

Mr. John Scott
Technical Director
OFGEM
9 Millbank
London SW1P 3GE



27th Nov 2006

Our Ref: ERS/DO

Dear John,

Consultation on the Innovation Funding Incentive and Registered Power Zone Schemes for Distribution Network Operators

Thank you for your open letter consultation regarding the above schemes.

We have given careful thought to the questions raised by your consultation and have provided a detailed and objective response suggesting a number of possible beneficial developments. In so doing, we have fully reflected our experiences with the schemes since their inception and, therefore, the possible limitations and development opportunities we have encountered surrounding the current workings of the schemes.

You will know from our annual IFI / RPZ report, and other communications, that EDF Energy is a strong supporter of both schemes. The attachment to your letter bears testament to our engagement with the schemes and our commitment to beneficial RD&D generally. We believe that the schemes have provided an essential and effective catalyst to DNOs to re-engage in RD&D at a time when we can foresee technical challenges and opportunities on a scale arguably unparalleled since the large-scale expansion of distribution networks during the 1950's and 60's.

Whilst there is scope for development and refinement, there is no doubt in our minds that these two schemes have been successful, and have far from run their course; on the contrary we believe that they have merely overcome some inherent inertia to RD&D activity. As such they have achieved an important objective. However, what will be important going forward is that the resulting momentum that has been built up is both maintained, and indeed accelerated, to achieve a sustained critical level of RD&D activity.

Our detailed response is included as an attachment to this letter but the key messages can be summarised as follows:

- Whilst not currently a constraint, consideration could be given to raising the current 15% internal cap in order to reflect the higher internal costs that might be anticipated as a greater proportion of projects within an overall IFI portfolio reach the 'deployment' stage. This would be conditional upon DNOs providing adequate cost transparency.

- There might be scope for widening the IFI eligibility criteria so that ‘enabling’ projects which are clearly consistent with the *future* enablement of technical or commercial innovation would not be excluded. This would permit the inclusion of projects that establish building blocks towards technical or commercial enhancement, but do not, in isolation, deliver customer benefit.
- A further opportunity might be to consider a wider definition of ‘customer benefit’ so as to remove any ambiguity as to whether research into techniques that would have an enduring *societal* benefit would be considered eligible.
- In terms of assessing benefits arising from IFI projects, it might be helpful to broaden the criteria for value assessment such that qualitative as well as quantitative benefits could be better captured. A purely npv approach might give undue bias towards low risk / fast payback projects at the expense of projects that might deliver less certain, but potentially more far reaching, technical or commercial enhancements.
- The apparently slow take-up of the RPZ incentive is partly due to the difficulty in co-ordinating the location and timing of network technical enhancement opportunities so as to align with known potential DG activity. A modification to the incentive mechanism such that *created capacity* for DG formed part of the reward, with the balance of the reward being dependent upon DG take-up, might reduce this dependency without unduly diluting the objective of the scheme.
- One way to market RPZ opportunities would be for DNOs to issue invitations for expressions of interest to jointly develop DG / DER solutions to network reinforcement pressures (as enabled by E/R P2/6). If such joint proposals were to automatically qualify for RPZ status (in recognition of the fact that some technical and commercial innovation would probably be necessary to ensure the security of the DG contribution), this could be a powerful incentive to the wider deployment of RPZs.
- A possible relaxation of the RPZ criteria would be to permit the repeat application of an innovative technology within a defined time period from the original application. This might encourage the deployment of technologies that have potentially wide application (such as GenAVC), but a relatively small potential benefit in terms of freed-up DG capacity at any one location. Ideally coupled with this would be a relaxation of the maximum 2 RPZ’s per licence per annum cap.
- Albeit possibly in a modified form, it will be important to carry forward both the IFI and RPZ schemes into DPCR5. Moreover, in order to maintain the current momentum in R&D activity, it is important that DNOs have confirmation of such a decision in the near future. We believe that a rolling 5-year programme would provide the required confidence to DNOs to maintain a comprehensive forward portfolio of quality R&D projects.
- Capitalisation of R&D expenditure is an option, but we feel it is important to retain the currently strong ‘use it or lose it’ message. Retaining an appropriate minimum level of pass-through cost is also an important element of the IFI incentive. With certain caveats, a possibility is a hybrid arrangement whereby R&D expenditure is part pass-through with the balance being allowed as capital

expenditure provided proof-of-concept had been established (i.e. provided deployment potential had been proven).

- In terms of evolution towards practical application, we believe that as R&D activity continues to develop from its recently quiescent state, there will be a progression towards dynamic equilibrium such that there will be a natural balance of projects across the various stages of the RD&D spectrum at any given moment in time. We do not believe that any intervention is necessary to force such a balance. However, our above comment regarding part capitalisation of IFI expenditure on proof-of-concept would strengthen the incentive to take projects to a stage where prototypes and network trials could be developed.
- Finally, in terms of the wider future regulatory framework, the key requirement is that DPCR5 and future settlements must be seen to provide the necessary incentive for timely, efficient, and sustainable levels of network investment, based on a longer term view of network renewal and development need. Technical innovations established through the IFI and RPZ schemes would then naturally be incorporated into network development and renewal projects, provided a 'least-cost' approach to regulatory benchmarking did not discourage such enhancements, and instead encourage simple like-for-like asset replacement.

An important element of this framework will be to ensure an appropriate balance between public and private network investment. Whilst we believe there are some good private network models (the ESCO model being a case in point) that encourage an integrated DER approach and deliver demonstrable benefits to end-customers, including Distributed Generators, the wider expansion of competition in network provision should be conditional upon proven longer term benefits to end-customers and adequate protection of their interests.

I hope you will find our suggestions useful, at least as a basis for further and/or wider debate. In the meantime, please do not hesitate to contact me if there are any particular aspects of our proposals that require further clarification. Alternatively, if you would like to meet to discuss our ideas, please let me know.

Yours sincerely,

Dave Openshaw
Head of Engineering Regulatory Strategy
Networks Branch

EDF Energy's Response to Ofgem's Consultation on the Innovation Funding Incentive and Registered Power Zone Schemes for Distribution Network Operators – 5 Oct 2006

- 1. The level of the cap on IFI internal expenditure – this is currently set at 15% of total expenditure but a number of network companies have proposed that it should be raised. The average proportion of internal expenditure in 2005/06 was 15.53% with a range from 10.07% to 30.06%. As the level of the cap for total IFI expenditure is set for the current price control period, any increase in the proportion of internal expenditure will substitute for available funding for external expenditure rather than increase costs overall. If the cap on IFI internal expenditure is raised, what should the higher level be set at and what justification is there for this?**

The current cap of 15% has not so far proved to be a constraint to EDF Energy. However, it is possible that a future portfolio of projects might require a different ratio of in-house to outsourced resources. Provided the underlying principles of collaboration and sharing of information are respected, we would see no disadvantage in raising this internal cap to say 20 or even 25%. Indeed this might be more consistent with the level of 'internal' costs that might be incurred as a greater proportion of projects reach the deployment phase and hence require a greater level of network design integration, project management, supervision, and commissioning. However, such a relaxation would need to be conditional upon there being sufficient cost-transparency in reporting to show that all companies were complying with both the spirit and letter of the RRP arrangements, and not simply hiding inefficient opex costs.

- 2. IFI eligibility criteria – There have been discussions with some of the DNOs regarding the eligibility of expenditure put forward under IFI and some DNOs hold the view that the criteria should be revised to include additional areas of innovation. In particular, the boundary between commercial and technical innovation may benefit from clarification.**

The existing eligibility criteria, which require that projects should have the objective of enhancing the technical development of distribution networks and/or of delivering value (financial, supply quality, environmental, safety) to end customers, should be retained. An optional minor refinement might be to substitute 'economic' for 'financial' but consideration could also be given to also including 'social' (value) to reflect possible technical enhancements that might have wider societal benefits, such as reduced public inconvenience arising from DNO maintenance and construction works.

Also worthy of consideration is whether there might be scope for extending the criteria to include projects that would support the IFI philosophy even though they might not in themselves strictly meet the criteria in terms of enhancement or delivery. An example might be development of information communication technologies that could enhance the future functionality of the network in terms (say) of control and automation capability; in other words 'Smartgrid-ready' technologies that might not yet have application, but which could be developed and refined pending the evolutionary development of network architecture to that of an 'Active Network' regime. IFI eligibility would be dependent on being able to demonstrate at least a potential development path towards technical deployment.

Similarly, projects which may have demand-side (rather than network) application (for example storage and active load profiling) should be considered eligible, provided they are able to demonstrate the potential for more efficient management or utilisation of distribution networks and/or (particularly) for supporting lower carbon emissions.

Moreover, projects which would enhance our understanding of barriers or opportunities (technical, commercial, or even regulatory), or which would help to clarify the potential for technological or commercial development, should not be excluded. Such 'enabling'

projects may well be a necessary precursor to properly scoping a 'development' project, even though they may not in themselves strictly meet the current eligibility criteria. Examples could include developing new network modelling techniques and decision support tools (including, for example, tools to facilitate DG feasibility studies), or scenario planning techniques that might better inform future network investment options (for example DG solutions to network (demand) capacity constraints), or even tools to derive energy pricing regimes that would support the optimisation of DER solutions and/or energy efficiency.

Finally, in terms of delivering environmental / social / safety value, projects which do not directly impact on network architecture or components, but otherwise add value, should not be excluded. To do so might result in a missed opportunity for R&D into improved diagnostic techniques and construction techniques that could make a significant contribution to safety and/or environmental and social sustainability. Examples could include techniques for condition monitoring, better management (or recycling) of waste, and techniques that would reduce the need for disruptive street works.

3. IFI benefit assessment requirements – the Good Practice Guide indicates methods to assess the likely benefits of R&D projects. Are better methods available? Is additional reporting required to track delivery against these projected benefits?

The nature of R&D projects is that whilst there is often a conceptual benefit, such benefit is often difficult to quantify, indeed (referring to our response to question 2) the output of the project might indeed be as intangible as knowledge enhancement and/or a better understanding of the potential for further informative R&D. The danger of having a too rigid regime that requires a demonstrable overall positive npv¹ is that higher risk (but potentially more valuable) projects might be excluded from the portfolio (or at least given insufficient weighting in any project portfolio prioritisation) in favour of projects that are less adventurous but which provide greater assurance of an earlier payback.

A further practical difficulty is in demonstrating that a predicted 'financial' benefit has actually been realised. Under laboratory conditions, outputs can generally be measured with reference to a 'control' sample. However, IFI projects will often need to be evaluated under live network conditions where no such control sample is readily available.

Clearly it is necessary to ensure that a responsible and measured (rather than purely speculative or indiscriminate) approach to R&D is being pursued, but it should be recognised that citing a positive npv should not necessarily be the sole qualifying criteria for a project to be IFI eligible. For example, if a project is expected to deliver value principally in terms of environmental, safety, or societal benefit, then assigning a *financial* benefit is likely to be highly subjective. G85 provides some guidance on 'non-financial' benefits. However, it is probably of greater value to the project business case to accurately describe the nature and scale of the potential (environmental / social / safety) mitigation that the project would be expected to address.

In terms of additional reporting, we believe that the annual IFI / RPZ report could readily be adapted to describe non-financial benefits, as well as anticipated npv.

4. RPZ constraints due to the lack of willing generators – a DNO cannot develop an RPZ without the support of a generator. Are there ways by which the number of good quality RPZs could be increased? How can DNOs be encouraged to market RPZ opportunities and/or to engage more proactively with the generator community?

¹ i.e. "Each eligible IFI project will be justified prior to commitment on the expectation that the Present Value of its costs will be exceeded by the Present Value of the benefits it could deliver to customers" (Ref. ENA Engineering Recommendation G85)

We have identified four possible complementary developments of (or relaxations to) the RPZ qualifying criteria that could be helpful.

- i. The first possible development would be that the actual incentive be based, at least partly, on the accessibility or *capacity* enhancement rather than actual (DG) capacity *take-up*. This would be helpful in two ways:
 - a. firstly it would overcome the current dilemma that DNOs, in order to be sure of benefiting from the incentive, must be certain that additional DG will connect to the network in the foreseeable future; and secondly
 - b. it would overcome the issue that Generators may have already 'sized' their proposed generation according to the constraint imposed by the existing network capacity limitation.

Under the above proposed arrangement, DNOs would at least be certain of some return on their 'RPZ' investment even if the anticipated DG was unforthcoming (e.g. perhaps due to a planning refusal). In order to ensure that DNOs did not invest indiscriminately, the DNO would have to demonstrate the potential for DG penetration at a particular point on the network, and part of the incentive would be payable only once the additional DG (or demand) had actually connected to the network. For simplicity, the incentive might be structured so that (say) 50% would be recovered on completion of investment (and/or proof of concept); 50% on connection of additional generation (or demand).

- ii. The second possible development would be not to necessarily exclude from RPZ eligibility, the repeat application of innovative technology. This is currently a potential disincentive to technologies that could have widespread application, but which might create only a relatively small increment of 'DG headroom' on a given network (and therefore, under the current mechanism, severely restrict the quantum of the incentive to the DNO). An example of this is GenAVC, a technology that has been jointly developed by Econnect, United Utilities, and EDF Energy and which was the basis of EDF Energy's first RPZ. This technology, now proven, has potentially wide-scale application to (especially) 11kV networks. A better approach might be to place an 'RPZ repeat life' on a given technology so that incentives could be realised from valid repeat applications provided such repeat applications occurred within a given timescale following the original application.
- iii. A third opportunity would be for DNOs to actively seek DG (or DER) alternatives to conventional reinforcement (as enabled by E/R P2/6) by issuing invitations for expressions of interest and then jointly developing solutions with prospective Generators. Whilst there is essentially nothing to prevent a DNO adopting such a practice now, if such a joint approach were to attract RPZ status (in recognition of the fact that some technical and commercial innovation would probably be necessary to ensure the security of the DG contribution) then this might be a powerful incentive that would also deliver longer term benefits to end-customers in terms of reduced conventional reinforcement expenditure.
- iv. Finally, a fourth possible development (complementary to ii above) would be to relax the current maximum of two new RPZs per licence per annum. Whilst this has not hitherto proved to be a constraint, it could become an unnecessary future barrier to innovation, particularly if our above-stated proposals for extending the RPZ eligibility criteria are accepted.

5. The future of IFI and RPZ in DPCR5 – is it necessary to decide now whether one or both of the schemes should be retained after 2010 and if so why and for what horizon beyond 2010?

The nature of collaborative R&D projects is that many will span a number of years. Moreover, much work has been undertaken 'behind the scenes' in establishing the

necessary collaborative partnerships (with universities, equipment manufacturers, and other supporting stakeholders) to provide the necessary platform for taking forward R&D projects.

For both these reasons, it is necessary to know well in advance of 2010 that the current incentives (in one form or another, and ideally modified in line with our suggestions) will continue. The consequence of not providing this assurance is that new projects that would otherwise extend beyond 2010 will not be commissioned and, potentially more seriously, the necessary stakeholder engagement and commitment will dwindle as alternative, more secure, R&D opportunities outside the UK are explored. A 5-year rolling commitment is necessary and it follows that with less than 4 years of the remaining price control review period now remaining, a commitment is required in the very near future.

In terms of whether one or both schemes should be retained, a possible option would be to simply roll the RPZ scheme into the IFI scheme, since an RPZ might be the culmination (or the final 'D') of one or more strands of IFI-eligible RD&D. However, we would not support this proposal for two related reasons:

- (i) The risk (and to some extent the experience) is that R&D projects sometimes struggle to develop beyond the proof of concept stage. The RPZ incentive provides an important driver to convert R&D into practical applications; and
- (ii) The RPZ incentive is based specifically on benefit delivered which, along with IFI, provides a balanced mix of input and output incentives which we believe is consistent with deriving an effective RD&D strategy.

We therefore believe that both the IFI and RPZ incentives should be continued.

- **An OXERA paper² suggested an alternative would be to capitalise R&D expenditure (which could be structured to have the same financial value to the network operator) – what are the pros and cons of this approach?**

There are certainly some benefits to the 'capitalised R&D' proposal in that investment would then be added to a DNO's RAB and hence enable the DNO to make a return on that investment through the normal price control mechanism. This would give the DNO a high level of certainty that R&D investment would be recovered, albeit over a longer timeframe. The 'efficiency' of such investment could be challenged in exactly the same way that load or non-load related network investment is challenged, so there need be no real concern that DNOs would invest unwisely.

From a DNO / shareholder perspective, it would mean that the initial funding for R&D would need to be financed from available funds rather than recovered as an expensed (part pass-through) cost. Indeed, this is one disadvantage of the current incremental sliding pass-through mechanism whereby an increasing year-on-year (DNO) contribution to the R&D programme is inappropriately treated as an operating cost, thereby adversely impacting the DNO's apparent operating cost efficiency.

The potential downside of the capitalisation approach is that the current very clear 'use it or lose it' signal would be diluted. And given the still relatively low level of investment in R&D compared with (say) network renewal investment, it could mean that R&D might then receive relatively little priority within an overall capital investment portfolio, especially given the relatively intensive technical governance (and innovation) required.

Given the above considerations, a helpful compromise might be for the current partial pass-through mechanism to be at least partially retained. One approach might therefore be for the incremental sliding mechanism to continue in 5% p.a. steps post-2010 down to a level of 50% pass-through (i.e. at 2014, at which point this level of pass-through would

² Where has the innovation gone? R&D in UK utility regulation – Oxera 2005

be held) but with the balance of R&D expenditure being added to the RAB and depreciated thereafter at the pertaining rate for network investment. One possible option to consider would be whether the 'demand' or 'DG' RAB should be the recipient of the capitalisation; this could be determined on a project-by-project basis and/or through an apportionment mechanism.

In summary, the current 'use it or lose it pass-through' mechanism provides a strong signal and gives clear visibility of R&D activity. However, capitalisation of R&D expenditure is logical since the objective is ultimately to enhance the cradle-to-grave performance of the distribution network. It is therefore inappropriate for R&D to be regarded as an operating cost (at least unless it is ring-fenced and excluded from efficiency benchmarking).

The current IFI 'pass-through' arrangement should therefore be retained, at least in part. And provided that the effect is not simply to displace the current level of overheads that is allocated by apportionment to capital (for regulatory accounting purposes – i.e. in order to preserve financial ratios) then the balance of R&D expenditure that is not 'pass-through' could be capitalised.

- **Another alternative would involve valuing the benefits that flow from the R&D rather than the costs – would this be preferable and how could it be achieved in practice?**

Unlike in the case of a company that depended on R&D to retain or grow market share, the benefit of R&D to DNOs in financial terms is not enduring for two reasons:

- (i) since a key plank of the IFI philosophy is that the results of R&D are shared then, notwithstanding any IPR benefit, there is no enduring 'competitive' advantage; and moreover,
- (ii) in a regulated environment, the financial benefits derived from R&D are ultimately (and correctly) returned to customers.

Therefore, whilst it is possible to value benefit (if only in qualitative terms in some cases) to customers and other non-financial stakeholders, it is important to understand that this does not reduce the need for ongoing incentives on DNOs to innovate.

In terms of valuing benefit, in practice, for the reasons stated in our response to question 3, in the absence of 'laboratory conditions' it is not always a straightforward matter to value the direct financial benefit of the output of an R&D project. Hence we would see the financial valuation of benefit being problematic, and potentially creating a perverse incentive in that less quantifiable (but equally valid) R&D projects might be disadvantaged.

Our suggestions for part-capitalisation of IFI expenditure described above could be further refined to allow capitalisation of the balance of IFI expenditure only where the technological enhancement and benefits that were expected to flow from the R&D had been deployed and demonstrated. Albeit that 'value' would essentially be a qualitative assessment, we believe this would be a more practical approach than attempting to value the benefits in purely financial terms. The justification for capitalisation would be stated within the annual IFI / RPZ report. Moreover, it would provide an incentive for DNOs to take R&D projects to the proof-of-concept stage (before which point all too many R&D projects have failed in the past) and then develop the technology through to the deployment stage.

- **Does there need to be evolution after 2010 to strengthen the focus of IFI in its support for practical application – for example prototypes and network trials? If so, how might this be achieved and how would the transition work?**

The natural evolution of R&D from its currently 'embryonic' or 'start-up' status is such that an increasing number of field trials might be expected as projects reach maturity and/or spur other projects that result in the wider deployment of a (semi-proven) technical innovation.

However, logic would suggest that as some projects reach maturity, other new projects will commence that might have lead times of some years before they evolve into field trials. Hence, in theory, a state of dynamic equilibrium should evolve whereby at any given time there will be a portfolio of projects each at different phases of completion; some at the research phase, some at the development phase, and some at the deployment phase.

Given the above, the need for any intervention, or predetermination as to the perceived appropriate mix of projects that would make up the 'ideal R-D-D spectrum', is questionable. It is however appropriate to monitor the overall impact of the IFI incentive to ensure that an appropriate level of projects reach maturity and/or lead to follow-on field trials, and ultimately wide-scale deployment. The annual IFI / RPZ report provides the means for such monitoring.

Our proposals for partial capitalisation of IFI expenditure and a retained RPZ mechanism should provide the necessary additional incentives to develop prototypes and network trials.

- **With regard to distributed generation, are there other changes to the regulatory framework (e.g. to encourage active management – technical and commercial - by the DNO) which need to be considered?**

The framework has hitherto focussed on extracting inefficiencies through a very challenging RPI-X mechanism based on regression analyses to determine frontier performance. This has undoubtedly been successful in driving efficiency albeit, we would suggest, not necessarily equally across all DNOs due to some dubiously derived scale variables.

Going forward, there is a need for a new framework wherein the emphasis shifts significantly towards providing incentives to sustainable longer term investment. In this context, we believe that 'sustainability' necessarily embraces three key elements: social, environmental, and economic sustainability.

A key plank of this sustainable framework must be to provide DNOs with the opportunity to make the sort of returns on investment that will encourage financial stakeholders to see network investment in a better light than alternatives which are currently perceived to provide a more attractive risk/reward option.

In particular, if networks are to be developed in line with future customers' expectations for safety, reliability and functionality, and in line with the wider sustainability agenda, perhaps best summed up by the DWG workstream: '*network design for a low carbon economy*', then it will be important that financial stakeholders perceive an incremental benefit in investing in new network architectures rather than simply minimalist investment to comply with statutory and/or licence obligations.

Moreover, if DNOs are to be encouraged to move away from the current 'passive' management environment and instead develop, and embrace, wide-scale 'active' technical and commercial network management regimes, then the enhanced risk that is implied by such an approach needs to be reflected in terms of WACC, as well as in terms of appropriate (more direct) incentives.

A further part of this overall framework must be to ensure an appropriate balance between public and private network investment, and to ensure that where competition in such investment is justified, the benefits of competition are passed through to end

customers, and that such customers are appropriately protected in terms of available recourse to address poor service.

The extent to which private network development would naturally embrace IFI-derived technical enhancements, and incorporate these into the resulting network architecture, would be an important test as to whether the longer term interests of end-customers were being optimally served.

Finally, in terms of the regulated / non-regulated interface, in the context of DG (and DER), we believe that given the appropriate attention to accreditation, and to the derivation of unambiguous network boundaries, the ESCO private network model is potentially helpful, especially when applied to relatively large scale green or brown-field development.