SECCCA
South East Councils
Climate Change Alliance

SEMREP Procurement Models Evaluation Report

31 May 2019

(Updated 18 September 2019)

Contents

1. Executive Summary

The South East Councils Climate Change Alliance (SECCCA) undertook a feasibility study to determine the viability of tendering for a corporate Power Purchase Agreement (PPA) from renewable energy generators. Renewable Energy Power Purchase Agreements have been used by other local governments, universities and corporations to deliver lower cost electricity while also delivering on emissions reductions, greater uptake of renewable energy generation and delivering local socio-economic benefits. SECCCA and SEM Councils formed a partnership in undertaking the feasibility study into a group purchasing model. Importantly, an objective of the initiative was to deliver socio-economic benefits to the South East Melbourne region. It was anticipated that the SEMREP model would be adapted or expanded to deliver lower electricity costs and emissions reductions to a broader range of energy users.

In undertaking a feasibility study, four purchasing models were identified. These included two models which involve the purchase of electricity from powerplants elsewhere in the grid, and supplied by an electricity retailer. Two other models involve the development of solar farms on Council owned land, either by Councils themselves, or by a third-party lessee. The options identified are all based on existing models which have been proven and tested in the market.

The models identified were presented to Councils in an earlier version of this paper in May 2019. Councils were asked to consider their participation in a group purchasing arrangement. Participation was sought from sufficient Councils to then seek participation from corporate customers. The inclusion of external partners was deemed necessary to underpin the tender development and transaction costs. Ultimately, it was determined that sufficient commitment from Councils did not exist for the project to proceed to a procurement phase. Councils instead opted to pursue other electricity procurement options.

This report outlines the methodology, findings and conclusions of the study. This paper provides an overview of the models evaluated and a summary of the cost impact analysis. It accompanies the detailed energy pricing spreadsheets which have been provided to Councils. The earlier version of this paper recommended a preferred tendering model, recommends next steps, and identified critical success factors. This information has been retained in this final version of the feasibility study report.

Summary of findings

An energy market specialist consultant was engaged to develop a comparative cost model to enable a comparison of the models against 'business as usual' (BAU) electricity purchasing approach. The cost comparison model considered three future energy price scenarios which are premised on low, medium and high uptake on renewable energy uptake in the grid.

When compared against a business as usual procurement approach, the proposed PPA approaches were deemed to deliver electricity cost savings under the low and medium renewable energy uptake scenarios, and a slightly higher cost of energy in the event of high energy uptake in the grid. Under a high renewable energy uptake scenario, the cost of energy was projected to have been depressed resulting in a slight cost differential between a BAU approach and a renewable energy PPA.

A subset of the SEMREP feasibility study has considered models that would enable delivery of renewable energy products to residents, SMEs and other smaller customers. This is the subject of the *SEMREP for Business Options Paper.*

2. Background

Large energy customers are adopting new electricity procurement methods to achieve long-term cost savings, cost certainty and deliver on emissions reduction objectives. Local governments, universities, water utilities and corporate customers, have engaged in energy purchasing practices that depart from a 'business as usual' approach of short-term electricity purchasing. These new approaches involve entering into long-term Power Purchase Agreements (PPAs) or developing their own powerplants, such as solar farms.

The South East Melbourne Renewable Energy Project sought to investigate alternative electricity purchasing initiatives which deliver reduced electricity costs, emissions reductions, and additional social and economic benefits to the South East Melbourne Region. The initiative is led by the South East Councils Climate Change Alliance (SECCCA), in partnership withSEM Councils, namely the Cities of Frankston and Monash.

The SEMREP working group worked from November 2018 to develop an agreed set of objectives, considered a range of purchasing models, and engaged expert market advise to advise on expected costs. This report sets out the cost modelling outcomes, along with the non-cost considerations for each of the models that the working group has identified as being of interest.

For the purposes of this investigation each Council was asked to identify their current annual electricity consumption across all sites, and to identify an indicative volume of load that would be put towards an SEMREP contract. Most Councils only nominated a proportion of their load, opting to split their electricity purchasing arrangements between SEMREP and other purchasing arrangements. The nominated loads were for modelling purposed and business case development and did not 'lock in' Councils' electricity commitments to a SEMREP contract.

Indicative loads contributed by each Council for the purposes of modelling:

	Small sites	Large sites	Streetlights	total
Bayside	750	-	-	750
Cardinia	-	-	-	-
Casey	2,654	4,600	-	7,254
Dandenong	1,800	2,700	4,500	9,000
Frankston	1,197	1,940	3,566	6,703
Monash			1,953	1,953
Mornington	-	-	-	
Port Phillip	-	-	-	
				25,660

Note: Each Council has been provided with a tailored spreadsheet and is able to model the forecast costs of electricity associated with the various models for its own operations based on its own actual consumption figures and add or subtract loads as required.

2.1. Objectives

SEMREP sought to deliver an electricity purchasing solution which:

- Delivered a lower cost of electricity to Councils
- Increased the use of renewable energy
- Delivered emissions reductions
- Delivered social and economic benefits to the South East Melbourne region.

Several the SECCCA Councils and partners expressed a strong desire to develop a model which would enable other electricity consumers in the South East Melbourne region to also be able to access cost-effective renewable electricity.

While other local government purchasing initiatives are being developed, SEMREP specifically seeks to deliver social and economic benefits to the South East Melbourne region. While not prescribed, these benefits could have include:

- Delivery of low-cost renewable electricity products to community customers
- Creation of renewable energy projects in the region
- Training and employment opportunities in SE Melbourne
- Research partnerships
- Development of renewable energy facility in the region, including supply chain and job creation benefits.

2.2. Current electricity procurement practices

Councils currently purchase electricity for short term (2-3 year) periods. Procurement for electricity and gas is usually undertaken as part of a group purchasing arrangement with other Councils. This typically involves using one or more of three group purchasing arrangements. The two predominant group purchasing arrangements are facilitated by MAV Procurement and Procurement Australia. Councils are also able to enter into the State Government's group electricity contract, which provides greater flexibility to enter or exit the contract compared to the MAV Procurement and Procurement Australia options.

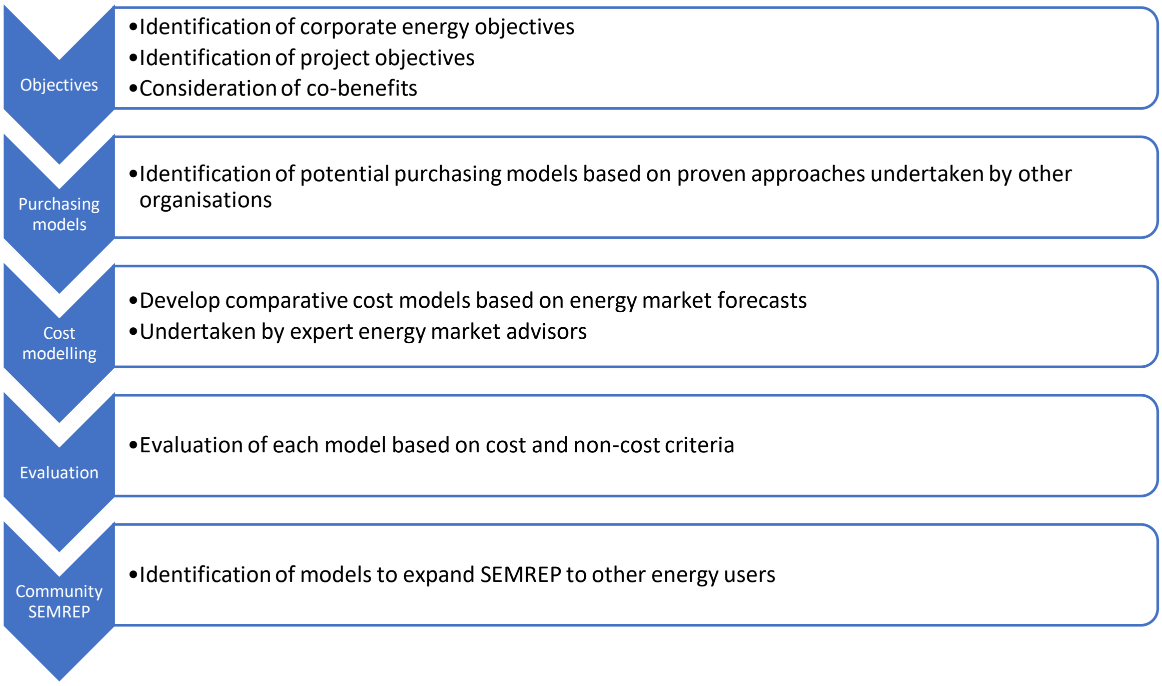
Councils involved in SEMREP do not currently purchase Green Power or renewable energy certificates (RECs). Green Power and Renewable Energy Certificates (RECs) are both methods of certifying that electricity purchased by a customer is matched by an equal volume of electricity generated by a renewable source and supplied to the grid. Some Councils in the region have adopted emissions reduction targets or renewable energy targets within the coming decade. The purchase of renewable energy helps to achieve these emission reduction objectives.

In developing a business case it will be necessary for the extra cost that may have been associated with a renewable energy purchase under a business as usual (BAU) scenario to be taken into account when comparing with a renewable energy purchase under a PPA.

3. Study methodology

The feasibility study involved identification of suitable models to support a SEMREP aggregated purchasing approach based on Councils corporate needs and objectives. The models were evaluated against these criteria, which included a cost evaluation based on energy market forecasts developed by expert consultants. To minimise unnecessary complexity, the feasibility study sought to identify models that would first meet the needs of Councils and then identify how these could be adapted or expanded to provide energy solutions to a broader range of energy customers.

The feasibility study adopted the following process.



Objectives

The corporate needs and objectives of Councils were considered in the identification of models. This was done through meetings with executive officers, procurement and property teams, and through workshops with the SEMREP working group. Existing Council energy purchasing practices were identified, as well as Councils' appetite for long-term contracts, price risk and cost uncertainty, and the risks associated with developing, owning and operating a large power plant.

It was determined that Councils had an interest in achieving emissions reduction targets, a desire for managing and reducing energy costs, and that they placed value on delivering social and economic benefits to the region. Several Councils also expressed a strong preference for enabling other large energy users in the region to access a local renewable energy product. Councils generally accepted the prospect of a long-term contract if there were demonstrated benefits. While some councils were prepared to consider developing their own power plant, this was not a universal position with some Councils seeing it as falling outside the usual business focus of Council, identifying the lack of suitable land, or recognising that Councils generally lacked the necessary experience to develop and manage a sizable electricity generating asset.

Models

Several purchasing models were identified based on models recently adopted and proven by other Councils and institutions. These included the option to purchase electricity from power plants located in the grid in other parts of Victoria. The models were evaluated based on several criteria including complexity, resourcing, risk, market acceptance.

Procurement models which have the potential to deliver on these objectives were identified based on previous practices undertaken by similar organisations such as:

- purchasing electricity from renewable energy powerplant located elsewhere in the grid through retail PPA arrangements (based on Melbourne Renewable Energy Project, University of NSW, and others). This approach considered purchasing electricity from new (yet to be built) power plants, or existing powerplants. The cost of power from each was modelled separately.
- the development of power plants owned and operated by Councils (based on the experience of the City of Newcastle, Sunshine Coast Regional Council and University of Queensland),
- leasing Council land for the development of powerplant by third parties (based on current practice of operating methane capture systems at some Victorian Councils' landfill sites).

Models identified for business case consideration are detailed in Section 4.

Cost modelling

A specialist energy market consultant – Energetics – was engaged to develop an electricity market forecast and advise on comparative procurement costs of the models selected. A scenario-based modelling approach considered likely developments in the National Energy Market which would affect supply-side factors affecting price. These scenarios are outlined in Section 5. Energetics also provided advice on several risk factors associated with the various models which were considered by the SEMREP working group.

Evaluation

The purchasing models were evaluated using price and non-price criteria. These included co-benefits, risks, timeframe to development and resourcing implications. A discussion of the project characteristics against these criteria is contained in (Part 4). The evaluation score sheet is outlined at (Section 6). The SEMREP Working Group developed recommendations based on the evaluation of potential models, and consideration of the practicality and cost associated with undertaking a tender process.

Community SEMREP - Inclusion of businesses

The SEMREP Working group expressed a strong preference for delivering renewable energy purchasing solutions to the broader community with large energy users identified as a priority segment. The ability to deliver renewable energy solutions to businesses and institutions in the South East Melbourne region is a key differentiator from other local government procurement initiatives. The SEMREP working group agreed to focus on identifying and selecting procurement models that would primarily meet the needs of SEMREP Councils and then consider how these models could be expanded or adapted to incorporate business and institutional customers.

In the short-term, it has been identified that delivering renewable electricity services within tested and proven procurement processes can be achieved by strategically partnering with large, credit-worthy businesses and institutions, such as hospitals and educational institutions. This approach will deliver material gains for emissions reduction, renewable energy uptake while providing community consumers with a cost-effective renewable electricity product.

Options for delivering community electricity products is the subject if the *SEMREP for Business Options Paper.* This focusses on delivery to residents, small and medium enterprises, and corporate customers.

The SECCCA Project team met with Fulton Hogan, the South East Melbourne Manufacturing Alliance (SEMMA) and GHG Alliance to gauge interest in participating in a group Power Purchase Agreement. The team has established that these organisations were interested in maintaining a dialogue to understand Councils' decisions on a purchasing model and expected cost impacts.

It is proposed that engagement with hospitals, tertiary education institutions and businesses would continue, pending Council decision making processes regarding project next steps.

4. Options identification

The study identified purchasing models based on consideration of the SEMREP group's stated criteria. Four models were identified. These have all been piloted and proved by other Australian local governments or universities in the recent past.

The desire to deliver local solutions and benefits brought into consideration the possibility of developing a local powerplant of suitable scale to supply the SEMREP group. This model gained additional relevance as several Councils in the region had considered or were actively considering the development of solar farms on Council-owned land. Similar approaches have been adopted by the Sunshine Coast Regional Councils, the City of Newcastle and the University or Queensland. All have all developed, or are in the process of developing, their own solar farms.

One of the models assumes that electricity would be supplied by a Council-owned solar farm. Three of the models involve purchasing electricity from a third party-owned powerplant.

All of the models involve the retail supply of electricity by a retailer. A retailer provides a 'firm' electricity supply. This means that electricity is sourced from the grid at times when the renewable energy resource is intermittent, and any spot market price fluctuations are managed by the retailer. On advice from the energy market advisor, all of the models assume a 10-year retail supply agreement. The model involving a Council-owned power plant involves assessment over a 25-year asset life and therefore involves a different cost comparison methodology.

The possibility of entering into a financial-type contract, such as a derivative contract called a 'contract for difference' was also considered. This approach involves some revenue and risk sharing between the customer and the power plant. It can present some financial advantages to the customer in times when electricity prices (and therefore revenues) are high but can also present financial risks at times when electricity revenues are low. The contract for difference approach has been adopted by universities, State Governments and private sector customers. It has not been adopted by local governments largely because it involves additional administrative and accounting complexity, additional technical due diligence, and a perception of greater price risk exposure. For this reason, solutions that involved a contract for difference were not selected.

The options listed below were identified as being *complementary* to installation of rooftop solar systems on Council buildings and it is recommended that any renewable energy purchasing initiative be pursued in parallel with ongoing rooftop solar installations.

4.1. Overview of options

Model 1 – Retail electricity supply from new renewable power plant.

This option involves undertaking a tender to select an electricity supply from a new, yet to be constructed, powerplant. The power would be supplied by a retailer which would 'firm' the electricity supply – that is, ensure that electricity was supplied when the renewable energy resource was unavailable, and manage any spot market price exposures.

The powerplant could be located within the South East Melbourne region or outside the region. Contracting to purchase electricity from a new powerplant can have the benefit of enabling a new powerplant to proceed to construction that would not otherwise have proceeded. The approach enables community engagement and 'storytelling' benefits associated with the construction of the new powerplant, including focusing on job creation and economic development benefits. Because the powerplant is a new, not yet constructed, facility, this approach carried several additional development and construction related risks and involved a considerable longer lead-time before power is supplied.

Model 2 – Retail electricity supplied from existing powerplant.

Similar to the option above, this option involves undertaking a tender to select an electricity supply from an existing renewable energy powerplant. As with the option above, the electricity is supplied by a retailer which would 'firm' the electricity from the renewable powerplant. This option is less likely to result in a contract with a powerplant in the South East Melbourne region as there are limited existing renewable energy powerplants locally. This approach reduces the ability to promote the benefits that result from constructing a new renewable energy project (such as job creation). There are fewer development risks associated with the powerplant as it has already been developed and therefore largely de-risked. This may result in a slightly higher cost of energy as the development risk was incurred by the project developer and is reflected in the price.

Model 3 –Electricity from solar farm on Council land – operated by third party.

This approach involves selecting a third party to develop a renewable energy powerplant on Council land. This approach is based on existing models for the operation of third party-owned generators at Council-owned landfill sites. The electricity would be supplied by a retailer and, as in the models above, the renewable electricity would be 'firmed' – managing intermittency and spot market exposure.

The approach would likely involve a competitive process to select the developer. Part of the process would involve determining land tenure and leasing arrangements, contracting with intermediary retailers, managing development risks and obligations, residual ownership of the asset following the conclusion of the contracted period, and undertaking due diligence on the proposed developer.

The approach may enable councils to outsource some of the costs and risks associated with project management, development risk, grid connection risk, operational and business case risk. To some extent, Councils would still carry some reputational risk associated with the project.

Model 4 – Council owned powerplant on Council owned land.

This approach involves Council/s developing and owning a new powerplant on council land. For the purpose of comparative cost modelling, it was assumed that the powerplant would be a solar farm. This approach was taken by Sunshine Coast Regional Council in Qld in developing a 15MW solar farm on floodplain and the Newcastle City Council in NSW in developing a 5MW solar farm on a disused mine site.

This approach involves the greatest level of risk and resourcing involvement by Councils. The approach involves developing a business case for the project, sourcing capital, tendering for the design and construction of the project, obtaining development and grid connection approvals and managing construction contracts. Responsibility for managing and operating the powerplant rests with Council although may be contracted to a third party. Unlike the approaches with involve purchasing electricity from a third party, risks associated with the development, construction and operation of the project rests with Council. Electricity would be exported to the grid. If the electricity is to be consumed by Council a supply agreement with a retailer will be required, even if the electricity is to be consumed by other Council owned sites.

5. Evaluation of price criteria

A comparative cost model, based on an electricity market forecast, was developed to evaluate the four purchasing models against cost criteria. The cost models were developed by energy market advisory firm Energetics. The cost model compared a business-as-usual (BAU) electricity purchasing approach with the expected long-term costs of purchasing electricity under each of the modelled scenarios.

Each Council has been provided with an energy price model tailored to its own energy costs, load profile volumes. It is necessary to review and analyse the tailored energy cost model for each Council to understand the specific expected energy cost impacts. This report provides a high-level discussion of the energy modelling results aggregated across all Councils. An aggregated cost model takes into account the expected contracted electricity volume and load profile across the group of Councils.

The model for PPA pricing was based on recently contracted renewable energy PPA deals with credible retailers. The model assumes that retailers will adopt a retail price hedging strategy (firming) matched to the group's relevant load profiles, taking into account the customer's load profile relative to the generation profile at the contracted power plant.

The electricity market forecast developed three possible future scenarios modelling different supply and demand effects. The scenarios each modelled a future electricity price under low, medium and high renewable energy uptake scenarios and compared these against a business as usual BAU short-term retail purchasing scenario.

Wholesale electricity prices are relevant to the model as these inform both the BAU scenario, as well as the cost of firming under a retail PPA arrangement. The level of uptake of renewable energy in the grid in future will affect supply (the volume of electricity available in the grid overall) which will affect the wholesale electricity price. The low, medium and high renewable energy scenarios are based on potential developments which are likely to occur in the national electricity grid as modelled by the Australian Energy Market Operator (AEMO) and documented in the 2018 Integrated System Plan (ISP). The low, medium and high renewable energy scenarios assume greater or lesser extent of uptake, as well as earlier or later adoption of the various solutions identified. These are detailed in Appendix A.

The cost model for solar farms relied on Energetics' existing market knowledge of medium-scale solar farm development costs. The model takes into account Local land prices and local solar irradiance levels were applied to the model.

The model has been developed for the purpose of comparing a BAU purchasing approach with retail PPA deals under the modelled scenarios. It cannot be relied on as a true indicator of future prices as future prices are dependent upon various factors in a volatile electricity market. Actual pricing will be tested in market during a competitive tendering process for either PPA or solar farm. The models do however enable a comparison of the models under the same market scenarios.

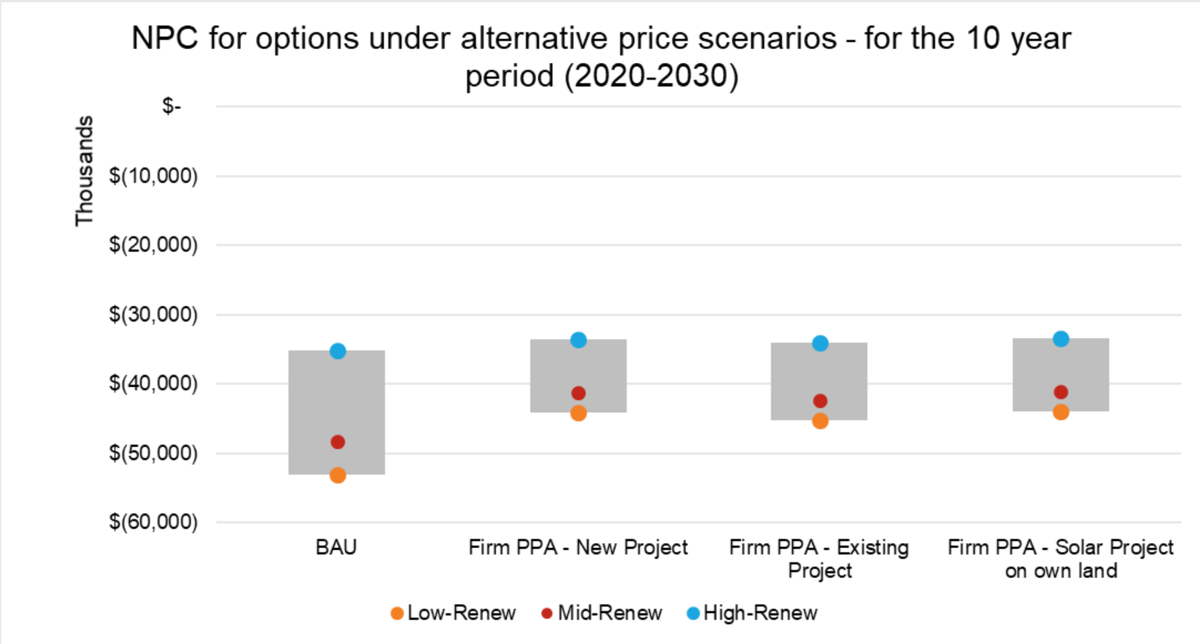
Because Councils do not currently purchase renewable energy certificates or certifies Green Power, the business case in this document presents a comparison of 'black power' under a business as usual scenario with the purchase of electricity from a renewable energy source, *without* the supply of renewable energy certificates. The business case also presents modelling presenting a renewable energy certificate cost, which can then be added to the electricity cost. This reflects the true costs of a like-for-like comparison.

Energetics has advised that the unit cost difference for each customer that would result from a reduction in volume, or exclusion or inclusion of particular sites would be negligible. Councils can therefore use the indicative comparison price models to consider the cost impact regardless of whether Council's energy contribution increases or decreases, so long as the overall group demand is broadly consistent with the modelled load volume.

5.1.1. Energetics price evaluation

The energy cost model identified that under two of the three modelled scenarios – low and medium renewable energy uptake in the grid – the PPA purchasing models compared favourably with a BAU approach over a 10-year period. The aggregated model for all councils indicates that under these two scenarios, a PPA presents a cost saving of between 7.25% to 14.7%. Under the high renewable energy uptake scenario, the additional generation in the grid would depress wholesale electricity prices, also depressing the cost of electricity under a BAU approach. Under this scenario, the cost of electricity sourced from a corporate PPA would be fractionally more expensive over a 10-year period (+2.6% to +6.2%) than purchasing electricity under a BAU approach.

The models identified that purchasing electricity from an existing renewable energy powerplant is likely to be marginally more expensive than contracting with a new, undeveloped plant. This reflects that fact that an existing powerplant has been largely 'de-risked', whereas the customer carries some risk in contracting with an undeveloped powerplant.



The chart above does not indicate costs associated with 'Option 4 – owning a solar farm on Council land'. The the longer life of the asset (25 years) involved a different net present value (NPV) calculation and a different comparison of energy costs. Energetics modelling indicates that owning a solar farm can, under ideal conditions, deliver energy at 13% less cost compared with a PPA, however there are a number of risks associated with this approach that need to be taken into account. Furthermore, this favourable costing is based on the assumption that the solar farm does not encounter any design or siting challenges, such as access to grid, favourable geotechnical conditions, etc. These are discussed further below.

5.1.2. Additional considerations – Council-owned power plant.

Energetics advised that there are a range of additional considerations and risks associated with developing a Council owned power plant, or a power plant on Council land, which impact the business case. Development of a solar farm involves various project risks which need to be carefully managed. These risks can result in significant cost overruns, as was the case with the Sunshine Coast solar farm, developed by Sunshine Coast Regional Council. The costs presented in this report associated with the development of a solar farm are based on a 'best case' scenario where grid access, land access, and geotechnical factors do not present significant challenges. Energetics advised that cost overruns resulting from complications in relation to these factors can easily be in the order of 200% and even 300% depending on project specific factors. Most Councils lack the specialist knowledge and experience that comes with having developed previous solar farms. Energetics cautioned that the modelling for solar farm scenarios should therefore be treated with caution when compared with the PPA models.

6. Decision making framework

Based on the criteria outlined above, a decision-making framework was developed ranking each criteria. A higher number of stars indicates a more favourable score.

	Cost of power	Ability to supply businesses & community	Local & Community benefits	Ease of managing Risk	Procurement process resourcing (costs)	Timeframe
Model 1 Retail PPA – New project		**	**	****	****	****
Model 2 Retail PPA – Existing project		**	*	***	***	***
Model 3 Solar farm – leased, council Land		***	***	**	**	*
Model 4 Solar farm – Council owned		***	***	*	*	*

6.1. Recommendation

Based on the criteria above, the SEMREP Working group recommended that SEMREP Councils seek to undertake a tender process for a Power Purchase Agreement (PPA) for the long term supply of electricity from a renewable energy source. The tender would be open to supply from a new or existing renewable energy project (Options 1 and 2). In order to test the market as broadly as possible, it was suggested that the tender would be open to projects from across Victoria with a preference for projects in the South East Melbourne region. The tender would not specify a technology type. The tender would have sought to deliver local benefits to the South East Melbourne Community and would have enabled suppliers to identify the ways in which local benefits can be realised.

The options of developing solar farms on Council land were not recommended as a means of sourcing electricity for Councils operations at this time. This was primarily due to the longer timeframes involved in developing a Council-owned solar farm, or leasing land to a solar farm developer, along with the additional project complexity. SECCCA has undertaken a separate but related piece of work to understand the implications of aggregating Councils to participate in a solar farm development project and this option remains a possibility in the future.

7. Next Steps

The following process steps and timeline was developed for undertaking a PPA tender process. The timeframe required for evaluation, negotiation and contracting would have been dependent on the number of responses received, the number of proposals that are shortlisted, whether the projects are new or existing and consequently, the level of due diligence required.

The inclusion of strategic purchasing partners (businesses and/or institutions) was considered critical to securing sufficient electricity demand to issue an attractive tender to the market. It would also have reduced the procurement administration costs.

June 2019	Indication of intention to proceed
June – July 2019	Engagement with potential strategic purchasing partners
July 2019	Commitment from Councils to undertake tender process MOU
August 2019	Appointment of specialist energy advisors and procurement advisors
August – September 2019	Finalisation of purchasing group members and loads
September 2019	Development of tender documentation, including electricity loads and tender scope
Sept – Oct 2019	Pre-tender market engagement
Oct – Nov 2019	Release tender
Dec – 2019	Initial evaluation and shortlisting
Jan – Feb 2020	Negotiation and contracting with preferred suppliers
Feb – April	Tender award and commence transitioning to new contracts

It was recommended that a preferred purchasing model be recommended to Councils and that Councils would commit the necessary resources to proceed to a procurement process. It was recognised that a project governance and cost-sharing frameworks would have been required across participating councils. This would have included a decision-making frameworks and a commitment to a cost sharing approach.

7.1. Decision to proceed - Adequate load and strategic partnerships.

Commitment from Councils Administrations (or Councils, as appropriate) was sought before proceeding with a SEMREP tendering project. Ultimately, it was determined that there was insufficient commitment among the group of Councils to provide a minimum viable load and for the project to proceed into procurement phase.

A minimum load of 20GWh from 3-4 Councils was sought by the end of July 2019. This timeframe was based on timeframes for expiry of Councils' existing electricity supply contracts.

The SEMREP group possessed insufficient volume of electricity demand to present an attractive tender to market. The indicative load contribution from SEMREP Councils was in the range of 25GWh spread among five Councils. The minimum volume of electricity required was considered to be in the range of ***50GWh***. Greater volumes will represent more attractive contracting opportunities to suppliers, would likely result in greater interest from the market and a more competitive procurement process. It was also considered necessary to seek participation from businesses and institutions to supplement the Councils' load and distribute costs associated with undertaking the tender process.

Inclusion of businesses and institutions would have been sought once sufficient load from Councils had been achieved. A target of 50GWh from not less than 8-10 Customers across the entire SEMREP group was sought.

It was proposed that a Memorandum of Understanding between the purchasing group members be developed to govern the administration of the purchasing group.

In order to maintain attractiveness of the purchasing group to prospective suppliers (eg. credit worthiness, reliability of load, similar procurement processes and requirements), the SEMREP working group was asked to consider and agree to a proposed set of criteria for inviting and accepting business participation in the purchasing group.

A non-exhaustive list of potential strategic project partners was developed based on the following criteria:

a) Potential load contribution
b) Likely creditworthiness and/or longevity
c) Presumed stability and predictability of electricity demand.

This list is provided at Appendix B

Councils identified that a fair and equitable process for enabling businesses to express interest in participating in the process would need to have been developed. It was proposed that the SEMREP working group undertake this task.

The SEMREP project team made informal approaches to institutions in the South East Melbourne to gauge their appetite for participating in the project. This included the South East Melbourne Manufacturers Alliance, Fulton Hogan, and GFG Alliance.

7.2. Project management and resourcing

Facilitating a joint procurement process for a long-term electricity supply through a PPA involves considerable resources beyond those which can be expected through a normal short-term electricity procurement process. These include:

- Project management and purchasing group facilitation
- Specialist energy market advice (tender development, evaluation support, negotiation support)
- Procurement process and probity advice
- Legal services (specialist contracting)

It is estimated that costs associated with undertaking the tender process would be in the range of $500,000. Additionally, Councils would need to commit officer time to participate in tender evaluation, internal project management and stakeholder engagement. These costs would be distributed among the SEMREP purchasing group members. The cost estimate was broken down in the following way:

Project management and group facilitation	$100,000 +
Energy market technical advice	$100,000

Other tendering costs	$20,000
Procurement and probity advice	$40,000
Legal	$150,000 - $300,000
Total	**$410,000 - $560,000**

Pursuing Options 3 and 4 (development of a solar farm on Council land) would have involved significantly greater level of technical design, due diligence, and contracting work and would have involve considerably greater cost.

7.3. Critical Ingredients for success

There are several critical ingredients required to deliver a successful tender for a long-term renewable energy contract. The emerging and innovative nature of corporate power purchase agreements for local governments requires ***high-level executive involvement and support*** and ***adequate resourcing.***

Executive support**.** The innovative and collaborative nature of tendering for a corporate PPA will likely result in non-standard procurement processes, contracting requirements, and potentially resourcing challenges. This requires senior executives at Councils to have an understanding of emerging issues and possibly strategic decisions to be made from time to time as unforeseen situations arise. An understanding at the executive level of the project objectives, and how these align with Councils' needs and objectives, will enable the project team to navigate challenges and hurdles as they arise, increasing the likelihood of a successful tender outcome.

Adequate resourcing*.* Undertaking a tender for a long-term PPA will involve a greater degree of resourcing than a regular electricity purchasing arrangement. This is because the greater level of complexity and risk associated with the contract requires and the greater need for due diligence, contracting support, contract negotiation, and implementation. The greatest resourcing need is expected to be associated with legal services, followed by energy market advice and evaluation. Other costs involve project management and administration, probity and procurement service provision and advice, and communications and market engagement. There exists a possibility that these costs will exceed initial expectations if the tendering process encounters unexpected challenges. Customers should be prepared that, to some extent, the actual tendering costs will not be known undertaking the tendering event, evaluation and negotiation.

While corporate PPAs are becoming more common in the Australian market, they are to an extent still emerging in an evolving market. The offers to date have been relatively bespoke and there are not yet standard PPA products in the market. This is particularly the case with projects such as the proposed SEMREP which seeks to secure local supply chain and community benefits.

SECCCA has joined the Business Renewables Centre – Australia (BRCA). The BRCA is developing guides and primers to assist with the tendering process. A degree of tailoring and adapting the materials to SEMREP's needs will likely still be required. The extent to which PPAs tendering and contracting processes become standardised by the time the MEMREP group issues a tender – and consequently costs reduced – remains to be tested.

Appendix A - Energy market forecast scenarios.

Assumptions applicable to all scenarios:

The following is an overview of the assumptions made by Energetics in developing the three energy price forecast scenarios. These scenarios were the a) low renewable energy penetration scenario, medium renewable energy penetration scenario, and high renewable energy penetration scenario.

Demand

As part of NEM system planning, the Australian Energy Market Operator (AEMO) provides a range of regional gross and net demand forecast scenarios. In this analysis, Energetics selected the 'Neutral' gross demand forecast, excluding behind-the-meter solar, with a 50% probability of exceedance (POE50). Energetics has used this common demand basis across all three supply scenarios considered.

Supply

Coal-fired power stations: Within the forecast period (2020-30), three coal fired power stations are expected to close as it reaches the end of technical life: Liddell Power Station (NSW) in 2022, Vales Point Power Station (NSW) in 2028, and Gladstone Power Station (Qld) in 2030. No new coal fired power stations are assumed in our model. Replacement capacity for closures assumes AEMO's neutral replacement strategy outlined in the 2018 Integrated Systems Plan (ISP). This is a mix of solar, wind, OCGT, and storage.

Gas power stations: Torrens Island A (SA) is expected to close due to end of technical life between 2019-21. Barker Inlet Power Station (210MW) opening in 2019 is expected to operate as its replacement.

Wind/solar: All existing and committed utility-scale projects are modelled in all scenarios.

Batteries: All existing and committed utility-scale battery storage projects are modelled in all scenarios. Charge and discharge is optimised by Plexos, assuming a yearly cycle count in-line with a 15 year lifespan.

Fuel input prices: 'Neutral' coal, gas, and liquid fuel price scenarios from the 2018 ISP on a station basis.

Plant reliability and maintenance: Maintenance rate based on respective fuel type, randomised and with a maintenance factor dependent on month in the year. Forced outage rate and time to repair dependent on respective fuel type and generator technology, with allowance for both full and partial outages.

Bidding behaviour: Coal-fired power stations bidding minimum generation at the market floor to ensure dispatch, ramping up generation progressively once prices have reached short-run marginal cost (SRMC). Combined-cycle gas power stations currently providing 'baseload' electricity to transition to peakier generation in the medium to long-term, bidding volume at or above the short run marginal cost (SRMC) for this class of generators. Wind and solar units bid volume below $0/MWh to ensure dispatch. Pumped hydro units progressively increase pump load once prices fall below $20/MWh, and progressively increase generation once prices rise above $100/MWh in order to profit from price arbitrage.

Interconnectors

Interconnector capabilities: In the absence of detailed constraint modelling, Energetics has placed 'worst-case' transfer limits at times of peak demand in the receiving region's interconnector limits based on AEMO's 2017 Interconnector Capabilities report.

Interconnector upgrades: 'Group 1' interconnector developments on existing transmission lines as per AEMO's 2018 ISP were assumed across all scenarios.

Assumptions applicable to 'low renewable energy' scenario:

Current policy scenario, accounting for prevailing policy settings and known input variables. The scenario considers the build out of new renewable energy generation capacity as per the AEMO generation information schedule, with consideration of those projects that have confirmed finance and/or are under construction.

Supply

Coal and gas power stations: No early withdrawals, operation until end of technical life aside from Osborne Power Station (SA) and the mothballing of one unit at Pelican Point Power Station (SA) as detailed below.

Aggregated batteries: 'Weak' capacity growth for small-scale batteries (2018 ISP).

Rooftop PV: 'Weak' capacity growth for rooftop PV (2018 ISP).

Interconnectors

Riverlink (NSW-SA): 750MW interconnector built between NSW and SA when Torrens Island B is retired in 2026. Once the Riverlink interconnector is built, Osborne Power Station (SA) is expected to be mothballed, alongside one unit of Pelican Point Power Station, leaving the station to operate at half capacity.

Assumptions applicable to 'mid renewable energy' scenario:

The mid-renew scenario assumes an extension of renewable energy generators uptake, and fast-tracking of upgrades to the transmission network, including the interconnector between NSW and SA. This scenario also includes mothballing of both coal and gas units as detailed below.

Supply

Coal-fired power stations: No 'early' withdrawals, operation until end of technical life. Gladstone Power Station to mothball two units from 2028 due to low capacity factors.

Gas power stations: Swanbank E (Qld) gas station to be mothballed from 2022 due to sufficient electricity supply, and Osborne Power Station (SA) to be mothballed from 2024 due to Riverlink.

Aggregated batteries: 'Neutral' capacity growth for small-scale batteries (2018 ISP).

Wind/solar: Above committed and existing projects, advanced projects and those which have undergone feasibility studies are included in this scenario.

Rooftop PV: 'Neutral' capacity growth for rooftop PV (2018 ISP).

Pumped storage: The 250MW/2000MWh Kidston Pumped Storage Hydro Project (Qld) and 300MW/1350MWh Highbury Pumped Hydro Energy Storage project to be operational from 2024 and 2026 respectively.

Interconnectors

Interconnector upgrades: 'Group 2' interconnector developments on existing transmission lines as per the 2018 ISP. Riverlink (NSW-SA): 750MW interconnector between NSW and SA to be built by 2024. Once Riverlink interconnector is built, Torrens Island B is expected to be mothballed or withdrawn, Osborne Power Station (SA) is expected to be mothballed, alongside one unit of Pelican Point Power Station, leaving the station to run at half capacity.

<u>Assumptions applicable to 'high renewable energy' scenario:</u>

The high-renew scenario assumes a high uptake of renewable energy generators, and further fast-tracking of upgrades to the transmission network, including the Riverlink interconnector between NSW and SA. This scenario includes mothballing of both coal and gas units as detailed below. In addition, this scenario assumes the completion of Snowy 2.0 by mid-2025.

Supply

Coal-fired power stations: No 'early' withdrawals, operation until end of technical life. Gladstone Power Station to mothball two units from 2024 due to low capacity factors.

Gas power stations: Swanbank E (Qld) gas station to be mothballed from 2020 due to sufficient electricity supply, and Osborne Power Station (SA) to be mothballed from 2023 due to Riverlink.

Aggregated batteries: 'Strong' capacity growth for small-scale batteries (2018 ISP).

Wind/solar: Above committed and existing projects, advanced projects and those which have undergone feasibility studies are included in this scenario.

Rooftop PV: 'Strong' capacity growth for rooftop PV (2018 ISP).

Pumped storage: The Kidston Pumped Storage Hydro Project (Qld) and Highbury Pumped Hydro Energy Storage project (SA) to be operational from 2023 and 2025 respectively. 2000MW/350,000MWh Snowy 2.0 (NSW) to be operational from 2025.

Interconnectors

Interconnector upgrades: 'Group 2' interconnector developments on existing transmission lines. Riverlink (NSW-SA): 750MW interconnector built between NSW and SA to be completed by 2023. Once Riverlink interconnector is built, Torrens Island B is expected to be mothballed or withdrawn early. In addition, Osborne Power Station (SA) is expected to be mothballed, alongside one unit of Pelican Point Power Station, leaving the station to run at half capacity.

Appendix B - Potential strategic purchasing partners.

There may be opportunities to partner with other organisations in the region to increase scale and enable access to renewable energy solutions to these partners. The appropriateness of strategic partners should be considered once criteria for participation are developed by the SEMREP Working group. As a general principle, strategic partners should be able to contribute a material volume of electricity demand, be secure long-term customers, and should have objective and interests broadly aligned with Council's objectives and processes.

The list below is not exhaustive and evolve with input from Councils during the SEMREP project.

- Water utilities
  - Melbourne Water
  - South East Water
- Monash University
- Swinburn University
- Institutes of TAFE
- Metro Trains (Department of Treasury and Finance)
- South East Melbourne Manufacturers Alliance (SEMMA)
- Transurban / Eastlink
- Victorian Desalination Plant (Wonthagi)
- Port of Hastings Development Authority
- BlueScope Steel
- Monash Health
  - Monash Medical Centre
- Bass Coast Health
- Peninsula Health
  - Frankston Hospital etc.
- Gippsland Southern Health Service
- South Gippsland Hospital
- KooWeeRup Regional Health Service
- West Gippsland Healthcare Group
- Supermarket chains
- Major shopping centre operators
- Fulton Hogan and other municipal services providers
- Transport and logistics companies
- Orica and chemicals companies

Appendix C - Benefits and risks assessment of purchasing models

Model 1 - Retail electricity supply from new renewable power plant.

Benefits	Disbenefits	Risks
Enables strong 'story telling' and community engagement benefits that stem from opening a new power plant. 'ribbon cutting benefits'	Longer lead time to implementation	Development and construction risks associated with the new powerplant need to be assessed and managed. This can include grid connection, development approvals, construction delays and failures, reliability if technology selected etc.
Enables strong 'job creation' benefits, whether in the region, or outside the region.	Requires closer assessment and management of development and construction risks during tender evaluation and contracting phase.	Potential for construction delays to impact on project.
Enables construction of new power plant that may not have proceeded to development without an off-take agreement.	Potentially more resource intensive during tender evaluation and contracting phase then purchasing from an existing powerplant.	Long term electricity market pricing risks exist with all long-term energy contracts and can be managed but not avoided entirely.
	This approach requires a long-term contracting commitment (Likely ~10 years).	Community impacts associated with the power plant and resulting reputational risks need to be assessed and managed.
		If an electricity retailer is involved, risks associated with satisfactory provision or retail service need to be managed.

Model 2 – Retail electricity supplied from existing powerplant

Benefits	Disbenefits	Risks
An existing project is relatively de-risked. Development and operational risks have been largely dealt with.	Doesn't present the strong 'story telling' and 'ribbon cutting' opportunities that are associated with building a new power plant.	The development and construction stage of the project is largely de-risked.
Existing powerplant presents quick pathway to contract and supply.	Doesn't enable the same strong job creation storytelling opportunities that come with building a new power plant.	Depending on structure of contracts, the contracted electricity supply may be able to help mitigate risk of fluctuation in electricity priced. There is some risk resulting from market uncertainty in all energy contracting transactions.
Avoids development and construction process with necessary contracting, project management and associated resourcing.		Risks associated with satisfactory provision or retail service. (This risk exists with all retail electricity supply contracts and can be managed but not avoided).
Can involve a shorter-term contract that the alternative approach of purchasing power from a new power plant.		

Model 3 – Electricity from solar farm on Council land – operated by third party

Benefits	Disbenefits	Risks
Project development responsibilities sit largely with third party developer.	May require a tailored procurement approach to select project developer	Consideration of risks involved in awarding a third-party rights to operate powerplant on Council land, including procurement risks, and contractual liabilities.
Responsibility for operating, maintaining and managing power plant rest with third party (along with associated costs and risks).	Council to undertake due diligence on third party responsible for project development	
Enables a strong story-telling and community engagement benefits relating to project development and job creation. Contributes additional renewable energy to the grid.	Longer development lead time than procurement options.	
	Financial benefits associated with owning and operating the powerplant shared/relinquished to third party.	
	Some reputational risk resides with Council.	

Model 4 – Council owned powerplant on Council owned land

Benefits	Disbenefits	Risks
Enables a strong story relating to project development and job creation.	Requires commitment to project management, development and construction.	Development and construction risks associated with the new powerplant need to be assessed and managed. This can include grid connection, development approvals, construction delays and failures, reliability if technology selected etc.
Enables development of a new renewable energy power plant contributing additional generation in the grid.	Development risks, including development approvals, grid connection, and supply and construction of generating technology rests with Council.	Long term electricity market pricing risks exist with all long-term energy contracts and can be managed but not avoided entirely.
Enables strong 'story telling' and community engagement benefits that stem from opening a new power plant. Reputational benefits.	Steep learning curve associated with development of energy generating assets including understanding energy market management and contracting.	Community impacts associated with the power plant and resulting reputational risks need to be assessed and managed.
Control and ownership of the powerplant rests with Council. To some extent, Council is protected against volatility in electricity market.	Resourcing: The project will require adequate resourcing to manage feasibility, design, procurement, risk management, contracting, construction, commissioning and operational stages of the project.	Risks associated with satisfactory provision or retail service need to be managed.
	Longer lead time to implementation than with other approaches.	Complexity involved in partnership with multiple councils
	Requires greater due diligence at all project phases.	