



**INTERIM SUBMISSION**

**Economic Regulation Authority**

**INQUIRY INTO  
STATE UNDERGROUND POWER PROGRAM  
COST BENEFIT STUDY**

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## EXECUTIVE SUMMARY

Local Governments are integral to the implementation of the State Underground Power Program (SUPP) through the preparation of Expression of Interest Proposals, community surveys, detailed proposal development and project implementation (with Western Power and its contractors). Local Governments who have and others who have not undertaken projects under the SUPP contributed comments to this submission from their differing perspectives.

In order to effectively assess the overall public benefits of the SUPP it is important to establish the objectives of the program within contemporary State Government policies, including energy security and environmental policies. There have been significant changes in these policies over the fifteen years since the program was established.

Local Governments have indicated that they do not believe that the current SUPP configuration, which is being assessed in this Inquiry, provides a sound basis for funding the program into the future. Local Governments believe that as the owner and operator of the electricity distribution infrastructure within the South West Interconnected System (SWIS), Western Power needs to include the progressive undergrounding of remaining overhead distribution infrastructure within its asset management program. This long term program would enable the overall investment in renewal of the distribution infrastructure to be optimized, minimizing the cost of replacing poles and associated overhead equipment and achieving the most rapid and cost effective improvement in reliability of power supply to consumers. The ability and willingness of property owners to fund half the cost of installing underground power is a currently a key project selection driver. Consequently it is unlikely that the greatest increase in reliability and stability of supply is achieved for the resources invested.

Feedback indicates that in some areas stakeholders are willing to contribute to the costs of undergrounding electricity distribution infrastructure. Where the beneficiaries of underground power, including the majority of property owners in an area, wish to receive the benefits of underground power sooner than would occur under the optimized program, they would contribute to the cost of bringing forward the program.

Potential beneficiaries from the undergrounding of electricity distribution infrastructure include power generators and retailers who enjoy greater sales through a more reliable network. These should be included in assessment of benefits achieved by stakeholders. In order to assess the benefits of the SUPP achieved by the identified beneficiaries it will be important that this Inquiry consider the outcome for a sample of projects rather than just the program as a whole. It may be the case that the share of costs between the parties should differ in different circumstances.

A range of broad community benefits from removal of overhead power distribution infrastructure, such as reduced road trauma, have previously been identified. However,

provision of underground power can be catalytic in enabling achievement of other benefits such as enhanced and more energy efficient street lighting (as spacing of the luminaires is no longer constrained by spacing of poles for the power network). This contributes to the achievement of other State and Federal Government objectives including reduction in greenhouse gas emissions (from improved energy efficiency), improved feelings of community safety and arguably health benefits from encouraging more physically active lifestyles. Furthermore, the opportunity for increased tree plantings in the road reserve provides important habitat for wildlife and contributes to broad environmental and biodiversity objectives.

Local Governments have identified that the lack of capacity and willingness of property owners to pay half the cost of providing underground electricity distribution is increasingly a barrier to achieving the objectives of the SUPP. In order to better understand this and develop appropriate solutions, it is suggested that this Inquiry consider the benefits likely to be achieved by different types of residential property owners including owner-occupiers; private, non-government organization and corporate property investors; government owned homes and commercial property owners. It will also be important to understand whether any estimated impact of underground power on property values is sustainable over time, as underground power becomes increasingly prevalent throughout the urban areas of south west Western Australia.

Currently the costs of electricity distribution are essentially spread between electricity consumers. However, the reliability and quality of the service delivered in different areas across the SWIS differs significantly. The equity impacts of this require consideration, alongside the impact on those who have (or have not) contributed directly to the cost of undergrounding the power network.

## **Recommendations**

1. Re-examine the objectives of the State Underground Power Program (SUPP) within broader State Government policies including energy and environmental policy objectives.
2. Western Power be required to develop a high level program for the undergrounding of all electricity distribution infrastructure over 20 – 40 years utilizing best practice asset management principles and use this as the basis to determine the sequence of work within the SUPP (notwithstanding the opportunity to bring forward projects identified below).
3. Determine whether the benefits received by stakeholders are similar across all projects and if not, identify the principles for a project specific basis for cost sharing between the beneficiaries.
4. Assess whether the benefits of higher property prices have changed over time (as underground power becomes more common) and whether that benefit is sustainable if the vast majority of the entire network is underground.

5. Estimate the benefits from improved reliability of the power network to electricity generators and retailers and include these in share of costs on the beneficiary pays principle as appropriate.
6. Investigate the potential benefits to community health from higher exercise rates arising from improved street lighting.
7. Include network asset management principles and economics more clearly in the project identification, prioritization and funding determination process.
8. This Inquiry specifically consider the perspectives of owner-occupiers, private investors, government owned homes and other investors in assessing the benefits received by property owners.
9. This Inquiry should consider whether measures such as the SEIFA index for an area provide a sufficient measure of the capacity of a property owner to contribute to the cost of an underground power program.
10. Cost estimates used to gauge community support for projects be adjusted for cost inflation during the expected time between the consultation period and project construction.
11. This Inquiry should give guidance as to the analysis of equity considerations between those who have already received a public contribution to the provision of underground power and those yet to do so.
12. Within the context of an established program for progressive replacement of overhead electricity distribution infrastructure with an underground network, provide the opportunity for communities to bring forward the work in their area by contributing the marginal cost of early infrastructure write-off and capital expenditure.
13. Evaluate the implications to the overall SUPP and its objectives of broadening the scope of the program to include peri-urban areas and the undergrounding of electricity distribution infrastructure to accommodate road expansion and upgrade works.



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## 1.0 BACKGROUND

The West Australian Local Government Association (WALGA) is the united voice of Local Government in Western Australia. The Association is an independent, membership-based group representing and supporting the work and interests of all 139 Local Governments in Western Australia.

The Association provides an essential voice for almost 1,400 elected members and over 12,000 employees of the Local Governments in Western Australia as well as Christmas Island and Cocos (Keeling) Island Councils. The Association also provides professional advice and offers services that deliver financial benefits to Local Governments and the communities they serve.

Local Government is represented on the Underground Power Steering Committee, convened by the Office of Energy, and individual Local Governments are actively engaged in the development and implementation of projects under the State Underground Power Program. Consequently the opportunity to contribute to this Inquiry is valued.

The Local Government sector advocated for increased State Government funding for undergrounding power distribution infrastructure as part of its submission prior to the 2010/11 State Budget.

This Interim Submission on behalf of the Local Government sector has been prepared in consultation with a limited number of Local Governments served by the South West Interconnected System, due to the tight time frames provided by this Inquiry. Comments and input was sought from all Local Governments and a workshop held involving practitioners from a small number of Local Governments who have recently or are currently undertaking projects under the State Underground Power Program (SUPP).

This interim submission will be considered at the next State Council meeting and further matters may be brought to the attention of the Inquiry at that time.

## 2.0 STRATEGIC CONTEXT

### Recommendation

1. Re-examine the objectives of the State Underground Power Program (SUPP) within broader State Government policies including energy and environmental policy objectives.

There have been major changes in State Government energy and environmental policies since the State Underground Power Program (SUPP) was established in 1996. The structure and organization of the electricity industry has been significantly reformed. The former,

vertically integrated monopoly provider of electricity (Western Power had only been formed from the State Energy Commission one year before the SUPP commenced) has been replaced by separate generating, retailing and distribution businesses. Although Western Power is responsible for the distribution assets, generators and retailers are vital stakeholders not separately identified as key stakeholders and beneficiaries of the SUPP.

The SUPP has the potential to contribute catalytically to the achievement of environmental policy objectives, particularly in Greenhouse gas reduction and biodiversity enhancement.

There are now emerging changes in the generation technology, particularly the more widespread use of embedded generation, including photovoltaic systems on houses and commercial buildings. A number of reports have highlighted the implications of these technological changes on demands on the electricity distribution network, including the need for "smart grids." Significant public investment in electricity distribution infrastructure needs to be cognizant of the emerging demands on the network.

The National Broadband Network (NBN) will be rolled out in areas served by the SWIS over the coming few years. While details are still subject to discussion between stakeholders, it would seem unlikely that fibre-optic cable will be installed above ground in areas already served by underground power. For areas soon to be provided underground power, there may be efficiencies arising from coordinating the installation of underground power and fibre-optic cable.

If appropriately configured, the SUPP could contribute to reduced energy consumption and greenhouse gas emissions, through the installation of optimized street lighting, once the spacing of streetlights is no longer constrained by the location of power poles. This may require some change to the program design to facilitate the adoption of energy efficient lighting, including utilizing the scale economies of the program to lower the costs of new luminaires.

Trees and other vegetation in the road reserve are increasingly important to the maintenance of biodiversity in urban areas as the demand for higher density housing reduces block size. Removing overhead power lines allows larger trees to be grown providing habitat and other environmental values enjoyed by the community.

The SUPP was established to improve the standard of electricity supply, after a finding that 80% of the damage to power lines was caused by falling trees. The initial goal was to have at least half the houses in Perth supplied by underground power by 2010, with a corresponding improvement in regional areas.

Currently about 49% of the metropolitan area is serviced by underground power. The requirement for new developments to be serviced by underground power has made a significant contribution to the achievement of this total.

Consequently the context of this specific inquiry and related activities being undertaken by the Office of Energy would be well supported by re-examining the objectives of the State Underground Power Program (SUPP) within broader State Government policy objectives. A clear policy context and strategy will enable better analysis and articulation of the achievements of the program, or changes that could be considered in order to achieve the objectives (refer Terms of Reference point 5).

### 3.0 SUSTAINABLE ASSET MANAGEMENT

#### Recommendation

2. Western Power be required to develop a high level program for the undergrounding of all electricity distribution infrastructure over 20 – 40 years utilizing best practice asset management principles and use this as the basis to determine the sequence of work within the SUPP (notwithstanding the opportunity to bring forward projects identified below).

The power distribution network within the South West Interconnected System (SWIS) is owned and operated by Western Power, a regulated, State-owned monopoly provider of electricity distribution infrastructure and services. In line with the broad policy objectives of the State Government, Western Power should be required to develop and articulate the funding requirements for an optimized program to underground the remaining above ground power distribution infrastructure within the SWIS over a period of time consistent with broader State Government policies (potentially 20 – 40 years). This would also provide an estimate of the costs in completing this infrastructure upgrade.

The design of this program would be informed by the anticipated work and investment required on the existing overhead transmission network. Underground power projects in areas where significant investment is anticipated in the near term are of greater value to the network owner, all other things being equal. An average depreciated value, perhaps based on the age of the assets, does not necessarily reflect this.

A significant component of the network asset management program undertaken by Western Power involves the on-going replacement of power poles. Although there are examples of Western Power replacing all the poles in a street or neighbourhood block it would appear that often just a few poles are replaced on each occasion. Consequently this progressive renewal of the overhead power network may appear as a maintenance expense.

Against this backdrop of an identified and funded asset upgrade program, beneficiaries may collectively agree to “bring-forward” underground power projects in specific locations and meet the incremental costs of doing so.

This proposed approach fundamentally changes the funding framework for the SUPP. Currently property owners are the main funding providers and determine whether or not projects proceed at each point in time. Under this alternate approach, prime responsibility rests with the network owner, potentially supported by other stakeholders and beneficiaries.

#### 4.0 BENEFICIARY PAYS PRINCIPLE

##### **Recommendation**

3. Determine whether the benefits received by stakeholders are similar across all projects and if not, identify the principles for a project specific basis for cost sharing between the beneficiaries.
4. Assess whether the benefits of higher property prices have changed over time (as underground power becomes more common) and whether that benefit is sustainable if the vast majority or the entire network is underground.

The current funding arrangement for Major Residential Projects (MRP's) is notionally based on a beneficiary pays principle. Since 1999/2000 MRP projects have been funded 50 per cent by Local Government (which typically recovers this partially or fully from property owners in the project area), 25 per cent by the State Government through the Office of Energy and 25 per cent by Western Power. It is noted that additional funding of 15% of the project cost is available from the State Government for eligible local governments in low income areas, as defined by the Socio Economic Index for Areas developed by the Australian Bureau of Statistics.

Notwithstanding the conceptual and practical issues associated with estimating the benefits received by each beneficiary, the current approach which shares the costs between beneficiaries on the same basis in all projects implies that there is a similar distribution of benefits in very different situations. Intuitively this is unlikely to be the case and will therefore result in a sub-optimal allocation of resources and potentially a sub-optimal selection of projects.

The analysis undertaken as part of this inquiry should seek to identify (and quantify) the beneficiaries of the program for a range of different projects that have been completed and determine whether they are in fact similar. Should significant differences be observed between projects in different situations then the principles for a project specific basis for sharing the costs between beneficiaries should be developed.

## 4.1 Other Beneficiaries

### Recommendation

5. Estimate the benefits from improved reliability of the power network to electricity generators and retailers and include these in share of costs on the beneficiary pays principle as appropriate.
6. Investigate the potential benefits to community health from higher exercise rates arising from improved street lighting.

The benefits of the SUPP in improved reliability of the power network to households and businesses are identified. However, opportunities for increased sales of electricity also provide a benefit to electricity generators (Verve and others). It would appear that this has not been a consideration in the past, due to Western Power being both the generator and network provider.

Most of the opportunity to sell electricity will be lost when the distribution network is unavailable. The electricity will not be sold at a later time. Consequently it would appear that both electricity generators and retailers enjoy some benefits as a result of a more reliable distribution network.

The removal of power poles as a result of undergrounding power infrastructure enables street lighting to be optimally spaced and upgraded. This has been, anecdotally at least, linked to higher rates of exercise (particularly walking) leading to improved health outcomes, and reduced use of cars, leading to broad environmental benefits.

## 4.2 Streetscape Maintenance Costs

Western Power is responsible for vegetation management for naturally occurring vegetation on verges under power lines. Property owners and Local Governments are responsible to ensure that cultivated vegetation is kept well clear of power lines.

A preliminary investigation of the cost savings to Local Government from reduced tree pruning indicates that the savings are quite short-lived. Less tree pruning is required for several years following the placement of electricity infrastructure underground. Thereafter tree pruning is again required to ensure that verge trees remain healthy and safe.

## 5.0 RELIABILITY OF ELECTRICITY SUPPLY

### Recommendation

7. Include network asset management principles and economics more clearly in the project identification, prioritization and funding determination process.

The current process for identifying projects for funding under the SUPP is driven by the identification of areas with poor reliability but within the tight constraints of the property owners' willingness to pay.

It is suggested that the design principles of the SUPP should be amended so that project identification is based on system reliability and asset management optimization principles, rather than the capacity of the householders to pay.

Analysis of electricity network reliability performance data presented in the Issues Paper<sup>1</sup> highlights that there are only marginal benefits in reliability if a small proportion of underground power is installed in an area. This is presumably due to faults in the remaining, above ground parts of the network. This indicates that the current approach, not necessarily working out from electricity distribution substations, does not necessarily deliver the key benefit (improved reliability) in an effective way.

## 6.0 AFFORDABILITY AND CAPACITY TO PAY

### Recommendation

8. This Inquiry specifically consider the perspectives of owner-occupiers, private investors, government owned homes and other investors in assessing the benefits received by property owners.

9. This Inquiry should consider whether measures such as the SEIFA index for an area provide a sufficient measure of the capacity of a property owner to contribute to the cost of an underground power program.

10. Cost estimates used to gauge community support for projects be adjusted for cost inflation during the expected time between the consultation period and project construction.

Local Governments have noted that the costs to households for the SUPP have increased significantly since the program commenced. Consequently the willingness (and ability) for householders to pay is increasingly difficult to achieve. It is noted that in nominal terms the

<sup>1</sup> Inquiry into State Underground Power Program Cost Benefit Study: Issues Paper Economic Regulation Authority June 2010 p14

costs to property owners have approximately tripled during the life of the program and the program may now be unaffordable in areas prioritised on the basis of network reliability.

In the current allocation of costs amongst project beneficiaries appears to implicitly assume that the property owner achieves a range of benefits including higher property price, more reliable power supply, improved visual amenity etc.

However, nearly 27% of Perth households are renters<sup>2</sup> and the proportion of rental properties is much higher in some locations. In these cases the property owner, who will be paying the SUPP contribution, will not receive the benefits of more reliable power supply, visual amenity etc. The property investor will receive the benefit of any higher market value for their property as a result of the power infrastructure being underground. While this price premium may be true when the majority of properties are serviced by overhead power distribution systems, once the vast majority (or all) of the network is underground there is likely to be no differential and therefore no benefit to the property investor.

A number of Local Governments have experienced very large increases in project costs between the initial estimates and the budget costs when the project is designed. This is particularly true where there is a long lag (several years) between project concept and execution. Although Local Governments who have undertaken several projects in similar areas over time report improved accuracy in project cost estimates, several fold increases in costs (and hence ratepayer contributions) between the initial consultation and final project lead to community dissatisfaction with the program.

## **6.1 SEIFA Index Limitations**

The Index of Relative Socio-economic Disadvantage (SEIFA) prepared by the Australian Bureau of Statistics is widely recognized as a comprehensive measure of disadvantage. However, while there is support from the Local Government sector to both acknowledge socio-economic disadvantage in determining the contribution from property owners and use the SEIFA index as a measure of eligibility, limitations in the application of this index at a practical level were noted.

The SEIFA index is constructed at the Census Collection District Level, which in the metropolitan areas comprises approximately 250 households. Because Collection Districts are based on suburban blocks, it is possible that the blocks on either side of a street fall into different collection districts and have different SEIFA indexes. Similarly if the street is long enough, it could also comprise more than one Collection District and have more than one SEIFA index.

This means that at the practical level, it has been noted that the definition of a project area can determine whether or not a project is eligible for consideration as a socio-economic

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<sup>2</sup> ABS Cat No 1367.5 Western Australian Statistical Indicators

disadvantaged area. In recent years several projects have needed to be redefined or rescheduled because part of the proposed area would require a higher ratepayer contribution due to a higher SEIFA index (less disadvantaged). For example, a project in the Gosnells area had to be redefined to exclude areas that did not qualify for the additional State Government funding on the basis of a SEIFA index. One of two potential projects in the Town of Bassendean was withdrawn as it was believed that the different ratepayer contribution required would create considerable confusion as well as division within the community. Difficulties remain in providing an adequate explanation of this apparent inequity between neighbours.

## 6.2 Concession Card Holder Rebates

The *Local Government Act (1995)* and associated Regulations prescribe underground power as a one of a small number of services for which a service charge may be applied. However, rebates for Concession Card Holders (primarily pensioners) do not apply to service charges.

Previously some Local Governments had recovered the contribution to an underground power program from property owners via a Specified Area Rate, which provides for a rebate to Concession Card holders. However, a more recent ruling means that this option is no longer available. Consequently Concession Card holders are now much less likely to be able to meet the cost of an underground power program and will consequently vote against it and suffer hardship should it proceed.

There is an outstanding request, supported by the Minister for Energy and the Minister for Local Government, for an amendment to the Rates and Charges (Rebates and Deferments) Regulations (1992) to include underground power as a prescribed charge. This would enable concession card holders to become entitled to a rebate on the cost of providing underground power.

## 6.3 Equity Considerations

### Recommendation

11. This Inquiry should give guidance as to the appropriate consideration of equity considerations between those who have already received a public contribution to the provision of underground power and those yet to do so.

Since the program commenced there has been significant public (taxpayer funded) investment in providing underground power both directly and through the State owned Western Power. It could be argued that if the program were now discontinued due the

inability or unwillingness of property owners to contribute, this results in an inequitable outcome for those in areas yet to receive underground power.

If this Inquiry ultimately supports the assertion that the maintenance and operating costs for underground power are higher<sup>3</sup> and the distribution network costs continue to be allocated amongst consumers according to their electricity consumption, then over time consumers without underground power will be contributing to the additional costs of those with underground power, without the commensurate benefits in terms of reliability and stability of supply.

Different funding models for providing underground power infrastructure to areas of Western Australia outside of the SWIS also raises questions of equity between different groups that should be considered within the context of this Inquiry.

## 7.0 CAPACITY TO BRING FORWARD UNDERGROUND POWER PROJECTS

### Recommendation

12. Within the context of an established program for progressive replacement of overhead electricity distribution infrastructure with an underground network, provide the opportunity for communities to bring forward the work in their area by contributing the marginal cost of early infrastructure write-off and capital expenditure.

It is suggested that if there were a well developed, structured forward plan for the conversion of the remaining above ground power infrastructure to underground aligned with the asset management plan of Western Power, then this would provide the opportunity for communities to request the upgrade in their location to be brought forward, on the understanding that they would incur the incremental costs associated with this decision. Conceptually this would be similar to the incremental costs paid by land developers to infrastructure providers should they wish to “leap frog” the development frontier. Currently it would appear that either a potential project is successful under the program, or the property-owners (or Local Government on their behalf) would be required to meet the full cost of undergrounding.

Provided there is sufficient capacity amongst Western Power’s contractors, this approach would potentially enable faster uptake of underground power, with the draw on additional public resources.

<sup>3</sup> Inquiry into State Underground Power Program Cost Benefit Study: Issues Paper Economic Regulation Authority June 2010 p26

## 8.0 PROGRAM SCOPE

### Recommendations

13. Evaluate the implications to the overall SUPP and its objectives of broadening the scope of the program to include peri-urban areas and the undergrounding of electricity distribution infrastructure to accommodate road expansion and upgrade works.

### 8.1 Peri-urban Areas

The objectives of the SUPP relate to improved reliability of electricity supply, particularly during storm events, and better safety outcomes. It is unlikely that placing the power distribution network underground will be cost effective in the peri-urban areas (particularly the hills and foothills). With the exception of the improved environmental and aesthetic outcomes, most of the other intended benefits of the SUPP can be delivered by the installation of Aerial Bundled Cables (ABC's).

The bushfire risks associated with aging and inadequately maintained overhead power distribution systems also supports the case for considering solutions in these areas.

In its consideration of the overall costs and benefits of the SUPP it is suggested that the Inquiry give consideration to technologies such as ABC's which may be more appropriate in some potential project locations. Whether this should be considered as a separate program, or a sub-program within the SUPP requires further consideration.

### 8.2 Relocation of Overhead Infrastructure in Road Reserve

In order to undertake upgrades and expansion to the road and path network Local Governments on occasion seek that Western Power relocate power poles. The cost of this relocation is charged to the road project. In some instances Western Power requires that the distribution infrastructure be placed underground rather than be relocated. Local Governments note that in these cases:

- a. the full cost of installing underground electricity distribution infrastructure is charged to the Local Government; and
- b. the cost of work completed in this way is significantly higher than that completed by the specialized underground power program team.

Given that these are public works funded by and undertaken on behalf of the community it is appropriate to ensure that these projects are undertaken most efficiently, and if a benefit is achieved by the network owner, that only a share of the relocation cost be applied.