JCCU Industrial Tour to Milan – 2012

This report provides an overview of the 2012 JCCU Industrial Tour to Milan, a 6 day trip for 16 students and the Director of Studies, Dr Adrian Taylor. The tour comprised of visits to the European Commission Joint Research Centre at Ispra on Lake Maggiore, the Maserati factory in Modena, and a Sealed Air packaging factory to the north of Milan.

During the tour, we stayed at Ostello Olinda in the north of Milan; this was situated close to a metro station and had easy access for coaches to take us on visits. Students had time to enjoy a taste of Italian culture, with time spent exploring the food and history of Milan.

Itinerary:

Below shows a concise itinerary of the tour:

Sunday	07.45	Meet at Gloucester Green for coach to Gatwick departing at 8.00
	10.25	Check in – for those meeting us at the airport.
	15.20	Arrive in Milan and coach to hostel
	16.30	Free evening in Milan
Monday	8.00	Coach to Joint Research Centre – Ispra.
	10.00	Industrial visit to Joint Research Centre, Ispra
	15.30	Coach back to hostel
Tuesday:	10.00	Coach to Modena
	12.00	Free time + lunch in Modena
	14.00	Tour of Maserati Research Centre
	16.00	Return to Milan
Wednsday:	9.00-10.30	Coach to Stresa
	11.00	Day trip to Stresa + cruise around Lake Maggiore and islands in it.
Thursday		Free Day
	20.00	Tour dinner
Friday	8.30	Coach to Sealed Air Factory
	10.00-14.30	Tour of Sealed Air Factory
	15.00	Coach to Milan Malpensa Airport
	18.10	Flight to London Gatwick
	20.15	Coach to oxford to arrive at around 10pm.

Industrial Visits – Ispra

The visit to Ispra was made possible by Silvia Imarisio, and we would like to thank her, and all the other staff at Ispra for hosting our visit.

The joint research centre was set up in 1957 after the singing of the European Atomic Energy Community. This resulted in the establishment of a Joint Nuclear Centre, which was set up at Ispra on the shore of Lake Maggiore in northern Italy.

Since the establishment of the site at Ispra, more research sites have been built across Europe, and the nature of research has changed and diversified. It currently has a budget of around €400 million, and in 2011 produced 1467 publications. Today the JRC has the mission statement:

> "The mission of the Joint Research Centre is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of European Union policies. As a service of the European Commission, the Joint Research Centre functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national."[1]

The site at Ispra, which was visited on the Monday, covers an area of 168 hectares and employs around 1800 staff. The staff at Ispra work both on current research, as well as decommissioning the nuclear reactor at Ispra which was completed in 1962.

At Ispra, research is being conducted towards achieving the goals of 20% energy produced in the EU being renewable and 10% of the energy in transport being renewable, as well as monitoring the effects and costs of these goals on the economy, society and the environment, to ensure sustainable changes are made.

One area of research is in engine emissions. At the Ispra site, the standard European emission tests, and limits for engines are developed. Current research is to develop the Euro 6 standards that will come into force in 2014 to further reduce vehicle pollution across the EU.

Ispra also conducts research into the effects of earthquakes on concrete buildings, to advise the EC about construction regulation, particularly for earthquake prone regions like Italy and Cyprus. In these tests, true shear stresses are applied to a concrete block, and marks on the surface observed with video, the sample is cycled and hysteris loops are generated. This data is used to help develop new, safer construction materials. The work on earthquakes also extends to a full scale testing laboratory for large structures, which simulates the effects of an earthquake on a structure. This is useful for assessing the risk of current buildings. At the time of visit investigations into a particular type of concrete tower block built across Cyprus in the 1980s was being done, with a view to investigating how minor modifications can improve the safety of these buildings.

The visit was useful to understand the way in which governmental organisations are working to improve regulation and safety of technology.

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[1] http://ec.europa.eu/dgs/jrc/index.cfm?id=5080
Other facts and figures given by Ispra staff during visit.

Industrial Visit – Maserati

The visit to Maserati comprised of a tour around their assembly line, and the company museum. We would like to thank Maserati and Gaia Molinari for making this visit possible.

The site at Modena contains the commercial offices, design centre and assembly line for Maserati. As part of the Fiat Group, some components like the bodyshell (made by ITCA in Turin from lightweight steel) and engine are made off site. The engine is made from a lightweight aluminium alloy (A356)[2], and is cast and assembled at the Ferrari Maranello site. The production line at Maserati consists of 26 work stations at which a team of workers has 40 minutes to complete their specialised stage of construction.

As can be seen in the image to the right, the cars are moved around the assembly line attached to a ceiling mounted conveyor belt that starts holding the bodyshell and stops the cars at each construction station for 40 minutes. At each station a specific task must be completed within this timeframe, for example the attachment of the drivetrain, or the instillation of the dashboard require a station.

http://web.pdx.edu/~jiaoj/phy451/Lect6.p 1

One of the main difficulties to overcome in the manufacturing process is that the cars can be customised to a huge degree by the customers. To ensure that the correct components are put on each car, an information pack, and pre-prepared trolley containing most of the required parts accompany each car throughout the assembly process. Other components like the drive train and seats are delivered on a 'just in time' basis to the relevant assembly station.

The drivetrains are assembled in a separate assembly line, where the engines, drive shaft, axels and brakes are put together. Maserati does not use ceramic brakes, due to concerns over performance drop as the brakes heat. Instead they use more traditional metal piston breaks, but with an extra piston to give fast breaking with minimised loss of performance after use.

Maserati's assembly process is entirely by hand, excluding one painting and gluing stations that has to be automated to avoid worker contact with hazardous chemicals. Maserati believes that this gives greater assurance of quality to their customers. With a low volume of cars produced day (about 50), the capital costs of automation, and limited demand to increase production do not justify automation.

The visit to Maserati was useful as it gave a full explanation of the assembly process, with discussion of the wide range of materials used in the final product – these varied from the steel used in the bodywork, to the leather of the seats.

[2] http://www.maserati.com/maserati/en/en/index/passion/company/production-cycle/Light-Alloys.html
Other facts and figures given by Maserati Staff during visit

Industrial Visit – Sealed Air

The visit to Sealed Air on Friday Morning, consisted of a presentation by Colin Parnell, their Vice president, about Sealed Air and in particular what takes place at the factory in Milan. After this we split into groups for a tour of their R&D, pilot facilities and production area, followed by a question and answer session.

While Sealed Air is a global company, with subsidiaries worldwide and a huge range of products, the Milan unit focuses on producing and improving a small range of products, the main ones being shrink packaging and rolls of extruded polymer films, to be sold and transported to other plants to be made into packaging. These are sometimes often dyed depending on their ultimate purpose.

The extruded polymer films were produced by two methods. The first involved extruding polymer sheets in several stages through dies, to reduce the thickness gradually into a thin film; each film consisting of up to 9 layers of material. This was a continuous process, and the film was therefore constantly water cooled to avoid overheating. It passed through several sensors to monitor thickness and length across the width of the film.

The second method was through film blowing. Here hot air was blown through a tube of the plastic to inflate it to several times its original size. We were able to see the smaller of two extruders of these, which already inflated the material to a bubble of up to 7 meters in height. The thin film was then pulled away and rolled up. The materials used here were mainly polyethylene based, due to its high flexibility, but varied depending on the ultimate purpose.

The manufacturing of shrink packaging was completely different. The material used was far more rigid and the packaging was manufactured directly around the products that needed packaging.

The visit was useful and interesting for all year groups to illustrate first-hand the mechanical processing of polymers and continuous manufacturing as well as getting an introduction to the new developments and possible improvements in the use of polymers in industry.

Free time:

With Industrial visits on Monday, Tuesday and Friday, students had time in the evenings to explore Milan by metro. The visit on Tuesday to Maserati, also allowed students time in the beautiful renaissance city of Modena. The day trip to Stresa and Lake Maggiore comprised of a boat tour of the lake, and a central island. This was followed with some famous Italian gelato in the picturesque lakeside town of Stresa.

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Finally, thank you to Dr. Adrian Taylor for helping in the organisation of the tour and supervising the trip.

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