# Notice

## Invitation for submissions

## Proposed 330 kV South West Transmission Reinforcement

DATE:

December 2008

DOCUMENT PREPARED BY:

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safe reliable efficient

# 1 Summary

The purpose of this document is to seek submissions from the public and interested parties regarding Western Power's proposal to upgrade the 330 kV transmission network to increase the electricity supply capability between Collie and Perth. Western Power has a requirement to provide increased capacity for the Perth metropolitan area to meet the growing demand for electricity.

This call for submissions is the second invitation relating to the need to upgrade the 330 kV transmission network and addresses a new recommended option. The first call for submissions was made in October 2007. No alternative proposals were received. Social and environmental issues have been raised that affect Western Power's ability to deliver the previously recommended option on time. The new option has been developed to meet the necessary time frame, while retaining the economic and technical benefits of the original recommended option, and aligns with Western Power's long term strategic plans.

The proposed network upgrade was identified as Western Power's recommended option to cater for expected demand growth after considering a number of options.

Submissions are invited seeking alternative options to the proposed network upgrade, as outlined in the Electricity Networks Access Code 2004.

This invitation addresses only the technical and economic issues relating to the proposed network upgrade. A separate consultation process seeking input from the community is being conducted in relation to social and environmental aspects of the proposed project. If you have questions regarding the line route or substations please email **ppc@westernpower.com.au**.

The South West Interconnected System contains significant generation located in the region south of Perth. This generation exports most of its power into the Perth metropolitan area. Recent developments have seen new power stations established along the coastal plain in the area between Bunbury and Kwinana. These new power stations have increased the loading of the 330 kV bulk transmission network between the south west and Perth.

Studies show that from 2011 onwards the transmission network will not have sufficient capacity to accommodate the forecast increase in generation located south of Perth. Should any one of the four 330 kV transmission lines supplying the Perth metropolitan area be forced out of service, the increased power transfer on each of the remaining lines may cause the voltage level within the network to fall below acceptable limits. To maintain an acceptable level of security in the electricity network, the proposed network upgrade is required.

Western Power has considered 11 major options to solve the capacity constraints in the network supplying Perth. These options include transmission, generation and demand management solutions. Independent consultants, SKM (Sinclair Knight Merz) have reviewed Western Power's discussion paper and support the conclusions drawn. Independent consultants ACIL Tasman have evaluated the range of network and non-network options and concluded that the proposed solution is the optimal solution considering economic benefit and technical performance.

This proposal will be subject to review by the Economic Regulation Authority (ERA) under the Regulatory Test and the New Facilities Investment Test (NFIT). The Regulatory Test requires that a range of network and non-network alternatives (such as demand side management initiatives or alternative generation solutions) are evaluated and that the proposed network investment is the most efficient outcome.

On the basis of ACIL Tasman's evaluation, Western Power believes that the proposed solution provides the transmission capacity to support the connection of a new generating plant to the south and east of Perth that is required to support growing electricity demand, whilst maximising net economic benefits.

Industry is encouraged to submit alternative proposals. Western Power will evaluate all proposals before submission of its final recommendation under the Regulatory Test.

# 2 Purpose

This document has been prepared to provide information on:

- the network constraints in the electricity network supplying Perth;
- the range of options considered; and
- the proposed solution.

This invitation:

- seeks alternative proposals to alleviate the network constraints, as required by the Electricity Networks Access Code 2004; and
- invites interested parties to make submissions to Western Power regarding alternative options.

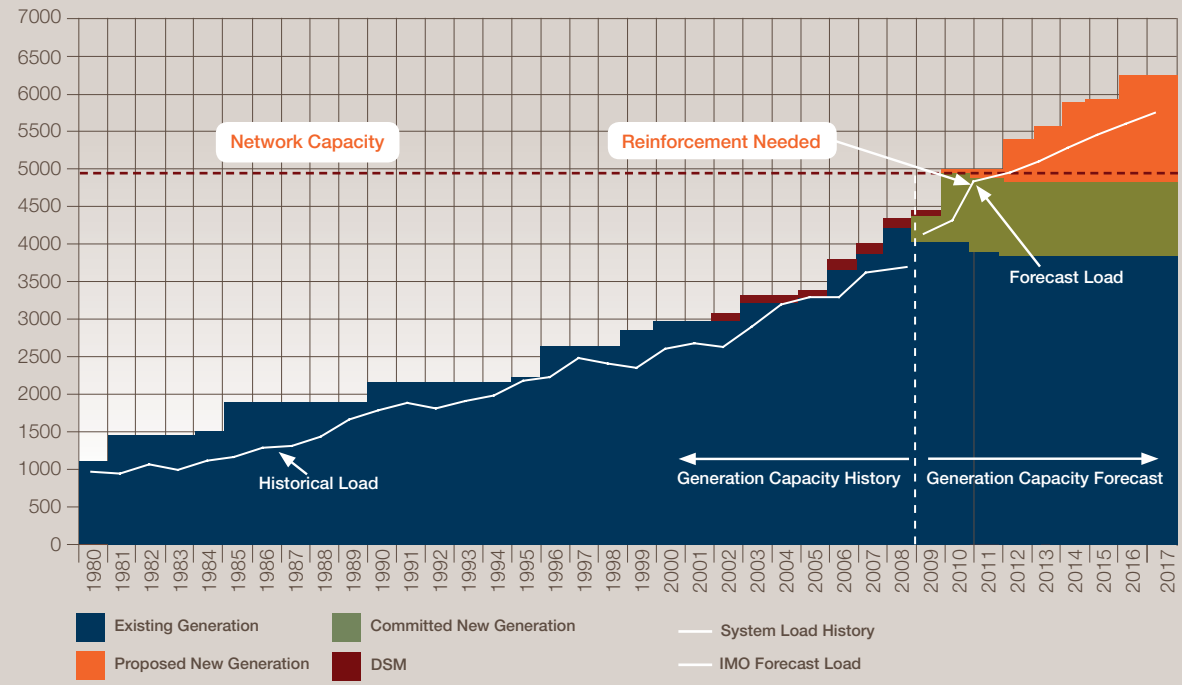
# 3 Background

The existing 330 kV bulk transmission network supports the transfer of large volumes of power from generation sources located in the region south of Perth to the large load centre based in and around the Perth metropolitan area. The loading of these lines from the south west are nearing their capacity limits.

An electricity demand forecast and an energy forecast are published annually in July by the Independent Market Operator (IMO). These forecasts are for the entire South West Interconnected system (SWIS) load for the next 10 years. This demand forecast is used by the IMO to determine the minimum acceptable level of generation that must be connected to the network each year to reliably supply the forecast load. This forecast is shown in Figure 1.

The forecast electricity demand for the SWIS indicates that substantial amounts of new generating capacity will be required in the future. If this new generating capacity were to locate and connect to the network south or east of Perth, the 330 kV bulk transmission network would be loaded above its capacity.

**Figure 1: Forecast system load and the expected capacity constraint on the 330 kV system**



The majority of access applications that Western Power is currently assessing indicate that there are strong prospects for new generators to locate in this region. Benefits encouraging proposals in this region include access to land, access to fuel and access to industry where cogeneration produces efficiency gains. Work undertaken by economic consultants (ACIL Tasman) supports this outlook as they have determined that the most efficient development scenario for the electricity market contains a number of new generating stations located in the south-west.

Western Power has identified and assessed a number of alternatives for enhancing the bulk transmission network to accommodate the new generation.

## Options considered

Western Power has identified and assessed the technical and economic merits of a total of 11 improvement options to address the power supply capacity constraints in the south west region. A separate consultation process seeking input from the community is being conducted in relation to social and environmental aspects of the proposed project. These are:

### Network solutions:

1. Establish South East Terminal (near Oldbury) and a new 330 kV double circuit transmission line between Landwehr Terminal (near Wagerup) and South East Terminal.
2. Establish South East Terminal and cut the Shotts to Southern Terminal/Oakley 330 kV transmission line into Landwehr Terminal. (A new double circuit transmission line will be required from Landwehr Terminal to South East Terminal 2 years later.)
3. Establish South East Terminal and install additional high voltage capacitor banks at South East Terminal and Guildford Terminal. (A new double circuit transmission line will be required from Landwehr Terminal to South East Terminal 2 years later.)
4. Install a Static VAr Compensator (SVC) at Northern Terminal (to defer option 2, a new double circuit transmission line will be required from Landwehr Terminal to South East Terminal 5 years later).
5. Install series compensation in the 330 kV bulk transmission lines between South West generation sources and the Perth metropolitan area. (A new double circuit transmission line will be required from Landwehr Terminal to South East Terminal 5 years later.)
6. Install conductor on the spare circuit of the 330 kV transmission line between Shotts Terminal (near Collie) and Wells Terminal (near Boddington) and rebuild an existing transmission line to a new double circuit 330 kV transmission line between Wells Terminal and a proposed new Eastern Terminal.
7. Install an SVC at Northern Terminal (a new double circuit 330 kV transmission line from Wells Terminal to Hacketts Gully and the establishment of South East Terminal will be required 2 years later).
8. Install conductor on the spare circuit of the 330 kV transmission line between Shotts Terminal and Wells Terminal and rebuild an existing transmission line to a new double circuit 330 kV transmission line from Wells Terminal, connecting to existing transmission lines in the Hacketts Gully area and establish South East Terminal.
9. Establish a 500 kV transmission link to the metropolitan area.

### Non-Network solutions:

10. Seek from the market installation of additional generation in the metropolitan area.
11. Undertake a demand management program to reduce electricity demand sufficiently to defer the need for the connection of new generating plant and network augmentation.

## Overview of options assessment

Demand management (option 11) has not been recommended as the magnitude of the load reduction that could be achieved through such a program is very unlikely to be sufficient to defer the network expansion, even under low growth scenarios.

The existing network is currently constrained by a lack of transmission infrastructure needed to support generation growth in the South West region. Therefore, there is only limited potential for alternative generation proposals to alleviate the need for network reinforcement.
Western Power commissioned ACIL Tasman to assess potential generation options that would be required to support increased power demand within the network. ACIL Tasman has based their assessment on the following generation scenarios:

i) Generation in the South West region with transmission reinforcement (options 1-9)

ii) Generation in the metropolitan area near the major load centre without transmission augmentation (option 10)

The generation only option (option 10) would require new generation to connect to the network within the metropolitan area. As there is limited opportunity for large-scale cogeneration plants, renewable energy plants or coal fired plants in this area, new generation would be restricted to gas-fired plant. This is not the recommended solution as it constrains the competitive generation market and restricts fuel competition for generation. This would result in higher electricity costs passed on to consumers. This option also creates a barrier to the connection of renewable generation located south or east of Perth. The recommended transmission option (option 8) provides a greater net benefit than option 10.

Western Power, SKM and ACIL Tasman have studied the transmission network enhancement options (1-9) and concluded that option 8 provides the most economical, technically acceptable solution to meet the Perth community's growing power requirements through to 2017 (based on the current load forecast).

Establishing a new double circuit 330 kV transmission line from Collie to Perth (Hacketts Gully) under a range of market development scenarios:

i) Increased transfer capacity by 1,000MW;

ii) Reduced energy losses;

iii) Improved security of supply; and

iv) Provided the opportunity to connect renewable generation in the South West region.

Option 8 is required to be in service by the end of 2011.

# 4 Proposed 330 kV transmission reinforcement

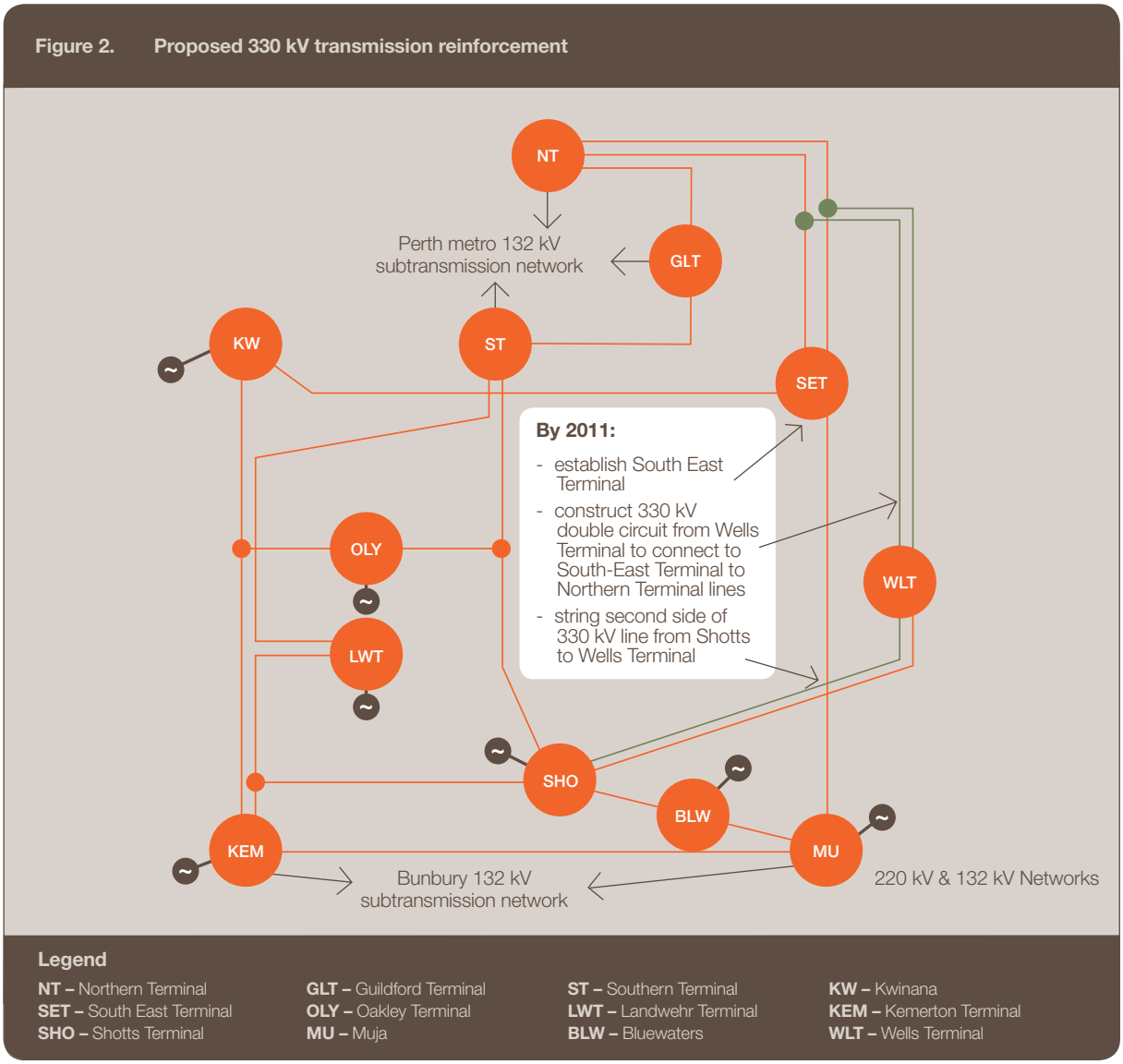
## Recommended option

The optimal economic development of the electricity market is reliant on the reinforcement of the electricity transmission network. To maximise net benefit, Western Power's recommended option is to establish a new double circuit 330 kV transmission line from Shotts Terminal (near Collie) to Perth via Wells Terminal (near Boddington) and a new South East Terminal switchyard.

The new transmission line will be established by stringing a conductor along the spare circuit of the existing 75 km long Shotts Terminal to Wells Terminal 330 kV double circuit transmission line and rebuilding a 90 km long section of 132 kV transmission line from Boddington to Perth as a double circuit 330 kV transmission line. This line will connect directly to the existing double circuit transmission line between the new South East Terminal and Northern Terminal (as shown in Figure 2) at Hacketts Gully.

The new South East Terminal will need to be cut into two existing 330 kV transmission lines – KW-NT and MU-NT.

**Figure 2. Proposed 330 kV transmission reinforcement**



## Proposed timeline

| Proposed timeline | |
|---|---|
| December 2008 | Call for submissions |
| January 2009 | Regulatory Test submission (to the ERA) |
| January – February 2009 | Regulatory Test assessment process (by the ERA) |
| February 2009 | Regulatory Test determination (by the ERA) |
| March 2009 | Board and Government approvals (subject to Regulatory Test approval by the ERA) |
| May 2009 – November 2011 | Construction |
| November 2011 | Target completion date |

## Expected Benefits

There are a number of expected benefits from the proposed project.

- Creates capacity for new generation to be connected in the South West region, including renewable generation.
- Enables optimal generation market development.
- Reduces greenhouse gas emissions by enhancing network efficiency.
- Facilitates the development of power station sites remote from the metropolitan area.
- Assists in meeting load growth in the metropolitan area.
- Maintains system voltage levels and network reliability.

## Other facts at a glance

- Independent evaluations of the reinforcement options have been commissioned. After considering submissions from public consultation, the final major augmentation proposal will be lodged with the ERA.
- The proposed 330 kV transmission line length is approximately 165 km (75 km stringing spare circuit plus 90 km of new double circuit).
- The total cost of the project is expected to be in the order of $180 million.
- An invitation for submissions for a similar proposal was issued in 2007. Social and environmental issues have been raised that affect our ability to deliver the previous proposal on time and this new alternative has been developed to meet the necessary time frame.
- This proposal is economically and technically equivalent to the previous proposal.
- The call for submissions last year did not result in any alternative proposals.
- The new proposal aligns with Western Power's long term network development plans.

## Final call for submissions

Western Power is obliged to adhere to the Electricity Networks Access Code 2004.

The objective of the code is to:

- inform the public, customers and interested parties about the proposed transmission line;
- ensure that all credible alternative options are considered and compared with the proposed improvements; and
- ensure that Western Power has regard to alternative options and gives reasonable consideration to any information obtained under the consultation process when forming its view and conclusion prior to the Regulatory Test Submission as required by the Electricity Industry Act 2004.

This invitation addresses the technical and economic aspects of the proposed network augmentation. A separate consultation process with input from the community is being conducted in relation to social and environmental aspects of the proposed project. If you have questions regarding the line route or substations please email **ppc@westernpower.com.au**

# 5 Invitation

Western Power encourages submissions from interested parties, in particular where parties consider that there may be an alternative option to the proposed reinforcement and where parties are considering connecting to the network.

Comments and submissions may be in either printed or electronic form and should be received by Friday 9 January 2009 addressed to:

**NPD Submissions**
**Manager**
**Network Planning & Development**
**Western Power Corporation**
**GPO Box L921**
**Perth WA 6842**

**T: (08) 9326 6293**
**F: (08) 9218 5167**
**E: npdsubmissions@westernpower.com.au**

## Confidentiality

In general, all submissions from interested parties will be treated as being in the public domain and placed on either Western Power's or the Economic Regulation Authority's (ERA's) web site.

If an interested party wishes to make a confidential submission, it should clearly indicate the confidential sections of their submission and outline in reasonable detail the request for confidentiality.

The receipt and publication of any submission on Western Power's or the ERA's web site shall not be taken as indicating that Western Power or the ERA have knowledge, either actual or constructive, of the contents of a particular submission and, in particular, whether the submission in whole or in part contains information of a confidential nature and no duty of confidence will arise for Western Power or the ERA in these circumstances.

**General enquiries**
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**For more information on this project, please visit:**
**www.westernpower.com.au/sw330**

[1] 'Electricity Industry Act 2004' requires that for the first round public submissions the time for the making of submissions must be: (a) at least 10 business days; and (b) no greater than 20 business days after the invitation is published, and must be at least 10 business days after any issues paper was published under clause A7.4.