

South East Regional Office
42 Kings Hill Avenue, Kings Hill,
West Malling, Kent ME19 4AJ
Tel: 01732 229200 Fax: 01732 229280

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Electricity Market Reform Project
Department of Energy & Climate Change
4th Floor Area E
3 Whitehall Place
London
SW1A 2AW

Dear Sirs

EMR Consultation Document

Viridor are pleased to submit their feedback and comments with regard to the EMR Consultation Document.

We will forward these by post and by email as required in your website.

We look forward to hearing more about the consultation in the near future.

Yours faithfully,

[Redacted signature block]

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Electricity Market Reform Consultation

Response by Viridor Waste Management Ltd

Current Market Arrangements

1. *Do you agree with the Government's assessment of the ability of the current market to support the investment in low-carbon generation needed to meet environmental targets?*

1.1. Not completely. Viridor agrees with the bullet points in paragraph 45 of the consultation document. However, when we consider

- the total amount of new low-carbon generation required to meet the Government's carbon reduction objectives (allowing for an 80% growth in electricity supply), and
- the fact that capital costs for all generation technologies are increasing faster than RPI, and that most have done so for 18 out of the last 20 years

we think that the £200 billion required investment quoted in the consultation document may be an underestimate. We therefore consider that the challenge of finding investment for low carbon generation is likely to be greater than the Government has described.

1.2. A significant part of the challenge will be driven by the fact that, ignoring environmental taxes, low-carbon energy is more expensive than new-build gas-fired generation, and is likely to remain so for at least to 20 years. We do not agree with the Government's assumptions regarding future gas prices, particularly with the opening of the Russian Far East gas fields, the growth of unconventional gas and recent discoveries in the Eastern Mediterranean.

1.3. Likewise we do not agree with the methodology used to calculate levelised costs of generation in the *UK Electricity Generation Costs Update* report published by DECC in June 2010. When Viridor does its own comparison of generation costs, it calculates the average real price per MWh required to justify investment. To do this it uses a methodology that fully captures development costs, costs of finance, insurance, taxation, decommissioning costs and investor risk adjusted return requirements. This indicates that not only will gas-fired generation remain the cheapest form of generation, but also that new-build coal plant would be cheaper than most low-carbon generation were it not for environmental taxes and requirements for CCS.

1.4. In the mind of investors this creates political risk; the viability of new build low carbon generation will be dependent on the maintenance of support programmes and carbon taxes/environmental legislation (that increases the cost of gas and coal fired generation) for the foreseeable future. Despite the current consensus amongst the main political parties to support low carbon energy, there will be a fear that a future government could reduce or remove either the support or carbon taxes or both. In this regard, the constant changing of the Renewable Obligation, the failure to bring on stream the Renewable Heat Incentive and the decision to restrict the Feed-in Tariff support for large green field PV have been unhelpful; they have increased the perception of political risk in connection with low carbon energy support in the UK.



2. *Do you agree with the Government's assessment of the future risks to the UK's security of electricity supplies?*

- 2.1. Not entirely; we agree that in the short to medium term, the greatest risk to security of supply is likely to come from a decreasing margin of generation capacity over peak demand. In Viridor's opinion, this is primarily a consequence of the current bilateral market, which not only does not reward capacity, but which in certain circumstances can reward generators for not having capacity available¹. We see little risk in the short to medium term as a consequence of shortages of gas or coal, given the continued expansion in global gas supply and the fact that much of the new supplies are coming from stable jurisdictions.
- 2.2. In the long term, in the face of increasing global energy demand, fuel security of supply will threaten electricity security of supply. In this regard, increasing the amount of nuclear generation may not increase security of supply if the new plant are based on a "once through" uranium cycle, as security of supply will then be dependent on access to global uranium supplies (once the current UK stockpile is consumed). Viridor is disappointed that the EMR consultation has not mentioned nuclear fuel re-processing and the impact that this could have on future security of supply.
- 2.3. We agree that as the proportion of inflexible generation in the generation mix increases, this will have a negative effect on security of supply (unless sufficient flexible generation and pumped storage are built, and demand side management is enabled to a greater extent than is the case now)
- 2.4. Decarbonisation of the economy will increase electricity demand by up to 100%. This will exacerbate the risk to security of supply caused by both fuel security of supply and by inflexible generation. Of these two, fuel security of supply will be the greater risk as Viridor can envisage no scenario where the marginal flexible plant is not fossil fuelled.

Options for Decarbonisation

Feed-in Tariffs

3. *Do you agree with the Government's assessment of the pros and cons of each of the models of feed-in tariff (FIT)?*

- 3.1. No. We consider that the assessment has been entirely based on assumptions surrounding licensed and/or transmission connected generation, i.e. nuclear power stations and large off-shore wind farms, and presumes that output is directly sold in the wholesale market. It fails to take into account the impact that the different FIT models will have on embedded renewable generation, which does not participate directly in the market but sells its electricity via a power purchase agreement (PPA) with a licensed supplier.

¹ The UK market design is such that when the system is experiencing high demand, prices tend to increase exponentially. This can result in the situation where, if a portfolio generator reduces its total output, the revenue derived from the reduced output multiplied by the higher prices (that result as a consequence of the output reduction) is greater than the revenue that would have been derived from the full output multiplied by the lower prices (that would be achieved at full output).



- 3.2. If the wholesale electricity market is rising, the level of the FIT payment under a CfD FIT will reduce. Licensed generators will see no difference in their gross revenue as the rising electricity price will compensate for the reduced FIT payment. Embedded generators however will see reducing gross revenue as their electricity sales price is fixed under the PPA. This is the opposite of the current situation under the Renewable Obligation.
- 3.3. Most embedded generation PPA prices are set at a discount (of 5% to 10%) to the wholesale forward markets. If market volatility increases as the level of inflexible generation increases (as suggested in the EMR consultation document), it is likely that the discount will increase, exacerbating the problem.
- 3.4. Therefore, in Viridor's opinion, a CfD FIT based around the wholesale market price is likely to damage investor confidence (in embedded generation) compared to the Renewable Obligation.
- 3.5. We understand the Governments rationale for promoting a CfD FIT, particularly the concern (voiced in the Redpoint study) that after 2030, marginal prices could become negative, and that a CfD FIT would protect low carbon generation from this. However, this protection from a possible future risk does not outweigh the near and medium term increase in risk that a CfD FIT will create for embedded generators.
- 3.6. An alternative could be a CfD FIT based around the NFPA auction of NFFO output, however this benchmark will only last as long as there are both live NFFO contracts and the Renewable Obligation: the auction principally exists to sell ROCs (tied to electricity output) from NFFO contracts.
- 3.7. A Premium FIT will more closely mimic the Renewable Obligation and therefore will give greater debt and equity investor confidence than with a CfD FIT (depending on the level at which the FIT is set, and how easily a future government could vary it). Embedded generators will however still take a discount to the wholesale price in their PPA sales price, and will still be disadvantaged as market volatility increases. The potential for upside is attractive to equity investors, which should result in greater risk appetite amongst developers.
- 3.8. A Fixed FIT should give the greatest level of confidence amongst debt investors, (depending on the level at which the FIT is set, and how easily a future government could vary it). However the removal of upside potential will reduce risk appetite amongst developers.
- 3.9. The analysis of the Feed-in Tariffs does not consider what will happen in the future when large amounts of inflexible generation has been built. Without greater connection both to mainland Europe and within the UK, there will be a number of periods when generation exceeds demand, either locally or nationally, and the surplus cannot be exported. In this circumstance, some generation will have to be constrained off and it is not yet clear how this will be compensated. If this generation is subject to a FIT, logically it should still receive the FIT payment for the output constrained off.
- 3.10. Viridor, through its parent the Pennon Group Plc, has experience of the Regulated Asset Base. We consider that this method could be useful for supporting predictable, baseload low carbon generation such as nuclear power if it is based on availability. This would facilitate the constraining off of large plant at times when the system is long, without the need to develop complex compensation arrangements, or make nuclear



subject to capacity payments. The certainty of payments would give greater confidence to investors in these plants.

3.11. The question of constraining off however raises much greater questions;

- will it be achieved through the balancing actions of the transmission system operator, and if so, does this mean that all low-carbon generators will now have to notify the TSO?
- will payments made by the TSO to constrained generation (including foregone FIT payments) be recovered through TSUOS and or TNOUS?
- will constrained generation be liable to imbalance charges?
- is Betta fit for purpose in a system where frequent constraining is required, or will the market have to move back to a single buyer/central dispatch model?

3.12. In all cases it is unclear who will be the off-take counter-party to the FIT. This is a critical issue for generating confidence in the FIT, thus enabling investment in low-carbon generation.

3.12.1. If the counter-party is a government sanctioned entity that guarantees the FIT payment is gilt edged, this will clearly facilitate investment.

3.12.2. If the counter party is an industry body similar to the Non-Fossil Purchasing Agency (i.e. it is owned by electricity suppliers), confidence will be determined by the governance of that body, the manner in which it is funded and where the risk of underfunding will sit.

3.13. It is unclear how FITs will be funded. Having given careful thought to this, Viridor considers that the only workable model is to have a levy raised on all electricity supplied over "public" wires, similar to the Fossil Fuel Levy. Logically this would be collected by suppliers and paid to a central, government sanctioned agency who would distribute payments based on meter notifications. This could either be Elexon or a specialist agency.

4. Do you agree with the Government's preferred policy of introducing a contract for difference based feed-in tariff (FIT with CfD)?

4.1. No. We consider that a CfD FIT would reduce investor confidence and be damaging to embedded low-carbon generation, for the reasons stated in 3 above. A Premium Fit or a Fixed Fit would be preferable, again for the reasons stated in 3 above.

5. What do you see as the advantages and disadvantages of transferring different risks from the generator or the supplier to the Government? In particular, what are the implications of removing the (long-term) electricity price risk from generators under the CfD model?

5.1. Viridor agrees with the government, that

"Without reform, the existing market will not deliver the scale of long-term investment, at the pace we need, in particular in renewables, new nuclear and CCS, nor will it give consumers the best deal. However, if we are to meet our long-term carbon targets, we need to reform the market now, to make low-carbon investment more attractive"



5.2. In considering this question, Viridor first examined whether or not there is a market design that could achieve most of the objectives of EMR without transferring risk to the Government. We have concluded that this would be possible under a single buyer model with central dispatch and a merit order based on

- a) carbon emissions;
- b) price; and
- c) available output.

The merit order would be determined on a "carbon intensity" basis. Put simply, the current notification process would be changed so that each generator would be required for each half hour period to state the carbon intensity of its output, its price and its available output (which could be revised by the TSO if the TSO needs to constrain off that generator in that half hour). The TSO would then develop the merit order selecting zero carbon out-put first, ranked according to its price². If the total output in the first merit order did not meet anticipated demand, the TSO would then consider generation with say less than 50kg per MWh, then 100kg per MWh and so on until demand was met. Such a system would be relatively easy to implement and would remove the need for a carbon floor price, thereby minimising the cost of electricity without deterring the development of low carbon electricity.

5.3. However, Viridor has not developed this idea further. We realise that it would move away from bilateral trading and require complete redesign of the market, which is unlikely to be favoured by the Government.

5.4. The primary question therefore is "what, within the current market architecture, will give the greatest investor confidence in a world that is still grappling with the credit crisis (to deliver the scale of long-term investment, at the pace we need)?" The secondary question, which is much harder to answer, is "what risks should be transferred"

5.5. Clearly, transferring risk from generators (who will make the investments) to Government will do more than any other measure to attract the investment needed to achieve the Government's objectives.

5.6. We note that in USA, the government there has reached a similar conclusion. However, it has taken the radically different approach of giving loan guarantees for low carbon generation. This underwrites the debt investment, the largest and most difficult part of raising project finance. However it leaves market and operating risk with the generator, who is thus incentivised to perform.

5.7. In Viridor's opinion, the amount of risk transferred under a FiT system is less than under a loan guarantee system. As shown in 3.3 above, a CfD FiT could actually increase the risk for embedded generators (compared to the Renewable Obligation). Given the Government's desire for generators to retain market risk, and given the important role that embedded generators will play in achieving the decarbonisation

² This could be an agreed Fixed FiT price whilst the plant debt is being repaid, to give security to debt funders. Thereafter the generator would bid a price based on its marginal operating costs. This would incentivise generators not to ask for FiT prices higher than necessary; the higher the FiT price the greater the risk that the plant would not be called to run. As the amount of low carbon generation increases, it will also incentivise developers to choose the least cost form of new-build generation



risks, we suggest that the CfD FiT is used for Licensed low carbon generation, and a Premium or Fixed FiT is used for unlicensed (embedded) generation. This would address the different risks faced by the different scales of generation.

- 6. *What are the efficient operational decisions that the price signal incentivises? How important are these for the market to function properly? How would they be affected by the proposed policy?***
- 6.1. Viridor only operates embedded generation and therefore cannot directly participate in the wholesale market. Like most small scale generation, our plant are "must run" and therefore the number of operational decisions affected by the price signal are limited. If the wholesale market price were to rise to a sufficiently high level, under a CfD or Premium FiT, we might consider building gas storage facilities so that we could operate our land-fill gas engines as peak power stations. However, we consider this to be unlikely as the capital cost of storage on a landfill gas scale is very high.
- 6.2. The price signal does affect the decision whether or not to invest in new plant. For example, with the level of ROC support for landfill gas now cut to $\frac{1}{4}$ ROC, we have shelved development plans for a number of new sites that would have been economical at 1 ROC. We continue to watch the power markets to see if the price rises to a level to justify investment at these sites, however landfill gas is a wasting asset as each reservoir has a finite life. This means that the total energy potential of a site reduces year by year.
- 6.3. Our detailed study of the power market leads us to conclude that the price signal could operate in a perverse manner; as explained in 2.1 above. However, in our opinion, the price signal generally results in generation being adjusted to meet changes in short-term demand. This is exactly what is expected of a bilateral market with self dispatch. Combined with the fact that gas-fired generation sets the marginal price on the system, this results in electricity prices being hedged by gas market hedges rather than through electricity hedges. In turn, this means that the price signal does not efficiently incentivise new build generation other than gas-fired generation.
- 6.4. Logically, the proposed policy will deliver more low-carbon generation to the point that gas and coal become minor players in the market. At this point Licensed low-carbon generation will set the market price for a significant portion of the time, leaving the market susceptible to distortion.
- 6.4.1. under both CfD and Premium Fits as currently proposed, generators will be incentivised to agree market prices as close to marginal market prices as possible, irrespective of their marginal costs. This means that gas and coal will continue to set the market price, even if no fossil fuel plant is running in any half-hour;
- 6.4.2. under a Fixed FiT, there will be just two prices in the market; zero, when there is no fossil fuel plant running and the marginal price of gas or coal when there are fossil fuel plant running.
- 6.5. We consider that a Carbon Floor Price as proposed would have the effect of raising market prices. However we question the wisdom of this:
- 6.5.1. in our opinion the floor price will not create certainty, it will simply heighten perception of political risk as described in 1.4 above;



- 6.5.2. in our opinion it would be better to negotiate with our partners in the EU to fix problems with EUETS; acting unilaterally will simply put British business at a disadvantage to businesses elsewhere in the EU.
 - 6.5.3. in our opinion the carbon floor price will disincentivise CHP; depending on the level of the floor price, many CHP units will either stop producing electricity or will downsize to smaller CHP units, with the bulk of the heating requirement provided instead by boilers. If a carbon floor price is to be introduced, either this should not apply to CHP, or it should be scaled according to the GQCHP index of the plant.
 - 6.5.4. We presume that the carbon floor price would be the primary incentive for CCS. Given the unproven nature of CCS, in our opinion this would require the floor price to be set at a very high level. In our opinion, CCS should be successfully demonstrated through grant funding before it is decided how to incentive it.
- 7. *Do you agree with the Government's assessment of the impact of the different models of FITs on the cost of capital for low-carbon generators?***
- 7.1. No. For the reasons stated above, we consider that a CfD Fit will increase the risk of embedded generators, thereby increasing the cost of capital.
 - 7.2. It took three years for debt providers to get comfortable with the Renewable Obligation after its introduction. Given the funding market's perception of political risk, we fear that the introduction of a CfD FIT will reduce the number of debt providers willing to support embedded generation, which will further increase the cost of capital in the short term.
- 8. *What impact do you think the different models of FITs will have on the availability of finance for low-carbon electricity generation investments from both new investors and existing the investor base?***
- 8.1. Compared with the Renewable Obligation, we consider that:
 - 8.1.1. a Fixed Fit will increase the availability of debt for embedded generators but may reduce the availability of equity.
 - 8.1.2. A Premium FIT will maintain or increase the availability of debt and equity for embedded generators
 - 8.1.3. A CfD FIT will reduce the availability of debt and equity for embedded generators in the short to medium term. Depending on how the electricity market evolves, and if marginal prices do go negative after 2030, a CfD Fit would help maintain the availability of debt and equity in the long term.
- 9. *What impact do you think the different models of FITs will have on different types of generators (e.g. vertically integrated utilities, existing independent gas, wind or biomass generators and new entrant generators)? How would the different models impact on contract negotiations/relationships with electricity suppliers?***
- 9.1. As explained in 3 above, in Viridor's opinion the primary difference of impact is between Licensed generation and unlicensed, embedded generation, rather than



between technologies. This is entirely attributable to the fact that embedded generation does not participate directly in the wholesale market.

- 9.2. As explained in 3 above, the manner in which the CfD FIT will operate around the whole sale price will increase the risk of an embedded generator selling its power under a PPA with a supplier. Embedded generators will still sell their power at a discount to the wholesale price
 - 9.3. A Premium FIT will maintain the status quo for embedded generation.
 - 9.4. A Fixed FIT will increase the availability of debt finance for embedded generators, but remove the upside potential that is attractive to equity. The removal of the need to contract a PPA with a Licensed Supplier logically may increase the amount independent generation (compared to the other two FITs).
- 10. *How important do you think greater liquidity in the wholesale market is to the effective operation of the FIT with CfD model? What reference price or index should be used?***
- 10.1. We consider that the current level of liquidity in the wholesale market is an integral part of a bilateral market dominated by vertically integrated utilities that self dispatch. We consider that the key issue for the operation of a CfD FIT is not liquidity but the lack of transparent price reporting within the wholesale market.
 - 10.2. Whilst there are existing price reporting services that can be used in the absence of transparent price reporting, the quality of their data can vary with time. If just one service is selected as the reference, there is a danger that this could be subject to manipulation through selective reporting (by large market participants). This suggests that the reference should be derived from the weighted average of all available reporting services in the market (that meet a minimum data quality standard set by and overseen by OFGEM).
 - 10.3. However, if all suppliers (or generators) were required to report the prices of all trades to a central body, a true average wholesale price could be established, which could then be used as a reference.
 - 10.4. Given the amount of money that consumers will have to pay to support low carbon energy in the future, we consider that it is essential that they have absolute certainty that they are not overpaying. We cannot see how this can be delivered under a CfD FIT support mechanism without the price of all trades being reported. We therefore support the setting up of an independent central body for this purpose.
 - 10.5. The FIT support itself should pegged to RPI. This is consistent with the current practice of the Renewable Obligation as well as the NFFO before it.
- 11. *Should the FIT be paid on availability or output?***
- 11.1. An output based FIT will ensure that generators maximise their output in an efficient manner.
 - 11.2. An availability based FIT will protect generators that have been constrained off by the System Operator(s), but increase the cost to the consumer by removing the need for generators to maximise their output in an efficient manner.



- 11.3. We therefore favour a FIT that is output based, but which contains an availability element for generators that have been constrained off. Ideally the availability payment would be based on the average operating export over the previous 12 months, multiplied by the availability during the period it is constrained off. However, we recognise that it may be difficult to establish the true availability of a plant that has been constrained off. The availability payment should take into account any avoided marginal costs (such as fuel) during the period it is constrained off.

Emissions Performance Standards

12. ***Do you agree with the Government's assessment of the impact of an emission performance standard on the decarbonisation of the electricity sector and on security of supply risk?***

12.1. No.

12.1.1. In our opinion the EPS will simply add another layer of regulation and cost to the existing raft of emissions legislation and the EUETS.

12.1.2. Given the variability of wind turbine output and the inflexibility of nuclear power, in a system where there are large amounts of both it will be impossible to predict how much fossil fuel generation, unconstrained or otherwise will be required in any year to maintain security of electricity supply. In our opinion an EPS will act as a further disincentive to investment in new-build fossil fuel plant, and therefore will directly increase security of supply risk.

12.1.3. As stated in 6.5 above, we consider that CCS should be commercially and technical proven before its use is mandated. Prior to this, an EPS would be premature.

13. ***Which option do you consider most appropriate for the level of the EPS? What considerations should the Government take into account in designing derogations for projects forming part of the UK or EU demonstration programme?***

13.1. As stated above, we do not favour an EPS. However, if one must be introduced then we would consider Option 1 to be less damaging to the UK economy.

14. ***Do you agree that the EPS should be aimed at new plant, and 'grandfathered' at the point of consent? How should the Government determine the economic life of a power station for the purposes of grandfathering?***

14.1. As stated above, we do not favour an EPS. However, if one must be introduced then we agree that it should be aimed new plant and grandfathered at the point of consent.

14.2. The economic life should be determined by the tenor of any bank debt used to finance the plant plus a period of x years, based on the history of similar plant. Additionally, if any such plant is substantially refurbished after the initial debt has been re-paid, grandfathering should end at that point.

15. ***Do you agree that the EPS should be extended to cover existing plant in the event they undergo significant life extensions or upgrades? How could the Government implement such an approach in practice?***



- 15.1. As stated above, we do not favour an EPS. However, if one must be introduced then we agree it should be extended to existing plant when it is refurbished to extend its life.
16. *Do you agree with the proposed review of the EPS, incorporated into the progress reports required under the Energy Act 2010?*
- 16.1. As stated above, we do not favour an EPS. However, if one must be introduced then careful consideration must be given to the frequency of the reviews and how their findings will be implemented. In our opinion, the potential for review and change will create a disincentive to invest in new fossil fuel generation plant and therefore will risk to security of supply.
17. *How should biomass be treated for the purposes of meeting the EPS? What additional considerations should the Government take into account?*
- 17.1. In our opinion, thermal biomass is the most marginal of all renewable energy technologies; this is by virtue of the energy density of the fuel, the lack of available biomass grown within the UK's borders and the capital and operating costs of biomass plant. If biomass is included in the EPS, it will act as a disincentive to investment in new biomass plant. It should be noted that conventional energy from waste generates from a feedstock that is 50-60% biomass.
- 17.2. Applying the EPS to biomass will have a detrimental effect on energy from waste plant. If the EPS results in individual EfW plant being limited in the number of hours they can operate in any year, this will increase the amount of waste sent to landfill, thereby potentially increasing emissions of methane³. Therefore, as methane has 21 times the warming potential of carbon dioxide, applying the EPS to EfW could have the perverse effect of increasing total UK weighted emissions.
18. *Do you agree the principle of exceptions to the EPS in the event of long-term or short-term energy shortfalls?*
- 18.1. As stated above, we do not favour an EPS. However, if one must be introduced, then the principle of exceptions will be essential to cope with energy shortfalls. However, if the effect of the EPS is to disincentivise new build fossil fuel power stations before we reach the point that the exemptions are needed, they will be meaningless as the plant that utilise them will not exist.

Options for Market Efficiency and Security of Supply

19. *Do you agree with our assessment of the pros and cons of introducing a capacity mechanism?*
- 19.1. In Viridor's opinion, a capacity mechanism is not only essential, but if properly designed could achieve the objectives that the Government is trying to attain through the carbon floor price and the EPS

³ Most landfill operators will have a duty of care to either utilise the bio methane in landfill gas for generation or to flare it. The downgrade in the ROC support for landfill gas to ¼ ROC means that flaring is now more likely than generation, which in turn means that even if the additional methane is not emitted, it will contribute to increased CO2 emissions.



19.2. The system currently relies on aging coal-fired generators to provide the flexibility and capacity margin that ensure stability and security of supply. However, as a consequence of the low cost of gas-fired generation, no new coal-fired plant has been built in the UK since the 1970s.

19.3. In the future, some flexibility will be built up by proposed increases in pumped storage and by demand side management. However this will not replace the flexible coal plant that will shut in the next 10 years, let alone give the increased flexibility required for a system with large amounts of nuclear and wind power.

19.4. In the short to medium term, flexibility is most likely to be provided by open cycle gas turbines, as nuclear power does not follow load well.

19.5. In the long term, particularly if gas prices increase, there is likely to be a need for new coal fired capacity to provide flexibility and security.

19.6. Both OGCT and new coal will require long-term price signals in order to justify investment. Given that in the future system both are likely to have load factors well under 20%, the form of the capacity payment will be as important as the price.

20. *Do you agree with the Government's preferred policy of introducing a capacity mechanism in addition to the improvements to the current market?*

20.1. Yes

21. *What do you think the impacts of introducing a targeted capacity mechanism will be on prices in the wholesale electricity market?*

21.1. This will depend on the form that the mechanism takes. There is insufficient detail in the EMR consultation to express explicit opinions.

21.2. Notwithstanding this, a system based on availability (of plant of a given capacity) will ensure plant is available when it is needed. This may result in an oversupply of flexible plant, which will increase the average retail price of electricity. However, it will also result in lower marginal wholesale prices at times when the system is under stress, which will help reduce average retail prices. The key issue therefore will be how the targets are set.

21.3. In our opinion a capacity payment based on price per MWh delivered will not offer enough confidence to investors unless the price is set at a very high level.

21.4. On balance, we consider that the consumer is less likely to overpay for capacity under a system based on availability (volume).

22. *Do you agree with Government's preference for a the design of a capacity mechanism:*

- a central body holding the responsibility;
- volume based, not price based; and
- a targeted mechanism, rather than market-wide.

22.1. Yes



23. *What do you think the impact of introducing a capacity mechanism would be on incentives to invest in demand-side response, storage, interconnection and energy efficiency? Will the preferred package of options allow these technologies to play more of a role?*
- 23.1. We think that, if properly designed, a capacity mechanism will increase incentives for demand-side response, storage and interconnection. Despite the experience of the PJM market, we consider that energy efficiency is more likely to be motivated by other factors, which include the average retail cost of energy and tax allowances.
- 23.2. A properly constructed mechanism will allow demand-side response, storage and interconnection to play a larger role. However, given the existing system and the geography of the UK, in our opinion this will always be a minor role compared to that played by flexible fossil fuelled plant.
24. *Which of the two models of targeted capacity mechanism would you prefer to see implemented:*
- *Last-resort dispatch; or*
 - *Economic dispatch.*
- 24.1. This will depend on the design of the capacity mechanism. If the capacity mechanism is based on the availability of a given volume, then economic dispatch based on the marginal cost of operation of that plant should be used. In the short to medium term, logically this will mean OCGT, but in the longer term coal (with or without CCS) could play a significant role.
25. *Do you think there should be a locational element to capacity pricing?*
- 25.1. We think that this is unavoidable, given that the weight of demand will remain in the south-east of England for the foreseeable future, whereas low carbon generation is likely to be predominantly based in the north and west of the UK.

Analysis of Packages

26. *Do you agree with the Government's preferred package of options (carbon price support, feed-in tariff (CfD or premium), emission performance standard, peak capacity tender)? Why?*
- 26.1. We are concerned that there is much detail lacking in the consultation document about how any of these options will operate in practice. Our responses have therefore been coloured by these concerns.
- 26.2. We do not agree with the preferred package. This is primarily because in our opinion a CfD FIT will increase the risks for embedded generation (see 3 above). This concern would be abated if CfD Fits were restricted to licensed generation and embedded generators were given a Premium FIT.
- 26.3. We agree with the use of a capacity payment, which we feel could remove the need for both the carbon price support and the EPS if properly designed.
- 26.4. We consider that the carbon price support and the EPS could have unintended consequences which will not necessarily result in more low carbon generation, and



which at worst could damage the UK economy by making us less competitive than our European neighbours.

27. *What are your views on the alternative package that Government has described?*

27.1. Given our concerns regarding the impact of CfD FITs on embedded generation, we have a clear preference for the alternative package. However, this does not alter our misgivings about the carbon price support and the EPS.

28. *Will the proposed package of options have wider impacts on the electricity system that have not been identified in this document, for example on electricity networks?*

28.1. Logically yes. The document addresses the issue of constraining off through its assumption that excess low-carbon energy will send wholesale prices negative, and that in this circumstance generators will simply not run. However, as most low-carbon energy has low marginal costs, prices will have to go strongly negative before a generator with a FIT is better off not running than running. This means that at some point in the future, it is likely that the system operator will have to constrain off some generation, with consequent impacts. In our opinion the options do not address this adequately.

29. *How do you see the different elements of the preferred package interacting? Are these interactions different for other packages?*

29.1. We consider that the carbon support price has little linkage with the other elements. In our opinion it will do little to support embedded renewables, however it has the potential to disincentivise CHP and therefore could reduce low-carbon energy. It could have the effect of reducing overall electricity demand, and therefore decrease the risk of security of supply, if the consequence of its introduction is a reduction in UK competitiveness and an increase in movement of energy intensive industry to other countries.

29.2. We consider that the key interaction is between FITs and capacity payments. If the latter is properly designed, there would be no requirement for an EPS or carbon support price.

29.3. We consider that the EPS will be damaging to biomass and EfW, and could result in an increase in UK emissions as a consequence of lower diversion of waste from landfill. As currently proposed, the EPS will ensure that the flexible plant in the capacity tender (required to maintain security of supply) will be almost entirely gas-fired, whereas Viridor considers that there will be a need for new coal fired power stations in the long term.

Implementation Issues

30. *What do you think are the main implementation risks for the Government's preferred package? Are these risks different for the other packages being considered?*

30.1. EMR was triggered by concerns that there were not enough investors to meet the funding requirements for the transition to low carbon electricity. There is a risk that, notwithstanding the Government's commitment to a rapid programme, bundling four



different elements into EMR will prolong its implementation, resulting in finite capital being invested in other markets during the period of uncertainty.

- 30.1.1. Viridor therefore suggests that, if FiTs for renewables and nuclear power are to be implemented, this be done first and at an accelerated pace.
 - 30.1.2. This would need to include a commitment that the other elements, if/when implemented, would not be allowed to adversely affect projects already in development.
 - 30.1.3. This would improve the risk to security of supply. In the short to medium term the risk to security of supply is one of margin of capacity over peak demand, rather than a lack of flexible plant or fuel constraints. Accelerating the implementation of FiTs will accelerate the addition of new generating capacity, particularly nuclear power.
 - 30.1.4. The development of the capacity payment mechanism, carbon support price and EPS could then follow at slower pace which would allow these elements to be properly developed.
- 30.2. There is a risk that the Government could give an unjustifiably higher weighting to the responses of some consultees than those of others. This could result in a package that does not appeal to the majority of current and potential market participants, which in turn would result in fewer low-carbon and flexible plant being built (or retained in service). In this situation, EMR will become self defeating. Viridor therefore suggests that the Government pays close attention to the needs of independent generators in its implementation of EMR, as this will maximise the amount of capital available to invest in low-carbon generation.
- 30.3. Energy poverty is growing; real disposable incomes for most of the population are falling at the same time that energy prices are rising. There is a risk that EMR will produce a backlash amongst the electorate (similar to the fuel protests) if it is realised that electricity prices will rise because of it.
- 30.4. If a carbon support price is introduced and it is set to high, it could accelerate the closure of existing fossil fuel power stations, including CHP. This would exacerbate the security of supply risk. A similar risk applies to EPS.
- 30.5. Viridor perceives that the key issue for capacity payments is to ensure that flexible fossil fuelled generation is available post 2020 to run when needed. There is a risk that, in focussing on the cost of the actions required to stabilise the current system, the mechanism as proposed will not work for a future system that is reliant on fossil fuelled power stations operating on very low load factors.
31. *Do you have views on the role that auctions or tenders can play in setting the price for a feed-in tariff, compared to administratively determined support levels?*
- *Can auctions or tenders deliver competitive market prices that appropriately reflect the risks and uncertainties of new or emerging technologies?*
- 31.1. It is hard to see how an auction could be run for nuclear plant;
- 31.1.1. If the auction was technology specific there would not be enough bidders.



- 31.1.2. If the auction was non-technology specific the nuclear plant would dwarf the other technologies.
- 31.1.3. FIT contracts for nuclear should therefore be awarded through a different system, possibly an adaptation of the process used by OFGEM to determine the rates for regulated assets.
- 31.2. Auctions could be used to deliver competitive prices for renewables, provided that they are properly designed and run, and there are enough bidders.
- 31.3. A major failing of the NFFO competitions was that it was relatively easy for bidders to pass the "will secure" test. Consequently bidders won NFFO contracts for sites that could not be developed, because they were not viable and/or because they could not win planning permission. This is the principal reason that the NFFO failed to deliver capacity.
- 31.4. Drawing on the NFFO experience, in Viridor's opinion bidders should only be allowed to enter a project in an auction if it already has planning permission, there is grid capacity available and it can demonstrate that it has investor support at the level at which it is bidding.
- 31.5. In the past when such a system has been suggested, developers have complained that this would mean that they would effectively have to complete bank due diligence in order to be able to make a bid. Developers would only be willing to do this if they had a high level of certainty of winning a FIT contract, which would reduce the competitive pressure.
- 31.6. This indicates that if the auction approach is to be adopted:
- 31.6.1. Auctions should be held at intervals of six to 12 months.
- 31.6.2. Each auction should award contracts that in total equal between 90% to 95% of the total capacity entered into the auction. The knowledge that not all bids would be successful would still maintain competitive pressure.
- 31.6.3. Unsuccessful bidders should be allowed to enter subsequent auctions as many times as they wish.
- 31.7. The auction process itself will be prolonged, as each bid will have to be verified by the awarding authority. Based on our experience of residual waste PFI/PPP, we would not be surprised if the verification process took up to six months per bid. This will be expensive, it will tie up considerable numbers of civil servants and could become a significant drag on development.
- 31.8. Viridor therefore has a preference for the administrative approach
- *Should auctions, tenders or the administrative approach to setting levels be technology neutral or technology specific?*
- 31.9. Auctions do not have to be technology specific as it is possible to select a variety of technologies within any given auction. The knowledge that not all bids will be successful will maintain competitive pressure for all.
- 31.10. The administrative approach should be technology specific.
- *How should the different costs of each technology be reflected? Should there be a single contract for difference on the electricity price for all low-carbon and a series of technology different premiums on top?*



- 31.11. Under an auction, individual projects should receive the price bid (in real terms).
- 31.12. In the administrative approach, Viridor considers that a single CfD FIT with technology specific premiums would be no simpler than setting a FIT for each technology. However it would lack the clarity of the latter.
- 31.13. In Viridor's opinion, there should be two classes of FIT for each technology. The first class would be for embedded generation and should be a Premium FIT. The second class should be for licensed generation and/or generation owned by vertically integrated utilities, which could be a CfD FIT. Under the administrative approach, within a class all projects should receive the same price which will be fixed in real terms at the point the developer applies for the FIT.
- 31.14. In the administrative approach, the Government should be free to adjust the FIT price for new projects in any technology or class, to represent changing economic and market conditions. For example, if the costs of a particular technology fall, the FIT price for new projects using that technology would be reduced, whereas if interest rates rose the FIT price would increase.
- 31.15. The FITs for different technologies should have durations that reflect the life of the plant and the period over which they are financed. For example, an on-shore wind-farm with a life of 20 years and financed over 13 years should have a FIT lasting 15 years, whilst a tidal barrage with a life of 120 years and financed over 35 years should have a FIT lasting 40 years. The extension of the FIT beyond the tenor of the debt is necessary to accommodate the tails that all bank financed deals require.
- *Are there other models government should consider?*
- 31.16. Not in our opinion.
- *Should prices be set for individual projects or for technologies*
- 31.17. Prices should be set for technologies, however once a project has entered into a FIT, that price should become specific to that project. By this we mean that project should not see a change in its FIT if the technology price is subsequently altered.
- *Do you think there is sufficient competition amongst potential developers / sites to run effective auctions?*
- 31.18. This will be dependent on the auction design.
- *Could an auction contribute to preventing the feed-in tariff policy from incentivising an unsustainable level of deployment of any one particular technology? Are there other ways to mitigate against this risk?*
- 31.19. This will be dependent on the auction design. However, under the administrative approach, 31.14 and 31.17 above describe how excess deployment can be managed.
- 32. *What changes do you think would be necessary to the institutional arrangements in the electricity sector to support these market reforms?***
- 32.1. Setting up an auction, depending on the auction design, will create a large administrative burden that will require a new architecture.



- 32.2. The administrative approach will require little change as this is effectively what happens under the Renewable Obligation. However, changes to the RO have taken place in a reactive and sometimes haphazard, rushed manner. Viridor would therefore support the establishment of a department, either in DECC or in OFGEM, that would publish an annual review of the operation of FITs and set levels for new projects year on year.
33. *Do you have view on how market distortion and any other unintended consequences of a FIT or a targeted capacity mechanism can be minimised?*
- 33.1. It is inevitable that FITs will cause market distortion, as they are designed to support generation technologies that can't compete in an unconstrained market (see 6.4 above). In our opinion, the only way that this could be adequately addressed would be to move to a single buyer, centrally dispatched market along the lines described in 5.2 above.
- 33.2. The capacity mechanism will have varying distorting effects depending on its design. However, as noted in 21.2, this could be beneficial in certain circumstances in that the distortion will benefit the electricity consumers who ultimately fund EMR.
34. *Do you agree with the Government's assessment of the risks of delays to planned investments while the preferred package is implemented?*
- 34.1. In our opinion, the Government has underestimated the risk of delays. As pointed out in 1.4, 3.12.2, 6.5 and 7.2, in our opinion the EMR process will increase perceptions of risk (compared to the present system).
- 34.2. Allowing investors to choose between the FIT and the Renewable Obligation until 2017 will help minimise the delays to renewable investments that are viable under the RO. However, it will not help nuclear power, or renewables such as tidal power than are not viable under the RO. In our opinion perception of risk will result in many investment decisions for these technologies being delayed at least until the package has been through the committee stage of Parliament.
- 34.3. We are conscious that the current coalition Government has no precedent in Britain since the second world war, and therefore investors have no way of gauging how likely it is that it will survive for a full term. There is a fear amongst investors that if the Government falls before the legislation is passed, the cost of EMR could become an election issue for an increasingly fuel poor electorate.
- 34.4. For these reasons and those mentioned in 30.1 above, Viridor suggests that the implementation of FITs is accelerated, i.e. they are enacted before the other measures in the package.
35. *Do you agree with the principles underpinning the transition of the Renewables Obligation into the new arrangements? Are there other strategies which you think could be used to avoid delays to planned investments?*
- 35.1. Yes
36. *We propose that accreditation under the RO would remain open until 31 March 2017. The Government's ambition to introduce the new feed-in tariff for low*



carbon in 2013/14 (subject to Parliamentary time). Which of these options do you favour:

- All new renewable electricity capacity accrediting before 1 April 2017 accredits under the RO;
- All new renewable electricity capacity accrediting after the introduction of the low-carbon support mechanism but before 1 April 2017 should have a choice between accrediting under the RO or the new mechanism.

36.1. Viridor favours giving investors a choice.

37. Some technologies are not currently grandfathered under the RO. If the Government chooses not to grandfather some or all of these technologies, should we:

- Carry out scheduled banding reviews (either separately or as part of the tariff setting for the new scheme)? How frequently should these be carried out?
- Carry out an "early review" if evidence is provided of significant change in costs or other criteria as in legislation?
- Should we move them out of the "vintaged" RO and into the new scheme, removing the potential need for scheduled banding reviews under the RO?

37.1. For Viridor, the issue is primarily one of confidence in the ability to set the right levels of support for "sireless" technologies, regardless of whether this is by banding under the RO or under the new scheme.

37.2. Our concern stems from our past experience; in advance of the first banding of the RO, Viridor cooperated with the Government's chosen consultant (Ernst & Young) and gave evidence of the cost of a variety of landfill gas generation projects. We were subsequently disgruntled when support for new projects was set at ¼ ROC, which rendered a number of our prospects unviable.

38. Which option for calculating the Obligation post 2017 do you favour?

- Continue using both target and headroom
- Use Calculation B (Headroom) only from 2017
- Fix the price of a ROC for existing and new generation

38.1. Viridor favours using the continued use of both target and headroom



