Attachment 3 Submissions and Western Power responses 1st round of public consultation

PUBLIC CONSULTATION AND SUBMISSIONS

Received Submissions

MID WEST ENERGY PROJECT – SOUTHERN SECTION

NEERABUP TO ENEABBA

DATE:

August 2010

DOCUMENT PREPARED BY:

Western Power
GPO Box L921, Perth WA 6842
ABN 18 540 492 861

safe reliable efficient

List of Received Submissions from Public Consultation

	Received Submissions	Date
1	Mr Mark Babidge **Eneabba Gas Limited**	14 July 2010 4 August 2010
2	Mr K. C. Wan **City Beach, WA**	16 July 2010
3	Mr Robert A. Stein **South Perth, WA**	21 July 2010
4	Mr Gavin Treasure **Shire of Morawa**	22 July 2010
5	Mr Stan Scott **Shire of Perenjori**	22 July 2010
6	Mr David W. Lantzke **Ardross Estates Pty Ltd**	23 July 2010
7	Mr Russell Hayes **Fire and Emergency Services Authority (FESA)**	26 July 2010
8	Ky Cao **Perth Energy**	26 July 2010
9	Mr Mike Teague **Email Submission**	28 July 2010
10	Mr Rob Rohrlach **Energy Response Pty Ltd**	28 July 2010
11	Mr Matt Duxbury **Extension Hill Pty Ltd**	28 July 2010
12	Mr Shane Cremin **Griffin Energy**	30 July 2010
13	Mr G F Stevens **City Beach, WA**	2 August 2010
14	Brett Edwards **Landowner, Gingin**	2 August 2010
15	Mr Robert Tana **Noranda (Perth Metro Area)**	2 August 2010
16	Steve Douglas **Mid West Development Commission**	3 August 2010
17	Mr Luca Castelli **Advanced Energy Resources**	3 August 2010

	Received Submissions	Date
18	Mr Rob Jefferies **Geraldton Iron Ore Alliance**	3 August 2010
19	Submission **Confidential**	3 August 2010
20	Hon Wilson Tuckey MP **Parliament of Australia House of Representatives**	3 August 2010
21	Ms Suzanne Ward **Mid West Regional Council**	4 August 2010
22	Submission **Confidential**	4 August 2010
23	Simon Middleton **Synergy**	4 August 2010
24	Tim Koehler **Private Consumer**	4 August 2010
25	John Kerwan **Department of Defence**	4 August 2010
26	Tony Brun **City of Geraldton-Greenough**	4 August 2010
27	Tony Petersen **ERM Power**	4 August 2010
28	Bill Bowyer **RPV Developments Pty Ltd**	4 August 2010
29	David Griffin **Infigen Energy Ltd**	4 August 2010
30	Dajian Li **Xian Continental Power Engineering Corp.**	4 August 2010
31	Troy Forward **Independent Market Operator (IMO)**	4 August 2010
32	Piers Verstegen **Conservation Council of Western Australia Inc.**	4 August 2010
33	Lisa Edwards **Landowner, Gingin**	4 August 2010
34	Richard Sellers **Department of Mines and Petroleum**	4 August 2010
35	Mr Mike Joyce **Giralia Resources NL**	10 August 2010

ENEABBA GAS LIMITED
ABN 69 107 385 884
Office: Level 1, 30 Ord Street, West Perth WA 6005 All Mail: P.O. Box 772 West Perth WA 6872
Tel+61 8 9321 0099 Fax+61 8 9321 0299 E-mail: admin@eneabbagas.com.au Website: www.eneabbagas.com.au

Mark de Laeter
General Manager, Customer Services
Western Power Networks
GPO Box L 921
PERTH WA 6842

14th July 2010

Dear Mark

Mid West Energy Project : Options Paper

As you are aware I was at your presentation of the above at 12 noon yesterday at the Rydges Hotel conference room.

Following that conference / consultation, I was given a copy of the Project Options Paper and was significantly surprised at the statement in that paper on page 22 being section 4.2.2 local generation. That being *"……it is unlikely that an alternative new project would be able to achieve the required environmental approvals and construct a plant to meet supply requirements.."*

I was disturbed that Western Power would stoop to such comments in a public document, which can only be assumed that this comment, plus others in your public document, can only be described as intended misinformation. It is not something that would be expected of a public authority.

This Company lodged its request for access in March 2005 and you and many other officers of Western Power are well aware that Centauri 1 power station has EPA approval, ERA licence approval and also all other regulatory planning items. Your comments in other areas of this public document are also demeaning of this Company's generation project and your focus is solely on wind generation and do not detail the Centauri 1 asset.

We would urgently seek your response, which should entail that this paragraph be removed and replaced with the following *"...Eneabba Gas has all the regulatory approvals in place inclusive of environmental approval, electricity generation licence and all other necessary planning and council planning to build the Centauri 1 168 MW Gas-fired Power Station, some 8 kms east of Dongara. The Centauri 1 Power station project can be built and deliver energy direct to iron ore mining locations within a 14 month period after a firm energy off-take agreement..."* This is well inside the timeframe of the energy needs.

We would request that this also be immediately adjusted in regard the Options Paper on the website and persons who attend yesterday's Industry Forum, Yesterday's Open Forum, Three Springs Forum and Geraldton Forum be advised of the misinformation that you have delivered.

We are particularly concerned that this has occurred and will take further appropriate action as required to ensure that Western Power does not misinform the public on basic facts of such a major project.

Yours sincerely

Mark H. Babidge
Managing Director

A / WPN / de Later / 195 / H

ENEABBA GAS LIMITED
ABN 69 107 385 884
Office: Level 1, 30 Ord Street, West Perth WA 6005 All Mail: P.O. Box 772 West Perth WA 6872
Tel+61 8 9321 0099 Fax+61 8 9321 0299 E-mail: admin@eneabbagas.com.au Website: www.eneabbagas.com.au

The Manager
Mid West Energy Project
Customer Service Centre
Reception 363 Wellington Street
Perth WA 6000

04 August 2010

Public Submission : Eneabba Gas Limited

Eneabba Gas Limited ('ENB') is an ASX listed Power Generation and Resource Company and is the only energy company to have received all approvals required for rapid development of vital power infrastructure in the Mid West. Any proposal by the State Government or Western Power Networks ('WPN') to address energy network constraints in the Mid West concerns ENB.

This submission on ENB's review of WPN's July 2010 Major Augmentation Proposal / Option Paper for the Mid West Energy Project - Southern Section Neerabup to Eneabba ('the Option Paper') is made in the hope that our views will be considered when WPN prepares the final proposal.

Review of Option Paper

1. Objectives of the Option Paper

(a) As part of due consultative process and benefits test

In its opening paragraph, the Option Paper stated that WPN has '*assessed various options to address energy network constraints and selected a preferred option (Mid West Energy Project – southern section), which satisfies the Regulatory Test*' (Page 1). It would be expected that a proposal with such major ramifications for the Mid West would have been made following third party submissions. Indeed, WPN advised in subsequent correspondence that '*.... The options paper clearly indicates that it's a preliminary analysis and through the consultation process we are seeking comments on that analysis...* .

We are concerned, therefore, that statements in the Option Paper appear to pre-empt the consultation process. The Option Paper is worded to appear that this has occurred, when it clearly has not reached the appropriate stage in the process for 'approval'.

We also question statements that the selected option satisfies the NFIT Regulatory Test. We believe that the Economic Regulation Authority ("ERA"), as the legislated custodian of this test, needs to be better convinced that the option passes the test.

(b) <u>In support of the Geraldton region</u>

The Option Paper is disappointing with respect to its objectives to ensure network meets forecast natural load and block load growth. By saying *'...we will conduct a more detailed planning assessment...'*, one is led to conclude that Geraldton and Stage 2 (the line from Eneabba to Geraldton, the subject of application funding from Infrastructure Australia) are not priorities, yet it is claimed that all capacity will be met. WPN must accurately state its contingency plan for the greater Geraldton area, if funding is not approved by the Australia Government.

2. Support skewed towards wind power

An example of this singular focus in recommending the Mid West Energy Project is the prevalence of statements supporting wind farms and the RET obligations of the target, by 2020, of renewable sources, and the near total absence of any support for thermal generation. The Option Paper gives the impression that decisions already appear to have been made by WPN that when such wind farms are inoperable, power will be delivered from the 'southern sources', which is indicated to be mainly coal fired power. Such assumptions are out of place and totally destroy any position by the WA Government to assist in reducing the total carbon emission. We would even question if taking up a position as this is irresponsible and ignores the wider community position and policy issues of other state organisations.

3. Simultaneous development of Stage 2

It is commercially illogical not to consider the simultaneous development of Stage 2 (a new 160 km double circuit 330 kV line, Eneabba to Moonyoonooka) as it has manifest benefits. It would connect loads of the general farming areas, towns and Geraldton / Oakajee Port with existing & approved generators – including ENB's Centauri 1 gas-fired project. Doing so may prove least cost. This comment is made despite WPN indicating this Stage 2 will not be considered. ENB believes that without a firm plan for Geraldton in the future, it is inappropriate as no detail is given for the northern area.

4. Alignment with network requirements

Like other network participants, WPN is subject to the SWIS Network Rules. However, there is no detailed discussion or alignment in network growth in the Options Paper that is aligned with the IMO Statement of Opportunities ("IMOSoO") as well as the IMO Long Term Roadmap ("IMOLTR") issued in February 2010. Instead, WPN appears oblivious to the innovative review required by the Minister of Energy to reform the W.A. electricity market. WPN is demonstrating with its proposed 'preferred position' for this project that it is maintaining a monopolistic position in transmission and as such has focussed on provision of one key customer and not supported a broad range of options.

This raises the question of whether WPN is subject to Market Rules and also other detailed arrangements undertaken by the IMO.

5. Reliability of capital cost estimates

The submission by WPN for this project has lodged its 'preferred position', with some explanation; it has not divulged any detailed cost comparison for each of the options that support the "preferred position', with the paper favouring wind generation, while conventional thermal generation, including more economic (less capital intensive) gas turbine generation has been mentioned in passing only.

Hard numbers in regard these assumptions are sought to define the decisions being taken by WPN. The Option Paper accurately defines the WPN preferred position, but the Paper conveniently glosses over items that require discussion, with this being a public document and supposedly reviewing details on an even playing field, there are many areas that can only be assumed as intended misinformation or insufficient due care.

6. Other Concerns

Other issues have been raised and included in the table below.

It is assumed that certain undertakings and future regulations have been proposed in relation to Carbon Emissions & Carbon Tax by both Federal and State Governments. While the Federal Government appear to have placed this 'on hold' until 2013, there is absolutely no discussion or apparent comments on the impact of these significant future cost items. With the proposed Network Peak Load Forecast of 1,400MW of future load, it will be indicated later in this submission, that significant commercial imposts may accrue depending on the future generation methods that may be employed. (see attached table # 01)

It must be confirmed that while this "wish list" of customer loads has been given, at the date of this project announcement by WPN, while there has been numerous press and media, there is not any confirmed and signed-off customers for this project.

This project has a long history with a number of previous Western Power 'forays' into the Mid West over many years. It is also an unfortunate position, where the total regulatory and overkill of duplicated government departmental approvals, in trying to establish this project, but the same regulatory duplication for generation development has had to run in parallel.

This same burden of regulatory duplication further exists with potential customers who wish to off-take energy and while unfortunate, government and governmental agency disruption to projects of this nature create significant impediments to growth opportunities in this State.

It should also be realised that while these delays defer some projects for years, it is a wasteful use of human and shareholder capital that would be better utilised to increase the wealth of the State as a whole, with the whole community having commercial and social benefits, particularly in Regional W.A.

Overview : Eneabba Gas Limited

The W.A. State Labor government in October 2004 announced that the Department of Energy (Minister Eric Ripper) would seek 'expressions of interest' of private generation for increases of capacity into the South West Interconnect System ("SWIS").

In December 2004 ENB was given approval from the Office of Energy to proceed with the project. The location was outside the influence, at that time, of 91% of W.A. power generation locations. This made the project a high priority for development and connection and that view was shared by the W.A. Government and opposition at that time, as well as local community and potential customers. The aim of ENB was, having secured a power station site that it would be located in an area where provision of generation capacity offers network benefits that at that time would alleviate or defer the major new transmission which would meet the load within the region, thus relieving the pressure on the north-south system. This is still the case, despite the limited options that WPN has already advised. WPN already had a system which relied on dispatch to Geraldton via the Mungarra power station to provide network support and maximise network capacity.

The Dongara property of ENB is a major land holding (in excess of 1,800 Ha) with the Brand Highway on one boundary and the Midlands Road on the other. In addition it is adjacent to the AWE Dongara gas processing plant and a short distance to the Mondarra underground storage facility. The Parmelia natural gas pipeline is some 20 metres (within ENB owned land) from the proposed generation plant. This power station has the facilities and flexibility in gas supply arrangements, including gas injection or withdrawal at short notice and ENB also has a fixed gas storage capacity within the Mondarra facility of the APA Group.

ENB lodged an Access Approval to Western Power Networks ("WPN") on 16 March 2005 – registered access SW050316 - to be connected to the SWIS. (5 years ago !)

On 12 May 2005 the Company lodged its application to the Independent Market Operator ("IMO") and took registration as a Market Generator and Market Customer

On 23 June 2005 the IMO approved Conditional Certification of Reserve Capacity of 100MW to start generation in the 2008-2009 year. The Centauri 1 Power Station will comprise in its initial format an installed capacity of approximately 168MW and a peak summer day of 130 MW depending on temperature. For purposes of reserve capacity certification the IMO had confirmed 100MW of capacity with a peaking demand of 110MW. Capacity in excess of these levels, up to the nominal capacity level of the plant, would be offered on an as-available basis depending on meteorological and plant operating conditions.

The contract for the power station has been signed with GE Energy for the supply of 4 x LM 6000 gas-fired turbines and ancillary equipment as a 'turnkey project. As soon as the project is activated it will be only some 14 months for full energy delivery. The site has been approved and all regulations agreed by both ERA and EPA. Future expansion capacity has also been planned for and these details are given below.

The initial Centauri 1 Power Station access was to have a connection for energy generation into the existing Mid West North Country Region ("NCR") but the system had been poorly maintained and upgraded for many years. About the same time WPN decided to undertake a further review and announced that it was the intention to have an upgraded line from Pinjar to Moonyoonooka.

The Centauri 1 Power Station is designed to ensure that the initial platform has the capacity for rapid growth should the region require. This is demonstrated as below;

Initial plant	4 x LM6000 gas turbines	168MW
Stage I	add water chilled columns	211MW
Stage II	add cogeneration capacity	243MW
Stage III	add extra turbine	258MW
Stage IV	add extra turbine	327MW
Stage V	add chillers & cogeneration	365MW

While this is the initial capacity planning, it can be clearly demonstrated that a number of combinations and accelerated options could easily be met, should additional loads and off-take specifications be requested from the customer base. The customer / off-taker will determine the mix of open cycle and co-gen units for energy delivery and subsequent unit cost.

ENB has, since late 2005 undertaken development questions and also undertaken system studies within WPN, within this time frame some 18 meetings (unfortunate mostly with a repetitive agendas and duplicated regulatory requirements from a number of 'review teams") as well as ENB delivering to WPN, detailed power system models by Worley Parsons and GE Energy.

This significant time and investment over the past 5 years has basically made no substantial development and progress at all to ensuring the power station would be connected.

This by no means is a gripe, but a demonstration of the significant human and financial capital that has been expended with no benefit, plus the frustration of no activation of the access connection. The Centauri 1 Power station and many other projects have been in the same circumstances in the Mid West not moving in a positive direction or being completed in the past 5-7 years.

On 23 July 2010 Prime Minister Gillard released the announcement that all new coal-fired power stations will have to meet greener standards before they can be built. This however would not be the position in W.A. due to the further statement that "*.....On coal-fired power stations, Ms Gillard explained the tougher system would only apply to new projects, not to existing ones or proposed ones which already have environmental approval...*", since the major coal-fired power stations already have the EPA approvals in place.

Ms Gillard did not indicate whether the Federal Labor government would shift from its timeline of reviewing the need for a carbon price in 2012, to start some time from 2013, hence the impact for the Mid West remains as per the status quo.

With this position being fixed and the current carbon tax that has been indicated the table below gives approximate comparisons between the delivery of energy from the SWIS and that of having energy delivery from Centauri 1 Power station.

It can be seen from the table below that with the initial stage I for Centauri 1 Power station, the anticipated net customer 'bottom line' benefit from gas fired energy could be in excess of $40 million per annum.

CARBON EMISSIONS : POWER GENERATION INDUSTRY : GREENHOUSE GAS : Western Australia

Carbon Tax / 100 MW / @ $20/tonne

	kg	TPA CO2	ETS $m p.a. penalty	168 MW ETS	Saving Domgas	Saving UCG
Total average estimates SWIS	910	1,721,866	34,437,320	57,854,698	19,454,434	29,435,952
Bluewaters* #	1,315	2,488,190	49,763,800	83,603,184	45,202,920	55,184,438
Muja A & B	1,205	2,280,053	45,601,060	76,609,781	38,209,517	48,191,035
Collie A	951	1,799,444	35,988,880	60,461,318	22,061,054	32,042,572
Kwinana pulv coal	935	1,769,170	35,383,400	59,444,112	21,043,848	31,025,366
Kwinana fuel oil	814	1,540,216	30,804,320	51,751,258	13,350,994	23,332,512
Kwinana diesel	782	1,479,669	29,593,380	49,716,878	11,316,614	21,298,132
Kwinana gas fired	604	1,142,865	22,857,300	38,400,264	(1)	9,981,518
new gas fired turbine *#	514	972,570	19,451,400	32,678,352	(2)	4,259,606
new gas fired turbine - UCG#	447	845,796	16,915,920	28,418,746		

* Annual reports Western Power 2005-2008
# manufacturer warranty specifications
* EPA lodged reports for new generation

kg CO2 - e / MW hr *
** 8,760 hrs p.a.

(1) & (2) due to varying technical combinations there may be differing values

ENB, having provided a view of the WPN project position and also a detailed history of its frustration (both with WPN and government inaction in the Mid West) to connect to the SWIS, would propose to give further detail in tabular form as attached.

Sincerely

Mark H Babidge

Mark H Babidge
Managing Director

ATTACHMENT

REVIEW OF MAJOR AUGMENTATION PROPOSAL / OPTIONS PAPER FOR THE MID WEST ENERGY PROJECT (SOUTHERN REGION)

PROPOSED SUBMISSION PROTOCOLS: ENEABBA GAS LIMITED ('ENB')

No.	Item	Comment	Reference
1	Objectives of the Option Paper	(a) The Option Paper has similar objectives as those of the Major Augmentation Proposal, a submission to ERA, dated 2 October 2007. In the latter, the objective was to increase overall network capacity; as though it was already determined that network reinforcement was the only solution to relieve supply constraints in the Mid West region. The Option Paper adopts a similar approach. Indeed, it dismisses thermal power proposals as an economic option by its mere omission. (See Item 2 below.) (b) While stating that its objective was to ensure the network meets forecast natural load and block load growth from the proposed new port developments and Oakajee industrial estate, WPN has also declared 'we will conduct a more detailed planning assessment…". This can only suggest that Stage 2 (Eneabba to Geraldton) is not a priority, yet throughout the Options Paper, it is claimed that all capacity requirements will be met. Although funding for Stage 2 is being sought from Infrastructure Australia, what is WPN's contingency plan if funding is not approved? (Also, see Item 3 below.)	Major Augmentation Proposal, 330kV Transmission Line and Associated Works in the Mid-West Region of Western Australia (2 October 2007)

No.	Item	Comment	Reference
2	Options Paper does not favour gas turbine-based proposals	It is well-known that wind farms present significant network challenges in demand management. It is a worldwide energy best-management practice to support wind farms with gas-fired gas turbine (GT) power, which has quick start-up and shut down capability, and does ensure lower carbon emission. WPN appears to ignore this. Wind generation is promoted as a net benefit in the NFIT assessment, while conventional thermal generation, including more economic GT-based generation, has been mentioned in passing only. Relevant and up-to-date costs of generation from gas-fired sources should be presented if a meaningful comparison is to be made. Favouring wind power in the context of the Option Paper is clearly a skewed view; it is hard to see how the benefits test can be met. When a carbon emissions scheme is yet to be in place (2013?), it begs the question of whether WPN favours wind generation at the expense of cheaper gas-fired generation for a reason yet to be revealed to the public.	Section 3.3
3	Simultaneous Development of Stage 2 (a new 160 km double circuit 330 kV line, Eneabba to Moonyoonooka)	It is commercially illogical that an NPC (net present cost) assessment was not made on the simultaneous development of Stage 2 which would connect the general farming areas, towns, Geraldton / Oakajee Port and existing & approved – including ENB's Centauri 1- in this development. We question if a combination of Stage 1 & Stage 2 will not give a least cost option to meet the NFIT regulations. This would also attract greater confirmed block loads. By ring-fencing Stage 2 in the Option Paper and leaving Stage 2 in a vacuum seems to be short-sighted.	Prior ERA NFIT 330 Kv line from Perth - Moonyoonooka

No.	Item	Comment	Reference
4	Alignment with Network Requirements	The project is an augmentation of the SWIS. WPN is not the regulator of the SWIS Network Rules, as this relies totally within the management and regulation control of the IMO. There is no detailed discussion or alignment in network growth in the Option Paper that is aligned with the IMO Statement of Opportunities ("IMOSoO") as well as the IMO Long Term Roadmap ("IMOLTR") issued in February 2010. It raises the question whether WPN can safely get away from observing Market Rules and also other detailed arrangements undertaken by the IMO, when all other energy market participants cannot disregard the requirements of the law. The recent IMOLTR Report has identified a number of assumptions and is relying on the Minister of Energy's plan to develop the Strategic Energy Initiative ("SEI") which will present the future of the electricity industry in W.A. for the next 25-30 years. The IMO has indicated that further reform is necessary if competition is to be achieved in the medium term. Decisions to be taken with the Minister's SEI reform include • A nodal pricing electricity market; • Full retail contestability; • Reliable and secure electricity supply; • A mechanism to detect and deter market power abuse • Moving away from monopolistic inefficiencies Instead, WPN demonstrates with its proposed 'preferred position' for this project that it is maintaining a monopolistic position in transmission	Office of Energy; IMO ; Minister of Energy; State Treasury; Item 4.1 & 4.2

No.	Item	Comment	Reference
		and as such has focussed on provision of one key customer (Karara Mining) and not supported a broad range of options.	
5	Reliability of Capital Cost Estimates	WPN has not divulged a cogent cost comparison for each of the options in order to support its "preferred position'; while favouring wind generation, conventional thermal generation, including less capital intensive GT generation has been mentioned in passing only. (See Item 2 above.) Being proposed for 100 per cent borrowing, it is even more crucial for costs to be totally reliable, considering that the Option Paper has determined that only one option has been singled out for approval. The Option Paper labours at defining the WPN preferred position, but conveniently glosses over items that require discussion. Being a public document and supposedly needing to review details on an even playing field, it begs the question whether there is intended misinformation or lack of due care. An example in point is the presentation of capital cost estimates. When costs of building infrastructure have gone up significantly in recent years, and this is not helped by the volatility of the AUD, it is not unreasonable to expect that cost estimates used to calculate the NPC will quickly become out of date. We would hope that Western Power has conducted fresh studies of these costs, considering that the costs of the proposed option in 2007 came to be double what was estimated in the 2007 Option Paper.	Comments item 4.2.1 and "investigation"

No.	Item	Comment	Reference
6	Upgrading of Three Springs Sub-station	A question to be posed to WPN is whether the upgrading of the Three Springs Sub-station will similarly be subject to the NFIT test. A second question concerns network contributions as required by Access code – what form of network contribution charge has been agreed with Karara Mining?	Workshop discussion : 13 July 2010
7	Cost of Efficiency Loss in the proposed option	The proposed line will initially be energised at 132 kV. Have the line losses been considered in the cost-benefit analysis?	Workshop discussion : 13 July 2010
8	Confirmed Customers	The 'wish list' of customers is up to 1,400 MW. What are the confirmed customers? Have agreements been signed?	Workshop discussion : 13 July 2010 : item 6 graphs with minimal description

Email Submission (received 16 July 2010)

Mr K.C. Wan

SUBMISSION FROM Mr. K C WAN on Friday 16 July 2010 k.wan@ecu.ecu.au

I refer to paragraphs 2 and 4 on PAGE 22 of the Westernpower MAJOR AUGMENTATION PROPOSAL Options Paper MID WEST ENERGY PROJECT - SOUTHERN SECTION NEERABUP TO ENEABBA JULY 2010 DOCUMENT PREPARED BY Westernpower.

I question whether the statements in paragraphs 2 and 4 of page 22 are correct. It may be correct based only on wind power but may not be correct when other sources of power generation in the midwest are taken into consideration.

It would be most helpful clarification be provided in the final document.

Thank you for the opportunity to make comment from
K C Wan >k.wan@ecu.edu.au>phone/fax 93859069>mobile 0419044760>
48 Tilton Terrace, City Beach WA 6015

Robert.A.Stein

P.O. Box 178
South Perth
W.A. 6951

21.7.2010

Mid – West Energy Project
Western Power
G.P.O. Box L921
Perth W.A. 6842

PUBLIC SUBMISSION

Dear Sirs,

Please record my unqualified support for the resource proposal to seek approval to construct a 330kV double circuit transmission line , replacing an existing 132kV line.

The new line will allow prospective new loads and new sources of generation , including wind farms to connect to the network. In addition , a new 330/132kV terminal substation will be established at Three Springs to interconnect with the existing 132kV network.

I would appreciate receiving any information on the progress of support and approvals that may result from this project.

Yours faithfully

Robert.A.Stein

Email Submission (received 22 July 2010)

Shire of Morawa

Hi,

I would like to lodge a Public Submission for the Mid West Energy Project.

The Shire of Morawa is a fringe of grid community that has a direct feeder distribution link from the Three Springs Substation. The distribution feeder also services the Shire of Perenjori and the Perenjori community.

The Morawa & Perenjori communities have had to deal with long term reliability and capacity issues relating to the feeder. These issues have resulted in significant outages, particularly during the warmer (Summer) months of the year.

The outages cause significant disruption to all sections of our community. The outages usually extend for prolonged periods and far exceed Western Power's benchmark level for minimum outages.

The Shire of Morawa has lobbied for many years to improve on the Morawa – Perenjori feeder. A copy of correspondence received from the Minister for Energy in 2009 indicates that Western Power may have completed some design work to either rebuild or replace particular sections of the line. Despite this advice, nothing has eventuated.

The Shire of Morawa also took the opportunity to brief the Premier, Hon Colin Barnett on local issues relating to power at a recent visit to Morawa.

The communities of Morawa and Perenjori are gearing up to provide service centre opportunities to the emerging mining (iron ore) sector in the Mid West. Power remains the one issue holding back our communities from reaching their full potential.

It would be a trajedy to see a major upgrade occur as part of the Mid West Energy Project which results in a new line to be built from Three Springs to Golden Grove / Karara that **bisects** the Morawa and Perenjori communities without any change to the energy servicing needs of these communities.

The Shire of Morawa asks that this important shortcoming is addressed before the final design of the Mid West Energy Project is signed off for construction.

Many thanks,

Gavin Treasure
Chief Executive Officer MCom MBA CPA FPNA

Mob: 0427 711 204
A/Hours: (08) 9971 1025
ceo@morawa.wa.gov.au

Email Submission (received 22 July 2010)

Shire of Perenjori

Hello

I have received an invitation to attend an information session in Three Springs related to the Mid West Energy Project Stage 1. Unfortunately I was unable to attend due to prior commitments and very short notice. (The invitation for the 14 July forum was dated 9 July)

The proposed project will upgrade the transmission infrastructure to service the Midwest in General and the Karara Iron Ore Project in particular. The infrastructure is an absolute requirement for the Karara Iron Ore Project which will initially produce 8 million tonnes per annum of magnetite, increasing to up to 32 million tonnes within 5 years of commencement of operations.

The infrastructure will also service the Extension Hill magnetite project which will construct a privately owned 330kv power line from Three Springs to service a 10 Million tonne per annum magnetite project. The proponent announced this week that a Chinese company has taken a 60% stake in the operation at a cost of $280M. This power line will run 2 km south of the Perenjori townsite.

Magnetite projects are by their nature energy intensive at the mining and beneficiation stage and these multi billion dollar projects are dependent on reliable energy supplies.

I note your public advertisements allude to the capacity of the new system to accommodate new wind farms, but makes no mention of the solar thermal projects that have been proposed for this region. Building the capacity for these power generation projects to tie into the system should be a critical part of the state's planning and investment. Victoria has just announced a feed in tariff subsidy and a mandatory solar power target to encourage solar projects in that state. The Midwest in general and Perenjori in particular provide the highest solar radiation anywhere on the South West grid. Planning should include means to both accommodate and encourage large scale solar power generation.

The towns of Morawa and Perenjori are in close proximity to the new transmission line. It passes approximately 15 km north of Perenjori and 25 km south or Morawa. These two towns have some of the most unreliable power supplies in the state and over the last 5 years have experienced frequent outages often over 24 hours, and on some occasions up to 3 days in duration. These outages are as a result of a crumbling distribution system. Advice from Western Power indicate that the existing feeders could be substantially upgraded for less than $10 Million. I am reluctant to use the term upgraded as the problem is largely deferred maintenance.

Ironically this substantial investment in the transmission system will make not one iota of difference to the quality of power supplies to the two towns. There is enormous potential for these communities to gain benefits from the mining projects but we are substantially constrained by a lack of state investment in infrastructure, with lack of investment in the distribution system a telling example.

Planning for the transmission line should include:

- Consideration of future generating capacity and where it is likely to join the transmission system. There would be cost savings in building this capacity rather than retrofitting in the future;
- The same infrastructure that would support power generation (such as solar thermal) would allow off take for better servicing of adjacent towns. The current distribution line from Three Springs covers around 80 km to reach Perenjori. A new substation would place the distance at less than 20 km.
- Installation of a substation between Morawa and Perenjori would support the development of an Agribusiness Precinct that is far enough away from existing settlements so that they would not suffer the same problems with neighbours that they have experienced elsewhere in the state.

The State's investment in infrastructure should support a triple bottom line outcome. New mining projects (economic benefits), better power supplies to residents and local businesses (community benefits) and grid access for solar power generation (environmental benefits).

Thank you for the opportunity to comment.

Stan Scott
Chief Executive Officer
Shire of Perenjori
(08) 9973 1002

Ardross
Group of Companies

POSTAL ADDRESS:
P.O. BOX 7019 • CLOISTERS SQUARE
WESTERN AUSTRALIA • 6850

LEVEL 33 • QV1 BUILDING
250 ST GEORGES TERRACE • PERTH
WESTERN AUSTRALIA • 6000

TELEPHONE +61 8 **9481 7070**
FACSIMILE +61 8 9481 7077
E-MAIL admin@ardross.com
WEBSITE www.ardross.com

01-204410-01
23 July 2010

Mid-West Energy Project
Customer Service Centre
Western Power
GPO Box L921
PERTH WA 6842

Dear Sir/Madam

RE: WESTERN POWERS MID-WEST ENERGY PROJECT

The Ardross Group of Companies is a major developer of new communities at Jurien Bay, MillBridge Private Estate and Yakamia in Albany.

Jurien Bay is the company's land mark project and since 2005 significant infrastructure has been developed including in excess of 600 residential lots. The company is also undertaking planning and feasibility studies for a 68 unit tourist resort.

Western Power has advised the Ardross Group that the availability of power may, without augmentation, constrain further development of Jurien Bay. The Ardross Group understands that light industry and commercial operators have received similar advice. Augmentation would include upgrading of the transmission line from Eneabba to Jurien Bay. To this end the company has identified a substation site for use by Western Power.

Additional power from Eneabba assumes that supply is available from Eneabba.

The Ardross Group supports the proposed Neerabup-Eneabba 330kv transmission line upgrading to accommodate load growth in the region including the growth projected in Jurien Bay.

Yours faithfully

David W Lantzke
Chief Executive Officer
ARDROSS ESTATES PTY LTD

Email Submission (received 26 July 2010)

Fire and Emergency Services Authority

Dear Sir,

FESA Staff have recently attended the Perth Industry and Stakeholder Forum and would like to offer the following contribution in your deliberations for the construction of the double circuit 330kV per line from Neerabup to Eneabba.
FESA has not comment to make on the route as it is understood that the new circuit will replace the existing pole circuit on the same easement.

FESA would like to make comment and seek Western Powers engagement on the following matters.

- Construction timetable. It is understood that the construction phase of the project subject to approvals will commence in January 2011. This is a the height of the bush fire period in Western Australia. FESA and Local Governments en route wish to work very closely with Western Power and Western Powers construction contractors to ensure the safety of the community during this period. It is likely that movement of vehicle bans and Total Fire Bans will be called during the construction phase which will have to adhered to unless prior arrangements are made with FESA and Local Governments.
- Safety of fire fighters; The safety of fire fighters combating fires in the vicinity and under the newly constructed lines is paramount to FESA and Local Governments. FESA currently has Standing Operating Instruction (SOI's) which address this matter. FESA would like to review this SOI in conjunction with Western Power and widely distribute this SOI to all Shires, brigades and farmers along the route.
- FESA would like to discuss the maintenance of bush fire fuels under the power line.

To assist Western Power FESA would like to offer its services in liaising with Local Governments and brigades.

Please contact:

FESA Operations.
Mid West Gascoyne Regional Office.
District Manager Stephen McDonald
Stephen.McDonald@fesa.wa.gov.au
Telephone: 99566000
Facsimile: 99644617

Thank you for the opportunity to comment

Russell Hayes
FESA Operations
Regional Director
Mid West Gascoyne Region.
Phone: 99566009
Fax: 99644617
Mobile: 0427012947
email: Russell.Hayes@fesa.wa.gov.au
Emergency Services Levy - A fairer system for all

perthenergy

26 July 2010

Mr Mark de Laeter
Mid West Energy Project
Customer service Centre
Western Power
GPO Box L921
Perth WA

Email: Midwest.submissions@westernpower.com.au

Dear Mark

Re: Major Augmentation Proposal Options Paper Mid West Energy Project – Southern Section Neerabup to Eneabba (Western Power - Public Consultation)

I would like to thank Western Power for providing information on the Mid West Energy Project – Southern Section (Project) and for the opportunity to provide comment on the preferred approach and other subsidiary matters which could be considered relevant to the Project.

The Options Paper: Mid West Energy Project (Southern Section) – Stage 1 outlines the rationale for the required network augmentation and the options considered. Perth Energy sees merit in reiterating the major conclusions.

Background

The Western Power South West Interconnected Network (SWIN) covers the South West corner of the State. It extends in the Mid West region to what is currently the main load centre in Geraldton. The section of the network servicing the Mid West is known as the North Country Network, being the section extending nearly 400km from the northern outskirts of Perth to the north of Geraldton. The network, as currently configured, has limited capacity to supply load growth or to connect new generators.

The primary issues arising from the present system configuration are that it is operating close to its capacity limit and system studies show that for the underlying growth trend there is an impending constraint which is likely to arise in 2011/12. The constraint involves voltage stability issues in and around the Geraldton region. Further the thermal capacity of the transmission lines are estimated to be constrained from 2015/16 and this will impact on all substations north of Eneabba and Muchea.

Load forecast

As the electrical load continues to grow into the future, additional thermal constraints of the transmission lines to Geraldton as well as voltage stability issues will arise. Various load forecasts were undertaken with a conclusion emerging that significant increases in the load in the Mid West can be expected in the near future. Both the underlying natural load growth, resulting from expansion of existing activities and associated population growth and the development of major new block loads with their associated demand, will increase the demand considerably in the Mid West region. The economic development strategy of the Mid West is strongly supported by all levels of Government. Significant funds are proposed to be invested by Government and the Private Sector to facilitate the industrial development of the region.

An analogous region of Western Australia is the Pilbara Region. Development has proceeded based primarily on the growth of the iron ore and later the Liquid Natural Gas (LNG) industries. In 1995 there was an installed capacity of approximately 365MW of generation capacity in the Pilbara. Currently there is approximately 950MW on the Pilbara Network. This equates to a growth of 160% over a 15 year period. The Mid West is in a similar position to where the Pilbara was 15 years ago where large new mines are planned with associated developments required to the enabling market, regulatory and policy environments. With the prospective geographical size and variety of minerals available in the Mid West Region the potential electricity requirement could be much greater than currently envisaged. The mining projects envisaged in the Mid West will require reliable and affordable power. Without such an enabler, these projects will not proceed. It could further be argued that the delay already experienced in proceeding with developments in the Mid West has been caused in part by the lack of suitable energy infrastructure, and in particular by a failure to provide an appropriate electricity transmission network. The current network will not support either the new loads envisaged in the Mid West, nor would it support general electricity growth in the SWIN.

It should be noted that load forecasting is inherently probabilistic in nature. Over the course of time it has been found that load forecasting will inevitably produce low-side forecasts, particularly where commodity derived electricity demand is a large proportion of the load forecast. When commodity investments proceed the requirements are generally 'chunkier' and will be required sooner than was forecast to meet a window of opportunity in the world market. If the investment in infrastructure is not undertaken in a timely manner, there is a consequential loss to the whole economy from lost growth, employment and output.

Generation Outlook

The Mid West is a highly prospective area for new generators. The Federal Government has recently extended the Mandatory Renewable Energy Target (MRET) legislation. This will translate into a renewable energy requirement of 4750GWh of renewable energy by 2020. It is anticipated that a significant proportion of the requirement will come from winds located in the Mid West. Additionally, there are other generation developments proposed for the Mid West. These projects are based on local fuel sources such as coal and gas, which are dependent on the new transmission line being constructed.

The risk of not proceeding with the immediate development of the Mid West Project, both as a result of the load forecasts (i.e. customer demand) and from the proposed generation opportunities, is lost investment worth billions of dollars. The consequential impacts are also significant:

- lost regional development;
- Employment opportunities abandoned;
- Opportunities to reduce greenhouse emissions vanish;
- Ability to facilitate increased competition in generation by attracting new 'players' is significantly diminished;
- The opportunity to use currently stranded fossil fuels in the Mid West region is gone;
- The ability to diversify supplies and increase security of supply in both the electricity and gas markets will not occur; and
- Full Retail Contestability (FRC) is delayed as new supplies of energy for generation are unlikely to become available.

Options

The options considered appear to be fair and reasonable, as do the costing of each option. Consideration of the advantages, disadvantages and risks associated with each option are balanced. Perth Energy views that the recommended option, 330kv Double Circuit, balances the costs and risks and is supported as the best option. This option provides the lowest Net Present Costs (NPC) for the High Load forecast case and is only 15% more than the NPC of the lowest cost option under the Central Case. This option has the ability to cater for most loads forecast in the foreseeable future. It will accommodate many generation options planned in the Mid West region and facilitate achievement of many of Government's environmental objectives.

Conclusion

This Project represents a wonderful opportunity for the State to make a contribution to its triple bottom line – via its environmental, social and economic objectives. While there are risks associated with the development proceeding, the risks appear even greater of not proceeding. Delaying the 330kv line will cause concerns for investors and will make the State hostage to power supplies from the South West of the State, inevitably delaying FRC and the benefits to all retail customers of the introduction of competition.

Finally, there is no better example of a Project that assists the State Government in meeting its objectives, as set out in the State Energy Initiative (SEI) of secure, reliable, competitive and cleaner energy.

Perth Energy would be happy to meet with you in person to provide further information in support of this submission.

Yours sincerely

KY CAO
MANAGING DIRECTOR

Email Submission (received 28 July 2010)

Mike Teague <mdteague@bigpond.com>

Wider Consideration

It seems ridiculous to me that we will be indirectly paying for a natural gas line to come south from Geraldton to Perth while you are proposing for us to pay (perhaps indirectly) for an electricity line to take electricity from Perth to Geraldton. It seems clear that a proportion of the state's electricity is going to come from gas into the foreseeable future. Why not generate electricity from gas near Geraldton and avoid sending power back and forward over 500km.

Regards Mike

ENERGY RESPONSE linking demand with supply in the Australian energy market

28th July 2010

Mid West Energy Project
Customer Service Centre
Western Power
GPO Box L921
Perth WA 6842

Dear Sirs **Mid West Energy Project – Southern Section**

Thank you for this opportunity to comment on your Augmentation Proposal and the valuable information you provided at your public forum.

We have studied your Options Paper; particularly section 4.2.3. Demand Side Management. We support your conclusions in that section, viz:

1. The southern section will be subject to connection of large mining block loads and, possibly, large generator additions. These are likely to be difficult to cover with DSM. However, DSM may provide you with network support in the event this section cannot be commissioned in time to cover natural growth in demand.
2. DSM can provide an economic solution to cover natural growth in demand in the Geraldton load.

Yours sincerely,

Rob Rohrlach
Manager Western Australia

Energy Response Pty Ltd
PO Box 406, Cottesloe, WA, 6911
Tel: 1300 792 377

Extension Hill Pty Ltd

Submission - Major Augmentation Proposal

Matt Duxbury – Manager Infrastructure Services, Extension Hill Pty Ltd.
28/07/10

Introduction

Extension Hill Pty Ltd (EHPL) welcomes the opportunity to provide comment on WPC's Major Augmentation Proposal, Options Paper, Mid West Energy Project – Southern Section Neerabup to Eneabba.

EHPL supports the Recommended Option that entails the construction of a double circuit 330 kV transmission line from the Perth metropolitan area to Eneabba in the Mid West, and the interconnection of the existing 132kV Three Springs substation with a new 330kV Three Springs Terminal.

This vital piece of long term infrastructure is essential for the economic development of the Mid West region. To emphasise the scale and speed with which this region is expected to grow, it is notable that the so called "low case" demand assessed by WPC shows within 10 years a doubling of power demand within the region. The so called "high case" shows a 430% increase in demand over the same period.

We are concerned that by focusing on the constraints of the regulatory setting surrounding this investment, WPC's narrow, incremental analysis presented in the Options Paper does not give appropriate weight to key aspects of back bone transmission system design to service such a significant regional electricity demand. We believe that the Options Paper gives undue emphasis to the commercial and revenue elements of this incremental investment, with little analysis of system reliability, electricity supply competition, power generation, renewable energy, state development, broader community benefits and regional economic growth.

This should be of major concern to all leaders and decision makers, political, regulatory and business.

In this paper we develop a persuasive case not only for the Southern Section Major Augmentation Proposal to proceed, but also to support more rapid and substantial development of the mid west transmission infrastructure by WPC, in line with transmission developments that have traditionally underwritten the state's development.

The main areas are:

1. Application of The Regulatory Test and The New facilities Investment Test is not comprehensive and relies almost solely on the revenue element.
2. The three load scenarios selected are inappropriate and understate the growth in the region.
3. There insufficient reference to and fit with state planning.
4. There is a lack of generation information and no generation capacity plot.
5. The design criteria appears to be an N-0, not N-1, and is not in accord with the Technical Rules.
6. The Options Paper fails to mention or refer to the N-1-1 provisions of the Technical Rules.

7. The northern section must be considered comprehensively as part of the Mid West project, as it has now deteriorated into an N-0 state.
8. Insufficient weight is given to maximising the use of existing line routes as opposed to obtaining new routes.
9. The Eneabba to Three Springs line is an integral part of the solution to the mid west and should be included in the NFIT. It should not stand alone as a separate submission.
10. Another Option – Neerabup-Moora-Three Springs 330kV.
11. General issues.

Before moving on to detailed discussion on these issues, it is timely to reflect on the past. The existing 132kV transmission system servicing the "North Country" was installed at a time when a lower voltage system could have provided an adequate, lower cost solution. The then Government and old State Electricity Commission showed proper regard to long term regional development, the technology characteristics and economics in selection of 132kV. The supply to Geraldton, even then some 40 years ago, was installed with two 132kV lines from Perth, providing full redundancy (N-1, explained later) at the 132kV level.

However, Figure 4 from WPC's options paper (copied below) illustrates that the North Country section of the SWIS is now capacity constrained

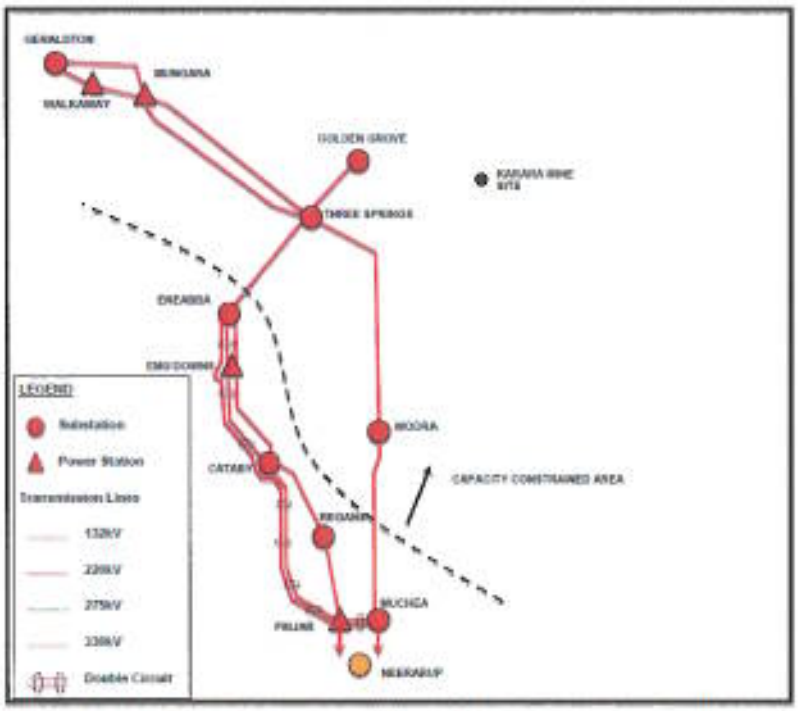


Figure 4: Existing network layout showing area where capacity is constrained

Furthermore, the existing North Country transmission network is rapidly reaching the point where N-1 redundancy of the 132kV system can no longer be maintained. In these circumstances, if one 132kV line trips, there has to be load shedding of customers, including in and around Geraldton. Right now, in Geraldton, a Block Load of say 4MW, which is not a large site, cannot be offered firm supply.

The 2 October 2007 WPC submission to the ERA for the original 330kV project proposal[1] is relevant to this discussion. We have made reference to technical facts and statements from that submission, not presented in the current Options Paper. It is important to note the changes in the North Country since then, because in 2007, no new major mining loads were firm. Since that time the Karara and EHPL have progressed significantly, seeking connections at Three Springs and with significant concomitant loads in Geraldton. So Three Springs must be part of the North Country transmission development and the original 132kV line layout appears to be an obvious and natural development route, with considerable community and technical benefits.

EHPL wishes to leave the readers of this submission with the sense that the current approach to the provision of transmission infrastructure to the North Country is inappropriate. There is a pervasive sense in the Option Paper of a strong tendency to design to a budget constraint, rather than design to a need. EHPL contends that this approach will lead to multiple, sub optimal, incremental projects being developed.

This will ultimately provide a high cost, low efficiency transmission network that will constrain the development of the Mid West region. Both power generation and power consumption in the Mid West are well positioned to grow with the support of a reliable, high voltage transmission system.

1. THE REGULATORY TEST AND NEW FACILITIES INVESTMENT TEST

Development of the power network and the conduct of the service provider (in this case WPC) are set out in the Electricity Networks Access Code 2004. These tests are to be conducted according to the Code Objectives, which are presented below;

> **Code objective**
>
> 2.1 The objective of this Code ("**Code objective**") is to promote the economically efficient:
>
> (a) investment in; and
>
> (b) operation of and use of,
>
> *networks* and *services* of *networks* in Western Australia in order to promote competition in markets upstream and downstream of the *networks*.
>
> (Note: This Code sets out more specific objectives that also apply in relation to the performance of certain functions under the Code, for example, section 6.4 sets out objectives for the *price control* in an *access arrangement*.)
>
> 2.2 The Minister, the *Authority* and the *arbitrator* must have regard to the *Code objective* when performing a function under this Code whether or not the provision refers expressly to the *Code objective*.

We will refer to this in the following discussion regarding the Regulatory Test and the New Investment Facilities Test (NFIT).

Is should be noted that the objectives are broad, and later direction in Chapter 2 of the Electricity Networks Access Code 2004 sets out some specific objectives, but leaves open a great deal not specified. For example, there are no specific clauses about how to value regional growth or increased market competition.

Our observation is that submissions to date have focussed on the specific clauses Chapter 2 of the Electricity Networks Access Code 2004, in an attempt to make the outcome through the ERA more certain. However, this ignores significant value that arises from regional growth and promotion of competition, which are harder to quantify.

[1] Western Power, 2 October 2007, Submission to the Economic Regulation Authority Major Augmentation Proposal 330 kV Transmission Line and Associated Works in the Mid-West Region of Western Australia

The above Code Objective prevails where there is not a specific provision in the Electricity Networks Access Code 2004.

a. The Regulatory Test

The ability of WPC to recover costs for any transmission augmentation rests on the Regulatory and NFIT tests as set out in the Electricity Networks Access Code 2004. The purpose of the regulatory test is to determine that the proposed project solution is the best possible, having demonstrated by assessment of other options that it is so. The ranking is by determining the Net Benefit of each option. The relevant definition from the Code of Net Benefits is provided below;

'Regulatory test' defined

9.3 The **"regulatory test"** is an assessment under this Chapter 9 of whether a proposed *major augmentation* to a *covered network* maximises the *net benefit after considering alternative options*.

9.4 A **"net benefit after considering alternative options"** means a net benefit (measured in present value terms to the extent that it is possible to do so) to those who *generate*, *transport* and *consume* electricity in the *covered network* and any *interconnected system*, having regard to all reasonable *alternative options*, including the likelihood of each *alternative option* proceeding.

WPC summarises the Net Benefits in section 6 as follows,

- Has a net present cost which is comparable with other options capable of supplying the central case load forecast;
- Offers a significantly lower cost option for supplying high case load forecast;
- Delivers additional non-economic benefits compared to the other options; and
- Delivers similar benefits to those who generate, transport and consume electricity in the SWIS as other alternatives.

These are appropriate and clearly substantiate the proposed augmentation. Especially given the fact that the revenue test is likely to be sufficient on its own for the NFIT. Our contention is that there are sufficient benefits to substantiate a project similar to Western Power's, 2 October 2007 proposal to Geraldton. Indeed with the major projects, Oakajee, Ginadalbie, Extension Hill and other added, which were not included in the 2007 load projection, it is difficult to understand why the project only goes to Eneabba. If the additional loads and the other net benefits are fully assessed, EHPL believes the project can immediately include extension to Geraldton.

For instance, WPC makes no reference to the nature of the wood pole lines, their age and the technical limitations with respect to lightning and vulnerability to weather events. There is no reporting of the failure rates and the down time of these lines.

Given the importance of this piece of infrastructure to the State, it is reasonable to suggest that all Net Benefits need to be identified, not normally needed in less strategic infrastructure rate cases. To do this effectively the state planning and other government departments have to be involved.

b. The New facilities Investment Test

The New Facilities Investment Test (NFIT) is the assessment carried out by the ERA in accordance with the Electricity Networks Access Code 2004. The relevant clause is set out below.

WPC's 2 October 2007 submission relied solely on 6.52 (b) (i) A, that projected revenue covered the investment and appears to be the case again, which is great, as the case to invest is unequivocal.

To substantiate more extensive development, full assessment and weight needs to be given to the provisions of 6.52 (b) (ii) and (iii), because these clauses capture the other benefits. Traditional, sound back bone transmission planning and development rely more on these clauses, especially 6.52 (b) (ii), than the constrictive and simplistic 6.52 (b) (i) A.

New facilities investment test

6.52 *New facilities investment* may be added to the *capital base* if:

(a) the *new facilities investment* does not exceed the amount that would be invested by a *service provider efficiently minimising costs*, having regard, without limitation, to:

(i) whether the *new facility* exhibits economies of scale or scope and the increments in which capacity can be added; and

(ii) whether the lowest sustainable cost of providing the *covered services* forecast to be sold over a reasonable period may require the installation of a *new facility* with capacity sufficient to meet the forecast sales;

and

(b) one or more of the following conditions is satisfied:

(i) either:

A. the *anticipated incremental revenue* for the *new facility* is expected to at least recover the *new facilities investment*; or

B. if a *modified test* has been approved under section 6.53 and the *new facilities investment* is below the *test application threshold* – the *modified test* is satisfied;

or

(ii) the *new facility* provides a *net benefit* in the *covered network* over a reasonable period of time that justifies the approval of higher *reference tariffs*; or

(iii) the *new facility* is necessary to maintain the safety or reliability of the *covered network* or its ability to provide contracted *covered services*.

6.53 The *Authority* may, in an *access arrangement*, approve a **"modified test"** for the purposes of section 6.52(b)(i)B to apply to a *covered network* in respect of *new facilities investment* below the *test application threshold* where:

(a) the *service provider* has proposed a *modified test* to apply in respect of *new facilities investment* below a proposed *test application threshold*; and

(b) the *Authority* determines that *approving* the *access arrangement* with the proposed *modified test*:

(i) would be efficient in that the advantages of approving the *proposed modified test* would outweigh the disadvantages; and

(ii) would promote the achievement of the *Code objective*.

6.54 In making a determination under section 6.52 the *Authority* must have regard to whether the *new facilities investment* was required by a *written law* or a *statutory instrument*.

6.55 Section 6.54 does not limit the matters to which regard must or may be had in making a determination under section 6.52.

Recommendation

WPC provide a full account and assessment of the contributions of all benefits in Net Benefit to substantiate accelerated North Country transmission network development to support the augmentation extending to Geraldton.

2. THE THREE LOAD SCENARIOS SELECTED IS INAPPROPRIATE,

This point requires that first we understand the terminology regarding planning. When projecting the future for infrastructure needs or such things as budgets, the usual approach is to develop a low, central and high case. The central case is the one which is usually adopted as the most likely, the low case is a low as can reasonably be expected and the high is one that could reasonably occur. All of this is based on gathered intelligence and then constructed with a substantial amount of judgment. In summary our understanding of the WPC's cases is;

- Low case – historical trend case with no change in the region.
- Central case – includes Karara, Oakajee and small Block Loads totalling 12MW.
- High case - EHMP and other prospective mining loads in the region.

WPC's current approach is also not in accord with WPC's 2 Oct 2007 ERA submission for the original 330kV proposal as reproduced below which is in accord with usually accepted practice,

> ***Low forecast*** - based on historical load trend growth (called also 'natural' load growth) plus firm already approved small block loads.
>
> ***Central forecast*** - including diversified 'prospective loads' with a probability weighting.
>
> ***High forecast*** - includes 100% of all 'prospective' loads.

So how does current WPC's Low, Central and High cases compare to this framework?

The amounts allowed and the timing of the large Block Loads is not provided in a clear format and has to be interpreted from general statements throughout the document. This makes it difficult to comment properly on the validity of the planned capacity and its timing. And yet, as WPC points out, the new mine loads of Karara and EHPL are each equivalent to the existing regional demand, they should be explicit, as should Oakajee.

We have taken WPC's Figure 9 and relabelled the projections to reflect a more accepted approach. In WPC's Figure 1, the forecast we have labelled Central in WPC's figure 9 is not shown.

EHPL makes the point that WPC's Low, Central, and High case selection in the Options Paper runs contrary to past practice for selecting the Low, Central and High. In WPC's forum presentation, it was stated that the Central case was based on committed projects, the High case was quite probable and the Low case had next to no chance of being realised.

EHPL contends that the three cases should be possible with the central being most likely. Accordingly, WPC's Central case should be the Low case, since it is based on underlying historical growth plus committed projects and is the reason the augmentation is needed.

The low case, which is historical, should therefore only be presented to emphasise the order of magnitude of change brought about by the new Block Loads.

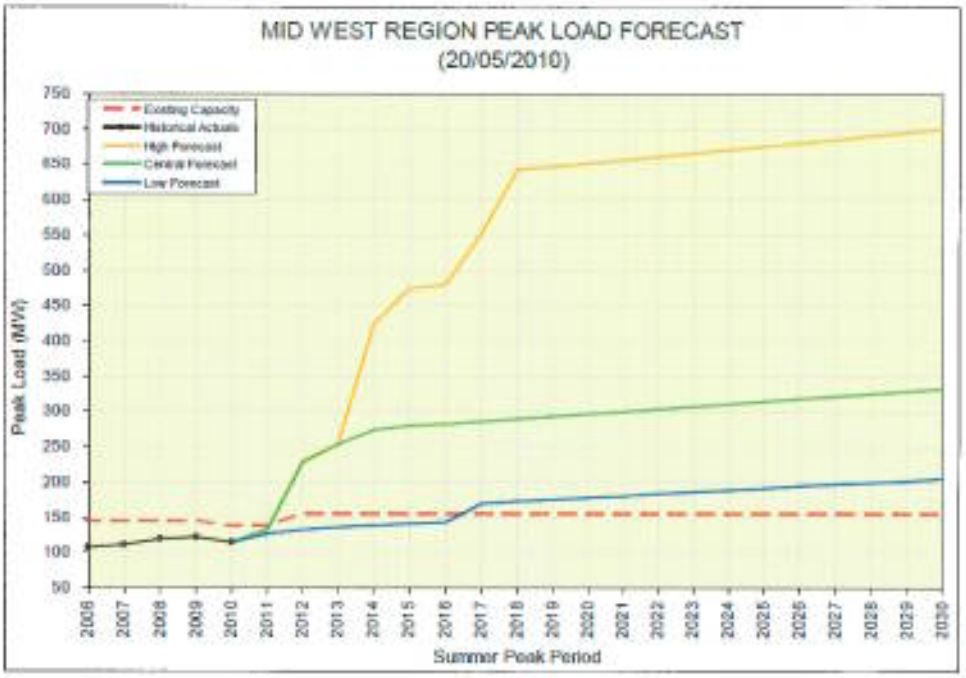


Figure 1: Mid West Peak Load Forecast (ex Eneabba / Muchea)

This presents a critical misdirection of emphasis in internal planning and to the Options Paper's readers, as the focus is on WPC's Central case not on the likely case which could be presented as the Central plus Karara's expansions, or EHPL's demand, represented by the Central case marked up on WPC's figure 9 above. In planning such fundamental backbone infrastructure, the known future should not form the basis of design – longer term potential should be given greater weight. For this reason, we argue that the single circuit or lower voltage solutions are simply not worthy of consideration

Now to the treatment of EHPL's project loads. The status of EHPL has not been properly factored into WPC's Options Paper and to highlight this we contrast below how EHPL's project compares with Oakajee. EHMP's load inclusion in the WPC's forecasts can be deduced by the large increase in demand for WPC's High case at 2013.

Issue	Oakajee	Oakajee Mines (Other than Karara)	EHPL
EP Act Part IV PER published	No	No	Yes
EP Act Part IV received for whole project scope	No	No	Yes
Financial close	4Q 2011	4Q 2011	4Q 2010
1st product	End 2014	End 2014	1st Qtr 2013

Further to the above, Oakajee's demand does not materialise without the railway line and the two northern mines it services, Jack Hills and Weld Range, being able to supply ore. Based on the above analysis, Oakajee's load and timing is less certain than EHPL's. Attached is EHPL latest press release.

The inclusion of the above projects in the planned case is entirely appropriate, which leads to the question as to why EHPL is not also included in the planned load?

So in summary, using the cases as EHPL proposes and as marked up on WPC's Figure 9, WPC's Low case should include Karara and Oakajee and EHPL, but at the very least EHMP should be included in WPC's Central case.

As a consequence, the resulting focus on the WPC's central case does not properly present the actual load probabilities in the mid west.

Recommendation

EHPL requests WPC to recast the load projection and the case for the Section 1 augmentation in this light.

3. FIT WITH STATE PLANNING

WPC's Options Paper does not mention any integration or reference to State planning.

It is unreasonable to set WPC up to plan such a fundamental piece of state infrastructure without a clear purpose being enunciated as a critical element in an overall state development plan. These plans by their nature are long term, as is the nature of their implementation.

That having been said, a series of public commitments by the State Government have been made that provide sound direction in this respect, such as support and involvement with;

- Oakajee
- Geraldton Port
- Karara
- EHPL

There is substantial political support and commitment to the development of the mid west and it has not been adequately included in the load and growth assessment of the mid west.

4. LACK OF DETAIL FOR DEMAND AND GENERATION,

Firstly, generation has not been properly presented for the reader to understand what has been allowed for and what has not. The fact that a similar capacity plot, as with WPC's demand Figure 9, is not provided for generation and leads to a lack of balance about the impact generation has. In fact the reader cannot properly assess where or what generation has been allowed for and the extent to which generation supports the NFIT is not provided.

The Options Paper really understates the need for transmission to service new generation in the region and how it fits with national and state drivers. Given the focus on load by WPC, we fear the revenue benefits of generation may not be included it the NFIT.

Secondly, EHPL is happy for its demand to be shown explicitly; we were not asked about this. If an organisation does not want to be named, they can be allocated to a node as a block load with others of like mind. But is has to be said that there is strong argument that connection to a monopoly, public, regulated asset should require MW, timing, nature of Block Loads and their location to be public knowledge. No

generation details are provided and no explicit load details. For instance the Karara and EHMP loads are largely base load, with little diversity, which is a material issue.

The consequences and benefits of this on the South West Interconnected System are not discussed. The summation of Karara and EHPL's base loads, of the order of 250MW, added to the overnight minimum of 1,200 MW is a 20% increase in overnight load. The economic benefit to generators and wind is not mentioned. The base load nature is however recognised in WPC's Table 3, as the diversified capacity is only of the order of 10% less than the connected peak capacity, compared to residential and commercial loads of closer to 50%.

Finally in WPC's 2 October 2007 ERA submission for the original 330kV project proposal WPC stated there was;

- Uncertainty in availability of existing local generation (from Mungarra PS and Geraldton GT) after October 2010;

Also;

> The transmission network in the Mid West is weak and can not transfer large amounts of power due to thermal and voltage limitations. This 400 km transmission network is also susceptible to stability issues caused by disturbances in the network. Heavy reliance is placed on the use of generating plant at Mungarra and Geraldton to maximise capacity in the region.

Where does this now fit into the generation picture and overall economics? It is well known that the Mungarra power plant is past its technical life, and given the reliance indicated above, how is this assessed?

It is not really possible to talk with confidence about WPC's plans without this basic information.

Recommendation

EHPL requests proper disclosure of capacity, location, type (generation or demand), the timing and nature, i.e. intermittent, temperature dependent, peak or base load as part of its case to extend the 330kV to Geraldton.

5. THE DESIGN CRITERIA IS AN N-0 AND IS NOT IN ACCORD WITH THE TECHNICAL RULES

Whilst EHPL supports the Recommended Option, we believe that this only provides a partial solution to the provision of transmission infrastructure to service the North Country. We believe that the planning and design of the augmentation has failed to properly address the requirements of the Technical Rules as it relates to firm supply. The relevant Technical Rules clause excerpts pertaining to this discussion are 2.5.2.1 and 2.5.2.2, which are set out below.

2.5.2.1 N-0 Criterion

(a) A sub-network of the *transmission system* designed to the N-0 criterion will experience the loss of the ability to transfer power into the area supplied by that sub-network on the loss of a *transmission element*. Following such an event this

power transfer capability will not be restored until the *transmission element* has been repaired or replaced.

(b) The N-0 criterion may be applied to sub-networks with a *peak load* of less than 20 MVA and to *zone substations* with a *peak load* of less than 10 MVA. The N-0 criterion also applies to the 220 kV *interconnection* supplying the Eastern Goldfields region.

2.5.2.2 N-1 Criterion

(a) Any sub-network of the *transmission system* that is not identified within this clause 2.5.2 as being designed to another criterion must be designed to the N-1 planning criterion.

We believe that Technical Rules clause 2.5.2.3 is also germane to the assessment of the appropriate approach to the design of the North Country transmission infrastructure but, WPC fails to list it. We discuss this clause in the next section.

Geraldton and many of the new Block Loads are greater than 20MVA and so clause 2.5.2.1 (N-1) applies to the transmission system North Country.

The existing 132kV system was designed to complied with N-1 design criteria and all WPC's discussion and analysis for north of Three Springs is now focused on how to maintain N-1 at the 132kV level. As soon as loads have to be shed for a transmission element failure, the performance level has slipped from N-1 to N-0. This will be the case for all new Block Loads in north of Three Springs, as they are being offered an interruptible connection. To address this, WPC refers to the need for the Section 2 augmentation.

The application of the Technical Rules design performance criteria of N-1 as opposed to N-0 must be applied to;

- The loads north of Three Springs, Section 2 augmentation, and
- To the proposed Section 1 augmentation.

Application of the N-1 versus N-0 to Section 2 has been address above. However, we believe there is also a problem with Section 1's compliance with the Technical Rules for N-1 versus N-0.

The nature of the generation and load demand as discussed above has a material impact, but the general thrust of this discussion is relevant to WPC's current analysis. Again WPC fails to provide sufficient details to be fully confident of ratings and limits, but the principles and analysis are valid regardless.

Using WPC's Table 3, we have demand in the Central case of 333MW peak and a High case demand of 701MW. If the EHPL proposition is used, the Central case would be 480MW and the high case remains the same.

The issue to analyse is the performance of the system on transmission element failure, such as;

- A lightning strike on the 330kV line with insulator damage that prevents a reclose.
- A 330kV circuit breaker failure, this may be OK if a breaker and a half configuration is utilised from the start.
- A bush fire under the line that persists and re-trips following a re-close
- Failure of the Three Springs 330/132kV step down transformer.

There are many more scenarios that can be contemplated, but these demonstrate the point. Technically the 132kV system may not survive a 330kV re-close, as it is already near its voltage and real power dynamic limits and detailed system modelling would have to be done to determine the system response and whether or not it complied with the Technical Rules. For this discussion it is not included in the failure scenarios, but there is a real possibility it will not be acceptable without load shedding.

Given the loss of the single 330kV transmission element to Three Springs the connected load will suddenly be thrown onto the existing 132kV system through the Three Springs 330/132kV transformer. We know that the existing 132kV system cannot handle even modest new loads, so large loads will have to be shed to protect the system. This fails the N-1 Technical Rules criteria.

For overnight, low load situations, base load generators run at their minimum stable load. Should the event discussed above happen at this time, the generators on line will see a significant loss of load, pushing them into low load instability and automatic shut down. To protect against this, and the potential of system instability, generators will have to be tripped at the same time the loads are tripped. Tripping large coal generators is stressful on the machines, costly and introduces the risk that the uncontrolled shut down will result in the inability to bring the units on line in time for the next day's load, thereby forcing more expensive machines to run and penalising the unit owners' which were forced off line. The additional cost will be paid for by all consumers. This fails the N-1 Technical Rules criteria.

Further, it is reasonable to expect that the network charges would be discounted to reflect the lower class of service, if the N-0 situation were to persist.

In summary, WPC has not addressed how they have complied with the Technical Rules, although they listed a number of clauses in Section 3 "that are of particular interest".

It is unreasonable to plan with out explaining the application of this requirement and if it is not to be complied with for some short development period, an explanation is needed as to why it is reasonable to do so and provide a schedule and plans so as to come into compliance.

Recommendation

We request that WPC address:

- How the approach to Sections 1 and 2 of the mid west, Neerabup to Geraldton complies with the Technical Rules?
- How it intends to develop the North Country network over time to comply with the Technical Rules in this respect?
- How it intends to charge any customers provided with an N-0 service at the transmission level?

6. THE OPTIONS PAPER FAILS TO MENTION OR REFER TO THE N-1-1 PROVISIONS THE TECHNICAL RULES

The discussion in Section 3 above made the point that the application of the Technical Rules dictated at least N-1 performance criteria. On reading 2.5.2.3 it is evident that the North Country planned augmentation should be run past the ruler of clause 2.5.2.3, which is provided below.

2.5.2.3 N-1-1 Criterion

(a) The N-1-1 Criterion applies to those sub-networks of the *transmission system* where the occurrence of a *credible contingency* during planned maintenance of another *transmission element* would otherwise result in the loss of *supply* to a large number of *Consumers*. Sub-networks of the *transmission system* that are designed to the N-1-1 criterion include:

(1) all 330 kV lines, *substations* and *power stations*;

(2) all 132 kV *terminal stations* in the Perth metropolitan area, and Muja *power station* 132 kV *substation*;

(3) all 132 kV *transmission lines* that *supply* a sub-system of the *transmission system* comprising more than 5 *zone substations* with total *peak load* exceeding 400 MVA; and

(4) all power stations whose total rated export to the *transmission system* exceeds 600 MW.

If the Technical Rules are reviewed, it clearly differentiates load areas and the mandated transmission infrastructure servicing it into three levels of service, defined as;

- N-0 – Load can be lost on the failure of a transmission element.
- N-1 – No load will be lost on the loss of a transmission element, but will, if a transmission element is out of service and a second element fails. This applies to sub-networks with a load greater that 20MVa and substations of greater than 10MVA.
- N-1-1 – No load will be lost on the loss of a transmission element, or on the loss of an element with an element already out of service, say for maintenance. The criteria states that a large number of customers needs to be connected to qualify, and then goes on to state that all 330kV lines and 330kV substations fit the criteria. It sets 400MVA as a total transfer capacity to qualify.

The defining elements for N-1-1 in the Technical Rules provides scope to argue that the proposed North Country 330kV system fails in the definition because of the "large number of Consumers" element, if Geraldton is not judged to be a large number of consumers, but passes in all other respects. Further, the characterisation of N-1-1 is determined by its potential effect the total system, which for the South West Interconnected System is self evident at 330kV and an aggregate load of in excess of 400MVA, which are both satisfied.

It is instructive to note that WPC did not refer to any of these clauses in the 2 Oct 2007 ERA submission for the original 330kV augmentation proposal, but it did refer to the following clauses. It seems to indicate that consideration of the N-0, N-1, N-1-1 provisions have not been fully recognised as applicable.

- 2.2.7 - Transient Rotor Angle Stability (Synchronous Stability)
- 2.2.8 – Oscillatory Rotor Angle Stability
- 2.2.9 – Short Term Voltage Stability
- 2.3.7 – Power System Stability and Dynamics, and
- 2.3.8 – Determination of Power Transfer Limits

The point is that at the least the North Country system is transitioning to N-1-1, if not already there, and that the minimum design performance should be to N-1.

Recommendation

We request that WPC address;

- How the approach to Sections 1 and 2 of the mid west, Neerabup to Geraldton will comply with the Technical Rules' N-1-1 performance criteria, now and as the North Country continues to grow.

7. THE NORTHERN SECTION MUST BE CONSIDERED COMPREHENSIVELY AS PART OF THE MID WEST PROJECT, AS IT IS INEXTRICABLY LINKED TO THE SOUTHERN SECTION, TECHNICALLY, BY THE PROJECTS AND THE RESULTANT UNDERLYING GROWTH.

In 2 Oct 2007 WPC made the following statement in its submission to the ERA for its original proposal,

> The power transfer limits are currently constrained by the potential risk of synchronous instability. Operation with power transfers above the stability limits would expose the regional network to a risk of islanding from the SWIN with significant load shedding in the area north of Three Springs. The existing stability limits are required until new transmission reinforcements can be constructed. System studies, reviewed by independent consultant –

We believe that the North Country system has been islanded on at least one occasion.

As set out previously, the loads associated with the Gindalbie, Oakajee and Extension Hill at Geraldton, plus the economic regional growth flow on effects have not been added to the Historical load growth for Geraldton.

It can be seen below, from the current Options Paper, that the same situation is stated to persist in 2015, even with the Section 1 Augmentation, for Historical growth. Considering the last transmission development for the region was in 1970, 40 years ago, playing about with 3 years is inferring a load forecast accuracy, given the region is on the cusp of exponential growth that is just not possible.

At the forum, WPC specifically excluded the northern section, Section 2, from consideration. In the Options Paper the following statements are made regarding Section 2;

> The existing system is presently operating close to its capacity limit and system studies have identified that for the underlying growth trend there is an impending constraint in 2011/12. This constraint is a voltage stability constraint in the Geraldton region and affects load in the area around Geraldton. A further constraint (thermal capacity of transmission lines) has been identified for 2015/16 and affects all substations located north of Eneabba and Muchea (refer to figure 4).

And,

> Network augmentation would be the only alternative available to offer network connection to either:
>
> - substantial new load developments above the natural (underlying) load growth forecast; or
> - market generators (i.e. any generator intending to earn income from the reserve capacity and energy markets)

And,

> The forecast new block loads contained within the central and high case load forecasts for this region require substantially greater network capacity than the underlying load growth. This need has therefore required the consideration of other, much higher capacity alternatives. The needs of the underlying load growth are acknowledged here to promote the understanding that the proposed project alleviates the need for reinforcement work to address those issues. In the event that a major augmentation to supply the central or high forecast did not proceed then a different major augmentation would be proposed to meet the underlying load growth needs of the region.

The critical issue with exceeding thermal rating in summer is the reduction of conductor clearance over roads and paddocks, presenting an unacceptable safety risk to drivers of vehicles and machinery passing under the lines.

The fact is contrary to WPC's statement above in that the Section 1 augmentation does not relieve the Section 2 limitations for the Base case as presented by EHPL. One has to use the WPC "no change" "Historical" base case to draw this conclusion.

Page 10 (Excerpt below) indicates that the 2015/16 augmentation is needed base on "natural load growth". As discussed above, this is not a believable scenario.

> Preliminary technical and economic studies to identify and rank options to resolve the voltage and thermal constraints outlined above have been completed. A number of solutions are available to meet the underlying load growth needs – ranging from demand management, generation connected as a network control service to network augmentation. While a preferred network augmentation has been identified, it does not require substantial expenditure until around 2015/16. It is expected that the issue could initially be managed through the use of demand management and local generation (as network control services).

The discussion in relation to WPC's selection of Low, Central and High demand cases is relevant here. Given the statements above, new Block Loads associated with Oakajee, and Karara and EHPL at the Geraldton Port, cannot be accommodated at an N-1 performance level. Even with Section 1 being completed, failure to deliver N-1 performance north of Three Springs persists. Failure to meet the Technical Rules is further exacerbated due to the frailty of old wood line 132kV system north of Three Springs.

While we appreciate that Section 2 is the subject of a separate funding request from the Federal Government's Infrastructure Australia Fund, it is not appropriate to rely solely on success here to address the issue.

The overall analysis here substantiates the need for the augmentation to include the extension to Geraldton.

Recommendation

EHPL requests WPC as a matter of urgency;

- to complete works to determine the augmentation for Section 2 and address, in the ERA submission for Section 1, the importance of the southern section to the northern augmentation, and
- to put the loads in Geraldton relating to Karara, Oakajee and EHPL into the base case for Section 2 augmentation.

8. INSUFFICIENT WEIGHT IS GIVEN TO MAXIMISING THE USE OF EXISTING LINE ROUTES AS OPPOSED TO OBTAINING NEW ROUTES.

EHPL has had a great deal of recent experience with negotiations and discussions with land owners, councils and community for corridors in the mid west. We have been securing 320km of pipeline and 145km of 330kV power line corridors, mostly through private property.

Services corridors are a crucial element in enabling the development of the state. They are needed for roads, rail, water, power and communication and the like, and yet there is substantial opposition to them from landowners, where new corridors are needed. It can take years and a lot of community angst to secure corridors. Compromises have to be made and new routes end up taking circuitous route alignments rather than the straight line option. An example is the new route obtained by WPC for Section 2 from Eneabba, which ducks and dives considerably compared to the old line corridors.

The alternative is to maximise the use of existing corridors. Any existing corridor is gold! Its value needs to be nurtured and maximised. It is irresponsible to the community and future generations to consume the corridor by installing inadequate infrastructure. A point in case is the poor investment decision for the Pinjar to Eneabba dual circuit 132kV line. WPC summarised the situation in its 2 October 2007 submission to the ERA for the original North Country augmentation project.

> In 2001, Western Power sought approval to construct a new 330 kV transmission line between Pinjar and Eneabba, operated initially at 132 kV. Western Power was unable to secure sufficient funding for the project and as a result, a 132 kV construction option of a lower initial capital cost was approved. This line was commissioned in 2004. This line increased supply capability to the Mid-West region, particularly in the area between Pinjar and Eneabba.

It lasted 6 years before its capacity contribution was consumed, leading to the premature need for this Section 1 augmentation. This is an appalling illustration of short term, low cost solutions creating long term costs and constraints. The lesson must be heeded.

Consideration of the 220kV and 275kV cases can be seen as a miss directed attempt to demonstrate a sound assessment of all options. The South West Interconnected System backbone system is 330kV, so it is technical nonsense to add new, inferior, voltage levels. When the load assessment EHPL offers is accepted, compliance with the Technical Rules is considered and the use of valuable corridors is factored into the assessment, the case for dual circuit 330kV is further cemented. Other voltage levels are not real options.

Recommendation

WPC strengthen the argument for Dual circuit 330kV as the only reasonable solution.

9. THE ENEABBA TO THREE SPRINGS LINE IS AN INTEGRAL PART OF THE SOLUTION TO THE MID WEST AND SHOULD BE INCLUDED IN THE NFIT

At the industrial organisations forum, WPC presented the situation where they were contemplating the appropriateness or not of the Three Springs to Eneabba 330kV line being part of the NFIT. WPC initially suggested that the line was simply a customer connection (to Karara) and therefore did not need to be submitted in the case to the ERA.

The issue raised above, relating to N-1 and Section 2 augmentation, makes this line a critical element in the mid west transmission system and overall augmentation. There is no benefit or reason for the Section 1 augmentation with out it.

EHPL believes very strongly that the Eneabba to Three Springs leg and Three Springs 330kV/132kV terminal should be included in the overall project submissions to the ERA and not as a separate stand alone project or customer connection asset. It is an integral part of the North Country transmission system. EHPL's connection request has been with WPC since 13 Aug 2007 and must be accommodated.

Any connection at Three Springs must be open access and the connection conditions and basis must be available as soon as the Section 1 augmentation is completed. There must not be another long process to establish an Open Access regime to enable a new connection to use the infrastructure at Three Springs.

EHPL is particularly concerned for its 330KV connection at Three Springs and does not want a regulatory process to delay the connection, if it is determined at a later time that the process has to be followed.

Recommendation

- The Eneabba to Three Springs 330kV line be included in the base regulatory case, and
- WPC to advise that it can ensure that loads such as EHPL's can connect at Three Springs immediately the facilities are available.

10. ANOTHER OPTION – NEERABUP-MOORA-THREE SPRINGS 330KV

An alternative project configuration not canvassed by WPC is a Neerabup, Muchea, Moora, Three Springs dual circuit, constructed at 330kV, one side run at 132kV and the other at 330kV line, replacing the existing wood pole 132kV line. This configuration has several advantages;

- It is inland and avoids the more costly, sandy soil access of much of western route option.
- It is very straight with easier access for construction.
- It provides a much more secure 132kV connection to Moora and Three Springs than the existing 132kV line.
- It leaves the relatively well performing 132kV Eneabba to Three Springs line in place.
- It is approximately 30km shorter than the proposed 330kV route length through Eneabba to Three Springs.

Overall this option appears to deliver substantial additional value at a lower cost. It is quite likely that this route could be in the order of $30m less that the proposed western option.

Its disadvantage is that it has no environmental approvals for corridor access that the western route has. EHPL is not suggesting WPC's option be ditched in preference to this, but that this, as an alternative, if it has lower cost, should be the basis of the cost recovery from customers, unless the current proposal is part of overall development plans for the North Country to transition into an N-1-1.

Recommendation

A quick assessment should be done to determine if this option could meet the drivers, including time, for Section 1 Augmentation.

11. OTHER ISSUES

a. Renewable Generation

Not enough emphasis has been made of the need of the system to accommodate wind and possibly solar thermal and PV in the region. As WPC properly points out the region is ideal for renewables, there are few alternatives regions in the South West Interconnected System. They also correctly identify that if the RET is to be met, and wind is the sole source, some additional 1,350MW is needed. If the State is not to secure most of that here in WA then, the State and WA community will lose. WPC has allowed for 200MW of new wind, but do not indicate where or in what time frame. Firstly 200MW falls far short of what is needed, so it appears to be extremely conservative.

We refer you to our earlier discussion of the nature of the magnetite mine loads, being base load. There is no analysis or discussion on what this means for wind penetration. There is no discussion on the level of wind and the basis for its connection to substantiate the 200MW.

There is no discussion of the incident solar resource in the region and project proponents' investigations.

This area of the Options Paper needs much more information to allow a reasonable assessment of the basis of 200MW of wind and in what time frame.

One of the reasons EHPL elected to connect to the grid instead of self generating on site was to access all types of energy in the competitive market, including renewable energy.

Recommendation

WPC provides more information on specific indigenous energy sources in the area and how that would integrate with the State Government's commitment to the RET's and the resulting need or other wise for this infrastructure.

b. Cost information

The Net Present Cost, (NPC) does not fully inform the reader of the nature of the cost. WPC should provide the actual CAPEX and differential OPEX values in the time period of the assessment.

Recommendation

WPC to provide a break down over time of capital and operating costs.

Asia Iron Holdings Ltd

Extension Hill Pty Ltd

ABN 81 067 128 938

First Floor, 66 Kings Park Road
WEST PERTH WA 6005
Australia

PO Box 82
WEST PERTH WA 6872

Telephone: 61-8-9216 2600
Facsimile: 61-8-9322 9801

E-mail: austadmin@extensionhill.com.au

20 July, 2010

MEDIA RELEASE

KEY APPROVAL RECEIVED FOR CCMD'S 60% EQUITY INVESTMENT IN ASIA IRON

Asia Iron's Extension Hill Mid West magnetite project has taken a major step forward on the road to production following regulatory approvals for a Chinese joint venture to take a 60% equity stake in the company.

Asia Iron Holdings Limited (Asia Iron), currently a wholly owned subsidiary of Hong Kong headquartered SINOM Investments Limited, has received approval from key Australian and Chinese regulators to enter into a transaction that will see Asia Iron issue new shares to Chongqing Chonggang Minerals Development Investment Limited (CCMD).

CCMD's equity investment into Asia Iron is worth up to $280million and the transaction will result in CCMD having a 60% equity interest in Asia Iron with 40% held by SINOM Investments Limited.

CCMD has received approval from China's National Development Reform Commission (NDRC) for the transaction, satisfying a key condition of binding transaction agreements between CCMD and SINOM signed in May. It follows Australian Foreign Investment Review Board approval for the transaction received in February.

CCMD has now released a US$40 million prepayment, with completion of the transaction subject to other conditions, including CCMD receiving approvals and sign-offs from other relevant Chinese regulatory authorities. These are expected to be received within the next month.

Following completion, the parties will immediately start preliminary works for the project development.

Under the terms of the agreements, funding for development of Stage 1 of the Extension Hill Magnetite Project, which will target production of 10 million tonnes of high grade iron ore magnetite concentrate annually, will be provided by proportional debt and equity contributions from CCMD and SINOM together with project debt financing from a Chinese bank.

CCMD's Chairman Jiacai Liu said the achievement of NDRC approval represents another very important milestone for the project.

"We remain fully committed to the development and future growth of the Extension Hill Magnetite Project and other projects of Asia Iron," Mr Liu said.

SINOM's Chairman Andy Zhang said the two parties had been working closely in the past months to head to the completion of the transaction.

"We are looking forward to continuing the cooperation with CCMD as we move into the development of the project," Mr Zhang said.

"Once again, we would like to thank the Chinese and Australian government authorities for their support to this transaction and the efficient manner in which they have dealt with the transaction approvals process."

ENDS

Contact:
Bill Mackenzie
Managing Director - Extension Hill
Phone: +61 8 9216 2600

About CCMD
CCMD is a joint venture established between Chongqing Iron and Steel Group (CISG) and Chongqing Foreign Trade and Economic Cooperation Group (CFTEC). CISG and CFTEC are incorporated in the People's Republic of China, based in Chongqing municipality. CISG is primarily a manufacturer of steel products and also has machinery manufacturing, construction and real estate, electronics and IT, environmental engineering and mining business units. CFTEC engages in foreign economic assistance programs, international construction projects contracting, labor exporting, equipment and technology import & export, and international trade.

About SINOM
SINOM is a company incorporated in the British Virgin Islands. SINOM is engaged in mineral resources development business and ultimately controlled by Mr Andy Zhang.

Extension Hill Pty Ltd

Extension Hill Pty Ltd

ABN 81 067 128 938

First Floor, 66 Kings Park Road
WEST PERTH WA 6005
Australia

PO Box 82
WEST PERTH WA 6872

Telephone: 61-8-9216 2600
Facsimile: 61-8-9322 9801

E-mail: austadmin@extensionhill.com.au

4 August 2010

Our Ref No: 10-547-PO-LET-0014_8

Mark De Laeter
General Manager Customer Service
Western Power
363 Wellington Street
PERTH WA 6000

Dear Mark

RE: **CONCERN REGARDING THE SUPPLY RELIABILITY IN GERALDTON.**

Thank you for the industry information session this Tuesday at the Ridges Hotel, which was very well done. EHPL has submitted a detailed submission in response to the Options Paper, but write here to specifically register our concern regarding the supply reliability in Geraldton.

You will remember that you and David Bones specifically stated that the presentation was about the southern section, not the northern section of the mid west transmission reinforcement project. I seek some clarification on the northern section status, especially as the increased Geraldton port demands associated with EHPL, Karara and other mines have been known about for a couple of years. These new loads are part of and on the same time line as the mines they serve. Oakajee adds significantly to the power supply problems.

As you know EHPL needs up to 15MW in the Geraldton Port region (originally under the Geraldton Port load access applications, but now under DQA reference number: 114485) and at a meeting with WPC on 15 June 2010, Dean Frost specifically pointed out that at this time and with out the federal government providing funds from Infrastructure Australia, WPC could not provide a firm supply. Further, non-firm status would prevail in any event until 2015, if the Australian Infrastructure funding did came through.

However, at the forum this week I got the impression that this situation was in the absence of any real work having been done to determine the incremental capacity enhancements needed to address this issue. It was also stated that the southern section project will provide some additional transmission capacity north from Three Springs to Geraldton. However, the scale of increase is in line with normal regional load growth not the high growth associated with the regional project flow-on and the indicated block loads.

On the loss of one of the 132kV legs to Geraldton, the region will likely suffer voltage instability and exceed thermal limits of the 132kV feeders to Geraldton, in the absence of being able to add generation north of Three Springs. Given the increase in load, this contingency situation of having to load shed on the loss of a 132kV line north of Three Springs, could almost be permanently present.

We were advised that with the projected loads and a 132kV leg outage, load shedding of the port and EHMP loads would be required. Given the nature of port operations, this is of serious concern. Should this be the case, EHPL would expect a significantly lower power tariff to apply for interruptible supply.

While the scale of load at the Port is much lower than the mine site, it is a significant load and a crucial part of the mine magnetite delivery process and I contend that the resolution of the northern section should be integral with the southern section. It should not be sequential with resolution of the southern section.

I seek your urgent advice on what is being done and the time frame to address this issue.

Yours sincerely,
EXTENSION HILL Pty Ltd

MATT DUXBURY
Manager Infrastructure Services

cc Mark Gooding
Steve Harms

MD/sm

GRIFFIN ENERGY
A Member of the Griffin Group

15th Floor
28 The Esplanade
Perth, Western Australia, 6000

Telephone: (08) 9261 2800
Facsimile: (08) 9486 7330

30 July 2010

Midwest Energy Project
Customer Service Centre
Western Power Corporation
GPO Box L921
PERTH WA 6842

Email: Midwest.submissions@westernpower.com.au

RE: Submission on Western Power's Midwest Energy Project

Griffin Energy welcomes the opportunity to provide comment on the proposed stage 1 of the Midwest Energy Project, which will augment the southern section of the Perth to Geraldton transmission system to a double circuit 330kV transmission line.

The SWIS transmission network is experiencing system-wide constraints. New generation facilities face difficulties connecting to the SWIS to the north and south of the metropolitan area. Major new mining loads in the Midwest and the development of the Oakajee Port will necessitate large scale expansion of the current transmission system. Additionally, it is widely recognised that the Midwest region offers extremely favourable renewable solar and wind energy resources. New renewable generation projects are currently constrained by the lack of transmission capacity. An augmentation of the type proposed (followed by the stage 2 development to Geraldton), will enable development of new large scale renewable generation facilities. This will lead to more renewable energy being generated in the SWIS and bring new investment and jobs to regional centres.

Of the options considered in the Major Augmentation Proposal Option Paper, Griffin concurs with Western Power's assessment that the double circuit 330kV is the preferred option. This option offers flexibility (in allowing for one circuit to operate initially at 132kV and one at 330kV) as well as meeting all but the highest load growth scenarios for the region.

Griffin is firmly of the belief that regulatory decisions on projects such as these must allow some leeway for valuing the potential for state and community development that will flow from the opening up of the Midwest region to serious economic development. Focusing strictly on econometric cost-benefit scenarios, as traditional economic regulation tends to do, will be unlikely to enable the type of large scale regional and industrial development that WA has enjoyed periodically over the years, such as opening the North West iron ore and gas provinces or the current efforts to deploy large scale agricultural production in the Kimberly.

Griffin is also encouraged by Western Power's acceptance that the benefits of efficient generation investments is ultimately shared across all users of an electricity network, as has

been recognised by other jurisdictions for some time. This means that efficient generation investment (and the requirement for this to connect to the bulk transmission system) can contribute to the determination of the Net Benefit Test under the Access Code. Historically, Western Power has preferred that generation facilities pay hefty capital contributions for deep connection costs where there is a clear case for smearing these costs across the asset base. Griffin has been arguing this point for several years. We look forward to scrutinising Western Powers analysis of the net benefit value of new generation connections.

Griffin also looks forward to understanding Western Power's assumptions around the value attributed to incremental revenue from new loads. This revenue, the vast majority of which will derive from the block loads of prospective mining ventures, will be very dependent on the assumptions made around the timing and probability of such ventures progressing. These assumptions will rely on many factors outside of Western Power's control, not least including global economic conditions, commodity markets and access to finance; but also including the robustness of the individual ventures themselves. Griffin trusts Western Power has applied sufficient rigour to these assumptions.

An issue familiar to Griffin is the potential to connect new generation to the grid at the southern-most extremity of the proposed stage 1 project – at the Neerabup terminal. Our understanding is that new generation is currently constrained at this point due to the requirement (and excessive cost) for a new 330kV connection between the Neerabup and Northern terminals as well as strengthening of the 132kV system around Wanneroo and Warnbro. Griffin would like to understand how these issues would be alleviated by the proposed stage 1 project. We understand that the assumption that significant new loads in the Midwest (including the Karara Mining load, which underpins the base case analysis) will alter the dynamic flow profile in the region. This would likely mean that new generation connected at Neerabup would no longer be constrained under this scenario. However, without the reinforcements identified above, when the block mining loads are in outage, it is likely that the Neerabup terminal will again have its output constrained. It could be argued that in circumstances when such significant block loads are offline, it is unlikely that (at least) peaking facilities would be required. However the SWIS operates a capacity market, which (currently) requires unconstrained capacity to qualify for capacity credits. Griffin would like to see analysis and comment around whether the stage 1 project should include the reinforcements identified above, which will open up considerable new low-cost generation connection opportunities within the fast growing northern metro corridor.

Griffin has been advocating investment in the transmission network for some time. We encourage Western Power's efforts to progress its preferred option for stage 1 of the Midwest Energy Project. Coupled with new investment to the similarly constrained south west region, such upgrades will greatly enhance the likelihood of continued economic growth within the SWIS region.

Yours Sincerely,

Shane Cremin
GM – Policy & Strategy

129/60 Kalinda Drive
City Beach
W.A. 6015

2nd August 2010

The Western Energy Project:

With respect to your request for Public Submission for a Double Circuit transmission power line between Neerabup and Eneabba.

As a retired Transmission Line Engineer I would initially install a 330kv line adjacent to the 132kv line between Muchea and Three Springs and then construct a single single circuit 330kv line to Neerabup parallel to the 132kv lines from Muchea to Three Springs via Regans and Eneabba.

With these arrangemtnys the two 330kv lines can be commissioned with minimum loss of supply to the existing arrangement.

Yours faithfully

G.F. Stevens

2 AUGUST 2010

WESTERN POWER
MIDWEST ENERGY PROJECT

LATE PUBLIC SUBMISSION - SUBMISSION ON 330KV VOLTAGE LINE ON LOT 101 BRAND HIGHWAY GINGIN, BOONARING

DEAR SIR/MADAM

WE STRONGLY OBJECT TO THE PROPOSED 330KV TRANSMISSION LINE ON THE FOLLOWING GROUNDS AND REQUEST THAT ALL THE BELOW QUESTIONs ARE ANSWERED AND RESPONSES ARE PROVIDED TO US PRIOR TO PROGRESSING THIS INITIATIVE ANY FURTHER;

1. Western Power do not respect landholders and have no dialogue between landowners and service men who enter properties by stealth, cutting locks on gates, fences etc How will you deal with this if it can't be done now?

2. The subject property is too wet to in the winter time to access and already Western Power service men get vehicles bogged and call on the landholder, on each occasion to pull them out. (this has occurred on our property for the last 5 years!) How will you deal with this?

3. Properties have been accessed on Sundays having no regard for the weekends. How will you deal with this?

4. Western power servicemen access properties from the wrong access points and drive "wherever they like on private property". How will you change this?

5. The drive where you like mentality poses biosecurity issues for landholders. Western Power vehicles spread weeds from one property to another. How will you stop this?

As you can clearly see there is no relationship between the landholders and Western Power.

The new line should be placed on the road reserve or on government land so that the above issues can be managed to the governments satisfaction and not the landholders.

Please be notified that Western Power does not have access to our property and will be seen to be trespassing.

Western Power have not investigated other alignments and I request to know why this is?

How will Western Power handle the spread of weeds from one property to another?

What line management and access is proposed?

I ask are 330Kv power lines a health hazard and request this to be answered?

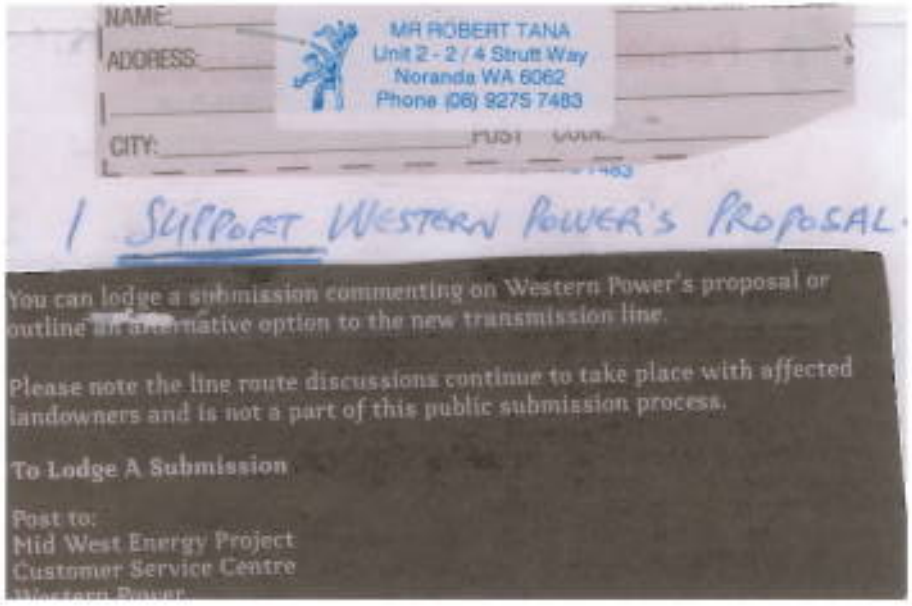
Please be advised the proposed transmission line is in an unsuitable location on our property. What dialogue will you enter into if this is the case?

Western Power has a legacy of lousy management and disrespectful servicemen who are not welcome on this property. Over the years we have had enough and welcome you to get your infrastructure off our land.

Western Power has had a 132Kv line on this property for years with no compensation made to the landholder. Will you correct this anomaly?

Why won't you go away, do your homework and use Government land?

BRETT EDWARDS
PO BOX 44
GINGIN


NAME:
ADDRESS:
CITY:
MR ROBERT TANA
Unit 2 - 2 / 4 Strutt Way
Noranda WA 6062
Phone (08) 9275 7483
I SUPPORT WESTERN POWER'S PROPOSAL.
You can lodge a submission commenting on Western Power's proposal or outline an alternative option to the new transmission line.
Please note the line route discussions continue to take place with affected landowners and is not a part of this public submission process.
To Lodge A Submission
Post to:
Mid West Energy Project
Customer Service Centre

Government of **Western Australia**
Mid West Development Commission

Mid West Energy Project
Customer Service Centre
Western Power
GPO Box L921
Perth WA 6842

Dear Sir / Madam

MID WEST ENERGY PROJECT

The Mid West Development Commission has provided substantial input to a variety of forums, including the ERA, outlining the future power needs of the Mid West region, including the completion of the 330 kv power line from Pinjar through to Moonyoonooka and ultimately Oakajee.

Rather than recount that information, I wish to advise that the Mid West Development Commission Board regards power as the number one issue in the Mid West. Our concern extends to the reliability and capacity of the existing SWIS network; the provision of adequate and cost effective gas supplies; encouragement of third party power generation within the Mid West including that relating to renewable energy sources; support for remote major projects (eg Crosslands' Jack Hills magnetite project) and stimulation of downstream processing (for example at Oakajee).

In respect to the 330 Kv power line, the Commission fully supports its construction on the basis of four fundamental reasons:

1. To bring much needed power in to the Mid West region to meet future regional community needs. There are already tangible constraints on business in the MW.
2. To support the establishment of major magnetite projects (particularly Gindalbie's Karara project and Asia Iron's Extension Hill project) and other planned and proposed industry in the Mid West. MWDC remains concerned that the power requirements of major industry into the future are under-estimated.
3. To encourage geographically dispersed third party power generation in the Mid West including the use of renewable sources, for which the Mid West is highly prospective; and
4. To reduce the risk of an over reliance within the SWIS on two major pieces of energy infrastructure, namely the Dampier Bunbury Natural Gas Pipeline and the 330 kV lines from Collie based power stations. The 330 Kv line to Geraldton would add a third, geographically dispersed, strategic energy link to Perth, and other key markets in the south west corner of the State, based on an alternative source of power generation.

Please address any enquiries on this matter directly to myself on (08) 9921 0701 (email steve.douglas@mwdc.wa.gov.au), or to Ms Anne Finlay (08) 9921 0286 (email anne.finlay@mwdc.wa.gov.au).

Yours sincerely

STEVE DOUGLAS
CEO

3rd August 2010

45 Cathedral Avenue (PO Box 238) Geraldton Western Australia 6531
Tel (08) 9921 0702 | Fax (08) 9921 0707 | Email info@mwdc.wa.gov.au | www.mwdc.wa.gov.au

Advanced
Energy Resources

Mid West Energy Project
Customer Service Centre
Western Power
GPO Box L921,
PERTH WA 6842

3rd August 2010

To whom it may concern,

Letter of Support: Mid-West Energy Project – Stage 1

Advanced Energy Resources (AER) would like to express its support for stage 1 (southern section) of the Mid-West Energy project.

AER supports vital investment in infrastructure which will propagate the development of new industry in the mid-west region.

With an interest in sustainable energy projects in the Mid-West region as well as across the state of Western Australia, AER welcomes any future network capacity upgrades which sustain the development of renewable energy projects.

Yours sincerely,
Advanced Energy Resources

Luca Castelli
Director

88 Tweeddale Road, Applecross WA 6153 Tel: (08) 9364 0400 Fax: (08) 9364 0444 admin@castelligroup.com.au ACN 115 008 869 ABN 93 115 008 869

Geraldton
Iron Ore Alliance

Postal: P O Box 2394, Geraldton W A 6531 **Office:** 23 Sanford Street, Geraldton W A
Phone: (08) 9964 7923 **Mobile:** 0407 447 923

Mid West Energy Project
Customer Service Centre
Western Power
GPO Box L921
Perth WA 6842

3RD August 2010

Dear Sir/Madam

Re: Mid West Energy Project

The Geraldton Iron Ore Alliance (GIOA) has a membership of five iron ore mining companies which are at various stages of exploration and development of mines in the Mid West. These companies are:

- Sinosteel Midwest Corporation Limited
- Crosslands Resources Ltd
- Gindalbie Metals Ltd
- Golden West Resources Limited
- Asia Iron Holdings Limited

The GIOA is providing this submission in support of development of the proposed 330kV Mid-West Augmentation proposal. The GIOA considers that the expedient progress of this project is essential to enable planned economic and social development of the region to occur, without serious power supply shortages in the very near future.

There are significant iron ore projects in the region which are substantially progressed and have significant power supply requirements, providing long-term base loads which shall require and "anchor" the planned augmentation infrastructure investment.

The Options Paper significantly understates the current load projection by only including Oakajee, Gindalbie and 12MW of block loads in the Central Case. Usual planning of this nature would include these loads and a number of prospective loads in the Central Case, such as Extension Hill's stage 1 and Gindalbie's and Extension Hill's stage 2 and an allowance of other prospective projects in the region. The stated central peak load 297MW should be more in the region of 450MW or greater.

In fact two significant magnetite proposals, Asia Iron's Extension Hill project (Extension Hill Pty Ltd) in the Mt Gibson Ranges and Gindalbie Metals' Karara project are currently progressing on the basis of connection into the 330KVA line to eventually achieve the full potential of their projects. And yet Extension Hill is not included in the Central Case.

The State Government is well aware of these projects and the GIOA has been lobbying for the progression of this power-line augmentation project for over four years, seeking its progression so that the expansions of these multi-billion dollar projects are not delayed.

Geraldton
Iron Ore Alliance

Postal: P O Box 2394, Geraldton W A 6531 Office: 23 Sanford Street, Geraldton W A
Phone: (08) 9964 7923 Mobile: 0407 447 923

The Gindalbie Metal's Karara magnetite project aims for its first stage production to be operational by the end 2011 (with a 100MW base load). Gindalbie has in place a long term power supply agreement with Verve Energy for approx. 1 million MWh's per annum for a 15 year term. This power is to be sourced from Verve and shall be delivered at Eneabba via a SWIN connection. Both Gindalbie's and Western Power's studies confirm that the 330kV upgrade is necessary to support the planned Karara project expansions.

Similarly, the Extension Hill project has its environmental approvals in place and design works significantly progressed with production intended to commence in early 2013. The project requires 150MW at its initial stage with significant ramping up to service its further stages of development for a planned production of 40Mtpa by 2019, requiring in the order of 600MW.

The two major magnetite projects previously mentioned are required to connect into the 330kV line at Eneabba and Three Springs and shall at considerable cost construct 330kV transmission lines to their projects, in the order of $200m for Gindalbie and $150m for Extension Hill.

The progress of these projects of regional and State significance requires the 330KVA upgrade to be progressed without delay, however they are just part of a rapidly developing new industry which has the capacity to generate well in excess of 70 million tonnes of iron ore per year from the region by 2015.

Full development of these iron ore projects requires a deepwater port and they shall underpin the proposed Oakajee port and Murchison rail infrastructure. The new port has the potential to trigger significant industrial development on the adjoining State Government owned industrial estate.

Estimated potential benefits the Mid West iron ore industry will bring are:

- 1,360 jobs a year during construction phase (min 6 years)
- 4,254 direct jobs a year (for at least 25 years)
- More than 12,000 direct and indirect jobs a year in WA
- $17 billion of investments by 2015
- Major infrastructure investment in Rail, Port, Electricity, Water and Gas

Further details of the companies and their projects can be attained from the Alliance's website at www.gioa.com.au .

Geraldton
Iron Ore Alliance

Postal: P O Box 2394, Geraldton W A 6531 **Office:** 23 Sanford Street, Geraldton W A
Phone: (08) 9964 7923 **Mobile:** 0407 447 923

Details of GIOA members' planned projects are provided in the Table below:

Company	Project	Start	Workforce	Target Production (Annualised Rate in Dry tonnes)
Crosslands Resources	Jack Hills Stage 2 Expansion	2011 2013 -14	2000 Construction 1000-1500 Operations	25-35Mtpa (2Mtpa Current)
Sinosteel Mid West	Koolanooka/ Blue Hills	2010	100	1Mtpa
Gindalbie Metals	Karara Hematite Magnetite	2009 -11 2011 2011 2012 - 21	1500 Construction 180 Operations 500 Operations	2Mtpa (Hematite) Initial 8Mtpa (Magnetite) Staged expansions to 30Mtpa
Asia Iron	Extension Hill	2010 - 12 2012 - 13 2015 - 19	2000 Construction 500 Operations	Initial 10Mtpa Staged Expansions to 20 then 40Mtpa
Sinosteel Mid West	Weld Range	2011 2013 - 14	1000 Construction 500 Operations	15Mtpa (Hematite)
Sinosteel Mid West	Robinson Rd And Jack Hills	2016	80 Operations	2Mtpa (Hematite) - Satellite DSO for Weld Range Hub
Golden West Resources	Wiluna West	2011-13 2014 2015 2016 on	80 Operations 400 Operations	1Mtpa 7Mtpa 8 Mtpa ~10 Mtpa
Sinosteel Midwest	Koolanooka or Jack Hills	2017	Significant	20Mtpa Magnetite Concentrate

The total estimated power needs of the planned GIOA members' magnetite projects in the region are estimated to exceed 2000MW by 2020. The Murchison based projects plan to deliver their own power solutions, with gas-fired power stations the most practical outcome for the large magnetite projects, however the magnetite projects in the southern half of the region are pursuing power supply via the upgraded SWIN.

The GIOA also has significant concerns in respect to the efficiency and reliability of the current 132kV transmission system through to Geraldton. We are firmly of the belief that the extension of the 330kV upgrade through to the city of Geraldton and its extension to the planned Oakajee industrial estate is required to be progressed as soon as practical. Failure to progress the augmentation in a timely manner is most likely to see major projects delayed, limitations placed on power supply to industry, overall economic development of the region curtailed, a substantial increase in interruptions to supply and shall raise the risks of fire and/or other safety issues.

Geraldton
Iron Ore Alliance

Postal: P O Box 2394, Geraldton W A 6531 **Office:** 23 Sanford Street, Geraldton W A
Phone: (08) 9964 7923 **Mobile:** 0407 447 923

Already, WPC is unable to offer uninterruptible connections to the concomitant loads associated with Ginadalbie and Extension Hill at the Geraldton Port, much less the Oakajee loads. The GIOA urges WPC to accelerate the second stage augmentation to Geraldton to enable firm power connections in Geraldton.

Clearly the case to expedite Western Power's proposed 330KVA augmentation project in the Mid West is compelling and any potential delay by government is of extreme concern to the Mid West Iron ore industry.

Yours sincerely

R W Jefferies

Chief Executive Officer

PARLIAMENT OF AUSTRALIA
HOUSE OF REPRESENTATIVES

HON WILSON TUCKEY MP
MEMBER FOR O'CONNOR

3RD August 2010

Mid West Energy Project
Customer Service Centre
Western Power
GPO Box L921
PERTH WA 6842

Dear Sir

I refer to your advertisement in the 30th July issue of the 'West Australian' requesting submissions regarding the 330kv AC transmission line between Neerabup and Eneabba and reply both in terms of my objection to this line and to provide a viable option.

My objections are as follows. The concept of pumping gas from the Pilbara to generate energy in the SW and around Muchea for delivery through what is now the least efficient transmission technology fails the test of Energy security and transmission efficiency in both the transmission of gas and electricity.

The proposal fails on the grounds that it creates visual pollution and inconvenience to the agricultural properties along its route.

With approximately 60% of WA electricity now generated from Natural Gas, it must be patently obvious of the supply risks arising from the further dependence upon the Dampier to Bunbury gas pipeline.

The concept of pumping the gas south of the Mid West at considerable energy loss and carbon emissions to turn it into electricity for transmission via a system that will experience significant line losses back to the Midwest, can only be described as high farce.

The solution resides in repositioning the proposed 200mw of additional gas generation at Kwinana and future additions to the Pilbara for transmission by an HVDC line to interconnect to the South West Land Division network at Geraldton.

If the reported cost of the completed 330kv AC line is $750m, an HVDC line as I propose, complete with converter station and with line losses of approximately 5% would cost approximately $1bn, but be eligible for a variety of Greenhouse funding assistance. Even more so were the Pilbara also identified for future large scale Desert Solar generation as proposed in the EU-MENA scheme for Europe.

GREAT SOUTHERN
(Albany)
Unit 5
The Link Centre
St Emilie Way
Albany, W.A.
(P.O. Box 5077
Albany W.A. 6332)
Tel: (08) 9842 6228
Fax: (08) 9842 6606
Toll Free: 1300 301 868

MID-WEST
(Geraldton)
23 Chapman Road
Geraldton W.A.
(P.O. Box 1781
Geraldton, W.A. 6531)
Tel: (08) 9964 2196
Fax: (08) 9923 7990
Toll Free: 1300 301 821

CANBERRA OFFICE
Suite R147
Parliament House
Canberra, A.C.T. 2600
Tel: (02) 6277 4660
Fax: (02) 6277 8569

THE ELECTORATE OF O'CONNOR COVERS THE FOLLOWING 50 LOCAL GOVERNMENTS

Albany, Boyup Brook, Bremer Bay, Bruce Rock, Cervantes, Coorow, Corrigin, Cranbrook, Cunderdin, Dalwallinu, Dandaragan, Denmark, Dowerin, Dumbleyung, Geraldton, Gnowangerup, Goomalling, Greenough, Irwin, Jerramungup, Katanning, Kellerberrin, Kent, Kojonup, Kondinin, Koorda, Kulin, Lake Grace, Mingenew, Moora, Morawa, Mt Marshall, Mukinbudin, Narembeen, Nungarin, Pearaicol, Plantagenet, Quairading, Ravensthorpe, Tambellup, Tammin, Three Springs, Trayning, Victoria Plains, Wagin, West Arthur, Wickepin, Wongan-Ballidu, Woodanilling,Wyalkatchem

This initiative could also be the first stage of extending the HVDC line onwards to James Price Point to access the Browse Domgas commitment as electricity whilst leaving more of the Pilbara supply for direct gas consumers.

This would also access the Kimberley Tidal resource and on this issue I refer you to the South Korean 250mw Sihwa Tidal Station now approaching completion at a cost of $350m; a cost approximately half a similar coal fired station see attachment.(enc)

I refer also to the Xiangiaba to Shanghai 2,000km HVDC line now in operation, which brings Chinese Hydro power to Shanghai. This facility is rated at 6.4gw and operates at 800kv, so there is no technological impediment. A further HVDC line to interconnect the SW Land Division with the Eastern network would bring advantages of extending the daily life of base load power in both directions, considering the 3 hour summertime difference. (Enc.)

To summarise, the 330kv proposal would cause the late Sir Charles Court to turn over in his grave as it denies W.A. the opportunity to lead in transmission and practical renewable technology when both major Federal political parties have made commitments in this area in their policy announcements.

Yours sincerely

HON WILSON TUCKEY MP

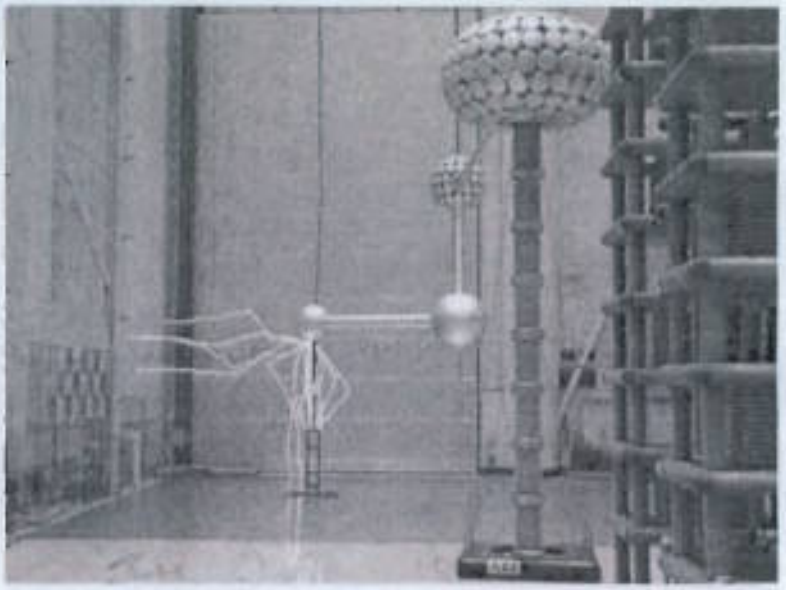
Ger:km

Encl:

Converter $150/KW

Xiangjiaba - Shanghai ±800 kV UHVDC transmission project
The world's longest transmission link with breakthrough technology

The Xiangjiaba – Shanghai route



Insulation gap tests for the 800 kV development

The State Grid Corporation of China, will transmit 6,400 MW power from the Xiangjiaba hydro power plant, located in the southwest of China, to Shanghai, China's leading industrial and commercial center, located 2,071 km (1,286 miles) away. This will be the largest transmission project ever built when the first pole goes into operation in 2010.

Largest transmission project to be built

The Xiangjiaba - Shanghai transmission link represents a major breakthrough in the technology of electric power transmission in many aspects:

- The new system voltage ±800 kV is 33% higher than the voltage used for the Itaipu ±600 kV transmission in Brazil, until now the world's highest HVDC transmission voltage rating.
- The power rating, 6,400 MW, is more than double the power rating of the most powerful transmission in operation today.
- The overhead line length, 2,071 km, will be the longest overhead transmission in the world, compared with 1,700 km for the Inga-Shaba HVDC transmission in Kongo-Kinshasa, until now the world's longest transmission line.
- The losses for this long line will be reduced to 7% compared with 10% if the line had been built with conventional 500 kV DC transmissions.
- The 800 kV voltage is formed by two 400 kV series connected 12-pulse converters.

Thorough development and preparations

ABB has invested in equipment development, manufacturing and testing facilities to enable this new technology to be used in commercial operation. The developed equipment has been under successful test operation at 850 kV DC since November 2006. The test set-up has been organized at the STRI laboratory in Ludvika, Sweden.
New thyristors with 6 inch diameters are developed to operate at a direct current of 4000 A.

ABB an extensive supplier to the project

To the Xiangjiaba - Shanghai link, ABB will supply system engineering including design, supply and installation of the two converter stations including 800 kV HVDC power transformers and switchgear, air insulated and water cooled thyristor valves provided with newly developed 6 inch thyristors rated 8,5 kV and advanced control equipment.

The system is scheduled to go in operation in 2010.

Data
Connection point Xiangjiaba: Fulong substation
Connection point Shanghai: FengXian substation
Ownership: State Grid Corporation of China
Start of project: December 2007
Commissioning year: Pole 1 and bipole: 2010
Transmission technology: UHVDC, Ultra High Voltage Direct Current
Transmission capacity: 6 400 MW
No. of poles: 2
DC voltage: ±800 kV
Length of overhead DC line: 2 071 km
AC voltage: 525 kV (both ends)
Main reason for choosing HVDC: Long distance and low losses
HVDC converter stations: Convert alternate current (AC) to direct current (DC) and on the other side DC to AC

For more information, please visit:
www.abb.com/hvdc

ABB AB
Grid Systems - HVDC
SE-771 80 Ludvika, Sweden
Tel: +46 240 78 20 00
Fax: +46 240 61 11 59
www.abb.com/hvdc


SIHWA TIDAL POWER PLANT
PROJECT
DAEWOO E&C

Email Submission (received 4 August 2010)

Mid West Regional Council

Hello

I received an invitation to attend an information session in Geraldton related to the Mid West Energy Project Stage 1 however was unable to attend due to other commitments.

The Mid West Regional Council is now comprised of 5 member councils - the Shires of Mingenew, Morawa, Mullewa, Perenjori and Three Springs. Power is a matter of great concern to the member councils of the Mid West Regional Council. Both the shires of Morawa and Perenjori communities experience significant disadvantage due to unreliable power supplies to their communities and over the last 5 years have experienced frequent outages often over 24 hours, and on some occasions up to 3 days in duration during summer months with temperatures exceeding 40 degrees C. We have been advised that capacity can be increased but reliability will remain an issue for these communities. The new transmission line passes approximately 15 km north of Perenjori and 25 km south or Morawa. Western Power have provided indicative costs to upgrade the existing feeders of less than $10 Million.

The project being proposed will upgrade the transmission infrastructure to service the Midwest in General, the Karara Iron Ore Project and the Extension Hill magnetite project which will construct a privately owned 330kv power line from Three Springs. This power line will run 2 km south of the Perenjori town site.

These multibillion dollar projects are dependent on reliable energy supplies and there is potential for these communities to benefit from the mining. The town sites of Morawa and Perenjori are already gearing up to provide support services to the mining on their doorsteps. Hospital and local businesses are however obliged to provide their own power sources to back up an unreliable system.

7 member shires of the Mid West Regional Council recently completed a Climate Change Risk Assessment and Adaptation Action Plan and it was identified in this plan that draw on power supplies will increase dramatically as climate change heats our environment.

Power generation projects should be a critical part of the state's planning and investment. Perenjori provides the highest solar radiation anywhere on the South West grid. Planning should include means to both accommodate and encourage large scale solar power generation.

We request that planning for the transmission line includes:

- Consideration of future generating capacity and where it is likely to join the transmission system. There would be cost savings in building this capacity rather than retrofitting in the future;
- The same infrastructure that would support power generation (such as solar thermal) would allow off take for better servicing of adjacent towns. The current distribution line from Three Springs covers around 80 km to reach Perenjori. A new substation would place the distance at less than 20 km;
- Installation of a substation between Morawa and Perenjori would support the development of an Agribusiness Precinct that is far enough away from existing settlements so that they would not suffer the same problems with neighbours that they have experienced elsewhere in the state; and
- Climate change implications be a consideration in planning for future needs.

Thank you for the opportunity to comment.

Suzanne Ward
Chief Executive Officer

MID WEST REGIONAL COUNCIL
PO Box 3276, Bluff Point, Geraldton WA 6530
Ph (08) 99210 521, Mob 0429 184 555
Email: ceo@mwrc.wa.gov.au
Website: www.mwrc.wa.gov.au

Our Ref: #3353666
Enquiries: Mr Simon Middleton
Telephone: (08) 6212 1397

4 August 2010

Mid West Energy Project
Customer Service Centre
363 Wellington Street
PERTH WA
Emailed to: Midwest.submission@westernpower.com.au

RE: Mid West Energy Project – Southern Section – Neerabup to Eneabba

Thank you for the opportunity to comment on the your Major Augmentation Proposal Options Paper related to the Mid West Energy Project – Southern Section – Neerabup to Eneabba **(the Paper)**. In response Synergy offers the attached comments in support of the proposed double 330 KV circuit option.

Synergy has reviewed Western Power's most recent proposal addressing how load growth in the Mid West, given the high level of interest in this region resulting from the potential for mining load development as well as further and significant wind farm investment, can be met. Synergy's expectation is that development in this region will progress irrespective of the augmentation option selected, but that an option that does not allow for its full potential will result in a higher overall cost and reduce the flexibility of the Wholesale Electricity Market interaction in this precinct.

Synergy fully supports Western Power's proposed major augmentation proposal, subject to the Authority's determination of the regulatory test, for the Mid West being the progressive development of a double circuit 330KV transmission lines from Pinjar to Eneabba as a considered and timely response.

Yours Sincerely

Simon Middleton

SIMON MIDDLETON
HEAD OF STRATEGY & GROWTH

1.0 Diversity of Loads and Wind Farm Suppliers Proposals

Expectation is that a number of different developments with different ownership will proceed in the Mid West over the next decade. The region can therefore be seen as one that has attracted and will continue to attract a number of large scale loads as well as a number of large scale wind farms on account of the area's attractive wind regime. The region is also likely to attract, at a later date, other forms of generation capacity both conventional and renewable based.

The diversity of load and generator types interested in connecting in this region indicates that any transmission development will not benefit a single project but a diversity of projects.

2.0 Expected Mid West Load Growth

The Paper indicates the inherent load growth expected with no major block load arrivals the current capacity would be exceeded by 2016/17. Synergy expects that the actual load growth which includes new mining loads will more closely approximate the high forecast if the transmission network is augmented sufficiently to supply that level of development.

Even without a major augmentation Synergy expects significant development activity in the Mid West although this would more likely be supplied via expensive onsite generation development and such investment would be limited in its interaction with the Wholesale Electricity Market, which may well be an inefficient outcome for the whole market.

3.0 Improvements in South West Interconnected System (SWIS) Load Profile Resulting from Mid West Load Development

The SWIS load has been growing its peak demand at a faster rate than its total energy consumption. This has largely been due to the increase in air-conditioning installations. The increased peakiness, often referred to as a reduced system load factor, will drive electricity costs higher as the need for fixed generation capacity cost per unit of energy provided increases.

The types of loads expected to be developed in the Mid West are not considered weather dependent loads and if similar to other mining loads will exhibit relatively flat consumption profiles in comparison to most other load types in the SWIS.

When these higher load factor loads are added to the SWIS load they improve the load factor of the total SWIS effectively decreasing the need for peaking generation capacity allowing existing base-load and mid-merit type generation plant to better utilise their capacity improving energy production efficiency.

4.0 The Options

4.1 Embedded Generation as Possible Supply Options

The timing of the arrival of new mining loads in the Mid West will depend upon arranging a suitable electricity supply source. The Paper discusses two supply options including embedded generation, being private generation located at the mine site, and network support for the South West Interconnected Network (SWIN) connected capacity.

Synergy considers the first option, stand alone generation, as being inferior to a transmission connection given the relative cost arguments presented in the Paper. For example, at stand alone sites it is necessary to over-build capacity which is expensive and does not address the risks inherent in single site generation such as fuel supply and generator outages.

The second option of local generation acting to support the network would only be a temporary solution and an expensive solution in energy terms due to scale issues. Ultimately, it would need to be replaced with either embedded generation or transmission augmentation as the expected load developed. The Paper indicates there are other technical issues with this approach including lack of reliability of supply.

4.2 Voltage Level Selected Options

It is noted that the Paper presents four voltage levels for consideration.

The existing 132 KV supply, although commonly used in the SWIN, is insufficient to meet expected growth apart from expanded growth required for the development of the Mid West mining zone.

The option to build at 220 KV is also a limited approach and if implemented is likely to result in a situation similar to the Goldfields where transmission capability was quickly inadequate to meet the growth in demand resulting in local businesses needing to build their own generation and fuel supply infrastructure.

The 275 KV option whilst delivering greater transfer capacity than 220 KV is not a common technology for the SWIN and although used in other parts of Australia would still be a non-standard SWIN voltage. Realistically, the use of 275 KV would only be a temporary arrangement before, required because of load growth, being converting to the more standard 330 KV arrangement would be required.

The 330 KV is the extra high voltage standard for the SWIN and apart from delivering compatible equipment design also offers the highest transfer capacity while being the most cost efficient over the long term.

4.3 Single or Double Circuit Designs

It is understand that the cost differential between single and double circuit designs is marginal given most of the fixed costs are inherent in the single circuit. Clearly, the double circuit apart from greater transfer capacity delivers a level of reliability allowing for line maintenance activities.

For these reasons, when considering the net benefit under the Code[1], serious consideration should be given to adopting the double circuit arrangements in preference to the single circuit options.

5.0 Wind Farm investment

Expectations are that the renewable energy forecast requirement for the SWIS as a result of the Federal Government's 20% target by 2020 would see investment in renewable capacity between 150 to 250 MW of wind equivalent supply by 2015 with another 300 MW by 2020. It is expected wind projects planned for the Mid West are highly prospective in meeting this investment requirement and that their development (among other commercial factors) will be dependant on the necessary network capacity being available.

It is important to note that local based renewable energy investment has advantages for the State over purchasing Renewable Energy Certificates (REC) from the eastern States in that the impact of any future carbon price is naturally hedged.

6.0 Conclusion - Synergy's preference for the double 330 KV Option

Synergy understands that the Mid West is a zone of development that will grow in electricity demand volumes above the central forecast rate as well as potentially being a source of significantly increased renewable energy production. A major concern must be that the potential for growth in this region will likely be constrained if there is lack of adequate transmission connection and transmission transfer capacity. Growth in this region will benefit the energy production of the entire SWIS by increasing the system load factor and overnight demand and also increase the scope for the production of renewable energy, particularly but not limited to wind, allowing Western Australia to meet its share of the national 20% renewable energy target at a lower cost.

The 330 KV double circuit augmentation option, of all those proposed by Western Power, best provides for high load growth allowing the existing 132 KV facilities to be converted to the higher voltage within a reasonable timeframe consistent with growth. This option promotes development in the Mid West allowing for expansion of both mining load and further development of renewable investment without creating temporary and potentially expensive interim steps. Synergy supports this augmentation option as the best approach for State development in the Mid West region and as a practical way in promoting Western Australia's renewable energy credentials for the future.

[1] Electricity Network Access Code 2004.

Submission to Western Power – Mid West Energy Project

Alternate Proposal for the Southern Section Stage 1 Upgrade

Summary of Proposal

It appears that the following possibility has not been considered.

The single circuit 132 kV line through Moora should be the first part of the Midwest Grid to be upgraded, to either double circuit 220 kV or (preferably) 330 kV. At the same time, or later, the current double circuit 132 kV line through Cataby should be upgraded to the same higher voltage, as seems to have be the intention, as it was constructed on steel towers. One circuit of either or both routes could be left at 132 kV, and upgraded when the demand increased.

Some advantages of this proposal are:

1. Several Renewable Energy generating projects are proposed directly on, or within a few km of the Moora single circuit 132 kV line. These include:
    a) at least one windfarm of up to 180 MW
    b) a similar sized geothermal project a few km west (drill program at planning stage)
    c) The area is also prospective for Solar Thermal.
    d) Several gas prospects are closer to the Moora route than the Cataby route.

2. The reliability of the network will be greatly enhanced. The network is a ring main, with substantial redundancy advantages in the case of a partial failure. To keep it functioning as a symmetric ring main, the eastern side is in urgent need of upgrade.

3. The proposed Wind Farm and Geothermal sites near Coorow are about 50 km south east of Three Springs, about 30 to 50 km shorter than the distance to most proposed wind farms near Cataby

4. The voltage upgrade of the existing western 132 kV double circuit would require little extra footprint.

5. The upgrade of the Eastern line through Moora, could follow the current route, which includes much low value land unsuitable for agriculture. Little extra footprint is required.

6. The eastern route through Moora to Three Springs is shorter than the western route, with less capital cost and less transmission loss.

7. The eastern route is subject to less fierce winter storm wind gusts, being farther from the ocean.

This proposal is put forward by the following landowner and proponent for a wind farm near Coorow, listed by Karara with Western Power.

Tim Kochler,
Mobile 0427 378 202

4 August 2010

Australian Government
Department of Defence
Defence Support Group

2005/1036786/5
LPSI/OUT/103/2010

Mid West Energy Project
Customer Service Centre
Western Power
GPO Box L921
PERTH WA 6842

Dear Sir/Madam

MID WEST ENERGY PROJECT - STAGE 1 (SOUTHERN SECTION) WESTERN AUSTRALIA

I refer to the invitation for public submissions for the Western Power Mid West Energy Project Stage 1 (Southern Section), namely the proposed construction of a new 330kV double circuit transmission power line between Neerabup and Eneabba. The 330kV double circuit transmission line will replace an existing 132kV line.

Defence has assessed the proposal for any impact on its activities including the safety of military aircraft operations and possible interference (Corona Noise) of the transmission line with ATC communications at Gingin Airfield, navigation aids at the Remote ILS/TACAN site at Beermullah and the operation of the Defence Radar on Eclipse Hill.

Mr Neil Reedy from Western Power first provided details of this proposal to the Department of Defence (Defence) back in 2007 and in June 2010 Neil provided updated design details for the steel lattice transmission line towers between Pinjar to Eneabba Terminal. The June 2010 design information advised that Western Power were asked to optimise the line route in an attempt to minimise costs. This has been achieved by increasing the tower heights to obtain maximum spans possible and a consequent reduction in the number of towers. The majority of above ground level (AGL) tower heights will range from 50m up to 69m, however, a section of line will use 30m high towers to the west of Gingin Airfield and a section of line will use 40m high towers to the west of the Remote ILS/TACAN Site. The supplied tower heights have assumed that the AGL values mark the highest part of the structure and that any attachments such as lightning arrestors will not extend above the highest point. Defence was previously advised that the transmission line towers between Neerabup to Pinjar have already been constructed.

A part of the proposed transmission line between Pinjar and Regans is located on land affected by the RAAF Base Pearce and Gingin Airfield Defence (Areas Control) Regulations (DACR) and the Remote ILS/TACAN site DACR. The DACR control the height of objects (man made structures and vegetation), including temporary structures including cranes, and to an extent the purpose for which they may be used within an area of approximately 15km radius of RAAF Base Pearce, Gingin Airfield and the Remote ILS/TACAN site. The DACR are made under the Defence Act 1903.

The proposed tower heights have been assessed against the Obstruction Clearance Surfaces (OCS) for Gingin Airfield and the Remote ILS/TACAN Site. The aim of the OCS at an airfield is to restrict the height of development to ensure obstruction free airspace and the continued safety of flying operations. The height of the towers has also been checked for aircraft Instrument Flight Rules (IFR) procedures. IFR procedures are used when a pilot is flying an aircraft with reference to on board instruments. IFR procedures require a minimum obstacle clearance (MOC) height is maintained between structures and vegetation on the ground and over-flying aircraft.

None of the proposed towers within the area of the DACR will infringe the OCS except a 57m AGL tower within the Pinjar to Regans section (Structure No 73 with coordinates 386807.528m E, 6536144.511m N). The tower will have an above mean sea level elevation to the top of the structure of 109.5m AHD (Australian Height Datum). Defence requests that the tower height be reduced to below an elevation of 106.5m AHD to ensure nil infringement of the Inner Horizontal Surface OCS. Care will also be needed with the height of the neighbouring tower (Structure No 72 with top elevation of 102.02m AHD) as its elevation is also controlled by the same Inner Horizontal Surface OCS of 106.5m AHD.

It should be noted that tall structures present a hazard to flight safety for low level flying operations. RAAF Base Pearce conducts flying training in the area of the transmission line and has requested that Western Power informs the Base of the construction commencement date and progress of the development so that the flying units can be notified. The RAAF Base Pearce points of contact are the Base Aviation Safety Officer (BASO), HQ RAAF Base Pearce, WA 6084 on telephone (08) 9571 7120 and the Operations Coordinator (OPSCOORD) on telephone (08) 9571 7004. The current BASO is Squadron Leader Murray Sullivan murray.sullivan@defence.gov.au and the current OPSCOORD is Mr David Dunham david.dunham@defence.gov.au

During the construction phase of the project cranes may be used along the transmission line alignment. Cranes have the potential to infringe the OCS for the Remote ILS/TACAN site and the OCS at Gingin Airfield. The cranes may also affect current published IFR procedures. Defence requests that prior to rigging of cranes commences within an area of 30 km radius of the Remote site and 30 km radius of Gingin Airfield that crane height and location details are supplied to allow assessment of the impact on aircraft operations.

In addition to the above requirements, there is an ongoing need to obtain and maintain accurate information about tall structures so that risks associated with inadvertent collision by low flying aircraft can be reduced. The RAAF Aeronautical Information Service (RAAF AIS) in Melbourne is responsible for recording the location and height of tall structures. The information is held in a central database managed by RAAF AIS and relates to the erection, extension or dismantling of tall structures the top measurement of which is:

a. 30 metres or more above ground level - within 30 kilometres of an aerodrome, or

b. 45 metres or more above ground level elsewhere.

The proposed Western Power transmission line will meet the above definition of tall structure. Defence therefore requests that Western Power provide RAAF AIS with "as constructed" details. RAAF AIS has a web site with a Vertical Obstruction Report Form at

www.raafais.gov.au/obstr_form.htm which can be used to enter the location and height details of tall structures.

The consultation period by Western Power via Mr Neil Reedy over the past three years and the implementation of reduced tower heights to the west of Gingin Airfield and the Remote Site to ensure aircraft safety requirements is acknowledged with thanks. Defence has no objection to construction of the power line subject to the conditions stated above and a request that details of the future stages of the Mid West Energy project are provided for Defence assessment. My point of contact for this matter is Mr Gary Lee on telephone (02) 6266 8187.

Yours sincerely

John Kerwan
Director Land Planning & Spatial Information
BP3-1-A052
Department of Defence
CANBERRA ACT 2600

4 August 2010

For Information:
Regional Manager DS Central & West
RAAF Base Pearce SADFO
RAAF Base Pearce ABXO
RAAF Base Pearce BSM

City of Geraldton-Greenough
Climate of Opportunity

Our Ref: tb:lgt:605
Your Ref: N/A
File Ref:
Enquiries: Mr B Davis

4 August 2010

Mid West Energy Project
Customer Service Centre
Western Power
GPO Box L921
PERTH WA 6842
Email: Midwest.submission@westernpower.com.au

Dear Sir/Madam

SUBMISSION TO THE MID WEST ENERGY PROPOSAL

Thank you for the opportunity to make a submission to Western Power on this vital infrastructure issue.

The City contends that the development of a 330kva transmission line from Pinjar to Oakajee is an extremely important and vital not only for the immediate needs of the Geraldton and Mid West community, but also to facilitate the development of the Mid West as a national significant resources, down stream, processing/industry and logistics hub on the back of the Oakajee port and industry project. It is also vital to ensure the vast potential of the Mid West to become a critical element and supplier of renewable energy is also achieved.

If you have any queries regarding the submission, please contact the Director of Commercial Enterprises, Mr Bob Davis on 9921 0517.

Yours sincerely

Tony Brun
CHIEF EXECUTIVE OFFICER

ABN 56 641 867 188
T 08 9956 6600
F 08 9956 6674
E council@cgg.wa.gov.au W www.cgg.wa.gov.au
A Cathedral Ave Geraldton WA 6530 | PO Box 101 Geraldton WA 6531

SUBMISSION TO WESTERN POWER

FOR THE MID WEST ENERGY PROJECT

4TH AUGUST 2010

Background.

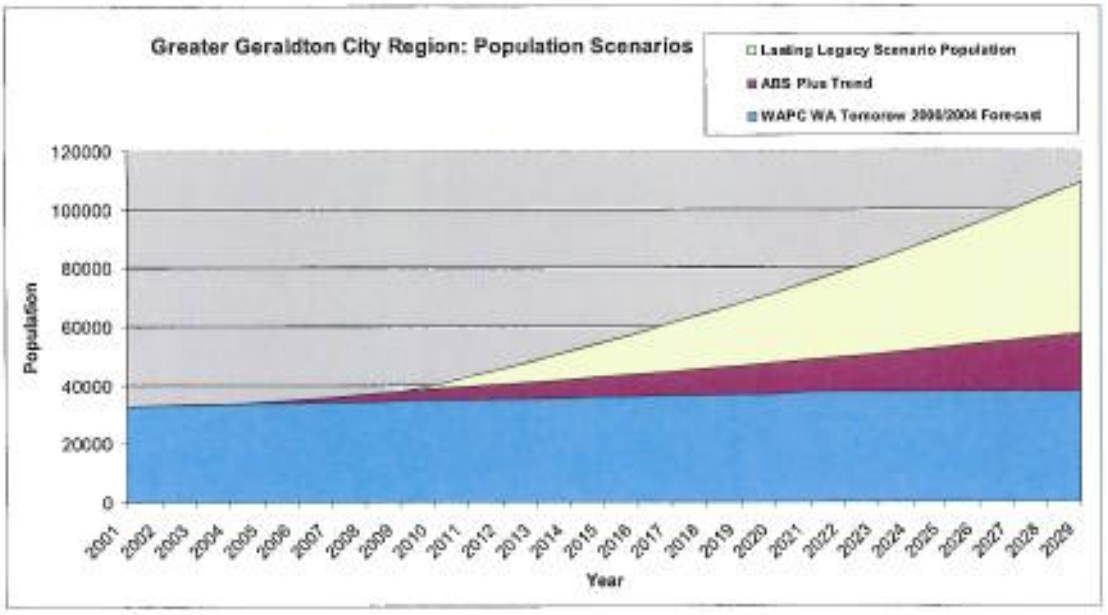
The City of Geraldton-Greenough is aware that the current consultation process addresses only the project solution for Stage 1 of the project. This covers the proposal to establish a new double circuit 330kV line from Neerabup to Eneabba, and establish a new 330/132kV terminal at Three Springs, leveraging the 330kV line to be established by Karara Mining from Eneabba via Three Springs to their mine site.

The City understands that, provided all necessary approvals to commence are received by January 2011, the target completion date for the Stage 1 project is March 2013.

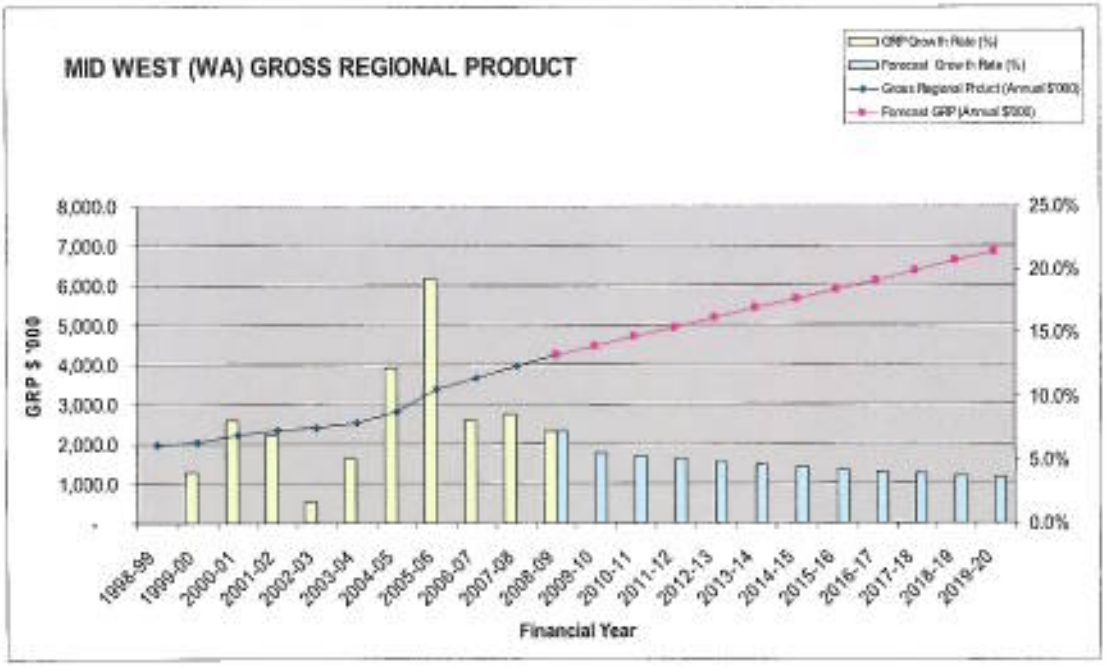
The City supports the Stage 1 solution as proposed by Western Power, and endorses the assertion put by Western Power that the solution must be based on the central and high load forecasts for the region. The City strongly agrees with Western Power that the 'high' forecast scenario has high probability of being realised, and that the proposed solution delivers the best economic outcome, creating essential scale-up ability in prudent anticipation of the high forecast scenario. Significantly, the City believes that failure to base the solution for Stage 1 on the central and high load forecasts will jeopardise the ability for the Stage 2 solution to deliver adequate secure electricity supplies to the northern section.

The City is currently undertaking a review of population figures through a joint initiative with the Mid West Development Commission and the Department of Planning. In the interim the City believes that 'upper' level figures should be used, as there is considerable supporting evidence to highlight that right across Australia, State Governments have failed to understand the impact of the resources sector boom on regional populations. This planning failure has lead to chronic infrastructure collapse in power, water, sewer and a limited capacity to respond with new land release for housing and commercial developments.

For the purposes of planning, until such time more accurate and realistic figures are provided the City believes the following growth rates should be assumed for the Greater Geraldton urban area.



The City also notes that the current growth is backed by substantial levels of economic investment in the region. This growth over the past 10 years is unrelated to the 'speculative' growth considered possible post the development of Oakajee and this highlights a major issue in further delaying infrastructure development.



The above graph demonstrates the regional GDP levels and how they have rapidly grown from around $2 billion in 1998/99 to the current $4 billion plus level. The City has modelled a very conservative future growth based on an average 4.5% per annum growth (even though the previous 10 years dramatically exceed this level – and it is

realistically expected that the next 10 years surpass the previous 10 years) even with this conservative modelling regional GDP is expected to reach $7 billion.

It is widely acknowledged and supported that there is a direct correlation between regional GDP, population and power consumption. Given the clear implications of the data provided above, there remain little to no justification for the State and Commonwealth Governments not to support immediate and substantial investment into the Mid West Energy Project by way of the commitment and full funding over the next 3 years of the total 330kva project from Pinjar to Oakajee (as opposed to Moonyoonooka).

Stage 2 Northern Section Issues

While understanding that the current consultation process is only addressing the Stage 1 project, we feel obliged to highlight concerns regarding the consequent timing impact on Stage 2 of the project, the interim strategies for addressing energy requirements in the Northern section, and the bases for assessments that load growth can be satisfied by 132kV reinforcement until 2015/16.

The City is increasingly alarmed by continued perpetuation of a demand assessment that does not reflect increasing adverse symptoms of a capacity-constrained northern section, including instances of load-shedding when one of the 1342kV lines trips; nor reflect the rapid progress being made with major regional developments, including Gindalbie and Extension Hill.

On 15 July 2010, at a closed meeting with stakeholders following the public consultation session in Geraldton, Western Power provided some summary information in a handout to participants, including population forecast information, and demand forecasts for four key substations located within greater Geraldton. Forecast demand growth rates for these substations were in the range 0.4 to 0.8 MVA per year. For Geraldton-only, a summary graph suggested that with a low growth forecast, existing capacity would be sufficient until 2016-17, while the central and high forecasts both suggest existing capacity would be exceeded by early 2013, with Karara and Extension Hill exports commencing in 2012, then high growth associated with Oakajee Port stage one subsequently and rapidly exceeding available capacity.

The City is concerned that, should commencement of Stage 2 be delayed until the Stage 1 target completion date of March 2013, and assuming that Karara and Extension Hill exports through Port of Geraldton commence beforehand, then supplies to Geraldton will be inadequate, and there may be a protracted delay before that problem is solved. Hence the City is anxious for advice from Western Power on the nature of available interim solutions, and their timing.

It is not clear how 132kV reinforcement alone can meet forecast demand beyond early 2013. Presumably this will be supported by Peak demand management methods, and access enabled to the local grid for Peak Generators? These are patently finger-in-dike interim solutions, and there is real danger that the same thinking may lead to an economically sub-optimal incremental approach to bolstering supply over time, with industry and commerce largely left to install their own generation capacity, at high cost and least environmental value, due to inability of Western Power to enhance the network properly to a higher high-forecast need that recognises the real demand growth.

In this context, the City is aware of a number of problems reported by local businesses of either inadequacy or instability of current supplies in areas such as the CBD, Webberton and the Narngulu industrial estate. These problems are exacerbated (from the perspective of local businesses) by need to upgrade transformers to obtain supplies. We seek urgent advice on Western Power assessments of demand for these key parts of the City. It is also our understanding that, because of capacity constraints, any new block loads requested by businesses in the northern section are only being offered on an interruptible basis, subject to load shedding. Clearly, augmentation of the northern section is already necessary.

On behalf of the regional business community, it is necessary for the City to highlight the urgent need for investment and the significant loss of potential jobs and industry due to lack of energy supply and security. Recent examples of problems include the following:

- The Homemaker Centre in Geraldton is having continual difficulty with Western Power supply.
- McDonalds has concerns over its building timeframe for the Homemaker centre due to problems with power supply.
- Building Education Revolution additions to Geraldton Schools have not been able to be occupied due to the inability or insufficient capacity from Western Power.
- Subway's new store next to Chicken Treat on the intersection of Place Road is unable to open or proceed as Western Power have failed to provide infrastructure for power.
- Housing development at Seacrest estate, including the development of the new shopping centre complex could be significantly delayed as Western Power is unable to provide capacity within the desired time frame.
- Western Power has problems with double-up on job allocations from contractors in Geraldton and Perth.
- Development in Geraldton of major industrial buildings is being hindered by a significant lack of Western Power infrastructure as the company has not had a policy of forward planning or implementing additional capacity until demand is proven.
- Previously demonstrated or claimed power availability in industrial areas such as Place/Flores Road has already been allocated, preventing new businesses from accessing power supply.

IGA Northampton is not able to open due to Western Power having insufficient capacity in Northampton. The City notes Western Power plans to utilise STATCOM devices as an interim solution to reinforce supply north to Northampton and Kalbarri. Advice on timing would be appreciated.

Connection to Oakajee

In relation to Stage 2, we note that the original proposals for 330kV lines envisaged connection only to Moonyoonooka. More recent information suggests that Western Power recognises the need to extend the 330kV connection to Oakajee – assuming that that port and rail infrastructure project proceeds. The City regards this as essential for the Port going forward, but more particularly for enabling development of the

adjacent Industrial Estate. Establishment of down-stream processing capabilities associated with the mineral export industry and related support and manufacturing capacity is dependent on 330kV supply to Oakajee. Confirmation of this understanding would be appreciated in due course.

The July 2010 information sheet on the project indicates Western Power intention to conduct a more detailed planning assessment of solutions and timing to meet northern section requirements. We urge Western Power to commence this assessment and begin consultation with stakeholders sooner rather than later.

Importance of Smart Grid

In that context, the City believes that smart grid technologies need to be considered as an essential part of the solution framework. We have previously outlined our *Vision for a Carbon Neutral Region*. The concept is based on the area encompassing Eneabba (east to Perenjori) and up to Kalbarri, e.g. the northern edge of the South West Integrated (electricity) System, and facilitating the following (potentially achievable within a $100 million budget). The concept would embrace:

- smart meters in all households and business premises in that area;
- smart switches on the entire power network;
- mix of solar panel, micro-gas generators or micro-wind (all about 1KW capacity equivalent) on at least a quarter of all households; and
- opportunity for a higher level of larger scale renewable energy such as:-
    - Solar thermal (currently a proposal by Mid West Energy for a 400MW station at Perenjori);
    - Solar PV (currently a proposal for a 10 – 50MW plant in Geraldton which would be Australia's largest);
    - Wind (currently 80MW generated in the region and proposals have received Council Planning Approval for an additional 500MW to be generated) -

      Alinta Wind farm (existing) - Infigen: The Atlinta Wind farm consists of 54 Wind Turbines located 8kms east of Walkaway. It has been operating since 2005 and achieves a capacity factor of 47% which is much higher than the average for wind farms.

      Mumbida Wind farm (proposed) - Verve Energy: This proposal, approved by Council on 25 August 2009, is for up to 42 wind turbines with a generation capacity of up to 90MW. Located immediately south of the existing wind farm.

      Walkaway Stage II (proposed) - Infigen: On 23 December 2008, Council approved an additional 195 wind turbines as part of the Walkaway II Wind farm as an extension of the existing Infigen project with a potential capacity of 400-600MW.

    - Wave (for example, potential for a wave generation plant as part of the Oakajee Deepwater Port project);
    - Geothermal (various large scale exploration tenements have been granted by the WA Government).

- Carbon sequestration (a 300MW proposal has received EPA and WA Ministerial approval for Aviva Corporation at Eneabba)
- Coal seam gasification (a proposal has been developed for a 164MW coal seam gas power station Eneabba Gas at Dongara)

A key outcome would be a contained and measurable energy grid from which to determine a model for smart grid technology, also enabling renewable energy developments and energy sources into the mix. Current trials and proposals for Smart Grid do not have the capacity to all be detailed or to provide comprehensive data to monitor effectiveness from a householder, business or network point of view. This Mid West proposal represents a real unique opportunity in Australia to develop a true test bed which can measure outputs/outcomes.

Combined with Smart grid capabilities, the 330kV connection into the Northern Section will unleash a wave of renewable and clean energy projects enabling the WA energy mix to surpass the 20% renewable energy target by 2020 and will enable our region to achieve its desired state of being a Carbon Neutral Resources/Industry Region.

Security of Supply in Northern Section after Southern Section Enhancement

Our advice is that 330kV enhancement of the southern section, and its extension to new 330kV/132kV transformers proposed for Three Springs – from which the N-1 designed dual 132kV lines service Geraldton – may have inherent risks for supply stability for the northern section. Our understanding is that because the northern section is very close to its voltage limits, and cannot accept even relatively small additional loads, then should either the single 330kV connection to Three Springs trip, or a re-close not stabilise or suffer a re-trip, then significant load shedding would be required in the northern section. Advice is sought as a matter of urgency on how design of the southern section augmentation project will include essential protections for stability and security of supply for the northern section.

Email Submission (received 4 August 2010)

ERM Power

I refer to your major augmentation proposal for the above project as detailed in various documents posted on your website http://www.westernpower.com.au/networkprojects/substationPowerlineProjects/Mid_West_Energy_Project.html.

ERM Power is supportive of the recommended option and urges the Minister to approve the Project with the absolute proviso that the assets funded and constructed by Karara Metals Limited (KML), to ensure early supply to their mine, are available for immediate access from other generators such as ERM Power under arrangements to be agreed between the parties.

Regards,

Tony Petersen
WA Director
ERM Power
Mobile: 0401 994 565

GPO Box 2742 Cloisters Square Perth 6850
Level 4, 225 St Georges Terrace
Ph: (08) 9481 1100 Fax: (08) 9322 6154
www.ermpower.com.au

RPV Developments Pty Ltd
ABN 65 128 906 703

Level 22, 56 Pitt St
Sydney NSW 2000
Australia

T +61 2 8031 9900

4 August 2010

Midwest Energy Project Submissions
Customer Service Centre
Western Power

By Email: Midwest.submission@westernpower.com.au

RPV Developments Pty. Ltd. (RPV) thanks the Western Power for the opportunity to comment on the proposed Midwest Energy Project.

RPV is the developer of the 400 MW Walkway 2 Wind Farm, located approximately 35km SE of Geraldton. RPV has development and environmental approvals to construct the wind farm, however in order connect to the South West Interconnected System requires augmentation of the transmission network from Perth all the way to Geraldton.

Stage 1 of the Midwest Energy Project proposes augmenting the network from Perth as far as Three Springs, with augmentation further north to Geraldton deferred to Stage 2.

RPV supports Western Power's preferred option for Stage 1 as the double circuit 330kV line, as this is the only solution that caters for the higher load scenarios (which are admitted by Western Power to be the most likely) as well as maximising opportunities for connection of generation.

RPV also believes that there is sufficient case in the (conservative) medium and high load growth scenarios to justify the inclusion of the Northern Section (Stage 2) of the project. Indeed the load around Geraldton and Oakajee are used to justify the Southern Section of the project. The submission of the Infrastructure Australia application supports this view. The decision to stage the project must therefore be assumed to be a budgetary constraint rather than the best option to support the full range of Midwest development opportunities.

RPV urges Western Power to expedite the process for the Northern Stage of the project which we believe is required at the same time as Stage 1.

Yours sincerely,

Bill Bowyer
Director

+61 457 707 549
bill.bowyer@infigenenergy.com

Walkaway Wind Power Pty Ltd - ABN 43 116 297 309
Level 22 - 56 Pitt Street - Sydney NSW 2000 - Australia
T +61 2 8011 9900 - F +61 2 9247 6860 - www.infigenenergy.com

4 August 2010

Midwest Energy Project Submissions
Customer Service Centre
Western Power

By Email: Midwest.submission@westernpower.com.au

Walkaway Wind Power Pty. Ltd. (WWP) thanks the Western Power for the opportunity to comment on the proposed Midwest Energy Project.

WWP is a 100% owned subsidiary of Infigen Energy Ltd, Australia's largest wind farm owner and operator. WWP is the owner of the 89.1MW Alinta Wind Farm, located approximately 35km SE of Geraldton.

WWP sees significant potential for further development of its wind farm operation through its existing connection infrastructure, however is currently constrained due to there being insufficient network capacity. Augmentation of the transmission network from Perth to Geraldton as proposed in the Mid West Energy Project will unlock the potential for further investment.

WWP therefore supports Western Power's preferred option for Stage 1, being a double circuit 330kV line from Neerabup to Eneabba. We also stress the critical importance of building Stage 2 of this project (Eneabba to Geraldton) as soon as possible.

Yours sincerely,

David Griffin
General Manager Development
Infigen Energy Ltd

Power Generate Plan

Under new Grid of

Mid West Energy Project

By

Xian Continental Power Engineering Corp.

Contents

1. Summary of Power Generate Plan

2. Our understanding of Mid West Grid Situation today and New Grid Plan
2.1 The situation Nowadays
2.2 New Grid Plan

3. Our Generate Plan--Location and Capacity
3.1 Combined Generator Station One
3.2 Combined Generator Station Two
3.3 Connection Point

4. Generator
4.1 Combined Power Station One
4.1.1 Generator 1
4.1.2 Generator 2
4.1.3 Generators 3
4.1.4 Main Board Diagram
4.2 Combined Power Station Two
4.2.1 Generator 1
4.2.2 Generators 2
4.2.3 Main Board Diagram

5. Connection with Mid West Grid
5.1 Combined Power Station One
5.2 Combined Power Station Two

6. Specification and Feature of Generator
6.1 Gas Turbine
6.1.1. S109E
6.1.2. S106B
6.2 Wind Turbine

7. Conclusion
8. Introduction of Xi'an Continental Power Engineering Corp

1. Summary of Power Generate Plan

Under Western Power New Grid Plan of Mid West Energy Project, we submit this Application of Power Generate Plan to meet local electricity demand.

Two Combined Power Station we are planning connect Mid West Grid

Eneabba Terminal Connection:

470 MW ------ 270 MW Gas Turbine Generators Station + 200 MW Wind Farm

Neerabup Terminal Connection

200 MW ------ 100 MW Gas Turbine Generators Station + 100 MW Wind Farm

2. Our understanding of Mid West Grid Situation today and New Grid Plan

2.1 The Situation Nowadays

Local Grid Geographical connection diagram in West of Australia, as picture 1

There are four power plant linked to 132kv grid now.

Three 132KV double-cycle lines from Pinjar power plant to Eneabba Terminal, another double-cycle line linked to Muchea transformer terminal extend to Three Springs Terminal via Moora Terminal. All of them form a 132KV close grid. Emu Downs power plant is merged to this grid.
In the north of the Area, Mungarra Power Station link to Three springs 132kv pivotal terminal and Geraldton Terminal by double-cycle lines. Walkaway power plant is link to one of those lines.

2.2 New Grid Plan

Stage 1, a new 200 KM 330KV power line from Pinjar to Eneabba is planning set up to meet increased demand. New terminal will build up in Enaeabba, Three Springs and Neerabup. A foundation customer, KML, with 500MW load demand will get power supply through Three Springs Terminal. The exiting 132KV grid will convert to 330KV.

Stage 2, 120km 330KV power line will be built up from Eneabba 330kv Terminal to Moonyoonooka new 330KV Terminal.

3□Our Generate Plan--Location and Capacity

According to the Mid West Grid situation and the New Grid Plan, we draw out our Power Generate Plan to set up two Combined Power Stations, one station connects Eneabba Terminal and one connects Neerabup Terminal. Total capacity of generator is 670 MW in total, lowest power supply ability is not less than 500 MW.

3.1 Combined Power Station One

Will be located in Eneabba region, close to the Dampier-Bunbury Gas Pipeline, Connect to Eneabba Terminal.
Generator Capacity: 270 MW Gas Turbine Generator + 200 MW Wind Farm.

3.2 Combined Generator Station Two

Will be located in Neerabup region, close to Dampier-Bunbury Gas Pipeline, connect Neerabup Terminal.
Generator Capacity: Gas turbine Generator 100MW + Wind Farm 100MW.

Those two stations, one connects the new grid ending point which is close to the main load and one connects the grid start point. In this way will easy for electricity dispatch and easy manage grid system balance.
We are effort supply **green and clean energy** with multiple energy resource, wind and gas or recycle oil.

3.3 Connection Point

Picture 2

4. Generator

4.1 Combined Power Station One

4.1.1 Generator unit 1

S109E Two stage Close-cycle gas turbine generator, total installed capacity: 172.8MW.
Includes: gas turbine 116.8MW (generator 119.2MW), steam turbine generator 60MW

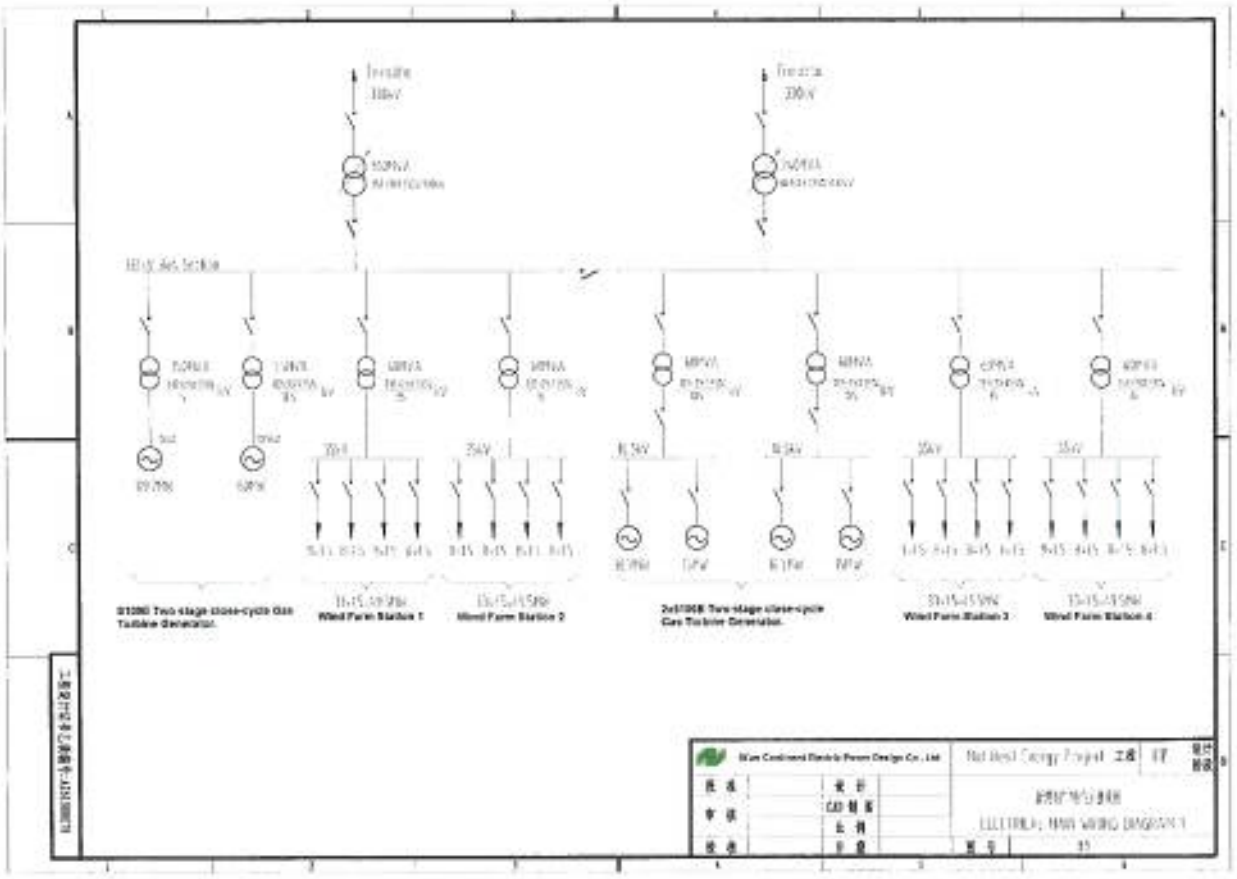
4.1.2 Generator unit 2 + 3

2 unit S106B, two stage Close-cycle gas turbine generator, with total installed capacity: 2x51MW.
Includes: PG6541b gas turbine generator 36.7MW, steam turbine generator 15MW.

4.1.3 Generators 3

There will be 132 unit 1.5MW wind turbine generators placed in four stations, with total installed capacity 200MW. They are central controlled.

4.1.4 Main Board Diagram



4.2 Combined Power Station Two

4.2.1 Generator 1

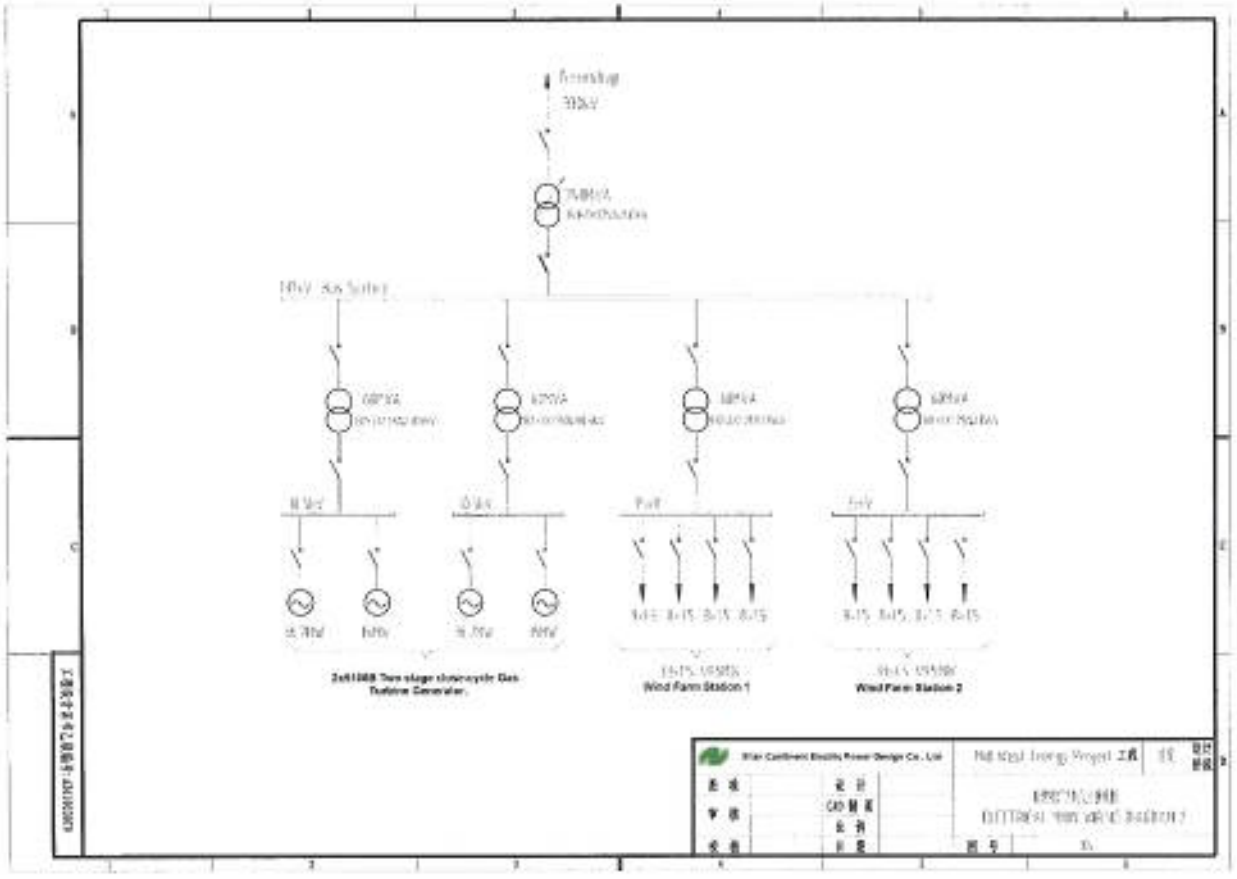
2 unit S106B, two stage Close-cycle gas turbine generator, with total installed capacity: 2x51MW.

Includes: PG6541b gas turbine generator 36.7MW, steam turbine generator 15MW

4.2.2 Generators 2

There will be 66 unit 1.5MW wind turbine generators placed in two stations, with total installed capacity 100MW. They are central controlled.

4.2.3 Main Board Diagram



4.3 The advantage of our combined power station

Small and large capacity multiple fuel turbine plus wind turbine generator will provide most benefit to grid system, easy manager power balance and electricity dispatch, economic operation, environmental friendly and the lowest carbon dioxide emission.

5. Connection with Mid West Grid

5.1 Combined Power Station One

By the two stages of S109E generators, because the output voltage is difference, uses the transformer - power unit separately, link to 132kV section bus, in this section bus also connects 2 wind farm stations, mutually for supplement adjustment.

The 132kV main bus uses the single bus partition connection, second bus section connects 2 unit of S106B and 2 set of wind power stations, voluntarily adjustment power supplement. From 2second bus section of 132kV main bus, connects 330/132kV, 360MVA, 240MVA Step-up Load Transformer separately. Because the distance link to the 330kV grid quite near, therefore no longer supposes set up 330kV bus in our station, but directly sends electricity out through the transformer – lines unit.

5.2 Combined Power Station Two

Two unit S106B gas turbine generator link to 132kV main bus separately, another two wind farm stations also connect the same bus, the single main bus does not partition. Through 330/132kV, 240MVA Step-Up Load Transformer increase voltage to 330KV, then link to Neerabup Terminal.

6. Specification and Feature of Generator

6.1 Gas Turbine

Manufacturer: GE

Type: Two stage close-cycle Gas Turbine Generator.

Fuel：Multiples fuel, gas, diesel, recycle oil.

Control system: DCS

Module combined unit, easy install and maintenance, highly reliable and efficiency.

Gas turbine and steam turbine both can operation individually; also can combined to be a close-cycle.

6.1.1. S109E

Gas Turbine

Model	PG9171E
Capacity	116.8MW
Generator	T900B
Rate Output	119.2MW

Steam Turbine

Boiler	Q11701/524-125
Steam Turbine	N56/C35-54/0.6/0.25/501/245
Capacity	56.49MW
Generator	WX18Z-0.54
Generator Output	60MW

Frequencies	50Hz

6.1.2. S106B

Gas turbine

Model	PG6541B
Capacity	36.7MW
Voltage	10.5kV
Power Factor	0.8
Frequencies	50Hz

Steam Turbine

Model	N15-3.43
Steam Turbine Generator	QF15-2
Rated Output	15MW
Rated Output Voltage	10.5kV

6.2 Wind Turbine Generator

Output: 1.5MW

Voltage 690V

Tower Height: 70~80m high

One 1.8MVA step-up transformer is sit on the bottom of the tower, increase voltage from 690V to 35KV, T-connect by cable it is connected with 35kv Overhead power line. 8~9 wind turbine generators are connected to each line in this project and the lines continue for few kilometers. Finally, link to the 35KV of step-up transformer main bus. Another 3 same overhead power lines extending to other wind generator station.

In the second step-up transformer, one 60MVA transformer increased output voltage to 132kv, and then it will be combined with other generator increased to 330KV by a 330/132KV transformer for exporting from power station.

Alone with western coast, there are rich of wind energy, 2,000 to 3,000 wind farm full capacity operation hours can be expected. Cause by unstable of wind power it is hard for Grid system to balance and dispatch, in our generate plan we combined wind power and multiply fuel turbine generator can use most of the wind power generator capacity. We can dispatch and harmonize timely and flexible power supply to help grid steadily.

7. Conclusion

7.1. In our plan, one power station in north and one smaller power station in south of Mid West Region Grid Circle can meet load demand in most of the area. Actual power outputs will be not less than 500 MW.

7.2. Combined gas turbine generator and wind power generator in order to maximize use of green energy, meantime make well balanced power supply.

7.3. Use difference capacity of gas turbine is easy for adjusting the base-load or peaking hours, so that the grid can work economically and reliably.

7.4. Multiply gas turbine can use natural gas, diesel or recycled oil which increase the reliability and adaptive capability.

7.5. Those power plants can be completely constructed within 24 months.

8. Introduction of Xian Continental Power Engineering Corp.

Company Survey

Our company business involves electric power engineering design for the thermal power generation, power transmission, transformation, construction supervision, engineering management, complete sets of equipment general contract of electric power project. Moreover and Investment in power, it possesses the qualification of grade B for design and engineering general contract, with the registered capital 136 million. There are a group of national first-rate senior experts, middle-aged key technical personnel, as well as young technician with full vigor and vitality. Our company possesses strong strength for engineering design, supervision and general engineering contract through implementing the combination of three generations. At present, there are about 120 employees, over 65% of them have obtained various technical and professional titles, and 55% hold intermediate and senior professional titles, as well more than 20 professor senior engineers.

Managerial Principles

- Build brand engineering
- Quality first, profit second
- Aim at providing professional services for power industry.
- Achieve double win situation with our customers.

Qualification and Certificates

- Member of China Electric Power Planning Engineering Association
- Member of Shaanxi Exploration and Design Association
- General Contracting Permission
- Bank Credit AAA
- ISO9001 2000 Quality System Certification

Address and Contacts

ADD: F26, Tiancai Building , No.169 Jinhua North Road , Xi'an Shaanxi Province

ZIP CODE: 710032 Http://www.cepdec.com

TEL:+86 29 82501701 FAX: +86 29 82501711

Main technical personnel

Yao Chengkai Chief Engineer, Professorate Senior Engineer

Member of Chinese Electrical Engineering Society, Senior Expert of China Electric Power Survey and Design Association, Former Deputy Chief Engineer in the Northwest Electric Power Design Institute, the Director of Electrical Department

Chen Baolian Chief Engineer Professorate Senior Engineer,

Chief technical adviser and chief engineer of Zhejiang Province electric power design institute, chief engineer of Power plant Services department in Shanghai Electricity Group, head of project administrative department and chief engineer in the northwest electric power design institute

Yi Dongfang Chief Engineer Professorate Senior Engineer

edits the domestic universal use " Handbook for Electric power project design " and " Equipment Handbook of Electrical engineering", publishes dozens of papers, bureau level science and technology rewards. Once was appointed as member of the national arrester specialized committee, the national transformer substation standard Technical committee, national high pressure power distribution equipment standard Technical committee.

Zhong Dawen Chief Designer of Electric Specialty, Professorate Senior Engineer

Member of China Electrical Engineering Association, Senior Electrical Expert of China Power exploration and Design Association.

The technology elite of the company has been involved in the completion of project design, project management and EPC project of 300MW, 600MW and supercritical of the thermal power plants, gas station, garbage power plant, gas-steam combined cycle power plants, photovoltaic solar power

station and 220kv、330kv、750kv various voltage rate transmission project. They have taken part in the investment and construction of power plants for Argentina, Indonesia and Chile so that they accumulated rich experience and formed a complete, scientific and practical engineering construction management mode.