Western Australian Auditor General’s Report

Pilbara Underground Power Project

Report 15: August 2015
PILBARA UNDERGROUND POWER PROJECT

This report has been prepared for submission to Parliament under the provisions of section 25 of the Auditor General Act 2006.

Performance audits are an integral part of the overall audit program. They seek to provide Parliament with assessments of the effectiveness and efficiency of public sector programs and activities, and identify opportunities for improved performance.

This audit assessed how the Pilbara Underground Power Project (PUPP) was planned, funded and managed.

My report outlines a number of issues that have led to PUPP now being forecast to cost up to $122 million more than originally budgeted and will take until 2018, six years later than planned. Since 2012, a number of improvements have been made in the contracting, planning, management and oversight of PUPP, which have improved the likelihood of meeting the revised completion date and budget.

There are a number of important lessons in this report, which will benefit all agencies involved with capital works projects.

I wish to acknowledge the staff at Horizon Power, Department of Regional Development, Pilbara Development Commission and the Department of Finance – Public Utilities Office, for their cooperation with this audit.

COLIN MURPHY
AUDITOR GENERAL
12 August 2015
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Auditor General’s Overview

Replacing above ground power poles and wires with an underground system makes the network safer and more reliable, and improves social amenity. Moving power distribution underground is not new in WA — the State Underground Power Program has been running for almost 20 years.

The Pilbara Underground Power Project (PUPP) started in 2009 as a $130 million project to underground power in Karratha, South Hedland, Roebourne and Onslow where the above ground network is exposed to cyclones and other severe weather. Using a combination of Royalties for Regions and local government funding, PUPP planned to complete all four towns in three years, a different approach to the more gradual statewide program. PUPP has not gone as planned. Instead of completion in 2012, it will now be 2018 and will cost the state and local governments well over $100 million more than budgeted.

The majority of the problems on PUPP have occurred in Karratha, where residents will have to wait longer and pay more than they expected. The City of Karratha’s share of total funding has remained at 25 per cent, half that normally required under these state-local government projects. However, the dollar amount has gone up substantially, understandably influencing local views on the project.

The explanation of why PUPP did not go as planned is a familiar one. Unrealistic estimates and inadequate early planning, coupled with governance and project management inadequately matched to risk, led to overruns and delays. It is disappointing to have to report this story again.

But importantly, the project is now on a more stable footing. To reduce risk, implementation now involves smaller parcels of work done over a longer time frame. Changes have also been made to program management and oversight. This is encouraging and helps to reassure taxpayers and ratepayers that there should be no further surprises.
Executive Summary

Introduction

This report provides an assessment of how the Pilbara Underground Power Project was planned, funded and managed.

Background

The Pilbara Underground Power Project (PUPP) aims to replace overhead power supply for a safer and more reliable power supply to approximately 5 600 residential and industrial lots in parts of Karratha (3 327 lots), South Hedland (2 028 lots), Roebourne (50 lots) and Onslow (214 lots). The initial planned cost and timeframe was $132 million and three and a half years, with completion due in December 2012.

The risks of power outages and economic disruption resulting from cyclones and extreme weather events in the Pilbara are well established. In 2008, Horizon Power (Horizon) produced a strategy to ‘harden’ regional power supply across numerous parts of the state, including the Pilbara.

In June 2009, Cabinet provided an initial $35 million of a $100 million state government contribution funded through the Royalties for Regions (RfR) program. The remaining $65 million was approved in January 2010 and funds provided in November 2010. PUPP is part of a larger $300 million Pilbara Revitalisation Plan.

Like other underground power projects in Western Australia (WA), local government was required to share the cost with the state. In this case, the state was to contribute $100 million and participating local government authorities were expected to provide $30 million. This was different from other such projects in regional and metropolitan areas where the funding split has been 50-50.

The Department of Local Government and Regional Development (DLGRD), now Department of Regional Development (DRD), was responsible for bringing together and assessing the project proposal and administering the funding agreement. The Office of Energy (OOE) developed the original costings for PUPP. Project oversight rested with a steering committee made up of DLGRD, OOE, the Pilbara Development Commission, local government authorities and Horizon.

Horizon was the organisation chosen to deliver the undergrounding project, including contracting the construction works, project design and overall project delivery. Horizon is a government trading enterprise, governed by a Board, which reports to the Minister for Energy.

Horizon contracted separate companies to undertake the undergrounding works in Karratha and South Hedland. Work first began in Karratha in 2010. The initial contractor stopped work in 2012 and another contractor is now in place. Work began in South Hedland in 2012, and was completed in 2013. Work has yet to start in Roebourne or Onslow.

Audit Conclusion

Completing the Pilbara Underground Power Project is forecast to cost up to $122 million more than originally budgeted and will take until 2018, six years later than planned. The state government, through the Royalties for Regions program, has funded $75 million of this additional cost. Horizon has incurred nearly $29 million. Most of this increase has been for works in Karratha. The City of Karratha’s contribution has remained at about 25 per cent of the total budget, but risen to $34.55 million.
A number of factors in the planning and management of PUPP combined to cause the cost growth and delays in the project. The original budget of $130 million and completion date of December 2012 were unrealistic and did not reflect local conditions. The funding decision did not include a robust assessment of the feasibility of delivering the project as planned. External oversight was not effective in providing visibility of project progress and risks. Horizon underestimated the scope of works, and in the early stages of the project did not monitor progress closely enough and did not adapt its management to the project risks.

Since early 2012, Horizon has improved its contracting, planning, management and oversight of the project. These changes address the problems experienced in delivering PUPP, and improve the likelihood of meeting the revised completion date and budget.

**Key Findings**

PUPP is currently forecast to cost state and local governments a total of $252 million and be completed by June 2018. This is $122 million more and six years later than originally approved. The state government agreed in 2014 to contribute an extra $75 million in funding.

- The estimated cost of the undergrounding works in Karratha (which now includes Roebourne) is $138 million, up from $75 million. This includes a $34.55 million contribution from the City of Karratha, up from the original estimate of $18.7 million. Forty-five per cent of these works in Karratha are complete. Site works have not begun in Roebourne.

- Work in South Hedland finished in December 2013 and cost $54 million, $7 million more than expected. As well, only 1,613 lots were connected instead of the original estimate of 2,028 lots. The Town of Port Hedland’s contribution will be $11.3 million, $200,000 under the amount set in its funding agreement.

- Work has not started in Onslow.

- Horizon spent almost $22 million of its own funds on top of the $230 million budget, which already included $7 million contributed by Horizon.

The assessment of risks and costs that supported the decision to provide funding for PUPP was not sufficiently robust:

- The original costing for the project was not based on an accurate assessment of the local conditions and complexities. The Office of Energy (now Public Utilities Office) estimated a cost of $17,000 per lot. Current figures suggest an actual cost of over twice that amount at $41,000 per lot.

- There was no specific robust business case for PUPP when it first went to Cabinet, although this was rectified for the 2014 submission.

- The 2010 funding agreement between the then Department of Regional Development and Lands (DRD&L) and Horizon for the $100 million in RfR funds had unrealistic milestones, and did not link funding to progress.

Horizon’s initial management of PUPP did not adequately address the risks in delivering the project. This reflects that it had no experience in large undergrounding projects, and had to develop capacity as it went. The way Horizon tendered and contracted for the project introduced risks that were not then effectively managed. In Karratha:

- Horizon originally planned to use two undergrounding contractors to minimise project risk but then changed its plan to let one large contract. It also focused too much attention on price considering the management approach it had chosen.
The scope of works and schedule of quantities for the initial Karratha contract were inaccurate, which meant the cost to complete the work was underestimated:

- the overall amount of excavation was underestimated by 14 per cent
- the proportion of excavation across all of Karratha that would involve drilling rather than digging increased significantly; drilling generally costs significantly more than digging
- the amount of hard rock compared to soil and softer rock in some areas was higher than the budgeted 10 per cent. We note that Horizon considers that across the entire Karratha works the 10 per cent figure will be sufficient.

Horizon’s oversight and management for the initial contract in Karratha was inadequate:

- works were expanded beyond two pilot cells without reviewing performance, which meant issues and improvement opportunities were not recognised and acted on
- Horizon made the contractor responsible for monitoring and reporting on performance and progress, which reduced its ability to manage or control progress
- under the terms of the contract, the contractor was entitled to payment for works carried out. However, payment was not linked to weekly or monthly performance targets, limiting Horizon’s ability to manage any problems with progress.

Cabinet required the appointment of an external steering committee for the project to approve funding disbursement and monitor progress. The Committee, comprising Horizon, DRD&L, OOE, Pilbara Development Commission and the local government authorities never functioned as intended. It had oversight but no control of funding, and Horizon rarely sought its approval before making major decisions.

There are improved aspects of oversight, but some weaknesses remain:

- The Department of Regional Development (previously known as DRD&L), which manages the RfR program, now has a phased approach to releasing funds. The new approach ties any release to progress on the ground.
- The committee has new terms of reference, but still lacks decision-making powers; DRD does not sit on the committee, but is represented by the Pilbara Development Commission; there is still no formal reporting line to the Minister.

Since 2012, Horizon has improved its budgeting, contracting and project management of PUPP, and is now confident that it will deliver the project within the revised timeframe and budget:

- Internal oversight has improved, with active participation and improved reporting lines.
- Remaining works in Karratha are now arranged in smaller, more manageable contracts, reducing risk.
- There is more robust, proactive contract management. This includes detailed progress targets and monitoring.
- Horizon has engaged a specialist consultant to provide extra assurance by regularly reviewing expenditure and cost forecasts. This is now formally required under the funding agreement, and must be shared with the steering committee.
Recommendations

Horizon should:

- ensure it more fully discloses the full cost of PUPP.

The Department of Regional Development should:

- stringently maintain its requirement since July 2013 of RfR funding submissions being supported by comprehensive business cases and sufficient evidence of project feasibility in regard to cost and timelines.

The Pilbara Development Commission should:

- as part of its role on the PUPP steering committee, ensure that the Ministers for Regional Development and Energy receive all relevant updates on progress and project risk.
Agency responses

Horizon Power

Horizon Power has valued the opportunity presented by the Office of the Auditor General’s audit into the Pilbara Underground Power Project and notes the following:

- With respect to the recommendation made by the Auditor General, all expenditure incurred by the project has been appropriately reported.
- Horizon Power has effectively addressed issues in delivering PUPP on time and on budget.
- The Auditor General found that since early 2012 the changes made by Horizon Power “address the problems experienced in delivering PUPP and improve the likelihood of meeting the revised completion date and budget”.
- The 2009 estimate of the project’s cost and schedule was unrealistic and further impacted by the unanticipated cost escalation of the mining boom.
- Throughout 2011 the project was subject to increasing levels of internal scrutiny following appointment of a new Managing Director. Actions taken included:
  - addressing the problems experienced with the primary contractor for the Karratha component of the PUPP;
  - relocating management of the project to the Pilbara; and
  - restructuring delivery into smaller, more manageable tranches of work supervised internally over a more realistic time frame.
- The revised capital budget of $230 million for the project is realistic, as determined by an independent engineering consultant.
- The Auditor General has recognised that the City of Karratha is not contributing to the $28 million voltage upgrade component of the $230 million capital budget.
- Disclosure of all additional operating expenditure, absorbed by Horizon Power, has been presented to Government, the external steering committee and publicly through audited financial reports.

Department of Regional Development

DRD welcomes the findings and recommendation of the Auditor General’s report and acknowledges the work undertaken by his staff.

In response to the Auditor General’s recommendation concerning DRD, I can confirm that all proposals for Royalties for Regions funding are required to include a comprehensive business case which includes information on project feasibility. This requirement has been in place since July 2013. The concept of undergrounding power in Pilbara towns evolved into what became PUPP through several reviews and proposals before Cabinet approval in June 2009. While there was no single specifically developed business case for PUPP, the combined information from several key industry experts provided a reasonable case that substantiated the State’s support for the PUPP project.

As validated by the Auditor General’s report, PUPP has proven to be a significantly more complex project than initially envisaged by all key stakeholders. Nonetheless, DRD has
always acted in an appropriate, timely and proactive manner in relation to the emerging issues and risks of the project.

For example, in 2013 DRD engaged audit firm Stantons International to conduct an independent audit on Horizon Power and PUPP. This audit was instigated by DRD due to identified issues pertaining to delays and overspend associated with PUPP. The audit confirmed that Horizon’s current project management practices are adequate and that the governance and management arrangements for this project match the risks and complexities of the project.

**Department of Finance (Public Utilities Office)**

The Department does not have any concerns with the content of the draft as far as it relates to the involvement of the former Office of Energy.

I am pleased to note that the performance audit recognises improvements that have been implemented prior to the audit process.

The Department of Finance supports the recommendations made.

**Pilbara Development Commission**

The Pilbara Development Commission, as part of its role on the PUPP steering committee, will provide to our Minister for Regional Development and for the information of the Minister for Energy the minutes from the Pilbara Underground Power Project External Steering Committee monthly meetings. These minutes include updates on progress and project risks.
Audit focus and scope

We assessed the funding, planning and management of the Pilbara Underground Power Project (PUPP). We focused on three lines of inquiry:

- What is the status of PUPP against its original scope, timeframe and costs?
- Were risks to delivering the project adequately identified and managed?
- Has Horizon Power effectively addressed the deficiencies in the management of PUPP?

Our scope included:

- Horizon Power
- Department of Regional Development (formally Department of Regional Development and Lands)
- Pilbara Development Commission
- Department of Finance — Public Utilities Office (formally Office of Energy).

The audit focused on the period between June 2009 and March 2015.

In conducting the audit we:

- reviewed key policies, procedures and supporting documents
- interviewed senior officers from key agencies, and project management staff
- spoke to representatives from City of Karratha (formally Shire of Roebourne), Shire of Ashburton and Town of Port Hedland
- conducted fieldwork and interviews in Karratha.

We conducted the audit in accordance with Australian Auditing and Assurance Standards.
The $130 million, 3.5 year project is now expected to cost $252 million and take nine years

The aim of PUPP was to secure the power supply in parts of Karratha, South Hedland, Roebourne and Onslow against the effects of cyclones and other extreme weather events. This was to be done by replacing existing above ground power lines with underground power for about 5,600 properties. When finished, all of Port Hedland and Karratha will have underground power. Figure 1 outlines key milestones since 2009.

Figure 1: Key PUPP events since 2009

2009
- June - Cabinet approves $35 million for PUPP (with in principle $100 million State total plus $32 million local government contribution)
- June - DRD&L and Horizon sign financial agreement for $35 million RfR funds
- October - Request for tender for Karratha undergrounding works

2010
- January - Cabinet approves remaining $65 million
- August - Contract for Karratha awarded
- October - Construction in Karratha starts
- November - DRD&L and Horizon sign financial agreement for total $100 million RfR funds

2011
- May - Tender for South Hedland undergrounding works
- July - Karratha contract signed
- December - South Hedland contract signed
- December - Town of Port Hedland approves $11.5 million PUPP contribution

2012
- February - Construction in South Hedland starts
- April - Original undergrounding contractor for Karratha demobilises
- June - Horizon board approves budget of $230 million and delivery strategy for PUPP
- August - PUPP steering committee endorses revised budget and strategy
- November - New contracts signed with new contractor for parts of Karratha work

2013
- January - Karratha works slowed down as funds near end
- November - DRD commissions review of PUPP management
- December - Construction in South Hedland complete
- December - City of Karratha approves $34.55 million PUPP contribution

2014
- June - Government approves additional $75 million RfR funding

2015-2018
- June 2015 - DRD and Horizon sign financial agreement for extra $75 million RfR funds
- 2016 - Roebourne works to be completed
- 2018 - Karratha works to be completed
- 2018 - Onslow works to be completed
Budgeted costs have increased by $100 million

When Government approved PUPP in July 2009, it expected that the project would be complete by December 2012 at a cost of $132 million. State government, through RfR, was to contribute $100 million and participating local governments would contribute around $32 million. The budget (Table 1) and timelines have changed considerably since then.

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>2009 budget ($ million)</th>
<th>2010 budget ($ million)</th>
<th>2012 budget ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RfR</td>
<td>100</td>
<td>100</td>
<td>175</td>
</tr>
<tr>
<td>City of Karratha</td>
<td>18.7</td>
<td>18.7</td>
<td>34.6</td>
</tr>
<tr>
<td>Town of Port Hedland</td>
<td>11.7</td>
<td>11.7</td>
<td>11.5</td>
</tr>
<tr>
<td>Shire of Ashburton</td>
<td>1.2</td>
<td>1.2</td>
<td>2.1</td>
</tr>
<tr>
<td>National Broadband Network (NBN) Co.</td>
<td>Nil</td>
<td>18.7</td>
<td>Nil</td>
</tr>
<tr>
<td>Horizon</td>
<td>Nil</td>
<td>Nil</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td><strong>132</strong></td>
<td><strong>150</strong></td>
<td><strong>230</strong></td>
</tr>
</tbody>
</table>

Source: Horizon, with OAG analysis

Table 1: PUPP funding budgets 2009-12

The NBN works offered the prospect for Horizon to offset costs for PUPP, including a voltage upgrade in Karratha. However, by 2013 both parties agreed that the work carried out for Horizon did not meet technical specifications, and terminated the contract. As a result, RfR is now funding the voltage upgrade at an estimated cost of $28 million. The City of Karratha is not contributing to this sum.

In August 2012, Horizon proposed a new budget of $230 million and a completion date of 30 June 2018 for PUPP. In June 2014, Government increased its total RfR contribution to $175 million, with local governments to provide $48 million. Horizon contributed $7 million after gaining Ministerial approval. This approval was required because Government was unwilling for the project to impact on Horizon’s financial bottom line. As discussed below, Horizon also contributed another $22 million outside the budget.

The budget growth was almost entirely due to the cost of works in Karratha increasing from $73.3 million in 2009 to the current figure of $136 million (Table 2). As a result, the City of Karratha’s contribution has also increased, from an expected $18.7 million in 2009 to the current agreed sum of $34.6 million (this includes the sum for Roebourne).

The cost of works in South Hedland increased from a budget of $46.8 million to a total of $53.8 million. An agreement signed between the Town of Port Hedland and Horizon in December 2011 limited the Town’s contribution to $11.5 million, or 21.4 per cent of the cost. Currently, the Town has thus far paid $10.9 million. Horizon is taking on $200 000 of this sum.
Table 2: Project cost by town

* Karratha voltage upgrade added to budget in 2010 to support PUPP.

Horizon spent almost $22 million on PUPP in addition to the $230 million

The expected cost of PUPP to the state through RfR and the three local governments is $230 million. Horizon is confident it can deliver the remaining parts of the project within this budget.

However, Horizon has incurred almost $22 million of expenditure on top of the RfR and local government contributions. To date, Horizon has not included these figures in public discussion about the total cost of PUPP. However, it has met its reporting requirements by including the information in notes to its annual financial statements, reporting to their Minister and to the steering committee. Table 3 details the additional costs.

Table 3: Costs incurred by Horizon

<table>
<thead>
<tr>
<th>Description of additional costs</th>
<th>$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dismantling overhead network in Karratha and South Hedland</td>
<td></td>
</tr>
<tr>
<td>Karratha – Removed from tender to limit initial contract price. Horizon took on most of this work.</td>
<td>5.2</td>
</tr>
<tr>
<td>South Hedland – carried out by contractor, but expense removed from budget and absorbed by Horizon</td>
<td></td>
</tr>
<tr>
<td>Contractor overheads</td>
<td></td>
</tr>
<tr>
<td>Initial Karratha contractor paid monthly overhead totalling $12.9 million over 18 months as per the contract terms. Horizon did not believe it received value for money from these payments. It therefore transferred $6.5 million from the PUPP account to its own general account. This decreased the sum required from RfR and the City of Karratha.</td>
<td>6.5</td>
</tr>
<tr>
<td>NBN works</td>
<td></td>
</tr>
<tr>
<td>Horizon paid $10 million for works carried out specifically for NBN in Karratha but received no payment for this work and has expensed these amounts for accounting purposes.</td>
<td>10.1</td>
</tr>
<tr>
<td>Total additional costs</td>
<td>21.8</td>
</tr>
</tbody>
</table>

Source: Horizon, with OAG analysis
Work is now forecast to be completed in 2018

Work on PUPP was originally proposed to start in July 2010 and finish in all four towns by the end of 2012. The revised completion date is now June 2018.

Works began in Karratha in October 2010. The first contractor remained in place until April 2012. Until 2014, other contractors continued works under the original budget limits. At January 2015, about 1 500 lots or 45 per cent of the initial plan of 3 300 had been completed. Work in Karratha should finish in March 2018.

Work in South Hedland commenced in February 2012 and was completed in December 2013. One thousand six hundred and thirteen lots were connected, compared to the initial estimate of 2 028.

Site works in Roebourne are planned to be complete by October 2016. Onslow should be completed by June 2018.
The assessment of risks and costs supporting the decision to fund PUPP was not sufficiently robust

Government approved total funding of $100 million for PUPP in June 2009. At that time, it released $35 million and in 2010, it released the other $65 million. We expected to find comprehensive supporting evidence for the proposal including its costings. Instead, although there was a good case for undergrounding power in the Pilbara, the information supporting the proposal was insufficient for such a large project, especially for the costings. DRD believes that its processes have improved, but that this process met expectations at the time.

PUPP evolved from several earlier undergrounding proposals

The concept of undergrounding power in Pilbara towns evolved into what became PUPP through several reviews and proposals before Cabinet approved it in June 2009. There was no single specifically developed business case for PUPP, but the combined information from key industry experts, provided a reasonable case to argue the need for the project, although it would be unlikely to meet current RfR proposal requirements.

In August 2008, Horizon produced a network ‘hardening’ strategy. This described a 10-year plan to move power underground in 13 towns across the state at an indicative cost of $184 million.

In December 2008, the Office of Energy released a review of the state wide underground power project, which had been in place since 1996, and delivered by Western Power. This review recommended that the newly established RfR program should fund a project to harden power networks in Pilbara towns that routinely suffered from cyclones.

By March 2009, Horizon had developed an undergrounding proposal for Cyclone Area Reliability Enhancement (CARE). This involved a first stage, in Karratha, South Hedland, Roebourne and Onslow, and a second stage in Exmouth and Carnarvon, with a potential third stage for the other towns in the hardening strategy.

In June 2009, PUPP was submitted to Cabinet as a $35 million portion of the $300 million Pilbara Revitalisation Plan, with Horizon as the agreed delivery agent.

DRD has advised that since July 2013, all proposals for RfR funding must be supported by a project business case. The business case has to be assessed by DRD and submitted to Treasury for input before being provided to the Minister for Regional Development for consideration. The assessment by DRD now checks:

- if cost estimates are supported by evidence
- if there is sufficient evidence that the project can be delivered within the proposed timeframes.

We note that the 2014 proposal for $75 million extra funding was supported by a business case that met these new requirements.
The original costings were based on limited evidence and did not reflect local conditions

The costings up to and including those in the Cabinet proposal were based on limited evidence. Until the Karratha tender process, no costing had been based on detailed plans, or good understanding of ground or market conditions, all of which would impact the final outcome.

In 2009, the Office of Energy (now the Public Utilities Office) developed the formal costings for the PUPP proposal. We expected that it would base these costings on sound information reflecting the real cost of delivering underground power in the Pilbara. However, we found almost no evidence to support the basis for the costings.

The limited evidence available showed that the original estimates were based on the experience of undergrounding power in other parts of Port Hedland between 2004 and 2007, which was estimated at $13 000 per lot. Another $4 000 per lot was added as a generic loading for increases in costs, making the estimate $17 000 per lot. We note that the $17 000 estimate was referenced to the cost of a similar project in Fremantle in 2007. The estimates did not factor in the potential impact of different conditions in different towns.

Ground conditions for the project sites were noted as a concern during the costing but were not factored in to the final estimate. The Office of Energy assumed that the designated project manager would survey the ground conditions prior to the commencement of the project. However, this did not happen.

Horizon’s hardening strategy costed the undergrounding of power across 13 towns in regional WA at $187 million, with costs in most towns about $11 000 per lot. The strategy noted that these figures were preliminary estimates, and that detailed planning would be needed to find the actual cost.

In the 2009 CARE proposal, Horizon costed the four towns at about $12 800 per lot. The total for those towns was $91 million, including $39.7 million for 3 100 lots in Karratha, and $40.5 million for 3 200 in South Hedland. This document also noted that these costs ‘may vary following planning and design’.

We note that ‘per lot’ estimates only provide very broad average costs and are only accurate if the two compared areas have similar conditions. Further, they do not take into account differences between single house lots and multi-unit developments, or between residential lots and commercial or industrial lots.

The revised cost of PUPP of $230 million to service 5 100 lots (excluding the voltage upgrade) means the average cost per lot is now expected to be $41 000.

Choosing Horizon increased risk because it had no experience of large undergrounding power projects

In May 2009, the Office of Energy recommended that Western Power should manage PUPP due to its experience in delivering the State Underground Power project. Based on later advice from the Office of Energy (supported by DRD&L and Horizon) the Minister for Regional Development decided that Horizon would manage the project. We found no documented rationale for the advice.
In its initial recommendation, the Office of Energy noted that Horizon had no previous experience in delivering large undergrounding projects and would need to develop its capacity and contracts before it could commence development and implementation. Western Power was recommended as it:

- had the skills and experience, developed over 13 years of delivering undergrounding projects
- would be able to contain costs due to the competitive contracts and relationships established through a three-year heads of contract agreement
- had contracts and contractors already in place, which would reduce development and implementation times
- could start almost immediately due to the capacity and contracts that were already in place for the State Undergrounding Program.

Assigning Horizon as project manager meant it would need additional time to develop capacity and contracts. However, the planning and delivery timeframes did not account for this.

The original funding agreement had unrealistic milestones and did not link funding to progress reporting

In November 2010, Horizon and DRD&L finalised an agreement for $100 million of RfR funding for PUPP, which had a total budget of $150 million, including a $20 million voltage upgrade for Karratha. The agreement included only high-level milestones that were to be reported on, but it was not intended to be a monitoring tool. Specifically, single milestones were set for starting and completing activities such as tendering, design and construction. These were of little use because PUPP was a program of four individual town based projects, and setting single milestones reduced the visibility of progress on each project.

**Example of an unachievable milestone included in the original agreement for PUPP**

The initial completion milestone for design of construction work was 30 April 2010:

- this date had passed before the agreement was signed
- it did not reflect the intention to complete design of the different projects over a number of years.

By November 2010, when DRD&L and Horizon signed the agreement, only designs for parts of Karratha were completed. Designs for the two parts of South Hedland were not completed until February 2011 and Roebourne was finalised in 2014.

The milestone for construction to commence was 1 June 2010. However, construction did not commence in Karratha until October 2010. South Hedland commenced in February 2012, while Roebourne and Onslow are yet to start.
The funding agreement also had inadequate monitoring and reporting requirements, and did not link the release of funding to progress or completion. This made it difficult for the Department to retain funds, which gave it little influence on progress.

The funding agreement did not contain sufficient formal reporting requirements. For each town and the Karratha voltage upgrade, the agreement required one report on progress, with ‘supporting photographic evidence’. The voltage report was required at the end of 2010, the report on Karratha residential areas by the end of 2011, and one at the end of 2012 for each of the other towns. This was wholly inadequate for a $100 million investment over three and a half years.
Oversight and management was inadequate, contributing to cost overruns and delays

PUPP was a large and complex project that presented cost, delivery and reputational risks. These risks were well known at the start of the project but were not effectively managed.

We expected to see:

- clearly identified project objectives and scope
- realistic timeframes and budget
- sound governance structure that provided transparency and accountability
- procurement practices that reflect value for money and best practice
- sound contract and project management suited to the project risks.

Horizon contracted out the works parts of the project made up of excavation, laying cables and connecting. It retained responsibility for purchasing materials, which it then supplied to its contractors.

Horizon’s management did not match the project risks

In the initial contracting for undergrounding works in Karratha, Horizon did not adapt its project management effectively to the risks in its chosen contracting and delivery approach. At times, it made choices that increased the project risk, and at others, it did not have adequate oversight to manage progress.

By changing its procurement strategy Horizon increased the risk to the project

In July 2010, following a 10-month tender process, Horizon awarded a single contract for all construction work in Karratha to one company, at a price of $41.1 million. Initially, Horizon sought to divide the work into two contracts to have more manageable projects and lower project risk. However, higher than expected tender prices led them to re-tender the work in one package to seek cost savings.

Horizon’s initial plan to issue separate contracts for smaller work parcels was intended to reduce risk by containing any cost growth or performance issues and to allow lessons learned to be incorporated in future contracts. Horizon’s actual contracting process increased its exposure to risk, and a number of risks were realised.

The tender process for Karratha focused heavily on finding the lowest price. When assessing value for money, Horizon put a weighting of 55 per cent on the tender price. By comparison, Horizon put a weighting of 30 per cent on the tender price for the South Hedland contract. We note that a probity evaluation of the South Hedland tender process recommended reducing this even more in future tenders, to improve the overall value for money judgement.

Following an expression of interest process, Horizon invited 12 companies to submit proposals for two separate contracts. Companies were not required to bid for both. Eight companies responded.

No tender submission for either of the two contracts were within Horizon’s budget estimate of $35 million (we note that this figure is lower than the $39.7 million estimated in the CARE plan in 2009). Seven of the eight companies submitted bids for both contracts. The combined bids ranged from $55.2 million (from the company finally awarded the contract) to $116.7 million (Table 3). We note that one company was not considered beyond the original tender round
because it had only bid for one part of the contract. This appears inconsistent with seeking to spread the risk across separate contracts.

The fact that no company submitted a bid within the estimated budget should have provided a warning that the project estimates might have been unrealistic.

Horizon then asked the remaining seven companies to retender, believing there were ‘major arithmetical errors and/or rates inconsistencies’ in the bids. Again, all the ‘corrected’ bids were over budget (some had actually increased). A further request sought savings from bidders. Five companies responded, but prices still exceeded budget.

To lower prices, Horizon then reduced the scope of works by removing the requirement to dismantle overhead power lines. It received five tenders with a lowest price of $49.9 million. Finally, in an effort to reduce overheads and therefore total price, Horizon asked companies to bid for a combined single contract for all the works in Karratha. This resulted in three bids, ranging from $41.1 million to $55.2 million.

Horizon accepted the bid of $41.1 million, which was above its original estimate for Karratha, and significantly less than the other two bids. During negotiations, the price increased to $51.2 million to accommodate increased contractor rates and the cost impacts from NBN works. This was almost the same figure as the selected contractor’s ‘corrected’ bid.

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<th>Both contracts — ‘corrected’ bid</th>
<th>Both contracts — Horizon push for savings bid</th>
<th>Reduced scope bid</th>
<th>Final bid — combined single contract</th>
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<td>$55 166 143</td>
<td>$52 534 058</td>
<td>$49 902 861</td>
<td>$45 678 078</td>
<td>$41 146 094</td>
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<td>Contractor B</td>
<td>$74 181 342</td>
<td>$74 585 343</td>
<td>$65 004 607</td>
<td>$58 147 311</td>
<td>$48 840 370</td>
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<td>Contractor C</td>
<td>$73 785 984</td>
<td>$79 966 570</td>
<td>$74 130 659</td>
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<td>No bid submitted</td>
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<tr>
<td>Contractor D</td>
<td>$73 590 431</td>
<td>$82 778 577</td>
<td>$67 373 861</td>
<td>$58 283 080</td>
<td>$55 209 000</td>
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<tr>
<td>Contractor E</td>
<td>$82 241 931</td>
<td>$97 853 444</td>
<td>$77 209 132</td>
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<td>No bid submitted</td>
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<tr>
<td>Contractor F</td>
<td>$102 801 266</td>
<td>$102 735 696</td>
<td>No bid submitted</td>
<td>No bid submitted</td>
<td>No bid submitted</td>
</tr>
<tr>
<td>Contractor G</td>
<td>$116 677 478</td>
<td>$114 366 408</td>
<td>No bid submitted</td>
<td>No bid submitted</td>
<td>No bid submitted</td>
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</table>

Source: Horizon, with OAG analysis

Table 4: Karratha tender prices 2010
The scope of works and price in the initial Karratha contract did not accurately reflect the work needed

Horizon and the successful tenderer agreed a contract price for the works in Karratha of $51.2 million. This was based on a scope of works that estimated the type and quantities of works to be done. For example, whether the excavation would be by digging or drilling and the types of soil or rock. A set of rates was agreed that would be paid for quantities of work. How achievable the price was rested on the accuracy of the estimates in the scope of works. Those estimates were inaccurate, and consequently the price was not an accurate reflection of the actual works needed.

The main activities required to move power underground are excavation and installation. Excavation includes two main options – digging trenches (the less expensive option) and drilling. The contract schedule included set amounts for each type of excavation work. In addition, each type of excavation work was priced according to the type of ground involved (soil, rock, or hard rock). The contract also estimated the amount of each type of ground to be excavated.

Horizon considered that a substantial increase to the contract price was unlikely. The submission to the Board seeking approval to proceed with the initial Karratha undergrounding contract states that:

The quantities [in the contract] were derived from detailed engineering designs, supported by soil condition assessments across the project footprint by local Horizon Power representatives, thus substantial deviations from these quantities are considered unlikely.

The submission noted that there were risks if the total excavation amount or the soil-to-rock ratio were underestimated. However, it concluded that detailed drawings and advice on the soil ratio meant the remaining risk would be covered by a contingency of five per cent (about $2 million). In fact, these mitigation efforts were inadequate, and all the estimates appear to have been in error.

The contract underestimated the total amount of excavation that was required. A review carried out for Horizon in March 2015 found that the amount of excavation needed would be 213 linear kilometres, an underestimation of 30 kilometres (14 per cent) from the contract figure of 183. In a contract priced on the metres of excavation, this obviously increases the expected overall cost. Extra metres dug also means extra cables and conduits, adding to material costs.

The same review also found the amount of drilling compared to digging across all works in Karratha would be much higher than the original estimates. Drilling costs more than digging and so inaccurate estimates of the balance of the two have a direct impact on total contract costs.

Finally, inaccurate estimates of the local ground conditions and the proportion of excavation in more difficult ground conditions impact overall costs. Horizon noted in its analysis of contract bids that the proportion of hard rock ranged from 25 to 85 per cent across Karratha. The initial Karratha contract set the hard rock figure at about 10 per cent of all work. A more recent contract for the Karratha industrial area has a 20 per cent hard rock estimate. However, given the significantly lower proportion of hard rock in the areas still to be completed, Horizon expects the remaining areas of Karratha to come within or below this figure to achieve overall delivery of 10 per cent hard rock for all work.
Horizon did not have effective oversight of the Karratha contract

Having settled on a quantities and rates based contract, it was essential that Horizon should have a clear and regular view of progress and mechanisms to limit the impact of any variations from the scope of works, timelines and price. At the start of the contract, Horizon put measures in place, but then did not generally follow these and its oversight of the contractor was limited.

When the contract was established for works in Karratha, Horizon sought to limit the risk of cost escalations through:

- pilot work areas that were set up to allow Horizon to assess the actual cost and timeliness of work delivered by 31 December 2010
- mapping the project and budget into discrete work areas, called ‘cells’, and limiting costs on each cell to 110 per cent of the cell budget. The contractor had to seek written approval from Horizon to exceed this limit
- a cap of $41 million as a trigger for a review of project progress and costs. This was intended to provide further control over costs and progress outside the day-to-day management of the contract.

Although these measures were in place, they were not effective:

- Horizon’s information system could not provide financial data by ‘cells’. This meant it could not monitor the 110 per cent cell limit and know if it had been breached.
- Works were expanded beyond the two pilot cells without a formal review of any issues arising. A review in June 2011 forecast that costs in one pilot cell would be 46 per cent more than budgeted. Horizon broadly attributed this increase to high levels of rock in the area, but this did not trigger a review of this risk across the contract.
- Payment was based on work carried out, but it was not linked to performance. There were no weekly or monthly performance targets. Under the works contract, Horizon also paid $745 000 per month for contractor overheads throughout the 18 months it was on site, regardless of output or progress. Nor were there requirements or outcomes that had to be demonstrated before the $41 million cap was reached.
- The overall cost impact of decisions to change the amounts of drilling compared to digging trenches was not properly considered or monitored. Drilling can help limit the disruption caused by putting power underground, but may have large cost implications.
- Horizon initially made the Karratha contractor responsible for progress monitoring and performance reporting, which it believes was routine contracting practice. This reduced Horizon’s ability to manage or control progress, especially given the lack of formal progress requirements. Horizon initially budgeted only $4 million for oversight across the whole of PUPP. Horizon took on this role after the first contract period, and expects it will spend another $16 million by 2018.
- Notwithstanding the inadequate oversight of performance, the initial contract did not allow Horizon to compel the contractor to make good any shortfalls resulting from delays created by the contractor. This limited its ability to manage any possible problems in the project.
Horizon put better arrangements in place for South Hedland

Construction work in South Hedland, the second largest component of PUPP commenced in February 2012 and the contractor completed it in December 2013, with 1,613 customers connected to new underground power.

Horizon had improved its planning, oversight, and management for this part of the project:

- Horizon again let a single contract for works in two distinct areas (South Hedland and the Wedgefield industrial area), although this was planned from the beginning of the process
- there were more complete designs and plans before the contract was finalised, allowing for more accurate costings
- payment was linked to performance, with detailed daily, weekly and monthly progress requirements.

Although the actual cost of $53.8 million for the South Hedland work exceeded the budget of $46.8 million, Horizon attributes most of this to two extreme weather events during the delivery, which invoked ‘unexpected and disruptive event’ clauses in the contract.

Key agreements were unsigned when work in Karratha began

When construction of the first component of PUPP commenced in October 2010, the contract was not finalised and no funding agreement was in place with the City of Karratha. This increased risk and uncertainty on the project.

Horizon awarded the contract for Karratha in September 2010. Construction commenced in October 2010, and continued for 10 months before the full contract was signed. During that time, a $4 million letter of intent referencing the scope of works was used to allow the contractor to commence work, within Horizon’s delegated financial authority, prior to the Minister’s approval.

Horizon’s internal audit reported in April 2011 that this arrangement increased Horizon’s financial, legal and reputational risk and recommended that management bring it to the Board’s attention. The value of the contract when signed in June 2011 was $51.2 million.

When construction in Karratha commenced, Horizon did not have a formal agreement with the City of Karratha for its contribution, although the City had agreed in principle to pay 25 per cent. They signed a $34.6 million agreement in November 2014. Until that time, it was not clear what amount the City would agree to, increasing uncertainty about funding. We note that the Town of Port Hedland limited its exposure to $11.5 million in its agreement.

The external steering committee has not met Cabinet’s original intentions

When Cabinet approved PUPP in 2009, it clearly expected that an external steering committee would provide oversight for the project and report to the Minister for Regional Development and Lands. This would have provided strong, high-level governance, which is important in a project like PUPP. However, the committee in various forms has not been able to give this level of assurance.

PUPP is an unusual project in a number of ways, which adds to the importance of having high-level governance and oversight. Horizon is at once the delivery agent and the final owner of the asset. DRD is the funder as well as one of the state’s representatives. Local governments are stakeholders and funders.
An external steering committee was established from 2009 and included CEOs of the Department of Regional Development and Lands (who chaired the committee), Horizon, the Pilbara Development Commission, the three local governments and a senior officer from the Office of Energy. Under its 2009 terms of reference, the committee was intended to provide transparent, effective and efficient delivery of PUPP by:

- overseeing the project and approving the project plan
- approving disbursements from project funds
- approving costing and timelines that Horizon Power developed
- overseeing project implementation and report to government on status
- addressing project issues that arose or were brought to the attention of government
- providing guidance on cost recovery undertaken by local governments involved to ensure consistency and equity
- approving communication and community liaison strategies and plans for the project.

Under the terms of reference, the committee was required to approve the disbursement of project funds. However, this did not happen. In fact, this was impractical because Horizon had received the entire $100 million by November 2010, and was entirely in control of expenditure. We saw no evidence that major decisions, such as letting the contracts in Karratha or South Hedland, were brought to the committee for approval, although we note Horizon asked the committee to endorse its tendering process.

While the committee met regularly from 2009, it mainly worked as an information sharing body between key stakeholders of PUPP. Rather than approving activity, it appears that expectation within the committee was that it would endorse decisions. Although Horizon regularly reported progress and key issues, there is little evidence from the minutes that the committee sought clarification or assurance that Horizon would meet timelines, or gave any clear direction. Again, this reflects that the committee had no clear authority, or that there was an expectation of regular reporting to the Minister. For example, we found no minuted correspondence to the Minister, or recorded decisions on funding.

Finally, attendance at steering committee meetings was inconsistent, and a number of senior members were routinely absent.

In January 2015, new terms of reference for the steering committee came into effect. In June 2015, a new funding agreement between Horizon and DRD was formalised, giving DRD improved oversight.

Nevertheless, improvements could still be made. The committee includes representatives from Horizon, local government, the Public Utilities Office, and the Pilbara Development Commission (as Chair). DRD does not sit on the committee, but informed us that the Pilbara Development Commission represents it and the state. The committee is now expected to consider:

- oversight of stakeholder management
- program scope and prioritisation of major project stages
- oversight of major project changes
- changes to execution strategy as deemed necessary to improve the overall delivery of the program
- financial contribution arrangements
• monitoring of performance and cost
• policy matters
• support from relevant government agencies
• program branding and external communications.

The committee’s terms of reference contain no requirement to approve or endorse disbursement of funds and as before, there is no formal reporting expectation, although DRD receives copies of minutes and Horizon does routinely report on its activities and plans. This again improves oversight, and the committee is currently exploring options to facilitate direct reporting of this information, which would give added assurance to its operations.

In June 2015, DRD and Horizon signed a formal funding agreement for the extra $75 million. This improves areas of oversight, but also has weaknesses. Specifically:

• DRD now has a phased project payment approach, which requires Horizon meeting agreed milestones before receiving payments. This increases oversight and limits risk of costs blowing out.

• The agreement states that progress must be endorsed by the Pilbara Development Commission. This third party endorsement may improve oversight but on the other hand, it means that this role falls on the chair rather than on to the steering committee.
Horizon has addressed the weaknesses evident in the early phases of PUPP

Since 2012, Horizon has improved the way it manages PUPP to respond to issues from the earlier parts of the project, most of which it identified through internal reviews. Key improvements to Horizon’s oversight include:

- a management-level internal committee including the general manager and other senior staff from Horizon responsible for the delivery of PUPP
- regular meetings between senior Horizon project management staff and the contractor to review the progress of works and resolve any emerging contractual issues
- additional weekly meetings between Horizon and the contractor to monitor and address operational matters such as detailed progress against weekly schedules, resources and quality.

Contracting, management and monitoring have also improved. Specifically:

- the remaining construction works in Karratha have been separated into eight small, more manageable parcels, each to be contracted separately. Works have also been scheduled in succession rather than together, to increase focus and control over each project
- contracts have been improved to allow Horizon to compel contractors to complete work that is behind schedule
- Horizon has established detailed daily, weekly, and monthly progress targets for contractors, and verifies claims on the ground. Horizon has based these targets on the delivery times of works already carried out in Karratha and South Hedland. Given the problems already experienced in Karratha, this makes the targets realistic and highly achievable
- there is considerable management effort monitoring and managing the project. Currently Horizon has seven FTE assigned to managing the contract and the project. This gives Horizon adequate visibility and ability to act. Horizon now expects management costs to total $20.5 million, compared to $4 million in the original budget.

Horizon has engaged an expert consultant to carry out ongoing expenditure reviews and to forecast costs. This is now required under the funding agreement, and Horizon is required to provide this information to the steering committee. This again improves oversight, and the committee is currently exploring options to facilitate direct reporting of this information, which would give added assurance to its operations. In 2013, DRD commissioned a review of Horizon’s changed approach to the project, which found that they were reasonable and appropriate for the project risks.

With these processes in place, Horizon is confident that it will complete undergrounding power in the selected parts of Karratha, Roebourne and Onslow by 2018, within the $230 million funding limit and without incurring further costs to itself.
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Office of the Auditor General
Western Australia

7th Floor Albert Facey House
469 Wellington Street, Perth

Mail to:
Perth BC, PO Box 8489
PERTH WA 6849

T: 08 6557 7500
F: 08 6557 7600
E: info@audit.wa.gov.au
W: www.audit.wa.gov.au

Follow us on Twitter @OAG_WA

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