TRANSMISSION DEVELOPMENT PLAN 2006-2010

REPORT ON PUBLIC CONSULTATION

1. Introduction

ESB National Grid as Transmission System Operator (TSO) issued its draft Transmission Development Plan for the period 2006-2010 in accordance with its legal requirements under Statutory Instrument 445 (2000). Regulation 8(6) of SI445 requires the TSO to consult on the plan before submitting it to the Commission for Energy Regulation (CER) for approval:

> (e) The development plan shall be submitted to the Commission for approval.
>
> (f) The transmission system operator shall-
>
> (i) engage in a public consultation process, including any other form of consultation that the Commission may direct, before submitting the development plan to the Commission for approval, and
>
> (ii) report in writing to the Commission on the results of that process not later than when submitting the development plan to the Commission

This report is prepared to fulfil regulation 8(6) (f)(ii). It describes the consultation process, provides an overview of the submissions and the TSO's response to the issues raised.

2. Description of Consultation Process

Following a period for review of the initial draft by the CER, the Transmission Asset Owner (TAO) and the Distribution System Operator (DSO), a draft of the plan was posted on the EirGrid website on January 18th 2006 for consultation. The period allowed for consultation was six weeks ending on February 28th 2006.

Notification of the plan and the consultation process was made in the following ways:

- A news item was placed on EirGrid home page with a link to a page describing the consultation process and a further link to the plan itself.
- Emails were posted to the TSO's client base and other groups likely to be interested in the plan.
- An advertisement was placed in the three national daily newspapers, Irish Times, Irish Independent and the Examiner on 23rd January 2006. A copy of the advertisement is included in Appendix A to this report.

Following publication and notification of the draft plan, a number of key stakeholder groups were contacted with an offer of a presentation on the plan. Presentations were made to representatives of the following groups:

- Irish Business and Employers Confederation, on February 13th 2006.
- Irish Wind Energy Association, on February 15th 2006.
- Western Development Commission Board, on February 21st 2006.
- Department of Communications Marine and Natural Resources on February 23rd 2006.
- Investment and Development Authority, on February 27th 2006.

3. Response to the draft Transmission Development Plan 2006-2010

Twelve submissions were received in response to the consultation on the draft Plan, and are included in Appendix B. These were from:

1. Roy Johnston, Consultant
2. Ballina Chamber of Commerce
3. Sure Engineering
4. Viridian Power and Energy (VPE)
5. Airtricity
6. Forfás
7. Western Development Commission / IBEC West (WDC)
8. Econnect on behalf of the Irish Wind Energy Association (IWEA)
9. Hibernian Wind
10. ESB Power Generation
11. Investment and Development Agency (IDA)
12. ESB Networks

The full submissions are included in the Appendices.

ESB National Grid would like to thank those who responded to the draft Transmission Development Plan. Some of the responses were very detailed covering a wide range of issues.

The rest of this report deals with the issues raised in the submissions. These are dealt with under a number of category headings in an effort to structure the report. Some issues may equally sit under another heading.

- Section 4 Welcome for the Development plan and Consultation
- Section 5 Planning and Development Policy
- Section 6 Planning Process

- Section 7 Specific Wind Issues
- Section 8 Interconnection with other systems
- Section 9 Specific Issues
- Section 10 Clarifications
- Section 11 Issues not Directly Related to the Development Plan

In the following sections, the TSO's responses to the comments made are in italics. It is noted in the TSO's response where changes have been made in the final Transmission Development Plan to take account of the comments and suggestions made.

4. Welcome for Development Plan and Consultation

In general the respondents welcomed the publication of the draft Transmission Development Plan and the opportunity afforded them by the consultation process to comment on the Plan.

> "Sure Engineering (Europe) Ltd welcomes the opportunity to comment on the Grid Development Plan."

> "VP&E welcome the consultation on the Transmission Development Plan 2006-2010 by ESB NG."

> Airtricity: "The provision of this plan, the first Transmission Development Plan (TDP) openly shared with the industry, together with ESBNG's presentation to the IWEA on the 15th February, is a very welcome development."

> "The Western Development Commission (WDC) and IBEC West welcome the opportunity to make a submission to the ESB National Grid Transmission Development Plan 2006-2010.
>
> We also welcome the publication of a draft Development Plan which describes the process of planning and development of electricity transmission in Ireland for the next five years. "

> "Hibernian Wind Power welcomes the publication of this draft of a new document and is pleased to avail of this opportunity to comment upon it.
>
> The draft Development Plan presents vital information comprehensively and with commendable clarity.
>
> Hibernian Wind Power sees it as fulfilling a key role in complementing the cycle of information and insights already put into the public domain every year by ESBNG by means of the Transmission Forecast Statement and the Generation Adequacy Report."

"ESBPG welcomes the opportunity to comment on the draft Transmission Development Plan 2006 – 2010. "

"ESB National Grid's progressive move in taking IDA's Strategic Site Programme into account in the preparation of next years Transmission Forecast Statement underpins all of our efforts to provide a robust infrastructural offering to projects examining Ireland as a potential location for significant investment, as well as supporting Government policy in relation to industrial development and the National Spatial Strategy.

ESB National Grids essential role in this strategy, with the preparation of Prefeasibility Studies and Advance Works Packages, is very much appreciated and valued.

IDA welcomes the preparation of ESB National Grid's Transmission Development Plan 2006 – 2010 in support of your recent Transmission Forecast Statement 2005-2011 publication. "

"ESB Networks welcomes the preparation of this plan, which is a vital step towards the development of a new strategic relationship between ESB Networks and the Transmission System Operator. The need for such a plan is evident, given Ireland's rapidly growing economy as manifested in the huge growth in both electricity consumption and in generation projects. "

5. Planning and Development Policies

A number of respondents raised issues relating to the TSO's planning and development policies.

5.1 A number of respondents thought that the Transmission Development Plan should include detailed plans for dealing with as-yet uncommitted wind generation.

Sure Engineering and WDC/IBEC West want to know how the planned reinforcements presented in the development plan will accommodate signed and planned wind.

Airtricity states that ESBNG only starts reinforcement projects when connection agreements are signed. The long lead-times for reinforcement projects mean that generators get offered non-firm access and have to live with curtailment uncertainties. The current policy does not allow flexibility. ESBNG should review the policy and put a case for change to CER. It should consider all existing applications, apply a success probability, develop likely projects and bring these to an advanced (pre-construction) stage without incurring huge cost. It states that many of these projects will be required anyway.

IWEA argues for early evaluation and modelling in advance of "gate" formation. It also believes that wind farm connection applications should be used as a basis for developing a wind-generation forecast for planning. IWEA reckons that there will be a power flow shift to West-East because of new wind generation on the west coast and demand growth primarily on the east coast. This should be planned for.

With regard to targets IWEA believe that the TSO should look beyond the 13.2% renewables target, and indeed the 2020 target should be viewed as a minimum level in planning the transmission system. It asks if the TSO will adhere to the 2020 Renewables Targets, and whether the TSO is carrying out its own analysis / models?

TSO Response:

The current policy is not to initiate transmission projects which are specifically and uniquely for connection of generation that does not yet have a signed connection agreement. However, this is not to say that we are not aware of the potential future generation or that we have not examined likely impacts on the network, such as the west to east flows envisaged in the IWEA response. Further, in selecting optimum solutions from a range of development options we do take other likely network requirements (such as connection of generation in the queue) into account and may select a higher capacity project on that basis. This approach has been supported by the CER.

The Transmission Development Plan provides planning information in terms of development projects that have been initiated by the TSO, and discussions on other potential developments. Generators in the application queue are dealt with in the plan under the discussions of future potential developments as the projects have not yet been initiated.

The planned reinforcements listed in the Transmission Development Plan will accommodate the signed wind farm connections as these are considered in planning the system. We do carry out early evaluation and modelling of wind farm connections prior to gate formation where, on the basis of Transmission Forecast Statement results and other analyses, we anticipate limited capacity for connections. We will build on this work in developing, selecting and sizing the necessary reinforcement projects following gate formation.

With regard to targets, we support the government's initiative on setting longer-term targets for renewable energy. Our plans will take account of these longer term targets as they emerge.

5.2 WDC and IBEC West point out that the west is particularly reliant on electricity and so it is important that electricity users can plan for future developments confident that supplies will improve and that their remoter locations will not militate against them in terms of electricity provision and cost. They also argue that advanced infrastructure is required to promote regional development, and quote:

- NDP (2000) "electricity infrastructure should not hinder regional development";
- NSS (2002) policy "strengthen energy networks in West, North West, Border, Midlands and North Eastern Areas"

They asked specifically how the National Spatial Strategy is taken in to account in planning the network developments. It also calls for system planning to be done on an all island basis as suggested in the NSS.

The NSS emphasises that "reliable and effective energy systems, such as gas and electricity to power industry and services, are key prerequisites for effective regional development." (NSS, 2002, p64)

It goes on to suggest that "prime considerations in terms of spatial policies relating to energy include:

- Developing energy infrastructure on an all-island basis to the practical and mutual benefit of both the Republic and Northern Ireland
- Strengthening energy networks in the West, North West, Border and North Eastern Areas in particular
- Enhancing both robustness and choice of energy supplies across the regions, through improvements to the national grids for electricity and gas"

They also maintain that 25% of the investment in the BMW regions is not enough.

TSO Response:

The transmission infrastructure in the north-west and the BMW regions generally has been significantly improved since the publication of the NDP (2000) and the NSS (2002), so that the network in these regions is now operating within the same network design standards as the rest of the country. In addition, the plan includes further development in this region to maintain these standards and to ensure an adequate supply to permit a balanced regional development.

It should be pointed out that by their nature these planned transmission development projects will provide a step change in capacity beyond what is immediately required and as such will provide opportunities for further use of the network.

The TSO holds regular planning meetings with NIE with a view to co-operating on network development in the border areas. This co-operation is likely to increase and become more formalised as a consequence of the introduction of the all island electricity market.

5.3 The IDA is concerned that Ireland can demonstrate that loads up to 90 MVA can be accommodated at its Strategic Sites to win internationally significant projects.

TSO Response:

We work closely with the IDA on provision of infrastructure for its strategic sites, as recognised in the IDA's submission. We can and do respond to specific needs as and when they arise. However, provision of large amounts of spare capacity at each site has to be balanced with the knock on cost to the TUoS customer.

It is worth noting that it is unusual that a large load will appear within a short time-frame. It is more usual that a smaller load is connected first and then ramped up to the full capacity. Often, there is capacity in the network to accommodate the likely initial load. The network can then be developed to match the increasing demand. To illustrate this point, the largest load connected in Ireland will soon reach 90 MVA having started up over ten years ago.

5.4 Airtricity suggests the use of SmartGrids (remedial action schemes that would trip out a generator in the event of a line outage causing an overload on another line) to maximise the use of the network for wind generation.

TSO Response:

In general, the use of remedial action schemes is considered as unsuitable for widespread use on the meshed transmission system due to the complexity of the system and the likelihood of un-intended operation. However, they can be and are used on the grid in some limited circumstances, generally as operational tools to bridge a gap until a permanent transmission solution is achieved.

The TSO continually monitors and evaluates the opportunities afforded by new and existing technology for greater use of the network. It is actively participating in the European Commission's work on a Smartgrids technology platform and its development of vision for electricity networks of the future.

5.5 VP&E and Airtricity argue that line ratings should be adjusted dynamically to allow for greater line capacity due to the cooling effects of wind on the lines during high wind generation output.

TSO Response:

We are aware of a number of studies being carried out in the area of variable line ratings. Accurate dynamic line ratings are a complex issue as they are dependent on a number of factors including sunshine, ambient temperature, wind speed and wind direction. It is important in selecting ratings for a line that public safety is not compromised. The ability to accurately determine dynamic line ratings would therefore have to be proven practically before implementing in the planning timeframe. However, given the potential benefits of more dynamic line ratings it is our intention to initiate a study in this area.

6. Planning Process

A number of issues raised related to the TSO's planning process as described in Chapter 2.

6.1 WDC and IBEC West sought more detail of how demand forecasts were established. IWEA wants more transparency in forecasting and consultation with stakeholders in preparation of forecasts.

TSO Response:

Forecasts of system demand are generated based on predictions of key economic variables and using a proven relationship between electricity demand and these economic variables. This forecasting process is described in detail in the TSO's Generation Adequacy Reports, available on www.eirgrid.com. These forecasts are updated annually.

Demand projections at individual transmission stations are developed from the system demand forecasts on a top-down basis. The forecasting process includes regular monitoring and review of trends in consumption in all parts of the country. The allocation of the system demand forecast to each station is based pro-rata on an up-to-date measurement of actual peak demand at each station. In this way, changes in the geo-diversity of electricity consumption are captured. This process provides a station demand forecast and by extension a regional demand forecast for the short to medium term.

This will be clarified in the final Transmission Development Plan.

6.2 VP&E argues that a holistic economic rationale should be applied to the management of the system so that constraints costs are considered in investment decisions. It wants more transparency of the rationale underlying the Transmission Development Plan to understand the basis of decisions made. It also wants a detailed timetable for projects to ensure timely delivery and avoid delays.

TSO Response:

The Transmission Planning Criteria provide a balance between cost and service for most development cases. However, some network limitations have consequences for generation constraints. In the decision to initiate a development, the project may be justified on a holistic economic basis, as suggested in the paragraph entitled "Select Optimum Development Project" in Section 2.4.1.

The plan includes an expected start date, at which point the project could enter the detailed design and construction phase, and an expected completion date. However, these dates are subject to the uncertainties of the public planning and way-leaving processes. Every effort is made to manage the constituencies so that development projects are completed in the least time possible.

6.3 It is unclear to the IWEA whether the planning process has the required flexibility to deal with step change in fuel costs.

TSO Response:

The transmission system is designed to deal with a range of generation scenarios that might result from inter alia different fuel costs. In addition, the process is dynamic and flexible with opportunities at various stages for review of project need and scope.

7. Specific Wind Issues

Several respondents raised issues relating specifically to wind generation.

7.1 The Transmission Planning Criteria were approved in 1998 after an independent review in 1997. A number of respondents have called for a review to take account of the significant wind generation that has connected and is planning to connect to the system.

Airtricity argues that wind is different to thermal generation, its average output is just 35% of its capacity and it never reaches 100% at summer valley. Therefore, designing the network for full access for wind is costly and over-design. It also argues that the TSO's deterministic examination of winter peak, summer peak and summer valley is flawed; it suggests a probabilistic year-round approach.

ESB Power Generation also argue that the Transmission Planning Criteria should be reviewed on the basis that wind and thermal generation will never be both at maximum in a particular area, because of the need for reserve when wind is high.

TSO Response:

We agree that the application of the Transmission Planning Criteria need to be reviewed in light of the emerging way that the system is being used and the new interactions between increasing wind generation and thermal generation. We plan to review the application of the Transmission Planning Criteria this year and these inputs will be considered in that review.

7.2 Airtricity, IWEA and Hibernian Wind refute the claim in the draft plan (Section 3.3.2, page 3-8) that "group processing not only allows more plant to connect at a given time but also means they are likely to do so at a lower cost given the potential to share connection assets with other interacting applications". They claim that the group processing has resulted in higher costs and longer delays in connection. Hibernian wants to know how this situation will be rectified.

TSO Response:

We accept that the wording in the draft may have been unclear. The wording in the final Transmission Development Plan has been altered to indicate that group processing leads to lower overall costs for the group. However, individual connections may have higher costs. It is not clear that group processing in itself has led to significant extra delays.

7.3 The draft TDP states that thermal plant closures may need to be replaced like-for-like to maintain system voltages within acceptable limits and thus avoid the need for additional reinforcements (Section 5.3.5, page 5-14). The IWEA submission pointed out that this suggests unreasonably that a wind-farm cannot replace a thermal generation station, even though wind generation can provide reactive power as required by the Grid Code.

TSO Response:

We accept that if an existing generator closes network reinforcement may be avoided if it is replaced by any generator type at the same location offering the same active and reactive power capability with equal reliability. The wording in the final TDP has been amended to clarify the point.

7.4 The IWEA makes the point that in selecting an optimum project from a number of options, the impact of constraints on generation costs is taken into account. Wind generators do not get paid for any constraint they suffer due to transmission limitations. It claims that they are not, therefore, drivers in the consideration and selection of optimum projects, and that wind is unfairly disadvantaged. IWEA would recommend that an alternative method of evaluation of final generation costs needs to be considered.

TSO Response:

The system is currently designed to ensure access for all connected generation. However, under certain circumstances some level of constraints will exist in the bulk system limiting the output from a group of generators in some areas and requiring output from other generators. In designing out these constraints the TSO considers a number of factors including the likely impact on generation costs. Investment decisions involve a trade-off between the cost of transmission

development and the constraints costs. Wind generation is considered in a similar fashion to other generation in this economic analysis.

7.5 WDC and IBEC West state that the TDP needs to address wind constraints resulting from closure of Unifi and question to what extent Binbane-Letterkenny will resolve wind generation constraints issue.

TSO Response:

The closure of Unifi was taken into account in the preparation of this Transmission Development Plan. The planned Binbane to Letterkenny 110 kV line will significantly reduce constraints for existing and currently contracted generators in Donegal.

7.6 IWEA claims that in terms of statutory legislative requirements, the TDP does not refer to EU Directive 2001/77/EC on promotion of renewables and that it appears to ignore it.

TSO Response:

The directive is referred to in Chapter 3 of the draft TDP. The directive requires the TSO to "guarantee the transmission and distribution of electricity produced by renewable energy sources." The TDP includes plans to accommodate over 1140 MW of wind generation, both existing and with signed connection agreements. The TSO is committed to continuing to connect wind generators and to providing the required transmission service to its customers.

7.7 Hibernian Wind asked what consideration was made of CER's suggestion that a review of the Connection Policy "should be considered under the forthcoming multi-annual review of network investment …" i.e. the TDP. The final TDP should record the outcome of that consideration. It wants details as to how Gate 2 group processing will speed up the current backlog.

TSO Response:

A significant number of changes have been made to connection policy in recent times, including group processing, connection charging and GUDP funding. These have been taken into account as appropriate in the multi-annual review of network investment as an input to CER's pricing review. A review of contestability is underway. Other aspects of connection policy may benefit from further review, such as is planned as part of the All Island Project.

CER's draft proposals for Gate 2 processing, if progressed, is expected to reduce the current backlog by issuing offers to approximately 1,300 MW of wind farm applications.

8. Interconnections with Other Systems

A number of issues concerning interconnections were raised.

8.1 IWEA wondered if CP466 matched the description of a second interconnector to Northern Ireland in the discussions in Section 3.4.1.

In relation to the second interconnector with Northern Ireland, Airtricity claims that the draft TDP fails to address “this critical infrastructure”.

TSO Response:

The project CP466 described in Section 4 is the second interconnector project discussed earlier in Section 3.4.1 and is thus addressed in the plan. The final TDP makes this clear.

8.2 Sure Engineering is concerned at the lack of consultation on options before selection of the second interconnector with Northern Ireland. It claims that ESBNG could not model the NIE system and therefore the chosen solution is sub-optimal. It suggests that the route chosen is to facilitate Coolkeragh access to the RoI market. It suggests however another circuit connecting Coolkeragh with Srananagh 220 kV station to facilitate wind. It also recommends that part of the NIE 275 kV networks be upgraded to 400 kV and that Tandragee should then be connected to the RoI network with a circuit east of the two 220 kV lines to Louth. While this option may be more expensive initially than the chosen solution, CER should allow the expenditure as it would facilitate renewables exporting to Great Britain.

Airtricity would like to see details of the options being considered for a second interconnector with Northern Ireland included in the final plan. IWEA would like to know what other options were considered – routes and voltage levels – for the second RoI-NI interconnector.

TSO Response:

The selection of the second RoI-NI interconnector project (CP466) came after extensive joint studies between ESBNG and NIE using combined models of both systems. The project was selected from a range of options on the basis of the criteria as outlined in Section 2.4.1. The application for planning permission will include a description of other options considered.

8.3 A number of respondents expected that the TDP would deal with the RoI-GB interconnector. Airtricity sought details of the options being considered for the interconnector to Great Britain. IWEA states that it is unreasonable to omit the RoI-GB interconnector from the plan.

The Forfás submission dealt entirely with the need to progress the RoI-GB interconnector. To this end it suggested that the TSO should progress the engineering design and deep reinforcements now (ahead of the DCMNR/CER decision to proceed or selection of the route and connection points).

TSO Response:

At present the connection points for this interconnector are not known. For that reason it is dealt with in the TDP under the discussions of future potential developments. The TSO understands that the decision in relation to the

interconnector project is the subject of a submission from the CER to the Minister for the Department of Communications, Marine and Natural Resources and that a decision is expected shortly. The TSO is cooperating with CER in its considerations including analysis of possible deep reinforcements arising from different route options. We will continue to co-operate with CER in whatever role we are requested to undertake.

9. Specific Issues

The following specific comments were received.

9.1 Ballina Chamber argued that a minimum of a 220 kV connection to Ballina is required for economic development in that area, and to connect likely wind and gas fired generation that is likely to follow Corrib gas.

TSO Response:

The network in North Mayo is within standards following significant investment in the area. The TSO has initiated further projects detailed in this plan, in particular the Castlebar–Tonroe project, which will ensure that the network remains within standards while meeting increased demands in Ballina and surrounding areas.

9.2 WDC / IBEC West are concerned that capital budgeting may mean that the Castelbar-Tonroe line is built at 110 kV not 220 kV.

TSO Response:

It is our intention that the Castlebar-Tonroe line is built at 220 kV. However, if capital constraints impact on the development programme it will be necessary to review all projects and project scopes while maintaining the integrity of the system.

9.3 WDC / IBEC West suggest the better use be made of Letterkenny-Strabane for the benefit of Donegal.

TSO Response:

The Letterkenny-Strabane 110 kV line is used in planning models and as intended it provides support for the network in Donegal in some circumstances.

9.4 WDC / IBEC West expect that future Transmission Development Plans will deal with emerging problems in the west, described in Section 5.1.3.

TSO Response:

This is correct.

9.5 IWEA asked whether the capital budget allowed by CER for the 2006-2010 period includes, in addition to the costs of projects already initiated, provisions for potential future developments as described in Section 5 of the draft TDP, in

particular those arising from potential overloads, interconnection with Great Britain, generation connections with live offers, DSO connections, refurbishments and diversions, alterations and minor capital works.

TSO Response:

Capital provisions for potential future developments, adjusted by appropriate probabilities, were included in the submission to CER for the 2006-2010 price review. Subsequently the CER capped the overall capital expenditure at €520 million. We have indicated to the CER that we will work with the constraints imposed but will revert to the CER should this have serious implications. The impact of the capital constraints will be monitored as we progress through the period to 2010.

9.6 ESB Networks stated that there was not enough detail in the plan to enable it to prepare a full Programme Implementation Plan or to prepare a Project Implementation Plan for the projects listed.

TSO Response:

Through regular interface meetings and information exchanges, the Transmission Asset Owner is aware of all the projects listed in the Transmission Development Plan and has full details of the projects as far as they are available. With regard to potential future developments the TSO has not selected a project and so can not provide project information for these developments.

9.7 ESB Networks stated that reinforcements for the Dublin area have not been spelled out in the plan, but that the plan acknowledges the need for such developments.

TSO Response:

The TSO confirms that reinforcements will be required in the Dublin area to meet the needs of the city and its growing environs. Details of reinforcement projects to meet these needs will be included in future plans as they are selected and initiated.

10. Clarifications

A number of issues raised indicated that the reader may have mis-interpreted the information provided in the draft plan and that certain clarifications are required.

10.1 Some respondents interpreted 2006-2010 period of the TDP as the period for which the TSO planned. They argued that a five year planning horizon is too short. WDC and IBEC West point out that the long term strategic view is missing from the TDP.

TSO Response:

The legislation under which the TDP is prepared, Statutory Instrument 445 (2000), requires the TSO to produce a plan outlining its transmission development requirements over the following five years. In the case of the current draft this

relates to the period 2006 to 2010. The TDP provides information about all development projects, some of which are currently under construction and other that are likely to enter the construction phase towards the end of the 2006-2010 period. Many of the major projects in the plan deal with network issues emerging beyond 2010. The TSO does consider the long-term needs of the network, as referred to under the heading "Evaluate Network Performance" on page 2-7. The TSO has identified potential longer-term development requirements depending on certain drivers occurring. These requirements are considered in the context of project selection. However, the TSO will not initiate other projects to deal with long-term needs before it is required to, on the basis that conditions are highly likely to change and the plan needs to be cost effective for the TUoS customer and flexible enough to manage these changes.

10.2 IWEA claims that IPPs, particularly wind farm developers, have built 110 kV infrastructure in less time than suggested in Figure 2-2 of the draft TDP. It suggests that these project lead-times should be reviewed. The proposed Critical Infrastructure Bill should be taken into account.

TSO Response:

The project lead-times illustrated in Figure 2-2 are typical values derived from recent experience. They are not intended as target values. Naturally the lead-time for a specific connection project will depend on the length of line, the terrain and the number of local authorities involved. Short 110 kV lines may indeed be completed in less than the five years indicated in Figure 2-2. The likely impact of the Critical Infrastructure Bill will be clearer when the details of the bill are made public. It is expected that the public planning phase of major transmission projects may be reduced following successful implementation of the bill.

11. Issues not directly related to the Development Plan

Finally, a number of issues raised were not directly related to the Transmission Development Plan and if appropriate will be dealt with by the TSO outside of this process.

11.1 IWEA suggests that wind generators should be paid for reactive power. This would allow for optimum investment for reactive power support.

TSO Response:

The Grid Code requires wind generators to provide reactive power capability. Payment for reactive power is not a TDP issue.

11.2 Sure Engineering is concerned about the independence of ESB National Grid as TSO.

TSO Response:

ESB National Grid is a ring-fenced business unit of ESB acting independently from the rest of ESB. It is expected that the TSO role will soon transfer to EirGrid, a separate and fully independent company.

11.3 Airtricity and IWEA expressed concern that the two thermal generators mentioned in Chapter 5 may be allowed skip the queue for system security reasons.

TSO Response: This issue is not directly related to the Transmission Development Plan.

11.4 VP&E wants the ESBNG to suggest economic signals to discourage new CCGT plant. Peaking plant would facilitate wind in the west. It also wants ESBNG to suggest economic signals to encourage the retirement of old Dublin generation to relieve congestion in Dublin.

TSO Response: This issue is not directly related to the Transmission Development Plan.

Appendix A Newspaper Advertisement

ESB National Grid Issues its Transmission Development Plan 2006-2010 for Public Consultation

ESB National Grid, the agency responsible for operation and development of Ireland's transmission system, has issued a draft Transmission Development Plan covering the years 2006 to 2010 for public consultation.

The draft Development Plan outlines the programme for transmission network development over the next five years (including projects which are under construction) and indicates where further potential development is likely to be required in this period.

ESB National Grid is now inviting comment on this draft Transmission Development Plan. Responses should be submitted by February 28th, 2006. The draft Plan and details of how to respond are available at www.eirgrid.com

ESB National Grid www.eirgrid.com

Figure 1 Newspaper advertisement placed on January 23rd, 2006

Appendix B Full Responses to the Draft Transmission Development Plan

1. Roy Johnston, Consultant
2. Ballina Chamber of Commerce
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10. ESB Power Generation
11. Investment and Development Agency (IDA)
12. ESB Networks

-----Original Message-----
From: Roy Johnston [mailto:rjtechne@iol.ie]
Sent: 28 January 2006 18:24
To: info@eirgrid.com; emer@eos.ie
Subject: comments on grid plan

At Emer's suggestion I have looked at the website, and examined the Grid mapping. I must say I find the rationale for the layout hard to follow; presumably it has evolved over various technologies from the pioneering Shannon Scheme, taking on board successive generations of production systems, adapting finally to link with Moneypoint.

With this structure it seems the Grid has found problems in adapting to the emergence of wind generation as a serious source, in such a way as apparently to put a brake on the latter. This suggests a serious need for some strategic thinking on the role of the Grid.

I feel I should offer the suggestion that this strategic role should be given priority. I made this case at a meeting of the Electrical Division of the IEI in UCD recently (20/01/05), in response to a paper by Larry Staudt, the Dundalk wind-energy expert. I had hopes that someone in the know might take it up; I don't have the resources to do so myself.

Essentially, the question to ask is, what sort of Grid layout would we need if renewable energy generation is actually to be encouraged? The key renewable sources are wind-farms, from selected identifiable exposed areas, and in accessible areas at sea, and also biomass, but the latter I feel need research. Are we talking about forestry waste and wood chips from dedicated energy plantations, perhaps feeding CHP systems in urban areas? Or are we talking about dedicated managed biomass systems intensively feeding fast pyrolysis units, and if so, is the main output gas for the gas grid, or liquid fuel for transport? These technologies were discussed in a renewable energy conference at the RDS on 28/11/03, to which ESB input was, if I remember correctly, notable for its absence.

In other words, does the electicity grid need to adapt to the existence of the gas grid, and vice versa? And/or does the electricity grid need to adapt to the extensive existence of a large number of relatively small local CHP systems?

Also, the utility of CHP systems at the urban domestic level needs some strategic planning, if the electricity demand is to reconciled with the domestic hot water demand. For example, is there perhaps a need to plan for buffer domestic storage of hot water, produced at electical peak generation time? Might there be a role for a domestic-scale heat pump?

I looked into this in the context of the Cloughjordan eco-village planning, and developed an outline proposal, but was unable to pursue it at the time. I did however discover that heat pumps on a scale intermediate between the domestic refrigerator and the large-scale cold-store system did exist on the market, and that by suitable selection of working fluid a source temperature of say 30 and sink temp of 60 could efficiently be accommodated. I

had in mind a CHP system on a village scale feeding low-grade hot-water stores in individual houses, and then the heat being pumped up to domestic hot water temperature, using off-peak electricity in heat-pump mode, giving a gain of perhaps 4 or 5 over ohmic heating.

I can see much scope for detailed techno-economic modelling, and a national level, and at specific urban levels, to explore in 'what-if' mode a variety of energy system mixes. From this one selects a satisficing set of solutions, and then plans the Grid to encourage them.

If anyone gets to do this, I would be interested to interact with the process, having done much techno-economic modelling in my time; in my semi-retirement however I am not in a position to be a prime mover.

RoyJ

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Please note change of address:

Roy H W Johnston PhD FInstP CIEI
Techne Associates: Consultants on Techno-economic, Socio-technical, Political and Environmental Issues. 47 Meadowbank, Bushy Park Rd, Rathgar, Dublin 6; Phone +353-1-490-4040; e-mail rjtechne@iol.ie; website http://www.iol.ie/~rjtechne/.

-----Original Message-----
From: McDonnell Louise, BCOF [mailto:louisemcdonnell@ballinachamber.com]
Sent: 27 February 2006 17:09
To: info@eirgrid.com
Subject: Submission from Ballina Chamber

Ballina CHAMBER
IN BUSINESS FOR BUSINESS

Louis Fisher
Grid Development and Commercial Department
ESB National Grid
27 Lower Fitzwilliam St,
Dublin 2,

Dear Louis,

Ballina Chamber is the leading business organisation in North Mayo, representing 200 businesses that in turn employ 2500 people. We are committed to campaigning to secure the highest quality infrastructure for our region, infrastructure that is necessary for our businesses to operate on a level playing pitch and to facilitate any future growth. Infrastructure that is also necessary for us to attract new businesses and provide greater employment opportunities in Ballina and North Mayo.

We note the publication of the draft "Transmission Development Plan 2006 – 2010". We welcome your commitment to expand the 220 kv system into the North West and we wish to make the following points:

- Ballina is designated as a hub town in the National Spatial Strategy. We note your commitment in the plan, *"to facilitate its (NSS) delivery through the provision of a high quality transmission infrastructure where it is required*". In order to derive the benefits from our hub town status, Ballina must receive connection to a minimum of a 220kv line.
- As you are aware, there are detailed plans in place to bring ashore the contents of the Corrib Gas Field in North Mayo, a project which has the full support of this Chamber. There are other proposals in relation to the construction of a gas powered electricity generation station and a major wind farm in the region. In order to enhance the economic case for these developments we feel that the region require a 220 kv connection.
- Finally, we also welcome your commitment to "*provide the backbone for further economic development in the regions*". A 220kv connection is an essential backbone for the development of Ballina and North Mayo.

We look forward to hearing from you in the future.

Yours sincerely

Ed Gunning
President
Ballina Chamber Of Commerce

GRID DEVELOPMENT PLAN

Sure Engineering (Europe) Ltd welcomes the opportunity to comment on the Grid Development Plan. We set out our points and concerns below:

- All reinforcements to the grid are important. However the Plan does not explicitly set out how the proposed reinforcements will optimise grid performance in order to accommodate firstly the current slate of windfarm developments but also those whose future plans are known.
- Therefore while this first engagement with the TUOS paying community is useful, in our opinion the need for a standing wholly independent body with authority for grid operation, management and planning is manifestly clear.
- The planning window that is currently set at five years is far too short. We strongly urge that a multi-strata approach with a fifteen year time horizon is more appropriate.
- The on-going concerns of many if not virtually the entire body of non-ESB industry participants, to the links (however tenuous, however stated to the contrary) between the owner of the grid asset and this body that is consulting with the users as to its future development remain.
- It is difficult to believe that the proposed 400kV link heading in the general direction of the new ESB power plant at Coolkerragh has not in some way been the subject of grid planning between one element of the grid asset owner, the owner of the power plant and the planner of the grid. The fact that such grid planning even at this probability could take place without full and open engagement with all parties adds substance to the need for the standing body referred to above.
- There are two steps that would achieve the important further integration of not only the Coolkerragh power plant into the combined NI and ROI systems but also facilitate low cost renewable energy.
    - The western corridor from Coolkerragh through Co Donegal to meet up with the newly developed 220kV at Sligo would have the effect of improving the connection capacity for wind power in the North West.
    - Upgrading the lines to Tandragee to 400kV from both Ballylumford and Castlereagh and then linking Tandragee by means of an Eastern corridor link has not been presented as a proposal. The fact that ESB NG cannot model the NI system suggests that the 400kV link as proposed is based on less that the full range of options. A strong Eastern corridor would be of benefit to longer term plans that would include export of low cost renewable energy to the UK and beyond.

- As always the defence of such arguments in favour of the presented preferred choice is that the alternative is more expensive in terms of final prices to end users. We submit that viewed in the round this is no longer true. Indeed the ongoing trend where wind power has passed the point of being cheaper than the current best new gas fired entrant is likely to continue. Wind power, is therefore moving from having been “a tiny speck on the radar screen” to a potentially substantial and ever more reliable source of energy. Given these changes it is timely for the regulator(s) both NI and ROI to consider whether a

slightly more advanced spend on the grid infrastructure that will allow for more of the cheap power from wind is now timely.

We would welcome the opportunity to discuss and enlarge upon any of the issues raised in this response.

etc

Response from VP&E dated 28th February 2006

Introduction

VP&E welcome the consultation on the Transmission Development Plan 2006-2010 by ESB NG.

Constraints and Congestion

Consideration for constraint costs as a result of congestion should inform investment decisions on the level of investment required and the timing of an investment. A holistic economic rationale should be applied to the management of the system, with consideration for wider market metrics. The structure of the future All island SEM (Single Electricity Market) will determine how constraint costs are allocated to generation, and studies of the costs of network upgrades to avoid these constraint costs should inform network planning decisions. Progressing the North South Interconnector upgrade is a major priority in reducing constraint payments under the SEM.

Lack of investment in a region or a poorly timed investment can result in costs in excess of the costs that would be required to deliver an appropriate upgrade of the network at an appropriate time. A plan based on economic considerations should optimise network investment, deliver a plan for the management of the network and provide a level of transparency and accountability for efficient implementation.

Transparency of the rationale underlying the management plan for the transmission system is necessary to understand the basis for decisions made.

Delays

As funding for the transmission system ultimately comes from customers it is important that the costs of delays are considered. A full and detailed timetable for work on the transmission system is necessary to ensure that work is done on time.

Infrastructure Requirements for Renewables

Whilst the government target of 13.2% of energy from renewable generation by 2010 is likely to be met the full benefits of wind generation, both to security of supply and economic benefits, are restricted by the limited capacity of the transmission system. Consideration for measures such as increasing the capacity of lines in high winds due to the cooling effect, allowing more wind based generation on the system could contribute to maximising the use of the existing network.

Plant Retirement Reducing Congestion

Congestion in the Dublin area could be alleviated by the retirement of older less efficient generation plant in the Dublin area and an increase in load resulting from economic growth. This could contribute to a reduction in transmission issues with a concomitant reduction in losses to generation plant in the area. ESB NG could suggest economic signals for the retirement of older generation plant.

Peaking Plant Supporting Wind Generation

The wind generation in the west of Ireland could be supported by peaking plant. An appropriate generation plant mix would reduce the impact on the transmission system and the requirement for additional reinforcement that would be necessary for a plant mix of CCGTs with wind generation in the system.

As the new build of CCGTs will limit the penetration of renewables ESB NG could suggest an appropriate economic signal to curtail this, say by the imposition of penalties.

VP&E agree with the statement by Michael Kelly of ESB NG that *"... the arrival of new generation, interconnection or a large cluster of wind farms could significantly change how dynamic issues are addressed"*. This underlines the need for economic signals to encourage an appropriate plant mix to allow increased renewable penetration.

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Airtricity
The Natural Progression

Mr Louis Fisher
Grid Development and Commercial Department
ESB National Grid
27 Lower Fitzwilliam Street
Dublin 2

28th February 2006

Subject: Response to ESBNG document -"Transmission Development Plan 2006-2010"

Dear Louis,

This submission is in response to an invitation from ESB National Grid (ESBNG) to comment on the 'Transmission Development Plan 2006-2010' document. The provision of this plan, the first Transmission Development Plan (TDP) openly shared with the industry, together with ESBNG's presentation to the IWEA on the 15th February, is a very welcome development.

Airtricitys' comments on the draft plan fall largely into four categories:

1. Long-term horizon planning
2. Changes required to the current Transmission Planning Criteria (TPC)
3. Interconnection with other systems
4. Other general issues

1. Long-term Horizon Planning

A very real current problem with transmission system development in Ireland is the time disparity between delivery of a 'shallow' connection (to connect a generator to the grid) and completion of the associated 'deep reinforcement' works. Typically the shallow works can be completed in two years with the associated deep reinforcement works requiring a further six years. This has resulted in the latest 'Gate 1' group of generators connecting on a 'non-firm' basis initially and living with curtailment uncertainties until the required deep works are complete.

The problem originates from the fact that the TSO does not commence materially with any deep system upgrades associated with a project until the execution of a Grid Connection

Agreement. We believe that considerable efficiencies could be realised if this policy were to change. By considering system upgrades, generally required in any case to alleviate current and predicted system bottlenecks, shorter lead-times to gain firm access would occur and lower overall system development costs could be realised.

As an example of one of the limitations of the current policy consider the following scenario; a group of generators connect to the grid requiring a new section of meshed 110kV line. It is known that a further group of generators in the same area will be issued with offers in a subsequent Gate in the near future. However the 110kV line is only sized for the initial Gate. When the subsequent Gate issues the line has to be taken back down and re-strung with a larger conductor causing significant further outage duration and cost inefficiencies. This case illustrates a classic example of where the marginal cost of a heavier conductor should be funded from the outset with costs recovered from future connections.

By analysing the current generation queue, where the potential sizes and locations of future plant are well documented, and by applying appropriate 'probability success factors', a number of 'expected future reinforcements' can easily be identified. The current gate process and the unprecedented backlog of applications awaiting offers to connect facilitate this approach. Since the first 40% of time spent on these projects is preliminary design and planning, a significantly lower cost investment is involved during the early project stages. This could allow projects to initiate and proceed to a point with relatively little cost expenditure. It is important to note that many of these upgrades will be required in any case to alleviate known network bottlenecks as the system grows, regardless of exactly where a new generator locates.

While ESBNG outline that they, "consider the effectiveness of options in meeting the longer-term needs", and that they, "seek ways to phase the project", current policy does not allow the flexibility required. We feel it would therefore be prudent to review current policy with a view to amending. We would suggest that the TSO advise the CER of the potential efficiencies that could be realised. Savings would ultimately be passed on to the customers who fund the transmission system.

Another aspect of long-term horizon planning that we feel should change surrounds the provision of reactive power. System upgrades, triggered under the current Transmission Planning Criteria normally fall into one of three categories:

a) Transformer upgrades

b) Line upgrades/installations

c) Reactive Power device installations, to mitigate voltage stability issues

While the former part of section 1 deals mostly with a & b above we also feel that considerable efficiencies could be realised through an integrated approach to reactive power

planning. Reactive power is required throughout the system to support network voltage. It is outlined in the TDP as being required further in the North-East, West, East and South-West over the duration of the plan. Some wind technologies are particularly adept at providing reactive power support, even when the wind is not blowing. An example of this is our Meentycat site in Co. Donegal which has over 74Mvar of reactive power capacity on a 24/7 basis. However, while conventional generation is remunerated for provision of this necessary service, renewable generators are not. The lack of any financial incentive means that wind developers do not currently consider whether or not the technology type they are selecting for a project has the capability to provide this function. We have been in discussions with ESBNG for almost two years on this issue and would contend that it is in the best interests of the consumer to amend this policy and allow ancillary service payments to renewable generators. This would send out the appropriate market signals and potentially result in deferring a significant portion of unnecessary capital spend. For example, section 5.1.2 highlights the requirement for reactive power in the North-East around Louth and Gorman 220kV stations. Airtricity are aware of large 110kV wind farm projects in the area with signed connection agreements that, if suitably equipped, could have provided a significant portion of the anticipated requirements. It could also be argued that the recent addition of a 30Mvar SVAR compensator at Letterkenny could have been averted, with significant savings to the customer, if an integrated planning approach had been undertaken with wind farms in the area.

2. Changes to the current Transmission Planning Criteria (TPC)

The current TPC document was last amended in 1998. It was originally conceived on the basis that most of the plant connecting to the grid would be conventional generation. Given the growing portion of renewable generators connecting to the system, particularly wind power, we would contend that a full and formal review needs to take place.

Wind powered generation has inherently different output characteristics to that of conventional generating plant. With typical capacity factors of circa 35%, the average wind farm will produce significantly less power per annum than an equivalent (name-plate) rated base load or mid-merit conventional generator.

The TPC sets the trigger levels for system reinforcement. The addition of small amounts of generation can trigger a required upgrade. If the current Transmission Planning Criteria were to be applied in a power system with a high penetration of wind, then significant levels of network over-design would occur. On the one hand the application of the criteria in its current format ensures a robust and reliable transmission system. On the other it is uneconomic and wasteful of resources resulting in overdevelopment in certain areas. This over-development is not necessarily beneficial in terms of overall system reliability as resources could be deployed more optimally elsewhere. Wind generation, due to its variable and stochastic nature, requires a fundamental shift in the techniques used for planning and operating power systems. It is no

longer appropriate to apply entirely deterministic operational and planning criteria. We would envisage that system development could occur in a more optimal fashion if a degree of probabilistic assessment were to be employed.

Transmission planning assessments have been typically based on “snapshots” of the system at times such as summer night valley, summer peak, and winter peak. The assumption that the rules and criteria which are derived from these snapshots are applicable during all hours of the year is flawed. New operational and planning techniques are required.

Figure 1 below is used to better illustrate the inadequacies of using deterministic snapshots to assess a fundamentally stochastic problem. It shows the frequency of occurrence of the various combinations of wind output and load level. This is based on an all-island load series and a synthetic all-island wind series. Load level is expressed in % where 100% equates to winter peak and 0% equates to summer night valley.

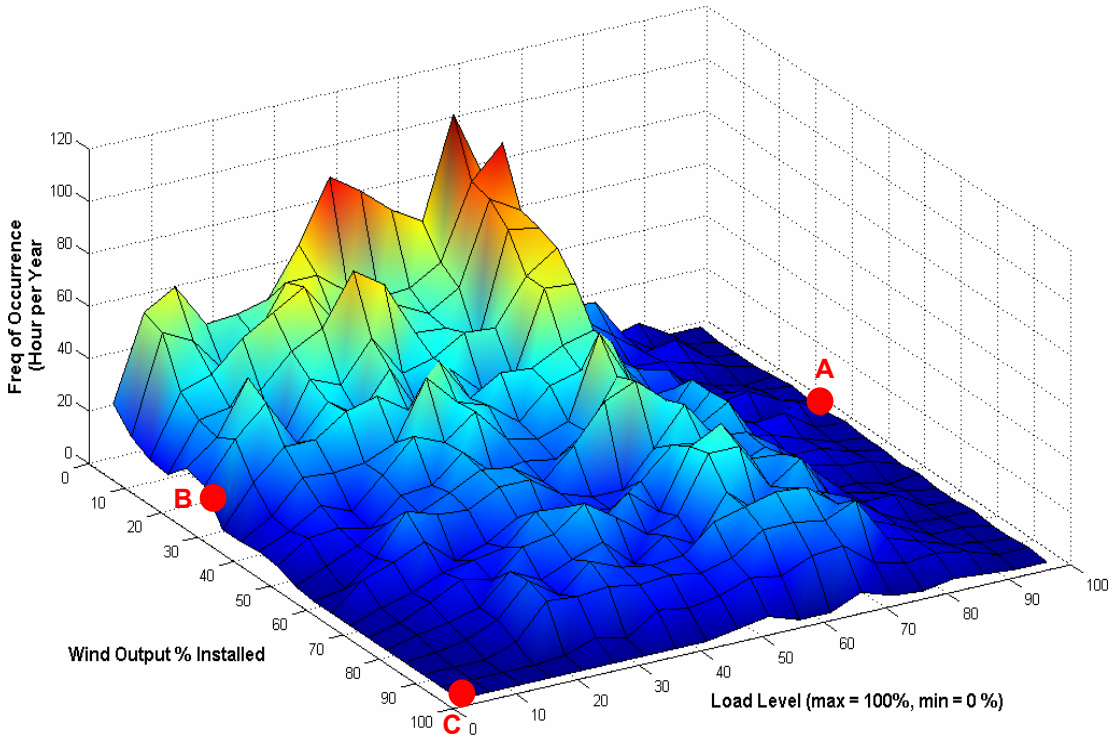

Figure 1 - Frequency of occurrence of load level and wind output

Point A equates the winter peak and average wind output. Point B equates the summer night valley and average wind output. Point C equates to the summer night valley with maximum wind output.

Points A and B along with another point at the summer peak are used to assess the state of the network in the ESB NG forecast statements. It is clear from looking at Figure 1 that three points are grossly inadequate to represent the state of the network with high wind penetrations in each hour during the year. Consideration of other system variables such as

unusual system power flow due to combinations of line or generator outage and geographically disparate wind output will only serve to highlight the failings of this technique.

Point C in the Figure plays an important role currently in connection offers to generation. Basing connection offers for wind generation on a summer night valley scenario with maximum wind output is flawed. Figure 1 shows that this combination of events will almost certainly never happen.

A number of new methodologies can be incorporated within a revised TPC. These include:

i) 'Intelligent' or 'SmartGrid' devices within the system to recognise the potential for overloading during system contingencies and take an appropriate action; e.g. line A has potential to become overloaded during the outage of line B; therefore if line B trips, limit the output of local generation to x% to avoid an overload condition.

ii) A probabilistic assessment of wind output during the periods under review, as the combined output from all wind generators on the Irish Grid during the summer months is never 100%.

iii) Dynamic line ratings. A particular problem with the current assumptions is the non-inclusion of dynamic line rating information when assessing line loading. The criteria currently uses the normal and emergency limits based on seasonal line ratings; i.e. summer line ratings for summer night-time valley and summer peak assessments. These assessments assume 100% output from wind generation. However, Figure 2 illustrates that line rating has a significant dynamic element. It shows that line rating is in fact proportional in some degree to wind speed. The graph shows that for a wind speed of 1m/s the line rating is 1,950A for an ambient temperature of 10^{o}c. For an 8m/s wind speed, where a typical wind generator output will be at c25% of nameplate rating, the line rating is 3,750A. Since the summer ratings applied in the current TPC assume a zero wind speed then the application of this rating in a high wind scenario is inappropriate. NIE, for example, apply a higher 'autumn rating' in assessing line rating capability for wind related projects. They are currently performing investigative studies to assess the degree of extra capacity that can be released in various scenarios by the inclusion of a dynamic element in these assessments. Such changes have the potential to significantly defer network reinforcement.

The method of deterministically assessing the state and requirements of the network with high wind penetrations using "snapshot" hours will become increasingly invalid for the reasons highlighted above. Methods are required that will appropriately capture the stochastic elements of the system. Ideally, this will require network assessments not only during a few "snapshot" hours but during all hours of the year using realistic time series for wind production and other key inputs. Ideally all relevant system variables should be handled in a similar

stochastic manner. Network power flow analysis is computationally intensive and by no means a trivial task. However, modern processing and data handling capabilities mean that the task of year long network assessment is certainly achievable.

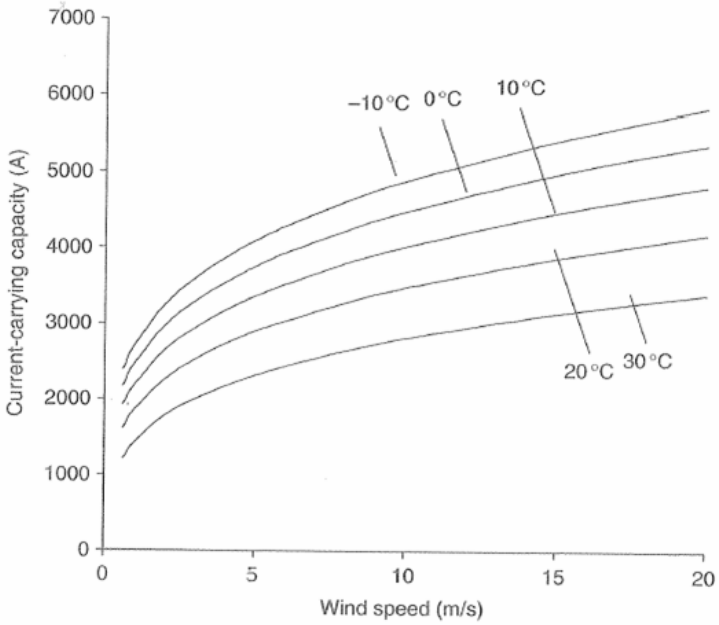

Figure 2 – Variation of line rating with wind speed

More innovative network planning techniques will not just help facilitate more efficient use of the network but it will also help discover and quantify the probability of unusual coincident conditions which would jeopardise system security and reliability of the system

One illustration of how year long transmission assessment may help the efficient utilisation of the network is given in Figure 3. The illustration shows how much wind capacity may be connected at a point on the network versus the of energy curtailment from the capacity due to transmission constraints.

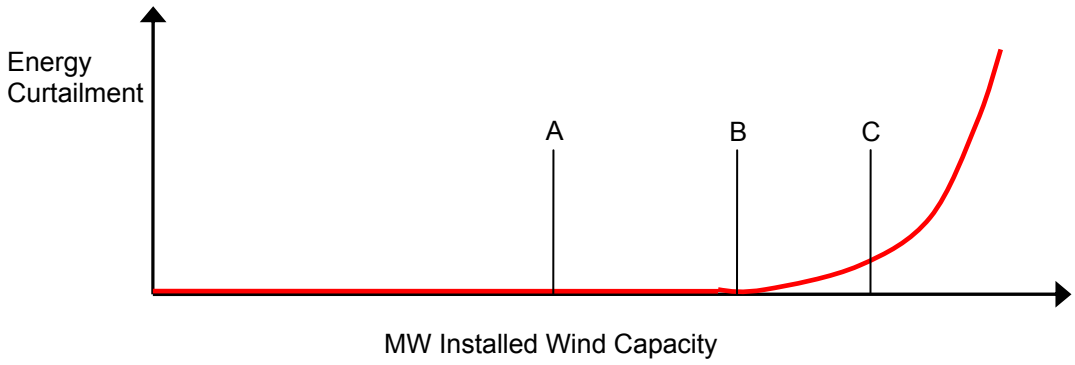

Figure 3 - Output curtailment versus MW installed capacity.

Point A represents the maximum amount of installed wind capacity assumed possible without curtailment based on a summer night valley maximum wind output analysis. Currently a firm network connection offer would only be given for this amount. Point B represents the capacity that could be accommodated without curtailment if the full nature of the wind generation and system conditions were taken into consideration with year long network assessments. This is the true point at which firm network capacity should be offered. Point C represents an installed capacity which will require slight curtailment from time to time but may in fact represent the optimal size of wind farm from a commercial point of view. In this case dynamic network assessments could result in not only a firm connection offer for capacity up to point B and an estimation of the level of curtailment at point C, but rather a connection offer based on the curve in Figure 3 which will offer compensation for all energy curtailed above the amount calculated in the assessment.

3. Interconnection with other systems

Section 3.4 refers to the North South interconnection plans, endorsed by the Minister in 2004 and required to meet the needs of the new All Ireland Single Electricity Market (SEM). The SEM is currently due to come into force in July 2007.

The new market is expected to increase greatly the requirement for transfers between the regions. With current lead times for large infrastructure developments of the order of eight years the lack of any finalised project details represents a significant gap in the current development plan. The plan fails to address this critical development with any detailed information. The full benefits of the All-Island Market intended to operate as The Single Energy Market will not be obtained until more significant interconnection of the two meshed grids in NI and RoI is made operational. It is therefore imperative that the TSOs examine maximum utilisation of the existing infrastructure and expedite the construction of additional transmission lines. The opportunity should be taken in siting the new transmission lines to utilise their location to maximise the potential of renewable generation.

We would suggest that the final TDP highlight the options under consideration in some detail for both the North South interconnector and the GB interconnector.

4. Other general issues

a) Section 3.3.2 makes the reference that connection costs for renewable generators have reduced under the Group Processing Scheme given the potential to share connection assets with other interacting applications. In every case that we are aware of the actual connection costs, together with project risk and connection timeframes, have increased under the Group Processing Scheme.

b) It is stated in 5.3.2 of the Transmission Development Plan – “The decision by the Department for Communications, Marine and Natural Resources on the long-term targets for wind generation and the staging of those targets will provide the necessary

context for the strategic development of the network to accommodate increased levels of wind generation."

It appears that the author's of the transmission development plan are suggesting that DCMNR targets will set the necessary context for network development. DCMNR wind generation targets will presumably reflect the level to which the DCMNR will support wind generation. As such these targets should be seen as absolute minimum targets for network development.

Rising fuel and carbon prices have already had the effect of increasing the BNE price significantly above the REFIT support price for wind generation. Given this and the fact that over 93% of Airtricity's wind farms have been developed on a merchant basis, then it reasonable to expect that the amount of wind generation needing connection to the network may well surpass the amount the DCMNR are willing to support. A more appropriate indication of the likely amount of generation yet to connect would be the current generation queue (2,674MW), scaled with an appropriate probability factor to reflect the probable level of project fallout.

c) Section 5.3.3 suggests that it is reasonable to expect new thermal generation to connect to the transmission system before the end of the plan period. We re-iterate our stance, outlined in previous submissions[1], that grid applications for conventional generation should not be allowed to leapfrog renewable generator applications where the conventional generation application was made after that of the renewable generator. There would be no basis for such action on the grounds of "security of supply" as there is more than enough wind capacity in the queue to restore system generation adequacy. Any generation capacity deficit would be a result of the delay in issuing connection offers. Addressing this issue requires the acceleration of this process rather than the inequitable treatment of some generators within the process. We believe that any other approach would be baseless and would contravene RES-E Directive 2001/77/EC in respect of its discriminatory nature.

In summary, Airtricity would like to thank the TSO for this first edition Transmission Development Plan. To summarise the main points of this submission we advise:

a) That the TSO take appropriate steps to implement a 'long-term horizon policy' for transmission system planning. This would include assessing potential efficiencies that could be gained if system planning could consider potential levels of generation prior to the signing of a Grid Connection Agreement using a probabilistic assessment of the generator queue.

[1] Response to CER document CER/05/010 - Group Processing Approach for Renewable Generator Connection Applications, 25th February 2005

b) Implement an integrated approach to reactive power planning that incorporates wind generation. This will include remuneration to renewable generators for ancillary service provision.

c) That the current Transmission Planning Criteria be updated to reflect the characteristics of wind powered plant. Consideration should be given to intelligent devices, probabilistic assessment of wind conditions and dynamic rating of lines.

d) Inclusion of detailed information on the current status, plans and options for further North-South and GB interconnection.

Should you have any queries arising from this submission we would be pleased to address them.

Yours Sincerely,

_____

Paddy O'Kane
Electrical Engineering Manager

Forfás Submission
to
ESB National Grid
on the *draft*

Transmission Development Plan 2006-2010

28th February 2006

Forfás Submission to ESB National Grid on the *draft* Transmission Development Plan 2006-2010

Introduction

Forfás is the national policy advisory board for enterprise, trade, science, technology and innovation; it operates under the auspices of the Department of Enterprise, Trade and Employment. In view of the critical importance of electrical energy for each of these policy areas, Forfás has a keen interest in all aspects of the Irish electricity system. Forfás therefore welcomes this opportunity to comment on the draft *Transmission Development Plan 2006-2010* from ESB National Grid.

Forfás welcomes the overall approach to transmission development embodied in the plan and appreciates its comprehensiveness. Forfás is not in a position to comment on the specific detail of the plan and confines its comments to one aspect of the plan which, in its view, is of national strategic importance.

Recommendation

Forfás believes that the most important strategic issue for the development of the transmission system over the time frame of this plan is the establishment of a direct link with the British transmission system, such as the proposed twin 500 MW inter-connectors, alluded to in Section 3.4.2 of the TDP. Therefore, Forfás recommends that ESB NG adopt a proactive approach to furthering this objective.

Rationale

The benefits flowing from such a connection (increased security of supply, greater diversity of fuel source, greater competition in the market) would accrue to both the enterprise and consumer sectors and make a significant contribution to the future development of the economy.

In view of the long lead time for commissioning these inter-connectors (detailed engineering design, public planning approval, construction *etc*) it is imperative that the project is fast-tracked. While recognising that ESB NG cannot achieve this unilaterally, Forfás recommends that ESB NG should actively progress and expedite those aspects of the project which are within its ambit, such as engineering design and deep reinforcement.

In this regard, Forfás is concerned that no deep reinforcement to support inter-connectors with Great Britain are included in the TDP. In order to minimise the lead time for commissioning the inter-connectors it is important that such work is initiated as soon as possible.

ENDS

Public Consultation

on the

Transmission Development Plan 2006-2010

Submission from the

Western Development Commission and IBEC West

28 February 2006

Western Development Commission

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Introduction

The Western Development Commission (WDC) and IBEC West[1] welcome the opportunity to make a submission to the ESB National Grid Transmission Development Plan 2006-2010 (hereafter referred to as the Development Plan). The WDC and IBEC West have been working together in the last few years to highlight electricity infrastructural development and regulatory issues as they affect the west (the WDC remit covers a wider area than that of IBEC West). As part of this work the WDC and IBEC have together (with a number of IBEC members who have significant electricity demand) met with the Commission for Energy Regulation, ESB National Grid and ESB Networks on a number of different occasions to highlight issues of concern. This submission on the Development Plan provides another opportunity to continue this work.

The WDC is a statutory body established by government to promote, foster and encourage economic and social development in the Western Region[2]. Established in 1997, the Commission was put on a statutory basis in February 1999. One of the functions of the WDC is regional policy development. In doing this, the WDC seeks to ensure that government policy reflects the needs of the region across such areas as infrastructure, natural resources, industrial and rural development. It also tracks the implementation of policies and recommends adjustments as appropriate.

In monitoring government policy and associated regulation, and ensuring that these reflect the needs of the Western Region, the WDC regards the provision of a quality electricity network and supply as important elements of the infrastructure required to underpin the economic development of the region. Hence the WDC monitors and comments on developments and policies for the electricity sector.

The IBEC West office represents over 350 businesses, in the manufacturing and service/distribution sectors, throughout Mayo, Galway, Roscommon and Athlone. Our IR/HR service is frequently identified as the main feature, which distinguishes us from other business and employer organisations. We also offer many other related services, such as Health & Safety Consultancy and Management Training. The IBEC West regional office also provides a highly effective lobby on specific regional issues of concern to members. We wish to ensure that policy makers are aware and take into account the concerns expressed in relation to the impact of policy on the future development of the West Region.

In this submission we make general comments about the importance of electricity provision in regional development and of ensuring that this is taken into account in planning for electricity infrastructure. We also highlight government policy on energy and regional development. We consider the system planning process and the development objectives and strategies outlined in the Development Plan. We then comment on the issues relating to future network development needs before commenting on specific network developments outlined in the Development Plan.

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[1] Services counties Galway, Mayo and Roscommon.

[2] Counties Donegal, Sligo, Leitrim, Roscommon, Mayo, Galway and Clare.

The importance of electricity for regional development

The WDC and IBEC West believe that an efficient, resilient energy infrastructure is crucial for regional development. Given the importance of energy infrastructure in underpinning development we are concerned that regions such as the west, with low population densities and spatially dispersed industrial development, are given due consideration in the development of electricity transmission infrastructure.

The link between economic growth and electricity demand is recognised in the Development Plan with projected GDP growth a key element of the models for predicting future electricity demand. Thus quality, reliable power supply, capable of meeting increasing demand is essential to any economic development.

Manufacturing industry is particularly important in the west which is home to a number of very significant exporters. There is already an important cluster of advanced manufacturing in the region. In order to promote further development, the Western Region needs to be able to attract new industries to this cluster of pharmacological/medical devices firms.

Existing industry needs robust, reliable electricity supply, and infrastructure which is capable of meeting any increase in their electricity need. To allow further development, the Western Region also needs to be able to attract new industries. The internationally traded services (ITS) sector is seen as a significant growth area for the future in the Western Region. This sector is also very power dependent, particularly in terms of reliability. In order for the Western Region to be in a position to compete with other parts of Ireland for investment and employment, there needs to be sufficient electricity supply capacity available in order to attract new industries and services to locate or to start up in the Region. Without good capacity and reliability such businesses are less likely to consider regional locations.

As the Enterprise Strategy Group[3] noted in its report 'Ahead of the Curve':

> Weak infrastructure in the regions presents a barrier to their economic development. The key mechanism for enabling regional development is to enhance their infrastructure. Regions will attract enterprise only if they have the infrastructure and facilities that allow them to compete with Dublin and international regions for trade and investment. (Ahead of the Curve – Ireland's place in the Global Economy, 2004, p98)

The WDC has, with IBEC West, previously raised concerns with both the Commission of Energy Regulation (CER) and ESB National Grid (ESBNG) in relation to infrastructure and supply, and has emphasised that appropriate investments must be made to allow the region to compete in attracting industry and employment.

While we welcome the recent improvements and reinforcements in the transmission network, there are still areas of difficulty, and we are particularly concerned as to their effect on inward investment and consequently on regional development. A clear example of the role of electricity transmission in regional development is its influence on the choice of location of Masonite, a major transmission connected customer near Flagford, Carrick on Shannon. We believe that Masonite could not have located further west or north than its current location because of the weaker electricity

[3] The Enterprise Strategy Group was appointed by Mary Harney, T.D. Minister for Enterprise, Trade and Employment to develop a 10 year strategy for maintaining growth in enterprise in Ireland.

infrastructure in the north and west. In the future, similar companies may face similar choices. Clearly electricity infrastructure has an effect on regional development.

In much of the region there is little choice of energy supply (e.g. natural gas) and hence the Western Region is particularly reliant on electricity. It is thus important that electricity users in the region can plan for future developments confident that supplies will improve and that their remoter locations will not militate against them in terms of electricity provision and cost.

The WDC and IBEC West welcome the recognition in the summary to the Development Plan, that the TSO is very conscious of the need to support regional development. However, only 25% of the investment in the Development Plan will be undertaken in the Border Midland and West Regions (BMW). This is not enough. Given the importance of electricity infrastructure in regional development as outlined above, we believe that the investment in the less developed region (the BMW) should be significantly more. We believe that this is underpinned by government policy on balanced regional development which is discussed below. Furthermore, we believe that the breakdown of the investment spend between regions needs to be more detailed so that the planned investments and the development of the network in different regions can be more easily monitored. This would be normal practice in relation to other infrastructural development (such as that funded under the NDP).

Government policy for balanced regional development

The TSO must take account of government objectives in its development planning. The promotion of balanced regional development is a key government policy, with the commitments outlined in the National Development Plan 2000-2006 (NDP) and the National Spatial Strategy 2002-2020 (NSS). In both of these major policy documents the role of electricity in regional development is considered. The key points in relation to electricity are highlighted here.

In the NDP it is acknowledged that the investment in electricity infrastructure and supply will not be directly controlled by the government, but it was highlighted that it should not constrain regional development:

> The vast bulk of capital investment in the energy sector over the period to 2006 will take place outside of the provisions provided for in the Plan. The importance of the energy transmission network to the promotion of regional development is recognised. The Government will be concerned, in the context of a more competitive environment for energy supplies, to ensure that energy capacity *does not act as a constraint on regional development*. (NDP, 2000, p67 (italics added))

The WDC would like to emphasise that this should be borne in mind when planning investments in transmission and that regional development considerations be explicitly recognised in planning and development in the sector.

The NSS 2002-2020 is the key government policy on balanced regional development. As was highlighted throughout the NSS, the development of regional infrastructure is essential to achieve that strategy. A number of the relevant points are drawn attention to here.

The NSS emphasises that:

> Reliable and effective energy systems, such as gas and electricity to power industry and services, are key prerequisites for effective regional development. (NSS, 2002, p64)

It goes on to suggest that:

Prime considerations in terms of spatial policies relating to energy include:

- Developing energy infrastructure on an all-island basis to the practical and mutual benefit of both the Republic and Northern Ireland
- Strengthening energy networks in the West, North West, Border and North Eastern Areas in particular
- Enhancing both robustness and choice of energy supplies across the regions, through improvements to the national grids for electricity and gas (NSS, 2002, p64)

Clearly the provision of electricity infrastructure is an essential part of government policy for balanced regional development. It is therefore important that there is a mechanism to take this into account in relation to investment in transmission infrastructure and the development of the electricity grid. The NSS is discussed again below in comments on specific aspects of the Development Plan.

General Comments on the Development Plan

The WDC and IBEC West welcome the major investment which has taken place in the electricity transmission grid in recent years, and we recognise the benefits which it has brought to the region. We also welcome the publication of a draft Development Plan which describes the process of planning and development of electricity transmission in Ireland for the next five years. We do have, however, a number of general comments about the Development Plan.

We recognise that the period covered by the Development Plan (to 2010) is relatively short and that the Development Plan is based on short term projections of demand and future transmission needs. Section 3 of the Development Plan 'Future Network Development Needs' covers some of the longer term drivers of network development. Investment in electricity transmission infrastructure is, however, a long term investment with the assets having a useful life of about 40 years (and longer with refurbishment). It is therefore important that long term electrical provision issues and future energy needs, generation issues and potential patterns of consumption are given some consideration in the Development Plan so that their impact on planned developments is taken into account before investments are made. This is in fact in the requirement for the TSO 'to plan the long term ability of the transmission system to meet reasonable demands for the transmission of electricity[4]'

Hence planning for the future needs to take account, not just of demand issues, but also trends in electricity generation and consumption patterns in the future. We recognise that we are in a period of rapid change in relation to energy issues and policy and that it is difficult to capture this in a Development Plan; however we think that it is important that wider issues are addressed. These might include longer term possibilities in relation to generation. As outlined in the Development Plan there is a government commitment to increasing the amount of renewable generation. There is also likely to be an increased focus on security of supply and the use of indigenous energy sources for generation. The greatest potential for renewable generation is likely to be in the least developed regions where there are the opportunities to make best use of natural resources such as wind and wave power and biomass production etc.

[4] Statutory Instrument 60 (2005) section 8.1c

These trends have implications for the development of electricity networks. Thus planning of infrastructure needs to take account, not only of the demand for electricity in an area, but also future like use of electricity transmission infrastructure by generators. We recognise the direct connection of generators is planned in a different context, however we emphasise the importance of anticipating future generating trends when planning the overall transmission infrastructure. In the context of our region, we believe that developing capacity in order to facilitate regional economic development will also provide important opportunities for generation and the export of power to other parts of the country, in the long term. In future, perhaps, there needs to be more integration of transmission development planning and generation planning, although we accept that this is outside the scope of the current draft Development Plan.

We believe that the Development Plan provides the opportunity to take a longer term view of the electricity sector and should consider future issues in more detail rather than focusing on the incremental improvements. We do acknowledge that this may occur in relation to specific projects (as mentioned page 2-3) but feel that it needs to be more visible in relation to overall transmission planning.

We also believe that planning the development of the transmission network should be done on an All-Island basis and that this would allow for improved electricity infrastructure and capacity in border counties. This is discussed in more detail below.

Comments on specific aspects of the Transmission Development Plan 2006-2010

In this section we comment on specific parts of the Development Plan. We do not make comments on every section.

Section 3.1 Government Objectives

The WDC and IBEC West are pleased that the TSO seeks to take account of national and regional government policy objectives in putting together the Development Plan. We also welcome the commitment to ensuring that 'under development of the network will not affect Ireland's overall economic development either locally or at an aggregate level' (pg 3-1).While we accept the concerns of the TSO about the possible stranding of assets, and believe that the cost of electricity must be carefully controlled, we also recognise that in the longer term more balanced regional development will increase regional demand and be of benefit to all users in the long term.

Section 3.2 Electricity Demand Forecasts

The Development Plan provides a very brief outline of the method of projecting growth in the demand for electricity. We believe that the Development Plan needs to provide more detail on the method of projecting demand growth and in particular how the projection of national demand growth is estimated at a regional and local level.

Section 3.2.3 Demand reduction

The WDC is concerned at the comment in the Development Plan that the closure of the Unifi factory in Donegal will increase the constraints on wind generation in Donegal at times of low demand and high wind. This is a serious issue, which clearly indicates the difficulties with the transmission system in Donegal. It is important that plans for the development of the network address this issue and that the nature of

planned developments and the way that they will resolve the problem are clearly specified in the Development Plan.

Section 3.2.4 National Spatial Strategy (NSS)

In the first part of this submission the government commitment to balanced regional development and the NSS as the policy for doing this is outlined in some detail. Clearly the TSO is not expected to 'deliver the NSS' (pg 3-5) however electricity infrastructure is an important part of the infrastructural development required in the implementation of the NSS. The NSS is government policy and should be taken into account by the TSO when planning transmission network developments. The Development Plan should provide more information on how the NSS is being integrated into the transmission planning process.

3.3 Generation

Comments in relation to the integration of the planning the development of the electricity transmission network and planning generation capacity have been made above. Comments have also been made in relation to the need to plan for potential future types, patterns and locations for renewable generation and for dispersed generation and micro generation which are likely to increase in the longer term. The Development Plan is focused on new connections and applications in progress, but it also needs to be able to consider some of the future scenarios in relation to generation (in the long term) and how these might affect the transmission network.

3.4.1 Interconnection with Northern Ireland

As mentioned above the WDC believes that there is considerable potential to improve electricity transmission and supply in Donegal by increased use of the Strabane/Letterkenny interconnector, and also by planning electricity transmission on an All-Island basis. While the emphasis in the Development Plan is on the main interconnector and the planned 2nd interconnector, we believe that there is potential for improvement to the network in the north west by increasing the potential and use of the smaller interconnectors. Coolkeeragh power plant is very close to Donegal and could be in a position to provide stability in the North West in the context of the growth of wind generation in Donegal and neighbouring counties. This could also bring benefits in relation to the All-Island Single Energy Market (section 3.5).

3.7 Implications of Drivers for Network Development

We welcome the All Island study which will investigate the implications and consequences of large scale penetration of renewable energy on the island of Ireland. We believe that this will give some indication of the network developments required to facilitate the growth of renewable energy in Ireland and believe that the results should be incorporated into transmission planning as soon as possible.

Planned Network Developments

We welcome the section on regional benefits, which clarifies how the developments in the network affect each region.

Srananagh Project:

We agree that the Srananagh 220kV station will strengthen the whole North West region and welcome the extension of the 220kv transmission system into the North West. The availability of high-capacity transmission networks is a major

consideration in the location decisions of investors and the expansion of existing industry.

We welcome the fact that it will provide the network flexibility to accommodate developments envisaged by the NDP and the NSS.

Castlebar – Tonroe Circuit:

The current proposal in the Development Plan is to construct the new Castlebar – Tonroe line at 220kV capacity but to operate initially at 110kV. We believe this proposal, if approved by the CER, will provide the flexibility to meet long-term needs and significantly improve reliability for consumers in Co. Mayo. We would be concerned that in order to reduce the overall level of expenditure in the Development Plan, the CER may not approve the construction of the new line in Co. Mayo at 220kV capacity. While we fully support the efforts of the CER to achieve cost efficiencies, we believe the construction of the Castlebar – Tonroe line at 220kV capacity is a critical step in the strategic development of the network.

While we agree that the Castlebar-Tonroe 110kV line will provide an extra connection into Mayo and should be able to meet significant demand growth, we remain concerned about security of supply issues and voltage issues in Ballina. We do not feel that this part of the Development Plan provides enough detail to alleviate these concerns.

Dalton – Galway loop into Cashla:

There are three lines from Cashla to Galway. At present if one of these lines is out of service and another one happens to trip, the remaining line will overload. The new loop proposed is critical in that it will provide a fourth circuit and remove the Dalton load from Galway. We welcome the fact that this will help to ensure that the rapid growth in demand in Galway can be met.

Binbane – Letterkenny:

It seems that the Binbane Letterkenny 110kV transmission line will resolve the issue of constraints on wind generation in Donegal at times of low demand and high wind mentioned above. It is not clear whether this planned development will resolve the issue completely and how much additional wind generation capacity at periods of low demand will be provided. More detailed information needs to be provided on this.

As mentioned above, there is potential for significantly more wind generation in the North West (and wave generation in the longer term). It is important that planned network developments will be able to take account of this.

This development should also help to meet increased demand in Donegal. We would like to see this development progressed as quickly as possible.

Potential Further Developments

5.1.3

We note that there are a number of significant issues expected to arise in the West in the period from 2010 onward. We expect that solutions to these will be addressed in more detail in the next Development Plan.

5.3.2 Significant wind generation on the network

The Development Plan recognises that there is likely to be significant wind generation on the network in the future, and describes some of the issues which will arise if this should be the case. It does not, however, provide any detail on the changes which might need to be made in planning the transmission infrastructure or the infrastructural solutions which might be required. As commented earlier we feel the Development Plan should have more focus on likely long term trends in electricity provision and transmission infrastructure and show how current network developments are taking these possibilities into account.

Conclusion

The WDC and IBEC West welcome the publication of the draft Development Plan and are pleased to have the opportunity of making a submission on it. We are happy to provide further information or examples in relation to this submission, should they be required.

Western Development Commission & IBEC West
28 February 2006

If there are any queries in relation to this submission, please contact

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02/03/06

Project No: - 1647 IWEA Response to ESB Transmission Development Plan 2006 -2010

By E-mail

CC to:	Company	Fax Number
Ann Curneen	IWEA	office@iwea.com

Dear Louis,

IWEA Response to ESB Transmission Development Plan 2006 - 2010

ESB National Grid has invited comments on their draft 'Transmission Development Plan 2006-2010', published on the 18th of January.
The attached document, entitled 'IWEA Response to ESB National Grid Transmission Development Plan 2006 –2010', comprises of such comments submitted on behalf of the IWEA.

Yours sincerely

Dave McNamara
Country Manager

IWEA Response to ESB National Grid Transmission Development Plan 2006 -2010

Econnect Project No: 1647

Prepared For	Maureen de Pietro, IWEA, Argina, Carrick-on-Shannon, Co. Roscommon, Ireland.

	Name	Date	Signature
Prepared By	Aishling Reidy Dave McNamara	17/02/06	
Checked By	Dave McNamara	02/03/06	
Approved By	Simon Cowdroy	02/03/06	

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01	Original Document Issue	02/03/06

Copy No.	Copy Issued To	Company
1	Maureen de Pietro	IWEA
2	Econnect (Client File)	Econnect Ltd
3	Econnect (Project File)	Econnect Ltd

Table of Contents

1 Executive Summary

ESB National Grid (ESBNG) has prepared a draft Transmission Development Plan 2006-2010, issued on the 18/01/06, for public consultation. The document sets out the development plan for the transmission system for the next five years and points out where the potential for further development lies. The document discusses the planning procedure, drivers and assumptions underlying the plan. ESB National Grid has invited comments on their draft Transmission Development Plan 2006-2010 to be submitted by the 28th February.

Econnect Ireland have been appointed by the IWEA to prepare a technical response to the Transmission Development Plan, on behalf of the association, with regard to its effect on the Irish wind industry.

The comments in response to the Transmission Development Plan are as follows: -

- There is no mention in the draft plan of "DIRECTIVE 2001/77/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL" of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market.
- The current Transmission Planning Criteria was last reviewed in October 1998. ESBNG have stated that another review will be carried out in the next year or two. The IWEA would recommend that a review of the transmission planning criteria take place immediately.
- The flexibility of the planning process needs to be considered and whether it can take account of a step change in costs, in particular, recent fluctuations in conventional fuel costs and the knock on effect in terms of cost of the generation mix in Ireland today.
- The process and actions involved in the development of forecasts of future conditions is not transparent. A suggestion would be to involve the stakeholders in this process, as they will be affected by the eventual result of this forecast.
- A revision of the method of dealing with connection applications would be welcomed by the IWEA to allow early evaluation of connections of wind farms in the Group Processing Scheme.
- Wind generation is not paid for any constraint it suffers due to transmission constraints and so ceases to become a driver in ESBNG's determination and selection of optimum development projects. IWEA would recommend that an alternative method of evaluation of the final generation costs in this area needs to be considered.
- IWEA would recommend a review of the lead times for development projects detailed in the draft plan.
- A breakdown is requested of the allocations to generator connections and interconnections in order to ascertain what level of investment in generator connections and interconnection projects is actually included for in this plan
- Only wind farms with signed connection agreements have been considered in this plan. The IWEA recommend that applicants in the Group Processing Scheme queue should be taken into account when planning and identifying projects.
- Demand forecast methods used by the TSO to predict future demand trends and growth locations should be adapted to develop a similar method for generation forecasting. It is suggested that existing wind farm locations and wind farm applications submitted could be used to predict the future scenario for wind farm location and generation. The current draft

Transmission Development Plan appears to be unfairly biased towards demand when identifying the future network projects for consideration.

- Two thermal generators have applied for connections and under a variety of 'plausible scenarios' there will be a requirement for additional generation capacity from 2009. The IWEA wish to find out if these thermal generators will 'skip the queue'.
- The TSO states that the reactive power capability of a generating plant needs to be replaced by 'like with like'. Reactive power capability requirements differ in what is expected from a conventional generation plant and from a wind farm. It appears to be an unreasonable element of the planning process and should be revised.
- The TSO has indicated that a 3% allocation for 'interconnections' is for initial planning and design work for the 400kV Northern Ireland interconnector. Given the scale of the project, is a 3% allocation sufficient to complete all necessary preliminary work? The IWEA wish to discover whether other interconnection scenarios have been considered.
- The construction of the planned 500MW DC interconnector between Ireland and Great Britain would result in high levels of network reinforcement at whatever connection point is finally chosen in the Irish system. The interconnection project was not included in the draft plan. The interconnector will have a dramatic affect on the surrounding area to which it is connected and should be considered. If it is left unaccounted for it will radically change the current Transmission Development Plan when a location for connection is decided upon.
- As part of the All Ireland Single Energy Market policy, several supporting renewable energy studies are being carried out. The IWEA would like to establish if ESBNG will accept all the findings and conclusions of the final policy document for renewable energy projects and the studies undertaken to arrive at the targets identified or whether they have their own independent model/study in place for an all-island market and network.
- A significant list of 'potential' projects has been identified in the draft plan. The IWEA would like to ascertain if any of these projects have been allocated funding from the €520 million capital expenditure fund.

2 Scope of Services

The Scope of the Econnect's Services is as follows:

- Technical review of ESB National Grid's Draft Transmission Development Plan 2006-2010 with a view of it's affect on the wind industry
- Transmission Development Approach – examine the following and how they may influence the development of the wind industry in Ireland
    - Development objectives and strategies detailed by ESBNG
    - Future network planning process and the timescales for development projects
    - Procedures for the development of the network
    - Refurbishment process of the network
- Future Network Development Needs – examine how the following may affect the development of the wind energy in Ireland
    - Government objectives
    - Demand forecasts
    - New generation connections and closures
    - Interconnection with other systems
    - Condition of the Irish network
- Planned Network Developments - examine the following and asses their possible influence on overall wind penetration in Ireland
    - Planned upgrades and network reinforcements
    - DSO connections
    - Generator connections
    - Refurbishments
    - Line alterations and diversions
- Potential Further Developments – examine the following and assess their possible affect on the development of wind energy in Ireland.
    - Expected reinforcements
    - DSO plans for further connections
    - Possible future network developments
- Attendance at the Draft Transmission Development Plan 2006-2010 Public Consultation on the 15/02/06 and production of full meeting minutes.
- Collection and assessment of IWEA member comments on ESBNG's document for inclusion in the final consultation response.
- Production of final response report to client
- Separate document detailing IWEA member comments and whether they have been included in the final response report or not, motivation for exclusion detailed.

3 Introduction

On the 18 of January 2006 ESBNG issued a draft document entitled 'Transmission Development Plan 2006-2010' for public consultation. The document sets out the development plan for the transmission system for the next five years, points out where the potential for further development lies and discusses the planning procedure, drivers and assumptions underlying the plan.

The previous five years have seen a high level of generation connected to the system and a 20% increase in demand. A capital investment programme was carried out during this period that brought the system within the required reliability standards. Continuous investment is needed to ensure the system remains within these standards as it expands and grows. A fund of €520 million has been allocated by the CER for development projects during the period 2006-2010.

On the 15th February 2006 ESBNG held a public consultation meeting with IWEA members regarding the draft Transmission Development Plan in the Aisling Hotel, Dublin. ESBNG gave a presentation outlining in brief the contents and purpose of the draft document. A questions and answers session followed. Econnect recorded the minutes of this meeting on behalf of the IWEA and the concerns voiced by IWEA members have been taken into account in the preparation of this response.

4 Transmission Development Approach

4.1 Section 2.1 statutory and legal requirements

In terms of statutory legal requirements there is no mention of "DIRECTIVE 2001/77/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL[1]" of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market. Among its requirements in relation to grid system issues this directive states the following:

- Transmission system operators and distribution system operators guarantee the transmission and distribution of electricity produced from renewable energy sources. They may also provide for priority access to the grid system of electricity produced from renewable energy sources. When dispatching generating installations, transmission system operators shall give priority to generating installations using renewable energy sources insofar as the operation of the national electricity system permits.
- Member States shall ensure that the charging of transmission and distribution fees does not discriminate against electricity from renewable energy sources, including in particular electricity from renewable energy sources produced in peripheral regions, such as island regions and regions of low population density.

From the details being shown in this plan it seems as if these sections of the directive have been effectively ignored. The document states that the planning criteria throughout all regions are determined by presupposed demand growth, however the impact of future generation growth in peripheral regions only being considered when the connections are confirmed.

4.2 Network Development Planning Process

Transmission Planning Criteria:

In relation to the planning standards, Transmission Planning Criteria[2], the last time a review of these criteria was conducted was in October 1998. Since that time the penetration of renewable generation on the system has greatly increased with a number of the wind power plants connecting directly to the transmission system. Currently two reviews of the UK transmission planning criteria are taking place in the UK in order to take account of the significant portion of renewable generation both on the system at present and envisaged on the system in the future. ESBNG have stated that another review will be carried out in the next year or two. The IWEA would recommend that a review of the transmission planning criteria take place immediately.

Process flexibility:

In terms of development objectives and strategies it is accepted that a wide range of issues is taken into account when selecting a transmission system enhancement. These include long-term economic assessment of the full range of costs and benefits associated with each option, however the question of whether the process is flexible enough to consider a step change in any of these costs needs to be considered. Of particular interest to the renewables bodies are the recent fluctuations in conventional fuel costs and the knock on effect in terms of cost of the generation mix that we have in Ireland today. There seems to be a question of whether the network development planning process can take this into account when evaluating projects.

[1] Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market.
[2] ESB National Grid Transmission Planning Criteria, October 1998.

Stakeholder involvement:

In terms of the process flow chart shown in Figure 2-1 of the draft document, the initial and key task, which defines and drives all subsequent actions, is to develop forecasts of future conditions and define list of potential needs. The process and actions involved in these tasks is not transparent and there is very little information provided about how this is carried out. A suggestion would be to involve the stakeholders in this process, as they will be affected by the eventual result of this forecast. Typical stakeholders would be IBEC, the large energy users group, IWEA and other various renewable energy representative bodies. By involving them at this stage and having an ongoing discussion in terms of future conditions, forecasting and potential needs, they will be able to actively participate. The planning process will also benefit from their hands on industry knowledge and combined ideas.

Evaluation of connection applications:

Even though the document states that the main drivers for network development, as both demand growth and generation growth, the method in which these connection applications are dealt with is quite different. The evaluation of connection applications entails an analysis of the shallow and deep reinforcement. The document states that this is carried out when an application for new generation, demand or a Distribution System Operator (DSO) connection is received. However under the Group Processing Scheme[3] for wind generator connection applications this does not occur for wind generation applications until the generation grouping or "gate" formation has been agreed by the CER. There seems to be no system in place for allowing early evaluation of the effects of connecting these applications prior to being included in a gate. As stated in section 5.1.5 of this document the "Gate 1" integration studies identified a number of 110kV lines at risk of overloading as a result of this increased generation in the south west area. This can then result in a long lead-time for the necessary network reinforcement to take place in order to allow these projects connect to the system in a firm manner. This lead time could be reduced if modelling works could be carried out at an early stage prior to connection offer or gate formation. The formation of a reserve list or similar mechanism to allow modelling of these connection offers to take place in a similar way to conventional generation or demand applications would be welcomed by the IWEA.

As an aside, the document states in section 3.3.2 that "Group processing not only allows more plant to connect at a given time but also means they are likely to do so at a lower cost". Econnect would contest this statement as it has been our experience that since the introduction of the group processing approach and the standard pricing for connecting renewable generators[4] the connection price for renewable generation projects has increased with respect to prior levels of pricing. IWEA would welcome further information in regards to this point.

Selection of optimum development project:

In regards to the selection of optimum development projects, a number of factors are mentioned including, economics of alternative development options, and impact of constraints in the transmission system on generation costs. As wind generation is not paid for any constraint it suffers due to transmission constraints, this ceases to become a driver in ESBNG's determination

[3] CER 05/010, 'Group Processing Approach for Renewable Generator Connection Applications Connection and Pricing Provisions', proposed direction to system operators, 14/02/05

[4] CER 05/090, 'Standard Pricing Approach for Connecting Renewable Generators to the Distribution Network', commission decision, 24/06/05.

and selection of optimum development projects. It could be considered that wind generation is being unfairly disadvantaged in relation to conventional generation in this area. IWEA would recommend that an alternative method of evaluation of the final generation costs in this area needs to be considered.

4.2.1 Network Development

The typical lead times for the development projects detailed in figure 2-2 of the draft document need to be examined. While ESBNG have explained that these lead times are conservative, and are due to factors such as planning permission, which is outside of their control, the lead times for shared assets particularly items such as cables and substations are considered to be greater than expected. Independent power producers, typically wind farm developers, have succeeded in developing 110kV infrastructure in far less than the lead times suggested here. Also it has been proven in the last number of years that there are significant cost savings in independent power producers constructing their own infrastructure.

While it is encouraging to note that the national importance of electrical infrastructure projects is recognised in the governments proposed Critical Infrastructure Bill[5] the fact that the Department of Environment, Heritage, and Local Government specifically states that a specialised consent procedure for major electricity transmission lines is also being provided for this act, should also lead to reduced timescales for this infrastructure.

IWEA would recommend a review of these lead times taking these factors into account.

4.2.2 Refurbishment

A the forum in the Aisling hotel on the 15th of February ESBNG stated that during the previous five year period €500m had been spent on development required to maintain transmission system at required planning levels". They also stated that the capital allocated under the draft development plan for 2006 until 2010 will be spent on system development.

As a response to a question on the breakdown of the capital expenditure in E-mail from Louis Fisher, 17/02/06, the transmission capital expenditure total that was sought for the 2006-2010 revenue period was €620 million. In its Price Determination the CER allowed €520 million. The breakdown of the original €620 million submission was as follows:

Network Reinforcements	60%
Generation Connections	5%
Demand and DSO Connections	10%
Refurbishment	15%
Diversions, Alterations and minor capital works	9%
Interconnection	3%

If we consider that even with the reduced amount the % allocation will not change this gives the following euro values breakdown for each area

Network Reinforcements	€312m
Generation Connections	€26m
Demand and DSO Connections	€52m

[5] Critical Infrastructure Bill, 19/02/06

Refurbishment	€78m
Diversions, Alterations and minor capital works	€46.8m
Interconnection	€15.6m

From the list of projects listed in sections 4.11 the vast majority of projects fall into the network reinforcement, reinforcement, and diversion/alteration categories and are made up of various projects from new line and substation construction to installation of additional transformers and disturbance recording equipment in existing stations.

The next significant area of planned expenditure is the connection of generators. The plan states that €26m will be expended on generator connections. Of the seven generator connection projects in the detailed design and construction phase, six of them are for independent power producers connecting wind farms. Of these six projects five of them will be made up of new contestable 110kV stations built by the Independent Power Producer (IPP) themselves. The remainder of the works, involving provision or refurbishment of substation bays, is considered to be shallow works and as such have to be paid for by the IPP. Of the three generator connection projects currently in the preliminary design phase, all of these projects are wind generation contestable connections with only minor shallow works which will again be paid for by the IPP. In this case, it is requested that a breakdown of the €26m be provided in order to ascertain what level of investment in generation projects is actually included for in this plan.

In terms of the expenditure on interconnection, as the vast majority of the work on the second northern Ireland interconnector is scheduled for beyond the lifetime of this plan and the proposed Ireland-Britain interconnector is not sufficiently advanced to be included in this plan, it is requested that a breakdown of the €15.6m be provided in order to ascertain what level of investment in interconnection projects is actually included for in this plan.

5 Future Network Development Needs

5.1 Government Objective

ESB National Grid states its intention to accommodate government policy objectives in the progression of the Transmission Development Plan. The current government objective is to ensure 13.2% of Irelands gross national electricity consumption is generated from renewable energy sources by the year 2010. The TSO has, in some instances, as part of the Group Processing Scheme hastened or upgraded the current network infrastructure in expectation of future likely renewable energy projects. The document states that the total MW from wind farms should surpass the 13.2% target before 2010. This total (as of December 2005) includes wind farms

- Connected (492.9MW)
- With signed connection agreements (650.2MW)
- With live connection offers (139.3MW)
- Applications in process (2,663.8MW)

The draft Transmission Development Plan only takes into account signed connection agreements for wind farms when identifying future network development projects for the five-year period. However, wind farms with live connection offers from Gate 1 have still been included in achieving the 13.2% by 2010. These wind farms would not have been considered in planning the network developments detailed in the draft document. The IWEA wish to ascertain whether any of the €520 million has been apportioned to the network development required to connect the wind farm developers with live offers should they decide to sign their connection agreement. The plan should take account of these wind farms with live connection offers. The TSO should also look ahead to the provision of wind farm connection and integration into the system from Gate 2 and future Gates of the Group Processing Approach, looking beyond the government target of 13.2%.

5.2 Demand

Demand figures are presented in the draft Transmission Development Plan document for the five-year period from 2006 -2010. A growth figure of 16.45% for the five-year period is indicated, a total increase of 779MW in the winter peak demand, from 4,736MW in 2006 to 5,515MW in 2010. These demand forecasts are prepared using historical demand data at each transmission interface station, predicted economic growth and signed connection agreements with demand customers. The eastern region of the country has higher demand requirements than the western. The DSO 110kV station connection projects that are either in the preliminary design phase, in the public planning process or under construction are shown in Table 3.2 of the Transmission Development Plan document. These projects are based on demand forecasts and the majority are located in the east of the country. Two projects are listed in Counties Kildare, one in Meath, Wexford, Wicklow, Kilkenny, while the only projects that are listed for the western region of the country are in Counties Limerick, Galway, Tipperary and Cork.

The wind farms connected to date have been predominantly in the west and south regions of the country and, using the wind farm connection applications submitted to date as indicative of the future scenario, future wind farms will probably be located in the same regions. Most of the wind farms will therefore be located in remote areas, some distance from demand centres. Should the network develop in this fashion there will be significant power flows from west to east. As indicated in Section 5.3.2 of the draft Transmission Development Plan document, wind farm energy

production alone may be significantly higher than winter peak demand in the western regions. Consideration should therefore be given to a similar method as that used for forecasting demand growth during the system development process with regard to generation. The wind farms connected to date and the wind farm connection applications submitted should be used as a basis for developing a forecast of wind farm generation trends on a region or county basis. At the moment only signed generation connection offers have been considered from Gate 1 of the Group Processing Scheme. The current draft Transmission Development Plan appears to be unfairly biased towards demand when identifying the future network projects for consideration.

5.3 Generation

The TSO has stated in the draft plan that the network must be developed in such a way as to accommodate the output from wind farms. As wind penetration levels increase the required levels of development to achieve this integration will also increase. Deep reinforcements will be required to accommodate both large and small generators alike. Despite the TSO's acknowledgment of such development necessities and knowing the extent of wind farm applications in the Group Processing Scheme queue, only signed connection agreements with wind farm developers are being considered in the draft plan. The draft Transmission Development Plan outlines that the network has been designed 'to accommodate existing generators and known additions'. As stated in the previous section no account is taken of the 139.3MW of wind farms with live connection offers or the 2.6GW of wind farm connection applications in the Group Processing Scheme queue. These applications are currently on hold awaiting decisions from the CER and the TSO on the processing criteria of Gate 2. When the procedure for inclusion into Gate 2 is finalised the wind farms requiring connection may change the network projects identified in this current draft plan.

The demand growth for the five-year period has been identified in the previous section as approximately 16.45%, 779MW. In Table 3.3 of the draft document a list of future planned generation connections are detailed, totalling 770.2MW. Of this total 401MW is a CCGT plant and the remaining 369.2MW consists of wind farm developments. At the end of 2005 532MW of conventional generation plant was connected to the network. This means a total of 1,302.2MW will have been connected to the network in the period from 2005-2010. There is only a 40% gap in generation growth compared to the demand growth predicted in the same period. Should there be a more significant gap than that planned for in the draft document? Two thermal generators have also applied for connection to the TSO. The Generation Adequacy Report 2006 –2012 outlines that under a variety of 'plausible scenarios' there will be a requirement for additional generation capacity from 2009. The IWEA wish to learn whether or not these thermal generators will 'skip the queue'? On what basis should the thermal generation plant utilise capacity on the network, which may displace wind farms seeking connection in the same area but are restricted to waiting in the Group Processing Scheme queue.

The draft Transmission Development Plan states that the reactive power capability of a generating plant needs to be replaced 'like with like' to ensure that network reinforcements are not required as a result. The WFPS1 section of the current Grid Code stipulates the reactive power requirements for wind farms, which have been approved by the CER. The reactive power capability requirements of conventional generation are detailed in section CC.7.3.6.1 of the Grid Code. Both sets of requirements differ in what is expected from a conventional generation plant and from a wind farm. It is therefore implied that a wind farm would not be considered as replacing 'like with like' when conventional generation plant is retired even though it complies with the current Grid Code requirements as laid out by the TSO and CER. It appears to be an unreasonable element of the planning process in the development of the network, even when wind farms comply with all the relevant requirements of the Grid Code and should be revised.

5.4 Interconnection with Other Systems

5.4.1 Northern Ireland

It is stated in the Transmission Development Plan, section 3.4.1, that ESB National Grid (ESBNG) and Northern Ireland Electricity (NIE) are making provisions for a second major North – South interconnector. Connection Project (CP) 466, listed in section 4.3.1 of the draft document, is detailed as a reinforcement development in the preliminary design phase and entitled 'Second NI Interconnector'. Is CP466 the same North – South interconnector discussed in section 3.4.1? The estimated start date for CP466 is December 2009 and the estimated completion date is December 2012. An e-mail from Louis Fisher of ESB National Grid gives a breakdown of the capital expenditure for the period from 2006 –2010. Considering the reduced amount of capital expenditure permitted by the CER, 3% of the €520 million fund, €15.6 million, is allocated to 'Interconnection'. Following a conversation with Louis Fisher this 3% allocation is for initial planning and design work leading up to the end of the current five-year period in 2010. Actual construction will not begin on the CP466 until the end of the period. Given the scale of the project, the IWEA wish to establish whether a 3% allocation is sufficient to complete all necessary preliminary work?

Should CP466 be the second north – south interconnector being discussed by ESBNG and NIE, have any other routes being considered other than that given along the east coast. The IWEA wish to discover if a route along the west coast of the country was considered?

The reason for the development of the 400kV line of CP466 is stated in the Transmission Development Plan document is to prevent a situation where a 'single event could lead to system separation'. During the network planning process the IWEA wish to learn whether an alternative to the single 400kV interconnector have being considered, for example, several 110/220kV connections at various points? The event of system separation would be less likely if the number of connection points between the north and south systems were more numerous. These types of connections between the north and south networks would also facilitate the connection of wind farms along their routes.

5.4.2 Great Britain Interconnector

Intentions were announced in February 2004, by the then Minister for Communications, Marine and Natural Resources, Mr Dermot Ahern TD, for the development of two 500MW interconnections between Ireland and Wales. A consultant was appointed in March 2005 to review the optimal system of a competition for such a project. As of yet the method by which to process the project is under review by the CER.

Because of the current situation, the location of the actual connection point of the 500MW interconnection into the Irish network is to date unknown. ESBNG has examined the capacity at nine points of the network along the east and south coasts. None of the areas examined currently have the capacity to both import and export 500MW. The studies indicate that wherever the connection point is 'significant deep reinforcements' would be required. The interconnection point in the Irish network, regardless of where it will eventually be located, will result in that area being outside the planning standards. To ensure this situation doesn't occur a huge amount of capital spending and reinforcement will be required. ESBNG have indicated that they have sent some potential cost figures to the CER based on their studies.

ESBNG have not accounted for this 500MW interconnector with Great Britain in their draft plan. It is unreasonable to omit this interconnector from the Transmission Development Plan considering the huge implications it will have on the Irish network as it will drastically alter current power flows. If the connection point of the interconnector is decided upon, for example, next year, the current network development plans will require major modifications as a result and will be vastly different

to the this draft plan. It would seem reasonable; given ESBNG has estimate expenditure costs that the 500MW interconnector with Great Britain should have been taken into account in the current draft Transmission Development Plan.

5.5 All Island Energy Market

The Minister for Communications, Marine and Natural Resources, Noel Dempsey TD, and his Northern Ireland counterpart, Barry Gardiner MP, Minister for Enterprise, Trade and Investment, confirmed a commitment to an all island energy market. A joint high-level consultation document was released in July 2005, entitled "All-Island Energy Market: Renewable Electricity – A '2020' Vision ". This document seeks to map out a possible '2020 Vision' for policy cooperation on the development of sustainable energy supplies for the island of Ireland. The document refers to 'several important supporting renewable energy studies' that are being carried out and states that the relevant conclusions will need to be fully assimilated into the policy. 19 studies are identified in Annex A of the document which deal with issues such as support options, energy markets, economic assessment and integration into a wider electricity system. These studies are being conducted by Sustainable Energy Ireland (SEI), Department of Marine, Communications and Natural Resources (DoMCNR), Carbon Trust, Action Renewables, Department of Trade and Industry (DTI), Department of Enterprise, Trade and Investment (DETI), Northern Ireland Electricity (NIE), Department of Agriculture and Rural Investment (DARD) and Department of Enterprise (DOE).

During the public consultation meeting on the 15 February with the IWEA, ESBNG indicated should any all –island renewable targets be set they would be accommodated in their network development plans. The IWEA wish to ascertain whether or not ESBNG will accept all the findings and conclusions of the final policy document for renewable energy projects and the studies undertaken to arrive at the targets identified or whether they have their own independent model/study in place for an all-island market and network?

5.6 Implications of Drivers for Network Development

The main drivers behind the Transmission Development Plan have been discussed in the previous sections. The new generation connecting does not match up with where the demand is located. As a result there will be significant increase in power flows. Only generation with signed connection agreements have been considered in the draft plan. As mentioned a similar method used for forecasting demand should be used to forecast generation during the five-year period.

The TSO has stated in the draft plan that the network must be developed in such a way as to accommodate the output from wind farms. As wind penetration levels increase the required levels of development to achieve this integration will also increase. Deep reinforcements will be required to accommodate both large and small generators alike. Despite the TSO's acknowledgment of such development necessities and knowing the extent of wind farm applications in the Group Processing Approach queue, only signed connection agreements with wind farm developers are being considered in the draft plan.

The construction of the planned 500MW DC interconnector between Ireland and Great Britain would result in high levels of network reinforcement at whatever connection point is finally chosen in the Irish system. The nine connection points considered by ESBNG do not currently have the capacity to both import and export 500MW. The interconnection project was not included in the draft plan at all as no decision has been made on the connection point and no projects initiated. The interconnector will have a dramatic affect on the surrounding area to which it is connected and deserves to be considered in this draft plan. If left unaccounted for it will radically change the Transmission Development Plan when a location for connection is decided upon.

6 Potential Further Developments

Developments classified as 'potential' are listed in section 5 of the draft document. Areas of the network have been identified, but as yet not approved, as possibly requiring development in the five-year period.

Specific 110kV lines in the southwest have been identified in section 5.1.5 of the document, which in the absence of further development, sub-standard performance will arise during the five-year period. The eight lines identified will become overloaded as a direct result of wind farm connections from Gate 1. The draft plan states that the TSO is only now 'preparing to bring forward network reinforcement projects to deal with these potential overloads'. The IWEA wish to learn whether these reinforcement projects have been included in the 60% capital expenditure allocation? The wind farms considered in coming to these conclusions have signed connection agreements since the end of 2005 but the provision of their connection into the system has not been included as planned network developments.

A list is given in section 5.2 of the draft document of additional DSO transformers at existing TSO supplied substations as well as new DSO 110kV stations to be connected to the transmission grid. A total of eleven DSO transformers and nine 110kV stations are identified in the plan. The IWEA wish to establish whether any of the €520million allocated to the TSO has been apportioned to any of these 'potential' developments?

Section 5.3.7 of the draft document considers the condition of equipment in transmission stations. A review was undertaken of all 110kV stations over 25 years old. Seven stations were identified as requiring further detailed assessment. Should any refurbishment be found necessary of these stations, it is stated in the draft plan to be undertaken in 2007 and 2008. The IWEA seek clarification on whether any of the 15% allocated to 'Refurbishment' by the TSO has been apportioned to any of these possible refurbishment projects? Two additional stations are being investigated due to some equipment being obsolete and in poor condition. These stations should surely have been identified as necessary development projects to ensure their operation remain within planning standards. They are only listed as 'possible future developments' depending on whether their refurbishment coincides with 'potential reinforcements' in the area. Possible line refurbishments are considered in section 5.3.8 of the draft report. 20 lines are detailed which are being considered for refurbishment and if works are required on any of these lines, they will be carried out in the period 2006 –2008. Again, the IWEA seek clarification whether any of the 15% allocated to 'Refurbishment' by the TSO has been apportioned to any of these possible refurbishment projects?

Three line diversion projects are being considered by the TSO and detailed in section 5.3.10 of the draft document. The IWEA wish to discover whether any of the 'Diversions, Alterations and minor capital works' allocation of 9% of the overall €520 million fund has been apportioned to these projects should they be undertaken?

7 References

1) ESB National Grid, Grid Code Version 1.2, May 2005.

2) E-mail from Louis Fisher, ESB National Grid, 17/02/06.

3) ESB National Grid, Transmission Forecast Statement 2005 –2011, June 2005.

4) ESB National Grid, Generation Adequacy Report 2006 –2012, November 2005

5) Meeting: - ESB Public Consultation with IWEA, regarding the draft Transmission Development Plan 2006-2010, 15 February 2006.

6) CER 05/010, 'Group Processing Approach for Renewable Generator Connection Applications Connection and Pricing Provisions', proposed direction to system operators, 14/02/05

7) CER 05/090, 'Standard Pricing Approach for Connecting Renewable Generators to the Distribution Network', commission decision, 24/06/05.

8) Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market.

9) ESB National Grid Transmission Planning Criteria, October 1998

DRAFT TRANSMISSION DEVELOPMENT PLAN 2006-2010

RESPONSE BY HIBERNIAN WIND POWER

Hibernian Wind Power welcomes the publication of this draft of a new document and is pleased to avail of this opportunity to comment upon it.

The draft Development Plan presents vital information comprehensively and with commendable clarity.

Hibernian Wind Power sees it as fulfilling a key role in complementing the cycle of information and insights already put into the public domain every year by ESBNG by means of the Transmission Forecast Statement and the Generation Adequacy Report.

The comments which follow relate primarily to perceived omissions from the draft.

1. Background: Status of grid strategic planning

CER published '*Background Paper to Direction on Resuming Connection Offers to Wind Generators'* in 2004. Under the heading '*Generation Connection Policy'* this stated:

> *... Such a policy would include grid strategic planning ... The Operators would be required to plan and develop the systems in anticipation of renewable generation connecting ... a thorough review of generation connection policy with a view to maximising the connection of renewable generation in the long-term ... The Commission considers that this is an issue which should be considered under the forthcoming multi-annual review of network investment.*

The Development Plan should:

- set out in detail the consideration that this issue received under that review
- record the outcome of that consideration.

2. Scope of the Development Plan

Regulation 8(6) of Statutory Instrument 445 (2000) which is quoted in Appendix E of the Draft Development Plan requires that it '*take account of … **existing** and **planned** generation*'.

However, no account has been taken of wind generation for which grid connection offers are pending and overdue, although much of it was ***planned*** – and applied for grid connection – ahead of some of the newer ***existing*** generation.

The Development Plan should:

➲ be redrafted to rectify this omission.

3. Representation of current situation

Section 2.4 describes the evaluation of connection applications as follows:

> *An analysis of shallow connection and associated deep reinforcements are carried out when an application is received for connection of new generation or demand, or for a Distribution System Operator (DSO) connection.*

This misrepresents the situation for wind generator applications, the processing of which is subject to indefinite delay.

The Development Plan should:

➲ reflect this reality

➲ explain how the situation will be rectified as a matter of priority.

4. Obligations to wind generation applicants

Section 3.3.2 states:

> *The TSO has facilitated the connection of a greater quantity of renewable plant through the introduction of group processing and issued a significant number of offers as part of the 'Gate 1' process. The TSO is continuing to work with the CER and industry to ensure that 'Gate 2' offers will also be processed in a timely manner.*

Given that the criteria for inclusion in Gate 2 are still awaited twenty-seven months after the suspension of the 70-business-day rule for the issuing of grid connection offers to wind generators, the suggestion that Gate 2 offers can still be processed in a timely manner is unrealistic.

The Development Plan should:

- reflect this reality
- demonstrate in detail how the declared aim of the Group Process Approaching – '*speeding up the clearing of the applications backlog*' – is now going to be achieved.

5. Unwarranted stasis pending issue of targets

The Summary states:

> *[TSO] has contributed*[1] *to the draft vision paper for renewable energy in 2020 being prepared jointly by the Department of Communications, Marine and Natural Resources and the Department of Enterprise, Trade and Investment in Northern Ireland. The TSO will take account of new renewable targets in future Development Plans.*

Section 3.7 states:

> *When the targets for wind generation and the staging of those targets are decided, the TSO can develop the necessary plans to accommodate it.*

Section 5.3.2 states:

> *The decision by the Department for Communications, Marine and Natural Resources on the long-term targets for wind generation and the staging of those targets will provide the necessary context for the strategic development of the network to accommodate increased levels of wind generation.*

[1] The ESBNG submission stated *inter alia*:

> *A significantly increased penetration of renewables will require a wide range of complementary actions to ensure satisfactory integration into the power system. These could include .. Investment in major transmission infrastructure developments to cater for the resulting changes in power flows …*

The Development Plan should:

- set out in comprehensive detail how this is to be achieved.

Furthermore, as it has been clear for the past decade that some non-zero rate of annual increase of wind generation should be anticipated, the Development Plan should:

- set out an assumed best-estimate short-term rate of increase of wind generation

- set out in detail what is going to be done – starting now – to accommodate it.

6. Conclusion

Hibernian Wind Power looks forward to the publication of the Development Plan in final form without undue delay.

It sees this Development Plan and its future annual updates as significant elements in increased understanding of critical strategic issues which will lead to more informed stakeholder dialog.

It looks forward to continuing to participate in and constructively contribute to that dialog.

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ESB Power Generation,
27 Lower Fitzwilliam Street,
Dublin 2.
6th March 2006.

Mr. Louis Fisher,
Grid Development and Commercial Department,
ESB National Grid,
27 Lower Fitzwilliam Street,
Dublin 2.

Submission on (draft) Transmission Development Plan 2006 – 2010.

Dear Louis,

ESBPG welcomes the opportunity to comment on the draft Transmission Development Plan 2006 – 2010.

It is difficult for a generation business to comment on the more detailed aspects for the plan, nevertheless, we wish to comment on some of the underlying principles which the plan is based on, namely, the Transmission Planning Criteria and how these may be impacted by increased penetration of Wind generation.

Attached pleased find ESBPG's response to your request for comments. We will be pleased to clarify any aspect of this submission, should the need arise.

Yours sincerely,

Kieran Sweeney,
Asset Manager, ESB Power Generation.

ESBPG Submission on Consultation on

(draft) Transmission Development Plan 2006 – 2010.

The document also outlines the extent of connection applications from prospective Wind generators. There is a total of 1,143 MWe of Wind generation with signed connection agreements, a further 139 MWe with connection offers and another 2,664 applications outstanding, amounting in total to almost 4,000 MWe.

The document refers to the Transmission Planning Criteria in Section 2.3 and also to SI445 8(3) which states that in discharging its function, *the transmission system operator shall take into account the objective of minimising the overall costs of generation, transmission, distribution and supply to final customers*.

The planning criteria (section 2.1.1) refer to "more probable contingencies" and specify both dynamic and steady state limit-criteria which must be satisfied, for such more probable contingencies. The planning criteria (section 2.1.2) also refer to "less probable contingencies" and specify that the system should be able to withstand such more severe but less probable contingencies without going into voltage collapse or uncontrolled cascading outages. However, compliance with steady state limit-criteria is not specified for such less probable contingencies.

Given the very significant potential increases in Wind generation over the coming years and the intermittent nature of Wind generation, there will be an increasing requirement for Reserve Capacity for Wind generation. It is widely recognised that Wind generation makes very little contribution to capacity adequacy at the winter peak, due to the high coincidence of low output from all Wind generation during many peak-load situations in winter. For most situations, there will either be a high output from the Wind generation or alternatively the Reserve Capacity will be required to generate, but both will not be required at the same time. Given the significant increases in Wind generation since the Transmission Planning Criteria were last revised (in October 1998) there is an urgent requirement to review the planning criteria to take into consideration the very low probability of requiring all dispatchable generation in a region to run and export its full output at the same time as a high output from Wind generation in the same region. This must be considered as a "less probable contingency" if not a very low probability scenario. If the planning criteria fail to recognise the mutually exclusive transmission requirements for Wind generation and its associated Reserve Capacity, then:-

- Additional capital intensive transmission infrastructure will be installed, which will never be required in reality - adding to the costs to final consumers.
- Applications for new generation connections, (both Renewable and Thermal), will be delayed.

Such outcomes would not be consistent the requirements of SI445.

Consequently, ESBPG requests that consideration be given to reviewing the Transmission Planning Criteria in the context of significant increases in Wind generation on the system and the very low probability of requiring all thermal generation to operate at the same time as a high output from Wind generation.

Mr. Dermot Byrne,
Chief Executive Officer,
Eirgrid,
Lower Fitzwilliam Street,
Dublin 2.

16th March 2006

RE: ESB Transmission Development Plan, 2006 – 2010

Dear Dermot,

Thanks to Louis, Derek and yourself for your informative presentation to IDA on Monday, 27th February.

As you are aware, IDA is engaged in the development of a number of Strategic Sites with a view to accommodating internationally significant projects with utility intensive requirements (including electricity) in the following regional locations;

- Dundalk;
- Galway (Oranmore & Athenry);
- Cork (Ringaskiddy & Carrigtoohill);
- Waterford (Belview & Knockhouse).

In addition to IDA's sites, Shannon Development, having responsibility for the Mid West Region, are progressing a site with similar infrastructure capability with input from IDA. As you are also aware South Dublin County Council are well advanced in the provision of similar scale infrastructure at Grangecastle Business & Technology Park.

The programme involves the development of a landbank with significant infrastructure in place in advance of a client assessing the site for the location of a utility intensive investment. The programme is designed to assist Ireland win investment in the Bio-technology and ICT sectors. Projects such as the recent announcement of Amgen in Cork and Centocor, Intel, Genzyme, Wyeth and Takeda are examples of these projects, which involve significant investment in capital and jobs.

With regard to these projects they will require upto 30Mva for a Bio-tech project and 90Mva for an ICT project, with additional phases requiring additional loads. While there is a long lead time to a project requiring these loads it is essential that Ireland can demonstrate that such loads are available at the sites outlined above to win such investment and that existing agreements regarding the availability of electricity can be delivered upon.

The successful marketing of these sites is dependant on the delivery of infrastructure ahead of demand.

ESB National Grid's progressive move in taking IDA's Strategic Site Programme into account in the preparation of next years Transmission Forecast Statement underpins all of our efforts to provide a robust infrastructural offering to projects examining Ireland as a potential location for significant investment, as well as supporting Government policy in relation to industrial development and the National Spatial Strategy.

ESB National Grids essential role in this strategy, with the preparation of Prefeasibility Studies and Advance Works Packages, is very much appreciated and valued.

IDA welcomes the preparation of ESB National Grid's Transmission Development Plan 2006 – 2010 in support of your recent Transmission Forecast Statement 2005-2011 publication.

IDA also greatly appreciates the important input made by ESB National Grid personnel during site visits to Ireland by potential investors and your ongoing positive and critical assistance in furthering the development of IDA's Strategic Site programme.

Yours sincerely,

Brendan McDonagh,
Manager,
Property Division.

Copy: Mr. Louis Fisher, Transmission Network Planning Manager, ESB NG
Mr. Derek Lawlor, Customer Relations, ESB NG

ESB Networks

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Rx 30/3/06
ASL

Dermot Byrne
Managing Director, ESB National Grid
Lr Fitzwilliam Street
Dublin 2

Re: Transmission Development Plan 2006 - 2010

Dear Dermot,

ESB Networks has reviewed the draft Transmission Development Plan 2006 – 2010, in the context of ESB Networks' dual roles as both Distribution System Operator, and Transmission Asset Owner (TAO).

As the TAO, ESB Networks is charged with investment funding, building, and maintaining the Transmission System. Although the Infrastructure Agreement which sets out how Eirgrid as Transmission System Operator (TSO) and the TAO discharge their roles has been agreed between the parties it is not yet fully implemented, as it awaits the establishment of Eirgrid to take over the role of TSO. However, the key principles implicit in our licence obligations underpin our respective working arrangements.

ESB Networks welcomes the preparation of this plan, which is a vital step towards the development of a new strategic relationship between ESB Networks and the Transmission System Operator. The need for such a plan is evident, given Ireland's rapidly growing economy as manifested in the huge growth in both electricity consumption and in generation projects. The level of enquiries being generated by developers and customers in Ireland is unprecedented in the history of the state. The impact of this is that ESB Networks is under enormous pressure to respond quickly to the needs of customers and to provide new infrastructure more rapidly than ever before. Therefore this plan is critical in co-ordinating Ireland's energy infrastructural needs at Transmission level for the future.

Specifically we would comment as follows on the draft plan;

- The Transmission Development Plan sets out the major projects where ESB Networks in its capacity as Distribution System Operator (DSO) has referred to the TSO for connection of new Distribution Substations to meet customer loads. The current draft plan has clearly taken on board the views expressed by the DSO in December 2005 and this is very much to be welcomed.

ESB Networks

- In addition, the format of the plan will help the co-ordination of planning between the two System Operators.

- Annual updating of the Transmission Development Plan as proposed is critical to ensure that the Transmission System continues to be developed to meet the rapidly evolving requirements of the electricity users in Ireland.

- The current draft Transmission Development Plan does not provide sufficient detail to enable the TAO to prepare a full Programme Implementation Plan or to prepare a Project Implementation Plan for the projects listed. For ESB Networks to put the necessary framework contracts for the procurement of materials, and resources to deliver the projects in place, a more detailed reference document will be required.

- The Transmission System reinforcements for the Dublin area have not been spelled out in this plan. However the draft plan acknowledges in Sections 5.2 & 5.3 the need for such a plan. ESB Networks welcomes this. The existing Bulk Supply Points are being stretched to deliver the required energy to the City and its growing environs, and while improvements to the Transmission System have been made over the past five years, it is clear that there is considerable reinforcement still required into the future.

  In addition, the scale of the projects required in Dublin is likely to be very significant in financial terms and may impact on the recent Transmission Price Control determination and ESB Networks Investment requirements. The issue of Transmission reinforcement for Dublin needs to be addressed as a matter of some urgency.

Regards

John Shine
Executive Director
ESB Networks

March 16th, 2006