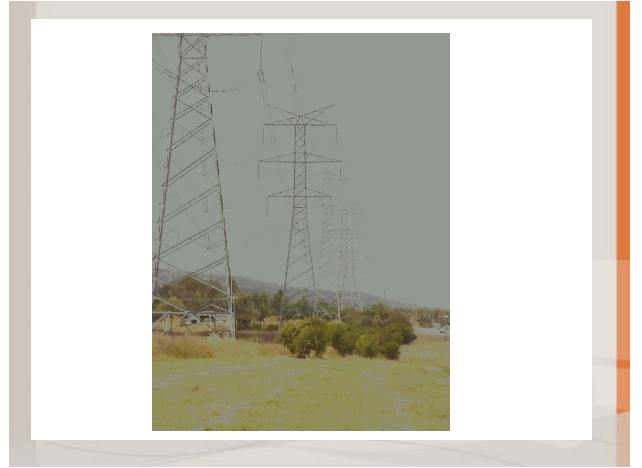


# Use of Multi-Criteria Decision Analysis in Planning of Western Power Transmission Projects

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## The Need for MCDA

- In 1986 a superior EP Act was proclaimed
- Proponents had to justify their projects, demonstrate they had considered options and consulted
- Political Forces were supporting social interests such as those of landowners
- WP started to use matrix methods to make decisions between options

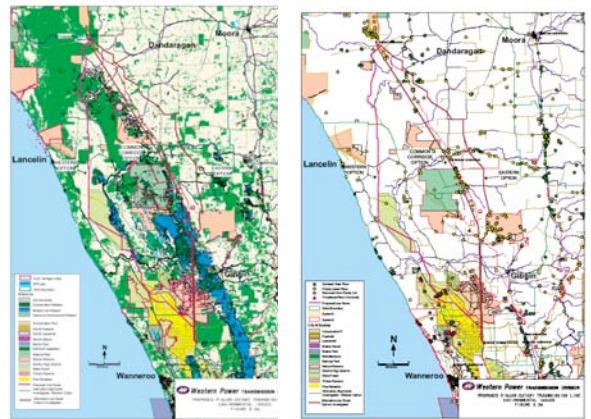


TABLE 3.1 : COMPARISON OF ISSUES BY RISK RATING

ISSUE	SCALE	REGULATIONS	DURATION	PUBLIC IMAGE	RISK RATING
	(local/regional/global)	(nil/procedure/policy/legislation)	(short term/moderate/ongoing)	(no effect/acceptable/low/moderate/high)	(sum of other ratings)
	(rating 1-3)	(rating 0-3)	(rating 1-3)	(rating 0-4)	
Vegetation	2	3	2	3	10
National Parks	2	3	3	4	12
State Forest	2	3	3	3	11
Nature Reserves	2	3	3	3	11
Weeds	1	3	2	1	7
Dieback Risk	2	3	3	2	10
DRP/Priority/Significant Flora	1	3	3	3	10
Threatened Plant Communities	1	3	3	3	10
Threatened Fauna	1	3	3	3	10
Wetlands EPP	1	3	3	3	10
Wetlands Conservation	1	2	3	3	9
Visual Amenity	2	1	3	3	9
Wilderness Quality	1	0	3	1	5
Aboriginal Heritage	1	3	3	3	10
Public Health & Safety - UXO	1	3	3	4	11
Public Health & Safety - Low	2	3	3	4	12

TABLE 3.3 : COMPARISON OF OPTIONS

ISSUE	WESTERN OPTION	
	Impact Severity (0-4)	Combined Severity/Risk Rating (Severity/Risk)
Vegetation	2	20
National Parks	0	0
State Forest	2	22
Nature Reserves	1	11
Weeds	1	7
Dieback Risk	1	10
DRP/Priority/Significant Flora	1	10
Threatened Plant Communities	2	20
Threatened Fauna	0	0
Wetlands EPP	0	0
Wetlands Conservation	0	0
Visual Amenity	2	18
Wilderness Quality	2	10
Aboriginal Heritage	1	10
Public Health & Safety - UXO	2	22
Public Health & Safety - Low Flight Zones	1	12
Landuse Existing	2	18
Landuse Potential	3	30
Landowners	2	18
Shires	1	6
Line Length	1	6
Number of Angles	1	6
Number of Structures	1	6
Construction Restrictions	1	3
All Factors	30	268

All Factors	268	428	355
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# WPs Current Use of MCDA

- Consultants involved in 4 corridor and 1 site selection MCDA processes
- Findings of SA assessment process and associated MCDA were generally accepted by stakeholders with some exceptions
- Decisions based on MCDA have enabled approval processes
- Two of those projects resulted in almost identical MCDA scores for the two preferred options

Criteria	Indicator	Measurement for Impact Assessment	Key Outcomes of Impact Assessment	Best for Scores		
				West	Southern	
Views (continued)	Residential buildings - close	<ul style="list-style-type: none"> <li>This assessed the number of residences / buildings where the transmission line is within 2 km and views are affected.</li> <li>The primary focus of this criterion is residences, although in some cases the experience at other buildings may have some importance.</li> <li>Residences and other buildings were identified from existing building data.</li> <li>The number of these residences / buildings within 2 km of the transmission line was identified. It was assumed that all new buildings would have views to the sea, given the general nature of the coastline road and the generally limited extent of vegetation near buildings.</li> </ul>	<ul style="list-style-type: none"> <li>There are more residences / buildings along the southern alignment where the transmission line is within 2 km and views would potentially be affected.</li> <li>Therefore, the northern option would be preferred based on this factor.</li> </ul>	number	102	218
	Residential - distant	<ul style="list-style-type: none"> <li>This assessed the number of residences / buildings where the transmission line is within 4 km and views to significant features are affected.</li> <li>As above, the primary focus of this criterion is residences, although in some cases the experience at other buildings may have some importance.</li> <li>Residences and other buildings were identified from existing building data.</li> <li>The number of these residences / buildings within 4 km of the transmission line was determined. For this indicator, only buildings / residences that were on the opposite side of the line to the Stirling Range were used.</li> <li>The identified buildings / residences were manually checked, based on a desktop assessment using professional judgement, to determine whether sea/river and vegetation would affect views to the Stirling Range.</li> </ul>	<ul style="list-style-type: none"> <li>There are more residences / buildings along the southern alignment where views to significant features may potentially be affected.</li> <li>Therefore, for this factor, the northern option would be preferred.</li> </ul>	number	20	28

	Indigenous business owners and local business owner	Regional business representative	Local environmental or community group	User of recreational amenities	Local Government	State Government Agency representative	Average all
<b>Visual Values</b>							
Local or landscape character	5.50	6.08	5.81	5.44	5.72	5.52	6.77
Significant features	4.82	5.01	4.92	5.19	4.68	4.38	5.81
Views	7.01	8.11	7.16	8.10	6.01	7.04	11.05
<b>Recreation</b>							
Access to amenities	5.58	6.94	6.90	5.11	6.97	7.71	4.58
Aerial recreation	5.01	5.18	5.20	4.64	3.92	4.18	2.51
<b>Heritage</b>							
Indigenous heritage	3.88	4.58	3.87	8.18	5.63	3.58	5.34
European heritage	6.39	4.58	6.70	9.30	6.71	7.40	5.82
<b>Social Amenity</b>							
Noise	2.37	2.17	2.34	2.46	2.30	2.84	3.73
Electromagnetic fields	7.08	6.48	6.98	7.42	8.01	7.18	5.20
Traffic volume	4.20	3.78	3.93	2.04	3.40	3.42	2.77
<b>Land Use</b>							
Direct land impacts	7.10	7.43	6.93	5.40	6.75	6.14	7.23
Impacts on land use	7.12	6.30	6.80	8.22	7.78	8.84	5.98
Business impacts	6.88	7.48	7.12	7.59	7.20	7.18	6.48
<b>Construction / Operation Issues</b>							
Project cost	5.18	4.62	5.14	5.04	6.35	5.10	3.85
Ease of maintenance	4.04	3.82	3.74	1.95	3.21	3.59	3.75
Total	100	100	100	100	100	100	100

In particular, Figure 3 shows the variation between the stakeholder groups, and the average of all stakeholders combined.

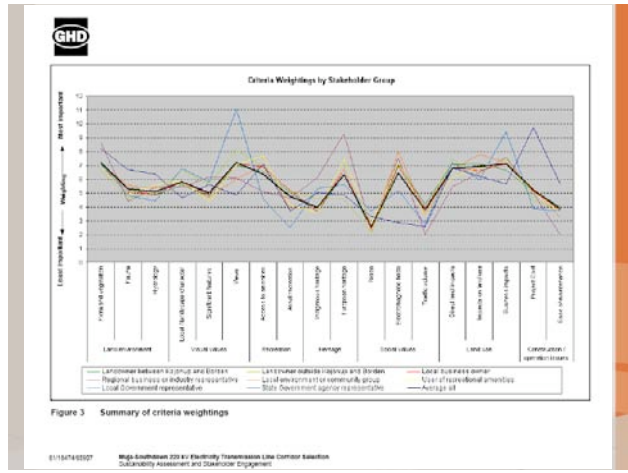


Figure 3 Summary of criteria weightings

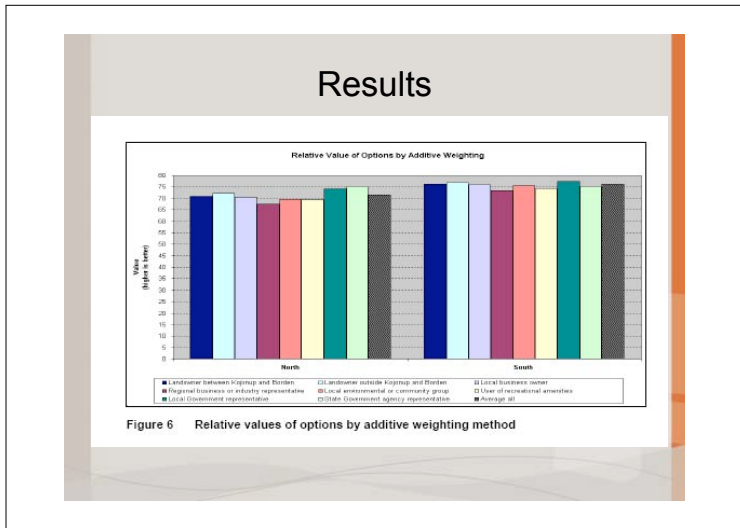


Figure 6 Relative values of options by additive weighting method

- ## Further Thoughts on WPs future Use of MCDA
- MCDA should be transparent to the "lay person" and this seems to be a particular challenge for MCDA, given its relative complexity
  - MCDA should be based on a comprehensive list of issues or factors that are compiled in conjunction with lists of mapping constraints and no go areas
  - The MCDA method should be sound and inclusive (this should be easier to achieve than transparency)

## Further Thoughts on WPs future Use of MCDA

- MCDA is a useful tool but the decision ultimately rests with the proponent-processes don't make decisions people do, which people?
- Consider using MCDA in network planning decisions (with Enhanced Cost Benefit Analysis?)
- If MCDA is to be used in technical planning decisions need to convince ERA of validity of models
- MCDA is labour intensive and time consuming
- Consider the use of alternative or complementary methods eg. Citizens Jury or Deliberative Polls – Do these offer different dimensions, could they be less time consuming or labour intensive, are their potential issues with local communities?

Questions?