



The European Retail Sector

Commerce plays a unique role in the European economy. Over a billion times a day, commerce serves as the link between manufacturers and the 500 million consumers across Europe. It is a dynamic and labour-intensive sector, generating 11% of the EU's GDP. One company out of three in Europe is active in the commerce sector. Over 95% of the 6 million companies in commerce are small & medium-sized enterprises. Over 30 million Europeans work in commerce and it is one of the few sectors steadily creating employment.

The energy consumption of retail companies

One key requirement for the operation of modern retail outlets is a secure power supply. Providing a broad assortment of products, offering fresh foods daily and creating sophisticated shopping environments entail a high energy demand. Rising energy prices and the effects of climate change are increasingly prompting European retailers to address the challenge of steadily improving their energy efficiency.

On average, three quarters of the total energy demand of a sales outlet account for power consumption. The electricity is mainly used for lighting, air conditioning and food refrigeration. Add to this the energy required for heating the sales floor and for water heating.

Lighting

Good store design and attractive presentation of merchandise are increasingly becoming factors in competitiveness. How lighting is used in a shop can play a decisive role, in particular in the textile and furniture sectors. Moreover, legislation concerning the lighting of retail areas must be observed to prevent accidents to customers and employees.

Ventilation systems

Nearly all retail locations use ventilation systems to ensure air exchange which is mainly required for hygienic reasons. The ventilation systems that provide for a continuous inflow of fresh air are driven by powerful electric motors. On average, these systems can run for over 2,000 hours per year. Owing to the store opening times, which vary considerably across the European retail sector, the corresponding power consumption shows regional variations. But the continued trend towards longer opening hours and increased number of opening days lead us to expect that average operating hours will continue to rise across Europe.

Heating/air conditioning

Today's customers take it for granted that store environments will have a comfortable temperature. In addition to energy consumption for heating during winter time the rising average temperatures in Europe also result in increased operating hours for air conditioning systems. Here, too, regional differences have to be taken into account. Customer expectations regarding a pleasant shopping atmosphere may vary substantially from one country to the next.

Food cooling and refrigeration

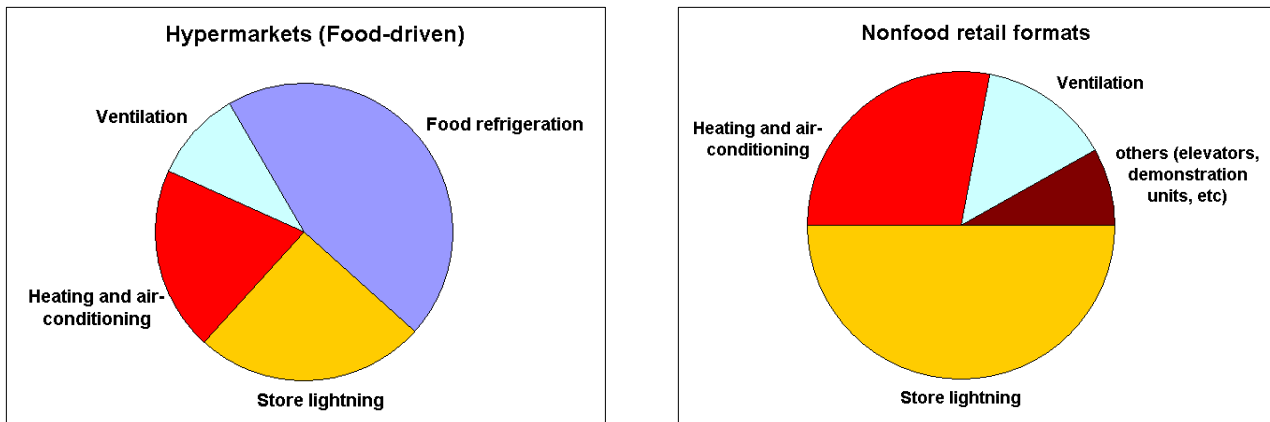
The stringent requirements of European food law and the rising customer demand for convenience and fresh products call for extensive food refrigeration. The refrigeration of fresh and frozen products accounts for up to 50 percent of the energy consumption of a shop which deals mainly in food. Irrespective of whether the stores are equipped with stand-alone refrigeration units or refrigeration systems, maintaining the cooling chain and thus the product quality 365 days per year, 24 hours a day, always involves high power consumption.

The energy consumption of a retail outlet may vary considerably depending on the format and segment. Food retailing accounts for the highest specific consumption owing to the high power consumption for food refrigeration and merchandise presentation in the fresh produce area.

Given the smaller size of cooled areas and the slightly less sophisticated shop lighting, wholesale formats with a

focus on food require somewhat less power than comparable retail formats. The lowest power consumption is found in non-food formats such as DIY and furniture stores. Improving energy efficiency, especially in the field of building and technical services, would appear to be particularly reasonable for retailers in view of the high share of power consumption.

Also the internal distribution of the energy demand varies strongly among different store formats. The pie charts below provide a rough outline of the main energy rubrics for food and non-food driven retailers.



Source: EuroCommerce

The EU Legal Framework

The energy efficiency of a retail location is mainly defined by the technical equipment used and the building itself, but the behaviour of owners and employees also plays a role, although minimal. For each of these areas, the European Union has adopted numerous regulations and standards.

A key piece of legislation for energy saving is the EU framework directive on energy end-use efficiency and energy services (2006/32/EC), under which every EU Member State had to adopt a National Energy Efficiency Action Plan (NEEAP). Member States also set national quantitative targets for saving energy in sectors not covered by the EU Emissions Trading Scheme (ETS). Some included measures and actions addressing the tertiary sector.

The directive also sets inter alia a requirement on member states to ensure the availability of efficient, high-quality energy audit schemes to identify potential for energy efficiency improvements for all final consumers, including smaller domestic, commercial and small and medium-sized industrial customers.

Separate national targets for the increased use of renewable energies could equally have a positive effect on the energy efficiency strategies adopted by retailers. Some countries are planning extensive measures to advance the construction of renewable energy installations (e.g. solar collectors, geothermal heat pumps etc).

One important goal of the EU is to improve the energy efficiency of buildings. To this end, it enacted the Directive on the Energy Performance of Buildings (EPBD), among other measures. European retailers are materially affected by this directive because it specifies binding energy standards for commercially used buildings (new buildings and existing buildings that are subject to major renovation). Although this directive does consider the different climatic conditions in the EU member states, some European countries have gone beyond the requirements of the directive. In Spain, for example, new commercial building projects are mandatorily required to use renewable energies.

At present, it is very difficult to get adequate information through to either the potential tenant or to the consumer about the energy advantages of a building. The certificates under the EPBD are limited to only some energy related activities in a retail store and due to a lack of quality of the certifiers, they are often not really comparable. As a result, other initiatives are being developed such as BREEAM (see annex), which seek to establish a methodology to look for a better performance in relation to the national legislation in each country. However, many of these initiatives are not yet state of the art mainly because they are not governed by a European framework.

In the field of technical equipment in buildings, the EU is also working on new requirements to raise efficiency. Implementing measures under the directive for Energy-using Products (EuP) will have a direct effect on the business activities of European retailers, in particular when purchasing equipment like refrigerators and freezers, boilers, air conditioning or lighting.

Other legal initiatives also involve opportunities for European retailers. The legislative initiatives relating to the further liberalisation of the EU energy markets could result in economically attractive alternatives for energy-efficient power supply solutions. Also, the involvement of highly-efficient decentralised power plants, which could directly benefit retail outlets, would probably be considerably facilitated by liberalisation.

Moreover, the European retail sector is also actively involved in achieving the European energy targets. In a voluntary move, some of the major European retailers have committed to reducing their own energy consumption by 20% by 2020 (ERRT Declaration on Energy Efficiency) compared to the year 1990 where feasible¹: <http://www.errt.org/uploads/MediaRoom/documents/080310%20Energy%20Declaration.doc>.

Energy efficiency improvements are closely associated with greenhouse gas emission reductions and constitute an essential element of climate change and energy policies. Given the urgent challenges of climate change, technologies need to remain being assessed on the basis of their energy efficiency, however in the wider context of their overall environmental footprint.

Opportunities and barriers on the road to energy-efficient retail

Various factors may inhibit or promote the implementation of measures to raise energy efficiency and corporate decisions are influenced by general legal and economic conditions as well as cultural and regional particularities.

Opportunities

The reduction of operational costs is the main incentive for a company to reduce energy consumption. Across the EU, the price of electricity rose by an average of 30 percent from 2005 to 2008 and that of natural gas by about 40 percent. Regionally, energy prices still vary significantly - the price bracket for electricity is +/- 80%, for example. Pilot projects have proven to be a good basis for retail companies to increase investment in energy efficiency. Cost-benefit analyses of measures taken in individual companies play an increasingly important role in the development of energy efficiency processes on a broader basis. In this context, especially planned new stores offer a good platform for technical innovation projects.

To encourage investment in energy efficiency and reduce periods for returns on investment, many EU countries are introducing, or have already set up, financial incentives. Examples of such incentives include: the UK Enhanced Capital Allowance Scheme: <http://www.eca.gov.uk/et/default.htm>

In some cases, consumer expectations and consumer awareness might also be a driver for energy efficiency in stores, especially for retailers - like organic supermarkets - with very environmentally conscious target groups.

Barriers

(i) External barriers

Overall, there are insufficient incentives or rewards for companies investing in energy efficiency or greener technologies. Improving store energy efficiency requires the convergence of the environmental objective of sustainability and the economic objective of cost savings. Today, some green technologies applied to stores require significant investment with relatively low return in terms of environmental and economic benefit. For example, the use of renewable energies in stores, such as photovoltaic.

From a company's viewpoint, major investments in the field of building services are only economically reasonable if the technology can be used over the long term. However, retail premises are frequently leased. At the end of the lease or in case of a premature change of location, any capital investment would be lost.

There is also occasionally a conflict as to whether the owner of the building or the tenant should pay for energy improvements. This is further complicated by the lack of information sharing and comparability of data on energy use between owners and tenants, which makes it difficult to highlight problems and implement solutions.

The excessive administration required in many European countries for constructional changes represents another barrier. Time-consuming, difficult or uncertain approval procedures for the construction of power generation units on the premises, or extensive building rehabilitation measures, may involve economic risks and may discourage shop owners.

¹ Where this is not possible, the most recent year for which companies have the necessary reference data will be used and extrapolated back to 1990 to provide a consistent reference year for the reductions achieved.

In the inner city, the location of retail outlets may present problems with regard to energy efficiency measures. Frequently, local construction regulations can render the modernisation of the insulation in building façades impossible or extremely difficult

Many EU countries are starting or have already set up financial incentives to help companies invest in energy efficient technologies. However, these incentives are not always adapted to the needs of smaller retailers. For instance, they often consist of tax breaks, yet this requires that a company is making a profit and has sufficient resources to pay for the investment.

(ii) Company specific considerations

At company level there is a need for a holistic approach to energy efficiency measures and policy. However, the technical aspects of energy efficiency are not always fully understood. SME retailers may occasionally have limited awareness of the potential cost savings or environmental implications of purchasing or leasing decisions. Furthermore, especially for smaller retail companies, there is not always an energy manager and energy diagnosis or audits are not routine business. Investment and/or leasing decisions are therefore made by non-energy experts without full knowledge of the energy saving potential.

In larger companies also, the final investment decision often lies in hands other than those of the energy managers. Despite its growing importance, the energy efficiency criterion remains one of numerous criteria.

Transfer of Good Practices

For the members of the Retail Forum, reorganising their economic activities towards more energy efficiency is already part of the long-term business strategy. Many examples document the multiplicity of approaches of European retailers.

Examples in the field of store lighting

- IKEA (<http://www.mypaper.se/show/ikea/show.asp?pid=345224322265443>)

Examples in the field of ventilation systems

- C&A (<http://www.c-and-a.com/aboutUs/socialResponsibility/report/>)

Examples in the field of heating/ air-conditioning

- METRO Group (<http://www.metrogroup.de/servlet/PB/show/1172910/Verantw-Nachh-Umwelt-Klimaschutzbroschuere-en.pdf>)

Examples in the field of food refrigeration

- Tesco plc. (<http://www.tescopl.com/plc/media/pr/pr2009/2009-01-13b/>)

Examples in the field of energy management

- Carrefour Group (<http://www.carrefour.com/cdc/responsible-commerce>)
- El Corte Ingles (<http://www.elcorteinglescorporativo.es/elcorteinglescorporativo/elcorteinglescorporativo/portal.do?IDM=24&NM=1>)
- Kingfisher (<http://www.kingfisher.com/index.asp?pageid=453>)
- Rewe Group (<http://www.rewe-group.com/index.php?id=3790|L=1>)

Examples in the field of buildings

- Auchan (<http://www.groupe-auchan.com/pub-adm-fw3/display/000/506/695/5066951.pdf>)
- Tesco plc: (http://www.tescopl.com/plc/storage/pdf/build_env.pdf)

Conclusions and possible areas for action

Key challenges

- Finding a balance between ecological effectiveness and economic efficiency
- Matching customer demands with energy efficiency measures
- Overall strategy of European retailers as a general frame and/or company-specific and/or local efficiency strategy
- Sensitising market participants to the issue of energy efficiency

What retailers can do now

Given their substantial number, existing stores is the field offering the largest energy savings potential in the context of energy efficiency improvement.

There are many standard solutions for saving energy in stores, which are often cost-effective and lead to immediate energy savings, such as the installation of energy-saving lamps, the use of refrigerators and freezers with doors, the regrouping of refrigerators and freezers in the same area of shops etc. The transfer of experience gathered in innovative pilot stores is therefore very important and should continue to be promoted. However, differences in regional conditions and energy prices must be duly considered when planning the measures.

When planning individual projects, retailers should take advantage of the numerous national incentive programmes in the field of building rehabilitation and capital goods modernisation because, in addition to the added ecological value, commercial viability is also an important criterion for company-specific measures. The economic and administrative differences within the EU also have a direct impact on the payback period and scope of capital expenditure.

What retailers can do in the future

To lower their energy costs, retailers have been voluntarily investing in energy-efficient technologies and properties for many years. In most cases, the flexibility allowed by company-specific measures proved to be highly effective with regard to the impact on the environment and on the company.

For retailers, the customers' wishes are the benchmark and are the guiding principle for the development of a future approach to energy efficiency. Considering the growing demand for convenience and fresh products, refrigerated areas in supermarkets are unlikely to decrease. Instead, retailers have to develop individual energy-efficient solutions to suit different customer demands.

Training is essential to equip staff to use new technologies, while education and awareness-raising are needed to improve staff understanding of the benefits of efficiency improvements. There is also a need to improve the monitoring of energy use and sharing of information between shop owners and tenants.

What policy-makers can do

- Ensure that EU and NEEPs (National Energy Efficiency Action Plans) properly address all sectors of the economy including retail companies
- Encourage companies to better understand and monitor energy consumption
- Encourage energy audits by SME preferably by trade associations for smaller retailers
- Help to improve the quality of energy audits and certifiers
- Improve access of small retailers to environmental expertise through business support programmes such as the Enterprise Europe Network and similar national and regional schemes.
- Improve/encourage incentive programmes at national level.

What retailers and other stakeholders can do

- Collaborate further with specific relevant actors on certain issues – perhaps by means of a specific platform. Among the first issues to be addressed could be cooling, heating and lighting in stores, with a view to a common understanding of the methodology for energy efficiency measurements.
- Improve communication between actors along the supply chain;
 - tenants >< shop owners and shopping centres;
 - shop owners >< suppliers of components, energy technicians etc
- Share good practice and implement practical application of energy efficiency measures.

European Retail Forum



**Annex to the
Issue sheet on
energy efficiency
of stores**

Examples of Good Practices

The following examples of good practices were sent by stakeholders:

Buildings

World Business Council for Sustainable Development: Survey on Energy Efficiency of Buildings <http://www.wbcsd.org/DocRoot/IKDpFci8xSi63cZ5AGxQ/EEB-Facts-and-trends.pdf>

BREEAM Retail

BREEAM is a pan European environmental assessment scheme for retail buildings. . The scheme rates the performance of a building according to a broad range of criteria covering the management, energy use, pollution, transport, land use, ecology, materials, water and health and well-being impacts. BREEAM Retail was developed by the Building Research Establishment and has to date been piloted in 9 countries and in 22 developments and is the accepted standard within the industry in Europe. For more information please see <http://www.breeam.org/page.jsp?id=19>

Green Leases

Green Leases cover the traditional rights and responsibilities of landlords and tenants as well as additional benchmarks that create a basis for monitoring and improving energy performance and sustainability practices. These leases bringing together landlords, managing agents, tenants and energy consultants to set overall goals and to define individual roles which makes standards easier to manage and achieve. For example, tenants can sign-up to an agreed level of energy consumption - which might cover lighting and air-conditioning use - during the fit-out stage.

Company Best Practises

Redevco - First C&A Eco-Store in Mainz with BREEAM Very Good rating.
:<http://www.redevco.com/Portals/0/press%20releases/Germany/REDEVCO%20First%20CA%20Eco%20Store%20in%20Mainz%20with%20BREEAM%20certification%20Very%20Good%2021-10.pdf>

Refrigeration

Financial incentives

In Germany, the German Federal Ministry for Environment instituted a Climate Protection Incentive Programme for Commercial Refrigeration (http://www.bmu.de/klimaschutzinitiative/nationale_klimaschutzinitiative/impulsprogramm_kaelteanlagen/doc/41744.php), in order to advance development and market launch of particularly energy efficient and ecological refrigeration systems using natural refrigerants. New installations with a minimum energy consumption of 100,000 kWh per year or energy costs of at least €10,000 are eligible to receive a 25% funding of the net investment cost if they are using natural refrigerants only. A further 10% of funding is available if the system using natural refrigerant is non-electrically powered (e.g. gas), or for the further use of waste heat from refrigeration systems. Similarly, existing installations are eligible to receive a 25% of net investment costs if they are using CO₂, ammonia, or non-halogenated hydrocarbons, as opposed to only 15% if conventional refrigerants are used.

Retail companies good practices in the field of refrigeration

Aldi Süd http://www.focus.de/wissen/wissenschaft/klima/neue_technologien/tid-13345/zukunftstechnologie-aldi-sued-kuelt-mit-co2_aid_369657.html (in German) and

<http://www.r744.com/articles/2009-02-11-aldi-sued-expects-serial-co2-systems-in-two-years.php>

ASDA <http://www.r744.com/articles/2007-07-03-asda-gets-co2-star-treatment.php>

COOP Denmark FDB (Fakta) <http://www.hydrocarbons21.com/files/papers/refrigeration-systems-supermarkets.pdf>

Kauffeld, Trends and Perspectives in Supermarket Refrigeration
<http://www.ammonia21.com/files/papers/trends-perspectives-supermarket-refrigeration.pdf>

METRO Group <http://www.metrogroup.de/servlet/PB/show/1172910/Verantw-Nachh-Umwelt-Klimaschutzbrochuere-en.pdf>

REWE Group <http://www.r744.com/articles/2007-12-14-rewe-group-chooses-co2-for-its-new-city-markets.php>

Other sector good practices in the field of refrigeration

Ben & Jerry's first company to test hydrocarbon refrigerants in the US
<http://www.hydrocarbons21.com/content/articles/2008-09-29-ben--jerrys-set-to-start-freezer-revolution.php>

Unilever Ice Cream Cabinets <http://www.ammonia21.com/files/papers/unilever-ice-cream-cabinets.pdf>

Refrigeration machinery manufacturers

Advansor CO2 based refrigeration systems for heating and cooling
<http://www.r744.com/files/shared/advansor-co2-refrigeration.pdf>

AHT UK launches propane cabinets <http://www.hydrocarbons21.com/content/articles/2009-04-27-aht-uk-launches-propane-cabinets.php>

Green & Cool - product range of, company that has supplied more than 60 commercial refrigeration systems using natural refrigerant CO2 in Sweden, Denmark, Norway, Finland and Switzerland
[http://www.greenandcoolco2.com/pdf/Green&Cool-PRODUKTKATALOG\(eng\).pdf](http://www.greenandcoolco2.com/pdf/Green&Cool-PRODUKTKATALOG(eng).pdf)

MYCOM/MAYEKAWA NH3/CO2 cascade refrigeration system
<http://www.mayekawa.co.jp/en/special02.html>

Internet Platforms

Internet platform on the **natural refrigerant CO2** (R744) www.R744.com

Internet platform on the **natural refrigerant ammonia** (R717) www.ammonia21.com

Internet platform on the use of **hydrocarbons as natural refrigerants** www.hydrocarbons21.com

Internet platform on the use of **natural refrigerants** www.naturalrefrigerants.com

Association Initiatives

European Vending Association Energy Management protocol
<http://www.vending-europe.eu/standards/EVA-EMP.html>

NGO documents

Examples of HFC-Free Cooling Technologies in the Retail sector

<http://www.greenpeace.org/raw/content/china/en/campaigns/stop-climate-change/climate-friendly-cooling/cool-technologies-working-wit.pdf>