like this').
- Primarily upgrade existing buildings and extend their service life as a more carbon-dioxide-efficient alternative to demolition and new construction.
- Handle each existing building as a material bank and map out the materials and use the Byggvarubedömningen (Swedish for building product assessment) or similar.
- Minimise their prescribing of virgin materials and prescribe recycled buildings and materials.
- Apply the updated guidelines for resource and waste management during construction and demolition at an early stage.
- Primarily upgrade existing furnishings and extend their service life as a more carbon-dioxide-efficient alternative to demolition and new construction/new procurement.
- Handle each existing interior as a material bank and map out the materials.
- Minimise their prescribing of virgin materials and prescribes recycled furnishings and recycled materials.
- Primarily upgrade existing land development and extend its service life, as a more carbon-dioxide-efficient alternative to demolition and new construction/new acquisition.
- Manage each existing land facility as a materials bank and map out the materials.
- Minimise their prescribing of virgin materials and prescribe recycling of land and materials.

To achieve this, the architectural offices must:

- Offer climate-smart and circular design beyond what is required by law.
- Provide information on climate impact in tenders and quotations even without customer requirements to drive development on the market.
- Demonstrate long-term profitability with climate-smart solutions and become part of the new circular economy.
- Develop calculation tools to argue for long-term benefits with circular and climate-smart design.
- Make profitable business of climate-smart architecture: offer their customers more climate-smart and circular design and show in numbers how it pays off in the long run.

3 Architects design ecologically sustainable and resilient communities, places, landscapes and structures that can withstand climate disasters

To achieve this, architects must:

- Design robust, self-sufficient buildings, landscapes and communities.
- Start projects based on climate scenarios for the site.
- Perform climate calculations and quality assure decisions and use of land, water and green areas already in the planning and development phase.
- Be clear interpreters of future users' needs, behaviours, values and priorities since the necessity of a design that provides space for the user in the long term becomes decisive for the life cycle perspective of a building's lifespan and timeliness.
- Perform climate calculations for new developments already during the planning stage and make comparisons with maintaining and upgrading all or parts of existing built environments.
- Analyse, evaluate and measure the long-term effect of early decisions.
- Assume long-term income, designs, values and resource impacts to secure the building, the city, the green structure or the interior as a long-term financial resource, material bank and source of income within both hard and soft economic values.
- Conduct dialogue on strategies for how increased sustainability can permeate the project from the planning stage to the finished building with clients, authorities, users and architects.
- Do business with climate-smart architecture and offer its customers more climate-smart and circular design and show in numbers how it pays off in the long run.

4 Architects design services for ecosystems and green spaces

To achieve this, architects must:

- Develop parks, green areas and nature areas close to urban areas.
- Ensure ecosystem services in the built environment.
- Offer solutions with ecosystem services and choose green areas instead of hardened surfaces by routine.

5 Architects find new solutions for climate-smart and ecologically sustainable architecture through research and innovation

To achieve this, the architectural offices must:

- Invest more in research and innovation, collaborate with the academy, and join Arkus (Swedish foundation for the promotion of research and development in architecture).
- Share knowledge and research on an open-source basis.

6 Architects design climate-smart and ecologically sustainable architecture that is encouraged and realised

To achieve this, the architectural offices must:

- Use procurement forms or strategic collaborations that stimulate increased collaboration and dialogue between stakeholders throughout the value chain.

7 Architects measure and limit the climate and environmental impact of their own operations

To achieve this, the architectural offices must:

- Set up its own climate goals and implement them throughout the business.
- Provide sustainability reports to declare and set goals for their climate impact.

Links to industry initiatives to which the report refers:

- Roadmap for fossil free competitiveness for the construction and civil engineering sector.
- Swedish Architects Declare Climate & Biodiversity Emergency.

‘Everyone cannot do everything, but everyone can do their best.’

Architects Sweden
Storgatan 41
Box 5027
S–102 41 Stockholm

kansli@arkitekt.se
+46–8 505 577 00

www.arkitekt.se

@sverigesarkitekter
@sveriges_arkitekter

Architects Sweden