.05 Environment

- We are applying our R&D expertise to create new products to tackle toxic contaminants in industrial water applications.

R&D

Clever Chemistry to Clean Up Water

"As part of our new business development activities we are working on high technology purification products for industrial applications in the water industry. Alarmingly, there isn't a single country in the world whose regulations meet or exceed all of the World Health Organization's recommended limits for pollutants in water. Whilst this can be a result of economic factors, in some cases it is simply because there isn't effective technology to meet the recommendations.

At Johnson Matthey we are focusing our R&D efforts on technology to remove a range of low level toxic contaminants, including mercury, from water. Mercury is a particularly harmful environmental pollutant which can enter the water cycle from many sources and is present as a mixture of chemical species.

Creating a product to remove mercury effectively is a tough chemistry challenge. First of all, our product must selectively isolate the range of mercury species in a soluble form from the water – which also contains a wide range of other chemical species. It must then convert the mixture of soluble mercury species into an inert, solid form which can be removed. We are using chemical modelling to design the best materials to strongly bind mercury. We then take our designs and develop complex lab based chemistries to create materials that can be tested and scaled up for manufacture.

We are making good progress to date and our products are being trialled by customers on three continents. With strong demand for more effective water purification technologies, we are applying our R&D expertise to develop a new generation of products to improve water quality."

SUPPORTING OUR STRATEGY – RESEARCH AND DEVELOPMENT

This section provides more detail on the impact of our business on the environment. It details the environmental performance of our operations in the year and highlights the beneficial impact of our products.

ENVIRONMENT

05

Contents

78 Environmental Performance Summary
78 Conserving Natural Resources and Improving Our Processes and Products
79 Managing Performance and Driving Continuous Improvement
79 Environmental Performance in 2012/13
83 Environmental Aims and Targets
83 Biodiversity

Environment

Performance Summary

		2013	2012	% change
Energy consumption	thousands GJ	**4,648**	4,726	-2
Total global warming potential	thousand tonnes CO_2 equivalent	**413**	417	-1
Total acid gas emissions	tonnes SO_2 equivalent	**334**	444	-25
Total VOC emissions	tonnes	**185.6**	189.8	-2
Total waste	tonnes	**110,448**	120,363	-8
Total waste to landfill	tonnes	**3,218**	10,708	-70
Water consumption	thousands m^3	**2,444**	2,201	+11

Johnson Matthey has an impact on the environment in many ways: through the resources we use, the way we operate our processes and the action of our products and services on enhancing the environment for others.

A major part of our business involves applying our scientific knowledge and expertise to turn natural resources into more valuable products for our customers. Natural resource costs are likely to increase in future as they are depleted or become harder to access. Our Sustainability 2017 and Manufacturing Excellence programmes both focus on increasing the efficiency with which we use these valuable resources and will generate cost savings for our business today and help to conserve resources for the future.

In addition, as a leading recycler and refiner of precious metals, we draw on our expertise in this area to enhance the resource efficiency of our own operations and provide improved solutions and services for our customers.

Many of the group's products have a positive impact on the environment including emission control catalysts for vehicles, process catalysts that improve resource efficiency and abatement systems which mitigate the production of greenhouse gases. A significant proportion of our R&D efforts are directed towards developing the next generation of environmentally beneficial products.

→ Read more about how we use life cycle assessment tools to better understand and improve the sustainability credentials of our products on page 46.

→ Read more on our product stewardship systems in the Health and Safety section on pages 74 and 75.

Targets to improve environmental performance are a key part of our Sustainability 2017 Vision. The group aims to cut its carbon intensity by half, achieve zero waste to landfill and halve the key resources per unit of output consumed (compared with baseline data from 2007) by 2017. In order to meet these aspirations, long term environmental improvement plans and performance indicators have been established.

Read more on Sustainability 2017 on pages 15 to 17 and at www.matthey.com/sustainability.

→ Read more on our progress towards Sustainability 2017 on page 21.

Read more on the environmental benefits of our products at www.matthey.com/sustainability/products.

Conserving Natural Resources and Improving Our Processes and Products

As part of our Sustainability 2017 aspirations to reduce environmental impact whilst sustaining growth, Johnson Matthey has set targets to halve the key resources it uses per unit of output. We have identified natural gas, electricity and water as our most significant resources in the current and future context of availability (including accessibility, geopolitical factors and infrastructure), cost and quantities used.

Each of our businesses set internal reduction targets which are formally reviewed as part of the annual budget planning process to ensure alignment of their Sustainability 2017 and Manufacturing Excellence programme efforts and their contribution towards the group's goals. There are a wide range of operational initiatives underway to optimise resource use and improve processes across the group. In addition to process improvement efforts, efficiency and longevity of equipment are considered in purchasing decisions and for large capital expenditure projects.

Given that we operate in a world where increased demand for key resources and critical raw materials can expose the group to the risk of price volatility or resource availability, we also seek to apply our technical expertise and know how to develop more sustainable products. Our efforts are threefold: we develop products which deliver the same performance but with less critical raw material content (for example, our work to thrift rare earth materials from our emission control catalysts and refinery additives); products that can be manufactured via a less resource intense route (for example, our compact catalysed soot filter product for diesel cars); or products that enable our customers to lower their environmental footprint (for example, our process catalysts).

- Lean manufacturing initiatives at Johnson Matthey's emission control catalyst manufacturing operations in Royston, UK.

- Fuel cell research and development at Johnson Matthey's Technology Centre in Sonning Common, UK.

Managing Performance and Driving Continuous Improvement

The group has well established policies, systems and processes in place to manage its environmental performance and to drive continuous improvement. All our major manufacturing sites are required to maintain certification to the ISO 14001 environmental management system as a means of setting, maintaining and improving standards. The group also requires new or acquired sites to achieve ISO 14001 certification within two years of beneficial operation or acquisition. During the year, Johnson Matthey made two acquisitions, Axeon and Formox, and plans are being developed to support their major manufacturing sites in implementing the standard.

→ Read more in the Governance section on pages 90 and 91.

Read full details of our policies and strategies to manage and drive performance at www.matthey.com/sustainability.

Environmental Performance in 2012/13

Johnson Matthey undertakes a comprehensive annual review of group environmental performance which covers all manufacturing and research and development facilities. Data is presented for a five year period for nine key environmental indicators.

Johnson Matthey has made progress in improving its environmental performance with decreases in eight of the nine key environmental indicators we report. These improvements have been achieved in the context of similar / increased production. They demonstrate the positive impacts of our Sustainability 2017 and Manufacturing Excellence programmes on the efficiency and environmental performance of our business. Consequently, with sales excluding precious metals (sales) flat for the year, eight out of nine of our environmental metrics also reduced relative to the rate of growth of the group's sales as illustrated in the graphs and tables in this section of the report. There were no significant fines and no non-monetary sanctions for non-compliance with environmental laws and regulations in the year.

Energy Consumption

The group's total energy consumption reduced slightly to 4,648 thousand GJ and by 2% relative to sales, benefiting from programmes at our sites to improve energy efficiency. Of the energy consumed in 2012/13, 64% arose from direct sources (i.e. various fuels and natural gas combusted by the group) and 36% from consumed electricity generated by a supplier. The global energy bill for 2012/13 was £55.6 million, an increase of £0.9 million compared with 2011/12, reflecting higher global energy costs.

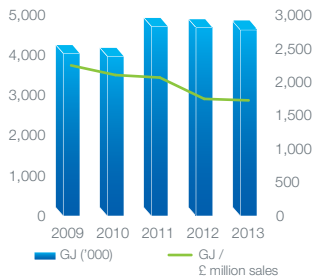
Business growth often means higher production volumes and the commissioning of new manufacturing lines, both of which increase the challenge of energy conservation. During the year, our Emission Control Technologies business has implemented energy management systems and energy process mapping, along with sharing best practice, an example of which is presented in the case study on page 80.

Global Warming Potential

We report greenhouse gas emissions from process and energy use and convert the total group energy use to tonnes of carbon dioxide (CO_2) equivalent using national and regional conversion factors for each emissions source as appropriate. The group's total global warming potential (GWP) is based on our Scope 1 and Scope 2 emissions (as defined by the greenhouse gas protocol www.ghgprotocol.org).

Energy Consumption

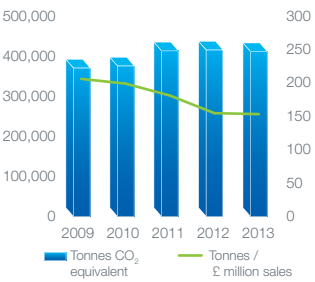
GJ ('000) / GJ / £ million sales



	GJ ('000)	GJ / £ million sales
2009	4,070	2,265
2010	4,001	2,121
2011	4,749	2,083
2012	4,726	1,764
2013	**4,648**	**1,737**

Total Global Warming Potential (GWP)

Tonnes CO_2 equivalent / Tonnes / £ million sales



	Tonnes CO_2 equivalent ('000)	Tonnes / £ million sales
2009	372	207.0
2010	377	199.9
2011	415	182.0
2012	417	155.7
2013	**413**	**154.3**

Environment continued

CASE **STUDY**

→ Energy Efficiency at Germiston, South Africa

In 2008 South Africa experienced an energy shortage due to insufficient capacity within the national grid. This shortage led to the initiation of the Industrial Energy Efficiency Project (IEE) which is supported by two government departments and the United Nations Industrial Development Organization (UNIDO). In 2012 Johnson Matthey's Germiston site signed up to this project to target energy reduction.

The IEE promotes energy efficiency, based on ISO 50001 principles. This standard provides companies with a framework to identify significant energy users, develop reduction strategies and put in place data management systems. Additionally, management commitment is a core part of the process.

Johnson Matthey Germiston appointed an energy team and ensured that two members of this team received advanced training in energy management systems. A consultant from UNIDO was employed to provide guidance and to assist with the introduction of ISO 50001.

Significantly, although the new system swiftly brought benefits, behavioural change lay at the heart of the improvements. Various campaigns were run and energy awareness increased. A range of energy efficiency improvements were identified and put in place. Capital costs were modest and over the 12 month implementation period impressive savings were made. The cost savings in this short period alone were several hundred thousand pounds and energy savings amounted to over 2 million kWh. The reduction in greenhouse gas emissions for the period was over 1,695 tonnes.

The project has succeeded on two levels – it reduces emissions and makes cost savings. These strengthen the business financially and are achievements that are in line with Johnson Matthey's sustainability targets. At the same, it is playing a part in South Africa's shift towards more sustainable industrial energy practices.

Having implemented the principles of ISO 50001, the Germiston site will be looking to achieve full certification within the next year.

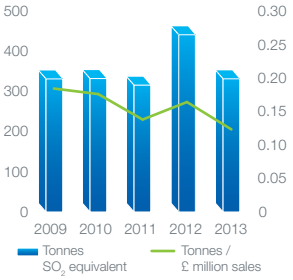
Read the full case study at www.matthey.com/sustainability.

In 2012/13 the group's GWP decreased slightly, down 1% to 413,130 tonnes CO_2 equivalent, with reductions in gas use at some big user sites and some green electricity usage at our West Deptford facility in the USA. Of this year's total, 38% resulted from Scope 1 emissions (generated by the direct burning of fuel, predominantly natural gas) and 62% from Scope 2 emissions (generated by the purchase of grid electricity). The group also made progress towards its Sustainability 2017 target to halve carbon intensity in 2012/13 with a year on year reduction of 1% in GWP relative to sales.

This year we have elected not to collect or report data from our Scope 3 emissions sources. Previously we have reported emissions data from travel by employees on company business however this figure represented less than 2% of our emissions in 2011/12 and at this stage we do not consider them to be material. The majority of our products are high value but low volume and so the carbon produced by transportation is low, relative to other carbon intensity figures. The majority of our Scope 3 emissions relate to the extraction and / or production of purchased materials and outsourced activities such as waste disposal. We continue to develop our understanding of these Scope 3 emissions through conducting life cycle analysis studies of our major product categories and by improving our knowledge of our role in the value chain.

Total Acid Gas Emissions

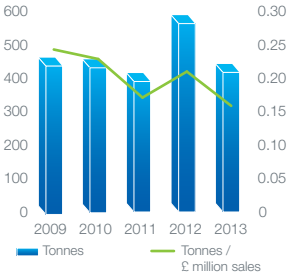
Tonnes SO_2 equivalent / Tonnes / £ million sales



	Tonnes SO_2 equivalent	Tonnes / £ million sales
2009	334	0.1859
2010	335	0.1776
2011	318	0.1395
2012	444	0.1658
2013	**334**	**0.1248**

Total NOx Emissions

Tonnes / Tonnes / £ million sales



	Tonnes	Tonnes / £ million sales
2009	439	0.2443
2010	434	0.2301
2011	393	0.1724
2012	566	0.2113
2013	**420**	**0.1570**

The UK's Carbon Reduction Commitment
Ongoing compliance with the UK government's Carbon Reduction Commitment (CRC) does not present a material issue for Johnson Matthey, given that the majority of our UK facilities are exempt from the process as they are already being regulated under existing climate change levy agreements that drive year on year energy efficiency and reduction programmes. The government's review of this legislation during the year did not impact our business. In the 2012/13 CRC Annual Report, to be submitted to the Environment Agency during July 2013, Johnson Matthey Plc will report energy usage data for four subsidiary businesses that are not covered by the group's exemption. This is estimated to be approximately 6,000 tonnes of carbon credits at a cost of £60,000 to £70,000.

Mandatory Greenhouse Gas (GHG) Reporting
Under the Companies Act 2006 (Strategic and Directors' Reports) Regulations 2013, quoted companies are required to report their annual Scope 1 and Scope 2 GHG emissions in their directors' report, effective 30th September 2013. This applies to Johnson Matthey from the start of the year beginning 1st April 2013 and we will be required to report according to these regulations in our 2014 annual report. In preparation, we have undertaken a readiness assessment to ensure that the data we report will meet the new reporting regulations. The initial assessment raised no issues and concluded that Johnson Matthey is already reporting to the required level. However, a more detailed analysis of other emission sources of GHGs in our operations may be required.

Quoted companies will also be required to provide a breakdown of emissions by geographical area in the directors' report. Johnson Matthey already reports total emissions from its operations on a global basis. Data on a geographical basis is currently captured internally to drive performance improvement and so we foresee no major issues in meeting this requirement. With companies' environmental performance under ever increasing scrutiny, we continue to monitor and assess the impacts of legislative changes on our business, assisted by specialist consultants as required.

EU Emission Trading Scheme (EU ETS)
We are closely monitoring the potential impacts and opportunities for our businesses arising from Phase III of EU ETS implemented in 2013.

Other Emissions
Emissions from our operations are generated from a number of sources including combustion processes, materials handling and chemical reactions and are typically licensed by local regulations. All sites monitor emissions to ensure compliance with these regulations and set their own absolute targets aimed at reducing significant emissions as part of their local environment, health and safety improvement plans.

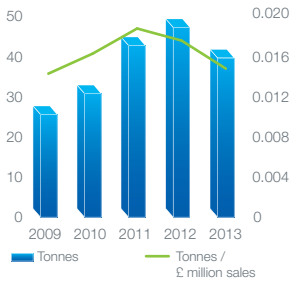
In 2012/13, our total emissions of acid gases have decreased by 25% to 334 tonnes sulphur dioxide (SO_2) equivalent. This was mainly due to reductions in the emissions of both oxides of nitrogen (NOx) and oxides of sulphur (SOx) at several of our larger sites. Compared with last year, total NOx emissions were 420 tonnes which represented a 26% reduction in both absolute terms and relative to sales.

The group's total SO_2 emissions reduced by 16% to 39.9 tonnes, benefiting from a reduction in reported emissions from our Brimsdown site in the UK, which is Johnson Matthey's largest emitter of SO_2. Emissions of volatile organic compounds (VOCs) also fell this year by 2% to 185.6 tonnes.

Waste
The group generated 110,448 tonnes of waste during the year, a reduction of 8% in both absolute terms and relative to sales. Waste to landfill decreased significantly in the year, down 70% to 3,218 tonnes, benefiting from a reduction in waste from construction activities at our sites as a number of projects to expand our operations reached completion. Achieving zero waste to landfill by 2017 is one of the group's Sustainability 2017 targets and improved performance this year was also boosted by initiatives across our sites to reduce their landfill waste.

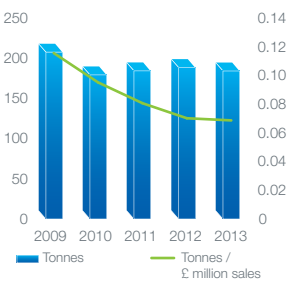
Johnson Matthey's facilities set rigorous internal targets to reduce waste to landfill. A number of sites have renegotiated waste disposal contracts with contractors who specialise in processing each different type of waste. For example, our Kitsuregawa site in Japan has accelerated progress towards its waste reduction target using this approach.

Total SO_2 Emissions



	Tonnes	Tonnes / £ million sales
2009	25.8	0.0144
2010	31.0	0.0164
2011	43.0	0.0189
2012	47.5	0.0177
2013	**39.9**	**0.0149**

Total VOC Emissions



	Tonnes	Tonnes / £ million sales
2009	209.1	0.1164
2010	180.8	0.0959
2011	185.7	0.0814
2012	189.8	0.0709
2013	**185.6**	**0.0694**

Environment continued

Not only has the site achieved a 1.3 tonne reduction of plastic waste, all plastic waste was recycled and together this resulted in zero plastic waste to landfill. Our Clitheroe, UK site has also partnered with waste contractors to divert waste from landfill and several other sites have investigated industrial symbiosis to find alternative routes for their key waste streams.

In terms of other waste streams, 3,685 tonnes of waste were sent for incineration (down 30%), 13,100 tonnes were sent for recovery (down 18%) and 82,592 tonnes of waste were sent for treatment and disposal by third party waste service providers (down 9%).

Whilst we have historically presented data on the different types of packaging waste recycled by our global operations, in efforts to reduce the reporting burden on site personnel we have chosen to no longer formally report on our performance in this area. Our sites around the world continue to collect and quantify this information for their internal inventories. To meet Johnson Matthey's compliance within the UK's packaging waste regulations, we collect and report on steel, paper, plastic and wood packaging waste recycled by our UK sites through Valpak, a compliance services consultant who is the leading provider of producer responsibility and recycling solutions.

The subject of waste continues to be a polarising topic among environmental experts because of varying opinions on the credibility of other disposal routes compared with disposal via landfill. While it is Johnson Matthey's target to send zero waste to landfill, our focus has been to reduce, reuse and, where possible, recycle. The introduction of our Manufacturing Excellence programme has reinvigorated our waste reduction efforts this year. Our sites now evaluate their waste beyond simply a material destined for disposal and consider factors such as time, expense, resource, procurement. As a result, there has been a greater focus on reducing the amount of material wasted, the reuse of raw materials in our processes and on the recycling of raw materials where possible.

CASE **STUDY**

→ Waste Reduction with Ingenuity

One of Johnson Matthey's six sustainability targets is to achieve zero waste to landfill by 2017. The task is devolved to the individual sites around the world who are coming up with ingenious and entrepreneurial ways of finding new uses for waste materials that once ended up in landfill.

Johnson Matthey's active pharmaceutical ingredient manufacturing business in Edinburgh, UK identified an alternative use for an industrial mineral which is used as a filter aid in some of its manufacturing processes. After conducting trials with a compost manufacturer, the waste filter aid was found to be of benefit to their product and compost containing the filter aid is now sold to landscapers, local authorities and the construction industry. Importantly, implementing this recycling route allowed the site to reduce its waste to landfill to just an estimated 26 tonnes in 2012/13 – a reduction of over 75%.

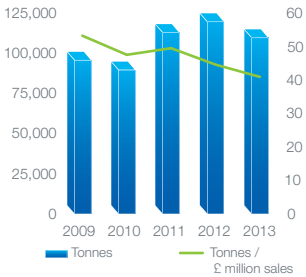
On the other side of the world, at its Kitsuregawa site in Japan, Johnson Matthey's Japanese emission control technologies business targeted its two main sources of waste. Through inventive ways of reusing – by using it as a concrete filler in the construction industry – and recycling, the site has reduced its waste to landfill to less than 1 tonne in 2012/13.

These initiatives make a substantial contribution to Johnson Matthey's sustainability goals and show how, with creativity, we can take steps towards achieving zero waste to landfill – where waste from a speciality chemicals manufacturing factory can form the compost of a flower bed or the concrete in a new building.

Read the full case study at www.matthey.com/sustainability.

Total Waste

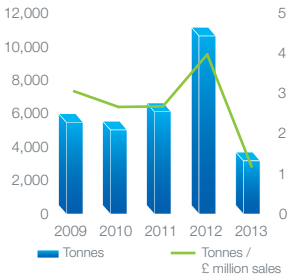
Tonnes / £ million sales



	Tonnes	Tonnes / £ million sales
2009	96,287	53.58
2010	90,308	47.88
2011	113,671	49.86
2012	120,363	44.94
2013	**110,448**	**41.27**

Total Waste to Landfill

Tonnes / £ million sales



	Tonnes	Tonnes / £ million sales
2009	5,535	3.080
2010	5,071	2.689
2011	6,165	2.704
2012	10,708	3.998
2013	**3,218**	**1.203**

Water Consumption

During the year, water consumption increased by 11% compared with 2011/12 to 2.4 million m^3. Water use increased at 11 of our sites, primarily as a result of increased production and from new plants coming on line at our facilities in Panki, India and Tennessee in the USA. Of the total water used by the group, 91% was supplied by local municipal water authorities, 6% was drawn from boreholes and 3% was taken from local water courses. Total effluent increased by 9% this year to 1.5 million m^3, mainly as a result of increased activity at our operations. Of the total effluent produced, 86% was discharged to local authority sewers after treatment and in accordance with local discharge consent agreements and 14% was discharged to water courses after treatment and within quality limits set by local water authorities. The method of water treatment used at each site is appropriate to the effluent quality and volume and the requirements of the receptor.

The chemical oxygen demand (COD) test is commonly used to indirectly measure the amount of organic compounds in water. Most applications of COD determine the amount of organic pollutants found in surface water (e.g. lakes and rivers), making COD a useful measure of water quality. In 2012/13 the group discharged organic chemicals equivalent to a COD of 226 tonnes into water courses, as regulated by local emission limits at each manufacturing facility, a decrease of 13% on prior year.

Johnson Matthey has a robust and effective management system which requires all sites to report environmental incidents to the group's EHS department. During 2012/13 no significant spillages to the environment of raw materials, intermediates or products have been reported by the group.

In ongoing efforts to further improve our internal reporting systems for environmental data, during the year we have developed and tested an enhanced system. We plan to introduce the new system to our sites in 2014 and historical data will be transferred to it in advance of its launch. User training will also be provided. The new, more user friendly system will provide greater consistency and clarity of reporting across our global operations.

Environmental Aims and Targets

The group will continue to manage environmental impacts in the context of an expanding business by building on the best practice examples of performance improvement delivered so far, integration of lean manufacturing principles, process intensification and step change manufacturing technologies. This work will be supported by the group's global Sustainability 2017 and Manufacturing Excellence programmes.

Our environment related priorities for 2013/14 are to:

- Ensure that the future environmental performance of the group is aligned to the Sustainability 2017 Vision of cutting carbon intensity by half, achieving zero waste to landfill and halving key resources per unit of output.
- Oversee the implementation of the ISO 14001 environmental management system within the next two years for Axeon's and Formox's sites, which were acquired in October 2012 and March 2013 respectively.
- Undertake a review of our sites' impact on biodiversity and develop a set of tools to evaluate biodiversity and increase awareness of it at our sites.
- Ensure we have an understanding of all GHG emission sources (where material) within Johnson Matthey.

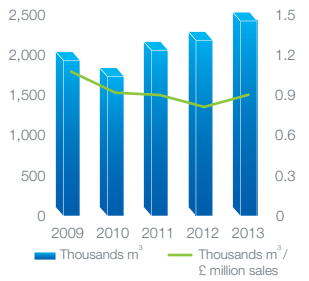
Biodiversity

By the nature of our business activities, Johnson Matthey has very little negative impact on the biodiversity of terrestrial, freshwater and marine environments. We do not have any manufacturing facilities located in areas of significant ecoimportance and we have not identified any major biodiversity issues in our supply chains as we do not source large volumes of naturally derived substances. Consequently, at this stage, we do not consider biodiversity to be amongst the most material issues for our business.

As part of all significant investments and acquisitions, we complete a detailed environmental impact assessment. Over the years, we have managed a number of projects looking at improving biodiversity at our operating sites and in 2012/13, one of our UK facilities commissioned a biodiversity assessment in preparation for construction of a new building. This is considered best practice, particularly if construction is intended to be close to ecologically sensitive areas.

Water Consumption

Thousands m^3 Thousands m^3 / £ million sales



	Thousands m^3	Thousands m^3 / £ million sales
2009	1,951	1.086
2010	1,750	0.928
2011	2,076	0.911
2012	2,201	0.822
2013	**2,444**	**0.913**