Submission on
the IPART Discussion Paper on Distributed Generation

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Introduction

The IPART Discussion Paper summarises the Tribunal's current understanding of the issues related to distributed generation (DG) in NSW and in particular discusses:

- what is meant by DG and the role it can play in demand management
- the current regulatory framework for DG
- the main barriers to DG in NSW
- a range of options for overcoming these barriers.

The Tribunal has identified the following barriers to DG and has developed the associated options for addressing the barriers:

SUMMARY OF BARRIERS TO DG AND PROPOSED OPTIONS	
Barrier	**Proposed Options**
Difficulties in negotiating fair connection agreements • Light handed regulation and lack of incentive for DNSP to support DG • DNSP has information leverage in negotiations • DG pays deep connection costs, unlike existing transmission-connected generators, and existing generators may free ride on network enhancements paid for by DG	**Develop national guidelines and standard offer agreements** • Streamline connection arrangements • Clarify regulatory approach to assessing prudent investment • Establish guidelines for efficient, effective negotiations • Apply NSW DM Code of Practice and extend it to include standard offers • Provide DG with preferential access to deep connection assets it paid for • Provide rebate to DG if, in the future, other users make use of the deep connection assets it paid for • Amend the National Electricity Code to reflect the outcomes of NECA's 'Beneficiary Pays' Review, due to report by December 2002
Uncertainty about payment of avoided network costs • Uncertainty on methodology for assessing avoided costs	• Demonstrate mechanisms in place for DG to capture avoided TUOS and avoided network augmentation costs • Develop appropriate schedules to the PPM
Lack of clear framework for small generators and smart metering • The small generator is disadvantaged by fees and metering technology	• Address in national forums and reviews • Develop a market framework for small generators and support the development and implementation of smart metering

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Institutional and structural factors • National market institutions • Uncertainty on reliability of DG options • Lack of locational signals in network pricing	• Address in national forums • Work with utilities to integrate DG into planning processes • Create clearer regulatory incentives and endorse DG trials • More cost-reflective pricing

The Tribunal seeks comments on the following issues as well as any other issues discussed in the Paper:

- Successful distributed generation (DG) projects which have been implemented in NSW or other jurisdictions and any insights into what factors contributed to the success of such projects
- Suggested proposals to make it easier for DGs to connect to the network and in relation to ensuring more equitable treatment of connection costs
- The negotiation principles set out in Section 5.1.3 as a possible basis for the development of standard guidelines for connection agreements and whether standard offers can assist in the negotiation process
- The Tribunal's current approach to avoided TUOS (transmission use of system) costs and its proposals relating to avoided distribution network costs, to assist the Tribunal in the preparation of appropriate schedules to its PPM
- Possible responses to the problems facing small generators in the NEM and the role that smart meters might play in assisting adoption of small-scale DG
- Proposals to improve the incentives for implementing DG and reducing the associated risks
- Proposals to reduce any institutional and structural barriers to DG in NSW.

Discussion of the issues relevant to consideration of DG

Definition of DG

A useful definition of DG is "generation that is connected to a distribution network such that the area served by the distribution network remains a net-load area". In this definition, a "net-load area" is one in which the aggregate demand for electricity exceeds the aggregate output of all generation in the area under nearly all circumstances.

Implications of DG for the electricity supply industry (ESI)

DG has the following implications for the electricity supply industry, compared to a situation without DG:

- DG will compete with remote generation to supply demand, possibly reducing local prices for energy and for voltage- and frequency-related ancillary services;
- The patterns of energy flow in the network may change during both normal and fault conditions, with possible implications for voltage control strategies and for power system protection schemes;
- The risks associated with maintaining availability and quality of supply may change and so may the outcomes following contingencies, affecting consumer satisfaction for better or worse. There may also be implications for legal liability in the event of lost supply and/or damage to equipment.
- The need for network services generally, including voltage-related ancillary services, may change.

Potential benefits of DG

DG has potential benefits from its proximity to load of a greater size (these will not apply in all cases):

- DG may reduce the need for network services and improve local quality and availability of supply
- DG may use local resources in a manner that improves social and environmental sustainability
- DG may exploit cogeneration opportunities by supplying heat, cooling or other energy services apart from electricity.
- With small unit size and short installation times, DG may improve the incremental matching between local supply capacity and increasing demand, reducing both the need for over-capacity and the associated financial risks.

Barriers faced by DG in capturing benefits it delivers

DG faces a number of significant barriers to capturing benefits that it may deliver:

- The effects of DG are not usually measured with sufficient accuracy to adequately assess the benefits it delivers.
- Most DG benefits are local in scope, and therefore valued in retail, rather than wholesale electricity markets. However retail markets are embryonic and don't produce market values for many of the potential benefits of DG.
- DG may source its primary energy requirements (eg natural gas) from retail energy markets that are also dysfunctional, and have distorted price signals.
- There are often no market values for the potential social and environmental benefits of DG.
- DG can sometimes substitute or defer the need for network investments, however the current industry organization model is not well-suited to exploiting such opportunities:
    - There are important asymmetries in information and resources
    - Availability and quality of supply remain largely matters for regulation. This creates asymmetries in legal accountabilities that favour network options.
    - Differences between the characteristics of DG and network augmentation as risk management tools are not well understood by either network service providers or DG proponents.
    - Because of tradition and deficiencies in retail electricity markets, network assets are valued on a "cost of replacement" basis rather than a "market value" basis. As a result, network tariff design places more emphasis on cost-recovery than economic efficiency, often providing misleading signals as to the value of DG.

Strategies for addressing barriers to DG

Barriers to DG should be addressed on a broad front:

- Design retail electricity markets to provide appropriate signals for DG, with a market structure that includes ancillary services, spot energy and forward contracts, and addresses the legitimate concerns of politicians and consumers about full retail competition.
- Install metering for all network users that records market-interval energy as well as key measures of supply availability and quality.
- Develop standard negotiation procedures and contract templates for grid connection of DG.
- Shift the objective of network regulation further away from cost-recovery towards economic efficiency
- Investigate more fully the characteristics of network and DG options as risk management tools, considering both spatial and temporal aspects of risk.
- Develop approaches to value and internalise important social and environmental externalities.
- Adopt an end-use energy service perspective to energy planning and separate the planning function from network services providers.
- Shift from planning based on demand forecasts to planning based on the aggregated hedged volumes of retail market forward contracts.
- Support innovation in DG and associated measurement and control technologies, and support innovative approaches to delivering end-use energy services.

Responses to specific issues for comment

Issues suggested by IPART

Suggested proposals to make it easier for DGs to connect to the network and in relation to ensuring more equitable treatment of connection costs

The proposals in the discussion paper are appropriate. In broad terms, it is very important to reduce transaction costs through technical standards, contract templates containing standard terms and conditions, and protocols for resolving "deep connection" issues and for allocating costs and benefits associated with

DG impacts (positive or negative) on risks to availability and quality of supply. Standardisation is particularly important for small DG, otherwise transaction costs can become prohibitively high. Standardisation would also facilitate the timely installation of DG to meet demand increases, by minimising the delays associated with negotiating connection agreements.

The negotiation principles set out in Section 5.1.3 as a possible basis for the development of standard guidelines for connection agreements and whether standard offers can assist in the negotiation process

The negotiation principles set out in Section 5.1.3 are a useful step forward, noting that timelines should be specified. However, problems remain with respect to quantifying and managing future risks (demand forecasts are inadequate for this purpose), and for allocating costs and benefits associated with risk management between DG and the network service provider.

The Tribunal's current approach to avoided TUOS (transmission use of system) costs and its proposals relating to avoided distribution network costs, to assist the Tribunal in the preparation of appropriate schedules to its PPM

The problems associated with network pricing arise from the underlying cost-recovery basis of network tariff formulation, which makes it difficult to develop tariffs that are equitable for both consumers and DG. The development and implementation of more efficient retail market should provide a long-term solution to this problem.

Possible responses to the problems facing small generators in the NEM and the role that smart meters might play in assisting adoption of small-scale DG

DG requires efficient retail markets to value the potential benefits that it can provide. For retail markets to be efficient requires all participants (consumers and DG) to have meters that record market interval energy and key measures of supply availability and quality. Efficient retail markets would also address the problems faced by DG that currently participates in the NEM.

Proposals to improve the incentives for implementing DG and reducing the associated risks

Apart from the issues discussed above, there should also be support for innovation in technology and services, and for early adopters of DG.

Proposals to reduce any institutional and structural barriers to DG in NSW

Important institutional reforms include separation of responsibility for planning from network service providers, and the adoption of an least-cost end-use energy service objective; the use of forward contracts as a market-based alternative to demand forecasts; and procedures to enhance industry sustainability by internalising social and environmental externalities.

Conclusions

DG participates in retail electricity markets and is highly dependent on the efficiency with which they operate. Therefore it is important to either continue with the implementation of effective full retail competition or revert to a scheme of franchise distributor/retailers to supply small consumers. In either case, the objective should be to achieve a focus on delivering least-cost energy services that takes account of important social and environmental externalities. DG should then compete with other options to meet this objective. It is also important to take all opportunities to move network economic regulation towards a value-based paradigm and streamline the negotiation of network connection agreements, for example through the development of technical and commercial standards.