

Addendum to the Economic Assessment as part
of the Socio-Economic Specialist Report:
Northern Corridor Economic Impacts

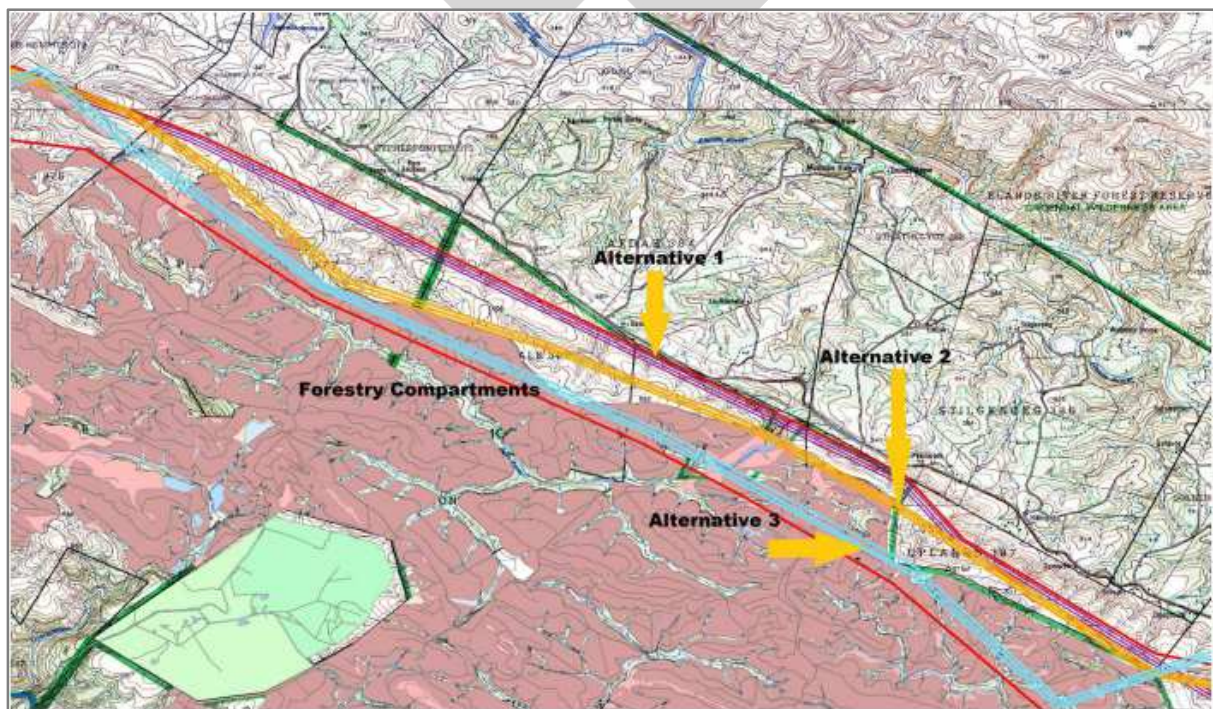
Thyspunt Transmission Lines Project EIA

1. Introduction

This addendum to the economic study aims to resolve three outstanding economic issues with regard to the current northern corridor transmission power line routings for the Thyspunt Transmission EIA project. These are:

- Whether there is any preference, from an economic point of view, with regards to routing power lines either along the Longmore Forest northern firebreak vs. or elsewhere in the Northern Corridor (guided by three possible routings supplied with the Terms of Reference).
- Whether there is any preference from an economic point of view, for routing on either agricultural or forestry land along both routes.
- Whether there are any strategic economic risks associated with power lines traversing forestry land.

Fig 1: Final routing alternatives for the northern corridor in the area of the Longmore northern firebreak and the Elands River Valley.



As requested in the Terms of Reference¹, this study is focused and presents only evidence, evaluations and conclusions for the three specific issues listed above, as these were not fully investigated as part of the initial socio-economic impact report. Due to the magnitude of social and economic impacts found along the original “southern corridor” routes next to the coast, much of the original socio-economic impact study focused on these routes, and found them to be fatally flawed. A recommendation was therefore made in the original report to shift all lines away from the area of intensive development found near the coast.

For a more complete overview of the economic issues associated with the original southern routings, project as a whole, such as the greater economic context and the overall macro-economic benefits of the project, please refer to the original Socio-Economic specialist studies².

2. Methodology

With regard to the first two items of study (the comparison the impacts of different routings in the Longmore Northern Firebreak and the comparison of agriculture and forestry land impacts) the study will attempt to compare and then minimise the direct impacts on different industries on three dimensions, namely impact on economic output (production), investment and employment. The information used in this comparison will be sourced from other research studies (tourism studies, forestry industry studies, and a study of irrigated agricultural activities conducted for the initial economic study) and then calculated for the purposes of this study. For the last item the study will attempt to evaluate both quantitatively and qualitatively whether there are any

¹ Sivest (2012). TOR for Economic Addendum Study - Thyspunt Transmission Lines Integration Project.

² MasterQ (2010). Socio-Economic Impact Assessment for the Proposed Thyspunt Lines Integration Project: Northern Corridor. MasterQ (2010). Socio-Economic Impact Assessment for the Proposed Thyspunt Lines Integration Project: Southern Corridor.

special economic risks associated with a forestry routing based on a review of available information.

3. Impact Comparison 1 – Within the Northern Firebreak (Tourism vs. Forestry)

During the EIA process there have been strong objections raised by both residents of the Elands River Valley and Cape Pine to a Northern Corridor routing along the northern firebreak on the one hand and a routing through the plantation itself on the other. According to both parties, the economic impacts associated with either routing option is, at least conceptually, a strong consideration. A routing through the plantation has been supported by the visual and tourism impact studies, which both indicate a routing along the northern firebreak as having serious negative visual and tourism implications. In this section, the economic basis for a routing either along the firebreak (on the northern edge of the corridor) or through the plantation (on the northern edge of the corridor) is explored. Although there are three final routing alternatives supplied with the TOR, from an economic point of view these can be distilled initially into either a routing with primarily a forestry impact or one with a visual (and therefore tourism) impact. The analysis considers which routing should be favoured to minimise economic impacts, as listed below:

Northern Corridor Economic Impacts – Northerly Routing (Elands River Route)
Tourism Industry Output Impacts
Tourism Industry Investment Impacts
Tourism Industry Employment Impacts
Overall Impact

VS

Northern Corridor Economic Impacts – Southerly Routing (Longmore Route)
Fire Related Risk Impacts
Forestry Industry Value Impacts
Forestry Industry Investment Impacts
Forestry Industry Employment Impacts
Overall Impact

3.1. Northern Corridor Economic Impacts

3.1.1. Impact on Tourism Industry Revenues and Employment

If routed along the Longmore northern firebreak (the Elands River Route), the primary impact that is investigated in this study is a tourism industry impact (i.e. revenues and employment) due to a loss of the visual or aesthetic character of the Elands River Valley. The tourism study for this project (the Thyspunt Transmission Lines EIA) notes:

"The aesthetic character of the Elands River Valley is a critical component in the current tourism and future in the area."

Research from South African Tourism authorities indicate that both international and domestic tourists highly value nature and wildlife amenities, i.e. can be classified as eco-tourism customers. According to a study of domestic tourism by the Department of Environmental Affairs and Tourism:

*"Nature reserves were favoured by half of those who visited the province, thus signalling to tourism authorities the potential profitability of better marketing of the Addo Elephant National Park and similar localities. More vigorous marketing of the Amatola and Karoo Heartland regions is needed to attract a larger proportion of the leisure segment, identified as Game and Bush Lovers and Upmarket Campers."*³

Even if the Elands River Valley does not currently clearly fall into this category, it may do so in the future, and the natural setting and scenery will most likely be one of the primary tourist assets to the valley.

Numerous previous studies on the effects of transmission lines on tourism have indicated negative impacts:

- *"For people coming from overseas or even from other parts of South Africa who are seeking a pure experience in the wilderness, it is possible that they will not want the view which they have sought out obscured by electricity lines."*⁴
- *"It must be noted that the existing Matimba-Witkop Transmission line has impacted on numerous small eco-tourism and hunting operations within the study area." And further: "The impact will be of a permanent visual nature, detracting from the unspoilt environment of the Marken area."*⁵

³ South African Domestic Tourism Survey (2001)

⁴ Tourism Report for Proposed Eskom 400kv Power Transmission Line EIA between Garona & Aries Sub-Stations (2005)

⁵ Tourism Report for the Proposed Matimba-Witkop No. 2 400 KV Transmission Line EIA, Northern Province (2002)

- *"The transmission line could have a significant negative impact on the visual character and ambience of the area, and thus negatively impact on the numbers of eco-tourists visiting the area."*⁶

The tourism study for this project (the Thyspunt Transmission Lines EIA) concurs, stating:

"The power lines could have a significant impact on the visual aesthetic character of the area on which ecotourism activities practised in the area depend. Moreover, eco-tourism activities in the Elands River Valley area generate income for a number of residents, and the compromising of ecotourism activities could have a concomitant socio-economic impact."

However, many of these studies do not supply any quantifiable data or an economically defensible quantitative dataset and method at which a conclusion was arrived, other than being the professional opinion of the author. The Thyspunt Nuclear 1 tourism study supplies a slightly more concrete calculation framework, and even provides a monetary estimate of the total impact to tourism in the Thyspunt area (a decrease of R6,108,536 or -7.86%). The study indicates:

"From a tourism perspective, the discerning visitor might choose not to visit the Thyspunt area and the eastern section of the Garden Route as a result of the construction and operation of a nuclear power station, as reflected through the loss in sense of place. However, any associated short-term reduction in the number of leisure tourists would be expected to be offset by the associated growth in the local population brought by Nuclear-1 that would increase the local demand for tourism related services such as restaurants and accommodation. There would also be increased business tourism with specialists and consultants being brought in, especially during the construction phase, although an influx of

⁶ Mercury - Perseus 400 KV Transmission Line EIA Tourism Report

construction labour and NPS staff would alter the current social amenity of the area. Bed-nights sold to business visitors would help to offset the loss of traditional leisure tourists. However, the desertion of the area by leisure tourists is not likely to extend into the operational period of Nuclear-1 once its benign nature is realised.”⁷

Interestingly, this study concurs that the impact on recreational tourism would be negative, however only during the construction phase. This is partly based on studies overseas that have not recorded any significant tourism decline due to a new nuclear power plant (as referenced in the above study). Also, the study considers the power plant to contribute positively to business tourism based on increased visitor traffic during both construction and operation phases. It must be said however, that any business tourism increases should probably not apply in the case of transmission power lines as more business visitors to the Elands River Valley due to the transmission power lines is not expected.

Based on the information supplied above and findings of the socio-economic specialist study, three assumptions can be made:

There is likely to be a visual/aesthetic impact: The visual impact assessment for the Thyspunt Transmission lines project EIA concludes this in general, as well as specifically in the case of the Northern Corridor section⁸. This is supported by research suggesting that transmission

⁷ Imani Development (2010). *Tourism Study for Proposed Nuclear Power Station ('Nuclear-1') EIA at Thyspunt*.

⁸ SSI (2012). *Thyspunt Transmission Lines Integration Project – Addendum to Visual and Tourism Reports*.

power lines are associated with negative visual impacts internationally⁹, locally (as found in the referenced studies above)

Land values are affected by transmission power lines: Again, there is significant research to suggest property values are impacted when the land is directly affected, but suggestions are that this effect reduces rapidly when the distance from the transmission power line is 100m or more. See the Socio-Economic specialist study of this project for more information and applicable references.

Recreational tourism will be negatively affected: Despite a lack of quantitative research on the subject, there is an indication from previous studies that transmission power lines do affect recreational tourism, especially where a natural rural or pristine setting is part of the main tourism product offering.

However, the key answer that this study aims to provide is: "By how much?" Unfortunately there is no research precedent that could be found either internationally or locally that provides quantitative values. Similar previous studies have not determined quantitative industry data such as total tourism value, visitor numbers, job creation and investments in tourism made in the area. Also, there is no indication of the preferences of tourists that visit the valley, nor is there any information on what they consider to be the most attractive features of the area. Therefore, any value impact cannot be reliably estimated without a primary research study that is specific to the valley or at least the greater area. Such a study should determine:

- 1) The size and value of tourism activities
- 2) Tourism related employment and job creation

⁹ Soini, K., Pouta, E., Salmiovirta, M., Uusitalo, M., Kivinen, T. (2009). *Perceptions of Power Transmission Lines among Local Residents: A Case Study from Finland.*

- 3) The characteristics of the offering and what visitors to the area value most
- 4) Determine if development, and which kinds of development, would affect the offering
- 5) Actual realised impact by conducting a pre and post construction impact study

Once the value, employment and investment levels, the preferences of visitors and their sensitivity to development is known, an economically defensible estimate of the impact in respect of lost revenues, employment and investment can be made. Findings should ideally be further informed by a wider research project that investigates issues on a national and international level.

Conclusion

No value for comparison can be reached with currently available information. It is recommended that future tourism studies are undertaken to include primary research (i.e. a survey) on tourism in areas of such value to facilitate a direct value comparison.

3.1.2. Blackout Event Due to a Major Forest Fire

If the power lines are routed through forest plantation land (the Longmore Route) there may be a risk of damage to strategic transmission assets, resulting in a power shortage and blackouts. The evaluation of this economic risk was required by the study terms of reference, however no information about the risk of forestry routings in South Africa or past damage due to forest fires could be obtained from Eskom in time for conclusion of the study. This is probably because Eskom has largely avoided forested areas in the past. News articles from the USA in North America do indicate that forest fires could potentially damage strategic transmission lines in

forested areas, causing blackouts.¹⁰ How applicable this risk is to the South African context is uncertain. During an interview with NASA for the purposes of satellite based fire monitoring, an Eskom official did state that fires were a major cause of line failures on grassland.¹¹ There have also been reports in the media of blackouts caused by fires.¹² It seems that routing through a forest could increase the risk of line outages further.

3.1.3. Fire hazard of the line itself due to arching and lighting.

The power transmission line could also cause damage to the surrounding forest and farmland if servitudes are not well maintained and if appropriate measures for managing static discharge (lightning strikes) are not in place. Power lines have been found to be implicated in a number of large forest fires. A recent study in the USA suggests:

“Fire records maintained by the California Department of Forestry and Fire Protection (“Cal Fire”) show that power lines are currently responsible for about 3% of all ignitions within the their jurisdiction in California. However, power lines ignited four of the twenty largest fires in California history by acreage and four or five of the twenty largest fires by structures

¹⁰ ABC15 (2012). *Poco Fire grows near Young, threatens power lines*. Accessed at: http://www.abc15.com/dpp/news/region_northern_az/payson/poco-fire-grows-near-young-threatens-power-lines

¹¹ NASA (2007). *Fire Alarms from Orbit*. Accessed at: <http://earthobservatory.nasa.gov/Features/FireAlerts/>

¹² Pretoria News (2012). *Massive blackout in city caused by Rietvlei fire*. Accessed at: <http://www.iol.co.za/pretoria-news/massive-blackout-in-city-caused-by-rietvlei-fire-1.1397384#.ULT9dYesiSo>

destroyed. The probability that a rate of 3% would produce a fluctuation resulting in an observation of 4 or more out of 20 events is only 0.3% - strongly suggesting that power line fires are somehow larger than fires started by other means.”¹³

Again, no information on fire risks has been supplied by Eskom although information from residents in the Elands River Valley indicate that major forest fires do occur periodically, and have been devastating in the past, both for Cape Pine and for landowners in the valley.¹⁴ Any increase in this risk is potentially disastrous and must be properly considered during the EIA process.

Conclusion

Fire-related risks and potential economic impacts are an important consideration that is not well understood for the purposes of determining routing on this project, largely due to an avoidance of such areas by Eskom in the past. Further research is recommended in future for more conclusive answers in this matter.

3.1.4. Loss of Forestry Revenues, Investment and Employment

There is sufficient industry data to allow the calculation of the loss of forestry land associated with the Longmore Routing which is estimated to traverse forestry land, and sterilise (for the purposes of forestry) a total of 495 hectares. The results could be further refined by investigating the financial records of Cape Pine, however this information is not publicly

¹³ Joseph W. Mitchell (2008). *Power Lines and Catastrophic Wildland Fire in Southern California*. Accessed at: http://www.mbartek.com/FM09_JWM_PLFires_1.0fc.pdf

¹⁴ M Dodd (2012). Interview by author.

available and was not supplied by Cape Pine in time for the conclusion of this study. Data below was obtained from industry statistics compiled by Forestry South Africa, in 2010.

Economic Implications of a 495 Ha loss of forestry land	All Phases
Loss in annual revenues (timber)	R 2 081 475 per annum (R 4 205 per ha)
Loss in capital investments	R 7 231 950 (R 14 610 per ha)
Loss in job opportunities	25 (0.05 Opportunities per ha or 20 ha per opportunity)

As can be seen in the table above, the impact is moderate in nature. However, to make a proper judgement on the severity of the impact, it is necessary to examine the financial results of Cape Pine. If the company is at a financial break-even any loss above could make the operation unfeasible. On the other hand, if Cape Pine makes a profit it could potentially absorb the revenue losses and re-allocate job opportunities.

Conclusion

The economic impact on Cape Pine for the loss of 495ha of forestry land seems to be moderate, but can only be fully interpreted once the overall health of the current operation is known.

3.2. Value Determination and Recommendations

Although the two routings cannot be directly compared on quantitative terms there seems to be the opportunity for a compromise that minimises both the visual impact in the Elands River Valley and the loss of forestry land. Based on Google Earth visualisation by the author, there may be the opportunity for a routing that uses the Cape Pine northern firebreak, but moves onto

productive forestry land only when visual impacts become extremely visible. This route would roughly follow the 'Alternative 2' routing in the Longmore area presented in the TOR for this study. The routing should be able to mitigate up to 40% of the economic impact associated with the loss of land and should also help minimise the risk of serious damage in the event of a forest fire. In this case the following impacts could apply:

Economic Implications of a 240 Ha loss of forestry land	All Phases
Loss in annual revenues (timber)	R 1 009 200 per annum (R 4 205 per ha)
Loss in capital investments	R 3 506 400 (R 14 610 per ha)
Loss in job opportunities	12 (0.05 Opportunities per ha or 20 ha per opportunity)

The table indicates that the above impacts are less pronounced in nature.

This routing may also reduce any fire related risks by avoiding forestry plantations in some sections. A routing in the middle of the Northern Corridor, which diverts into forestry land at a point where visual impacts on the Elands River Valley become severe, is therefore recommended for further consideration. This supports the findings of the visual and tourism study of a routing in the middle of the corridor being a possible compromise between forestry and tourism/visual impacts.¹⁵

¹⁵ SSI (2012). *Thyspunt Transmission Lines Integration Project – Addendum to Visual and Tourism Reports*.

4. Impact Comparison 2 – Agriculture vs. Forestry

During the initial phases of the socio-economic studies¹⁶ a strong emphasis was placed on investigating agriculture impacts in the southern corridors due to intensive agronomy and a number of nodes of highly productive agricultural land along all southern corridor routings. General economic values for highly productive land, based on interviews with landowners, were determined as part of the socio-economic specialist studies. Valuations were based on irrigated farmland, found mostly along rivers in the area, used for grazing of milk producing animals. No impact was specified for dry agricultural land. Based on these values, the socio-economic specialist study recommended that all original southern corridors should be avoided due to the scale and severity of impact on irrigated agricultural land.

As part of the Terms of Reference for this study, a comparison of economic data for high value (irrigated) agricultural land with forestry industry economic data was requested, and an analysis is done here to determine if, based on industry investment, output and employment, highly productive agricultural land should be avoided in favour of forestry land.

The analysis is structured as follows:

Northern Corridor Economic Impacts	VS	Southern Corridor Economic Impacts
Forestry Industry Output Impacts		Agri Industry Output Impacts
Forestry Industry Investment Impacts		Agri Industry Investment Impacts
Forestry Industry Employment Impacts		Agri Industry Employment Impacts
Overall Impact		Overall Impact

¹⁶ MasterQ (2010). Socio-Economic Impact Assessment for the Proposed Thyspunt Lines Integration Project: Northern Corridor. MasterQ (2010). Socio-Economic Impact Assessment for the Proposed Thyspunt Lines Integration Project: Southern Corridor.

This analysis of forestry economic values is similar to the impact discussed under heading 2 above, however, for the comparison below it is most useful to do a per-hectare comparison of the loss of agricultural land and forestry land, as the agricultural production and employment for the overall route could vary considerably depending on the final routing within the corridors.

4.1. Northern and Southern Corridor Economic Impacts

4.1.1. Loss of Forestry Revenues, Investment and Employment

This table presents the average value of forestry land as per the previous impact, but for one hectare of land:

Economic Implications of a 1 Ha loss of forestry land	All Phases
Loss in annual revenues (timber)	R 3 000 per annum
Loss in annual revenues (milling)	R 2 790 per annum
Loss in capital investments	R 21 017
Loss in job opportunities	0.02 Opportunities (37 Ha per opportunity)

4.1.2. Loss of Agricultural Revenues, Investment and Employment

While the majority of high value land was found along the original Southern Corridor routings, there do seem to be nodes along both current corridors that may be impacted. In this case, the economic impact of loss of high-value agricultural land can be calculated as follows:

Economic Implications of a 1 Ha loss of high potential agricultural land	All Phases
Loss in annual revenues (milk and associated)	R 25 000 to R 80 000 per annum

Loss in capital investments	R 30 000 to R 50 000
Loss in job opportunities	0.06 Opportunities (15 Ha per opportunity)

Conclusion

Were a choice between irrigated agricultural land and forestry land exists; loss of forestry land is preferred from an economic point of view. Where a choice between dry agricultural land and forestry land exists, a routing on dry agricultural land is preferred as no impact is likely.

4.2. Value Determination and Recommendations

This analysis confirms the recommendations of the initial socio-economic studies and indicates that irrigated, high value agricultural land should be avoided at all costs in all corridors due to investment, economic value and employment levels found on high productivity agricultural land. However, the corridors and routings supplied as of September 2012 suggested that the loss of irrigated land could be avoided entirely.

5. Overall Conclusions and Recommendations

Based on the arguments presented above the following conclusions can be specified:

With regards to the comparison of Tourism and Forestry Impacts associated with different routings in the Northern Corridor.	<p>There is a lack of information available to the author with regards to the strategic economic risks, tourism assets (and therefore economic impact) and forestry related dangers of different routings inside this corridor:</p> <ol style="list-style-type: none"> 1. Financial information from Cape Pine could not be obtained and industry averages were used. 2. Neither the original tourism study nor the tourism addendum study gathered quantitative data on
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	<p>the value of tourism in the Elands River Valley.</p> <p>3. Limited literature information on strategic risks (major forest fires or regional blackouts) associated with power lines in a forestry environment could be obtained due to a lack of experience in the South African context and history of placing power lines outside boundaries of forests within South Africa.</p> <p>A clear quantification and therefore economically defensible comparison cannot be made. There does seem to be the opportunity to minimise the risks associated with both the Elands River Route and the Longmore Route through a compromise, however, further research would be required to confirm this quantitatively.</p>
With regards to the comparison of Agriculture and Forestry Economic Impacts associated with both corridors.	<p>The findings of this study supports that of the original Socio-Economic study, and irrigated high-productivity agricultural land should be avoided at all costs. Where a trade-off is necessary between irrigated agricultural land and forestry land, forestry land should be sacrificed. Where a choice exists between dry agricultural land and forestry land, a routing on dry agricultural land is preferred as no impact is likely. Current routings suggest that impacts on irrigated agricultural land could be avoided entirely.</p>

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