

## SELECT COMMITTEE - ENERGY SECURITY

MINUTES of a meeting of the Select Committee - Energy Security held in the Wantsum Room, Sessions House, County Hall, Maidstone on Friday, 4 December 2015.

PRESENT: Mr J N Wedgbury (Chairman), Mr D L Brazier, Mr B E Clark, Mr A D Crowther, Mr C P D Hoare, Mr P J Homewood, Mrs E D Rowbotham, Mr C P Smith and Mr M E Whybrow

IN ATTENDANCE: Mr G Romagnuolo (Policy Overview Research Officer), Miss L Adam (Scrutiny Research Officer) and Mr J Cook (Scrutiny Research Officer)

### UNRESTRICTED ITEMS

**10. Professor Gordon MacKerron and Emily Cox (University of Sussex and University of Sussex & Oxford)**  
(Item 1)

*Professor Gordon MacKerron (Professor of Science & Technology Policy & Co-Director of the Sussex Energy Group, University of Sussex) and Emily Cox (PhD Research Assistant, University of Sussex & Oxford) were in attendance for this item.*

(1) The Chairman welcomed the guests to the meeting and invited them to introduce themselves. Emily stated that she was a Research Assistant and PhD student at the University of Sussex; she also taught a Masters course on Energy Policy. Professor MacKerron stated that he was an economist specialising in the economics of electricity particularly nuclear power; he was currently researching the economics of new build nuclear power stations: waste and decommissioning; modelling climate change risk and reducing energy demand.

#### **Q – What is the future for Dungeness as a nuclear power site?**

(2) Professor MacKerron noted the Government's recent announcement of £250 million funding for nuclear research into a small modular reactor. He stated that from reading the evidence published by the Government, he felt that there was very little interest in Dungeness being a future site due to the risk of coastal erosion and flooding. He reported that a small modular reactor would not be available for a minimum of 20 years.

(3) Ms Cox explained that in terms of Kent, the output of a nuclear power station was 400 kV and went directly into the grid for distribution; the power was not retained in the local area. She noted that it may be possible for smaller reactors to connect to the lower voltage electricity network.

#### **Q - Should the UK have a root (big suppliers) or branch (small suppliers) system?**

(4) Ms Cox stated that it was difficult to say one was better than the other. She noted that the centralised National Grid was a key piece of infrastructure and it was pragmatic to work with that. She reported, however, that there was significant investment in distributed generation in mainland Europe particularly in Germany. She stated that Kent had one of the

largest increases of distributed generation in the UK over the past year. She explained that distributed generation was produced by solar panels on houses, community energy projects and small windfarms; the electricity generated was connected to local distribution networks rather than the National Grid transmission network which had multiple implications for energy security.

**Q – Following the announcement of China being allowed to develop nuclear power stations in the UK, is their technology as advanced as the UK?**

(5) Professor MacKerron explained that the development of Chinese nuclear power stations in the UK was part of a wider partnership deal between China and the UK. He stated that the UK had not had a nuclear capability for many years. The system proposed for Bradwell in Essex would be a Chinese design adapted from the American Westinghouse design. He reported that China had the intellectual property rights to the reactor design and there were no restrictions on the Chinese selling the reactor design. He noted that China would pay for a third of the nuclear power plant at Hinkley Point, Somerset and fully fund the Bradwell plant.

**Q – How can excess electricity, produced by distributed generation, be fed into the National Grid?**

(6) Ms Cox stated that it was expensive to upgrade the network system to allow this and it was done on a case by case basis. She noted that there was a pattern of distributed generation power centres producing excess electricity for their local networks across the country and it was a shame for the electricity to be wasted. She reported that the energy regulator Ofgem's remit was to ensure reliable power for the least cost and it was therefore difficult to integrate renewable electricity onto the National Grid. She noted that Ofgem was working on incentives for renewable energy. Professor MacKerron noted that the regulatory system had not yet caught up with technology. Ms Cox reported that there was regulatory confusion about distributor sites and distribution operators owning generation assets.

**Q – There are frequent reports in the media that the 'lights will go out', is this true?**

(7) Ms Cox explained that academics had reached different conclusions about the risks of an energy shortfall. Ms Cox stated that she personally felt that there was no danger of this happening in the UK anytime soon. She noted that UK did have a problem with the age of its power stations and emergency measures to reduce demand were implemented in November. She stated that power stations were turned off for the summer period and when they were turned back on in November, many of the older power stations reported problems. The emergency measures implemented by the National Grid were to ensure the grid was resilient to power stations not working; measures included industrial consumers being asked to reduce their usage for an hour. She reported that the UK had had a spare supply for a long time and demand for energy has been reducing fairly consistently despite the economy rebounding. She stated that a more interconnected grid, with countries importing and exporting, made for a more efficient energy market.

Professor MacKerron stated that he agreed with Ms Cox; it was positive to have a spare surplus which could be exported as it was more efficient and cheaper. He reported that the National Grid often published things to make the outlook as pessimistic as possible.

**Q – The output through nuclear has been declining, how has this been managed?**

(8) Professor MacKerron explained that the reactors in the UK were relatively modern, using designs from the 1970s, which were still working well and had a life expectancy until

2020. He stated that there had been a deliberate phased reduction of old reactors such as Dungeness A which were too expensive and did not conform to current standards. Ofgem, National Grid and the Department of Energy & Climate Change were fully aware of the reduction and had managed the process to ensure that it did not cause any problems. He stated that replacements to nuclear included gas turbine and wind power. He reported that the current situation was not substantially worse than before.

(9) Ms Cox stated that to ensure energy security, a coherent long term policy was required; the UK did not have this at present. She reported that short term changes and policy resets for political aims, such as changes to wind farms, spooked investors and diverted investment to elsewhere.

**Q – What are your views on community energy provision through biogas?**

(10) Ms Cox explained that she was a supporter of biogas; it was low carbon and flexible (could be turned on and off) which was good for energy security. She noted, however, that anaerobic digestion was expensive and required very diverse industries talking to each other.

**Q – What are your predictions for nuclear going forward in terms of cost and timescales?**

(11) In response to a comment about subsidies for Hinkley Point Nuclear Power Station, Professor MacKerron stated that subsidies would come from the consumers not the public and would not start until completion in 2025 – the power station was originally scheduled to be completed by Christmas 2017.

(12) Professor MacKerron explained that the same type of power station planned for Hinkley Point was running nine years late at three times the cost in Finland and five years late in France; both were liable for court action. He noted that the boiling water reactor and the Westinghouse reactor had never been completed anywhere in the world. He reported that it was also difficult to gain approval and raise the finances for a nuclear power station in Western Europe and the USA. He highlighted that the Government's promotion of nuclear and fracking did not guarantee the political and economic security, at the scale that they would wish.

**Q – Is there a replacement for uranium?**

(13) Professor MacKerron explained that uranium was a plentiful resource; if it did run out thorium could be used instead. He stated that fast breeder reactors used more uranium than thermal reactors. Ms Cox reported that the fuel was a tiny proportion, 2%, of the overall cost of a power station; if the cost increased it would not cause problems.

**Q – What is the health impact of nuclear power?**

(14) Professor MacKerron stated that he was not able to comment as it was not his area of expertise.

**Q – How safe is the Westinghouse nuclear technology?**

(15) Professor MacKerron stated that Westinghouse was in the process of designing a passive reactor which could be shut down by gravity and convection. The design was significantly safer than current reactors. A Westinghouse reactor was not involved in the Three Mile Island nuclear meltdown.

**Q – Did high energy prices cause Tata Steel to withdraw production from the UK?**

(16) Ms Cox reported that cheap Chinese imports of steel were the main cause for Tata's withdrawal; there was huge Chinese public investment in steel production which the UK could not compete with. She noted that energy costs were less than 1% of the total cost of steel production in the UK. She stated that Tata's decision to withdraw before the Government's statement was interesting; it suggested political manoeuvring by Tata in an attempt to reduce energy costs.

**Q – Can the UK produce more than 15 – 20% of its energy through renewables?**

(17) Ms Cox stated that she thought it would be possible for the UK to produce more than 15 – 20% of its energy through renewables but it was unrealistic for renewables to produce 100% of the UK's energy. She highlighted the academic David Mackay's argument that there was not enough physical resource in the UK to meet its energy needs. She reported that biomass was a crucial factor as it could be turned into fuel; wind, solar and nuclear could only produce electricity. Professor MacKerron stated that it was more important to reduce demand; he noted it was useful to use Terrawatt hours, instead of percentages, in terms of energy production.

**Q – Can you comment on natural gas?**

(18) Ms Cox explained that the natural gas supply was secure; the UK imported gas from Belgium, the Netherlands and Norway which were stable countries. She noted that the UK used to burn coal instead of gas as it was cheaper. She reported that there was work to be done on gas storage in the UK.

**Q – What can Kent County Council do to promote energy security?**

(19) Ms Cox stated that the County Council should focus on reducing demand through information campaigns and encouraging behaviour change. She noted that it was important for the public to understand how the energy system worked and why energy demand should be reduced.

(20) She explained that the County Council should work with UK Power Network and local **Distribution Network Operators**; the energy industry was under challenge and it was important for the Council to find out what it could do to help them.

(21) She noted that weather had the biggest impact on the energy system and it was important for the energy infrastructure to be protected from severe weather events which could become more frequent and severe with climate change. She highlighted the importance of the Council cutting back trees and putting in place flood prevention measures.

(22) She also suggested that the Council should work with community groups and grassroots organisations that were developing locally produced energy.

**11. Dr Wim Melis (University of Greenwich)**  
*(Item 2)*

(1) The Chairman welcomed Dr Melis and thanked him for agreeing to support the Select Committee process.

(2) Dr Melis introduced himself, advising the Committee that he was a Senior Lecturer in the faculty of Engineering and Science at the University of Greenwich. He was presently working on sustainable energy technology and how to improve their efficiency at a system level.

**Question: What are the challenges involved in Energy Storage?**

(3) Dr Melis explained that the need for effective storage was increased due to the inconsistent power generation of many renewable processes, for example solar and wind technologies being reliant on weather conditions. Generation would peak during good conditions and drop at other times, requiring a good method of storing the excess energy to minimise the waste involved with such a peak / trough generation cycle.

(4) Dr Melis explained that a common problem was that energy storage was usually only developed on large-scale projects, such as hydro-dams. This was further complicated by the fact that renewable generation could be set up more quickly than these large-scale storage systems could be put in place, leading to long periods of excess energy waste taking place prior to these storage systems coming online.

(5) Dr Melis commented that batteries have long been considered the main alternative but they present their own problems given their limited lifecycle and disposal issues. Batteries are also not necessarily suited to dealing with some of the large scale storage that is required.

**Question: How can Smart meters help?**

(6) Dr Melis advised the committee that Smart meters are beneficial in terms of informing energy consumers about their usage. This form of communication between the supplier and consumer was an improvement as it replaced the quarterly bill with a process that allows consumers to easily monitor their usage and take action to minimise it for both financial and efficiency reasons.

(7) Allowing the consumer to see their usage more real time increases the likelihood of more efficient energy use and greater uptake of efficiency measures such as insulation. However, the system as such had technical challenges that would not directly help the energy producers to more easily match generation and demand.

**Question: What is your view on fossil fuel generation?**

(8) Dr Melis provided an outline of the use of coal and gas, notably that coal achieves only 33% conversion to usable electrical power with the rest dissipated as waste heat. Gas may achieve slightly higher levels, due to additional heat conversion processes able to minimise the wastage to bring overall efficiency for electricity generation up to around 60%.

(9) Dr Melis acknowledged that coal and gas were still necessary at present but emphasised the need for reliable renewable alternatives to be identified.

**Question: How does government reconcile the expense of environmentally friendly forms of energy production with the high cost involved?**

(10) Dr Melis explained that as renewables represented a relatively new technology, the cost of such schemes still reflected more of the technology development costs. As a consequence, the cost may be expected to drop as the technology becomes more mainstream and attracts more investment.

(11) Dr Melis commented that at present, there was little incentive for private sector investment so ongoing subsidies were required to maintain renewable schemes. Dr Melis noted, however, that established renewables such as solar panels have seen a significant price drop over time which he expected to see in other technologies over the next ten to fifteen years if their uptake continued at least at current rates or improved further.

(12) Dr Melis confirmed that there was a requirement to continue investment and research on renewables as fossil fuel resources were finite and that alternatives needed to be identified and made usable as soon as possible. He appreciated that this presented financial and political challenges but urged that commitment to better energy use should be maintained and improved where possible.

**Question: Do energy generation operators know how to effectively measure excess?**

(13) Dr Melis confirmed that the Smart meter system would not be able to assist with real time measurement of use to ensure a better matching between supply and demand.

(14) He explained that the energy grid is currently regulated to stay within 5% of the 50 Hertz. The derivations versus this 50 Hz are currently used as a measure to identify whether there is a shortage of energy (lower than 50 Hz) or overproduction (higher than 50Hz). He advised that it was not always practical to cease energy production at short notice to minimise waste, an example being wind turbines, which are not capable of immediate switch-off.

(15) The key process was maintaining the grid at a reasonable level that bridges supply and demand, considering that both vary continuously. Therefore, a better understanding of usage patterns could be beneficial to enable a better matching of supply and demand.

**Question: How can excess/waste heat energy be efficiently used in buildings?**

(16) Dr Melis explained that heat energy varies in usefulness depending on the temperature.

(17) The need for maintenance and the different use of buildings, makes it challenging to ensure a 24 hour energy provision for any building, due to the fact that energy requirements move between office/commercial buildings and consumer homes within these 24 hours. He explained that certain systems can make use of heat energy to create electricity by using temperature differences to create an expansion cycle in an engine which then generates motion that can be converted into

electricity, and these are the most promising technologies in terms of efficiency of conversion from heat to electrical.

(18) Additionally, heat storage systems such as phase-change materials can be used to keep buildings at constant temperatures. These materials change properties within a certain temperature range, which is when they store excess energy when available and release stored heat when required.

**Question: What are your views on Fracking?**

(19) Dr Melis gave his personal opinion that while the potential energy resource return could be promising, the ecological and environmental impact of the process was too large and not worth the risk.

**Question: Value of biofuel as a source of energy?**

(20) Dr Melis explained that some biofuel resources require significant land usage which can have a negative impact on food supply, while food supply is obviously more important considering the growing population, as has been clearly noted by the European Commission. When it comes to waste food, one can however make use of this in combination with an anaerobic digester to produce gas, which can then be used to generate electricity, as currently is already the case.

(21) Dr Melis stated that the best way of looking at the energy generation issue was to consider how best to use as many of the various methods and systems in combination to achieve a good mix that minimises overall waste resulting while moving towards a truly circular economy.

**Question: Please provide further information on the Biofuel system used at the Medway Campus of the University of Greenwich**

(22) Dr Melis explained that the system had been set up following an extensive study of the demand profile to assess the required scale. Issues such as what generation level to aim for (baseload or excess), storage options and capacity to import or export relative to demand all had to be considered prior to implementation.

(23) The system set up produced 400kw of electricity via a CHP Diesel engine adapted to run on multiple fuels, with the aim of running it on Glycerol. The process involved using a generator to produce electrical energy, with the engine's cooling water used to heat up the water in the return cycle of the heating system before it goes to the boilers, which consequently reduces the heating contribution required from the boilers .

(24) Challenges for the system included the sourcing of suitable Glycerol which is a by-product of the biodiesel manufacturing, but necessitates extra purification work to prevent excess salts from damaging the engine. Furthermore, Dr Melis commented that his University had other linked projects that look at alternative Glycerol supply chains that would alleviate this problem.

**Question: Feasibility of renewable technology for public transport?**

(25) Dr Melis explained that there were positive steps to take in promoting more efficient use of transport to minimise excess energy usage and waste but that this was dependent on consumer behaviour shifting in response to improved awareness.

(26) Dr Melis emphasised that current alternative transport methods still relied on energy produced by conventional, non-renewable methods. For example, electric cars still relied on power from the main grid which was maintained through fossil fuel usage. Consequently, it was crucial to develop technology to ensure sustainable renewable energy production at required levels before considering the use of electricity as the main source of energy for transport. As a consequence of this, most public transport improvements based on electrification are not sufficiently thought through and would not achieve significant energy efficiency or environmental benefit. Examples raised by the Committee such as the Japanese bullet train model that uses magnetic forces were discussed in terms of the very high energy usage required that could undermine the benefits of the technology.

(27) Responding to questions from the Committee regarding High Speed Rail, Dr Melis commented that the high energy requirements meant that there was a risk of exceeding supply if demand levels were not properly assessed. Additionally, there were technical issues to be considered such as the capacity for generators to bridge the supply / demand gap when necessary as was the case for the London Underground. However, such generator systems are very expensive and rarely used, making them not particularly cost effective. All these considerations made the project a complicated matter from the point of view of energy management.

**Question: Will the challenges of effective energy storage be overcome in the near future?**

(28) Dr Melis advised the Committee that the success of future development in the area of energy storage was dependent on investment, as with other areas of research. He explained that the storage market had been content with batteries for so long that innovation had stagnated and no solution to larger scale situations had been developed.

(29) Alternatives to batteries being researched included hydrogen and compressed air. The problem with hydrogen was that it has a round trip efficiency of around 40% while batteries achieve 80% and upwards. Compressed air, which produces heat on compression and requires heat during decompression, had potential as it seeks to address heat and electricity production/use together, creating a less wasteful energy cycle. However, this requires energy demand was being looked at as a combination of heat and electrical, which are required in most situations, but rarely looked at in combination.

**Question: What are the main issues facing the UK energy landscape?**

(30) Dr Melis advised the Committee that long term strategic planning was required, instead of the more common short term, quick fix approaches currently being taken. He emphasised that much more work needed to be done on identifying better sources of energy rather than just minimising waste or pollution from existing sources. Additionally, consumers needed to be better informed about their usage so that demand could be better managed in the future through more responsible consumer behaviour. This was also linked with promoting the concept of individual



responsibility and helping to make a difference, as many people seemed to not bother to change behaviour due to a perception that their energy use was negligible compared to nations or corporations.

(31) Responding to Member questions about pricing incentives, Dr Melis suggested that increased pricing based on usage would encourage lower demand and should not be detrimental to businesses as they could tailor their processes to use less energy as a result.

(32) Dr Melis suggested that greater investment in energy research would be beneficial to the UK as further development would reduce renewables technology costs and speed the development of reliable and sustainable alternatives to fossil fuels. These developments should comprise looking at the overall picture, with electrical and heat energy in terms of generation, storage and consumption.

(33) The Chairman thanked Dr Melis for his contribution to the Select Committee.

## **12. Stephanie Karpetas (Sustainability Connections)** *(Item 3)*

(1) The Chairman welcomed Ms Karpetas to the meeting and thanked her for participating in the Select Committee process.

(2) Ms Karpetas introduced herself as the Director of Community Energy South, which is an association of community energy groups across the Southeast of England which aims to support the transition to a distributed renewable energy network.

(3) Sustainability Connections seeks to support sustainable renovation, energy efficiency and community owned renewable energy through sharing expertise and sourcing alternative financing.

### **Question: How can community energy schemes help in Kent?**

(4) Ms Karpetas explained that these schemes were helping to reduce energy demand by improving consumer awareness, reducing personal costs and encouraging the conversion of existing housing stock to include more energy efficient facilities. She commented that the resulting retrofitting required to bring older housing stock up to efficiency standards had knock on economic benefits by creating employment and opportunity. These projects could hopefully include renewable energy generation on people's homes (e.g. solar panels).

(5) Ms Karpetas explained that there were challenges at present in light of the significant reduction in subsidies that we still needed for renewables projects given the high cost of technology. While it was expected that the technology cost will drop over time as it becomes more mainstream, subsidies were still required. An eventual reduction in technology costs would help promote the spread of community owned renewable energy farms.

(6) Orchard Solar Farm at Iwade had accelerated the share offer in order to benefit from community investment tax relief for shareholders: 50% tax relief (SEIS)

for investment in start-up costs and and 30% tax relief for project delivery. This tax relief was removed on November 30, 2015. The plans were to provide a 7% return on investment with £1m going into the community pot and potential for this to rise to £3m. The farm is now examining the process of selling energy directly to the community rather to the grid, with a plan for it to have its own tariff by April 2016.

**Question: How can KCC help the situation following cuts to subsidies?**

(7) Ms Karpetas explained that the cut in subsidies, both in the Feed-in-tariff reduction and removal of social investment tax relief, had been sudden and significant. The project had always taken a long term view with alternative business models consistently being reviewed to ensure sustainability when circumstances changed. Given the long term basis of renewables development, Ms Karpetas recommended that KCC consider the longer term view, show patience and maintain its commitment to energy efficiency.

(8) This longer term and less reactionary approach was evidenced by the initial fierce opposition from Bobbing and Iwade Parish Council when the Solar Farm was being developed. When the local community believed the project was a private development, opposition was very strong but once it was made clear that it was a community based project with local benefits over time, challenge to the scheme dropped significantly. KCC's support in promoting the local benefit of these schemes would assist in the future of such community projects.

**Question: How are shares managed?**

(9) Ms Karpetas explained that the price for share purchase was £250 for local investment and £500 for others. An issue had arisen as a side effect of the subsidy reduction as it has meant looking to raise a greater amount of finance from institutional investors, including banks. With lenders wishing to have their repayments first, there is a knock-on effect on the level of the community fund, which is not only reduced, but also has a delay of several years before it begins to materialise.

Ms Karpetas explained that the programme was now looking at running a second community share offer, opening up to a wider market while maintaining the community focus.

**Question: Please provide an overview of how return on investment (ROI) changes over time and what evidence there was of sustainability?**

Ms Karpetas explained that the Mongoose Company set up Iwade and had since moved on to buying up private solar farms where the feed-in tariff at the higher rate had been locked –in (providing some protection of ROI) – and bringing these farms into community ownership.

(10) There were several opportunities present for similar investment in Kent with attractive returns combined with the beneficial elements of community ownership. The combination should be helpful to businesses and encourage local support, making initial development run more smoothly and promoting long term returns.

**Question: Could KCC pay in or buy shares in the programme?**

(11) Ms Karpetas explained the previous set up finances, in that Triodus Banks supported the set up with a 2.5% arrangement fee and 7-8% interest while Mongoose charged 1% for the set up process.

(12) Ms Karpetas advised the Committee that KCC could invest as it was an attractive investment opportunity that would benefit from long term funding security via local authority backing, which would also show KCC's commitment to supporting such energy programmes. Additionally, Ms Karpetas suggested various options for managing longer term financial management approaches such as including energy tariffs within council tax that would be used to support energy sustainability, promote local generation and reduce reliance on National Grid.

**Question: What are your views on Biomass processes?**

(13) Ms Karpetas explained that there were many positives including strong financial incentives for development as well as the practical evidence of good use. One such project, in which KCC was a partner, along with the Forestry Commission, was looking at privately owned woodland, mapping which schools were off the gas grid, and looking to replace oil-powered boilers with wood burning boilers. The programme also included apprenticeships in forestry management, creating employment and ensuring security of supply of wood. There are also good examples of anaerobic digestion energy generation (food waste being used as an energy source). However, it was noted that organising the most efficient and effective use of waste for this purpose was difficult to achieve given the need to link so many agencies and private companies.

**Question: Despite the benefits of renewable energy sourcing, what is the long term viability of small community projects such as Iwade Solar Farm?**

(14) Ms Karpetas explained that the grass roots engagement processes inherent in such local schemes were vital to embedding the concept of community ownership and responsible energy use. The schemes help reduce demand through education of consumers and encourage more and more small scale personal energy generation.

(15) Ms Karpetas clarified that the company was based on a Social Enterprise Model and was not a charity so had numerous funding streams and was not overly reliant on subsidies, having developed long term business plans that considered the changeable funding landscape.

**Question: Will people get better or cheaper electricity as a result of similar projects?**

(16) Ms Karpetas explained that historically the take up retrofit programmes and similar green initiatives was low and that this had been due to the initial Green Deal being flawed, despite its positive intent and good ideas.

(17) The current approach for her project is more financially sound with a longer term outlook on investment return, meaning better electricity sourcing and generation which will result in savings to individuals and help encourage reduced usage.

**Question: How to discuss complex arguments around supply and demand, environmental impact etc. with the general public?**

(18) Ms Karpetas explained that the progress had been made since the greater emphasis on switching providers, encouraging consumers to take more interest in their electricity supply and their own usage. By learning more about their supply options, consumers were giving power usage issues more thought.

(19) Additionally, the project has supported training for a growing range of people on the impact of power use and the complexities of energy supply. This has helped people manage their own usage. Further work on communication and training on these issues is planned with Lottery Funding being sourced.

**Question: How can KCC educate people on these issues?**

(20) Ms Karpetas advised the Committee that KCC should use the Council's local knowledge to focus on key demographic groups where education and communication work would be most beneficial, emphasising personal responsibility and promoting its own carbon reduction goals.

Several Kent based District Councils have already done good work in the same vein, including Dover, Swale and Tonbridge & Malling. Annual reports from each District Council shows mixed level of buy-in so more KCC support to promote similar work would help.

**Question: How to improve education of energy use at school level?**

(21) Ms Karpetas advised that the issues should be addressed in core science education in terms of the technical aspects of energy generation and its implications but also recommended subjects such citizenship and politics could also help promote personal responsibility and an understanding of the broader considerations.

**Question: How can planning issues related to sustainable developments be addressed?**

(22) Ms Karpetas advised that there were pockets of good practice, including the Kent Design Guide, but noted that environmentally friendly developments were not always publicised and celebrated as much as they could be. She suggested that this might be an area in which Members could assist.

(23) Planning is a feature of all developments and the onus is on developers to take a longer term view as often there is a short term economic argument used at the planning stages to justify development.

(24) Members commented that while District Councils were responsible for housing planning, it would be worth promoting the idea of renewable generation and usage reduction elements being mandatory on all new builds. Members noted that without policy change or new legislation, control and focus on profits would remain with the developers, limiting the role of government in promoting a more long term development approach.

**Question: Will renewables bring down energy prices for individuals?**

(25) Ms Karpetas explained that renewable energy schemes in their current format would not reduce prices by themselves but had an important role to play in a wider shift in energy generation and sourcing. To achieve improvements, a cohesive and strategic approach was required including several options for energy distribution, generation and storage.

(26) Smart metering was a good step toward helping consumers manage their usage which could result in savings through appropriate energy use reduction.

**Question: What training and employment does renewable energy bring to or make available in Kent?**

(27) Ms Karpetas explained that Energy Champions are already in place and are qualified to promote responsible energy use. This is a City & Guilds Level 1 qualification.

(28) Employment is generated by the work being undertaken to support the Smart Meter implementation and retrofitting projects around the County. With retrofit the most immediate and logical step, renewables installation will flow more logically. Both retrofit and renewable energy combined present a large field that involves numerous professions so a growth in the industry would be good for employment.

**Question: Is there anything else that can or should be done?**

(29) Mr Karpetas advised the Committee that more work should be done to push for greater collaboration between the renewables work and business. She noted the work already done by KCC to support Small / Medium Enterprises and recommended that this continued.

(30) Ms Karpetas advised KCC to continue to work with Central Government and challenge it where appropriate to ensure continued support for renewable energy. She also advised that KCC should consider investing directly in suitable renewable energy and community owned projects.

(31) The Chairman thanked Ms Karpetas for her contribution to the work of the Select Committee.