

27 February 2020

Audrey Zibelman
Chief Executive Officer
Australian Energy Market Operator
Level 22, 530 Collins Street
Melbourne VIC 3000

Via: ISP@aemo.com.au

Dear Ms Zibelman,

RE: DRAFT 2020 INTEGRATED SYSTEM PLAN

TasNetworks welcomes the opportunity to make a submission to the Australian Energy Market Operator (**AEMO**) on the Draft 2020 Integrated System Plan (**ISP**).

TasNetworks is the Transmission Network Service Provider (**TNSP**), Distribution Network Service Provider (**DNSP**) and Jurisdictional Planner in Tasmania. TasNetworks is also the proponent assessing the business case for Marinus Link, a new interconnector between Tasmania and Victoria. The focus in all of these roles is to deliver safe and reliable electricity network services to Tasmanian and National Electricity Market (**NEM**) customers at the lowest sustainable prices. TasNetworks is therefore appreciative of the AEMO's efforts to deliver a robust, dynamic, transparent and actionable roadmap for the NEM.

TasNetworks supports Energy Networks Australia's (**ENA**) submission and would like to make several further comments with a particular focus on the Tasmanian context. The key points in this submission are:

- TasNetworks notes the Draft 2020 ISP findings but considers there are further refinements that could be made to improve transparency, robustness and stakeholder acceptance.
- TasNetworks acknowledges and strongly supports the findings that Marinus Link design and approvals works are included as part of the optimal development path, as this provides the opportunity for Marinus Link to play an earlier role in the transformation of the NEM.
- Despite this, TasNetworks notes there are a range of uncertainties and modelling inconsistencies that likely underestimate the value of Marinus Link to the NEM, yet none that overestimate the value. Utilising the latest modelling data, including hydro inflows in Tasmania, and optimal timing sensitivity analysis provides an opportunity to ensure the value proposition of Marinus Link is adequately reflected in the future of the NEM.
- For example, when adjusted for changes in ISP assumptions and cost data since the publication of the Marinus Project Assessment Draft Report (**PADR**), TasNetworks' updated

modelling shows that in some scenarios, with only minimal 'regret costs', Marinus Link could be commissioned earlier than AEMO's draft ISP suggests. TasNetworks strongly encourages AEMO to consider a range of intermediate timing options for Marinus Link in the final 2020 ISP.

- TasNetworks also suggests there is further work required to refine the development options to reflect practical rather than purely conceptual considerations. In this regard, TasNetworks recommends the use of a project readiness principles to establish increased credibility of development options and costs. At present, there is little differentiation which recognises the state of project progression, other than for committed projects, and which impacts the credibility of REZ capacity assessments.
- TasNetworks supports the inclusion of relevant Commonwealth and State Government policies in the ISP but only when there is sufficient information available to accurately gauge their impact on scenarios for the optimal development path and, by extension, customer costs.
- TasNetworks also generally supports the changes made to Renewable Energy Zone (**REZ**) assessment criteria but considers system security issues, active developer interest and climate risks need reflecting so that an optimal development plan results.
- TasNetworks supports the Queensland Renewable Energy Target (**QRET**) sensitivity being included in the Draft 2020 ISP and considers this should be expanded to include several Victorian policies in the final ISP. This will provide stakeholders with a clearer understanding of the overall system costs and effect that such policies are having on the optimal development path.
- TasNetworks suggests that resilience considerations should be included as part of ISP project evaluation to the extent that incremental costs are justifiable; and the discretion afforded AEMO to select such an option as part of the optimal development path is also granted to TNSPs as part of the Regulatory Investment Test for Transmission (**RIT-T**) process.
- TasNetworks considers further information on the timing of ISP projects, and those development options considered to be sub optimal, should be provided as part of the final 2020 ISP. TasNetworks also requests that AEMO publishes detailed time-sequential data from ISP models. Such information would both provide transparency and aid stakeholder understanding.

TasNetworks responses to individual questions are provided below and we welcome the opportunity to discuss this submission further with you. Should you have any questions, please contact Chantal Hopwood, Leader Regulation, via email (chantal.hopwood@tasnetworks.com.au) or by phone on (03) 6271 6511.

Yours sincerely,



Wayne Tucker

General Manager, Regulation, Policy and Strategic Asset Management

Question 1 - Has AEMO considered the most appropriate development options for Australia's future energy system? If not, what other credible options should AEMO consider for the 2020 ISP?

TasNetworks considers that the appropriate development options have been included in the Draft 2020 Integrated System Plan (ISP). However, TasNetworks suggests there is further work required to refine the options to reflect practical rather than purely conceptual considerations. For example, although many possible pumped hydro sites have been identified for development in mainland NEM regions, further economic, environmental and engineering analysis is required to determine their actual practical potential. The recent decision to revoke the 2017 Queensland Government policy initiative and place the Burdekin Falls Hydro project on hold is instructive in this regard.

Beyond this point, TasNetworks understands that the Australian Energy Market Operator (AEMO) is working to incorporate the recently announced New South Wales Electricity Strategy into the final 2020 ISP. Amongst other things, this strategy proposes development of a 3 GW Renewable Energy Zone (REZ) in Western New South Wales and a commitment by the Commonwealth Government to support three other New South Wales projects¹ as part of the Underwriting New Generation Investment (UNGI) program. TasNetworks also notes there have been two other recent UNGI announcements that bear relevance to the ISP. These include a 220 MW gas fired plant in Dandenong, Victoria and a 132 MW gas fired plant for Gatton, Queensland.

TasNetworks supports the inclusion of all relevant Commonwealth and State Government policies likely to have a material impact on the optimal development path in the ISP. However, noting the rudimentary nature of these policy announcements, and the limited time in which to finalise the 2020 ISP, TasNetworks suggests these are held over for scenario inclusion until the next ISP or ISP update. That is, until such time as sufficient information becomes available to accurately gauge their impact for the optimal development paths.

Question 2 - Has AEMO properly described the identified need for upcoming actionable ISP projects? If not, how can that description be improved?

TasNetworks notes that there is considerable uncertainty in respect to future demand, technology costs and life expectancy of existing resources. TasNetworks considers AEMO's role is to identify a development plan that balances economic efficiency with market uncertainty, while minimising costs and risks for consumers in an uncertain future landscape. Access to renewable energy resources will play a critical part of the future of the NEM under the full range of scenarios and should be recognised as such.

In this light, TasNetworks considers that, in general, the identified needs for all actionable projects for which a RIT-T is yet to be completed are adequately described in the Draft 2020 ISP. More specifically, TasNetworks supports the identified need for Marinus Link in the ISP. That is, as an additional interconnector between Tasmania and Victoria to deliver net market benefits and support the energy market transition through:

- more efficient generation sharing between Tasmania and Victoria;
- reduced generation dispatch costs;
- reduced voluntary load curtailment and involuntary load shedding by improving reliability on the mainland following retirement of coal generators; and
- facilitating access to increased dispatchable generation and storage.

¹ Currently, only three projects have made the shortlist: a gas plant in Port Kembla, a renewables and pumped hydro scheme for northern New South Wales and an upgrade of the Vales Point coal generator at Lake Macquarie.

Noting that the Draft 2020 ISP identifies Marinus Link as being required as soon as practicable in some scenarios (for example, Step Change), the Draft 2020 ISP defers the decision with respect to Marinus Link for the 2022 ISP. TasNetworks strongly supports the design and approvals of Marinus Link as being recommended, however, suggests given the information contained in this submission that consideration should be given to advancing Marinus Link to actionable status.

Question 3 - What, if any, additional factors should AEMO consider when identifying which Renewable Energy Zones are best suited to further development?

TasNetworks acknowledges and supports the improvements made in identifying REZs since the last ISP, such as the additional land cover and terrain complexity changes. Despite this, TasNetworks considers that there remain two fundamental elements absent from the REZ assessment criteria. These are active developer interest and system security considerations. A third factor, which may be more difficult to consider with currently available data, concerns the future impact of climate change on REZs.

System security considerations

As noted in a recently released REZ development paper for the Australian Renewable Energy Agency (**ARENA**)², the technical challenges facing REZ developments vary from REZ to REZ. This is as a result of differences in variables such as the network topology, current network age and condition, level of generation build out and curtailment likelihood. For example, the North-West Victorian REZ is severely impacted by both thermal and system strength constraints, with limited opportunity to unlock new hosting capacity without significant network augmentation and investment. In contrast, the Central West New South Wales REZ faces fewer technical challenges and has a wider range of options to improve hosting capacity. TasNetworks acknowledges AEMO's efforts to assess the fault level for each candidate REZ as a proxy for system security considerations. However, it is not clear how, or if, this information has been applied to the Detailed Long Term (**DLT**) model which forms the basis of ISP cost outcomes. Without inclusion of these different cost implications, there is a risk that the preferred ISP development path will not achieve a least cost, least worst regrets outcome.

In addition, TasNetworks notes the benefits in diversity on both the type and location of availability of generation resources, this is particularly the case for variable renewable generation development. The development of REZ with diversity in this respect should be prioritised or at least the benefit quantification captured as part of underlying modelling.

Active developer interest in a REZ

Currently, the DLT model does not reflect developer interest until such time as a project is classified as committed. This can lead to the situation in which the DLT model can predict little or no development of a given REZ whereas, in reality, substantial progress may have already been made towards increasing that REZ's installed generation capacity. For example, TasNetworks is aware of significant developments in Tasmania's North-West that cannot currently be reflected in the DLT model. This disconnect between modelling and real-world outcomes could again lead to the risk that the ISP development path will not achieve a least cost, least regrets outcome.

TasNetworks recommends the use of project readiness principles to establish increased credibility of development options and costs. At present, there is little differentiation which recognises the state of project progression other than for committed projects. TasNetworks therefore requests AEMO to consider mechanisms for increasing the weighting in the DLT model for those REZs which are experiencing significant active developer interest, but which projects have not yet been formally classified as committed.

² Available from <https://arena.gov.au/knowledge-bank/development-of-renewable-energy-zones-in-the-nem/>

Future impact of climate change

TasNetworks acknowledges and supports the work AEMO has done to incorporate climate impacts to date. TasNetworks considers it is also crucial that project assessment is based on information from up to date and reputable sources. In this regard, TasNetworks understands that Hydro Tasmania has commissioned further analysis from the Commonwealth Scientific and Industrial Research Organisation (**CSIRO**) about expected inflows to hydro-electric catchments in Tasmania, in light of expected climate change impacts. TasNetworks would support consideration and utilisation of this information in the development of the ISP.

Question 4 - Has AEMO combined the development options into the most likely candidate development paths? If not, what other combinations should AEMO consider?

TasNetworks considers the development options have been combined into plausible candidate development paths as they have been modelled to date. In this respect, TasNetworks acknowledges and strongly supports the findings that Marinus Link has positive net benefits in all scenarios bar the slow change scenario, with Marinus Link 'shovel-ready' works included as part of the optimal development path for the NEM. TasNetworks notes that Marinus Link is required as early as 2026 under the Step Change scenario and contends positive net benefits in the Slow Change scenario can be demonstrated if key assumptions and underpinning data sources are updated.

In this respect, TasNetworks considers there are a range of modelling inconsistencies that are likely to underestimate the value of Marinus Link to the NEM, however none that are likely to overestimate the value. TasNetworks considers there is an earlier role for Marinus Link to play under a number of modelled scenarios as part of the optimal development path. Ensuring the utilisation of the latest data in modelling, including hydro inflows in Tasmania, optimal timing sensitivity analysis, and consideration of modelling limitations, will ensure the value proposition of Marinus Link is adequately reflected. Further to this point, it is noteworthy that Tasmania's Battery of the Nation pumped hydro sites have undergone more detailed project evaluation (including detailed technical and environmental assessment) than other proposed pumped hydro projects which are at desktop study status. Consequently, these have been assessed to be the lowest cost pumped hydro in the NEM.

Although the Draft 2020 ISP and Marinus Link PADR RIT-T scenarios differ, there is general alignment between them and the future states of the NEM they are intended to depict. Moreover, recent work undertaken by TasNetworks has shown that outcomes are broadly consistent between both the draft ISP and Marinus Link RIT-T models when provided with the same inputs. However, Marinus Link PADR results were based on earlier ISP model inputs which have now been superseded with the publication of the Draft 2020 ISP. As a result, TasNetworks has commenced updated analysis to reflect the changes made to the ISP model inputs since the release of the Marinus Link PADR.

Amongst other things, TasNetworks has modelled changes (to one scenario) in:

- the increase in REZ hosting capacity across the NEM;
- the increase in pumped hydro potential across the NEM; and
- the decreased demand forecasts for New South Wales and Victoria.

When these changes are included, the revised Marinus Link Status Quo scenario modelling broadly aligns with the Draft 2020 ISP Central scenario. This is illustrated in Appendix 1 to this submission.

With respect to TasNetworks' updated analysis, under the Central scenario, the net benefits for a single 750 MW link peak in 2035. However there is little difference in net benefits between 2031 and 2035; bringing Marinus Link forward by 4 years to 2031 in this one scenario would reduce the net market benefit by only \$15 million. This is a low insurance or 'regret' cost for the NEM to bear for this scenario, particularly as the Draft ISP Step Change scenario shows that the link can provide net benefits from the late 2020s.

TasNetworks notes a similar finding in the Draft 2020 ISP for the Fast change scenario: the regret value for advancing Marinus Link from 2036-37 to 2026-27 is \$25 million³. The difference between the ISP's DLT model and Short Term model total system costs is in the order of 5% in the Central scenario⁴. In this context, a difference of \$15 or \$25 million, or approximately 0.002% of total system costs, is immaterial.

As noted in the response to Question 7 below, it is not clear exactly what interconnector timing options AEMO has considered when evaluating the ideal development path in each scenario. For the Marinus Link 1st cable, the only timing options presented in the Draft 2020 ISP are 2026-27 and 2036-37. Given this and the results noted above, TasNetworks considers the value of Marinus Link is likely understated in the Draft 2020 ISP. TasNetworks therefore strongly encourages AEMO to examine a range of intermediate timing options for Marinus Link in its modelling to support the final 2020 ISP.

As TasNetworks has previously communicated to AEMO, review of Marinus Link costs, delivery schedule and technical parameters has resulted in minor changes, some of which are favourable and some of which are unfavourable to the development of Marinus Link. TasNetworks notes that cost and schedule information has also been revised for other proposed interconnector projects such as EnergyConnect. TasNetworks encourages AEMO to incorporate the most recent information for all interconnector projects so that the impacts on the optimal development path can be accurately assessed.

Question 5 - Are there any other factors that AEMO should take into account when assessing the merits of candidate development paths?

TasNetworks considers inclusion of robust analysis of competition costs and benefits to consumers of the proposed development paths is of critical importance. Analysis should include but not limited to, analysis of market benefits arising from increased interconnection, and the benefits of resource sharing among regions. Consumers bear the risk of both under and over investment, noting that under investment has the potential to result in increased costs to meet a short term gap. The cost benefit analysis underpinning the ISP should consider the risks associated with such under investment, this is particularly important when considering project timing associated with projects such as Marinus Link.

TasNetworks notes that there is an ISP sensitivity that looks at the effect on the optimal development path of the Queensland Renewable Energy Target (**QRET**) being repealed. TasNetworks supports this analysis and suggests it should also be extended to the Victorian Renewable Energy Target (**VRET**) and uptake assumptions on the Victorian Energy Efficiency Certificate (**VEEC**) schemes. TasNetworks considers this would provide valuable information on the effect such policies are having on the optimal development path and total system costs.

Beyond this point, TasNetworks notes that the Draft 2020 ISP Slow Change scenario models smelter closures in every state apart from Tasmania. While TasNetworks is working to support the continued operation of our customers, TasNetworks acknowledges that the owners of two Tasmanian smelters have raised concerns about their long-term viability, with the TEMCO smelter being under review.^{5, 6} Indeed, a decision on the future of the TEMCO smelter is expected in March 2020. Given this, and the recently announced review of Tomago smelter operations in New South Wales, TasNetworks suggests AEMO consider how these developments may impact Draft 2020 ISP assumptions and scenarios.

³ Draft 2020 ISP, Table 10, p. 60

⁴ Draft 2020 ISP Appendices, Appendix 4.1, Table 5

⁵ <https://www.afr.com/companies/mining/cashed-up-rio-warns-smelters-on-thin-ice-20190801-p52cs5>

⁶ <https://www.examiner.com.au/story/6444380/temco-workers-told-of-potential-buyers/>

Finally, TasNetworks notes that the Value of Customer Reliability (**VCR**) figures have recently been updated by the Australian Energy Regulator (**AER**). These are significantly different to the previous 2014 numbers in some cases. TasNetworks supports these updated figures being used in the final ISP to ensure the optimal development path is consistent with both customer reliability expectations and TNSP RIT-Ts which require the use of these figures.

Question 6 - What, if any, additional factors should AEMO consider to assess the development and timing of VNI West?

System resilience was highlighted as a major issue of concern from multiple stakeholders including TasNetworks at the recent ISP workshops. TasNetworks therefore supports further analysis on the benefits from increased system resilience on transmission projects. For example, from improved bushfire risk mitigation.

As this relates to VNI West, TasNetworks understands that there is an option to build the second interconnector transmission line in the same corridor as the current interconnector. Over recent months this corridor has experienced reliability issues owing to bushfires. As a result, there is consideration of building the second transmission line 50 kilometres away in a less bushfire prone area. TasNetworks considers that such an approach is to be supported for this and other ISP projects to the extent:

- incremental costs are justifiable with reference to the cost of events they are intended to avoid;
- stakeholders are engaged and supportive; and
- the discretion afforded AEMO to select such an option as part of the optimal development path is also granted to TNSPs as part of the RIT-T process.

Question 7 - Are there any aspects of the Draft 2020 ISP that require further or clearer explanation so that results are transparent and can be easily understood?

TasNetworks considers the following aspects of the Draft 2020 ISP could be clarified.

Tabulated summaries of interconnector augmentation timing

Tables 4 and 5 of the Draft 2020 ISP list the ideal timings for all proposed interconnectors for the five scenarios considered. However, it is not clear what timings are applied in a number of other scenario, sensitivity and candidate development path combinations. This is particularly pertinent for both VNI West and Marinus Link. For example:

- Table 5 indicates the optimal timings of VNI West and Marinus Link under the Central scenario are 2031-32 and 2036-37 respectively.
- Table 7 shows that in the 'No accelerated action' development path, the timing of VNI West could vary from 2030-31 to 2031-32, and that of the Marinus Link 1st cable could vary from 2030-31 to 2036-37.
- The introduction to Appendix 5.3 suggests, but does not explicitly state, that sensitivities were conducted based on the Central scenario optimal development path.
- Table 8 shows the total system costs for the optimal development timing (column C) and the candidate development path (column B) for the Early retirement sensitivity. These two costs are different. It follows that there must be some difference in the timings of one or both interconnectors in these two cases in order to cause such a cost difference. However, it is not possible to determine what the actual timing applied for VNI West and the Marinus Link 1st cable was in this sensitivity given the lack of information presented.

TasNetworks therefore suggests that tables be included in the final 2020 ISP, or be included with downloadable workbooks, which explicitly list the timings applied for all interconnectors in all scenario, sensitivity and candidate development path combinations. This will afford stakeholders a better understanding of optimal project timings and the basis of regret costs.

Further information about development options which were not optimal

The Draft 2020 ISP discusses AEMO's methodology and final results in selecting an optimal development path in each scenario. However, no information is provided on the many candidate paths which were evaluated but found not to be optimal. Figure 79 in the Draft 2020 ISP Appendices provides an example – presumed to be a small extract – of some combination of developments which AEMO had evaluated. TasNetworks considers publication of a supplementary worksheet which lists the combinations of developments evaluated and the resulting total system cost of each would be valuable. This would allow stakeholders to understand the relative cost magnitudes of different possible paths, and whether or not a particular path has been considered at all.

Publication of time sequential model output data

TasNetworks encourages AEMO to publish the time-sequence output data from ISP models. Publication of such data would greatly aid informational transparency and utility by enabling stakeholders to undertake their own independent analysis of the underlying market effects seen in the various scenarios and sensitivities modelled. Although AEMO has provided a variety of analyses and commentary on each scenario and sensitivity in the Draft 2020 ISP Appendices, stakeholders will inevitably have further questions which relate to their own particular interests. The publication of time sequence data would allow many of these questions to be answered by stakeholders themselves. TasNetworks suggests such data should include:

- regional demand;
- all generator, pumped hydro and battery generation (or charging) power output (or consumption) aggregated to a regional level for each technology type;
- regional behind-the-meter generation and self-storage consumption; and
- all interconnector flows.

Question 8 - What, if any, modifications should AEMO consider for the proposed 2020 ISP stakeholder engagement plan and timeline?

TasNetworks considers the proposed stakeholder engagement plan and timeline is appropriate.

Appendix 1: Salient outcomes from Marinus Link supplementary modelling

When undertaking modelling for the Marinus Link RIT-T PADR, TasNetworks observed that in some scenarios, altering the commissioning year of Marinus Link resulted in only a marginal difference in net market benefits⁷.

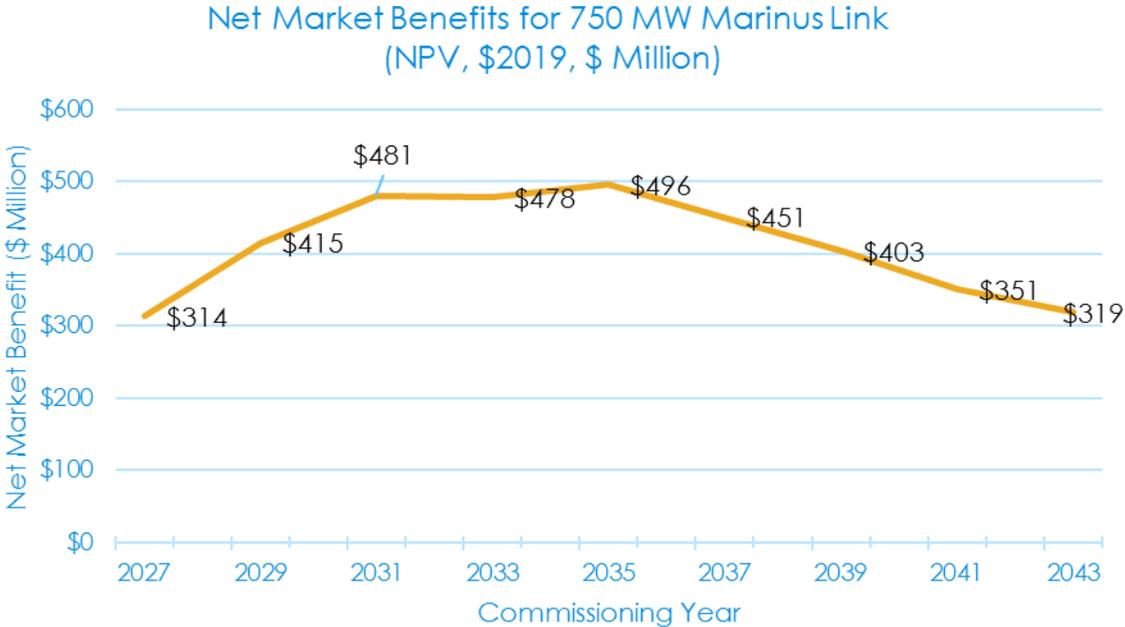
TasNetworks’ modelling for the Marinus Link PADR was based on ISP draft model input data (February 2019), which was superseded in the Draft 2020 ISP. Since the publication of the Marinus Link PADR, TasNetworks has updated the input data for the Marinus Link RIT-T model to incorporate the most significant changes to the ISP model dataset.

TasNetworks has also recalculated the net market benefit of Marinus Link for the Status quo/current policy scenario via the Marinus Link RIT-T modelling service provider Ernst & Young (EY). This scenario is closely aligned with the Central scenario in the Draft 2020 ISP. A number of different commissioning timings for the first 750 MW stage of Marinus Link were evaluated. The results are shown in the graph below.

The following can be observed:

1. If the Marinus Link PADR model inputs are aligned with the latest ISP model input data, the maximum net market benefits occur in 2035.
2. There is a plateau of net market benefits over the commissioning years from 2031 to 2035. The reduction of net market benefits if the commissioning is advanced from 2035 to 2031 is \$15 million.

TasNetworks notes that this result is for one scenario only, which is most closely aligned with the Central scenario in the Draft 2020 ISP. Given similar plateauing results were observed for other scenarios in the PADR modelling, it is likely that a similar effect would be observed in the ISP model in other scenarios.



As stated previously, TasNetworks considers there are a number of changes to model inputs which AEMO should incorporate. These include factors such as active developer interest in REZs being

⁷ TasNetworks, *Project Marinus RIT-T Project Assessment Draft Report*, p. 77

adequately considered, and the actual availability of pumped hydro capacity across the broader NEM. The inclusion of these model inputs would result in different optimal timing for Marinus Link than shown in the graph above.