

Question 6 What are your views on AEMO's proposed inclusion of distribution network capabilities and their impact on CER within the ISP model? What further enhancements could be made?

The premise of question asks for the ISP is, is Rooftop PV is now inevitable. Beyond the immediate parameters of the question lies the challenge of the question's breadth to the ISP's assumptions its processes and to the Optimal Development Path (ODP).

Risk management, focussed on supply (risk of shortage) and infrastructure (risk of inadequacy) has underpinned energy research and administration. This body of research has not only been the basis for planning for the ODP, but its scope has also guided the transition debate by framing the risk management paradigm for the ODP. Of the twelve questions asked, Question 6 is the only question focussed on the distribution grid and as such it is a significant step towards expanding the risk management paradigm for the ODP. The importance of question 6 is that it begins to query a supply risk that is characterised by managing the risk of excess.

The current scale and the future potential of rooftop PV challenges traditional grid assumptions and Question 6 asks for the impact of its continued growth to be understood. Being new to the supply industry and until recently being perceived as an anomaly, the impact of Rooftop PV on the grid is not highly researched. However, this anomaly has grown beyond expectations to become not only one of the biggest supply channels to the grid, but in its lack of integration into the supply logics, it has simultaneously become a risk to the grid.

Rooftop PV's inevitability is not only due to its environmental benefits but also to its cost-effectiveness. Its rapid growth has created a tension not only to electricity grid management but to the electricity market also. In response various jurisdictions are attempting to exclude rooftop generation from their markets, however as this approach challenges the "optimal" part of the ODP, the challenge of rooftop PV is to integrate it within the ODP rather than keep it in isolation. Question 6 opens up this issue, but the question's scope needs to be broadened so that it includes the IASR and the forecasting reference group process.

Consideration on the dynamic relationship between regions of excess and regions of shortage in the grid and the grid infrastructure required to manage this tension, rather than their polemics, is the key to smoothing the energy transition. Resolving this relationship is vital to achieving the Optimal Development Path. In order to achieve this, *a priori* assumptions need to be challenged, and again Question 6 begins this.

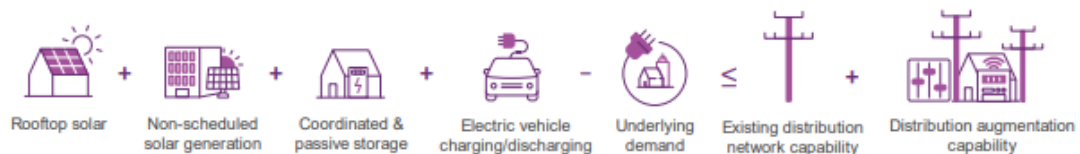
However, there is a question implicit in question 6 that needs to be explicit. This question is "How does the ODP combine the benefits of the Distribution Grid and the Transmission Grid to achieve its aims". It is an overarching question that contains Question 5,6,8,10 & 11.

I believe that including the distribution network capabilities and their impact on CER developments within the ISP model is vital for the ODP.

Below are some suggested enhancements with the equation proposed and the social license implications of the question.

ENHANCING THE EQUATION

Figure 4 Representation of distribution network capabilities and opportunities for CER and other distributed resources, to be applied for each sub-region in the ISP model



One of the key problems in managing the impact of rooftop solar has been that the lack of hard numbers has made planning decisions difficult. What is happening behind the meter has always been an approximation and for an industry based on hard data this is a problem. For this reason, when the potential for the distribution network is discussed in IASR meetings, the focus in the discussion dissipates due to the theoretical complexity of knowing what happens behind the meter. Largely due to this theoretical complexity, planners have tended to undervalue the opportunity the distribution network represents viewing it more as a risk to certainty than an opportunity to be understood.

The challenge for the proposed equation is to create a certainty that planners can utilise, and its structure should be measured by its ability to do this. In the way it is portrayed, I don't believe that this is fully achieved. To achieve the desired certainty, battery storage needs to be the equation's focus.

Battery storage is a known quantity, and planning assumptions can be made based on this known quantity. That battery storage is a known quantity is reflected in Questions 9 & 10. Added to this, by encouraging battery uptake at a distribution grid level, the tension that is being caused by daytime excess in the distribution grid can be better managed. Surplus daytime supply can be directed to accumulate in the battery, smoothing supply dynamics and strengthening the whole grid structure. If distribution level batteries are given the necessary primacy in the equation, they can play a vital role in establishing the required certainty for planners by allowing the uncertainty from behind the meter to be ignored. With certainty established and guided by existing risk management policies, planning within the new energy paradigm incorporating grid management, incentivisation and pricing mechanisms can proceed seamlessly.

Importantly at a distribution grid level, it is the fixed household battery rather than the variable car battery that creates this certainty. In IASR and forecasting reference group meetings, the variable EV battery is often discussed at length, but its consideration needs to be minimised as for the foreseeable future, the impact of EV batteries on supply are another unknown factor. It will take many years, technological advancements in VPP utilisation and much cultural and behavioural learning before the EV battery has any significant impact on the supply equation.

There are real world examples of how powerful the logic of focussing on the fixed distribution level battery can be to stabilise the grid and to utilise excess daytime production, with Basepower in Texas being a small but very sophisticated company operating in this sphere. They are taking full advantage of exactly this. Numerous papers are being produced highlighting the importance of distribution level batteries, but they need to be ingested into the thinking of the IASR and forecasting reference group regimes of the ISP so they are central to the ODP, rather than peripheral to it.

QUESTION 6'S IMPACT ON SOCIAL LICENSE

In midst of Change, managing the mechanics of change becomes the focus for change leaders, and the noise of the external debate surrounding the qualities of the transition becomes diminished. In a societal transformation such as the energy transition, this distinction can cause problems. The traditional driver of change, the risk of shortage, is the current driver of the public transition debate, whereas the impact of the risk of excess is almost unheard in the public sphere. Changing the social debate from the current focus on shortage to one including excess has many positive outcomes and Question 6 has a role to play here too.

The Clean Energy Council have just announced that there are now over 4 million householders with Rooftop PV. The current frustration for these investors in clean energy is the disconnect between the general conversation about shortage whilst they are producing electrons that are not being utilised. The disconnect builds distrust and in turn reduces the social license given to planners. Discussing the role and the opportunity that the Rooftop PV excess supplies within the ODP will include these 4 million households in the transition quest and while the different market dynamics for local electrons and distant electrons are not broadly understood, by acknowledging the important role and opportunity that rooftop solar represents it will enable many householders and businesses to understand how they are a part of the transition rather than feeling disassociated from it. The flow on impact for householders will markedly increase the social license for the transition not to mention the benefits from reduced infrastructure costs, transition speed and electricity pricing.

Question 6 represents a bridge between the theory of the transition and the experience of the transition, and its psychological impact in the public sphere where social license is built is very important.

EMBEDDING QUESTION 6 IN IASR CONSIDERATIONS

For AEMO to truly consider the distribution network in its ODP, then the impact of rooftop solar on supply and pricing must also be addressed in the directions given to the inputs, assumptions and scenarios committee. While this is implicit in Question 6, it needs to be explicit.

Fundamental to question 6 is an acknowledgement that battery storage in the distribution network **will** occur whereas in IASR discussions, for reasons discussed above, this is still discussed as in **if**, and as such, it is not deeply considered when supply calculations are produced.

The potential change caused by a rollout of batteries can be calculated by using the vast amount of rooftop PV's that don't have a battery attached. The immense impact that this will have on demand and hence on grid management must be considered within the IASR. Most importantly once batteries are in place they give the opportunity for the rapid expansion of Virtual Power Plants (VPP). This potential can be quantified, mapped and planned for and the central co-ordinating of this rollout is vitally important for grid risk management.

The IASR process currently does not give adequate weight to the potential impact of storage in the distribution network in their musings nor in their findings. Given the importance of this report within the structure of developing the ODP, this lack needs to be urgently addressed. Question 6 begins the process to address this, but the essence of the question needs to be extended throughout the IASR process.

Question 6 challenges a fundamental logic within the IASR process, the formulation of the three supply scenarios. The premise for mission-based approaches to the energy transition such as the Australian Government's Future Made in Australia, and the USA's Inflation Reduction Act, is that

supply will drive demand, i.e. create cheap electricity and economic growth will follow. In contrast to this, the underlying philosophy for the three scenarios contained in the IASR is for demand to regulate supply. The inherent tension in the structure and intention of the two competing approaches is significantly limiting the transition. A logical limitation to the demand-based approach is that the chance that any of the three economic scenarios ever being actualised is minimal and even if one was actualised, a mechanism for determining which one it was, cannot be defined. So, from a mathematical perspective, creating supply scenarios to suit a theoretical demand scenario that cannot be realised is like trying to resolve a circular equation, and yet debating this circular equation forms the focus of IASR discussions. Furthermore, as a risk strategy, the demand-based scenarios limit potential solutions as their current premise means that the only supply solutions that can supply the different scenarios requires supply commissioned from the transmission grid.

As the 2024 ISP demands and question 6 explores, supply from the distribution grid is essential for the ODP. For this to occur a redrafting of the underlying premise of the IASR to include how to best exploit the opportunity that both the distribution grid and the transmission grid provide is essential.

So, for Question 6 to be fully asked, its scope also needs to be fully explored.

IN CONCLUSION

As a risk management strategy, the current tension that exists between transmission and distribution grid supply needs to be resolved before it causes significant grid management issues. The IASR is the correct body to resolve this, but the directions given to them will need to change if Question 6 is to be viewed as important.

This is a big task, and requires some fundamental changes to the ISP process, however for Question 6 to be truly answered as a yes, this needs to begin now.