Deliverability of Proposed Works

by

ETSA Utilities

for the

2010 -2015 Regulatory Period

Prepared by

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1 Engagement

Energy and Management Services Pty Limited (EMS) are engaged by the Australian Energy Regulator (AER) as secondary consultant to provide advice in relation to the AER's assessment of distribution network service providers' (DNSPs') regulatory proposals for the period 2010-2015.

Specifically, as the subject of this report, EMS has been engaged to review the deliverability of ETSA Utilities' (EU's) proposed network capital expenditure program, having regard to capex delivered in the current regulatory control period and the DNSP's capex delivery framework and policies for the next regulatory control period. In addition to the proposed network capital works, the deliverability of key non-network capital projects, and the operating expenditure program are briefly addressed.

The principal document upon which this review is based is *ETSA Utilities Regulatory Proposal 2010 – 2015,* dated 1 July 2009, including attachments and appendices, as submitted to the AER. Wherever this document is cited within this review, it is referred to simply as "*Proposal".*

EMS and the AER met with key EU managers on 17, 18 August 2009 to discuss a range of issues relevant to the deliverability of the proposed capex program. Information provided during the meetings was subsequently formalised and has become an additional basis for this review.

Questions of whether EU's proposed capital expenditure program for 2010-15 is necessary and sufficient to meet capacity, reliability, safety, environmental and other relevant criteria are not addressed in this review. These questions are addressed in Sections 6.1 to 6.10 of the *Proposal* and will be reviewed in detail by others. Rather, the focus of this review is on the efficiency and prudence of the capex program from the viewpoint of resource availability and overall deliverability. This is addressed in Section 6.11 of the *Proposal*.

2 Executive Summary

ETSA Utilities have proposed a works program that, if approved, will involve a gross capital expenditure of nearly $2.8billion over the 2010-15 regulatory period. This is more than double the gross capital expenditure in the current period which is expected to be in the vicinity of $1.2billion.

The main drivers of the proposed capex are network reinforcements and upgrades, asset replacement and refurbishment, and customer connections. These three categories, accounting for some $1.75billion of the proposed $2.8billion spend, will create an unprecedented upsurge in the demand for resources of labour, materials, plant and equipment. Moreover, the call on resources of engineering expertise has already commenced as the lead time for some aspects of capital works extends to many months or years. The proposed capex in the early years of the next regulatory period will not occur unless a substantial amount of preparatory works are already in place.

In determining the deliverability of the proposed capex program, EMS has reviewed workforce resources in terms of both the field workforce required at the time of construction, and the engineering expertise required in the years preceding construction. Actual preparedness in the form of project management, design, and materials and plant procurement was also reviewed. In undertaking the review, EMS has relied on EU's *Proposal,* including attachments and appendices, information received during interviews with key personnel during a site visit on 17, 18 August 2009, a range of supplementary information documents provided following the site visit, and a number of external references relating to labour availability.

The deliverability of key non-network capital proposals, and the proposed operating expenditure program are also briefly addressed.

Details of the review are provided in Chapters 5 to 8 and our findings and conclusions are outlined in Chapter 9 as follows:

EMS considers that some challenges may be faced in the early years of the 2010-15 regulatory period due to:

- the need to re-assign at least 10% in the first year and 20% in subsequent years of work traditionally performed by trade skilled workers to general skilled workers by means of outsourcing to contractors alone (no re-assignment is anticipated for the in-house workforce)[1];
- the external demand for general skilled workers that is likely to occur in the mining, building and construction sectors due to the recovery of the Australian economy; and
- the sheer volume of the proposed works, being more than twice the current level, will undoubtedly create unforeseen issues requiring uncharted managerial responses.

EU's proposed capex program peaks in the second year of the next regulatory period. EMS is of the view that due to the challenges that are likely to arise in the early years, it is almost inevitable that some slippage will occur such that some of the works planned for 2011-12 may be delayed until later years.

Whilst EMS has reviewed the proposed capex program from the viewpoint of its deliverability, EMS has not reviewed the necessity or sufficiency of specific projects within the proposed program and is therefore unable to comment on whether any of the 2011-12 projects may be moved to latter years without adverse effect. We simply point out that it may be prudent to plan now for the deferment of some early year

[1] EU has indicated that it will only explore reassignment to contractors' GSW's after all other practical avenues for obtaining qualified tradespeople (e.g. apprenticeships, recruitment, etc) have been exhausted.

projects rather than experiencing the inefficiencies and costs that unplanned delays inevitably create.

However, regardless of any adjustment to the year-on-year timing of projects, EMS considers that, *in toto* over the full 2010-15 regulatory period, the proposed network and non-network capital expenditure programs are deliverable.

To the extent that it depends on the availability of workforce, plant and materials, indications are that the proposed operating expenditure program will also be deliverable.

3 Shortened Forms

AER	The Australian Energy Regulator
ASCO	Australian Standard Classification of Occupations
DaNM	Design and Network Management
DEEWR	Department of Education, Employment and Workplace Relations (Cmwlth)
DNSP	distribution network service provider
EDPD	electricity distribution price determination
EMS	Energy and Management Services Pty Ltd
EU	ETSA Utilities
FTE	full time equivalent (employee or labour unit)
GSW	General Skilled Worker
PM	Project Manager
TASC	Training and Skills Commission (South Australia)
TSW	Trade Skilled Worker
WPM	workforce planning model

4 Capital Expenditure – Past and Proposed

EU's past and proposed total capital expenditure is depicted in Figure 4.1[2]. The major ramp up in proposed capital works is clearly evident.

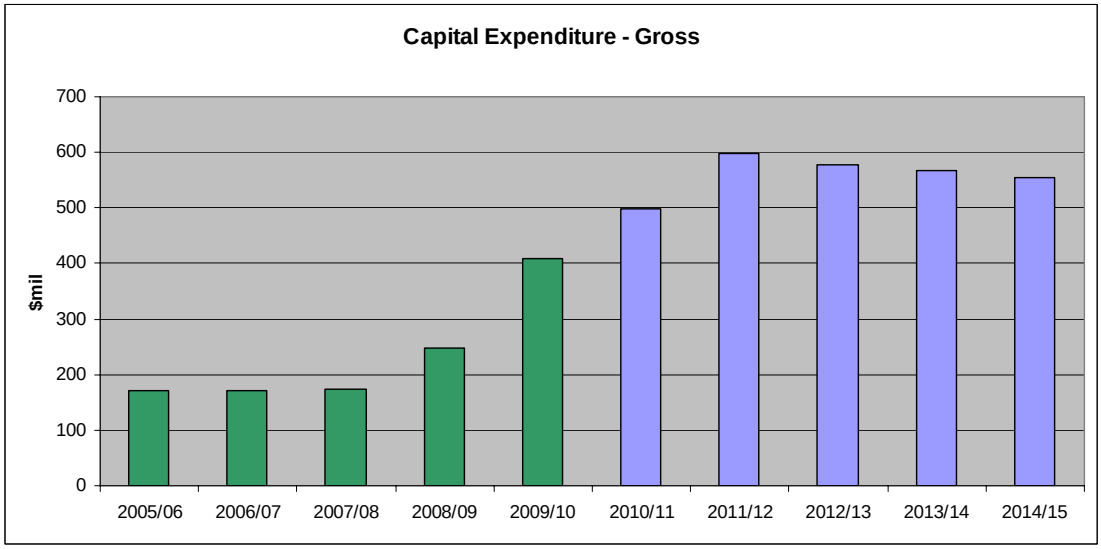

Figure 4.1

In the current regulatory period (2005-6 to 2009-10), actual capex in the first three years has been respectively, 7%, 11% and 8% below the Electricity Distribution Price Determination (EDPD) set by the Essential Services Commission of South Australia. The capex in 2008-09 represents a 45% increase on the previous year and is some 23% above the EDPD allowance for that year. This overspend will reverse the underspend of the previous three years such that the cumulative capex over the four years will approximately equal the EDPD allowance.

The capex for 2009-10 is expected to be some 86% above the EDPD allowance, resulting in a net overspend for the five year regulatory period of 19%. EU has advised that the main driver for the capex increase in 2009-10 is connection works for one project: the Adelaide desalination plant.

Further details of historical capex are provided in *Proposal* Attachment E.1 (confidential). Expenditure back to 1999-00 is provided, broken down into a wide range of network and non-network categories. A review of the labour, materials and services details that underlie each of the categories in *Proposal* Attachment E.1 indicates that the categories that are resource intensive include:

- Asset Replacement and Refurbishment
- Reinforcement and Upgrades
- New Customer - Gross
- URD
- Reliability
- Environmental
- Safety
- Strategic - Network Security.

[2] From *Proposal*, Fig 6.6, p 108. The discussion in this report focuses entirely upon gross capex since this indicates the total volume of capital work irrespective of funding sources (tariff revenue or customer contribution). Dollar values to 2009/10 are nominal; projected values are real (June 2010).

Capex under these categories is depicted in Figure 4.2. The peak in 2009-10 customer connection works for the desalination plant is clear. Without this peak, the total resource intensive capex in 2009-10 would have largely followed the steady trend that has been historically occurring since 2002-03.

The main drivers for increased capex in the 2010-15 regulatory period are reinforcements and upgrades, asset replacement and refurbishment, and a continuation of customer connections at a level slightly above the 2008-09 level.

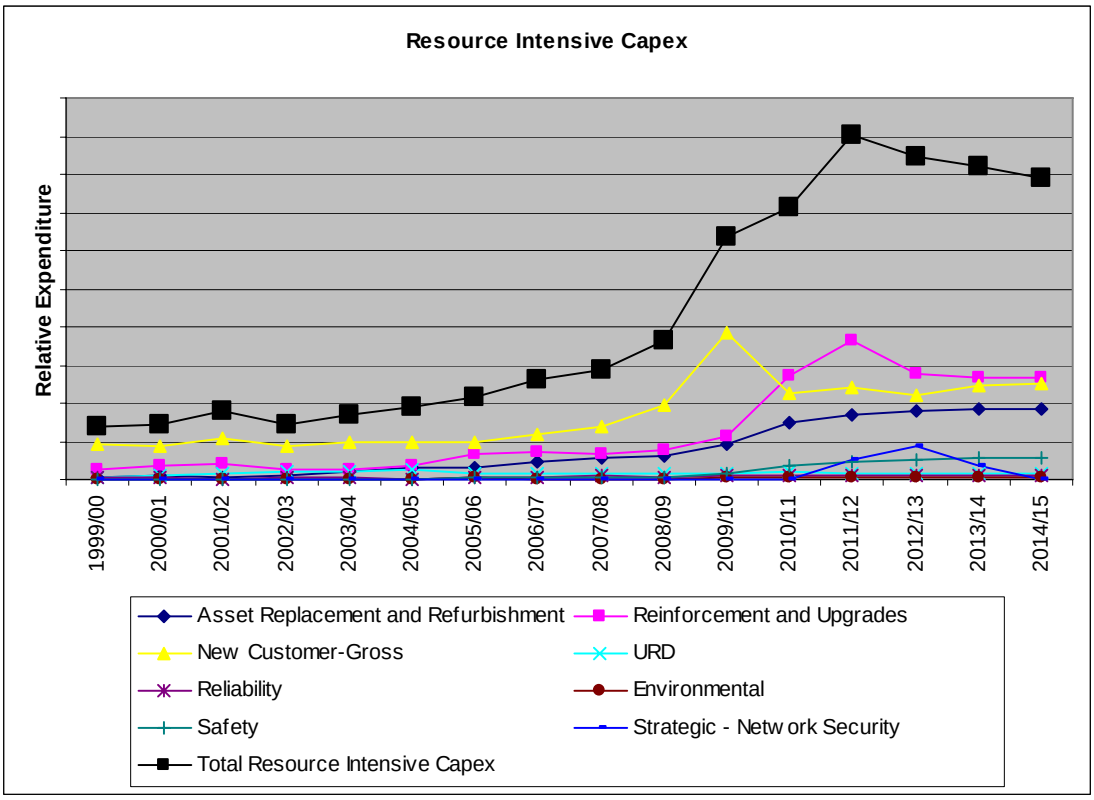

Figure 4.2

The step change between historical levels of resources-intensive capex and those proposed for the 2010-15 regulatory period is clearly very significant, being two to three times current levels. Accordingly, a heavy demand will made upon resources of labour, materials, plant and equipment.

5 Workforce Supply and Demand

5.1 Introduction

The two critical workforce-related issues that will determine the deliverability of the proposed capex program are "engineering expertise" and "field workforce".

Sufficient numbers of staff with engineering expertise (i.e. project managers, professionals and para-professionals) are required, amongst other things, to:

- Undertake environmental assessments
- Undertake community consultation
- Secure easements and land ownership where required
- Obtain all necessary statutory approvals
- Finalise design work
- Write technical specifications for materials and equipment
- Administer tendering and contracting procedures
- Develop critical relationships with all partners, contractors, and suppliers.

The above functions require a long lead time, up to three years in some areas. In order to deliver capital works in the 2010-15 regulatory period, adequate engineering expertise should have been in place for several years prior to the present time. To verify the existence of such a workforce, EMS sought information from EU in relation to their recruitments since 2006 and their engineering expertise resource plans for the next five years. EMS also reviewed a number of works marked for commencement in the early years of the next regulatory period to assess EU's level of preparedness. The adequacy of engineering expertise workforce is discussed in Section 5.2 below while EU's overall preparedness for undertaking the major increase in capex is discussed in Chapter 6.

By contrast, the field workforce is, of course, required at the time of the works being undertaken. EU engaged PB Associates to review its increase in forecast capex and opex with a view to providing recommendations for completing the additional workload. In their report[3], PB Associates recommend a 'strategic alliancing' model be pursued by ETSA Utilities to undertake the additional workload. EU states that they have commenced planning such an alliance, with a view to establishing such arrangements early in the next regulatory period. In the interim, traditional contracting methods are being employed to undertake the additional works beyond the capacity of the in-house workforce.[4]

More specifically related to the determination of the demand and supply of actual workforce numbers is EU's Workforce Planning Model (WPM) [5] which seeks to determine the total workforce required for both capex and opex. The core of the methodology is to derive the FTEs required in each of four ASCO[6] groups based on the hours that were allocated in the reference year, being 2006[7]. Productivity, that is, the proportion of total hours that are available for productive (billable) work, and overtime availability, are also taken to be equal to that which occurred in the reference year.

The four ASCO groups addressed in the WPM are Advanced Trade, Trade Skilled Worker (TSW), General skilled worker (GSW), and Para-Professional. EU has since advised that

> "the 'advanced trade' (and 'para-professional') numbers in the model were relics of prior analysis and are not considered representative of supply and demand in these areas. This being the case, these categories should be ignored, and the sum of 'TSW'

[3] *Proposal,* Attachment E.16
[4] *Proposal,* p 141
[5] *Proposal,* Appendix OX509 (Confidential)
[6] Australian Standard Classification of Occupations
[7] The Notes page of Appendix OX509 indicates that the reference year is 2004. EU have since confirmed that model was recalibrated in 2007 and is in fact based on 2006 actual workforce data.

and 'GSW' numbers is considered representative of the total field workforce demand."[8]

The underlying assumption is that 2006 represents a normal profile of the demand and supply of the TSW and GSW workforce. Using this assumption, the total dollar value of various work types in each year is resolved into FTEs required. That is to say, the capex budget in each year is determined by a range of methods which do not necessarily identify specific labour requirements[9]. The total budget is then back-solved to forecast the workforce demand.

5.2 Engineering Expertise

In their *Proposal*, EU states that they have

"developed a number of strategies for delivering the proposed workload, many of which are well progressed. These include… increased employee numbers in workload 'supply' roles - ETSA Utilities has increased employee numbers for the past five years at a rate of approximately 150 per annum. Many of these personnel are in 'upstream' roles that will be required to supply designs, procurement, and project management for the increased workload."[10]

In supplementary information submitted at EMS's request, EU has provided details of engineering expertise recruitment and resource plan for the coming years. Recruitment has been as shown in Table 5.1.[11]

	2006	2007	2008	2009 (ytd)
Project Management	1	1	1	0
Para-Professional	22	23	20	7
Professional	15	24	14	9
Total	**38**	**48**	**35**	**16**

Table 5.1 Engineering Expertise Recruitment[12]

It is planned that the para-professional workforce will grow from a total of 352 in 2009 to 460 by 2015: an average annual increase of 18, and the number of engineering professionals will grow from 101 to 145: an average increase of 8[13]. EU states:

"Historically, ETSA Utilities has recruited approximately 20 para-professionals per annum on average (qualified to advanced diploma level) in engineering related roles. This has included between 7 and 10 TAFE graduates, with the balance being recruited from other organisations.

"Whereas ETSA Utilities historically recruited in the electrical discipline for these roles, recent recruitments have included civil, mechanical and project management qualifications. This has assisted in meeting ETSA Utilities' demand for para-professionals and has diversified ETSA Utilities' skill-base. ETSA Utilities' quality

[8] Supplementary information, document AER.EU.5
[9] EU provide a description of the methods used to determine the total dollar value of capex in each year under each of the capex categories in the *Proposal*, sections 6.1 to 6.10. Further detail is provided in Appendix CX001 (Confidential) where cross-referencing to Asset Management Plans identifies the methodologies adopted for determining future capex in each asset type. Typically, 2008 costs per unit of construction (asset additions, refurbishments, replacements, etc) are applied to the predicted future demand for units, adjusted by escalation factors for labour and materials.
[10] *Proposal* section 6.11, p 141.
[11] EU normally base all programming, accounting and management on calendar years.
[12] Supplementary information, document AER.EU.3
[13] Supplementary information, document AER.EU.4

management systems have also assisted in allowing the recruitment of an increasingly diverse and less experienced para-professional workforce.

"Historically, ETSA Utilities has recruited an average of 16 professional engineers per annum. The forecast for the next six years, at an average of 8 engineers per annum is well below historical levels of recruitment.

"ETSA Utilities has a mature graduate engineering program that recruits engineers of all disciplines, largely from the local Universities. The engineers are placed on a three year experience rotation scheme within the businesses before being allocated permanently to a particular business unit.

"The number of graduate engineers employed is set to meet the long term business plans, with some allowance for attrition and external recruitment of more experienced engineers. Access to ETSA Utilities' graduate program is highly valued by the available student pool, as ETSA Utilities is considered an employer of choice in South Australia, has high exposure in the University fairs, and employs undergraduate engineers during vacation periods (often the source of some of our successful applicants). ETSA Utilities normally has a high application rate with well over 100 eligible applicants in 2009."[14]

EMS is of the opinion that the pattern of recruitment in the past, and the future resource plan, together indicate a sound approach to meeting the challenges of EU's proposed capex program for the next regulatory period. The high recruitment rate in the preparatory phase (2006-2009) and the lower recruitment rate once the program is underway are appropriate. The present engineering expertise workforce of 453 (352 para-professional and 101 professional) may be considered to be at the high end of a normal workforce profile for a DNSP of EU's size were it in "steady state". However, EU proposes an unprecedented increase in their capex program and the current high level of engineering expertise will be required to adequately complete the required preparatory work and project management functions. The broadening of engineering disciplines (into civil, mechanical and project management areas) adds further confidence that EU is well-equipped in terms of engineering expertise.

The real test of the adequacy of EU's engineering expertise is, however, the degree to which EU can demonstrate their preparedness for the projected capex, especially in the early years of the next regulatory period. This is discussed in Chapter 6.

5.3 Field Workforce Demand

As discussed in Section 5.1, EU has provided supplementary information which provides updated baseline demand forecasts relating to the field workforce (TSW and GSW)[15].

EU further suggests that three major projects (City West Connection Point, the Adelaide Desalination Plant, and the Kangaroo undersea cable and augmentation project) skew the baseline forecasts because of their abnormally high capital cost. As a consequence, back-solving the cost yields FTE numbers which are also abnormally high. EMS accepts the argument in principle, that for major one-off projects such as these, a high level of contract labour, unique to the project, will be procured and that the WPM forecasts should therefore be modified to remove the abnormality. Whilst the determination of the actual quantum of the abnormality has not been demonstrated, in view of EU's sound planning and project management practices which became evident during our on-site meetings, EMS accepts that the reductions in the forecast field workforce figures likely represent a reasonable estimate of the quantum of outsourcing that will be utilised for the three unique major projects.

[14] *op cit,* Footnote 13
[15] *op cit*, Footnote 8

EU's forecasts for field workforce demand, excluding the abnormalities created by the three major projects, are as shown in Table 5.2.

	2009	2010	2011	2012	2013	2014	2015
TSW Demand	587	708	760	867	846	867	868
GSW Demand	32	39	44	51	50	51	51
Total	**620**	**746**	**803**	**918**	**896**	**918**	**919**

Table 5.2 Field Workforce Demand (in-sourced basis)[16]

EU's recent experience with contracted works has revealed that the TSW/GSW mix that has traditionally applied to EU's own workforce does not apply to out-sourced labour where alternative workplace agreements allow for a greater proportion of GSWs. The contractors' general skilled workers are able to undertake some of the non-electrical construction work, thus relieving the demand for trade skilled workers.

EU has suggested that the proposed level of out-sourcing during the next regulatory period will result in 20% of TSW work being re-assigned to contractors' GSWs, which together with a 5% "inefficiency factor", yields the forecast field workforce demand shown in Table 5.3[17].

	2009	2010	2011	2012	2013	2014	2015
TSW Demand	587	637	608	694	676	693	694
GSW Demand	32	122	223	256	250	256	256
Total	**620**	**759**	**830**	**950**	**927**	**949**	**951**

Table 5.3 Field Workforce Demand (anticipated out-sourced basis)[18]

Analysis of the figures indicates that EU have in fact allowed for a 10% re-assignment in 2010 and 20% from 2011 onwards.

5.4 Field Workforce Supply

The WPM's forecasts of the in-house supply of TSWs and GSWs are as shown in Table 5.4. Also shown are the annual gaps between the in-house supply and the demand forecast under the anticipated out-sourcing scenario shown in Table 5.3.

	2009	2010	2011	2012	2013	2014	2015
TSW Supply	546	553	558	581	612	640	664
TSW Gap	**41**	**84**	**50**	**113**	**64**	**53**	**30**
GSW Supply	25	25	24	24	24	24	24
GSW Gap	**7**	**38**	**199**	**232**	**226**	**232**	**232**

Table 5.4 Field Workforce Supply and Gap[19]

[16] *ibid*, Table 2 (minor layout error corrected)
[17] EU has indicated that it will only explore reassignment to contractors' GSW's after all other practical avenues for obtaining qualified tradespeople (e.g. apprenticeships, recruitment, etc) have been exhausted.
[18] *ibid,* Table 3
[19] Supply figures determined from *Proposal* Appendix OX509. Gap figures from comparison with demand figures in Table 5.3

In broad terms, provided that the re-assignment of TSW work to GSWs occurs at the anticipated levels, between 50 and 100 additional TSWs will be required per year of the regulatory period, and around an additional 200 GSWs per year.

The manner in which EU plan to address these gaps is discussed below. The TSW and GSW labour categories are treated separately, reflecting the differences between the sources of such workforces.

5.4.1 Sources of Trade Skilled Workers

Australia's electricity distribution infrastructure, in all States, was the subject of huge expansion in the post WWII decades and accordingly, many components are now reaching the end of their economic lives. This, together with today's increased reliability expectations and recent asset management strategies that aimed to extract the last vestige of service from assets overdue for replacement, have combined to force most Australian DNSPs to consider huge increases in capital expenditure in the coming five to ten years.

As EU has itself noted, Energy Australia increased its annual capital program from approximately $320 million in 2004-05 to a projected $950 million in 2008-09, with a further approved increase to $1.4 billion by 2013-14. Similarly, Energex and Ergon Energy have increased their combined annual capital program from $705 million in 2002-03 to nearly $1.5 billion in 2005-06.[20]

The upshot of this Australia-wide growth in electricity network capital expenditure is that labour resources will generally have to be procured locally. It is unreasonable to expect that any significant import of skilled labour from other States will be achievable during the next five years.

Looking at the situation in South Australia, the Training and Skills Commission (TASC) published a report in May 2009 entitled *Skills for Jobs – Priorities for Developing South Australia's Workforce*[21] which addresses the State's workforce needs by reviewing 16 broad industry groups. The following extract is relevant to this discussion[22]:

> ***Electrotechnology***
>
> *The Electrotechnology sector includes occupations involved in the generation, transmission and distribution of electricity, the provision of postal, courier and telecommunication services and printing, publishing and recording of media. The key occupations within the sector directly employ 42,600 South Australians (just under 6% of the workforce). The industry accounts for 5.1% of GSP.*
>
> *The industry will be positively affected over the coming years by various major projects currently underway or in the pipeline in South Australia, in particular the $8 billion Air Warfare Destroyer project and the recent announcement of additional defence spending on the next generation of submarines. The substantial water management and Cleantech developments, and the electrification of the train network, will also impact on the demand for labour and skills.*
>
> *The sector is currently experiencing skills shortages across a number of key professional, associate professional and trade occupations.*

[20] *Proposal,* Section 6.11, p 141
[21] Available at http://www.tasc.sa.gov.au/Portals/0/Documents/skillsforjobs/DFEESTskillsforjobslowRes.pdf
[22] *ibid,* p24f

> *It is expected to have a relatively small number of job openings over the next five years (just over 5,000), with openings resulting from both growth and replacement demand.*
>
> *The top-down modelling suggests that the sector will account for 6.7% of the total demand for qualifications over the next five years, with the largest demand for qualifications at the Certificate III level. It is estimated that the sector will receive 4.7% of the total supply of publicly funded qualifications over this period. On present evidence it therefore seems likely that this sector will need to receive an increase in its share of total education and training places, especially as many of these skills are relatively specialised.*

The TASC report provides an up to date description of the development of skills critical to EU's capex program. The report does not indicate a time frame for addressing the current under-provision of training (6.7% of total demand, 4.7% of total supply) but it is not unreasonable to assume that the under-provision will not be fully reversed until after the next regulatory control period has commenced and possibly not until its second or third year.

More specific analysis of the electrotechnology sector is provided in Appendix 2 of the TASC report[23]. According to the Department of Education, Employment and Workplace Relations, current skill shortages are in the following electrotechnology categories:

Electrical and Electronics Engineers
Electrical Engineering Associate Professionals
Electronics Engineering Associate Professionals
Electricians
Refrigeration and Air-conditioning Mechanics
Communications Tradespersons
Printing Machinists and Small Offset Printers
Binders and Finishers.[24]

On the evidence of these State reports, it would appear likely that there will be a shortage in South Australia of trade skilled workers during the 2010-15 regulatory period.

EU proposes to undertake a portion of the proposed works by awarding contracts to external contractors and ultimately to alliance partners. This will allow for the re-assignment of some non-electrical components of the work to the contractors' GSWs. EU has indicated that it will only explore reassignment to contractors' GSW's after all other practical avenues for obtaining qualified tradespeople (e.g. apprenticeships, recruitment, etc) have been exhausted. As discussed in Section 5.3, a 10% re-assignment is assumed in 2010 and a 20% re-assignment from 2011 onwards.

The following discussion assumes that the re-assignment quanta are in fact achieved. It will be shown that the re-assignment greatly improves the deliverability of the capex program in terms of skilled workforce availability. However, the criticality of actually achieving the assumed re-assignment of traditional TSW work to GSWs should not be understated.

The projected workforce supply and demand are determined by means of the WPM which has the following characteristics:

- The model is based on the assumption that 2006 provides a reference that is valid for the 2010-2015 regulatory period in terms of the mix of labour, materials and plant per $mil spend, the TSW and GSW proportions within the labour component, and the level of productivity and overtime[25].

[23] Available at http://www.tasc.sa.gov.au/Portals/0/Documents/skillsforjobs/appendix2/Electrotechnology.pdf
[24] *ibid,* p3
[25] The 2006 levels of overtime have been included in the productivity build-up data.

- No external recruitment is factored in.
- No attrition, other than retirement, is factored in.
- Retirement predictions are factored in.
- Apprentices are added to the workforce upon the completion of their apprenticeships. The labour contribution of apprentices during their apprenticeship is not factored in.

In supplementary information provided during and since EMS's and AER's site visit to EU's offices on 17, 18 August, EU made the following points:[26]

- EU has a relatively stable workforce with historically low attrition rates
- EU is highly regarded as an employer of choice
- Whilst no significant external recruitment of qualified workers is planned (relying instead upon apprenticeship completions), EU has in the past been successful in the recruitment of qualified overseas workers. This strategy could be re-applied but does not appear to be necessary at this stage.
- EU currently procures the services of some 80 GSW and TSW staff through contracting with two principal and a number of minor contractors. One of the principal contractors has approximately 200 qualified tradespersons on their workforce.
- Alliance partners will not be sought until the 2010-15 capex program has been approved and will then require some 15-18 months to become fully mobilised.
- The CaMS[27] group employs about 50 trade, engineering and project management staff who could be diverted for brief periods should the need arise.

EU has been active in recent years in developing its powerline and electrical workforce through its apprenticeship program. Anticipated apprenticeship completions are as shown in Table 5.5.

	2010	2011	2012	2013	2014	2015
Apprenticeship Completions	31	33	49	56	50	50

Table 5.5 Anticipated Apprenticeship Completions[28]

Comparing these figures with the TSW gap figures in Table 5.4, it will be seen that apprenticeship completions will fully address the TSW gap in the latter years of the 2010-15 regulatory period, but a gap of 20 to 50 TSWs will exist in each of the first three years.

In EMS's view, the following conclusions may be drawn in relation to the supply of the TSW workforce:

- There is a critical dependency on successfully re-assigning the assumed portions of traditional TSW work to the contractors' GSW workforce.
- Even if the proposed re-assignment is achieved, on the basis of in-house resourcing alone, a gap will exist between the demand and supply of TSWs in the early years of the 2010-15 regulatory period.
- There is capacity within existing contractors and the CaMS workforce to bridge the TSW gap for brief periods.
- Further overseas recruitment is possible but unlikely.
- The proposed alliance partner scheme will have no effect on the delivery of the capex program in the early years of the 2010-15 regulatory period. Rather, traditional contracting arrangements will be utilised.

[26] Summarised from supplementary information document AER.EU.6
[27] Construction and Maintenance Services – a contracting business unit of EU undertaking unregulated work for external customers.
[28] From Supplementary information document AER.EU.6 and *Proposal* Appendix OX509

5.4.2 Sources of General Skilled Workers

EU acknowledges that the restructuring of the field workforce to allow a greater proportion of GSW workers is an option that is available only to out-sourced contractors. It follows that virtually all of the 200 additional GSWs per year will be recruited by such contractors. The question therefore, is whether the GSW availability in South Australia will be sufficient to fill this gap.

The South Australian Labour Market Review published by the Commonwealth Department of Education, Employment and Workplace Relations (DEEWR) provides an indication of the State's position in comparison to the broader Australian labour market. The July 2009 edition of the Review[29] provides the following data:

		July 2008	July 2009	Annual Change
Employed persons (,000)	SA	791.0	794.1	0.4%
	Australia	10790.0	10778.3	-0.1%
Unemployed persons (,000)	SA	40.7	46.2	13.5%
	Australia	476.8	670.5	40.6%
Unemployment Rate	SA	4.9	5.5	0.6pp
	Australia	4.2	5.9	1.7pp
Participation Rate	SA	63.5	63.4	-0.1pp
	Australia	65.4	65.3	-0.1pp

Table 5.6 Labour Market Statistics

The statistics indicate that the labour market in South Australia is in substantially better condition than that of the nation as a whole. Employment over the last twelve months has grown faster and the upturn in unemployment (generally attributed to the global financial crisis) has been much less severe in South Australia (13.5% increase compared to national increase of 40.6%).

More specifically related to the GSW workforce, recent DEEWR Vacancy Reports[30] show that the number of job vacancies for "Labourer" in South Australia fell by 955 (46.4%) in the twelve months to July 2009, and the pattern is continuing: the most recent Vacancy Report indicates a fall of 1361 (49.5%) in the twelve months to August 2009.

Whilst care must be exercised in the interpretation of such broad statistics, the above indicators suggest two somewhat opposing trends. On the one hand, the decreasing vacancy rate indicates a pool of potential labourers (GSWs) is available, while on the other, the resilience and relative buoyancy of the South Australian economy, as depicted by overall labour market statistics, would suggest that recovery from the current economic contraction may be rapid. Mining and mineral resources play a major role in the South Australian economy and a recovery of global resources markets is likely to create a swift response from that sector, with a flow-on effect in the building and construction sector.

The conclusion may be drawn that the South Australian labour market is currently favourable for EU's contractors who will be seeking to employ large numbers of general skilled workers should the proposed capex program be approved. However, a cautionary note must be added, that as Australia recovers from the present economic contraction, there will likely be a strong demand for GSWs in other sectors, especially mining, building and construction.

[29] Available at http://www.workplace.gov.au/NR/rdonlyres/B79D7276-0CBB-476A-8438-A666F4D431AA/0/SA_LMR_2009_07.pdf
[30] Available at http://www.workplace.gov.au/workplace/Publications/LabourMarketAnalysis/VacancyReports/

6 ETSA Utilities' Preparedness

6.1 Introduction

Regardless of the resources available, the deliverability of such a greatly increased volume of capital expenditure will require a high level of competence in terms of project management, procurement, planning, and standardisation of designs to avoid the additional cost and unnecessary time of solving 'one-off' problems. This section provides a discussion of these aspects, relying mostly on written advice from EU provided as supplementary information following the site visit by EMS and AER on 17, 18 August 2009.

6.2 Capital Expenditure in the Current Regulatory Period

As noted in Chapter 2, EU's actual capex in the first three years of the current regulatory period was respectively, 7%, 11% and 8% below the Electricity Distribution Price Determination (EDPD) set by the Essential Services Commission of South Australia.

EU has advised:

> "The underspend on net expenditure allowances at the beginning of the current regulatory period resulted from a number of factors, including:
>
> 1. The expenditure allowances received for 2005/06 to 2009/10 reflected an increase of about 50% above previous levels of expenditure, and in particular, capacity-related expenditure was required to nearly double in the transition from the previous period to the current one; and
>
> 2. The level of customer connect activity experienced early in the period was greater than had been anticipated (and has remained at these levels).
>
> In combination, these new levels of expenditure stretched ETSA Utilities' ability to deliver the required program in the early part of the period."[31]

Subsequently, EU recognised that their processes for undertaking major works (over $1million) were sub-optimal in some regards.

EU work on a calendar year basis and invariably, the South Australian climate gives rise to a summer peak in network demand. The aim therefore is to complete all capacity-related capex by early November each year. However, in the past, EU "did not firmly commit to work for the following calendar year until the 4th quarter of the preceding year."[32] Thus design work, civil works and procurement of plant and equipment took up most of the 1st and 2nd quarters, compressing the construction period in the 3rd and 4th quarters. The tight project cycle inevitably led to errors requiring re-work and causing delays.

EU claim to have largely overcome the above difficulties as discussed in the following.

6.3 Project Management

6.3.1 Project Cycle

EU has now adopted a significantly longer project cycle. For a typical major project (over $5million):

- land and easement acquisition commences 18 months before the project year;

[31] Supplementary information document AER.EU.8
[32] *ibid*

- concept designs, budget submissions and external approvals[33] are sought six months before the project year;
- authority to proceed is obtained and detailed design and specification work is undertaken in the 4th quarter of the year before the project year; and
- construction commences early in the project year leaving a 10 month construction window rather than the previous 5 or 6 month window.[34]

6.3.2 Project Managers

Organisationally, network planning is undertaken by the Demand and Network Management (DaNM) group who then determine and specify the required capital works required to meet network and customer requirements. The project specifications are then handed to Field Services for design and construction.

In recent years, EU has recruited and/or trained increased numbers of project management personnel. Current practice is to assign a specific Project Manager (PM) from each of DaNM and Field Services to all major projects.

6.3.3 Major Project Review

DaNM and Field Services PMs meet with key personnel on a monthly basis to review the progress of all major projects[35]. This meeting involves the Project Owner, Estimators, Designers and Construction Work Planners. During the site visit on 17, 18 August 2009, EU managers exhibited the major project review folder for July 2009. EMS and AER sighted the systematic review and frank discussion of progress and difficulties faced with each project, duly recorded and retained for follow up at subsequent meetings.

All major projects are tracked on a summary tracking sheet[36] and each project is individually monitored by means of a Gantt chart[37].

Further review is undertaken by means of the DaNM and Field Services Performance Report prepared each month[38]. This report provides a comprehensive picture of the status of projects in the following categories:

Network Capital
- DaNM 2009 Top Projects
- DaNM 2010 Top Projects
- Customer Connection
- URD Connection/Construction
- Capacity Upgrade
- Reliability
- Capital Refurbishment
- Capital Public Lighting
- Safety
- Community Obligation/Environment

Network Operating
- Maintenance – Line
- Maintenance – Substation
- Emergency Response
- Public Lighting
- Other

[33] Typically involving the SA Development Application Commission
[34] EU provided a detailed typical major project Gantt chart, scanned document SI408
[35] Major projects are generally those over $100,000. Other factors such as urgency for customer or network reasons may elevate a smaller project to the major projects list.
[36] EU provided a sample (29 June 2009), scanned document SI407
[37] EU provided a sample (Hackham substation upgrade), scanned document SI409
[38] EU provided a typical monthly report (July 2009), scanned document SI410

The report tracks expenditure (both dollars and labour hours) and identifies any critical issues that require attention. Additionally, the report includes an appendix that identifies any issues of concern in relation to long lead time material. An item may be classed as a long lead time item for many reasons, including: the item comes from overseas; the quantity required is larger than average monthly usage; local, interstate or worldwide supply shortage; supplier issues; or not bought frequently. All such items are listed against the name of the responsible inventory analyst and inventory officer.

In order to illustrate the improvements made in project management and project deliverability, EU cites two major projects:

> "This capability to rapidly and effectively ramp up our projects delivery capacity has been proven by the successful execution of the Oxiana Project (greater than $100m involving distribution, transmission and substation work) and the current Desalination project (greater than $50m) all on top of an elevated level of construction work."[39]

6.3.4 Regional Project Review

The management of minor and medium works is generally undertaken at regional level. DaNM staff are located at all main regional offices and work with Field Services to track and regularly review the progress of such works.

> "When a depot-based project is initiated, a construction project folder is also created. The folder holds all relevant information as the project develops including (but not limited to) project dates, customer contact information, drawings, materials information, safety information, and switching information. The construction folder is the mechanism for the management of all relevant information on each project.
>
> "Labour balancing, in order to ensure availability of resources for projects, is a centrally based function within ETSA Utilities. Field Services' Work Planners forecast construction labour demand up to 18 months in advance and balance the forecast on a monthly basis.
>
> "Depot-based Work Schedulers manage depot construction schedules on a rolling 4-6 month basis. In common with Telstra, ETSA Utilities utilises third party scheduling software (ClickSchedule) to manage project scheduling at the depot level.
>
> "The local Field Services construction depot manage the delivery of the work 2-3 weeks ahead, in accordance with the schedule.
>
> "Depot-based joint DaNM/Field Services monthly work planning meetings are held involving the DaNM Asset Manager (project owner), Field Services Work Planner, Field Services Work Scheduler and Field Services Contract Supervisor (depot workforce supervisor). In the meetings, work schedules are reviewed to:
>
> - Ensure construction project folders are provided to Field Services in a timely manner to meet the construction timeframe;
> - Prioritise work to meet customer needs; and
> - Review and confirm that the available construction resources are adequate to meet the construction workload.
>
> "Labour transfers between depots (to balance workload) and outsourcing (to address peaks in demand) are discussed at the above planning meetings and is initiated if

[39] From supplementary information document AER.EU.8

> required. New customer projects are also discussed and "pencilled in" to the work schedule in order to assist with labour forecasting."[40]

6.4 Procurement

In mid-2008, EU recognised that improvements could be made to increase the effectiveness of the procurement function to, amongst other things, better ensure the security of supply for critical materials and services. EU's non-regulated business (CaMS) which provides contracted services to a range of external customers provided the incentive for and experience in a more strategic approach to procurement as did the pressure of the Oxiana project.

The procurement group was restructured into four key business functions:

- Strategic procurement (supply contracts for goods and services)
- Project procurement for regulated projects
- Procurement operational functions (transactions, vendor data management, low value purchasing, accounts payable, etc), and
- Project procurement for non-regulated projects[41].

Strategic procurement is being developed through the creation of five senior procurement officer positions These officers are responsible for managing teams of procurement specialists who work with internal technical experts to establish and manage supply contracts for goods and services. Particular emphasis has been placed on major projects procurement for regulated projects planned for the next regulatory period[42].

The strategic approach has seen the expansion of different contract types intended to spread the risk of procurement difficulties including short, medium and long term, single source, multi-source and panel contracts.

> "ETSA Utilities prides itself on having stable, secure relationships in place with its major suppliers of materials and services, particularly in the areas of cable and conductor, transformers and switchgear, distribution hardware and construction services.
>
> "ETSA Utilities has a strong focus on supplier relationship management to ensure security of supply of goods and services. From a supplier viewpoint, ETSA Utilities' business is, while smaller than some other utilities, within the reliable, repeatable, 'business-as-usual' manufacturing and delivery program, which is the core business of many suppliers. ETSA Utilities enjoys a reputation with suppliers of being demanding, but fair and reliable."[43]

Possibly more significant, considering the huge demand for materials and equipment which is building up across Australia in the current environment of major refurbishment and expansion of electricity distribution infrastructure, is EU's recent decision to implement a procurement basis of "order on program" rather than "order on project". In the past, although EU utilised a process whereby production slots of long lead time materials were booked well ahead, this remained an order on project procedure as firm orders were not placed until a project was approved.

The scheme now to be adopted is that approval requests for the 2011 major materials procurement "on program" requirements are to be presented to CEO in October/November 2009. This will allow orders to be placed in late 2009 for key long lead time material required

[40] From supplementary information document AER.EU.7
[41] From supplementary information document AER.EU.9
[42] From supplementary information document AER.EU.10
[43] *ibid*

to deliver the 2011 capital program[44]. This will significantly improve EU's position in the increasingly strong competition for the supply of critical network components.

It can be concluded that the new strategic approach to procurement, the quality of existing supplier relationships and the diversity of contract types and terms will reduce the risk that procurement difficulties will adversely affect the deliverability of the proposed capex program.

6.5 Standardisation

Preparedness for a major capital works program is greatly assisted by the use of standard designs as much as possible. This reduces design time, decreases the complexity of specifications, tendering and procurement, and simplifies commissioning.

In recent years EU have implemented the following initiatives:

- Templates and standard designs are being developed covering components of electrical design, civil works and equipment procurement. EU has provided samples of electrical protection design templates[45] and civil design templates for standard substation control rooms[46].

- Modular substations that provide a standard modular, transportable design for some substation requirements are constructed off-site, in workshops, improving efficiency and reducing the requirement for local site labour. Currently there are six types of modular substation that have been, and will be, utilised as shown in Table 6.1.

Type	Description	No. of Installations	
		To date	Next Regulatory Period
1	12.5MVA 66 or 33/11kV	7	5
2	6.26MVA 33/11kV	6	7
3	3MVA 33/11kV	6	5
4	25MVA 66/11kV	1	2
5	2x25MVA 66/11kV	0	0
6	2x3.8MVA 33/11/7.6kV	2	6

Table 6.1 Modular Substation Installations[47]

6.6 Summary

The foregoing discussion demonstrates the improvements that EU has implemented since the early years of the current regulatory period. Whilst the 50% step increase in capex in 2005-06 caused problems due to lack of engineering expertise and sub-optimal project planning and management, EU claim to now be well-prepared for the next major step increase in capex.

The major increase on volume of resource-intensive capital works in the 2010-15 regulatory period will create unprecedented pressure on every aspect of planning, procurement, and project management. In response, EU has demonstrated a high level of preparedness.

[44] From supplementary information document AER.EU.11
[45] Scanned document SI405
[46] Scanned document SI406
[47] From supplementary information document AER.EU.12

7 Non-Network Capital Expenditure

7.1 Introduction

The AER also requested EMS to briefly review the deliverability of non-network capex items to the extent that they interact with network capex proposals. Section 6.9 of the *Proposal* outlines the capital expenditure proposed for the 2010-15 regulatory period in four areas: information technology, fleet, plant and tools, and property. Whilst all these have critical interaction with network projects, matters of fleet, plant and tools are in essence "business as usual" and as described in Section 6.4, it appears that the procurement function is prepared for the projected increase in the demand for such items. Information technology and property however, have long lead times and require adequate planning and project management. These areas were the subject of further enquiry by EMS, as discussed in the following.

7.2 IT Capital Expenditure Program

In common with most large corporations, EU's IT capex tends to be characterised by occasional surges when major upgrades or new systems are installed, and steady growth in the intervening years to cater for expansion of existing systems. Proposed capex in the next regulatory period is as shown in Table 7.1.

	2010-11	2011-12	2012-13	2013-14	2014-15
IT Expenditure ($mil)	28.8	25.2	22.0	27.9	45.7

Table 7.1 Proposed IT Capex[48]

The surge in 2010-11 is understood to be related to an upgrade of the outage management system and the field services mobility system. The larger surge in the last two years of the period relates to a proposed major enhancement of the enterprise data management system particularly for the data requirements of full retail contestability which is currently supported through a partnership with Powercor in Victoria. The proposed capex in the intervening years is related to the steady expansion of staff numbers and depots and to ongoing software upgrades.

During the site visit on 17, 18 August 2009, EMS and AER representatives met with senior IT management to discuss the proposed IT capex program. Good levels of project preparation and management were described including regular meetings with key users and stakeholders. Project management is supported through the use of propriety software.

In terms of staffing, it is intended to recruit further personnel with project management skills in order to ensure that the operating staff are able to remain focussed on supporting existing systems. It was noted that recent events in corporations external to EU had resulted in a number of potential recruits making unsolicited enquiries regarding employment in EU.

The information provided to EMS indicated that that the IT capital expenditure program in the next regulatory period will be deliverable as proposed.

7.3 Property and Facilities

Along with the expansion of depot and office facilities that will be required to support the increased work levels occasioned by the proposed network capex program, EU also has to address issues associated with ageing depots and facilities such as asbestos removal,

[48] *Proposal* Table 6.40, p132

improved access and other OH&S matters, and enhanced security and fencing. Proposed capex in the next regulatory period is as shown in Table 7.2[49].

	2010-11	2011-12	2012-13	2013-14	2014-15
Property Expenditure ($mil)	17.0	17.8	21.7	15.9	11.0

Table 7.2 Proposed Property Expenditure[50]

During the site visit on 17, 18 August 2009, EMS and AER representatives met with senior Property management to discuss the proposed property capex program. The near term requirements (for example Port Augusta, Port Adelaide, Gawler and Streaky Bay) were discussed and a good level of preparedness was demonstrated.

In order to speed the process of depot construction, and reduce costs, a standard depot design has been prepared by architects and costed by quantity surveyors. It is expected that Port Augusta will be the prototype trial with an anticipated program of eight months construction period and twelve months for completion of the whole project.

The information provided to EMS indicated that that the property expenditure program in the next regulatory period will be deliverable as proposed.

[49] Property capex does not include land and easements required for network projects. These form part of the specific network project and are managed as part of the project as described in Section 6.3
[50] *Proposal* Table 6.44, p135

8 Network Operating Expenditure

The deliverability of the proposed operating expenditure program will depend in large part upon the availability of an appropriately trained workforce and the timely procurement of plant and equipment.

In terms of the field workforce, it is noted that the Workforce Planning Model forecasts labour requirements for both capex and opex. Thus the figures presented in the tables in Section 5.4 include the supply and demand of opex field workforce requirement. Thus the conclusions relating to field workforce availability for the capex program apply also to the consideration of the deliverability of the proposed opex program.

Similarly, the procurement function, as described in Section 6.4, is equally applicable to the opex program.

In summary, the conclusions that EMS has arrived at in relation to the capex program are equally relevant to the opex program, namely:

- There is a critical dependency on successfully re-assigning the assumed portions of traditional TSW work to the contractors' GSW workforce.
- Even if the proposed re-assignment is achieved, on the basis of in-house resourcing alone, a gap will exist between the demand and supply of TSWs in the early years of the 2010-15 regulatory period.
- There is capacity within existing contractors and the CaMS workforce to bridge the TSW gap for brief periods.
- The SA labour market is more buoyant than other States.
- The decreasing vacancy rate indicates a pool of potential labourers (GSWs) is available.
- Australia's recovery from the present economic contraction may result in a heavy demand for GSWs especially from the mining and building construction sectors. Indications are that this may occur in the early years of the 2010-15 regulatory period.
- The new strategic approach to procurement, the quality of existing supplier relationships and the diversity of contract types and terms will reduce the risk that procurement difficulties will adversely affect the deliverability of the opex program.

In conclusion, to the extent that it depends on the availability of workforce, materials and plant, the proposed operating expenditure program appears to be deliverable subject to the above factors. Issues related to planning, scheduling, and management of opex works have not been specifically reviewed. The quality of EU's project management in the capital sector provides confidence that management within the operating sector is similarly sound.

9 Findings and Conclusions

On the basis of the information presented by EU in their *Proposal*, further information obtained during and since the site visit, and information obtained from external sources relating to the labour market, EMS concludes that:

1. EU's "engineering expertise" workforce has been built up with sufficient lead time to allow an adequate level of training and development.

2. The range and diversity of engineering disciplines is appropriate and the evidence of actual preparedness indicates a sufficiently robust level of expertise and experience.

3. In terms of EU's field workforce:
    a. If EU's current (2006) TSW/GSW mix in the field workforce continues then a significant shortfall of trade skilled workers will occur, especially in the early years of the next regulatory period;
    b. By awarding a portion of projects to external contractors, EU will effectively re-assign much of the TSW work to GSWs but even in this scenario, a gap will exist between the demand and supply of TSWs in the early years of the 2010-15 regulatory period;
    c. The TSW gap appears to be manageable through the existing capacity of contractors, and EU's CaMS workforce, for brief periods at least;
    d. There is a critical dependency on successfully re-assigning the assumed portions of traditional TSW work to the contractors' GSW workforce;
    e. The proposed alliance partner scheme will have no effect on the delivery of the capex program in the early years of the 2010-15 regulatory period;
    f. The SA labour market is more buoyant than other States;
    g. The decreasing vacancy rate indicates a pool of potential labourers (GSWs) is available;
    h. Australia's recovery from the present economic contraction may result in a heavy demand for GSWs especially from the mining and building construction sectors. Indications are that this may occur in the early years of the 2010-15 regulatory period.

4. EU's preparedness for the proposed capex program appears to be sound:
    a. Experience during the current period has resulted in improvements to the project planning cycle;
    b. Project management is of high quality in terms of assignment of dedicated project managers, involvement of key stakeholders, progress review procedures and cost monitoring;
    c. The procurement function has been restructured to develop a more strategic approach including the introduction of "order on program" rather than "order on project";
    d. EU claim to have sound relationships with existing suppliers and a diversity of contract types and terms;
    e. Standardisation of designs is being developed.

5. Preparations and planning for non-network capital expenditure in the long lead time areas of IT and Property appear to be sound.

6. The deliverability of the proposed opex program, to the extent that it relies on the same workforce forecasting methodology and the same strategic procurement function, mirrors the deliverability of the proposed capex program.

As discussed in Chapter 2, questions of whether EU's proposed capex program for 2010-15 is necessary and sufficient to meet capacity, reliability, safety, environmental and other relevant criteria, are not addressed in this review. These questions will be reviewed in detail by others.

Rather, EMS's assignment was to assess the overall deliverability of the proposed capital expenditure program, and to briefly assess the deliverability of non-network capex proposals and network opex.

EMS considers that some challenges may be faced in the early years of the 2010-15 regulatory period due to:

- the need to re-assign at least 10% in the first year and 20% in subsequent years of work traditionally performed by trade skilled workers to general skilled workers by means of outsourcing to contractors alone (no re-assignment is anticipated for the in-house workforce)[51];
- the external demand for general skilled workers that is likely to occur in the mining and building construction sectors due to the recovery of the Australian economy; and
- the sheer scale of the proposed works, being more than twice the current volume.

Figure 4.1shows that the proposed capex program peaks in the second year of the next period. EMS is of the view that due to the challenges that are likely to arise in the early years, it is almost inevitable that some slippage will occur such that some of the works planned for 2011-12 may be delayed until later years.

Whilst EMS has reviewed the proposed capex program from the viewpoint of its deliverability, EMS has not reviewed the necessity or sufficiency of specific projects within the proposed program and is therefore unable to comment on whether any of the 2011-12 projects may be moved to latter years without adverse effect. We simply point out that it may be prudent to plan now for the deferment of some early year projects rather than experiencing the inefficiencies and costs that unplanned delays inevitably create.

However, regardless of any adjustment to the year-on-year timing of projects, EMS considers that, *in toto* over the full 2010-15 regulatory period, the proposed network and non-network capital expenditure programs are deliverable.

To the extent that it depends on the availability of workforce, plant and materials, indications are that the proposed operating expenditure program will also be deliverable.

[51] See Footnote 17