

Pilot Version 1.3
01/04/2009

Corporate PMO

Royal Albert Basin Decentralised Energy System

Business Case Workbook Part 2 (of 2): Supporting Data

| | |
|------------------|-----------------|
| Project Number: | 25400 |
| Project Manager: | Simon Tilleard |
| Team and Head: | DDE Peter North |
| Director (SRO) | Martin Powell |



GATEWAY B

Document Control

| | |
|-------------------|---|
| Specific Audience | Board |
| Purpose | To set out a business case for approval |
| Document Title | Royal Albert Basin Decentralised Energy System - Gateway B (Part 2) |
| Document Status | Final |
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| Document Number | 3048274 |

| Version | Date | Name | Comment |
|---------|------------|----------------|---------------|
| 2 | 24/06/2009 | Simon Tilleard | Working Draft |
| 3 | 30/06/2009 | Joseph Uwagba | Final Version |

Introduction

This workbook has been locked so **only the green cells can be edited**. The white cells are automatically populated.

Refer to the **grey boxes** for guidance on which sections need to be completed for each type of change control

Use the data in the "to apportion" boxes on the right-hand side to ensure that your cost and funding figures are correct. All figures in these boxes should be zero, if not then the figure shown still needs to be apportioned. They **will turn Green** when they are correct.

PLEASE START AT SECTION 3 AND COMPLETE ALL FOLLOWING TABS; THEN USE SECTION 2 TO REVIEW ALL OPTIONS, SELECTING A PREFERRED IN SECTION 1

Section 1. Preferred Option Key Data

| | | |
|------------|-----------------------------------|---|
| 1.1 | Preferred Option Selection | <i>Using the information in Section 1 to help inform your choice, please select an option to take forward</i> |
|------------|-----------------------------------|---|

Chosen Option: Option 1

| | |
|-----------------------------|------------------|
| Total Cost | 6,001,000 |
| Net Present Value | -136,295 |
| Cost / Benefit Ratio | 1 : 0.89 |

| | | |
|------------|-----------------------|---|
| 1.2 | Cost Profiling | <i>Please profile the preferred option cost</i> |
|------------|-----------------------|---|

| | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Future Years | TOTAL |
|--------------------|---------|---------|---------|-----------|--------------|------------------|
| Total Project Cost | | 134,000 | 870,000 | 1,000,000 | 3,997,000 | 6,001,000 |

| | | |
|------------|--------------------------|---|
| 1.3 | Funding Profiling | <i>Please profile all funding sources. NOTE: Please ensure funding = cost in each column / year</i> |
|------------|--------------------------|---|

| | | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Future Years | TOTAL |
|-----------------------------------|-------------|----------|----------------|----------------|------------------|------------------|------------------|
| LDA Funding | | | | | | | |
| LDA Single Programme | Capital | | 134,000 | 870,000 | 1,000,000 | 3,997,000 | 6,001,000 |
| | Revenue | | | | | | |
| | Feasibility | | | | | | |
| Total LDA Funding | | 0 | 134,000 | 870,000 | 1,000,000 | 3,997,000 | 6,001,000 |
| LDA Accountable Funding | | | | | | | |
| Total LDA Accountable | | 0 | 0 | 0 | 0 | 0 | 0 |
| GROSS LDA FUNDING | | 0 | 134,000 | 870,000 | 1,000,000 | 3,997,000 | 6,001,000 |
| Other Public Funding | | | | | | | |
| Total Other Public Funding | | 0 | 0 | 0 | 0 | 0 | 0 |
| Private Funding | | | | | | | |
| Total Private Funding | | 0 | 0 | 0 | 0 | 0 | 0 |
| FUNDING NOT YET SECURED | | | | | | | 0 |
| Total Funding | | 0 | 134,000 | 870,000 | 1,000,000 | 3,997,000 | 6,001,000 |

| | | |
|------------|-------------------------|---|
| 1.4 | Income Profiling | <i>This is entirely AUTO-POPULATED as specified under LDA Accountable funding</i> |
|------------|-------------------------|---|

| | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Future Years | TOTAL |
|---------------------|---------|---------|---------|---------|--------------|-------|
| Income | | | | | | |
| Total Income | 0 | 0 | 0 | 0 | 0 | 0 |

| | | |
|------------|---------------------------|---|
| 1.5 | Receipts Profiling | <i>Please profile Receipts using NEGATIVE FIGURES</i> |
|------------|---------------------------|---|

| | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Future Years | TOTAL |
|-----------------------|---------|---------|---------|---------|--------------|-------|
| Receipts | | | | | | |
| Total Receipts | 0 | 0 | 0 | 0 | 0 | 0 |

| | | |
|------------|----------------------------------|--|
| 1.6 | Gross and Net LDA Funding | <i>This is entirely AUTO-POPULATED and is for information only</i> |
|------------|----------------------------------|--|

| | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Future Years | TOTAL |
|--------------------------|---------|---------|---------|-----------|--------------|------------------|
| Gross LDA Funding | 0 | 134,000 | 870,000 | 1,000,000 | 3,997,000 | 6,001,000 |
| Net LDA Funding | 0 | 134,000 | 870,000 | 1,000,000 | 3,997,000 | 6,001,000 |

| | | |
|------------|----------------|---|
| 1.7 | Outputs | <i>Please profile the projects GROSS Outputs. The Net and unit costs will auto-populate</i> |
|------------|----------------|---|

| | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Future Years | TOTAL |
|--------------------------------|---------|---------|---------|---------|--------------|-----------------|
| Gross Outputs | | | | | | |
| 4. Low/Zero Carbon Development | | | | | 1.00 | 1.00 |
| 5. BREEM Met or Exceeded | | | | | 1,700.00 | 1,700.00 |

| | | | | | | |
|--------------------------------|--|--|--|--|----------|-----------------|
| Net Outputs | | | | | | |
| 4. Low/Zero Carbon Development | | | | | 1.00 | 1.00 |
| 5. BREEM Met or Exceeded | | | | | 1,700.00 | 1,700.00 |

| Unit Costs | Gross | Net |
|--------------------------------|------------|------------|
| 4. Low/Zero Carbon Development | £4,500,750 | £4,500,750 |
| 5. BREEM Met or Exceeded | £883 | £883 |

| | | |
|------------|-----------------|--|
| 1.8 | Outcomes | <i>Please profile the projects GROSS Outcomes. The Net and unit costs will auto-populate</i> |
|------------|-----------------|--|

| | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Future Years | TOTAL |
|---------------------------|---------|---------|---------|---------|--------------|------------------|
| Gross Outcome | | | | | | |
| 3. Carbon Dioxide Savings | | | | | 21,100.00 | 21,100.00 |

| | | | | | | |
|---------------------------|--|--|--|--|-----------|------------------|
| Net Outcomes | | | | | | |
| 3. Carbon Dioxide Savings | | | | | 21,100.00 | 21,100.00 |

| Unit Costs | Gross | Net |
|---------------------------|-------|------|
| 3. Carbon Dioxide Savings | £284 | £284 |

Section 2. Option Analysis Summary

| | | |
|------------|-----------------------|--|
| 2.1 | Reference Case | <i>This section is entirely AUTO-POPULATED. The intended use is to compare the options key metrics</i> |
|------------|-----------------------|--|

| | |
|---------------------------|----------|
| Total Project Cost | 0 |
|---------------------------|----------|

| | |
|---------------------------|-----------|
| Cost Benefit Ratio | 1: |
|---------------------------|-----------|

| | |
|--------------------------|----------|
| Funding Breakdown | |
| LDA Single Programme | 0 |
| LDA Accountable | 0 |
| Other Public | 0 |
| Other Private | 0 |
| Funding Not Yet Secured | 0 |
| Total Funding | 0 |

| | |
|--------------------------|----------|
| Net Present Value | 0 |
|--------------------------|----------|

| | |
|----------|---|
| Income | 0 |
| Receipts | 0 |

| | |
|--------------------|-----|
| Qualitative Rating | 10% |
|--------------------|-----|

Written Influence
Reference Case would not provide low carbon energy and it would rely entirely on one fossil fuel, natural gas or alternatively electricity. This does not fulfill the London Plan guidelines and is not a sustainable solution in long term taken the environmental as well as fuel security and price risk aspects.

| | |
|-------------------------------------|--|
| Committed Assets (Opportunity Cost) | |
|-------------------------------------|--|

| | |
|--------------------------|----------|
| Gross LDA Funding | 0 |
| Net LDA Funding | 0 |

| | | |
|-----------------------------------|--|--|
| Project Cost Reliability (10 Max) | | |
|-----------------------------------|--|--|

| Outputs | Gross | | Net | |
|--------------------------------|--------|-----------|--------|-----------|
| | Number | Unit Cost | Number | Unit Cost |
| 4. Low/Zero Carbon Development | | | | |
| 5. BREEM Met or Exceeded | | | | |

| Outcomes | Gross | | Net | |
|---------------------------|--------|-----------|--------|-----------|
| | Number | Unit Cost | Number | Unit Cost |
| 3. Carbon Dioxide Savings | | | | |

| | | |
|------------|-----------------|--|
| 2.2 | Option 1 | <i>This section is entirely AUTO-POPULATED. The intended use is to compare the options key metrics</i> |
|------------|-----------------|--|

| | |
|---------------------------|------------------|
| Total Project Cost | 6,001,000 |
|---------------------------|------------------|

| | | |
|---------------------------|-----------|-------------|
| Cost Benefit Ratio | 1: | 0.89 |
|---------------------------|-----------|-------------|

| | |
|--------------------------|------------------|
| Funding Breakdown | |
| LDA Single Programme | 6,001,000 |
| LDA Accountable | 0 |
| Other Public | 0 |
| Other Private | 0 |
| Funding Not Yet Secured | 0 |
| Total Funding | 6,001,000 |

| | |
|--------------------------|-----------------|
| Net Present Value | -136,295 |
|--------------------------|-----------------|

| | |
|----------|---|
| Income | 0 |
| Receipts | 0 |

| | |
|--------------------|-----|
| Qualitative Rating | 80% |
|--------------------|-----|

Written Influence

This option will provide the maximum impact on demonstrating the technology and setting the guidelines to ensure the technical compatibility throughout the Docklands and the whole East London area anticipated for the LTGHN. Demonstrates the process and financial and institutional solutions for a public sector intervention in a market failure to ensure long term sustainability. The project will support the biomass fuel business by providing an industrial scale off-taker with long-term contracts.

| | |
|-------------------------------------|---------|
| Committed Assets (Opportunity Cost) | 150,000 |
|-------------------------------------|---------|

| | |
|--------------------------|-----------|
| Gross LDA Funding | 6,001,000 |
| Net LDA Funding | 6,001,000 |

| | |
|-----------------------------------|--|
| Project Cost Reliability (10 Max) | 6.00 Not Reliable or Unreliable |
|-----------------------------------|--|

| Outputs | Gross | | Net | |
|--------------------------------|--------|------------|--------|------------|
| | Number | Unit Cost | Number | Unit Cost |
| 4. Low/Zero Carbon Development | | £4,500,750 | | £4,500,750 |
| 5. BREEM Met or Exceeded | | £883 | | £883 |

| Outcomes | Gross | | Net | | | |
|---------------------------|-----------|-----------|-----------|-----------|--|--|
| | Number | Unit Cost | Number | Unit Cost | | |
| 3. Carbon Dioxide Savings | 21,100.00 | £284 | 21,100.00 | £284 | | |

| | | |
|------------|-----------------|--|
| 2.3 | Option 2 | <i>This section is entirely AUTO-POPULATED. The intended use is to compare the options key metrics</i> |
|------------|-----------------|--|

| | |
|---------------------------|------------------|
| Total Project Cost | 7,574,300 |
|---------------------------|------------------|

| | |
|---------------------------|-----------|
| Cost Benefit Ratio | 1: |
|---------------------------|-----------|

| | |
|--------------------------|------------------|
| Funding Breakdown | |
| LDA Single Programme | 0 |
| LDA Accountable | 0 |
| Other Public | 0 |
| Other Private | 7,574,300 |
| Funding Not Yet Secured | 0 |
| Total Funding | 7,574,300 |

| | |
|--------------------------|-----------------|
| Net Present Value | -150,000 |
|--------------------------|-----------------|

| | |
|----------|---|
| Income | 0 |
| Receipts | 0 |

| | |
|--------------------|-----|
| Qualitative Rating | 22% |
|--------------------|-----|

Written Influence
 This option Option would not provide a technically and financially efficient model for duplication. Small scale units would not remove enough of the risk for biomass producers to create a stable market. Fulfilling the London Plan requirements separately on each site leads to inefficient and costly energy supply. Utilising biofuel and CHP (if any) would be inefficient in small units.

| | |
|-------------------------------------|---------|
| Committed Assets (Opportunity Cost) | 150,000 |
|-------------------------------------|---------|

| | |
|--------------------------|---|
| Gross LDA Funding | 0 |
| Net LDA Funding | 0 |

| | | |
|-----------------------------------|-------------|-----------------------------------|
| Project Cost Reliability (10 Max) | 5.00 | Not Reliable or Unreliable |
|-----------------------------------|-------------|-----------------------------------|

| Outputs | Gross | | Net | |
|--------------------------------|--------|-----------|--------|-----------|
| | Number | Unit Cost | Number | Unit Cost |
| 4. Low/Zero Carbon Development | | | | |
| 5. BREEM Met or Exceeded | | | | |

| Outcomes | Gross | | Net | |
|---------------------------|-----------|-----------|-----------|-----------|
| | Number | Unit Cost | Number | Unit Cost |
| 3. Carbon Dioxide Savings | 18,000.00 | | 18,000.00 | |

| | | |
|------------|-----------------|--|
| 2.4 | Option 3 | <i>This section is entirely AUTO-POPULATED. The intended use is to compare the options key metrics</i> |
|------------|-----------------|--|

| | |
|---------------------------|------------------|
| Total Project Cost | 5,100,000 |
|---------------------------|------------------|

| | | |
|---------------------------|-----------|-------------|
| Cost Benefit Ratio | 1: | 0.00 |
|---------------------------|-----------|-------------|

| | |
|--------------------------|------------------|
| Funding Breakdown | |
| LDA Single Programme | 5,100,000 |
| LDA Accountable | 0 |
| Other Public | 0 |
| Other Private | 0 |
| Funding Not Yet Secured | 0 |
| Total Funding | 5,100,000 |

| | |
|--------------------------|------------|
| Net Present Value | N/A |
|--------------------------|------------|

| | |
|----------|---|
| Income | 0 |
| Receipts | 0 |

| | |
|--------------------|-----|
| Qualitative Rating | 62% |
|--------------------|-----|

Written Influence
 Without the CHP and heat accumulator, the Reduced Option has less value as a technical model. Fulfilling the carbon reduction requirements would rely entirely on biomass utilisation, no CHP. The financial viability compared to option 1 will depend on the outcome of the on-going redrafting of the electricity market regulation.

| | |
|-------------------------------------|---------|
| Committed Assets (Opportunity Cost) | 150,000 |
|-------------------------------------|---------|

| | |
|--------------------------|------------------|
| Gross LDA Funding | 5,100,000 |
| Net LDA Funding | 5,100,000 |

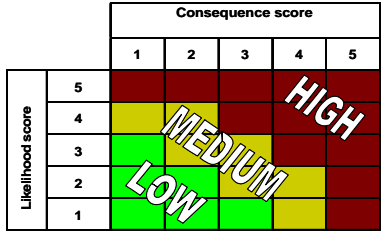
| | |
|-----------------------------------|--|
| Project Cost Reliability (10 Max) | 6.00 Not Reliable or Unreliable |
|-----------------------------------|--|

| Outputs | Gross | | Net | |
|--------------------------------|----------|------------|----------|------------|
| | Number | Unit Cost | Number | Unit Cost |
| 4. Low/Zero Carbon Development | 1.00 | £3,825,000 | 1.00 | £3,825,000 |
| 5. BREEM Met or Exceeded | 1,700.00 | £750 | 1,700.00 | £750 |

| Outcomes | Gross | | Net | |
|---------------------------|-----------|-----------|-----------|-----------|
| | Number | Unit Cost | Number | Unit Cost |
| 3. Carbon Dioxide Savings | 18,000.00 | £283 | 18,000.00 | £283 |

Risk Register Owner: Simon Tilleard
 Risk Register Manager: Peter North

| Initial | Participants Name |
|---------|-------------------|
| ST | Simon Tilleard |
| HLL | Herko Lehtoranta |
| | |
| | |
| | |
| | |



| Score | Likelihood | Descriptor |
|-------|------------|----------------------|
| 1 | improbable | improbable |
| 2 | remote | unlikely |
| 3 | occasional | less likely than not |
| 4 | probable | likely |
| 5 | frequent | probable |

| Score | Consequence | Cost | Schedule | Health & Safety | LDA Output Targets | Environment | Reputation | Legal/PI |
|-------|--------------|------------------------------|----------|-----------------------------------|-----------------------------|--|---|---|
| 1 | Minor | E thousands | Day | Health & Safety Negligible injury | Exactly meets targets | Short term local damage | No Press coverage | Improvement notice |
| 2 | Moderate | Tens of E thousands | Week | Minor injury | significantly meets targets | Medium term local damage, short term regional damage | Minor local adverse press coverage | Prohibition notice |
| 3 | Significant | Hundreds of thousands of E's | Month | Major injury | Meets 50% of targets | Long term local or regional damage | Major local adverse press coverage | Prosecution with fine |
| 4 | Substantial | Millions of E's | Year | Fatality | Partially meets targets | Long term widespread (ie off-site) damage | National adverse media coverage | Directors charged, national public enquiry, major |
| 5 | Catastrophic | Tens of millions of E's | Years | Multiple fatalities | Does not meet targets | Permanent widespread damage | International adverse media coverage (one year or more) | Directors convicted, major compensation claims, exceeding |

| Ref. No. | Risk | Initial Likelihood (1 to 5) | Initial Consequence (1 to 5) | Priority | Risk Owner | Action Plan summary | Action Plan Owner | Due/ Review Date | Residual Likelihood (1 to 5) | Residual Consequence (1 to 5) | Priority | Target |
|----------|---|-----------------------------|------------------------------|----------|------------|--|-------------------|------------------|------------------------------|-------------------------------|----------|--------|
| 1 | The technology does not yield the expected output | 2 | 3 | Yellow | ST | Proven technology, reliable suppliers, LDA procurement rules, purchase contracts with adequate liquidated damages | ST | 26.5.2009 | 2 | 3 | Yellow | Green |
| 2 | The construction of the energy station or network falls behind schedule | 3 | 3 | Yellow | ST | Heat supply to be ensured by using temporarily transportable gas/oil boilers, which are quick to mobilise | ST | 26.5.2009 | 3 | 3 | Yellow | Yellow |
| 3 | The targets set for carbon reduction may not be achieved due to unavailability or high price of biomass fuel | 2 | 3 | Yellow | ST | Pursue long-term supply arrangements, LDA has initiated common wood fuel market development with Lee Valley Park Authority | ST | 26.5.2009 | 2 | 3 | Yellow | Green |
| 4 | The sales revenues remain low due to changed or delayed building volumes (e.g. credit crunch) | 3 | 4 | Red | ST | LDA has knowledge and some leverage on timing and amount of buildings. Investments will be phased, delayed or scaled down depending on heat load. Further customers can be sought within and outside of the RAB region. | ST | 26.5.2009 | 3 | 3 | Yellow | Yellow |
| 5 | Contracts for procurement of equipment and works are needed | 2 | 4 | Yellow | ST | LDA Procurement Rules shall be followed and experience can be drawn from similar contract systems typically used in commercial energy business environment | ST | 26.5.2009 | 2 | 4 | Yellow | Yellow |
| 6 | Profile of fuel and electricity cost over term, what certainty does the SPV have to provide or underwrite | 4 | 3 | Red | ST | The SPV shall transfer the fuel price risk to customers by using appropriate price indexation in energy sales contracts. | ST | 26.5.2009 | 3 | 3 | Yellow | Green |
| 7 | Contracts are needed for heat and electricity sales | 2 | 3 | Yellow | ST | Experience shall be drawn from similar contract systems typically used in commercial energy business environment | ST | 26.5.2009 | 2 | 3 | Yellow | Yellow |
| 8 | The energy system may not be operated as designed | 3 | 3 | Yellow | ST | Experienced O&M contractor to be assigned and SPC will ensure that O&M personnel receives adequate training | ST | 26.5.2009 | 3 | 3 | Yellow | Green |
| 9 | Lack of adequate financing for investments and operation (current investment estimate is £5 million) | 3 | 4 | Red | ST | Implementing the SPC structure with clear financing commitments. Fixed cost turn-key procurement. No outside loan financing. Heat and electricity sales revenues to cover operation costs. | ST | 26.5.2009 | 2 | 4 | Yellow | Yellow |
| 10 | The carbon reduction effect may not be multiplied in further projects | 3 | 4 | Red | ST | CHP and biomass will reduce CO2. Results to be disseminated efficiently, LDA is already working on further energy initiatives. | ST | 26.5.2009 | 2 | 3 | Yellow | Green |
| 11 | The ABE energy system may be delayed and can not meet some property developers' schedule | 4 | 4 | Red | ST | Timely development and decision making at LDA. Energy sales contracts to be concluded as early as possible. Customers can be connected even after they have purchased their own heating systems. Further customers can be sought within and outside of the RAB region. | ST | 26.5.2009 | 4 | 4 | Red | Yellow |
| 12 | Institutional or other reasons may prohibit the use of an efficient legal structure (SPV) | 3 | 4 | Red | ST | Inside and external legal advisers to be used to ensure applicable solutions on structure, inc. SPV, before investment decision. | ST | 26.5.2009 | 3 | 4 | Red | Yellow |
| 13 | LDA financing may not be possible due to State Aid issues | 3 | 5 | Red | ST | Inside and outside legal advisers to be used to clarify and solve the state aid issue, before investment decision. | ST | 26.5.2009 | 3 | 5 | Red | Yellow |
| 14 | LDA may not be able to secure the site for the Energy Station or it is delayed | 2 | 4 | Yellow | ST | The project shall not be started unless the site is secured. Regarding delays, see 9. | ST | 26.5.2009 | 2 | 4 | Yellow | Green |
| 15 | Obligations for third party to connect to our CHP, can this be challenged legally | 4 | 3 | Red | ST | The scheme shall not attempt to impose obligations to connect but rather offer attractive enough terms. London Plan and planning requirements support the willingness to connect. | ST | 26.5.2009 | 2 | 3 | Yellow | Green |
| 16 | Extended Planning decision (for energy centre) | 3 | 3 | Red | ST | Timely development and submission of Planning Application. Customers can be connected even after they have purchased their own heating systems. Further customers can be sought within and outside of the RAB | ST | 26.5.2009 | 3 | 3 | Red | Yellow |
| 17 | Coordinate the road dig and other works to avoid multiple digs when installing infrastructure | 3 | 3 | Yellow | ST | Early coordination with DfL | ST | 26.5.2009 | 3 | 3 | Yellow | Yellow |
| 18 | Failure to spend CfF funding within timescale. Possible risk of clawback of funding | 2 | 1 | Green | ST | Proper budgeting and work planning | ST | 26.5.2009 | 2 | 1 | Green | Green |
| 19 | DfL input and influence on cost and time | 4 | 2 | Yellow | ST | Efficient coordination | ST | 26.5.2009 | 4 | 2 | Yellow | Green |
| 20 | IVAX is critical to the scheme viability, what is plan if they do not sign up to energy scheme | 3 | 4 | Red | ST | Energy sales contract to be concluded as early as possible. Further customers can be sought within and outside of the RAB region. System down-scaling | ST | 26.5.2009 | 3 | 4 | Red | Yellow |
| 21 | Electricity business contains significant uncertainty due to changing regulation; risk of lower revenues and difficulties in obtaining permits. | 4 | 4 | Red | ST | Close follow-up of the regulatory reform. Final investment decision on CHP shall be subject to satisfactory regulatory environment in place. | ST | 26.5.2009 | 4 | 4 | Red | Yellow |