

REFLECTIONS ON THE “PROMOTING EFFICIENT INNOVATION” WORKSHOP

IPAG

Key Conclusions from Workshop

Most innovation is likely to occur at the “grid edge”: ie development of “smart equipment” able to provide value to consumers, retailers or DSOs

Need for clarity around how regulatory framework applies at grid edge: especially around connection and access rights and processes

Need easy information and data exchange: because transaction costs loom large at the retail level

Hard for novel products to gain critical mass: there is a threshold level of DER aggregate response before wholesale buyers (DSOs etc) become interested.

Regulatory processes can get bogged down: eg around code change and code enforcement

*But no **fundamental** problems with market design: just need to make the existing design clearer and simpler*

Understanding a product's value and impact

Smart Equipment Supplier (SES)

- what is the connection approval process for my product?
- will I get permission to connect?
- what conditions will be attached?
- how do these impact on the product's value

Consumer

- how much will it save me on my electricity bills?
- will my comfort and convenience be affected?
- is the product portable between retailers?

DSO

- will the product impact on grid quality or reliability?
- does it give me tools for managing the network?
- does it create costs for my business: eg in network reinforcement

Retailer

- how do I incorporate the product's functionality into a value proposition to the consumer?
- can I control it to provide wholesale products? Might I lose control to the DSO?
- what value can I obtain from?

Some important facilitators, or impediments, for smart products

- *Plug and Play*: a consumer can buy a new air-conditioner and just “plug it in”. Why not for a new PV or battery system?
- *Value Proposition*: how can a consumer or retailer assess what value a novel product provides?
- *Portability*: will the product still work if the consumer switches retailer?
- *DSO uniformity*: will a SES be able to sell, install and support its product across all 29 EDB areas?
- *Funded trials and prototyping*: justified by the “network economics” of greater DER development and penetration

Plug and Play

Issue	New air conditioner	New smart product	Comments
Manufacturing standards	Must comply with standards	Standards still emerging	Need to be global, not DSO specific
Impact on grid quality	No problem, for standard-compliant equipment	Unclear: case-by-case assessment needed	Progress is reliant on manufacturing standards
Connection rights	Consumer can connect, so long as does not “blow fuse”	No automatic connection right	Need “safe harbour” connection rights
Reliability impact	DSO responsible for maintaining grid	“Connection cost” can be levied on consumer	Need clear allocation of responsibility
DSO control	DSO has no right of direct control	DSO might make connection contingent on control	Control OK, so long as clear and minimum necessary

How Regulation Can help

DSOs encouraged to work with manufacturing standards: DSOs shouldn't set standards, but should test their implications for grid quality, decide which standards are relevant, and how standard functionality (eg voltage response) should be configured.

Clarify “export reliability” standards: the regulatory framework should ideally mirror that for existing (import) reliability standards.

Clarify curtailment rights and mechanisms: DSOs currently “shed load” when necessary. Similarly, they should be permitted to “shed exports” and be given the tools to do so. But need to clarify what tools are appropriate and when they can be used.

DSOs should specify “safe harbours”: set of equipment standards and functionalities sufficient to give an *automatic* right to connect.

Value Proposition for the new Product

The value of a new smart product depends upon 3 factors: knowledge of these is spread over three different parties.

- *The SES's product functionality:* this could even be updated from time to time through firmware upgrades.
- *The consumer's preferences and consumption patterns:* these will be partially revealed in smart metering history.
- *Retail prices and tariff structures:* these, in turn, reflect prices set by the TSO and DSO.

Calculating value: somebody needs to (a) bring all this information together and then (b) crunch the numbers. Who can do this? Who does the consumer *trust* to do this?

How can regulation help?

Clarifying DSO prices and products: this might be through network tariff reform, or by improving transparency around how DSOs value and procure network support services.

Simplifying data exchange: metering data should be easily acquired by the consumer, competing retailer or SES, subject to consumer permission.

Supporting consumer trials: consumer preferences can be revealed through trials of load-response products and prices

Retail Portability

Smart equipment will generally be sold to the consumer, not the retailer. this is (a) because it is installed in the home, so needs consumer permission anyway and (b) will have a payback period longer than a retail contract term.

So the product must be portable: if it is not, the consumer is either hostage to a single retailer (who, therefore, captures all of the product's value), or is left with a stranded product when they change retailer.

New retail tariff structures should easily be accommodated by the SES: eg through product functionality or firmware upgrades.

Control interfaces need to be standardised and/or transparent: where the product is retailer-controlled, so the outgoing retailer can easily “hand over the reins” to the incoming retailer.

Consumer confidence and trust is critical: vague reassurances are not enough.

How can regulations help?

not by setting portability standards: this will simply impede innovation. Product developers will anyway be strongly incentivised to support portability.

promoting transparency: for example, where retailers are required to provide information to comparison websites, this requirement could include information on supported products.

preventing hold-up: the outgoing retailer could be required to provide to the incoming retailer, or the consumer, the information needed for picking up the reins.

supporting trials: these will provide useful insights on consumer-retailer interface requirements and on their implications for portability.

Uniformity across EDBs

Making life easier for the SES: a SES would find it hard to maintain 29 different product functionalities, or 29 different installation processes, to accommodate differences between all of the EDBs.

Super DSOs: it seems probable that, as the DSO role increases in scope and complexity, EDBs will *choose* to develop joint ventures where a single DSO covers multiple EDB territories.

Common connection frameworks and processes: whilst diverse policies may be unavoidable, a common *framework* would be helpful. For example, if each EDB specified a maximum kW size of rooftop PV that would enjoy automatic connection rights, then even 29 different sizes are easily listed on a single sheet of paper.

Common structures for pricing and procuring network support: if a SES can easily compare prices, it can focus its marketing on the “hotspots”.

Supporting Trials and Prototyping

Smart equipment and products enjoy “network economics”: the greater the penetration, the higher the value (eg in selling aggregate response to DSOs) and the easier they are to market and sell (eg through consumer awareness and trust).

Trials can address some of the impediments already discussed: eg in better understanding consumer preferences and portability issues.

“Public” funding is economically justified: all consumers can gain from the “positive externalities” of more products and improved transparency.

Various funding models are possible: eg in Australia, there are dedicated funding bodies (eg ARENA) and also funding via distribution business revenue allowances (eg Demand Management Incentive Scheme)

Information sharing is critical: key insights and outcomes from trials must be in public domain, but private intellectual property should be protected.