

## White goods distribution in the spotlight

Sustainable distribution networks: what can be learned?

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## Introduction

### About “in the spotlight”

On a regular basis, Capgemini Consulting focuses on the main aspects of the supply chain in a particular industry. This comprises the topic of “in the spotlight.”

The objective of this exercise is to identify and share best practices. The background is based on a strong belief and proven track record that best practices from a particular industry are applicable to other industries, and can result in significant added value.

Every two years, over 400 executives from the world’s leading manufacturers, retailers, logistics service providers, universities, and consulting firms participate in discussing future developments that will impact the future value chain. This study<sup>1</sup> and other findings, identify a number of developments that will have a significant impact on European distribution networks. These developments will drive manufacturers, retailers, logistics service providers, and other participants towards structural changes in European distribution.

The white goods sector has always been different. There has not been much integration with other consumer electronics, due to lack of synergies with the most closely related brown goods distribution.

Differences occur in demand (relatively low turnaround, smaller numbers, more diversified retail channels, etc), supply (European production share of white goods is much higher than that of brown goods), and product characteristics (size and value of white goods compared to brown goods).

Thanks to these differences and particular characteristics, logistic costs for white goods transportation represent a larger proportion of the total landed cost than, for example, brown goods. To cope, leading white goods manufacturers have developed dedicated, efficient and sustainable distribution networks.

These networks display a relatively high share of inter-modal distribution, horizontal collaboration, while maintaining high levels of service to the market (this involves both the retailer and the consumer). Leading practices in white goods distribution can therefore be a valuable example for other sectors, including wider consumer electronics and consumer products industries. One example is the trend of modal shift from road transport to inland shipping and rail transport, which is already being picked up by multiple industries and comes with the additional benefit of greening the supply chain.

This report discusses the white goods distribution networks and their best practices. It also provides some thoughts on the added value of these best practices for the wider consumer products industries.

The main takeaway of this article is that supply chain executives will shortly face a number of strategic battlefields for their European distribution networks. Challenging requirements due to further increasing service levels, fast changing consumer markets and demographics, are in contradiction with the drive for sustainable distribution and competitive distribution costs. Adopting some of the best practices from the white goods industry could benefit them in their way towards sustainable distribution networks.



## White goods distribution

The white goods industry in Europe is dominated by a limited number of players (please see figure 1): First there are a number of large “traditional” players like Electrolux, BSH, and Whirlpool. These have a strong European (and global) footprint. Second, there are a number of smaller “traditional” players that, most of the time, have a strong regional footprint. Third, there are a number of upcoming players like Samsung and LG that have their origin in the Asian market. In many cases these Asian native companies already shift at least part of their white goods product portfolio to production in (Eastern) Europe. This is driven by high transport cost on one hand, and increasing rules and legislation regarding CSR and sustainability on the other.

Figure 1: White goods companies within Europe

Company	Main brands (non exhaustive)	Total TO* (2010, bln €)	Global ranking	TO* in Europe (2010, bln €)	European ranking
BSH	Bosch, Siemens, Gaggenau, Neff	8.4	3	6.7	1
Electrolux**	Electrolux, AEG, Zanussi	11.5	2	4.8	2
Indesit	Hotpoint, Indesit, Scholtès	2.9		2.7	3
Whirlpool**	Whirlpool, Bauknecht, Ignis, KitchenAid	13	1	2.2****	4
Samsung**	Samsung	7.5		1.7***	
LG**	LG	6.1		1.2***	
Miele	Miele	2.8		--	

Other players in European white goods: Haier, Amica, Fagor

\*Not all turnover is white goods related. Figures most of the time concern the overall home appliance turnover, including small home appliances like vacuum cleaners, coffee machines, etc.

\*\*Converted to €, based on June 2010 currency rates

\*\*\*High level estimate, based on published European TO share for all product groups

\*\*\*\*EMEA figure, assuming that turnover in Middle East and Africa is small compared to Europe

Although the white goods industry is closely related to the consumer electronics industry, it is characterized by a number of differences, both in demand and supply. These differences are briefly discussed, below.

**Specialized retailers:** The retail channel of white goods is characterised by a large number of smaller retailers specialized in white goods and household appliances, kitchen manufacturers and resellers, large grocery chains, mail-order companies and rapid increasing number of online shops. In contrast, brown goods are often distributed by large electronic retailers offering the full range of products.

**Demand pattern:** The demand pattern of white goods differs from other product groups in consumer electronics. The pattern is not as fast moving, product life cycles are longer, and order sizes are relatively small. As a consequence, the leading manufacturers operate numerous production locations in different European

countries. Each production location is generally specialized in one product group (for example, washing machines) and in general supplies the whole of Europe, apart from some factories that produce a strong local brand or other specialty. The majority of supply is from European located factories in Italy, Poland, Germany, Spain, Hungary, and Turkey. Overseas import is decreasing.

**Product characteristics:** In addition to the previously discussed differences that impact the distribution setup, the other main differentiator is the product itself. Due to size and weight, handling and distribution costs of white goods products are much higher compared to other product groups in consumer electronics. Additionally, the economic value, sales, and order quantities of white goods tend to be lower. These characteristics limit synergies in distribution with other product groups in consumer electronics.

Thanks to these particular white goods characteristics and the clear notice that efficient and green logistics is a key success factor to survive competition, leading white goods manufacturers have developed efficient distribution networks, most of the time dedicated for white goods products. The main characteristics are described, below.

**Regional warehouses -** Leading white goods manufacturers operate in or are in the process of setting up regional warehouses that service multiple sales subsidiaries (see figure 2, for example). They move away from the traditional setup, with local or country distribution centers (DCs), managed by the country organization, towards a structure with around ten central warehouses managed by a centralized supply chain or logistics function.

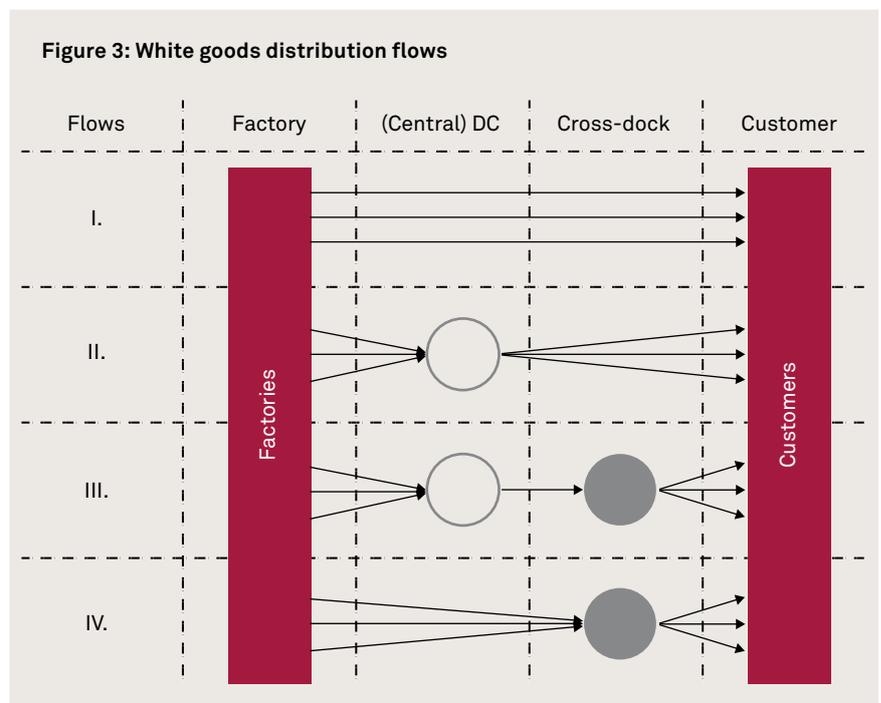
**Figure 2: European warehouse footprint**



In general, this setup enables 48 hours delivery lead times for so called indirect customers. Direct customers like large chains that run their own DC, are serviced with full trucks or containers directly from the factories. In some occasions, local DCs operate in parallel to the centralized structure. Reasons vary and relate to the historic network structure, political reasons, local products or special service level requirements.

One of the main advantages of a centralized DC structure is the potential of centralized inventory management, most of the time resulting in significant savings on inventory carrying costs, obsolete products, and warehouse operations. Transportation is key, also taking into account that by centralizing DCs, the ratio between the relatively cost efficient primary transport (from factory to DC) and the expensive secondary transport / last mile (from DC to customer) changes.

Efficient distribution structures - Leading white goods manufacturers have developed efficient distribution structures. In general, there are four main flows to be taken into account, when considering the goods flow from factory to customers (other than consumers). These are visualized in figure 3.



*The first flow (Flow I) is the direct flow. Very large customers (having central goods receipt facilities) receive full truckloads or containers with one type of product directly from the factories. For the leading manufacturers between 10 to 25 percent of the volume is distributed directly.*

*The second flow (Flow II) involves shipments from the factories to the DCs in Europe. Products are stored in the central DC. From the central DC, based on customer order, customer orders are picked and shipped with direct deliveries, or “milk runs” to the customers.*

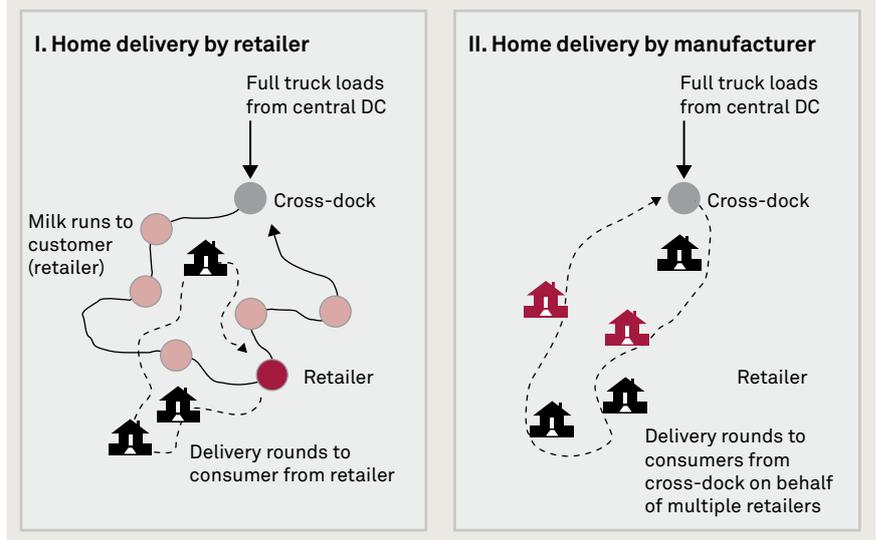
*The third flow (Flow III) includes shipments from the factories to the DCs in Europe and subsequent shipments to cross-dock centers. This enables full truckloads from the DC to the cross-dock center, and relatively short delivery rounds from the cross-dock to the customer. The cross-dock process also allows to merge with customer orders from other (mostly) white goods flows (also from competing manufacturers) or to diversify (for example, into normal delivery rounds to retail customers and so called two-man deliveries that can do home deliveries). These cross-dock centers are usually part of the network of the Logistics Service Provider (LSP), and are out of control of the manufacturer.*

*The fourth flow (Flow IV) involves production and delivery from factory stock, based on order. This concept is rapidly gaining popularity with market players. Due to an end-to-end integrated supply chain planning, they are able to produce and deliver from factory stock, based on order. Producers ship full truck loads of homogeneous products, directly from the factories to a network of cross-dock centers, which can be directly contracted by the manufacturer. At the cross-dock centers, customer orders are collected from the incoming “bulk” flows. Subsequently, customer delivery rounds are prepared. Similar to Flow III, it is possible to apply horizontal integration with customer orders from other white goods flows. The fourth flow has the potential to prevent stock levels. On the other hand, it requires end-to-end operational excellence to prevent service level failures.*

Efficient lead times - Retailers are usually not fond of storing a lot of white goods products in their warehouses, or using a lot of space in their stores for white goods, at the expense of products with a much higher turnover per meter square. Therefore, one of the key success factors for white good manufacturers is to differentiate in short and reliable lead times to their customers, as the consumers expect their purchase rather yesterday than today. The distribution networks of the leading manufacturers enable short and reliable lead-times of about 48 hours, but also less if required.

Home delivery - The efficient lead times of white goods often involve only the goods flow from factory to customer, mainly to the retailer locations, and not to the consumers' homes. How to get the white goods products at the house of the consumer is quite relevant for white goods, as these products are not as easily handled as a smart phone or digital cameras. The majority of the home deliveries is organized by the retailer, including the online retailers. However, on a regional basis, white goods manufacturers are also offering or investigating home deliveries. This type of distribution can easily be connected to the cross-dock flows (see Flows III and IV, above), and would enable shorter lead times by physically bypassing the retailer (see figure 4). This type of distribution can also contribute to the sustainability challenges that manufacturers face.

Figure 4: White goods home deliveries



Based on the picture that we created of the white goods distribution setup, we will outline a number of best practices. They are described in the next section.



## Best practices in white goods distribution

Unique processes and equipment: Leading manufacturers have actively developed unique processes and equipment for handling white goods products. This involves warehouse picking and stacking; and vehicle loading and unloading. Leading manufacturers have developed (patented) handling equipment like clam trucks (see figure 5). They are able to accomplish high warehouse utilization rates and optimal truck loads, by unique stacking rules and optimization tools.

Figure 5: Clam truck



For example, truckloads for trucks used for customer delivery are optimally prepared by stacking heavy washing machines at the bottom, lighter products on top, while also taking into account the order of deliveries. Full truck loads and high truck utilization in general is not only cost efficient but also very good for decreasing the carbon footprint.

Effective use of horizontal integration: This involves the effective use of horizontal integration in warehouse operations and secondary distribution (from central DC to customers). White goods manufacturers use shared warehouse services in combination with other white goods manufacturers. Apart from synergies in the warehouse (both in equipment and expertise), this also enables synergies in customer distribution. This requires collaboration between (competing) manufacturers, to align delivery priorities and the use of corporate identity (for example, branded trucks).

High ratio of inter-modal sustainable distribution. The high ratio of inter-modal sustainable distribution is yet another best practice. It is higher in white goods players making use of a combination of water channels, rail and road when compared to other European players in consumer electronics or consumer products that largely depend on road distribution within Europe.

Inter-modal solutions have been successfully applied, while service levels in terms of lead times are similar or just slightly longer compared to road by leveraging overnight services. There are examples on various routes, like Poland - Germany (rail), Germany - France (rail), Italy - Scandinavia (rail), Germany - the UK (barge - short sea shipping), from and to Spain and Portugal (short sea shipping), within France (rail) and Germany - the Netherlands (barge). Inter-modal solutions are mainly applied in primary distribution, but there are also examples where it is successfully applied for customer delivery, for example, using overnight rail connections in combination with cross-docking to various distribution rounds results in 48 hour delivery lead times.

Environmental care, hence sustainable distribution, is a key priority of the top 3 manufacturers. As a consequence (and, of course, also driven by efficiency) distribution networks have been set up in a way to maximize the ratio of sustainable transportation. Manufacturers share their environmental policy publicly. Some examples:

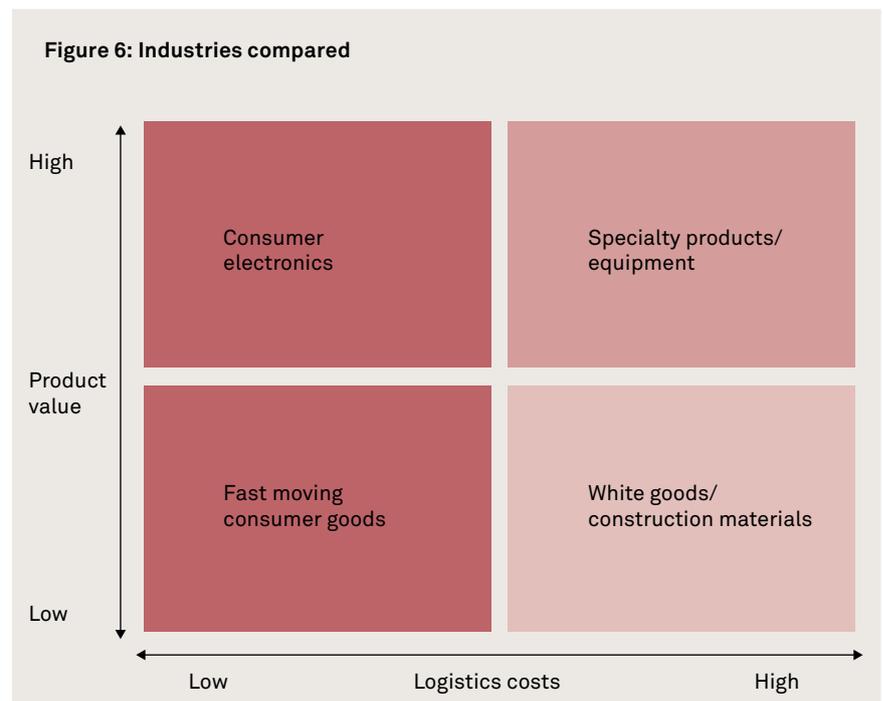
- BSH (Bosch und Siemens Hausgeräte GmbH) claims to have a proportion of more than 50 percent of their international transports *not to be shipped by truck*. Their latest report on environmental and corporate responsibility<sup>2</sup> states a proportion of road 46 percent, rail 36 percent, short sea 5 percent, and deep sea 13 percent.
- BSH and Whirlpool publish their location policy publicly. They have chosen most of the factory and DC locations, based on the availability of multi-modal connections (road, rail, and, to a lesser extent, water).

Centralized logistics infrastructure: The centralized logistics infrastructure enables the shipper to create visibility throughout the supply chain and actively steer all logistics activities. By doing so, the supply chain becomes more flexible, inventories can be reduced, and logistics consolidation can take place. Logistics consolidation is also key in utilizing inter-modal logistics solutions, as it creates the critical volume that is required to make it cost efficient.

## What to learn from white goods distribution

As was described above, the white goods sector has developed several interesting strategies to ensure optimal goods distribution. Some of the strategies discussed, such as the transformation to a centralized DC structure for European distribution, can involve significant investment and change the pattern of goods distribution. The question then becomes if these best practices are equally interesting to all sectors.

To answer this question, we need to look at the nature of the products. In general, white goods are heavy products but relatively low in value. Supply chain distribution costs therefore constitute a significant portion of the cost of goods. Any improvements in the supply chain quickly represent a relevant competitive advantage in the white goods sector. In comparison, consumer electronics often have lower transportation costs so that the competitive advantage more often lies in product differentiation.



Comment: White goods find themselves in the lower right corner (low value, high logistics costs), together with, for example, construction materials. Optimizing logistics for this kind of products is beneficial as every optimization initiative results in relatively high logistics cost saving in the total picture of cost of goods sold (COGS).

Moving to the left on that same axis, we find low value products with low logistics costs (for example, fast moving consumer goods). Right on top there is the high value products with low logistics costs (for example, consumer electronics). For both product categories, logistics optimization initiatives need to be quite substantial before becoming interesting because of the relatively low logistics costs.

The fourth quarter is that of specialty products or equipment (for example, industrial machines). These high value products mainly ship in very low quantities and therefore it is not feasible to design an optimal distribution network for this segment.

Taking into consideration figure 6, the distribution strategies developed by the white goods sector should have a positive impact on all sectors where products have low product value and high logistic costs. However, the proven logistics practices we have seen in the white goods sector can be very interesting for other sectors as well.

The transformation towards a centralized DC structure for European distribution, for instance can also have a positive impact on other sectors. These centralized structures not only have the potential to save costs on inventory and operations, but they are also more resilient to deal with market dynamics. They are able to serve multiple countries, hence multiple requirements. The centralized DC represents an opportunity for other sectors. With centralized DCs full truckloads can be achieved and inbound and outbound flows can be executed by inter-modal transport. Collaboration with LSPs and manufacturers increases this success.

Second, integration of home delivery with the manufacturer's distribution network is also interesting. The white goods sector boasts some excellent examples where home delivery and service is integrated with or closely connected to the manufacturer's distribution network. They have organized effective communication and information exchange between consumer, retailer, logistics service provider, and manufacturer. Consumer electronics or shiny goods, in particular, can actually benefit from the same physical supply chain setup as the white goods since they share the same customers and final consumers. And, in many cases, even the same manufacturer. Naturally, many logistics parameters between consumer electronics and white goods differ, but consolidation potential should certainly be investigated.

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