Responsible Investment

Corporate Governance and SRI – Q3 2005

Contents

A Mellon Financial Company℠

NEWTON
The Power of Ideas

Voting profile for Q3 2005

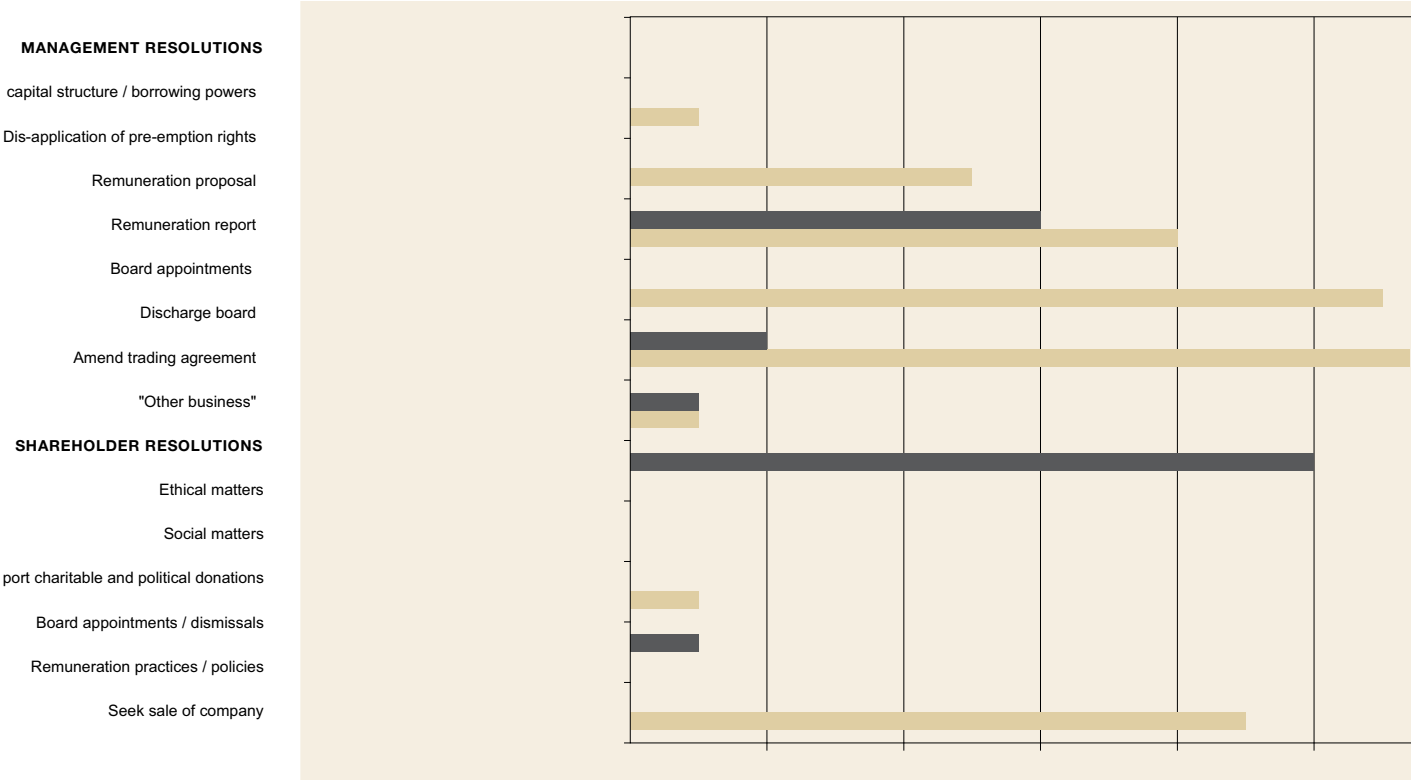
Over the quarter, Newton voted on behalf of its clients at 353 meetings. At 11% of these meetings, Newton instructed votes against one or more resolutions. During this period there was a noted increase in the number of UK companies proposing resolutions seeking to dis-apply pre-emption rights above the best practice level of 5% of their issued share capital. The dis-application of pre-emption rights allows a company to issue shares without first offering them to their existing shareholders.

In departing from best practice, some companies have been requesting a level of 10% or more. Newton, considers it inappropriate to potentially dilute shareholders to this extent without first offering an adequate explanation for this requirement.

Newton took no action on thirteen occasions. In all these instances, blocking of shares was required in order to exercise voting rights.

Complete voting summary – Q3 2005	Total	UK	Ex-UK
AGMs			
Voted in favour of all resolutions	210	181	29
Voted against one or more resolutions	29	19	10
Took no action	2	0	2
Abstained	0	0	0
	241	**200**	**41**
EGMs			
Voted in favour of all resolutions	84	57	27
Voted against one or more resolutions	10	3	7
Took no action	11	0	11
Abstained	0	0	0
	105	**60**	**45**
Court Meetings			
Voted in favour of all resolutions	7	7	0
Voted against one or more resolutions	0	0	0
Took no action	0	0	0
Abstained	0	0	0
	7	**7**	**0**
Totals	**353**	**267**	**86**
Voted in favour	**301**	**245**	**56**
Voted against	**39**	**22**	**17**
Took no action	**13**	**0**	**13**
Abstained	**0**	**0**	**0**
Totals	**353**	**267**	**380**

Breakdown of resolutions voted against during Q3 2005



UK Companies

BAA PLC – AGM – 15/07/2005

A shareholder requisitioned resolution sought to amend the company's articles of association. If passed, the amendment would require the company to gain shareholder approval for any investment project where the cost is estimated to exceed 50% of shareholders' funds. The resolution was proposed by supporters of the Stop Stansted Expansion campaign. Newton did not consider the resolution to be in the best interests of long-term shareholders. Newton is confident in the company's strategy of maximising shareholder value, whilst balancing the requirements and expectations of its stakeholders. Also, the transactions that require shareholder approval are clearly and adequately detailed in the Financial Services Authority's Listing Rules. Newton voted against the shareholder proposed resolution.

Baltimore PLC – AGM – 15/09/2005

A total of four resolutions were voted against at the company's AGM. Two resolutions sought an authority for the company to issue and allocate shares equal to nearly 200% of its then market capitalisation. The company intended to use the funds to release the company from any liability pertaining to directors' remuneration. Newton felt that the potentially high level of dilution to existing shareholders was excessive.

Votes were also instructed against a resolution seeking approval of a share option plan intended for incentivising non-executive directors. Newton considers that providing share-based incentives to non-executive directors hinders their ability to exercise independent judgement.

The final resolution, that Newton voted against, requested shareholder approval to distribute 20% of the annual increase in the company's Net Asset Value to its directors. The company provided neither rationale for this proposal nor a related structure for the incentive.

Belhaven Group PLC – AGM – 15/07/2005

Newton voted against the resolution seeking approval of the company's remuneration report. Concern centred on the service contract for the CEO, which was terminable upon two years' notice. It was felt that the explanation from the company did not adequately justify this continued departure from best practice. The company stated that the benefits of reducing the contract length to one year would not justify associated costs. These costs were unspecified.

Berkeley Group Holdings PLC – AGM – 01/09/2005
Last year, the company proposed a scheme of arrangement. Newton considered this to be in the best economic interests of shareholders. However, the company placed a unique requirement on the approval of the resolution. In order for the scheme of arrangement to be passed, a proposed Long-Term Incentive Plan (LTIP) would also need to be approved by shareholders. Newton did not consider the LTIP to be in the best interests of shareholders. Therefore, at the company's AGM this year, Newton instructed votes against the company's remuneration report. Newton felt that it was unnecessary for the company's four executive directors to be awarded 15% of the issued share capital in the company following the proposed scheme of arrangement. In addition, the company made a special award of shares to the chairman of the company's remuneration committee for additional work carried out during 2004. Newton felt that this award was inappropriate. Newton also instructed votes against the re-election of three non-executive directors, who were members of the remuneration committee. Finally, Newton voted against two further resolutions seeking shareholder approval to issue shares to the four recipients of the poorly structured LTIP arrangements.

Block Shield Corporation PLC – AGM – 12/08/2005
Despite requests to the company, a remuneration report was not made available to shareholders prior to the company's AGM. Therefore, Newton voted against the resolution seeking approval of the company's remuneration report.

Carphone Warehouse PLC – AGM – 28/07/2005
Newton's instruction to vote against the approval of the company's remuneration report was based on two key concerns. The first was that no performance conditions would govern the free matching shares offered to those individuals that defer their annual bonuses. Secondly, Newton did not consider it to be sufficiently challenging for 50% of share option awards to vest for merely achieving median relative Total Shareholder Return.

Clapham House (The) – AGM – 09/09/2005
A resolution was voted against that sought shareholder approval for the company to issue up to 50% of its issued share capital on a non-pre-emptive basis. The company provided no explanation as to why it would issue this level of share capital without first making an offer to its existing shareholders. Newton considered that the potential dilution was excessive.

Dana Petroleum PLC – AGM – 28/07/2005
Newton instructed votes against the resolution requesting approval of the company's remuneration report and also against two members of the remuneration committee, who were seeking re-election to the board. The level of share option awards were considered to be disproportionate to the performance conditions governing the vesting of the awards. Grants of share options were between 604% and 711% of base salaries. Awards are solely reliant upon the achievement of absolute share price growth, without any requirement to improve the underlying financial performance of the company. The scheme allows for unlimited re-testing of performance conditions should they not be achieved at the end of the initial three-year vesting period. Finally, the service contract for the CEO contains a two-year notice period, which is not in line with best practice of one year.

Dart Group PLC – AGM – 04/08/2005
Newton voted against the resolution seeking approval of the company's remuneration report and also against a member of the remuneration committee, who was seeking re-election to the board. The company's remuneration committee consisted of just two members, who were first appointed to the board in 1993 and 1988. Newton recognised that the member appointed in 1993 provided expert industry knowledge to the board. Therefore, votes were cast in favour of his re-election. For the second member, who had served 17 years, the company provided no explanation for this departure from best practice.

DDD Group PLC – AGM – 26/07/2005
The company sought to issue up to 10% of its share capital. The authority was sought without first offering existing shareholders pre-emptive rights on any issuance. Without an explanation from the company, Newton was uncomfortable with the potential dilution to existing shareholders and voted against the proposed resolution.

EMAP PLC – AGM – 14/07/2005
Newton voted against the resolution seeking approval of the company's remuneration report. Under the deferred annual bonus arrangements, individuals receive a one-for-one share match after three years. However, the matching arrangements are not subject to the achievement of any performance conditions. This situation was aggravated by the increase in the maximum annual bonus.

ITM Power – AGM – 30/09/2005
The company did not provide any assurances that existing shareholders would not be unnecessarily diluted in the event of new share issuances. Therefore, Newton voted against the resolution seeking to issue up to 10% of the company's share capital, without pre-emption rights for existing shareholders.

NEXT PLC – EGM – 15/07/2005
A single resolution was proposed at the company's EGM. This sought approval of a new Risk / Reward Investment Plan. The company's executives could be rewarded with up to 16 times their own investment in shares for absolute share price appreciation only. For such substantial levels of share matching, Newton would expect performance conditions that incentivise management to improve the underlying financial performance of the company. The Risk / Reward Investment Plan, as structured, would reward or penalise participants solely on share price movement, which may be merely a function of market momentum.

NMT Group PLC – EGM – 14/09/2005
This EGM was requisitioned by one of the company's largest shareholders. It was an attempt to replace the existing board members with the proponent's own nominees. Newton did not support the resolutions due to the proponent failing to provide information relating to its proposed nominees and details of the proposed strategy for the business.

Northgate Information Solutions PLC – AGM – 29/09/2005
The structure of the company's remuneration policy led to Newton voting against two members of the remuneration committee, who were seeking re-election to the board. Votes were also instructed against the remuneration report and a resolution seeking to amend the company's 1999 share option scheme. Prior to making a substantial acquisition, the company's shareholders approved an absolute number of shares that could be placed under share option arrangements for the company's executives. This absolute number of shares equated to 15% of the pre-acquisition share capital. However, following the acquisition and resultant increase in share capital, the company sought shareholder approval to alter this absolute number of shares to a rolling 15% of the larger post acquisition share capital. Newton felt that this level of dilution to existing shareholders was excessive given the post acquisition market capitalisation of the company.

Perpetual Income & Growth Investment Trust PLC – AGM – 22/07/2005
Newton voted against a resolution that sought to amend the company's articles of association. The proposed change would provide the company with the power to indemnify its auditors. Newton does not consider it appropriate that a company should bear the costs of indemnifying its appointed auditors as this brings about an unnecessary conflict of interest.

SABMiller PLC – AGM – 28/07/2005
The company altered the structure of its executives' remuneration. This was done to reflect the company's progress from eightieth to twenty-ninth position within the FTSE 100 index. Base salary for the CEO was raised by almost 20% and maximum bonus increased from 100% to 175% of this enhanced base salary. In addition, maximum awards of share options, which are also a multiple of base salary, were granted. This share option scheme allows the undemanding performance conditions to be re-tested in years four and five should they not be achieved at the end of the initial three year vesting window. Newton instructed a vote against the resolution seeking approval of the company's remuneration report.

SSL International PLC – AGM – 20/07/2005
Newton voted against the resolution seeking approval of the company's remuneration report. Despite lacklustre performance, the company made maximum awards under its annual bonus arrangements and put in place a special bonus scheme. Special bonuses, of 200% of basic salary, would be awarded to the CEO and FD for their contributions to achieving a successful takeover of the company. Generally, Newton does not consider it appropriate for management to be offered an incentive for this type of transaction, especially if the bid results from the previous poor performance of management. Votes were also instructed against the re-election, to the board, of a member of the remuneration committee.

Stagecoach Group PLC – AGM – 26/08/2005
The company sought approval of a new Long-Term Incentive Plan to replace the company's existing share option scheme. This would be in addition to increased maximum bonus potential and proposed deferred bonus arrangements. Newton voted against the proposed LTIP. This was largely due to a lack of justification by the company for significantly increasing the remuneration potential of its key executives. In addition, Newton was concerned at the company's intended use of cash to satisfy vesting of share based LTIP awards. The company sought discretion to settle vesting awards in cash rather than in shares. This was due to the company reaching the accepted industry ceiling for share based incentive awards to executive directors.

Newton instructed votes against a non-executive director seeking re-election, who was a member of the company's audit committee. The individual had been a board member for 17 years and was a non-executive director of a company that provided services to the Stagecoach Group.

Torotrak PLC – AGM – 21/07/2005
Newton voted against two resolutions proposed by the company. These sought approval of the company's remuneration policy and its remuneration report.

Newton's concern related to the vesting of share option awards and the ability to re-test performance conditions should they not be achieved at the end of the initial three-year assessment period. Of additional concern was the use of absolute share price growth governing partial vesting of share option awards.

Wyevale Garden Centres PLC – EGM – 12/09/2005
This EGM was requisitioned by the company's largest shareholder. It was an attempt to remove the chairman and two non-executive directors from the company's board, whilst proposing the appointment of a non-executive director to the board. The proponents failed to provide the company or its shareholders with appropriate rationale for this action. Newton voted against all four of the shareholder proposed resolutions. The chairman and the two non-executive directors were appointed between February and August 2005. Considering the recent appointments and the fact that the new management had not had sufficient time to prove its worth, Newton felt that it could not support the shareholder proposed resolutions.

Overseas Companies

Electronic Arts Inc – AGM – 28/07/2005
Newton instructed votes against the resolution that requested shareholder approval to increase the number of shares that may be awarded under the company's Omnibus Stock Plan. The resulting dilution to existing shareholders would be over 17%. In addition, non-executive directors would automatically be awarded share options.

H.J.Heinz Co – AGM – 23/08/2005
A shareholder proposed resolution requested the company to appoint an investment bank in order to explore a potential sale of the business. Given that the company did not appear to lack strategic direction and its board was not entrenched, Newton voted against this shareholder proposed resolution.

Medtronic Inc – AGM – 25/08/2005
Votes were instructed against the election of a non-executive director, who would also be elected to the company's remuneration committee. Given that the candidate was the father of the company's marketing director, Newton did not consider him to be independent.

A further resolution was voted against. This sought to amend the company's non-executive director share option plan. Newton believes that the award of share-based incentives clouds the independent judgement expected of non-executive directors. This is especially important when the potential recipients are members of the remuneration committee, which is tasked with overseeing all remuneration practices of the company.

Mpower Holdings Corp – AGM – 16/08/2005
The company has a history of awarding above industry average levels of share based incentives to its directors. To satisfy this high level of award, the company sought shareholder approval to increase the number of shares that may be awarded. Newton considered that the proposed dilution to existing shareholders of 21.6% was excessive. Also, the company did not disclose any performance conditions that would govern the vesting of share-based incentive awards.

Nike Inc – AGM – 25/07/2005
Newton felt that the proposed amendment to the Omnibus Stock Plan did not warrant shareholder approval. In addition to dilution to existing shareholders of 14.7%, vesting of awards would not be subject to the achievement of performance conditions or even to a minimum holding period. Newton voted against the resolution seeking to amend the company's Omnibus Stock Plan.

Singapore Airlines – AGM – 28/07/2005
The company proposed the re-election of a non-executive director, who was a member of the company's compensation committee. Newton believes it is important for all members of a compensation committee to be independent. The proposed nominee was a director of the company's controlling shareholder. Newton also voted against a resolution that sought approval of "Other Business". The unknown content of this resolution suggests that it is foolhardy to proffer support.

Singapore Airlines – EGM – 28/07/2008
The company held a separate EGM on the same day as it held its AGM. Newton instructed votes against the resolution that sought approval of a new restricted share plan. The dilution to existing shareholders was felt to be excessive at 13%. Also of concern was the lack of performance conditions that would govern the vesting of the proposed nil-cost awards.

Teva Pharmaceutical Industries Ltd – AGM – 27/07/2005
Newton voted against two resolutions at the company's AGM. The first was a request to approve the purchase of liability insurance for the company's directors and officers. Approval of the resolution could be seen as compromising the concept of a duty of care for a director or officer.

The second resolution that Newton voted against sought shareholder approval of a new omnibus long-term incentive plan. The proposed plan included special considerations in the event of a change in control. No individual award limit was divulged. Dilution to existing shareholders was felt to be excessive at 11.5%. Furthermore, no performance conditions would govern the vesting of the share option awards.

Other Business

The following companies all proposed a voting resolution entitled "other business". In these instances, this was the only resolution that Newton instructed votes against.

Resolutions entitled "Other Business" are requests for shareholder approval that allow the board and shareholders to raise other issues at a company's AGM. While such requests are often routine in certain jurisdictions, there is a possibility that certain items may be raised and approved under this resolution, which may not be in shareholders' best interests. Until further information and assurances can be provided, Newton will continue to exercise a level of prudence and vote against resolutions seeking approval of "Other Business".

Cox & King Overseas Fund, India 21st Century – AGM – 26/08/2005
HSBC Global Investment Funds, Chinese Equity – AGM – 29/07/2005
Merrill Lynch Intl Inv Mgrs, European Opportunities Fund – EGM – 09/08/2005
Merrill Lynch Intl Inv Mgrs, Asian Tiger Bond Fund – EGM – 09/08/2005
Merrill Lynch Intl Inv Mgrs, US Opportunities Fund – EGM – 09/08/2005
Merrill Lynch Intl Inv Mgrs, United Kingdom Fund – EGM – 12/09/2005
Merrill Lynch Intl Inv Mgrs, World Bond Fund – EGM – 09/08/2005
Merrill Lynch Intl Inv Mgrs, Japan Opportunities Fund – EGM – 09/08/2005
Spectre Group of Great Restaurants – AGM – 19/07/2005

Examples of engagement – Corporate Governance Q3 2005

Irish Unit Trust – July 2005
Contact: Relationship Manager

The company contacted Newton regarding its intention to change the name and registered address of one of its investment funds. This was required for compliance with UCITS III by September 2005. It was confirmed that the fund would continue with its current investment approach, style of investing, investment manager and benchmark. It was also confirmed that it was not the funds intention to use derivative products, which is allowable under UCITS III. It was also stated that any costs would be borne by the management company and not the fund.

UK Aerospace & Defence Company – July 2005
Contact: Director of Human Resources

The company's newly appointed Director of Human Resources contacted Newton to seek views on the company's remuneration policy. Specifically, Newton's thoughts were sought on the new Deferred Annual Bonus (DAB) arrangements, which the company had proposed at its AGM without first consulting major shareholders. Newton re-iterated its comments made at the time of the AGM. Newton's main concern was the staggered and potentially lumpy vesting of the DAB. Additionally, it was suggested that, to provide some comfort to shareholders, the company should consider introducing minimum shareholding requirements for its executive directors.

UK Support Services Company – August 2005
Contacts: Chairman
Remuneration Consultant

Newton was contacted by the company regarding a proposed one-off share incentive award for the company's two executive board members. It was appreciated that the company was at a turning point in its recovery and that the remuneration committee needed to engender stability within the executive board. However, Newton considered that the performance condition governing the vesting of awards was not sufficiently challenging given the proposed dilution to existing shareholders of 6%.

Without the underpinning of a demanding financial measure, Newton considered that the performance condition of absolute share price growth was not appropriate. It is only in exceptional circumstances that Newton will be supportive of absolute share price growth as a performance measure for long-term incentive awards. The company agreed to increase the absolute share price target for maximum vesting and also to include an Earnings Per Share performance condition of annual real growth of 25%. Newton also requested, and received agreement from the company, that vesting would be pro-rated to reflect the period elapsed and the extent to which performance conditions had been achieved in the event of termination of employment or in the event of a change in control of the company. Originally, the company had requested that the remuneration committee retain absolute discretion on vesting.

UK Leisure & Hotels Company – August 2005
Contact: Chief Executive Officer

Newton was concerned at the company's request to issue up to 10% of its market capitalisation without first offering pre-emption rights to existing shareholders. The company failed to provide Newton with assurances as to the intended use of the proposed issuance.

UK Media & Entertainment Company – Sept 2005
Contacts: Chair of Remuneration Committee
Compensation and Benefits Director

A number of changes to the company's remuneration structure were proposed. The two main proposals were the removal of share options for key executives and a change in performance conditions that would govern the vesting of the awards made under the Performance Share Plan (PSP). Newton was in agreement with the company's intention to only issue share options to key executives in exceptional circumstances, which may be at the time of recruitment. However, Newton requested further detail and comfort surrounding the company's intention to move away from relative Total Shareholder Return, which was the performance condition governing vesting of grants made under the PSP. The proposed performance conditions were the same short-term targets that govern the distribution of annual bonus awards. Shares granted under the PSP would

then be deferred for two years. In the event of termination, change in control of the company or on resignation, the company confirmed that individuals would forfeit any awards unless departure was for any reason other than disability, death or retirement. On retirement, awards would be pro-rated to time and achievement of performance conditions. However, in the first instance, awards would not be made to individuals who are expected to retire within two years of the proposed vesting date. The company stated that the proposed shift to short-term performance targets was largely due to its three key competitors offering their executives a similar structure. Unlike many of its competitors, vesting of awards is subject to the achievement of predetermined performance conditions, sign-on awards are not made and no guaranteed bonus arrangements are in place. The company provided comfort to Newton on the setting of short-term performance targets and the levels of payout for achieving on-target performance versus the payout for exceeding performance targets. It was proposed to the company that, given the commercial sensitivity of disclosing prospective short-term performance targets, shareholders would appreciate retrospective disclosure.

UK Utility Company – Sept 2005
Contact: Investor Relations

The company sought Newton's views relating to its dividend payment date. In addition to considerations that need to be made for investment funds requiring a set yield and the personal tax planning of individual shareholders, Newton suggested that the date of dividend payment should be sufficiently separate from that of the AGM date. Generally, stock lending activities are at their greatest during the time of a company's dividend payment. This is due to the dividend payment being transferred with the borrowed shares. However, like the dividend payment, a share's voting rights also transfer to the borrower. Separating the dividend date and the date of the AGM can help to ensure that a greater number of votes are cast at the company's AGM. Also, where borrowers do actually exercise the transferred voting rights, the separation of these dates means that the company will receive a greater proportion of votes from investors with a longer-term interest in the prospects of the company.

UK Electronic & Electrical Equipment Company – Sept 2005
Contact: Chief Executive Officer

Newton raised concerns over the structure of the board's remuneration and audit committees. Both of these committees included executive directors as members. Also of concern was the company's request to issue shares of up to 10% of its issued share capital whilst dis-applying existing shareholders' pre-emption rights.

Although Newton did not have any immediate concerns with the structure of the company's remuneration policy or have any audit related concerns, it was suggested that the company revisit the structures to bring them in to line with best practice.

On the potential share issuance, there was no plausible explanation for wishing to dis-apply the pre-emption rights of existing shareholders. The company stated that existing shareholders should not be concerned if the company wished to alter its capital structure by diluting its shareholders' value by up to 10%. This comment appeared disingenuous, especially as the company's board members control over 60% of the issued share capital in the company.

UK Investment Trust – Sept 2005
Contact: Investor Relations

Newton sought comfort over a resolution seeking to dis-apply pre-emption rights enjoyed by existing shareholders. The proposed issuance level was roughly 10% of the Trust's market capitalisation. Newton requested assurances from the Trust that any issuance would only be undertaken in order to enhance earnings and would not be issued at a discount to the share price. The Trust provided Newton with comfort over this proposed dis-application of pre-emption rights.

SRI Focus: Energy Supply(2)

Introduction

Last quarter's SRI focus outlined some of the challenges surrounding energy supply. The report highlighted the issues involved in meeting increasing demand for energy, while avoiding the environmental threat posed by growing fossil-fuel use.

The report discussed the projected increase in energy demand resulting from a growing population combined with the rapidly expanding economies of developing countries. Issues such as security of supply, the need for energy diversity and the importance of the development of low-carbon technologies were outlined. Also discussed were global targets to cut harmful greenhouse gas and carbon emissions, the Kyoto Protocol, the EU Emissions Trading Scheme as well as country regulations/ incentives for renewable energy production. This led on to a discussion about one way businesses can adapt for a low carbon future: through investment in wind-generated energy.

Meeting the increasing demand for energy in an environmentally responsible way is a major global challenge. The focus of this quarter's SRI report continues on the theme of energy supply, concentrating on solar-generated energy.

The report is divided into three parts.

Part I: The Solar Industry
The drivers, technology, support mechanisms, challenges and opportunities of this "booming" industry are all considered.

Part II: Understanding Photovoltaics
Definitions, the process of converting sunlight into energy and the construction of a PV System are described.

Part III: Company Involvement
This section looks at some of the ways companies are preparing for a low-carbon future through investment in the solar industry.

Part I: The Solar Industry

A major area of growth

The solar industry has been in the spotlight recently. The industry is currently booming and, consequently, is generating high levels of interest and investment. The main drivers are:

Environmental concerns
Supplying energy to meet increasing demand, combined with the need to slow, and eventually reverse the rise in carbon emissions, is a major challenge for both energy producers and users. Businesses need to adapt, to understand changing expectations and to plan for the long-term. To help companies do this, many governments are setting targets to produce energy from renewable sources. Targets to reduce CO_2 and greenhouse gas emissions are also being set. These targets are creating new opportunities and risks for businesses, particularly in the area of energy use and supply. Solar-generated energy, once installed, does not produce any CO_2 emissions. The industry can therefore, play an important role in helping countries to meet their CO_2 emissions targets.

Targets for the UK include:

- The Kyoto Protocol, through which the UK aims to reduce greenhouse gas emissions by 12.5% below base year (1990) levels over the period 2008-2012.
- The national goal to reduce CO_2 emissions by 20% below 1990 levels by 2010.
- The longer-term national goal of a 60% cut in CO_2 emissions by 2050.

Security of fuel supply
Using renewable energy as a source of power generation can increase diversity of energy supplies and act as an alternative to finite fossil-fuel resources over the long-term. It can also enhance a country's independence from external supplies of primary fuels, thereby contributing towards security of fuel supply.

The high price of conventional fuels
The high price of oil, the rising gas price, the increasing cost of carbon credits and awareness of the environmental issues caused by coal-fired energy generation are further contributing to the attractiveness of the solar industry.

Currently, solar energy contributes less than 0.03% of global annual electricity production. Further investment and development in technologies is required for the solar industry to become widely utilised and independently cost competitive. However, with strong government support and drivers to encourage development, it would seem that the positive momentum currently being experienced by the industry should continue. Current growth rates are roughly 30% p.a. and the expectation from most industry observers is that this pace should be maintained throughout the current decade.

The Photovoltaic (PV) or Solar System

Definitions of the main technology used in the solar industry are given in Part II, along with a description of the process involved in constructing a PV system. For a PV system there are two main end uses: off-grid and grid-connected. Approximately three quarters of solar installed power is grid-connected.

Off-Grid

For locations that are not connected to an electricity grid, off-grid systems can be used to power water pumps, electric fences and even households. The potential market for off-grid PV systems is substantial. There are, for instance, 2 billion people in the world without any access to electricity. These people are mainly located in rural communities in the developing world. Off-grid systems do require investment upfront. However, they can be cheaper than paying the costs associated with extending the electricity grid.

The Paranhos solar project: Angola

BP Angola and the UK government are jointly funding a solar pilot project in Angola. The project, already in operation, is providing a reliable off-grid source of energy to a village of about 360 people. The project was launched in June 2004 and is helping the area recover from the recent war by providing energy to community buildings. This includes the school and medical centre, a vaccine refrigerator, lighting for houses, a water pumping system and street lighting. Before the project, the only electricity supply came from a small and unreliable generator that villagers could usually not afford to run or repair. BP, as part of the project, provided a training course to the Paranhos Farmers Association to teach them how the systems operate.

Grid-Connected

The grid-connected market is made up of centralised systems (commonly referred to as solar farms) and distributed applications (for example, roof-mounted systems). Grid-connected operations, on their own, are not yet sufficiently cost effective to compete independently with conventional energy sources. Therefore governmental support is required to help in the development of grid-connected solar energy.

Government support mechanisms

Government support for the solar industry can help to address energy access, security of supply, industry innovation and the costs of emissions mitigation or environmental impacts. It can also help in the development of large-scale grid-connected solar energy production. Such support, coupled with technology development to make the process more efficient and cheaper, should eventually lead to solar energy being able to compete financially with conventional fuel energy, without subsidised help. However, to attract investors to the industry, the support offered needs to be effective over the longer term.

Governmental support can be provided in the following forms:

- Investment grants for individual PV installations;
- Tax allowances on investments;
- Subsidised loans; and
- Higher feed-in tariffs into the grid.

The German government is amongst the most ambitious in its support for solar energy.

Case study: Germany

Germany provides an interesting example of what can happen to an industry if sufficient government support is provided.

The European Commission directive on Electricity Production from Renewable Energy Sources is one driver behind the strong government support. The objective of the directive is to increase the share of renewable sourced electricity to 22% by 2010. In 2003, c.12% of the electricity produced in Europe came from renewables. Of this, only 0.2% came from solar.

To give an indication of the price differential between solar energy and conventional energy, Landesbank Baden-Wuttemberg, in 2005, conducted a study to determine the costs for generating electricity in Europe. The study found that the costs amounted to €0.04 per kW/h for nuclear power and to €0.03 per kW/h for coal, while the costs of generating electricity by photovoltaics for an average rooftop system in Europe range from €0.25 (Southern Europe) up to €0.60 per kW/h (Northern Europe).

The German government set incentives for the solar industry to take effect January 1st 2005. The incentives are based on the Renewable Energies Act (EEG). The EEG requires grid operators to connect PV systems to their networks and to

purchase the electricity generated by such systems at long-term, guaranteed, minimum prices that are above the market price for conventionally produced electricity. For systems attached to the top of a building or on a noise protection wall, the minimum EEG feed-in tariff for electricity generated by PV systems, commissioned in 2005, is:

- €0.55 per kW/h for the first 30kW
- €0.52 per kW/h for the next 69kW
- €0.51 per kW/h for every additional kW

The feed-in tariff regime is set to last for 20 years. There is a built in annual decrease of 5% from 2005 onwards. For plants (not buildings and sound barriers), the decrease will be 6.5% from 2006 onwards. The tariffs have led to substantial growth in Germany's PV industry.

Many other countries have observed the positive take-up of PV in Germany and are adopting similar schemes to promote solar energy. The majority of southern European countries have decided on similarly generous feed-in tariffs which, given the higher number of sun hours per annum in this region, results in an even more attractive market.

The table opposite outlines other European PV support mechanisms.

PV support mechanisms in Europe (as at the end of 2004)

Country	Programme
Austria	No specific PV programme at present
Belgium	€0.15/kWh feed-in tariff
Cyprus	€0.12-0.26/kWh feed-in tariff as well as investment subsidies
Czech Republic	€0.2/kWh feed-in tariff, reduced VAT (5% vs. 22%) and investment subsidies
Denmark	No specific PV programme at present
Estonia	No specific PV programme at present
Finland	Investment subsidy (up to 40%)
France	€0.15/kWh feed-in tariff for projects <12MW, lower VAT
Germany	€0.457-0.574/kWh feed-in tariff with 5% p.a. decline from 2005 (6.5% decline for open sites from 2006)
Greece	€0.078/kWh feed-in tariff on islands, €0.07/kWh on mainland plus subsidies
Hungary	€0.06-0.068/kWh feed-in tariff
Ireland	No specific PV programme at present
Italy	No specific PV programme at present (expected in 2005)
Latvia	Feed-in tariff of 2x average sales price for 8yrs
Lithuania	€0.056/kWh feed-in tariff
Luxembourg	€0.45/kWh feed-in tariff for private investors (€0.25/kWh for municipalities)
Malta	Reduced VAT (5% vs. 15%)
Netherlands	€0.068/kWh feed-in tariff
Poland	Tax incentives (no customs duty, lower VAT)
Portugal	€0.41/kWh feed-in tariff for projects <5kWp (€0.224/kWh for those >5kWp)
Slovakia	No specific PV programme at present
Slovenia	€0.37/kWh feed-in tariff for projects <36kWp (€0.065/kWh for those >36kWp
Spain	€0.396/kWh feed-in tariff for projects <100kWp (150MW cap), €0.216/kWh for those >100kWp
Sweden	70% tax deduction on investment
Switzerland	€0.1/kWh feed-in tariff
UK	Investment subsidy

Source: European Commission – PV Status Report 2004, DrKW Equity research

The current market

Until 2005, solar industry growth has been mainly driven by support from just three countries (Japan, Germany and the US), though the emergence of new markets (China and Spain in particular) offer significant growth potential. Currently Japan, Germany and the US, account for more than 85% of global installed PV capacity. Japan, until recently, was the largest market. This was due to political support and overall high electricity prices allowing solar energy to be competitive. In 2004, for the first time, Germany was responsible for a higher number of solar installations than Japan.

Japan

By the end of 2004, 1.1GW[1] of solar power had been installed in Japan. The government is targeting 4.8GW of solar capacity by 2010. This target is considered attainable. New solar installations were 220MWp[2] and 280MWp in 2003 and 2004 respectively. The main support scheme currently in place is the Residential PV Dissemination Programme (RPVDP). The RPVDP is scheduled to expire at the end of March 2006, though a final decision has not yet been made. However, it should be noted that the current RPVDP subsidy only covers 3% of the system cost, an almost insignificant amount. This reflects the high electricity prices in Japan which have enabled solar energy to be price competitive with much less governmental support.

Germany

New solar installations in 2003 were 130MWp and c.360MWp in 2004. Driven by a new renewable energy law in Germany, demand and installations have soared to the number one position globally in 2004. This should continue provided supply of PV systems is sufficient.

US

New solar installations were 65MWp and 85MWp in 2003 and 2004 respectively. Considering the country's enormous energy consumption and high number of annual sun hours in the south, there is a large untapped growth potential for the solar industry. The 2005 Energy Bill contained the US solar industry's first solar tax credit since 1982. Under the credit, homeowners purchasing a solar thermal system[3] in the next two years will receive a 30% tax credit (worth up to US$2,000). In support of the federal policy, industry development is being driven by increasing state incentives – California, for example, is currently in the process of adopting its own Million Solar Roofs Initiative. This programme has the goal of placing 1,000,000 solar energy systems, or 3,000MW, on new and existing residential and commercial customer sites by December 31, 2018. New Jersey's Clean Energy Programme, which targets 90MWp by 2008, is also proving a success.

China

China shows promise for near term solar development. While a desire for improved air quality is one driver behind the country's push for renewable energy, China's basic need for power generation capacity is likely to prove far more potent.

The suitability of solar power to function off-grid is particularly beneficial in a developing market – industry estimates suggest that there are 30 million inhabitants in China currently living without access to electricity. The Chinese Government recently announced a renewable energy law that is expected to lead to 10% of total power generation capacity coming from renewable energy by 2020. China has already committed to 450MWp installed PV by 2010 and will introduce feed-in tariffs.

South Korea

South Korea has a target of 1.3GW of installed solar energy by 2011. In 2004, only c.10MW were installed. Incentives exist in the form of investment subsidies and feed-in tariffs. South Korea has copied the German Renewable Energy law and extended it by requiring newly built houses to generate c.50% of their energy requirements from renewable energy sources. This has lead to a rapid increase in demand for solar which currently cannot be satisfied.

Spain

Spain benefits from a very good natural solar resource. The Spanish PV market is expected to grow by at least 40% in 2005. It is already the fourth largest market in the world in terms of newly installed power per year. The government targets are to install 135MW of PV power by 2010. 10MW was installed in 2004. Recent legislation passed in Spain requires that, as of 2005, any new or renovated buildings must be fitted with solar panels.

1| **Watt (W):** The unit of power. One watt equals one joule per second. Watts are commonly used to define the rate of electricity consumption of an electric appliance.
MegaWatt (MW): Unit of electrical power equal to 1 million watts.
KiloWatt (kW): Unit of electrical power equal to 1 thousand watts
GigaWatt (GW): Unit of electrical power equal to 1 billion watts or 1 million kilowatts

2| A watt-peak (Wp) is the direct current watts output of a solar module as measured under an industry standardised light test, before the solar module leaves the manufacturers facility.

3| A system that converts sunlight into heat.

Further development for the industry

For solar-generated energy to compete with conventional energy sources without subsidies, production costs have to come down. There are several ways this can occur. These include:

- Increasing scale benefits as plant size increases.
- Technological improvements in respect of size, efficiency and decreasing the thickness of a PV cell.
- Reducing energy usage in silicon production.
- Lowering silicon waste in the sawing process.
- Reducing breakages in cell production.
- Decreasing variation in product quality.
- Creating a higher level of automation in module manufacturing.

Technology advancements currently offer the most scope for cost reductions. These could occur by increasing cell size, reducing cell thickness and/or improving cell efficiency.

Increasing cell size
A standard cell currently measures 6 inches in length. As the industry moves towards larger cells, costs should decline, due to a reduction in sawing waste and an increase in plant volume potential.

Reducing cell thickness
An average crystalline silicon cell currently has a thickness of between 250-300µm. This is expected to decline to below 200µm by the end of the decade, if not sooner. Only the first 50µm is required to absorb the sunlight, but this thinness creates problems for structural strength. A reduction in thickness has clear implications for material usage and thus input costs. According to CitiGroup, moving from a 300µm to a 200µm wafer would save 26% of material per MW output, increasing wafer gross margins by c.11% and knocking 2% off the final system price.

Improving cell efficiency
A typical polycrystalline solar module currently achieves an efficiency of 14-17%, compared with a theoretical maximum of around 28%. Therefore, further improvement should be possible. This relatively low level of theoretical electricity conversion is caused by a combination of bandwidth limitations, electrical resistance, solar reflection and heat losses. Reducing resistance and reflection should be achievable with current technology.

Technology for the future: Thin film technologies

Thin Film Technology can provide a way of reducing silicon wastage that is caused when sawing the silicon ingots into wafers.

Instead of going through the process and making wafers into cells, thin-film modules are made by coating and patterning entire sheets of substrate, generally glass or stainless steel, with micron-thin layers of conducting and semiconductor materials. This is then followed by encapsulation. This leads to a process that can be highly efficient in materials utilisation, has relatively low labour requirements, and uses comparatively little energy in the total manufacturing process. Efficiency is in the range of 5-15%, i.e. lower that a crystalline cell. In theory, this is enough to enable large-scale use. However, efficiency improvement is crucial to reduce module-manufacturing costs per watt-peak, which will lead to lower system costs and allows for efficient use of space.

Other challenges for the industry

The industry faces other challenges alongside the need for technological development. These are discussed below.

Withdrawal of political support
In any industry that relies on government support to make it competitive, there is the risk of political developments that might lead to a significant deterioration of the support. A significant reduction in the scope of incentives, an unfavourable amendment, or a discontinuation of a renewable energy policy could have a considerable impact on the profitability of the industry.

This risk does appear slight. The longer-term direction of government support is clear. Environmental concerns, coupled with a desire for energy security and diversification, are driving political support for renewable energy and hence solar power.

Burdensome extra costs
The higher cost of using energy generated from renewable resources could lead to price increases for utility companies and, ultimately, consumers.

Supply chain shortages
Any industry growing at the pace of the solar industry will face problems with capacity along the production chain. Currently, demand is outstripping supply in silicon. It is expected that this will be rectified, or perhaps overcompensated for by 2008.

Financial ability to expand production

More investment to increase production capability is required, given the industry's rate of growth. This takes time and cash. The large number of small companies in the industry further complicates production. However, there appears to be a healthy appetite in financial markets to fund expansion of publicly traded companies.

Intermittency

PV systems can only generate electricity when the sun is shining. Therefore, for small-scale PV systems, some sort of energy storage or back-up system is required. However, for larger-scale PV systems, studies and field experience have shown that integrating intermittent PV-generated electricity into the electric grid provides few technical difficulties.

View from Newton's utilities analyst: Robert Canepa-Anston

"Governments' environmental policies are already having a direct impact on energy users' bills. The biggest is the cost of carbon dioxide credits, which we have seen reflected in the rising wholesale electricity price in the UK or Germany. Funding renewable schemes through additional tariff supplements will not produce dramatic rises in bills, but they are coming at a time of dramatic rises driven by commodity costs. The additional scrutiny that this brings about can be seen, for example, in Germany's recent public debate over the extent of any further wind generation roll-out.

"Ultimately, governments would like markets to produce price signals for utilities and end-customers that would encourage renewable investment of their own accord. Solar would be an obvious beneficiary of better price signals to consumers – it is one of the easier technologies to fit (especially to new houses) and its generation pattern (during the day) fits domestic consumption more predictably than wind. However, there are two problems to tackle. The first is the infrastructure – better price signals mean more sophisticated meters (such as Enel is fitting to Italian households). The second is more difficult – the responsiveness of consumers to price signals when making long-term investment decisions especially where this involves significantly greater upfront costs being offset by lower running costs. The UK government recently changed building regulations requiring the most efficient boiler type to be fitted as standard – the economic argument (a pay-back period of less than 3 years) has failed to encourage any significant switching. There are several reasons why – consumers tend to go for the lowest cost option upfront; the builder/developer is not incentivised by the long term prospect of a higher up-front cost to himself being offset of lower, longer-term bills for his customer; longer-term uncertainty (length of likely ownership of a particular house); as well as a lack of awareness of the issues. It is these issues that the government will find hardest to tackle. And this means that subsidised schemes, implemented by utilities centrally, are likely to be the mainstay of renewables investment."

Conclusion

As awareness and understanding of the issues surrounding the demand for energy grows, it becomes clear that all energy supply options must be kept open. Fossil fuels, nuclear, hydro and renewables all need to work together. Each option has uncertainties and challenges and, thus, energy source diversity is very important for a robust supply system. Cost reflective energy prices, including appropriate returns for investors, are essential.

The solar industry is expected to experience continued significant growth in the coming years as governments look at alternatives for fossil fuels. The challenges that the solar industry faces are those of a new and fast growing market. As global demand increases and economies of scale develop, costs should come down, making the technology affordable to many markets that are in need of a clean energy supply.

Part II: Understanding Photovoltaics

Defining the process

1. **Photovoltaics** – technology that produces electricity from sunlight. Photo comes from the Greek word meaning 'light', while voltaic refers to the production of electricity by chemical action in a battery (from the Italian physicist Alessandro Volta). Also referred to as solar electric.

2. **Silicon** – the main base material used in the manufacture of silicon wafers.

3. **Silicon wafers** – ingots of silicon are grown and then sliced to make wafers. Wafers are further processed to form the semiconductor material of a photovoltaic cell.

4. **Photovoltaic or solar cell** – a semiconductor device, usually made of a silicon wafer, which converts the energy of sunlight into electric energy. The photovoltaic cell is the basic building block of a photovoltaic system.

5. **Photovoltaic or solar module** – the smallest complete weather-protected assembly of interconnected photovoltaic cells. One solar cell only produces 1 or 2W of power. This is insufficient to power most applications. To increase power output, cells are electrically connected to form a module.

6. **Photovoltaic or solar panel** – a group of modules fastened together, pre-assembled and wired, designed to serve as an installable unit in a photovoltaic array.

7. **Photovoltaic or solar array** – a mechanically integrated assembly of modules and panels, together with support structure, to form a power producing unit. The term array refers to the entire generating plant, whether it is made up of one or several thousand modules.

8. **Photovoltaic or solar system** – a complete set of components for converting sunlight to electricity, storing that electricity and delivering it to its end use.

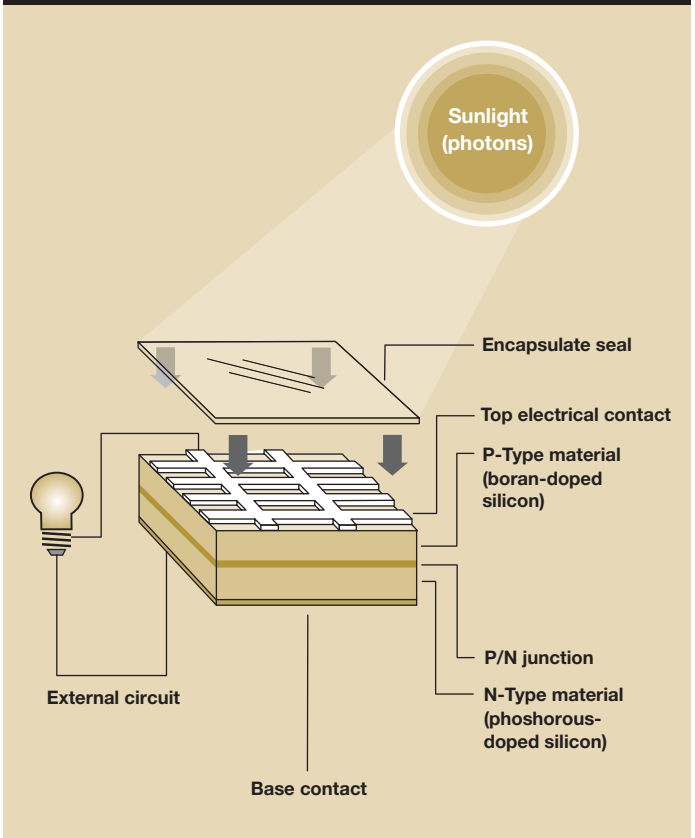
9. **PV** – abbreviation of photovoltaic.

The photovoltaic effect – converting sunlight to energy

The 'photovoltaic effect' is the physical process through which a photovoltaic cell converts sunlight into electricity. Sunlight is composed of photons, or particles of solar energy. When photons strike a PV cell, they may be reflected or absorbed, or they may pass right through. Only the absorbed photons generate electricity. When this happens, the energy of the photon is transferred to an electron in an atom of the cell (which is actually a semiconductor). With its newfound energy, the electron is able to escape from its normal position associated with that atom to become part of the current in an electrical circuit.

Electricity can be conducted when the PV cell is connected to an electrical load – a device or appliance that is using power. The stimulated electrons result in a flow of current.

Diagram 1: PV Cell Construction



Source: State Energy Conservation Office, Austin, Texas 78774

Constructing a PV system

A typical silicon photovoltaic cell is composed of a thin wafer consisting of an ultra-thin layer of phosphorous-doped (N-type or negatively charged) silicon and a thicker layer of boron-doped (P-type or positively charged) silicon. The phosphorus and boron are added so that an electrical field is created where these two materials are in contact (the P/N junction). There are four stages in the process of creating a PV system:

1. Silicon supply
Silicon is widely available, has proven reliability, and is well understood as it is founded on the knowledge and technology originally developed for the electronics industry.

2. Manufacture of wafers
To begin the process, silicon is melted and boron is added. The silicon then crystallises to form either a single (mono) or multi (poly) crystal ingot in a special casting furnace. In 2004, mono and poly crystalline silicon was used as the base material in the manufacture of 90% of the solar cells produced globally. A melting and crystallisation cycle takes typically 40-60 hours. The ingot is then cut into blocks using a horizontal band saw. The blocks are further sliced into wafers with a thickness of c. 200-320 µm2. The saw wastes between 150-180 µm of material per cut. Therefore, substantial cost savings would occur if less waste could be achieved and if wafers could be sawn more thinly. For example, a 50 µm wafer could be sufficient in maintaining the same cell efficiency as one of 280 µm. Subsequently, the wafers are washed, dried, and quality controlled.

3. Manufacture of cells
The process of converting wafers into PV cells is capital intensive and requires substantial technical knowledge. The wafer is first subjected to several chemical, thermal and deposition treatments to give it a surface that has a certain texture. This texture can be described as consisting of many pyramid-shaped figures. The pyramids reflect the light that hits the surface so there is a greater chance of light being absorbed by the silicon. In addition, a thin anti-reflecting layer is applied to the front surface. The coating reduces the reflection, making the cells absorb more light and produce more energy.

Phosphorus is then introduced onto the front surface of the cell and screen printing forms the electrical contacts. This is a process where a paste containing the metal is squeezed through a screen onto the wafer. The solvents in the paste are removed once it has been applied to the wafer so that only the metal remains. This occurs through a carefully controlled heat treatment method.

4. Manufacture of modules
Solar module assembly now takes place. To form a module, crystalline silicon cells are interconnected and encapsulated between a transparent front, usually glass, and a backing material. The ‘module’ is then typically mounted in an aluminium frame ready for installation and distribution. Modules can be customised for specific projects.

Part III: Company Involvement

Newton, on behalf of its clients, has either a current or past interest in the companies in the table below. Outlined is the steps being taken by these companies to prepare for a low carbon future by investment in the solar industry.

Company	Country	Solar interests
BP Solar	UK	BP Solar operates production facilities in the US, Australia, Spain and India. The company became profitable for the first time in 2004. Production is expected to rise from the current 90MW to 200MW by 2006. 2004 saw BP Solar open a 4MW solar farm in Merseburg, Germany. The farm supplies enough power for 1,000 four-person households.
Conergy	Germany	Conergy is the largest solar-specific systems integrator and distributor in Europe. The group's principal activity is to develop, produce and sell system components relating to PV systems. The company is currently present in 15 countries worldwide. In 2004, over 94% of group sales were generated in Germany.
CSG Solar	Germany	The company derives its name from the technology being developed: Crystalline Silicon on Glass. In this process, an extremely thin layer of silicon is deposited directly onto glass sheet suitable for mounting outdoors. This approach bypasses the need for expensive, energy-intensive silicon wafers that are often in short supply. CSG Solar expects to release its first product for sale in 2006. Construction of the first factory for CSG Solar began in January 2005. When it becomes fully operational in 2006, the factory will produce 10MW per year of CSG solar modules. When it reaches full capacity it will produce 25MW per year.
Ersol	Germany	The Ersol Group manufactures and distributes crystalline silicon solar cells. Production capacity is expected to be 60MW by the end of 2005.
Evergreen Solar	US	The company is focused on proprietary string ribbon technology. At the end of 2004, the company's manufacturing capacity had been expanded to 12MW. In January 2005, Evergreen Solar set up a joint venture with Q Cells (EverQ) in order to rapidly expand volumes. The main advantage of ribbon technology is the reduction in silicon usage by using thinner wafers and by lowering sawing waste. EverQ is targeting the use of 30% less silicon per Wp. This suggests strong potential for cost reductions in cell manufacture.
FirstSolar	Germany	FirstSolar manufactures PV modules using thin-film technology. The company is expected to produce more than 20MW of solar modules in 2005, increasing to 40MW in 2006 and 75MW in 2007. Thin film technology allows for high energy production with less semiconductor material than is required by traditional solar modules. This also greatly reduces PV module manufacturing costs.
Kyocera	Japan	Kyocera was the second largest PV cell manufacturer in 2004. Operating headquarters are located in the US and the company has regional sales centres in Brazil and Australia. Facilities are also in operation in Japan, China, the Czech Republic and Mexico. The company is planning to expand production to 240MW by mid 2005.
Mitsubishi Electric	Japan	Mitsubishi Electric is the fourth largest solar cell manufacturer. Current capacity is expected to be c. 135MW, rising to 230MW by 2006.

Company	Country	Solar interests
MoTech Solar	Taiwan	MoTech Solar is part of the conglomerate MoTech Industries and is a PV cell producer. The company plans to increase production capacity to 120MW by the end of 2005 and is expanding production capacity to be 300MW by 2006. Currently the company's main products are mono- and multicrystalline silicon solar cells. The company has also begun a pilot production line for wafer slicing. This should lead to cost reductions and an increased supply of silicon wafers.
Q Cells	Germany	Q Cells is a pure-play solar cell manufacturer. Its core business is the development, production and marketing of mono- and multicrystalline PV cells. The company is one of the largest solar cell manufacturers in Europe and is in the top five globally. The company also plans to take the lead in bringing additional PV technologies – thin film technology and crystalline silicon on glass – to industrial mass production. This is through two minority interests in EverQ and CSG Solar.
Sanyo	Japan	Sanyo has been a pioneer in the development of solar power. In 2004 the company was the largest manufacturer of thin film PV cells. 2004 production capacity of 88MW is expected to rise to 160MW by the end of 2005.
Sharp	Japan	Sharp is a leading manufacturer of solar cells with over forty years experience in solar cell development and production. Sharp is focused on cell and module manufacturing and carries out a limited volume of wafer production. The company currently operates five manufacturing sites (three in Japan, one in the UK, and one in the US), with a combined capacity of 400MW, as at the start of 2005. Sharp holds the top share of the global solar cell market at 27%.
Shell Solar	UK	Shell Solar provides an integrated solution; from manufacturing silicon components, solar cells and modules to selling and designing complete systems for grid connected or remote power applications. The company is also currently developing a thin-film product. Shell Solar is headquartered in Amsterdam and has manufacturing facilities in the United States, Germany, and Portugal with a total yearly capacity of c.80MW in solar cells. Production capacity is expected to reach 110MW in 2005. In June this year, Shell announced it would construct the world's largest single connected solar plant of 10MWp. It is to be constructed at a former military site near Pocking, Bavaria. The solar plant will consist of approximately 62,500 modules and it will deliver electricity to almost 3,300 households in Germany per year. The power plant is expected to cost €40 million to construct. It will consist of 6 sub plants, each of 1,667MWp, linked in parallel to the 20kV grid of the utility E.ON Bavaria. Modules will be mounted on aluminium structures, with a total length of approximately 16.5 km. The system has been especially designed to deliver an optimised energy output. Construction was scheduled to begin in August with completion expected in March 2006.
SolarWorld	Germany	The company is a vertically integrated supplier of solar energy systems. Coverage of the entire value chain is a significant feature that distinguishes the company from its competitors. With a 14% global market share in 2004, SolarWorld is one of the global leaders in the silicon wafer market. SolarWorld manufactures a wide variety of solar powered products for educational, consumer, electronic and custom OEM markets.

Next quarter's focus

Since 1980, energy consumption, mainly oil, has risen by 62% in the transport sector. The upward trend is expected to continue. There are currently few real substitutes for oil in transport, even though the use of biofuels is strongly promoted at European Union level.

Continuing along the energy supply theme, next quarter's report looks at the developing industry of biofuels and changes in the transport industry to accommodate new EC environmental directives.

SRI Activity Log

Please note that this activity log shows examples of SRI activity and engagement over the quarter. It is not an exhaustive list. A complete list of how Newton voted on securities during the period is available upon request.

- **BP**

  Subject: SRI issues surrounding the Baku-Tbilisi-Ceyhan pipeline project
  July 2005

  Construction of the Baku-Tbilisi-Ceyhan Pipeline project began in May 2003. The pipeline runs for over 1700km across Azerbaijan, Georgia and Eastern Turkey, transporting oil from the Caspian Sea to the Mediterranean port of Ceyhan. The pipeline was completed in May 2005, sixteen months behind schedule. It is now operational and has the capacity to supply one million barrels of oil per day. This equates to approximately 1% of worldwide production of oil.

  Responsibility for the construction and operation of the pipeline lies with BTC Co (BTC). BTC consists of eleven participating companies, led by BP – the majority participant with 30.1% of BTC's equity. In addition to the eleven participating companies, BOTAS, the Turkish state petroleum pipeline company, was contracted to BTC to construct the pipeline in Turkey. BOTAS continues to manage the operation of the pipeline in Turkey now that it is functional.

  The total cost of the project is estimated at $3.6bn. Both the European Bank for Reconstruction & Development (EBRD) and the International Finance Corporation (IFC) approved significant financial packages for the project. Agreements on these two loans came after two years of extensive monitoring and scrutiny of the projects environmental and social impacts. A public consultation process was also undertaken. Additional finance was provided by export credit agencies, commercial banks and equity investment.

  Despite involvement by the EBRD and the IFC, there have been reports outlining allegations of violations of environmental and social standards, and human rights abuses. With the project sixteen months behind schedule, there were concerns that BOTAS, in particular, was cutting corners in order to reduce cost overruns and construction penalties. Concerns centred around land acquisition and quality control.

  BP is known for its strong policies on social, ethical and environmental matters. However, there were issues and allegations that warranted further investigation from an SRI perspective. Newton discussed some of these issues directly with BP's CEO, Lord Browne.

  The company understood that it would encounter many SRI related issues while leading the project. Therefore, BP was prepared to delay the project until the necessary agreements and procedures were in place. Lord Browne highlighted that environmental and social considerations formed an integral part of the early phases of project development. These resulted in "hundreds" of modifications to the original plan to significantly reduce the potential for adverse environmental and social impacts. Intergovernmental treaties enacting standards were signed in advance of the project commencing. These were often based on EU regulation and/or inline with BP's own standards. BP contractually required adherence to high standards and provided training in order for these to be achieved.

  As investors, Newton is comfortable with companies that take on such risks, providing the necessary and appropriate planning, protocols, procedures and standards are in place and adhered to. Investment in energy infrastructure is needed to help secure energy supplies. A lack of investment in this area over the 1990's, when the oil price was lower, is one of the reasons why today's oil price is high.

  The pipeline will be an ongoing legacy earnings stream for the three host countries. As in any country, the sovereign government holds the responsibility for safeguarding people and ensuring human rights are respected. BP appears to have ensured that a difficult project was completed in line with its strong social, ethical and environmental polices.

- **Dyson Group**
  Subject: Social Ethical and Environmental (SEE) Disclosure
  August 2005
  The company currently has limited disclosure on SEE issues. Newton contacted the company to find out why disclosure was so low, to discuss the SEE issues surrounding the business and to find out if there are plans to improve this situation going forward. The company stated that their environmental reporting for 2004 is an improvement on that of 2003. For 2005, another improvement is expected with the production of the company's Operating and Financial Review. The company stressed that it does take SEE issues seriously, particularly environmental issues, as they are pertinent to the Chemicals Sector. An Environmental Officer is employed and ensures compliance with appropriate rules and regulations. The group's environmental policy was updated in June 2005. However, it is a "broad-brush" policy (i.e. the company will comply with all regulations, deal with complaints etc.). The company is not planning to report on its progress during the year.

- **Extractive Industries Transparency Initiative (EITI)**
  Subject: Investor update
  September 2005
  Newton attended an investor update on the continued progress of the EITI. The EITI is an initiative that aims to increase transparency in transactions between governments and companies within the extractive industries. Kazakhstan is the most recent country to join the initiative. There are now 20 participating countries. However, only four are taking the necessary actions to fully implement the initiative. Azerbaijan and Nigeria are taking the lead. Azerbaijan has now produced two audited reports disclosing the revenues received from oil companies operating in its country. It is disappointing that no major mining nation has adopted the EITI.

  There are still many issues surrounding implementation of the initiative. Each country has its own set of difficulties and challenges. Therefore, uniform methods of implementation are not appropriate if the initiative is to be successful. Discussions are taking place on who should offer advice on implementation. Validation methods and incentives are further issues currently being discussed.

  One encouraging development is the potential to link the initiative with the Equator Principles. If this goes ahead, it would mean that all banks that have endorsed the Equator Principles would also need to recognise the EITI. There are also discussions taking place on the potential role of the EITI in a post conflict environment, for example, in Iraq or Sudan. One final development was discussed. This focused on the US government taking a greater interest and role in the EITI.

- **Carbon Disclosure Project 3 (CDP3)**
  Subject: Investor update
  September 2005
  Newton attended an investor update on the results of the CDP3 project. The CDP is a coordinating secretariat for institutional investor collaboration, relating to climate change. Its aim is twofold: to inform investors of the significant risks and opportunities presented by climate change and to inform company management of shareholders' concerns relating to the impacts of these issues on company value. The project involves sending a request for information to the FT Global 500 companies and collating responses. 2005 was the third year the project was completed. The CDP3 project obtained the support of 155 signatories including Newton. These institutions represented over $21 trillion in assets.
  71% of companies completed the information request, a jump from 59% in CDP2 and 47% in CDP1. The report found that awareness of climate change risks and opportunities is rising but action to mitigate risk or take advantage of an opportunity is not always grasped. Over 90% of responding companies flagged climate change as posing commercial risks and/or opportunities to their businesses. However, only 51% have implemented emission reduction programmes, only 45% have established emission reduction targets and only 35% have taken action by way of emissions trading.

- **Attendance at corporate responsibility updates**
  Subject: Investor update
  Over the quarter, Newton attended investor updates on corporate responsibility for BAA, Total, Petrobras, BG and BP.

Company Meeting Log: Q3 2005

During the quarter, Newton analysts and fund managers had individual meetings with the management of 272 companies to initiate or maintain dialogue around financial performance and/or responsible investment matters. The insights gained through this engagement are used when making investment decisions. Meeting were held with the following companies:

AAC Acoustic Technology Holdings
Acambis
ACS Actividades de Construccio
Adecco
Advanced Micro Circuits
Alexon
Alkane Energy
All America Latina Logistica
Alliance Unichem
American Capital Strategies
AMS
Anadarko Petroleum
Anglo American
Apollo Hospitals
Aracruz
Arcelor
Autonomy
Aviva
AWG
BAE Systems
Banco Pastor
Bank of Nova Scotia
Bank Pekao
Banpu Coal
Baywa
BBA
Belgacom
Belgravium
BG Group
BHP Billiton
BHP Billiton – China
Boris Homes
BP
British American Tobacco
Buenaventura
Bumi Resources
Bunge
Bunzl
Bursa Malaysia
Canico
Capita
Cardinal Resources
Caretech
Carlsberg
Carpetright
CBA
Celesio
Celoxica
Centrica
China Light & Power
China Netcom
China Resources Peoples Telephone
Chungwha Telecom
Clariant
Clinical Cell
Clipper
CME
CNOOC
Cobham
Computer Sciences
Conergy
Cooper Companies
CRC
Creative Education
Creston
CSC
CVS
Datong
Davis Service Group
De La Rue
Dechra
Denizbank
Deutsche Boerse
Diageo
Dyson
E.On
EADS
Ebay
EFG Bank
EGG
Eisai
Elisa
ENI
Enova
Ersol
Exel x 2
Fielmann
First Choice
Fortum
France Telecom
Fraport x 2
Fun Technologies
Genzyme
Georgica
Getinge
GKN
Global Santafe
Habib
Halfords
Hammerson
Hana Bank
Hanson
Hays
Hellenic Petroleum
High Tech Computer
Hokuriku Electric
HSBC
Huawei
Iberdrola x 2
IBM
IMI
Infosys Technologies
Interlink
Interserve
Intertek
Investcom
Investec
Irish Life & Permanent
iSoft
Isotron
Japan Tobacco
JS Group
Jubilee Mines
KBC
Kingston Communications
Kokuyo
Komercni Bank
KT & G
Kuroda Electric
Kyocera
Kyowa Exeo
Lafarge
LG Philips
Logitech International
Lowe's Companies
Malakoff
Mapeley
Mapletree Logistics
March Networks
Mears
Meiko
Melco
Melrose
Michael Page

Micrometals
Minerva x 2
Miraca Holdings
Mitsui Trust
Mizuho
Monsanto
Morrison (WM) Supermarkets
National Express
Natura Cosmetica
NCC
Nestle
Neteller
Newport Networks
Nexen
Nippon Oil
Nipson Digital Printing
Nishimatsuya Chain
Noble Group
NordNet
Norfolk Southern
Norilsk
Northern Rock
Novint
Old Mutual
OMV
Pacific Basin Shipping
Pacific Media
Partner Communications
Peninsular & Oriental Steam
Persimmon
Petra Foods
Petrofac
Pinewood Shepperton
Pioneer Natural Resources
PowerDsine
Premier Farnell
Premier Foods
Premier Research
Prime REIT
Printing.com
Promina
Provident Financial
Prudential
PT Indosat
PT Medco
Q Cells
Rank
Resolution Group
Rexam
RHM
Robert Walters
Roman Hauser
Royal & Sun Alliance
Royal Dutch Shell
Samsung SDI
Sanofi Aventis
Scottish Power
Secom
Serco
Sevan Marine
Severn Trent
Shanks
Shed Productions
Shinsegae
SHL
SIG
Sigma Tel
Sinon
Sit-up
SK Corp
SK Telecom
SmarTone
Smith & Nephew
Smiths Group
Software Quality Systems
Sony
ST Engineering
Stanelco
Suez
Sumitomo Trust
Supporta
Swiss Life
System C
T & D Holdings
Taiwan Semiconductor Manufacturing
TDS
Telefonica
Timbercorp
TNT
Tomkins
TPSA
Trident Microsystems
Trinity Mirror
TV Tokyo
Ubiquity
Ultra Electronics
Umeco
Umicore
Unibanco
Unicredito Italiano
Union Fenosa
Usiminas
Vantis
Veidekke
Verbund
Vivendi Universal
VNU
Vodafone
Vodafone Egypt
Waste Management
Weir
Whatman
Wienerberger
Wilson Bowden
Windriver
Wistron
Wolseley
Wolters Kluwer x 2
Wood (John) Group
Xaar
Xansa
Xstrata
Yahoo

In addition, the analysts and fund managers attended a large variety of external meetings arranged by the companies or by brokers and other research providers.

Ian Burger Associate Director of Investment Management, Corporate Governance Officer
Katie Swanston SRI Officer

Tel: 020 7163 9000
Fax: 020 7163 5063

newton.co.uk

Issued and approved by Newton Investment Management Limited,
Mellon Financial Centre, 160 Queen Victoria Street, London EC4V 4LA.

Registered in England No. 1371973.

Authorised and regulated by the Financial Services Authority

Please be advised that the companies named throughout this document are not indicative of current investments made by Newton on behalf of its clients.

Newton Investment Management Limited
This is a financial promotion and is not intended as investment advice. Past performance is not a guide to future performance. The value of investments, and income from them, is not guaranteed and can fall as well as rise due to stock market and currency movements. When you sell your investment, you may get back less than you originally invested.

The information pertaining to individual securities contained within this document are purely for illustrative purposes and must not be construed as a recommendation to buy or sell. The opinions expressed in this document are those of Newton Investment Management Limited and should not be construed as investment advice.

Newton Investment Management Limited
The Bank of New York Mellon Centre
160 Queen Victoria Street
London EC4V 4LA
Registered in England No. 1371973

Tel: 020 7163 9000
www.newton.co.uk

Registered office: As above
Authorised and regulated by the Financial Services Authority

Newton Capital Management Limited
'Newton' refers to the following group of affiliated companies: Newton Investment Management Limited, Newton Capital Management Limited, Newton International Investment Management Limited, Newton Capital Management LLC and Newton Fund Managers (CI) Limited. Assets under management include assets managed by all of these companies except Newton Capital Management LLC, which provides marketing services in the U.S. for Newton Capital Management Limited. Except for Newton Capital Management LLC and Newton Capital Management Limited, none of the other Newton companies offer services in the U.S. Newton Capital Management Limited is an investment management firm authorized and regulated in the United Kingdom by the Financial Services Authority in the conduct of investment business and is a wholly owned subsidiary of The Bank of New York Mellon Corporation. Registered in England no: 2675952. Newton Capital Management Limited is registered in the United States as an investment adviser under the Investment Advisers Act of 1940.

The information pertaining to individual securities contained within this document are purely for illustrative purposes and must not be construed as a recommendation to buy or sell. The opinions expressed in this document are those of Newton and should not be construed as investment advice.

Tel: (516) 338 3521
www.newtoncapitalmanagement.com

Printed on think[4] warm 150 g/m² FSC

Investors should be aware that past performance is not a guide to future performance and that the value of investments and the income derived from them can go down as well as up. Investors may not get back the full amount invested.

The opinions expressed are those of Newton Investment Management and should not be construed as investment advice.
In addition the information contained in this document should not be construed as a recommendation to buy or sell a security.

13667R 03/09