

# annual sustainability report

'19



**Annual Sustainability Report**  
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**Illustration on front page**

Solrødgård Climate and Environmental Park

Photo: Lars Rolfsted Mortensen

**annual  
sustainability  
report**

**'19**

**GOTTLIEB  
PALUDAN  
ARCHITECTS**



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# introduction

## comments from the CEO

As one of the largest architectural companies in Denmark, Gottlieb Paludan Architects has a significant responsibility for sustainable global development. We want to play an active role in the progress towards a more inclusive, sustainable and resilient future for people and planet. This mission places sustainability firmly at the core of our organization. Our work is driven by our belief in the sound business sense of increased focus on ethics, sustainability and holistic thinking, and our goal is to continue to promote greater environmental responsibility through our work.

Gottlieb Paludan Architects has been a member of the UN Global Compact initiative since 2009. This Annual Sustainability Report reaffirms our support and describes our actions to continually improve the integration of the Ten Principles of the United Nations Global Compact in the areas of human rights, employee rights and the protection of the natural environment and actively op-



posing corruption in all its forms. As a newly integrated initiative, this report will illustrate how we contribute with our sustainable solutions, by showing how each project contributes to the United Nations' Sustainable Development Goals. A large number of the 17 Goals are relevant to Gottlieb Paludan Architects, however, three Goals (7, 9, 11) have a clear link to our business. These have been reinterpreted to create target areas, in which Gottlieb Paludan Architects can create the most value.

The recent merger with Norwegian architects tegn\_3 allows us to broaden our professional expertise and capacity and deliver sustainable architectural solutions and consultancy within an even wider array of services. Moreover, the merger has led us to work actively with the company's identity and core values. As a Scandinavian architectural company with offices in Copenhagen, Malmø, Oslo and Trondheim, we have been strengthened in our conviction that Gottli-

” *Infrastructure is crucial for development. From transport systems to power-generation facilities and water and sanitation networks, it provides the services that enable society to function and economies to thrive. This puts infrastructure at the very heart of efforts to meet the Sustainable Development Goals.*

*The Economist Intelligence Unit Limited 2019*

eb Paludan Architects is on the right path, focusing our design and consulting expertise on the types of collective facilities needed to support well-run communities and on environmentally and socially sustainable architectural solutions.

We look forward to an exciting year together with our new Norwegian colleagues in Oslo and Trondheim and will continue to focus our efforts on delivering leading sustainable solutions for our clients and shareholders.

Copenhagen, October 2019



Kristian Hagemann  
Chief Executive Officer  
Gottlieb Paludan Architects

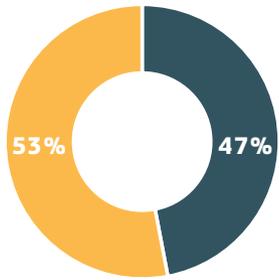


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**Infographic**  
*Distribution of employees*

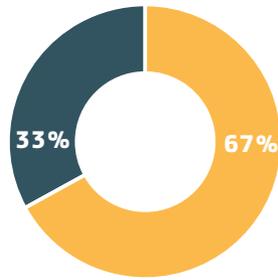
**x86**

## the year in **brief**

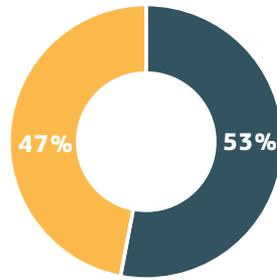
- » We expanded into Norway per June 2019. Gottlieb Paludan Architects took over Norwegian architects tegn\_3 and established a Scandinavian architectural company with offices in Copenhagen, Malmø, Oslo and Trondheim. >> Read more on page 19
- » We won two major infrastructure projects in Danish public transport, thereby consolidating the position as Scandinavia's preferred transport infrastructure architects. We have been chosen to design three sustainable maintenance facilities for Denmark's new fleet of electric trains and we have also been appointed architects for the second stage of Aarhus Light Rail. >> Read more about these projects on page 38
- » Our Creative Director, Jesper Gottlieb, received the Dreyer Foundation's honorary award on March 20 for his "persistent and committed effort to raise the architectural expression of the society's infrastructural and technical facilities." Every year, the award is granted to a lawyer and an architect who has made a particularly valuable contribution within his or her field.
- » Anna Aslaug Lund, landscape architect at Gottlieb Paludan Architects, defended her thesis 'Room for Rain – the city as a garden and the future of streets' on Monday 25 February and she was awarded her PhD. The thesis deals with the issues of handling increased quantities of water and how innovative solutions will enhance the quality of life in our cities by contributing to their architectural, sensory and recreational values. >> Read more about this project on page 26
- » Gottlieb Paludan Architects won the competition to design Network Rail's new pedestrian footbridges. The bridges will replace some of the old bridges on the British railway network and improve access for train passengers and other pedestrians. Gottlieb Paludan Architects' design entitled 'The Framing Bridge', was selected among 120 entrants from nineteen countries. >> Read more about this project on page 37
- » Gottlieb Paludan Architects held a two-day hackathon in collaboration with City of Copenhagen, CPH City & Port Development and DHI with focus on developing integrated solutions to the challenges of rising sea levels and more frequent extreme weather events. >> Read more on page 21
- » Gottlieb Paludan Architects and L2 Arkitekt won two out of six new stations on the new Fornebu Metro Line in Oslo. The team won first prize in the design competition for both Skøyen and Vækerø stations on what is set to become Oslo's largest expansion of its public transport system for many decades. We are looking forward to contributing to the future sustainable development of Oslo.
- » Our project, Holmestrand Station, won the Norwegian Lighting Award 2018 for best outdoor lighting design.



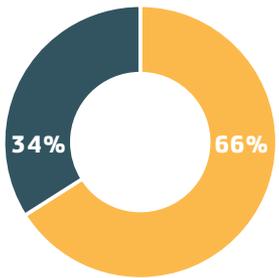
Employees: **133 in total**



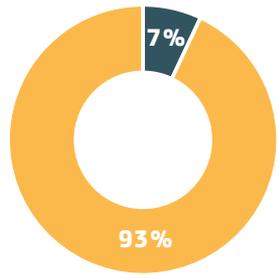
Hereof Partners: **6**



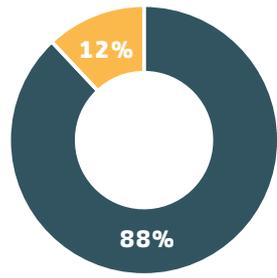
Hereof Team Leaders: **15**



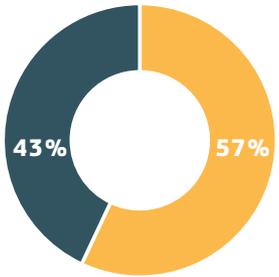
Architects: **67**



Constructing Architects: **14**



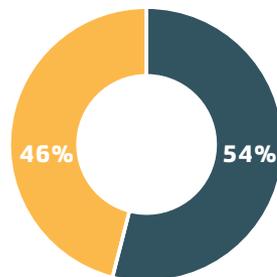
Landscape Architects: **7**



Engineers: **7**



Interior Architects: **8**

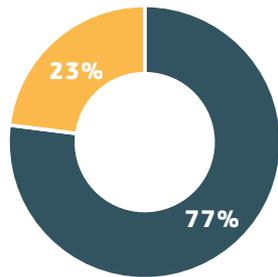


Adm., IT and Communication: **11**

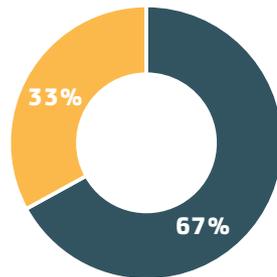


**Infographic**

*Employees and gender diversity*

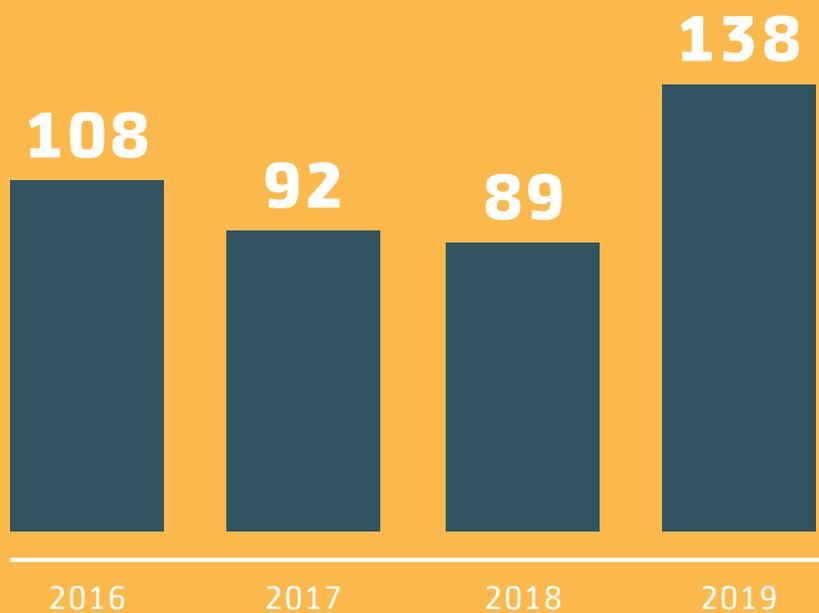


Geographers, Sociologists, Philosophers, etc.: **13**



Students and interns: **6**

# the year in numbers



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## Infographic

*Change in the number of employees over the past 4 years*

Financial ratios	2016*	2017*	2018*
Turnover	127,0	93,8	100,4
Pre-tax profit	10,1	11,6	10,5
Equity	20,9	26,0	24,2
Balance sheet	66,3	72,9	71,2
Equity ratio	31,6 %	35,6%	33,9%

All figures are stated in DKK million

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## Infographic

*Financial key figures*

\* Numbers reflect Gottlieb Paludan Architects in DK

# company profile

## architecture, infrastructure, liveability



Gottlieb Paludan Architects is one of the largest architectural companies in Denmark, specializing in architecture, landscape architecture, urban development and client consultancy in Scandinavia, Northern Europe and Asia. Gottlieb Paludan Architects has offices in Copenhagen, Malmö, Oslo and Trondheim and employs 133 people.

### **Architecture for our everyday environment**

Since 1901, we have delivered architecture that works both technically and aesthetically – often in very complex contexts. Aesthetics and functionality are not opposites but aspects that support each other in creating value for clients, end-users and society at large. As a company, we are characterized by fostering long-term relationships with our clients built on trust and in-depth specialist knowledge within our areas of expertise. We strive to integrate sustainability, social responsibility and environmentally conscious solutions in all our projects. We listen carefully and take on board the client's wishes and requirements.

We take a special interest in the transition from black coal to green energy, the interaction between different modes of transport, the transformation of urban spaces left behind by time and tide, the integration of striking structures into the surrounding landscape and the move from cellular offices to new ways of working.

^  
**Gottlieb Paludan Architects' Head Office**

*Photo: Jens M. Lindhe*

### **Commercial & Office**

Well-designed workspaces, homes and institutions are fundamental for the quality of our everyday life, and creating beautiful, sustainable and long-lasting architectural solutions for these fundamental functions is a vital part of our architectural mission.

We are currently undertaking several projects for international clients and our tools and processes support the professional delivery of these projects, carrying the client's needs and expectations into a local Danish context, technically as well as culturally. Through consulting processes, we keep a clear focus on the client's values and goals, and we manage the projects professionally throughout all project stages; from preliminary analyses to construction and commissioning.

### **Mobility & Transport**

Urbanization continues to shape our society. The move from country to city is still ongoing, as people move for jobs and education opportunities. The consequence is that the issues of overcrowding are compounded in our cities, while rural areas face challenges of quite a different nature.

At Gottlieb Paludan Architects, we contribute to reducing urban overcrowding and bridging the distance between country and city. For the last

century, we have been heavily involved in designing for the Danish State Railways, creating cohesion across the country. Our strong involvement continues – in Denmark as well as internationally. We also focus on developing transport hubs, intermodal transport solutions and cohesion with the surrounding urban space. For an overview of our mobility and transport services, go to p. 34.

### **Energy & Utilities**

For over half a century, Gottlieb Paludan Architects has advised a wide range of clients within the energy and utilities sector. With several hundreds of realized projects under our belts, we have gained extensive expertise within the sector, including power stations, electricity distribution, district heating and cooling, biogas plants, geothermal energy, waterworks, water treatment plants and waste incineration plants. Over the years, we have also designed quite a few control rooms, laboratories, workshops and administration offices. For an overview of our services within energy and utilities, go to p. 42.

With the addition of two Norwegian offices, we have strengthened our knowledge in Planning & Urbanism and expanded our professional expertise to also encompass Interior & Workplace Development, Briefing & Process Management and Integrated Design & Architecture.

# our workplace

## - knowledge is key

In line with Gottlieb Paludan Architects' business strategy, we are constantly improving our professional capabilities in order to strengthen the ability to solve the increasingly complex challenges that face our societies. Our employees are offered further training in relevant disciplines, for example DGNB certification, the Green Building Council's LCA tool for life cycle analysis, project management and process management courses and seminars.

Gottlieb Paludan Architects in Copenhagen is organized into six teams: three teams focusing on energy and utilities and three teams focusing on mobility and transport. Each team is headed by a team leader. The team leaders support the project managers and undertake the quality assurance process and secure coordination of competences and staff across the office. This provides a good working environment for our employees and allows for direct lines to the nearest day-to-day managers.

We will continue to improve the organizational development within the company, ensuring optimal working conditions for all employees.

Gottlieb Paludan Architects offers its employees ongoing training and development, tailored to the individual employee's role and responsibility.

**Project management:** Every GPA project manager who is the lead professional on a specific assignment is a member of the GPA Project Manager Forum. The members come together to participate in structured programmes on the responsibilities, duties and tools of project managers. The programmes are concise and carefully managed; both internal and external speakers contribute and members share their knowledge and experience, ensuring that the company's knowledge is updated and employees apply uniform methods wherever relevant.

**Digital development:** Gottlieb Paludan Architects uses BIM, VR and other digital tools on many levels. Employees are invited to participate in ad hoc, internal training courses, adapted to specific projects or current challenges, and in external programmes, such as ICT management courses.

**Skills networks:** Employees at Gottlieb Paludan Architects develop their skills and professional networks via a formalized internal networking programme which supports the company's strategic tools and business areas. The internal networks have set coordinators who organize about four annual meetings which revolve around internal or external presentations. Currently, Gottlieb Paludan Architects has the fol-



lowing networks: Cycling Solutions and Bicycle Culture, Materials, Public Procurement Legislation, Accessibility, Health & Safety at Work, Digital Technology, Sustainability, Project Planning and Landscape Architecture.

**Professional events:** “Friday Briefing” is a set weekly presentation on current projects or themes. Venues are organized together with internal and external speakers, internal workshops and study tours.

**GPA Practice:** Every six months, Gottlieb Paludan Architects runs GPA Practice which is the company’s modular induction course for new employees and interns. The seven modules provide the participants with insight into the company’s general expertise and specialisms, phased services, contractual basis and business understanding.

**GPA interns:** Gottlieb Paludan Architects regards interns as valuable and significant mem-

bers of the organization. GPA internships provide students with the opportunity to develop their skills and professionalism while they are still at university. All interns are asked to attend the modular induction course GPA Practice, and they are allocated individual mentors who function as their supervisors throughout their internships. The mentors ensure that the individual interns are academically challenged during their internships and that they are appropriately equipped to embark on their professional careers in the construction industry.

We combine our professional expertise with a keen eye for society’s challenges, user needs and client wishes whether we are working on new builds or renovations. As architects, we have a passion for our profession and for working closely with both clients and colleagues. This is what powers our teams, and we expect a similar attitude and commitment from those wanting to come aboard with us.

There is a pleasant atmosphere in our office; we are friendly, open and respectful of each other. We are good at sharing our knowledge and experience among ourselves, and nobody would hesitate to ask for help or advice. We are busy, but we make space for inspiration and reflection and always take the time to celebrate our successes.





# **professional and organisational development**



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**Oslo Buserminal**

*Photo: Katrine Lunke / Apeland*

# we have expanded into Norway

Gottlieb Paludan Architects has taken over Norwegian architects tegn\_3 and thereby established a Scandinavian architectural company with offices in Copenhagen, Malmø, Oslo and Trondheim.

We believe that this merger gives us an even better opportunity to deliver high quality consultancy and that the breadth of our professional expertise and capacity, based on the offices' various focus areas, will benefit our customers and partners.

Both companies are part of ÅF Pöyry AB and have already cooperated on a number of projects. Gottlieb Paludan Architects' current tasks in Norway include the stations Skøyen and Vækerø on the new metro line FornebuBanen in Oslo. We have also been responsible for the design of Holmestrand Station, just as we have solved urban development assignments in Sarpsborg, Grålum and Odda.

Gottlieb Paludan Architects Norge AS is divided into the following teams: Interior & Workplace Development, Briefing & Process Management, Planning & Urbanism, Landscape & Urbanism and Integrated Design & Architecture. Together with ÅF Engineering AS, Gottlieb Paludan Architects Norge forms one of Norway's largest con-

sultancy environments. We are co-located and work seamlessly across competence areas to ensure a holistic approach to projects.

Gottlieb Paludan Architects Norge works extensively with interior design and strategic workplace design. Furthermore, they work with a wide range of construction projects including elderly homes, schools and educational buildings, commercial and industrial buildings, offices, housing, etc. The company also employs city planners and urbanists, who develop some of Norway's largest campuses, as well as building applications advisors who have comprehensive experience in building applications from the largest construction case environments in Norway and assist as responsible applicants for a wide range of projects.

The company is composed of architects, interior architects, planners and experts in management and organization. It is therefore possible to combine expertise in strategy, organization and management, including practical process expertise, with architecture and programming expertise. Gottlieb Paludan Architects Norge AS is therefore equipped to take on complex and interdisciplinary tasks and provide unique solutions.

# building knowledge on sustainable architecture

According to the UN, dominant research modes are not enough to guide the societal transformations necessary to achieve the 2030 Agenda: "Researchers, practitioners, decision makers, funders and civil society should work together to achieve universally accessible and mutually beneficial sustainability science" (2019/09/24, "Expansion of sustainability science needed for the SDGs", Nature Sustainability).

Ultimately, anthropogenic climate changes and their impacts on our world require the inclusion of new methods and new ways of thinking in the field of architecture.

Gottlieb Paludan Architects is actively engaged with the necessary development expressed by the UN and participates in multiple conferences to help develop action-oriented knowledge on sustainable solutions.



## Practice meets academia

In September 2019, Gottlieb Paludan Architects shared knowledge and experience on urban sustainability work at Urban Forum – Practice meets Academia; the International Transdisciplinary Conference 2019 in Goteborg, Sweden.

The purpose of the conference was to gather action-oriented knowledge, based on the exchange between practice and practice-oriented research, related to sustainable solutions within the urban realm. The conference consisted of so-called floor talks where practitioners and researchers in architecture, landscape architecture, urbanism, etc. engaged with the audience to shed light on issues of societal importance.

In total, 12 projects were presented in the course of two days and Gottlieb Paludan Architects headlined two of these talks. Head of Communications & Development, Sten Sødning presented

Solrødgård Climate and Environmental Park and the aspects related to transforming farmland into a multifunctional “energy-landscape” and our Ph.D. fellow Anna Aslaug Lund presented inspiring findings from her Ph.D. “Room for rain: The city as a garden and the future of streets”.

### **Interdisciplinary Methods**

Gottlieb Paludan Architects held a two-day hackathon in collaboration with City of Copenhagen, CPH City & Port Development and DHI with focus on developing integrated solutions to the challenges of rising sea levels and more frequent extreme weather events.

In order to create a more realistic and tangible case, the City of Copenhagen and CPH City & Port Development agreed to present a task and function as a sparring partner for the interdisciplinary teams. The project, therefore, took its

point of departure in concrete challenges in the capital with protection against floods.

A hackathon is an innovative method where interdisciplinary teams attempt to solve a concrete challenge through a short and intense process and produce many different possible solutions within a short time. At Gottlieb Paludan Architects, we believe that it is necessary to innovate, in order to cope with both rising sea levels and the growing number of inhabitants Copenhagen will experience in the future. This means, among other things, that we have to move away from thinking in silos and instead work across disciplines and cultures to develop sustainable and profitable solutions. The hackathon was, therefore, an attempt to generate ideas for the future’s smart urban development by creating integrated solutions for complex climate challenges.



# our sustainability network

Søren Gjerlev is a very experienced infrastructure architect, project manager and DGNB Consultant at Gottlieb Paludan Architects. He has great expertise within managing complex infrastructure projects such as railways, stations, airports and energy facilities. Søren is also head of Gottlieb Paludan Architects' Sustainability Network.

Currently, Søren is working on a challenging project in Stockholm where several techniques are used to enhance the sustainability of the construction; *"We are designing a new entrance to a station which will be located between tracks in operation. We are using materials that are durable and that have the smallest possible impact on the CO2 accounts. We aim to construct the roof at night where we will have a "window" of approximately 4 hours to use the train tracks closest to the construction. Sustainability is also about "building smart", i.e. optimizing the logistics before, during and after installation on the construction site.*

*I am also participating in the completion of the BIO4 power station on Amager, which is a bio-mass-fuelled plant and thus does not burden the climate and the CO2 accounts as a conventional oil or gas-fired plant. The construction is sustainable in the sense that the supporting steel structures are bolted together in a way that makes them easily dismantled and re-used. At Gottlieb Paludan Architects we are quite good at building components into contexts where they can be easily separated again.*

## Circular Economy

Circular economy is an economic system based on the idea of planetary boundaries. To create a sustainable society, we must live and operate within these boundaries.

This holistic mindset is the foundation for the design concept "cradle to cradle" in which products are created according to the principles of an ideal circular economy. As architects, we must strive to design, develop and build in a way that integrates resources into a cycle which secures them for the future.



*I keep an eye on advancements in the development of new materials and I am especially interested in the concept of “circular economy”. This is centered around the idea that the materials we use must be included in a cycle and either be re-used as they are or easily separated and included as subcomponents in a new context”.*

A central objective in Gottlieb Paludan Architects’ strategy is the development and sharing of knowledge and in 2017, we launched seven new office networks which aim to support and expand the knowledge inside the company. Our Sustainability Network is meant to strengthen our focus on sustainable development both internally and externally. The role of the Network is to stimulate knowledge sharing, innovation and new inspiration for our employees.

The Sustainability Network meets once a month to discuss recent national and global movements and activities related to sustainable construction. Several members of the Sustainability Network have acquired the title DGNB Consultant through Green Building Council courses. This authorises Gottlieb Paludan Architects to certify office and commercial buildings according to the DGNB standard (Deutsche Gesellschaft für Nachhaltiges Bauen – German Sustainable Building Council).

In the following, you can read more about the thoughts behind the sustainability network and a tool that has been developed by Gottlieb

Paludan Architects to assist our employees in identifying and evaluating possibilities for enhancing sustainability in projects.

### **Why Sustainable Construction?**

Environmental sustainability includes parameters such as energy efficiency, resource consumption, use of renewable resources, the ability to minimize environmental and climate impacts - globally as well as locally as well as reduction in the impact of biodiversity.

Economic sustainability focuses on a building’s value optimization which includes the construction project’s ability to minimize operating costs, the possibility of higher rental prices, better rental possibilities, increased productivity of the user of the building, value stability and better financing opportunities.

Social sustainability has to do with building value in relation to the user, including user satisfaction and well-being, better indoor climate, increased flexibility, accessibility for all as well as safety and security.

Together, these three aspects lead the way to a better construction. Most of it can be considered common sense, but the challenge arises the moment we want to measure sustainability, because how do we measure this?

### **Gottlieb Paludan Architects' Screening Tool**

In order to be able to “sustainability-screen” a new project, we have developed a “screening tool” based on the DGNB certification model. The tool is used in the initial stages of a project where the sustainability efforts need to be clarified with the client and the other consultants. Gottlieb Paludan Architects' sustainability screening tool is a management tool for identifying possible sustainable mechanisms in projects. The screening generally reviews the same assessment criteria as the DGNB system and at the same time points to possible solutions to achieve a given sustainable goal.

It is the task of the project manager to review all the criteria and describe what mechanisms can be incorporated into the project. The screening is subsequently reviewed with the client and it is clarified whether you want to have Sustainability and / or Sustainability Management incorporated into the service and whether you want a definite DGNB certification.

If the developer chooses Sustainability / Sustainability Management, the selected mechanisms are transferred to the project's “Sustainability Plan”.

#### **ENVIRONMENTAL QUALITY**

- MATERIAL USAGE
- DANGEROUS CHEMICALS
- WOOD
- ENERGY CONSUMPTION
- WATER CONSUMPTION
- LAND REQUIREMENT

#### **ECONOMIC QUALITY**

- OVERALL ECONOMY
- FLEXIBILITY

#### **SOCIAL QUALITY**

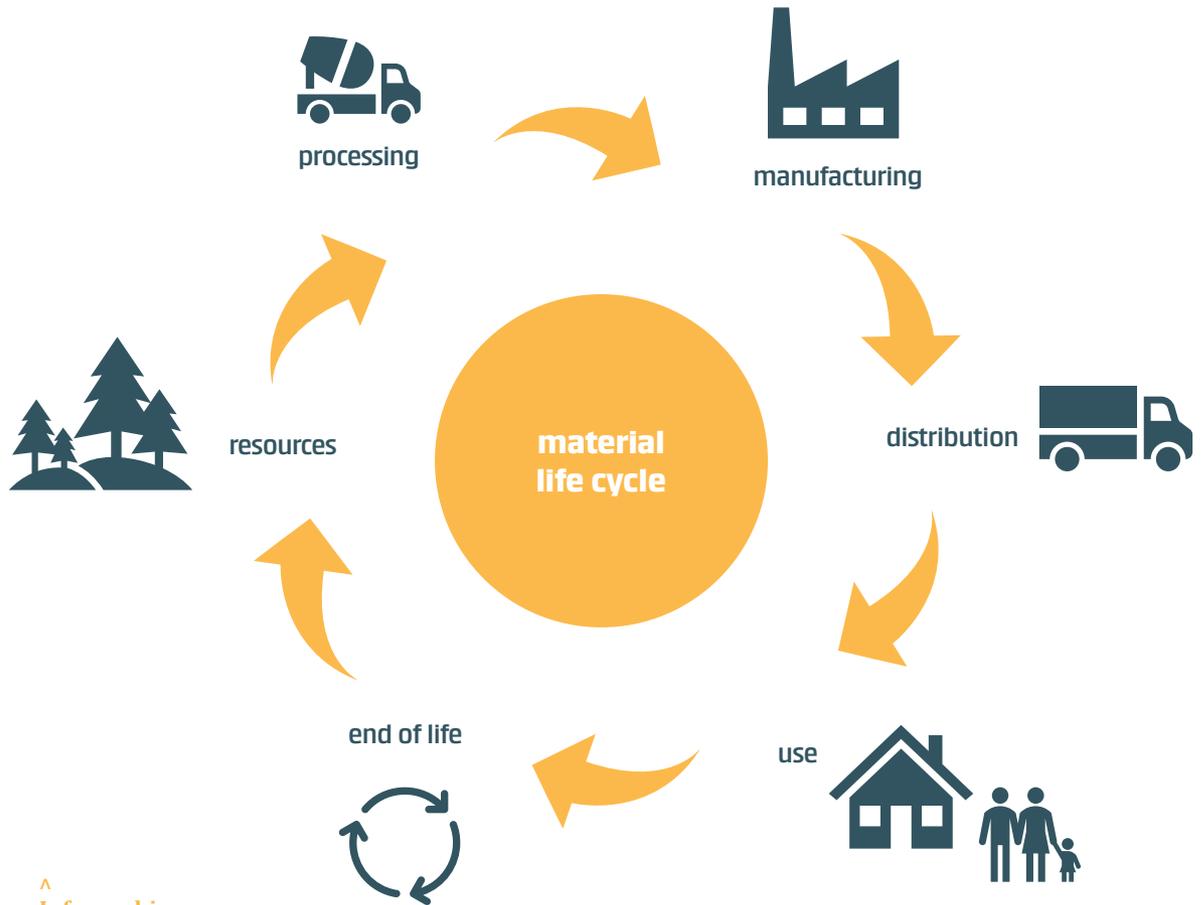
- INDOOR CLIMATE
- OUTSIDE AREAS
- SAFETY
- ACCESSABILITY
- PUBLIC ACCESS
- CYCLISTS
- AESTHETICS

#### **TECHNICAL QUALITY**

- FIRE AND SOUND
- BUILDING ENVELOPE
- CLEANING
- CLIMATE PROOFING
- REUSABLE BUILDING MATERIALS

#### **PROCESS QUALITY**

- PLANNING PROJECT STAGE
- PLANNING COMPLETED



^  
**Infographic**  
*The Material  
Life Cycle*  
<  
**Screening tool**

# room for rain

Anna Aslaug Lund, PhD and landscape architect at Gottlieb Paludan Architects, has completed her thesis 'Room for Rain – the city as a garden and the future of streets' as an Industrial PhD on urban climate adaptation, in collaboration with Gottlieb Paludan Architects, Rambøll and the University of Copenhagen.

The thesis deals with the issues of handling increased quantities of water and how innovative solutions will enhance the quality of life in our cities by contributing to their architectural, sensory and recreational values. The project evaluates existing Sustainable Urban Drainage Systems (SUDS) with particular focus on the architectural quality of these technical solutions. Anna Aslaug Lund's PhD supports our efforts to increase our business focus on the climate change adaptation market. Anna is our inhouse expert within the field of rainwater handling and her knowledge is put to immediate use in a number of our projects.

In the following, you can read a short interview with Anna about the project:

**Why did you choose to focus on the street as urban space in relation to the challenge of climate change adaptation?** The cloudburst plans in place for e.g. Copenhagen are based on what you might call landscape-based rainwater handling, meaning that as much of the water as possible is dealt with on the surface. In practical terms this means that our streets will function as im-



portant transport routes for cloudburst water. The central idea of the cloudburst plans is that the streets will delay the water, giving it the chance to infiltrate and in specific places creating the opportunity for the water to flow on the surface and subsequently to be directed to, for example, parks and watercourses. In other words, the cloudburst plans mean that many of our streets will change character in the near future. This is a consequence for the future of our streets which I believe is both very interesting and very important to discuss and explore as an architect; the fact is that seen from a social and purely physical perspective, our streets are environments that are central to urban existence in the sense that they are some of the urban spaces with which we are in most frequent contact on a day to day basis. In this way, the necessary climate change adaptation of the city provides us with a unique opportunity to develop the potential of the street as a social and sensory space in the urban environment.

### How does your PhD project contribute to the future handling of cloudbursts in street spaces?

One of the objectives of the project was to widen the spectrum of possible solutions to designing street spaces that will be able to handle the increasing quantities of rainwater on the surface, while supporting social and sensory values and improving the conditions for natural ecosystems. You could say that the project produced three main results. The first result is that I explored how we could develop a language to talk about the street as a physically experienced space. As it is, we predominantly speak about streets in technical terms. Our language is inextricably linked to our practice and the physical expression that we give our projects. That is why I believe it is very important to have a language to talk about the things that streets can also be – namely important sensory and social spaces. The second result is that I developed a type of catalogue of what I call “spatial shapes”, exploring through drawing and photography the variety of possible solutions to how the cloudburst management initiatives that we implement in streets can also support the sensory and social values of the spaces. I like to think that these findings will be useful to architects and engineers during the drafting phase of a project. The last result is a method to produce site-specific cloudburst solutions.

### You spent part of your PhD course at Columbia University in New York as a visiting researcher – what knowledge and experience did you gain from that?

In as much as Columbia University is an international hub where you meet scientists from all

over the world, I was able to confirm that many of the same issues in relation to the challenges of climate change adaptation are being discussed in many different countries. This brought it home to me that the themes I have explored in my PhD thesis have clear international relevance. Denmark is one of the countries that are at the forefront of combining climate change adaptation with other initiatives, but we can also learn a great deal from studying what they do in other countries to counteract the impact of climate change.

### What are your central recommendations to advisers, local authorities, utility companies and policy makers working with cloudburst management in cities?

I make various recommendations in my thesis, such as the importance of interdisciplinary collaboration and focusing on the natural cycles of the environment. However, a crucial point which I would like to emphasize here concerns awareness of site-specific solutions. Many initiatives to combat the impacts of climate change will involve transforming existing streets. It is crucial to the success and quality of these projects that they are manifestly sensitive to existing spatial qualities and are based on an accurate reading of, for example, existing social patterns. After all, the cloud burst solutions of the future will have to take account of a wide range of complex issues, ranging from kerbstone heights and accessibility, biodiversity, resource awareness and topography to cultural standards and power structures. I believe that it is absolutely essential that we retain the complexity of the initiatives we employ to protect our cities against cloudbursts.





how we  
**take**  
**responsibility**



^  
UN's 17 Sustainable Development Goals

# how we advance sustainability

As one of the largest architectural companies in Denmark, Gottlieb Paludan Architects has a significant responsibility for sustainable global development.

We have many years of experience within our primary business areas: Energy & Utilities and Mobility & Transport. They represent basic functions in society and have every right to professional and artistically ambitious architectural treatment. Good infrastructure is an obvious prerequisite for prosperity and sustainable development whatever the scale.

Through our work with clients and partners, we always seek to find solutions that are environmentally, economically, and socially sustainable. We recognize the United Nations' Sustainable Development Goals as guiding principles to align our efforts and priorities to support global development.

The 17 Sustainable Development Goals represent the ambition of world leaders and the United Nations to achieve a more inclusive, sustainable and resilient future for people and planet. The Goals outline the global challenges we face together and the problems that are necessary to

address, including those related to environmental degradation, climate, poverty and inequality. A large number of the 17 Goals are relevant to Gottlieb Paludan Architects. Three have a clear link to our business:

## **Goal 7: Affordable and Clean Energy**

Ensure access to affordable, reliable, sustainable and modern energy for all.

## **Goal 9: Industry, Innovation and Infrastructure**

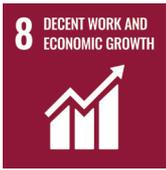
Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.

## **Goal 11: Sustainable Cities and Communities**

Make cities and human settlements inclusive, safe, resilient and sustainable.

These objectives have been reinterpreted to create the following target areas, in which Gottlieb Paludan Architects can create the most value. Gottlieb Paludan Architects contributes to:

- » sustainable energy
- » sustainable infrastructure/mobility
- » sustainable cities and urban areas



## Environment

As an architectural company, environmental sustainability is the area of responsibility in which we can create the most value. We contribute to promoting and strengthening public transport, cycling solutions and bicycle culture, thereby reducing transport-related CO<sub>2</sub> emissions.

We contribute to lowering the environmental impact of construction work by proposing building materials that require fewer resources in production, recycling and disposal, and which last longer. In this way, every individual construction leaves a smaller carbon footprint throughout its service life.

The least harmful construction is the building that is already built and we specialize in renovation, transformation and refurbishment. With a combination of architectural design, understanding of materials and respect for the construction and its history, we raise renovation and adaptive reuse to a level where it can easily compete with new construction. The focus is not only on improving energy performance but also on rethinking the purpose of the construction to suit current and future use.

We integrate climate adaptation measures and rainwater management in all relevant projects. Moreover, Gottlieb Paludan Architects commits itself to spread environmental sustainability by educating the public about resources cycles

through visitor and education facilities in connection with green energy facilities, power plants and waterworks.

## The Global Compact Core Values

It is emphasised with the 17th goal that concerted and collective efforts across all levels of society is necessary, in order to achieve each Goal by the year 2030. However, the UN has estimated that the active participation of companies is crucial, in order to achieve as much as one-third of these Goals.

Global Compact is a corporate sustainability initiative which urges companies to align strategies and operations with universal principles on human rights, labour, environment and anti-corruption, and take actions that advance societal goals. We fully support this initiative and the following will describe how we deliver on UN Global Compact's principles for human rights, labour conditions, the environment and anti-corruption.





### Anti-corruption

Gottlieb Paludan Architects' main activities are concentrated in Denmark and Scandinavia, which traditionally top Transparency International's list of least corrupt countries. We never encounter corruption in our daily work and will continue to oppose any signs of it.

### Human Rights

Gottlieb Paludan Architects conducts its business in accordance with Danish law, including the Danish Salaried Employees Act (Danish: Funktionærloven) which secures human rights and employment rights. We take care to uphold the general principles of basic human rights for everybody through all our work. We contribute to increasing liveability through the improvement of connectivity and public spaces in towns and cities. We contribute to improving living conditions in peripheral regions through the development of provincial towns.



### Labour

Gottlieb Paludan Architects conducts its business in accordance with Danish law, including the Danish Salaried Employees Act (Danish: Funktionærloven) which secures human rights and employment rights, including the prevention of child labour, forced labour and employment discrimination. All employees have the freedom of association and collective bargaining.

Our Employee Handbook secures our employees' rights and thereby expresses our responsibility within this area. We contribute to creating social cohesion through infrastructure projects which link city and countryside, suburb and town centre, giving more people the opportunity to be employed, get an education and participate in society.



The following will present project within the last year in which environmental sustainability has been a key aspect. Furthermore, these will be related to the SDGs. Many of the projects address more than one goal, but the main aim here is not to explore sustainable projects in their full complexity, but to understand how our architectural solutions relate to the Goals. The projects will be divided into two main areas: Green Mobility and Green Energy.

### Traffic hubs

We create intermodal traffic hubs that support the efficient interchange between different modes of transport

### Light rail

We manage and execute large design tasks for comprehensive transport systems

### Cycle lanes

We plan and design safe and attractive bicycle lanes

### Urban infrastructure

We advise cities and municipalities on the development of urban life through improved connectivity

### Bicycle parking

We plan, develop and design bicycle parking and innovative parking racks

### Bridges

We design bridges for soft and motorized traffic



### Station forecourts

We shape attractive and flow-efficient public space in connection with stations and traffic hubs

### Train stations

We design, renovate and transform stations for local, regional and international train traffic

### Metro lines

We contribute to feasibility studies and design stations for metro lines

### BRT systems

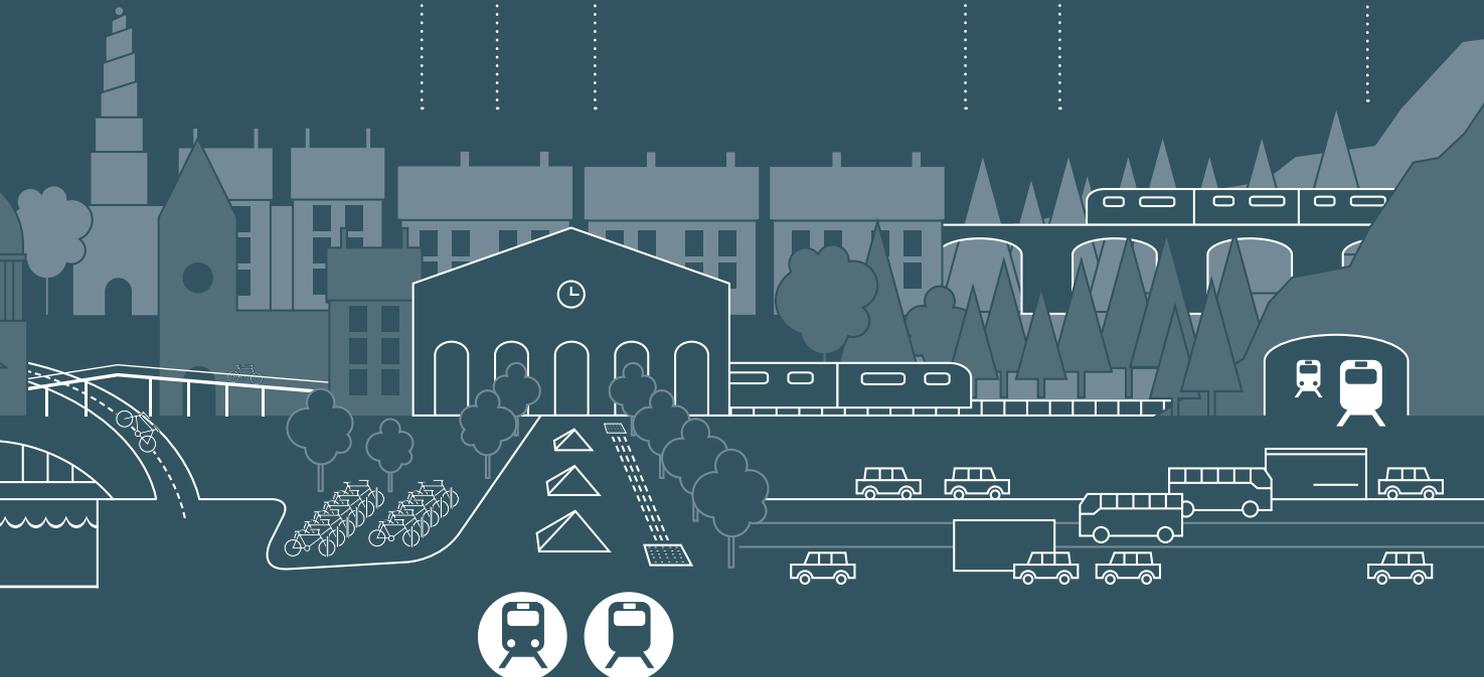
We plan and design for the integration of Bus Rapid Transit systems into existing urban contexts

### Industrial design

We design all the fittings, fixtures, equipment and furniture needed for urban space, station forecourts and platforms

### Railway lines

We contribute to feasibility studies, environmental impact assessments and design tasks for new railway lines



# green mobility

Urbanization contributes to shaping our society. People move from country to city for jobs, education opportunities and cultural offerings. The issues of overcrowding are compounded in towns and cities, while rural areas are left to deal with depopulation. At Gottlieb Paludan Architects, we contribute to easing the congestion in towns and cities and reducing the distance between country and city. For example, we have been involved in designing for the Danish State Railways continuously during the last century. We focus particularly on developing transport hubs, intermodal passenger transport and cohesion with the surrounding urban space – both in Denmark and abroad.

It must be easy and attractive to travel – across the country, within the town or city, by public transport, by bicycle, in a car or by a combination of several modes of travel. We regard this as a key job for architects. We design light rails, bus systems, stations, traffic terminals, bridges, urban squares, station forecourts, roads, streets as well as workshops, technology buildings and control rooms, improving travel experiences and traffic flows. In addition, we promote bicycle culture with projects such as foot and cycle bridges, bicycle paths and bicycle parking facilities.

However, our mobility solutions are not just about getting from A to B. They must also become part of the surroundings. Therefore, we





## Network Rail Footbridge

Visualization: Gottlieb Paludan Architects

design stations and forecourts that enhance the overall quality of the urban spaces in which they integrate. Likewise, we design roads and railway lines, so the infrastructure makes its own contribution to the urban or rural environment and not merely in the form of convenient utility value.

We have delivered innovative and reliable solutions to our customers since the turn of the 20th century. Our extensive experience has taught us to appreciate the complexity of mobility projects. Generally, such projects attract great public attention and involve many stakeholders. As consulting architects, we understand what it means and what it takes to work on projects to which many parties have legitimate requirements and attitudes.

Mobility projects are also part of our communal public space. They become integral parts of many people's everyday lives. Therefore, we are committed to developing solutions that are functional, user-friendly and aesthetically pleasing.

Network Rail's design competition sought ideas for pedestrian footbridges with optimised accessibility that can be used across the British rail network. Network Rail owns almost 2,400 footbridges across all of Great Britain, only 200 of which meet the future requirements.

Gottlieb Paludan Architect's design 'The Framing Bridge' will improve accessibility for train passengers and other pedestrians. The new footbridges must also address the challenges of electrifying the rail network with overhead masts and lines that require extra clearance above the tracks. Gottlieb Paludan Architect's winning design will be developed further and adapted to the many different locations where it is expected to be deployed.

The simple construction and framing of the bridge creates an open space where local features or artistic elements may be added. In addition to contributing to a good overview of the platform, the simplified design makes the bridge more identifiable and adaptable, both technically and architecturally.

This project contributes to the realization of several Goals. Economic growth, social development and climate action are heavily dependent on good infrastructure.

## Network Rail Footbridges

Gottlieb Paludan Architects won the design competition for new footbridges for Network Rail which owns and operates 32,000 km of the railway network in England, Wales and Scotland.





## DSB's maintenance facilities for new electric trains: DGNB Certification

In collaboration with Rambøll and Mott MacDonald, Gottlieb Paludan Architects has won the project for the design of three maintenance facilities for Denmark's new fleet of electric trains. Gottlieb Paludan Architects hereby consolidates the position as Scandinavia's preferred infrastructure architects

Danish State Railways DSB is entering a new era of electric trains. During the coming years, the national transportation company will replace its more than 100 current trains with electric trains in order to contribute to a more sustainable Danish public transport sector. In connection with this transition, DSB needs to establish three new maintenance facilities in the cities of Copenhagen, Aarhus and Fredericia.

Gottlieb Paludan Architects will be responsible for architectural and landscape work on the project, thus continuing its 100-year collaboration with DSB. Gottlieb Paludan Architects has been involved in all of the previous railway workshops in Denmark, and as such is able to contribute with extensive experience in this area. Sustainability is a guiding principle for the new facilities that must be certified under the DGNB sustainability standard.

This project represents one of the largest current developments towards a more sustainable Danish transport infrastructure and we are very glad to be involved. Gottlieb Paludan Architects specializes in infrastructure and buildings for

The new maintenance facilities are an important tool for DSB to reach the ambition of reducing their energy consumption with

# 50% by 2030

public transport and proudly contributes to Denmark's leading position in sustainable infrastructure and construction.



## Extension of Aarhus Light Rail

Gottlieb Paludan Architects has won the assignment to plan and shape the extension of Aarhus Light Rail in collaboration with Rambøll, Trailc, LE 34 and French landscape architects Ilex. New lines between "Spanien" in Aarhus C og Brabrand, between Lisbjerg School and Hinnerup, to Aarhus Ø and a new station on the main line in Brabrand make up the elements of this stage 2 of the light rail in Aarhus.

The aim for Aarhus Light Rail is to create a coherent infrastructure for Aarhus and its suburbs. Through the connection of separate urban areas



the light rail can contribute to the development of a more accessible, efficient and sustainable city - and with its large capacity it can ensure residents of Aarhus easy and efficient means of commute to and from work or education. The ambitions for the winning design are to add new qualities to the city, rather than just 'steal' away space for new infrastructure - all for the purpose of creating an attractive transportation alternative for today's car drivers. Gottlieb Paludan Architects is responsible for station design and integration of the light rail into the urban and landscape context.

The following will introduce the assessment method that we applied for the development of the design and integration solutions in the tender competition process.

### Mobility

The four modes of traffic which characterize an urban space – light rail, cars, pedestrians and bicycles – influence one another. If special attention is paid to one type of traffic, it will inevitably affect the others. There may be good reasons to change the balance, so certain areas or stretches, for example, do not provide access to some modes of traffic, however, the interactions need to be carefully assessed.

### City

The city's traffic is affected when light rail is constructed but so is the urban space and the life that unfolds in it changes. The physical manifestation of the light rail, in the form of stations, rails and masts, is an aspect. Another aspect is the landscaping-architectural change, from the greens over the paving to the lighting and fixtures. The recreational opportunities offered to

citizens to stay and utilize the urban space are a third aspect, while the economy for a solution is a fourth aspect.

### Assessment method

The diagram on p. 41 provides a simple graphical representation of the eight factors that form the basis for evaluating a solution proposal. Mobility is portrayed on the left side while other conditions have been placed on the right side. This diagram was used to display various scenarios and thereby reach the best possible outcome.

**Light Rail:** The light rail route is intended to support passenger comfort and provide travelers with value of experience along the route. The Light Rail's route and stoppages must create the best track geometry, suspension of running current systems, power supply and signal systems.

**Cars:** Motorists must experience clear and well-functioning traffic along the route. Any redirection of traffic should affect the surrounding city as little as possible.

**Pedestrians:** For pedestrians, the urban space along the stretch must be experienced as varied, experiential, safe and accessible. The light rail must not be perceived as a barrier in the street space but must create and strengthen new connections in Aarhus.

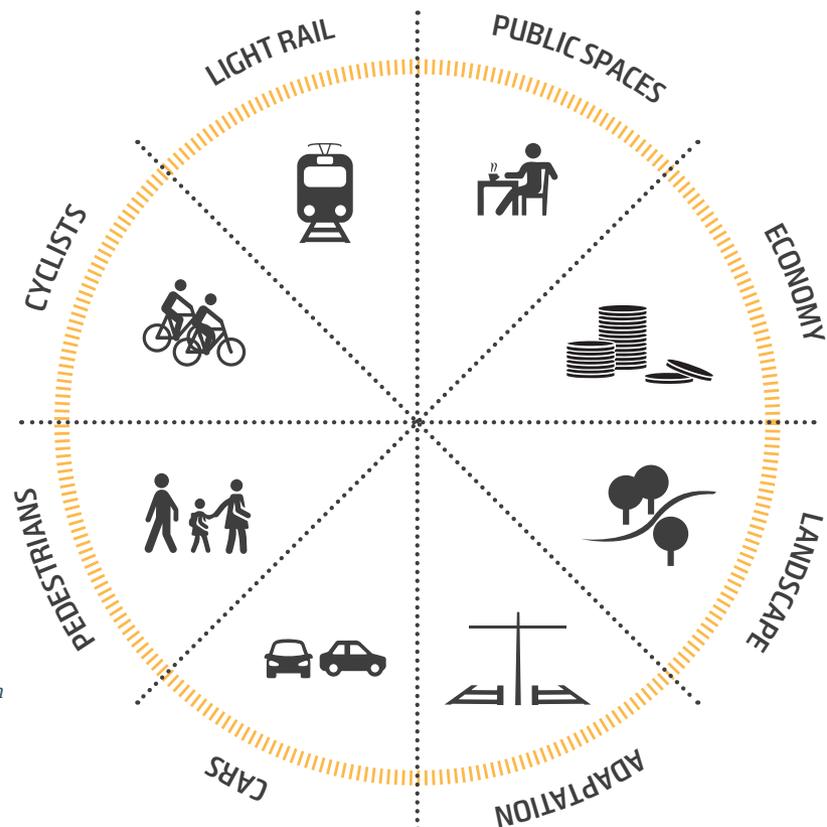
**Cyclists:** The bicycle connections along the stretch must be interesting, clear and secure and offer experiences that are not available today.

**Landscape:** It is essential that the green character of the stretch is preserved and reinforced, if possible. In addition, environmental concerns must be integrated into the solutions.

**Public spaces:** Where possible, the construction of the light rail should help to create attractive urban spaces with the possibility of communal activities and other functions.

**Adaptation:** The light rail's technical infrastructure - tracks, masts, stopover fixtures, etc. - must make a positive contribution to the area and adapt to local conditions.

**Economy:** The total construction economy of a scenario contains not only the project itself but also the derived costs for e.g. wiring and for handling interim situations.



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**Aarhus Light Rail**  
 Visualization: Gottlieb Paludan  
 Architects

>  
**Infographic**  
 Assessment method

### **Industrial facilities**

We specialize in the development and design of efficient, sustainable and architecturally distinct industrial facilities.

### **Recreational storm water solutions**

We offer experienced specialists in recreational rainwater management and integrated solutions for complex climate challenges.

### **Cooling plants**

We helped design the very first sustainable cooling plants in Denmark and we continue to assist in this sector

### **Control facilities**

We have delivered numerous control room facilities securing optimal work environments and the highest level of operational safety.



### Water works

We have contributed to developing Denmark's clean and efficient groundwater extraction system by designing state-of-the-art waterworks

### Heat and power plants

Having realized a very large number of projects, we have gained outstanding competencies within the planning and design of sustainable power plants.

### Data centres

We have managed the planning and design of some of Denmark's largest data centres

### Switch stations

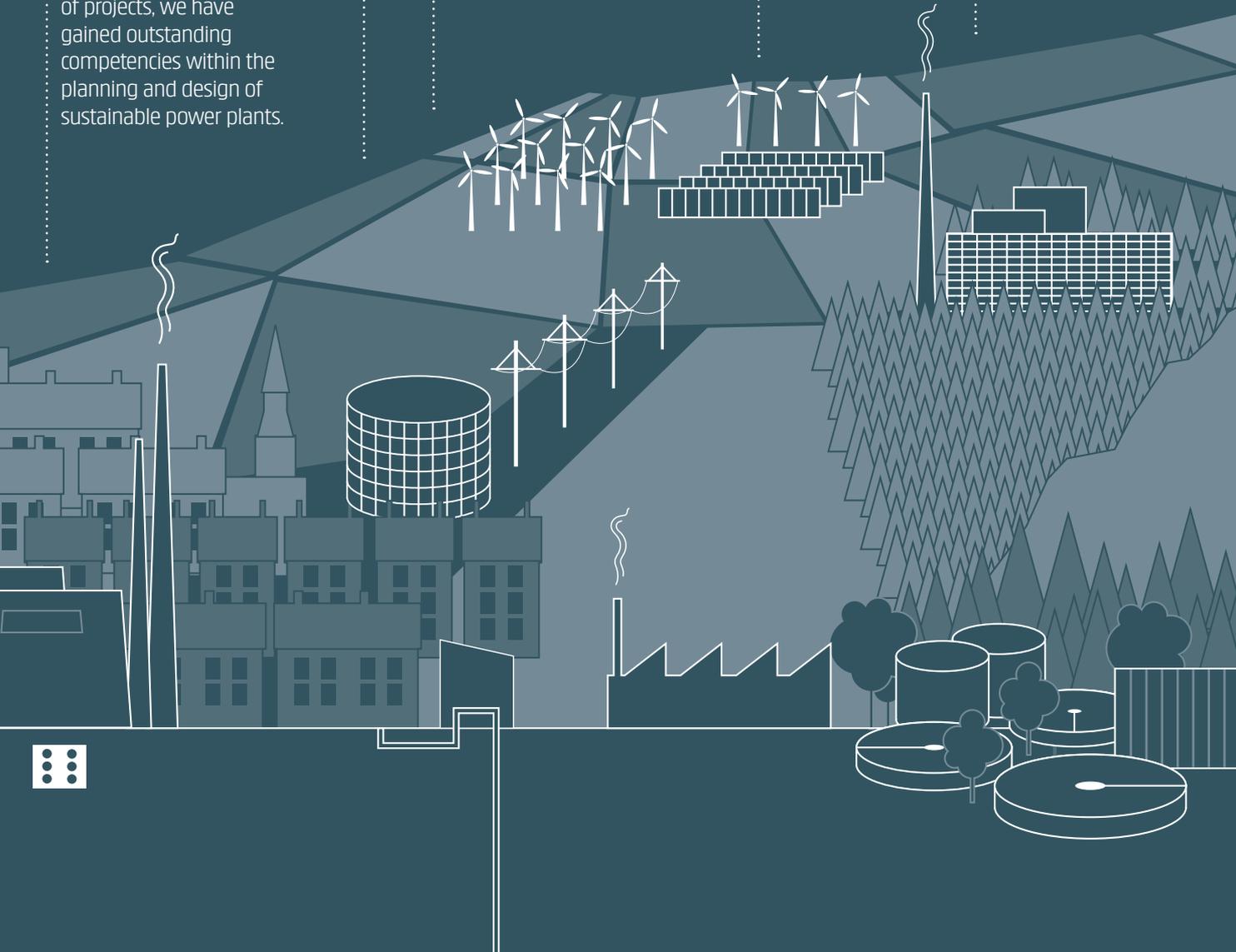
We design new switch stations as well as extensions of older facilities – large and small alike

### Energy from Waste facilities

We design some of the largest EfW facilities in the world

### Waste water treatment plants

We have a lot of experience with water treatment plants and their integration into often scenic and protected surroundings



>  
**Map of Gottlieb Paludan Architects' energy projects on Copenhagen's inner harbour front**

*Gottlieb Paludan Architects*



**SUNDKROGSGADE**  
 2019  
 COOLING STATION



**SVANEMØLLEVÆRKET**  
 20??  
 CONTROL ROOM & TRANSFORMATION PROJECT



**KALV**  
 20??  
 STORM WATER STATION



**VASBYGADE**  
 1984  
 PUMP STATION



**H.C. ØRSTEDSVÆRKET**  
 2011  
 SUBSTATION



**AVEDØREVÆRKET**  
 1992  
 CHP PLANT



**SVAF**  
 2018  
 HEAT PUMP





**NORDHAVN**  
2018  
HEAT PUMP - GROUNDWATER

CTR



**AMAGERVÆRKET, BIO 4**  
2020  
POWER PLANT



**BORGERGADE**  
2010  
COOLING PLANT



**KVÆSTHUSMOLEN**  
2010  
SEAWATER CHAMBER



**KALVEBODBRYGGE**  
2011  
SEAWATER CHAMBER



**TJETGENSGADE**  
2011  
COOLING PLANT



**FÆLLEDDIGET**  
2019  
COOLING PLANT



# Green energy

A well-functioning society with high levels of activity and comfort is bound up with the availability of safe and environmentally friendly utilities. The development and design of the energy sector's physical infrastructure is a core business area and a key architectural challenge for us – not least integrating these buildings and facilities with the surrounding urban or rural landscapes.

Since the 1940s, Gottlieb Paludan Architects has advised a wide range of clients within the energy and utilities sector. With several hundred realized projects on our record, we have gained extensive expertise within this field. This includes power stations, district heating and cooling plants, biogas and geothermal plants, waterworks, water treatment plants and waste incineration plants. Over the years, we have also designed many related operations and service facilities, such as control rooms, laboratories, workshops and administration offices.

Over the last few years, we have provided architectural expertise on a number of high-profile projects that promote the shift from fossil fuel to renewable energy sources as not merely a technical issue but also as a visible project engaging the community at large. We take on projects of all sizes, ranging from large plants built in open landscapes to smaller plants in towns and cities as well as renovations of existing facilities. Good infrastructure is an obvious prerequisite for prosperity and sustainable development whatever the scale.

# Nominated for

*The Danish Landscape  
Architecture Award*

# 2019



## Solrødgård Climate and Environment Park

The aim of Solrødgård Climate and Environmental Park is to transform farmland into a multi-functional “energy-landscape” and create an inviting and attractive setting for the exploration of the energy cycles that are fundamental to daily life.

Solrødgård Climate and Environmental Park houses a new headquarters for Hillerød Utility Company, a wastewater treatment plant, a recycling centre, a geothermal system and a number of demonstration plots. The Climate and Environmental Centre, is a key factor of the park and epitomizes its sustainable profile.

The facility is situated in the southwest part of

Hillerød. On account of the area’s scenic qualities and topography, the earthworks, rainwater ditches and hedgerows in green wedges from the edge of the area conduct rainwater down to a new landscape of streams and meadowland. This new wetland will be established by Slænbækken and Havelse streams, which in torrential rain will enlarge into a lake. The lake will receive rainwater from the Solrødgård Climate and Environmental Park and absorb run-off from the surrounding areas.

Sustainability is a central element of the design of the design with special emphasis on:

- » **Building Class 2020:** This is an achievable ambition via mainly passive measures, such as daylight optimisation and hybrid ventilation,



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### Solrødgård Climate and Environmental Park and Centre

*Photo: Lars Rolfsted Mortensen*



supplemented by elements such as solar panels, green roofs and recycling of rainwater.

- » Exit strategy: The design facilitates disassembly into recyclable sections at the end of the complex's service life, which means that "raw" materials are prioritised with only the bare minimum of surface treatments, grouting, etc.
- » Social sustainability: Integration between different functions, groups of professionals and internal/external users is a clear priority in the organisation of the complex. Visitors to the Climate and Environmental Park are invited to explore close-up the various utility functions and processes, such as water treatment and the generation of green energy. ter to clean and safe drinking water.



### The Amager Power Plant, BIO4

Gottlieb Paludan Architects has designed a new biomass-fuelled combined heat and power unit for Copenhagen with a "forest facade" that people can walk in.

As a symbol of renewable resources, 'The forest' will be a recurring architectural theme for both the new combined heat and power (CHP) unit, BIO4, at the Amager Power Plant and the master plan for the future development of the area.

The planting of trees is a principal, distinguishing element of the landscape design. The CHP unit is enclosed by a deep façade made up of suspended tree trunks. The tree trunks are sourced from South African FSC labelled eucalyptus trees. The FSC aims to promote environmentally appropriate, socially beneficial, and economically viable management of the world's forests. The cultivar is thus both sustainably produced and long-lasting. The facade tangibly depicts the changeover from fossil fuels to renewable energy.

BIO4 integrates seamlessly with the existing technical installations, while infusing the peninsula with new architectural expression. Though prioritizing security and safety, the architectural design enables visitors to get close to the energy production processes and learn about the resource cycles involved.

The plant is an important element of the City of Copenhagen's efforts to become the world's first carbon neutral capital by 2025.

An analysis by the European Commission shows that biomass emits 90% less CO<sub>2</sub> than coal and gas.

# 90% less CO<sub>2</sub>



### Amager Power Station, BIO 4

Visualization: Gottlieb Paludan Architects

### Køge Waterworks

Photo: Lars Rolfsted Mortensen



### **Køge Waterworks**

Gottlieb Paludan Architects is responsible for the design project for a new “water house” commissioned by the local utility company in Køge near Copenhagen.

The project encompasses a test centre and a new waterworks as well as a new headquarters for the local utility company with workshops, garages and administration areas. All functions are brought together in one transparent building perched at the highest point on the site and the processes are visible from the outside.

A large sloping roof conducts rainwater to the

lower-lying areas of the site. An existing lake is enlarged into a rainwater reservoir which, in case of torrential rain, is also capable of receiving runoff from the surrounding countryside. The facility is designed to safeguard drinking water specifically in connection with cloudbursts.

The general public is invited to get close to the water processes both inside and outside the facility. The result is a “water house” with a “water park”, an outward-facing facility which will be an attractive place to work and will generate value for the local community. It will contribute to the research on water treatment of the future and engage visitors by telling the story about the cycle of water from rainwater to groundwater and from groundwater to clean and safe drinking water.



## our focus in 2019/2020

### During the coming year, we will focus on:

- » Constantly improving our work environment.
- » Applying for funding for an industrial PhD-project, in collaboration with KADK, from Innovation Fund Denmark. The project will employ a novel sociological study of our work practices in order to innovate and expand Gottlieb Paludan's expertise within coordinating inclusive public spaces.
- » Enabling effective integration of our new Scandinavian colleagues.
- » Working intensively to retain our position as Scandinavia's preferred infrastructure architect.
- » Engaging with our customers to promote recycling and increase the use of local and sustainable materials.
- » Actively pursuing assignments and research projects with a sustainable profile.
- » Continuing to invest in professionalising our employees with the newest knowledge within the field of sustainable solutions, in order to enhance sustainability in an even greater extent.
- » Devoting ourselves to a monitoring and evaluation mechanism in relation to the implementation of the ten principles of the UN Global Compact and the UN Sustainable Development Goals as an integrated part of our daily practice and corporate identity.



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**The Arena Quarter**

*Photo: Gottlieb Paludan Architects*



**GOTTLIEB  
PALUDAN**  
ARCHITECTS