

An operational review of Part 6 of the Code - second consultation

Consultation Paper

Submissions close: 5 pm 31 January 2014

2 December 2013

Executive summary

This is the second consultation paper published for the Electricity Authority's (Authority) operational review of Part 6 of the Electricity Industry Participation Code 2010 (Code).

Part 6 relates to the connection of distributed generation (DG). The first consultation paper proposed:

- a new, streamlined notification process for connecting standards-compliant small-scale distributed generation (SSDG) to local networks (Part 1A of Schedule 6.1)
- a range of technical and operational Code amendments throughout Part 6, aimed at clarifying the drafting of Part 6 and addressing a number of other concerns.

After consideration of the 25 submissions received on the first consultation paper, the Authority has revised a small number of the proposals. In particular, the Authority now proposes:

- a revised proposal for Part 1A of Schedule 6.1 that requires the approval of the distributor prior to connection but significantly shortens the window in which the distributor may consider the application
- revised drafting to other Part 6 clauses.

The Authority now seeks submissions on a small number of questions relating to these revised proposals. The Authority intends to finalise the review of Part 6, following its consideration of the submissions received on this paper.

The Authority notes the steadily increasing annual growth rate in new connections of SSDG installations, and considers that the finalisation of this Part 6 review project is timely in supporting the efficient connection of this SSDG, which is in the long-term benefit of consumers.

Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
AS	Australian Standard
Authority	Electricity Authority
CBA	Cost-benefit analysis
CoC	Certificate of compliance
Code	Electricity Industry Participation Code 2010
DG	Distributed generation
DoC	Declaration of Conformity
NPV	Net Present Value
NZS	New Zealand Standard
RAG	Retail Advisory Group
September 2012 consultation paper	Consultation Paper - An Operational Review of Part 6 of the Code: Connection of Distributed Generation, 4 September 2012
SSDG	Small-scale distributed generation – i.e. Distributed Generation with a nameplate capacity not exceeding 10 kW
summary of submissions	Summary of Submissions Paper summarising submissions on the Consultation Paper - An Operational Review of Part 6 of the Code: Connection of Distributed Generation, 4 September 2012

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1. Introduction and purpose of this paper

1.1 Introduction

- 1.1.1 The Authority commenced an operational review of Part 6 of the Code in 2011. Part 6 provides for the connection of DG to local networks. To this point, the Authority has undertaken consultation with interested parties on the following papers:
- (a) *Pre-consultation: Connection of Distributed Generation*, 11 October 2011,¹ which introduced the project and sought input from interested parties to assist with development of the scope of the review
 - (b) *Consultation Paper - An Operational Review of Part 6 of the Code: Connection of Distributed Generation*, 4 September 2012,² which described a Code amendment proposal covering a range of detailed amendments to Part 6, and also discussed a number of additional questions relating to the connection of DG to networks (September 2012 consultation paper)".
- 1.1.2 The review of Part 6 has progressed alongside a separate, related work stream, undertaken by the Retail Advisory Group (RAG), which sought to investigate potential barriers facing consumers seeking to invest in small-scale distributed generation (SSDG), and develop options for dealing with these barriers.³ The RAG completed this work stream in July 2012.⁴
- 1.1.3 The Authority has published a Summary of Submissions paper⁵ (summary of submissions) that provides:
- (a) a summary of the submissions received on the September 2012 consultation paper
 - (b) the Authority's responses to those submissions.

¹ 11 October 2011 pre-consultation is available at: <http://www.ea.govt.nz/our-work/consultations/retail/pre-consultation-connection-of-distributed-generation/>.

² September 2012 consultation paper is at: <http://www.ea.govt.nz/our-work/consultations/retail/operational-review-part6/>.

³ Further information about the RAG's investigation is available on the Authority's website at this URL: <http://www.ea.govt.nz/our-work/consultations/advisory-group/investigating-barriers-small-scale-generation/>.

⁴ Final RAG report to the Authority is available at: <http://www.ea.govt.nz/our-work/programmes/market/distributed-generation/>.

⁵ Summary of submissions is available at: <https://www.ea.govt.nz/our-work/consultations/retail/operational-review-part6/submissions/>.

1.2 The purpose of this paper is to consult on a revised Code amendment proposal

1.2.1 The purpose of this paper is to consult with participants and persons likely to be substantially affected by amendments to Part 6 of the Code, including consequential amendments to Parts 1, 11 and 17 of the Code.

1.2.2 This paper:

- (a) provides revisions to the Code amendment proposals as a result of the Authority's consideration of feedback received on the September 2012 consultation paper
- (b) seeks submissions on the revised draft Code amendment proposal included with this paper.

1.3 Submissions should be received by 31 January 2014

The Authority's preference is to receive submissions in electronic format (Microsoft Word). It is not necessary to send hard copies of submissions to the Authority, unless it is not possible to do so electronically. Submissions in electronic form should be emailed to submissions@ea.govt.nz with "Consultation Paper—An operational review of Part 6 of the Code - second consultation" in the subject line.

If submitters do not wish to send their submission electronically, they should post one hard copy of their submission to the address below.

Submissions
Electricity Authority
PO Box 10041
Wellington 6143

Submissions
Electricity Authority
Level 7, ASB Bank Tower
2 Hunter Street
Wellington

Tel: 0-4-460 8860

Fax: 0-4-460 8879

1.3.1 Submissions should be received by 5 pm on 31 January 2014. Please note that late submissions are unlikely to be considered.

- 1.3.2 The Authority will acknowledge receipt of all submissions electronically. Please contact the Submissions Administrator if you do not receive electronic acknowledgement of your submission within two business days.
- 1.3.3 If possible, submissions should be provided in the format shown in Appendix A. Your submission is likely to be made available to the general public on the Authority's website. Submitters should indicate any documents attached, in support of the submission, in a covering letter and clearly indicate any information that is provided to the Authority on a confidential basis. However, all information provided to the Authority is subject to the Official Information Act 1982.

2. Background to this review

2.1 Recap of progress made to date

- 2.1.1 The Authority provided a comprehensive background to this technical and operational review of Part 6 of the Code in the September 2012 consultation paper.⁶
- 2.1.2 The purpose of Part 6 is “...to enable connection of **distributed generation** if connection is consistent with **connection and operation standards**”.⁷ Part 6 includes a default set of terms and conditions governing the connection and operation of DG, where the distributor and the DG owner are unable (or one or both parties are unwilling) to negotiate a connection agreement, or both parties explicitly or tacitly agree to be governed by regulated terms.
- 2.1.3 The Authority commenced the review after becoming aware of a number of operational issues with Part 6. Issues had been raised by distributors, distributed generators, interested parties and the Authority itself. Submissions on the October 2011 pre-consultation paper provided a further reference point for the issues that the review needed to cover.
- 2.1.4 The September 2012 consultation paper proposed a range of Code amendments, and included the following:
- (a) a new simplified connection process for standards-compliant SSDG under a new Part 1A of Schedule 6.1
 - (b) a range of detailed technical amendment proposals throughout Part 6, including some consequential amendments to Parts 1 and 17. These proposed amendments sought to improve the clarity of Part 6, correct obvious drafting errors, address further relevant matters that were not originally provided for, and remove redundant provisions.

2.2 How this paper is structured

- 2.2.1 This paper follows on from the September 2012 consultation paper and the summary of submissions paper, and progresses the review of Part 6 of the Code to the next stage.
- 2.2.2 This paper uses the structure set out in Table 1.

⁶ See footnote 2 for further details.

⁷ The bolded terms in this paragraph are defined terms in the Code.

Table 1: Structure of this paper

Section	Contents
3	A revised proposal to introduce a new Part 1A into Schedule 6.1 of the Code. The Authority has developed this revised proposal after considering submissions received on the September 2012 consultation paper.
4	A revised proposal to make technical and operational amendments to Parts 1, 6, 11 and 17 of the Code. The Authority developed these revised proposed amendments after considering submissions received on the September 2012 consultation paper.
Appendix A	A summary of the questions included in this paper and format for submissions.
Appendix B	The revised draft Code amendments to Parts 1, 6, 11 and 17.
Appendix C	A cost-benefit analysis (CBA) of the proposal to introduce a new Part 1A into Schedule 6.1, developed against the counterfactual of not introducing the proposed amendment.

3. Proposal to introduce a revised SSDG connection process

3.1 The Authority has developed a revised proposal

- 3.1.1 Having considered the views submitted on the September 2012 consultation paper, the Authority remains of the view that a standardised, simplified connection process for standards-compliant SSDG would have efficiency benefits when compared against the counterfactual, which is to retain the status quo.
- 3.1.2 The Authority remains of the view that non-notified SSDG connections are a safety issue for distributors. That discussion is not duplicated in this consultation paper.
- 3.1.3 The Authority expects that the proposed introduction of a new Part 1A connection process would contribute to an increase in the proportion of properly notified SSDG connections, by making compliance easier for SSDG owners and installers. However, the revised proposal developed in this paper does not rely solely on this benefit.
- 3.1.4 The Authority acknowledges that a more simplified connection process for standards-compliant SSDG is unlikely, on its own, to resolve the problem of non-notified SSDG connections. Other initiatives, in particular initiatives that promote education and awareness amongst key stakeholders, are also important but are not appropriate for incorporation in the Code.

3.2 The efficiency of processing standards-compliant SSDG connection applications

- 3.2.1 The Authority considers that the current process set out in Part 1 of Schedule 6.1 of the Code for connecting SSDG is inefficient if an applicant seeks to connect certain standards-compliant SSDG equipment.
- 3.2.2 In some cases, distributors have modified the existing process set out in Part 1 of Schedule 6.1,⁸ but there is no consistent national approach relating to standards-compliant SSDG. This is inefficient because each distributor will need to research and develop its own approach, and installers operating across multiple networks will need to comply with multiple application processes.

⁸ For example, it is understood that some distributors have streamlined the Part 1 process by requiring less information if the connection equipment meets certain standards, as well as providing faster turnaround for such applications.

There are two potential solutions

Option one is to introduce the proposed revised Part 1A of Schedule 6.1 into the Code

- 3.2.3 Introducing the proposed revised Part 1A into Schedule 6.1 of the Code would standardise the connection application and approval process where an SSDG system incorporates an inverter that has received a Declaration of Conformity with AS 4777, and complies with other safety requirements (conforming SSDG).

Option two is not to introduce the proposed Part 1A of Schedule 6.1 into the Code

- 3.2.4 This option retains the status quo, which would oblige applicants to continue to use the existing process under Part 1 of Schedule 6.1 for connection of all SSDG systems and, in some cases, individual distributors develop their own variations to the Part 1 process (within the constraints that exist within the Code).

Option one is the Authority's preferred solution

- 3.2.5 The Authority considers it would be more efficient to introduce:
- (a) a streamlined process to connect conforming SSDG installations, as compared with the existing Part 1 process
 - (b) a nationally consistent process applying across all distribution networks.
- 3.2.6 A regulated solution would promote certainty for investors and installers of conforming SSDG, particularly for installers that operate across multiple local networks. A regulated solution would also promote certainty for distributors, equipment importers and SSDG system designers.
- 3.2.7 As option two is the status quo, it would not provide any improvement to the existing situation, and would continue to encourage a range of ad hoc approaches. Option one is expected to resolve the problems that have been identified with the current connection process, and is the Authority's preferred solution.

3.3 Regulatory Statement relating to the revised proposal for Part 1A of Schedule 6.1

The objective is a streamlined connection application process

- 3.3.1 The Authority proposes that a new approval process for connecting SSDG (i.e. DG with a nameplate capacity not exceeding 10 kW) be added into Schedule 6.1 as a new Part 1A.
- 3.3.2 This revised proposal for a new Part 1A uses the original proposal outlined in the September 2012 consultation paper as its foundation, but draws on points raised in submissions to that paper.
- 3.3.3 At an overview level, the revised proposal for Part 1A replaces the post-connection notification process set out in the September 2012 consultation paper with a streamlined pre-connection application process for conforming SSDG.
- 3.3.4 The primary feature of an SSDG system that would qualify it to use this proposed Part 1A process for connection is an inverter that conforms to AS 4777 within an SSDG system installed in accordance with the Electricity (Safety) Regulations 2010.
- 3.3.5 The inverter is the device that provides the electrical interface between the electricity generator and the local network.⁹
- 3.3.6 Inverters sold for use in network-connected SSDG systems are type-tested against the requirements of a relevant international standard. Australia and New Zealand have adopted AS 4777–2005 as the primary standard. Using an inverter that conforms with AS 4777 should address distributors' safety and power quality concerns.

The detail of the Authority's revised Part 1A proposal for Schedule 6.1

- 3.3.7 The application must be completed by the distributed generator.
- 3.3.8 A distributed generator, with a conforming SSDG installation may, at its discretion, apply to the distributor for approval under Part 1A instead of Part 1 provided that:

⁹ An inverter is an electrical appliance that converts low voltage, direct current (DC) electricity, such as would be generated by an array of solar PV panels, into low voltage, alternating current (AC) electricity at a voltage and frequency that matches the local electricity supply (in New Zealand, this is nominally 230 volts single phase, 50 Hertz). In addition, the inverter performs a number of important safety and power quality functions, so that the generated electricity causes no harm to people or other electrical equipment or adversely impacts the quality of supply provided by the local network.

- (a) the SSDG is designed and installed in accordance with AS 4777
- (b) the SSDG incorporates an inverter that has been type-tested and issued a Declaration of Conformity (DoC) with all relevant parts of AS 4777 by a laboratory with accreditation issued or recognised by International Accreditation New Zealand¹⁰
- (c) the SSDG has protection settings that meet the distributor's connection and operation standards
- (d) the SSDG installation has been issued a certificate of compliance (CoC) under the Electricity (Safety) Regulations 2010.¹¹

3.3.9 To approve a connection under Part 1A, the distributor would need to be reasonably satisfied that the conforming SSDG meets the requirements in paragraph 3.3.8. It is proposed that every distributor would be required to publish on its website a register of the make and model of every inverter that the distributor had previously approved for connection to that distributor's network. The register would be required to identify the specific AS 4777 edition that was used for conformance testing of each inverter (e.g. AS 4777–2005).

3.3.10 Under the proposal, every distributor would be required to publish on its website a list of all specific locations on its network that are currently known to be subject to export congestion¹² (or reasonably expected to become subject to export congestion within the next 12 months) and, hence, unable to accept additional export of electricity from DG connections at specific times. Congested parts of the network could be identified with reference to districts, suburbs, feeders, streets or street addresses, such as may be relevant, to clearly indicate to a reasonable person that a point of connection of DG to the network may be subject to export congestion.

3.3.11 The list would also be required to provide contact information for follow up enquiries relating to connection of DG.

¹⁰ Having a DoC issued and specified protection settings applied provides the distributor with assurance that the inverter will operate safely and reliably when the DG is connected to the distribution network. Furthermore, the DoC includes compliance with Australian Standard (AS) /New Zealand Standard (NZS) 3100 (covering general requirements for electrical equipment) and a range of standards relating to electromagnetic compatibility.

¹¹ Having a CoC issued by a person authorised under the Electricity (Safety) Regulations 2010 provides assurance that the SSDG meets the relevant safety requirements set out in those regulations.

¹² Export congestion occurs where an additional unit of electricity injected into the network would directly cause a component in the network (e.g. a circuit or a transformer) to operate beyond its rated maximum capacity or give rise to an unacceptably high level of voltage at the point of connection to the network.

- 3.3.12 It is proposed that the distributed generator may connect new SSDG (or increase the nameplate capacity of an existing installation) within an area of the network subject to export congestion, but may be subject to export restrictions at certain times. A distributed generator that never exports excess generation into the network (because all of the generated electricity is consumed within the premises at all times) would be unaffected by network export congestion restrictions.
- 3.3.13 If AS 4777.2 is revised and reissued, the proposal is that an SSDG installation connected under a previous edition may remain connected to the distribution network, provided that it continued to meet the original conditions for connection. New applications under Part 1A made after the date of publication of any revision to AS 4777.2 may be made under the previous edition of AS 4777.2 for a further period of 12 months (or more at the distributor's discretion). This is intended to allow an orderly transition to a new edition of the standard, including allowing for clearance of inverter stock that received a DoC to the earlier edition of AS 4777.2, while providing time for inverters that conform to the new edition of the standard to become available in the market.
- 3.3.14 If the distributed generator applies for connection under Part 1A then the application would specify which of the following circumstances apply. Either:
- (a) connection to the distribution network is sought for a new SSDG installation;
 - (b) continued connection is sought for an existing SSDG connection if a connection contract is in force or has expired;
 - (c) continued connection is sought for an existing SSDG connection that has not previously been connected under a connection contract; or
 - (d) a change¹³ in nameplate capacity or fuel type is sought for an existing SSDG connection.
- 3.3.15 The application would need to include the following information:
- (a) the name and contact details of the distributed generator and, if applicable, the distributed generator's system installer
 - (b) the ICP identifier that applies to the SSDG
 - (c) the physical location (i.e. the location of the SSDG within the premises) of the SSDG installation

¹³ To enable the distributor to meet the requirement under clause 8(1) of Schedule 11.1 in respect of a change in nameplate capacity, the distributor needs to be made aware of any changes (both increases and decreases) to the nameplate capacity of the ICP.

- (d) the SSDG fuel type (e.g. solar, wind, hydro or liquid fuel)
 - (e) the make and model of inverter to be installed and information as to whether the inverter:
 - (i) is included on the distributor's published register of approved inverters; or
 - (ii) is not included on the distributor's published register of approved inverters, in which case the application must include, in respect of the inverter that is to be installed, a copy of the DoC with AS 4777.
 - (f) evidence of the SSDG installation's conformance with the protection settings specified in the distributor's connection and operation standards for SSDG systems
 - (g) when available, a copy of the CoC for the SSDG installation issued under the Electricity (Safety) Regulations 2010.
- 3.3.16 It is proposed that the application would be required to be accompanied by payment of any application fee specified by the distributor, up to the limit provided in Schedule 6.5.
- 3.3.17 The regulated terms for the connection of DG set out in Schedule 6.2 would apply, but the parties may agree to substitute negotiated terms in place of the regulated terms.
- 3.3.18 It is proposed that the distributed generator may connect the conforming SSDG installation to the network if:
- (a) it receives a notice of approval from the distributor; or
 - (b) it receives no notice from the distributor within 10 business days from the date on which the application was submitted, in which case the distributor's approval is implied.
- 3.3.19 Under the proposed new Part 1A process, the distributor would have 10 business days from the date on which the application was submitted in which to notify the distributed generator of deficiencies in the application. Deficiencies in the application include:
- (a) the SSDG does not meet the qualification criteria for processing under Part 1A
 - (b) the SSDG differs from the information provided in the application submitted by the distributed generator
 - (c) the documentation submitted by the distributed generator is incomplete.

- 3.3.20 If the intended point of connection is in a part of the network subject to export congestion (as per paragraph 3.3.10), the distributor must take reasonable steps to work with the distributed generator to assess whether solutions exist to mitigate the export constraint. Resolution may include restricting export to certain time periods.
- 3.3.21 Under the proposed new Part 1A, the distributor may inspect the SSDG installation for the purposes of verifying:
- (a) that the SSDG meets, or continues to meet, the requirements for connection
 - (b) the information provided in the distributed generator's connection application.
- 3.3.22 If the distributor wishes to carry out such an inspection, it must give the distributed generator at least two business days' notice of the time and date of the inspection.
- 3.3.23 It is also proposed that, if the distributor notifies the distributed generator that it does not meet the criteria for connection, either as part of the application process or as a result of an inspection, then if the SSDG:
- (a) is not connected, the notice may, at the distributor's discretion, prohibit the distributed generator from connecting the SSDG; or
 - (b) is connected to the distribution network, the distributed generator must remedy the deficiency. If the distributed generator does not remedy the deficiency to the distributor's reasonable satisfaction within 10 business days, the distributor may require the distributed generator to disconnect the SSDG within a reasonable timeframe specified by the distributor.
- 3.3.24 Under the proposal, if the distributor has disconnected SSDG for failure to remedy a deficiency, the distributor must reconnect the SSDG if the deficiency is remedied to the distributor's reasonable satisfaction within 12 months (or a longer period of time if this is mutually agreed by the parties) of the date on which the DG was disconnected, without the need for the distributed generator to follow the application process again. If the distributed generator elects to remedy the deficiency, the distributor may charge the appropriate fee(s) up to the limit set out in Schedule 6.5.¹⁴
- 3.3.25 It is proposed that the prescribed maximum fees for applications processed under Part 1A in Schedule 6.1 would be:

¹⁴ Potentially requiring payment of a resubmission and inspection fee reflects the additional cost incurred by the distributor and provides an incentive for the distributed generator to submit complete and compliant documents in its application for connection.

- (a) \$100 (excluding GST) for making an application for connection
- (b) \$80 (excluding GST) for processing information related to the remedy of a deficiency in the notice or the information that accompanies the notice
- (c) \$60 (excluding GST) for an inspection of the SSDG, if the distributor requires an inspection.

3.3.26 A draft Code amendment for the proposed Part 1A process in Schedule 6.1 is provided in Appendix B.

3.3.27 If the proposed Part 1A of Schedule 6.1 does proceed, the Authority considers that the Code amendment should come into force six months from the date that the amendment is published in the New Zealand Gazette. The six month window would enable distributors to:

- (a) create business processes and forms relating to the proposed new Part 1A process in Schedule 6.1
- (b) modify existing application forms
- (c) modify existing guidance material
- (d) identify any export constrained parts of their network and publish this information on their websites
- (e) publish a schedule of approved inverters on their websites
- (f) publish any new and revised documentation on their websites and make them available at their offices.

Statement of the objectives of the proposed amendment

3.3.28 The objective of the proposed Part 1A of Schedule 6.1 is to:

- (a) improve the efficiency of the current Part 1 connection process in relation to conforming SSDG installations
- (b) increase the proportion of connections of SSDG systems that are notified to distributors, which will decrease the likelihood that substandard, potentially hazardous SSDG will be connected to distribution networks.

Evaluation of the costs and benefits of the proposed amendment

Competition

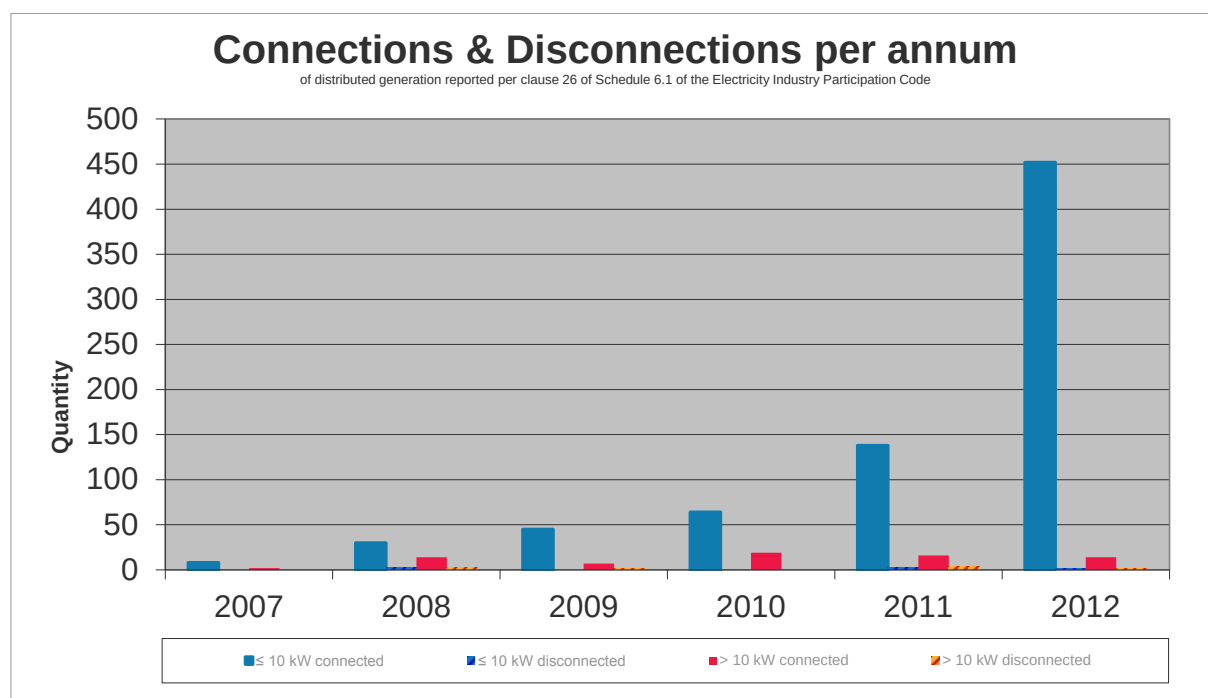
3.3.29 The proposed Part 1A process under Schedule 6.1 would lower compliance costs when connecting conforming SSDG that has been installed and tested in accordance with relevant regulations. The proposal avoids both the inefficient situation in which all 29 distributors develop

individual approaches, and the additional unnecessary work for applicants to apply under the Part 1 process. These two outcomes promote competition in the generation market by standardising a connection approvals process nationally, which would lower a barrier to market entry for distributed generators.

Reliability

- 3.3.30 Connecting SSDG that meets relevant standards decreases the likelihood that nearby consumers might encounter power quality related issues arising from poorly designed and installed SSDG.
- 3.3.31 SSDG that complies with relevant standards and has an inverter with voltage and frequency trip settings set to the distributor's specifications is more reliable than SSDG that does not comply with relevant standards or that has inappropriate voltage and frequency trip settings applied.
- 3.3.32 Given the total number of SSDG installations currently connected, this benefit would be very small. However, when aggregated across several thousand SSDG installations, as looks likely to eventuate over time based on current growth trends, the benefit would become more significant on a system-wide basis. Figure 1 shows the accelerating number of SSDG connections since the introduction of the DG Regulations in 2007 (the solid blue bars).

Figure 1: DG connection statistics



Source: Electricity Authority summary of annual distributor returns of DG connections

- 3.3.33 SSDG that is not notified to distributors may pose serious safety risks to consumers, electricity workers and the public. While not specifically within the Authority's statutory functions, the extent that aspects of the Code may frustrate safe outcomes by making the application process onerous is a matter that the Authority should consider when performing its functions. Safe supply is related to reliable supply.

Efficiency

- 3.3.34 The proposed Part 1A of Schedule 6.1 would promote efficiency by decreasing transaction costs for both distributed generators and distributors (which ultimately benefits consumers if these lower costs are reflected in the cost of electricity) for a significant subset of DG connection applications. Compared with the current process in Part 1 of Schedule 6.1, the number of required information exchanges between the parties under the proposed Part 1A process would reduce from four to one in the case of a complete and compliant initial application.¹⁵ Each notice requires time and effort to prepare, send, receive, consider and act upon, so reducing the required number of information exchanges increases efficiency.
- 3.3.35 Decreasing the turnaround time on an application approval from 30 business days (Part 1 process under Schedule 6.1) to 10 business days (proposed Part 1A of Schedule 6.1) would enable conforming SSDG systems to be commissioned and connected earlier than they otherwise would have been. This would enable the investment benefits to accrue more quickly to the distributed generator.
- 3.3.36 The proposed Part 1A of Schedule 6.1 should also decrease the scope for disputes and delays between distributed generators and distributors by providing a robust and universal process for dealing with straightforward conforming SSDG connections. This would provide a particular benefit to SSDG service providers that service clients across multiple distribution networks; a benefit that would be expected in time to pass on to SSDG investors through lower SSDG system prices.
- 3.3.37 Against these benefits, the proposed Part 1A of Schedule 6.1 would introduce some one-off and on-going costs to distributors by requiring them to modify their existing DG connection processes and publish

¹⁵ The Part 1 process, assuming it leads to a connected DG installation, requires (1) an application by the distributed generator, (2) an approval from the distributor, (3) a notice of intention to proceed from the distributed generator and (4) a notice of intention to test and inspect from the distributed generator. In addition, the parties must attempt to negotiate a connection contract in good faith. In contrast, the proposed simplified process would only require an application for connection from the distributed generator. Approval would be implied if the distributor made no further contact within 10 business days of the date of application. Negotiation of a connection contract would be optional and likely not pursued in the majority of cases.

updated guidance material and approved inverter makes and models. Once that is done, administrative costs for processing new Part 1A applications would be less than applications processed for approval under Part 1.

3.3.38 The Authority considers that the proposed fee structure would not affect allocative efficiency, assuming that:

- (a) the current prescribed maximum fees set out in Schedule 6.5 are appropriate
- (b) the proposed maximum fee for a connection under the Part 1A process of Schedule 6.1 (\$100) is representative of the relative reduction in transaction costs compared to the costs that would be incurred if the connection were progressed under the process for approval in Part 1 of Schedule 6.1 (for which the prescribed maximum fee is \$200).

3.3.39 The Authority notes that some distributors have opted not to charge a fee for processing applications for connection of SSDG under Part 1 of Schedule 6.1 and considers that others may follow this approach in respect of the proposed, simpler process under Part 1A of Schedule 6.1.

Assessment of risks of the proposed amendment

3.3.40 The Authority has considered the risks associated with the introduction of the proposed Part 1A process under Schedule 6.1.

3.3.41 The risks considered include:

Risk	Mitigation	Impact
Use of a non-guaranteed communication method ¹⁶ can result in applications for connection not being received by the distributor.	The Authority considers that this risk is negligible. If this risk became material distributors could implement an application acknowledgement system that would prompt applicants to contact them if they did not receive the acknowledgement or as a last resort, implement a guaranteed delivery	This risk may give rise to more non-notified connections because of the implied consent if there is no response within 10 days. This creates risks associated with the safe operation of the network and compliance risks regarding the distributor's obligation

¹⁶ An example of a non-guaranteed communication method is e-mail.

Risk	Mitigation	Impact
	communication method.	to update the registry. However, these risks already exist if SSDG owners do not even apply.
Applicants may leverage the proposed Part 1A process for the connection of a large number of SSDG installations at one time. ¹⁷	The Authority has considered this issue when drafting the proposed Code amendments. The streamlined process under the proposed Part 1A will only apply to individual connections.	Large scale installation of DG may create congestion where congestion did not previously exist. Large scale installation of DG may require distributors to dedicate additional resource to reviewing applications within the prescribed timeframes. However, the cost of this extra resource would be offset by the efficiencies gained through processing a large number of applications with similar requirements, as would be the case with multiple applications for SSDG in close geographical proximity.
Implementation period is too short to allow distributors to meet revised obligations.	Provide a suitable implementation period. It is noted that the responses to the consultation paper <i>Consultation Paper - An Operational Review of Part</i>	An implementation period that is too short may lead to unintended non-compliance by distributors as they develop their systems and processes to meet

¹⁷ For example a developer installing DG on an entire sub-division.

Risk	Mitigation	Impact
	<i>6 of the Code: Connection of Distributed Generation</i> , 4 September 2012 supported an implementation period of between three and six months.	the revised obligations.

- 3.3.42 The Authority considers that these risks are negligible and that options exist to mitigate them should they arise.

Evaluation of alternative means of achieving the objectives of the proposed amendment

- 3.3.43 The Authority considered the following two alternatives to the proposed Part 1A of Schedule 6.1.

- (a) Require the distributed generator to provide less or more information in the connection application to the distributor.

The Authority believes that the information that the distributed generator would be required to provide under the proposed Part 1A of Schedule 6.1 creates an optimal balance between:

- (i) ensuring that the distributor has sufficient information to determine whether the SSDG is compliant with Code requirements (and to meet its own Code obligations)
 - (ii) minimising the transaction costs that the distributed generator and the distributor respectively would incur in preparing and considering an application.
- (b) Require the distributed generator to provide the information specified in the proposed Part 1A of Schedule 6.1, but instead of requiring the distributed generator to obtain the distributor's approval prior to connection, allow the distributed generator to connect the SSDG on notice to the distributor.

This option is essentially the option proposed in the September 2012 consultation paper. The Authority rejected it as a result of submissions as it would not provide the distributor with prior notice of the connection. Prior notice of a connection of SSDG is important to distributors for safety and operational purposes. It also enables the distributor to notify the distributed generator of any connection concerns before connection occurs.

Assessment under section 32(1) of the Act

3.3.44 Section 32(1) of the Act provides that Code provisions must be consistent with the Authority's objective and be necessary or desirable to promote any or all of the following:

- (a) competition in the electricity industry
- (b) the reliable supply of electricity to consumers
- (c) the efficient operation of the electricity industry
- (d) the performance by the Authority of its functions
- (e) any other matters specifically referred to in the Act as a matter for inclusion in the Code.

3.3.45 The table below sets out an assessment of the proposed amendment against the requirements of section 32(1) of the Act.

Section 32(1) requirements:	Response
The proposed amendment is consistent with the Authority's objective under section 15 of the Act, which is as follows:	
(a) to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.	The proposal is consistent with the Authority's statutory objective because it promotes competition by reducing the barriers to entry for DG. It likewise promotes reliability by providing a streamlined connection process for conforming DG. The proposal also promotes efficiency by reducing the transaction costs for distributed generators and distributors when connecting conforming DG; all of which is to the long-term benefit of consumers. As concluded in paragraph 3.3.55 the benefits of the proposal are considered to materially exceed the costs imposed.
The proposed amendment is necessary or desirable to promote any or all of the following:	
(b) competition in the electricity industry	The proposal promotes competition, as set out in paragraph 3.3.29.

(c) the reliable supply of electricity to consumers	The proposal promotes reliable supply, as set out in paragraphs 3.3.30 – 3.3.33.
(d) the efficient operation of the electricity industry	The proposal promotes efficiency, as set out in paragraphs 3.3.34 – 3.3.39.
(e) the performance by the Authority of its functions	The proposal is not considered to promote the Authority's performance of its functions.
(f) any other matter specifically referred to in the Act as a matter for inclusion in the Code.	The proposal is not considered to promote any other matter specifically referred to in the Act as a matter for inclusion in the Code.

Assessment against the code amendment principles

- 3.3.46 When considering amendments to the Code, the Authority is required by its Consultation Charter to have regard to the following Code amendment principles, to the extent that the Authority considers they are applicable.
- 3.3.47 *Principle 1 – Lawfulness:* The Authority and its advisory groups will only consider amendments to the Code that are lawful and that are consistent with the Authority's statutory objective.
- 3.3.48 The Authority considers that the proposal is lawful.
- 3.3.49 *Principle 2 – Clearly Identified Efficiency Gain or Market or Regulatory Failure:* Within the legal framework specified in Principle 1, the Authority and its advisory groups will only consider using the Code to regulate market activity when:
- (a) it can be demonstrated that amendments to the Code will improve market efficiency;¹⁸
 - (b) market failure is clearly identified, such as may arise from market power, externalities, asymmetric information and prohibitive transaction costs; or
 - (c) a problem is created by the existing Code, which either requires an amendment to the Code, or an amendment to the way in which the Code is applied.

¹⁸ Where efficiency refers to allocative, productive and dynamic efficiency, and improvements to efficiency include, for example, a reduction in transaction costs or a reduction in the scope for disputes between industry participants.

- 3.3.50 The Authority considers that the proposed Part 1A of Schedule 6.1 will improve market efficiency for the long-term benefit of consumers. In particular, the proposed Part 1A would provide a more streamlined process that will decrease transaction costs for both distributed generators and distributors, if SSDG that complies with relevant standards and regulations is installed, tested, and approved for connection to a distribution network. The Authority considers that all consumers would benefit from a more competitive generation market in which entry barriers are lowered for conforming SSDG.
- 3.3.51 *Principle 3 – Quantitative Assessment:* When considering possible amendments to the Code, the Authority and its advisory groups will use quantitative cost-benefit analysis to assess long-term net benefits for consumers, to the extent that they consider appropriate in each case. This approach means that competition and reliability are assessed solely in regard to their economic efficiency effects. Particular care will be taken to include dynamic efficiency effects in the assessment, and the assessment will include sensitivity analysis when there is uncertainty about key parameters.
- 3.3.52 A quantitative assessment of the benefits and costs of the proposal is set out in Appendix C.
- 3.3.53 The quantitative assessment does not consider the impact of any competition benefits. As a result, the Net Present Value (NPV) is likely to be understated.
- 3.3.54 The high net benefits case produces a positive NPV of \$3.3 million. The low net benefits case produces a positive NPV of \$0.9 million.
- 3.3.55 The assessment concludes that the expected benefits of introducing a new process into the Code under the proposed Part 1A of Schedule 6.1 would materially exceed the costs that the proposed process would give rise to.

- Q1. Do you agree that the proposed Code amendment to introduce a lower cost connection process promotes the Authority's statutory objective? If not, please explain why not.**
- Q2. What improvements, if any, should the Authority consider to the process proposed under Part 1A of Schedule 6.1?**

4. The Code amendment proposal is updated

4.1 Recap of the proposal

- 4.1.1 The September 2012 consultation paper proposed a number of detailed technical and operational amendments to Parts 1, 6 and 17 of the Code. The need for each proposed amendment was either:
- (a) raised in pre-consultation feedback;
 - (b) communicated to the Authority at an earlier date; or
 - (c) identified by the Authority in its own review of Part 6.
- 4.1.2 The proposed technical and operational amendments were set out in Table 5 in Appendix D of the September 2012 consultation paper. Each proposed amendment included a brief rationale.

4.2 The Authority has revised some of its technical and operational amendment proposals

- 4.2.1 The Authority summarised submissions received on the technical and operational Code amendment proposals in the summary of submissions. The Authority also provided its responses to submissions in that paper.
- 4.2.2 Submissions broadly supported the approach taken by the Authority to propose the large number of technical and operational amendments. Therefore, the regulatory statement provided in the September 2012 consultation paper will not be repeated in this paper.
- 4.2.3 Where the Authority considered that the draft Code amendment proposed in the September 2012 consultation paper should be modified in response to a particular submission, the Authority has redrafted the relevant proposed Code amendment.
- 4.2.4 The revised proposed Code amendments are provided in Appendix B and the Authority seeks submissions from interested parties.

Q3. Do you have any comments relating to the proposed Code amendments that have resulted from the Authority's review of Part 6? Please provide comments and suggested drafting improvements with reference to specific parts, schedules and clauses of the draft Code amendments set out in Appendix B.

Appendix A Format for submissions

Question No.	Question	Response
Q1	Do you agree that the proposed Code amendment to introduce a lower cost connection process promotes the Authority's statutory objective? If not, please explain why not.	
Q2	What improvements should the Authority consider to the proposed process under Part 1A of Schedule 6.1?	
Q3	Do you have any comments relating to the proposed Code amendments that have resulted from the Authority's review of Part 6? Please provide comments and suggested drafting improvements with reference to specific parts, schedules and clauses of the draft Code amendments set out in Appendix B.	

Appendix B Proposed Code amendments

- B.1 The proposed amendments to Parts 1, 6, 11 and 17 of the Code have been published as a separate document. This document is available on the Authority's website, alongside this consultation paper.
- B.2 Copies of the current Code are available at <http://www.ea.govt.nz/act-code-regs/code-regs/the-code/>.

Appendix C Quantitative cost-benefit analysis for the proposed process under Part 1A of Schedule 6.1

There are net benefits in respect of productive efficiency

- C.1 This appendix sets out the assumptions and methodology that support the conclusion that introduction of the proposed Part 1A connection application process into Schedule 6.1 would have positive net benefits.
- C.2 The analysis considers efficiency considerations only. Competition and reliability benefits are discussed qualitatively in the body of the paper starting at paragraph 3.3.29.
- C.3 Figure 2 sets out the assumptions used in the analysis. The counterfactual is that the proposed Part 1A of Schedule 6.1 is not introduced, and consequently that applications continue to be processed under Part 1 of Schedule 6.1 (which is a defined process with a required sequence of steps that must be followed).

Figure 2: Assumptions used in the CBA

Notes	ASSUMPTIONS								
1		High net benefits case				Low net benefits case			
	Benefits	high benefits				low benefits			
		number	unit	rate	total	number	unit	rate	total
2	reduced transactions between applicant and distributor	3 transactions		\$50	\$150	2 transactions		\$50	\$100
3	delay in commissioning SSDG	28 days		\$2.50	\$70	14 days		\$2.50	\$35
4	reduced system cost				\$100				\$50
	Total per connection benefits				\$320				\$185
	Costs	low costs				high costs			
5	costs for distributors (annual)				\$1,000				\$3,000
	Total per distributor costs				\$1,000				\$3,000
	Costs	low costs				high costs			
6	costs for Authority (one off)				\$8,000				\$10,000
	Total Authority costs				\$8,000				\$10,000
	Discount factor	8%							
	NPV years	10							
7	Connection growth rate (high)	300		linear at current rate of increase					
7	Connection growth rate (low)	200		linear at 50% slower than current rate of increase					
8	Benefits in year 1?	no							

- C.4 All amounts in Figure 2 are in 2013 dollars.

- C.5 Explanations of the note references in the first column in Figure 2 are as follows:
- C.5.1 Note 1: The analysis considers two cases to test sensitivities to input assumptions: high net benefits and low net benefits:
- (a) “High net benefits” combines high benefits with low costs
 - (b) “Low net benefits” combines low benefits and high costs.
- C.5.2 Note 2: The proposed process under Part 1A of Schedule 6.1 would reduce transaction costs by lowering the amount of analysis a distributor would need to undertake. This proposed process would also reduce the number of application/notification exchanges, as compared with the process under Part 1 of Schedule 6.1.
- C.5.3 Note 3: The proposed process under Part 1A of Schedule 6.1 would avoid the delay in commissioning an SSDG installation, which has the benefit of achieving commercial production earlier than is the case with the process under Part 1 of Schedule 6.1. The benefit is conservatively estimated by considering that a typical SSDG system (e.g. a 2.5 kWp solar PV system) could generate 10 kWh per day, avoiding the need to purchase the equivalent amount of grid-supplied electricity (10 kWh/day @ \$0.25/kWh = \$2.50/day).¹⁹
- C.5.4 Note 4: The proposed process under Part 1A of Schedule 6.1 would reduce the cost of SSDG systems by providing a nationally consistent process for connection applications that is less time consuming for installers.
- C.5.5 Note 5: Distributor costs accrue through having to establish an initial process and website documentation and maintaining this information on an on-going basis.
- C.5.6 Note 6: The Authority incurs some legal costs when amending the Code.
- C.5.7 Note 7: The rate of SSDG connection growth is shown in Figure 1. While it is evident that the growth rate observed over the past 5 years is significantly greater than linear, for simplicity we have made the conservative assumption that the growth rate will follow a linear growth trend over the next 10 years, set at an incremental +300 connections annually (high benefits) and +200 connections annually (low benefits).
- C.5.8 Note 8: We have assumed that no benefits will accrue in year one. This conservative assumption, used in both high and low benefits cases, reflects the likely reality that the effort in year one will focus on establishing the proposed new process under Part 1A of Schedule 6.1.

¹⁹ See, for example, EECA: <http://www.energywise.govt.nz/your-home/generating-your-own-energy/pv>.

C.5.9 Figure 3 shows the NPV calculations (constant 2013 dollars). The high net benefits case produces a positive NPV of \$3.2m. The low net benefits case produces a positive NPV of \$0.9m.

C.5.10 The analysis is very sensitive to the assumed connection growth rate, which, as note 7 pointed out, is set at a very conservative level based on current growth trends. The benefits of the proposed Part 1A process would scale significantly as SSDG installation rates increase, as is expected with the current downward trend in solar panel prices and observed increases in the price of grid supplied electricity. The Authority estimates that there would need to be a growth rate of at least 30 connections annually over 10 years in order to break even under the low net benefits scenario.

Figure 3: NPV calculations for high and low net benefits cases

High net benefits case										
	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10
connections	450	750	1050	1350	1650	1950	2250	2550	2850	3150
per connection benefits	\$0	\$0.32	\$0.32	\$0.32	\$0.32	\$0.32	\$0.32	\$0.32	\$0.32	\$0.32
total benefits (\$'000)	\$0	\$240	\$336	\$432	\$528	\$624	\$720	\$816	\$912	\$1,008
distributors	29	29	29	29	29	29	29	29	29	29
per distributor costs	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1
Authority (year 1)	\$8									
total costs (\$'000)	\$37	\$29	\$29	\$29	\$29	\$29	\$29	\$29	\$29	\$29
Net benefits (\$'000)	-\$37	\$211	\$307	\$403	\$499	\$595	\$691	\$787	\$883	\$979
NPV (\$'000)	\$3,125									

Low net benefits case										
	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10
connections	450	650	850	1050	1250	1450	1650	1850	2050	2250
per connection benefits	\$0	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19
total benefits (\$'000)	\$0	\$120	\$157	\$194	\$231	\$268	\$305	\$342	\$379	\$416
distributors	29	29	29	29	29	29	29	29	29	29
per distributor costs	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3
Authority (year 1)	\$10									
total costs (\$'000)	\$97	\$87	\$87	\$87	\$87	\$87	\$87	\$87	\$87	\$87
Net benefits (\$'000)	-\$97	\$33	\$70	\$107	\$144	\$181	\$218	\$255	\$292	\$329
NPV (\$'000)	\$850									

C.6 In summary, the Authority considers that the expected benefits of introducing a new process into the Code under the proposed Part 1A of Schedule 6.1 would materially exceed the costs that the proposed process would give rise to.