

Possible Frequency Response Options

	Generating Unit			Company Portfolio			Technology		
	SO Procures	Generator Procures	Supplier Procures	SO Procures	Generator Procures	Supplier Procures	SO Procures	Generator Procures	Supplier Procures
Tradable Capacity	Option 1	Feasible Option	Non Feasible Option	Non Feasible Option	Feasible Option	Feasible Option	Feasible Option	Non Feasible Option	Non Feasible Option
Tradable Delivery	Non Feasible Option	Feasible Option	Feasible Option	Feasible Option	Feasible Option	Feasible Option	Non Feasible Option	Feasible Option	Feasible Option
Both Tradable	Non Feasible Option	Feasible Option	Feasible Option	Feasible Option	Feasible Option	Feasible Option	Non Feasible Option	Non Feasible Option	Non Feasible Option
Neither Tradable	Current Provision	Feasible Option	Non Feasible Option	Non Feasible Option	Non Feasible Option	Non Feasible Option	Feasible Option	Non Feasible Option	Non Feasible Option

Key

	Current Provision
	Feasible Option
	Non Feasible Option
	Option 1

Action : To consider Grid Code obligation solution

There are a number of potential methods when considering the development of a Grid Code obligation.

Using the table above, we can develop three options:

- Obligation per generating unit
- Obligation per portfolio
- Obligation dependent on technology

a) Obligation per generating unit

Current obligations are on a generating unit basis. However, may need to consider if this can be extended to generating unit plus auxiliaries providing the total level of response.

Pros

- Familiar
- Non-discriminatory
- Would allow for frequency response volumes to be (almost) guaranteed, ensuring system security

Cons

- Stifles innovation in new providers
- May stifle innovation in new technologies
 - o More efficient or economic technologies may be overlooked as they would not be able to meet the Grid Code requirement

Providing response from generating unit plus auxiliaries may result in the investment in new technologies, reducing some of the impact of the cons.

b) Obligation per portfolio unit

Pros

- Provides flexibility to providers in determining what technologies provide the service
- Investment in new innovative, more efficient and economic generation sources would potentially mean lower power prices
- Would allow for frequency response volumes to be (almost) guaranteed, ensuring system security
- Promote innovation from within the portfolio

Cons

- Would favour large portfolio's over small independent generators

- Is this considered discriminatory
- May be more costly to ensure response volumes are available at times of low demand (i.e. taking off non-response generation within the portfolio and putting on responsive generation)
- Stifles innovation from new commercial providers
- Issues with divestiture of portfolio plant in determining whether the portfolio was still Grid Code compliant post generation sale. However, the premium realised for generation that provides high volumes of response would provide some form of value for the service.

To ensure that the correct volumes of response are available at all times, the portfolio responsibility could be on capability and delivery. In addition, to ensure that small providers were not disadvantaged, the capability and delivery could be sold outside the portfolio to other generators.

c) Obligation dependent on technology

Pros

- Allows technologies to connect with their inherent response abilities, potentially reducing generation procurement costs (with the potential to feed through to lower power prices?)

Cons

- Discriminatory (is this really a con or just a statement)
- Response costs would rise significantly in periods of low demand (i.e. when the non-responsive generation is alone in supplying demand)
- Does not ensure adequate volumes of response are provided at all times

My Conclusion

From the list above, as a System Operator, I would opt for either a) or b) as these provide the most secure option. Probably I would opt for a) as I do not believe that large diverse portfolios should have an advantage over smaller portfolios.

Transferable Capability

Generally the question is; can a generator transfer their capability requirement to another party i.e. contract with another party to provide their response capability. This assumes that there are technologies that can exceed the Grid Code requirements or that technologies not covered by the Grid Code could provide the capability (such as batteries).

The main issue I have with this is how can you ensure that the correct volumes is on the bars at any one time e.g. if generator 1 has transferred their capability requirement to generator 2 but generator 2 is not running, if generator 1 is selected to provide response, how does it provide the capability? To enable enough capability to be synchronised, generator 1 would need to be shut down and generator 2 would need to be synchronised. Who is responsible for ensuring that enough capability is provided at all times; is there a provider of last resort and also would there need to be something akin to a response imbalance price to incentive providers to meet their obligations?

Generally this option would work with a portfolio capability if the portfolio was responsible for ensuring adequate capability was supplied by their portfolio. Not sure this would work well for individual generators.

Transferable Delivery

My understanding of the transfer of delivery is that a providers has the capability but contracts with another provider to actually supply the energy as and when required.

As long as capability is maintained on each individual generator, there should be no system security issues associated with this option.

I am not sure as to why a provider would transfer their delivery if the price they are receiving for the service is in line with the cost + for the provision of the service. This could be the case if the obligation to provide frequency response was on the generators i.e. all generators connected must provide X of response.