

ARCHITECTURE CREATES VALUE

**Buildings, urban spaces and
landscapes generating social,
economic and environmental value**

**DANISH
ASSOCIATION OF
ARCHITECTURAL FIRMS**

Architecture should generate more value for more people by making the best use of the resources available. This is the challenge facing every project, large or small, and architectural design is able to create value at many levels – socially, environmentally and financially.

In view of the fact that construction accounts for 30-35 % of society's resource consumption, architects face a challenge, and a unique opportunity, when it comes to developing society in relation to the UN Sustainable Development Goals. Architects work at all levels in our surroundings, from urban development to product design, from urban spaces to buildings. All these levels must be coordinated in order to achieve the best possible conditions for sustainable development. This booklet presents buildings, urban spaces and facilities designed by Danish architectural firms. The value generated by these projects has been documented by analyses, assessments, statistics and data. The results can be surprisingly impressive, whether in connection with improved health, well-being and learning or improvements to the environment or economy. Value is created jointly, requiring many considerations and involving many types of expertise. We must find solutions that create value at many levels, both for those who use the buildings daily and for society as a whole. By far the majority of the projects presented here result from innovative processes in which architects have challenged project developers and user needs through a dialogue to define the strategies required to materialise a joint vision and to carry ideas through to the completed

building. In architectural projects, we need to focus on processes, efficiency and construction costs. To achieve this, architects use digital models that provide an overview of the technical performance of a building, area allocations and the amount of materials, and thereby financial resources, needed for a project. The models improve decision making support, and provide a collaboration platform for project developers, architects, engineers, suppliers and contractors that enables them to complete construction as cost-effectively as possible. However, the next wave of digital technologies can provide an even more precise and dynamic understanding of how surroundings affect the behaviour and well-being of people, and how buildings and neighbourhoods act and change over time. Architects are already working on the lifecycle of buildings, and are setting up design strategies for the economic and environmental consequences caused by the flow of materials and resources. By using circular economy concepts, solutions that are currently creating waste issues can be redefined and become resources for future generations. Design solutions are vital: How to understand the challenges, and how each part of a solution creates the most possible value for the most possible people for the longest possible time.

The examples of architecture creating value in this booklet are grouped according to themes. The themes address the social, environmental and cultural dimensions that architects work with. There could be more themes, and they could be defined differently. The best projects add value in several dimensions. Accordingly, all the projects presented in this booklet could be categorised into more themes than those we have grouped them into here.

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HEALTH

QUALITY IN BUILDING MEANS HEALTHIER CITIZENS

Space and surroundings affect mental and physical well-being. Access to daylight, fresh air and appealing outdoor spaces stimulates health, comfort and well-being. Architecture with a good indoor climate can contribute to fewer sick days; daylight and green surroundings mean patients can be discharged from hospital sooner; and parks and appealing outdoor spaces affect public health.



69 % DROP IN PHYSICAL RESTRAINTS
DEPARTMENT OF PSYCHIATRY, ESBJERG
ARKITEMA ARCHITECTS
 Significant reduction in the use of physical restraints at the Department of Psychiatry, Esbjerg.

50 % OF USERS HAD PREVIOUSLY NEVER PLAYED SPORTS AT A SPORTS CENTRE
DGI HUSET AARHUS
SCHMIDT HAMMER LASSEN | 3XN
 Diversity, spaciousness and atmosphere attract new users to Aarhus' sports centre DGI-Huset.

27 % less use of physical restraints
30 % fewer occupational accidents
59 % reduction in the use of sedatives



DEPARTMENT OF PSYCHIATRY, AABENRAA
WHITE ARKITEKTER | DEVE ARKITEKTER
 New facilities support behaviour and therapies that have reduced occupational accidents and the use of force.



URBAN LIFE

GOOD URBAN SPACES HELP MAKE AREAS MORE INVITING

Buildings and urban spaces help create a better quality of life for citizens, improve social cohesion, and can even have a significant branding effect. In order to create liveable urban environments, access to parks and nature is very important, as is stimulating a thriving business community and outdoors activities. Likewise, the area must feel safe and accessible. All these elements greatly depend on the design of buildings and urban spaces.

**STRONG IDENTITY AND SENSE OF BELONGING
SUPERKILEN**

BIG - BJARKE INGELSGRUPP | TOPOTEKI | SUPERFLEX

A dynamic activity space and meeting area for local initiatives in in Nørrebro, Copenhagen.



Photo: Ivan Baan



Photo: Adam Merk

**MORE THAN 750,000 VISITORS EVERY YEAR
THE CULTURE YARD**

AART ARCHITECS

The Culture Yard in Elsinore is a popular success and very important for the city's cultural development.



Photo: JWH

**AALBORG HARBOUR BATH
JWH ARKITEKTER | ETN ARKITEKTER**

A gathering place to swim, relax and socialise is revitalising the harbour front in Aalborg.

88 % are satisfied or very satisfied with the harbour swimming facilities



**THREE TIMES AS MANY VISITORS,
UP TO 50,000 A YEAR
HERNING LIBRARY**

GPP ARKITEKTER | ARKITEKTFIRMA KRISTIAN H. NIELSEN

Time and money were saved by reusing the existing building's concrete construction rather than demolishing it and building a new one.

**71% OF TOURISTS ARE SATISFIED
OR VERY SATISFIED**

**MARIELYST: THE SQUARE AND THE BEACH PATH
GHB LANDSKABSARKITEKTER | ETN ARKITEKTER**

The renewal of the square and beach boardwalk in Marielyst creates value for tourists, citizens and local businesses.

“Rarely have you seen a prouder Mayor. From now on, the square we are standing on will be the hallmark of Guldborgsund. Forget everything you have heard about problems in rural Denmark.”

John Brædder, Mayor of Guldborgsund Municipality, 2015

GOOD ARCHITECTURE IMPROVES LEARNING

The appearance and design of a space signals the values and attitudes of an organisation or community. Good workplaces and learning environments provide ample opportunity for sharing knowledge, working together in larger or smaller groups or finding room for solitary concentration. Attractive environments can boost recruitment, students' results or visitor numbers, and affects behaviour, well-being, productivity and learning – which in turn can generate financial value.

PRODUCTIVITY & LEARNING



Photo: Lars Kaase

EMPLOYEES EXPERIENCE IMPROVED PRODUCTIVITY
ALLER MEDIA BUILDING
PLHARKITEKTER

New facilities enhance Aller's image and communication with its stakeholders and provide employees with new opportunities for collaboration in their daily work.

Improved innovation and entrepreneurship, as well as significant increase in the number of start-up enterprises



Photo: STAMERS KONTOR

DTU SKYLAB
JUUL | FROST ARKITEKTER
 Popular meeting place inspires more innovation and entrepreneurship with its transparent walls and intelligent acoustics design.

DOUBLES THE NUMBER OF STUDENTS CONTINUING TO FURTHER EDUCATION
VUC SYD

AART ARCHITECTS | ZENI ARKITEKTER
 If just one in three can be moved from benefits to employment, an estimated annual added value of more than DKK 60 million would be added to the public purse. Therefore, the education centre will have paid for itself in just three years.

Photo: Jens Lindhe

CLIMATE

ARCHITECTURE CAN HELP IN THE FIGHT AGAINST CLIMATE CHANGE

Construction is one of the largest contributors to climate change, mainly due to large consumption of energy and materials. However, it is possible to design urban spaces that are capable of dealing with extreme weather conditions, while at the same time adding new qualities to the urban space. Studies show that there are significant financial savings to be gained by combining climate protection with the construction of new facilities. We can reduce the climate footprint of buildings drastically by improving energy-efficiency and by designing buildings so that materials can be reused in new contexts.

Rebaldersparken, GHB Landskabsarkitekt, SNE Architects, Photo: Rune Johansen



Photo: Carsten Ingemann

LOW-LYING BUILDINGS IN THE AREA ARE PROTECTED AGAINST A 100-YEAR EVENT

**SØNÆS
MØLLER & GRØNBORG**

Recreational city park brands a city neighbourhood, attracts house buyers and reduces the risk of flooding and leaching of phosphorus and nitrogen.

Adapting to climate change using green solutions can reduce costs of underground infrastructure by 75 %



**LINDEVANGSPARKEN
MARIANNE LEVINSEN LANDSKAB**

Innovative and inviting urban spaces and landscapes exploit rainwater creatively rather than sending it to the sewers.

Photo: Torben Petersen



Photo: Rune Johansen

**TAASTRUP AVOIDED FLOODED BASEMENTS
AFTER THE CLOUDBURST IN JULY 2011
SELSMOSEN
FORCE4 ARCHITECTS**

The combined technical installation and recreational area Selsmosen has created a new and inviting urban space in Taastrup.



Photo: Kontrastframe

**REDUCES DAMAGE COSTS BY MILLIONS
OF DANISH KRONER
LE MUR
HASLØV & KJÆRSGAARD**

The high-tide installation Le Mur protects the area from high tides while simultaneously generating activities and revitalising the harbour front in Lemvig.

” The concrete wall has been part of transforming Lemvig Harbour into a bustling area with activities for local citizens, tourists and sailors. It was necessary to secure the town and harbour of Lemvig. We chose to make a virtue out of the necessity and we have thereby gained much more out of our investment for everyone.

Erik Flyvholm, Mayor of the Municipality of Lemvig, 2015

SOCIAL COHESION

ARCHITECTURE SHAPES COMMUNITIES

Buildings and urban spaces help create an identity, a sense of belonging, a sense of security and social cohesion. Our surroundings reflect who we are, who we wish to be and where we come from. Our surroundings can be shaped in a way that not only generates value for the individual but also creates communities and rich experiences, stimulates participation or ensures accessibility for all. Even small projects can redefine a place, give it a new narrative, or reverse or generate a trend.

**UP TO 17,000 VISITORS ANNUALLY
EGBJERG MØLLE
PRAKSIS ARCHITECTS**

Egebjerg Mølle is the pride of the local community and has become a gathering point in Egebjerg Bakker.



Photo: Per M. Hansen

“The local community takes pride and joy in the mill. We see that they return to visit it again and again. They also bring guests from other parts of Denmark to the mill to show the unique attractions Southern Funen can offer.”

Per M. Jensen, Chairman of Egebjerg Mølle Guild



Photo: Mikkel Frost

**80-90 % OF LOCALS HAVE USED THE HALL
IN THE COURSE OF A SEASON**

**MULTIHALLEN
CEBRA**

The refurbishment has strengthened social cohesion, created a sense of pride in the local community and bolstered tourism.

RESOURCES

REUSE IS GOOD FOR THE BOTTOM LINE

Architecture should generate as much value as possible

from the resources invested in a building. New Danish buildings are among the most energy-efficient in the world, but there are still challenges with regard to reducing the energy consumption of existing buildings. When architects design with circular economy in mind, resources can be recycled and recirculated. This results in significantly improved environmental profiles, and accounts for a growth potential of DKK 8.5-12 billion in the Danish construction industry alone.

”Originally, we thought the 65 % reduction in carbon emissions was unrealistic, but once we completed our calculations, it turned out that our carbon emission accounts were almost 86 % better than the benchmark house.”

Anders Lendager, Lendager Group, Realdania Byg 2014



Photo: Adam Mørk

**NATURAL VENTILATION WITH 70 %
HEAT RECOVERY
DTU COMPUTE B324**

CHRISTENSEN & CO. ARKITEKTER | KRAGH & BERGLUND
Green solutions have been implemented from floor to ceiling at DTU's Department of Applied Mathematics and Computer Science.



Photo: Jesper Ray

**86 % LESS CO2 DURING CONSTRUCTION
UPCYCLE HOUSE
LENDAGER GROUP**

The single-family house in Nyborg was built using recycled materials. Upcycling and circular economy means materials are given new life and the environmental impact is significantly reduced.



**RAMBØLL HEAD OFFICE
MIKKELSEN ARCHITECTS**

Adapting to climate change and innovative architecture reinforces Rambøll's brand as a visionary enterprise.

Daylight enhances the well-being of employees and reduces energy consumption. The need for cooling is reduced by 85 %

Real estate constitute a significant share of society's assets and buildings account for 30-40% of resource consumption. Due to this, strict financial diligence is a core element in construction and refurbishment. High quality design can stimulate a number of derived effects such as improved health, productivity and learning or improved urban life. The calculated value of these effects can surpass the initial costs of construction within just a few years, generating improved return on investment for clients as well as communities.

THE WEALTH OF SOCIETY IS TIED UP IN BRICKS AND MORTAR

ECONOMICS



Photo: Carsten Ingermann

**NEW CONVERTED ATTIC APARTMENTS FINANCE
A 56 % DECREASE IN ENERGY CONSUMPTION
RYESGADE 30 A-C**

KRYDSRUM ARCHITECTS | RØNBY.DK

Ambitious energy renovation reinforces preservation-worthy architecture while simultaneously making the conversion more attractive for residents and providing a better investment for the project developer.



Photo: Jens Lindhe

**SEVENFOLD INCREASE TO
422.000 VISITORS IN A YEAR
MOESGAARD MUSEUM**

**HENNING LARSEN ARCHITECTS |
ARKITEKT KRISTINE JENSEN TEGNESTUE**

The increase in the number of visitors to Moesgaard Museum has meant increased revenues and growth in the tourist industry in Aarhus.

**40 % more cyclists
in the area = 20,700 cycle
every day = DKK 5 million
in time saved for cyclist
commuters**



**BICYCLE SNAKE
DISSING + WEITLING**

Photos of the Bicycle Snake have gone around the world and the bridge effectively brands Copenhagen as the world's leading city for bicycles.

Photo: Rasmus Hjortshøj

Sønder Boulevard has given such a lift to the neighbourhood that the costs of the city park will be recovered in a year and a half



**SØNDER BOULEVARD
SLA**

The value of the green avenue is seven times more than total construction costs.

Photo: Mads Klitten

**22% CHEAPER RENT - 68% LESS CO2
DANMARKSHUSENE
TEGNESTUEN VANDKUNSTEN**

Danmarkshusene in Rødovre are a new generation of cheap, sustainable and attractive social housing.



Photo: Jens Lindhe



Photo: STAMERS KONTOR

**THE WORLD'S MOST ACCESSIBLE
HOLIDAY CENTRE
MUSHOLM HOLIDAY APARTMENTS**

AART ARCHITECTS | KEINGART | BSAA URBANLAB

With a DKK 35 million growth in revenue, Musholm is proof that accessible architecture can make a difference to society and simultaneously generate economic development.

BUILDABILITY



BUILDINGS SHOULD BE FLEXIBLE TO MEET NEW NEEDS

An efficient construction process saves time and money. Buildings should be flexible so that they can be modified easily when new needs arise. Buildability ensures that buildings can be upgraded periodically and that elements can be replaced and used again in new contexts. Last but not least, buildability ensures a good working environment during building construction and maintenance.

” Green Solution House reflects the dynamic society on Bornholm. Twenty years ago, we were mostly a fishing community, but now commerce, manufacturing, tourism and high green ambitions are just as important - this is clearly exemplified by this building.”

Winni Grosbøl, Mayor of the Regional Municipality of Bornholm, Magasinet Byggeri

Hotel revenue increased by 20 % in a year and the money will be re-invested in new green solutions



GREEN SOLUTION HOUSE
3XN | STEENBERGS TEGNESTUE | SLA
The hotel and research centre Green Solution House is a local, national and international centre for green and sustainable ideas.

80 % cheaper
than a normal
sports hall



Photo: STAMERS KONTOUR



Photo: Søren Aagaard



Photo: Mads Frederik

25 % LESS CO2 FOR MAINTENANCE
BRICK HOUSE
LETH & GORI

The mini-CO2 house "Brick House" has an estimated lifespan of minimum 150 years and its facade will not need maintenance for 50 years.

NEWLY DEVELOPED FACADE SYSTEM PROVIDES IMPROVED SPACE UTILISATION. TOTAL SAVING: DKK 1 MILLION
DAMESALEN, UNIVERSITY OF COPENHAGEN
MIKKELSEN ARCHITECTS

Intelligent facade technology enables maximum use of space and daylight in Damesalen at the Department of Nutrition, Exercise and Sports.

SKATE PARK IN GENTOFTE
TEGSTUEN VANDKUNSTEN

The carbon neutral street sports facility saves 80% in life cycle costs compared to conventional alternatives.

The Danish Association of Architectural Firms has collected a number of examples of architecture that have generated added value. The projects were selected on the basis of aspects documented in each individual project. Our work in selecting the projects has also shown that there is still a lot to understand about the interrelationships between architecture, behaviour and well-being, as well as the interrelationships between architecture, the environment and the economy. We hope that these examples will contribute to a better understanding of these interrelationships and thereby help to create better surroundings for all of us in the future.

For more information, visit www.danskeark.dk

THANK YOU to our members - all the architectural firms who have contributed with their cases - without you we would have no examples of architecture with added value!

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