

Review of Offer and Dispatch Rules for Industrial Co-generators – Reasonably practicable options

1. Section 172F(1) of the Act requires the Commission to seek to identify all reasonably practicable options for achieving the objective of the Proposal. As set out above, the Proposal aims to resolve the problems co-generators have in complying with the offer and dispatch rules while not adversely affecting the integrity of the pricing process or the system operator's ability to economically achieve the PPOs.
2. The Commission has identified six potentially reasonably practicable options for achieving the objective of the Proposal. These are as follows:
 - a. Increase the dispatch compliance band;
 - b. Widen the definition of bona fide physical reason;
 - c. Lower the compliance costs;
 - d. Allow 30-minute gate closure;
 - e. Permit bidding on a net basis; and
 - f. Maintain the status quo.
3. It is noted that the option of not requiring co-generators to offer or be dispatched, as suggested by some co-generators, was not considered reasonably practicable as it would undermine both the system operator's ability to meet its PPOs, and the integrity of the pricing process.
4. It is also noted that the option to treat co-generators in a similar manner as intermittent generators was not considered because the similarities between co-generators and intermittent generators was not close enough (see paragraph **Error! Reference source not found.** of this paper).
5. The assessment of each option against the objective is set out below.

Evaluation

Increase dispatch compliance band

6. This option was considered reasonably practicable and would achieve part of the objective (resolving co-generators' problems with complying with the Rules) to a significant extent. It is based on the current exemptions, which have proved effective in addressing co-generators' concerns.
7. However, providing special privileges for co-generators (a wider dispatch compliance band) may create incentives to game this privilege, for example, incentives for some other generators to try to

- artificially claim co-generator status, or reduced incentives for co-generators to comply with dispatch instructions where they can.
8. This gaming could lead to a wider variance between dispatch and actual generation at a system level. This could undermine the system operator's ability to economically achieve the PPOs by requiring purchase of additional frequency keeping, to manage the resulting frequency variations. It could also undermine price integrity by leading to a divergence between actual generation and prices.
 9. It is considered bad regulatory practice to create incentives to breach the rules. Such rules rely on extensive, and possibly expensive, monitoring and enforcement to be effective. It is much better to try and create economic incentives to comply with the rules. The proposed approach to rule drafting has therefore been to rely primarily on economic incentives for compliance, with a back up of a compliance regime.
 10. The primary economic incentive is to require co-generators to offer their entire output at \$0.01 (or \$0.00 if MRDA rights are obtained). A true co-generator is a price taker and such a requirement does not impose an undue burden on it. However, most other generators have a price sensitive component of their generation at some level or at some times (refer table below). That is, even if they are matching retail load or other hedges, a component of their output is price sensitive at times. So a requirement to always offer the entire output at such a low price would impose a real cost on them. This approach would therefore discourage generators from claiming co-generator status unnecessarily.

Table of generators having their entire offer at or below \$0.05 for more than 90 per cent of the time¹

Generator Name	Type	% Time Entire Offer < \$0.05
Opua	Run of River Hydro	100%
Glenbrook	Co-gen	100%
Whareroa	Co-gen	100%
Kinleith	Co-gen	100%
Kapuni	Co-gen	100%
Aniwhenua	Run of River Hydro	100%
Paerau	Run of River Hydro	100%
Ohaaki	Geothermal	100%
Poihipi	Geothermal	100%
Wheo	Run of River Hydro	100%
Te Apiti	Wind	100%
Mokai	Geothermal	100%
Rotokawa	Geothermal	100%
Wairakei	Geothermal	100%

¹ The information in this table is publicly available.

Generator Name	Type	% Time Entire Offer < \$0.05
Kamai	Run of River Hydro	100%
Te Rapa	Co-gen	99%
Southdown	Combined cycle	98%

11. Therefore, the regulatory back up to this economic incentive would be to have a tight approval process around co-generator status.
12. Finally, the key identifiable cost of a wider dispatch compliance band is increased frequency keeping costs. If these costs are assigned to those causing the need for frequency keeping, then the incentive to minimise such deviations from dispatch instructions will be minimised. However, it is recognised that the issues of dispatch compliance and frequency keeping costs are much wider than just for co-generation and should be considered in the common quality forum rather than the wholesale market forum.
13. Therefore, to mitigate any possible 'gaming' risks on the wider compliance band, it is proposed to:
 - a. require co-generators to offer at \$0.01 (or \$0.00 subject to winning rights in the MRDA);
 - b. impose a tight approval process; and
 - c. further consider whether frequency keeping costs should be assigned to causers.
14. Each of these conditions is explained further below.

Condition A: Requirement to Offer at \$0.01 or \$0.00

15. To mitigate the incentive to 'artificially' claim co-generator status it is proposed to require all co-generators to offer at \$0.01 or \$0.00. Note that offering at \$0.00 would be subject to participation in the MRDA.
16. The requirement to offer all output at \$0.01 or \$0.00 reduces the incentive for 'artificial' claiming of co-generator status as this would be a significant restriction on other types of generator (non co-generators). That is, most other types of generator would prefer not to generate at below marginal cost. If this is above \$0.01 then the requirement to always offer at \$0.01 or \$0.00 would be a significant risk to them and thus a disincentive to claim co-generator status.
17. However, the requirement to offer at \$0.01 or \$0.00 is unlikely to be a barrier to 'true' co-generators as they are price takers in the market. That is, they are largely net loads and their generation is primarily to service their own load.

Condition B: Approval as a co-generator

18. A rigorous approval process is proposed to filter out most 'artificial' attempts to claim co-generator status. This approval process is based

on both a tight definition of 'co-generator' and making the system operator the approving body. The system operator approval process is described further below and is based on the impact on the PPOs.

19. The system operator is considered to be the most appropriate party to approve co-generator applications as it has the best information on how each application would affect the PPOs.
20. A key part of any rule change to provide special privileges for co-generators, such as widening the dispatch compliance band, is a clear definition of what constitutes a co-generator and hence who should have access to these privileges.
21. The key objective is to avoid potential 'gaming' of the co-generation rules. For example, if the co-generation rules are perceived as providing a significant advantage to approved participants, other generators may try to gain this advantage by artificially trying to qualify as co-generators.
22. In defining a co-generator, consideration was given to whether it would be necessary to distinguish between the parts of the plant that are, and are not, co-generation.
23. One method of avoiding this would be to only allow that part of the plant that is 'true' co-generation to qualify as a co-generator. However, distinguishing such plant would be difficult and would potentially expose the system operator to numerous appeals, particularly if the incentive to become an approved co-generator is very strong.
24. Another method of limiting incentives to 'game' the benefits of co-generator status is to allow the system operator to impose conditions on any application. The Commission considers this approach has merits but clear criteria need to be provided for the system operator to impose conditions or to refuse an application. In line with the objective of the proposal, the criteria should be based on the system operator's ability to achieve the PPOs.
25. The Commission considered the ability to impose conditions would make it easier for the system operator to approve an application. An example would be the Whareroa exemption application. (It is noted that exemption approval is a Commission responsibility, whereas co-generator status approval would be a system operator responsibility. However the example is still relevant.) The Commission imposing conditions² on this application meant the system operator's concerns around its ability to meet the PPOs could be addressed without needing to refuse the exemption application. Similarly, the system operator could impose conditions on a co-generator status application.
26. As the approval process is likely to be controversial, it is considered worthwhile to allow for a specific dispute resolution process without the need for the breach allegation process.
27. Therefore, it is proposed that an applicant could appeal a particular approval decision, including the imposition of conditions, to the Rulings Panel for a binding ruling. The grounds for appeal are limited to whether the system operator correctly applied the approval criteria in the Rules.

² Additional to the 5MW dispatch compliance band and expiry date of the exemption.

Condition C: Further consideration of frequency keeping cost allocation

28. As noted above, a wider dispatch compliance band for co-generators may reduce incentives to comply with dispatch instructions even where they are able to do so. This could increase frequency keeping costs by requiring additional use of frequency keeping to manage the difference between actual generation and load.
29. This could be mitigated by assigning the costs for frequency keeping to causers. However, this is a much wider issue than just for co-generators and it could be argued that co-generators are a relatively small causer of the need for frequency keeping.
30. The Wholesale Market Advisory Group (WMAG), therefore, considered this issue was best dealt with by referring the wider issue of frequency keeping cost allocation to the common quality workstream.
31. It is noted that allocation of frequency keeping costs to causers may also address the incentives to artificially claim co-generator status. Therefore, it may be possible to revisit the co-generator approval process once this issue has been addressed.
32. The wider dispatch compliance band option is included in the Proposal, subject to the restrictions of being required to offer at \$0.00 or \$0.01 and a tight approval process.

Widen the definition of bona fide physical reason

33. This option was also considered reasonably practicable and would contribute to achieving the objective. It is complementary to the wider dispatch compliance band because it deals with situations where the variation from dispatch is greater than 5MW (or the approved band, if less than 5MW). It will lower the compliance cost in reporting these instances. This option is included in the Proposal.
34. Co-generators have advised that a considerable part of their compliance overhead is that, every time the generation plant changes output in response to a change in the industrial process, they have to explain to the Commission's Market Governance group why this constitutes a 'bona fide physical reason' under the Rules. This can involve the exchange of several letters and considerable overhead.
35. The current definition of bona fide physical reason includes an unforeseeable loss of generating capability from an item of 'generating plant'. The definition of 'generating plant' is wide enough to encompass an industrial process directly associated with the generation of electricity. However, the wording only allows for a loss of generating capability, not an increase.
36. By including a change up or down in generating capability in the definition of a 'bona fide physical reason', compliance could become much simpler and reduce overheads considerably.
37. It is noted that the proposed wider dispatch compliance band will mean that approved co-generators will not need to make 'bona fide' offer changes as frequently as under the current 1MW dispatch compliance band.

Lower compliance costs

38. Several options for lowering compliance costs were considered including:
 - a. instant fines; and
 - b. average compliance assessment over a longer term (six months).
39. Lowering compliance costs was also considered reasonably practicable and would contribute towards achieving the objective. However, it was considered that it should be incorporated in a more general review of whether compliance costs can be lowered for all market participants. This matter has been discussed with the Commission's Market Governance group, which is responsible for compliance monitoring.
40. Based on this discussion, the Commission considers that the two options discussed above in paragraph 38 are not practicable, as they would require changes to the whole philosophy of the compliance regime or changes to the Electricity Governance Regulations 2003 (Regulations). Changing the Regulations is resource-intensive.
41. However, the discussion with Market Governance did raise some ideas about how to make the compliance process easier for breaches of the two-hour rule (the most common breach by co-generators). Since these ideas would not just affect co-generators but all generators, the Commission will investigate these under a different subtask of task W16: Review of Offer and Dispatch Rules.

Allowing 30 minute gate closure

42. This would involve reducing the gate closure time for co-generators to 30 minutes, consistent with gate closure for embedded generators and intermittent generators. It is noted that most co-generators already have a 30-minute gate closure as embedded generators.
43. This option was also considered reasonably practicable and would contribute to achieving the objective. However, it was considered that it should be incorporated in a more general review of whether the gate closure can be lowered for all classes of generator. The gate closure review is on the WMAG's workplan as task W16c.

Net bidding

44. Under this option, co-generators would bid or offer into the market only the net difference between their generation and their load. In many cases co-generators have a net load and would not, therefore, be subject to the generator dispatch compliance regime.
45. This option would achieve the first part of the objective (resolving co-generators' problems with complying with offer and dispatch rules), but would not achieve the second part as it would undermine the system operator's ability to economically meet the PPOs.

46. Under net bidding, the system operator would not know how much actual generation or load is operating at a co-generation facility. Even if load and generation are tightly coupled, tripping of either can lead to large momentary fluctuations in the total net load until the control system brings the load or generation back to its net position. These large momentary fluctuations can cause frequency fluctuations if not matched by frequency keeping arrangements. If the system operator was unaware of this potential source of frequency variation it may, conservatively, have to schedule extra frequency keeping reserve to ensure it could always meet its PPOs. The current 50MW frequency keeping band costs approximately \$50 million per year. Therefore, even a small additional amount of frequency keeping could cost several million dollars per year. This option would, therefore, impact on the system operator's ability to economically meet the PPOs.
47. This option does not meet the objective and was not pursued further.

Maintain the Status Quo

48. Under the status quo option, the existing exemptions would expire and co-generators would face high compliance costs. This is not considered to meet the objective as well as the Proposal does.

Assessment of benefits and costs

Proposal

49. The above analysis shows that the only reasonably practicable options are the Proposal, outlined in paragraphs **Error! Reference source not found.** to **Error! Reference source not found.** above, and the status quo. The approach taken has, therefore, been to compare the costs and benefits of the Proposal relative to the status quo. The benefits of the Proposal include reductions in costs relative to the status quo.

Benefits

50. The primary benefit of the Proposal is reduced compliance costs for existing co-generators.
51. Additional benefits (discussed in paragraphs **Error! Reference source not found.** to **Error! Reference source not found.**.) may also arise from the dynamic efficiency gains of lowering barriers to entry for new co-generators. However, these would be difficult to quantify and have not been included in the numerical calculations below.
52. Three co-generators have advised the Commission that the reduction in compliance costs from the Proposal would be substantial. One co-generator estimated that, without the exemption, it would be in breach approximately 24 trading periods per day³, with compliance taking

³ Note, it is unlikely that, in the long term, the Commission would consider this level of breaches as an acceptable outcome.

- around five hours per breach. Another suggested it would spend 250 hours per year on compliance reporting.
53. It is likely that other centrally dispatched co-generators, which have not applied for exemptions, may also benefit from the proposed rule change. The Commission has 10 co-generators registered under the Regulations. Of these, six are subject to dispatch instructions⁴.
 54. Taking the more conservative of the above, and assuming 250 hours per year for six co-generators, suggests an annual compliance cost saving of 1500 hours per year, or approximately 75 per cent of a person-year.
 55. Assuming an annual total cost of employment of \$100,000 gives industry compliance savings of \$75,000 per year.
 56. There are also compliance costs for the Commission. Market Governance staff have estimated that, on average, perhaps 16 per cent of their time is spent investigating breaches by co-generators.
 57. There are three Market Governance staff and, again assuming an annual total employment cost of \$100,000, gives a Commission compliance cost saving of \$48,000 per year.
 58. Therefore, total compliance cost savings are approximately \$123,000 per year.
 59. These figures are only estimates and the parties providing them emphasised that they could vary considerably.

Costs

60. There are no quantifiable costs of the Proposal aside from the administrative costs of making the rule change (estimated at \$100,000).
61. It is possible that the Proposal could lead to a slight increase in frequency keeping costs if the dispatch compliance band became too wide or if the number of co-generators using this band became significant. To avoid this problem, the proposed rule changes have been carefully designed to restrict the band to a small quantity (5MW) and to ensure each application is assessed by the system operator.

Summary of costs and benefits

62. The benefits of the Proposal exceed the costs with a net benefit of approximately \$23,000 for the first year and an ongoing net benefit of \$123,000 per year. This analysis does not include dynamic efficiency benefits, which would increase the net benefit significantly.

⁴ Embedded generators below 10MW are not required to offer or be subject to dispatch instructions.