



Fast-Build Consultation Paper
Version: 1.6

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Executive Summary

In order to ensure the security of Ireland's electricity supply, consideration is being given to a rapid-deployment capability for new generation. The term "Fast-Build" refers to the provision of serviced developed sites capable of deploying generation plant(s) within 9 months of being requested (trigger activated). There are a number of scenarios where the sites may need to be used: one of the larger existing generation units may be forced out unexpectedly; generation availability as a whole may significantly fall below expectations for an extended period; or new anticipated generation may not be forthcoming for various reasons.

Following some concerns that have arisen with regard to security of supply in the period around 2009, EirGrid was asked by the CER to examine the viability of emergency generation being supplied through the Fast-Build process for the period 2009-2014 inclusive. While the likelihood of a shortage of capacity is low, a number of potential generating plant(s) closures and the continued strong growth in power demand in Ireland mean that more generation capacity may be required in the period in question. EirGrid has considered two potential options for the provision of a Fast-Build capability: the first is where EirGrid arranges the provision of sites with the capability to mobilise rapid generation capability; the second option involves the sites, as well as the generation capability, being sourced through competitive tender. EirGrid, with the approval of the CER, would like to consult with the industry with regard to the second option above and are publishing this consultation paper to commence a discussion on the Fast-Build concept. EirGrid welcomes feedback on the proposal, especially from those parties who are interested in participating in the provision of a Fast-Build service or who have a view on the main elements of the proposed Fast-Build approach.

EirGrid has examined a number of commercial and funding models for provision of Fast-Build generation. International best practices were analysed by an external economic consultancy firm on behalf of EirGrid and were applied to the proposed Single Electricity Market (SEM) in Ireland. This analysis showed that the recommended model for provision of Fast-Build generation should include a public tender process to find a suitable independent party who could deliver a total solution i.e. Build, Own and Operate. The provision of a suitably licensed and planned site(s) would be a requirement on any independent Build Own Operator.

The Fast-Build commercial model would be designed to allow the market to work. In the event that it is called upon to operate, it should not interfere materially with the market pricing arrangements for other generation. The Fast-Build generator would be intended as a peaking plant and would not be used for baseload application. Therefore, the time that it would be exporting to the grid should be relatively short when compared to other types of generation plant(s). It is envisaged that the Fast-Build generators would not be paid constraints or be in receipt of capacity payments. In normal operational circumstances, the likely revenue from the market would not be sufficient to cover running costs. As a result, a public levy would be required to make up the difference between total costs and SEM income. This levy would be subject to Government and EU Commission approval. In the event that revenue from the SEM is greater than the fixed costs of the project, a rebate to the levy would be payable (as is the case with renewable wind generation). It is essential that any Fast-Build capability would be delivered at a reasonable cost, commensurate with the security of supply benefit gained from it. The recommended model proposes that a regulated rate of return would be paid to the provider of Fast Build services.

EirGrid engaged an external consultant to advise it on the technology options available for peaking capacity generation systems with an output of up to 200MW. After analysing generators from international manufacturers with regard to fuel type, market impact (variable cost and fixed cost), availability, environmental impact and delivery lead time, two technologies appear to be most suitable for the Fast-Build application: high speed distillate and aero-derivative dual gas/distillate.

The trigger conditions necessary for the Fast-Build sites to be populated by generating plant(s) would be determined from a Capacity Adequacy Study (CAS) conducted by EirGrid. By having a trigger mechanism related to capacity rather than price, there is less likelihood that price signals would be affected. These price signals are important for maintaining investment incentives. The CAS would be carried out annually, during the last three months of the year, however it could be updated for major changes in circumstances. It would look forward nine months and beyond. The time period for the study would be reviewed over time. Where the study finds that there is a higher than normal risk of load shedding, the trigger would be enabled. This status would be advised to the CER by EirGrid. It would be the responsibility of the CER to activate the mechanism where it believes it necessary. Once the trigger has been activated the installation of the generating plant(s) would begin.

The location and number of Fast-Build sites (between one and three) are key elements in the project. The criteria used to decide which sites are appropriate include: the technical ability of the

grid to support the connection; the ease of fuel storage/supply; and the environmental/planning suitability of the location. Consideration was given to locating the sites in Northern Ireland (in keeping with the commencement of the Single Electricity Market). Factors such as the existing low interconnector capacity and the additional legal and funding complexity inherent in locating the plant(s) outside of the Republic mean that such an option was considered not viable.

1. Introduction

1.1. Background

The Generation Adequacy Report (GAR) published in 2007 shows that there is little spare margin available in generation capacity over the next few years in the Republic of Ireland. It is fully expected that the market will bring forward generation investment to meet the predicted growth in demand, however, with a number of generators expected to come on line there is an inherent risk of delay in completion of these projects. As Ireland is only lightly interconnected with external systems, any assistance from external sources during a security of supply shortfall would be limited. With aging plant(s) and a forthcoming divestment programme presenting some risk to supply during the period 2009-2014, a number of measures have been considered by EirGrid. One of these measures, which was mentioned in the government's 2007 white paper on energy "Delivering A Sustainable Energy Future For Ireland", is the provision of Fast-Build sites with the potential to deploy generation within nine months or less.

1.2. Consultation Process

The purpose of this consultation is to garner feedback from the electricity generation industry on the Fast-Build concept. EirGrid would welcome feedback from industry participants who may be interested in participating in any future competition. In particular, EirGrid would like to hear the views of interested parties in answer to the following questions:

- Do you believe that the proposed funding and commercial models are of sufficient interest to you to merit further enquiry?
- Do you have a view on the specific generation technology and fuel types mentioned in this document?
- Do you believe that it is likely that appropriate peaking capability could be deployed and available within 9 months?
- What views or interests do you hold with regard to suitable sites that could be supplied for the project?

Expressions of interest or other communications will be accepted in confidence (details may be shared with the CER only), and should be provided to:

Mark Needham
mark.needham@eirgrid.com
EirGrid
27 Lower Fitzwilliam Street
Dublin 2

The consultation closing date is Friday the 9th of November 2007.

Where appropriate, EirGrid may meet those parties who are interested in participating in the project to discuss their views. Note that, as the consultation period is limited, it may not be possible to meet all parties. However, this would not preclude those parties from participating in the tender stages of the project.

1.3. Structure of this document

This consultation document is structured as follows:

- Section 2 outlines the key assumptions and design features that underlie the proposed Fast-Build model and provides a high-level description of how the proposed Fast-Build mechanism would operate, both in terms of site requirements and process.
- Section 3 provides an overview of the proposed funding and commercial models and how the Fast-Build plant(s) will relate to the Single Electricity Market (SEM).
- Section 4 provides an assessment of the technologies with regard to fuel type, planning permission, market impact and availability that are appropriate for the Fast-Build application. It also makes some recommendations on the technologies that are likely to be most appropriate in the event that the project goes ahead in the short to medium term.
- Section 5 explains some of the issues relating to site selection including: planning permission, grid restrictions and licensing arrangements.
- Section 6 discusses an appropriate mechanism that would activate plant(s) deployment in preparation for export to the grid.

2. Fast-Build Mechanism

EirGrid is proposing a Fast-Build model, which has the aim of providing serviced developed sites capable of deploying peaking capacity generation plant(s) within 9 months of being requested (triggered) for security of supply reasons.

This section outlines the key assumptions and design features that underlie the proposed Fast-Build Model. This section then provides a high-level description of the proposed process.

2.1. Key Assumptions and Design Features of the Fast-Build Project

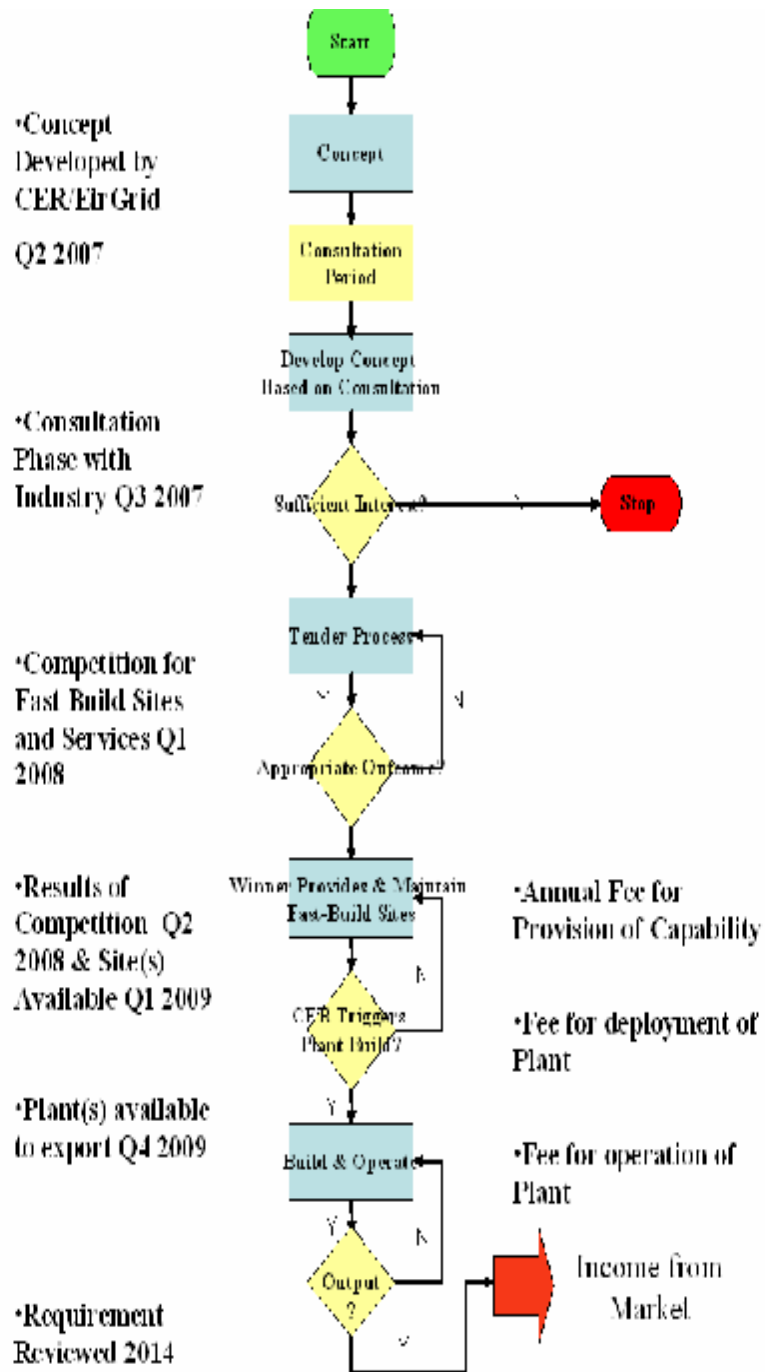
- § The period of interest from a security of supply perspective starts in early 2009.
- § The Fast-Build sites would be available from 2009 to 2014 inclusive.
- § The length of time between the trigger point (to deploy plant) and export of power from the site(s) would be a maximum of nine months.
- § The total amount of power to be supplied by the Fast-Build generating plant(s) would be 200MW.
- § The Fast-Build plant(s) would be suitable for the provision of peaking capacity i.e. they are not intended as baseload generator(s).
- § The amount of time spent exporting to the grid should be relatively short compared to the time not exporting.
- § The physical connection and network would be designed such that it could run when required.
- § There would be between one and three sites.
- § The operators of Fast-Build would not receive ancillary services, capacity or constraint payments.
- § All major decisions at key stages with regard to advancing the project would be made by the CER.

2.2. Fast-Build Process

The illustration on the next page describes the Fast-Build multi-stage process model. The first phase covers the concept and consultation phase. The second phase covers the competition process to be run to find the Fast-Build Site(s) and services provider(s). This process would be run by EirGrid on behalf of the CER. The competition winner(s) would then provide the developed sites and guarantees regarding the supply of generating plant(s). The third phase covers the deployment of plant(s) and accompanying support services to enable the sites to export to the grid. This phase would commence with a trigger provided by the CER under advice from EirGrid. The last phase would involve the plant(s) exporting to the Grid in exceptional circumstances. The rules governing the export of power from the Fast-Build plant(s) would be made available to interested parties during the tender phase of the project.

The requirement for the Fast-Build sites would be reviewed at the end of 2014.

Figure 1



3. Funding and Commercial Model

The winner(s) of a competition to provide Fast-Build services would be guaranteed a regulated rate of return on their investment. This section outlines, at a high-level, the likely funding and commercial models as currently envisaged by EirGrid, having been advised by international consultants. Feedback is sought from industry participants on the proposed models.

3.1. Funding Model

The Fast-Build provider would receive a number of payments for products and services including:

- Fees for provision and maintenance of sites;
- Fees for deployment of generation plant(s);
- Fee for operation and maintenance services; and
- Income from the generation of power.

In order to avoid distortion in the market, the plant(s) would not contribute to setting the market price but would rather be a “Price Taker Generator Unit” as defined in the Trading and Settlement Code.

The criteria for which plant(s) would be dispatched are beyond the scope of this report. Notwithstanding this, EirGrid envisages that export from the Fast-Build peaking plant(s) would only occur for a relatively short period of time each year. Therefore, it is not likely that income from the export of energy would be sufficient for it to be economically viable. The recommendation is that a public levy would make up any shortfall in income.

3.2. Commercial Model

A number of commercial models were evaluated and the preferred choice was determined to be an Independent Build Own Operator (Independent BOO). In this case, EirGrid would be responsible for running the competition /tender process to find an independent party who would provide and develop the site, as well as owning and operating the generation plant(s). In the event that suitable sites are not available then EirGrid would examine the possibility of providing the site. It would also consider changes to the model as a result of feedback arising through a consultation process with members of the industry.

4. Technology

EirGrid commissioned independent consultants in 2006 to advise on the technological aspects of the Fast-Build project. A final report was submitted earlier this year. This section provides a high-level overview of the results of the technology report.

4.1. Plant Types and Availability

The technical characteristics required for peaking capacity are outlined in Table 1.

Table 1

Technical Characteristics for Peaking Plant(s)
Quick Starting
High Starting Reliability
High Availability
Low Fixed Running Costs with remote control capability
Short minimum run time
Minimum down time
Ability to store fuel for at least two days running with capability for fuel top up
Low minimum load
Under Frequency pick-up capability

The technology report found that there are three different technologies that are appropriate for peaking capacity generation: industrial gas turbines; aero-derivative gas turbines; and high-speed diesel engine generators. Of these, the latter two are more likely to be deployed on account of the long delivery lead times that are associated with gas turbine technology. The lead times of each plant type varied from a few months, in the case of high-speed diesels, to 15 months in the case of gas turbines. The time available to populate any Fast-Build site is relatively short compared to those used for more mainstream generation plant(s). Therefore, the ease of installation and removal is also an important consideration. Even where the technology is easy to install, the amount of time taken to complete the necessary infrastructure could lengthen the project considerably. Depending on the choice of technology, definite signals could be sent to the market regarding the long term plans of the generating plant i.e. certain efficient technologies which may have high fixed costs may not be suitable as they might only be commercially viable if they participate in the market.

4.2. Preparation, Planning and Permission for technology

Project preparation is mainly concerned with planning, licensing and commercial issues. The requirements for each element are impacted by the choice of technology and the number of plants. If the net output of the particular generating station is more than 100-120 MW then an Environmental Impact Statement is required and would need to be prepared as part of the planning permission process.

High speed diesel plants have higher noise and emissions than the other technologies. Noise attenuation technology is available, however, this would add to the plant cost. In general, where high speed diesel technology is used for this type of application, large numbers of relatively small generator units are utilised. The visual impact of these generation farms is greater than for other types of plant. Restricting the number of locations to a few sites may make it easier to obtain planning permission, particularly in the case of diesel generation.

4.3. Fuel Supply

The choice of technology impacts on the fuel options available. High-speed diesel generators use distillate (diesel) fuel only, whereas aero-derivative turbines can use both gas and distillate. Peaking capacity plants can use up to one tanker of fuel per hour. In situations where the unit is used on a daily basis, frequent delivery of road transported fuel may be required. Therefore, in the event that the Fast-Build site(s) use distillate technology, a location with easy access to a large scale distillate storage facility would be desirable.

There is considerable fixed cost involved in connecting a gas powered generator to the national natural gas network. Regulations dictate that this work would entail additional pipeline and an above ground installation (AGI), which would cost in the region of €3million. It is a CER licensing requirement that all operating generators maintain a fuel storage capacity of at least 120 hours of base load running. The choice of fuel type may send a definite signal to market participants regarding the long term plans for the generating plant(s) used on Fast-Build sites. The use of gas with its high fixed cost, may impact on other entrants' investment decisions.

5. Site Selection

The choice and number of sites could have an impact on the SEM, both from an investment perspective and from a price performance point of view. The Build Owner Operator would have to have the necessary planning permissions and licenses.

5.1. Criteria for Site Selection

There are several criteria involved in the decision to pick a site suitable for the Fast-Build project. Firstly, the technical capability of the electricity grid to accommodate new generation at a particular connection point is significant. EirGrid carries out a range of incremental transfer capability (ITC) studies for its Transmission Forecast Statement (TFS), which determines the capability of the grid to accommodate changes in generation. These studies are less detailed than individual connection studies. The 2007-2013 TFS gives relevant information about potential generation opportunities. It is therefore a general guide to what locations may be suitable. Note that group process (Gate 2) offers, if taken up, will impact on the opportunities presented in the TFS 2007-2013.

The technology criteria may also have an effect on the choice of site particularly with regard to fuel. The choice of any particular site may have implications for other participants in the market or interested parties who may want to enter into the market. A list of the site specific criteria is listed in Table 2.

Table 2

Criteria for Site Selection
Grid Access
Environmental Factors
Local Planning issues
Availability of pre-used brown sites
Plans/ Intentions of other participants
Impact on other market entrants
Availability of fuel
Ease of access
Licensing issues

5.2. Number of Sites

It is most likely that between one and three sites will be chosen for Fast-Build. There are a number of reasons for this range. Firstly, the likelihood of one site being able to accommodate a total capacity of 200MW is restricted by the fact that the 220kV network has less geographical reach than the 110kV network. There are very few parts of the network where 200MW could be connected at 110kV. In addition, a larger single site would compound the planning and licensing requirements.

Ideally, the plant(s) would be installed on a (existing/former) generation or industrial site which has the required licensing and planning requirements. The provision of a site is included as a requirement of the tendering process.

6. Trigger Mechanism

There are a number of combining factors that go into the trigger mechanism: the criteria for the trigger; who the responsible party should be; how much transparency will exist; and whether the process should be reversible i.e. should it be possible to reverse a decision once it has been taken.

In addition to the supporting principles, the mechanism itself is key to realising the potential of the Fast-Build project. If the mechanism is not sufficiently sensitive to security of supply issues, the generation capacity may not be provided in time. If it is too sensitive: a high cost solution may be invoked without real need.

6.1. Background and responsibility for mechanism

There are three separate decision phases that are distinguishable in the Fast-Build programme. The first concerns whether to proceed beyond the consultation phase with the project. All such decisions will be made by the CER. The second and principal trigger point gives the go-ahead with the implementation phase (deployment of peaking capacity plant(s) onto the Fast-Build site). The last decision point determines when the generation plant(s) should export onto the Grid.

It is the second of the three decision points that the following sections will be concerned with. This trigger will see the Fast-Build site being populated with generation plant(s) and peaking capacity becoming available to run.

6.2. Decision Points

6.2.1. Trigger for the installation of generating plant(s) onto Fast-Build sites

A Capacity Adequacy Study would be conducted by EirGrid annually between October and December. In the event that this study showed that there was a higher than normal risk of load shedding, then EirGrid would formally advise the CER that the trigger for Fast-Build has been enabled. It would then be the responsibility of the CER to activate the trigger if it sees fit. The result would see a participant, identified through the tendering process, populate relevant site(s) with appropriate peaking capacity within 9 months. This party would then own and operate the generating plant(s) (See Section 3).

The Capacity Adequacy Study would examine a period ahead of nine months or more. The duration in question may change depending on the amount of time required to populate the Fast-Build sites.

Inputs into the Capacity Adequacy Study would be a key consideration. At each stage every effort would be made to keep the entire process as transparent as possible, except where information has been supplied to EirGrid in confidence.

Table 3

Criteria for Triggering Fast-Build Project
Capacity Adequacy Studies
Assessment of Generational Risk
Assessment of External risks

Certain unforeseen events may lead to EirGrid making a recommendation to trigger Fast-Build (See Table 3 above). The two-step approach (EirGrid advising and CER deciding) helps to provide a transparent and open system of control. This demonstrates acknowledgement by EirGrid, that policy decisions with regard to the Fast-Build project are the responsibility of the CER.

6.2.2. Export of power onto the national grid

The commercial model of operation outlined in section 3 states that the Fast-Build plant(s) will operate outside of the SEM, in order to limit distortion of the market. The rules for dispatch would be defined by EirGrid as agreed with the CER and would be made available to all participants during the tendering stage of the project.