Submission No 87

INQUIRY INTO FEASIBILITY OF UNDERGROUNDING THE TRANSMISSION INFRASTRUCTURE FOR RENEWABLE ENERGY PROJECTS

Organisation: Kingston and District Power Alliance

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Hon Emily Suvaal MP
Chair
Standing Committee on State Development
NSW Legislative Council

13 July 2023

Dear Emily

Standing Committee on State Development – Inquiry into Feasibility of Undergrounding Transmission Infrastructure for Renewable Energy Projects

Kingston & District Power Alliance (***KDPA***) lodges this submission in response to the Standing Committee's invitation for public submissions on the feasibility of undergrounding transmission infrastructure for renewable energy projects.

Kingston and the surrounding district are in central Victoria, between Ballarat and Daylesford. The economy of the district relies on farming and tourism. The area has been designated as a Renewable Energy Zone (***REZ***) by the Victorian Government.

KDPA is working collaboratively with Hepburn Council and community groups in Victoria and NSW who are concerned about the impact of the Western Renewables Link / VNI West interconnector project on the Hepburn region and beyond. The various proposed transmission projects in Victoria and NSW raise the same questions about the costs and benefits of undergrounding.

Executive Summary

In response to the specific questions raised by the Terms of Reference, KDPA submits:

- The Standing Committee's consideration of the costs and benefits of undergrounding should take a comprehensive view of both costs and benefits. When the full costs and benefits of undergrounding are taken into account, the short and long term return on investment by undergrounding is superior to overhead. Please refer to KDPA's attached submissions on feasibility, fire safety risk, bushfire insurance, farm productivity, tourism impact, significant landscape and land values.

- Transmission projects are intended to deliver a profit to private sector power companies. The resistance to undergrounding is driven by a desire to maximise profit for power companies. The NSW Government should not allow the power sector to force private citizens to carry part of the cost associated with privately owned projects. This amounts to a monetary transfer from individuals to private companies running very profitable businesses. We don't expect power companies to act altruistically but we are entitled to expect State Governments to work for the benefit of the community, rather than power companies.

- There are many examples of undergrounding of transmission lines, including Marinus Link, Murray Link and Star of the Sea in Victoria and the 750km SuedLink Project in Germany.

- The construction of transmission projects will be substantially delayed by the ongoing failure to address community concerns. There has been a remarkable lack of interest shown in considering how these projects will affect communities.

- Another source of delay will be disputes about legality. For example, on 26 June 2023 Moorabool Central Highlands Power Alliance Inc. disputed the legality of an AER decision in relation to VNI West. Also, Moorabool and Central Highlands Power Alliance Inc. has commenced Supreme Court proceedings in respect of the 20 February 2023 'VNI West and WRL Ministerial Order' issued by the Minister for Energy and Resources, Lily D'Ambrosio to disapply certain aspects of the law to accelerate that project. As recently demonstrated by the Royal Commission into the Robodebt Scheme, serious questions about the legality of schemes that impact thousands of people cannot be brushed aside. Checks and balances in the system are there to ensure good governance and probity compliance.

- There are environmental benefits of undergrounding, including mitigation of bushfire risk associated with overhead transmission and the need for a smaller number of trees to be removed, which benefits wildlife.

Key Submissions

In the short time available, KDPA has prepared submissions on these issues:

Submission 1: Feasibility.

Submission 2: Costs associated with fire and public safety.

Submission 3: Costs associated with fire insurance.

Submission 4: Cost of impact on farm productivity.

Submission 5: Cost of impact on tourism.

Submission 6: Cost of impact on residential property values.

Submission 7: Visual Impact of Overhead Transmission.

We are also concerned about a range of other issues, such as harm to wildlife but we have not been able to prepare submissions in the short time available.

Teleconference

If you wish to discuss any aspect of our submission, please contact Louise Charleson, Secretary of KDPA on the email mentioned above to arrange a teleconference.

Yours sincerely

Kain Richardson
Chair
Kingston & District Power Alliance

KDPA Submission 1: Feasibility

Summary

Good government requires the NSW Parliament to consider all relevant factors and stakeholders when assessing the feasibility and cost of undergrounding transmission lines.

Power companies place their own economic interests ahead of others. That's not surprising but they should not be the judge and jury on what is feasible. AEMO and power companies argue that overhead transmission delivers the cheapest financial outcome to energy users but that isn't the only benchmark for assessing feasibility. Our understanding is that return on investment is limited to construction and run costs and value to power companies, ignoring all other financial and non-financial impacts.

We note that a number of industry experts have raised concerns about the old-fashioned approach that is being proposed. The NSW Parliament should ask why Australia is behind the rest of the world, while Europe, the United Kingdom, China and India are using more advanced technologies to integrate renewables into their power systems. Many technical issues can be avoided or mitigated by undergrounding new lines using up to date technology.

Key considerations are:

- Underground transmission lines are proposed for renewables projects in Victoria, such as Marinus Link (90km underground High Voltage Direct Current (***HVDC***));
- Underground HVDC is more efficient to transmit power over long distances;
- Underground HVDC is more environmentally friendly; and
- Underground HVDC is at less risk of extreme weather events, including lightning and tower collapse associated with downbursts.

The premises of a design must also account for the long term and changing requirements of power consumption and generation.

Submission

There are many examples of undergrounding of transmission lines, including:

- Marinus Link in Victoria (90km);
- Murray Link in Victoria (176km);
- Star of the South in Victoria (75km);
- SuedLink Project (750km, 525kV) in Germany;
- SuedOstLink (500km, 525kV) in Germany.

These are all ***HVDC***.

Any cost comparison of overhead and underground transmission needs to be against HVDC rather than against High Voltage Alternating Current (***HVAC***). A cost comparison against

HVAC is misleading – yet HVAC is the comparator AusNet have used for the WRL. HVAC is suitable for shorter distances but not ideal for long haul transmission. There is higher power loss with HVAC compared with the equivalent HVDC. There are no line length limitations for HVDC.

Review carried out by Moorabool Council

In September 2020, Moorabool Shire Council in Victoria engaged Amplitude to prepare a report on the comparative cost of 500kV underground and 500kV overhead power (Moorabool Report)[1]. Subsequently, on 17 June 2021, Moorabool Shire Council engaged Amplitude to prepare an alternative scoping report involving HVDC for Western Renewables Link (Amplitude Report)[2].

At Item 10, Conclusion of the Moorabool Report, it states:

"A feasible alternative to the proposed 500kV double circuit overhead line would be 500kV double circuit underground cable. Whilst this would be approximately ten times more expensive than an overhead line, the overall cost impact could be reduced by placing only the most sensitive sections underground. Although using underground cable for a portion of the route is not a simple solution it appears to be technically feasible. Another option is to install some or all of the new overhead line adjacent to the route of the existing overhead line easement (Sydenham-Moorabool-Elaine-Ballarat)."

There is a summary of the major differences between overhead and underground options for a 500kV double circuit transmission connection in the Executive Summary of the Moorabool Report: The report states "The major differences between a 500kV double circuit overhead line and a 500kV double circuit underground cable … are as follows:

- Larger visual impact for overhead line due to the above ground infrastructure, reduced visual impact for underground cable, excepting possible need for transition stations. The visual impact of new overhead lines may be reduced by close location with existing overhead lines.

- Indicative EMF modelling results found that the magnetic field level for a person standing directly above the underground cables is higher than when standing below an overhead line. However, 500 kV underground cables offer a significant reduction of magnetic field level (even lower than overhead lines) when standing 15 m away.

- During construction, there would be greater ground disturbance for underground cables compared with overhead lines.

[1] https://www.moorabool.vic.gov.au/files/assets/public/orphans/documents/20200924-msc-transmission-comparison-overhead-with-underground.pdf
[2] https://www.moorabool.vic.gov.au/files/content/public/about-council/large-projects-impacting-moorabool/western-victoria-transmission-network-project-western-renewables-link/wvtnp-high-level-hvdc-alternative-scoping-report.pdf

- Underground installation of 500kV cables over a 75 km length has not yet been undertaken elsewhere in the world. Theoretically, an effective length of up to 80km is achievable with significant reactive compensation is required.

- Construction lead time is estimated as 3 times longer for underground cable (6 years) than overhead line (2 years), for a 75 km length. It may be possible to reduce the lead time (potentially by half the estimated time) by increasing resources for working simultaneously at multiple locations along the underground cable route, which may impact on the construction cost."

The Amplitude Report concluded that:

"It was determined that not only is a HVDC system utilising underground cables a technically feasible alternative, but it is also likely to be more reliable and efficient for the movement of renewable energy to major centres whilst presenting significantly reduced impact to social and environmental factors".

KDPA has since observed that much larger distances are being covered by underground HVDC transmission. For example the SuedLink HVDC Power Transmission Project in Germany is 750 km and 525 kV[3].

Extreme Weather

The costs associated with lightning strikes and extreme weather cannot be ignored when considering feasibility.

A Case Study Fact Sheet published by The Electricity Sector Climate Information Project (Australian Government, AEMO, CSIRO, AusNet) states:

"Severe wind events, often associated with severe thunderstorms, can cause transmission towers to fail, potentially impacting any nearby roads or dwellings. Also, as a consequence, any resulting power supply disruption decreases the reliability of electricity supply to customers. A recent example of one of these types of events (January 2020) occurred in south-western Victoria (VIC), where downbursts associated with a severe thunderstorm resulted in major damage to transmission lines, and six 500 kV AusNet transmission towers were destroyed".

It is not possible to engineer a tower that will resist all wind conditions. When towers collapse in extreme weather, this poses a fire hazard. The collapse of towers can also result in power blackouts.

Power companies are entitled to claim the full cost of rebuilding towers that collapse and to pass that through for reimbursement. For example, after the Cressy towers collapsed in January 2020 in south-western Victoria, AusNet applied to the Australian Energy Regulator under clause 6A.7.3(a) of the National Electricity Rules (*NER*) for approval to pass through

[3] https://www.nsenergybusiness.com/projects/suedlink-hvdc-power-transmission-project/

the additional costs that AusNet Services incurred to restore transmission services and replace the collapsed 500kV dual circuit transmission line Cressy towers. The application for reimbursement was approved by the Australian Energy Regulator. The risks associated with tower collapse and the associated costs could be avoided if lines were undergrounded, but there is no financial incentive for power companies to consider these risks, because they transfer them to other parties.

Undergrounding eliminates costs and blackouts associated with extreme winds and lightning strikes.

Changing Assumptions

KDPA contends that since the inception of lines such as the WRL-VNI West, the usage and generation of power has changed radically, necessitating a review of the assumptions that were applied for the design of those lines. This also has implications for other lines. We observe that:

- Renewable energy generation could be placed close to existing coal power stations as transmission infrastructure is already in place along with a skilled workforce with experience in energy and power generation, transmission and maintenance;
- Long haul transmission is an inherently inefficient solution, so alternative solutions need to be investigated;
- The feasibility of alternative energy generation systems, including battery storage and increased rooftop solar, has increased.

Accuracy of Cost Estimates

Questions have been raised about the accuracy of cost estimates on the various transmission projects. For example, in April 2023 the Victoria Energy Policy Centre raised concerns with AEMO regarding “biased, flawed and in parts dishonest analysis” of the costings for VNI West.

The NSW Parliament should ask whether the costings are under done. For example, have compulsory acquisition costs and biodiversity offset costs been captured properly, or at all? If these are not captured, why not, and who will bear the cost if these have been omitted on purpose?

The NSW Parliament should also question whether power companies are planning to make substantial profits from connection points into transmission lines to allow multiple new energy generation and customer load projects along the routes to connect into the system. Has this upside been captured in the costing?

As the world moves to renewable energy requiring new transmission networks, energy providers and proponents who have chosen the visually blighting overhead solution have faced severe opposition and backlash from impacted communities and consequential delays and spiraling costs for gaining approval for new overhead transmission networks. The NSW

Parliament should ask whether the costings for overhead transmission properly account for the value of time lost due to project delay and associated costs.

Corporate Profit v Community Benefit

The transmission projects that are being investigated by the NSW Parliament will deliver a profit to private sector power companies. Transmission infrastructure is a regulated asset, meaning the asset owner has a guaranteed rate of return over the project life, which can be up to 50 years. All costs are passed to consumers.

In the circumstances, the NSW Parliament is entitled to question whether the resistance to undergrounding is driven by a desire to maximise profit for power companies and to deliver financial returns to shareholders. In Australia, power companies have a well-documented track record of "gold plating" to achieve corporate interests, which speaks volumes about the regulatory regime for the sector.

We don't expect power companies to act altruistically but we are entitled to expect State Governments to ask tough questions and to work for the benefit of the community, rather than blindly accepting that what's good for power companies is also good for the community.

KDPA Submission 2 - Fire and Public Safety

Summary

Regional communities along transmission lines shouldn't be expected to accept the extra fire safety risk associated with overhead transmission. There are substantial costs associated with this risk that need to be recognised when considering the feasibility of undergrounding.

Submission

First and foremost, fire is a public safety issue. Firefighting can't be performed safely near transmission lines, regardless of whether firefighters are on the ground or fighting the fire in planes and helicopters.

Community Safety Information

There is plenty of information that makes it clear that transmission lines are a safety hazard during bushfires.

For example, Energy Safe Victoria's publication 'Bushfire Management and Community Safety' dated March 2023 says: "Areas near or beneath transmission lines should be avoided in the event of a fire, as dense smoke can increase the risk of an electrical arc or flashover which can endanger life and property."

Powerlink's publication 'Fires and Transmission Lines Safety', summarises some of the safety issues as follows:

"For your safety, when there is a fire close to a transmission line remember:

- Keep personnel, vehicles and attachments at least 25 metres away from the transmission line.
- Electricity, especially at high voltages, can 'jump' across several metres of air gap. This means that direct contact with the transmission wire or conductor is not required to produce a potentially fatal event.
- Smoke can act as a conductor. Fires burning on or near transmission line easements can greatly increase the chances of a flashover occurring.
- Don't count on rubber tyres on vehicles to stop a flashover from occurring.
- Wires on transmission lines sag lower in times of high demand, high temperatures and fires, reducing the ground clearance."

As a result of these concerns, safety regulations impose No Go Zones under transmission lines.

No Go Zone

The No Go Zone means that the area under and near overhead lines is difficult or impossible to defend during a fire.

In addition to flame height and smoke presenting significant arc hazard near transmission lines, water applied during firefighting poses an electrical safety risk. The presence of overhead lines increases the risk that fires can escape control lines while power companies decide whether to de-energise the power. The presence of 500kV lines over local roads is another factor to be considered because rubber tyres on vehicles will not necessarily prevent a flashover. This impacts the ability of fire vehicles to move around the district in a fire and affects evacuation of townships.

Country firefighters have personal experience of the challenges posed by overhead transmission. The area that is unable to be defended may be much bigger than the cleared easement around the transmission line.

For example, at the Clunes community meeting on 25 November 2021, Tom Drife spoke about a fire in the district where firefighters were hampered by the presence of transmission lines. Tom explained that firefighting can be hampered by restrictions on the use of aerial appliances near the lines. There are also restrictions on the use of fire-retardant spray due to concerns the retardant might be blown by the wind and drift onto the powerlines.

Tom emphasised that there is a major problem with visibility of the transmission lines in a fire. The lines are impossible to see in dense smoke when visibility can be reduced to between 2 to 20 metres.

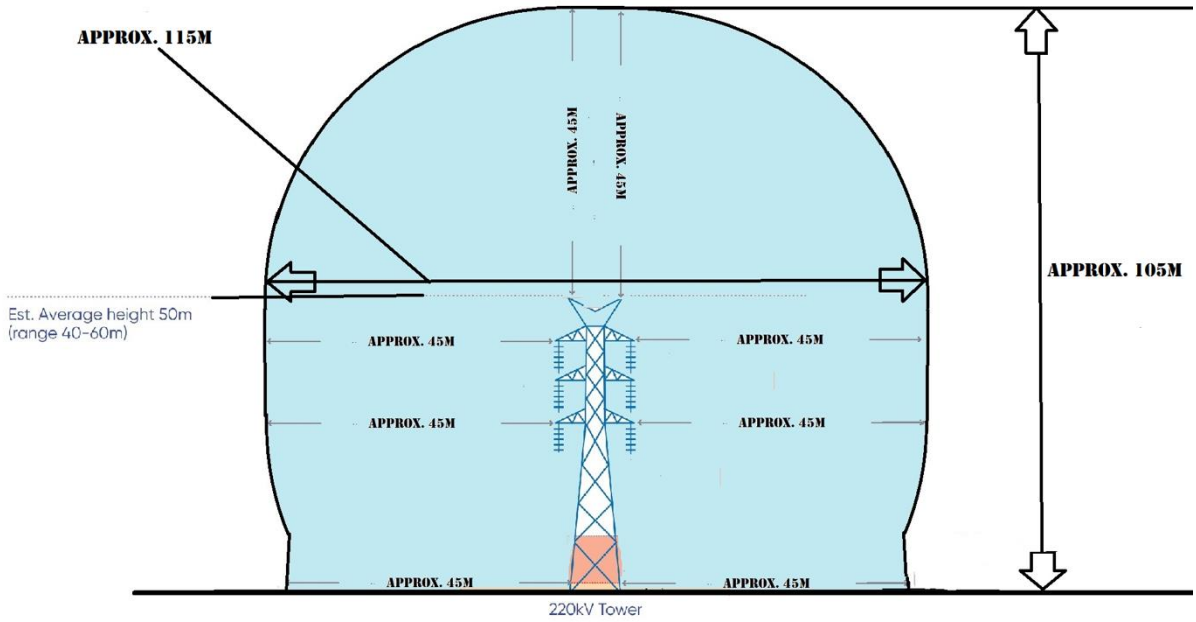
For safety, in these conditions firefighting teams are trained to fall back to a firm reference point (for example, a road) to avoid getting lost in smoke and straying too close to a transmission line. The nearest firm reference point can be one or two kilometres from the transmission line or even more. In other words, the area that is undefendable is much bigger than the cleared easement around the transmission lines. Tom explained that due to the presence of transmission lines, the fire was able to escape and burned a much larger area than would otherwise have been the case.

There are aerial restrictions imposed in each State. The intention of the aerial No Go Zone is that firefighting planes and helicopters keep a safe distance from the transmission towers and overhead lines.

The transmission lines are clearly marked on aeronautical maps but in dense smoke they are difficult to see, which means a cautious approach is needed to avoid getting too close.

In Victoria, the *Victoria (Electricity Safety (General) Regulations 2019 S.R. No. /2019)* impose aerial restrictions which create a No Go Zone around a 50 metre high 220kV tower, as shown below. The advice from electrical engineers is that for the bigger towers supporting 500kV which may be up to 85 metres in height, the No Go Zone is correspondingly bigger.

Diagram: Size of the Aerial No Go Zone – 220kV Tower



State Government Duty of Care

Fire risk creates a cost to the community. At an individual level, compensation to people facing transmission lines on their property (or 'community benefits' to people facing transmission in their community) may help to compensate for certain types of loss and damage, but money is not a solution to fire safety.

In circumstances where fire safety risk can be substantially reduced by undergrounding, the NSW Parliament has a duty to consider community safety and to assess whether to allow energy companies to build overhead transmission which increases the fire risk for regional communities.

State Government Liability and Cost Exposure

Increased fire risk is the unavoidable result of building overhead transmission lines.

For that reason, the NSW Parliament should seek advice to understand who bears the risk associated with permitting overhead transmission to be built through fire prone areas, creating areas which are undefendable. It is our understanding that certain statutory immunities have been granted to power companies.

Assuming the answer is that 100% of fire risk sits with the NSW Government, not energy companies, then this is a cost to the taxpayer to be taken into account in the Standing Committee's deliberations on the real cost of allowing overhead transmission.

KDPA Submission 3 - Fire & Insurance

Summary

If State Governments allow extra fire risk to be imposed on farmers, there is a genuine risk that the value of farms will be reduced or even destroyed and that farmers will be forced out of business. Claims that overhead power lines are cheaper to build than underground do not stack up when fire risk, insurance costs and farm viability are taken into account.

Confidential Information

It is not surprising that farmers are reluctant to be vocal on this sensitive issue. KDPA does not wish to disclose personal details in our submission. We can provide information on a confidential basis, if this is of interest to the Standing Committee.

Submission

Farmers have been warned by brokers that insurance costs will rise if overhead transmission lines are built on farms. In some fire prone districts, farmers have been warned by brokers that if transmission lines go through the farm, then no fire insurance will be available.

Farmers are aware that solar farms will be built along the transmission lines. In our district, solar companies have already approached local potato farms to express interest. Farmers have been warned that solar farms located near transmission lines create insurance problems for farmers[4].

Despite PR claims from power companies suggesting that overhead transmission doesn't increase fire risk, commercial discussions with farmers show the insurance sector doesn't accept these PR claims.

Insurance companies price their own private assessment of the risk that transmission lines will have an adverse effect on fire risk for some farms in some locations. They have a choice about who, what and where they insure.

Brokers report that underwriters have withdrawn from the bushfire market. For example, broker Steven Price from Ovens Valley Insurance Brokers in Myrtleford, Victoria was quoted in April 2023 as saying: "We've had five commercial underwriters withdraw from writing business insurance due to extreme bushfire risk, limiting market accessibility for our clients"[5].

Insurers understand that overhead transmission lines increase fire risk by hampering firefighting on the ground and from the air. This is discussed in KDPA submission 2.

[4] https://www.wangarattachronicle.com.au/rural-news/farm-insurance-fear-over-solar-neighbour
[5] https://www.wangarattachronicle.com.au/rural-news/farm-insurance-fear-over-solar-neighbour

Fires started by transmission lines are rare, but they do occur. There was a fire in 2017 at Tarago, NSW caused by a bird catching fire and falling to the ground, sparking a bushfire[6]. Litigation followed and the farmers were forced to take the case all the way to the door of the court to get resolution.

The massive Camp Fires in California in 2018 were found by the regulator to have been caused by a worn C-Hook on a transmission tower. That fire killed at least 85 people and destroyed 18,000 structures. As a result of that fire, the owner of the transmission line, Pacific Gas & Electricity, filed for bankruptcy protection[7] and several of their insurers were wiped out by the volume of claims. Following major fires, Pacific Gas & Electricity announced that it would underground new lines[8].

It is worth noting that engineers accept that transmission lines are a known cause of ignition. For example, during the Environmental Impact Assessment process on Snowy 2.0, Jacobs stated that "Unless carefully managed, installation of new transmission lines may increase the number of bushfire incidents in this region"[9]. Item 4.8 of the Jacobs Report states that powerlines and related infrastructure are a 'known cause of bushfire ignition' and lists multiple causes, including transmission line structure failure and conductor drop.

Insurers know that solar projects that cluster around transmission lines impact insurance. Brokers have expressed concern about the high replacement value of these projects and what this means for a farmer if a fire crosses into the solar farm. Farmers are unable to obtain insurance to cover this level of risk. If the replacement cost of the solar farm is (say) $750m and the farmer can only obtain $10m in insurance cover, there is a shortfall risk. This places the farmer's livelihood at risk and highlights why proper planning is needed for placement of industrial facilities.

Farmers' Personal Experiences

In NSW, Yass Valley farmer Hansie Armour is pushing back on Transgrid's plans to build overhead transmission lines through her farm. After the massive Dunn Road fire in 2020, she has raised concerns that fire prone land will become too expensive to insure and therefore unsustainable for farming in the longer term. Hansie was interviewed on WIN News Riverina on 22 June 2023 about her experience, saying "it just isn't safe, **insurances aren't available**, a whole range of other impacts are made on farming viability and, of course, the property prices drop as well".

In Kingston and the surrounding district, potato farmers report that they've been repeatedly warned by insurance brokers over the last 2 years that if WRL-VNI West overhead

[6] https://www.abc.net.au/news/2017-01-20/tarago-fire-sparked-when-bird-hit-powerlines-nsw-rfs-says/8197598

[7] https://www.nytimes.com/2020/07/01/business/energy-environment/pge-bankruptcy-ends.html#:~:text=PG%26E%20sought%20bankruptcy%20protection%20in,destroyed%20the%20town%20of%20Paradise.

[8] https://www.usnews.com/news/us/articles/2022-06-16/pg-e-moves-power-underground-in-plan-to-bury-10-000-miles

[9] Jacobs, Appendix F Bushire Assessment Snowy 2.0 Transmission Connection Project Environmental Impact Assessment, February 2021.

transmission lines are built through their farms, then the cost of their farm insurance will rise significantly.

Fire risk should be considered at the start when the route is being planned. Instead, power companies and AEMO refuse to engage on the fire insurance issue, claiming this is an issue to be discussed at the end when compensation is being negotiated. For example, after the recent VNI West Information Session at Boort on 3 July 2023, local farmers reported via community Facebook pages that their attempts to ask AEMO questions about fire risk and insurance were fobbed off. One farmer reported: “No answers for firefighting. No answers to insurance – that should be a conversation when discussing compensation”.

Farm Viability: How do you Operate a Farm without Insurance?

As a farmer, what do you do when insurance is no longer available in your district due to a web of transmission lines that increase fire risk? A farm that can’t obtain or afford fire insurance has no risk mitigation safety net for their primary, if not only, asset. This impacts the farm’s ability to borrow and therefore to even operate at all. If the farm is no longer financially viable, there is a disastrous impact on the farm's value.

We know what happens when disaster affects an uninsured community: simply look at the financial mess after the floods in Lismore.

The NSW Parliament review of the cost of undergrounding must consider the impact of overhead transmission on the availability and cost of private landholders’ insurance. If Governments allow uncapped and uninsurable fire risks to be imposed on farmers, there is a genuine risk that the value of farms will be reduced or even destroyed and that farms will be forced out of business.

Claims that overhead power lines are cheaper to build than underground fail to take into account the cost of uninsurable farms and the associated risk to farm viability.

KDPA Submission 4: Cost of impact on farm productivity

Summary

Power companies will build through Class 1 farmland used for intensive crop farming, if permitted to do so by State Governments. State Governments should not assume that power companies will self-regulate and make sensible route choices.

There will be significant productivity impacts associated with transmission lines through areas used for intensive crop farming. Farmers need to be able to make a profit to survive. Transmission through intensive crop farming areas will drive farmers to close their farms.

There is a real cost to the community associated with loss of farm productivity, including farmers leaving the land which will result in the hollowing out of country towns.

Submission

The farmland in Kingston and the surrounding district in central Victoria is volcanic soil. Farms are relatively small, rather than broad acre. This is 'Class 1 Farmland' used for potato production and intensive crop farming. Class 1 Farmland is the highest level of productive land in an Agricultural Land Capability Assessment, as produced by Agriculture Victoria (October 2018).

Around four percent of Victoria is classified as Class 1 Farmland. In Victoria, it is government policy to support the conversion of a large percentage of agricultural land to solar and wind farms in an attempt to achieve net zero targets. In the Offshore Wind Policy Directions Paper (March 2022) the Victorian Department of Environment, Land Water and Planning stated:

"… there are significant challenges for onshore wind and solar to meet all of our net-zero energy needs. Analysis indicates that to meet net-zero targets using onshore renewables could require **up to 70 per cent of Victoria's agricultural land** to host wind and solar farms."

The information in the Policy Directions Paper indicates that this equates to up to 88,900km^2 of the agricultural land in Victoria being converted to power generation. In circumstances where vast expanses of agricultural land are at risk of being converted to renewables, the small pockets of Class 1 Farmland will become especially valuable and should be protected.

Despite the scarcity of Class 1 Farmland, AusNet has shown that it is determined to build 500kV overhead transmission lines for WRL-VNI West through these farms, ignoring concerns raised by farmers, the Victorian Farmers' Federation and the Hepburn Shire Council.

This demonstrates that the planning of these routes should not be left in the hands of the private sector which is content to ignore government policy regarding food security and green wedge preservation.

The final route for WRL announced by AusNet made it clear that AusNet decided to ignore alternative routes and technologies to avoid or minimize harm to agriculture. The fact that a power company considers it is appropriate to destroy Class 1 Farmland demonstrates that power companies will always focus on their own profit.

Despite having no agricultural expertise, AusNet proposes that it can overcome farm impacts for potato farmers by building transmission towers higher than normal (85m high) and locating the towers closer together than normal. In our discussions with Energy Safe Victoria, KDPA was advised that AusNet has proposed this as a solution to lift the 500kV lines higher above the ground.

This ignores the fact that the farm sizes in our district are small and taking land for transmission towers substantially reduces the amount of suitable land for cropping. An easement for double transmission lines can be around 100 metres wide and depending on the layout of the farm, the reduction in productive land can easily be 15 percent and even up to 25 percent in some cases. For example, some small farms are proposed to be cut in half by transmission lines and access roads to the towers, resulting in 2 very small areas either side of the easement which cannot be farmed on a cost-effective basis.

Local farmers have raised specific concerns about direct impacts on farming practices within the vicinity of high voltage transmission towers which include safety prohibitions on:

- Some farming equipment, including spray gun irrigators used for potato farming;
- Aerial spraying around transmission lines, despite aerial spraying being routine for intensive crop farming in the area; and
- Farming drones, despite drones being routine in agricultural production.

Farmers in Kingston and the surrounding district estimate that around 15 to 20 percent of most farms in the district will be impacted by WRL – VNI West. KDPA can share examples on a confidential basis if the Standing Committee is interested in this information. We do not wish to disclose personal details in this submission.

Potato production involves crop rotation with other crops grown in other years. Farmers believe that overhead transmission lines will reduce crop rotation. Rotation is expected to reduce from 1 potato crop every 5 years to 1 in every 4 years, purely due to lack of suitable available land for potato crops. When the impact of reduced rotation is calculated over a 12 year period, this results in a permanent drop in potato yield in the district of between 25 to 30 percent. It is important for the NSW Parliament to understand the drastic consequences of a long term reduction in production on the financial viability of a farm.

Most of the yield penalty will be due to compounding increase in disease carry over from a shorter rotation, including pink rot, blackleg, scab (powdery/common), early and late blights etc.

Productivity will also be impacted by soil compaction associated with construction. Each tower has a concrete footing. Construction involves approximately 17 concrete trucks

crossing the paddock for each tower. Based on past experience with construction of pipeline projects in the district, farmers estimate that it will take up to 10 years to remediate the soil after compaction during construction.

Farmers will need to make up for losses by pushing the land harder with cash crops. This goes against the current best practice of regenerative agriculture, where industry is trying to use less synthetic inputs, whilst developing soil structure and health by increasing rotations and minimising the cash crops that are harvested in between potato crops.

This will reduce diversity and has other flow on effects to the whole of industry and farm productivity benchmarks.

It is suggested by power companies that compensation is available. It is clear that the compensation process will take years and, meanwhile, farmers will be facing financial hardship. This will happen on a huge scale along the route of transmission projects and will significantly impact the regional economy.

It is clear AusNet does not intend to compensate local farmers for the loss associated with a permanent 25 to 30% loss in farm production over the whole life of the transmission lines (50 years or more). On the contrary, discussions between farmers and AusNet make it clear that AusNet hopes farmers will accept that token measures will be sufficient: for example, new fences and a new irrigation system.

State Governments should critically examine whether it is credible for power companies to claim that overhead transmission has no impact on farm productivity or whether these claims are commercially motivated.

KPDA Submission 5: Tourism Impact

Summary

If State Governments allow transmission lines to be built through tourism areas, there is a risk that the tourism economy will be reduced or destroyed and then tourism operators will be forced out of business. The loss and damage to the tourism sector needs to be taken into account as part of the cost of overhead transmission.

Confidential Information

Many tourism operators have expressed their concerns on a private basis but are scared to make public comments about the impact of transmission lines on their businesses, knowing this may have an immediate commercial impact. KDPA does not wish to disclose personal details in our submission. We can provide information on a confidential basis, if this is of interest to the Standing Committee.

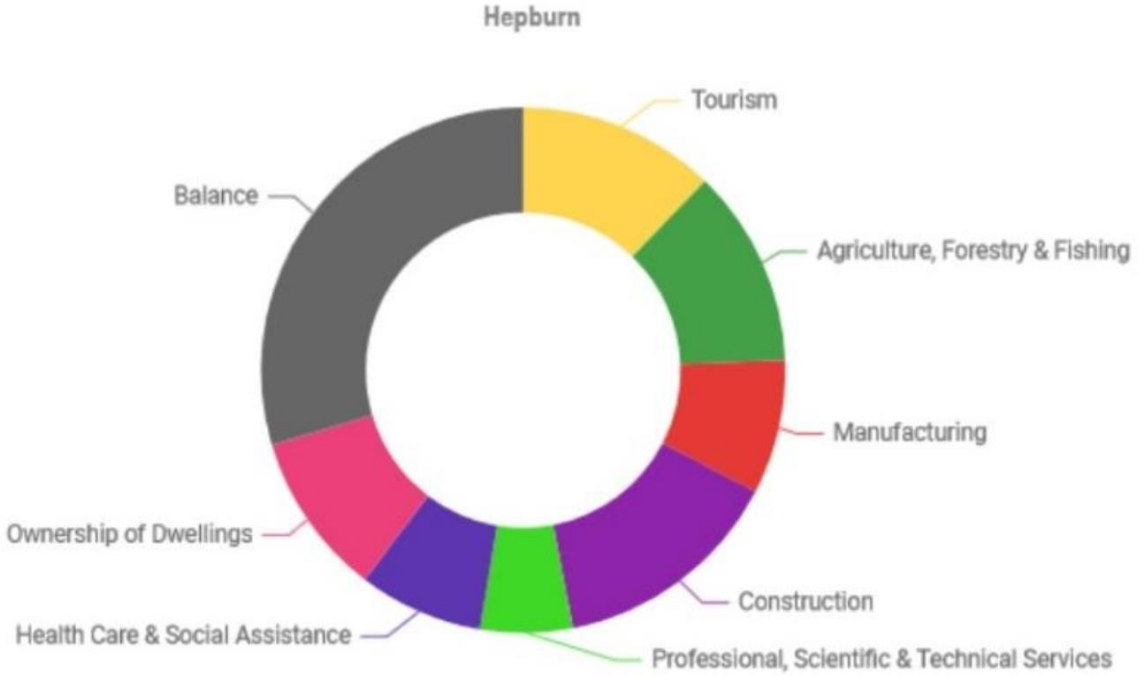
Submission:

There are a number of tourism areas in the line of transmission projects. The spa town of Daylesford in Victoria in central Victoria is an example.

Daylesford Macedon Tourism (***DMT***) is the regional tourism board and states on its website:

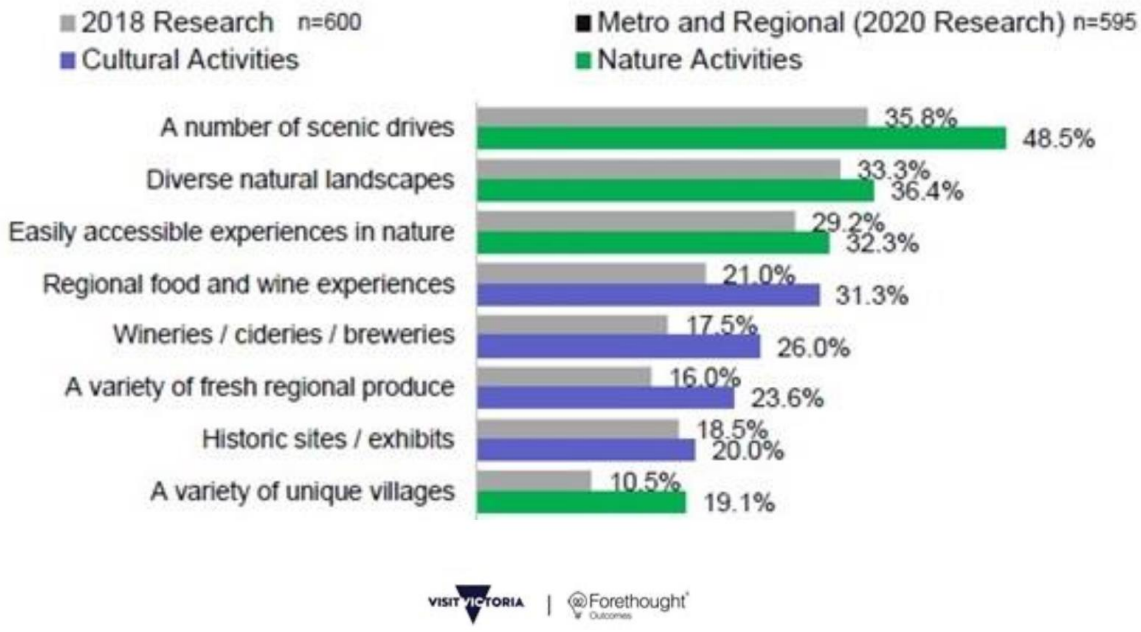
"The Daylesford and Macedon Ranges region is one of the best loved and most popular tourism regions in Australia ... Many people come here to escape and rejuvenate. Indeed our region is best known as a centre of wellness, having 80% of Australia's fresh mineral water, many spa and therapy offerings and a huge range of nature based activities".

Tourism is the second-highest contributor to the Hepburn Shire economy, generating $320 million per annum and employing many hundreds of people. DMT has estimated that just a 1 percent drop in visitation to the region would mean $3.2m less regional spend, every year. The graph below prepared by DMT shows the top economic sectors in Hepburn Shire:



DTB regularly undertakes surveys to understand what is driving visitation to the region. “A scenic and attractive environment” is top driver of visitation to regional Victoria, followed by “landscapes” and “nature-based activities”. The powerlines would negatively impact the top 3 visitation drivers, decreasing tourism.

Over 80 percent of people who responded to the DTB survey said that they would be less likely to visit the region if the powerlines were erected. These are the top visitation drivers for regional Victoria:



This is backed up by the personal experience of a local tourism operator (who can be identified on a confidential basis if the Standing Committee is interested) who has carried out a survey at their business to ask visitors if overhead transmission would make any difference to their interest in visiting. The business is in an area of significant natural beauty and is facing construction of overhead transmission very close to the property. The proposed towers are on adjoining land so no compensation is available.

Over 80 percent of 400 visitors to that tourism business said that overhead transmission would reduce their interest in visiting the district and the business. Further, many visitors have left comments, such as:

- Just go underground. Ian, Mildura
- Use existing technology and put them underground. Tarnya, Ballarat
- Don't trash such a beautiful spot. Nicole, Melbourne
- Disgusting clutter in the sky and dangerous. Shelley, Melbourne
- Piss off Ausnet! (many of these)

It is important to point out that the loss faced by this family business has the potential to wipe out the business and would be avoided if the lines were placed underground.

Compensation

It is often assumed that tourism operators can seek compensation for financial loss associated with transmission lines, but this is a convenient fiction. Compensation is only available to landowners who are forced to have transmission infrastructure on their land. For tourism operators with small landholdings, it is much more likely that they will not have any right to compensation and will simply exit the market. They don't have the financial clout to get into a dispute with a power company.

The NSW Parliament is entitled to ask – exactly how much compensation to tourism operators has been included in the costings for transmission projects?

Claims that overhead power lines are cheaper to build than underground fail to take into account the impact on the tourism economy in the affected regions, including the impact on employment created by tourism. It is not credible to suggest that a tourism region which is popular for scenic beauty and nature activities won't be impacted by overhead transmission.

KDPA Submission 6: Cost of impact on property values

Summary

Overhead transmission has a drastic impact on property values on adjoining and neighbouring properties. These individuals have no entitlement to compensation and bear the full loss.

If this cost was correctly taken into account, it would more than offset any difference in the cost of construction of underground lines, making underground transmission significantly cheaper than overhead.

The NSW Government should not allow the power sector to force private citizens to carry part of the cost associated with privately owned projects. This amounts to a wealth transfer to private companies, under the guise of public good.

Submission

It is often argued that undergrounding is prohibitively expensive when compared with the overhead alternative. Unfortunately, the current proposed compensation process (and therefore the cost assumptions leading to this point of view) fails to recognise the true "economic cost" of the overhead option's significant visual impact on adjoining and neighbouring properties and the resulting long-term adverse impact on the local economy.

In Kingston and the surrounding district in central Victoria, AusNet proposes 500kV towers, up to 85m in height and spaced closer together than normal in an attempt to elevate the lines to permit potato production to continue below. These towers are so big that they will be visible for a distance of 25 kilometres. The magnitude of these towers will create a visual blight on the whole district.

KPDA is aware of numerous examples where residential properties have become unsaleable simply because there is now a threat that overhead power lines will be erected within the sight lines of the home.

In one case, a small house in the township of Kingston was on the market for over a year during which time there was an Open for Inspection every weekend. Despite numerous price reductions, and on the advice of their Real Estate Agent, the property was eventually withdrawn from the market. There were many enquiries. However, once the prospective buyers became aware of the proposed 85m high towers planned to be built through a nearby farm, they went elsewhere.

In another case, an interested buyer who had arranged an inspection of a larger and more expensive property outside the town, in the opposite direction over 3 kilometres away from the proposed route, called and cancelled the appointment. The reason given was that they had no appetite to consider any property anywhere near the powerlines.

These are only a couple of examples of owners who have attempted to sell. However, there are many, many others in our district who are acutely aware of the significant drop in the value of their properties.

KDPA is aware of towers that are proposed to be built very close to houses but on adjoining land, destroying value but leaving the homeowner with no right to compensation. For example, on 15 February 2022 The Age newspaper reported on an example in Kingston where a tower is proposed to be erected around 150m from the house. See article here. Since that article was published, AusNet has proposed to change the tower to 500kV and to increase the tower to 85m in height.

KDPA is aware of other examples where the tower will be located even closer to the home. KDPA can share examples of properties that have been adversely impacted by towers on a confidential basis if the Standing Committee is interested in this information. We do not wish to disclose personal details in this submission.

For many people, their home or farm is their largest asset and very often represents their entire life savings. The unexpected loss of financial security has an immediate and significant negative impact on their future retirement and spending intentions, leading to a flow-on negative impact on the local business community and wider local economy.

This loss of property equity will affect everyone anywhere near overhead powerlines.

Local ABC Radio, Ballarat, highlighted an example where Tom Drife, a local farmer, was advised by his bank that his farm had been devalued by $1.5m as a result of two WRL towers that are merely proposed to be built on this farm. Mr Drife said this significantly impacted his ability to borrow. Mr Drife pointed out in the ABC interview that access to bank finance is essential to his business operations, particularly during unfavourable seasonal conditions such as drought.

Loss of value impacts the ability to borrow. This problem will impact thousands of households and farms along the routes of the various interconnector projects.

Cost

If all landowners who suffered economic loss were fairly compensated, and the cost was correctly taken into account, it would more than offset any difference in the cost of construction of underground lines, making undergrounding significantly cheaper than overhead.

In many cases, landowners have zero entitlement to any compensation. It isn't fair or reasonable for power companies to be able to force private citizens to carry part of the cost of their money-making private projects.

KDPA Submission 7 – Visual Impact of Overhead Transmission

Summary

Overhead transmission threatens the visual beauty of significant landscapes and the recreational value of the natural and cultural environment. The community has a significant interest in the preservation of significant landscapes, as demonstrated by the thousands of people who have protested against the construction of overhead transmission through the regions -not just in Victoria but in all locations where such visually blighting infrastructure is planned.

Submission

The visual impact of overhead high voltage transmission cannot be overstated and in recent times it has been one of the key driving forces for the transition to underground transmission in many jurisdictions overseas. Latest developments in underground HV cabling technology, particularly in terms of its lower cost, high reliability and low risk is facilitating this transition as described in Submission 1.

There is real loss associated with the destruction of significant landscape and special places, including the impact on the tourism economy which is discussed in Submission 6. This cost is not captured in the power company costings.

The Extent of Impacted Communities

These are not isolated communities. The visually impacted communities across Australia will be vast. The Federal Government has stated that more than 10,000kms of new transmission lines will be required by 2030. This translates to approximately 25,000 towers, if overhead cabling is proposed for the new networks. Twenty thousand of these towers will be located within the landscapes along Australia's populous eastern seaboard between Melbourne, Sydney and Brisbane, where 77% of Australia's population resides.

The McDonald's Sign Test

To assess what 20,000 towers might mean in terms of visual impact, it is relevant to apply the McDonald's sign test. The McDonald's sign is one of the most ubiquitous, visually impacting items in urban and country landscapes in Australia and a powerful marketing exercise for the company. There are approximately 2,000 of these signs within and between Melbourne, Sydney and Brisbane with a theoretical visibility distance of 11kms.[10]

[10] *As of June 2023 there were 1,035 Mc Donald's stores in Australia including 821 in Vic, NSW and Qld. At an average of 2.5 signs per store it equals ~2,600 signs across Australia or ~2,000 along the eastern seaboard. With a clear line of site and assuming an average height of 10m, each sign is visible from a distance of 11kms, although this is rarely the case because most signs are obscured by buildings, structures, vegetation and the like. However, transmission towers have much higher visibility because of their greater bulk and size, particularly height - on average 60m to 85m. By comparison with McDonald's signs, assuming a clear line of site each tower will be visible from distances of 19 kms 26 kms respectively.*

But as visually impacting as the McDonalds signs are, there are only 2,000 small signs. By comparison ten times this number - 20,000 towers will be located between Melbourne, Sydney and Brisbane each visible within a radius of approximately 20 to 25 kilometers. Within the WRL project alone, approximately 400 towers in the range of 65-80m high are proposed.

South West Landscape Study, June 2023

Kingston and its environs are located within the study area of the South West Landscape Study (fmr Department of Planning and Community Development) updated 9 June 2023. The study identifies the Kingston area as being predominantly within the Uplands area including areas around and between Daylesford and Creswick. Large parts of this area have been identified as either of State or Regional Landscape significance. If the WRL project proceeds as currently planned as an overhead solution and along its current proposed alignment, it will severely compromise and impact the integrity of those State and Regionally significant landscapes through which it passes.

This shows that the private sector will not self regulate. Claims of consultation have no credibility when areas of State and Regional Landscape significance are selected for overhead transmission.

Application for World Heritage Listing of the Central Goldfields

The Victorian Government has invested $3.8M over three years in two World Heritage initiatives, one being the Victorian Goldfields World Heritage Bid, which is a joint initiative championed by 13 councils across the region. The government has indicated that the World Heritage listing is estimated to be worth $1 billion to the region over 10 years (ref World Heritage Listing of the Central Goldfields Facebook).

The deep lead mines that are located within the Shire of Hepburn and particularly those within and west of Kingston in the vicinity of the West Berry and Daylesford Clunes Roads are amongst the most significant within the Central Goldfields region and should be an important inclusion in the government's application to UNESCO for world heritage listing.

However, the WRL project includes a 500kV overhead transmission line which dissects through this area - its impact on the government's UNESCO bid will be significant.

The visual blight caused by the towers and overhead transmission lines will at best potentially exclude the visually impacted areas from the bid and at worst, compromise the entirety of the bid.

Such an outcome is an economic lost opportunity for the $1 billion revenue expected for the region through a successful bid.

Despite these risks, AusNet is determined to press ahead with transmission towers over the top of heritage sites. This is further evidence that the private sector will not self regulate.

Lessons from Overseas – 'Invisible Infrastructure'

There is no clearer example of the cost the visual impact of overhead transmission lines and towers can have upon landscapes than at AlUla in Saudi Arabia. As part of its Vision 2030 to diversify its economy away from oil to tourism services, Saudi Arabia has nominated AlUla and the adjoining world heritage listed site at Hegra as its 'Journey Through Time' gateway to tourism.

One of the Guiding Principles embedded in AlUla's Framework Plan, which was released in 2020 is to achieve 'invisible infrastructure'. As a demonstration of its commitment to preserving and improving the areas significant high-quality landscapes, the Royal Commission responsible for planning the city is currently in the process of removing the existing overhead HV transmission lines and towers that serve the city and replacing this with underground transmission cables. The estimated cost for the replacing the 20kms of overhead lines is US$1.5 billion.

This is not an isolated case in Saudi Arabia – 20 kms of overhead transmission lines and towers are also planned for removal in the capital Riyadh for similar economic reasons.

Meanwhile, in the United Kingdom, the Visual Impact Provision Initiative has been introduced with the intention of significantly reducing the visual impact of electricity infrastructure on scenery in English and Welsh 'Areas of Outstanding Natural Beauty' (AOBN), National Parks and Scottish National Scenic Areas. One of the earliest initiatives is in the Dorset AONB where a rolling green landscape features the Hardy Monument which commands sweeping views over the chalk downs. To help restore the natural beauty of this unique environment for visitors, 9km of overhead lines and 22 pylons that can be seen from the top of the monument are now being removed and buried underground. Numerous initiatives to underground are now in progress to restore areas of beauty for the community and to attract tourists.

Compensation Does Not Stop The Blight

Power companies are unable to offer any meaningful compensation to the community for loss of significant landscape. As illustrated above, the value of landscape to communities is often immeasurable, not just for personal reasons but also importantly for economic reasons. AlUla is just one example of many overseas, where proponents have chosen to go

underground to avoid the visually destructive impacts of overhead lines and towers and the resultant socio-economic consequences.

The potential lost opportunity costs to Kingston and its district should the overhead line and towers proceed through the Central Goldfields is truly immense.

The paltry compensation efforts fail to measure against the personal and community costs of overhead transmission. For example, in our region, the suggestion that has been mentioned by our local MP is the possibility that AusNet might fund some netball courts under transmission lines as a 'community benefit'. State Governments should not grant permission to private companies to destroy significant landscapes and cultural assets in return for token 'benefits'.

The loss of significant landscapes and the blight caused by towers and overhead transmission lines cannot be eliminated by monetary compensation. But it can be completely eliminated by undergrounding transmission lines, as is the practice being increasingly adopted internationally. Saudi Arabia's extreme action in removing existing overhead is not an isolated case for communities that value their landscapes.

Photographs provided by Mark McLeod.