ANSWER TO THE CONSULTATION PAPER:

THE EUROPEAN INVESTMENT BANK REVIEWS ITS ENERGY LENDING POLICY

28th December 2012

1. 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?

In our opinion, the answer to the first question is ‘no’. Despite the economic difficulties, the energy model can reconcile competitiveness and energy security with environmental sustainability. However, energy policy must ensure that these objectives are met efficiently. Energy policy has the tools to make it possible.

Prospective analysis developed by the International Energy Agency and the European Commission (Energy Roadmap 2050) confirmed that the achievement of the decarbonization objective is possible while at the same time ensuring security of energy supply and competitiveness. In the medium to long term, the most ambitious scenarios in terms of CO$_2$ emission reduction (BLUE, 2DS Scenario, Scenario 450 ppm, Decarbonization scenarios) are also those which broadly show lower dependence on fossil fuels, a greater share of renewable energies or nuclear, a reduction in external energy dependence and lower prices of energy commodities (oil, gas, coal). All these elements are very important to the European economy, whose dependence on imports to fulfill its oil and natural gas needs will keep growing by 2050.

An energy model that reconciles these three objectives should consider at least the following elements:

Transforming the Energy System

- **Electrification of energy supply.** All scenarios show that electricity will have to play a much bigger role than at present (almost double its share in final energy demand, reaching 36 to 39% in 2050) and will have to contribute to the decarbonization of transport and heating/cooling.
- **Energy saving and managing demand.**
- **Growing role of renewable energies.**
- **Role of natural gas in the energy transition model.**
- **CO$_2$ capture and storage (CCS) and its relationship with carbon role in the energy model.**
- **Role of oil in the energy mix and its challenges.**
- **Contribution of nuclear energy.**
Within these options, the most cost-efficient one should be prioritized to achieve a sustainable and competitive energy model. Besides, when setting goals, regulators should ensure that they are not overlapped.

**Develop a regulatory framework to foster transformation and mobilize investments**

Achieving decarbonization, competitiveness and energy security goals requires wide-scale replacement of infrastructure and capital goods throughout the economy (including consumer goods in people’s homes).

A stable regulatory framework which considers all the trade-offs among energy policy goals (e.g. taking into account the impact on competitiveness) is essential to provide efficient signals for agents to invest in energy facilities. Uncertainty is a major barrier to investment.

The empirical evidence in the field of renewable energies deployment in the EU shows that increasing the share of renewable energies must go hand in hand with a regulatory framework that provides efficient incentives, the creation and exploitation of economies of scale, and greater integration of the European energy markets.

As a general consideration, an environmental tax reform is an essential element to achieve a sustainable energy model, in economic and environmental terms. A correct design is especially important to launch signals to promote efficient consumption and investment.

**Need for technology development at European level**

One of the main challenges for Europe is to enable market actors to drive down the costs of achieving a low carbon energy model. This is particularly important in the field of renewable energies. In the Energy Roadmap 2050, the European Commission highlighted that their reduction cost should be achieved through improved research and innovation, industrialization of the supply chain and more efficient policies and support schemes.

Early research and innovation efforts are necessary. It will be especially important to coordinate research, innovation and deployment policies at European level to support these efforts.

2. **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?**

The energy sector is very important for the European economy not only for its huge amount of investment but also for providing a basic input for the functioning of the economy (with an essential impact on its competitiveness and GDP growth). Regulatory framework should contribute to make energy a crucial element for the competitiveness of Europe.

Within the energy sector, the electricity sector plays a very important role, which will continue as long as electricity increases its share in the global European energy mix.

In 2008, the European electricity market was worth around 620 billion Euros. This figure represents 5% of EU GDP (Eurostat 2011).
Regarding contribution to employment, the energy sector employs a large number of workers in Europe, with a large proportion of highly qualified jobs (average personnel costs per employee in the energy sector were 40% above the average). (Eurostat 2011).

3. **What impact do you consider the current economic crisis will have on the energy sector (demand, policies, and supply)?**

The economic crisis is changing many of the assumptions underpinning the economic scenarios used in the recent prospective analysis on the energy model. The uncertainties in the economic outlook, lower economic growth, and financing difficulties in the public and private sectors, among others, are having a major impact on the energy sector on both the demand and supply sides.

On the demand side, the lower economic growth coupled with strong prospects for energy efficiency improvements have reduced energy demand in the short term and, in the medium and long term, have determined prospects for a weak energy consumption growth on the horizon 2050 in central scenarios, or a reduction in those scenarios with stringent environmental goals. In all cases, growth of the electricity demand is higher than the total energy consumption due to the trend of electrification of energy supply.

On the supply side, the challenge is to find financing to carry out the investments needed to move towards a less CO2 intensive energy mix, preserving security and competitiveness (e.g. renewable energy, network infrastructure, etc.). The current uncertainty in the economy increases the cost of capital for low-carbon investment, what increases the role of regulation as a tool to improve the conditions for financing in the energy sector.

In this context, energy policy is crucial when tackling the challenge of meeting goals efficiently. The design of policies should promote the transition to a new energy model without compromising the competitiveness of European energy supply.

The energy crisis should open a debate about the tools that the European Union is using to address sustainability objectives, and its compatibility with competitiveness and economic growth. Some strategies developed by other economic blocs show that there are more efficient ways of moving towards sustainable energy model with lower costs to the economy (e.g. U.S. and the shale gas deployment).

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

Drivers for investing in RES are based not just on costs but rather on other strategic commitments: CO2 reduction, security of supply, decreasing the dependence on fossil fuels and possible geopolitical tensions. Therefore, when speaking about costs in RES those positive aspects should be taken into account. Costs in RES are expected to decrease (or, at least, to be stable in real terms), while generation based on fossil fuels are expected to rise, or at least, be extremely volatile. That means that the cost gap between RES and
conventional technologies will eventually disappear even if RES costs don’t see a dramatic reduction.

Support frameworks for renewable energies should be adapted to the economic and technological maturity of each one. For example, those technologies that currently bear high costs and are still far from reaching maturity should be supported via R&D and specific pilot projects.

Nevertheless, and considering the current economic and financial context, investment in RES must prioritize the most cost-effective technologies.

5. What evidence is there that the cost of emerging renewable technology is falling?

Each technology is following its own learning curve and experiencing different cost reductions. But in general, all of them are seeing some level of cost reductions (considering the same resource conditions).

The evolution of three RES technologies illustrates this situation:

- Wind (on shore) is almost competitive with conventional power generation technologies.
- Solar PV has significantly reduced costs.
- CSP has also reduced costs, but it maintains a high level of cost and is still far from reaching maturity.

6. What level of investment in RE do you expect in the short and medium term?

Considering the current economic and financial situation, that has lead to a fall of electricity demand, to a halt of political commitment and policies and a lack of mid-term objectives, in the short term the investment will drop significantly compared with the last years. In the mid term, we expect that this tendency will change and investment in RES will be boosted again.

7. What are the barriers to investment in renewable energy outside Europe? How might these be overcome?

Each country has its own specificities, so it is not correct to treat them all as a whole. The general criteria followed to analyze and make an investment decision is correlated with the barriers to investments and also with the actions needed to overcome them. These elements are:

- Stability of Regulation. The first barrier seen in some countries is the lack a stable regulation.
- Favourable Regulation. As these technologies are all regulatory dependent, the type of regulation and, accordingly, the level of remuneration is critical for the decision making process. The type of regulation covers not only the level of remuneration but also the type of support (i.e. if is fixed or variable); duration of the regulatory scheme; process to access to the grid; planning consents processes, etc.
- Resource. It is obvious that the quality of the resource is vital for investments.
• Infrastructure. Access to the grids and in some cases to another type of infrastructure may prove decisive when deciding an investment. A well developed electrical network, as well as railways, roads or even harbours; or at least the way they can be expanded, is a critical issue in developing renewables everywhere, and especially in some countries outside Europe.

8. Do you agree that there is significant scope for investment in renewable heating and cooling?

9. What are the barriers to investments in this sector and how might these be overcome?

10. What do you think are the main barriers to energy efficiency investments? What might be done to overcome these?

There are three types of barriers to energy efficiency investments:

- Awareness barriers.

Despite the fact that the organisms with responsibilities in this area are developing many actions to promote energy efficiency, awareness is not as important as other variables in decision-making regarding equipment or constructive improvements. Generally, higher priority is given to aesthetic and productivity variables rather than those related to efficiency.

Besides, civil servants hardly have enough technical skills to manage these purchases of equipment, materials and taking into account energy efficiency criteria. Moreover, in some cases, government procurement and accounting procedures make difficult the provision of Energy Services contracts (and their associated investments).

- Economic barriers.

The current economic situation makes difficult the implementation of energy efficiency measures, both because of the lack of own economic resources and also because of the absence of financial lines on reasonable terms.

Besides, energy prices do not always reflect the real cost (as it is the case in the Spanish electricity tariffs), and then the incentive to implement energy efficiency measures is lower.

- Availability barriers.

In many cases, potential end-users do not find efficient solutions on the market, giving up the implementation of the envisaged measures. An example of this situation is the led lamps for housing. At the moment, the department stores and specialized shops do not have a sufficiently complete range of lamps to meet the replacement of the incandescent and the dichroic halogen lamps, which delay its implementation.

To overcome these barriers, it would be necessary to promote actions like:

- Promote the information and training to potential users.

- Facilitate lines of support to those who will apply improvement’s measures, such as tax exemptions, subsidies, etc.
- Enable credit lines with acceptable interest to the potential users of energy efficiency’s measures.
- Revise the rules or procedures of purchasing, accounting and costs of Public Administrations to facilitate the development of Energy Services and associated investments.
- Create a group of specialists within the different public administrations, who can provide support to the different organism in order to carry out Energy Services procurements.
- Aid to stores and consultants who are pioneers in the offer of products and services that maximize energy savings.
- Internalization of all costs in energy prices (including environmental) to reinforce the price signal. Environmental taxation is very useful to achieve this goal. In fact, most empirical analysis on energy efficiency regulatory frameworks highlights the importance of energy price signal to encourage energy efficiency investments. An Environmental Tax Reform is one of the main tools to achieve this goal.

Most of the former elements have been introduced in the recent EU Directive on Energy Efficiency. Along with the abovementioned elements, the Directive also proposes an Energy Efficiency Obligation Scheme on energy distributors/suppliers.

Regarding this scheme, the European experience casts doubts on the efficiency and effectiveness of this regulatory tool. For example, some analyses show that in the UK the cost of reducing a ton of CO$_2$ with the ECO is 77 £ (much higher than many other mitigation options). This suggested using alternative measures (standards, environmental tax reform, training and education, energy labelling schemes…) to achieve an equivalent energy saving target.

11. **What role can Energy Service Companies (ESCOs) play in developing energy efficiency investments?**

The role of ESCOs is basic in the development of investments in efficiency in the residential and tertiary areas, as they are entities aimed to do so, according to the definition provided for in Directive 2006/32/EC.

Regarding the industrial sector, agents usually have distrust about involving an external agent in the core of a business that is key in the income statement account.

Within the tertiary sector, in Spain, at this moment, ESCOs are in practice the only entities that can deal with the investments required to meet the requirements of energy efficiency’s improvement that impose various European Directives to Public Administrations. To carry out contracts of Energy Services, it is necessary to establish measures that prevent the arrears in payment by public sector. Otherwise, ESCOs will stop offering their services to this type of entities.

12. **What is the potential for energy efficiency outside Europe?**

The potential for energy efficiency outside the European Union is very large. It should be highlighted that the European Commission is really concern about energy efficiency, due to
its high dependence on foreign countries for fuel supplies. It also gives great importance to aspects related with the environment protection, and for this reason its members have supported various international protocols that have been signed regarding this matter.

Countries outside the European Union, have however different views energy efficiency. Highly developed countries, such as U.S., because they are energy-intensity countries and have resources on their own, might be more insensitive to these points. As for developing countries, their main concern is to have as soon as possible the resources that they have lacked until now. Energy saving and environmental conservation are then less priority issues. This problem becomes even more evident in the BRICS, which are enjoying a high growth rate and a fast development.

13. 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?

The criteria proposed by the Bank are suitable for large projects. However, most of the projects that SMEs, retail, residential sector... undertake are left without financial support for measures to improve efficiency or for using renewable energies.

14. Is the traditional model for electricity transmission and distribution changing? What implications does this have for future investments in electricity networks?

Assuming that the traditional model was based in: 1st forecasting the expected demand growth; 2nd investing in traditional “copper & iron” assets, 3rd remuneration schemes for TSO & DSO mainly based on the demand growth, we can definitely say it’s changing. As mentioned, the rise of distributed energy sources together with other energy policies, will need an efficient and more automated grid with higher levels of communication, that enables new services that are not possible with the traditional grid (active demand management, for example).

This means that investments have not only to be focused in the generation side, but also in the networks needed as flows will change and be more unpredictable. Remuneration schemes based on the approval of investments plans prepared by TSO & DSO with the support of all actors affected (National & local authorities, generators & consumers) with an adequate rate of return, are essential to give a minimum level of certainty and predictability for the grid investments.

We have to keep in mind that under the actual circumstances of credit crisis, all investments are competing to attract capital, and the development of smart grids / offshore grids may not sound attractive for the level of risk associated with this new investments (as traditionally, grid activities had longer recovery time and lower WACCs, but also lower levels of uncertainty)

15. What is the future role of smart grids, offshore grids and energy storage solutions?

The new electric model that is being designed with the massive deployment of RES and distributed energy, will not work appropriately without them. If we only concentrate on promoting investments in the generation side and we forget the grid side, the electric system will be more unstable and the possibility of black-outs will rise. And it’s important to
consider that most of the new generation that is being connected to the grid, is at Distribution level. The investments needed for Smart Grids in the distribution level is far more relevant than the investments needed at the Transmission level. Therefore, the level of support of the BEI for the Distribution networks should be enhanced.

16. Gas is an important bridging fuel source in the transition to a low carbon economy: to what extent and under what conditions should gas-fired generation be supported?

In the way to achieve the carbon neutrality for the electricity sector, gas will be part of the solution. Gas technologies can offer a flexible low cost - low carbon solution for the transition to a low carbon power system. As new baseload or intermittent low carbon technologies are incorporated to the system, the utilization of gas plants will decrease but its role in providing the services needed for the stability and adequacy of the system will increase. Therefore, gas-fired generation will need a well design regulatory framework that correctly pays for those services.

Moreover, once the electricity system achieves its carbon neutrality, CCS will be a necessary technology if gas plants are to generate significant amounts of energy. In order to maintain a highly diversified mix of primary sources of energy, it would be desirable that gas and other fossil fuels are available for generating electricity in a low carbon economy. However, the competitiveness of the low carbon generation technologies (which includes CCS) will be key in deciding its participation in such a future.

17. What role will coal and lignite fired generation have in the EU power system in the medium term, with or without CCS, and how is this consistent with the EU’s Climate Action goals and its security of supply objectives?

If coal has to have a role in a low carbon economy, CCS will have to be available and competitive with other technologies. As coal-fired generation is very carbon intensive, the need for CCS will appear sooner than for gas, if they want to have a significant role in the medium term during the transition to the low emissions economy. As said for the gas-fired generation, the competitiveness of the low carbon generation technologies (which includes CCS) will decide its future participation in the generation mix.

18. What will be the role of local coal supplies as input for highly efficient CHPs?

19. What evaluation criteria should the Bank use to assess the economic, environmental and financial viability of coal and lignite fired generation?

20. What is the scope for the development of shale gas resources in the EU?

The development of shale gas in Europe is dependent on whether extraction is economically viable. Extraction costs for shale gas are higher than those of conventional gas, as they include more complex extraction techniques, as well as environmental protection measures. Natural gas prices still show a link to oil prices, therefore they have experienced an increase in the latest years. In the future, we expect to see a decoupling between the prices for natural gas and oil, which should increase the competitiveness of conventional natural gas.
The scope for the development of shale gas is also linked to the evolution of gas demand in Europe. There is a danger that investment decisions in shale gas projects are initially economically feasible but, once the shale gas starts entering the markets, we experience a “shale gas boom” in a similar way as the one seen in the USA. This would cause the investments to stop being profitable / economically viable. Therefore, we think that at the moment there is not enough certainty in the market to be able to predict the importance that shale gas could take in the European context.

21. Do you expect the share of natural gas in EU primary energy consumption to grow further?

We believe that the share of natural gas in the EU energy mix should increase, since it is a “cleaner” energy source, when compared with other fossil fuels, having lower CO₂ and other emissions. In the UK, for instance, large investments are expected in CCGT plants (as well as zero-emission ones), given the closure of a significant portion of the existing generation resources, as well as increasing environmental pressures. Nevertheless, new coal technologies will also provide security of supply and flexibility in covering electricity demand while the new low-carbon technologies go through the development stage towards market readiness.

22. What would be the best approach to increase security of gas supply and reduce import dependency?

Security of supply is not necessarily an issue in neither of our main countries of operation in the EU: UK and Spain, since both countries have an important LNG importing capacity, which allows a high diversification of sources for LNG. In the UK, there is some debate about the storing capacity.

We believe that investment in LNG and storage infrastructure must be properly promoted to increase security of supply of the EU as a whole. However, it is important to have a proper balance for these investments to reach an optimum level, to avoid the risk of having stranded assets as a result of “market flooding” as a consequence of too many of these new facilities coming into the market at a much faster rate than demand growth.

23. Given the large uncertainty on future gas demand, what is the risk that investment in natural gas infrastructure may be stranded?

In Spain, we have already seen a situation with stranded assets for natural gas infrastructure, due to, amongst other things, poor planning that took into consideration higher than real demand growth (see our response to the previous question). The UK government has recently presented its new gas strategy plans, announcing a strong investment plan in gas generation technologies, in parallel to the installation of renewable and nuclear sources.

We believe that natural gas demand is expected to grow. Therefore there is scope for new infrastructures to support this growth. However, the investment plans should be properly planned and monitored, to avoid stranding.

24. What role do you expect nuclear power to play in the European energy market?

The long term scenario of a carbon neutral electricity sector as well as the corresponding low carbon society makes it necessary the consideration of all possible low emission energy
sources. Nuclear is of course a well known technology in Europe that, fulfilling all the security requirements, will have to play an important role in the future European energy supply.

25. As nuclear power stations are ageing, should their life be extended (where possible) or should they be replaced with other generation sources?

This is a security matter. As long as the plants fulfill all security requirements from the organizations in charge of guaranteeing a safe operation of the plants, they could have their life extended. In some cases, refurbishment as well as adaptation to new safety requirements will make it more economic to replace them by new generation plants.

26. What will be the impact on electricity generation and climate action of the reconsideration of nuclear policies within EU member states, in particular after the Fukushima accident?

The position in favour or against nuclear development is up to each Member Estate. If the nuclear option is rejected, there is a risk of under developing no emissions technology and therefore, diminishing the rate of decarbonizing the economy. Only equivalent non emitting technologies, such as renewables, could guarantee that global warming objectives are accomplished.

27. Which are the key innovative energy technologies under development? The development of which key innovative low-carbon energy technologies should receive most financial support?

- **Wind offshore** -> key technology that should receive most financial support. Floating device for off-shore applications, Analysis and development in Off-Shore foundations design, building, assembling and maintenance. Large scale network integration, Common carrier with other off-shore technologies.

- **Power distribution: smart grids** -> key technology that should receive most financial support. Increasing the use of information and control technology for management and dynamic optimization of the distribution infrastructure. Deployment and integration of distributed generation, including renewable energies, development and incorporation of demand response, demand-side resources and energy-efficiency resources. Promotion of the deployment and integration of smart technologies for metering and monitoring energy use. Development of standards for grid communication and interoperability. Deployment of advanced electricity storage and peak-shaving technologies, including the integration of plug-in electric vehicles.

- **Ocean, marine tidal/wave** -> key technology that should receive most financial support. Development and testing of wave dynamics technologies to produce electricity.

- **Others: Nuclear, Hydro, Biomass, Wind onshore, Power transmission, Storage, Electric Vehicle.**
28. Which barrier(s) are hindering the deployment of innovative, low-carbon energy technologies most significantly?

Cost, regulatory issues (clear and sustainable strategy) and technological uncertainties.

29. 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?

The financial support should be selective and concentrated on a few promising large research projects, focused on the key innovative energy technologies. The industry is facing such a big challenge that all the support on RDI should be concentrated on a few technologies (described in question 27). For this purpose, all types of public RDI support are needed: Grants, Soft loans, Risk sharing, Private Public partnership schemes depending of the technologies maturity.

30. In a developing market context, where should the balance lie between meeting local energy needs at least cost and reducing global greenhouse gas emissions – the trade-off between affordable energy for all and sustainable energy for all?

Investments should be focused on efficient technologies from an economic and environmental point of view to meet the needs of the 1.3 billion people in the world who still don’t have access to electricity. A production technology should be installed only when the learning curve makes it competitive. A good example is Brazil’s experience promoting universal access to energy supplies. In this way, and together with privately owned companies, it has promoted campaigns such as Luz para Todos (electricity for everyone), which in IBERDROLA’s case has helped to increase supplies to 10 million people over the past decade.

31. What should be the role of the EIB in promoting new technology and helping to transfer existing technologies to new markets?

A key role should be helping new and emerging clean technologies move from the R&D state to the marketplace as well as providing education and training, helping companies implement best clean practices and new technologies into their business processes, and providing business planning and quality control guidance. As mentioned in the previous question, a production technology should be installed only when the learning curve makes it competitive.

32. Where can sources of low-cost finance be more effectively used by the private sector to develop energy projects?

33. What are the main barriers to developing sustainable energy sources in developing markets?

For a business as capital-intensive as the electricity sector, it is essential to have a clear and stable energy model in the long term. For IBERDROLA it is a key issue having clear energy policies and stable regulatory frameworks for the $17 trillion of necessary investments needed by the world energy sector over the next 25 years. Again, Brazil is another good example. Brazil government has prioritized hydro and wind, using combined cycles as backup, and it has implemented an efficient tender process whereby successful bidders are awarded long-term concessions at guaranteed energy prices.