Submission to European Investment Bank
Consultation on Energy Sector Lending Policy
Call for public views

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Overview. This submission offers a few key points on the questions raised in the EIB Consultation document, focusing mainly upon some of issues around longer term energy strategy and associated investments particularly in renewable energy and energy efficiency. In this it complements a submission by Ofgem and draws attention to some specific related points in that submission.¹

I also draw the EIBs attention to the enquiry into Decarbonisation and Competitiveness by the House of Lords Select Committee on European Affairs, Subcommittee on Agriculture, Environment and Energy. I am Specialist Advisor to this Committee, which is due to close its evidence sessions in mid February 2013 and publish its report in late April 2013.

Consultation 4.1 General Energy and Economic Context

- Particularly in the current economic climate, is there a trade-off between promoting a competitive and secure energy supply and one which is environmentally sustainable? Where should the balance lie and what implications does this have for energy sector investments?
- How does investment in the energy sector contribute to growth and employment? Are investments in all energy sub-sectors equally valuable? And how does investment in the energy sector rank relative to other investments in the economy which support growth and employment?
- What impact do you consider the current economic crisis will have on the energy sector (demand, policies, supply)?

In some Member States- notably, those with substantial domestic coal resources - there is potential short term trade-off between ‘promoting a competitive and secure energy supply and one which is environmentally sustainable’? At a more strategic level – and particularly from an overall EU perspective – this is far more doubtful. Coal is characterised by numerous ‘external’ costs, over and above its climate change impact; the Extern-E studies illustrate the scale of these in Europe, and assessments in the US are just as striking about the “hidden costs” of coal.² With climate change also factored in – not only potential damages but also the

¹ Ofgem response to the EIB Energy Sector Lending Policy consultation
² I assume EIB would be familiar with the results of the EC’s Extern-E studies (external costs of energy) programme. I therefore just note that its results are echoed also by US studies. Eg. P. R. Epstein Et Al., ‘Full Cost Accounting For The Life Cycle Of Coal’, Ann. N.Y. Acad. Sci. 1219 (2011) 73–98, 2011,
pressures likely to arise through domestic and global negotiations – supporting coal dependence does not appear to be an economically justified or even plausible strategy for EIB involvement, except possible for exceptional circumstances in replacing very old facilities. In general, helping coal-dependent Member States to diversify would seem to be a better use of EIB resources, and one more consistent with European policy goals.

Development of domestic gas resources is more complex and touched on below.

Whether and how investment in the energy sector “contributes to growth and employment?” is complex, partly because the effects would be expected to vary by subsector. Relevant factors would include employment intensity, the share of supply chain value located in the EU, potential for innovation, and the overall time-profile of the investment. The time profile of investment is crucial because capital-intensive investments which may appear expensive in the short term may nevertheless provide energy at very low marginal cost for decades. These may be particularly good candidates for financial support, representing a “Keynsian” boost with clear long-term dividends.

This is important because many low-carbon energy sources have this ‘infrastructure’ like characteristic – capital investment with enduring returns, both private and public. On these grounds, a recent report from Cambridge Econometrics suggests that investment in offshore wind, despite higher costs, represents a good investment. ³

Whilst details of the modelling in such analysis can of course be (and have been) challenged, there are fundamentals that make the broad line or argument economically plausible. In the aftermath of the credit crunch and with historically low base rates, and recession characterised by inadequate demand, as Martin Wolf (Chief Economics Writer for the FT has said), ‘there has hardly ever been a better time in history to invest in infrastructure’. Particularly given European dependence on energy imports and the uncertain outlook for global fossil fuel markets, energy investments which are capital intensive, low operating cost, and with potential for innovation and a substantial component of European supply chain, unquestionably have the potential to bring significant benefits relative to many other investments in the economy, providing they can be financed from predominantly private sources.

The current economic crisis clearly has diverted attention and political capital away from energy and environmental costs. The factors indicated (and the scale of needs and opportunities) however point to clear potential for energy and environmental investment to be an important part of the solution to the EU’s economic difficulties.

Consultation 4.2 Renewable Energy

*The Bank’s economic justification for supporting emerging renewable energy technologies, whose cost is significantly above that of conventional and mature renewable energy technologies, is that continued investments in these technologies will eventually lead to cost reductions and will ultimately be the least-cost approach to meeting the EU’s renewable energy targets. Do you agree with this approach? Is*

estimate that the overall ‘external’ costs of coal in the US amount to ‘third to over one-half of a trillion dollars annually .. Accounting for the damages conservatively doubles to triples the price of electricity from coal per kwh generated’. Another study focuses upon including environmental affects in national economic accounts. N.Muller, R.Mendelsohn, and W.Nordhaus, ‘Environmental Accounting For Pollution In The United States Economy’, American Economic Review, 101 (Aug 2011): 1649-1675 - estimates the environmental cost of air pollution from coal power stations in the us to equate to about 3 c/kwh, and notes that the environmental damage per unit of sulphur emissions is also much higher than the current cost of sulphur emission permits, ie. The cap set under the us cap-and-trade scheme is much too lenient.

there an alternative approach to the economic justification of these technologies which you consider more appropriate?

- What evidence is there that the cost of emerging renewable technology is falling?
- What level of investment in RE do you expect in the short and medium term?
- What are the barriers to investment in renewable energy outside Europe? How might these be overcome?
- Do you agree that there is significant scope for investment in renewable heating and cooling?
- What are the barriers to investments in this sector and how might these be overcome?

The Consultation paper sets out well the complications of evidence – falling in some technologies (like PV, but with doubts over the sustainability of such low costs), rising in others (notably offshore wind).

The broad approach of “that continued investments in these technologies will eventually lead to cost reductions and will ultimately be the least-cost approach to meeting the EU’s renewable energy targets.” would appear incomplete. Not least, because the EU’s renewable energy targets are only set to 2020; renewable energy is part of a strategic transformation towards multiple goals that include strategic energy security and deep mid-Century reductions in GHGs. Renewable energy investment thus needs to be framed against these wider objectives. That is the purpose of Ofgem’s framework for “Strategic and Sustainability Assessment” (within which innovation forms a key component of the “learning by doing and pathways” component), as outlined in the final part of this Submission.

The inadequacy of agreed frameworks for strategic and sustainability assessment was less of a problem whilst the investments were moderate and innovation offered a potential (but uncertain) promise of relatively quick returns. As renewable energy becomes more mainstream, the total costs rise, and the innovation potential declines in relative terms, the absence of clear assessment frameworks is becoming more of a problem, and I would argue this in itself will become a rising ‘barrier’ to renewable energy.

Renewables are largely dependent on public policy incentives, and the scale of investment and the cost of capital is very contingent upon private sector confidence about the stability of such incentives. Their stability is undermined if there is not a more systematic and agreed basis for evaluating the costs and benefits of such policies. The essential conclusion that underpins Ofgem’s framework for Strategic and Sustainability Assessment – which also draws upon UK government work such as the Richard Price review on the Economics of Sustainability – is that these issues cannot be adequately captured in a classical ‘monetised cost-benefit’ assessment. The lack of systematic alternative assessment frameworks reduces consistency and transparency in public investment choices, and leaves public policy more susceptible to political winds of change, thus raising the cost and risks to private sector investors.

Ofgem’s approach to these issues combines an assessment of key characteristics (optionality; diversity and resilience; learning-by-doing & supply chain potential; and
pathway and lock-in analysis), together with specific tests for stress, security and sustainability implications of major decisions.\(^4\)

Note that the SSA framework informs, but does not determine, the balance between interests of ‘present and future consumers’ (Ofgem’s legal objective) – this is ultimately for the Board to determine and justify, based on both monetised estimates and this complementary evidence on strategic and sustainability implications, as explained further in the Discussion Paper.

**Renewable energy: offshore wind**

For many Northern European countries, a key renewable resource is offshore wind energy. The apparent costs of this have risen substantially and the cost outlook is uncertain. Strategically however, several factors point to considerable value in maintaining offshore wind investment. Exploiting this resource appears important in almost all low carbon scenarios. It is a “big investment” technology with long-run potentials for cost reductions for example through both incremental and radical (eg. alternate advanced materials) innovations.\(^5\) Moreover it is a complex, systems-dependent technology in which both supply chains and the supporting transmission systems have potential for (a) considerable technological advance (see eg. ABB’s recent announcement on HVDC technology) (b) cost reductions through enhanced co-ordination (eg. meshed networks), and (c) potentially major co-benefits associated with the usual gains from trade associated with stronger interconnections particularly (but not exclusively) across the North Sea and Baltics.

These potentials have not been adequately assessed. The NSCOGGI studies to which the Consultation paper refers provide only very limited insight into the potential benefits of North-Sea grid developments, for the simple reason that attempts to include a higher ambition scenario were thwarted by the reluctance of many Member States to offer any specific vision of developments beyond 2020. The result is that the sole reference scenario in NSCOGGI’s 2012 report involves only trivial degree of offshore wind expansion after 2020, in the context of a scenario that is clearly incompatible with the EU’s climate change ambition and German law (the reported EU CO2 emissions in 2030 are similar to those of 2020; the role of interconnectors is substantially to export German coal-based electricity, which is clearly incompatible with the *Energiwender* that was adopted shortly after the NSCOGGI assumptions were finalised).

ENTSO-E’s 2012 ten-year assessment helped to provide a starting input to NSCOGGI, but its published work did not look significantly beyond 2022 and was focused very heavily on transmission needs rather than broader sustainable energy scenarios. ENTSO-E has now begun work on its 2014 10-year assessment, and hopefully these will provide a more useful range of scenarios to understand the potential role of transmission

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\(^4\) See the Ofgem evidence and Discussion Paper on the SSA framework, with a brief summary available as a four page document ‘Assessing strategic and sustainability issues’. Both are available from the Ofgem website or by email from sustainable.energy@ofgem.gov.uk.

\(^5\) EIB will have access to the technical assessments (including the UK Crown Estate’s study on cost reduction potentials in Offshore wind). It remains hard to evaluate the plausibility of specific technological options, but recall also the experience with North Sea oil, which in the 1970s was projected to break even only at oil prices above $30/bbl but which actually continued profitable production at oil prices less than half this, due to a scale of innovation that had been inconceivable at the time of the initial investments.
and renewables in a decarbonising European electricity system. However key results are unlikely to be available for another year or more.
Consultation 4.3 Energy Efficiency

- What do you think are the main barriers to energy efficiency investments? What might be done to overcome these?
- What role can Energy Service Companies (ESCOs) play in developing energy efficiency investments?
- What is the potential for energy efficiency outside Europe?
- Do you consider the criteria used by the Bank to categorise projects as Energy Efficiency projects appropriate (see Annex 1)? What alternative would you propose?

Energy efficiency offers enormous potential, accompanied by an enormous (and underestimated) degree of complexity. It is hardly even possible to describe the “main barriers”; instead, in the Figure I have reproduced a diagram from my (forthcoming) book which classifies both “barriers” and “drivers” under four main headings, as indicated. \(^6\)

The book illustrates energy efficiency as the exemplar of “First Domain” phenomenon in which a good understanding of behavioural and organisational ‘real world’ behaviour is essential to good policy. Fortunately, theories and evidence are now quite well established. Our book gives a relatively brief overview of these; the most

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\(^6\) M.Grubb, J.C.Hourcade, and K.Neuhoff, ‘Planetary Economics and the Three Domains of Sustainable Energy Development’, Taylor and Francis, published Summer 2013: Chapter 4, “Why so wasteful?”, Figure 4.3.
comprehensive assessment, also with strong technological grounding, is to be found in the sectoral chapters of the massive *Global Energy Assessment*.7

In the European policy landscape, a particularly challenge to which I would draw EIBs attention is the relationship to the EU ETS. The tensions around the Energy Efficiency Directive are well known, but this is a microcosm of a larger issue. “Saving emissions” under an emissions cap does not actually save emissions, it just frees up emission allowances that others may then use. Without going into detail, it is important that EIB develops a clear and agreed methodology for evaluating emissions savings arising from energy efficiency investments.

A systematic approach also needs to be disseminated far more widely. For example, the call for evidence asks specifically about ESCOs, and amongst the “drivers” for energy efficiency investment, reducing energy and environmental impacts may feature highly for some consumers.

In my view, this is an additional strong reason for implementing a price floor in the EU ETS, so that successful strategies and cumulatively large investments in energy efficiency do not simply depress the carbon price further, but do result in real emission savings associated with emission allowances not entering the market.

4.4 Security of supply

I do not really see how “Security of supply” can be separated from policy on renewables, efficiency, and fossil fuels; and in practice the questions seem to apply more to networks. In this area I simpler refer across to Ofgem’s evidence to your enquiry, as well as various ongoing work led by DECC on the costs and benefits of interconnection.

4.5 Fossil fuel

I do not have special expertise on fossil fuels. It is clear that gas has a crucial role to play in the European energy balance, and this will endure for decades. Gas is also a natural complement to renewable energy. However, I have become more sceptical about shale gas; Jonathan Stern’s evidence to the House of Lords enquiry, drawing upon the extensive research he had overseen at the Oxford Institute for Energy Studies, seems particularly powerful in this regard.8

Europe has hardly even begun seriously the investments in drilling that would be required to map the possible resource, let alone try to exploit it, in a relatively crowded continent. Such evidence as we have leads me to conclude that the potential for shale gas is in a similar category to some of the renewables – uncertain and likely to be highly contentious. The big differences are that shale gas would have to compete directly with conventional gas imports, large-scale strategic exploitation of gas is less compatible with deep GHG reductions without CCS, which is also likely to make it very expensive; and most shale gas in Europe would appear likely to be worse than conventional gas on both counts.

Finally, exploration for economically attractive shales can be adequately financed by the oil and gas majors, so whilst it would be good to minimise any regulatory hurdles, the

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8 Oral Evidence (12 December 2012) to enquiry into Decarbonisation and Competitiveness by the House of Lords Select Committee on European Affairs, Subcommittee on Agriculture, Environment and Energy; available from the Enquiry website.
case for public sector finance is less clear. In short: it is far from clear what shale gas really offers to European energy strategy and the hype needs to be considered with due caution.

4.6 Research Development and Innovation
The terminology ‘RDI’ suggests a welcome recognition that in the energy sector, innovation is a complex process that involves far more than just research and development. Concerning the questions:

- Which are the key innovative energy technologies under development? The development of which key innovative low-carbon energy technologies should receive most financial support?
- Which barrier(s) are hindering the deployment of innovative, low-carbon energy technologies most significantly?
- Should financial support be spread across a large number of small research projects or be selective and concentrated on a few promising large research projects?

I don’t think we necessarily know the key innovative technologies, though UK analysis suggests that we may have under-appreciated the significance of innovation in system technologies (such as storage and advanced HVDC).

There are many barriers to innovation, but stylised analysis of the ‘Innovation Chain’ points to systematic problems in the transition from public R&D-funded work and applied commercialisations. In my view, there are two hugely underestimated factors:

- Market forces which in some sectors are a major spur to innovation in practice in energy have had the opposite effect, as the focus on short-run spot-market based competition, driven by marginal costs often with regulatory support to encourage “switching”, has led utilities to largely close down R&D investments; whilst
- the lack of ‘product differentiation’ in electricity from a consumer point of view removes the potential incentive for innovative new entrants and means that new entrants are basically having to compete on price alone against well established incumbents which inherent dominate the market through vertical integration. Consumer demand is the major driver of innovation in other markets and it is almost entirely lacking in energy, particularly electricity.

Consequently I think there is a strong case for strengthened public support of RDI and EIB involvement would seem entirely appropriate. In the UK, Ofgem has recognised and responded to the first challenge indicated through its £500m Low Carbon Networks Innovation Fund, and the fundamental change to its approach on price regulation represented by the RIIO framework.

In addition, in the light of the second problem I indicate here, EU governments should also build upon existing initiatives around Fuel Mix Disclosure, and certifications of Renewable Energy Generation Origin, to try and differentiate electricity markets for consumers, and thereby help to facilitate direct consumer investment in clean energy sources. This could enable the remarkable experience with the public response to PV, to be extended to other technologies.

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9 For more detailed discussion see the “Third Domain” Chapters on Innovation and Infrastructure (Chapters 9-11), in M.Grubb et al, Planetary Economics op.cit.

10 Ofgem response to the EIB Energy Sector Lending Policy consultation, December 2012, final sections.