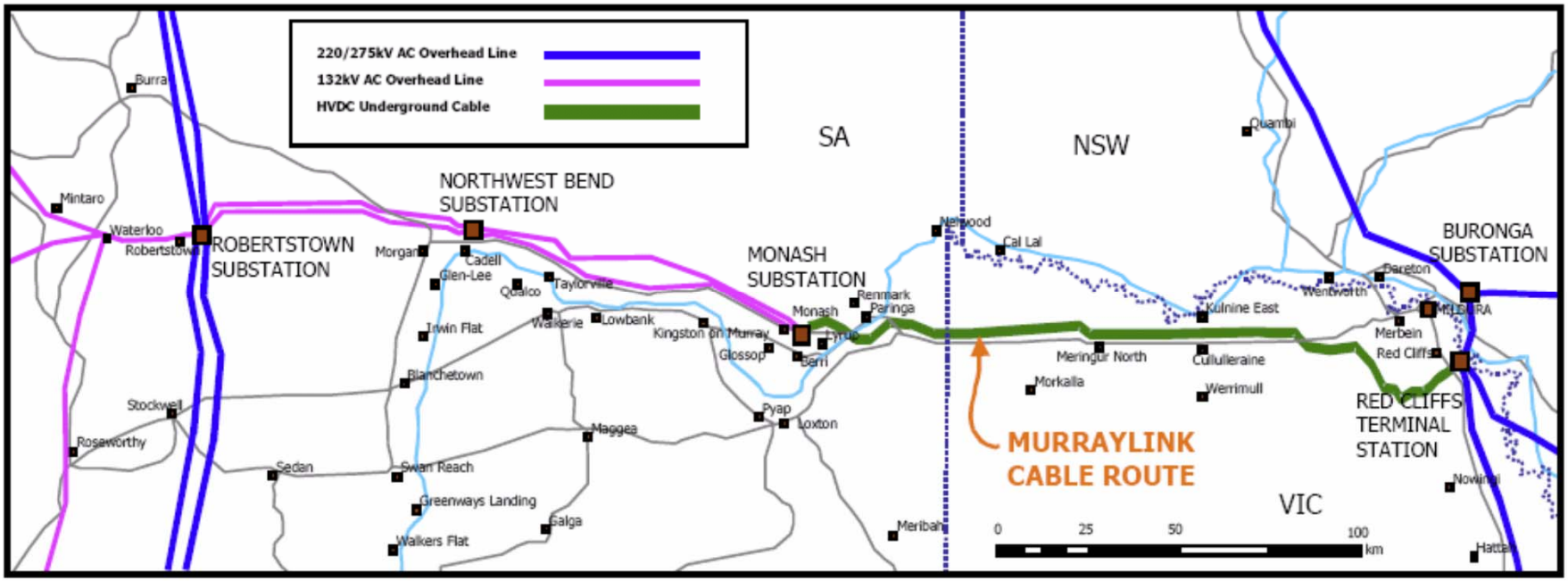
# Murraylink Interconnector Revenue Proposal

**Public forum**

**Adelaide 23 July 2012**

# About the Murraylink Interconnector

- Murraylink is a 180 km, HVDC 220 MW transmission link between Red Cliffs in Victoria and Berri in South Australia.



# About Murraylink

- At the time of its commissioning, Murraylink represented cutting-edge ‘HVDC Light’ technology.
- The Direct Current (DC) convertor stations were connected by the longest underground cable in the world.
- It can control power transfers to the limit of its capacity, in both directions, between the Victorian and South Australian transmission networks.
  - It can change the direction of flow in a matter of milliseconds.
- Whilst there have been a number of more recent DC transmission developments throughout the world, this type of equipment remains highly specialised.
- Compared with the static elements that comprise the great majority of conventional transmission networks, this equipment is complex and technologically advanced.

# Murraylink today

- Murraylink was originally built to operate as a market network service provider, trading between the SA and Victoria regions.
- In October 2003, the ACCC determined that Murraylink would be reclassified as providing a prescribed transmission service.
  - The ACCC determined Murraylink's maximum allowable revenues for the nominal 10-year period until 30 June 2013.
  - This revenue Proposal is for a second 10-year regulatory control period, from 1 July 2013 to 30 June 2023.
- Today, the link is dispatched by AEMO, in similar manner to a generator, to control flows between the NSW and South Australian regions of the National Electricity Market (NEM) and thereby minimise the costs of generation in the NEM.

# Murraylink ownership and operation

- Murraylink Transmission Company Pty Ltd is 100% owned by Energy Infrastructure Investments Pty Ltd (EII), which in turn is owned by a consortium of investors:

Energy Infrastructure Investments

| Shareholder | Ownership percentage |
|---|---|
| Dalmeny Gas & Power Holdings BV | 24.95 |
| Midstream Investment First BV | 24.95 |
| Osaka Gas Energy Europe BV | 30.20 |
| Australian Pipeline Limited | 19.90 |
| Total | 100.0 |

- Murraylink is operated by APA Group on behalf of EII.

# Murraylink assets

- There are two classes of equipment that comprise the link:
  - Major elements of equipment (main transformers, conversion equipment, filters and underground DC cable).
    - These have a standard life of 40 years or more, and are approaching the mid-period of their useful service lives; and
  - Ancillary equipment necessary for the operation of the link (notably air conditioners, water storage and treatment apparatus, control and protection systems).
    - These elements have service lives of 7 - 20 years and in many cases, are approaching this stage.

- Murraylink is now entering its second decade of operation.
  - There are a number of elements of ancillary equipment that will require refurbishment or replacement during the 2013-23 regulatory control period.
  - These elements have been factored into the capital expenditure program.

# Murraylink operational performance

- Murraylink's historic service performance has been excellent

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|
| Target planned availability | 99.17% | 99.17% | 99.17% | 99.17% | 99.17% | 99.17% | 99.17% | 99.17% |
| Actual planned availability | 98.75% | 98.18% | 99.11% | 99.32% | 99.22% | 99.31% | 99.58% | 99.11% |
| Difference | 0.42% | 0.99% | 0.06% | -0.15% | 0.05% | 0.14% | 0.41% | -0.06% |
| | | | | | | | | |
| Target forced peak availability | 99.48% | 99.48% | 99.48% | 99.48% | 99.48% | 99.48% | 99.48% | 99.17% |
| Actual planned availability | 98.89% | 99.63% | 99.76% | 96.42% | 99.99% | 100.00% | 100.00% | 99.8% |
| Difference | 0.59% | -0.15% | -0.28% | 3.06% | 0.51% | 0.52% | 0.52% | -0.59% |
| | | | | | | | | |
| Target forced o/p availability | 99.34% | 99.34% | 99.34% | 99.34% | 99.34% | 99.34% | 99.34% | 99.3% |
| Actual forced o/p availability | 99.38% | 99.72% | 99.91% | 94.69% | 99.95% | 100.00% | 100.00% | 99.9% |
| Difference | -0.04% | -0.38% | -0.57% | 4.65% | 0.61% | 0.66% | 0.66% | -0.57% |
| S-factor bonus/penalty | -0.79% | 0.15% | 0.18% | -0.32% | 0.69% | 0.87% | 1.00% | 0.007 |

# Capital expenditure

- Murraylink has had, and is forecast to incur, minimal capital expenditure:
- Historical ($000):

| F/Y ending | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| Regulatory Allowance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Actual Expenditure[1] | 0 | 0 | 0 | 0 | 410 | 0 | 21 | 37 | 640 | 1,118 |
| Difference | 0 | 0 | 0 | 0 | 410 | 0 | 21 | 37 | 640 | 1,118 |

[1] The 2012 and 2013 years are estimated.

- Forecast ($m):

| FY ending | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2013-23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Refurbishment | 0.707 | 0.271 | 0.057 | 0.344 | 1.347 | 0.359 | 0.059 | 0.077 | 0.500 | 1.103 | 4.823 |
| Compliance | 0.861 | 0.808 | 0.617 | 0.016 | 0.016 | 0.016 | 0.016 | 0.017 | 0.017 | 0.017 | 2.401 |
| Other | 2.190 | 1.965 | 2.208 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 6.363 |
| Total | 3.757 | 3.044 | 2.882 | 0.360 | 1.363 | 0.375 | 0.075 | 0.093 | 0.516 | 1.120 | 13.587 |

# Operating expenditure

| F/Y ending | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| Regulatory Allowance[1] | 3,380 | 3,450 | 3,520 | 3,590 | 3,660 |
| Actual Expenditure[2] | 3,200 | 3,256 | 3,426 | 3,426 | 3,559 |
| Maintenance | 789 | 729 | 816 | 816 | 891 |
| Operations and asset management support | 2,143 | 2,144 | 2,089 | 2,089 | 2,135 |
| Non system | 269 | 384 | 522 | 522 | 533 |
| Difference | -180 | -194 | -94 | -164 | -101 |

[1] Adjusted for CPI.

[2] The 2012 and 2013 years are estimated.

- Murraylink's opex has been, and is expected to continue to be, stable and predictable.
- Forecast features pass-through of connection costs.

| FY ending | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2013-23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maintenance | 0.879 | 0.881 | 0.900 | 0.910 | 0.935 | 0.966 | 0.984 | 1.011 | 1.022 | 1.053 | 9.542 |
| Operations and asset management support | 2.118 | 2.128 | 2.179 | 2.217 | 2.279 | 2.355 | 2.407 | 2.475 | 2.516 | 2.592 | 23.27 |
| Non system | 0.518 | 0.513 | 0.524 | 0.530 | 0.545 | 0.564 | 0.575 | 0.591 | 0.597 | 0.616 | 5.57 |
| Debt raising costs | 0.068 | 0.068 | 0.067 | 0.067 | 0.064 | 0.062 | 0.059 | 0.056 | 0.054 | 0.051 | 0.615 |
| Total | 3.582 | 3.589 | 3.670 | 3.724 | 3.823 | 3.947 | 4.025 | 4.133 | 4.188 | 4.312 | 38.995 |

# Capital base

| FY ending | 2003 (9mths) | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Opening Asset Base | 102.96 | 102.96 | 99.74 | 99.31 | 99.20 | 99.29 | 99.56 | 101.11 | 100.85 | 100.98 | 102.57 |
| Capex | 0.00 | 0.00 | 0.00 | 0.00 | -0.36 | 0.43 | 0.00 | 0.04 | 0.08 | 1.18 | 1.36 |
| Depreciation | 0.00 | -3.22 | -0.43 | -0.11 | 0.45 | -0.15 | 1.54 | -0.30 | 0.05 | 0.41 | -1.54 |
| Closing Asset Base | 102.96 | 99.74 | 99.31 | 99.20 | 99.29 | 99.56 | 101.11 | 100.85 | 100.98 | 102.57 | 102.40 |

| FY ending | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Opening Asset Base | 102.40 | 105.35 | 107.32 | 108.85 | 107.22 | 106.60 | 104.69 | 102.23 | 99.59 | 97.30 |
| Capex | 3.97 | 3.30 | 3.20 | 0.41 | 1.60 | 0.45 | 0.09 | 0.12 | 0.67 | 1.49 |
| Depreciation | -3.70 | -4.09 | -4.48 | -4.89 | -5.02 | -5.16 | -5.29 | -5.43 | -5.58 | -5.44 |
| Indexation | 2.68 | 2.76 | 2.81 | 2.85 | 2.81 | 2.79 | 2.74 | 2.68 | 2.61 | 2.55 |
| Closing Asset Base | 105.35 | 107.32 | 108.85 | 107.22 | 106.60 | 104.69 | 102.23 | 99.59 | 97.30 | 95.89 |

# Cost of capital (indicative)

- Cost of capital parameters largely driven by National Electricity Rules.
- Cost of debt based on extrapolated Bloomberg fair value curve as per AER practice.
  - Will be updated prior to Final Decision.

| Parameter | Murraylink Revenue Proposal |
|---|---|
| Nominal Risk-Free Rate | 4.17% |
| Inflation Rate | 2.50% |
| Debt Margin | 3.93% |
| Proportion of Debt Funding | 60% |
| Cost of Debt (Nominal, Pre-Tax) | 8.10% |
| Market Risk Premium | 6.50% |
| Corporate Tax Rate | 30% |
| Gamma | 0.65 |
| Equity Beta | 0.80 |
| WACC (Nominal, Vanilla) | 8.61% |

# Revenue Requirement

- Murraylink is projecting stable prices into the future:

| FY ending | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Return on capital | 8.81 | 9.07 | 9.24 | 9.37 | 9.23 | 9.18 | 9.01 | 8.80 | 8.57 | 8.37 |
| Return of capital | 1.01 | 1.33 | 1.67 | 2.04 | 2.22 | 2.36 | 2.55 | 2.76 | 2.97 | 2.89 |
| Total operating expenditure | 3.67 | 3.77 | 3.95 | 4.11 | 4.33 | 4.58 | 4.78 | 5.04 | 5.23 | 5.52 |
| Tax allowance | 0.26 | 0.28 | 0.29 | 0.31 | 0.32 | 0.34 | 0.35 | 0.36 | 0.38 | 0.38 |
| Unsmoothed revenue requirement | 13.76 | 14.45 | 15.15 | 15.83 | 16.09 | 16.45 | 16.70 | 16.95 | 17.15 | 17.17 |
| Smoothed revenue requirement | 14.77 | 15.01 | 15.25 | 15.49 | 15.74 | 15.99 | 16.24 | 16.50 | 16.76 | 17.03 |
| X factor | -1.67% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% |

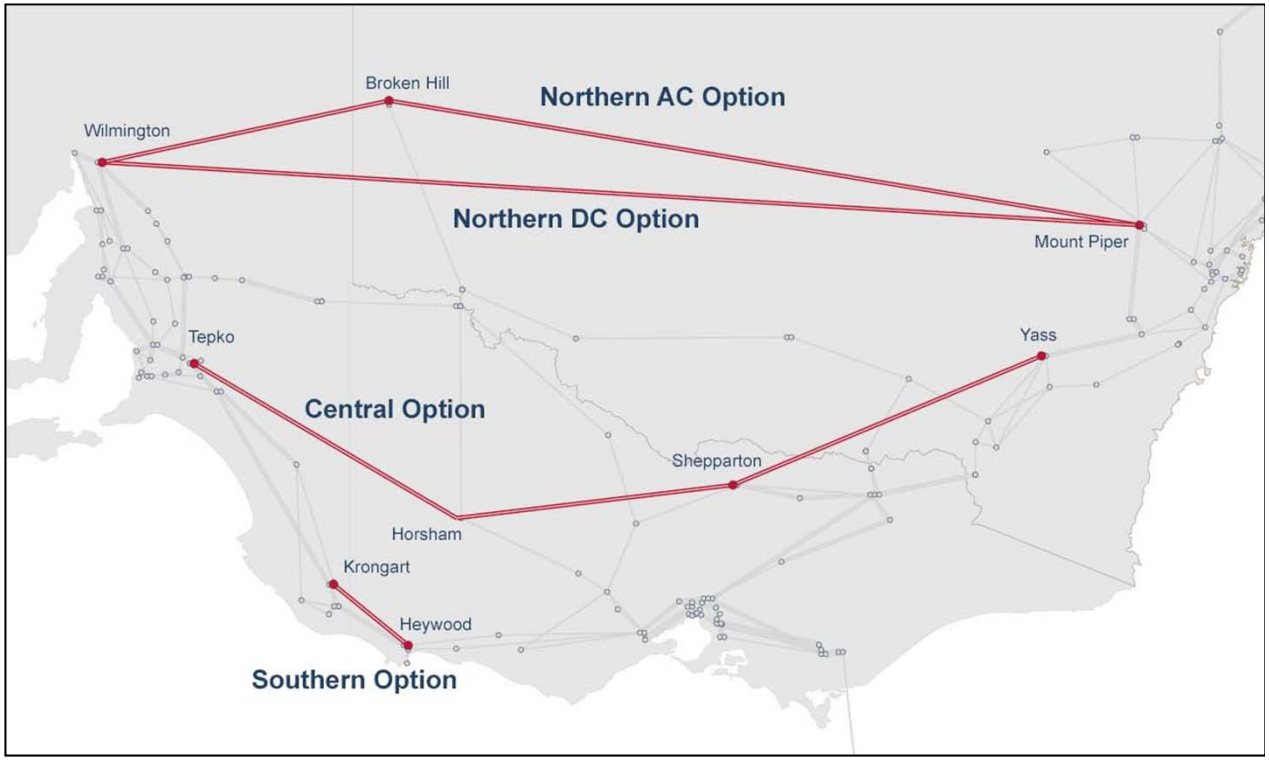
# STPIS

- Service Target Performance Incentive Scheme
- Murraylink's STPIS is focused on transmission circuit availability:

| No | Measure | Performance for Maximum Penalty | Target Performance | Performance for Maximum Bonus | Weighting Factor |
|---|---|---|---|---|---|
| 1a | Planned circuit availability | 99.04% | 99.17% | 99.38% | 0.40 |
| 1b | Forced outage circuit availability in peak periods | 98.90% | 99.48% | 100.00% | 0.40 |
| 1c | Forced outage circuit availability in off-peak periods | 98.84% | 99.34% | 99.94% | 0.20 |

# Contingent project – SA Interconnection

- 4 options are currently under review by AEMO and the TNSPs
- Options are AC or high capacity DC
- Options are grouped as Northern, Central and Southern
- Central option has been promoted
- The reinforcement of the existing Murraylink corridor has not been considered

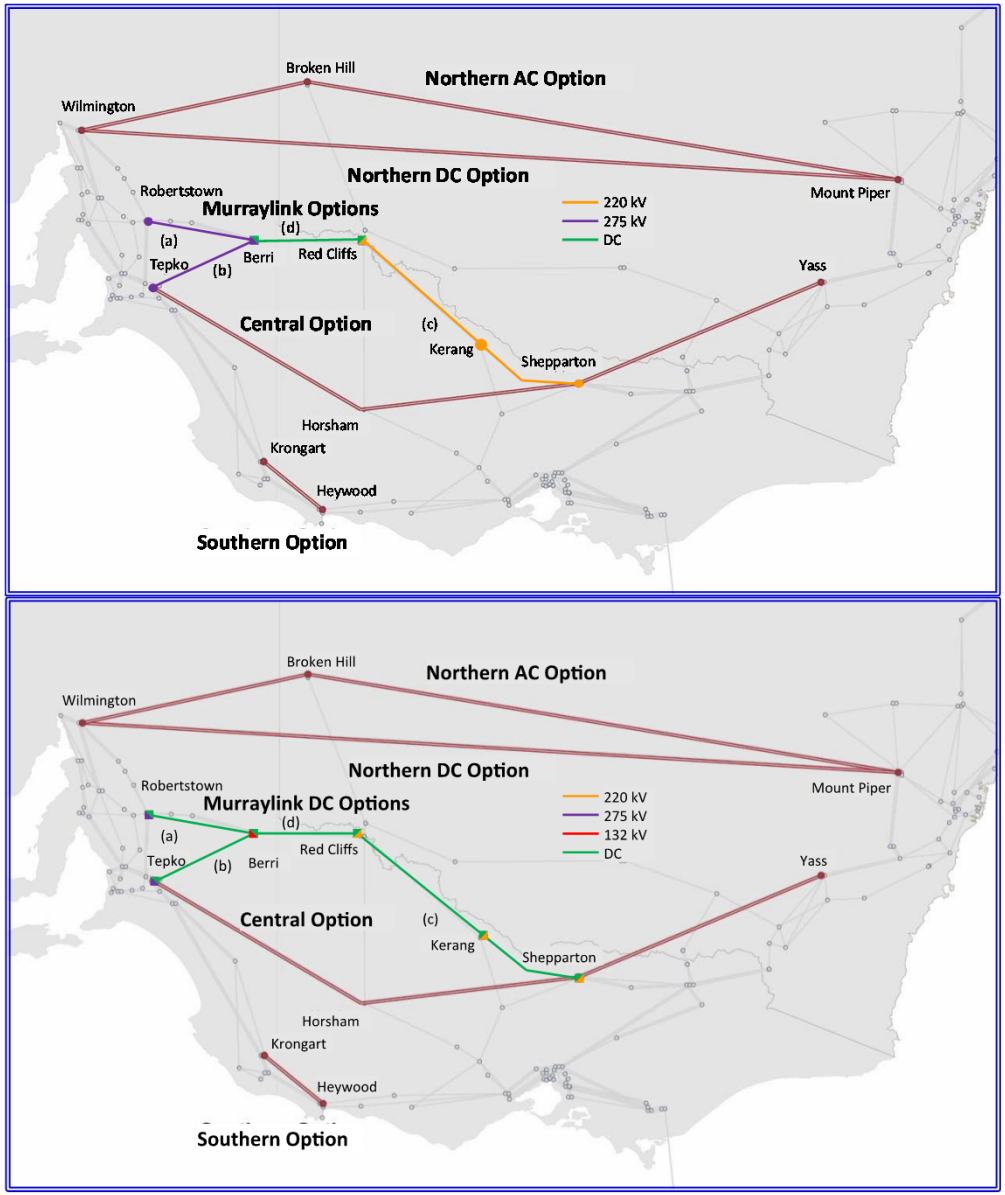


# Murraylink SA Interconnection options

- Murraylink has identified two additional options:

1. Murraylink augmentation with AC extension
2. Murraylink augmentation with DC extension

- This option has been discussed with AEMO
- Costs compare favorably with proposed options.
- Will be investigated more fully in context of RIT-T process.



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