

**12.1 UNDERGROUND POWER UPDATE**

**Attachments:** 1. **Underground Power Options - City of Vincent**

**RECOMMENDATION:****That Council:**

1. **RECEIVES** the high level report on options for providing underground power in the City of Vincent at Attachment 1.
2. **AUTHORISES** the CEO to engage with Western Power on options to provide underground power through-out the City of Vincent including those identified in the report at Attachment 1.
3. **REQUESTS** Administration to prepare a business case on the delivery of an underground power program in the event Western Power announces a new program in which the City of Vincent would be eligible to participate.
4. **NOTES** Administration may seek feedback on underground power options from the Community Panel as part of the City's long term finance and asset management priorities following any announcement from Western Power on a future program.

**PURPOSE OF REPORT:**

To provide Council with an update on Underground Power as requested at the 23 March 2021 Council Meeting.

**BACKGROUND:**

At the 23 March 2021 Council Meeting, it was resolved, in part, that Council acknowledges that whilst the City's current financial priority is dealing with renewal of major building assets, the City requires a contemporary position on underground power.

Council requested the CEO to:

- Develop an affordable financial model to support the City's competitive participation in future SUPP funding rounds where there is community support;
- Consider the feasibility of a City funded underground power program, where State funding opportunities are limited or absent, noting impacts on the City's Long Term Financial Plan, rates revenue and borrowing capacity;
- Consider the current technological landscape and understand the potential disruption caused by increasing battery use on the network;
- Present a high-level report to Council on the above by November 2021 Ordinary Meeting of Council to form the basis of engagement with the community on underground power in Vincent.

The high-level report is at **Attachment 1**.

**DETAILS:**

The City of Vincent strongly supports the amenity benefits and improvement to tree canopy that results from undergrounding power lines.

Council has previously considered a number of funding models to expedite the undergrounding of power rather than rely upon the State Underground Power Program (SUPP).

The State Government, through the Public Utilities Office, has been running the SUPP since the early 1990s. The City has, in the past, applied for funding through the SUPP to undertake both Localised Enhancement Projects (LEP), typically single streets of either extensive tree canopy or heritage significance, and Major Residential Projects (MRP), which encapsulates upwards of 800 residential properties.

The first trial projects, called Round 1 in the 1990's, were based upon two-thirds State to one-third local government funding (which was subsequently passed onto the ratepayers within the project area). From Round 2 onwards it became a 50/50 funding split. In respect of LEPs the City has had two past projects:

- 1) Mary Street, Highgate, in recognition of the significant trees, completed in the late 1990's; and
- 2) William Street, Perth (Brisbane to Newcastle Streets), as part of the William Street Upgrade Project, completed in late 2000's.

The City was successful in Round 3 in 2006, and secured funding for the Highgate East MRP Project, approx. 900+ properties, completed in 2009.

The City consulted residents on a SUPP project on Brookman Street and Moir Street Heritage Precinct in 2015 and majority of respondents indicated they did not support paying \$8,260 per residential property to underground the power.

Under the Round 6 Program, local governments proposed project areas based on community requirements and preferences. Local governments nominated their contribution (50% - 90%), while Western Power contributed its net benefit (as a result of replacement and maintenance costs avoided), and the State Government funded the remainder. In this instance the residents contributed to a portion of the network infrastructure costs and all of their consumer mains connection.

In 2017, 17 projects were funded from 70 Local Government applications in Round 6 of the SUPP. The last of these projects are scheduled to complete construction in late 2022. The selection criteria is extensive and includes the percentage of public support, ability to pay (lower socio-economic areas are eligible for additional funding), the age and reliability of the infrastructure, terrain and soil conditions, and housing density. The number of lots in the project areas is generally restricted to about 800.

A previous estimate to install underground power in the remainder of the City was over \$100 million.

The City engaged Strategic Leadership Consulting to prepare the Underground Power Options for the City of Vincent report at Attachment 1.

The report notes that Western Power is finalising a proposed new approach to completing undergrounding of the State that is different to, and more equitable than, the previous competition based, SUPP Schemes.

The new approach consists of 3 main scheme approaches:-

- All NRUP – Based on Western Power's prioritised program for network asset replacement and likely lower cost
- RUP – Customer Funded schemes at likely higher cost but considered for priority
- Combination NRUP:RUP

The new approach is being trialled in 4 pilot schemes in Perth, and is expected to be finalised towards the end of 2021, in time for implementation from 2022-23. Subject to final confirmation, the new approach potentially offers a substantially more affordable cost of program as it identifies several City of Vincent areas for priority consideration and the opportunity for the City of Vincent to engage pro-actively in agreeing a medium-term staged program to complete undergrounding of the City.

Noting that there is important further information to be received from both the City of Vincent and Western Power, this major positive change in approach by Western Power combined with other elements of the research, indicate at this stage, that the City of Vincent should focus on:-

High Level Implementation Options:

- All NRUP for some Districts
- Combination NRUP:RUP for some districts

Preferred High Level Financial Options:

- Service Charge With General Rates – a good % of Ratepayers pay up front, Remaining % Ratepayers Pay over 7 Years - From 2022-2023

- Sale of City of Vincent Property Assets + General Rates Increase From 2022-2023 for recovery of City Reserves in 30+ years.

The report elaborates on the above interim information and findings and recommends important next steps for the City of Vincent to determine final positions in regard to Implementation and Financing options as well approaches to achieving optimal outcomes in engagement, finalisation, and management of an agreed program with Western Power.

The report recommends the City of Vincent waits, but prepares, for Western Power to confirm the details of the new program approach and schemes (NRUP and RUP) proposed for areas within the City (*expected this calendar year*).

At this stage, Administration recommends Council approves the CEO continuing to engage with Western Power on a potential underground power program; prepares a business case if Western Power announce a new program in which the City is eligible to participate; and requests Administration to seek feedback on underground power options from the Community Panel as part of the City's long term finance and asset management priorities.

#### **CONSULTATION/ADVERTISING:**

The report recommends engaging the Community Panel on the options for underground power in the City of Vincent.

#### **LEGAL/POLICY:**

N/A

#### **RISK MANAGEMENT IMPLICATIONS**

Low: It is low risk for Council to receive this report. Implementing and funding an underground power program through-out the City of Vincent would be a major project and high risk.

#### **STRATEGIC IMPLICATIONS:**

This is in keeping with the City's *Strategic Community Plan 2018-2028*:

Enhanced Environment (select the priority outcome below or delete if not applicable)

*Our urban forest/canopy is maintained and increased.*

Thriving Places (select the priority outcome below or delete if not applicable)

*Our physical assets are efficiently and effectively managed and maintained.*

Sensitive Design (select the priority outcome below or delete if not applicable)

*Our built form is attractive and diverse, in line with our growing and changing community.*

Innovative and Accountable (select the priority outcome below or delete if not applicable)

*Our resources and assets are planned and managed in an efficient and sustainable manner.*

#### **SUSTAINABILITY IMPLICATIONS:**

This is in keeping with the following key sustainability outcomes of the *City's Sustainable Environment Strategy 2019-2024*.

*Urban Greening and Biodiversity*

#### **PUBLIC HEALTH IMPLICATIONS:**

(select the relevant option below, delete if not applicable)

This is in keeping with the following priority health outcomes of the City's *Public Health Plan 2020-2025*:

*Reduced exposure to ultraviolet radiation*

**FINANCIAL/BUDGET IMPLICATIONS:**

An underground power program would be a major financial undertaking for the City of Vincent. The estimated cost to complete the implementation of the undergrounding of power to the whole City is in excess of \$100 million, based on current costings, and the timeframe to carry out the implementation would be a long-term plan. The financial implications of the different options are outlined in the attached report.

There is \$222,000 in the City's Underground Power Reserve. One option in the report estimates a requirement of a reserve ranging from \$.65M to \$3.5m at high point to meet shortfall between annual cost investment and loan repayments. As an example, in the case of NRUP:RUP Mix scenario, if only 30% of ratepayers choose to pay upfront, Council would require a reserve ranging from \$1.2 to \$6.1m at high point to meet shortfall between annual cost investment and loan repayments.

If Western Power announces an underground power program in which the City is eligible to participate, Administration would prepare a business case for consideration by Council with options and more detailed advice on resourcing implications. In this event, Administration may seek Council approval at the mid-year budget review to use the \$222,000 in the underground reserve to engage external expertise to prepare the business case and detailed financial advice.

# Final Report Underground Power Options for the City of Vincent



September 2021



## Table of Contents

<b>1. EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>2. PROJECT BRIEF .....</b>	<b>4</b>
<b>3. CITY OF VINCENT POLICY STATEMENT.....</b>	<b>5</b>
3.1. VINCENT POLICY STATEMENT .....	5
<b>4. 2015 DISCUSSION PAPER SUMMARY .....</b>	<b>6</b>
4.1. KEY POINTS .....	6
4.2. SUMMARY OF DISCUSSION PAPER CONCLUDING COMMENTS .....	7
<b>5. POTENTIAL IMPACTS OF UNDERGROUNDING POWER .....</b>	<b>8</b>
5.1. POTENTIAL POSITIVE BENEFITS OF UNDERGROUNDING THE NETWORK .....	8
5.2. POTENTIAL NEGATIVE IMPACTS OF UNDERGROUNDING THE NETWORK .....	9
<b>6. SUMMARY WESTERN POWER NEW APPROACH TO UNDERGROUNDING NETWORKS .....</b>	<b>9</b>
6.1. REVIEW OF MARKET PRODUCT STREAMS .....	9
6.2. RUP (RETROSPECTIVE UNDERGROUND PROJECTS) .....	10
6.3. NRUP (NETWORK RENEWAL UNDERGROUNDING PROGRAMME) .....	10
<b>7. OTHER LOCAL GOVERNMENT APPROACHES .....</b>	<b>11</b>
7.1. VICTORIA PARK – NRUPP PROGRAM IMPLEMENTATION APPROACH.....	11
7.2. PILBARA – PUPP PROGRAM IMPLEMENTATION (REGIONAL) APPROACH .....	12
7.3. SUBIACO – SUPP PROGRAM IMPLEMENTATION APPROACH.....	13
7.4. MELVILLE – SUPP PROGRAM IMPLEMENTATION APPROACH .....	14
7.5. STIRLING – SUPP PROGRAM IMPLEMENTATION APPROACH .....	16
7.6. CAMBRIDGE – SUPP PROGRAM IMPLEMENTATION APPROACH.....	19
7.7. SUMMARY OF FINANCIAL APPROACHES .....	20
7.8. SUMMARY COMMON THEMES .....	20
<b>8. CITY OF VINCENT UNDERGROUND PROGRAMME .....</b>	<b>21</b>
8.1. IMPLEMENTATION – HIGH LEVEL OPTIONS .....	21
8.2. FACTORS INFLUENCING VINCENT IMPLEMENTATION APPROACH.....	21
<b>9. UNDERGROUNDING PROGRAMME FINANCIALS.....</b>	<b>22</b>
9.1. UNDERGROUNDING PROGRAMME AND FINANCING OPTIONS CONSIDERED .....	22
9.2. ASSUMPTIONS FOR HIGH LEVEL OPTIONS AND INITIATIVES .....	22
9.3. PROGRAMME IMPLEMENTATION COST SCENARIOS .....	24
9.4. EVALUATION OF FINANCING OPTION ‘A’ – SALE OF CITY OF VINCENT PROPERTY ASSETS .....	24
9.5. EVALUATION OF FINANCING OPTION ‘B’ – SALE OF CITY OF VINCENT PROPERTY ASSETS PLUS GENERAL RATES FROM 2022-2023 FY.....	25
9.6. EVALUATION OF FINANCING OPTION ‘C’ – GENERAL RATES INCREASE FOR ALL RATEPAYERS FROM 2022-2023 FY .....	26
9.7. EVALUATION OF FINANCING OPTION ‘D’ – SERVICE CHARGE WITH GENERAL RATES – 70% RATEPAYERS PAY UP FRONT, REMAINING 30% PAY OVER 7 YEARS FROM 2022-2023 FY .....	26
9.8. EVALUATION OF FINANCING OPTION ‘E’ – TREASURY LOAN RECOVERY BY GENERAL RATES .....	27
9.9. CURRENT INDICATORS – FINANCIAL OPTIONS TO FOCUS ON .....	27
9.10. NEED TO UPDATE FINANCIAL EVALUATIONS .....	27
9.11. INFLUENCES ON FUNDING OPTIONS .....	28
<b>10. SOLAR AND BATTERY UPTAKE BY HOUSEHOLDS.....</b>	<b>29</b>



10.1. PROBLEMS CAUSED BY SOLAR ..... 30

10.2. WHY THE GRID NEEDS BATTERIES ..... 30

10.3. WHY METROPOLITAN HOUSEHOLDS AREN'T GOING OFF-GRID ..... 30

10.4. THE CURRENT SOLAR LANDSCAPE IN VINCENT ..... 31

**11. CONCLUSION.....31**

**12. REPORT RECOMMENDATIONS.....31**

12.1. WESTERN POWER PROPOSAL ..... 31

12.2. UNDERTAKE FURTHER EVALUATION ..... 31

12.3. UNDERTAKE APPROPRIATE CONSULTATION ..... 32

12.4. OPTIMISE AGREEMENT AND IMPLEMENTATION PROGRAM ..... 32

12.5. RESCIND POLICY..... **ERROR! BOOKMARK NOT DEFINED.**

**APPENDIX A – MEDIA RELEASES – .....33**

1 - NEW FUNDING OPTION FOR UNDERGROUND POWER ..... 33

2 – INFORMATION TO PROPERTY OWNERS ..... 34

**APPENDIX B – CITY VINCENT DEMOGRAPHICAL DATA.....36**

**APPENDIX C – UNDERGROUND POWER CONSTRUCTION ACTIVITIES.....38**



## 1. Executive Summary

The City of Vincent recognises the compelling benefits of completing undergrounding of power infrastructure within its boundaries and has requested this review, by Strategic Leadership Consulting (SLC), to guide a contemporary and affordable approach, for consideration by Council. Approximately 10,000 lots in 12 districts remain for power to be undergrounded across the City.

SLC's review has researched and considered the information and conclusions from the City's previous review in 2015, relevant WALGA papers, common themes in other Council approaches under the previous SUPP schemes, Western Power Corporation's proposed future approach for power undergrounding the State, discussed interim findings with City Executive and Council to identify the main future implementation options and estimate financial feasibility for the City.

Encouragingly, for the City of Vincent, the review has identified that Western Power is finalising a proposed new approach to completing undergrounding of the State that is different to, and more equitable than, the previous competition based, SUPP Schemes. The new approach consists of 3 main scheme approaches:-

- All NRUP – Based on Western Power's prioritised program for network asset replacement and likely lower cost
- RUP – Customer Funded schemes at likely higher cost but considered for priority
- Combination NRUP:RUP

The new approach is being trialled in 4 pilot schemes in Perth, and is expected to be finalised towards the end of 2021, in time for implementation from 2022-23. Subject to final confirmation, the new approach potentially offers a substantially more affordable cost of program as it identifies several City of Vincent areas for priority consideration and the opportunity for the City of Vincent to engage pro-actively in agreeing a medium-term staged program to complete undergrounding of the City.

Noting that there is important further information to be received from both the City of Vincent and Western Power, this major positive change in approach by Western Power combined with other elements of the research, indicate at this stage, that the City of Vincent should focus on:-

High Level Implementation Options:

- All NRUP for some Districts
- Combination NRUP:RUP for some districts

Preferred High Level Financial Options:

- Service Charge With General Rates – a good % of Ratepayers pay up front, Remaining % Ratepayers Pay over 7 Years - From 2022-2023
- Sale of City of Vincent Property Assets + General Rates Increase From 2022-2023 for recovery of City Reserves in 30+ years.

The remainder of this Paper elaborates on the above interim information and findings and recommends important next steps for the City of Vincent to determine final positions in regard to Implementation and Financing options as well approaches to achieving optimal outcomes in engagement, finalisation, and management of an agreed program with Western Power.



## 2. Project Brief

In 2015, the City prepared an Underground Power Strategy Discussion Paper which the City has undertaken a review to determine its current relevance, changes in the environment over the last six (6) years, development of updated systems applied by Western Power Corporation, current cost structures and potential and Council's ability to pay.

The Council resolution is as follows:

At the 23 March 2021 Council Meeting, it was resolved, in part, that Council acknowledges that whilst the City's current financial priority is dealing with renewal of major building assets, the City requires a contemporary position on underground power.

Requests the CEO:

- Develop an affordable financial model to support the City's competitive participation in future SUPP funding rounds where there is community support;
- Consider the feasibility of a City funded underground power program, where State funding opportunities are limited or absent, noting impacts on the City's Long Term Financial Plan, rates revenue and borrowing capacity;
- Consider the current technological landscape and understand the potential disruption caused by increasing battery use on the network;
- Present a high-level report to Council on the above by November 2021 Ordinary Meeting of Council to form the basis of engagement with the community on underground power in Vincent.

To deliver these on this task the consultant should include:

1. Review the 2015 Discussion paper;
2. Research and meet with key stakeholders to understand changes since 2015, including Western Power, Energy Policy WA, WALGA, other local governments with experience;
3. Provide an interim report on major opportunities and constraints;



4. Facilitate a workshop with Council Members to discuss funding options available to the City, including SUPP, City-led, resident-led, and other grants or funding available from State or Federal Governments; and
5. Prepare a final updated discussion paper.

The final report would preferably be due to the City by 1 October 2021.

### 3. City of Vincent Policy Statement

The City of Vincent had a policy position on underground power in Policy No. 2.2.2 Undergrounding of Power which was rescinded on 25 June 2019. The previous policy stated:

#### 3.1. Vincent Policy Statement

*"The City of Vincent recognises the benefits of the undergrounding of power supplies and has a long-term objective to achieve this as soon as practicable, within the City's available financial resources.*

**2.1** *The funding model for all future State Underground Power Major Residential projects will be based on a 50% State Government and Western Power contribution, with the City's 50% contribution to be recouped from property owners in the project area.*

**2.2** *The funding model for all future State Underground Power Localised Enhancement projects will be based upon a maximum State Government and Western Power contribution of \$500,000 per project, with the City's contribution to be recouped from property owners in the project area.*

**2.3** *The City's share of any costs of any project under the State Underground Power Program, either Major Residential Projects or Localised Enhancement Projects, will be recovered from the property owners in the project area (who benefit from that project)"*

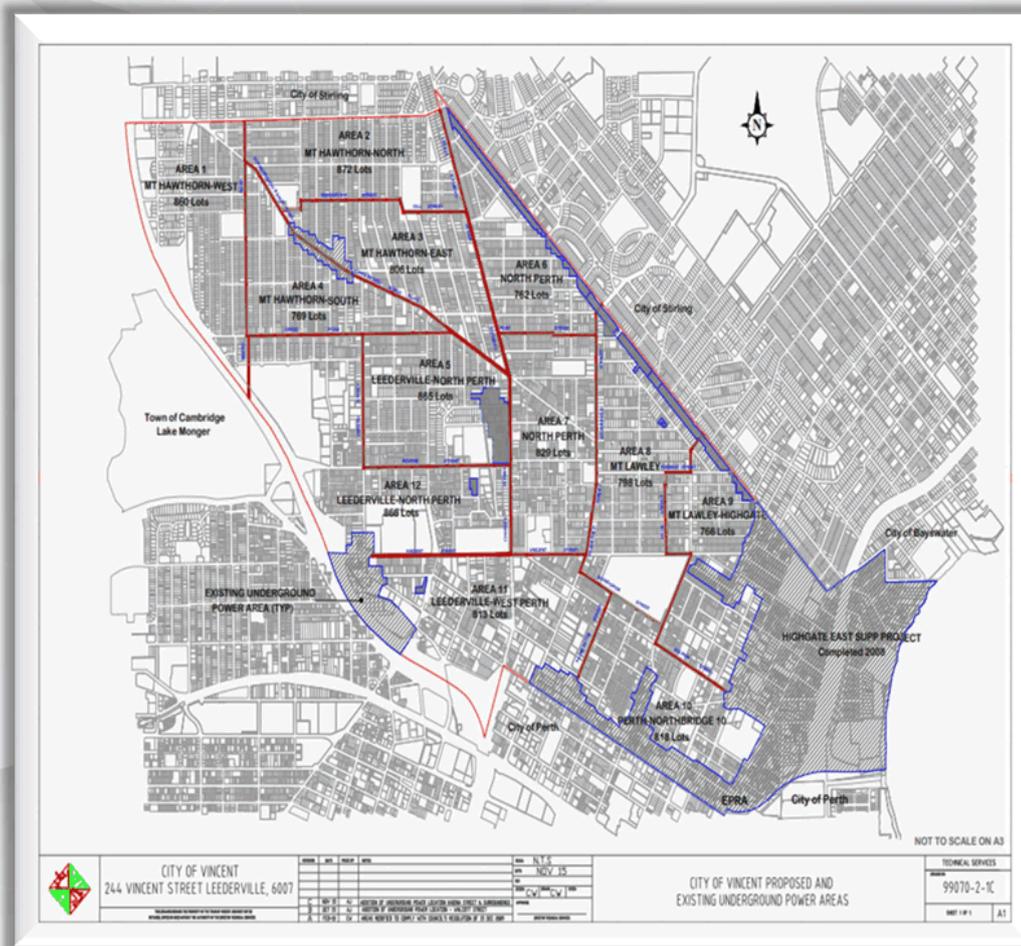


## 4. 2015 Discussion Paper Summary

### 4.1. Key Points

A summary of the 2015 discussion paper identified six (6) key points as follows:

- 1 The City of Vincent has approximately 14,500 rateable properties, equating to 10,000 lots which do not yet have underground power;
- 2 The estimated cost to complete the implementation of the undergrounding of power to the whole City is in excess of \$100 million, based on current costings, and the timeframe to carry out the implementation could be up to 48 years;
- 3 Several funding options have been identified however the most equitable and effective funding option is through the levying of a Service Charge;
- 4 The City can continue to submit Expressions of Interest for Major Residential State Underground Power projects for the 12 areas of the City of Vincent, as shown on attached Plan No 99070-2-1C as Attachment 1;
- 5 The Minister for Energy recently announced arrangements for the next major residential project funding round of the State Underground Power Program, Round 6;
- 6 Administration is still assessing the City's financial and resourcing capacity to roll out underground power. This assessment is affected and will be informed by:
  - (a) the current asset renewal project, which is due for completion in early 2016 which will identify the City's asset renewal backlog and gap and will be incorporated in the draft 2016/17 Budget and Long-Term Financial Plan; and
  - (b) an exercise currently being undertaken by staff to reconcile past underground power projects in the City in order to quantify the financial and resourcing impacts of embarking on a whole-of-City underground power strategy lasting several decades.



#### 4.2. Summary of Discussion Paper Concluding Comments

Approximately 80 – 85% of the City of Vincent is serviced by overhead power distribution lines. The estimated cost to complete the implementation of the undergrounding of power to the whole City is in excess of \$100 million, based on current costings, and the timeframe to carry out the implementation would be a long-term plan. This is particularly the case as Vincent underground power projects would still most likely need to be undertaken through the SUPP process and therefore be subject to the priorities and resourcing capacity of Western Power. Previous estimates have suggested at the current rate of conversion, it will take another 100 years for all properties in the metropolitan area to be serviced by underground power.



## 5. Potential Impacts of Undergrounding Power

Undergrounding of the City of Vincent power network may have both positive and negative impacts as listed below but not limited to those identified:

### 5.1. Potential Positive Benefits of Undergrounding the network

The most common sited advantages are, but not limited to the following:

- Potential reduction of the negative impacts of Climate change.
- More tree canopy cover from not having to prune trees reducing heat sink areas across the City.
- Reduce likely impacts of Cyclones events (*note predicted to move further South in future years*).
- Reduce impacts of annual severe weather events on citizens (*Note: State underground project (SUPP) established in 1996 after severe storms causing major disruptions across the metropolitan area*).
- Improve reliability and security of electrical supply to City of Vincent's consumers.
- Enhance streetscapes and amenity of the City of Vincent.
- Reduce street tree maintenance (*estimated to be \$1 million per annum*).
- Improve street lighting and potential to implement LED cost saving lighting across the City.
- Improve access and setbacks for pedestrians with the loss of pole infrastructure from verge areas, particularly in commercial precincts.
- Reduce maintenance costs for the City and the State GTE through reductions in operating and maintenance costs.
- Uplift in property prices within City will increase giving owners capital improvements (*note the Valuer General believes the increases can be between 1.25% - 2.5% on average*).
- Health and Safety benefits to the community.
- Health and safety benefits to the workforce especially using lifting equipment under power lines.



## 5.2. Potential Negative Impacts of Undergrounding the network

Undergrounding the City of Vincent overhead power network may have disincentives like, but not limited to:

- Disruption to commuters and the community during construction.
- Damage to 'Green Domes' at the property may expose live wires.
- Environmental damage, including soil erosion and disruption of ecologically sensitive habitat during construction.
- Despite the low-voltage and high-voltage lines being undergrounded the transmission lines system (66,000KV or higher) remains above ground.
- Potential risk from horizontal drilling damaging other underground utilities, such as telephone, water, gas, optic fibre etc.
- Susceptibility to flooding, storm surges, and damage during post-storm clean up.

*Note: refer Appendix C for more information on construction activities.*

# 6. Summary Western Power New Approach to Undergrounding Networks

## 6.1. Review of Market Product Streams

Western Power are improving their approach to undergrounding the overhead power lines with two new programmes. Western Power's Business Plan, and Regulatory submission for the AA5 period, sees Western Power Corporation business strategy to maintain network performance at minimum cost with a view to:

- managing public safety risk.
- maintaining reliability.
- managing compliance.
- maximising sustainability.
- meeting customer needs.
- optimising the modular grid transition.

To achieve these strategies Western Power Corporation's current SUPP (*State Underground Power Program, Round 6*) which is currently In progress with 17 projects of a size between 500-800 lots was announced in January 2017 will be completed and finalised sometime in 2022.



The SUPP process required Local Governments to nominated (*Bid*) a contribution between 50% - 90% with the highest bid being generally more successful than lower bidding local governments.

Two new concepts (Schemes) have been developed, with input from WALGA, to replace the old SUPP scheme. These schemes address the strategies (*goals*) set by Western Power and take into consideration future costs to the Corporation.

### 6.2. RUP (Retrospective Underground Projects)

A RUP (Retrospective Undergrounding Projects) is in development with NRUP (*Network Renewal Undergrounding Program Pilot*) currently in Progress in the suburbs of Scarborough, Eden Hill, Hilton, and St James.

The RUP Program will be customer funded projects with project areas nominated by the Local Government Authority. Western Power will apply a discount to project costs equal to the calculated avoided costs (Net Benefits) of the project. Of importance is that project size will not be limited by number of lots and can involve a rolling program covering the whole City over a period of time.

Additionally, the criteria to gain a successful application for the previous SUPP processes have been dropped with the responsibility of customer engagement, stakeholder management and funding being determined by each local government.

Currently the outcome of the RUPP – Pilot will determine the overall process and priority of future schemes by Western Power. The RUP process will see significant discounts to Local Authorities compared to the previous scheme, refer media statements in Appendix A.

### 6.3. NRUP (Network Renewal Undergrounding Programme)

NRUP (Network Renewal Undergrounding Program) has potentially excellent opportunities for the City of Vincent. With the NRUP programme Western Power nominates the project areas with project areas are determined based on network risk and maximum cost benefits. With NRUP Western Power calculate the current and future avoided cost of network replacements or upgrades required by them to deliver under their asset management plans or customer funded works as approved by Economic Regulatory Authority. WPC is in the



process to develop and approve this process and they are currently piloting the program it now. The detail of their work will be presented to the City sometime this calendar year. Western Power indicated that they are aiming to start the underground power program in the City of Vincent in early 2022, subject to approvals.

A Local Government's contribution is the value not covered by the calculated avoided costs which will be a much smaller contribution than SUPP and RUP schemes. The calculated avoided cost is the cost of current network replacements or upgrades required by them to be delivered under their asset management plans or customer funded works as approved by their internal processes and Economic Regulatory Authority approvals.

Project size again will not be limited by number of lots and there may be an opportunity to combine NRUP and RUP project areas to maximise undergrounding opportunities.

Further, a Pilot Program (NRUPP) limited to four project areas has been established with Western Power nominating the project areas. The project areas were determined based on network risk and maximum cost benefits.

These programmes being developed by Western Power align with the State Government's priority area of extending the State underground Power Program (WALGA immediate priorities for the state government report). The State wants to extend the underground power program to high priority projects identified on the basis of the need to invest in the electricity distribution network.

## 7. Other Local Government Approaches

### 7.1. Victoria Park – NRUPP Program Implementation Approach

NRUPP Pilot Program Approach: -

- Western Power covers the cost of the network infrastructure costs in the public space, up to and including the pillar (verge green dome).
- A service charge will be levied through your rates notice to cover the costs to connect the consumer mains (from pillar to your house).
- The service charge will not apply to vacant land, as no consumer mains will be installed within vacant private land.
- Properties with an existing underground consumer main will not be required to pay the service charge.



- The typical property connection types - There are three types of property connections - only a 'Type 1' will be charged the \$2,300 service charge, 'Type 2' and 'Type 3' have no service charge.
- Councils have negotiated with Western Power a deferral for the service charges for 12 months
- There will be two payment method options available for the St James NRUPP:
  1. Payment in full as part of the 2022-2023 rates notice; or
  2. Payment in annual instalments over a seven-year period, with applicable interest charges commencing as part of the 2022-2023 rates notices.
- To enable property owners to pay their underground power service charges in annual instalments over a seven-year period (as per option 2), the Town's cost of borrowings (principal plus interest) will be applied at the applicable interest rate and on-charged in the owner's rates notice.
- Eligible pensioners and seniors are entitled to rebates on underground electricity charges as determined by the State Government, as per the guidelines set out below:
  1. Holders of a Pensioner Concession Card, State Concession Card, or a Commonwealth Seniors Health Card WITH a WA Seniors Card, will be entitled to receive either up to 50% rebate or full deferral on underground electricity charges; or
  2. Holders of a WA Seniors Card, who do not hold a Commonwealth Seniors Health Card, will be entitled to receive a single \$100\* rebate on underground electricity charges for the first year only of the scheme.

*\*The current rebate amount is currently \$100 but is at the discretion of the Department of Finance.*

## 7.2. Pilbara – PUPP Program Implementation (Regional) Approach

City of Karratha implemented a service charge model for retrospective underground power based on the electricity connection capacity kilovolt-ampere (kVA) to each property. The model involved a contribution of 25% of the total cost of the Shire of Roebourne PUPP works to a maximum of \$34.55M funded by a service charge and was subject to the confirmation of the State Government's 75% contribution and to the execution of a funding agreement between Horizon Power and the Shire.

The total Shire contribution plus a contingency (for administration, rebates, and concessions) was allocated based on actual cost forecasts for High Voltage (HV) works (23%), Low Voltage (LV) works (63%) and consumer mains (14%) with all properties (including Shire owned



properties) attracting a service charge. Properties with underground power not part of PUPP would only pay a HV charge and vacant lots did not pay a connection charge.

The HV charge per kVA was based on the total HV costs divided by the total kVA load of the connections to which the HV charge applies (essentially all connections). The LV charge per kVA was based on the total LV costs divided by the total kVA load of the connections to which the LV charge applies (*all properties undergrounded as part of PUPP*).

The connection charge was based on the total connection costs divided by the total number of connections (*all properties undergrounded as part of PUPP*) with the exception of premises directly connected to the HV Network which was based on full cost recovery.

Pensioner rebates were available in accordance with the Rates and Charges (Rebates and Deferments) Act 1992 and instalment options were available over four years, subject to the same conditions that apply to rates instalments.

This model methodology, in theory, sounded fair and equitable for charging for the new underground power, however in practice the model caused confusion in practical application.

There were many examples of the methodology achieving opposite desired effects, for example, commercial owners on this same street with similar size connections received bills higher than their neighbours. Calculations of the individual property charges based on kVA capacity were very complicated and led to many mistakes and subsequent disputes. Social media was buzzing with negative comments against the underground power project.

Therefore, it is recommended to use reliable and easy to prove data for calculating charges for retrospective underground power, rather than the kVA model.

### **7.3. Subiaco – SUPP Program Implementation Approach**

The Subiaco's experience was an opportunist and innovative approach early in implementing its underground power programme (SUPP) which was generally achieved through its own endeavours. The SUPP commenced in the early to mid-1980's and at that time was done in a collaborative way with Western Power Corporation. In those days there was a good working relationship between the City and Western Power and both organisations would meet on a regular basis (quarterly) to discuss opportunities to expand the underground power throughout the City of Subiaco.

For example, if the City was planning to perform road works within the commercial district of the City, they would meet and discuss with Western Power how undergrounding overhead power lines could be included in the work and at what cost. This arrangement worked well as the City was always able to successfully argue that it was a good investment for Western Power to contribute to the cost as it would typically result in less maintenance costs caused by



storms, accidents, etc being incurred by Western Power. The end result was that the City would make some contribution to undergrounding power but nowhere near the full cost as the additional cost was often shared.

In addition, where Western Power was planning an upgrade to its overhead power line network within the commercial area, they would contact the City and meet to discuss what was involved. Both parties discussed what was proposed and would seek to ascertain costs not only to underground power of that portion of works planned but also if the works could be extended (to a block corner for example).

Under both scenarios, the contribution made by the City was funded from the Capital works programme and the individual properties were not levied with any SUPP levy. During this period of time, a large part of the Subiaco commercial area did receive underground power at no direct cost to the property owner that received the benefit. This practice set the tone for future underground power arrangements.

Since that time, the City has participated in Western Power underground power programme and submitted plans to each round available. In order to fund the City's contribution and be consistent with past practices the City applied a percentage levy to rates (1%) applied to all rateable properties. Each ensuing round of SUPP was funded utilising loans by the City for its proportion with repayments covered by the 1% levy on rates. The City has completed the SUPP and has approximately another 10 years to run on its loan repayments.

#### **7.4. Melville – SUPP Program Implementation Approach**

In Melville the number of Round 6 SUPP scheme projects awarded to Melville was 3, with an average project size of 931 properties. The City paid 50% of the total project cost. This was funded by raising service charges on those properties in the project area.

The Network Service Charge for residential properties included in the Kardinya South Underground Power Scheme as an example were charged a network service charge as follows:

- Single, duplex, or two-unit property \$ 4,333.61 (per property/dwelling)
- 3-to-10-unit property \$ 3,348.56 (per property/dwelling)
- 11+ unit property \$ 2,837.32 (per property/dwelling)

The Charge for full network connection is as follows:

- Single, duplex, or two-unit property \$ 1,013.80 (per property/dwelling)
- 3-to-10-unit property \$ 811.04 (per property/dwelling)



- 11+ unit property \$ 658.97 (per property/dwelling)

The Modified Network Connection charges are as follows:

- Single, duplex, or two-unit property \$ 811.04 (per property/dwelling)
- 3-to-10-unit property \$ 658.97 (per property/dwelling)

The Commercial properties are charged a network service charge as follows:

- 5 Kva installation \$ 10,580.49 (per property)
- 35 Kva installation \$ 20,854.50 (per property)

Commercial properties included in the Kardinya South Underground Power Scheme shall each be charged a standard installation connection fee of \$1,146.20.

In addition, the City incurred "in kind" costs for work done by officers in the course of conducting customer mail outs/surveys, answering customer queries, and costs incurred in the collection of service charges from ratepayers etc. Western Power reimbursed the City for these "in kind" costs in accordance with a schedule permitted under the terms of its contract with Western Power.

In terms of methodology for dealing with commercial ratepayers the City used the same process that were used for residential ratepayers, however the value of the service charges imposed to commercial ratepayers is higher in recognition of their:

- Generally, more substantial infrastructure is required to be installed to commercial properties than is required for residential properties.
- Greater capacity to pay

Western Power funded 25% of the total project cost and reimbursed the City for in kind costs as referred to above. The Office of Energy funded the remaining 25% of the total project cost.

A subsidy was provided by Western Power for the Kardinya South project to reduce final estimates to the project cost quoted in the original survey letters sent to residents. This is unusual but was required to ensure that sufficient approval was given by residents for the project to proceed.

In relation to the cost per resident with high voltage system remaining but low voltage undergrounded. This situation doesn't come up often, however in the 2019-2020 Budget, a concession of \$1,448 per property was granted to 72 properties.

The Capital funded was raised by the imposition of service charges in accordance with Section 6.38 of the Local Government Act 1995. No discounts on the underground power charges are



offered by the City however, reduced rate of late payment interest on underground power was available and pensioner and seniors' rebates were available for those ratepayers eligible under the Rate and Charges (Rebates and Deferments) Act 1992. The payment terms as per rate notice, ie, 4 instalments or payment in full, or individual payment arrangements.

Project management was managed by Western Power and the City assigns a project liaison officer.

The City of Melville raises funds by way of service charges imposed on ratepayers in the project area. It is not uncommon with other local governments, however, for treasury loans to be used to finance SUPP programs, with a service charge imposed on the ratepayer to recover the cost of loan repayments due each financial year until such time as the loan is completely repaid.

### 7.5. Stirling – SUPP Program Implementation Approach

Currently the City of Stirling is involved in 3 underground power schemes 2 x SUPP Round 6 and NRUPP (Pilot program by Western Power requiring only consumer mains connection contribution from Property Owners). For SUPP the Council nominate locations for inclusion in the next round of SUPP and this is then assessed by Western Power and the State Government if they are suitable or not.

Each round of SUPP has different models for both funding and size of area. For SUPP Round 6 the revised number of lots changed to between 600 and 1,000.

In relation to Council costs and subsidies it generally depends on the scheme .SUPP Round 6, minimum 50% or "bid" a higher percentage to gain points that add extra weight for those locations to go ahead (*minimum was 60% for one point*). Councils can go as high as 100% contribution if they wish for it to be done. But generally, the contribution model is Council 60%, State Government 30%, Western Power 10% NRUPP, only Consumer Main Connections which Western Power advised that the figure of \$2,350 for a new Consumers Mains to be placed underground. If Consumer Mains is already underground, then no charge.

Western Power subsidies in relation to SUPP programs depends upon the contribution from the associated Council but normally for SUPP it is around 10% this figure will reduce based on the contribution matrix Western Power or Energy Policy WA use.

With the new trial program - NRUPP Western Power are paying the Network Cost which is a significant amount of the total project cost.



For the City of Stirling the costs are broken down into two main groups for funding 1) Network Cost and 2) Connection Cost noting that the City of Stirling is not privy to the Tender response for Underground Power projects.

Network costs – has seen the placing of the main network infrastructure underground (*distribution lines and poles are removed – transmission lines are not part of SUPP or NRUPP*). This includes the green dome as that is Western Powers infrastructure. This figure can vary quite a lot as it depends on the ground conditions of the location (*e.g., limestone, other infrastructure like Telstra & NBN lines*). It can range from \$8,000 to \$10,000 per Property Owner, this is a figure that is usually provided to Property Owners as part of the Voting Survey sent by Energy Policy WA (*previously Public Utility Office*).

Connection costs – Consumer Mains new cabling (*include underground drilling of new Consumer Mains*), connections and testing to the green dome and property owner's main meter. For Trigg this figure was based on the Tender response that Western Power administrate, this was requested by the City of Stirling as previous estimates were starting to get out of date and this was considered the best practice as it reflected the unique requirements for each location.

In relation to the cost per resident with high voltage system remaining but low voltage undergrounded we have found that generally there is no difference to contribution requirement if Transmission lines remain, but each location is assessed individually on this matter. There is no guideline as to how this is to be done, each Council does it their own way. For a recent project in Menora it had significant concrete Transmission Line Poles that are not removed as part of SUPP or NRUPP – this project offered as a concession to those impacted property owners and was discussed at length internally to arrive at the percentage given. It must be noted that this concession amount was then distributed across the rest of the property owners as the City of Stirling doesn't fund such projects from operational funds.

Further, the City of Stirling endeavours to try and offer the best possible term to allow property owners to pay outstanding contributions – the premise usually used is around \$20 per week divided by the total contribution required for a Standard Residential Single Dwelling. For example, Trigg was advised by the State Government's voting survey was \$10,100 so the City of Stirling supplied a term of 10 years to pay for that contribution or pay in full (*Pensioners and Seniors are entitled to rebates from Revenue WA*)

The City of Stirling has always raised an Underground Power Rates Notice to the associated Property Owners to pay. The City of Stirling has not sort loans to fund those Contributions for outstanding Property Owners. Each Council does this part differently and this can be different for each location but generally Councils fully recover from Property Owners as they are the benefiter of the power network infrastructure being placed underground (*ERA report provides*



a breakdown of these benefits). Also, if the Council fully funded the Councils contribution the cost would form part of the normal Rates funding process and property owners outside that location would be required funding it and may never benefit from the undergrounding of power in their location.

The SUPP programs from our perspective is Project Managed by Western Power as they are the controlling entity for these types of projects. The City of Stirling provides technical advice on infrastructure and recovery of contributions from Property Owners. The City established a Steering Committee consisting of representative of State, Western Power, and the Council to control the project. The City of Stirling pays Cash Calls to Western Power over the term specified in the Funding Agreement and this is generally before the City of Stirling has received any funds from Property Owners. However, the NRUPP – is Project Managed by Western Power as it is different from SUPP and there is no oversight by a Steering Committee.

The City of Stirling Engineering Design are the party that ensure the project aspects satisfy requirements within the City of Stirling's area (*setbacks from kerbs and pathways, transformer locations*).

Commercial Property Owners are dealt with differently to normal residential property owners. The City of Stirling prefers to classify Commercial properties as non-residential due to the fact that there are many different types of property setups including: Churches, Primary Schools, Shops, State Government infrastructure and City owned Facilities. The City of Stirling requests consumption data from Western Power for these locations and this is in the form of the maximum load that location has drawn from the network over the previous 3 years. It is deemed that the network has to be designed to have capacity to feed that draw so that is the factor used to apportion that charge amount. Residential properties are assessed by Western Power via an average as providing individual max draws for each of those properties wouldn't be practical. The City of Stirling relies on Western Power to provide accurate information as they are the owners of that data and electricity experts.

Funding is raised by the issuing of an Underground Power Rates Notice, terms are dependent upon the amount required to be paid, loans are not sort by the City for such activities, interest is generally charged (*this was held off due to recent events with COVID but would normally apply for non-payment*), budget funds are approved by Council Members as per the requirements of the Local Government Act and Financial Management Regulations.

Excess funds are required under the Local Government Act to be returned to the Property Owner and this is done via a weighted average of the percentage of contribution required by each Property Owner – there is the option as per the Local Government Act, to have that either refunded directly to the Property Owner or allocated to their Property Rates. The City off Stirling's Finance Services section are responsible for this area, this includes the financial



model for apportioning required contributions, underground power rates notices, payment terms, debt recovery, instalment arrangements, allocation of revenue, WA rebates for pensioner/seniors, ensure that all financial matters are actioned in accordance with the Local Government Act and Financial Management Regulations.

#### **7.6. Cambridge – SUPP Program Implementation Approach**

Unfortunately, the staff involved in the modelling and implementation of the Town's current underground power project, Floreat East, West and North, as well as the remaining area in Wembley/West Leederville have left the Town. The projects have since been completed with only instalment payments now remaining.

In regard to funding, the Town was successful in obtaining funding from Western Power for Floreat North, East and West. The funding comprised of Western Power contributing 10%, the Town contributed 40% (*from reserves*) and the property owners the remaining 50%.

With respect to the Wembley/West Leederville underground power project, funding consisted of 50% Town and 50% property owners. In total the underground power projects included some 4,668 properties at a cost of \$43 million. The Town and property owners contributing \$39 million with Western Power the remaining balance.

The Town raised \$21.5 million from property owners with the remainder of the \$39 million coming from the Town's reserves.

Payment options consisted of pay in full by September/October 2018 to obtain a 3% discount, pay in full by mid-February 2019 with no discount. The alternative was to select 2-, 3-, 5- or 10-year payment options, which incur an interest charge of 5%. The service charges for these options appear on the rates notice and are payable over the same instalment options as offered for rates.



### 7.7. Summary of Financial Approaches

Approach	Pilbara	Cambridge	Subiaco	Melville	Stirling
Average Charge/Ratepayer	\$3469	\$2700-\$8250	Nil	~ \$5347	\$8000 - \$10000
Recovery of Charges	Service Charge	Service Charge	1% Rate Levy	Service Charge	Service Charge
Sale of Assets \$	Nil	Nil	Nil	Nil	Nil
LGA Contribution	25%	50%	Mostly	50%	60%
Treasury Loan \$,	No	No - \$ taken from reserves	No	No	No
Discount/Rebate	No	Yes 3% if paid in full	No	Senior/ Pensioner	Senior/ Pensioner
State Contribution	75%	10%	various	25%	30%
Transmission Line Subsidy	No	No	No	Yes - \$1448	No
Project Management	Liaison Officer	Liaison Officer	Liaison Officer	Liaison Officer	Committee
Business Model deemed successful	No - caused confusion	Yes - Schemes completed	Yes - system completed	Yes - standard process	Yes - Standard process

### 7.8. Summary Common Themes

The most common themes that can be obtained from this sample of underground power implementation processes seem to be:

- Service Charge used without any loan borrowings (note Subiaco used a 1% rate levy on all property owners.
- Discounts do not seem to be a common factor except for the Pensioners and Seniors being entitled to rebates from Revenue WA)
- The previous SUPP scheme was costly ranging from \$2500 - \$10,000 for residents albeit it has varied considerably from scheme to scheme.
- Project management is generally Western Powers responsibility with LGA's having appointed liaison officers.
- Some models did not achieve the desired results.
- Unless a local Government is proactive undergrounding of the area can take a considerably long period of time.



## 8. City of Vincent Underground Programme

### 8.1. Implementation – High Level Options

Based on the City of Vincent's current undergrounding progress, current information available from Western Power and other Council approaches, there are several high-level options that can be considered, to complete undergrounding in the City – each with benefits and compromises:

No.	Option Description	Benefits	Compromises
1	All suburbs under NRUP – potential priority areas may be Mt Hawthorn, Leederville, North Perth - identified by WP	<ul style="list-style-type: none"> <li>Overall cost lower as NRUP Lot Cost expected to be lower</li> </ul>	<ul style="list-style-type: none"> <li>Based on WP prioritised needs with duration to be advised by WP</li> </ul>
2	Combination NRUP and RUP	<ul style="list-style-type: none"> <li>Expedited – as Customer Funded RUP schemes will be favoured by WP</li> </ul>	<ul style="list-style-type: none"> <li>Overall cost higher as RUP Lot Cost expected to be higher, with COV will negotiate the timing with WP</li> </ul>

### 8.2. Factors Influencing Vincent Implementation Approach

The City of Vincent's implementation options will be influenced by a number of factors that require further information from both the City and Western Power. These include: -

#### City of Vincent Information Required

- Updated City Map and Scheme Areas
- Average – Number and Range of Lots per scheme
- Mix of Scheme Types or within Schemes – in relation to NRUP, RUP, Large Private Developments
- Preferred Program priority and phasing.
- Service charges methodology and structure.
- Preferred finance arrangements to support the program.

#### Western Power Information Required

- WPC Prioritised Program including NRUP and RUP areas and its delivery timelines.
- Average cost per lot NRUP, RUP in each area.
- Breakdown of lot cost between pole to house etc.
- Numbers or Ratio of Large Private Development lots reducing NRUP
- Schematics for current overhead and proposed underground network.
- Discounts applied in each area.
- Advice from WPC about the underground program application process.



## 9. Undergrounding Programme Financials

### 9.1. Undergrounding Programme and Financing Options considered

The City of Vincent is obligated to evaluate and ensure that any programme that is finally determined is affordable and equitable for residents as well financially sensible for the City.

To assist in this objective, the following undergrounding programme and financing options have been considered, at this early stage, to determine high level indicative financial outcomes:-

- Undergrounding Programme Options:
  1. All Schemes Undertaken through NRUP – Western Power Program
  2. Schemes undertaken to a 70:30 Mix of NRUP:RUP
- Financing Options for Above programs
  1. A-Sale of City of Vincent Property Assets
  2. B-Sale of City of Vincent Property Assets + General Rates Increase
  3. C-General Rates Increase for all ratepayers
  4. D-Service Charge with General Rates – 70% residents pay up front, 30% pay over 7 years
  5. E-Treasury Loan Recovered by general rates.

### 9.2. Assumptions for High Level Options and Initiatives

Evaluation of the above undergrounding program and financing options is based on the below range of assumptions, relevant to:-

- Program numbers and implementation approach
- Program costs-investment
- Estimated net sales proceeds of City of Vincent property assets
- Ratepayer recovery options
- Financial rates – inflation, deposit interest

It is important to note that these assumptions are based on best available current information and will need to be refined as updated and final information is received from both the City of Vincent and Western Power; additionally reflect latest economic data.



STANDARD ASSUMPTIONS		INFO SOURCE
<b>PROGRAM NUMBERS AND IMPLEMENTATION</b>		
No. of Lots	9824	COV - JULY 21
No. of Stages	8	COV - JULY 22
Average Lots Per Stage	1229	COV - JULY 23
Years Per Stage To Complete	2	ESTIMATE
Total Years To Complete Program	16	ESTIMATE
Annual Lots Per Stage-Year To Complete	615	ESTIMATE
NRUP:RUP Ratio	70:30	ESTIMATE
<b>PROGRAM COSTS-INVESTMENT</b>		
Cost Per Lot NRUP	\$2,300	NRUP PILOT
Cost Per Lot RUP	\$5,000	ESTIMATE - WP
70% NRUP Total Cost-Investment	\$15,816,640	ESTIMATE
30% RUP Total Cost - Investment	\$14,736,000	ESTIMATE
ALL NRUP Total Program Cost-Investment	\$22,595,200	ESTIMATE
NRUP:RUP Total Program Cost-Investment	\$30,552,640	ESTIMATE
ALL NRUP Average Total Cost - Investment Per Stage	\$2,824,400	ESTIMATE
ALL NRUP Average Annual Cost-Investment	\$1,412,200	ESTIMATE
NRUP:RUP Average Total Cost - Investment Per Stage	\$3,819,080	ESTIMATE
NRUP:RUP Average Annual Cost-Investment	\$1,909,540	ESTIMATE

POTENTIAL ASSET SALES - NET PROCEEDS		
Potential Sale of Selected Assets Could Return – <i>Note: may only need \$1.6 - \$6.1 million rolling reserve to be established.</i>	\$ 20,000,000	ESTIMATE-COV
TREASURY LOAN TERMS		
Treasury Loan \$	STAGED LOAN \$5M - \$30M	
Treasury Loan Int. Rate	3%	
Treasury Loan Term	20-30+ YEARS	
RATEPAYER RECOVERY OPTIONS		
General Rates Increase Annual \$ per 1% Increase	\$320K	ESTIMATE-COV
Discount For Pensioners Etc	50%	ESTIMATE VIC PK
Service Charge Upfront Payment	70%	ESTIMATE- COM Approach
Instalment Payment Option	7 YEARS	ESTIMATE WPC PILOT
OTHER FINANCIALS		
Undergrounding Cost Inflation	1-3% p.a.	ESTIMATE - ECON STATS
Treasury Deposit Interest	.65% (.0065) p.a.	ESTIMATE-WATC



### 9.3. Programme Implementation Cost Scenarios

Program Implementation Costs will be impacted by expected increases to the currently assumed NRUP cost per lot of \$2,300 which is based on Western Power's Pilot Program in St. James – Victoria Park and an estimated NRUP: RUP (70:30) cost per lot of \$5000. To assist in considering the impact of these estimated increases, program implementation costs have been estimated for a range of scenarios based on increases in constructions costs and general inflation, as follows:-

PROGRAM COSTS ALL NRUP	AVERAGE LOT COST \$	TOTAL PROGRAM COST \$	AVERAGE STAGE (8) COST \$	AVERAGE ANNUAL (16) COST \$
<b>Cost Per Lot as NRUP Pilot</b>	\$ 2,300	\$ 22,595,200	\$2,824,400	\$1,412,200
1% Annual Inflation		\$ 24,615,272	\$3,076,909	\$1,538,454
2% Annual Inflation		\$ 26,848,847	\$3,356,106	\$1,678,053
3% Annual Inflation		\$ 29,319,514	\$3,664,939	\$1,832,470
<b>Cost Per Lot as NRUP Pilot + 10%</b>	\$ 2,530	\$ 24,854,720	\$3,106,840	\$1,553,420
1% Annual Inflation		\$ 27,076,799	\$3,384,600	\$1,692,300
2% Annual Inflation		\$ 29,533,731	\$3,691,716	\$1,845,858
3% Annual Inflation		\$ 32,251,466	\$4,031,433	\$2,015,717
<b>Cost Per Lot as NRUP Pilot +30%</b>	\$ 2,990	\$ 29,373,760	\$3,671,720	\$1,835,860
1% Annual Inflation		\$ 31,999,853	\$3,999,982	\$1,999,991
2% Annual Inflation		\$ 34,903,501	\$4,362,938	\$2,181,469
3% Annual Inflation		\$ 38,115,368	\$4,764,421	\$2,382,211
PROGRAM COSTS NRUP:RUP (70:30)	AVERAGE LOT COST \$	TOTAL PROGRAM COST \$	AVERAGE STAGE (8) COST \$	AVERAGE ANNUAL (16) COST \$
<b>Estimated Cost Per Lot</b>	\$ 3,110	\$30,552,640	\$4,160,516	\$2,080,258
1% Annual Inflation		\$33,284,128	\$4,538,039	\$2,269,019
2% Annual Inflation		\$36,304,310	\$4,955,635	\$2,477,818
3% Annual Inflation		\$39,645,082	\$4,160,516	\$2,080,258
<b>Estimated Cost Per Lot + 10%</b>	\$3,421	\$ 33,607,904	\$ 4,200,988	\$ 2,100,494
1% Annual Inflation		\$ 36,612,541	\$ 4,576,568	\$ 2,288,284
2% Annual Inflation		\$ 39,934,741	\$ 4,991,843	\$ 2,495,921
3% Annual Inflation		\$ 43,609,590	\$ 5,451,199	\$ 2,725,599
<b>Estimated Cost Per Lot +30%</b>	\$4,043	\$ 39,718,432	\$ 4,964,804	\$ 2,482,402
1% Annual Inflation		\$ 43,269,367	\$ 5,408,671	\$ 2,704,335
2% Annual Inflation		\$ 47,195,603	\$ 5,899,450	\$ 2,949,725
3% Annual Inflation		\$ 51,538,607	\$ 6,442,326	\$ 3,221,163

The final Western Power charges to the city will also be determined by factors including:-

- New formula for U/G power charges under the NRUP scheme NRUP.
- Construction cost changes.
- Regulatory body support/approval of new WPC calculation for NRUP in the City area



- WPC overhead network asset condition leading to replacement decision and subsequent cost allocation between WPC and the City
- Ministerial support and approval of the new NRUP scheme.
- WPC asset management 5 years plan and allocated budget, as this budget for each specific underground power area within the City area will discount the cost applied for each area to the City.

**9.4. Evaluation of Financing Option ‘A’ – Sale of City of Vincent Property Assets**

REVENUE SOURCE			\$	\$
<b>Sale of Assets - Pre 2021/2022 and staged</b>				
Net Proceeds- Estimated			\$20,000,000	
Interest on Reducing Balance-Treasury Deposit @ .65%			\$832,000	
<b>Total Funds Available</b>				<b>\$20,832,000</b>
HIGH LEVEL INDICATIVE FINANCIAL OUTCOME				
<b>All NRUP* cost scenarios :</b>				
<ul style="list-style-type: none"> <li>• Sale Proceeds of Property Assets + Interest On Reducing Balance could fund "All NRUP" cost scenarios of Base cost as Pilot up to 3% annual inflation, Base Cost as Pilot plus 10% up to 2% inflation.</li> <li>• The other "All NRUP" scenarios require supplementation by sale of the other property assets at various later points in the scheme.</li> </ul>				
<b>NRUP:RUP 70:30 cost scenarios</b>				
<ul style="list-style-type: none"> <li>• NRUP:RUP scenarios require supplementation by sale of the other property assets at various later points in the scheme.</li> <li>• <b>The more likely use of Proceeds from Sale of Property Assets is to temporarily finance initial year program costs and annual shortfalls for other cost recovery methods.</b></li> </ul>				

**9.5. Evaluation of Financing Option ‘B’ – Sale of City of Vincent Property Assets Plus General rates From 2022-2023 FY**

REVENUE SOURCE	\$ p.a.	\$ Total 16 Years	\$ Total 30 Years	\$ Sale of Property Assets
<b>1% General Rates increase #</b>	\$320,000	\$5,516,000	\$ 11,131,000	
<b>2% General Rates increase #</b>	\$640,000	\$ 11,045,000	\$22,262,000	
<b>3% General Rates increase #</b>	\$960,000	\$16,568,000	\$33,394,000	
<i>#+ 1% annual inflation increase</i>				
<b>Sale of Assets – Estimated Current Net Value</b>				<b>\$20,000,000</b>
HIGH LEVEL INDICATIVE FINANCIAL OUTCOME				
<b>All NRUP* cost scenarios :</b>				
<ul style="list-style-type: none"> <li>• Sale Proceeds of assets initially to create a reserve+ Interest On Reducing Balance + General Rates from 2% annually could fund a number of cost scenarios .</li> <li>• Depending on cost scenarios, reserves could be recovered over approximately 30 years.</li> <li>•</li> </ul>				
<b>NRUP:RUP 70:30 cost scenarios</b>				
<ul style="list-style-type: none"> <li>• Sale Proceeds of assets initially to create a reserve+ Interest On Reducing Balance + General Rates from 2% annually could fund a number of lower cost scenarios.,</li> <li>• The other NRUP:RUP scenarios require supplementation by higher general rates increase or sale of the other property assets at various later points in the scheme.</li> <li>• Depending on cost scenarios, reserves could be recovered over approximately 30 years.</li> </ul>				



**9.6. Evaluation of Financing Option ‘C’ – General Rates Increase For All ratepayers from 2022-2023 FY**

PROGRAM COST SCENARIO	\$ Program Average Annual Cost	\$ Program Total Cost 16 Years	General Rates Increase %	\$ GR Increase over 16 years	\$ GR Increase +1% Inflation over 16 Years
Cost Per Lot as NRUP Pilot + 10% @3% Inflation	\$2,015,717	\$32,251,466	6.25%	\$32,000,000	\$34,515,779
Cost Per Lot as NRUP Pilot +30% @3% Inflation	\$2,382,211	\$38,115,368	7.5%	\$38,400,000	\$41,418,878
Cost Per Lot as NRUP:RUP 70:30 + 10% @3% Inflation	\$ 2,725,599	\$43,609,590	8.5%	\$43520,000	\$46,941,391
Cost Per Lot as NRUP:RUP 70:30 +30% @3% Inflation	\$ 3,221,163	\$51,538,607	10%	\$51,200,000	\$55,225,166
<b>HIGH LEVEL INDICATIVE FINANCIAL OUTCOME</b>					
<b>All NRUP* cost scenarios</b>					
<ul style="list-style-type: none"> <li>General Rates Increases from 6.25% to 7.5% plus 1% inflation increase annually required to fund NRUP Program cost scenarios of Cost as Pilot plus up to 30% Cost increase and 3% annual inflation,</li> </ul>					
<b>NRUP:RUP 70:30 cost scenarios</b>					
<ul style="list-style-type: none"> <li>General Rates Increases from 8.5% to 10% plus 1% inflation increase annually required to fund NRUP:RUP 70:30 Program cost scenarios of Estimated Base Cost plus up to 30% Cost increase and 3% annual inflation</li> <li>Likely untenable rates increase over long durations required</li> <li>Surplus receipts in early years need to balance deficits in later years</li> </ul>					

**9.7. Evaluation of Financing Option ‘D’ – Service Charge With general rates – 70% Ratepayers Pay Up Front, remaining 30% Pay over 7 Years from 2022-2023 FY**

PROGRAM COST SCENARIO	\$ Program Average Annual Cost	\$ Program Total Cost 16 Years	\$ 70% Upfront Payment by Ratepayers	\$ 30% Instalments over 7 Years @2% Interest	\$ Total Recovery over 22 Years
Cost Per Lot as NRUP Pilot +10% @3% Inflation	\$2,015,717	\$32,251,466	\$22,576,026	\$10,255,966	\$32,831,992
Cost Per Lot as NRUP Pilot +30% @3% Inflation	\$2,382,211	\$38,115,368	\$26,680,758	\$12,120,687	\$38,801,445
Cost Per Lot as NRUP:RUP 70:30 +10% @3% Inflation	\$2,477,818	\$39,645,082	\$27,751,558	\$12,607,136	\$40,358,694
Cost Per Lot as NRUP:RUP 70:30 +30% @3% Inflation	\$ 3,221,163	\$51,538,607	\$36,077,025	\$16,389,277	\$52,466,302
<b>HIGH LEVEL INDICATIVE FINANCIAL OUTCOME</b>					
<b>All NRUP* cost scenarios</b>					
<ul style="list-style-type: none"> <li>This approach can fully fund scenarios up to cost scenarios of Cost as Pilot plus up to 30% Cost increase and 3% annual inflation with instalments ending after 22 Years (6 years after Program end in Year 16).</li> </ul>					
<b>NRUP:RUP 70:30 cost scenarios</b>					
<ul style="list-style-type: none"> <li>This approach can fully fund scenarios up to cost scenarios of Estimated Base Cost plus up to 30% Cost increase and 3% annual inflation with instalments ending after 22 Years (6 years after Program end in Year 16).</li> </ul>					
<b>General</b>					
<ul style="list-style-type: none"> <li>The approach will require a reserve ranging from \$.65M to \$3.5m at high point to meet shortfall between annual cost investment and loan repayments, until surpluses kick in from Year 17.</li> <li>The approach also works in all other scenarios where a lower or higher percentage of ratepayers choose the upfront payment option with the variables being the annual repayment sum, interest earned on balances outstanding and loan or reserve required to fund shortfalls between annual cost investment and loan repayments, until surpluses kick in from Year 17.</li> </ul>					



- Sensitivity: As an example, in the case of NRUP:RUP Mix scenario, if only 30% of ratepayers choose to pay upfront, Council will require a reserve ranging from \$1.2 to \$6.1m at high point to meet shortfall between annual cost investment and loan repayments, until surpluses kick in from Year 17.

**9.8. Evaluation of Financing Option ‘E’ – Treasury Loan Recovery by General Rates**

PROGRAM COST SCENARIO	\$ Program Average Annual Cost	\$ Program Total Cost 16 Years	\$ Repayments-Staged Treasury Loan Drawn over 16 Years @3% Interest	\$ Rates Increase % Required Over 16 Years (Incl. 1% Annual Inflation)
Cost Per Lot as NRUP Pilot +10% @3% Inflation	\$2,015,717	\$32,251,466	\$33,219,010	6.5%
Cost Per Lot as NRUP:RUP 70:30 +10% @3% Inflation	\$2,477,818	\$39,645,082	\$41,418,875	7.5%
<b>HIGH LEVEL INDICATIVE FINANCIAL OUTCOME</b>				
<ul style="list-style-type: none"> <li>• A staged Treasury Loan to meet annual loan repayments will require likely untenable high rates increases from the outset over 16 plus years.</li> <li>• The City also will likely have other Loan imperatives and Loan Limits will need to be managed.</li> </ul>				

**9.9. Current Indicators – Financial Options To Focus On**

Based on currently available information and assumptions, the above financial evaluations indicate that the financing options most likely to offer the best outcomes for ratepayers and the City of Vincent are:-

No.	Financing Option	Observations
1	<b>Financing Option D</b> - Service Charge With General Rates – a good % of Ratepayers pay up front, Remaining % Ratepayers Pay over 7 Years - From 2022-2023	<ul style="list-style-type: none"> <li>• Popular approach applied by other Councils</li> <li>• Maintains City of Vincent property assets and financial position for other imperatives</li> <li>• Manageable with temporary smaller loan facilities</li> </ul>
2	<b>Financing Option B</b> - Sale of City of Vincent Property Assets + General Rates Increase From 2022-2023	<ul style="list-style-type: none"> <li>• Depletes City of Vincent property asset values but demonstrates use of assets for ratepayers' benefit</li> <li>• Consumes rates increases that may be required for other operational and strategic imperatives</li> </ul>

**9.10. Need to update Financial Evaluations**

As noted earlier, there will be changes to the current assumptions, requiring update of Financial Evaluations to guide any final decisions. These changes will be dependent on following factors, also identified earlier in the paper:-



#### City of Vincent Information Required

- Updated City Map and Scheme Areas
- Average – Number and Range of Lots per scheme
- Mix of Scheme Types or within Schemes – in relation to NRUP, RUP, Large Private Developments
- Preferred Program priority and phasing.
- Treatment of Program Management Costs -Project management (outsources/insourced).
- Project Governance approach.
- Preferred types of recovery from lot owners – rates, service charge, full actual cost.
- Service charges methodology and structure
- Equitable Treatment for Ratepayer Groups- Any discounts, if so what type for ratepayer groups egg. Pensioners.
- Any different treatment for commercial lots.
- Payment terms for non-rates recovery – upfront, over term in years.

#### Western Power Information Required

- WP Prioritised Program including NRUP and RUP areas and its delivery timelines
- Average cost per lot NRUP, RUP in each area
- Breakdown of lot cost between pole to house and other
- Numbers or Ratio of Large Private Development lots reducing NRUP
- Schematics for current overhead and proposed underground network
- Discounts applied in each area.
- Advice from WPC about the underground power program application's process.

### 9.11. Influences on Funding Options

The City of Vincent's Program Financials will be influenced by: -

- the above factors influencing program implementation and
- a number of financial factors that require further information from both the City and Western Power. These include: -

#### 9.11.1 Types of Capital Funding Preferences

- Sale of Assets – Net values, timing.



- Loans -Treasury or Other – borrowing limits, amounts borrowed, interest rates, repayment terms.
- 9.11.2 Treatment of Program Management Costs
  - Project management (outsources/insourced).
  - Project Governance approach.
- 9.11.3 Types of Revenue Raising
  - Preferred types of recovery from lot owners – rates, service charge, full actual cost.
  - Equitable Treatment for Ratepayer Groups- Any discounts, if so what type for ratepayer groups egg. Pensioners.
  - Any different treatment for commercial lots.
  - Payment terms for non-rates recovery – upfront, over term in years.
- 9.11.4 Information expected from Western Power Program Proposal
  - Clarify NRUP and RUP areas within the City of Vincent.
  - Estimated initial cost for NRUP vs RUP per lot and inflation over the life of the program.
  - Starting time and duration of schemes and whole program.
  - Project management approach.

## 10. Solar and Battery Uptake by Households

The Council resolution of 23 March 2021 relating to review of underground power options asked for consideration of the current technological landscape and potential disruption caused by increasing battery use on the electricity network. The Following is a brief overview of the uptake of households in regard to Solar installations including battery capacity.

The current and future impact of increasing battery use on the electricity network is stabilising rather than being disruptive. Growing reliance on distributed battery storage to smooth and buffer spikes and variations in supply is likely to result in government incentives to remain connected to the grid and to impose barriers to off-grid projects in the metropolitan area. Irrespective of regulatory settings, off-grid systems are likely to remain unfeasible for most residential customers in Vincent due to the high cost of built-in redundancy and issues with back-up generation.



### 10.1. Problems caused by solar

The rapid and growing uptake of residential solar without battery storage is causing instability in the Southwest Interconnected System (the electricity grid) due to the following combination of factors:

- The grid is designed to transport energy one way (from a central power station to end users) and struggles to handle simultaneous feed-in from many users at once;
- The intermittent nature of solar generation causes sudden spikes and drops in local voltage as all Photovoltaic (PV) systems in an area feed-in or drop out at the same time;
- The mismatch between solar generation (day) and peak domestic consumption (night) means large and sudden demand fluctuations across the grid, which are difficult to smooth using centralised generation.

### 10.2. Why the grid needs batteries

The State Government sees distributed battery storage systems (including individual residential batteries and community-scale battery banks) as a significant part of the solution. Such systems smooth the spikes caused by intermittent solar feed-in and buffer the rate at which back-up generators need to ramp up/down, thereby stabilising the grid.

As a result, the State Government has already started to indirectly incentivise installation of battery storage systems by limiting the size of PV systems that can be installed without batteries. In coming years, it is likely to follow the lead of other states and provide direct financial incentives for grid-connected household battery systems.

### 10.3. Why metropolitan households aren't going off-grid

Domestic-scale battery storage is becoming more affordable but going off-grid entirely is far from financially feasible for city households. The redundant storage capacity needed by an off-grid system would require each domestic property to have a community-scale battery bank and/or back-up generation capacity in the form of diesel generators.

As the State Government's Distributed Energy Resources Roadmap is implemented over coming years, the need for batteries in the system will continue to increase. It is foreseeable that additional barriers will be imposed to prevent households with batteries from going off-grid.



## 10.4. The current solar landscape in Vincent

Based on data provided by the Clean Energy Regulator, as of 30 June 2021:

- Approximately 22.9% of Vincent dwellings have solar PV;
- 2,580 is the total number of solar PV systems in the City of Vincent;
- 2,424 systems are less than 10kW (individual residential systems);
- 156 systems are over 10kW in capacity (commercial or multi-dwelling systems);
- Similarly detailed statistics are not yet available for battery storage in Vincent;
- WA currently has a total of 2,377 household scale battery storage systems;
- 781 of these were installed in 2020 and 569 in 2021.

## 11. Conclusion

The City of Vincent has an opportunity to underground its overhead power network at lower costs and more affordable, compared to previous SUPP programs based on recent Western Power discussions with the introduction of NRUP and RUP programs.

At this stage, subject to final information from Western Power on program costs, financial modelling suggests that the best option for the City of Vincent is to levy a service charge with the option for ratepayers to pay up front or by instalments over a determined period.

Depending on the quantum paid up front the City may have to consider the sale of asset(s), increasing rates, or a loan to finance the annual shortfalls.

## 12. Report Recommendations

### 12.1. Western Power Proposal

That the City of Vincent wait, but prepare, for Western Power to confirm the details of the new program approach and schemes (NRUP and RUP) proposed for areas within the City (*expected this calendar year*).

### 12.2. Undertake Further Evaluation

That the City once Western Power's detailed NRUP proposal is known undertake an evaluation of the impacts and implications to identify final appropriate options for Council.



### 12.3. Undertake Appropriate Consultation

That the CEO survey the Council to understand the preferred options for payment by ratepayers.

### 12.4. Optimise Agreement and Implementation Program

That the City of Vincent consider utilising specialist services to engage with, agree optimal joint program deliverables, develop management and governance arrangements with Western Power to provide strong assurance for the City and the Council.



## Appendix A – Media Releases –

### 1 - New Funding Option for Underground Power

<https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/02/New-funding-option-for-undergrounding-power.aspx>

New funding option for undergrounding power

Tuesday, 18 February 2020

- New funding option to increase undergrounding in WA
- Almost 4,000 customers to benefit from trial program
- Funding model capitalises on Western Power's significant capital works program

Energy Minister Bill Johnston is pleased to announce a trial of a new funding model that will allow more Western Australians to access the benefits of underground power.

Western Power's Network Renewal Underground Program Pilot will be tested in four suburbs where significant capital works projects have been planned to replace and upgrade sections of overhead network.

Local governments invited to participate in the pilot are the Town of Bassendean (Eden Hill), City of Stirling (Scarborough), City of Fremantle (Hilton) and the Town of Victoria Park with the City of Canning (St James).

Under the pilot model, local government authorities are being given the option to contribute additional funds to cover the difference between like-for-like pole replacement and the cost of converting the area to underground power.

Because the poles and wires in the pilot areas are old and due to be replaced, the cost to homes and businesses are expected to be lower than the State Government-led Underground Power Program and other local government-led programs for undergrounding.

Comments attributed to Energy Minister Bill Johnston:

"This is an opportunity for local governments to capitalise on the significant investment Western Power commits to rejuvenating and upgrading the network that supplies its customers' energy needs.



"On top of the reliability and aesthetic benefits that underground power brings to the customer, the increased capacity also helps unlock the network to new technologies.

"This announcement is in line with the McGowan Government's Energy Transformation Strategy, which is committed to a secure, safe and reliable energy future."

Minister's office - 6552 6700

## 2 – Information to Property Owners

<https://www.victoriapark.wa.gov.au/Your-property/House-and-garden/Underground-power/Network-Renewal-Undergrounding-Program-Pilot/NRUPP-Information-for-property-owners>

Information for property owners

Earlier this year, the Minister for Energy announced the trial of a new funding model for undergrounding power. This enables Western Power to upgrade aging sections of the electricity grid from the overhead power lines to an underground network.

The St James NRUPP area covers St James, Bentley, and East Victoria Park.

This project will deliver significant aesthetic, environmental and economic benefits for both local governments and its ratepayers. The Town and the City are proud to be working with Western Power to deliver this project, which creates local jobs through the certainty of work for contractors, sub-contractors and suppliers associated with underground power projects.

For NRUPP, Western Power covers the cost of the network infrastructure costs in the public space, up to and including the pillar (verge green dome). A service charge will be levied through your rates notice to cover the costs to connect the consumer mains (from pillar to your house). The service charge will not apply to vacant land, as no consumer mains will be installed within vacant private land.

Properties with an existing underground consumer main will not be required to pay the service charge. Below are the typical property connection types, enabling you to identify which property type you fall under and if a service charge will be levied. There are three types of property connections - only a 'Type 1' will be charged the \$2,300 service charge, 'Type 2' and 'Type 3' have no service charge.



Both Councils have negotiated with Western Power a deferral for the service charges for 12 months. This means that the NRUPP service charges will not be levied until the 2022-2023 financial year rates notice.

There will be two payment method options available for the St James NRUPP:

1. Payment in full as part of the 2022-2023 rates notice; or
2. Payment in annual instalments over a seven-year period, with applicable interest charges commencing as part of the 2022-2023 rates notices.

To enable property owners to pay their underground power service charges in annual instalments over a seven-year period (as per option 2), the Town's cost of borrowings (principal plus interest) will be applied at the applicable interest rate and on-charged in the owner's rates notice.

Eligible pensioners and seniors are entitled to rebates on underground electricity charges as determined by the State Government, as per the guidelines set out below:

1. Holders of a Pensioner Concession Card, State Concession Card or a Commonwealth Seniors Health Card WITH a WA Seniors Card, will be entitled to receive either up to 50% rebate or full deferral on underground electricity charges; or
2. Holders of a WA Seniors Card, who do not hold a Commonwealth Seniors Health Card, will be entitled to receive a single \$100\* rebate on underground electricity charges for the first year only of the scheme.

\*The current rebate amount is currently \$100 but is at the discretion of the Department of Finance.

In the interim, further queries regarding the St James NRUPP can be directed to Mr Terry McCarthy at the Town on 9311 8111, or via email at [admin@vicpark.wa.gov.au](mailto:admin@vicpark.wa.gov.au)



Appendix B – City Vincent Demographical Data

# City of Vincent

## Population and dwellings

There are a number of different ways of measuring the population of an area, all of which give an insight into the size of the place and its rate of growth over different time periods. The Census counts people where they are on the night of the Census (enumerated population) and also by where they usually live (usual residence). Both these populations are useful and form the basis for a range of characteristics collected in the Census.

However, the most accurate count of the total population is Estimated Resident Population, which factors in an estimate of those missed in the Census and those who were overseas on Census night. It is usually higher than either Census count, and is also updated annually after the Census, providing preliminary estimates for up to 5 years.

This page provides the three population counts for the City of Vincent at the last Census, with comparisons to previous Census years for the Census counts only. The current estimate for the City of Vincent at the most recent year available is shown at the top of the page. This figure is a preliminary estimate only and is subject to review after the next Census data are released. Please use with caution.

Also included are a range of sub-population groups and key statistics from the Census (usual resident) population, such as citizens, employed persons and Indigenous population.

These figures all provide the context for the size of the population and growth rate within the City of Vincent and should be looked at in conjunction with other basic demographic information, such as Age Structure, Dwelling Type and Household Size.

The data on this page are sourced from a variety of different tables and designed to give a range of population and dwelling numbers for the area.

### Population

City of Vincent - Total persons	2016			2011			Change
	Number	%	Greater Perth %	Number	%	Greater Perth %	2011 to 2016
Estimated Resident Population	35,674	--	--	33,857	--	--	+1,817
Enumerated Population	32,985	--	--	31,050	--	--	+1,935
Usual Resident Population	33,693	--	--	31,548	--	--	+2,145

Source: Australian Bureau of Statistics, Census of Population and Housing 2011 and 2016. Compiled and presented in profile.id by .id (informed decisions).

Please refer to specific data notes for more information



### Selected subpopulation categories

City of Vincent - Total people (Usual residence)	2016			2011			Change
	Number	%	Greater Perth %	Number	%	Greater Perth %	
Population group							2011 to 2016
Males	16,807	49.9	49.6	16,063	50.9	49.6	+744
Females	16,891	50.1	50.4	15,485	49.1	50.4	+1,406
Aboriginal and Torres Strait Islander population	237	0.7	1.6	177	0.6	1.6	+60
Australian citizens	25,555	75.8	78.3	23,997	76.1	80.0	+1,558
Eligible voters (citizens aged 18+)	20,765	61.6	59.1	19,717	62.5	60.6	+1,048
Population over 15	28,927	85.8	80.9	27,187	86.2	80.8	+1,740
Employed Population	18,787	93.9	91.9	17,951	96.0	95.2	+836
Overseas visitors (enumerated)	730	--	--	914	--	--	-184

Source: Australian Bureau of Statistics, Census of Population and Housing 2011 and 2016 (Usual residence). Compiled and presented in profile.id by .id (informed decisions).

Please refer to specific data notes for more information

### Dwellings

City of Vincent - Households (Enumerated)	2016			2011			Change
	Number	%	Greater Perth %	Number	%	Greater Perth %	
Dwellings							2011 to 2016
Total dwellings	16,836	100.0	100.0	15,416	100.0	100.0	+1,420
Occupied private dwellings	14,645	87.0	89.4	13,970	90.6	90.8	+675
Population in non-private dwellings	1,069	--	--	1,018	--	--	+51
Average household size (persons per dwelling)	2.18	--	2.55	2.19	--	2.55	-0.01

Source: Australian Bureau of Statistics, Census of Population and Housing 2011 and 2016 (Enumerated). Compiled and presented in profile.id by .id (informed decisions).

Please refer to specific data notes for more information

\*Note that this is an estimate based on ERP at the SA1 level. It is subject to review after the next Census data release and may not match .id's population forecasts.



## Appendix C – Underground Power Construction Activities

### Types of underground power work on and around properties.

There are two types of work to take place on street and around property:

- **Civil works** - including trenching, drilling and equipment installation.
- **Electrical works** - including inspections, testing and final connection.

### Surveying and equipment installation

The initial stage of work includes surveying, locating underground laid services and installing distribution equipment and streetlights. These works can be disruptive to street verges. Surveying, locating and marking underground laid services (water, sewage, gas, telecommunication) prior to starting trenching and drilling activities is required to minimize the risk of damaging and interrupting them.

### Cable installation

Cables are installed under the street verge using directional horizontal drilling. Numerous excavations are necessary for equipment installation and cable work. Although care is taken at all times to minimize the impact of this work, disruptions to verges and front gardens may occur. All holes and exposed cables are temporarily barricaded, ensuring public safety.

### The property

A trench may be required inside the property boundary to install the connection pillar that will supply property. The green pillars are generally installed in the corner of every second property and in most cases, this will service two dwellings. A smaller trench may also be created in line with meter box as an entry point for the drill.

### Connection

Electrician changes power supply to new underground power network. Customer receives a planned power interruption card a few days prior to connection providing a date and time. The power will be off for a few hours as the existing overhead cable is removed and the new underground cable is connected to the meter.

### Dismantling of Redundant Overhead Network

Dismantling of redundant overhead powerlines and poles is not conducted on individual streets, bases but is performed when several areas are connected and energized to the new underground network. This infrastructure may be still providing electricity and is therefore required until all properties in the supplied area have been fully transferred to the underground network.