

Australian Energy Market Operator
Draft 2022 Integrated System Plan Consultation
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Draft 2022 Integrated System Plan Submission

Walcha Energy thanks AEMO for the opportunity to submit this feedback for your consideration in finalising the 2022 Integrated System Plan.

Walcha Energy, a joint venture between Energy Estate and Mirus Wind, is developing the Walcha Energy Project, situated within the New England Renewable Energy Zone in northern New South Wales. It comprises more than 4GW of wind, solar, pumped hydro and battery storage projects. Due to the scale and density of the proposed projects, the overall development is a mini-REZ within the recently declared New England REZ.

Since 2004 we have been attempting to master plan its development so as to deliver the high quality renewable energy resources of the Walcha plateau to the NEM in a manner that is win-win for all parties, including residents and wider community, those affected by the prospective grid connections, electricity consumers, and the state of New South Wales as well as providing generously for affected land owners and their neighbours and protecting the environment.

Walcha Energy considers the adoption of Step Change as the most likely future scenario, with 14GW of coal plant retirements by 2030, and the accommodation of state-based roadmaps for our energy transformation and grid strengthening, are among many significant advances in the Draft 2022 ISP. The recognition of the rapid transformation of the NEM that is occurring and its continued acceleration is an appropriate response to stakeholder submissions, government ambitions and consumer preferences.

We note that many of the improvements accord with proposals we made in our 17 March 2021 submission to the IASR consultation. Attachment 1 is a copy of our IASR post-webinar submission for further consideration. This submission addresses the specific plans now promulgated in the Draft 2022 ISP for New England REZ transmission. It also provides responses to questions specifically raised in the Draft ISP consultation paper.

1. Provision for early closures of fossil fuel power stations

The draft 2022 ISP lists the *risk of faster than anticipated coal retirements* among the significant risks addressed by the optimal development plan (p12) and lists *risks that coal generation retires even earlier than announced or IASR anticipated* as a risk the ODP is robust against. However if the retirement of both Vales Point B Power Station (1320MW) and Eraring Power Station (2,880MW)

were both to occur in 2026 , or if Vales Point B and Yallourn W (1480MW) were to retire in that year it remains doubtful that the ODP would be robust.

There remains a serious risk that the Central West-Orana Transmission Link along with other committed projects will not result in sufficient replacement generation to be actually connected by 2026. There is significant potential for delays to the 500kV transmission link (targeted for mid 2025). The construction and connection of 330kV feeder lines to the 500kV hub has yet to be addressed and the time required for R2 testing of multiple generation projects is not to be forgotten.

For NSW the risk of inadequate supply to the NSW major load centres remains and is very significant indeed. Whether the consequence is brownouts or just a major price hike over many months or longer, it would lead to substantial economic impacts to the state and also to the national economy.

The 2022 ISP should make additional provisions to mitigate this risk, including measures to accelerate the grid reinforcement and generator connections in the New England REZ.

2. Delivering generation from NSW Priority REZ to the major load centres

The Draft 2022 ISP ODP proposes New England REZ 500kV transmission (first 500kV double circuit line to Bayswater) and either Bayswater – Eraring or Bannaby – Sydney 500kV line be actionable and targeted for July 2027.

Walcha Energy submits that completion of the NSW 500kV ring should proceed in both sections concurrently with the northern link targeted for July 2027 and the more complex southern link targeted for 2028.

With five new 500kV lines planned to connect major generation to the NSW load centres and ports a contingency impacting the Mt Piper - Bannaby portion of the ring, or between Wollar and Bayswater could be disastrous while the ring remains incomplete.

The combined project to complete the 500kV ring could be tendered in two separable portions to attract additional major international grid construction companies into the Australian market.

We also call for action in the 2022 ISP to initiate further development of the 330kV network in New South Wales within the 500kV ring. In particular, as discussed below, we call for immediate action to reinforce the 330kV network from Armidale to Tomago and Newcastle with a target of mid 2026.

3. New England REZ Transmission

Obtaining social licence and development approvals for the 500kV projects will be more challenging than a prior 330kV grid strengthening. The 330kV option can be completed more quickly. The 500kV project has a bigger scale, greater complexity, and more substantial impacts to address. The cost is much greater, construction will be slower and the added transmission capability is only slightly greater than for the alternative 330kV reinforcements. The 330kV reinforcement proposed in this submission and the 500kV projects proposed in the draft ISP are all required to connect the New England REZ south of Armidale and for the further national grid development.

With many projects expecting to connect to the 330kV network it makes no sense to delay 330kV grid reinforcement rather than to lead with this as the first stage of New England REZ transmission

augmentation. The 500kV actionable project proposed in the draft ISP should proceed concurrently to enable the required generation to connect in the 2020s.

The full capability of the first 500kV double circuit will not be available until the New England REZ Extension project is also constructed, so that four 500kV circuits connect to the NSW load centres. Option 7 of the Transmission Cost Report (the 330kV development) delivers 1,590MW of additional network capacity southwards, not much less than the power transfer of the first 500kV development, Option 6 in the Transmission Cost Report, which adds 1800MW southwards. The 330kV option cost was estimated at \$891M and the 500kV option \$1,678M. The 330kV development completes four 330kV circuits from Armidale to Liddell and the N-1 capability is the capability of three 330kV circuits while the first 500kV double circuit line has the N-1 capability of one 500kV circuit.

It better satisfies generator connection needs and reduces risks for the 330kV development to be concurrently actioned and targeted for earliest achievable completion in mid 2026.

4. Making the most of the 330kV network

Providing for N-1 contingencies, the two existing 330kV circuits between Liddell and Armidale are good to carry around 1,000MW southwards. Adding another double circuit line increases the 330kV capability to about 2,500MW subject to appropriate reactive plant for voltage control, etc.

The Liddell Switchyard and its transmission line outlets were designed for many more circuits than are presently connected. The switchyard connects six 330kV grid circuits carried on 5 double circuit lines. One double circuit goes to Sydney via Bayswater. The other double circuit outlets continue as single circuit lines after 2 or 3km. The switchyard infrastructure can readily be refurbished or expanded on the existing site to connect additional circuits northwards and southwards utilising the existing double circuit outlets or via generator switchbays released by the closure of Liddell Power Station.

To supply loads in the Newcastle area and to supply new green industries, including the greening and life extension of Tomago Aluminium, it will be necessary to reinforce the 330kV grid between Liddell and Newcastle, Tomago and Port of Newcastle. These reinforcements should also be initiated in the 2022 ISP. They can be delivered substantially by reconstruction of existing single circuit 330kV lines as double circuits, easing the approval processes. As reconstruction requires significant 330kV line outages, the first of these reinforcements should also be targeted for 2026.

The work of QNI Minor needs to be extended as soon as possible by uprating the Tamworth – Armidale 330kV steel tower line 85 to which several large generators propose to connect individually and at one or more proposed hubs. Reconstruction of the deteriorated, small conductor, 330kV wood pole transmission line 86 between Tamworth and Armidale, for which TransGrid has initiated an RIT-T process, should also proceed.

5. New England REZ Extension

The construction of a second 500kV double circuit transmission line from the New England REZ to the Hunter Valley/Newcastle area will be required by the time Bayswater Power Station retires. The

timing of this project will be made more flexible by the completion of both the 330kV reinforcements and the proposed first 500kV double circuit line.

The draft ISP provides for both the New England Transmission 500kV line and the New England REZ Extension 500kV line to terminate at Bayswater. With the CWO 500kV line also connecting west of Bayswater, be it at Wollar or elsewhere, this results in excessive power inflow to the 500kV switchyard and heavy loading of the Bayswater – Eraring 500kV line. This may lead to premature reconstruction of the Bayswater – Sydney 330kV double circuit line 31/32 as a 500kV line

It is submitted that consideration be given to terminating the New England REZ Extension project at Richmond Vale (a Newcastle West 500kV substation) on the route of the Bayswater – Eraring 500kV line rather than at Bayswater. Considering the expected load growth in the Newcastle area this will result in a more efficient 500kV grid and mitigate loading on the Bayswater – Richmond Vale section of the Bayswater - Eraring 500kV line. Walcha Energy believes that a route for this connection can be obtained and should be actioned no later than in the 2024 ISP. Reconstruction at 500kV on the route of TL 31/32 should also be provided for at a later date by widening its easement from Bayswater to the South Creek 500kV terminal of the Bannaby – Sydney section of the 500kV ring.

6. REZ Transmission Planning and Social Licence

Social licence is critical for renewable energy projects and it is also critical for power line and other grid augmentation projects. This is well recognised in the Draft ISP and was addressed in Walcha Energy's 17 March 2021 IASR submission. Although much of that submission has already been accommodated in the draft ISP, there is more in it that requires further consideration in ISP strategy and REZ development.

Walcha Energy now draws attention to the potential for negative impacts on social licence for REZ development due to inadequate consideration of cumulative impacts in REZ transmission design. There are limits to the number of extra high voltage lines, that can reasonably be connected to a grid hub or a REZ hub, even in most rural areas and certainly in the New England REZ.

Disregarding cumulative impacts and the wishes of affected landowners and neighbours is likely to foment major opposition to the REZ development as a whole.

Walcha Energy concluded five years ago that connecting QNI2 and Walcha plateau wind energy to an Armidale East Substation was not viable due to impacts of the power lines on the rural residential surroundings. We advanced the proposal for the Uralla Hub south of Uralla to connect TMs 85 and 86 and a new 330kV double circuit to Liddell as well as substantial Walcha plateau wind and nearby solar power. The Uralla Hub site was recognised by AEMO and TransGrid is a superior location for a REZ hub.

We now caution against locating the South of Armidale 500kV substation proposed in the draft ISP as close to Armidale as where TMs 85 and 86 meet and run together. Although a suitable substation site can be found, connecting the generation and multiple 500kV and 330kV grid circuits through the surrounding rural residential area would have unnecessarily significant impacts and stir up opposition to the grid and REZ development.

Although the Uralla hub remains suitable as a 330kV grid and REZ hub, the draft ISP proposal to overlay the 500kV development on the New England REZ hub would result in too many power lines coming together at the one location, even the Uralla Hub. Walcha Energy submits that two hubs, a

500/330kV grid hub and the Uralla 330kV grid and REZ hub, provide a superior grid solution. It accommodates both 330kV and 500kV REZ transmission and is far more likely to gain social licence for the New England REZ.

Walcha Energy submits that a 500kV site at Uralla West, adjacent to the route of TL 86, would be a superior site for a 2 x 1500MVA 500/330kV substation, South of Armidale, that is primarily a grid hub. A location some 10km west of the proposed Uralla 330kV Hub would be optimal. Interconnection of the hubs would have little additional impact.

As we submitted in March 2021 there is no way to manage social licence from the desktop. Walcha Energy's views are based on intimate knowledge of the local environment and community, discussions with stakeholders since 2004 and ongoing consultation.

7. An enhanced proposal for New England REZ Transmission

Walcha Energy believes that grazing lands and some forestry lands in the area north of Newcastle, South of Armidale and East of the existing 330kV lines can ultimately be developed to deliver at least 8GW of renewable energy to the Newcastle and Sydney load centres. With an appropriate grid design up to 6GW of this new generation could be developed by 2030 and also provide for increased transmission from substantial new generation located within New South Wales north of Armidale. There is also potential to connect long duration storage, possibly well in excess of the NSW roadmap target.

Attachment 2 outlines a proposed sequence of development between Armidale and the Hunter Valley – Newcastle area to better serve the development of the New England REZ.

8. Building Trust for Transmission

Significant points have been raised by RE-Alliance in its July 2021 discussion paper *Building Trust for Transmission, Earning the social licence needed to plug in Australia's Renewable Energy Zones*. The paper argues that that community benefit sharing is critical and that this extends to the grid development required to support a REZ.

One aspect relates to the adequacy of easement compensation. With the major program of new transmission driven by the ISP and tight project deadlines there is a real need to devise ways of facilitating the acquisition of overhead line easements. The paper proposes that new models of landholder compensation should be developed. Notwithstanding that an easement is not a lease, the presence and maintenance of a large overhead line has ongoing impacts that might be better addressed by an annual payment. AEMO could facilitate joint consideration of this question by jurisdictional planning bodies in a consultative manner, with input sought from landowners already hosting large power lines.

9. Questions Raised in Consultation Paper section 8.1

Do you consider that the Draft ODP appropriately reflects the consumer risk preferences? Is the reasoning for the Draft ODP clear? Are there any other risks that should be quantified?

Response: As discussed in sections 1 – 6 above we consider that the provisions against the risk of energy shortfall in NSW due to early coal closures have too many vulnerabilities. Grid projects to

connect the New England REZ in particular need to be accelerated by the urgent delivery of the 330kV development option targeted for 2026.

Is the proposed staging for HumeLink and VNI West, with early works as the first stage and then proceeding to implementation subject to conditions, appropriate?

Response: We agree that early works should be undertaken to retain the option of completion at the earliest practicable date. We also consider that early works should be expanded to more projects including projects to open up the ability to quickly reconstruct critical single circuit grid lines supplying the load centres as double circuit lines.

Is the proposed treatment of Marinus Link as a single actionable ISP project appropriate?

Response: Yes.

Do you consider that REZ Design Reports are warranted for the indicated REZs?

Response: Yes, with amendment. This is supported with the investigation and design report led by the local jurisdictional planning body. Amendment: the investigation and staging should not be limited to the capacity targets in the ISP.

Do you have any feedback on the Addendum to the 2021 Inputs, Assumptions and Scenarios Report?

No comment on the content of the Addendum. However we consider that, at a time of rapid and increasingly rapid transformation, too much emphasis on optimisation of timing is not appropriate in view of the risks of delivering the projects too late. Preparatory activities should be expanded to reduce project delivery times when accelerated delivery is triggered.

The Walcha Energy Team would be pleased to further elucidate matters raised in this submission to AEMO ISP planners.

Yours faithfully,



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ATTACHMENT 1



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2021 Planning and Forecasting IASR Consultation
Supplementary submissions following webinar
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17 March 2021

2021 Planning and Forecasting Inputs, Assumptions and Scenarios – Post-Webinar Submission

Walcha Energy thanks AEMO for the opportunity to submit this feedback for your consideration in finalising the 2021 Planning and Forecasting, Inputs, Assumptions and Scenarios Report.

Walcha Energy, a joint venture between Energy Estate and Mirus Wind, is developing the Walcha Energy Project, situated within the New England Renewable Energy Zone in northern New South Wales. The largest renewable energy project in the NEM, it comprises more than 4GW of wind, solar, pumped hydro and battery storage projects. The Walcha Energy Project will support NSW in the transition from coal fired generation and will play a major role in delivering the NSW Government Electricity Infrastructure Roadmap.

Our post- webinar supplementary submissions follow.

1. Provision for early closures of fossil fuel power stations

Walcha Energy believes that a series of closures of major NSW coal-fired power station units is likely to commence soon after the Liddell closure with several thousand MW of additional plant decommitments in the later 2020s. The announcement that Yallourn Power station will close in 2028 instead of 2032 is likely to be the first of many such announcements.

Given the fastest achievable lead times for major grid augmentations of 5 years, the current rate of progress of Integrated System Planning is too slow.

Annual updates identifying actionable projects are needed between the 2-yearly ISP publications. The transition is occurring too rapidly for the 2-yearly ISPs to keep up. Annual updates would be based on actual developments and decisions made during the year, such as power station decommitment and closure plans, priority REZ development progress, impact of development consent issues, generation plant failures, etc., not on global analysis of economic trends and market efficiency priorities which are covered in the 2-yearly reports.

An accelerated process to initiate refinement, definition, and funding of early works for projects is urgently needed. Funding will be needed for the development costs of critical actionable

transmission line projects in advance of final approval of the projects or it will be impossible to complete them in time to prevent wholesale market price surges and the possibility of power rationing.

AEMO Planning and Forecasting must now further revise its assessment of the sequence and likely earliest dates for power station generating unit decommitments and closures. This new assessment should be based on economic criteria, that is the short run marginal cost of generation at each power station, whether known or estimated. The effective operating range of coal-fired generating plant output and generating unit reliability will also be relevant factors.

The strategy of deploying large batteries in association with major coal generating plant and likely gradual withdrawal of operating generators would lead to an earlier gradual phase out of coal generators rather than the assumed open or closed approach. This emerging strategy should be modelled.

2. State-driven plans should drive the Central Scenario

State governments are ultimately responsible bodies for electricity supply within their state. They are more aware of decentralisation occurring in their Region. State government is the only body that can integrate regional planning and industry policy affecting specific sub-regions. Although AEMO's national analysis is a critically important input, State governments are the appropriate bodies to identify priority Renewable Energy Zones (REZ) within their state and to plan their progress.

AEMO must input a National Electricity Market perspective and National Grid requirements such as for interconnection and grid management. These inputs are critical as inputs to State-based plans and close liaison between AEMO and each state is essential. However, the deliverable plans of the states for the development of priority REZ must drive the Central scenario of the ISP upon which actionable projects are based.

3. Social licence is critical to a successful transition

Social licence is critical for renewable energy projects and it is also critical for power line and other grid augmentation projects.

It is essential that the developers of renewable energy projects consult closely with landowners and win the support of neighbours likely to be affected by the project or even to see the developments within an appropriately defined visual impact zone. This consultation is a relational activity and cannot be achieved in a week or a month. Developers must also recognise that the development requires not only compensation to those directly affected but also for a critical share of the benefits to flow to the wider community from the project. This is particularly the case for very large-scale developments and even more so for the transformative impacts of developing a Renewable Energy Zone.

The same principles apply to the development of the grid connections that are required to service a REZ, that is the effects of the development on neighbours and sometimes a wider

community need to be recognised. The impacts on the management of prime agricultural lands must be recognised as being potentially much greater than the impacts on grazing lands.

The development of a REZ with large renewable resources will require more main grid connections as well as Generator connections. There are limits to the number of lines, especially EHV lines, that can reasonably be connected to a grid hub or to a grid and REZ hub.

4. There is no global formula for managing social licence from the desktop

At the webinar AEMO recognised the significance of social licence and floated the idea of applying a penalty in its multi-criteria analysis against development of a REZ beyond a generation density limit.

Walcha Energy is very concerned that it is not realistic to attempt to assess a viable density of renewable development from the desktop which is the likely approach in a global multi-criteria analysis.

In one location it may be acceptable to have solar extend over a high proportion of the land. In another location it is unacceptable for neighbours to see the solar farm. In a third location tracking solar may be seen as desirable to complement and enhance pastoral farming activity.

Similarly wind generation may be acceptable on flat windy land at high density or not at all depending on the productivity of the land for agriculture for example. Wind generators on a ridge line may overpower the environment of a rural residential area or may be out of sight from residences due to nearer hills. In every instance due attention should be given to applicable noise and visual impact guidelines.

Rather than focussing on limiting the density of renewable energy development in a REZ, the focus should be site specific with due attention to the density, distance and views from residential and rural residential areas and even from individual landholders who are unhappy with the development concept.

There is no global formula for what is acceptable from a social licence viewpoint, however the quantum of the flow of community benefits is a significant factor. The key thing is to develop renewable energy with technologies appropriate to the location, respectfully with regard to the range of community opinions and with community benefits that make the development a win - win. Developments that divide a local community are to be avoided.

5. The Hydrogen economy

To add to the discussion in the webinar, Walcha Energy suggests that the development of a hydrogen economy will inevitably lead to innovative developer initiatives that AEMO cannot foresee, but which will impact on grid requirements, increasing loading in one location or perhaps reducing loading on the grid by placement of new major loads close to renewable generation sources.

6. Grid augmentations to service priority REZ areas must begin now

Walcha Energy considers that it is critical for the security of electricity supply that least regret transmission projects to connect priority REZ areas to the load centres be initiated immediately as the three year notice of power station closures is not sufficient to facilitate the establishment and connection of large scale renewable resources needed to replace the fossil fuel stations.

Yours faithfully,

signed

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ATTACHMENT 2

An Enhanced Proposal for New England REZ Transmission

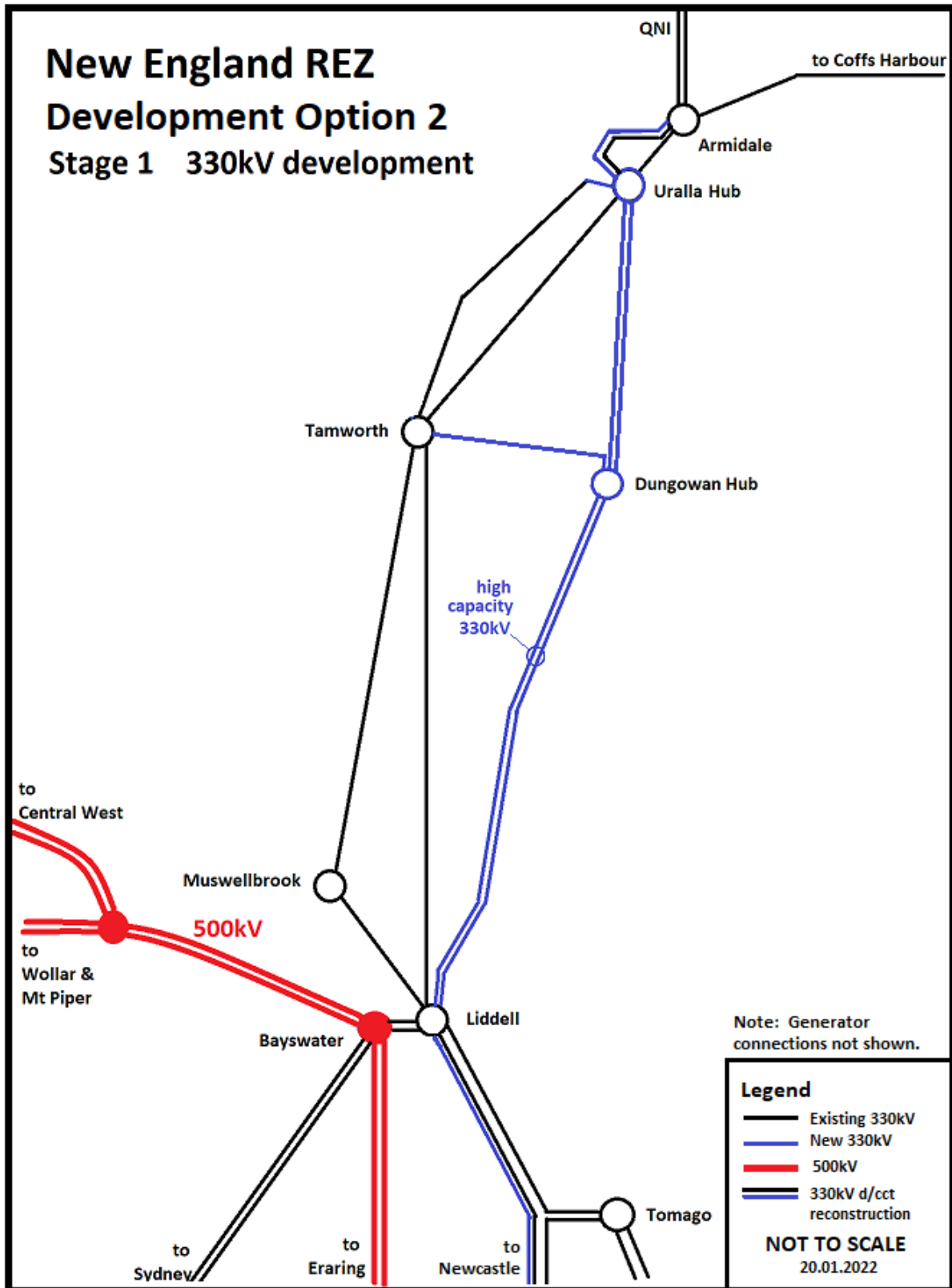


Figure 1 First New England REZ transmission - 330kV
Completion target: as soon as possible (expected mid 2026)

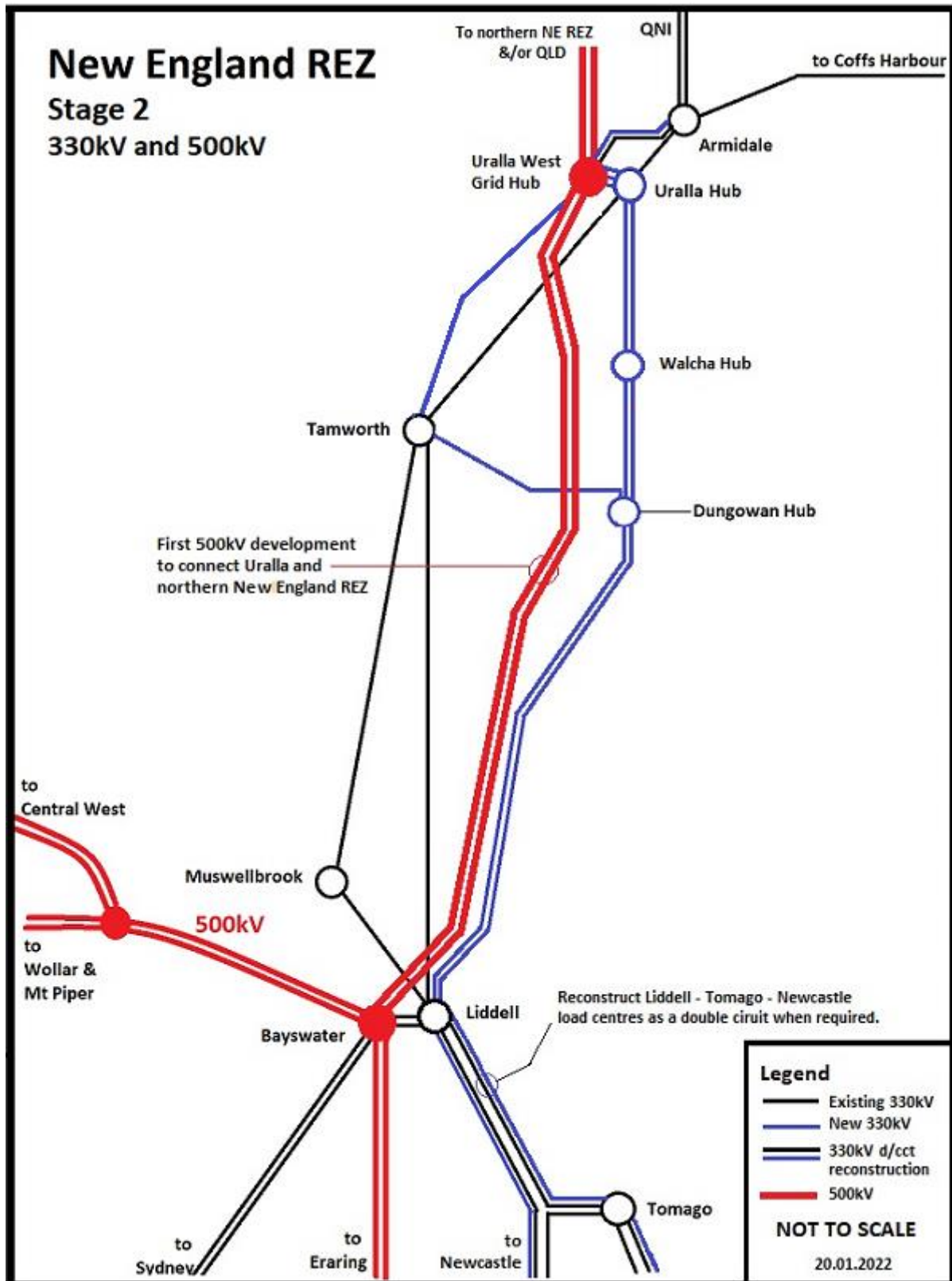


Figure 2 Second phase of New England REZ Transmission – 500kV and additional 330kV
Completion target:- July 2027

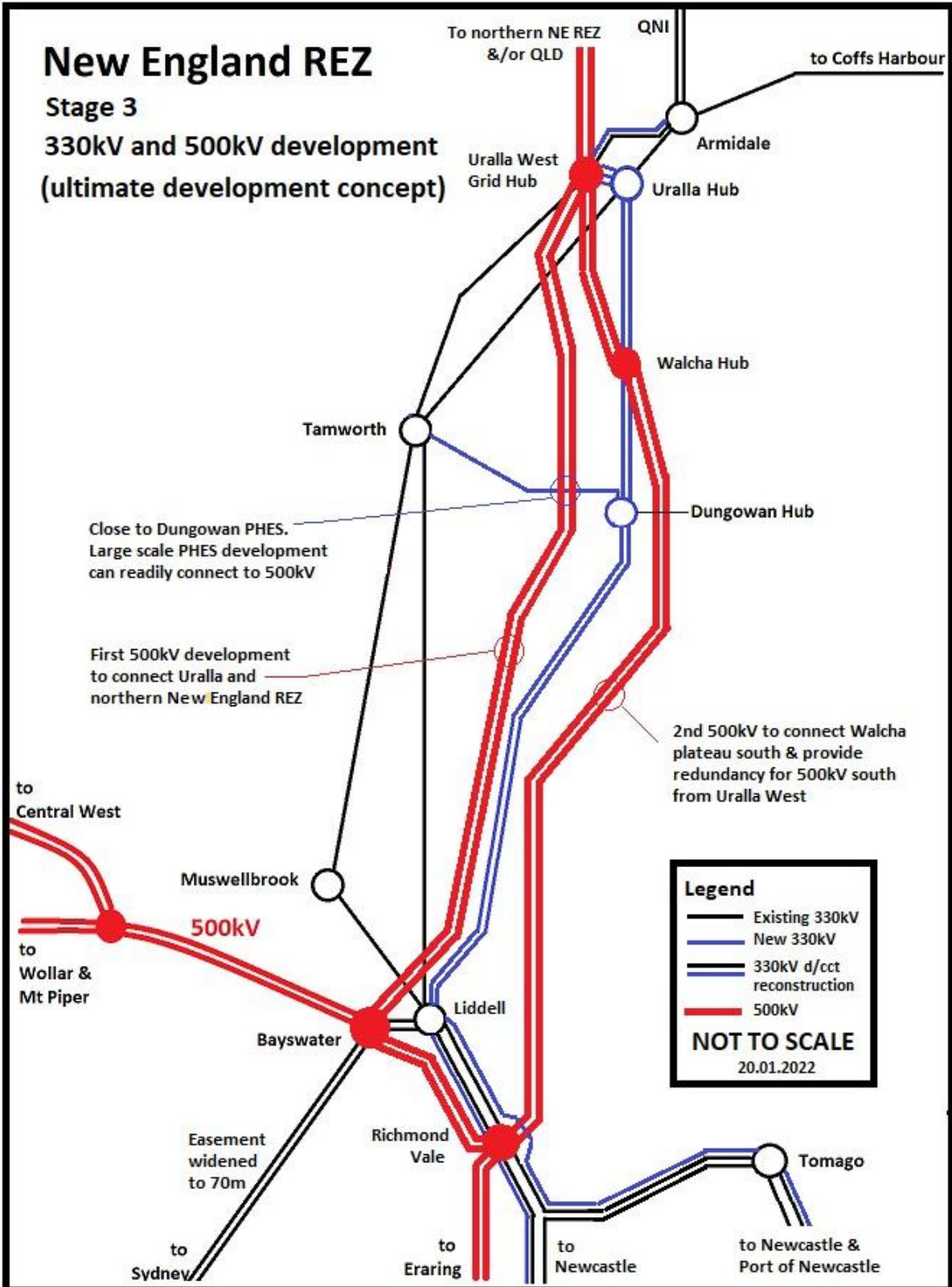


Figure 3 Third phase of New England REZ transmission – 2nd 500kV
 Target: Easement acquired by July 2027