



**LEADING TREASURY
PROFESSIONALS**

The Association of Corporate Treasurers

Examination Paper, Solutions and Examiners Report

MCT ADVANCED DIPLOMA CASE STUDY

Based on Global Gases Group plc

April 2014

QUESTION 1

GGG's industrial gases business consists of two distinct activities: i) the Tonnage (on-site) business and ii) the Bulk and Cylinder (merchant and packaged) sub-divisions. In addition there are the Healthcare and Engineering businesses.

Required:

- a) **Compare and contrast these four distinct business sectors in terms of their strategic and financial attractiveness.**

(5 marks)

- b) **What are the likely synergies for GGG from operating in these four distinct areas of business?**

(4 marks)

(Total 9 marks)

QUESTION 2

GGG's corporate credit rating at December 2013 was A+, based on the two key dimensions of business risk and financial risk:

business risk	excellent	strong	satisfactory	fair	weak	vulnerable
financial risk	minimal	modest	intermediate	significant	aggressive	leveraged

Required:

Give your assessment of where GGG sits on each of the two risk dimensions, supported by a summary of the key non-financial factors and key financial statistics.

(9 marks)

QUESTION 3

Required:

- a) **Assume that you are to be appointed Group Treasurer of GGG. List and rank in order of priority the five areas of treasury on which you would choose to focus over the next five years. Justify your choices.**
- b) **Explain and justify where and how you would plan to increase investment in treasury in the coming decade to ensure that it keeps pace with the development of the business and adds increased value.**

(5 marks)

(5 marks)

(Total 10 marks)

QUESTION 4

Required:

- a) **Analyse the composition of the company's debt.**
- b) **Assess the appropriateness of the level of the company's cash balances.**
- c) **Assess the appropriateness of the company's funding of:**
 - i) **normal operations**
 - ii) **its acquisition strategy**

(5 marks)

(3 marks)

(4 marks)

(Total 12 marks)

QUESTION 5

Table 1 gives a DCF valuation of GGG, as at July 2013, prepared by a leading investment bank specialising in the industrial gases sector. As Treasurer you have been asked to carry out a critical review of the valuation in preparation for a meeting with the bank's analysts next week.

Required:

- a) **Write a critical appraisal of the underlying assumptions behind the DCF valuation in light of your detailed analysis of the company's recent financial performance, current business situation and future prospects (with supporting calculations as appropriate).**
- b) **Based on your analysis in 5a, carry out your own calculation of GGG's WACC, Sustainable Cash Flow for 2013 and Enterprise Value as at the end of 2012.**

(7 marks)

(7 marks)

(Total 14 marks)

QUESTION 5 TABLE 1

Note: this table is also reproduced in a detachable A3 format at the end of the exam paper

DCF Valuation of Global Gases Group												
Cash Flow Projections		0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5
EUR millions	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Sales		17,390	18,382	19,449	19,867	20,294	20,731	21,176	21,632	22,097	22,572	23,057
EBITA		2,678	2,914	3,169	3,079	3,146	3,213	3,282	3,353	3,425	3,499	3,574
NOPLAT		1,982	2,156	2,345	2,279	2,328	2,378	2,429	2,481	2,534	2,589	2,645
Depreciation		1,350	1,370	1,380	1,430	1,461	1,493	1,525	1,557	1,591	1,625	1,660
Change in working capital		(38)	(38)	46	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)
Capex		(1,650)	(1,660)	(1,660)	(1,788)	(1,826)	(1,866)	(1,906)	(1,947)	(1,989)	(2,031)	(2,075)
Free cash flow		1,644	1,828	2,111	1,901	1,943	1,985	2,028	2,071	2,116	2,163	2,210
Discount factors @	6.76%	0.968	0.907	0.849	0.795	0.745	0.698	0.654	0.612	0.573	0.537	0.503
Discounted free cash flows		1,591	1,657	1,793	1,512	1,448	1,385	1,326	1,268	1,214	1,162	1,112
Present Value of FCF	39,295											
Calculation of Share Price Value		WACC Calculation										
Present Value of FCF	39,295	Risk-free rate		3.40%								
Financial investments	720	Borrowing spread (bp)		150								
EV (EUR mill)	40,015	Tax rate		26.0%								
Net debt	9,004	After-tax cost of debt		3.63%								
Pensions	1008	Risk-free rate		3.50%								
Minorities	769	Equity risk premium		5.50%								
Equity Value (EUR mill)	29,234	Beta		90.00%								
Number of shares outstanding (m)	185.529	Cost of equity		8.45%								
Fair value per share (EUR)	157.6	Target debt		35%								
		Target equity		65%								
		WACC (rounded to 2 decimals)		6.76%								

QUESTION 6

GGG has had discussions with SWV, a major Dutch construction services company (EUR 5 billion turnover, EUR 13 million EBITDA), regarding possible co-operation in a new business venture. The idea of recycling CO₂ emissions from a Shell refinery near Rotterdam for horticultural greenhouse use was developed by a small Dutch company (Delft Energy), with limited financial and human resources. The project involves the re-use of an existing 85-kilometre pipeline from the refinery, disused for 25 years, and construction of a 142-kilometre distribution pipeline network with delivery stations to 500 horticulturalists, situated between Rotterdam and The Hague.

SWV has a specialist pipeline subsidiary SWV(P) with relevant expertise. For GGG this is an opportunity to enter and test out a new retail-oriented industrial gas market with a “clean energy” label.

The initial risk profile of the project, the first of its kind in the world, is unfamiliar to both GGG and SWV. Outline discussions with Shell, who would see a reduction in their CO₂ emissions by 110,000 tonnes per year, have not revealed any supply-risk problems other than some volatility of CO₂ output.

The capital cost of the project is estimated at EUR 100 million for the first phase, with a possible EUR 35 million phase 2 extension to a second CO₂ source. The production capacity for project viability is seen as ambitious, but demand is expected to far exceed supply because of the very large number of Dutch horticulturalists and the huge productivity benefits to the growers via faster growth, better quality, higher yields and better crop planning. Timescale from project decision to maximum capacity is estimated at 4 to 5 years.

Required:

- a) **Briefly summarise the likely attractions and risks of the project, both short-term and longer-term, for GGG and SWV respectively, given what you know about the two companies' businesses.**
- b) **Propose, in outline terms, a shareholding and financing structure for the project, bearing in mind any identified differences between the main sponsors regarding short-term and long-term objectives.**

(3 marks)

(3 marks)

(Total 6 marks)

QUESTION 7

GGG is exposed to counterparty risk on its cash balances, currently running at around EUR 1 billion. GGG is also exposed to counterparty risk on derivative hedging instruments.

Required:

With reference to GGG:

a) Draft policy guidelines for managing these counterparty risks, covering:

- i) counterparty criteria and limits for investing cash**
- ii) counterparty criteria and limits for derivatives transactions if different to (i)**

(5 marks)

b) For investing cash balances, draft policy guidelines for:

- i) instrument types and limits**
- ii) metrics for monitoring the risk and actions to manage it**

(5 marks)

c) For transacting derivative contracts, draft policy guidelines for:

- i) limits for instruments permitted under the relevant risk policies**
- ii) metrics for monitoring and managing collateral exposures**

(5 marks)

(Total 15 marks)

QUESTION 8

The largest gas customers usually enter into “take-or-pay” contracts lasting 5-15 years. These contracts oblige the customer to take delivery of agreed amounts or pay an agreed penalty.

The physical delivery under this type of contract is either from on-site production units owned by GGG or by pipeline from other local sites owned by GGG.

Take-or-pay accounts for about 25% of GGG’s revenue. The customers are typically in the Chemicals & Energy, Metallurgy & Gas or Electronics sectors in North America, Western Europe and China.

Required:

a) What are the finance/treasury risks associated with these contracts?

(5 marks)

GGG is negotiating a 15-year on-site take-or-pay contract with a large, privately owned glass manufacturer in China.

The customer wishes to be invoiced in CNY. Finance is unlikely to be available locally for the on-site investment but the customer might consider an equity participation.

b) How would you propose to finance this contract and manage the associated risks?

(10 marks)

(Total 15 marks)

QUESTION 9

GGG is a global business investing selectively in emerging markets for growth. It already has a policy of local presence for treasury in all overseas regions (e.g. UK) so that it is attuned to local opportunities for financial efficiency (e.g. country-specific tax structures). However in some newer, less financially developed locations previously centralised activities may have to be delegated through force of circumstance, e.g. regulation, local financial infrastructure or JV partner preferences.

Required:

Classify the broad spectrum of GGG treasury activities into three categories, justifying your classification:

- i) those which must be centralised**
- ii) those which could be delegated locally without significant loss of control or efficiency**
- iii) the residual activities arranged on a spectrum between (i) and (ii)**

(10 marks)

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**MCT ADVANCED DIPLOMA
CASE STUDY
BACKGROUND INFORMATION**

Based on Global Gases Group plc

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1.0 INTRODUCTION

1.1 Group Overview

Global Gases Group (GGG) is among the four largest gases companies worldwide, with turnover of EUR 15bn and 62,000 employees working in over 100 countries.

Summary Financials	2011 EURm	2012 EURm
Turnover	13,787	15,280
EBIT	1,910	1,992
PAT	1,244	1,324
Gross Debt	7,814	10,204
Net Debt	6,814	8,986
Shareholders' Funds	12,144	13,658
Average Market Cap.	19,054	22,276

1.2 Divisions

The company has three divisions:

- gases: industrial and healthcare
- engineering: gas processing plant
- logistics: transport management

REVENUE by DIVISION 2011, 2012

Post-Consolid.	2011		2012	
Division	Revenue %	Revenue EUR bn	Revenue %	Revenue EUR bn
GASES	80	11,052	82	12,583
ENGINEERING	16	2,151	14	2,101
LOGISTICS	4	584	4	596
TOTAL	100	13,787	100	15,280

1.3 Sanacom Acquisition

Sanacom, the US homecare company, was purchased in August 2012 for USD 4.6 billion. This major acquisition contributed for the first time to the 2012 business performance. The acquisition has enabled GGG to become considerably stronger in a stable growth market and as a result they are now the leading global healthcare provider in the gases industry, as well as in the US market itself.

1.4 Macro-Economic Environment

Global economic trends

World economic growth slowed in 2012 compared with 2011. Global gross domestic product (GDP) rose by only 2.2 percent in 2012, following an increase of 2.7 percent in the prior year.

Growth in global industrial production (IP) decelerated to an even greater extent: ie growth in 2012 was only 1.5 percent, compared with 3.6 percent in 2011.

The sustained sovereign debt crisis in Europe and in the United States was the main factor to have an adverse impact on economic trends. Economic growth decelerated even in parts of Asia when compared with prior years.

The situation in the international financial markets has improved since the middle of 2012.

Gross Domestic Product (GDP) in Real Terms

	% Weighting	% Growth				
		2008	2009	2010	2011	2012
EMEA	34.0	0.8	-4.1	2.3	2.1	0.4
Eurozone	20.0	0.3	-4.2	1.8	1.5	-0.5
Germany	5.8	0.8	-5.1	3.6	3.1	0.9
Asia/Pacific	18.4	5.6	5.2	8.3	6.5	5.5
China	8.0	9.6	9.2	10.4	9.3	7.7
Americas	33.5	0.4	-3.2	3.6	2.3	2.3
USA	25.3	-0.3	-3.5	3.0	1.8	2.2
WORLD	100	1.4	-2.2	4.1	2.7	2.2

Industrial Production (IP)

	% Growth				
	2008	2009	2010	2011	2012
EMEA	-1.3	-12.3	6.1	2.8	-1.3
Eurozone	-1.8	-14.4	6.7	2.8	-2.5
Germany	0.6	-16.4	11.2	8.0	-0.5
Asia/Pacific	6.6	4.0	13.5	8.0	5.9
China	12.9	11.0	15.7	13.9	10.1
Americas	-2.7	-10.2	5.6	3.9	3.2
USA	-3.7	-11.2	5.3	4.1	3.7
WORLD	-0.4	-9.3	8.1	3.6	1.5

In the EMEA region overall GDP growth of 0.4% and industrial production decline of 1.3% masked substantial variations in the various sub-regions. In Western Europe economic output (and industrial production) shrank, while in Eastern Europe growth was positive but reduced. The Middle East, although lower than 2011, still showed better than average growth of 4.7%. Africa grew by a similar figure, an improvement on 2011, but with big differences between countries.

Asia/Pacific again saw the fastest growth at an average of 5.5% and 5.9% but with China even better, although also down on 2011. There were also stable economic trends in Malaysia, Indonesia, the Philippines and Thailand. Australia actually saw increased rates of growth at 3.6% and 2.5%.

The US economy remained relatively stable but the figures for South America were significantly lower than in 2011, but with significant differences between individual countries.

1.5 Sector-Specific Background

Gases industry

The international gases market continued to grow in the 2012 financial year. However, different rates of growth were to be seen in each region and industry sector.

North America, Europe and Asia remain the largest sales markets. The greatest rise in demand was once again in Asia.

The market environment in the steel industry in 2012 was affected by significant surplus capacity and by the sustained sovereign debt crisis in the eurozone. Demand for steel in Europe was modest. Many steel-producers had to rationalise and focus their production on low-cost locations. The recovery in the steel industry in China and India slowed. In the NAFTA (North American Free Trade Agreement) region, on the other hand, the sector saw high rates of growth. Positive momentum was generated here by strong demand, especially from the construction sector and the automobile industry. The global market for raw steel continued to expand in the course of 2012.

Modest economic trends in Europe and North America were also evident in the chemical sector in the reporting period. Growth here was no more than moderate. Experts are forecasting a more significant rise in demand in North America in the medium term. Positive momentum should be generated here by increasing shale gas production, which will lead to falling natural gas prices. In Asia, the chemical industry continued to grow at a faster rate than average, but not as rapidly as in the 2011 financial year.

In the refinery business, new plants were built in 2012 and existing plants extended so as to rectify regional imbalances of supply and demand. The focus here was on increasing diesel production capacity and improving product quality. In North America and Western Europe, growth slowed for refinery products. In

China, industry experts are expecting conditions for refineries to improve as soon as the government introduces product pricing adjustments.

In manufacturing in developed countries, demand for plastics applications rose at a faster rate than demand in the welding sector. In emerging economies, on the other hand, significant growth was to be seen once again in welding applications. This trend was boosted by improvements in quality and productivity. The market environment in the semiconductor industry was stable in the first half of 2012. In the second half of the year, the situation worsened.

Demand for LEDS (light emitting diodes) rose during the financial year in line with demand in general lighting markets. The electronic gases market also benefited. On the other hand, growth in the screen sector slowed. The phasing out of Chinese government subsidies for MOCVD (metal organic chemical vapour deposition) tools used in the production of screens had an adverse impact. OLEDs (organic light emitting diodes) are increasingly being used in displays for mobile devices.

In 2012, surplus capacity and consolidation had an impact on the solar cell market. Too much investment in prior years has driven production capacity to over 60 gigawatts, whereas global demand is only half that. As a consequence, the price of solar modules fell so sharply that competitors in Europe, the US and Asia have since deserted the market.

Against a background of sustained population growth, the performance of the food and beverage industry remained relatively steady in 2012. Consumer trends include healthier eating, higher consumption of meat protein and more processed foods. At the same time, the demand for convenience products continues to rise.

In the healthcare market, the long-term growth drivers remained intact in 2012: a growing, ageing world population, an increase in chronic diseases such as asthma and COPD (chronic obstructive pulmonary disease), and a move towards more patient care in settings other than hospitals. Each of these factors affects the market environment to a different extent in different regions. While rising prosperity in Asia has led to a significant increase in demand for healthcare services, the healthcare business has also been adversely affected by the debt crisis in southern Europe. In North America, it is not yet possible to predict exactly what impact the recent healthcare reforms there will have.

Engineering business

The market for large-scale international engineering projects has been recovering slowly since the 2009/10 economic and financial crisis and saw relatively steady trends in 2012. There was slightly more investment activity during the year than in 2011, although this had not yet returned to the high level set in 2008.

Demand in the market for air separation plants rose again in 2012. There was new investment in Asia and Eastern Europe in particular. As in 2011, most of the contracts awarded related to on-site projects for the gases industry.

The olefin plant market segment benefited in 2012 from the increasing production of natural gas from shale gas, especially in the US. Natural gas is an important raw material in the petrochemical industry. As a result of this development, there was a fall in raw material costs for ethane crackers and a number of new projects were started in this field. Existing naphtha crackers are increasingly being converted into ethane crackers.

Positive momentum for plant construction projects continues in United States with the easy availability and low cost of ethane. In Europe and Asia, on the other hand, growth rates in this market were modest.

The increased exploitation of shale gas reserves in particular resulted in greater demand for natural gas treatment, processing and liquefaction plants in North America. These plants supply natural gas for both the home market and for export.

The global market for hydrogen and synthesis gas plants stabilised in 2012. Most projects were realised in the emerging economies of Asia, the Middle East and the CIS countries. In North America, the exploration of shale gas reserves helped revive the hydrogen and synthesis gas segment. The current trend is away from large coal-based projects in favour of projects based on natural gas.

Other Activities

Other Activities comprise the Group's logistics services.

2.0 BUSINESS PROFILE & ANALYSIS

2.1 Revenue by Division & Geography 2012

<u>PRE-CONSOLIDATION</u>						<u>CONSOL.</u>
Division	Total EUR bn	EMEA EUR bn	Asia/Pac EUR bn	Americas EUR bn		Total EUR bn
80% GASES	12,696 100%	5,998 47%	3,498 28%	3,200 25%		-113
16% ENGINEERING	2,561 100%	1,228 48%	864 34%	469 18%		-460
4% LOGISTICS	596 100%					
100% TOTAL	15,853					-573

Source: Company Data

<u>POST-CONSOLIDATION</u>					
Division	Total EUR bn	EMEA EUR bn	Asia/Pac. EUR bn	Americas EUR bn	
82% GASES	12,583 100%	5,978 47%	3,488 28%	3,117 25%	
14% ENGINEERING	2,101 100%				
4% LOGISTICS	596 100%				
100% TOTAL	15,280 100%	7,132 46%	4,665 31%	3,483 23%	

Source: Company Data

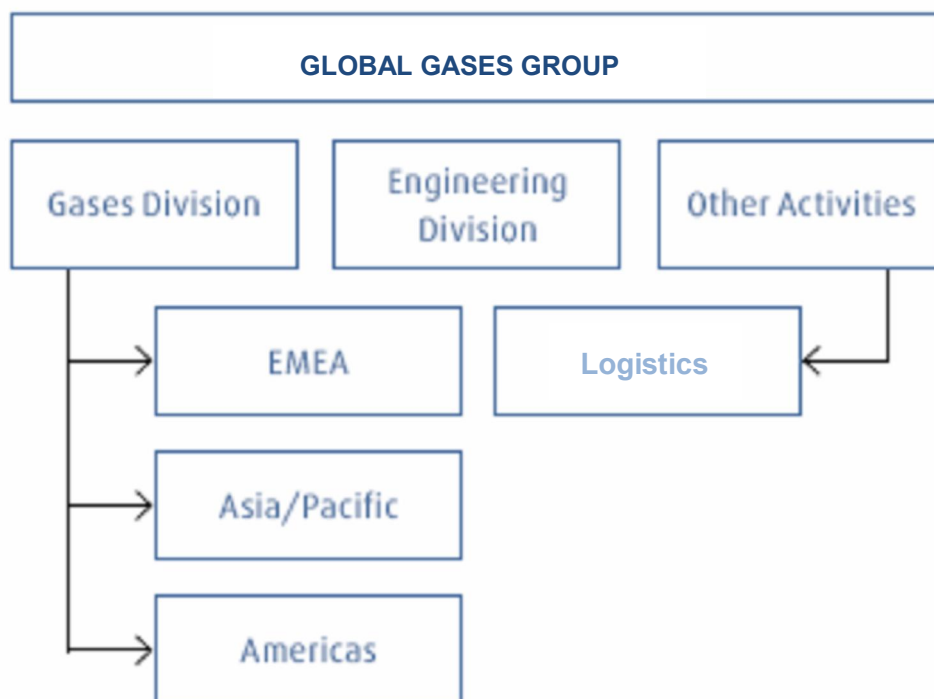
N.B. For the relative size of healthcare within the gases business see section 3.

The following table gives a summary of EBITDA margins and growth rates across the group in 2013:

	Margins	Growth rate
Gases - EMEA	28.8% falling	4.5% falling
- Asia/Pacific	29.0% falling	4.6% rising
- Americas	23.6% falling	4.9% rising
- Healthcare	25.0% falling	6.0% rising
Engineering	12.6% rising	2.9% falling

Analysts tend to use a 1.2 to 1.5 multiplier of GDP to estimate the growth rate for industrial gases, giving an overall CAGR of 6.5% from 2011 to 2020. However, the developed world is forecast to have lower than average growth rates eg Europe 2.9% CAGR and North America at 4.1%. In contrast, higher than average growth rates are forecast for the developing world eg South Africa at 8.0% and China at 11.5%.

2.2 Organisation Structure



Source: Company information

2.3 Global Representation

GGG has shareholdings, at differing levels, in around 666 legal entities globally, in over 100 different countries. The following table gives an indication of the reach of the different divisions.

	Countries	Legal entities
Gases - EMEA	57	181
- Asia/Pacific	23	145
- Americas	19	78
Engineering	16	25
Other	23	105
Equity accounted investments	-	55
Non-consolidated subsidiaries	-	56
Other non-consolidated participations	-	21

Source: Company accounts

3.0 COMPETITIVE ENVIRONMENT ¹

3.1 Industrial Gases

The global industrial gases market is highly consolidated. Industrial gases are employed in a vast variety of production processes and end uses, not all of which are actually industrial. A focus area for many producers is the healthcare market.

The global market for industrial gases is estimated at USD72bn in 2011. It is a consolidated market with five major producers competing for the bulk of the global market. Four of these operate globally, while GasCo2 is a predominantly US American business. GGG runs GasCo1 a close second.

Figure 1 Market Analysis and Competitors

Company	Market share	Sales (2011)	EBIT (2011)	EBIT margin	Geographical sales split	Divisional sales split	End-markets
GGG	19%	EUR 13,787m	EUR 1,910m	13.9%			
GasCo1	21%	EUR 14,457m	EUR 2,409	16.7%			
GasCo2	14%	USD 11,252m	USD 2,468m	21.9%			
GasCo3	13%	USD 10,082m	USD 1,671m	16.6%			N.A.
GasCo4	4%	USD 4,746m	USD 556m	11.7%	N.A.		

Source: Equity Analyst

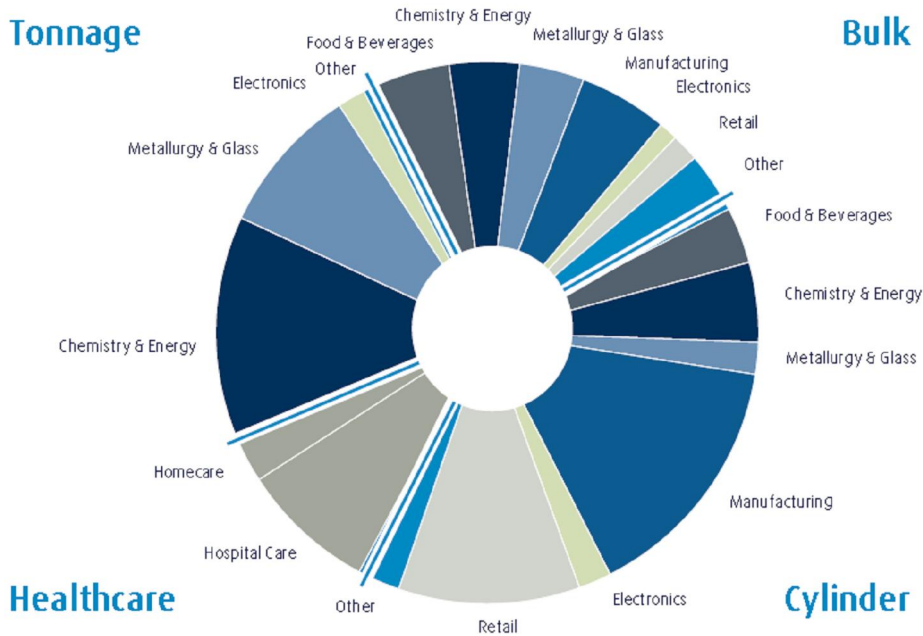
Note 1. Section 3 is drawn mainly from a 2012 Equity Analyst's Report.

There are core businesses that all producers engage in. The production and distribution of air gases for industrial uses are the historical root of this industry, and it is a business in which all the above-mentioned firms still engage generally. The industrial gases industry serves a vast array of end customers, ranging from metal fabrication to food processing.

There are different methods of distribution (see below), which accommodate specific customer requirements. The share of sales to specific end-customer industries varies by distribution method. On an overall scale, we would estimate that about 25% of industrial gases globally find their end customer in the manufacturing industry. This includes large industry customers such as automakers, but also smaller workshops that require a cylinder for welding, for example. We believe 20-25% of gas sales are to the chemistry and energy sector. Here, gases are usually employed as a catalyst in other processes, such as coal gasification or chemicals production. Metallurgy, in particular steel production, is an important end customer industry in the large industry/tonnage sector of industrial gases. We believe up to 18% of global gases go to this customer group. Healthcare is a growing end market, which has different submarkets: hospital supply gases and oxygen homecare. For an indicative sales split for the GGG group, see Figure 2 below.

3.1.1 End-consumer groups distribution

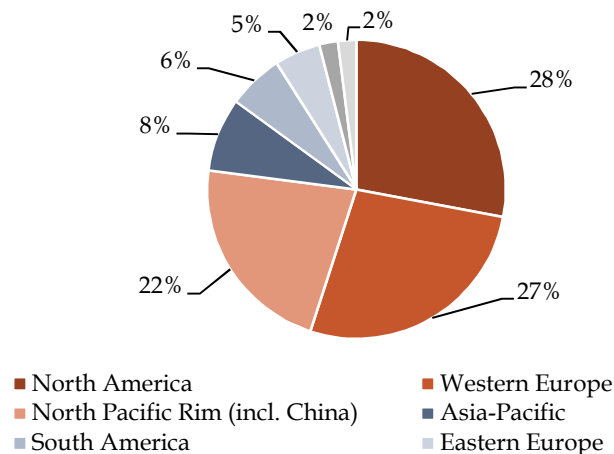
Figure 2 Split of product areas by end-customer groups, using the example of GGG



The global market for industrial gases is dominated by North America (which is the largest market, accounting for 28% of the total world market), Western Europe and China. With further industrialisation of emerging markets in Asia and Latin America, growth rates are strongest in these markets. In emerging economies, the potential for outsourcing is big, as many businesses still produce their own gas for industrial processes.

3.1.2 Breakdown by Regions and Gases

Figure 3 Global gases business by region



Source: GasWorld

The main industrial gases

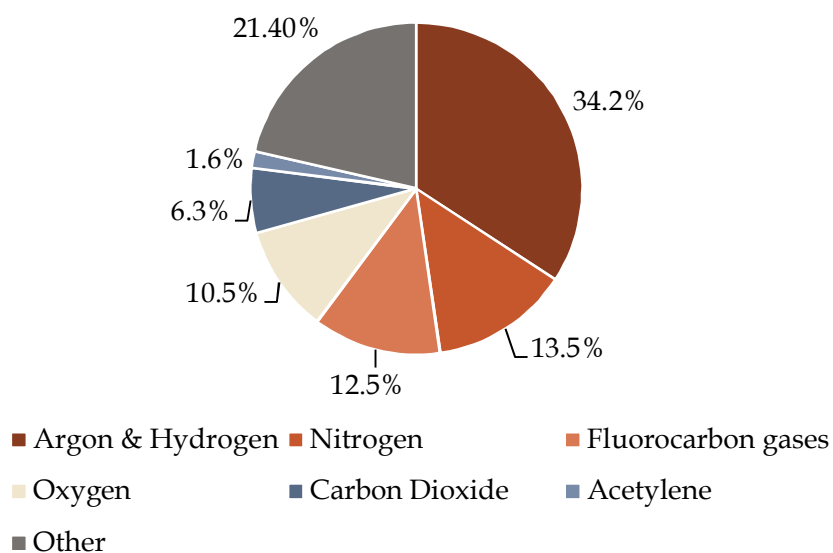
The main gases and their subsequent share of the market are shown below. These are used largely in manufacturing industry in applications such as welding and heat treatment. Other applications include freezing and packaging for the food industry.

Figure 4 Gases and their primary applications

Gas	Applications
Nitrogen	Blanketing, purging, freezing & food packaging
Oxygen	Medical, oxidizing, cutting, wastewater treatment, fermentation
Argon	Shielding for welding and cutting, steel manufacturing, heat treating, electronics, blanketing
Acetylene, Propylene, & Propane	Fuel gases for cutting and welding, brazing, heating
Specialty pure gases & mixtures	Carrier gases, fuel gases for gas chromatography, QA, process and continuous environmental monitoring
Carbon dioxide/Dry ice	Blanketing, purging, wastewater treatment, chemical feedstock, beverage carbonisation, freezing & food storage, EOR/EGR
Industrial gas mixtures	Shielding gases for welding and cutting, modified atmosphere packaging, breathing air, industrial air, special applications
Hydrogen	Petroleum refining, chemical feedstock, gas reducing, fuel cells, material handling equipment fuel
Helium	Lighter-than-air applications, leak detection, MRI
Refrigerants & Ammonia	Refrigeration, freezing, air conditioning, DeNOx, chemical processing, water treatment, metal treatment

Source: Equity Analyst

Figure 5 Market share of the industrial gases



Source: Equity Analyst

Hydrogen is forecast to be the fastest-growing product segment after 2012. Demand is expected to be driven by the trend for low-sulphur and cleaner burning fuels in the petroleum refining sector. Thereafter we believe hydrogen-fuelled passenger vehicles will lead growth in this area.

3.1.3 Distribution Channels and Business Streams

Produce, store and distribute

An important part of the value-add of the industrial gas industry is its ability to provide sophisticated distribution and supply solutions to customers. In broad terms, there are two systems, which can also be classed as either Tonnage or Bulk and Cylinder based on their different economics.

Tonnage business

- **On-site or pipeline supply:** Mostly used for large industrial customers, gases are provided from a production unit on the premises of the customer, or through a pipeline. A prominent example is air separation units at steel plants. The production unit will remain property of the gas company. A long-term (usually 15-year) contract with guaranteed offtake (so called take-or-pay) ensures the gas company is relieved of the investment risk associated with setting up such a plant. On-site production units yield higher returns on the capital employed when they can be used to supply additional customers either via pipeline connection, bulk transport (by truck) of liquefied or cylinder supply of gaseous excess production or by-product from the unit.

Bulk and Cylinder business

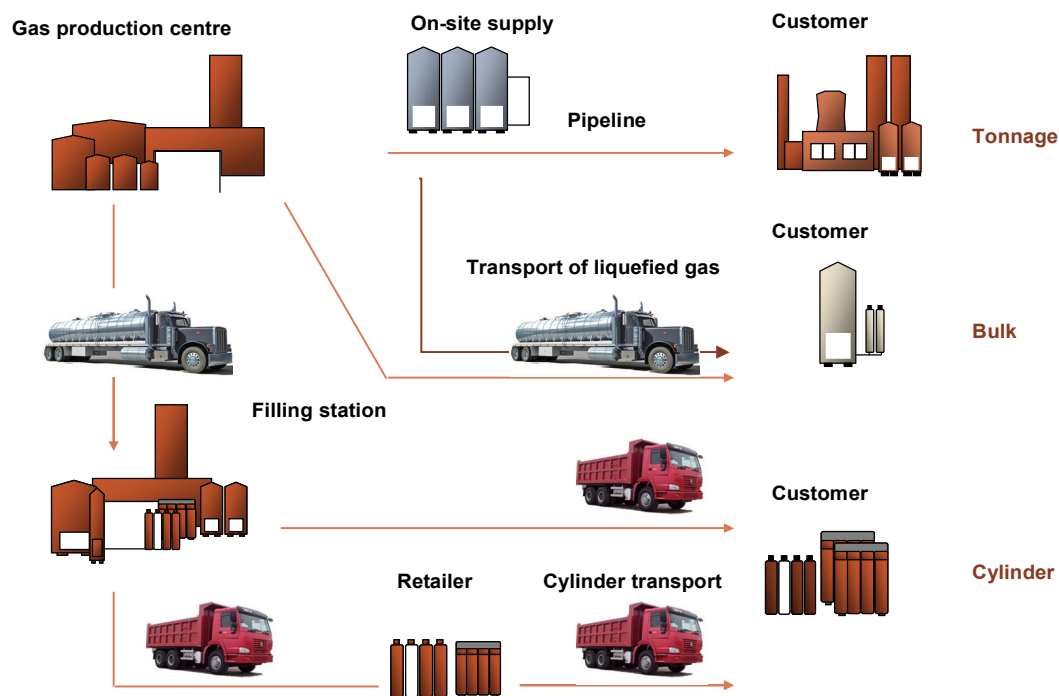
- **Supply in bulk to a storage tank:** In this case, the customer's needs are too small to justify the installation of an on-site unit, but too large to be catered for by the use of cylinders. Usually, a gas tank would be installed at the customer's premises, which is rented or leased to the customer (usually on a five-year contract). This facility is then refilled by the gas producer using a gas delivery truck. This is the typical distribution model for medium-sized metal workshops, hospitals and food manufacturers.
- **Cylinder:** These gases are traded in smaller volumes using gas cylinders. Customers such as craftsmen requiring gases for welding, but also customers of highly specialised gases, are supplied with cylinders. These are traded through own-retail outlets and distribution offerings, but also through retailers that have a refill agreement with the gas producer.

Gases Division: Revenue by Product Data

In € million	2012	2011	Change in percent	
Liquefied gases	3,381	3,296	2.6	Bulk
Cylinder gases	4,254	4,188	1.6	Cylinder
On-site	2,921	2,809	4.0	Tonnage
Healthcare	2,035	1,230	65.4	Healthcare
TOTAL	12,591	11,523	9.3	

Source: Company Data

Figure 6 Gases supply chain



On a general note, the cyclicity of the business increases as the distribution unit gets smaller. This is counterintuitive, as large industry customers are further upstream and therefore more cyclical. However, the contractual structure with these customers insures the gas producers' revenue to a large extent. Gas producers would not provide margins on the individual businesses split by distribution system. However, we believe that the cylinder business has significantly higher margins than the industrial business. Bulk supply should lie in between.

Take-or-pay contracts

Gases supplied in tonnage form typically involve long-term customers with which take-or-pay contracts of typically 15 years are entered into.

Take-or-pay contracts stipulate a rule between companies and their suppliers with regard to product delivery. With this kind of contract, the company is obliged to either take the product from the supplier or pay a penalty. A price for the product is determined as is a ceiling price the company must pay for the products it does not take.

This type of contract is entered to ensure that the transaction between the two parties does occur. It hedges the risk of the supplier, ensuring that the products it makes available for a company will be accounted for.

Industrial gas companies themselves also enter into such contracts with their suppliers. However, the risk arising from purchase of gases under these agreements are minimised by the corresponding agreements with customers.

3.2 Healthcare

GGG's healthcare activities cover Hospital Care and Homecare. The Hospital Care business is concerned with offering hospitals and healthcare institutions a complete medical gas solution – covering the full range of medical gases, medical gas related services, installations, devices and equipment. Homecare focuses both on the supply of medical gases and the provision of medical services to patients with chronic respiratory diseases in settings other than hospitals. Therapies offered include respiratory therapies such as oxygen therapy and sleep therapy.

The Sanacom acquisition was completed in August 2012 and the newly acquired business contributed EUR 630m to the total revenue of the Healthcare product area in the 2012 financial year. Without this contribution, the growth in the healthcare business would have been 14.2 percent. GGG is the industry leader in the US, the region with by far the largest homecare market in the world. With 11,000 employees, the company serves about 800,000 patients and generated revenue of around EUR 1.5bn in the 2011 financial year.

The purchase of Sanacom was GGG's second strategic acquisition during the 2012 financial year in the promising healthcare sector, which encompasses the medical gases and medical device business, as well as related maintenance and advisory services. Back in April, the Group completed its acquisition of the BritGas Continental European homecare operations, gaining 850 employees, 260,000 new patients and annual revenue of over EUR 200m.

GGG is now the only gases company in the homecare business with a global footprint. These acquisitions have transformed the Group into the leading global healthcare provider in the gases industry. This promising market is boosted by underlying demographic trends and ever better diagnostic and therapy options. Moreover, access to medical care is improving all the time for patients in the emerging economies.

A growing proportion of revenue relates to an integrated care path for patients requiring ventilation for long periods outside the acute care setting and at home. In the past year, GGG has continued to expand this service, especially in the major homecare market of Europe, with new centres being established for example in Germany and Italy.

Margins in healthcare have fallen from 40% to 25% in the US under aggressive bidding pressures and increasing legislation, which may now be easing. Having a large service component the business is less capital intensive and therefore delivers higher ROCE.

The healthcare market is non-existent in emerging countries.

3.3 Engineering Division

In its international engineering project business, GGG continued to see relatively steady trends in the 2012 financial year. It provides about 14% of group turnover.

There was a strong upward trend in order intake - 26.0 percent above the figure for 2011. Contributing to this significant increase was the higher number of orders from the Group's Gases Division.

Order intake was characterised not only by major projects in the four core lines of business (olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants), but also by a number of small and medium-sized new orders.

In North America, projects for the efficient exploitation of shale gas reserves had a substantial impact.

Almost 60 percent of the new business in the division in 2012 related to air separation plants and natural gas plants, with the rest evenly spread across the other plant types.

Our order backlog remains high. At 31 December 2012, it stood at EUR 3,700bn (2011: EUR 3,600bn).

Engineering Division: Revenue and Order Intake by Plant Type

<i>in € million</i>	<i>Revenue</i>		<i>Order intake</i>	
	<i>2012</i>	<i>2011</i>	<i>2012</i>	<i>2011</i>
Olefin plants	684	986	322	354
Natural gas plants	471	328	758	524
Hydrogen and synthesis gas plants	419	350	539	480
Air separation plants	704	644	898	574
Other	283	223	298	303
TOTAL	2,561	2,531	2,815	2,235

Source: Company Data

Appendix

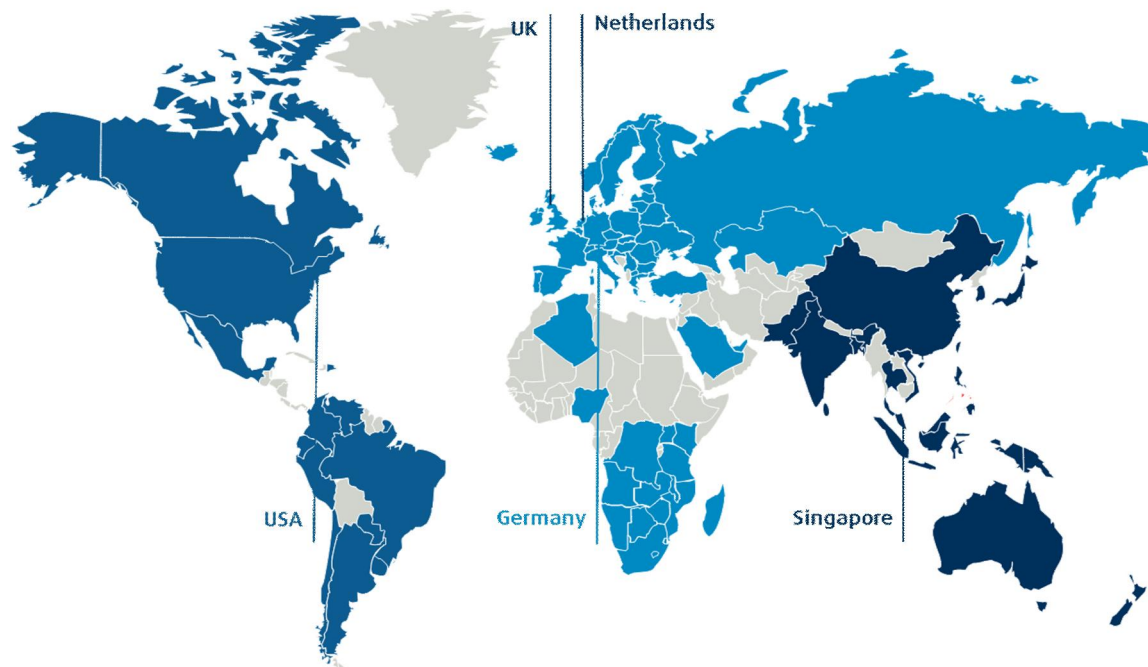
Glossary

- **ASU:** air separation unit. A plant that splits air into its components. Companies use proprietary technology and the commercialisation of this process is the root of both GGG and Air Chaud.
- **Coal gasification:** The process of producing coal gas, a type of syngas (mixture of carbon monoxide, hydrogen, carbon dioxide and water vapour) from coal.
- **COPD:** chronic obstructive pulmonary disease. Caused by smoking, working in polluted environments (e.g. mines) and other factors. An illness with a rising incidence.
- **FCEV:** fuel cell electric vehicle. Passenger car technology using a fuel cell to power an electric motor.
- **Homecare:** Refers to the market for homecare services, and in this context mostly to the provision of oxygen at the patient's home. Homecare is a cost-efficient form of treatment for respiratory illnesses such as COPD.
- **Liquefied gas:** Gases that are cooled to transform them to a liquid state. The liquid state has higher density, enabling more efficient transport.
- **LNG:** liquefied natural gas. LNG is regarded as a promising fuel for future energy needs because of its high energy density, constant heat rating and high purity.
- **Orders at hand:** The contractual value of all group and third-party engineering and construction contracts managed by the engineering and construction entities, excluding projects under warranty, from the signature date.
- **Sleep apnea:** An illness that causes the human body to stop breathing for short intervals when sleeping.
- **Syngas:** A mixture of carbon monoxide, hydrogen, carbon dioxide and water vapour.
- **Take or Pay:** Contracts used in large industries integrating fixed minimum payments below minimum volume thresholds.

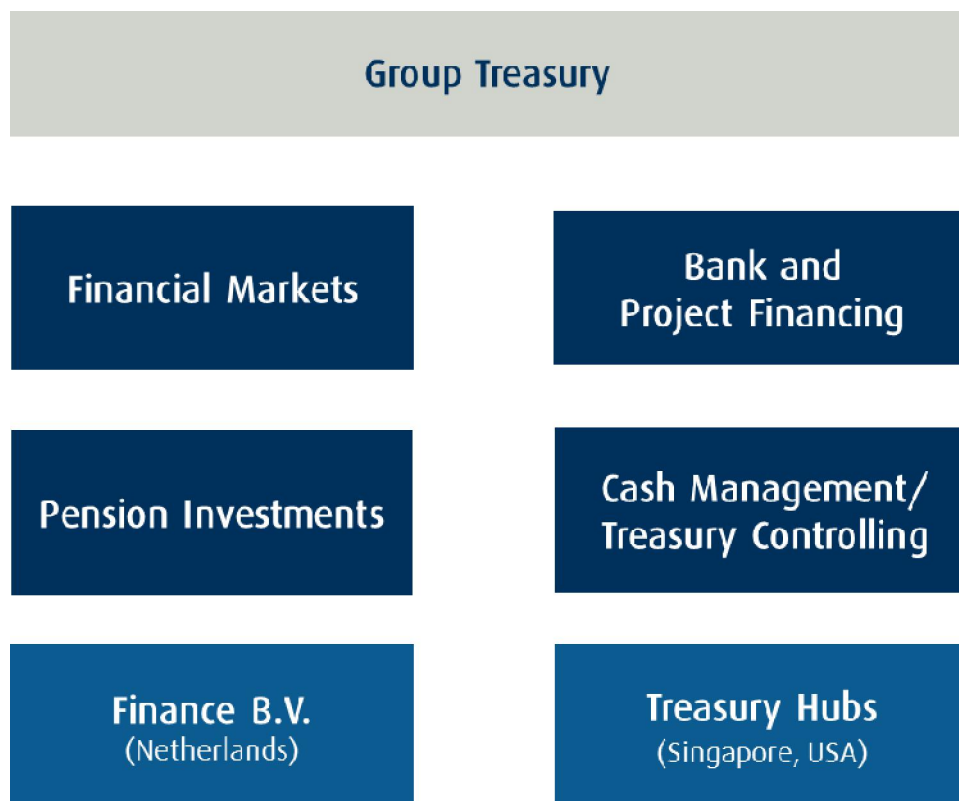
4.0 FINANCE AND TREASURY

4.1 Group Treasury Organisation

Locations



Organisational Chart



4.2 Financial Debt

Financial Debt

	Current		Non-current				Total	
	Due within one year		Due in one to five years		Due in more than five years			
in € million	2012	2011	2012	2011	2012	2011	2012	2011
Subordinated bonds	-	-	-	-	1,469	1,461	1,469	1,461
Other bonds	383	796	2,830	1,923	3,300	2,880	6,513	5,599
Commercial papers (cp)	358	132	-	-	-	-	358	132
Bank loans and overdrafts	521	349	1,184	224	79	3	1,784	576
GROSS FINANCIAL DEBT	1,262	1,277	4,014	2,147	4,848	4,344	10,124	7,768
Less: Securities	823	1,073	-	601	-	-	823	1,674
Less: Cash and cash equiv.	1,218	1,000	-	-	-	-	1,218	1,000
NET FINANCIAL DEBT	-779	-796	4,014	1,546	4,848	4,344	8,083	5,094

Source: Company Data

Note that finance lease liabilities have been excluded from Gross Financial Debt, ie 80 (2012) and 46 (2011).

Note also that Securities have been included together with Cash and cash equivalents in the calculation of Net Financial Debt, ie 823 (2012) and 1674 (2011).

Fixed-Interest Bonds

Issuer	Nominal volume in relevant currency (ISO code)	€ million	Weighted average residual term (in years)	Weighted average effective interest rate (in percent)
GGG Finance BV Amsterdam/GGG AG, Munich	EUR 6,043m	6,130	4.9	4.4
GGG Finance BV Amsterdam	GBP 750m	995	6.1	6.9
GGG Finance BV Amsterdam	USD 400m	303	1.9	3.7
GGG AG Munich	NOK 2,000m	272	4.7	2.8
SAG Ltd., Johannesburg	ZAR 100m	9	0.3	12.4
		7,709		

Source: Company Data

Variable-Interest Bonds

Issuer	Nominal volume in relevant currency (ISO code)	€ million	Weighted average residual term (in years)	Weighted average coupon (in percent)
GGG Finance BV Amsterdam	AUD 150m	117	2.6	4.3
GGG Finance BV Amsterdam	USD 140m	106	3.5	1.0
GGG Finance BV Amsterdam	EUR 50m	50	5.4	0.8
		273		

Source: Company Data

Selected Notes on Financial Debt

Subordinated bonds

There is a right to call the EUR 700m and GBP 250m subordinated bonds issued in July 2006, which have a final maturity date of 14 July 2066. This right applies as from 14 July 2016. If the right to call the loan is not exercised on this date, the coupon will attract interest at a variable rate (three-month Euribor + 4.125 (percent for the euro bond and three-month Libor + 4.125 percent for the bond in British pounds). The right to call the loan will then be available every quarter on the due date for interest payment.

The coupon payment may be suspended on any due date for interest payment. Coupon payments not made will be made up if GGG makes payments for securities pari passu or subordinated securities or GGG AG makes dividend payments.

The EUR 400m subordinated bond issued in July 2003 has no final maturity date, although there is a right to call the loan as from 3 July 2013. If the right to call the loan is not exercised on this date, the coupon will attract interest at a variable rate (three-month Euribor + 3.75 percent). The right to call the loan will then be available every quarter on the due date for interest payment.

The coupon payment may be suspended as soon as GGG AG fails to pay a dividend. Coupon payments may be suspended for a maximum period of five years. If GGG AG resumes the dividend payment, or if GGG AG or GGG Finance BV make other payments for securities pari passu or subordinated securities before a period of five years has elapsed, all the cancelled coupon payments are made up.

Recent bond issues

In May 2012, GGG Finance BV issued a new EUR 500m bond under its EUR 10bn Debt Issuance Programme. The seven-year bond has a fixed interest coupon of 1.75 percent and is guaranteed by GGG AG.

An eight-year EUR 1bn bond issued in September 2012 with a coupon of 1.75 percent was used as part of the refinancing of the acquisition loan for the purchase of US homecare company Sanacom. Moreover, in September 2012 GGG placed a five-year NOK 2bn bond at a coupon of 2.75 percent. This bond was converted on its issue date into USD debt and also used for refinancing.

In addition, a EUR 724m bond which matured in April was redeemed on schedule and a GBP 100m bond was redeemed early in October 2012 by exercising a call option.

Euro commercial papers

The GGG Group also uses a Euro Commercial Paper Programme. Under the programme, the issuers are GGG AG and GGG Finance BV with a guarantee from GGG AG. The volume of the programme is EUR 2bn. At 31 December 2012, there were commercial papers issued by GGG Finance BV of EUR 275m outstanding.

Bank loans and overdrafts

To finance the acquisition of US homecare company Sanacom, a syndicated credit facility of USD 4.5bn (around EUR 3.6bn) was underwritten. This was subsequently reduced significantly by refinancing. At 31 December 2012, the outstanding loan was EUR 922m (USD 1,225bn).

In addition, the GGG Group currently has an agreed unutilised syndicated revolving credit facility of EUR 2.5bn. The five-year revolving credit facility was agreed in May 2010 with a consortium consisting of twenty-five of the major German and international banks used by GGG.

Liabilities from finance leases

<i>in € million</i>	<i>31.12.2012</i>	<i>31.12.2011</i>
TOTAL MINIMUM LEASE PAYMENTS (GROSS INVESTMENT)	128	93
due within one year	28	15
due in one to five years	38	17
due in more than five years	62	61
PRESENT VALUE OF MINIMUM LEASE PAYMENTS	80	46
due within one year	24	13
due in one to five years	28	8
due in more than five years	28	25
FINANCE CHARGE INCLUDED IN THE MINIMUM LEASE PAYMENTS	48	47

4.3 Share Capital

Number of shares

	<i>2012</i>	<i>2011</i>
NUMBER OF SHARES AT 1 JAN.	171,061,401	170,296,941
Exercise of Management Incentive Programme (MIP 2002)	690,535	412,015
Exercise of Long Term Incentive Plan (LTIP 2007)	629,403	352,445
Increase in share capital	12,844,037	–
NUMBER OF SHARES AT 31 DEC.	185,225,376	171,061,401
Own shares	36,408	–
NUMBER OF SHARES OUTSTANDING AT 31 DEC.	185,188,968	171,061,401

4.4 Risk Management

Due to its global operations GGG is exposed to significant financial risks, for example counterparty risk, liquidity risk and risks arising from movements in interest rates and exchange rates.

GGG invests excess liquidity in instruments including bank deposits, government securities and money market funds. Permitted derivatives for managing financial risk include forwards, swaps (including cross currency interest rate swaps) and currency/interest rate options.

5.0 FINANCIALS

Equity Analysis Model Global Gases Group Income Statement

Month	Accounts date Currency / units Audit / man / fcst Number of months	Historical Data					Interim
		2008 EUR mill audited 12	2009 EUR mill audited 12	2010 EUR mill audited 12	2011 EUR mill audited 12	2012 EUR mill audited 12	2013 EUR mill audited 9
Dec.							
Sales Revenue		12,663	11,211	12,868	13,787	15,280	12,468
a (Cost of Sales)		(8,649)	(7,441)	(8,347)	(8,766)	(9,755)	(7,939)
a Gross Profit		4,014	3,770	4,521	5,021	5,525	4,529
a (Marketing Costs)		(1,738)	(1,572)	(1,859)	(2,031)	(2,303)	(1,885)
a (Administrative Expenses)		(1,092)	(994)	(1,074)	(1,163)	(1,354)	(1,061)
(R&D Expenditure)		(104)	(89)	(94)	(98)	(101)	(69)
a Other Operating (Costs) & Revenues +/-		192	(8)	117	105	133	115
a Exceptionals etc. +/-		59					
Other Expenditure Details (for information)							
b (Personnel Costs)		(2,380)	(2,319)	(2,527)	(2,653)	(3,096)	
b (Depreciation & Impairment of Tangible Assets)		(1,004)	(915)	(996)	(1,024)	(1,196)	(1,260)
b (Amortisation & Impairment of Intangibles)		(220)	(223)	(250)	(342)	(90)	(102)
b Exceptionals etc. +/-							
Operating Profit		1,331	1,107	1,611	1,834	1,900	1,629
Investment Income Income							
Income from Investments, Participations etc		60	60	68	76	92	15
EBIT		1,391	1,167	1,679	1,910	1,992	1,644
Interest Received & Paid							
Other Financial Income & Expenditure		72	(16)	61	52	41	(117)
Interest Received		25	73	60	48	53	54
(Gross Interest Paid)		(482)	(386)	(401)	(391)	(399)	(225)
Profit before Tax		1,006	838	1,399	1,619	1,687	1,356
(Tax charge)		(230)	(185)	(335)	(375)	(363)	(278)
Profit after Tax		776	653	1,064	1,244	1,324	1,078
Extraordinaries, Discontinued Operations etc							
Profit / (Loss) for the Year		776	653	1,064	1,244	1,324	1,078
Attributable to Non-controlling Interests		59	62	59	70	74	81
Attributable to Owners of Company		717	591	1,005	1,174	1,250	997
(Preference Dividends)							
(Ordinary Dividends)		(329)	(343)	(349)	(419)	(476)	(550)
Retained Profit for Year		388	248	656	755	774	447
Statement of Gains and Losses		(1,470)	597	1,375	(117)	(317)	(694)
Total Comprehensive Income		(694)	1,250	2,439	1,127	1,007	384

EBITA (before Exceptionals & all Amortisation)	1,552	1,390	1,929	2,252	2,082	1,746
EBITDA (before Exceps. Deprn, & all Amortisation)	2,556	2,305	2,925	3,276	3,278	3,006
Cash Earnings (Before Goodwill, Exceps. & Extraords)	878	814	1,255	1,516	1,340	1,099
Cash Retained Profit (Before Goodwill, Exceps & Extraords)	549	471	906	1,097	864	549

Equity Analysis Model
Global Gases Group
Balance Sheet

<i>Accounts date</i> <i>Currency / units</i>	Historical Data					
	2008 EUR mill	2009 EUR mill	2010 EUR mill	2011 EUR mill	2012 EUR mill	2013 EUR mill
Goodwill	6,893	7,297	7,799	7,868	10,620	10,570
Intangible Fixed Assets	3,177	3,318	3,506	3,300	3,580	3,201
Property, Land & Buildings & Capital Work	1,233	1,320	1,437	1,478	1,528	1,600
Plant, Equipment & Vehicles - net	5,929	6,246	7,286	7,552	8,660	9,615
Financial Investments, Tax & Pension Assets & Deriv.	1,594	1,185	1,322	2,045	1,571	720
Medium-term Trade-related Assets	671	1,017	910	828	836	932
Total Fixed Assets	19,497	20,383	22,260	23,071	26,795	26,638
Stocks, Inventories, Work in Progress	986	966	956	1,036	1,098	1,148
Trade and Other Receivables	2,255	2,086	2,386	2,638	3,355	3,657
Other financial assets & investments	20	17	17	1,073	823	321
Cash and Short-term Investments	1,002	831	1,159	1,000	1,218	1,087
Tax Assets, Derivatives, Assets for Sale & Other	64	98	110	97	188	186
Total Current Assets	4,327	3,998	4,628	5,844	6,682	6,399
Total Assets	23,824	24,381	26,888	28,915	33,477	33,037
Short-term Debt	1,301	392	469	1,290	1,286	1,212
Trade and Other Payables	3,149	3,019	3,514	3,708	3,793	3,873
Corporation Tax Payable	89	133	134	103	167	171
Provisions, Derivatives & Other Current Liabilities	1,482	1,468	1,515	1,455	1,565	1,298
Total Current Liabilities	6,021	5,012	5,632	6,556	6,811	6,554
Medium & Long-term Debt	6,178	6,603	6,253	6,524	8,918	8,879
Medium-term Trade Payables	150	154	192	200	243	433
Tax, Pension & Other Long-term Provisions	3,226	3,425	3,449	3,491	3,847	3,613
Total Non-current Liabilities	9,554	10,182	9,894	10,215	13,008	12,925
Issued Share Capital	431	432	436	438	474	475
Share Premium Account, Treasury Shares						
Revaluation Reserve						
Other Reserves	3,232	4,045	5,304	5,414	6,731	6,059
Revenue Reserves	4,209	4,259	5,108	5,752	5,889	6,255
Total Capital and Reserves	7,872	8,736	10,848	11,604	13,094	12,789
Non-controlling Interests	377	451	514	540	564	769
Total Shareholders' Funds	8,249	9,187	11,362	12,144	13,658	13,558
Accumulated depreciation	10,099	11,277	13,141	14,096	15,136	16,000

Equity Analysis Model							
Global Gases Group							
UK-Style Cash Flow Statement							
		Historical Data					
	<i>Accounts date</i>	2008	2009	2010	2011	2012	2013
	<i>Currency / units</i>	EUR mill	EUR mill	EUR mill	EUR mill	EUR mill	EUR mill
	Number of months	12	12	12	12	12	9
CASH FLOW FROM OPERATING ACTIVITIES							
	Operating Profit	1,331	1,107	1,611	1,834	1,900	1,629
	Tangible Asset Depreciation	1,004	915	996	1,024	1,196	1,260
	Dec(Inc) in Stock / Inventories	80	93	(7)	(79)	(37)	(89)
	Dec(Inc) in Debtors / Receivables	(73)	108	(145)	(179)	(160)	(244)
	Inc(Dec) in Creditors / Payables & Advance Payments	(204)	(41)	236	183	(101)	165
	All other non-cash adjustments & Exceptionals	(60)	220	(9)	(40)	134	(161)
Cash Generated from Operations		2,078	2,402	2,682	2,743	2,932	2,560
	Dividends Received from Associates	27	46	45	44	52	8
	(Tax Paid)	(229)	(306)	(305)	(361)	(462)	(410)
Net Cash from Operating Activities		1,876	2,142	2,422	2,426	2,522	2,158
CASH FLOW FROM INVESTING ACTIVITIES							
	Income Received from Investments						
	Interest Received	243	274	212	182	190	138
	(Purchase of Tangible Fixed Assets)	(1,404)	(1,056)	(1,158)	(1,292)	(1,850)	(1,525)
	Disposal of Tangible Fixed Assets	168	165	139	21	45	111
	(Purchase of Subs, Intang., Financial & Forestry Assets)	(310)	(222)	(126)	(1,817)	(2,970)	(347)
	Disposal of Subsidiaries, Intangibles & Financial Assets	274	123	80	151	962	692
Net Cash from Investing Activities		(1,029)	(716)	(853)	(2,755)	(3,623)	(931)
CASH FLOW FROM FINANCING ACTIVITIES							
	(Interest Paid)	(596)	(575)	(510)	(489)	(567)	(448)
	New Shares Issued	17	20	81	30	1,449	54
	(Repurchase / Redemption of Shares)	(47)		(9)	(11)	(506)	
	(Costs of Issuing / Redeeming Equity)						
	Total Increase in Debt	1,705	1,437	588	2,030	6,381	3,698
	(Total Decrease in Debt)	(1,428)	(2,144)	(1,091)	(956)	(4,955)	(4,140)
	(Dividends Paid on Ordinary Shares)	(329)	(343)	(349)	(419)	(476)	(550)
	(Preference and Minority Dividends Paid)						
	Miscell. Financing Costs e.g. derivatives, bank fees						
Net Cash from Financing Activities		(678)	(1,605)	(1,290)	185	1,326	(1,386)
Net Cash Flow from Ops. Investing & Funding		169	(179)	279	(144)	225	(159)
	Change in Cash	144	(171)	328	(159)	218	(131)
	Change in Overdraft	25	(8)	(49)	15	7	(28)

Equity Analysis Model							
Global Gases Group							
Share Price Data							
		Historical Data					
	Accounts date	2008	2009	2010	2011	2012	2013
	Currency / units	EUR mill	EUR mill	EUR mill	EUR mill	EUR mill	EUR mill
		12	12	12	12	12	9
Number of Shares & Eps							
	Basic Earnings per Share (cents)	427	351	594	688	703	538
	Underlying Earnings per Share (pence or equiv.)	427	351	594	688	703	538
	Interim Dividend Per Share (cents)						
	Final Dividend Per Share (cents)						
	Total Dividends Per Share (cents)	180	180	220	250	270	297
	Average number of common shares	162.293	168.579	169.328	170.649	177.853	185.359
	Average number of preference shares						
Share Prices							
	Common Share Price - Low (Euro)	51.62	49.85	76.85	95.91	114.00	128.35
	Common Share Price - High (Euro)	97.02	88.30	115.25	127.40	136.50	150.27
	Common Share Price - Average (Euro)	74.32	69.08	96.05	111.66	125.25	139.31
	Preference Share Price - Low (Euro)						
	Preference Share Price - High (Euros)						
	Preference Share Price - Average						
Risk rating							
	Variability %	20.70	20.70	16.70	20.60	24.40	28.80
	Beta (actual or estimate)	0.85	0.85	0.85	0.85	0.85	0.85
	Assumed Market Risk premium	4.00	4.00	4.00	4.00	4.00	4.00
	EUR 10-year Gilt Yield	3.70	3.20	2.70	2.55	2.00	1.75
	EURIBOR or equivalent	4.96	1.18	0.74	1.50	0.66	0.21
Market Capitalisation							
	Market Capitalisation - Common Stock	12,062	11,645	16,264	19,054	22,276	25,822
	Market Capitalisation - Preference Stock	-	-	-	-	-	-
	Market Capitalisation - Total	12,062	11,645	16,264	19,054	22,276	25,822
	Minorities	377	451	514	540	564	769
	Net Debt	6,477	6,164	5,563	6,814	8,986	9,004
	Enterprise value [EV]	18,916	18,260	22,341	26,408	31,826	35,595
Equity Analysis							
Equity Ratios							
	Underlying Eps Growth %	(26.0%)	(17.8%)	69.2%	15.8%	2.2%	5.7%
	P/E Ratio	17.4	19.7	16.2	16.2	17.8	17.3
	Market / Book Ratio of Equity	1.53	1.33	1.50	1.64	1.70	2.02
	Dividend Cover	2.4	2.0	2.7	2.8	2.6	1.8
	Dividend Yield %	2.4%	2.6%	2.3%	2.2%	2.2%	2.8%
	Total Return to Shareholders %	(8.4%)	(4.6%)	42.2%	18.8%	14.6%	18.1%
EV Valuation Multiples							
	EV / Sales	1.49	1.63	1.74	1.92	2.08	2.14
	EV / Book Capital Employed	1.28	1.19	1.32	1.39	1.41	1.58
	EV / EBITA	12.2	13.1	11.6	11.7	15.3	15.3
	EV / EBITDA	7.40	7.92	7.64	8.06	9.71	8.88
	EV / Staff Costs	7.9	7.9	8.8	10.0	10.3	

Equity Analysis Model							
Global Gases Group							
Cash Flow Analysis							
		Historical Data					
	Accounts date	2008	2009	2010	2011	2012	2013
	Currency / units	EUR mill	EUR mill	EUR mill	EUR mill	EUR mill	EUR mill
		audited	audited	audited	audited	audited	audited
	Number of months	12	12	12	12	12	9
Cash Flow Summary							
CASH FLOW FROM OPERATIONS							
	Operating Profit	1,331	1,107	1,611	1,834	1,900	1,629
	Other Non-cash & Exceptional Items	(60)	220	(9)	(40)	134	(161)
	Investment Income	27	46	45	44	52	8
	"Cash Profit"	1,298	1,373	1,647	1,838	2,086	1,476
	(Increase) / Decrease in Net Working Assets	(197)	160	84	(75)	(298)	(168)
	Tangible Asset Depreciation	1,004	915	996	1,024	1,196	1,260
	Net Capital Expenditure	(1,236)	(891)	(1,019)	(1,271)	(1,805)	(1,414)
	(Tax Paid)	(229)	(306)	(305)	(361)	(462)	(410)
	(Dividends Paid)	(329)	(343)	(349)	(419)	(476)	(550)
	Free Cash Flow before Interest	311	908	1,054	736	241	194
	(Net Interest Paid)	(353)	(301)	(298)	(307)	(377)	(310)
	Internal Cash Flow	(42)	607	756	429	(136)	(116)
ACQUISITION & FINANCING CASH FLOWS							
	(Acquisitions), Disposals, (Investments)	(36)	(99)	(46)	(1,666)	(2,008)	345
	Increase / (Decrease) in Share Capital	(30)	20	72	19	943	54
	Increase / (Decrease) in Debt	252	(699)	(454)	1,059	1,419	(414)
	(Increase) / Decrease in Cash	(144)	171	(328)	159	(218)	131
	Net Financing Cash Flow	42	(607)	(756)	(429)	136	(1,498)

Equity Analysis Model
Global Gases Group

Financial Profile

Financial Profile		Historical Data					Interim
		2008	2009	2010	2011	2012	2013
	Accounts date Number of months	12	12	12	12	12	9
Annual % Growth Rates							
Sales Growth		2.9%	(11.5%)	14.8%	7.1%	10.8%	8.8%
Margins and Cost Structure							
Cost of Sales % sales		(68.3%)	(66.4%)	(64.9%)	(63.6%)	(63.8%)	(63.7%)
Gross Profit % Sales		31.7%	33.6%	35.1%	36.4%	36.2%	36.3%
Marketing Costs % Sales		(13.7%)	(14.0%)	(14.4%)	(14.7%)	(15.1%)	(15.1%)
Administrative Expenses % Sales		(8.6%)	(8.9%)	(8.3%)	(8.4%)	(8.9%)	(7.6%)
R&D Costs % Sales		(0.8%)	(0.8%)	(0.7%)	(0.7%)	(0.7%)	(0.6%)
Other Operating Costs & Revenues % Sales		1.5%	(0.1%)	0.9%	0.8%	0.9%	0.9%
Personnel Costs % Sales		(18.8%)	(20.7%)	(19.6%)	(19.2%)	(20.3%)	
Depreciation % Sales		(7.9%)	(8.2%)	(7.7%)	(7.4%)	(7.8%)	(10.1%)
Total Exceptional Items % Sales (+/-)		0.5%					(0.8%)
EBITA% Sales		12.3%	12.4%	15.0%	16.3%	13.6%	14.0%
EBIT % Sales		11.0%	10.4%	13.0%	13.9%	13.0%	13.2%
Profitability / Return on Capital Employed							
EBITA % Capital Employed (pre-exceptionals)		10.5%	9.1%	11.4%	11.9%	9.2%	10.3%
Pre-tax Target Rate of Return On Book Value		12.7%	9.4%	9.9%	10.4%	9.5%	10.1%
EBITA % Market Enterprise Value		8.2%	7.6%	8.6%	8.5%	6.5%	6.5%
Pre-tax Target Rate of Return on Market Value		9.9%	7.9%	7.5%	7.5%	6.8%	6.4%
Asset Utilisation / Capital Intensity							
Sales / Total Assets		0.53	0.46	0.48	0.48	0.46	0.50
Stocks % Sales		7.8%	8.6%	7.4%	7.5%	7.2%	6.9%
Debtors % Sales		23.1%	27.7%	25.6%	25.1%	27.4%	27.6%
Creditors & Advance Payments % Sales		26.1%	28.3%	28.8%	28.3%	26.4%	25.9%
Net Working Assets % Sales		4.8%	8.0%	4.2%	4.3%	8.2%	8.6%
Intangibles % Sales		54.4%	65.1%	60.6%	57.1%	69.5%	63.6%
Tangible Fixed Assets % Sales		57%	67%	68%	65%	67%	67%
Depreciable Assets % Sales		47%	56%	57%	55%	57%	58%
Net Capex % Annual Depreciation		123%	97%	102%	124%	151%	112%
Average Age of Depreciable Assets (years)		10.1	12.3	13.2	13.8	12.7	9.5
Tax Ratios							
Effective Interest Rate [P&L] %		10.9%	5.3%	5.8%	5.4%	4.4%	3.4%
Effective Tax Rate [P&L] %		22.9%	22.1%	23.9%	23.2%	21.5%	20.5%
Cash Tax Rate [Cash Flow] %		22.8%	36.5%	21.8%	22.3%	27.4%	30.2%

Capital Structure & Credit Status

Balance Sheet Gearing & Leverage							
Leverage: (Net Debt % Capital Employed)		44%	40%	33%	36%	40%	40%
Net Debt % Enterprise Value		34%	34%	25%	26%	28%	25%
Interest Cover Ratios							
Interest Cover: (EBITA / Net Interest Paid)		3.4	4.4	5.7	6.6	6.0	10.2
Interest Cover: (EBITDA / Net Interest Paid)		5.6	7.4	8.6	9.6	9.5	17.6
Cash Flow before Interest / Cash Net Interest		0.9	3.0	3.5	2.4	0.6	0.6
Income Leverage (Debt Repayment Ability)							
Gross Debt / Cash Retained Profit (years to repay)		13.6	14.9	7.4	7.1	11.8	13.8
Net Debt / EBITDA		2.5	2.7	1.9	2.1	2.7	2.2

ADVANCED DIPLOMA

CASE STUDY EXAMINATION - NOTE FORM ANSWERS

APRIL 2014

QUESTION 1

[16.2 mins, 9 marks]

1.a.

(9.0 mins, 5 marks)

[Marking scheme: 1 have 20 points but there are surely others, so ¼ mark for each good point]

Tonnage Gas (c. 20% of sales)

Demand driven by construction activity and growth in key industrial sectors eg steel, oil and gas customers, chemicals, electronics, food, but a very wide variety of production processes – so very well diversified.

Extremely consolidated globally – 5 major players, GGG the second biggest. Good EBITDA margins 24 to 29% but falling. Growth in Asia but fall in EMEA which is the largest market for GGG.

Big users - supplied from on-site plant or via pipeline – low risk by being protected by 15 year take-or-pay contracts. Requires heavy capex by GGG. Add-on customers increase return on capital. Care needed on customer choice because of credit risk but effectively locked in to the risk of their sector – hence need diversification.

Bulk and cylinder gas (23% and 29% of sales respectively)

Bulk supply to on-site gas tank under 5-year contracts to reduce risk. Lowish customer risk because of low cost of exit.

- Medium size users. Cylinder supply for smaller users
 - Own-retail outlets plus other retailers, with shorter-term supply contracts
 - Capital investment required up-front.
- Margins similar to Tonnage.

Healthcare (14% of sales)

Long-term growth drivers are ageing world population, increase in chronic diseases, increasing patient care, technologic/medical research developments. Property increases demand. Healthcare reforms and regulations.

GGG industry leader in US, the biggest market and globally.

Medical gases devices maintenance and advisory services – varied risk
Good EBITDA margin (25.0% and rising) but better return on capital employed.

Engineering (14% of sales)

Large-scale engineering projects (corporate capex) very cyclical (crisis 2009/10)
– continuing slow recovery.

Key industries – predominantly oil and gas plants of all kinds.

Also medium and small-size applications

Lower margin business (12.6% EBITDA/Sales) Seems perverse as this business is more cyclical and risky. Is the pricing tight?

1.b.

(7.2 mins, 4 marks)

[Marking scheme: ½ mark for each good point]

Tonnage versus bulk and cylinder – between them they cater for the complete size range of customers from very large, mainstream to small, occasional gas users. Some customers may be both types allowing cross selling. Upgrades and downgrades possible.

Also achieves industrial sector diversification. Smoothing of cyclical demand fluctuations by supply contracts ranging from 15 years to 5 years to shorter, with length of term related to level of capital investment required.

Healthcare – medical gases plus a service business with lower margins but less capital intensive ⁸ so better ROCE. Higher growth rates in both developed and (in future) developing markets. Leading brand name, especially in US – non-commodity business. Totally different business drivers from all other (industrial) business of GGG. Much less cyclical business than the others.

Engineering – traditional complementarity with gases – majority of projects are limited to gases business. Expertise in plant design and construction extremely complementary for plant operations and performance. More cyclical business, based on customers' capex, than the others.

QUESTION 2

[16.2 mins, 9 marks]

[Marking scheme: ½ mark for each strong summary point, covering both credit dimensions]

NB A summary of key factors is required, not a rambling iteration of all the detail.

Business risk – excellent

- One of largest global players in industrial gases
- Strong geographic diversity with exposure to high growth markets

- High share of stable, predictable tonnage business based on long-term take-or-pay contracts
- Increased size of resilient healthcare business (US based 2012 acquisition).

Financial risk – intermediate

- Strong credit metrics, conservative financial policy

For Information: Not in the background material eg Targeted net debt/EBITDA less than 2.5 x (debt 10.1 billion)

- i) Net debt/EV 25% to 28% for last 3.75 years – low leverage
- ii) EBIT interest cover 7x, average last 3.75years (EBITDA 11x) – very strong
- iii) Net debt/EBITDA 2.23, average last 3.75years – good
- iv) Net cash from operating activities / net debt Cash from ops/net debt 34.8 % average last 3.75 years (2012 – 28.1%, 2013 32.0% estimate) – very strong

- Strong liquidity levels and policy (cash EUR 1.1 billion) but how much of this is trapped?
- But continuing high capex, potential depressant to free cash flows (internal cash flow negative by EUR 3,093 million last 18 months, after capex and acquisitions).

Question 3

[18.0 mins, 10 marks]

[Marking scheme: Up to 1 mark for each area identified, based on credibility and quality of justification]

3.a. Five key areas

(9.0 mins, 5 marks)

Here are the eight possibilities:

- Monitoring macro-economic trends/volatilities for emerging markets – indicates money available to invest; gas demand is capex-led, so large customer supply has to be very local. By implication good modelling of the future cash flows and requirement for funds.
- Counterparty risk – banks (depos, derivatives), customers (eg take-or-pay contracts), countries (regulations, disruption, expropriation).
- Capex currency risks in emerging markets – eg Vietnam, Pakistan, Saudi etc. re investment finance, invoicing currency.

How to fund and extract cash from countries with exchange controls. Also possible issue of trapped cash.

- Bank and financial market relationship management for planned and opportunistic investment.

- Credit rating maintenance – to ensure access to funds, eg currently risk on hybrids re possible re-appraisal of equity/debt weighting metrics.
- Treasury structure – keep pace with local development and have a presence to come up with creative local treasury solutions (5 regions currently); emerging markets are particularly challenging.
- Dividend – keep low to enable capex.
- Pension deficit – differential impact of macro factors on business prospects versus pension fund prospects.

Interest rate risk on large debt portfolio and its refinancings.

3.b. Where to invest in treasury

(9 mins, 5 marks)

[Marking scheme: 1 mark per suggestion, depending on rationale; looking for mention of investment in BOTH people and systems]

Combination of investment in treasury staff to improve and disseminate expertise, in systems to improve availability and quality of information for decision-making and possibly in local representation.

Expertise:

- Growth in gas consumption is capex-led, so appreciation of how that fits into the macro-economic picture especially in developing markets, is very important. Good modelling and simulation skills.
- Holistic grasp of the treasury function, ie business-led, ERM mindset combined with appreciation of differences at local level.
- Understanding of capital markets and equity investors – GGG “triangle” model of low dividend, stable credit rating and bond price, capex.
- Creative about emerging market risk management, eg fx, funding, ie lack of developed financial markets and different attitudes to financial risk and business culture – particularly important for GGG.
- Possibly more local presence where potential gains are material in the long term

Systems:

- Systems, eg company intranet, can be used to disseminate expertise, particularly where there is wide geographic diversification and treasury staff are thin on the ground in individual countries.

- An extension of this is to use the intranet to institutionalise the sharing of innovations in solving specific treasury problems group-wide.
- TMS for improving efficiencies in cash management, hedging and database management and for transparency. Particular capability needed for cash flow forecasting / inter co trading and netting.

Question 4

[21.6 mins, 12 marks]

4.a.

(9.0 mins, 5 marks)

[Marking scheme: 1/3 mark for each good point, ideally numbers plus comment]

At December 2012 GGG has EUR 1,218m of cash plus EUR 823m securities = 2,041m (Note: full details of debt are not available for the interim at September 2013). Debt = EUR 8,918m plus 1,286m = 10,204. Net debt = 8,163 This is after deducting cash, including other financial assets and securities of 2041 which is actually how the company defines cash. Elsewhere in the case cash and net debt may well exclude the other financial assets.

Maturity profile of gross debt at December 2012:

Due within 1 year	1,262
1 to 5 years	4,014
More than 5 years	4,848 (looks like 5 to 10 years)
	10,124

Therefore maturing debt averages about 1bn per year (covered by cash balances, as above)

EUR 2.5 billion revolving credit line, which is unutilised, serves as back up to company's EUR 2 billion C.P. programme of which EUR 358/275 was outstanding at end of 2012. CP used for short-term funding. Similarly bank finance is used for short-term bridge financing.

Composition of debt (EUR mill)	2012	2011
Subordinated bonds (Note)	1,469	1,461
Other bonds	6,513	5,599
Commercial paper	358	132
Bank loans and overdrafts	1,784	576
	10,124	7,768

Majority of funding is obviously bonds. (79%)

Currency of bonds (value in EUR), remaining average term and interest rates.

Fixed Rate Bonds		EUR mill	Term- yrs	Interest rate
	EUR	6,130	4.9	4.4%
	GBP	995	6.1	6.9%
	USD	303	1.9	3.7%

	NOK	272	4.7	2.8%
	ZAR	9	0.3	12.4%
		7,709		

Total Fixed and Variable 7.982

Variable Rate Bonds		EUR mill	Term- yrs	Interest rate
	AUD	117	2.6	4.3%
	USD	106	3.5	1.0%
	EUR	50	5.4	0.8%
		273m		

97% fixed rate bonds and 77% Euro, 12% GBP, probably 10 year term.

It is not possible to do a full interest rate or currency analysis because we are not shown the currency of bank debt, commercial paper or cash, or of any swapping that might have happened. Neither do we see any interest rate swaps. This is a major defect in the data provided and we therefore lack a clear view.

Subordinated bonds interesting eg – quasi-equity issued in 2003 and 2006 (maturity 2066) – long-term emergency funding, subordinated and callable. Relatively expensive. These are hugely important in the capital structure as they are most likely to have been issued to allow a specific credit rating to be targeted. The monitoring of these in the structure to ensure that they still work is an important role for treasury. The logic is that the extra cost of the hybrid will be more than matched by a lower cost on the senior debt. This needs careful work because it will be tied up with interest rate risk.

4.b. (5.4 mins, 3 marks)

[Marking scheme: 1/3 mark for each good point]

At September 2013 (using the latest available figures) ash = 1,087m plus 321 securities = 1,408, Debt = 10,091m

At 8.7% of turnover the 1,087 is not needed simply for normal working capital purposes. – looks very conservative but experienced previous downturns.

Company liquidity policy is obviously to maintain at least EUR 1 billion in cash and securities. However we are only seeing snap shots so it might be that a dividend is early payable with stockpiled cash. In addition we do not know if the balance sheet is window dressed, which is very common with multinationals. Some cash may be illiquid in the form of collateral (or margin) for derivative contracts.

Worst internal cash flow deficit over a year was 136 million in 2012, so more than adequate in that context.

Group has 666 legal entities in 100 countries so potential for short-term or

medium-term trapped cash is enormous and could even comprise the bulk of this cash.

Cash required centrally for dividend (550m) and interest (310m) also tax, not all central, (410), total 1,270m – again this is covered by cash balances but bearing in mind some of the liquidities explained there could in fact be very little really available cash.

Cash balance gives greater flexibility on financing and re-financing, even more accessible than short-term debt facility.

4.c.

(7.2 mins, 4 marks)

[Marking scheme: 1/3 mark for each good point]

4.c.(i) Other than acquisitions operations have been funded totally by internal cash flow (5½ years surplus 1,498 million. Only one full year negative (2012 as indicated above). Cash and short-term debt provide more than adequate cover and flexibility for cyclical downturns. Capex peaks, trapped cash, seasonal volatility eg dividends, re-financing, opportunistic exploitation of funding opportunities.

4.c.(ii) Acquisitions over 5½ years have cost 3,510 mill net funded 1,498 by cash flow, 1,078 by shares, 1,163 debt (934 net of cash), so conservative funding even of big acquisitions (27% debt). Dominated by (eventual) long-term fixed rate bonds but acquisitions effected initially using cash and shorter-term bank and market facilities, subsequent re-finance. However, should there be a very large acquisition, then GGG would have to step beyond the modest drawdowns of existing facilities and small share issues. It would have to hit the BIG button, but with a good commitment to a rating, this gives a sound backdrop for decisions.

Case study financials show average cost of debt = 4.4% at 2012 (fallen from 5.3% in 2009) – very cheap debt.

Question 5

[25.2 mins, 14 marks]

5.a.

(12.6 mins, 7 marks)

[Marking scheme: 1/3 mark for each good point]

2013-2015 5.7% and 5.8% sales growth, EBITA margins 15.3 to 16.3%
2016-2023 2%+ p.a. growth rate 15.5% EBITA % sales
Recently actual growth 7 to 11%. Margins average 14.7%⁵ – growth low?, margins high?

Terminal growth rate calculation: undiscounted TV = 23,828 / 0.503 = 47,371.8
TV/scf = 47371.8/2254.2 = 21.015
Therefore scf/TV = 4.76% [cash flow yield (WACC – g)], therefore g = 2%
positive OK – assuming EUR inflation 1.5 to 2.0% (best estimate at the time) and virtually no real growth.

Capex 120%. 125% of depreciation OK (Historically 120%)

Depreciation 7.8% falling to 7.2% of sales, historically, but high capex last 2 years¹³ will push it up (interim 10.1%)

Constant working capital increases after 2015 – 4.15 to 4.8% of sales, some fluctuation before that (historically 6.4%, range 4.2% to 8.6%) – therefore looks low, lazy assumption.

WACC

2 risk-free rates (debt 3.4% and equity 3.5%). Why? (Case 1.75%)

Gross cost of debt 4.9% (Case 4.4%/4.5%) – a bit high

Tax rate 26% (historically 20.5 to 23.9%) – a bit high, but OK if tax shelter rate higher than effective P&L tax rate.

Equity premium rather high at 5.5%

Beta 0.9 (0.85 given in case study)

Gearing – use of target or policy leverage is technically correct (debt historically 26% last few years)

Cost of equity 8.45% (maybe 6.4%)

On conclusion WACC maybe should be lower

This alone could increase the valuation.

Summary

Cash flow assumptions all look reasonable

Margins slightly optimistic, growth rates pessimistic

Capex ok, working capital slightly low

WACC rather high (but one can argue that all day!)

5.b.

(12.6 mins, 7 marks)

[Marking scheme: 1/3 mark for each good calculation or supporting argument/analysis]

Sustainable cash flow for 2013 –

• Free cash flow for 2013 as given in the question =	<u>1,644</u>
• Sales of 17,390 (up 13.8%) looks optimistic compared with growth (old EBITDA) figure so say 17,000m (Also 9mths x 4/3)P – 16,624) (new EBITDA)	-2,678
• EBITA margin 15.4% compared with 14% at 9mths so use 14% on 17,000	<u>+2,380</u>
• Tax rate $1 - (1982/2678) = 26\%$ in line with cash tax last 2¾ years OK	-298*
• Gross up depreciation from 9mth figure gives 1,680 because (old depn) of high capex last 21 mths so it will increase (and depreciation probably (new depn) stable throughout the year)	-
• Capex – fixed assets 13 yrs old indicating capex/depreciation (old capex) about 1.25/1.30. Historical and forecasts around 1.22, but some (new capex) years with low capex (recession and financial crisis)	-1,350
so assume $1.25 \times 1680 = 2,100$ say,	<u>+1,680</u>
• Working capital level at 2013 = say, $8.2\% \times 17,000 = 1,394$ (old w.c.)	+330
Assume steady state growth of 3% gives 41.8 increase (new w.c.)	<u>+1,650</u>
• NB. Average sales growth assumed for 2012-23 = 3.8%, EUR inflation, say, 2% so assume 3% in perpetuity	<u>-2,100</u>
	-450*
	<hr/>
Revised free cash flow = $1,644 - 298 + 330 - 450 - 4 =$	<u>1,222</u>
	<hr/>

WACC Calculation

$$\text{Revised } K_d = 4.5 \times 0.74 = 3.33$$

$$\text{Revised } K_c = 3.0 \times (0.85 \times 4) = 6.40$$

$$\text{WACC} = (3.33 \times 0.26) + (6.4 \times 0.74) = 5.60\%$$

- Re-calculated WACC (as above) = 5.6%. Growth 3 p.a.
- $\text{EV(cf)} = 1,222 / 0.026$ (plus 720 financial investments as per table)
- $= 47,720$
- versus given analysis of 40,015, maybe a little overvalued.

At 2% growth this comes out at $1,222 / 0.036 = 33,944$, add FI gives 34,664 which makes 40,015 a little heavy. This just shows how sensitive these calculation are to growth assumptions. Overall the investment bank is not bad.

Question 6**[10.8 mins, 6 marks]****6.a.****(5.4 mins, 3 marks)**

[Marking scheme: ¼ mark for each good point because very straightforward question, no calculations]

GGG

New market sector of potential longer-term interest, with presumably lots of scope for replicating the format elsewhere.

Promising “green” project

Initial “R&D” of concept already done including outline viability study.

Timescale relatively short ie maximum capacity

Need construction company for a) technical and financial appraisal of old pipeline building new pipelines and maintenance of pipelines b) sharing investment and risk.

Share of initial investment at risk is manageable (size). How well do GGG know the retail market? ⁹

SWW expertise as above. Pipeline assessment and construction work is routine business for them but short-term. Pipeline maintenance contract is longer-term but arguably not so significant unless further projects emerge with GGG

Project off-take in hands of experienced and safe GGG.

Again, capital and risk sharing, with investment at risk being manageable size.

For both there is a counter-party risk on the other.

6.b.**(5.4 mins, 3 marks)**

[Marking scheme: ¼ mark for each good point]

Will Delft Energy want and can they afford a small stake (5% of the equity)?

But probably not needed as a partner going forward – so maybe simpler to buy out – their idea.

Can Shell be persuaded to take a stake to tie them in as shareholders as well as gas suppliers?

If so, possible 34/33/33 split in SPV shareholding.

GGG have a greater long-term business interest in the project than SWV or Shell so maybe 50/25/25 split.

On reflection Shell also has a long-term interest, so a bigger stake from them could be argued.

NB. If Shell not involved as shareholders then GGG/SWV split better at eg 60/40

or 51/49 then 50/50 for legal reasons.

A good “green” project so try to get EU/EIB/Dutch Government grants or cheap loans (maybe EUR 10m).

Otherwise maximise SPV direct borrowing (60 to 70 mill).

Leaving main sponsors/shareholders to invest 20 to 30 mill, so GGG 34% or 50% ie between 6.8 mill and 15 mill.

Detailed shareholdings could depend on the particular requirements (including tax and on-off balance sheet issues) of the various sponsors.

Obviously, Shell, GGG and SWV need to be contractually tied into the project for the supply, construction and operational involvements as well as shareholder agreements for the benefit of them, its bankers and the project SPV.

GGG (and SWV) may want the option to buy out other shareholders or sell their stakes at some time after the project is completed and viability proven, or otherwise.

Question 7

[27 mins, 15 marks]

[Marking scheme: Overall – looking for recognition of scale and materiality of issue for GGG, need to compensate for lack of diversification possibilities by ensuring very close monitoring of counterparty quality and rapid response to any change, awareness of range of feasible instruments, range of market-based triggers for action, for derivatives the possibility of two-way MTM exposure and offset; specifically – six credible comments per part 7.a., 7.b., 7.c.]

7.a. Counterparties

(9 min, 5 marks)

- (i) Fully adequate diversification is difficult given the scale (cash at EUR 1bn plus is same order as PAT) so routine recognition of changes in counterparty quality and rapid response are key (see also 7.b. (ii) below).

Counterparties can be banks, other FIs and sovereigns; share price, ratings and CDSs are obvious criteria but would expect some more fundamental analysis, eg market cap, counterparty business diversification, systemic importance if a bank.

- (ii) Bank criteria similar to above plus the obvious need to have substantial derivatives capability.

7.b. Cash balances

(9 min, 5 marks)

- (i) Government securities, bank depos, MMFs, high quality secured (eg repos).
- (ii) Exposure management: routine daily checks, eg absolute/relative volatility of CDS, absolute/relative volatility of equity price with particular notice taken

of departure from peer group behaviour, CRA notching/outlook to trigger exposure reduction (increase); general overview of analyst and media comments.

With banks in particular, it certainly needs a more frequent assessment procedure because of the speed with which banks can fail. Policy needs triggers to allow quick action without referral to management.

7.c. Derivatives

(9 mins, 5 marks)

Main addition here is CSAs/provision for collateral payment both ways for MTM movements together with netting possibilities. Also possibility of offset against borrowings in event of bank default if lender to the company

Question 8

(27.0 mins, 15 marks)

[Marking scheme: expect minimum of at least five risks, including at least three of the seven listed below, for a pass]

8.a. Risks

(9 mins, 5 marks)

Here are seven possibles:

- Net investment on capex currency
- Sovereign risk on asset, eg expropriation
- Counterparty risk on buyer
- Product cost
- Transaction currency risk
- Continuity risk
- Property/Casualty

8.b. Financing contract, mitigating risks

(18 mins, 10 marks)

[Marking scheme: expect discussion of at least four risk areas, including net investment and transaction risks, for a pass]

- Net investment on capex currency
 - Local funding if available
 - If no local funding available then need to either invest in hard currency or do a lease arrangement in RMB which may well just price in the lessor's net investment risk if fx is an element of lessor's costs.
 - JV with buyer could mitigate part of the risk (and also part of the sovereign risk).
 - Price in currency depreciation
 - Currency derivatives if volatility rather than structural decline

- Sovereign risk on asset, eg expropriation
 - Government agency insurance
 - Non-recourse lease
 - Equity participation by customer
- Counterparty risk on buyer
 - Buyer failure: Government agency/ other insurance
 - “Pay” element: alternative buyer, insurance (penalty if buyer OK)
- Product cost
 - Term contract
 - Energy: pass through to buyer
 - Commodity: pass through or hedge – pass through
- Transaction currency risk
 - Currency variation clause?
 - Seek to peg sales revenue to a USD based commodity price which (if one could be found) is closely correlated with the buyers earnings and GGG’s
 - Derivatives: rolling hedge?
- Continuity risk
 - Standby supply (costly) & planned maintenance
 - Alternative source
 - (Insurance)
- Property/Casualty
 - Insurance
 - As for continuity

Question 9

(18.0 mins, 10 marks)

[Marking scheme: Looking for a broad classification of treasury activities requiring discretionary powers, eg 15 across (i), (ii and (iii), as well as a credible distribution across the three categories]

General Observations

The areas most likely to require local discretion are local bank relationships, creditor and debtor management and some transaction currency hedging.

The areas more likely for centralisation are major bank relationships, balance sheet structure, investment criteria and dividend policy.

However, the absence of relationship banks, local custom, competitive positioning and sophistication of local financial markets, eg for derivatives, dictates resorting to the art of the possible.

More likely areas for local discretion:

	(i) Central	(ii) Local	(iii)
• Bank relations <ul style="list-style-type: none"> - choice local bank - settlement - local debt - local deposit - cash liquidity management - trade finance - fx hedging 		X X X X	 X X X
• Debtors <ul style="list-style-type: none"> - terms of trade - quality counterparty 		 X	 X
• Creditors <ul style="list-style-type: none"> - terms of trade - quality counterparty 		 X	 X

Less likely areas for local discretion:

	(i) Central	(ii) Local	(iii)
• Balance Sheet - capital structure - net investment hedging	 X X		
• Dividend - level - fx hedging	 X X		
• Capex - business criteria - financial criteria	 X		 X
• Fx Risk - transaction policy - contingent policy - execution	 X X		 X
• Interest Risk - policy - execution	 X		 X
• Insurance - big ticket - small ticket	 X		 X

Examiner's Report

MCT Advanced Diploma - April 2014

OVERALL SUMMARY OF PERFORMANCE

	General Exam	Case Exam	Combined
Marks	43.9%	47.4%	45.3%
Questions	7	9	16
Students	9	6	15
Passes # @50%	3	3	6
Passes # @45%	4	4	8
Pass % (50%)	33%	50%	40%
Pass % (45%)	44%	67%	53%

Range of marks 28.5% to 55.7% 26.9% to 62.1%

OVERVIEW

This was a very disappointing set of results on all metrics, typified by the overall average mark of 45.3%. Only one paper out of 15 achieved a mark above 60% mark.

However, this was an unusual sitting, in that 11 out of 15 papers were from re-sit candidates, one of whom re-sat both papers. There were only 2 new candidates sitting both papers. All but one of the re-sits improved on their previous marks and the average improvement was 8.5 marks, which is very good.

Performance on the Case exam was only slightly better than on the General exam. Performance across the two papers on the Corporate Finance and Funding questions was, unusually, better on average than performance on the Risk and Treasury Management questions, but only marginally. The detailed figures below show that an average score of 50% or more was achieved on only one question out of seven in the General paper and on four questions out of nine

in the Case Study paper. The eleven questions on Risk and Treasury Management saw only one average pass mark.

General exam	marks available	passes out of 9	average mark
Q1	17	1	35%
Q2	24	2	40%
Q3	9	7	71%
Q4	12	2	41%
Q5	9	4	48%
Q6	15	4	44%
Q7	14	4	43%
Case exam	marks available	passes out of 6	average mark
Q1	9	4	56%
Q2	9	5	57%
Q3	10	5	56%
Q4	12	4	52%
Q5	14	2	42%
Q6	6	2	37%
Q7	15	3	44%
Q8	15	1	42%
Q9	10	4	45%

Examiner's Report - Case Study Examination

Question1 Strategic and financial similarities, differences and synergies between four group businesses.

Overall the marks were good, but the first, more descriptive part was much better done, with only one fail, than the second part, with only one pass. This required more analysis and creative thought about the likely synergies between the four businesses.

Question 2 Company's credit rating – financial risk and business risk dimensions.

Overall the marks were very good, with only one fail. This question required a summary analysis of the main credit factors affecting the company, both financial and non-financial, which most did very well, extracting the most critical longer-term factors and condensing material from the case-study detail. The weaknesses were where some candidates just rambled through a lot of detail or repeated what they had already covered in Question 1.

Question 3 Priority issues in the medium term future for treasury and where to invest so that treasury develops in line with the business.

This question had the highest pass rate at 5 out of 6 on the Risk & Treasury Management sections of the Case paper – not surprising perhaps as part 3.a. about future treasury priorities has been an evergreen and predictable topic. Responses to part 3.b. about where future investment in treasury should be

focused rightly picked up on both people and systems, for instance using the latter to help share novel solutions to treasury problems group-wide. Both parts of the Question were equally well answered.

Question 4 **Analysis and assessment of the composition of the company's debt and cash balances.**

This three-part question was well answered, with good identification and use of information from the background material. The relative weakness in the answers, especially on Question 4c, was the absence of critical commentary, analysis and interpretation.

Question 5 **Critique and revision of a broker's detailed DCF valuation of the company.**

This was the technical question, deliberately designed to test quantitative skills, that defeated two thirds of candidates. The first part required a critique of the DCF analysis provided – candidates either covered the cash flow projection assumptions or the WACC assumptions but few covered both. Unfortunately, in the second part, only two candidates demonstrated the ability to carry out their own sustainable cash flow calculation plus DCF valuation (one with excellence) – the other four were totally lost with marks below 30%.

Question 6 **Analysis of the opportunities, risks and possible structures for a joint-venture project.**

The performance on this question was very similar to that on question 5, with the two same candidates doing very well and the same other four terribly. In the first part the analysis of risks and opportunities was quite well done on average. The second part required some informed imagination and creativity about likely capital and ownership structures for the joint venture, in the absence of much detailed information – a deliberate test of their understanding of the general principles of structuring and financing. Like the previous number-crunching question this severely caught out the majority of candidates and half scored no marks at all.

Question 7 **Managing financial counterparty risk arising from investment of surplus cash and derivative transactions.**

Financial counterparty risk is a core area of treasury and one of obvious significance for GGG, given cash balances in excess of EUR 1bn. This three-part Question covering both cash investment and derivatives asked about (i) counterparty criteria, (ii) permissible instruments/limits and (iii) metrics for managing and monitoring risks. Responses weakened as candidates progressed from (i) to (iii), more noticeably on derivatives. Overall the Question was a good discriminator with three clear passes and three fails.

Question 8 **Take-or-pay contracts, with specific reference to China.**

Take-or-pay contracts comprise 25% of GGG's revenue and require commitment of resources for 5-15 years. This two-part Question asked for identification of

take-or-pay contract risks (5 marks) and suggestions for how these risks might be managed (10 marks). Four candidates passed part (a) but none reached 50% on part (b), with an overall pass rate of 1 out of 6.

There are parallels here with responses to Question 7, where broadly speaking there is awareness of risk but less understanding and imagination about its management.

Question 9 **In emerging markets where local circumstances sometimes frustrates central control of treasury, what is the scope for delegating discretionary powers?**

As global businesses refocus on emerging markets to sustain growth, the need for flexibility in central control (“dynamic balance” in the language of the Treasury Management Matrix) is growing, so this is a topical Question. Happily, and despite coming at the end of a paper which many found difficult, most rallied to this subject. Results were polarised with four clear passes and two very clear fails scoring below 20%. For those who passed the quality of discussion was very good, as indeed it was when a similar Question was asked in October 2012.

Again, a pattern seems to emerge here with candidates doing better on the more qualitative topics in Question 3 and 9 than on the more technically-specific topics in Questions 7 and 8.