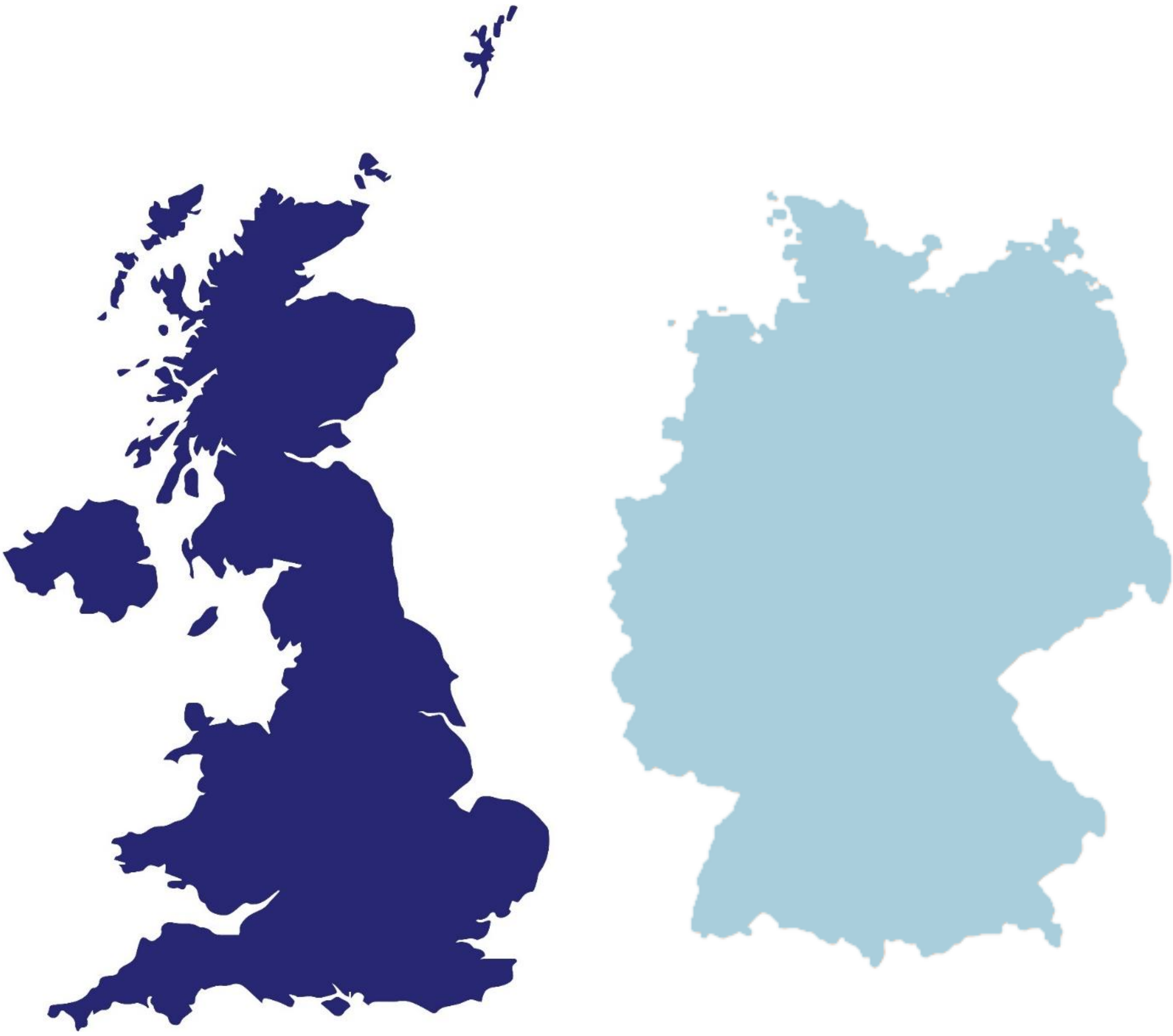
May 2016

OPPORTUNITIES IN THE GERMAN AND UK MARKETS FOR NORDIC LIGHTING DESIGN

INSIGHTS AND LESSONS LEARNED ABOUT BUSINESS-TO-BUSINESS EXPORT



Cover photo:
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Publisher:
The Danish Lighting Innovation Network, Lyskultur and Ljóstæknifélag Íslands.
The Report is carried out by Asser Kalsbøll on behalf of the above.

Publication Date
May 1st 2016

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Dear member

By addressing the concept of Nordic Lighting Design and export potential, we hope to inspire you to consider looking beyond your domestic markets. The report focusses on the German and UK markets because of their proximity to the Nordic countries both geographically and culturally.

In the report, three case stories will provide you with insights and inspirations with regard to the German and UK markets for professional lighting. In the section "Lessons learned", we collected insight from some of the best and most knowledgeable people in the industry. The most relevant local and global trends are explained with their relation to export of Nordic Design products and services.

Moreover, we invite you to join the movement: Establishing Nordic Lighting Design as a shared brand. A new, common starting point for your marketing activities. A conceptual framework that eases your own communication of product or service values to decision makers outside the Nordic region.

Best Regards

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OVERVIEW

This report has been prepared in relation to the LIGHTBOOST project – Boosting market potentials for Nordic Lighting Design. The project is supported by Innovation Express BSR STARS funding, and the report was prepared throughout 2015 and the beginning of 2016. The project partners are:

- Danish Lighting Innovation Network (www.dansklys.dk)
- Lyskultur (www.lyskultur.no)
- Ljóstæknifélag Íslands (www.ljosfelag.is)

Part 1 - Cases

This part presents some actual examples of companies that are present with Nordic lighting design products or services in the contract markets of Germany and UK. These examples aim to inspire and to share experiences.

Part 2 - Markets

This part brings together knowledge about what drives the markets, decision makers and the supply chain as well as lessons learned from companies and advisors that operate in the two markets.

Part 3 – Global Trends

This section introduces some global and local trends, which may be beneficial taking into account if addressing the markets in question.

Part 4 – Nordic Lighting Design

How can we describe the characteristics of Nordic Lighting Design? In this section, we conceptualize the Nordic Lighting philosophy and describe what makes it unique.

Contributors

This report would not be the same without the competent contributions from:

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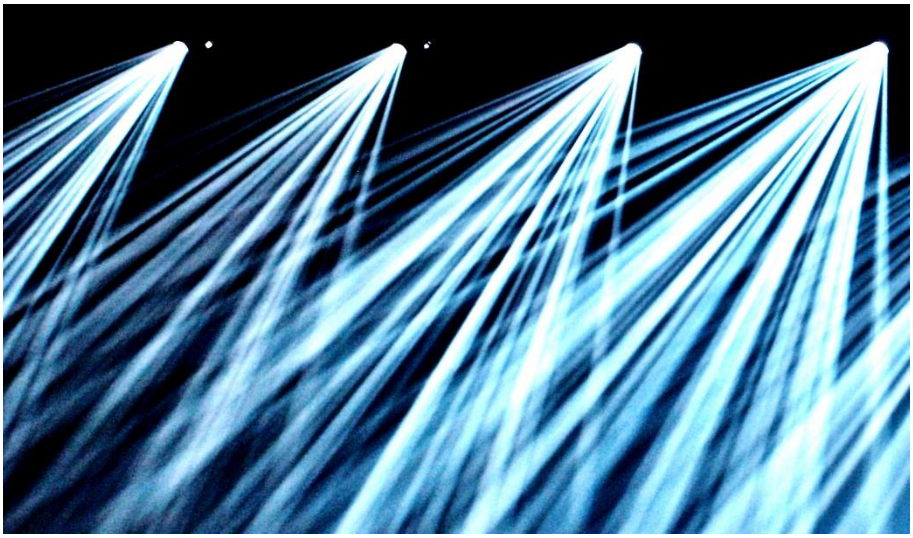


CONTENTS

PART 1 – CASES

This section contains three cases and three approaches to export of design products. The first case is about Lightyears A/S that is successful in exporting Nordic Lighting Design to 60 countries while maintaining a small organization. The second case is about Riegens A/S, a larger company that exports Nordic Lighting Design. Riegens A/S has a different setup in the UK than in Germany. The last case is about the family owned brickworks Petersen Tegl, which manufactures and exports high-end bricks to many parts of the world.

The cases intend to serve as inspiration on how to approach internationalization, how to setup sales and distribution and each case provides "lessons learned" from the process with an intended focus on the UK or German markets. All cases are Danish but chosen to apply to common situations of lighting companies in all of the Nordic countries.

Case: Lightyears A/S

Background

Lightyears A/S both develops and manufactures luminaires for the professional and private market. In just a decade, Lightyears has created an international brand sold in more than 60 countries while keeping a very lean organization of just 20 employees. Lightyears works in close cooperation with designers and architects to create modern luminaires combining tradition and innovation. According to Managing Director, Lars Østergaard Olsen, Lightyears is "New Nordic Lighting Design" and based on "a Scandinavian legacy". According to him, Lightyears is the only dedicated lighting specialist within "New Nordic lighting" whilst other companies are generic design companies. Financially, Lightyears has consistently generated profits since 2010 while maintaining investments in new products and new markets.

Lightyears managed to grow substantially in the professional market for "decorative lighting". Even into shops, hotels, offices and hospitality segments - though not being limited to zones such as the reception and "status" areas. Going forward, there is an increased focus on fulfilling these segments's requirements for documentation. So far, Lightyears has had the ability to create luminaires that have the quality requirements of the B2B markets but the design appeal of the residential market – and in some cases addressing both markets with the same luminaire. This creates a volume that further utilized the productions setup Lightyears currently have in China. One of the "hybrid" luminaires is the "Caravaggio Wall" that serves as an example of a luminaire designed for both markets.

Important events

Lightyears A/S is the former "Horn Lighting", and in 2005 "Horn Lighting" sold off Outdoor lighting to Nordlux and was relaunched as Lightyears A/S at Copenhagen International Furniture Fair in May 2005. Lightyears A/S, then with a new management on board, executed a new strategy based on high-end new Nordic lighting solutions for the indoor residential market. The strategy focused on designer luminaires of a high quality but with prices below key competitors. Since then, Lightyears has expanded to the professional markets and this has grown to be a very large part of today's business.

Facts

- Established in 2005 under the name Lightyears A/S
- Turnover is evenly split between the professional and the private market
- In 2015 Lightyears A/S is purchased by Fritz Hansen A/S
- 20 people employed in HQ in Aarhus, Denmark
- www.lightyears.dk

Caravaggio Wall, Grey

Markets

Lightyears A/S is present in more than 60 countries. Originally, Lightyears focused on the consumer markets but has increased their focus on (semi-)professional market since then. Today, roughly 50 % of the business is in the professional market and 50 % from the private market. The main driver of growth since 2011 has been the professional market.

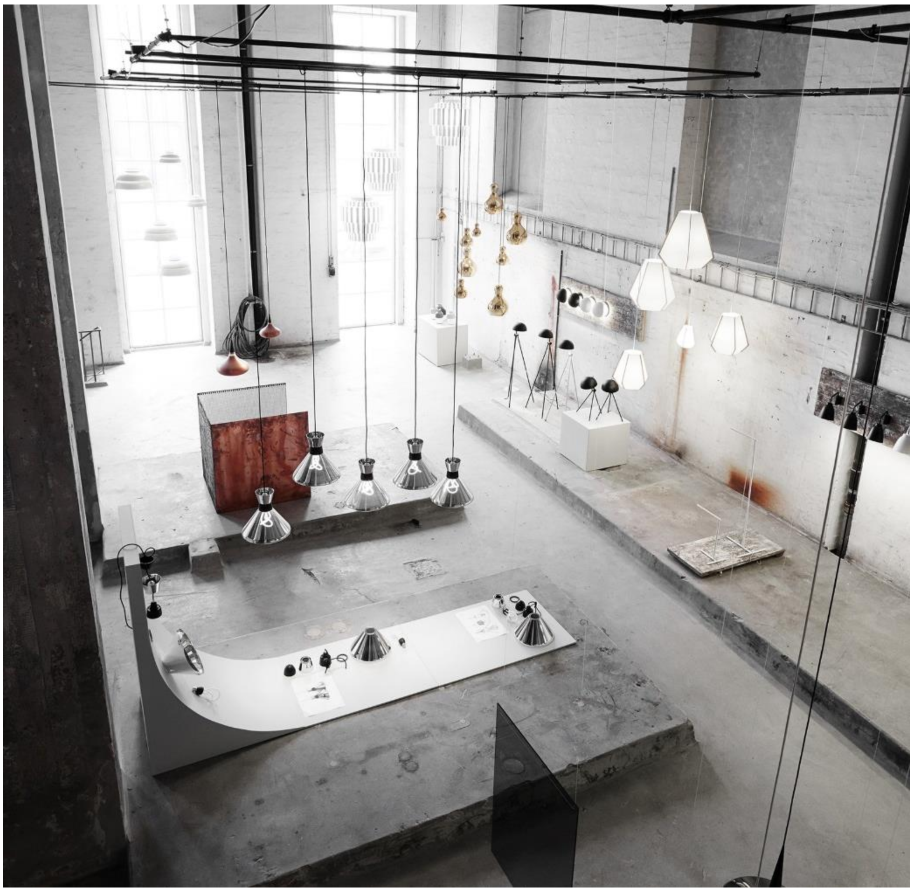
"...in every market segment there is someone who values Nordic Lighting Design"

Lars Østergaard Olsen, Managing Director, Lightyears A/S

Market Segments

Lightyears works only with "indoor" segments and is broadly represented here with the exclusion of the "Industrial" segment. They see the most willingness to pay for design in the "Shop" segments as well as "Hospitality" and "Office/institutions". As Lars Østergaard Olsen, Managing director at Lightyears states *"... in every market segment there is someone who values Nordic lighting Design"*.

One interesting effect of Lightyears's strong brand and market offering is the pull-effect experienced even by a small company such as Lightyears. Lightyears get regular requests from architects or interior designers around the globe. They are interested in their products and want to use them in a project. Often growth is driven by this type of demand as opposed to investing in pushing products to countries and cities chosen by analytical and strategic intentions.



With 160 years of brewing history, 8 meter high ceilings and a unique sense of space, the former Carlsberg production facilities now provide the unique surroundings for a showroom for Lightyears in Copenhagen. Architects and Interior designers from around the world visit to see the products in these industrial settings

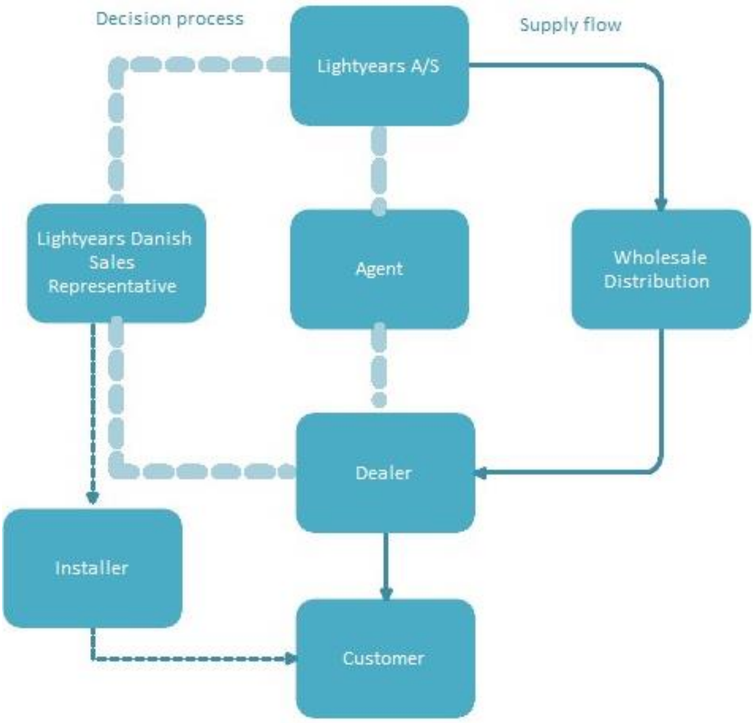
Boom in the Shop segment

Besides a new strategy and a turnaround in 2005, one of the important events that led the growth of the professional markets was becoming the supplier of lighting solutions for The Body Shop™ and Dean and Deluca™ – companies with thousands of shops around the globe.

Managing Director at Lightyears, Lars Østergaard Olsen, mentions Architonic[1] as a useful tool to create awareness among Architects and interior designers. Architonic is an online community that guide architects, designers etc. to the very best of current design. Lightyears is also a regular exhibitor at EuroLuce[2] and every second year they attend Salone Internationale del Mobile[3].

As of June 2015, Lightyears has become part of Fritz Hansen A/S and going forward Lightyears will utilize the sales and distributions channels of its owners. Today's global distribution setup is as illustrated below:

International setup and Marketing efforts



This diagram illustrates Lightyears A/S generic international setup used to sell and promote its products. The installer is rarely part of the supply chain.

In the UK, Lightyears uses an agent model to sell and promote products. Today a London based agent manages most of the business in UK. Agents typically have between 3-6 brands – both furniture and luminaires. Agents are payed a certain percentage of the turnover that they generate.

In Germany, Lightyears uses a distributor/wholesaler to manage distribution to the dealer. Wholesalers may have several agents working for them. The installer is only very seldom part of this supply chain.

The supply chain plays a critical role in the company's lean setup. Especially the dealers whom vary nature and type of organization but include e.g. "Shop fitters", a type dealer that sells entire interior and decorative concepts to shops. The dealers may have broad portfolios of designer products or in some cases – as with Lightyears's German setup, only focus on lighting. Sometimes, dealers offer

[1] http://www.architonic.com/
[2] http://www.fieramilano.it/en/euroluce-0
[3] http://www.salonemilano.it/en/

"turnkey solutions" to customers. This includes design services – everything from specification to delivery. In Germany, Lightyears works with the distributor Shapes[4]. Shapes, with the one-liner "Just Nordic", is a Munich company that works exclusively with lighting solutions with a Nordic Design focus. Shapes also has its own showroom.

Lars Østergaard Olsen states that, in ballpark figures, the turnover need to be in the area of 1 Mio Euro to make break even with a full time company sales representatives. At Lightyears the global market divides between just three people – one of them is Lars himself as he manages the US and Asia and the two other the rest of the world. However, just recently, a fulltime sales representative for Norway was hired.

Key lessons to be learned from Lightyears

- Focused strategy based on utilizing core competences within design and business to achieve an unfilled position in the market
- Lean organizational setup with focus on minimizing fixed costs in all aspects of the value chain
- Experimental and opportunistic approach towards international market development
- Competitive value proposition based on quality and design with a strong 'value vs price' ratio
- New products are built with focus on functionality, and do not meet demands of a specific market
- Many luminaires are designed to be used both in the professional and private markets with only minor adjustments to mounting.

[4] http://www.shapes.info/

Case: Riegens A/S

Background

Until 2008, Riegens A/S was a dedicated OEM (Original Equipment Manufacturer). In 2008, Riegens started to sell products under its own brand name but also continues to sell OEM products. Today, SG Lighting A/S owns Riegens A/S. SG Lighting is a Norwegian company founded in Lillesand Norway in 1990 with operations in more than 30 countries.

Based in Odense, Denmark, Riegens is a lighting manufacturer that offers Nordic Lighting Design for the European market for functional lighting. Riegens is an international player with sales offices in many areas of the EU and strong focus on the UK with a subsidiary as well as a brand new office and showroom.

Riegens has a strong brand built around energy efficiency, innovative lighting and Nordic Lighting Design. As Markus Hemmingsen states "*I align 100 % with the Nordic Lighting Design manifest* [Red.: As interpreted in section II]. *Companies need to ensure they can differentiate their products and services in the global competition"*. Riegens now ramps up their efforts in the German market and thus, this is now growing.

Important events

The success in UK began when Riegens started to focus on the "Office segment" – which Riegens defines internally as part of the "commercial lighting segment". With new products, a focused market segmentation and highly skilled sales staff the growth in the UK market was about to take off.

The UK market is strategically a very strong market for Riegens with its close geographical proximity to Denmark, local production setup and market demand for energy savings – a core characteristics of Riegens product portfolio.

Markets

Riegens is present in many geographic markets. The current level of export is at 70%. Of this number, the combined German and UK markets constitute 25,4 %. The UK market is very mature with a subsidiary whilst the German market is less developed. In Germany, Riegens's primary market is defined as north of the Ruhr district.

Facts

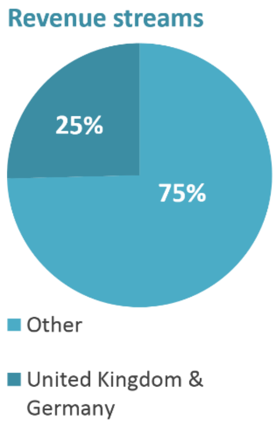
- Established in 1956 in Copenhagen & one of the biggest lighting manufacturers in Scandinavia
- More than 200 employees in Europe
- Export was about 70% of the total revenue
- 2015 total revenue net 266 mio. DKK (35,7 mio. EUR)
- www.riegens.dk

"I align 100 % with the Nordic Lighting Design concept. Companies need to ensure they can differentiate their products and services in the global competition"

Markus Hemmingsen, Sales Engineer, Riegens A/S

In Germany, Riegens's business is mostly north of the Ruhr District. The UK is the single largest market outside Scandinavia for Riegens. Riegens is represented in most of the UK.

For Riegens the most predominant barriers to the German market have been resources and capacity. Germany is a conservative market and it has taken years to establish what is present today. Nevertheless, export to Germany is still in an early phase. Right now Riegens has extra focus on the "Outdoor" segment with six new products coming up.



It is difficult to pinpoint which segments are the most attractive in Germany, but for Riegens, the Office segment has shown a slight increase in willingness to pay for design – however both the Education and Office segments have focus on Total Cost of Ownership (TCO). In Germany, the ability to document project offers in terms of TCO calculations are important. This is in spite of the fact that in some cases, the user and the contractor/owner are not the same organization – and this affects buying preferences to a large degree

In the UK, the focus tends to be on the technological aspects of the products and on energy savings and hence, it has been more difficult to sell products only based on their design values or user friendliness.

International Setup and Marketing efforts

In the UK, Riegens A/S is established with a subsidiary Riegens UK Ltd. The subsidiary currently employs fifteen people in the UK, of which five can be described as external sales people.

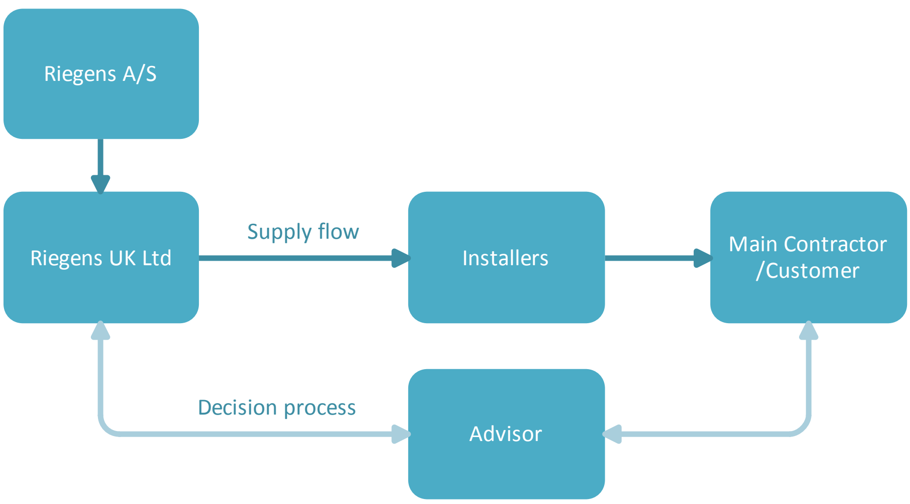
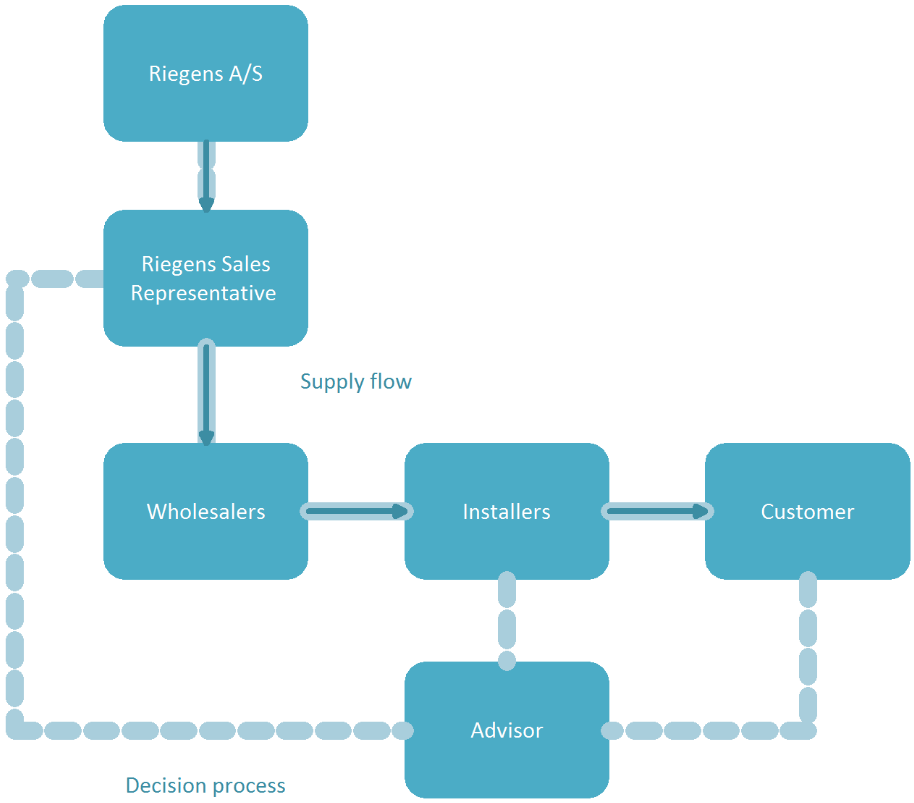


Diagram of typical supply chain and decision process in the UK market for Riegens. If a wholesaler is involved it is only to provide financial services/warranties.

In the UK setup, the subsidiary operates in a simple setup without involving a wholesaler. The customer's advisor is typically the consulting engineer, and the orders come directly from installers. The consulting engineer makes the specifications based on the customer's directions – but in dialog with the suppliers.

For Riegens, most business is project sales based on large tenders. Markus Hemmingsen states that once projects are specified in the UK, the specifications are usually not changed during the projects, which is common in other markets such as Germany. In the UK, the education level of installers is typically lowcompared to other countries. So, one important aspect of doing business directly with the installers is that you have to be very clear in your guidelines and instructions regarding installation – what should be done and more importantly what should *not* be done to avoid unnecessary risk or legal matters.



Riegens's decision processes are with the customers consultant engineer but the supply flow goes through the wholesaler. No agents or distributors are used in the German setup.

The local sales representative does all local marketing efforts today. That means no other local partners are involved except the wholesaler. However, according to Markus Hemmingsen, Sales engineer at Riegens, typically the wholesaler does not actively promote companies such as Riegens in the German market.

Key lessons to be learned

- In the German market, the wholesalers are very dominant but their role is passive and sales efforts must be done almost entirely by the manufacturer's sales force
- There is fierce competition in the German market and focus is predominantly on price. It is important to support the design with a strong brand and compelling story about 'Nordic Lighting Design' to differentiate your value proposition from the competitors
- Never underestimate the power of culture, language and relations – always hire in local people with the right network to the right people
- In the German market, typically all marketing material must be in printed format and in German

- Be prepared to document your products performance using the required national test practices and independent laboratories (TÜV, ENEC etc.)
- In the UK market, it is important to be clear on how to use and how *not* to use and install your products in order to avoid legal matters.

Photo of Riegens lighting project for office buildings

Case: Petersen Tegl

Background

Petersen Tegl has produced bricks since 1791 when King Christian VII granted the founder of the family business, smallholder Peter Andresen, permission to build a brickworks. The company is still family owned. Petersen Tegl[5] has built a strong brand and healthy business around its unique high-end products sold at prices that by far exceeds its competitors. Petersen Tegl develops and sells bricks for both the domestic and international market. Petersen Tegl is known for pricing its high-end products as much as 40 times higher than budget bricks can be bought for. This is only possible through superior product design and quality and a very strong brand.

This case is an inspiration to Nordic Lighting Design companies as the company puts emphasis on excellent craftsmanship and communicate this to key decision makers in the construction industry in a very convincing way. Petersen Tegl primarily provides high-end design products for the construction or refurbishment of prestigious buildings and its success can be used as an inspiration to Nordic Lighting companies due to the comparativeness in terms of the involvement in the building process.

The bricks produced by Petersen Tegl are unique. They are high-end quality products and the only brickworks in Denmark to produce in a coal-fired brick oven. The bricks are manufactured on machines designed by Christian A. Petersen and his staff. The bricks are either produced on machines that imitate the way bricks are made by hand, or – in specific product lines – are actually hand-made in accordance with centuries-old craft traditions. By using different types of clay and firing them at different temperatures, the bricks are infused with a variety of textures and beautiful shades.

Markets

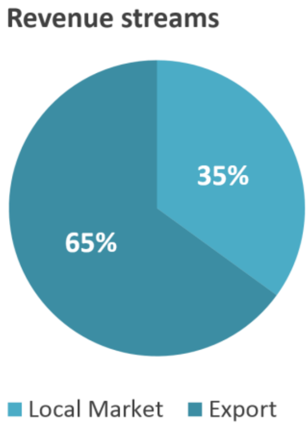
Petersen Tegl have markets all around the world – even Australia, Russia, Japan and USA – but the largest geographical market is still Europe.

In Germany, the primary market is defined as north of the city of Cologne. At Petersen Tegl, it is believed that south of that area the construction style differs a lot from their Nordic design and preferences favour limestone and chalkstone for facades, which is not part of the product line at Petersen Tegl.

Facts

- Established in 1791 and run in a direct line ever since
- 150 employees
- Today brickwork is exported throughout the world
- Total revenue of approximately 28 Mio. EUR
- www.petersen-tegl.dk

[5] http://en.petersen-tegl.dk/



For Petersen Tegl, Germany is not a homogeneous market. The majority of projects are executed north of the city of Cologne. The total export market is 65 %. Germany, UK and Holland are all very important export markets for Petersen Tegl

Important events

For Petersen Tegl, the international growth really began to take off in the nineties when the direct targeting of architects began. Architects are the key decision makers in the majority of projects where Petersen Tegl participates. Since then, the company have experienced increased international growth. The close collaboration with architects around the world also results in, that Petersen Tegl is often involved when bricks are required to match the colour, structure and format of existing architecture. The innovation potential in these challenges has spun out new products. Over the past decade, the newer markets include Japan and Russia. However, Europe is still the company's main export market.

This foto shows the newly created European Hansemuseum[6] in Lübeck. All tiles are handmade by Petersen Tegl. This is an example of the prestigious projects that Petersen Tegl is often involved In.

Seventh generation owner, Christian A. Petersen has a feel for the "*Zeitgeist"* (what is trending), is adaptable, and understands the importance of working closely with architects. Many of the innovations are done in very close collaboration with architects. Sometimes, saying "yes" to development within a project resulted in a

[6] http://www.hansemuseum.eu/language/en/

new product line such as the story of Kolumba™, a handmade product that was jointly developed in 2000 and forward by Petersen Tegl and the famous and influential Swiss architect Peter Zumthor. This proved to be a milestone in the company's recent history.

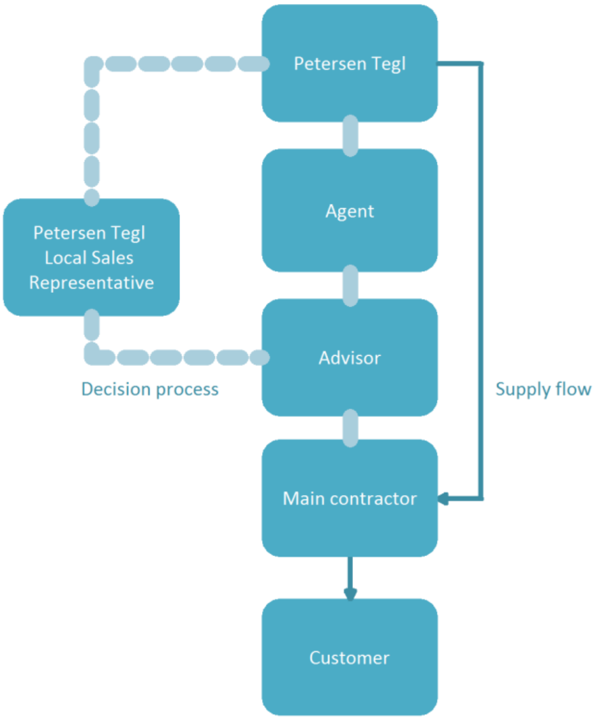
International setup and Marketing efforts

With a very few exceptions, Petersen Tegl does not operate with wholesalers. Instead, its supply chain consists of a direct supply to the main contractors. In the sales and marketing setup, Petersen Tegl has both sales representatives and sales agents. Dedicated sales representatives in Holland, Denmark, Belgium, Russia and Germany are part of the setup. Petersen works closely with a number of sales agents in Norway, Sweden, Germany, Poland and UK.

Almost all agents for Petersen Tegl have showrooms as it its essential to see and "feel" the products. The agent works with other producers of brick as well. This type of sales representation is specialized in bricks and the agents have a portfolio of different bricks that they can offer their clients.

The German setup consists of sales representatives and agents. The agents are sales agents, working under agent agreement. All of these agents have showrooms and some of them provide architectural and design services.

In addition to the sales agent agreement, Petersen Tegl also has dedicated sales personnel in the Hamburg Region. The sales agents buy bricks from Petersen Tegl and in principle, they operate as intermediaries and retailers with each their individual customer portfolio.



The diagram illustrates the international setup up of Petersen Tegl. Direct delievery to the contractor and use of agents with showroom are the cornerstones of this approach. Often no storage is needed as project supplies are made-to-order.

In the UK, Petersen also experiences growth but in this setup Petersen Tegl is without any local presence besides sales agents.

Marketing efforts

Petersen Tegl has worked with a strong local presence in all of the markets they have substantial markets shares in today. Ida Præstegaard, communication consultant from Petersen Tegl, states that *"…Local presence and network is of key importance to get into prestigious building projects if the brand awareness and pull from the market is not self-sustaining"*. By being in prestigious projects around the world, brand awareness increases as decision makers see, visit and read about these projects. This creates a brand/product pull. This means that in markets with very strong awareness – local sales efforts can be reduced and more can be managed centrally.

"…Local presence and network is of key importance to get into prestigious building projects if the brand aware-ness and pull from the market is not self-sustaining"

Ida Præstegaard, Communication consultant, Petersen Tegl

Petersen Tegl uses its genuine story to create a very strong brand. Among other things, Petersen issues a printed magazine. The magazine is distributed around the world twice a year to architects that would typically be key decision makers in the type of buildings projects that Petersen Tegl specializes in. The Magazine is free of charge and is of a very high quality. The magazine deliberately differentiate itself from common marketing material found in direct marketing. Instead, using photos, case stories and sharing relevant knowledge of what is achievable, it inspires decision makers.

Since the nineties, much of this has been driven by the direct approach to the architects. *"…Here it is important to be aware of local business culture. Typically, German architects are more formal than the Nordic architects – this includes using correct titles and dressing more formally including wearing suits…,"* states Ida Præstegaard of Petersen Tegl. She also mentions that the German market in particular is very demanding in terms of technical documentation.

Key lessons to be learned

- Strong branding and marketing efforts targeted towards key architects. Substantial efforts in branding, storytelling and marketing makes a difference
- New product designs are created in collaboration with the customers/key decision maker. Petersen Tegl has the willingness to experiment and develop new solutions to match customer needs
- Network and local presence are critical success factors for selling in Germany and Great Britain in the development phase of a new market
- Being in prestigious projects is a critical component for market awareness and in achieving a superior brand
- In Germany, the technical documentation needs extra attention. As a producer and seller of design products, specific emphasis must be put on this to match the expectations of the German buyers.

PART 2 – MARKETS

This report focuses on the German and UK markets for professional lighting – both decorative[7] lighting and functional lighting. These markets are high in population, high in income and they are in relative near proximity to the Nordic Countries. These markets have customer segments proven attractive for companies that base their high-end products and services on the concepts of Nordic Lighting Design philosophy.

Yet, these markets appear notoriously difficult to approach and succeed in for Nordic Lighting enterprises.

Not all market segments are equally interesting for providers of Nordic Lighting Design. The following sections attempt to point out which particular sectors that have the most potential.

Companies that go international, regardless of country, face some generic challenges. One of the key lessons learned from even big design companies is, that excessive prices in the market for functional lighting prevents you from getting new customers – regardless of the design. Even large German companies like Occhio[8] are challenged on their price in large tenders in their local German market: *"Price is essential. Design is taken into consideration but regardless of how unique the*

"Price is essential. Design is taken into consideration but regardless of how unique the design is, the price of the product has to be payable and within the upper price limits"

Mikala Holme Samsøe, Director, Henning Larsen Architects

[7] The following definitions will be used throughout this report.
Functional lighting
Luminaires or services sold to the professional market and regulated by regional or country-specific standards or law in relation to light emission, energy efficiency, glare etc. subject to documentation. Typically high in volume, yet often customer specific. Complex in installation. Often larger buildings or outdoor installations - and processes in accordance with EU tender regulations.
Decorative lighting
Decorative luminaires portfolios and services may overlap with residential requirements. Decorative lighting is often not subject to the same amount of documentation as functional lighting. Typically low in volume (per place) and complements (or overlaps) the functional lighting. Minor alterations to luminaire designs may take place to match the customer's needs. Decorative lighting are simpler to install.
[8] www.occhio.de

design is, the price of the product has to be payable and within the upper price limits" Mikala Holme Samsøe, Director, Henning Larsen Architects.

Another important lesson is that production, sales and marketing capacities are essential in these markets – especially in the German market. Often a "we can do it all" approach among small design companies leads to anything but a successful market introduction. According to Willy Goldby, FABA[9], *"competences in the sales process are just as important as product design and functionality".*

According to Dr Jürgen Waldorf, Managing Director Lighting Division at ZVEI[10], it is getting more and more difficult for small companies, and they may need to partner up to be successful. The burden of verifying technically advanced products increases. Both the risk and the need for specialized knowledge increase as well. Along with faster development cycles, these factors drive the need for partnerships with other companies to cope with these challenges successfully.

Globalisation means fierce competition, however, Nordic companies selling design have a head start, and so the opportunities are even greater than the threats – indeed high-end design products come from many countries now but the market also increases.

"Competences in the sales process are just as important as product design and functionality"

Willy Goldby, Director, FABA

Segmentation in the lighting industry

In this report, the attention is on the professional market for general lighting. We focus on both "functional lighting" (contracts, tenders) and the professional market for "decorative lighting" (non-contract/lower volume). The consumer market / residential segment is not in focus. Most segmenting approaches used by lighting companies do not vary with the specific countries. Instead, the model most commonly applied is based on segmenting by application. In the report "Lighting the Way" from 2012[11] McKinsey's approach to segmentation in the lighting industry for "General lighting" is listed below and includes seven segments:

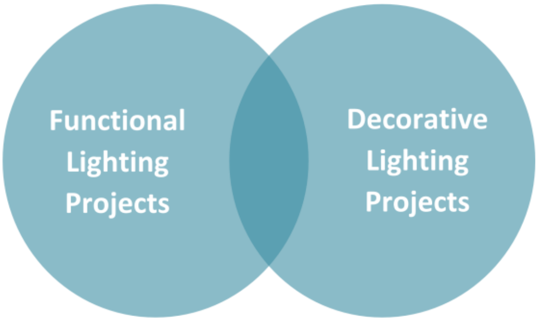
- *Residential*
- *Office*
- *Shop*
- *Hospitality*
- *Industrial*
- *Outdoor*
- *Architectural lighting*

This report will refer to this from time to time but also use a more detailed segmentation for general lighting, which is illustrated later in this section.

"Many customers are unable to see the difference between ordinary and excellent design. Branding, storytelling and relationship building are therefore essential to stand out from the crowd in these competitive markets"

Niels Bugge, Marketing Assistant, Design Denmark

[9] www.faba.dk
[10] www.zvei.de
[11] http://www.mckinsey.com/~/media/mckinsey/dotcom/client_service/automotive%20and%20assembly/lighting_the_way_perspectives_on_global_lighting_market_2012.ashx



Split between Functional and Decorative Lighting including overlaps

This segmentation approach is very good at illustrating the distinction between on one hand “functional lighting”, typically driven by tenders and regulations, and on the other hand, a “decorative lighting”, a professional market that consists of luminaires applied in particular zones[12] of public spaces/buildings and thereby complement the functional light.

In the “Decorative” segment, documentation is less of an issue and the buying behaviour and process resembles more that of a B2C customer than in a project/tender.

As we learned from the case about Lightyears A/S, the borderlines and relative sizes of these two segments are not given but can be influenced by the companies and their value propositions. In addition, what size each market segment has can even vary from country to country.

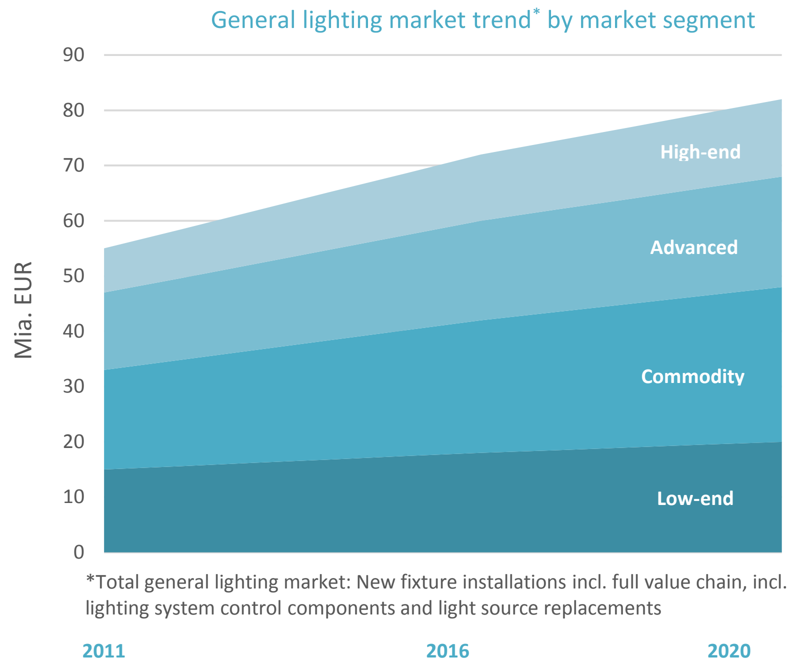
Another attempt would be to segment by geography - and to identify continents, countries or areas *within* a country where Nordic Lighting Design has the highest potential. Here it is only possible to provide rule of thumb guidelines based on other studies. Asia is already a larger market for general lighting than all of the EU combined - and by 2020 Asia is expected to be almost twice the size of the European market. This is predominantly lead by China. According to McKinsey, In China alone, the market for luminaires, measured in numbers, is larger than all of Europe by 2020.

Within the BRIC countries, China is by far the single biggest market for both LED and luminaires in general lighting with a total luminaire market of 16.721 million EUR by 2020.

In Asia, most of the growth is in the medium to low-end segments where there is very limited focus on quality and design.

Conclusion based on interpretation of McKinseys report “Lighting the Way…” 2012

[12] Zones where the ambience created by lighting etc. is important



Courtesy of Mckinsey: General lighting trends based on product grade, showing "high-end" lighting will grow by 6 Billions Euro by 2020.

In Asia however, most of the growth is within the medium to low-end range with price levels predicted to be very low with limited focus on quality. In Europe and North America, the combined markets of advanced and high-end markets segments account for the 4 out of the 6 billion EUR growth that is expected to occur in the high-end range in new installations alone.

The most commonly used segmentation approach in the lighting industry is similar to McKinsey's but more detailed and with a distinction between indoor and outdoor. Please see table below.

	Indoor							**Outdoor**						
Applications	Hotel and wellness	Health and Care	Offices	Education and Science	Art and culture	Retail and presentations	Industry	Pathways and landscapes	Entrances	Facades	Streets	Parking, servicing and access areas	Roads	Sports

Segmenting by applications – Indoor and outdoor and further break down into sub application segments

By segmenting by application, it is possible to discuss a number of applications and provide descriptions of the characteristics of each of these application "segments". This includes listing differences in product types, application(s), type of regulations, buying processes and buying behaviours, sizes etc.

Each of these application segments contains a specific unique spectrum of high-end to low-end products where only the size of the "High end" is assumed relevant for Nordic Lighting Design.

Attractive markets for Nordic Lighting Design

It is probably not possible to use existing segmentation approaches alone to identify a particular attractive segment for Nordic Lighting Design – nor to eliminate any of these.

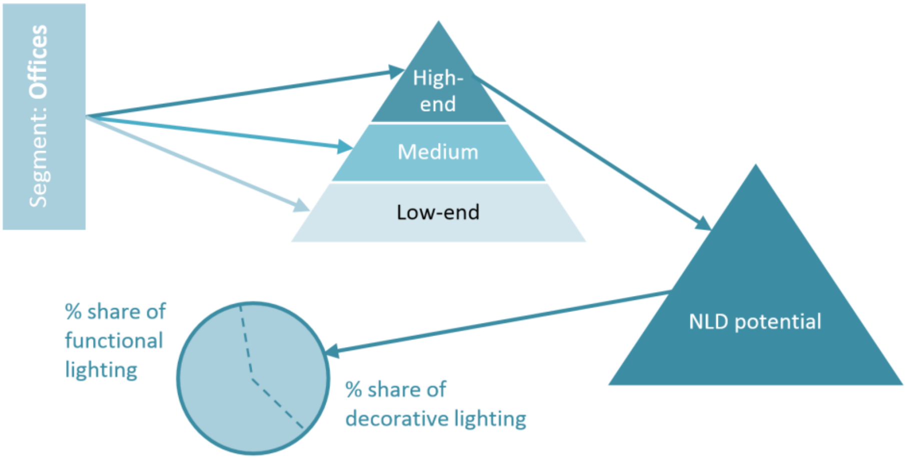
Following a strict "rule of thumb" approach – a set of general and top-down guidelines are deducted from this. These guidelines are as follows:

- According to Willy Goldby at FABA, *Indoor* segments are more attractive than *outdoor,* because the latter is more price driven and less susceptible to pay for design in general – Nordic Lighting Design included
- In all cases, (but "industry" segment) some potential for design have been identified across the indoor segments
- The further the geographical distance from the Nordic countries , the less appealing the values of Nordic Lighting Design seem to be. E.g. in Germany, the northern part responds most positively to Nordic Lighting Design
- Urban areas (the bigger the city) focus on design and subsequently, the area is more susceptible to the benefits of Nordic Lighting Design. Hamburg and London stands out as particularly attractive areas for Nordic Lighting Design
- In the UK, especially in a metropolis, Nordic design is popular in the residential markets and this is likely to be reflected in the professional market with an increase in demand for Nordic Lighting Design
- If Nordic Lighting Design is a subset of "high-end products", 66 % of the growth in this product category is to occur within EU and North America. This indicates that these markets are more attractive than Asia from a Nordic Lighting Design standpoint.

Despite several ways of segmenting the industry for general lighting, no clear method or variable to identify applicability for Nordic Lighting design in particular was identified. However, several approached experts provide inspiration as how to work with segmentation and different ways of looking at and addressing different markets, applications and segments.

The illustration below intends to provide an understanding that Nordic Lighting Design can take form of both functional lighting and decorative lighting. The size is based on the application segment's total size as well as relative size of the high-end share. Finally, this particular "high-end" segments potential demand for Nordic

Lighting Design and what the split between functional and decorative lighting will/can be in that particular segment.



All segments can be sub-divided into sections that have more or less potential for Nordic Lighting Design products and services

The supply chain in the general lighting industry

One of the many challenges in exporting to a new market is understanding the supply chain, decision makers and processes, distribution challenges and optimum pricing. Decisions on how to manage this are based on each company's individual strategy and the conditions and traditions of the specific geography, application area and segment.

There is a need to consider how to manage two potential players in the supply chain: The wholesaler and the installers. This consideration depends on the type of products or services, the segments and application, the volume and the customer requirements.

	Excludes Installer	**Includes Installer**
Includes Wholesaler	Functional lighting and decorative lighting *E.g. Glamox Luxo*[13]	Functional lighting *E.g. Focus Lighting*[14]*, Riegens Germany*
Excludes Wholesaler[15]	Decorative lighting *E.g. Lightyears*	Functional lighting, outdoor applications *E.g. very large public projects*

Some projects involve installers and wholesalers, but not all.

"There are four decision makers in the market for functional lighting; installers, consultants, architects and the customer. The key decision makers depend on the project"

Geir Skeie, Managing Director, Glamox Luxo Lighting

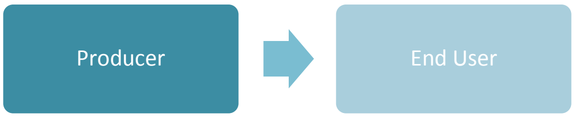
Value chain and sales channels

Sales channels differ by application and by country. However, three different typologies can be defined: *Direct, wholesale and retail.*

Generally, most indoor applications tend to rely heavily on the wholesaler as the channel (about 80% of all luminaires) but in the architectural lighting segment and outdoor applications the direct channels are more common. This is, however, case-

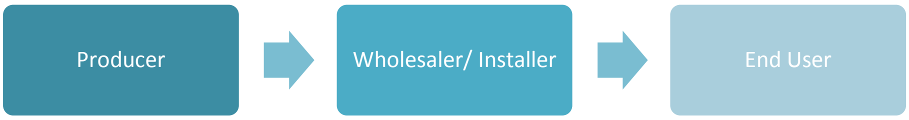
[13] www.glamox-luxo.com
[14] www.focus-lighting.com
[15] Large scale wholesalers focused on logistics and not including distributors with storage and sales capacity

specific and market dependent. In the replacement business, wholesalers play a critical role and the suppliers only go directly to the end-user to replace light sources in 10 % of the cases.



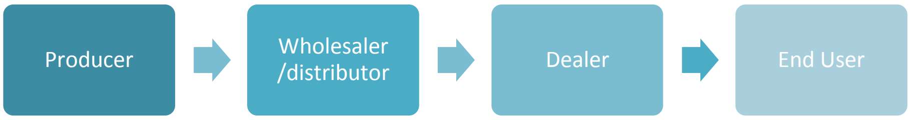
Typical professional market channel for outdoor and architectual lighting

Without the wholesaler, the company must identify another way of providing the logistics offered by the wholesaler.



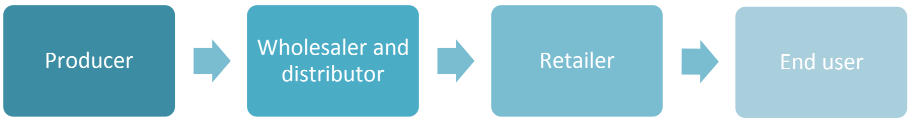
Typical professional market channels for indoor Functional lighting

Typically, only larger companies will have the technical competencies to approach the end user directly. Using a wholesaler and/or and additional intermediates in the form of the installers are more common in indoor functional lighting. According to McKinsey access to technical sales capabilities are increasingly important, as lighting control-systems and LED technologies become standard.



Typical market channels for decorative lighting

For decorative lighting, the path of indoor lighting generally applies but the use of wholesalers / distributors are commonly used. This is primarily for branding, marketing and storage purposes.



Example of residential market channels - described here to only to highlight the difference to the B2B channels.

Tips and tricks for successful export

Despite a focus on Nordic Lighting Design, our findings suggest that achieving international success is less about the design but more about the business acumen. Having attractive design, good quality and low energy consumption may be the starting point but solid organisational competences in business development, marketing, sales and logistics are even more important.

"The German market is driven by relations and traditions"

Willy Goldby, Director, FABA

As LED and lighting control systems spread in the general lighting industry, know-how of the technological benefits becomes increasingly important to influence key decision makers in functional lighting including electrical installers. According to McKinsey *"Having these technical capabilities will become a key success factor in most general lighting fixture applications"*.

According to Sofie Nordstrøm, Creative Director at Nordstrom Studio[16] it is a big task to take on the challenge to build up the business in the UK alone – and a long-term investment. However, she adds *"…Right now is the ideal time to promote Nordic lighting design in the UK… It is definitely a strong sales argument"*.

- **Define a clear strategy for market segments, supply chain and sales channels**
- **Be prepared, have the resources for a long term effort in order to be successful in international markets**
- **Know the culture and the language in the particular market**
- **Understand the supply chain and decision making processes in each market**
- **Be prepared to customize your sales and marketing material to the native language of the market**
- **Be ready to deliver once a customer is committed**
- **Dress formally, bring a business card and be ready to connect on LinkedIn**

16 http://www.nordstromstudio.com/

Overview of the German market

Germany is alone by its share size and geographical position an attractive market to the Nordic countries. According to a newly published study by PwC[17], 44 % of top managers in Denmark, consider Germany to be *the* most important growth market. This number was just 18 % as of 2015 and therefore indicates a growing attention to the German market across industries.

Lessons learned – The German market

When targeting the German market, it is important to come fully prepared and be able to deliver the order once a potential customer is identified. A highlight of lessons learned includes:

- Germany still uses a high degree of physical presentation material – therefore be sure to use printed material
- Always create specific marketing material in German, as proficiency in English should not be expected
- Be sure to use formal title and name, when addressing German business contacts. Also, be sure to dress more formally than in the Nordic countries
- Be on time and be well prepared during meetings in Germany – and be ready to deliver often larger quantities than in the Nordic countries.
- According to Julie Hansen, office Manager at Shapes, most Nordic companies fail to meet the technical documentation expected by the German customers. This mistake includes lack of proper certificates but also lack of detailed technical specifications (lumen, kelvin, etc.).
- The German market is difficult to enter for outsiders. "*The market is very traditional and relation based*", Willy Goldby, Director at FABA explains.
- Price is important! The market is also very price focused according to Mikala Samsøe, Director at Henning Larsen Architects. However, according to Peter Olivarius, Managing Director at Focus Lighting, prices are not *the* biggest challenge of the German market – instead understanding marketing challenges, distribution channels, purchasing processes and optimal price setting is a large barrier towards success on the German market.

The supply chain of the professional project market for functional lighting

The professional market for lighting solutions typically consists of the producer, wholesaler, installers and the customer. In Germany, the wholesaler plays a very central role. They typically provide both storage and financial services for the producers. There are not many examples of business without the wholesaler as part of the supply chain today. The wholesaler is not active in selling your products. On the contrary, the wholesaler may be working for the client with the purpose of identifying alternatives suppliers with similar specifications but lower prices.

The wholesaler is mostly passive and sales efforts are done by the producers or by their partners, according to Markus Hemmingsen, Sales Engineer at Riegens. However, using the wholesaler is the most favourable strategy for new entrants according to him. A big producer will rarely go directly to the client and if so this is typically when the client is public. *"Something in the German Value chain keeps the installation partners checkmate,"* says Peter Olivarius, Managing Director at Focus lighting. He continues *"…In Germany there are many cost increasing layers that eventually increases the price of the product for the customer…"*. This also applies for the markets for decorative lighting according to Managing Director at Lightyears, Lars Østergaard Olsen.

"Your chances on the German market being a very small company with a low budget are not in your favour"

Mikala Holme Samsøe, Director, Henning Larsen Architects

"It's a big task to take on the challenge to build up the business in the UK alone – and a long term investment. However, right now is the ideal time to promote Nordic lighting design in the UK."

Sofie Nordstrøm, Creative Director, Nordstrom Studio

"Something in the German Supply chain keeps the installation partners checkmate"

Peter Olivarius, Managing Director, Focus Lighting

[17] Price Waterhouse Coopers, 19th Annual Global CEO Survey, January, 2016

The supply chain for decorative lighting Lighting

Normally, a distributor is used in this German market channel setup. The distributor offers services such as:

- Storage and delivery services to the customer (dealers, architects, interior designers, etc.)
- Marketing
- Service and customer care
- Active sales efforts using e.g. own showroom and with the use of agents and sales representatives.

An example of a distributor specialized in Nordic Lighting Design is the company Shapes.[18] It works with suppliers of Nordic design luminaries and sells this in all of Germany as well as in Switzerland.

B2B decision making processes and key decision makers

Architects and engineers are key decision makers in the German market. Typically, in the role as advisors to a client/end user.

Do's and don'ts – Barriers and enablers when entering the German market

Germany is a conservative and a non-homogenous market. It is divided into a North and a South part – or even smaller regions with large demographical differences, states Mikala Holme Samsøe, Director at Henning Larsen Architects. Approaching the entire German market is capital demanding and requires a long-term effort. Therefore, Germany is often approached "one city at a time".

"In the German market you can get a very positive response from a potential customer, In Denmark this often leads to sales, but in Germany it often stops there…" states Managing Director Peter Olivarius at Focus Lighting. This confirms the need of strong relations and a continuous effort to build the necessary trust with the German customers before they switch to a new supplier. For smaller companies, a partner driven approach can be recommended.

In the German market you can get a very positive response from a potential customer, In Denmark this often leads to a sale, but in Germany it often stops there…"

Peter Olivarius, Managing Director Focus Lighting

Competition and vendor loyalty

The German market is characterized by fierce competition. Secondly, there is strong loyalty towards existing vendors. This loyalty, or conservatism, is a barrier for new players in the market. This is exemplified by Riegens, which after more than 6 years in the market is still represented by one full time employee in Germany. Niels Rasmussen from +RASMUSSEN[19] confirms that an additional 1-2 years's time may be required to be successful in the German market as opposed to i.e. the UK or the US – or any market more reluctant to "try things out". He elaborates: *"…once you are in the German market customers are very loyal, but you need to have a proper plan and be active and persistent when building the market – and it requires time and resources as well as a strong quality brand"*.

"It typically takes 1-2 more years to be successful in the German market as oppose to e.g. the UK or US market"

Niels Rasmussen, +RASMUSSEN

A successful German company like Occhio[20] with roughly 300 resellers is challenged when selling their high-end design products in the German contract market. Typically, the areas of high status of the buildings may purchase high-end

[18] www.shapes.info
[19] +RASMUSSEN is a consultancy company with experience from the German lighting market. http://plus-rasmussen.com/
[20] http://www.occhio.de/en

luminaires but the rest of the luminaires for the projects are purchased with emphasis on price.

Investment horizon and pricing

In German municipalities, the investment horizon is typically shorter than what we see in Denmark and even more so than what we see in Norway. One of the reasons for this is that in Germany the constructor/investor is not the same user. This setup tends to favour low upfront investments instead of TCO costs. Peter Olivarius of Focus Lighting states that *"…the higher the prices of your products, the higher the probability of losing the order after the specifications phase"*. Despite this, Peter Olivarius experiences that somewhat 90 % of all projects are won if Focus Lighting has supported the client's architects through the entire process.

"The higher the price of your products, the higher the proba-bility of losing the order after the specifications phase"

Peter Olivarius, Managing director, Focus Lighting A/S

Choice of technology and technical documentation

Today it is essential and expected that all solutions are based on LED technology, and the ability to produce and show technical documentation and TCO (Total Cost of Ownership) calculations are critical success factors.

Regulations and standards

Companies must be able to verify products using ENEC and VDE as this is commonly expected. Non-ISO approved companies will need to have third party validations also. It is notable that recessed luminaires in Germany are 625 by 625 mm where other European countries uses 600 by 600 mm. Typically, Germany has a higher percentage of recessed lighting than in the Nordic countries.

It takes one to know one

A common mistake by companies is to underestimate the importance of cultural aspects and language. Understanding German business culture, speaking German and using German marketing material (in physical prints) are all drivers of success. Often, you find that only engineers and architects speak English and not representatives from the wholesaler and the installation partners. Despite a strong product portfolio and designs – local presence and relation based marketing are essential.

Differentiate

Using the story of Nordic lighting to differentiate is a compelling story in Germany. Thus, talking about the design concepts and origin are contributing to a convincing story that goes a long way in Germany. Getting the customer to think "Nordic Design" is positive, but it must be backed up by equal excellence in quality.

"We see an increase in demand for Nordic Lighting Design and more and more people are able see the difference between Nordic design and other types of design. The trend is also noticeable as the amount of press coverage about the topic is growing"

Julie Hansen, Office Manager, Shapes

Trends

One of the local trends in Germany is the increasing focus on design, according to Marianne Seifert, Senior Commercial Advisor, Trade Council of Denmark, Germany. This is confirmed by an increase in prestigious construction projects.

Lars Boisen, International Manager, Louis Poulsen, explains this design trend:

"… we gradually see an increased interest for Nordic design in the market, a shift towards a less technical appearance", and he adds "*offices are slowly moving towards complementing the functional light from recessed luminaires with suspended lighting*". Marianne Seifert confirms the trend of increased use of suspended lighting in the residential market. This is a trend in favour of Nordic Lighting Design as:

"…recessed luminaires are even harder to differentiate by design" according to Willy Goldby, Director at FABA.

The presence of Nordic design in both residential and the professional markets increases in all of Germany with emphasis on the urban areas. This is confirmed by

Office Manager at Shapes, Julie Hansen – she explains: *"We see an increase in demand for Nordic Lighting Design, and more and more people are able to see the difference between Nordic design and other types of design. The trend is noticeable and the amount of press coverage about the topic is growing"*

Confirming the global trend, the German market is also focused on LED. AUDI's catchy slogan "*Vorsprung durch Technik"* fits very well here, and therefore LED is essential in products for the German market.

"The British market is one of the best places to begin to export. Culturally, mentally and language wise it is closely related to the Nordic countries."

EKSPORTFOKUS, No. 03.15

Overview of the UK market

According to the Danish Ministry of Foreign Affairs*: "The British market is one of the best places to start export. Culturally, mentally and linguistically it is closely related to the Nordic countries"*[21]. A liberal business environment makes it relatively easy and cheap to establish a company. However, the competition in UK is fierce – and time and money must be invested but often prove worth the effort. As the ministry further states: "*If you can't make it in the UK it is not advisable to try other places".*

Lessons learned – The UK market

Marcus Hemmingsen at Riegens states that there is a tendency for the specifications set in the initial phase of functional lighting projects in the UK to be kept unchanged as oppose to suffer from budget cuts or re-scoping as seen on other markets such as Germany.

For a company like Riegens, UK is the market that provides the highest growth rates. As we can see by the numbers that the office segment is increasing. It is interesting to note that in the office segment, the initial investment is often not made by the same budget that benefits from electricity savings. The construction business is particularly conservative and you should expect 12-18 months before the first sales, according to Louise Kirketerp, Senior Advisor, Trade council of Denmark, UK.

The market is still very price driven and it is particularly focused on energy savings. This can be seen with the case of Riegens and its success with low energy products for the office segments.

According to Sofie Nordstrøm, Creative Director at Nordstrom Studio, companies need to take into account that all parts of the supply chain will take a cut out of the potential revenues when they build a business cases. Fifty percent or more is not uncommon for a distributing wholesaler with a showroom. Another 10-15 % could be charged by architectural and interior design practices for being chosen as a supplier for a given project.

"You need to take into account that all parts of the supply chain will take a cut out of the potential revenues. 50 % or more is not uncommon for a distributing wholesaler with a showroom and 10-15 % to the Architectural and Interior Design Practices for being their choice for a given project"

Sofie Nordstrøm, Creative Director, Nordstrom Studio

The supply chain

"*Design products are specified and supplied directly to the end user or contractor, but for off-the-shelf products the wholesaler is still a major route"*, says Peter Hunt, COO at The LIA, the largest trade association for lighting equipment professionals in the UK (and in the EU). For Riegens A/S that has a strong sales force and subsidiary in the UK – and sells Nordic Lighting Design products in the market for functional lighting, the supply chain typically does *not* include a wholesaler.

Potentially, for decorative lighting, a number of players can take part of the supply chain. Wholesalers/distribution partners with showrooms and capabilities within lifestyle products are commonly used to name some.

"Design products are specified and supplied directly to the end user or contractor, for off-the-shelf products the wholesaler is still a major route…"

Peter Hunt, COO at The LIA

[21] EKSPORTFOKUS, No. 03.15

B2B decision making processes and key decision makers

For functional lighting, sales often go directly to the installation partners or to the client's advisor. These are typically consulting engineers, which act as the specifier in the decisions process for the customer.

The dominant decision makers in the UK market for decorative lighting are architecture and interior design practices. They provide the glue between the customers and the suppliers of luminaires according to Sofie Nordstrøm, Creative Director, Nordstrom Studio.

It is typically not senior management but project managers, FF&E Managers (Furniture, Fixture and Equipment) or Specifications Managers that would have the greatest influence on luminaire and lighting design choices. Each of them keep a personal portfolio of options and recommend lighting solutions based on this. These are the people that need to trust you and know your company and its products/services in order to promote them to the final decision-makers (leading designer/ architects).

These are dynamic relationships – wholesale distributors and decision makers look for something that is unique to make them stand out, and the supplier looks for the right partner to validate the design and the brand. Collaborating with a wholesaler with a strong brand will often generate a positive effect for the supplier of luminaires.

For decorative lighting, a large number of collaboration partners exist. Some of the relevant companies to work with specifically on high-end Nordic decorative lighting products for shop and hotel segments could be:

Smaller	Larger – some with retail space	Very large architectural/ interior design practices:
■ Studio Ashby	■ twentytwentyone	■ Conran + Partners
■ David Collins Studio	■ Hamilton Architects	■ Fosters and Partners
■ Martin Brudniski	■ ARAM	■ Capita Architecture
■ Folio Design LLP	■ Skandium	

Some of these act as wholesalers with showrooms, others offer architectural and design services, and some offer "turnkey" projects. More and more offer turnkey services. The real advantage with the larger collaboration partners is their capacity and ability to source and logistically coordinate delivery hassle-free, all in one – from specification to installation. It is important to collaborate with companies that offer an active sales effort and to have the proper incentives in order to promote *your* product and services. The more services the distribution/wholesaler companies provide – the more they take as a cut. E.g. if the company has a showroom, it will generally require a larger trade discount.

The Old School Tie

"I haven't heard of anybody that makes a sale just over the phone" Louise Kirketerp, Senior Adviser, Danish Trade Council, UK.

She elaborates*: "…As opposed to some Nordic countries, UK is a relation-based society. In the UK, you do not just meet once and then make a deal. You have to know the person, you are doing business with – and it is crucial to understand this. In the UK, you have to invest in the relations you want to do business with"*. This is confirmed by Sofie Nordstrøm, Creative Director, Nordstrom Studio: *"…In the Shop/hotel architectural and residential segments it is all about networking…"*

"The Key decision makers in the UK market for decorative lighting is predominantly Architectural and Interior Design practices. They provide the glue between the customers and the supplier…"

Sofie Nordstrøm, Creative Director, Nordstrom Studio

"As opposed to some Nordic Countries, UK is a relations based society. In the UK you do not just meet once and then make a deal. You have to know the person you are doing business with – and it is crucial to understand this. In the UK, you have to invest in the relations you want to do business with"

Louise Kirketerp, Senior Advisor, Danish Ministry of

Risks

In the UK, the producer is typically accountable for the proper installation of products. This poses a risk and needs to be considered carefully. Moreover, the focus in the market for functional lighting tends to be on technology and efficiency and less on design when compared to Germany. Finally, it is a conservative market, which creates a barrier for new entrants.

Trends

"Right now is the ideal time to promote Nordic lighting design in the UK. It is definitely a strong sales argument. Nordic design tradition and identity are trendsetting in the field of design at the moment'", claims Sofie Nordstrøm, Creative Director Nordstrom Studio. At the moment particularly Danish companies are generally successful in exporting to the UK – across many products and services. This is fuelled by Danish television and Nordics food trend among other things. Generally, the trends apply to products categories that are typically not price sensitive.

"Right now is the ideal time to promote Nordic lighting design in the UK. It is definitely a strong sales argument. Nordic design tradition and identity is trendsetting in the field of design at the moment'"

Sofie Nordstrøm, Creative Director, Nordstrom Studio

In the consumer market "Scandinavian design" is very popular and is trending at the moment. To some degree, it will also influence the professional market. Now, we see delegations coming to Denmark to seek inspiration on how we furnish and design our office buildings to both create a functional and comfortable working environment. Particularly in offices – as one of the growth segments – there is a need to create flexible multi-use offices. Most offices are built not knowing who the daily user will be and where the furniture will be put. In addition, users will require adapting possibilities, e.g. changing the office on demand from an open office plan to small flexible meetings rooms. This may provide opportunities to those who can deliver flexible lighting solutions.

Paradoxically, there is an equal strong focus on energy efficiency and this often drives decisions. According to Darío Gustavo Núñez Salazar, Lighting Designer, Verkis *"…There is enough knowledge and research in the UK about quality lighting, but the strong focus in energy efficiency makes it difficult for them to implement that knowledge".*

"There is enough knowledge and research in the UK about quality lighting, but the strong focus in energy efficiency makes it difficult for them to implement that knowledge"

Darío Gustavo Núñez Salazar, Lighting Designer, Verkis

Growth in construction

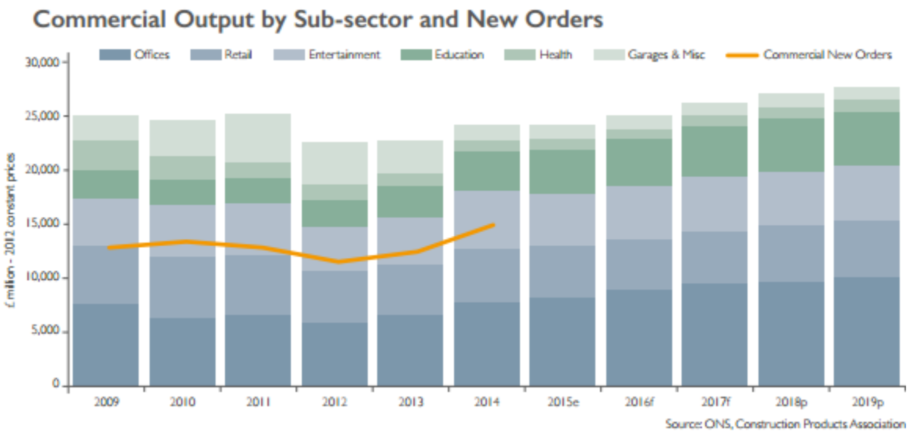
The latest construction industry forecasts 2016-2019 have provided some insights about the UK market that may prove relevant to product-service providers to one or more of the segments addressed here.

Some of the key points are highlighted below:

- Construction output to rise 3.6% in 2016 and 4.1% in 2017
- Private housing starts to rise 5.0% in both 2016 and 2017
- Industrial activity is to increase 21.3% by 2019
- Offices construction is to increase 7.0% in 2016 and 2017
- Infrastructural work is to rise 56.9% by 2019

The commercial sector is forecasted to enjoy growth averaging 3.7% per year through to 2019. New office construction is expected to be the driver of growth in the sector, rising 7.0% in both 2016 and 2017 due to high profile developments in London, Birmingham and Manchester followed by Leeds and Cardiff.

In Birmingham they experience the highest number of office constructions in 13 years and Manchester now have five major projects under construction totalling over 84.000 m^2 of new offices spaces that are expected to be completed in 2016 and 2017.



Growth by segment in the construction industry. Source: ONS, Construction Products Association forecast 2016-2019

PART 3 – GLOBAL TRENDS

Global, regional and local trends affect the lighting industry. In addition to describing what drives especially local British and German markets, this section briefly lists some of the relevant global trends within – or directly affecting – the lighting industry.

Design

Design products and services (defined as solutions where extra care has been given to the usability, visual appearance and aesthetics) is a global trend. Design is increasingly popular in the consumer market and especially "Scandinavian Design" is subject to a growing demand. The markets of Germany and the UK[22] are no exception to this. This tendency is expected to influence the professional market also, but exactly how, we have yet to see. One domain, where we are most likely to see the effect first, is office buildings that aim to provide attractive physical working environments. We know that the accumulated growth in High-end and advanced lighting products from 2016 until 2020 is driven by geographic regions of Europe and North America. If the inclination to invest in high-end design follows the willingness to pay for technology, features and quality, then the most relevant segments are offices, architectural buildings and some outdoor applications. However, this depends on geography, demography and the specific case.

Sustainability

In economics, the term sustainability may be defined as continued development or growth, without significant deterioration of the environment and depletion of natural resources on which human well-being depends. Sustainable actions are driven by both social awareness and by legislation. Sustainability is a global trend

[22] The Trade Council, EKSPORTFOKUS no. 3 September 2015

that focuses on global environmental challenges such as resource shortages and pollution. According to Ernst and Young, 65 percent of CFOs are now involved in sustainability initiatives in some way[23]. Legislators increasingly extend energy efficiency requirements to entire buildings, and EU regulations such as the buildings directive 2020 will affect all construction projects and sub-suppliers of these[24]. The European lighting industry association, Lighting Europe[25], has published information on this subject at its website[26], and it can be downloaded free of charge. For the lighting industry, this means a focus on energy efficiency but also on quality as part of the total cost of owner ship and sustainability agenda. BREEAM[27] is a design and classifications standard for energy efficiency that is growing in and outside the EU (so far in 73 countries). According to Christian Klinge, Head of Innovation at ÅF Lighting, purchasing a "timeless" design can be considered part of the total sustainability agenda for the customer.

"Ecobuild" is the world's biggest trade event for sustainable design, construction and the built environment – and also the UK's largest construction event of any kind. Ecobuild focuses on the future of construction and energy efficiency market in housing, Ecobuild may provide an interesting platform for companies promoting sustainable lighting according to Susanne Baden Jørgensen, Cluster Excellence Denmark

Ageing population

The world's population gets older and older. This is a global trend and the number of people aged 60 years or older will rise from 900 million to 2 billion between 2015 and 2050 (moving from 12% to 22% of the total global population)[28]. The elderly want to remain active and healthy.

Lighting solutions will need to consider the ageing population. As we get older, there is an increased need for higher luminance levels and for addressing increase in sensitivity to glare and positive effects of blue-enriched light in circadian rhythms. Light in both public spaces and indoor applications need improvements in order to achieve better orientation and prevent accidents for the growing number of elderly.

Urbanization – Turning spaces into places

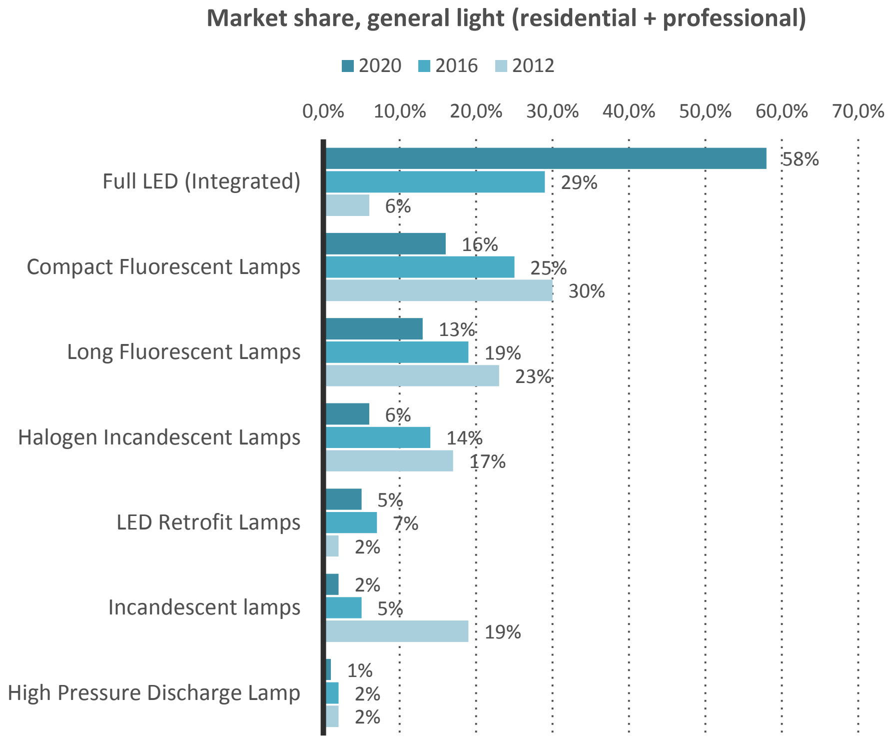
Urbanization is a global trend relating to the gradual increase in the proportion of people living in urban areas. By 2050, about 70% of the world's population will live in urban areas. Today's figure is 54 %[29]. In wealthy nations, this causes a focus on liveability and wellbeing in cities. The denser the population, the more important is the creation of liveable, efficient and attractive urban spaces. According to Anne Bay, Director of Danish Lighting Center, denser cities increase the need for creative daylight design inside buildings and stress the importance of artificial light that supports liveability. The usage of light is larger in urban cities than rural cities so as the world population migrates toward urban areas, the

[23] http://www.ey.com/US/en/Services/Specialty-Services/Climate-Change-and-Sustainability-Services/Six-growing-trends-in-corporate-sustainability_Trend-2
[24] http://www.premiumlight.eu/index.php?page=downloads-resources-10
[25] http://www.lightingeurope.org/
[26] Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Requirements, v. 1, July, 2013
[27] http://www.breeam.com/
[28] http://www.who.int/features/factfiles/ageing/en/
[29] www.un.org/en/ecosoc/integration/pdf/fact_sheet.pdf

need for lighting will increase[30]. One of the key players in the urbanization is the architect whom spearhead the manifestations of this trend and providers of luminaires and services have great opportunities in this domain.

LED

The ban of mercury based and incandescent light sources is a global shift in lighting and expands into other conventional light source technologies (exempting LED). The figure on market shares in general lighting below illustrates that almost 60 % of all revenues in the global lighting industry is based on LED technology. Right now, millions of lighting solutions are undergoing replacements alongside new installation. Recent numbers suggest that penetration of LED solutions will be up to 70% by 2020[31].



Source: McKinsey and Company: Lighting the Way, 2012 – illustrating the penetration of LED compared to other light sources

Architectural lighting is the earliest adopter of LED and LED solutions are expected to reach a market share of close to 90 % by 2020 followed by hospitality[32] with 80 %. Besides being the smallest of the application segments, the industrial application is also the slowest application to switch from CFL and HID to LED technology.

"LED is a must on ALL our markets" states Peter Olivarius at Focus Lighting A/S and confirms what appears to be a unanimous conclusion about high-end and advance grade products among industry experts.

LED efficiency as of 2016 is approximately 150 Lumen per watt for professional light *sources* but is expected to increase to more than 250 Lumen per watt in the

"LED is a must on ALL our markets"

Peter Olivarius, Managing Director, Focus Lighting

"LED efficiency as of 2016 is approxi-mately 150 Lumen per watt for naked professional light sources but is expected to increase to more than 250 Lumen per watt in the coming years"

Anne Bay, Director, Danish Lighting Center

[30] November 16, 2012, Industry News, LED Information
[31] McKinsey & co – Lighting the Way. 2012
[32] The hospitality industry is a broad category of fields within the service industry that includes lodging, event planning, theme parks, transportation, cruise lines, and additional fields within the tourism industry.

coming years according to Anne Bay, Director of the Danish Lighting Center. This technology trend goes hand in hand with the energy savings agenda and boosts replacement of light sources and luminaires all over the world. Today, the costs of LED are about 25-40 % of the costs of the luminaires.

As shown in a McKinsey Study, accepted payback periods (time before return on investment) in the different application segments vary, but are generally lowest in residential segment, a segment outside the scope of this report.

As LED prices are expected to decrease by another 30 % by year 2020, potentially luminaires can substantially decrease in price and hence improve payback time.

What payback periods are considered acceptable for LED

Q: At which payback period for LED vs. Tradiotional lighting would you choose LED?

	Residential	Office	Industrial	Shop	Hospitality	Outdoor	Achitectural	Total
No. of respondents*	338	399	261	259	127	232	235	1851
< 1 year	22%	15%	16%	17%	12%	14%	9%	19%
1 year	18%	18%	15%	22%	20%	23%	18%	20%
2 years	18%	19%	23%	21%	18%	25%	18%	17%
3 years	13%	17%	14%	19%	20%	17%	23%	7%
4 years	8%	7%	8%	5%	8%	6%	9%	10%
5 years	8%	11%	11%	5%	12%	6%	14%	4%
6-7 years	4%	5%	3%	3%	3%	3%	3%	3%
8-10 years	3%	3%	3%	2%	4%	1%	3%	2%
> 10 years	3%	2%	3%	3%	2%	2%	1%	3%
Not relevant	4%	4%	2%	3%	2%	2%	2%	0%
Average no. of years**	2,7	2,9	2,9	2,5	2,9	2,4	3,0	2,5

* One respondent could respond with up to 3 applications in the survey

** Assumed that "< 1 year" is 0,5 years and "Not relevant" means "0" in the calculation

Payback periods vary by segment (Source McKinsey's 2011 Global Lighting Professionals and Consumer Survey

Change in market expectance

Just a decade ago new lighting solutions could be developed over several years and remain in market for years. However today, development and commercialization cycles are down to 6 months according to Dr Jürgen Waldorf, Managing Director Lighting Division at ZVEI. The drivers of this speed-up are mainly LED updates, continuous energy efficiency advancements and a demand for customized solutions. Today, product life expectancy has dramatically decreased; in fact, the "Built To Order" (BTO) trend is driven not just by LED but also by customers's need and desire to choose e.g. colour, lumen package and control and regulation system. Standard luminaires in the professional markets are decreasing in numbers as customized solutions increase.

Smart cities and smart buildings

When cities and buildings become "smart", it is driven by digitalization. According to McKinsey Global Institute, 20-30 billion devices are to be online in 2025[33]. Large electronic manufacturers and the semiconductor industry push this development. For the lighting industry, intelligent solutions and the term "connected lighting" mean both opportunities and new requirements. Apart from the LED light source,

33 McKinsey Global institute, The internet of things: Mapping the Value behind the Hype, June, 2015

additional electronics may need to be integrated in the lighting solution. The design done right now needs to take into consideration the current and future functionalities expected by the customer. This includes selecting communication standards and what “eco system” (other devices and suppliers), the lighting solution will need to function with. How do you control your light? According to Christian Klinge, Head of Innovation at ÅF Lighting, most companies will need to enter or build alliances around these enabling technologies and widely used digital consumer platforms. Nordic capitals are generally rated within the top “smart cities” of the World. Except Munich, Berlin and Frankfurt the German cities are yet to have the same “smart city visions” as experienced in Scandinavia but there is no reason to believe smart city features will not become commodities in the near future. At Focus Lighting A/S they are already doing this in the street light segment. All its luminaries have a unique IP address and an 800 MHz communication platform enabling one big mesh network in Copenhagen City.

Fewer and bigger players in the market

As the market requests increasingly advanced products and services, the required competencies to fill in those demands follow this trend. The risk for companies also increases as providers of lighting solutions need to take responsibility for increasingly more complex products and services – perhaps containing multiple components manufactured by sub-suppliers. As a result, individual companies need to either grow in size and capabilities, or use their core competences in strong partnerships and alliances with other companies.

Recommendations for small and medium sized enterprises based on global trends

In addition to the trends we describe above there is also a clear industry trend towards increased standardization. Right now, the battle for dominant standard is being played out but is still to be settled. We recommend monitoring this closely. In addition, we also attempt to provide a set of recommendations for small companies based on the trends highlighted below.

Design

- Focus on product or service design in the broadest sense of the word: Design of user interfaces, mechanical function, architectural values, choice of materials, aestetics, connectivity etc.
- If Nordic Lighting Design is as an integral part of your product or design philosophy, make sure to use this feature effectively in marketing and on the front page of your website

Sustainability

- Build "sustainability" into your products and services
- Aim at longevity of both lighting design services and physical products
- Choose energy efficient solutions and simple, unmixed, non-toxic materials, and opt for ease of reuse

Ageing population

- Think of solutions that work for older people. E.g. adaption to imperfect eyesight, ease of use and support of circadian rhythms

Urbanization and smart solutions

- Products and services that improve the public space (transportation, safety, convenience, and beautification) will be in demand
- Facade solutions that utilize scarce daylight to the maximum will be in demand, as well as artificial light compensating for lack of daylight

Change in market expectancy

- Stay tuned to the lastest developments in LED technology and design products and services to adopt new, cheaper, more efficient solutions at a high pace
- Make sure that LED solutions still comply with principles in Nordic Lighting Design not jeopardizing fundamental human factors

Fewer and bigger players in the market

- Choose your in-house competencies and areas of excellence strategically: Which disciplines are necessary in order to maintain competitive edge, and which might just as well be obtained through partners

PART 4 – NORDIC LIGHTING DESIGN BACKGROUND

If well understood, the concept of "Nordic Lighting Design" may become as strong a marketing tool as "Scandinavian Design".

But despite the fact that there seems to be a common agreement, that a special Nordic approach to lighting design exists, there are not a lot of sources that conceptualise this idea comprehensively and combine daylighting and artificial light, indoor and outdoor. A few examples to mention are a couple of books (Matusiak B. S., 2013) (Mahiasen, 2015) (Sørensen N. a., 2011) (Matusiak B. S., 2014), articles (Klinge, 2011) and commercial websites (New Nordic Lighting, u.d.) (Northern Lighting Mood Makers, 2016) (Filosofi, 2016) (The FCA model, 2016).

In the years 1944 to 2012 open Nordic meetings, seminars or conferences on light and lighting have been organised almost every year by the Nordic lighting societies – Lyskultur (NO), Suomen Valoteknillinen Seura (FI), Ljostæknifelag Islands (IS), Ljuskultur/Belysningsbranschen (SE) and Danish Lighting Center (DA). These gatherings have strengthened the common understanding that a special Nordic Lighting Design approach in fact does exist throughout the professional lighting community.

This reports seeks to collect and condense interpretations from the sources above into a model that may serve as a short presentation of Nordic Lighting Design for branding and marketing purposes.

"I believe in Nordic lighting design as a brand that is competitive enough to be exported to the rest of the world, a brand that builds on three important resources. The first is the spectacular sceneries of nature - they inspire us. The second resource is the people who are active in the industry – they accumulate both the knowledge of light and under-standing of fine design traditions. The third is the cultural diversity that characterizes the five Nordic countries"

(Sørensen N. , 2012)

The concept

The concept of Nordic Lighting Design may be used at least in three situations:

- As a design philosophy used internally in companies designing new products or services
- As means to gain influence on international and regional legislation and standards
- As a marketing tool to communicate added value to customers.

The detailing of the concept and the choice of words must be adapted to the situation. For product or service developers that work with the concept on a daily basis it may be expressed in a complex way with more words. For most customers in the Nordic region, the concept "Scandinavian Design" may be a prerequisite and Nordic Lighting Design may be explained in less detail than toward customers with other cultural backgrounds.

Thus, the interpretation below is targeted marketing situations – and toward customers outside the Nordic region:

Nordic Lighting Design is

- An integral part of Scandinavian Design traditions – minimalistic beauty and functionality
- Genuine high quality in terms of materials and perception
- Design and solutions that shape light itself to human needs
- Optimal balance between function, aesthetics and sustainability
- Design that improves life through interaction with architecture and spaces

- **An integral part of Scandinavian Design traditions – minimalistic beauty and functionality**
  Nordic lighting design stands on the shoulders of Scandinavian design. This may seem obvious, but may not be quite as apparent for people outside the Nordic region. Referring to the well-known concept "Scandinavian design" serves to create immediate positive connotations. Furthermore, it establishes an initial framework of values comprising both aesthetical and functional/technical design qualities.
- **Genuine high quality in terms of materials and perception**
  Product quality must be stressed to emphasise the distance to price/performance solutions. A true quality product or service need to have both objective quality (expressed in numbers and specifications) and subjective quality (ambience and perception).
- **Design and solutions that shape light itself to human needs**
  The passionate and detailed appreciation of light itself (i.e. not light sources, windows and luminaires) in the Nordic countries is strongly influenced by the qualities and shortcomings of Nordic daylight – e.g. the

low sun angles and the variations in both colour and magnitude. Especially winter light makes Nordic people remarkably sensitive to getting sufficient light (artificial light as well as daylight), light with a suitable colour temperature, light that does not cause glare and light that creates atmosphere.

- **Optimal balance between function, aesthetics and sustainability**
  The Nordic countries already have a strong position in sustainable technologies. Many projects are driven by potential energy savings, so it is important to stress that Nordic Lighting Design is not only aesthetics and function but also energy consumption, durability and environmentally friendly materials. Energy regulations in Nordic countries are among the fiercest in Europe, which gives a head start in this aspect.

  Design that improves life through interaction with architecture & spaces
  What we see is defined by space combined with light – no light, no architecture. Light is manipulative, it emphasizes and conceals. Light shapes and may create direction and focus. The conscious design of light in conjunction with architecture is necessary for optimal human existence and work in spaces. The Nordic Lighting design approach can be found in any product or design category – as long as the conditions above are an integral part. The design can be very simplistic, understated and humble, yet still in full accordance with the concept.

Relations between Nordic Lighting Design and Human Centric Lighting

The concept "Human Centric Lighting" which was proposed by the European Lighting Industry and Stan Walerczyk in 2012 has many similarities with Nordic Lighting. But differences exist: Human Centric Lighting has a strong focus on acute effects on human beings, their visual acuity, hormone balance, alertness and productivity, whereas Nordic Lighting Design also includes more delicate perceptions within aesthetics and atmosphere.

Nordic Lighting Design is

- Aesthetical and relating to architecture
- Variation and experiences
- Ambience and atmosphere
- Human Centric Lighting
  - Circadian Rhythms
  - Mood
  - Visual Acuity
  - Energy Savings and sustainability
  - Productivity

RECOMMENDATIONS

In addition to the lessons learned through these pages, this section provides some recommendations for smaller companies, working within lighting, on how to approach export of Nordic Lighting Design.

Functional or decorative lighting regardless, in order to be successful, it is critical to be aware of the business-side of building a successful company within lighting. Managing the supply chain and sales channels, defining optimal price levels, access to decision makers, a strong brand, enough capital and a clear go-to market strategy are all but a few of the demanding tasks in *addition* to a unique product or service.

> *Some success in your local market doesn't translate into success in the German market. Patience, a battle plan and strong distribution agreements, or a dedicated sales organisation is essential. It can also be recommended to ally with other similar companies"*
>
> **Niels Rasmussen, Managing Partner, +RASMUSSEN**

Recommendation I: Collaborate

According to McKinsey[34] the rise of LED has increased the importance of vertical play or collaboration between light source and luminaire players. This means collaboration is – and *becomes* – essential for smaller companies. However, collaboration is not only to achieve technical integration, it also provides opportunities in a sales and marketing perspective. This is confirmed by Managing Partner, Niels Rasmussen from +RASMUSSEN. He states that "…*Some success in your local market doesn't translate into success in the German market. Patience, a battle plan and strong distribution agreements, or a dedicated sales organisation is essential. It can also be recommended to ally with other similar companies"*.

[34] McKinsey, 2012, "Lighting the way..." p. 43

One way would be to collaborate and form partnerships in one or more of the following setups:

Downstream marketing and sales alliances

By teaming up with the right local partners, it is possible to grow following a "no cure no pay" model and therefore avoiding unnecessary fixed costs and the efforts that are required in order to build the market from the bottom and up. However, the direct sales profits from this model are lower than the "do it yourself" strategy.

Get local partners involved, an industry partner or consultants that understand the dynamics and the culture and have a strong network to key decisions makers.

Resource and marketing alliances

- **Complementary partners** – collaborating with companies that offer different value propositions but are targeting the same segments and customers – the potential benefit from a partnering strategy here is to achieve a broader portfolio and a stronger position in the market. This will also convey a stronger brand message and make the products interesting.
- **Supplementary partners** – A local competitor may be a global partner. Consider collaborating to offer a deeper portfolio of luminaires or services and thereby achieve a more competitive position in the market (approaching the market together by handling administrative tasks, bulk supply, account management, networking and marketing)

An example for small companies and in order to get into the contract market is to become a strategic partner for larger companies. An example of this can be seen in the large company Glamox Luxo.

"We design and supply functional lighting but we collaborate with predefined partners. Currently, we work with a Swedish company for decorative and special lighting for status areas such as the reception or entrance," says Geir Skeie, Managing Director, Glamox Luxo Lighting.

Larger companies that aim to be a total solution providers often partner with many companies from architects, lighting control partners to specialists and suppliers of decorative lighting.

"We design and supply functional lighting but we collaborate with predefined partners. Currently we work with a Swedish company for decorative and special lighting for status areas such as the reception or entrance"

Geir Skeie, Managing Director, Glamox Luxo Lighting

Recommendation II: Differentiate from your competitors with the story behind Nordic Lighting Design

Take advantage of the positive vibe around Nordic design. If you can commit to the majority of the aspects in the Nordic Lighting Design (

Part 4 – Nordic Lighting Design), use these insights in your company's marketing efforts. Whether you are in functional or decorative lighting, it is essential to differentiate your products not just by function.

Within 2016, a Nordic Lighting Design website will be made available. The purpose is to assist companies in the branding of Nordic Lighting Design by offering a joint website. Feel free to refer to and link to this site from your own company website.

www.nordiclightingdesign.com

RESOURCES

This section lists both online and human resources that may be relevant for companies with the objectives of entering the German or UK market.

General information

- Insights about lighting regulations in Europe
  http://www.lightingeurope.org/

- McKinseys report "Lighting the Way" from 2012
  Download "Lighting the Way" 2012

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Standards and regulation on the German market:
http://en.licht.de/en/lighting-for-professionals/standards-and-regulations/

Generic info about the German market (in Danish):
http://tyskland.um.dk/da/eksportraadet/tyskland-som-marked/

Publications by ZVEI:
http://www.zvei.org/en/association/publications/

Generic info about the German market (In Danish):
http://tyskland.um.dk/da/eksportraadet/forretningskultur/

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RIBA – Royal Institute of British Architects (RIBA), we've been helping product manufacturers get their products specified for over 30 years. We place your products in front of the right people with the right level of information, in the right place and at the right time
http://www.riba-insight.com/

Generic info English market (in Danish)
http://storbritannien.um.dk/da/eksportraadet/storbritannien-som-marked/

Generic info English market about English Business culture (In Danish)
http://storbritannien.um.dk/da/eksportraadet/storbritannien-som-marked/forretningskultur/

Subcon is a supplier show in Birmingham.
http://www.subconshow.co.uk/

Norway

Lyskultur
Lysaker brygge 24
1366 Lysaker
http://www.lyskultur.no/
p: +47 67 10 28 40
post@lyskultur.no

Iceland

LFÍ
Ljóstæknifélag Íslands
Stórhöfða 27
110 Reykjavík
http://ljosfelag.is/
lfi@ljosfelag.is

Denmark

Danish Lighting Innovation Network
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3660 Stenløse
www.dansklys.dk
P: 47192932
info@dansklys.dk

Danish Lighting Center
Engholmvej 19
3660 Stenløse
www.centerforlys.dk
P: 47171800
information@centerforlys.dk

FABA – Foreningen af Fabrikanter og Importører af Elektriske Belysningsarmaturer
Engholmvej 19
3660 Stenløse
www.faba.dk
p: 40 80 80 11
wg@faba.dk

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