LIMASA is the public operating arm of the City of Malaga, located on the South West Coast of Spain in Andalucia. The city has 578,000 inhabitants and ranks as the fifth largest city in Spain. The company is responsible for waste collection, street and beach cleaning and waste treatment, and is one of the leading Spanish public companies in implementing innovative ideas, best practice as well as a sustainable waste management system. Waste collection, as well as street and beach cleaning, is carried out both night and day 365 days a year.
Waste Collection

There are different ways in which waste is collected in Malaga. LIMASA operate an entire fleet of refuse collection vehicles supplied by Geesink Norba. The traditional method of waste collected in 1100 litre containers is widely used in Malaga. Residents deposit their waste at communal collection points in the streets, where there are various 1100 litre containers in which the public can separate their waste streams. There are containers for residual waste, organic waste and plastic. There are also separate igloo containers for paper, cardboard and glass. These materials are collected by external contractors, ECOEMBES for paper and cardboard and ECOVIDRIO for glass. The vehicles used to collect this are non compaction and consist of a tipper with crane. Once the vehicle has collected the paper, cardboard and glass it delivers it to a material processing facility.

The 1100 litre containers are emptied by a Geesink Norba GPM111 refuse collection vehicle of 22 cubic metre capacity fitted with a GCB 1000 bin lift. The vehicle is manned by a driver and a crew of two. The collection crew place the 1100 litre containers to the rear of the vehicle for emptying. Depending on the waste collection crew determines what fraction of waste that they will be collecting, for example, residual waste, organic waste or plastics.

Another system used in the city is the underground waste collection system. The containers used for this collection are igloos or 1100 litre containers, mounted below ground level thus giving a more pleasing appearance to the area. The containers also have sufficient capacity stored below ground level for the excess waste that is normally piled up around 1100 litre containers located in communal collection points. The size of the underground waste collection system used depends upon the volume of waste generated in each area.

To empty the containers a Geesink GPM111 KT2 refuse collection vehicle is used of 18 cubic metre capacity. This collection vehicle consists of a crane mounted behind the cab and in front of the refuse collection body. The other advantage of using this
collection system is that it only requires one driver to carry out all of the operating functions. This is important because it reduces labour costs since loaders are not required to position the containers for emptying. This collection method is mainly carried out at night or in the afternoon to prevent traffic congestion in this busy city. The crane lifts the igloo type containers from below ground level and deposits the containers’ contents into the loading aperture / hopper of the Geesink GPM111 KT2. The waste is subsequently compacted inside the refuse collection bodywork. The operating controls of the equipment are manned by the driver, who repositions the containers below basement level before moving on to the next waste collection point.

Where 1100 litre containers have been sited below ground level, the driver uses hydraulics to lift them to ground level. An electronic adaption mounted on the tailgate of the refuse collection vehicle does this. To make the Geesink GPM111 KT2 refuse collection bodywork more versatile there is a GCB1000 lifter mounted to the rear of the tailgate. The driver operates the hydraulics to lift the extended hopper when emptying igloo type containers, which gives an open operating area to facilitate the use of the GCB1000 lifter to empty the 1100 litre containers. Once the driver has finished emptying the containers, he places them at ground level using the electrical adaption located on the refuse collection vehicle’s hopper. The driver can reset the hopper into the loading mode required for igloo type containers, or can leave it in the mode already set to continue loading the 1100 litre containers, before moving onto the next collection point. The types of waste collected from the underground waste collection system are residual waste, organic waste, plastic, paper and cardboard.

Another advantage of the Geesink GPM111 KT2 refuse collection vehicle is that it can empty 1100 litre containers in standard communal collection points of various waste commodities, as well as igloo type containers sited for the collection of plastic waste at ground level. This makes this particular type of refuse collection vehicle versatile for any mode of waste collection.
Another method of waste collection in Malaga is the use of side loaders. LIMASA operate four AMS side loaders of 22 cubic metres in volume. The type of collection containers that these vehicles empty can range from 2400 litres to 3200 litres in capacity. The containers are placed in communal collection points along the highway. The collection method uses containers for the collection of residual waste, organic waste, plastic, paper and cardboard waste. This mode of collection is very economical in labour, only requiring a driver so, once again it reduces the need for loaders.

LIMASA also operates several household waste recycling centres across the city for residents to deposit bulky waste. At these sites, the City Council also provides containers for the collection of organic waste, plastic, aluminium, steel, glass, paper and cardboard, as well as waste electronic and electrical equipment.

The bulky waste is loaded into five cubic yard skips. To empty these, LIMASA operates several Geesink GPM111 refuse collection vehicles fitted with their GAC industrial container lifting device. The device lifts the five cubic yard containers into the rear of the GPM111 refuse collection vehicle. All operating controls are manned by a driver, as once again this collection operation only requires the use of a driver. The waste is compacted into the body of the refuse collection vehicle, and once the container is empty, it is returned to ground level for reloading. The refuse collection vehicle moves on to empty the next five cubic yard skip located at the facility once the GAC container hoist has been stowed correctly. As well as using this service at household waste recycling centres, LIMASA also supply the five cubic yard skips to industry and commerce. The schedules for emptying these are agreed between both customer and LIMASA, and provides an economic method of collecting commercial and industrial waste in the City.

**Waste Treatment**

All of the residual, commercial and industrial waste collected by LIMASA in Malaga is delivered to a sanitary landfill site located outside the city. The landfill is fully
compliant with the European Union Landfill Directive. At the site, the methane gas is used to generate electricity, for supply to the national grid, where the electricity can power homes and industrial buildings. The landfill also treats leachate at its desalination plant, before safely discharging the clean effluent into the underground sewerage network.

Also located on the same site is a baling press for all of the waste plastic HDPE and PET bottles collected from the 1100, igloo and side loader containers in the city. Once the plastic has been baled it is transported to reprocessing facilities.

A recycling plant for construction and demolition waste also operates on the same site as the landfill. This waste is crushed to a type two specification, and is reused on construction sites in the city, for example, in building foundations. LIMASA provides a complete waste management system for the treatment of waste in the city.

Mr. Juan Ruiz Waste Collection Manager of Malaga, was presented with a new fleet of waste collection vehicles at Malaga Football Stadium on Monday 7th March 2011.

The new fleet of vehicles comprised four Geesink GPM111 KT2 units of 18 cubic metre capacity. These were mounted onto Volvo FE chassis in 6x2 rear steer configuration and with Allison 3000 series automatic transmission. Tests carried out by Mr Juan Ruiz at the presentation showed that the overall noise level did not exceed 6.5 decibels. These new units will be used to collect waste stored in the underground waste collection systems located across the city. Due to the low noise levels of these new vehicles they will mainly operate at night as well as in the afternoon.

In addition to this, three Geesink GPM111 GAC units with 22 cubic metre capacity bodies were also delivered. These units were mounted onto Ivec0 Stralis 6x2 rear steer chassis and equipped with Allison 3000 series automatic transmission. The new vehicles will be used to collect waste from the household waste recycling centres as well as commercial and industrial waste from across the city.
As well as these Geesink Norba also delivered two AMS side loaders of 22 cubic metre capacity. These units were mounted onto Iveco Stralis 6x2 rear steer chassis, complete with Allison 3000 series automatic transmission. The new vehicles will be used to collect residual and organic waste, as well as plastic, paper and cardboard recyclables from 2400 litre – 3200 litre containers from communal collection points located across the City.

A fleet of satellite refuse collection vehicles of 3.5 tonnes were supplied by Rossi. These waste collection vehicles will collect waste in narrow access areas and small suburbs of the city. When full they will transport the waste to a Geesink GPM111 refuse collection vehicle equipped with a GCB 1000 bin lift. Due to the vehicle’s high tipping height it will discharge its load into the rear of the Geesink GPM111 tailgate. Once the waste has been compacted into the larger refuse collection vehicle it will continue collecting waste in restricted access areas. The Geesink GPM111, GCB 1000 refuse collection vehicle will await another Rossi satellite refuse collection vehicle to arrive and deposit its load into its loading aperture. Once the Geesink unit is full, it will make its journey to the Sanitary Landfill Site of Malaga to discharge its load. The advantage of this equipment is that it can act as a mobile waste transfer station for the satellite vehicles, as well as improve productivity in the satellite vehicles’ waste collection rounds. To add to this it also reduces the carbon footprint as only one collection vehicle has got to travel to the landfill site.

The keys of the nine new refuse collection vehicles were handed over to Mr. Juan Ruiz, Waste Collection Manager for LIMASA City of Malaga by Mr. Cees Solinger, Managing Director of Geesink Norba Spain, Mr. Fabio Mendez, Area Sales Manager for Geesink Norba in South West Spain, and Mr. Javier Martin, Parts and Service Manager of Geesink Norba Spain. The total investment in these new waste collection equipments alone was 1.5 million euros.

The final exhibits on display were an Iveco Stralis 6x2 rear steer Multilift hooklift roll on off vehicle with truck mounted crane. This vehicle will be used to transport
construction and demolition waste, as well as oversized objects which need to be lifted by the crane into 20 and 22ft containers which the roll on off equipment can carry. The wastes collected may be delivered to the construction and demolition recycling facility for reprocessing operated by LIMASA in the City.

Finally, there were several motorbikes purchased with suction equipment mounted to them for litter and dog excrement collection. The use of these will help maintain the city’s cleanliness to a high standard.

With a significant investment in new capital equipment LIMASA will be able to maintain a high level of waste collection and street cleansing services for the residents of Malaga. Let’s hope that other municipalities in Spain follow in LIMASA’S footsteps, and similarly invest in new waste and street cleansing equipment so their towns and cities can be as well maintained as Malaga.